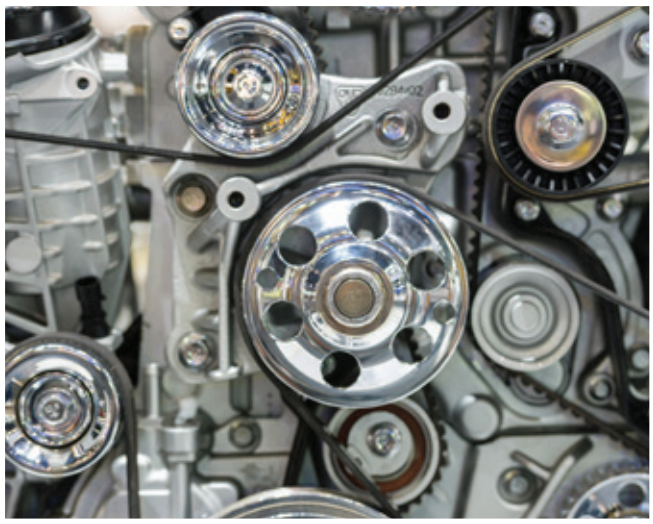


temperature humidity CO_2 level flow position


Product Catalogue 2024



SENSIT

extend your senses

SENSIT s.r.o. was founded in Roznov pod Radhostem in 1991. It was formed as association of natural persons SENSIT Roznov, in order to continue the development and designing capacities of the employees of Tesla Roznov, in the field of measurement and control. The name of SENSIT s.r.o. , which perfectly captures the line of business the company is engaged in, has been carried by the company since 1 January 2006.

At present, SENSIT s.r.o. is the leading manufacturer of sensors for temperature range from -200 °C to 1 200 °C and diameter of case from 1.0 mm in the Czech market. In recent years, company´s product range has expanded with humidity sensors, CO_2 sensors, level sensors, flow sensors and optical and inductive sensors.

A significant competitive advantage of SENSIT s.r.o. consists in its small-series production as well as single-part production. Its high flexibility in relation to requirements of customers enables the company to respond to the special needs of customers both in the composition of custom-made products and in time of performance.

SENSIT s.r.o. provides a higher level of quality of its products by means of sophisticated operation of cycling in 7 up to 10 cycles in the temperature range from -10 ° C to 80 °C in order to detect critical manufacturing defects. That operation is followed by a final calibration and an output inspection. The final end products is thus supplied in the guaranteed quality, which is reflected in a low percentage of justified complaints.

SENSIT s.r.o. meets requirements of standards EN ISO 9001, EN ISO 14001 and OHSAS 45001 for all areas of its activities, as evidenced by valid certificates.

Since 2001, SENSIT s.r.o. has included the Authorised Metrological Center authorised by the Office of Standards, Metrology and Testing (ÚNMZ) for the verification of measuring instruments. SENSIT s.r.o. has its own laboratory performing the calibration of its own products as well as similar products from other manufacturers.

Our products are compatible with the control systems from Siemens, Landis, Amit, Johnson Controls and other equally important companies specialising in the field of measurement and control. The sensors manufactured by SENSIT s.r.o. , in these systems as separate measuring elements, are standard and high-quality parts.

RNDr. Jan Janíček
SENSIT s.r.o. cofounder

The mission of SENSIT s.r.o. is to develop, manufacture and supply sensors for non-electric quantities.

Our goal is to provide a wide range of quality products, competitive prices and high quality services, including the provision of servicing and consultancy. Our priority commitment is to ensure our offered products and services optimally meet the expectations and requirements of our customers, positively influence their satisfaction and ensure the building of long-term partnerships.

In terms of development, production and utilization of sensors throughout their entire life cycle, we also deal with the issue of minimizing negative impacts on the environment and ensuring safety in production and actual use of these sensors.

To fulfil the specified mission, we rely on the following internal values of the company:

QUALITY

the high quality of processes ensures the flawlessness of the offered products and services

COSTS

by reducing input and operating costs we achieve competitive prices

SPEED

by improving the efficiency of processes we increase the speed of delivery of our products and services

RELIABILITY

by repeatedly verifying and testing basic properties, including compliance with current legislation, we ensure the reliability of our products and services

FLEXIBILITY

by selecting qualified, motivated and loyal employees we create conditions enabling us to respond flexibly to customer requirements

Ing. Petr Brzezina

CEO

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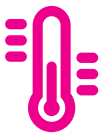
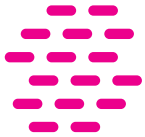

temperature


humidity


CO_2


level


flow


position

PRINCIPAL CLASIFICATION OF THE TEMPERATURE SENSORS

ACCORDING TO THE APPLICATION

- Paired temperature sensors – qualified meters
- Sensors for railway vehicles
- Sensors for heating systems control
- Sensors for machines and equipment
- Sensors for chemical industry
- Custom made production
- Sensors for food processing applications
- Sensors for air conditioning equipment
- Sensors applications for renewable resources
- Sensors for applications in rubber and plastic industries
- Sensors white goods and medical applications
- Sensors for science and research

ACCORDING TO THE SENSING ELEMENT TYPE

Nickel types
- Ni 1000 / 5000 (e.g. LANDIS)
- Ni 1000 / 6180 (e.g. SAUTER, SAIA, AMIT, TECO)
- Ni 891 (e.g. JOHNSON CONTROLS)
- T1 (e.g. STAEFA CONTROLS) = Ni 2226
- Ni 10000 / 5000 ■ Ni 10000 / 6180

Platinum types
- Pt 100 / 3850 ■ Pt 100 / 3911
- Pt 500 / 3850 ■ Pt 1000 / 3850

Thermistor types
- NTC 20 kΩ (e.g. HONEYWELL) ■ NTC 10 kΩ, etc.

Other types
- DALLAS 18B20 ■ KTY 81-X ■ KTY 83-X
- SMT 160-30 ■ ADT 7301 ■ TSic 20X / 30X

Thermocouple types
- typ K ■ typ J ■ typ T

ACCORDING TO THE OUTPUT SIGNAL

Resistance
- Pt, Ni ■ NTC ■ PTC ■ KTY

Current output
- output signal 4 to 20 mA

Voltage output
- output signal 0 to 10 V ■ according to the thermocouple type
- others (TSic, LM35)

Digital output
- MODBUS protocole ■ DS 18B20 ■ TSic ■ CAN protocole

INTERIOR TEMPERATURE SENSORS

007.17en

DESCRIPTION AND APPLICATION

These resistance sensors are designed for temperature measurement of gaseous substances in water-protected areas – e.g. for temperature measurement in rooms (schools, theatres, lecture halls, etc.), offices, interiors of residential houses or even production floors. Suitable design and high-quality material ensure that the sensors do not feel disturbing even in the interiors with high aesthetic requirements.

The temperature range of the sensors is -30 to 100 °C. The sensors meet ingress protection IP 30 according to EN 60529, as amended. Installation is recommended on an inner wall at the height of 1.5 m, in areas of movement of persons, at places not exposed to direct sunlight and not influenced by heat from walls, heating radiators or lighting.

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	NS 100	NS 101	NS 102	NS 300	NS 301
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-30 to 100 °C LEXAN				
Maximum measuring DC current	1 mA	1 mA	1 mA	0.3 mA	0.3 mA

Sensor type	NS 103	PTS 100	PTS 200	PTS 300	HS 100
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	termistor NTC 20 kΩ
Measuring range	-30 to 100 °C LEXAN				
Maximum measuring DC current	0.7 mA	2 mA	1.2 mA	0.8 mA	1 mW *)

**) maximum power consumption*

Sensor type	NS 500	NS 700	Note
Type of sensing element	Pt 1000/3850	Pt 1000/3850	
Output signal	4 to 20 mA	0 to 10 V	
Measuring ranges	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head: -30 to 70 °C
Power supply Ucc	12 to 30 V_{DC}	15 to 30 V_{DC}	recommended value NS 500: 12 V_{DC} NS 700: 15 V_{DC}
Max. load resistance Rs	150 Ω for Ucc = 12 V 700 Ω for Ucc = 24 V	> 10 k Ω	
Sensing element break	> 23 mA	> 10.5 V	
Sensing element short	< 3.5 mA	~ 0 V	

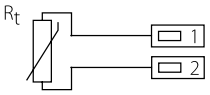
***) According to the customer's requirement, it is possible to provide a customized measuring range from -40 to 150 °C; the minimum span of the range must be 35 °C (e.g. -20 to 15 °C; -30 to 80 °C)*

OTHER PARAMETERS

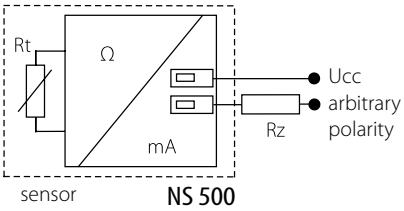
Accuracy class	Ni sensing elements: B class, t = ± (0.4 + 0.007t), for t ≥ 0; t = ± (0.4 + 0.028|t|), for t ≤ 0 in °C; Pt sensing elements: B class according to EN 60 571, t = ± (0.3 + 0.005|t|) in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Measuring error for NS 500 (range -30 to 70 °C)	power supply = 12 V: ±(0.5 °C + 0.2% from range) power supply = 24 V: (-0.2 to 0.80 °C) ± 0.2% from range
Measuring error for NS 700 (range -30 to 70 °C)	power supply = 15 V: ±(0.5 °C + 0.2% from range) power supply = 24 V: (-0.2 to 0.80 °C) ± 0.2% from range
Sensor connection	according to the wiring diagram
Time response	$\tau_{0.5}$ < 8 s (in air flow 0.4 m.s^{-1})
Recommended wire cross section	0.35 to 1.5 mm^2
Ingress protection	IP 30 in accordance with EN 60529, as amended
Material of the connection head	LEXAN
Dimensions of connection head	71.9 x 59 x 27 mm
Operating conditions	ambient temperature: -30 to 100 °C without converter -30 to 70 °C with a converter relative humidity: max 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa
Weight approximately	0.05 kg

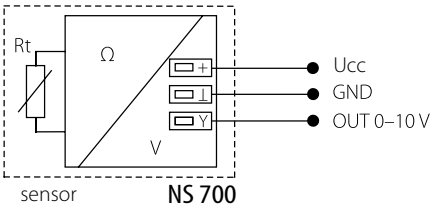
WIRING DIAGRAM

Resistance temperature sensor

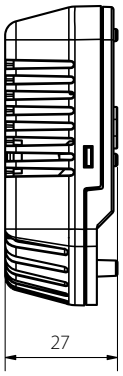


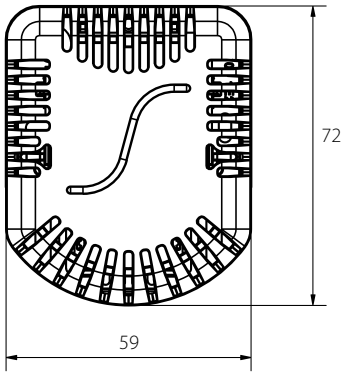
Sensors with converter



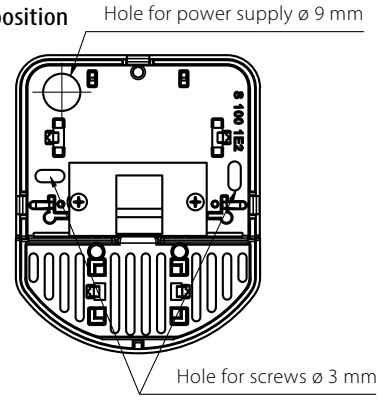


DIMENSIONAL DRAFT

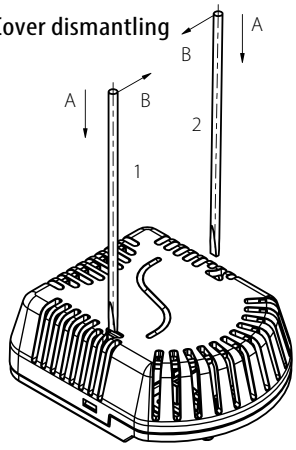




Operating position



Cover dismantling



MODIFICATION AND CUSTOMIZATION

- possibility of encasing two sensing elements
- possibility of encasing non-standard sensing elements (DALLAS, TSic, SMT, etc.) A class precision (with the exception Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, termistor NTC 20 k>10 k Ω)
- possibility of 3wire or 4wire connection
- possibility of providing custom temperature ranges for temperature sensors with converter

INTERIOR TEMPERATURE SENSORS IN ABB DESIGN

102.10en

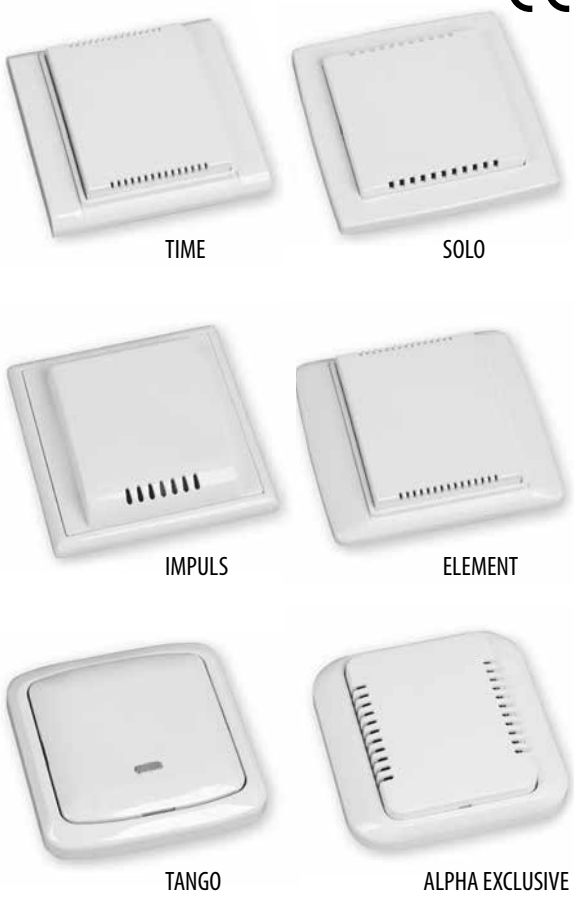
DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for temperature measurements in interiors and that is why they meet high aesthetic demands. Standard temperature operating range is between 5 and 55 °C (-20 to 75 °C for a short time).

The sensor design is based on the standard design of household wiring material of ABB - ALPHA EXCLUSIVE, IMPULS, SOLO, TANGO, TIME and ELEMENT. The standard colour for the ALPHA EXCLUSIVE line is alabaster. For SOLO, TANGO, ELEMENT and TIME – white, and alpine white for the IMPULS line.

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.



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, as amended) or in an Accredited laboratory.

According to customer´s requirements, sensors can be supplied in the designs of the following companies: SCHNEIDER, LEGRAND, UNICA.

SPECIFICATIONS

Sensor type	NS 100 xxxx	S 101 xxxx	NS 102 xxxx	NS 300 xxxx	NS 301 xxxx
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	5 to 55 °C (for short period -20 to 75 °C)				
Maximum measuring DC current	1 mA	1 mA	1 mA	0.3 mA	0.3 mA

Sensor type	NS 103 xxxx	PTS 100 xxxx	PTS 200 xxxx	PTS 300 xxxx	HS 100 xxxx
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	5 to 55 °C (for short period -20 to 75 °C)				
Maximum measuring DC current	0.7 mA	3 mA	1.5 mA	1 mA	1 mW *)

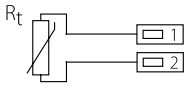
**) maximum power consumption*

OTHER PARAMETERS

Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C; NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Sensor connection	according to the wiring diagram
Recommended wire cross section	0.35 to 1.5 mm^2
Ingress protection	IMPULS – IP20; ALPHA EXCLUSIVE, SOLO, ELEMENT, TIME – IP 30; TANGO – IP50 in accordance with EN 60529, as amended
Material of the connection head	ABS
Operating conditions	ambient temperature: 5 to 55 °C (for a short period -20 to 75 °C) relative humidity: max 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa
Weight approximately	0.1 kg

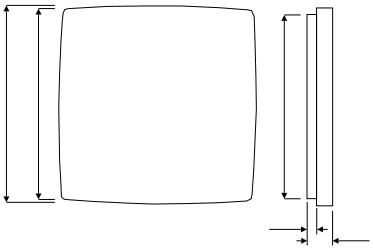
WIRING DIAGRAM

Sensors with resistance-type output

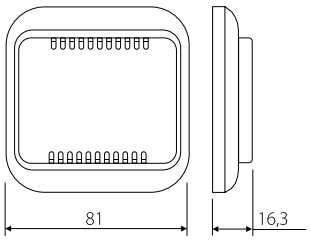


DIMENSIONAL DRAFT

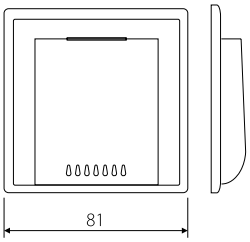
Design: **SOLO**
Sensor series: NS x0x SOLO, PTS x00 SOLO, HS 100 SOLO



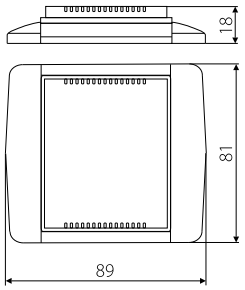
Design: **ALPHA EXCLUSIVE**
Sensor series: NS x0x ALPHA, PTS x00 ALPHA, HS 100 ALPHA



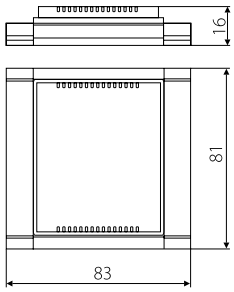
Design: **IMPULS**
Sensor series: NS x0x IMPULS, PTS x00 IMPULS, HS 100 IMPULS



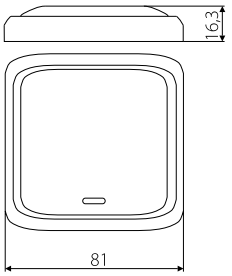
Design: **ELEMENT**
Sensor series: NS x0x ELEMENT, PTS x00 ELEMENT, HS 100 ELEMENT



Design: **TIME**
Sensor series: NS x0x TIME, PTS x00 TIME, HS 100 TIME



Design: **TANGO**
Sensor series: NS x0x TANGO, PTS x00 TANGO, HS 100 TANGO



MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- Accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, termistor NTC 20 kΩ)
- the colour of plastic sensor parts – according to the manufacturer's sampler

TEMPERATURE SENSORS FOR OUTDOOR USE WITH A PLASTIC CONNECTION HEAD

008.18en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact temperature measurement of gaseous substances. The plastic connection head is provided with a cable outlet bushing (terminal board is located in the head) or a connector. The standard temperature range in which the sensors are allowed to be utilised is -50 to 100 °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. Easy mounting of the temperature sensor is ensured by the unique "S head" design invented by SENSIT s.r.o. The sensors are designed to be operated in a chemically non-aggressive environment.

version A

version B

ACCESSORIES

- lead-in connector CONEC 43-00092
- connection cable with the straight-type RKT connector or with the rectangular - type RKWT connector

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, as amended) or in an Accredited laboratory.

Caution: The temperature sensors with the output 4–20 mA can be delivered with the new connection head only in the version A.

SPECIFICATIONS

Sensor type (K – with connector)	NS 110x NS 110xK	NS 111x NS 111xK	NS 112x NS 112xK	NS 310x NS 310xK	NS 311x NS 311xK
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-50 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 113x NS 113xK	PTS 110x PTS 110xK	PTS 210x PTS 210xK	PTS 310x PTS 310xK	HS 110x HS 110xK
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-50 to 100 °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)	NS 510A NS 510AK	NS 710x NS 710xK	Note
Type of sensing element	Pt 1000/3850	Pt 1000/3850	
Output signal	4 to 20 mA	0 to 10 V	
Measuring ranges**)	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °C;
Power supply U	11 to 30 V_{DC}	15 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	> 10 kΩ	
Output signal - sensing element break	> 24 mA	> 10.5 V	
Output signal - sensing element short circuit	< 3.5 mA	~ 0 V	

Note: x = version A or version B

***)According to the customer's requirement, it is possible to provide a customized measuring range from -40 to 150 °C; the minimum span of the range must be 35 °C (e.g. -20 to 15 °C; -30 to 80 °C)*

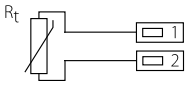
OTHER PARAMETERS

Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Measuring error NS 510A(K), NS 710x(K)	NS 510A ± 1.5 °C (based on air flow speed) NS 710A 0.6 % of the measuring range, min. 0.5 °C
Sensor connection	according to the wiring diagram
Standard length of the stem (version A)	for resistance output and for output 0 to 10 V: 25 mm for output 4 to 20 mA: 50 mm
Time response	$\tau_{0.5} < 9$ s (in air flow at 1m s^{-1}) – version A $\tau_{0.5} \leq 30$ s (in air flow at1m s^{-1}) – version B
Recommended wire cross section – sensors with grommet	0.35 to 1.5 mm^2
Type of connector in the head – sensors with connector	RSFM4 - Lumberg
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 65 in accordance with EN 60529, as amended
Material of the sensor stem	stainless steel DIN 1.4301 – version A
Material of the connection head	POLYAMIDE
Operating conditions	ambient temperature: -50 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	0.15 kg

WIRING DIAGRAM

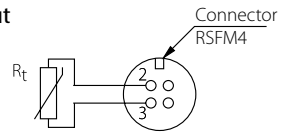
SENSOR WITH THE GROMMET:

With a resistance output



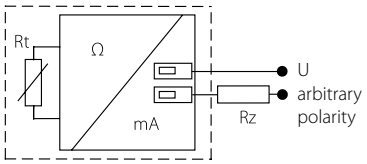
SENSOR WITH CONNECTOR:

With a resistance output

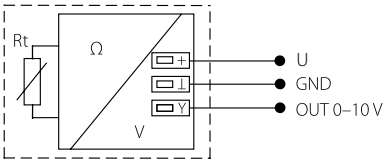


SENSOR WITH THE GROMMET:

With a converter



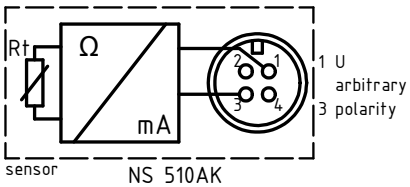
NS 510A



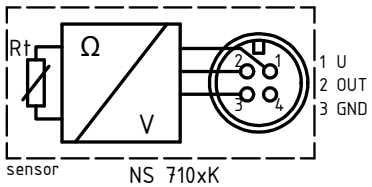
NS 710x

SENSOR WITH CONNECTOR:

With converter



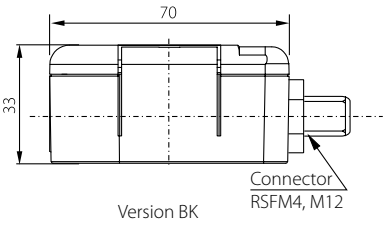
NS 510AK



NS 710xK

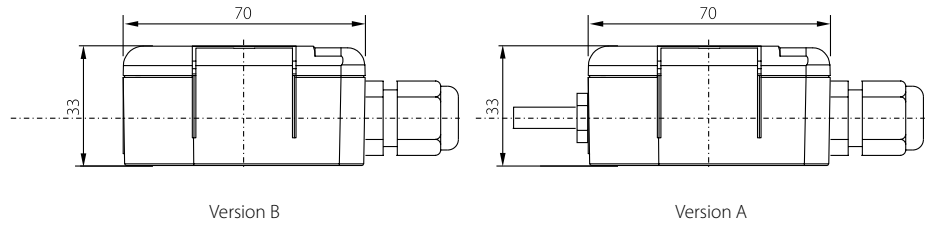
DIMENSIONAL DRAFT

Sensors with connector



Version BK

Sensors with the grommet:



Version B

Version A

MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- accuracy class A (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
- possibility of providing custom temperature ranges for temperature sensors with converter

TEMPERATURE SENSORS FOR OUTDOOR USE WITH A METAL CONNECTION HEAD

099.09en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact temperature measurement of gaseous substances outdoors or in industrial areas. The standard operating temperature range is -30 to 100 °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 K110

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	NK 110	NK 111	NK 112	NK 310	NK 311
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-30 to 100 °C				
Maximum measuring DC current	1 mA	1 mA	1 mA	0.3 mA	0.3 mA

Sensor type	NK 113	PTK 110	PTK 210	PTK 310	HK 110
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-30 to 100 °C				
Maximum measuring DC current	0.7 mA	3 mA	1.5 mA	1 mA	1 mW *)

**) maximum power consumption*

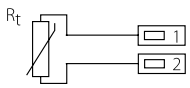
Sensor type	NK 510	Note
Type of sensing element	Pt 1000/3850	
Output signal	4 to 20 mA	
Measuring ranges	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °C
Measuring error	± 1 °C based on air flow speed	
Power supply (U)	11 to 30 V_{DC}	recommended 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

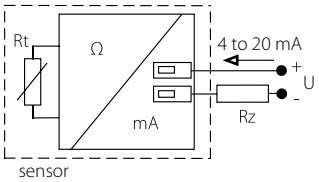
Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Sensing element connection	according to the wiring diagram
Standard length of the stem	for resistance output: 25 mm for output 4 to 20 mA: 50 mm
Time response	$\tau_{0.5} < 9$ s (air flow at 1 m.s^{-1})
Recommended wire cross section	0.35 to 1.5 mm^2
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ±3 °C; humidity < 85 %
Ingress protection	IP 54 in accordance with EN 60529, as amended
Material of the stem	stainless steel DIN 1.4301
Type of connection head	LIMATHERM MA
Material of the connection head	aluminium alloy
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	0.2 kg

WIRING DIAGRAM

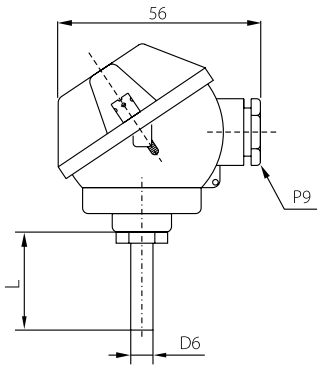
With a resistance-type output



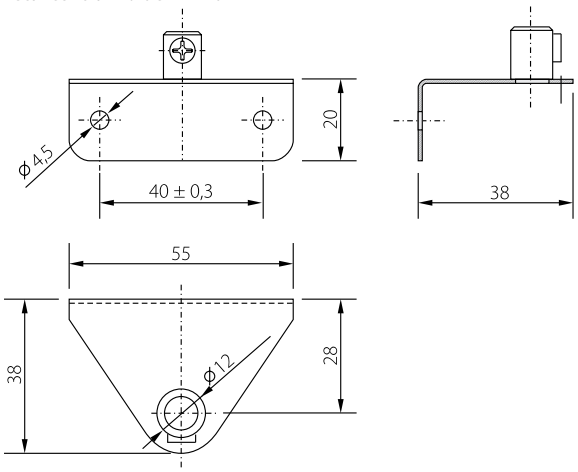
With a converter 4 to 20 mA



DIMENSIONAL DRAFT



Metal central holder K 110



MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- Accurycy class A (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

TEMPERATURE SENSORS WITH A STEM AND PLASTIC CONNECTION HEAD

038.17en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact temperature measurements of liquid or gaseous substances. The plastic connection head is provided with a cable outlet ending (the terminal board is placed in the connection head) or a connector. The sensor-central holder combination is suitable for temperature measurements in air condition ducts. The sensor-thermowell combination is suitable for temperature measurements in tubing. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The standard operating temperature range is -30 to 150 °C. By using a sensor with a longer stem the upper limit of allowable temperature can be extended up to 250 °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. Easy mounting of the temperature sensor is ensured by the unique "S head" design invented by SENSIT s.r.o. The sensors are designed to be operated in a chemically non-aggressive environment.

ACCESSORIES

- central plastic holder (part of the packaging)
- stainless steel thermowell JS 130
- metal central holder K 120
- 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

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type (K – with connector)	NS 120 NS 120K	NS 121 NS 121K	NS 122 NS 122K	NS 320 NS 320K	NS 321 NS 321K
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-30 to 150 °C				
Maximum measuring DC current	1 mA	1 mA	1 mA	0.3 mA	0.3 mA

Sensor type (K – with connector)	NS 123 NS 123K	PTS 120 PTS 120K	PTS 220 PTS 220K	PTS 320 PTS 320K	HS 120 HS 120K
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-30 to 150 °C	-50 to 150 °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	10 mW *)

**) maximum power consumption*

OTHER PARAMETERS

Sensor type (K – with connector)	NS 520 NS 520K	NS 720 NS 720K	Note
Type of sensing element	Pt 1000/3850	Pt 1000/3850	
Output signal	4 to 20 mA	0 to 10 V	
Measuring ranges**)	-50 to 50 °C -30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 250 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 250 °C	ambient temperature around the connection head -30 to 70 °C
Power supply (U)	11 to 30 V_{DC}	15 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	> 10 kΩ	
Output signal - sensing element break	> 24 mA	> 10.5 V	
Output signal - sensing element short circuit	< 3.5 mA	~ 0 V	

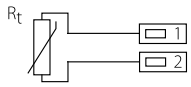
***) According to the customer's requirement, it is possible to provide a customized measuring range from -40 to 150 °C; the minimum span of the range must be 35 °C (e.g. -20 to 15 °C; -30 to 80 °C)*

Accuracy class	Ni sensing elements: class B, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: class B according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Measuring error for NS 520(K), NS 720(K)	< 0.6 % of the measuring range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Standard length of stem L1	70, 120, 180, 240, 300, 360, 420 mm
Time response	$\tau_{0.5}$ < 9 s (in flowing water at 0.4 $m.s^{-1}$)
Recommended wire cross section - sensors with the grommet	0.35 to 1.5 mm^2
Type of connector in the head - sensors with connector	RSFM4 - Lumberg
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 65 in accordance with EN 60529, as amended
Material of the sensor stem	stainless steel DIN 1.4301
Material of the connection head	POLYAMIDE
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	0.15 kg

WIRING DIAGRAM

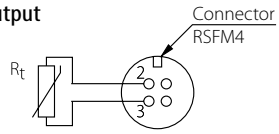
SENSOR WITH THE GROMMET:

With resistance-type output



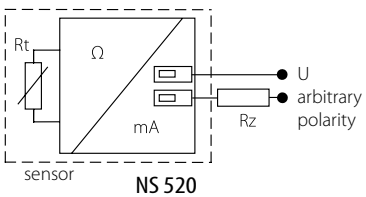
SENSOR WITH THE CONNECTOR:

With resistance-type output

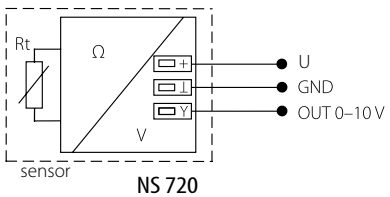


SENSOR WITH THE GROMMET:

With the converter



NS 520

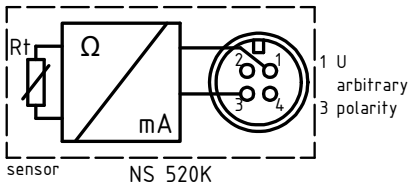


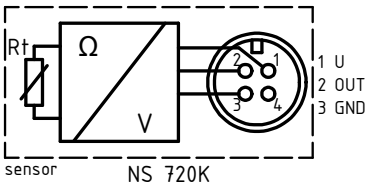
NS 720

WIRING DIAGRAM

SENSOR WITH THE CONNECTOR:

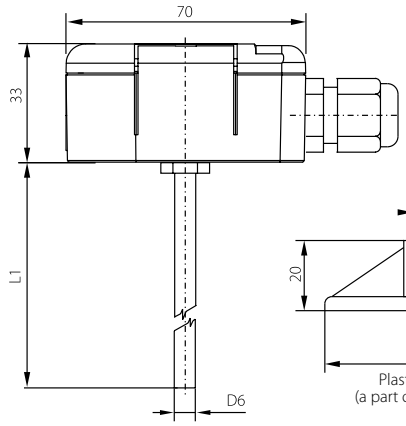
With converter



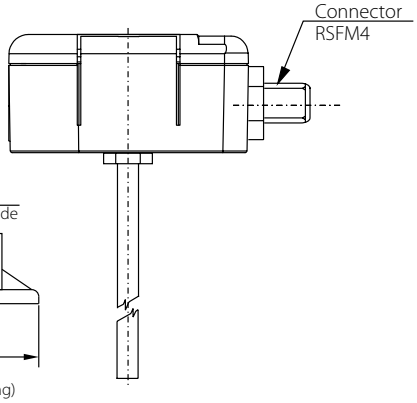


DIMENSIONAL DRAFT

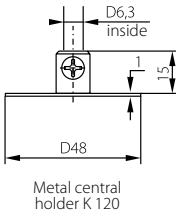
With the grommet

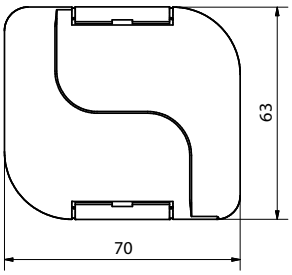


With the connector



Accessories





MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- accuracy class A (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
- thermowell thread type options
- possibility to provide custom temperature ranges for temperature sensors with converter

TEMPERATURE SENSORS WITH A STEM AND METAL CONNECTION HEAD

043.17en

DESCRIPTION AND APPLICATION

CE

These resistance-type sensors are intended for contact temperature measurements of liquid or gaseous substances. The sensor-central holder combination is suitable for temperature measurements in air condition ducts. The sensor-thermowell combination is suitable for temperature measurements in tubing. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The standard operating temperature range is -30 to 200 °C. By using a sensor with a longer stem the upper limit of allowable temperature can be extended up to 250 °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 K 120
- stainless steel thermowell JS 130
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	NK 120	NK 121	NK 122	NK 320	NK 321
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-30 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	NK 123	PTK 120	PTK 220	PTK 320	HK 120
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-30 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	10 mW *)

**) maximum power consumption*

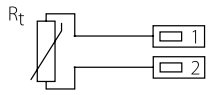
Sensor type	NK 520	Note
Type of sensing element	Pt 1000/3850	
Output signal	4 to 20 mA	
Measuring ranges	-50 to 50 °C -30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 250 °C	ambient temperature around the connection head -30 to 70 °C
Measurement error	< 0.6 % of the range	no less than 0.5 °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 - sensor element break	> 24 mA	
Output signal - sensor element short circuit	< 3.5 mA	

OTHER PARAMETERS

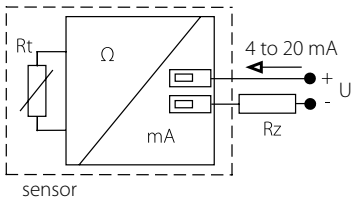
Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Sensor connection	according to the wiring diagram
Standard length of the stem L1	70, 120, 180, 240, 300, 360, 420 mm
Time response	$\tau_{0.5} < 9$ s (in flowing water at 0.4 m.s^{-1})
Recommended wire cross section	0.35 to 1.5 mm^2
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 54 in accordance with EN 60529, as amended
Material of the stem	stainless steel DIN 1.4301
Type of connection head	LIMATHERM MA
Material of connection head	aluminium alloy
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	0.15 kg

WIRING DIAGRAM

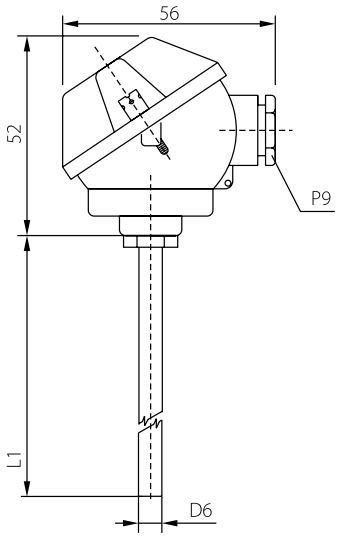
With the resistance output



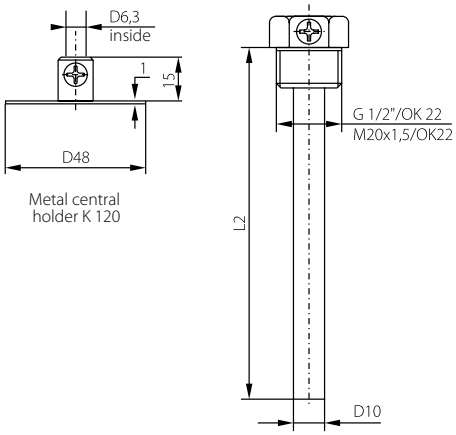
With a converter 4 to 20 mA



DIMENSIONAL DRAFT



Accessories



MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- Accuracy class A (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
- thermowell thread type options

FAST RESPONSE TEMPERATURE SENSORS WITH A PLASTIC CONNECTION HEAD

042.16en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact temperature measurements of liquid or gaseous substances. The plastic connection head is provided with a cable outlet ending (the terminal board is placed in the connection head) or a connector. The structure of the sensor's stem enables the sensor to be used for direct measuring of the temperature in ducts and also ensures quick response of the sensor to changes in temperature. The standard operating temperature range is -30 to 130 °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. Easy mounting of the temperature sensor is ensured by the unique "S head" design invented by SENSIT s.r.o. The sensors are designed to be operated in a chemically non-aggressive environment.

ACCESSORIES

- lead-in connector CONEC 43-00092
- connection cable with the straight-type RKT connector or with the rectangular-type RKWT connector

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, as amended) or in an Accredited laboratory.

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM - AIR AND WATER VAPOUR / WATER [$m.s^{-1}$]

Length of the stem	up to 60 mm	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm
Values for diameter of the stem 4 mm	8 / 0.8	6 / 0.6	3.2 / 0.4	1.0 / 0.25

SPECIFICATIONS

Sensor type (K – with connector)	NS 160 NS 160K	NS 161 NS 161K	NS 162 NS 162K
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891
Measuring range	-30 to 130 °C (Connection head ambient temperature -30 to 100 °C)		
Maximum measuring DC current	1 mA	1 mA	1 mA

Sensor type (K – with connector)	PTS 160 PTS 160K	PTS 260 PTS 260K	PTS 360 PTS 360K	HS 160 HS 160K
Type of sensing element	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-50 to 130 °C (Connection head ambient temperature -30 to 100 °C)			-30 to 130 °C
Maximum measuring DC current	3 mA	1.5 mA	1 mA	10 mW *)

**) maximum power consumption*

Sensor type (K – with connector)	NS 560 NS 560K	NS 760 NS 760K	Note
Type of sensing element	Pt 1000/3850	Pt 1000/3850	
Output signal	4 to 20 mA	0 to 10 V	
Measuring ranges**)	-50 to 50 °C -30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °C
Power supply (U)	11 to 30 V_{DC}	15 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	> 10 kΩ	
Output signal - sensing element break	> 24 mA	> 10.5 V	
Output signal - sensing element short circuit	< 3.5 mA ~ 0 V		

***)According to the customer's requirement, it is possible to provide a customized measuring range from -40 to 150 °C; the minimum span of the range must be 35 °C (e.g. -20 to 15 °C; -30 to 80 °C)*

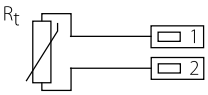
OTHER PARAMETERS

Accuracy class	Ni sensing elements: class B, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: class B according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Measuring error for NS 560, NS 760	NS 560 and NS 760 < 0.6 % of the measuring range, min. 0.5 °C
Sensor connection	according to the wiring diagram
Standard length of stem L1	50, 100, 160, 220 mm
Diameter of the stem	4 ± 0.1 mm
Standard thread	G ½"
Nominal pressure of the stem	PN 25
Time response	$\tau_{0.5}$ < 4 s (in flowing water at 0.4 m.s^{-1})
Recommended wire cross section - sensors with the grommet	0.35 to 1.5 mm^2
Type of connector in the head - sensors with connector	RSFM4 – Lumberg, M12
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 65 in accordance with EN 60529, as amended
Material of the sensor stem	stainless steel DIN 1.4301
Material of connection head	POLYAMIDE
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	0.15 kg

WIRING DIAGRAM

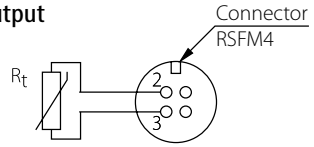
SENSOR WITH THE GROMMET:

With resistance-type output



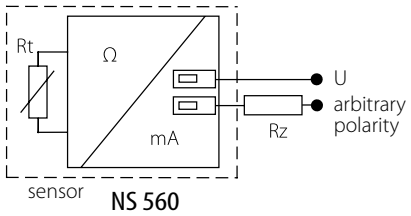
SENSOR WITH THE CONNECTOR:

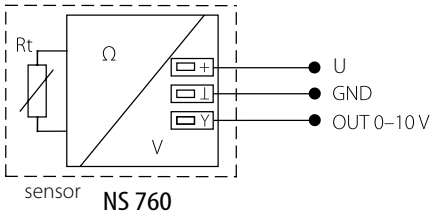
With resistance-type output



SENSOR WITH THE GROMMET:

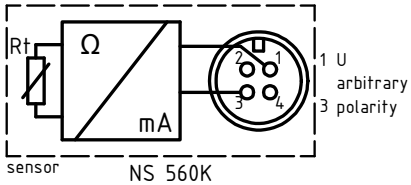
With the converter

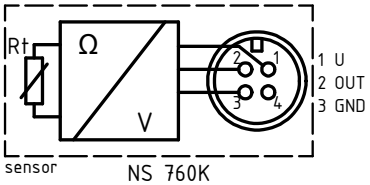




SENSOR WITH THE CONNECTOR:

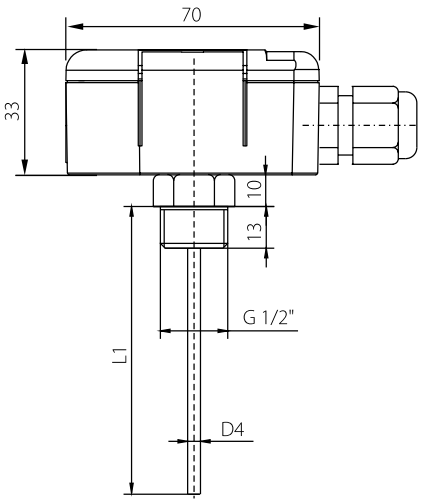
With the converter



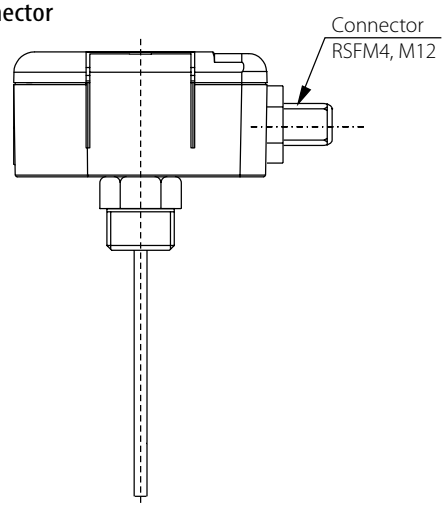


DIMENSIONAL DRAFT

Sensors with the grommet

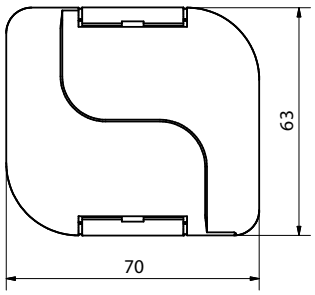


Sensors with the connector



MODIFICATION AND CUSTOMIZATION

- accuracy class A (with the exception of sensor termistor NTC 20 kΩ)
- option of three- or four-wire connection
- variable stem design – L1 length, materials, diameters, option of thread design
- possibility to provide custom temperature ranges for temperature sensors with converter



FAST RESPONSE TEMPERATURE SENSORS WITH A METAL CONNECTION HEAD

101.09en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact temperature measurements of liquid or gaseous substances. The structure of the sensor's stem enables the sensor to be used for direct measuring of the temperature in ducts and also ensures quick response of the sensor to changes in temperature. The standard operating temperature range is -30 to 130 °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.

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, as amended) or in an Accredited laboratory.

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM - AIR AND WATER VAPOUR / WATER [m.s^{-1}]

Length of the stem	up to 60 mm	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm
Values for diameter of the stem 4 mm	8 / 0.8	6 / 0.6	3.2 / 0.4	1.0 / 0.25

SPECIFICATIONS

Sensor type	NK 160	NK 161	NK 162
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891
Measuring range	-30 to 130 °C (Connection head ambient temperature -30 to 100 °C)		
Maximum measuring DC current	1 mA	1 mA	1 mA

Sensor type	PTK 160	PTK 260	PTK 360	HK 160
Type of sensing element	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-50 to 130 °C (Connection head ambient temperature -30 to 100 °C)			-30 to 130 °C
Maximum measuring DC current	3 mA	1.5 mA	1 mA	10 mW *)

**) maximum power consumption*

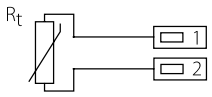
Sensor type	NK 560	Note
Type of sensing element	Pt 1000/3850	
Output signal	4 to 20 mA	
Measuring ranges	-50 to 50 °C -30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °C
Power supply (U)	11 to 30 V_{DC}	recommended value 24 V_{DC}
Load resistance	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

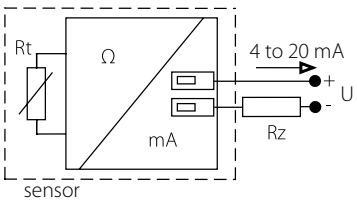
Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Measuring error for NK 560	< 0.6 % of the measuring range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Standard length of the stem L1	50, 100, 160, 220 mm
Diameter of the stem	4 ± 0.1 mm
Standard thread	G ½"
Nominal pressure of the stem	PN 25
Time response	$\tau_{0.5}$ < 4 s (in flowing water at 0.4 m.s^{-1})
Recommended wire cross section	0.35 to 1.5 mm^2
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 54 in accordance to EN 60529, as amended
Material of the stem	stainless steel DIN 1.4301
Material and type of connection head	aluminium alloy, LIMATHERM MA
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	0.2 kg

WIRING DIAGRAM

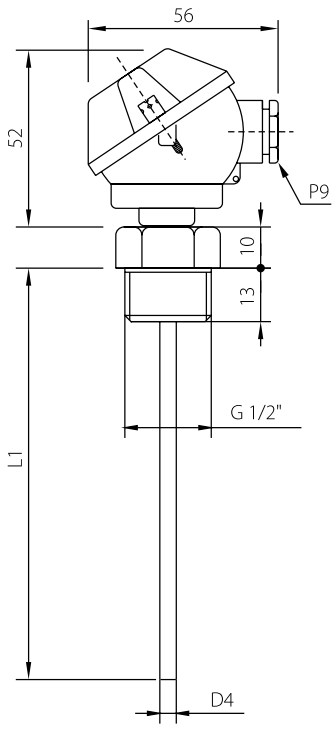
With a resistance output



With a converter 4 to 20 mA



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- accuracy class A (with the exception of sensor termistor NTC 20 kΩ)
- option of three- or four-wire connection
- variable stem design – L1 length, materials, diameters, option of thread design

TEMPERATURE SENSORS WITH A STEM, MINI SERIES

117.08en

DESCRIPTION AND APPLICATION

These resistance-type temperature sensors of serie MINI are designed for temperature measurements of liquid or gaseous substances in the temperature range -30 to 150 °C. The plastic connection head is provided with a cable grommet and lead-in cable or a connector. The sensor-central holder combination is suitable for temperature measurements in air condition ducts. The sensor-thermowell combination is suitable for temperature measurements in tubing. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. By using a sensor with a longer stem the upper limit of allowable temperature can be extended up to 250 °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

- central plastic holder (part of the packaging)
- stainless steel thermowell JS 130
- metal central holder K 120
- 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

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type (K – with connector)	MINI N 120 MINI N 120K	MINI N 121 MINI N 121K	MINI N 122 MINI N 122K	MINI N 320 MINI N 320K	MINI N 321 MINI N 321K
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-30 to 150 °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)	MINI N 123 MINI N 123K	MINI P 120 MINI P 120K	MINI P 220 MINI P 220K	MINI P 320 MINI P 320K	MINI H 120 MINI H 120K
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-30 to 150 °C	-50 to 150 °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	10 mW *)

**) maximum power consumption*

Sensor type	MINI N 520 MINI N 520K	Note
Type of sensing element	Pt 1000/3850	
Output signal	4 to 20 mA	
Measuring ranges	-50 to 50 °C -30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °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 mA	

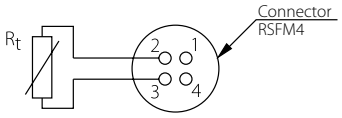
OTHER PARAMETERS

Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Measuring error (MINI N 520)	< 0.6 % of the range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Standard length of the stem L1	70, 120, 180, 240, 300, 360, 420 mm
Time response	$\tau_{0.5}$ < 9 s (in flowing water at 0.4 $m.s^{-1}$)
Type of connector - sensors with connector	RSFM4 – Lumberg, M12
Type of lead-in cable - sensors with converter or cable grommet	2 x 0.25 mm^2, PVC shielded up to 80 °C
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 65 in accordance with EN 60529, as amended
Material of the stem	stainless steel DIN 1.4301
Material of the connection head	POLYAMIDE
Operating conditions	ambient temperature: -30 to 100 °C; -30 to 70 °C with a converter or PVC cable relative humidity: max. 100 % (at the ambient temperature 25 °C) atmospheric pressure: 70 to 107 kPa
Weight	MINI approximately 0.06 kg, MINI K 0.035 kg

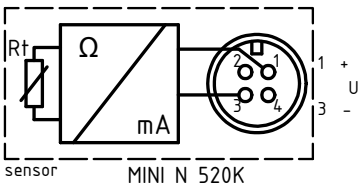
WIRING DIAGRAM

SENSORS WITH A CONNECTOR:

With resistant output

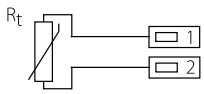


With the converter 4 to 20 mA

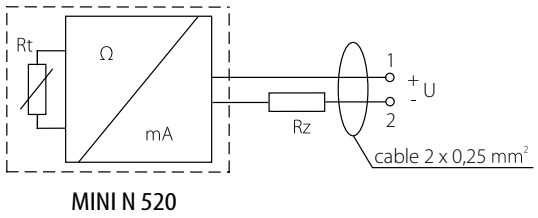


SENSORS WITH A GROMMET:

With resistant output

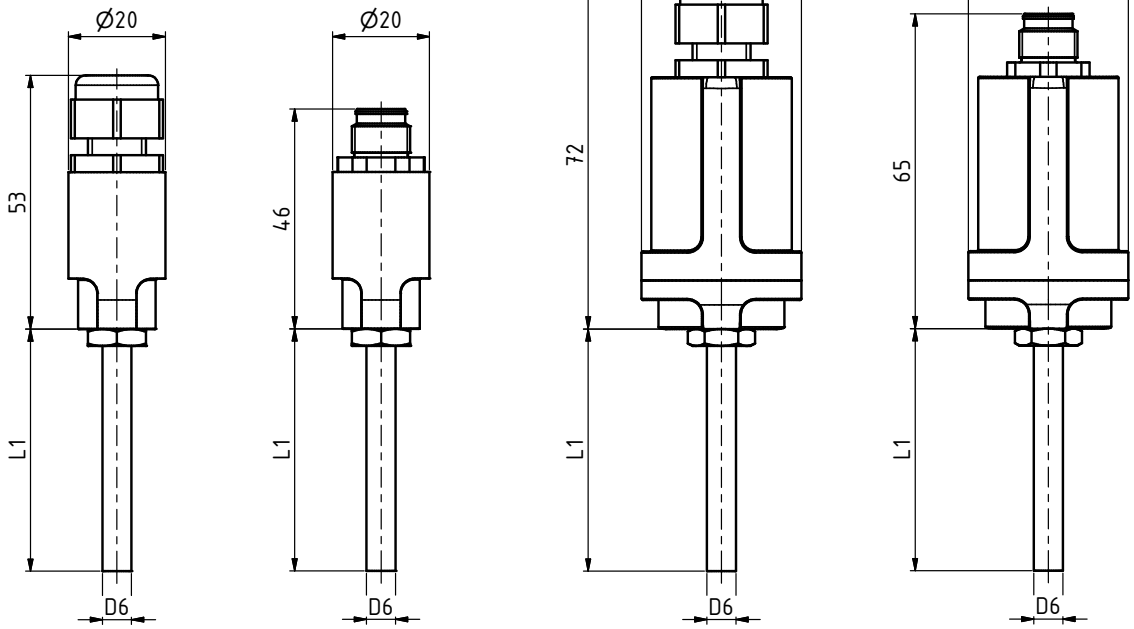


With the converter 4 to 20 mA

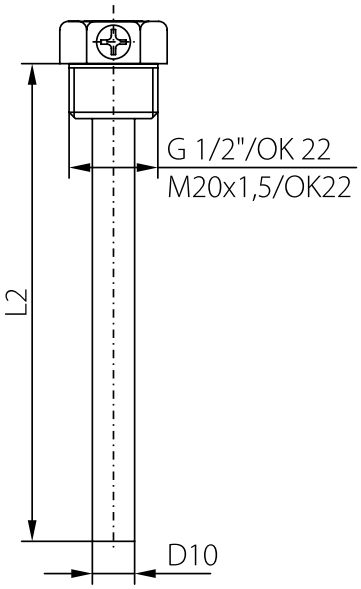


MINI N 520

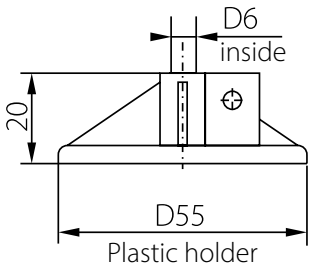
DIMENSIONAL DRAFT



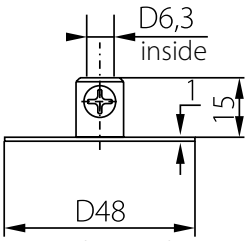
Accessories



Thermowell JS 130



Plastic holder
(part of packaging)



Metal central
holder K 120

MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- accuracy class A (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
- thermowell thread type options

TEMPERATURE SENSORS WITH A STEM AND STAINLESS STEEL CONNECTION HEAD

051.15en

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

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

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 -30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °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	

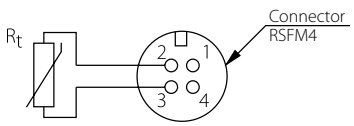
OTHER PARAMETERS

Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 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 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 67 in accordance with EN 60529, as amended
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

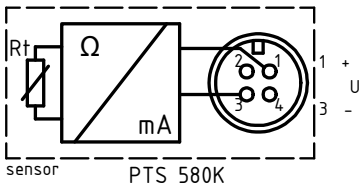
WIRING DIAGRAM

SENSORS WITH A CONNECTOR:

With resistance output

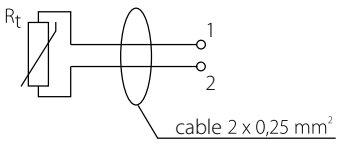


With current output

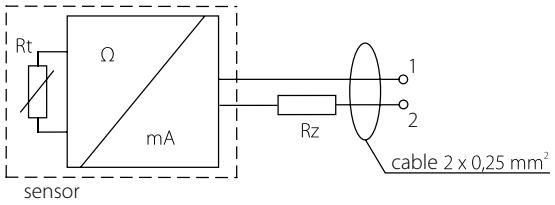


SENSORS WITH A GROMMET:

With cable



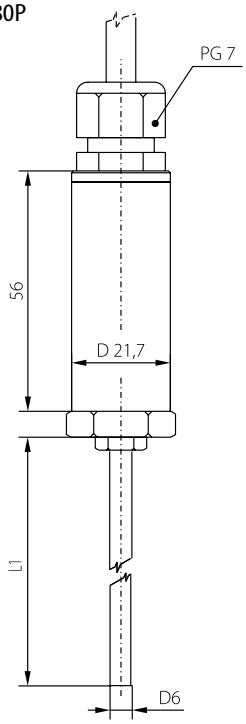
With cable



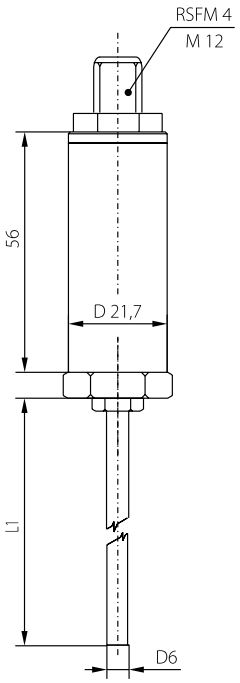
DIMENSIONAL DRAFT

SENSORS WITH CURRENT OUTPUT:

PTS 580P

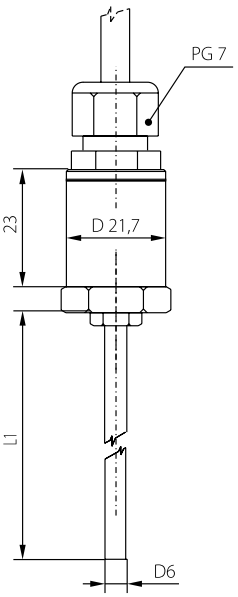


PTS 580K

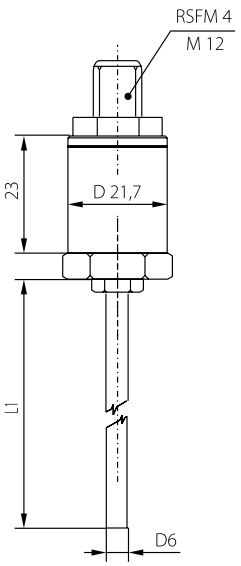


SENSORS WITH RESISTANCE OUTPUT:

xxSx8xP

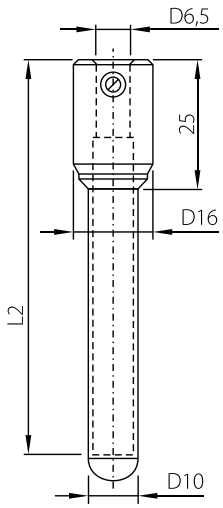


xxSx8xK

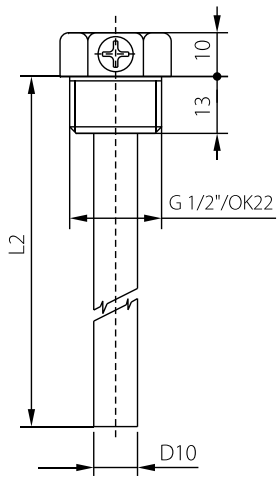


DIMENSIONAL DRAFT

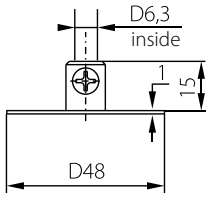
Accessories



Cyllindrical thermowell
welded in J 010



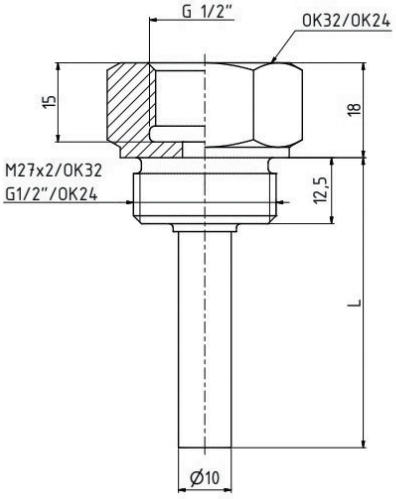
Thermowell JS 130



Metal central
holder K 120

MODIFICATION AND CUSTOMIZATION

- 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



TEMPERATURE SENSORS WITH A STEM AND STAINLESS STEEL CONNECTION HEAD IN HYGIENIC DESIGN

212.02en

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

- welded-on pieces NV PTS 680.1, NV PTS 680.2
- lead-in connector CONEC 43-00092
- connection cable with the straight type RKT connector or with the rectangular-type RKWT connector

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type (K - with connector)	NS 170K NS 170P	NS 171K NS 171P	NS 172K NS 172P	NS 370K NS 370P	NS 371 K NS 371P
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 173K NS 173P	PTS 170K PTS 170P	PTS 270K PTS 270P	PTS 370K PTS 370P	HS 170K HS 170P
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	termistor 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 680K PTS 680P	Note
Type of sensing element	Pt 1000/3850	
Output signal	4 to 20 mA	
Measuring ranges	-50 to 50 °C -30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °C
Power supply (U)	11 to 30 V_{DC}	recommended value 24 V_{DC}
Load resistance	150 Ω for power supply 12 V_{DC} 700 Ω for power supply 24 V_{DC}	
Output signal - sensing element break	> 24 mA	
Output signal - sensing element short circuit	< 3.5 mA	

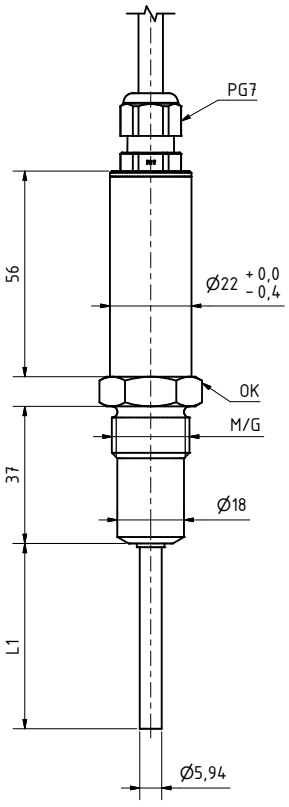
OTHER PARAMETERS

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 EN 60751, $\Delta t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 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 lenght of stem L1	70, 120, 180, 240 mm
Time response	$\tau_{0.5}$ < 9 s (in flowing water at 0.4 $m.s^{-1}$)
Type of connector in the head - sensors with connector	Lumberg RSFM4, M 12
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 67 in accordance with EN 60529, as amended
Material of the sensor stem	stainless steel DIN1.4301
Material of 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

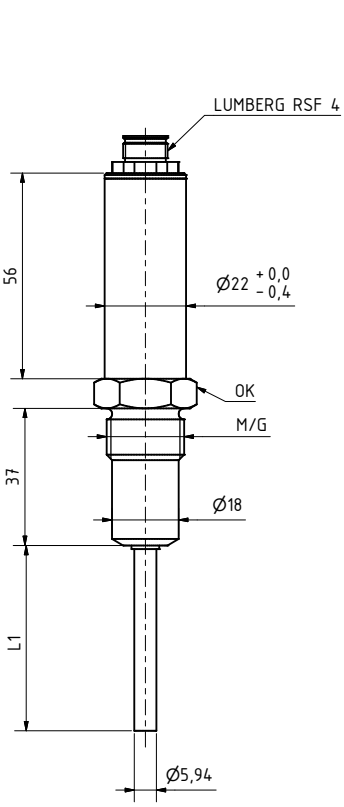
DIMENSIONAL DRAFT

SENSORS WITH RESISTANCE OUTPUT:

PTS 680P

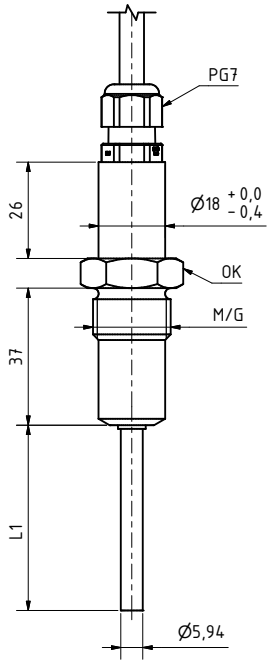


PTS 680 K

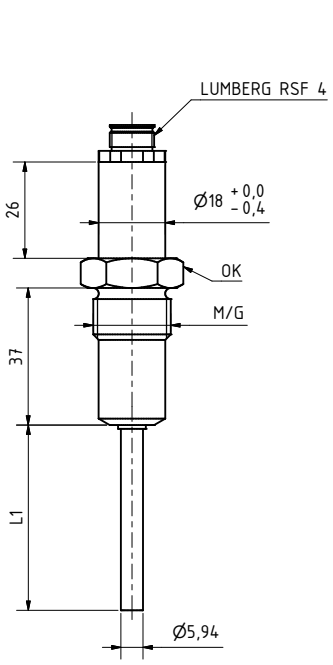


SENSORS WITH CURRENT OUTPUT:

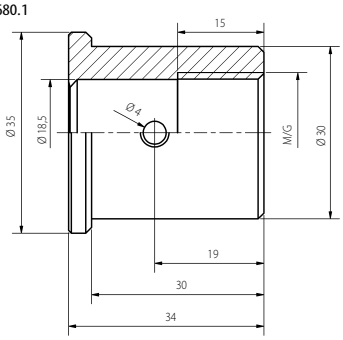
xxS17xP



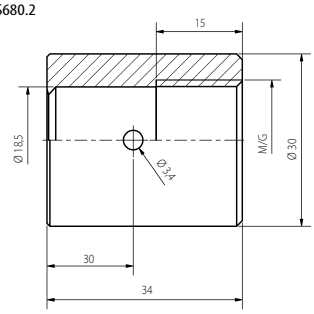
xxS17xP



Accessories
NV PTS680.1



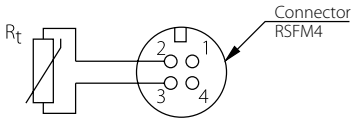
NV PTS680.2



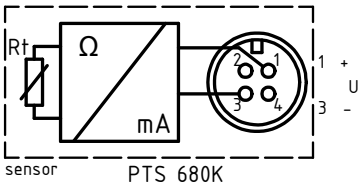
WIRING DIAGRAM

SENSORS WITH A CONNECTOR:

With resistance output

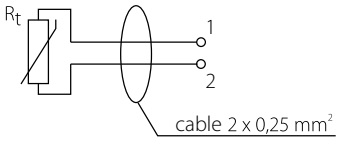


With current output

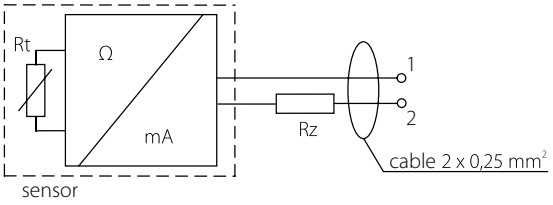


SENSORS WITH A GROMMET:

With resistance output



With current output



MODIFICATION AND CUSTOMIZATION

- 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 226, termistor NTC 20 kΩ)
- option of three-wire or four-wire connection
- variable stem design – L1 length, material, diameter

CONTACT TEMPERATURE SENSORS WITH A PLASTIC CONNECTION HEAD

011.19en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact surface temperature measurement. The sensors, which are available including the fastening strap and a closing device are suitable for temperature measurements on piping. The plastic connection head is provided with a cable outlet ending (the terminal board is placed in the connection head) or a connector. The standard operating temperature range is -50 to 130 °C. The proper sensing element is constructed to be isolated from the ambient influence. 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. Easy mounting of the temperature sensor is ensured by the unique "S head" design invented by SENSIT s.r.o. The sensors are designed to be operated in a chemically non-aggressive environment.

ACCESSORIES

- lead-in connector CONEC 43-00092
- connection cable with the straight-type RKT connector or with the rectangular-type RKWT connector
- thermal conductive paste up to 200 °C, 5g

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type (K – with connector)	NS 140 NS 140K	NS 141 NS 141K	NS 142 NS 142K	NS 340 NS 340K	NS 341 NS 341K
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-50 to 130 °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 143 NS 143K	PTS 140 PTS 140K	PTS 240 PTS 240K	PTS 340 PTS 340K	HS 140 HS 140K
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-50 to 130 °C (connection head ambient temperature -30 to 100 °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)	NS 540 NS 540K	NS 740 NS 740K	Note
Type of sensing element	Pt 1000/3850	Pt 1000/3850	
Output signal	4 to 20 mA	0 to 10 V	
Measuring ranges**)	-50 to 50 °C -30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °C;
Power supply (U)	11 to 30 V_{DC}	15 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	> 10 kΩ	
Output signal - sensing element break	> 24 mA	> 10.5 V	
Output signal - sensing element short circuit	< 3.5 mA	~ 0 V	

***)According to the customer's requirement, it is possible to provide a customized measuring range from -40 to 150 °C; the minimum span of the range must be 35 °C (e.g. -20 to 15 °C; -30 to 80 °C)*

OTHER PARAMETERS

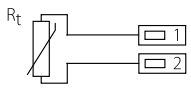
Accuracy class	Ni sensing elements: class B, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: class B according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Measuring error for NS 540(K), NS 740(K) *), **)	< 0.6 % of the measuring range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Time response	$\tau_{0.5}$ < 13 s (on the smooth surface without paste)
Recommended wire cross section - sensors with the grommet	0.35 to 1.5 mm^2
Type of connector in the head - sensors with connector	RSFM4 - Lumberg
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 65 in accordance with EN 60529, as amended
Material of the case	brass
Material of connection head	POLYAMIDE
Standard strap length	40 cm
Minimum pipe diameter	20 mm
Operating conditions	ambient temperature: -50 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	0.15 kg

**) The temperature sensor's measurement error is dependent on the influence of ambient temperature, environmental variables and the characteristics of the measured surface (error of method).*
***) It is recommended to apply heat-conducting paste or silicon grease to the measured surface, which will ensure faster response time and minimise the measurement error of the contact temperature sensor.*

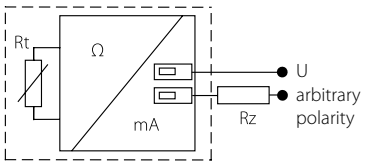
WIRING DIAGRAM

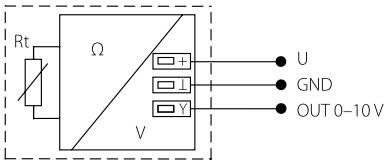
SENSORS WITH THE GROMMET:

With resistance output



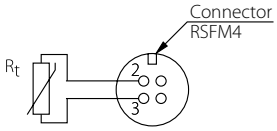
With the converter



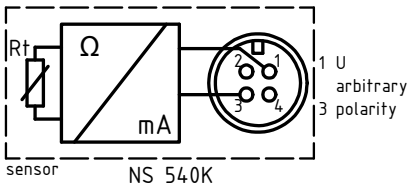


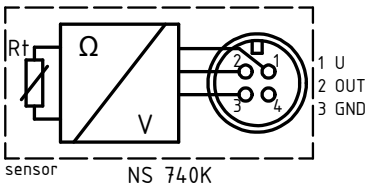
SENSORS WITH THE CONNECTOR:

With resistance output



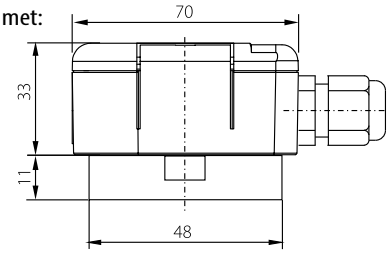
With converter



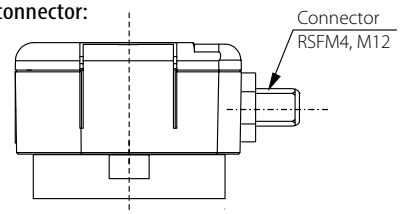


DIMENSIONAL DRAFT

Sensors with the grommet:

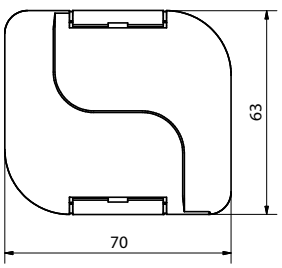


Sensors with the connector:



MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- accuracy class A (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
- various length of the fastening strap
- possibility of providing custom temperature ranges for temperature sensors with converter



TEMPERATURE SENSORS WITH MAGNETIC FIXING

004.06en

DESCRIPTION AND APPLICATION

The sensors are intended for contact temperature measurements of ferromagnetic materials. The contact with measuring surface is provided by springing of the measuring surface. The plastic connection head is provided with a cable outlet ending (the terminal board is placed in the connection head) or a connector. The standard operating temperature range is -30 to 100 °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

- lead-in connector CONEC 43-00092
- connection cable with the straight-type RKT connector or with the rectangular-type RKWT connector.

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, as amended) or in an Accredited laboratory.

Cable sensors with magnetic fixing are a possible alternative to the S 190 line of sensors.

SPECIFICATIONS

Sensor type (K – with connector)	NS 190 NS 190K	NS 191 NS 191K	NS 192 NS 192K	NS 390 NS 390K	NS 391 NS 391K
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-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 193 NS 193K	PTS 190 PTS 190K	PTS 290 PTS 290K	PTS 390 PTS 390K	HS 190 HS 190K
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	thermistor NTC 20 kΩ
Measuring range	-30 to 100 °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)	NS 590 NS 590K	NS 790 NS 790K	Note
Type of sensing element	Pt 1000/3850	Pt 1000/3850	
Output signal	4 to 20 mA	0 to 10 V	
Measuring ranges	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C	ambient temperature around the connection head -30 to 70 °C
Power supply (U)	11 to 30 V_{DC}	15 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	> 10 kΩ	
Output signal - sensing element break	> 24 mA	> 10.5 V	
Output signal - sensing element short circuit	< 3.5 mA	~ 0 V	

***)According to the customer's requirement, it is possible to provide a customized measuring range from -40 to 150 °C; the minimum span of the range must be 35 °C (e.g. -20 to 15 °C; -30 to 80 °C)*

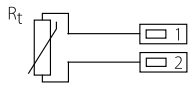
OTHER PARAMETERS

Accuracy class	Ni sensing elements B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements B class according to EN 60 751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Measuring error for NS 590 and NS 790	< 0.6 % of the measuring range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Measuring surface diameter	19 mm
Measuring surface pressure	5 N
Adhesive power of the sensor	60 N
Recommended wire cross section - sensors with the grommet	0.35 to 1.5 mm^2
Type of connector in the head - sensors with connector	RSFM4 - Lumberg
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 52 in accordance with EN 60529, as amended
Material ot the head	LEXAN 500RS
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	0.1 kg (NS 590, NS 790); 0.08 kg (passive)

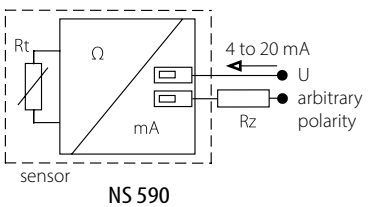
WIRING DIAGRAM

SENSORS WITH THE GROMMET:

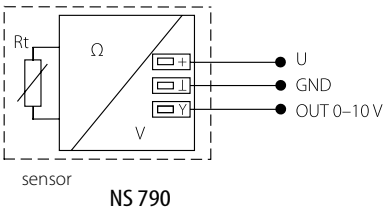
With resistance output



With a converter



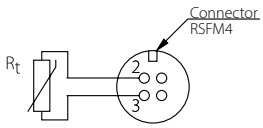
NS 590



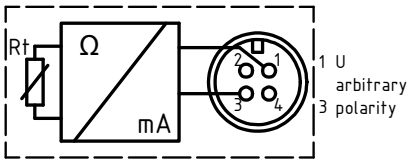
NS 790

SENSORS WITH THE CONNECTOR:

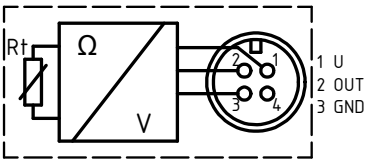
With resistance output



With a converter



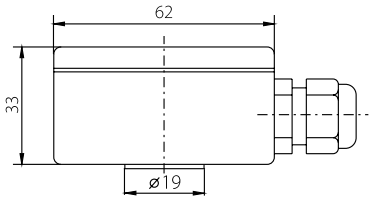
NS 590K



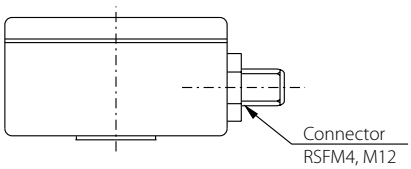
NS 790K

DIMENSIONAL DRAFT

Sensors with the grommet



Sensors with the connector



MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- accuracy class A (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
- possibility of providing custom temperature ranges for temperature sensors with converter

TEMPERATURE SENSORS WITH A DIGITAL OUTPUT FOR INTERIORS

095.01en

DESCRIPTION AND APPLICATION

These sensors are designed for temperature measurement of gaseous substances in water-protected areas – e.g. for temperature measurement in rooms (schools, theatres, lecture halls, etc.), offices, interiors of residential houses or even production halls. Suitable design and high-quality material ensure that the sensor does not feel disturbing even in the interiors with high aesthetic requirements.

The sensors consist of a plastic ribbing head, where a printed circuit board with the individual sensors or a converter is placed to establish a particular digital output according to the type of a sensor. The basic versions of digital outputs are:

SD 102 – MODBUS/RTU communication protocol, communication via the RS485 bus

SD 104 – CANopen/CiA DS 301 communication protocol, communication via the CAN bus

SD 105 – DS 18B20 digital temperature sensor, communication via the 1-Wire bus

SD 106 – TSic 206, 506 and 716 digital temperature sensors, ZACWire communication protocol

The temperature range of sensor use is defined in the table of technical parameters for the individual versions of sensors. The sensors meet the ingress protection of IP 30 according to EN 60529, as amended. Installation is recommended on an inner wall at the height of 1.5 m, in areas of movement of persons, at places not exposed to direct sunlight and not influenced by heat from walls, heating radiators or lighting.

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.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

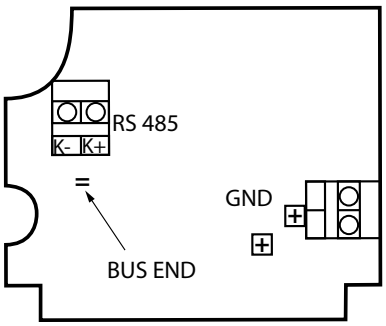
Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

SPECIFICATIONS

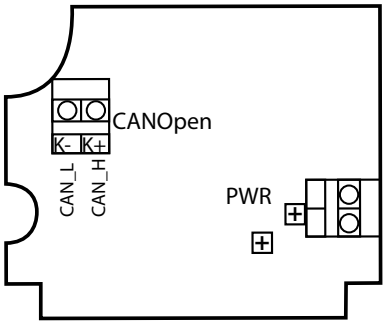
Sensor type	SD 102	SD 104	SD 105	SD 106
Output signal	RS 485 / MODBUS RTU	CAN / CANOpen-CIA DS 301	1-Wire / DS18B20	ZacWire / TSic x06
Measuring range	-30 to 70 °C		-30 to 100 °C	TSic 206 and 306 -30 to 100 °C TSic 506 and 716 -10 to 60 °C
Measurement accuracy	± 0.5 °C		± 0.5 °C in the range of -10 to 80 °C ± 2 °C in the range of -30 to 100 °C	TSic 206 ± 0.5 °C in the range of 10 to 90 °C TSic 306 ± 0.3 °C in the range of 10 to 90 °C TSic 506 ± 0.1 °C in the range of 5 to 45 °C TSic 716 ± 0.07 °C in the range of 25 to 45 °C
Supply voltage (U)	15 to 30 V DC		3 to 5.5 V DC	
Rated supply voltage (Un)	24 V DC		5 V DC	3.3 V DC
Consumption / Supply current	maximum: 500 mW typical: 300 mW		1 mA	30 µA
Ingress protection	IP 30 in accordance with EN 60529, as amended			
Working conditions	ambient temperature: -30 to 70 °C		ambient temperature: -30 to 100 °C	TSic 206 and 306 -30 to 100 °C TSic 506 and 716 -10 to 60 °C
	relative air humidity: max. 85% atmospheric pressure: 87 to 107 kPa			
Dimensions of the head	71.9 × 59 × 27 mm			

Material of the head	LEXAN	
Recommended wire cross-section	0.14 to 1 mm^2	0.35 to 1.5 mm^2
Weight	min. 0.05 kg	min. 0.035 kg

WIRING DIAGRAM

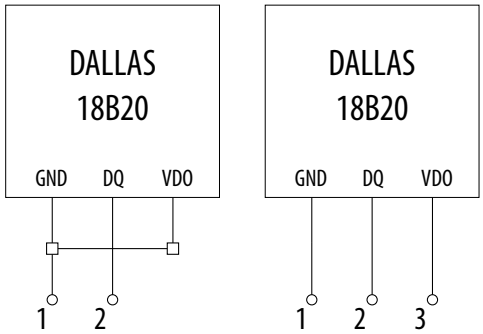


SD 102
GND, TPWR – supply voltage (U)
K+, K- – communication line
BUS END v– RS 485 termination



SD104
GND, PWR – supply voltage (U)
CAN_L, CAN_H – communication line

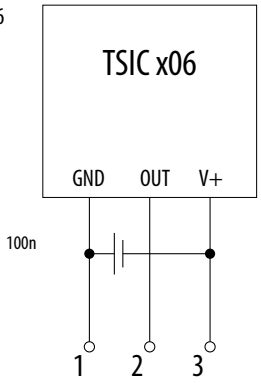
SD105



2-wire

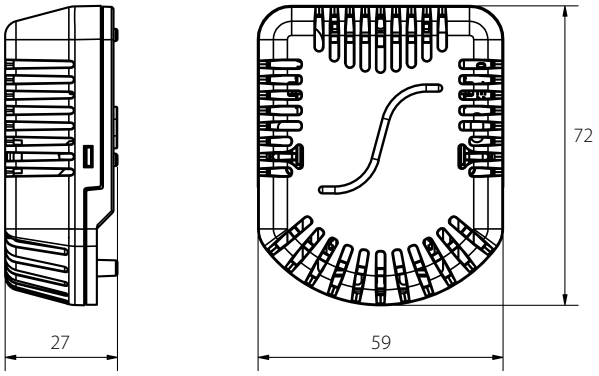
3-wire

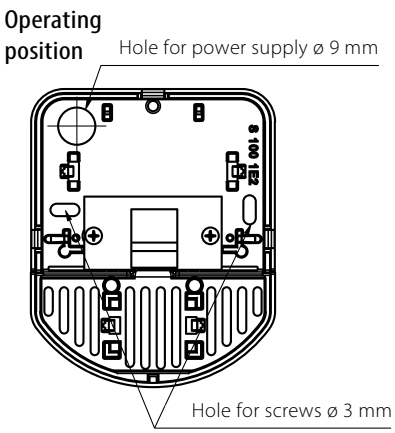
SD106

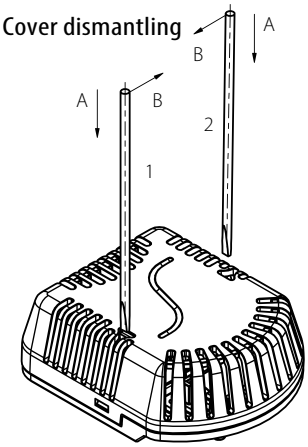


4-wire

DIMENSIONAL DRAFT







TEMPERATURE SENSORS WITH A DIGITAL OUTPUT FOR OUTDOOR ENVIRONMENT

097.11en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact temperature measurement of gaseous substances in outdoor or industrial areas, on building walls, but also in rooms, offices or in production halls. The temperature sensors are easy to install thanks to the unique "S-head" design of the SENSIT s.r.o. company.

The sensors consist of a plastic head and a metal case, where the sensing element for temperature measurement (sensor) is placed. In the head, there is a terminal block with a converter located, to which a supply cable for sensor supply and digital output signal according to the sensor type is connected through a cable grommet or a connector. The basic versions of digital outputs are:

SD 112A, SD 112AK – MODBUS/RTU communication protocol, communication via the RS485 bus
SD 114A, SD 114AK – CANopen/CiA DS 301 communication protocol, communication via the CAN bus
SD 115A, SD 115AK – DS 18B20 digital temperature sensor, communication via the 1-Wire bus
SD 116A, SD 116AK – TSic 206, 506 and 716 digital temperature sensors, ZACWire communication protocol

The temperature range of sensor use is defined in the table of technical parameters for the individual versions of sensors. The sensors meet the ingress protection of IP 65 according to EN 60529, as amended. Recommended installation of the sensor:

- for measurement of outdoor air temperature – the installation is recommended on the coolest side of the building (the northern or the northwest one) in a way that the sensor is not exposed to a direct sun light. The installation is recommended in 2/3 of the height of the building wall.
- for measurement of indoor air temperature in rooms, offices or in production halls – the installation is recommended on an inner wall at the height of 1.5 m, in areas of movement of persons, at places not exposed to sunlight and not influenced by heat from heating radiators or lighting

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.

ACCESSORIES

- CONEC 43-00092 connection plug
- connection cables with a straight RKT connector or right-angled RKWT connector

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

SPECIFICATIONS

Sensor type (K - with connector)	SD 112A SD112AK	SD 114A SD 114AK	SD 115A SD 115AK	SD 116A SD 116AK
Output signal	RS 485 / MODBUS RTU	CAN / CANOpen-CIA DS 301	1-Wire / DS18B20	ZacWire / TSic x06
Measuring range	-30 to 70 °C		-30 to 100 °C	TSic 206 and 306 -30 to 100 °C TSic 506 and 716 -10 to 60 °C
Accuracy of the electronics *)	± 0.2 °C			
Type / Accuracy of the sensing element *)	Pt 1000 / ± (0.3 °C + 0.0005|t|)	Pt 100 / ± (0.3 °C + 0.0005|t|)	± 0.5 °C in the range of -10 to 80 °C ± 2 °C in the range of -30 to 100 °C	TSic 206 ± 0.5 °C in the range of 10 to 90 °C TSic 306 ± 0.3 °C in the range of 10 to 90 °C TSic 506 ± 0.1 °C in the range of 5 to 45 °C TSic 716 ± 0.07 °C in the range of 25 to 45 °C
Supply voltage (U)	15 to 30 V DC		3 to 5.5 V DC	
Rated supply voltage (Un)	24 V DC		5 V DC	3.3 V DC

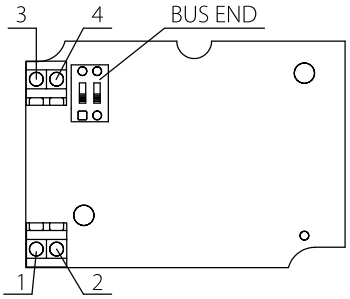
Consumption / Supply current	maximum: 500 mW typical: 300 mW	1 mA	30 µA
Working conditions	ambient temperature: -30 to 70 °C	ambient temperature: -30 to 100 °C	TSic 206 and 306 -30 to 100 °C TSic 506 and 716 -10 to 60 °C
	relative air humidity: max. 100%		
	atmospheric pressure: 70 to 107 kPa		
Ingress protection	IP 65 in accordance with EN 60529, as amended		
Length of the stem	50 mm		
Standard stem diameter	6 ± 0.2 mm		
Material of the stem	stainless steel DIN 1.4301		
Insulation resistance	> 200 MΩ at 500 V/DC, 25°C ± 3 °C; humidity < 85 %		
Dimensions of the head	70 × 63 × 34 mm		
Material of the head	POLYAMIDE		
Connector type in the head (for sensors with a connector)	RSFM4 - M12- Lumberg		
Recommended wire cross-section (for sensors with a grommet)	0.14 to 1 mm^2	0.35 to 1.5 mm^2	
Weight	min. 0.15 kg	min. 0.10 kg	

**) Measurement error of SD 112A and SD 114A temperature sensors depends on the flow rate and supply voltage (method error) and can be within -1.0 to 1.5 °C.*

WIRING DIAGRAM

SD 112A

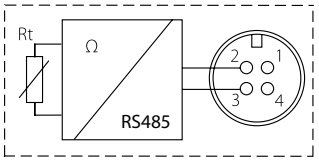
with a grommet



1 – power supply
2 – power supply
3 – data bus – K+
4 – data bus – K-

SD 112AK

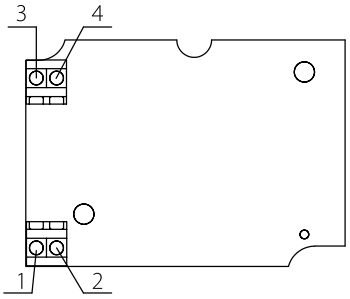
with a connector



1 – PWR+
2 – data bus – K+
3 – data bus – K-
4 – PWR-

SD 114A

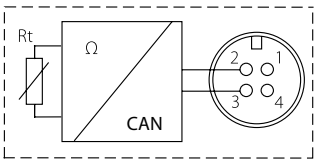
with a grommet



1 – power supply – U+
2 – power supply – GND
3 – data bus – CAN_L
4 – data bus – CAN_H

SD 114AK

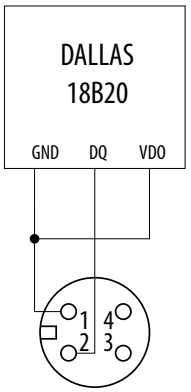
with a connector

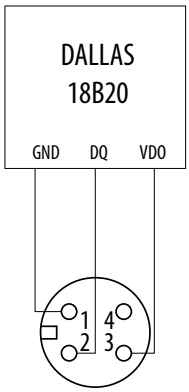


1 – PWR+
2 – data bus - CAN_L
3 – data bus - CAN_H
4 – PWR-

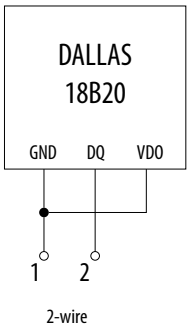
WIRING DIAGRAM

SD 115AK with connector

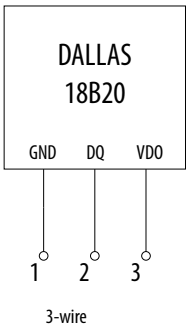




SD 115A with a grommet

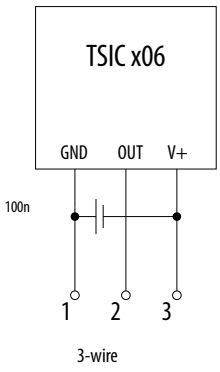


2-wire



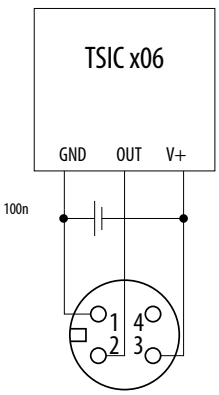
3-wire

SD 116A with a grommet

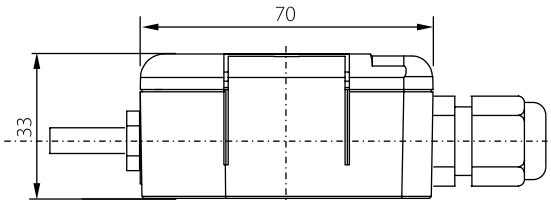


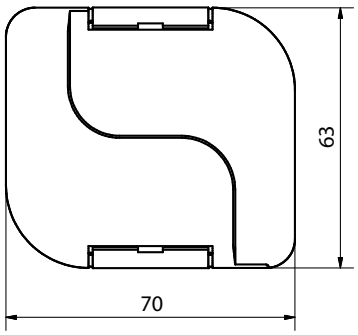
3-wire

SD 116AK with connector



DIMENSIONAL DRAFT





TEMPERATURE SENSORS WITH A STEM AND A PLASTIC HEAD WITH A DIGITAL OUTPUT

100.10en

DESCRIPTION AND APPLICATION

CE

These temperature sensors are designed for contact temperature measurement of liquid and gaseous substances. In combination with a central holder, the sensor is suitable for temperature measurement in air conditioning ducts. The combination of a sensor and a thermowell is suitable for direct measurement of the medium in pipelines. The temperature sensors are easy to install thanks to the unique "S-head" design of the SENSIT s.r.o. company.

The sensors consist of a plastic head and a metal case, where the sensing element for temperature measurement (sensor) is placed. In the head, there is a terminal block with a converter located, to which a supply cable for sensor supply and digital output signal according to the sensor type is connected through a cable grommet or a connector. The basic versions of digital outputs are:

SD 122, **SD 122K** – MODBUS/RTU communication protocol, communication via the RS485 bus

SD 124, **SD 124K** – CANopen/CiA DS 301 communication protocol, communication via the CAN bus

SD 125, **SD 125K** – DS 18B20 digital temperature sensor, communication via the 1-Wire bus

SD 126, **SD 126K** – TSic 206, 506 and 716 digital temperature sensors, ZACWire communication protocol

The temperature range of sensor use is defined in the table of technical parameters for the individual versions of sensors. The sensors meet the ingress protection of IP 65 according to EN 60529, as amended.

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.

ACCESSORIES

- plastic holder (supplied in the package)
- JS 130 stainless steel thermowell
- K 120 metal holder
- CONEC 43-00092 connection plug
- connection cables with a straight RKT connector or a right-angled RKWT connector
- fitting with a collet or with cutting rings – for setting of different immersion lengths of the temperature sensor stem

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

SPECIFICATIONS

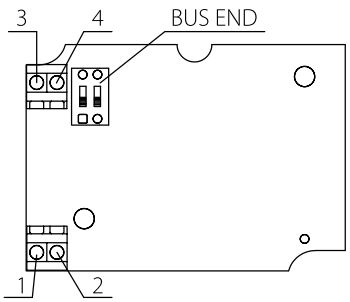
Sensor type (K - with connector)	SD 122 SD122K	SD 124 SD 124K	SD 125 SD 125K	SD 126 SD 126K
Output signal	RS 485 / MODBUS RTU	CAN / CANOpen-CIA DS 301	1-Wire / DS18B20	ZacWire / TSic x06
Measuring range *)	-50 to 150 °C		-40 to 125 °C	TSic 206 and 306 -30 to 100 °C TSic 506 and 716 -10 to 60 °C
Accuracy of the electronics	± 0.2 °C			
Type / Accuracy of the sensing element	Pt 1000 / ± (0.3 °C + 0.0005|t|)	Pt 100 / ± (0.3 °C + 0.0005|t|)	± 0.5 °C in the range of -10 to 80 °C ± 2 °C in the range of -30 to 100 °C	TSic 206 ± 0.5 °C in the range of 10 to 90 °C TSic 306 ± 0.3 °C in the range of 10 to 90 °C TSic 506 ± 0.1 °C in the range of 5 to 45 °C TSic 716 ± 0.07 °C in the range of 25 to 45 °C
Supply voltage (U)	15 to 30 V DC		3 to 5.5 V DC	
Rated supply voltage (Un)	24 V DC		5 V DC	3.3 V DC

Consumption / Supply current	maximum: 500 mW typical: 300 mW	1 mA	30 µA
Working conditions	ambient temperature: -30 to 100 °C relative air humidity: max. 100% atmospheric pressure: 70 to 107 kPa		
Ingress protection	IP 65 in accordance with EN 60529, as amended		
Time response	τ0.5 < 9 s (0.2 m/s^{-1} in running water)		
Standard stem lengths	70, 120, 180, 240 mm		
Standard stem diameter	6 ± 0.2 mm		
Material of the stem	stainless steel DIN 1.4301		
Resistance to pressure (impact on the stem with the medium)	PN 25 (without thermowell) / PN 63 (with thermowell)		
Insulation resistance	> 200 MΩ at 500 V/DC, 25°C ± 3 °C; humidity < 85 %		
Dimensions of the connection head	70 × 63 × 34 mm		
Material of the connection head	POLYAMIDE		
Connector type in the head (for sensors with a connector)	RSFM4 - M12- Lumberg		
Recommended wire cross-section (for sensors with a grommet)	0.14 to 1 mm^2	0.35 to 1.5 mm^2	
Weight	min. 0.17 kg	min. 0.12 kg	

**) By extending the stem length by 60 mm, the Sd 122, SD 122K, SD 124 and SD 124K sensors can be used up to 200 °C.*

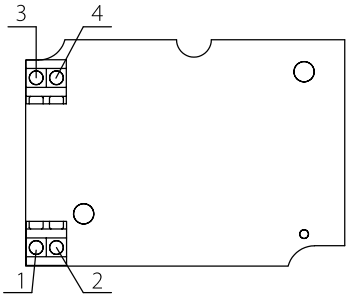
WIRING DIAGRAM

SD 122



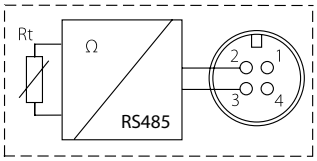
1 – power supply
2 – power supply
3 – data bus – K+
4 – data bus – K-

SD 124



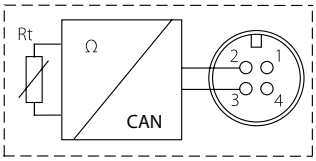
1 – power supply - U+
2 – power supply - GND
3 – data bus – CAN_L
4 – data bus – CAN_H

SD 122K with a connector



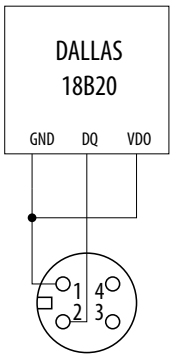
1 – PWR+
2 – data bus -
3 – data bus -
4 – PWR-

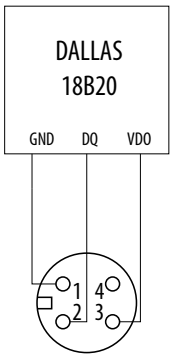
SD 124K with a connector



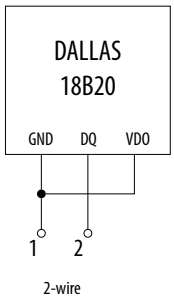
1 – PWR+
2 – data bus – CAN_L
3 – data bus – CAN_H
4 – PWR-

SD125K with connector

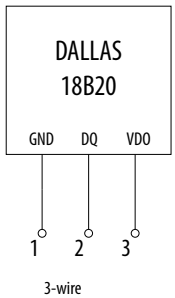




SD 125A with a grommet

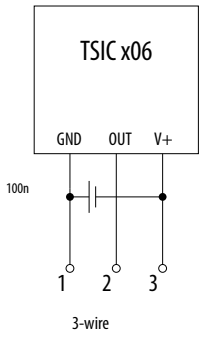


2-wire



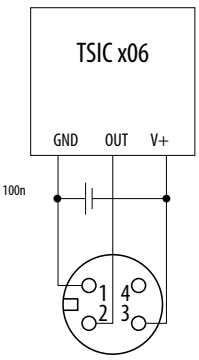
3-wire

SD 126 with grommet

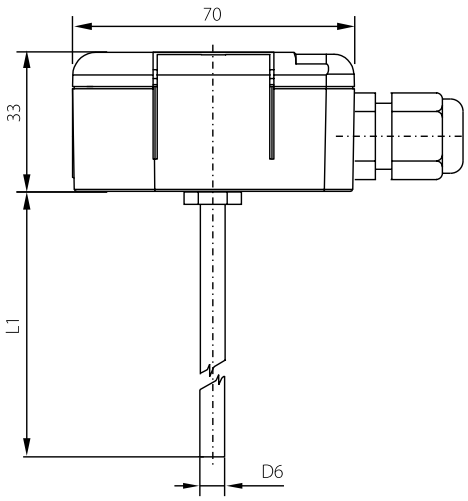


3-wire

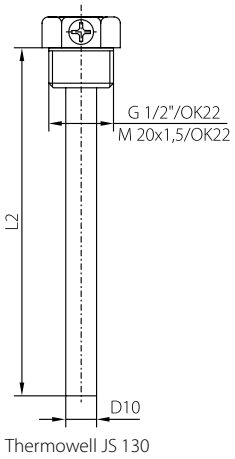
SD 126K with a connector



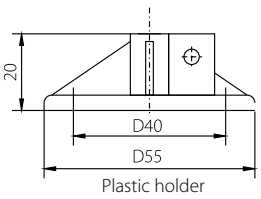
DIMENSIONAL DRAFT



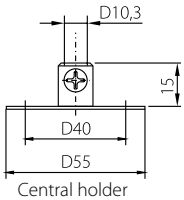
Accessory



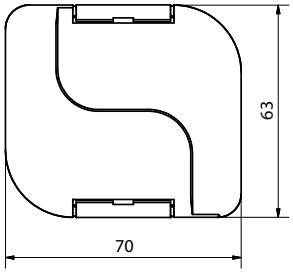
Thermowell JS 130



Plastic holder



Central holder
stainless steel, K 120



MODIFICATION

- Accuracy class A for SD 122A, SD 122AK, SD 124A, SD 124AK temperature sensor
- variable design of the stem in the area - length L1, material, diameter, threaded option
- thread type of thermowell

CONTACT TEMPERATURE SENSORS WITH A DIGITAL OUTPUT

096.01en

DESCRIPTION AND APPLICATION

CE

These type of sensors are intended for contact surface temperature measurement. The sensors are supplied with a fastening strap and cap and are suitable for temperature measurement on pipelines. The sensing element itself is insulated from the environment. The temperature sensors are easy to install thanks to the unique "S-head" design of the SENSIT s.r.o. company.

The sensors consist of a plastic head and a metal measuring case placed in a protective plastic, POLYAMIDE cover where the sensing element (sensor) for temperature measurement is placed. In the head, there is a terminal block with a converter located, to which a supply cable for sensor supply and digital output signal according to the sensor type is connected through a cable grommet or a connector. The basic versions of digital outputs are:

SD 142, **SD 142K** – MODBUS/RTU communication protocol, communication via the RS485 bus

SD 144, **SD 144K** – CANopen/CiA DS 301 communication protocol, communication via the CAN bus

SD 145, **SD 145K** – DS 18B20 digital temperature sensor, communication via the 1-Wire bus

SD 146, **SD 146K** – TSic 206, 506 and 716 digital temperature sensors, ZACWire communication protocol

The temperature range of sensor use is defined in the table of technical parameters for the individual versions of sensors. The sensors meet the ingress protection of IP 65 according to EN 60529, as amended. In order to ensure high accuracy of measurements, it is recommended to clean the contact surface with a file and to use a thermally conductive paste between the measured surface and the metal sensor case.

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.

ACCESSORIES

- CONEC 43-00092 connection plug
- connection cables with a straight RKT connector or a right-angled RKWT connector
- thermal paste up to 200 °C, 5 g

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

SPECIFICATIONS

Sensor type (K - with connector)	SD 142 SD142K	SD 144 SD 144K	SD 145 SD 145K	SD 146 SD 146K
Output signal	RS 485 / MODBUS RTUR	CAN / CANOpen-CIA DS 301CAN	1-Wire / DS18B201	ZacWire / TSic x06Z
Measuring range	-30 to 110 °C		-30 to 110 °C	TSic 206 and 306 -30 to 100 °C TSic 506 and 716 -10 to 60 °C TSic 206 and 306 -30 to 100 °C TSic 506 and 716 -10 to 60 °C
Accuracy of the electronics	± 0.2 °C			
Type / Accuracy of the sensing element *), **)	Pt 1000 / ± (0.3 °C + 0.0005|t|)	Pt 100 / ± (0.3 °C + 0.0005|t|)	± 0.5 °C in the range of -10 to 80 °C ± 2 °C in the range of -30 to 100 °C	TSic 206 ± 0.5 °C in the range of 10 to 90 °C TSic 306 ± 0.3 °C in the range of 10 to 90 °C TSic 506 ± 0.1 °C in the range of 5 to 45 °C TSic 716 ± 0.07 °C in the range of 25 to 45 °C
Supply voltage (U)	15 to 30 V DC		3 to 5.5 V DC	
Rated supply voltage (Un)	24 V DC		5 V DC	3.3 V DC

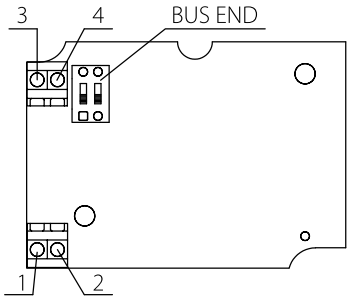
Consumption / Supply current	maximum: 500 mW typical: 300 mW	1 mA	30 µA
Working conditions	ambient temperature: -30 to 100 °C relative air humidity: max. 100% atmospheric pressure: 70 to 107 kPa		
Ingress protection	IP 65 in accordance with EN 60529, as amended		
Time response	τ0.5 < 13 s (on smooth surface without paste)		
Case materialCase material	brass		
Insulation resistance	> 200 MΩ at 500 V/DC, 25°C ± 3 °C; humidity < 85 %		
Dimensions of the connection head	70 × 63 × 34 mm		
Material of the connection head	POLYAMIDE		
Minimum pipe diameter	20 mm		
Length of the fastening strap	40 cm		
Fastening strap / cap material	stainless steel / galvanized steel		
Connector type in the head (for sensors with a connector)	RSFM4 - M12- Lumberg		
Recommended wire cross-section (for sensors with a grommet)	0.14 to 1 mm^2	0.35 to 1.5 mm^2	
Weight	min. 0.19 kg	min. 0.14 kg	

**) A temperature sensor measurement error depends on the ambient temperature and environment and the properties of the measured surface (method error) and can be within ± 1 °C.*

***) It is recommended to apply heat-conducting paste or silicon grease to the measured surface, which will ensure faster response time and minimise the measurement error of the contact temperature sensor.*

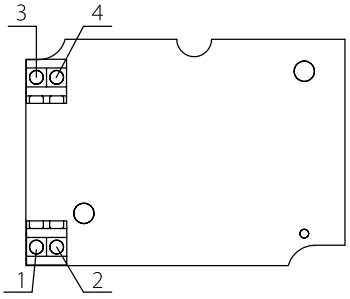
WIRING DIAGRAM

SD 142
with a grommet



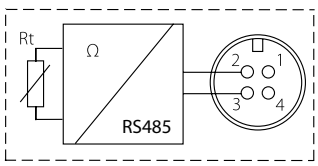
1 – power supply
2 – power supply
3 – data bus – K+
4 – data bus – K-

SD 144
with a grommet



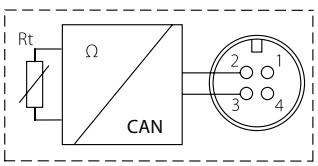
1 – power supply - U+
2 – power supply - GND
3 – data bus - CAN_L
4 – data bus - CAN_H

SD 142K
with a connector



1 – PWR+
2 – data bus - K+
3 – data bus - K-
4 – PWR-

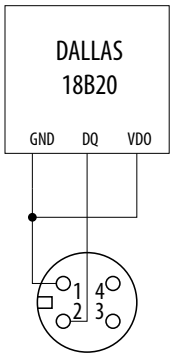
SD 144K
with a connector

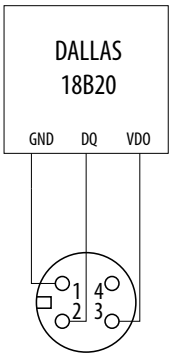


1 – PWR+
2 – data bus - CAN_L
3 – data bus - CAN_H
4 – PWR-

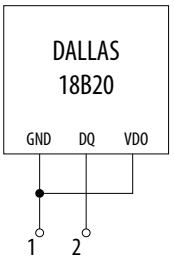
WIRING DIAGRAM

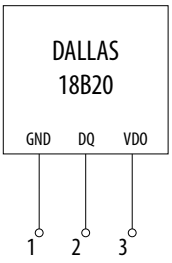
SD 145K with connector



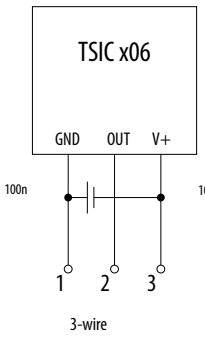


SD 145 with a grommet

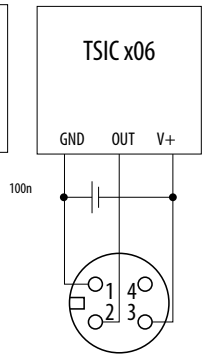




SD 146 with a grommet

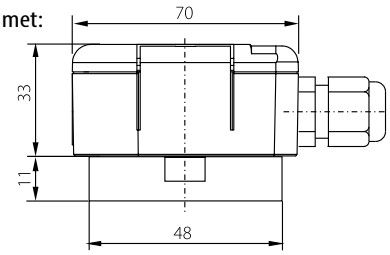


SD 146K with a connector

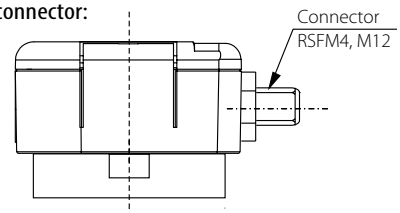


DIMENSIONAL DRAFT

Sensors with the grommet:

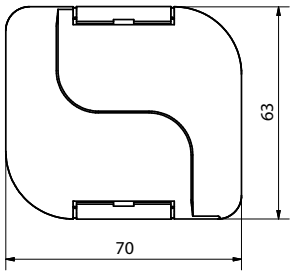


Sensors with the connector:



MODIFICATION AND CUSTOMIZATION

- accuracy class A for temperature sensing elements of **SD 142**, **SD 142K**, **SD 144**, **SD 144K** sensors



FAST RESPONSE TEMPERATURE SENSORS WITH A PLASTIC HEAD AND A DIGITAL OUTPUT

108.01en

DESCRIPTION AND APPLICATION

CE

These temperature sensors are designed for contact temperature measurement of liquid and gaseous substances. The stem design allows the sensor to be used for direct temperature measurement in pipelines and at the same time it provides a fast sensor response to changes in temperature. The temperature sensors are easy to install thanks to the unique "S-head" design of the SENSIT s.r.o. company.

The sensors consist of a plastic head and a metal case, where the sensing element for temperature measurement (sensor) is placed. Part of the metal case is a fitting with a standard G ½" thread. In the head, there is a terminal block with a converter located, to which a supply cable for sensor supply and digital output signal according to the sensor type is connected through a cable grommet or a connector. The basic versions of digital outputs are:

SD 162, **SD 162K** – MODBUS/RTU communication protocol, communication via the RS485 bus

SD 164, **SD 164K** – CANopen/CiA DS 301 communication protocol, communication via the CAN bus

The temperature range of sensor use is defined in the table of technical parameters for the individual versions of sensors. The sensors meet the ingress protection of IP 65 according to EN 60529, as amended.

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.

ACCESSORIES

- CONEC 43-00092 connection plug
- connection cables with a straight RKT connector or right-angled RKWT or PRKWT connector

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

SPECIFICATIONS

Sensor type (K - with connector)	SD 162 SD162K	SD 164 SD 164K
Output signal	RS 485 / MODBUS RTU	CAN / CANOpen-CIA DS 301
Measuring range *)	-50 to 130 °C	
Accuracy of the electronics	± 0.2 °C	
Type / Accuracy of the sensing element	Pt 1000 / ± (0.3 °C + 0.0005|t|)	Pt 100 / ± (0.3 °C + 0.0005|t|)
Supply voltage (U)	15 to 30 V DC	
Rated supply voltage (Un)	24 V DC	
Consumption / Supply current	maximum: 500 mW typical: 300 mW	
Working conditions	ambient temperature: -30 to 100 °C relative air humidity: max. 100% atmospheric pressure: 70 to 107 kPa	
Ingress protection	IP 65 in accordance with EN 60529, as amended	
Time response	$\tau 0.5 < 4$ s (0.2 m/s^{-1} in running water)	
Standard lenght of the stem	50, 100, 160, 220 mm	
Diameter of the stem	4 ± 0.1 mm	
Material of the stem	stainless steel DIN 1.4301	
Standard thread type	G 1/2"	

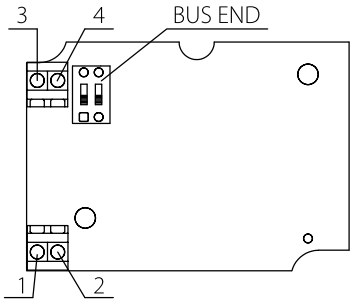
Resistance to pressure (impact on the stem with the medium)	PN 25
Insulation resistance	> 200 MΩ at 500 V/DC, 25°C ± 3 °C; humidity < 85 %
Dimensions of the connection head	70 × 63 × 34 mm
Material of the connection head	POLYAMIDE
Connector type in the head (for sensors with a connector)	RSFM4 - M12- Lumberg
Recommended wire cross-section (for sensors with a grommet)	0.14 to 1 mm^2
Weight	min. 0.2 kg

**) By extending the stem length by 60 mm above the thread, the sensors can be used up to 200 °C.*

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM – AIR AND WATER VAPOUR / WATER [$m.s^{-1}$]		
Length of the stem	up to 60 mm	> 100 to 160 mm
Values for the stem diameter of 4 mm	8 / 0.8	3.2 / 0.4

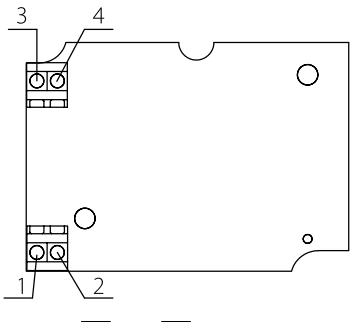
WIRING DIAGRAM

SD 162
with a grommet



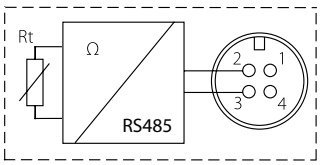
1 – power supply
2 – power supply
3 – data bus – K+
4 – data bus – K-

SD 164
with a grommet



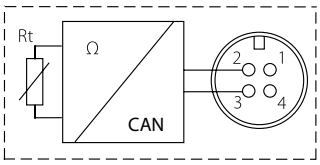
1 – power supply – U+
2 – power supply – GND
3 – data bus – CAN_L
4 – data bus – CAN_H

SD 162K
with a connector



1 – PWR+
2 – data bus – K+
3 – data bus – K-
4 – PWR-

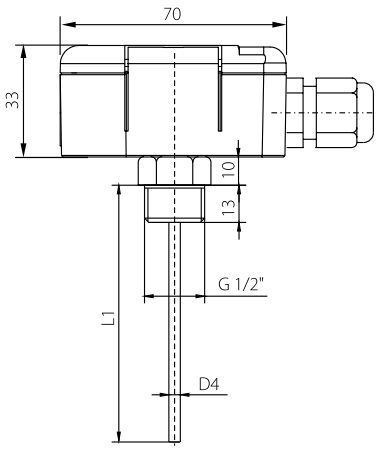
SD 164K
with a connector



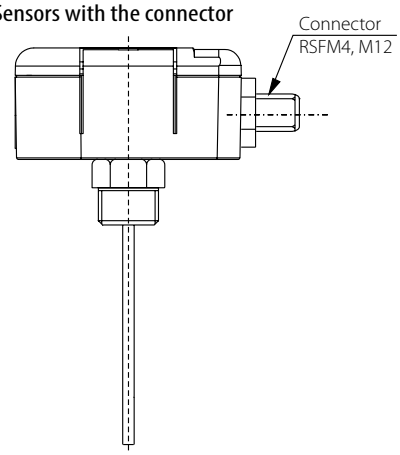
1 – PWR+
2 – data bus – CAN_L
3 – data bus – CAN_H
4 – PWR-

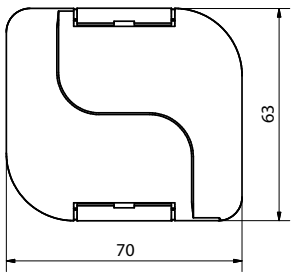
DIMENSIONAL DRAFT

Sensors with the grommet



Sensors with the connector





MODIFICATION AND CUSTOMIZATION

- accuracy class A for temperature sensing elements of SD 162, SD 162K, SD 164, SD 164K sensors
- variable stem design in the area - L1 length, material, diameter
- change of thread type
- by increasing the diameter of the stem to a minimum of 6 m, it is possible to realize also the following versions:
  SD 165, **SD 165K** – DS 18B20 digital temperature sensor, communication via the 1-Wire bus
  SD 166, **SD 166K** – TSiC 206, 506 and 716 digital temperature sensors, ZACWire communication protocol

TEMPERATURE SENSORS WITH A STEM, A STAINLESS STEEL HEAD AND A DIGITAL OUTPUT

109.01en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact temperature measurement of liquid and gaseous substances. In combination with a central holder, the sensor is suitable for temperature measurement in air conditioning ducts. The combination of a sensor and thermowell is suitable for measurement in pipelines. The material composition of the temperature sensor meets the requirements of Decree 38/2001 Coll., as amended, and thanks to the new design, the sensor can be easily cleaned. Due to these properties, the temperature sensors can be used in the food industry.

The sensors consist of a metal head and a metal case, where the sensing element for temperature measurement (sensor) is placed. An integral part of the head is M12 series connector to which the sensor power supply cable and the digital output signal are connected according to the sensor type. The basic versions of digital outputs are:

SD 182K – MODBUS/RTU communication protocol, communication via the RS485 bus

SD 185K – DS 18B20 digital temperature sensor, communication via the 1-Wire bus

SD 186K – TSiC 206, 506 and 716 digital temperature sensors, ZACWire communication protocol

The temperature range of sensor use is defined in the table of technical parameters for the individual versions of sensors. The sensors meet the ingress protection of IP 65 according to EN 60529, as amended.

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.

ACCESSORIES

- JS 130 stainless steel thermowell
- metal holder K 120
- CONEC 43-00092 connection plug
- connection cables with a straight RKT connector or right-angled RKWT or PRKWT connector
- fitting with a collet or with cutting rings – for setting of different immersion lengths of the temperature sensor stem

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

SPECIFICATIONS

Sensor type	SD 182K	SD 185K	SD 186K
Output signal	RS 485 / MODBUS RTU	1-Wire / DS18B20	ZacWire / TSic x06
Measuring range *)	-50 to 150 °C	- 40 to 125 °C	TSic 206 and 306 -30 to 100 °C TSic 506 and 716 -10 to 60 °C
Accuracy of the electronics	± 0.2 °C		
Type / Accuracy of the sensing element	Pt 1000 / ± (0.3 °C + 0.0005|t|)	± 0.5 °C in the range of -10 to 80 °C ± 2 °C in the range of -30 to 100 °C	TSic 206 ± 0.5 °C in the range of 10 to 90 °C TSic 306 ± 0.3 °C in the range of 10 to 90 °C TSic 506 ± 0.1 °C in the range of 5 to 45 °C TSic 716 ± 0.07 °C in the range of 25 to 45 °C
Supply voltage (U)	15 to 30 V DC	3 to 5.5 V DC	

Rated supply voltage (Un)	24 V DC	5 V DC	3.3 V DC
Consumption / Supply current	maximum: 500 mW typical: 300 mW	1 mA	30 µA
Working conditions	ambient temperature: -30 to 70 °C relative air humidity: max. 100% atmospheric pressure: 70 to 107 kPa		
Ingress protection	IP 67 in accordance with EN 60529, as amended		
Resistance to pressure (impact on the stem with the medium)	without a thermowell PN 25	with a thermowell PN 63	
Time response	τ0.5 < 9 s (0.2 m.s-1 in running water)		
Standard stem lengths	70, 120, 180, 240, 300, 360, 420 mm		
Standard stem diameter	6 ± 0.1 mm		
Measuring stem material	stainless steel DIN 1.4301		
Insulation resistance	> 200 MΩ at 500 V DC, 25 °C ± 3 °C		
Type of the connector	RSFM4 - M12- Lumberg		
Material of the head	stainless steel DIN 1.4301		
Dimensions of the head (without a connector)	D 21.7 x 71.5 mm	D 21.7 x 23 mm	
Weight	min. 0.2 kg	min. 0.1 kg	

**) by extending the stem length by 60 mm, the SD 182K sensors can be used up to 200 °C*

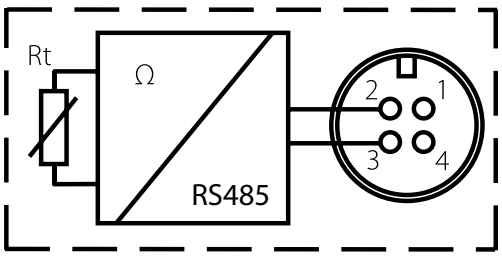
Maximum speed of water / air flow or water vapour flow when measuring the temperature in the pipelines:

Length of the case in mm	Flow speed of water / air without a thermowell	Flow speed of water / air with a thermowell
up to 60	2 / 20 m-1	3.5 / 35 m-1
> 70 to 120	1.5 / 15 m-1	3.0 / 30 m-1
> 120 to 180	1.0 / 8.0 m-1	2.0 / 15 m-1
> 180 to 240	0.6 / 2.5 m-1	1.2 / 5 m-1
> 240 to 420	0.3 / 0.6 m-1	0.8 / 1.6 m-1

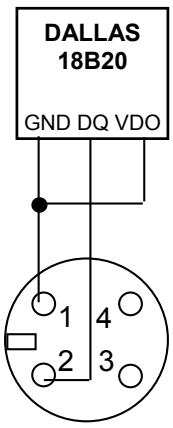
WIRING DIAGRAM

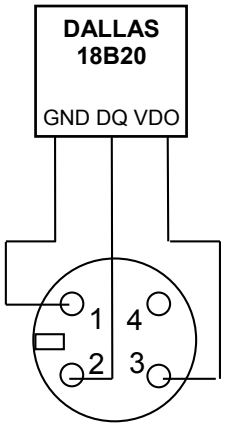
SD 182K

1 – PWR+
2 – data bus – K+
3 – data bus – K-
4 – PWR-

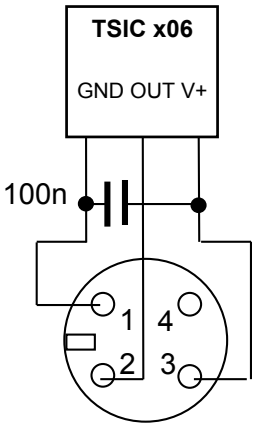


SD 185K



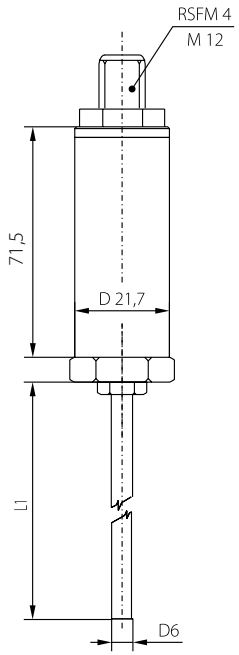


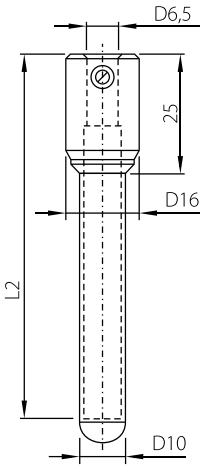
SD 186K



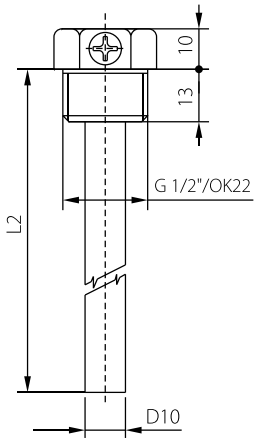
DIMENSIONAL DRAFT

SD 18xK

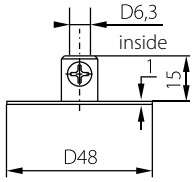




Cyllindrical thermowell welded in J 010



Thermowell JS 130



Metal central holder K 120

MODIFICATION AND CUSTOMIZATION

- variable stem design in the area – L1 length, material, diameter, possibility of threaded design
- the length of the sensor cable for the version with a grommet
- thermowell thread type

TEMPERATURE SENSORS UP TO 400 °C WITH A DIGITAL OUTPUT

110.01en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of temperature up to 400 °C. In combination with a central holder or a thermowell, it is possible to use the temperature sensors for temperature measurement in various industrial applications. The version of a sensor with a welded screw-on fitting is suitable for direct measurement of the medium in pipelines.

The sensors consist of a metal head and a metal case, where the sensing element for temperature measurement (sensor) is placed. In the head, there is a converter with a terminal block located, to which a 1-Wire bus supply cable is connected through a cable grommet or a connector. The basic versions of these sensors are:

PTS 4-1W – smooth stem version, communication via the 1-Wire bus

PTS 6-1W – version with a welded screw-on fitting, communication via the 1-Wire bus

The standard temperature range of the sensors is -50 to 400 °C. The sensors meet IP 54 ingress protection according to EN 60529, as amended.

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..

ACCESSORIES

- JPTS 41 stainless steel thermowell
- metal holder K 120
- fitting with a collet or with cutting rings – for setting of different immersion lengths of the temperature sensor stem

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

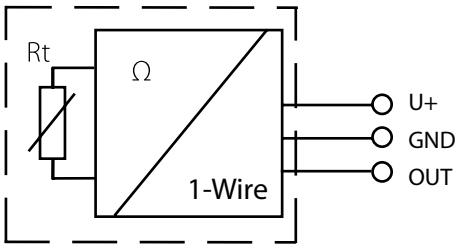
SPECIFICATIONS

Sensor type	PTS 4-1W	PTS 6-1W
Output signal	1-Wire / DS18B20	
Measuring range	- 50 to 600 °C	
Accuracy of the electronics	± 0.25 °C	
Type / Accuracy of the sensing element	Pt 1000 / ± (0.3 °C + 0.0005|t|)	
Supply voltage (U)	4.5 - 5 V DC	
Supply current	6.5 mA	
Working conditions	ambient temperature: -10 to 60 °C relative air humidity: max. 100% atmospheric pressure: 70 to 107 kPa	
Ingress protection	IP 54 in accordance with EN 60529, as amended	
Time response	τ0.5 < 9 s (0.2 m.s-1 in running water)	
"Resistance to pressure (impact on the stem with the medium)"	without a thermowell PN 25 with a thermowell PN 63	without thermowell PN 25
Insulation resistance	> 200 MΩ at 500 V DC at a temperature of 25 ± 3 °C; humidity < 85 %	
Material of the stem	stainless steel DIN 1.4301	
Standard stem lengths	50, 100, 160, 220, 280, 400 mm	
Standard stem diameter	6 ± 0.2 mm	
Thread types	/	G 1/2"; M 20 x 1.5; M 27 x 2
Material of the head	aluminium alloy, LIMATHERM B	
Recommended wire cross-section	0.35 to 1.5 mm2	
Weight	min. 0.25 kg	

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM – AIR AND WATER VAPOUR / WATER [m.s-1]

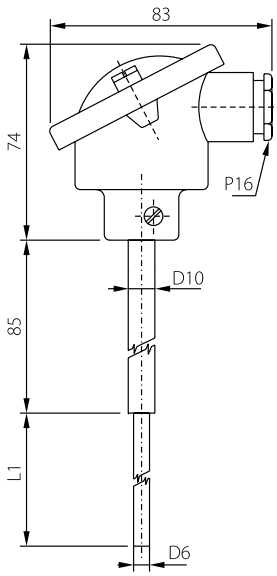
Stem length L1	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm	> 220 to 400 mm
Values for types with screw-on fitting	15.1.2005	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3

WIRING DIAGRAM

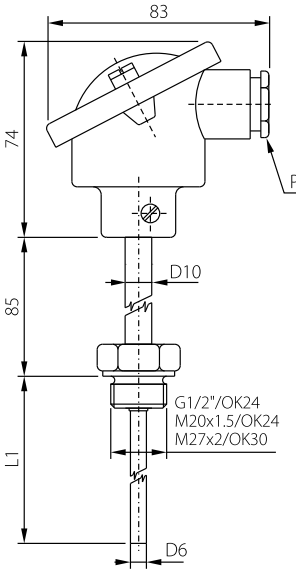


DIMENSIONAL DRAFT

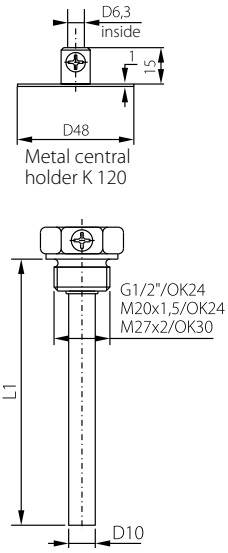
PTS4-1W



PTS6-1W



Accessories



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area - L1 length, material, diameter
- thermowell thread type
- IP 68 ingress protection - by using different version of the metal head
  – PTS 44-1W - smooth stem version, communication via the 1-Wire bus, IP 68
  – PTS 46-1W - version with a welded screw-on fitting, communication via the 1-Wire bus, IP 68

TEMPERATURE SENSORS UP TO 600 °C WITH IP 68 INGRESS PROTECTION AND WITH A DIGITAL OUTPUT

111.01en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of temperature up to 600 °C. In combination with a central holder or a thermowell, it is possible to use the temperature sensors for temperature measurement in various industrial applications. The version of a sensor with a welded screw-on fitting is suitable for direct measurement of the medium in pipelines.

The sensors consist of a metal head and a metal case, where the sensing element for temperature measurement (sensor) is placed. In the head, there is a converter with a terminal block located, to which a 1-Wire bus supply cable is connected through a cable grommet or a connector. The basic versions of these sensors are:

PTS 64-1W – smooth stem version, communication via the 1-Wire bus

PTS 66-1W – version with a welded screw-on fitting, communication via the 1-Wire bus

The standard temperature range of the sensors is -50 to 600 °C. The sensors meet IP 68 ingress protection according to EN 60529, as amended.

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.

ACCESSORIES

- JPTS 641 stainless steel thermowell
- metal holder K 120
- fitting with a collet or with cutting rings – in the case of setting of different immersion lengths of the temperature sensor stem.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

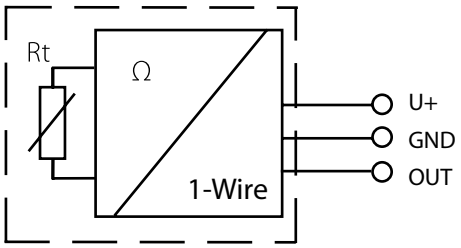
SPECIFICATIONS

Sensor type	PTS 64-1W	PTS 66-1W
Output signal	1-Wire / DS18B20	
Measuring range	- 50 to 600 °C	
Accuracy of the electronics	± 0.25 °C	
Type / Accuracy of the sensing element	Pt 1000 / ± (0.3 °C + 0.0005|t|)	
Supply voltage (U)	4.5 - 5 V DC	
Supply current	6.5 mA	
Working conditions	ambient temperature: -10 to 60 °C relative air humidity: max. 100% atmospheric pressure: 70 to 107 kPa	
Ingress protection	IP 54 in accordance with EN 60529, as amended	
Time response	τ0.5 < 9 s (0.2 m.s-1 in running water)	
"Resistance to pressure (impact on the stem with the medium)"	without a thermowell PN 25 with a thermowell PN 63	without thermowell PN 25
Insulation resistance	> 200 MΩ at 500 V DC at a temperature of 25 ± 3 °C; humidity < 85 %	
Material of the stem	stainless steel DIN 1.4301	
Standard stem lengths	50, 100, 160, 220, 280, 400 mm	
Standard stem diameter	6 ± 0.2 mm	
Thread types	/	G 1/2"; M 20 x 1.5; M 27 x 2
Material of the head	aluminium alloy, LIMATHERM B	
Recommended wire cross-section	0.35 to 1.5 mm2	
Weight	min. 0.25 kg	

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM – AIR AND WATER VAPOUR / WATER [m.s-1]

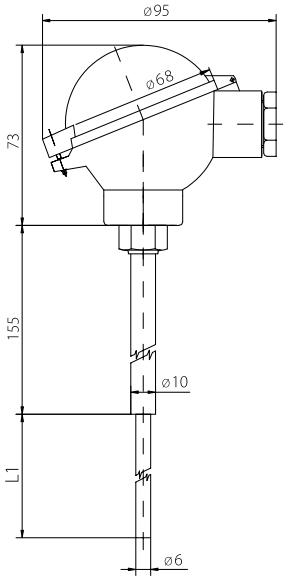
Stem length L1	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm	> 220 to 400 mm
Values for types with screw-on fitting	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3

WIRING DIAGRAM

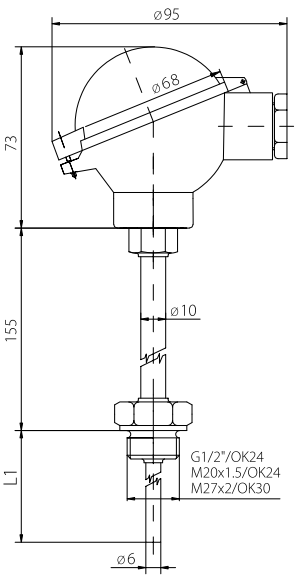


DIMENSIONAL DRAFT

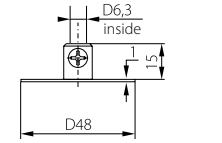
PTS 64-1W



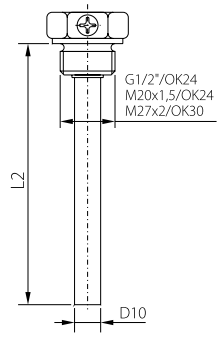
PTS 66-1W



Accessories



Metal central holder K 120



Thermowell JPTS 641 (stainless steel DIN 1.4571)

MODIFICATION AND CUSTOMIZATION

- variable stem design in the area - L1 length, material, diameter
- thermowell thread type

TEMPERATURE SENSOR FOR OUTDOOR USE WITH DISPLAY

D01.04en

DESCRIPTION AND APPLICATION

CE

These resistance temperature sensors with display are designed for contact temperature measurement of gaseous substances in outdoor or industrial areas. The temperature sensing element is located in a stainless steel stem of length of 25–50 mm. The plastic head of the temperature sensor with display is equipped with a cable grommet or a connector; the measured temperature is indicated on the 4-digit display located under the transparent cap of the head. The temperature sensors with display can be used for any control systems compatible with output signals listed in the table of technical parameters.

The maximum temperature range for current loop setting of the temperature sensors with display is -50 to 150 °C. Within this range, the required operating temperature ranges may be programmed, while the minimum difference between the lower and upper limit of the temperature range is 10 °C. The temperature range of measurement with the temperature sensor with display and, at the same time, the maximum temperature around the head is -30 to 70 °C and must not be exceeded even for a brief period. The temperature sensors with display meet ingress protection IP 65 according to EN 60529, as amended. The temperature sensors with display are easy to be installed thanks to the unique design of "S-head" made by SENSIT s.r.o. The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to temperature resistance of the head and the metal cases.

ACCESSORIES

- for the version with connector: lead-in connector CONNEC 43-00092
- connection cables with the direct RKT connector or rectangular RKWT

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

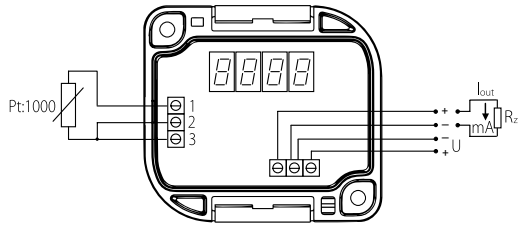
Sensor type (K – with a connector)	NSD 510A NSD 510AK	NSD 710A NSD 710AK
Output signal	4 to 20 mA	0 to 10 V
Type of sensing element	Pt 1000/3850, accuracy class. B ($\pm$ 0,3 + 0,005 x $\lvert t \rvert$) in °C	
Measuring range	adjustable	
Maximum temperature range	-50 to 150 °C	
Measuring error	0.8 % from the range, at least 0.5 °C	
Display screen	4-digit LED, character dimension 7.62 x 4.22 mm	
Power Supply U	15 to 30 V DC	
Nominal voltage Un	24 V	
Load resistance	max 250 Ω	min 10 kΩ
Current / voltage when the sensor is interrupted	> 24 mA	> 12 V
Current / voltage when the sensor is short-circuited	< 3 mA	~ 0 V
Material of the head	POLYAMIDE	
Dimension of the head	70 x 63 x 34 mm	
Wire cross-section	0.35 to 1.5 mm^2	
Ingress protection	IP 65 in accordance with EN 60529, as amended	
Cable connection	through the grommet M 16 x 1,5 / through the connector LUMBERG M12	
Ambient temperature around the head	-30 to 70 °C	
Electric strength	500 V / 50 Hz in accordance with EN 60730-1, as amended	

OTHER PARAMETERS

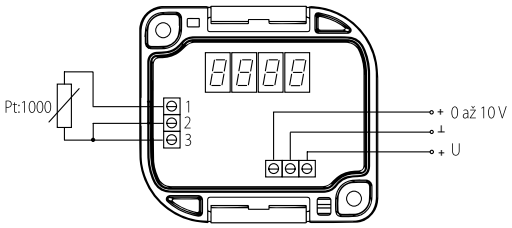
Length of the stem	50 mm for NSD 510A and NSD 510AK 25 mm for NSD 710A and NSD 710AK
Diameter of the stem	$6^{+0,2}$ mm
Material of the stem	stainless steel DIN 1.4301
Insulation resistance	> 200 MΩ at 500 V DC, 25° ± 3°C, relative humidity < 85 %
Max measuremet range	-30 to 70 °C
Weight approximately	0.15 kg

WIRING DIAGRAM

Output 4 to 20mA

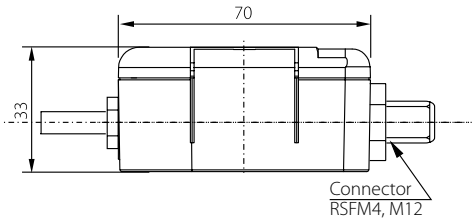


Output 0 to 10V

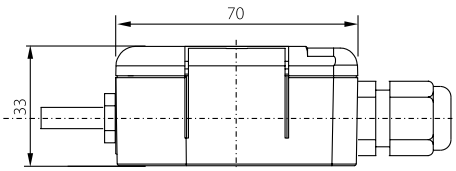


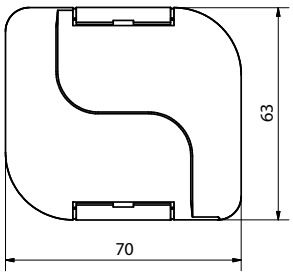
DIMENSIONAL DRAFT

Sensors with connector



Sensors with the grommet





TEMPERATURE SENSOR WITH STEM AND DISPLAY

D02.04en

DESCRIPTION AND APPLICATION

CE

These resistance temperature sensors with display and stem are designed for contact temperature measurements of liquid or gaseous substances. The temperature sensor-central holder combination is suitable for temperature measurements in air condition ducts. The temperature sensor-thermowell combination is suitable for temperature measurements in tubing. The temperature sensing element is located in a stainless steel stem of length of 70 to 420 mm. The plastic head of the temperature sensor with display is equipped with a cable grommet or a connector. The measured temperature is indicated on the 4-digit display located under the transparent cap of the head. The temperature sensors with display can be used for any control systems compatible with output signals listed in the table of technical parameters.

The maximum temperature range for current loop setting of the temperature sensors with display is -50 to 150 °C. Within this range, the required operating temperature ranges may be programmed, while the minimum difference between the lower and upper limit of the temperature range is 10 °C. The maximum temperature around the head is -30 to 70 °C and must not be exceeded even for a brief period. The temperature sensors with display meet ingress protection IP 65 according to EN 60529, as amended. The temperature sensors with display are easy to be installed thanks to the unique design of "S-head" made by SENSIT s.r.o.

The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to temperature resistance of the head and the metal cases.

ACCESSORIES

- central plastic holder (part of the packaging)
- stainless steel thermowell JS 130
- metal central holder K120
- for the version with connector: 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 lenghts of stem immersion of temperature sensor are set

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type (K – with a connector)	NSD 520 NSD 520K	NSD 720 NSD 720K
Output signal	4 to 20 mA	0 to 10 V
Type of sensing element	Pt 1000/3850, accuracy class B ($\pm$ 0,3 + 0,005 x | t |) in °C	
Measuring range	adjustable	
Maximum temperature range	-50 to 150 °C	
Measuring error	0.8 % from the range, at least 0.5 °C	
Display screen	4-digit LED, character dimension 7.62 x 4.22 mm	
Power Supply U	15 to 30 V DC	
Nominal voltage Un	24 V	
Load resistance	max 250 Ω	min 10kΩ

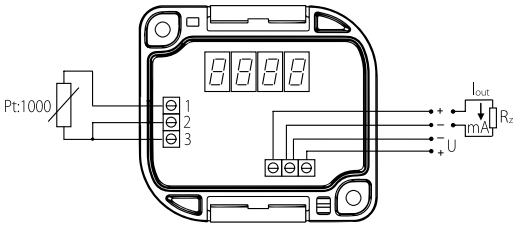
Current / voltage when the sensor is interrupted	> 24 mA	> 12 V
Current / voltage when the sensor is short-circuited	< 3 mA	~ 0 V
Material of the head	POLYAMIDE	
Dimension of the head	70 x 63 x 34 mm	
Wire cross-section	0.35 to 1.5 mm^2	
Ingress protection	IP 65 in accordance with EN 60529, as amended	
Cable connection	through the grommet M 16 x 1.5 / through the connector LUMBERG M12	
Ambient temperature around the head	-30 to 70 °C	
Electric strenght	500 V / 50 Hz in accordance with EN 60730-1, as amended	

OTHER PARAMETERS

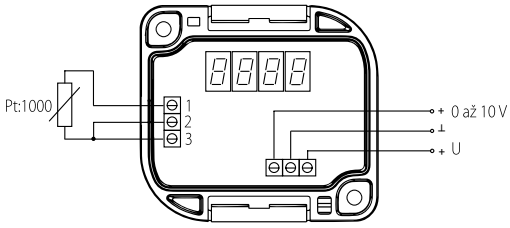
Length of the stem	70, 120, 180, 240, 300, 360 and 420 mm
Diameter of the stem	$6^{+0,2}$ mm
Material of the stem	stainless steel DIN 1.4301
Insulation resistance	> 200 MΩ at 500 V DC, 25° ± 3°C, relative humidity < 85 %
Max measurement range	-50 to 150 °C by using a sensor with a longer stem of 60 mm, the upper limit of allowable temperature can be extended up to 250 °C
Weight approximately	0.15 kg

WIRING DIAGRAM

Output 4 to 20mA

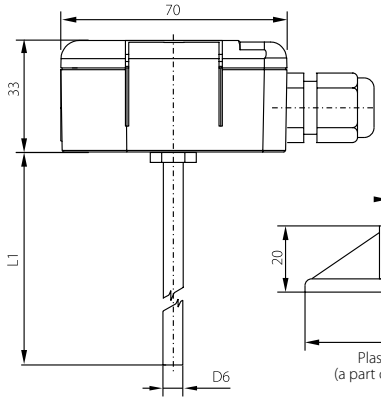


Output 0 to 10V

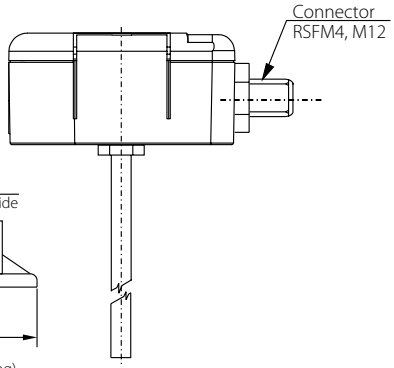


DIMENSIONAL DRAFT

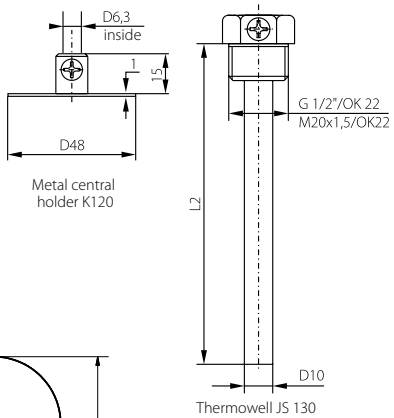
With the grommet

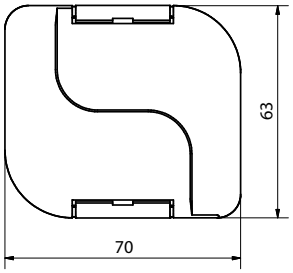


With the connector



Accessories





FAST RESPONSE TEMPERATURE SENSORS WITH DISPLAY

D03.04en

DESCRIPTION AND APPLICATION

CE

These fast response resistance temperature sensors with display are designed for contact temperature measurements of liquid or gaseous substances. The structure of the sensor's stem enables the sensor to be used for direct measuring of the temperature in ducts and also ensures quick response of the sensor to changes in temperature. The temperature sensing element is located in a stainless steel stem of length of 50 to 220 mm. The plastic head of the temperature sensor with display is equipped with a cable grommet or a connector; the measured temperature is indicated on the 4-digit display located under the transparent cap of the head. The temperature sensors with display can be used for any control systems compatible with output signals listed in the table of technical parameters. The maximum temperature range for current loop setting of the temperature sensors with display is -50 to 150 °C. Within this range, the required operating temperature ranges may be programmed, while the minimum difference between the lower and upper limit of the temperature range is 10 °C. The temperature range of measurement with the temperature sensor with display is -50 to 110 °C and, at the same time, the maximum temperature around the head is -30 to 70 °C and must not be exceeded even for a brief period. The temperature sensors with display meet ingress protection IP 65 according to EN 60529, as amended. The temperature sensors with display are easy to be installed thanks to the unique design of "S-head" made by SENSIT s.r.o. The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to temperature resistance of the head and the metal cases.

ACCESSORIES

- for the version with connector: lead-in connector CONEC 43-00092
- connection cable with starigt-type RKT connector or with rectangular-type RKWT connector

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type (K – with a connector)	NSD 560 NSD 560 K	NSD 760 NSD 760 K
Output signal	4 to 20 mA	0 to 10 V
Type of sensing element	Pt 1000/3850, accuracy class B ($\pm$ 0.3 + 0.005 x | t |) in °C	
Measuring range	adjustable	
Maximum temperature range	-50 to 150 °C	
Measurement error	0.8 % from the range, at least 0.5 °C	
Display screen	4-digit LED, character dimension 7.62 x 4.22 mm	
Power Supply U	15 to 30 V DC	
Nominal voltage Un	24 V	
Load resistance	max 250 Ω	min 10 kΩ
Current / voltage when the sensor is interrupted	> 24 mA	> 12 V
Current / voltage when the sensor is short-circuited	< 3 mA	~ 0 V
Material of the head	POLYAMIDE	

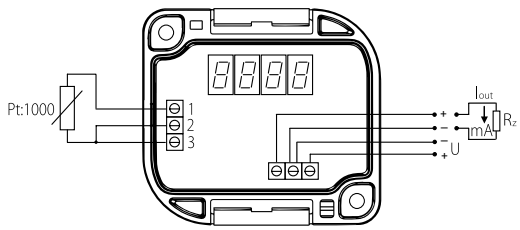
Dimension of the head	70 x 63 x 34 mm
Wire cross-section	0.35 to 1.5 mm^2
Ingress protection	IP 65 in accordance with EN 60529, as amended
Cable connection	through the grommet M 16 x 1.5 / through the connecotr LUMBERG M12
Ambient temperature aroung the head	-30 to 70 °C
Electric strength	500 V / 50 Hz in accordance with EN 60730-1, as amended

OTHER PARAMETERS

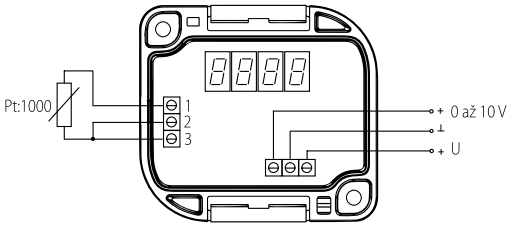
Length of the stem	50, 100, 160 and 220 mm
Diameter of the stem	$4^{+0,1}$ mm
Material of the stem	stainless steel DIN 1.4301
Insulation resistance	> 200 MΩ at 500 V DC, 25° ± 3°C, relative humidity < 85 %
Max measurement range	-50 to 110 °C
Weight approximately	0.18 kg for lenght 100 mm

WIRING DIAGRAM

Output 4 to 20mA

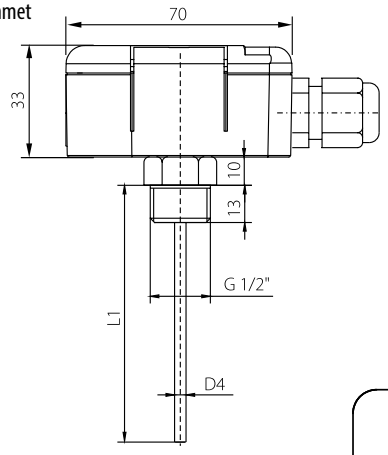


Output 0 to 10V

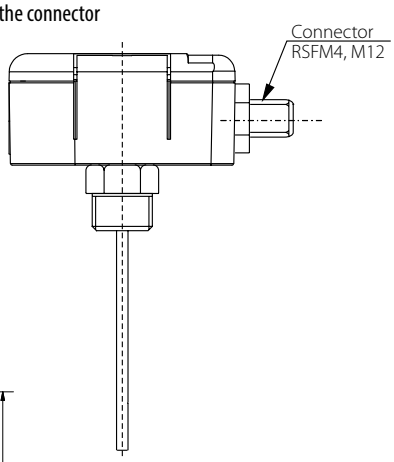


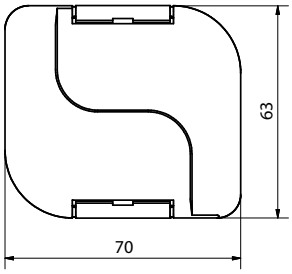
DIMENSIONAL DRAFT

Sensors with the grommet



Sensors with the connector





CONTACT TEMPERATURE SENSOR WITH DISPLAY

D04.04en

DESCRIPTION AND APPLICATION

CE

These fast response resistance temperature sensors with display are designed for contact surface temperature measurement. The sensors, which are available including the fastening strap (40 cm) and a closing device are suitable for temperature measurements on piping. The temperature sensing element is located in a stainless steel stem of length of 50 to 220 mm. The plastic head of the temperature sensor with display is equipped with a cable grommet or a connector; the measured temperature is indicated on the 4-digit display located under the transparent cap of the head.

The temperature sensors with display can be used for any control systems compatible with output signals listed in the table of technical parameters.

The maximum temperature range for current loop setting of the temperature sensors with display is -50 to 150 °C. Within this range, the required operating temperature ranges may be programmed, while the minimum difference between the lower and upper limit of the temperature range is 10 °C. The temperature range of measurement with the temperature sensor with display is -30 to 110 °C and, at the same time, the maximum temperature around the head is -30 to 70 °C and must not be exceeded even for a brief period. The temperature sensors with display meet ingress protection IP 65 according to EN 60529, as amended. The temperature sensors with display are easy to be installed thanks to the unique design of "S-head" made by SENSIT s.r.o.

The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to temperature resistance of the head and the metal cases.

ACCESSORIES

- for the sensor with connector: lead-in connector CONEC 43-00092
- connection cable with the straight-type RKT connector or with the rectangular-type RKWT connector
- thermal conductive paste up to 200 °C, 5 g

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type (K – with a connector)	NSD 540 NSD 540 K	NSD 740 NSD 740 K
Output signal	4 to 20 mA	0 to 10 V
Type of sensing element	Pt 1000/3850, accuracy class B ($\pm$ 0.3 + 0.005 x | t |) in °C	
Measuring range	adjustable	
Maximum temperature range	-50 to 150 °C	
Measuring error	0.8 % from range, at least 0.5 °C	
Display screen	4-digit LED, character dimension 7.62 x 4.22 mm	
Power Supply U	15 to 30 V DC	
Nominal voltage Un	24 V	
Load resistance	max 250 Ω	min 10 kΩ
Current / voltage when the sensor is interrupted	> 24 mA	> 12 V
Current / voltage when the sensor is short-circuited	< 3 mA	~ 0 V
Material of the head	POLYAMIDE	
Dimension of the head	70 x 63 x 34 mm	
Wire cross-section	0.35 to 1.5 mm^2	

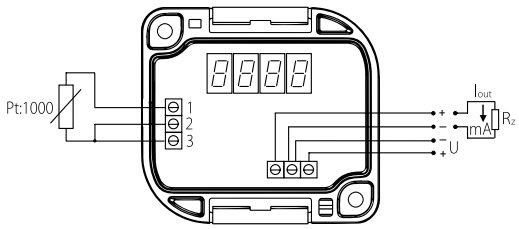
Ingress protection	IP 65 in accordance with EN 60529, as amended
Cable connection through the grommet M 16 x 1.5 /	through the connector LUMBERG M12
Ambient temperature around the head	-30 to 70 °C
Electric strenght	500 V / 50 Hz in accordance with EN 60730-1, as amended

OTHER PARAMETERS

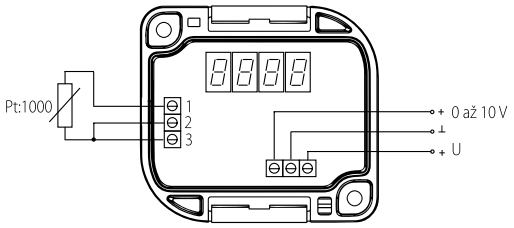
Material of the case	brass
Material of the protection case	POLYAMIDE
Insulation resistance	> 200 MΩ at 500 V DC, 25° ± 3°C, relative humidity < 85 %
Max measuring range	-30 to 110 °C
Weight approximately	0.15 kg

WIRING DIAGRAM

Output 4 to 20mA

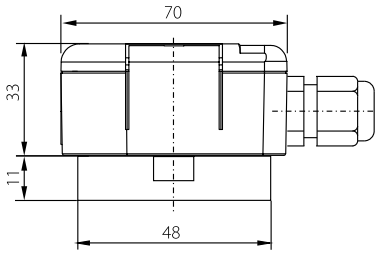


output 0 to 10 V

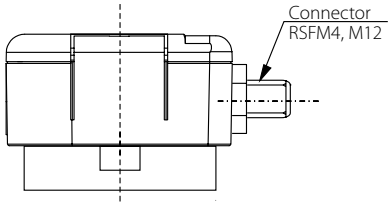


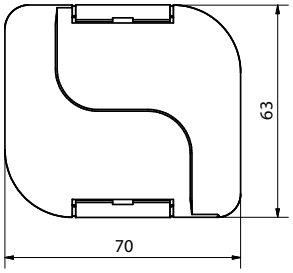
DIMENSIONAL DRAFT

Sensors with the grommet



Sensors with the connector





TEMPERATURE SENSORS UP TO 400 °C

028.17en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact measurements of temperatures up to 400 °C. Temperature sensors, in combination with a central holder or thermowell, can be used to measure the temperature in various applications of an industrial environment. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The standard operating temperature range is -50 to 400 °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 K 120
- stainless steel thermowell JPTS 41
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM - AIR AND WATER VAPOUR / WATER [$m.s^{-1}$]

Length of the thermowell/stem	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm	> 220 to 400 mm
Values for the versions with thread	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3

SPECIFICATIONS

Sensor type with smooth stem Sensor type with welded thread	PTS 41 PTS 61	PTS 43 PTS 63	PTS 45 PTS 65
Type of sensing element	Pt 100	Pt 500	Pt 1000
Measuring range B class	-50 to 400 °C		
Maximum measuring DC current	3 mA	1.5 mA	1 mA

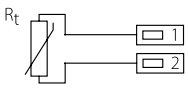
Sensor type with smooth stem Sensor type with welded thread	PTS 51 PTS 71	Note
Type of sensing element	Pt 1000/3850	
Output signal	4 to 20 mA	
Measuring ranges	-50 to 50 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 400 °C	ambient temperature around the connection head -30 to 70 °C
Power supply (U)	11 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	> 25 mA	
Output signal - sensing element short circuit	< 3.5 mA	

OTHER PARAMETERS

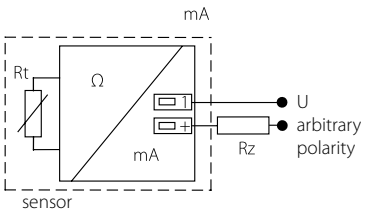
Accuracy class	B class according to EN 60751, t = ± (0.3 + 0.005|t|) in °C
Measuring error	< 0.6 % of the measuring range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Standard length of the stem L1	50, 100, 160, 220, 280, 400 mm
Nominal pressure of the stem	PN 63 (with a thread)
Time response	$\tau_{0.5}$ < 9 s (in flowing water at 0.4 m.s^{-1})
Recommended wire cross section	0.35 to 1.5 mm^2
Thead types for PTS 61, PTS 63, PTS 65, PTS 71	G ½"; M 20 x 1.5; M 27 x 2
Insulation resistance	> 200 MΩ at 500 V$_{DC}$, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 54 in accordance with to EN 60529, as amended
Material of the stem	stainless steel DIN 1.4301
Material of the connection head	aluminium alloy, LIMATHERM B
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

With a resistance output

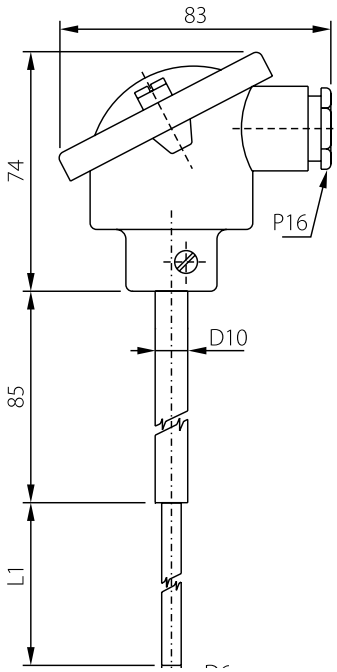


With a converter 4 to 20 mA

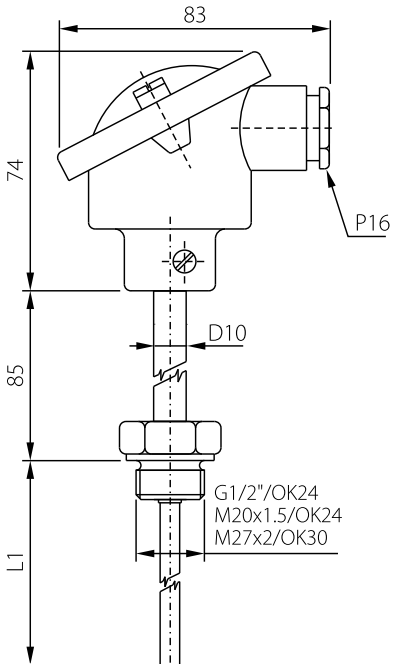


DIMENSIONAL DRAFT

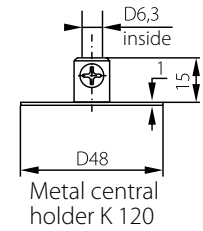
PTS4-1W

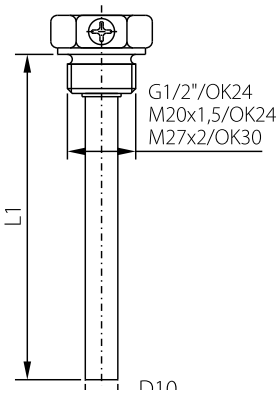


PTS6-1W



Accessories





MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing element
- accuracy class A for the range -50 to 250 °C
- option of three- or four-wire connection
- variable stem design – L1 length, materials, diameters, option of thread design
- thermowell thread type options

TEMPERATURE SENSORS UP TO 400 °C WITH PROGRAMMABLE CONVERTER 4–20 mA

115.08en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact measurements of temperatures up to 400 °C. Temperature sensors, in combination with a central holder or thermowell, can be used to measure the temperature in various applications of an industrial environment. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The standard operating temperature range is -50 to 400 °C. The sensors can be utilised for any control systems that are compatible with output signal 4–20 mA. The sensors are designed to be operated in a chemically non-aggressive environment.

CE

ACCESSORIES

- metal central holder K 120
- stainless steel thermowell JPTS 41
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM - AIR AND WATER VAPOUR / WATER [m.s^{-1}]

Length of the thermowell/stem	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm	> 220 to 400 mm
Values for the versions with thread	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3

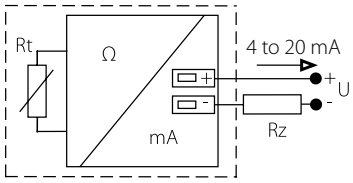
SPECIFICATIONS

Sensor type with smooth stem Sensor type with welded-on thread	PTS 81 PTS 91
Type of sensing element	Pt 1000/3850
Output signal	4 to 20 mA
Maximum measuring range	-50 to 400 °C
Adjustable measuring range	optional, minimum interval 10 °C
Accuracy of sensing element	class B in accordance with EN 60751
Accuracy of converter	temperature error < 0.05 °C error of setting < 0.12 °C error of linearity < 0.05 % from the set range, minimum 0.16 °C influence of supply voltage < 0.005 %/ V from the range
Current limitation	sensing element short < 3.2 mA sensing element break > 22.7 mA
Lead-in connection	1.5 to 2.5 mm^2
Ingress protection	IP 54 in accordance with EN 60529, as amended
Material of stem	stainless steel DIN 1.4301
Standard length of the stem L1	50, 100, 160, 220, 280, 400 mm
Nominal pressure of the stem	PN 63 (with a thread)
Method of programming	AY – USB adapter *
Thread types by PTS 91	G ½"; M 20 x 1.5; M 27 x 2
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25 °C ± 3 °C; humidity < 85 %
Material of connection head	aluminium alloy, LIMATHERM B
Operating conditions	ambient temperature: -25 to 70 °C relative humidity: max. 100 % (at the ambient temperature 25 °C) atmospheric pressure: 70 to 107 kPa
Weight	0.25 kg

**programming software is free*

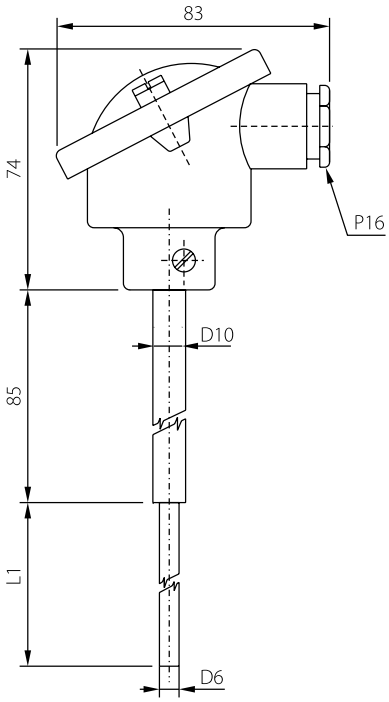
WIRING DIAGRAM

With a converter 4 to 20 mA

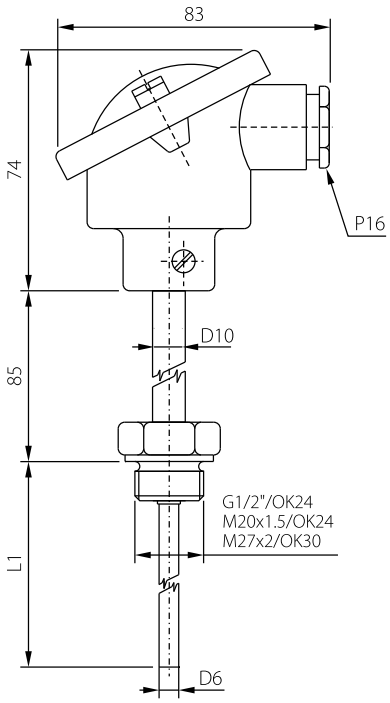


DIMENSIONAL DRAFT

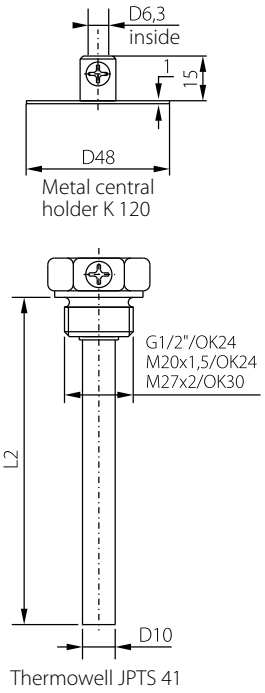
PTS 81



PTS 91



Accessories
(for the sensors PTS 81, PTS 91 only)



MODIFICATION AND CUSTOMIZATION

- variable stem design – L1 length, materials, diameters, option of thread design
- thermowell thread type options

TEMPERATURE SENSORS UP TO 400 °C WITH IP 68

029.07en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact measurements of temperatures up to 400 °C. Temperature sensors, in combination with a central holder or thermowell, can be used to measure the temperature in various applications of an industrial environment. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The sensors meet the level of protection IP 68 in accordance with EN 60529, as amended. The standard operating temperature range is -50 to 400 °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 K 120
- stainless steel thermowell JPTS 41
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM - AIR AND WATER VAPOUR / WATER [$m.s^{-1}$]

Length of the thermowell/stem	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm	> 220 to 400 mm
Values for the versions with thread	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3

SPECIFICATIONS

Sensor type with smooth stem Sensor type with welded-on thread	PTS 441 PTS 461	PTS 443 PTS 463	PTS 445 PTS 465
Type of sensing element	Pt 100	Pt 500	Pt 1000
Measuring range B class	-50 to 400 °C		
Maximum measuring DC current	3 mA	1.5 mA	1 mA

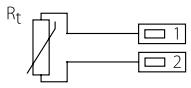
Sensor type with smooth stem Sensor type with welded-on thread	PTS 451 PTS 471	Note
Type of sensing element	Pt 1000/3850	
Output signal	4 to 20 mA	
Measuring ranges	-50 to 50 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 400 °C	ambient temperature around the connection head -30 to 70 °C
Power supply (U)	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	> 25 mA	
Output signal - sensing element short circuit	< 3.5 mA	

OTHER PARAMETERS

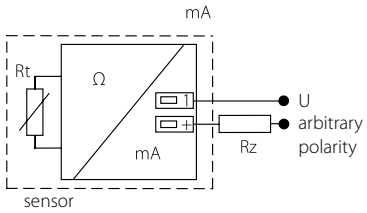
Accuracy class	B class according to EN 60751, t = ± (0.3 + 0.005|t|) in °C A class according to EN 60751, t = ± (0.15 + 0.002|t|) in °C
Measuring error	< 0.6 % of the measuring range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Standard length of the stem L1	50, 100, 160, 220, 280, 400 mm
Nominal pressure of the stem	PN 63 (with a thread)
Time response	$\tau_{0.5}$ < 9 s (in flowing water at 0.4 m.s^{-1})
Recommended wire cross section	0.35 to 1.5 mm^2
Thead types for PTS 61, PTS 63, PTS 65, PTS 71	G ½"; M 20 x 1.5; M 27 x 2
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 54 in accordance with to EN 60529, as amended
Material of the stem	stainless steel DIN 1.4301
Material of the connection head	aluminium alloy, LIMATHERM B
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

With a resistance output

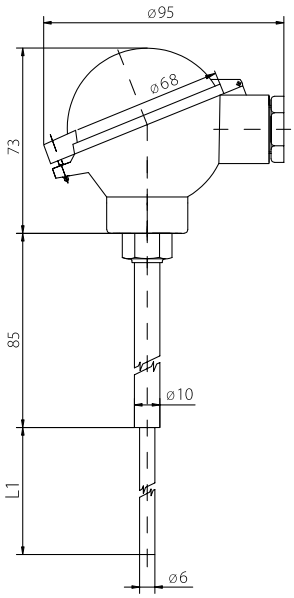


With a converter 4 to 20 mA

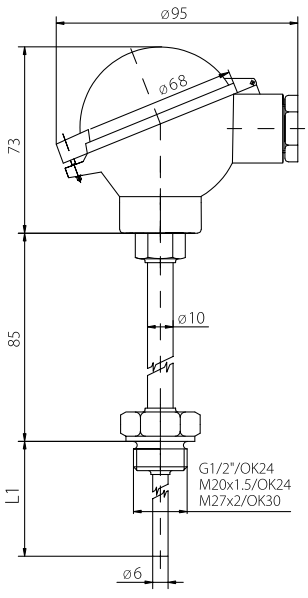


DIMENSIONAL DRAFT

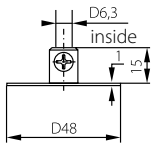
PTS 441, PTS 443,
PTS 445, PTS 451



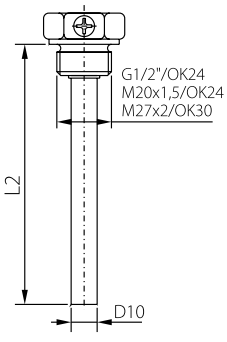
PTS 461, PTS 463,
PTS 465, PTS 471



Accessories
(for the sensors PTS 441,
PTS 443, PTS 445, PTS 451 only)



Metal central
holder K 120



Thermowell JPTS 41

MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing element
- accuracy class A for the range -50 to 250 °C
- option of three- or four-wire connection
- variable stem design – L1 length, materials, diameters, option of thread design
- thermowell thread type options

TEMPERATURE SENSORS UP TO 400 °C WITH IP 68 WITH PROGRAMMABLE CONVERTER 4–20 mA

116.06en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact measurements of temperatures up to 400 °C. Temperature sensors, in combination with a central holder or thermowell, can be used to measure the temperature in various applications of an industrial environment. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The sensors meet the level of protection IP 68 in accordance with EN 60529, as amended. The standard operating temperature range is -50 to 400 °C. The sensors can be utilised for any control systems that are compatible with output signal 4–20 mA. The sensors are designed to be operated in a chemically non-aggressive environment.

CE

IP 68

ACCESSORIES

- metal central holder K 120
- stainless steel thermowell JPTS 41
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

MAXIMUM FLOW SPEED OF THE **MEASURED** MEDIUM - AIR AND WATER VAPOUR / WATER [$m.s^{-1}$]

Length of the thermowell/stem	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm	> 220 to 400 mm
Values for the versions with thread	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3

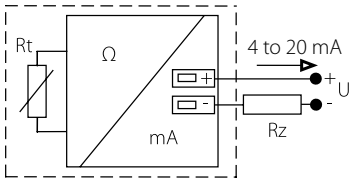
SPECIFICATIONS

Sensor type with smooth stem Sensor type with welded-thread	PTS 481 PTS 491
Type of sensing element	Pt 100
Output signal	4 to 20 mA
Maximum measurement range	-50 to 400 °C
Adjustable measurement range	optional, minimum interval 10 °C
Accuracy of sensing element	class B in accordance with EN 60751, as amended
Accuracy of converter	temperature error < 0.05 °C, error of setting < 0.12 °C error of linearity < 0.05 % from the set range, minimum 0.16 °C influence of supply voltage < 0.005 %/ V from the range
Current limitation	sensing element short < 3.2 mA sensing element break > 22.7 mA
Lead-in connection	recommended wire 1.5 to 2.5 mm^2
Ingress protection	IP 68 (1 bar) in accordance with 60529, as amended
Material of sensor stem	stainless steel DIN 1.4301
Standard length of the stem L1	50, 100, 160, 220, 280, 400 mm
Method of programming	AY – USB adapter *
Thread types for PTS 491	G ½"; M 20 x 1.5; M 27 x 2
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25 °C ± 3 °C; humidity < 85 %
Material of connection head	aluminium alloy, LIMATHERM B
Operating conditions	ambient temperature: -25 to 70 °C, relative humidity: max. 100 % (at the ambient temperature 25 °C) atmospheric pressure: 70 to 107 kPa
Weight approximately	0.25 kg

**programming software is free*

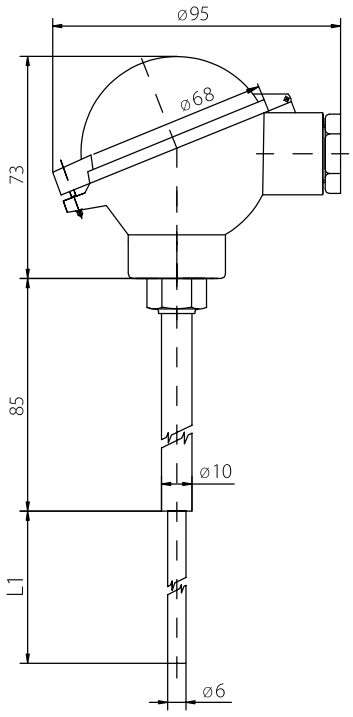
WIRING DIAGRAM

With a converter 4 to 20 mA

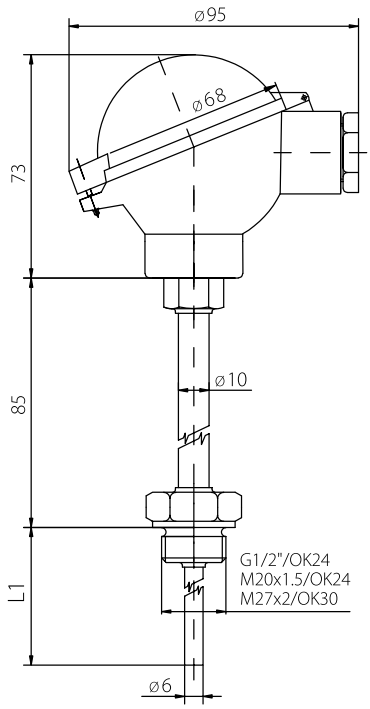


DIMENSIONAL DRAFT

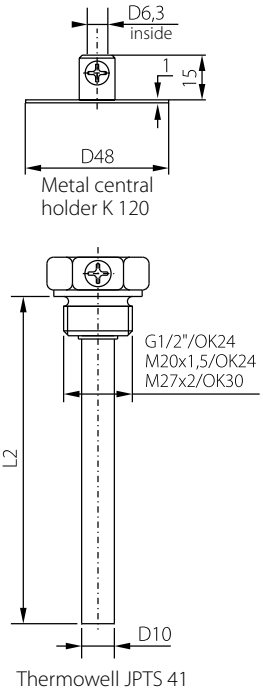
PTS 481



PTS 491



Accessories
(for the sensors PTS 481, PTS 491 only)



MODIFICATION AND CUSTOMIZATION

- variable stem design – L1 length, materials, diameters, option of thread design
- thermowell thread type options

TEMPERATURE SENSORS UP TO 600 °C WITH IP 68

030.06en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact measurements of temperatures up to 600 °C. Temperature sensors, in combination with a central holder or thermowell, can be used to measure the temperature in various applications of an industrial environment. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The sensors meet the level of protection IP 68 in accordance with EN 60529, as amended. The standard operating temperature range is -50 to 600 °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 K 120
- stainless steel thermowell JPTS 641
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM - AIR AND WATER VAPOUR / WATER [m.s^{-1}]

Length of the thermowell/stem	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm	> 220 to 400 mm
Values for the versions with thread	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3

SPECIFICATIONS

Sensor type with smooth stem Sensor type with welded-on thread	PTS 641 PTS 661	PTS 645 PTS 665
Type of sensing element	Pt 100	Pt 1000
Measuring range B class	-50 to 600 °C, in a short term to 650 °C	
Maximum measuring DC current	3 mA	1 mA

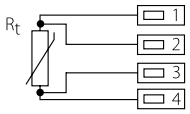
Sensor type with smooth stem Sensor type with welded-on thread	PTS 651 PTS 671	Note
Type of sensing element	Pt 1000	
Output signal	4 to 20 mA	
Measuring ranges	-50 to 50 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 400 °C 0 to 600 °C	ambient temperature around the connection head -30 to 70 °C
Power supply (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	> 25 mA	
Output signal - sensing element short circuit	< 3.5 mA	

OTHER PARAMETERS

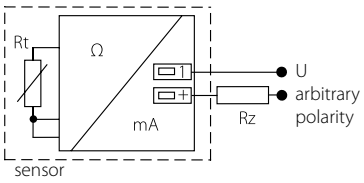
Accuracy class	B class according to EN 60751, t = ± (0.3 + 0.005|t|) in °C
Measuring error (PTS 651, PTS 671)	< 0.6 % of the measuring range, minimum 0.5 °C
Sensor connection	4-wire
Standard length of the stem L1	50, 100, 160, 220, 280, 400 mm
Nominal pressure of the stem	PN 63 (with a thread)
Time response	$\tau_{0.5}$ < 9 s (in flowing water at 0.4 m.s^{-1})
Recommended wire cross section	0.35 to 1.5 mm^2
Thread types for PTS 661, PTS 665, PTS 671	G ½"; M 20 x 1.5; M 27 x 2
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended
Material of the stem	stainless steel DIN 1.4571
Material of the connection head	aluminium alloy, LIMATHERM B
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

With a resistance output

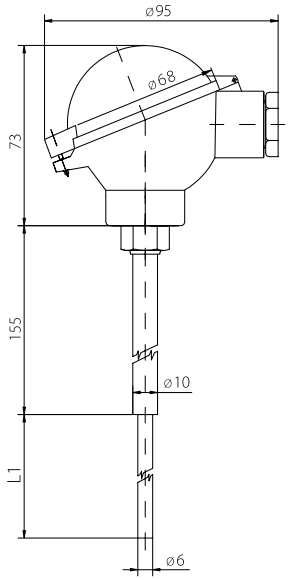


With a converter 4 to 20 mA

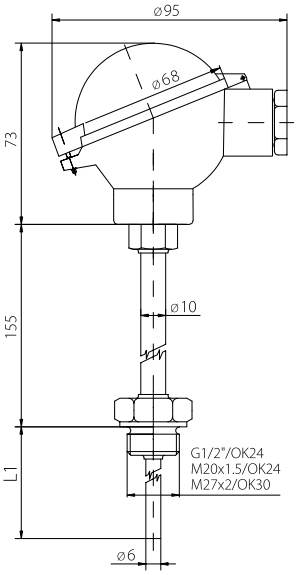


DIMENSIONAL DRAFT

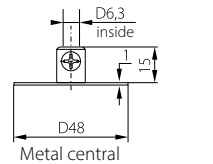
PTS 64-1W



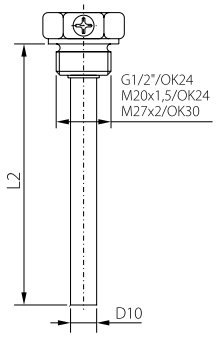
PTS 66-1W



Accessories



Metal central holder K 120



Thermowell JPTS 641 (stainless steel DIN 1.4571)

MODIFICATION AND CUSTOMIZATION

- option of encasing two sensing elements
- accuracy class A for the range -50 to 250 °C
- option of three- or four-wire connection
- variable stem design – L1 length, materials, diameters, option of thread design
- thermowell thread type options

TEMPERATURE SENSORS UP TO 600 °C WITH IP 68 WITH PROGRAMMABLE CONVERTER 4–20 mA

122.07en

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact measurements of temperatures up to 600 °C. Temperature sensors, in combination with a central holder or thermowell, can be used to measure the temperature in various applications of an industrial environment. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The sensors meet the level of protection IP 68 in accordance with EN 60529, as amended. The standard operating temperature range is -50 to 600 °C. The sensors can be utilised for any control systems that are compatible with output signal 4–20 mA. The sensors are designed to be operated in a chemically non-aggressive environment.

ACCESSORIES

- metal central holder K 120
- stainless steel thermowell JPTS 641
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM - AIR AND WATER VAPOUR / WATER [$m.s^{-1}$]

Length of the thermowell/stem	> 60 to 100 mm	> 100 to 160 mm	> 160 to 220 mm	> 220 to 400 mm
Values for the versions with thread	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3

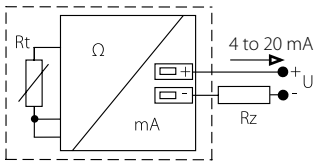
SPECIFICATIONS

Sensor type with smooth stem Sensor type with welded-on thread	PTS 681 PTS 691
Type of sensing element	Pt 1000/3850
Output signal	4 to 20 mA
Maximum measurement range	-50 to 600 °C, in a short term to 650 °C
Adjustable measurement range	optional, minimum interval 10 °C
Accuracy of sensing element	class B in accordance with EN 60751, as amended
Accuracy of converter	temperature error < 0.05 °C error of setting < 0.12 °C error of linearity < 0.05 % from the set range, minimum 0.16 °C influence of supply voltage < 0.005 %/ V from the range
Current limitation	sensing element short < 3.2 mA sensing element break > 22.7 mA
Lead-in connection	recommended wire 1.5 to 2.5 mm^2
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended
Material of stem	stainless steel DIN 1.4571
Standard length of the stem L1	50, 100, 160, 220, 280, 400 mm
Method of programming	AY – USB adapter *
Thread types by PTS 691	G ½"; M 20 x 1.5; M 27 x 2
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25 °C ± 3 °C; humidity < 85 %
Material of connection head	aluminium alloy, LIMATHERM B
Operating conditions	ambient temperature: -25 to 80 °C, relative humidity: max. 100 % (at the ambient temperature 25 °C) atmospheric pressure: 70 to 107 kPa
Weight approximately	0.25 kg

**programming software is free*

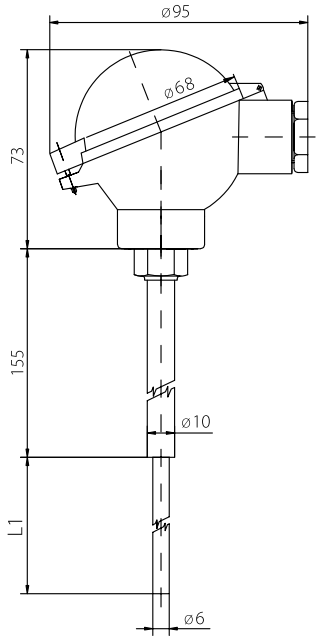
WIRING DIAGRAM

With a converter 4 to 20 mA

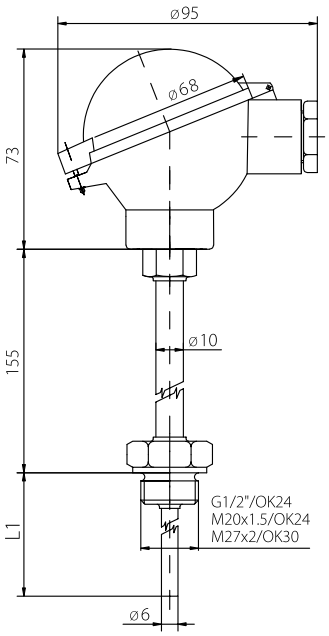


DIMENSIONAL DRAFT

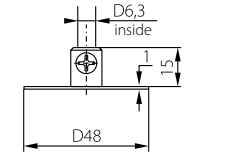
PTS 681



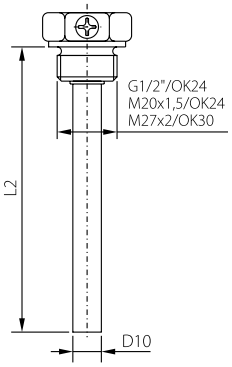
PTS 691



Accessories
(for the sensors PTS 681, PTS 691 only)



Metal central holder K 120



Thermowell JPTS 641

MODIFICATION AND CUSTOMIZATION

- variable stem design – L1 length, materials, diameters, option of thread design
- thermowell thread type options

TEMPERATURE SENSORS WITH METAL CONNECTION HEAD AND STEM FOR EXPLOSIVE ENVIROMENT

017.03en

DESCRIPTION AND APPLICATION

Resistance temperature sensors are designed for contact temperature measurement of liquid and gaseous substances. They operate on the principle of dependency of the change of resistance of the sensor and the change of temperature. Resistance temperature sensors are not able to create sparks, electric arcs or high surface temperatures and the maximum permitted DC input power for the sensor is 2mW. The standard temperature range for using of the sensor in ZONE 2 is - 30°C to 80°C, which corresponds to temperature class T6, and it must not be exceeded even for a brief period in areas with the risk of explosion. By combining it with a centre holder or thermowell supplied as accessories, the sensor can be used for measuring temperature in air conditioning ducts and pipes.

The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to temperature resistance of the head and chemical resistance of the case and head of the sensor.

ACCESSORIES

- stainless steel thermowell JS 130
- metal central holder K 120 – for use in air – conditioning ducts
- metal holder K 110C – for mounting to a wall
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	NK 120EX	NK 121EX	NK 122EX	NK 320EX	NK 321EX
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range in ZONE 2	-30 to 80 °C				
Max. DC measuring current	1 mA	1 mA	1 mA	0.3 mA	0.3 mA

Sensor type	NK 123EX	PTK 120EX	PTK 220EX	PTK 320EX	HK 120EX
Type of sensing element	T1 = Ni 2226	Pt 100/3850	Pt 500/3850	Pt 1000/3850	termistor NTC 20 kΩ
Measuring range in ZONE 2	-30 to 80 °C				
Maximum measuring DC current	0.7 mA	3 mA	1.5 mA	1 mA	1 mW *)

**) maximum power consumption*

OTHER PARAMETERS

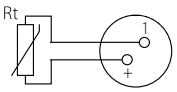
Measuring range	in ZONE 2: -30 °C ≤ Ta ≤ 80 °C
Sensor connection	2wire, 3wire, 4wire
Recommended power supply	from a PELV or SELV source maximum input power 2mW
Time response	in accordance with EN 60751, as amended (in flowing water > 0,2 $m.s^{-1}$), - for case diameter 4 mm: $\tau_{0.5} \leq 4$ s, $\tau_{0.9} \leq 10$ s - for case diameter 6 mm $\tau_{0.5} \leq 9$ s, $\tau_{0.9} \leq 20$ s - for case diameter 8 mm: $\tau_{0.5} \leq 14$ s, $\tau_{0.9} \leq 35$ s - for case diameter 10 mm: $\tau_{0.5} \leq 25$ s, $\tau_{0.9} \leq 60$ s

OTHER PARAMETERS

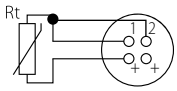
Insulation resistance	> 200 MΩ at 500 V_{DC}, 25 °C ±3 °C, relative humidity < 80 %
Electric strength	1000 V_{DC} for 1s, 25 °C ± 5°C, max. < 80 %
Ingress protection	IP 66 in accordance with EN 60529, as amended
Terminal board type	ceramic, recommended cross-section of the wires 0.5 to 1.0 mm^2
Material of the connection head	aluminum
Dimension of the connection head	83 x 83 mm
Temperature resistance of the head	-30 to 90 °C
Material of the stem	stainless steel DIN 1.4301, 1.4404 or 1.4571
Diameter of the stem D	4 mm, 6 mm, 8 mm, 10 mm
Standard length of stem L	diameter 4 mm: 70, 120, 180, 240 mm other diameters: 70, 120, 180, 240, 300, 340 and 400 mm
Wire resistance	0.254 Ω / m (two-wire connection)
Maximum operating pressure	with stem diameter 4 mm - 2.5 MPa with stem diameter 6 to 10 mm - 6.3 MPa
Weight approximately	0.4 kg

WIRING DIAGRAM

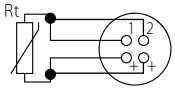
Two-wire



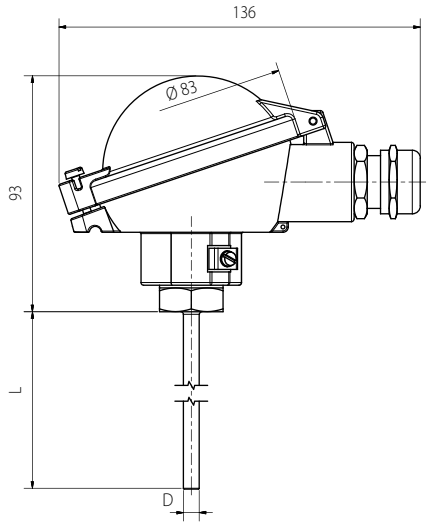
Three-wire



Four-wire



DIMENSIONAL DRAFT



TEMPERATURE SENSORS WITH METAL CONNECTION HEAD AND STEM WITH FAST RESPONSE FOR EXPLOSIVE ENVIRONMENT

018.03en

DESCRIPTION AND APPLICATION

Resistance temperature sensors are designed for contact temperature measurement of liquid and gaseous substances. They operate on the principle of dependency of the change of resistance of the sensor and the change of temperature. Resistance temperature sensors are not able to create sparks, electric arcs or high surface temperatures and the maximum permitted DC input power for the sensor is 2mW. The standard temperature range for using of the sensor in ZONE 2 is - 30°C to 80°C, which corresponds to temperature class T6, and it must not be exceeded even for a brief period in areas with the risk of explosion. The stem design allows the use of sensors for direct temperature measurement in pipelines and at the same time it provides a fast sensor response to changes in temperature compared to sensors with a thermowell.

The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to temperature resistance of the head and chemical resistance of the case and head of the sensor.

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	NK 160EX	NK 161EX	NK 162EX
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891
Measuring range in ZONE 2	-30 to 80 °C		
Max. DC measuring current	1 mA	1 mA	1 mA

Sensor type	PTK 160EX	PTK 260EX	PTK 360EX	HK 160EX
Type of sensing element	Pt 100/3850	Pt 500/3850	Pt 1000/3850	termistor NTC 20 kΩ
Measuring range in ZONE 2	-30 to 80 °C			
Max. DC measuring current	3 mA	1.5 mA	1 mA	1 mW *)

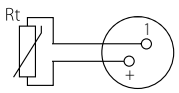
**) maximum power consumption*

OTHER PARAMETERS

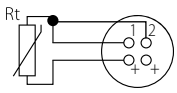
Measuring range	in ZONE 2: -30 °C ≤ Ta ≤ 80 °C
Sensor connection	2wire, 3wire, 4wire
Recommended power supply	from a PELV or SELV source maximum input power 2mW
Time response	in accordance with EN 60751, as amended (in flowing water > 0,2 $m.s^{-1}$), - for case diameter 4 mm: $\tau_{0.5} \leq 4$ s, $\tau_{0.9} \leq 10$ s - for case diameter 6 mm $\tau_{0.5} \leq 9$ s, $\tau_{0.9} \leq 20$ s - for case diameter 8 mm: $\tau_{0.5} \leq 14$ s, $\tau_{0.9} \leq 35$ s - for case diameter 10 mm: $\tau_{0.5} \leq 25$ s, $\tau_{0.9} \leq 60$ s
Insulation resistance	> 200 MΩ at 500 V DC, 25 °C ±3 °C, relative humidity < 80 %
Electric strength	1000 V DC for 1s, 25 °C ± 5°C, relative humidity < 80 %
Ingress protection	IP 66 in accordance with EN 60529, as amended
Terminal board type	ceramic, recommended cross-section of the wires 0.5 to 1.0 mm^2
Material of the connection head	aluminum
Dimension of the connection head	83 x 83 mm
Temperature resistance of the head	-30 to 90 °C
Material of the stem	stainless steel DIN 1.4301, 1.4404 or 1.4571
Diameter of the stem D	4 mm, 6 mm, 8 mm, 10 mm
Standard length of stem L	diameter 4 mm: 50, 100, 160, 220 mm other diameters: 50, 100, 160, 220, 280, 340 and 400 mm
Standard thread types	G ½" and M20x1.5
Wire resistance	0.254 Ω / m (two-wire connection)
Maximum operating pressure	with stem diameter 4 mm - 2.5 MPa with stem diameter 6 to 10 mm - 6.3 MPa
Weight approximately	0.4 kg

WIRING DIAGRAM

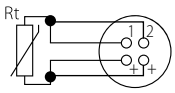
Two-wire



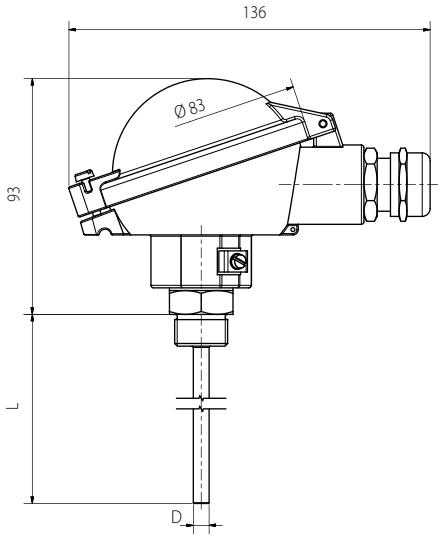
Three-wire



Four-wire



DIMENSIONAL DRAFT



TEMPERATURE SENSORS WITH CORRECTION OF THE REQUESTED VALUE SAU 1000 AND SAU 1500

067.12en

DESCRIPTION AND APPLICATION

The SAU 1000, SAU 1500 control modules are intended to measure air temperature in water protected rooms. In addition to measuring temperature they enable to correct the requested value. These sensors are encapsulated in a plastic case, in which the temperature sensing element and a potentiometer are situated. Based on the measured temperature information an adjustment in the control system can be done, resulting in temperature increase or decrease. Both control module types are enclosed in TANGO boxes made by ABB elektro, and as such they are a suitable supplement to wall switches, sockets, sensors and further elements of this series. The sensors are designed to be operated in a chemically non-aggressive environment.

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

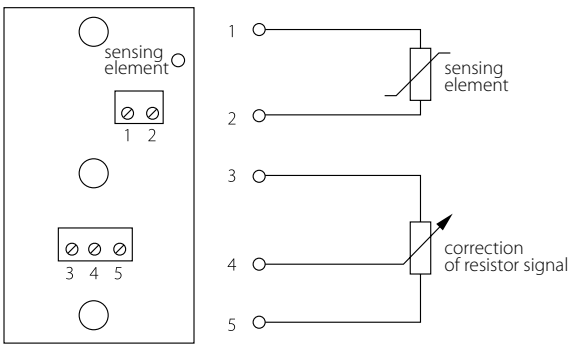
Sensor type	SAU 1000
Type of sensing element	Ni 1000/5000, Ni 1000/6180, Ni 891, Ni 10000/5000, Ni 10000/6180, Pt 100, Pt 500, Pt 1000, NTC 20 kΩ etc.
Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to dle EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Maximum measuring DC current	Pt 100 – 3 mA; Pt 500 – 1.5 mA; Pt 1000, Ni 1000, Ni 891 – 1 mA; T1 = Ni 2226 – 0.7 mA;
	Ni 10000 – 0.3 mA; NTC 20 kΩ – maximum power dissipation 1 mW
Correction range	Basic version: 0 to 250 Ω Possible options: 0 to 10 Ω 0 to 100 Ω 0 to 22 kΩ/G 0 to 2.5 kΩ
Sensor connection	according to the wiring diagram
Time response	$\tau_{0.5} < 15$ s (in flowing air at 1m.s^{-1})
Type of terminal board	MEB 02001, ARK 500/3 – wire cross section 0.35 to 1.5 mm^2
Ingress protection	IP 30 in accordance with EN 60529, as amended
Temperature range	30 to 70 °C
Dimensions of the box	81 x 81 x 28 mm
Material of the box	ABS
Working conditions	ambient temperature: -30 to 70 °C relative humidity: max. 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa
Weight approximately	0.15 kg

OTHER PARAMETERS

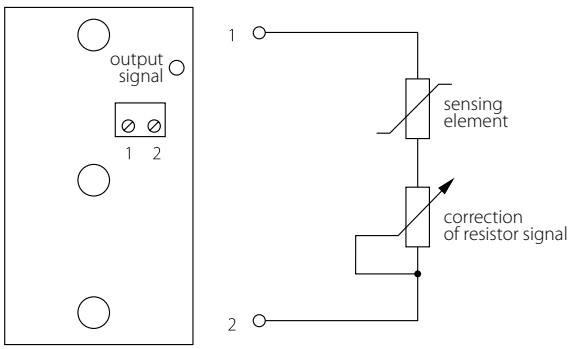
Sensor type	SAU 1500			
Type of sensing element	Ni 1000/5000, Ni 1000/6180, Pt 1000			
Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C			
Maximum measuring DC current	Pt 1000, Ni 1000 – 1 mA			
Correction potentiometer		0 to 10 Ω	0 to 25 Ω	0 to 50 Ω
Correction range	Ni 1000/5000 Ni 1000/6180 Pt 1000/3850	0 to 2.2 °C 0 to 1.8 °C 0 to 2.6 °C	0 to 5.5 °C 0 to 4.5 °C 0 to 6.5 °C	0 to 11 °C 0 to 10 °C 0 to 13 °C
Sensor connection	according to the wiring diagram			
Time response	$\tau_{0.5} < 15$ s (in flowing air at 1m.s^{-1})			
Type of terminal board	MEB 02001 – wire cross section 0.35 to 1.5 mm^2			
Ingress protection	IP 30 in accordance with EN 60529, as amended			
Temperature range	–30 to 70 °C			
Dimensions of the box	81 x 81 x 28 mm			
Material of the box	ABS			
Working conditions	ambient temperature: -30 to 70 °C relative humidity: max. 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa			
Weight approximately	0.15 kg			

WIRING DIAGRAM

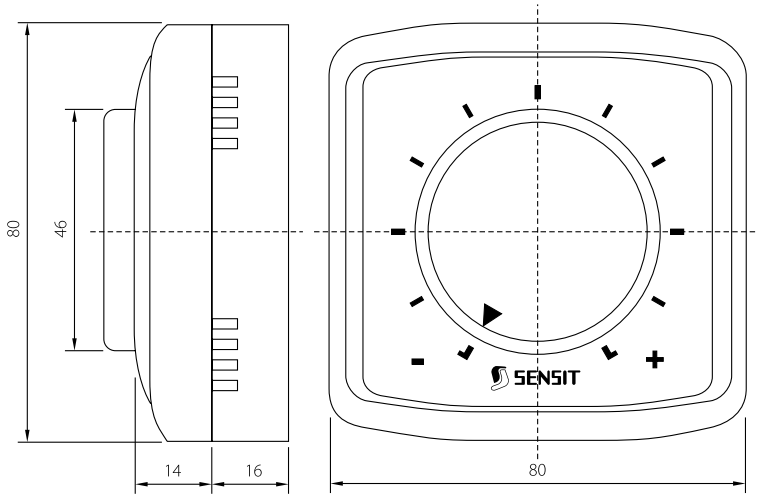
SAU 1000



SAU 1500



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- A class precision (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, termistor NTC 20 kΩ)
- other resistance type elements for temperature measurement, like the KTY or the NTC thermistors etc. can be encapsulated
- another correction (temperature set point) value can be implemented

TEMPERATURE SENSORS WITH CORRECTION OF THE REQUESTED VALUE SAU 2000

082.10en

DESCRIPTION AND APPLICATION

The SAU 2000 control modules are intended to measure air temperature in water protected rooms. In addition to measuring temperature they enable to adjust (correct) the temperature set point, as well as to utilise the indicating LED and the pulse push button. These sensors are encapsulated in a plastic case, in which two terminal boards are installed: a terminal board with a resistance-type temperature sensing element, and another one to which the potentiometer, the push button and the LED are connected. Based on the measured temperature information an adjustment in the control system can be done, resulting in temperature increase or decrease. Both control module types are enclosed in TANGO boxes made by ABB elektro, and as such they are a suitable supplement to wall switches, sockets, sensors and further elements of this series. The sensors are designed to be operated in a chemically non-aggressive environment.

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, as amended) or in an Accredited laboratory.

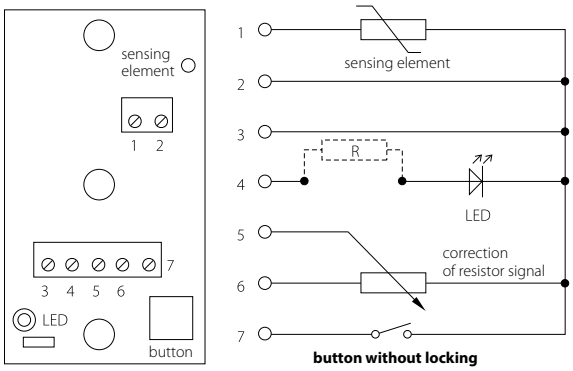
SPECIFICATIONS

Sensor type	SAU 2000
Type of sensing element	Ni 1000/5000, Ni 1000/6180, Ni 891, Ni 10000/5000, Ni 10000/6180, Pt 100, Pt 500, Pt 1000, NTC 20 kΩ etc.
Accuracy class	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Maximum measuring DC current	Pt 100 – 3 mA; Pt 500 – 1.5 mA; Pt 1000, Ni 1000, Ni 891 – 1 mA; T1 = Ni 2226 – 0.7 mA; Ni 10000 – 0.3 mA; NTC 20 kΩ – maximum power dissipation 1 mW
Correction range	Basic version: 0 to 250 Ω Possible option: 0 to 10 Ω 0 to 100 Ω 0 to 22 kΩ/G 0 to 2.5 kΩ
Sensor connection	according to the wiring diagram
Standard value of the resistor R for the signal diode *	1.5 kΩ for the power supply 12 V**
Button version	SAU 2000A without locking SAU 2000B with locking
Time response	$\tau_{0.5} < 15$ s (in flowing air at 1m.s^{-1})
Type of terminal board	MEB 02001, ARK 500/3 – wire cross section 0.35 to 1.5 mm^2
Ingress protection	IP 30 in accordance with EN 60529, as amended
Temperature range	-30 to 70 °C
Dimmensions of the box	81 x 81 x 28 mm
Material of the box	ABS
Working conditons	ambient temperature: -30 to 70 °C relative humidity: max. 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa
Weight approximately	0.15 kg

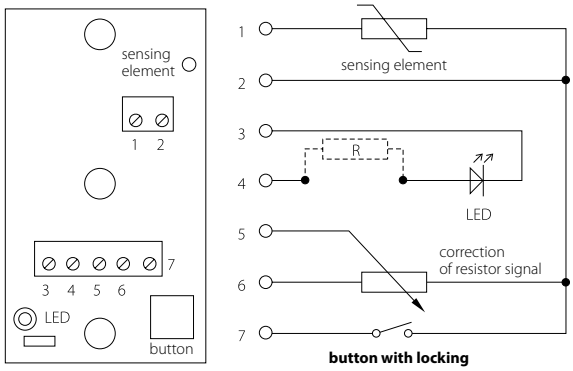
** Power dissipation of the signal diode and resistor must no be more than 150 mW. ** 3.9 kΩ for the power supply 24 V.*

WIRING DIAGRAM

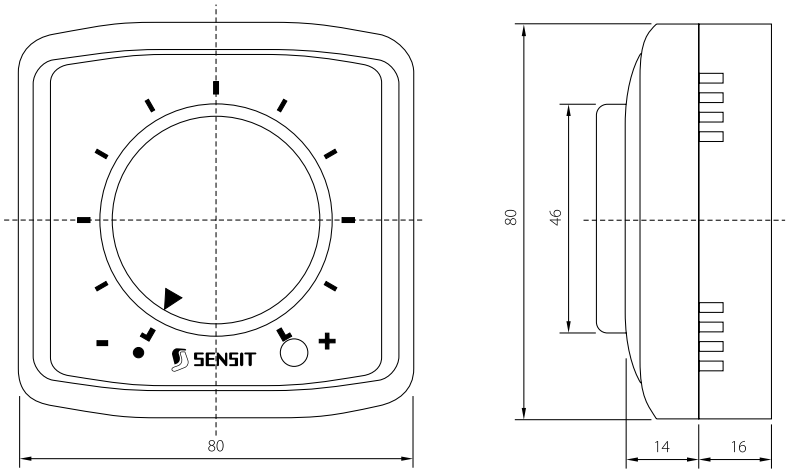
SAU 2000A



SAU 2000B



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

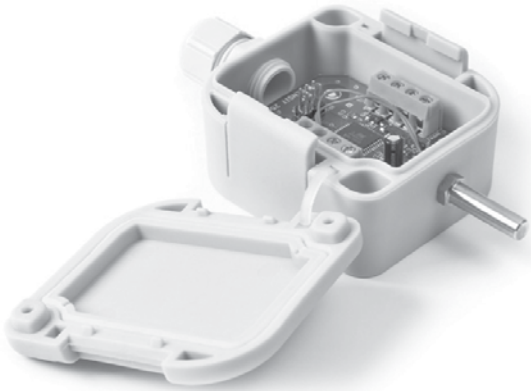
- A class precision (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, termistor NTC 20 kΩ)
- other resistance type elements for temperature measurement, like the KTY or the NTC thermistors etc. can be encapsulated
- another correction (temperature set point) value can be implemented

Plastic Heads for Temperature, Flow and Humidity Sensors

„S“ HEADS

1

Open the lid
with a flat tool



2

Connect
the supply cables

3

Snap
the lid shut

ADVANTAGES

- Fast and easy to assemble
- Modern design
- Meets the IP 65 ingress protection requirements in accordance with the EN 60529 standard
- Easy servicing inspections and maintenance
- Interconnection of the boxes and lids using a connecting strip

TEMPERATURE SENSORS WITH CABLE

DESCRIPTION AND APPLICATION

Temperature sensors with a cable are designed for contact temperature measuring of solid, liquid or gaseous substances in various sectors of industry, e.g. in the food industry, chemical industry, refrigeration etc, machinery etc.

Temperature sensors consist of a metal or plastic case, which conceals the temperature sensor and lead-in cable. All types of resistance sensors offered by SENSIT s.r.o. can be used as resistance sensors, i.e. – Pt 100, Pt 500, Pt 1000, Ni 1000, Ni 10000, Ni 891, T1 = Ni 2226, NTC, PTC etc, as well as other types of sensors, such as elements KTY, SMT 160, DALLAS, TSic, TC, etc. The following tables state the basic combinations of these types of cases, sensors and cables. Other combinations based on the customer´s requirements are possible through custom made production.

Based on design of the sensor, connections can be two-wire, three-wire and four-wire. The basic materials for sensor cases stainless steel DIN 1.4301, DIN 1.4571 (=316 Ti), DIN 1.4404 (316 L), aluminium alloy or brass. Temperature sensors can be used for measuring temperatures ranging from -190 to 600 °C, the specific range is determined for each type separately. Temperature sensors are designed for use in chemically non-aggressive environments.

SPECIFICATIONS

Type of sensing element	Resistance temperature sensing elements – Pt 100/3850, Pt 500/3850, Pt 1000/3850, Ni 1000/5000, Ni 1000/6180, Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, Ni 891, NTC Thermocouple temperature sensing elements – TCK, TCJ, TCT Special temperature sensing elements – KTY, SMT 160, DALLAS, TSic, etc.
Accuracy class of individual sensors	Ni sensing elements: class B, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: class B in accordance with EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C at a range of 0 to 70 °C KTY: ± 1 % at 25 °C NTC: ± 1 %, 3 %, 5 % at 25 °C (according to type) TC: class 2 in accordance with IEC 584-2 DS18B20: ± 0.5 °C for -10 up to 80 °C SMT 160-30: ± 0.7 °C TSic: according to type
Sensor connection	2-wire, 3-wire, 4-wire or 2 x 2-wire, 2 x 3-wire, 2 x 4-wire
Wire resistance	> 200 MΩ at 500 V DC, 25 °C ± 3 °C; relative humidity < 85 %
Insulation variant of lead-in cables	silicone -50 up to 200 °C PVC -30 up to 80 °C PVC* -40 up to 105 °C teflon -190 to 250 °C (short-term 300 °C) fibreglass insulation 0 up to 400 °C

** With increased temperature resistance.*

MAXIMUM FLOW SPEED OF THE MEASURED MEDIUM – AIR AND WATER STEAM/WATER [$m.s^{-1}$] **

Length of case L (mm) Case diameter (mm)	up to 60	> 60 to 100	> 100 to 160	> 160 to 220	> 220 to 400
Ø 6	20 / 2.0	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3
Ø 4	8.0 / 0.8	6 / 0.6	3.2 / 0.4	1.0 / 0.25	0.25 / 0.12

*** For sensors with a thread for direct mounting.*

TG 11.5 – TEMPERATURE SENSOR WITH CABLE AND METAL CASE

K33.03en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of the temperature of gaseous and liquid or solid substances. The maximum temperature range is -50 to 200 °C. The 1.5 mm diameter of the case ensures fast response to changes in temperature. The type of lead-in cable used has teflon insulation without shielding and their case length is 100 mm. Lead-in cables are possible to extend with different types of cables. The sensors are designed for universal use. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

The sensors are also designed for use in a chemically nonaggressive environment.

ACCESSORIES

- connectors
- extension cables

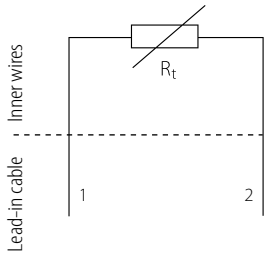
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

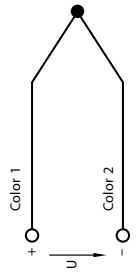
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

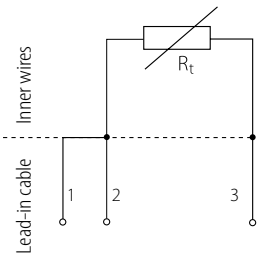
Two-wire



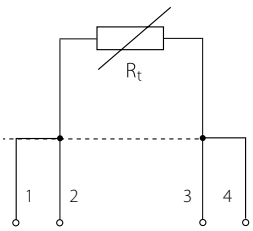
TC



Three-wire



Four-wire

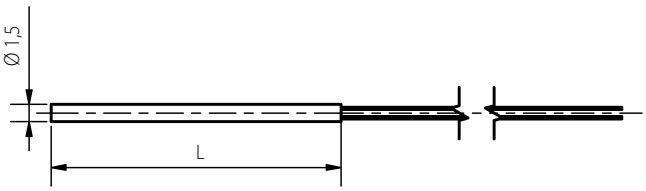


SPECIFICATIONS

Sensor type	TG 11.5
Measuring range	-50 to 200 °C
Type of sensing element	Pt 100, Pt 1000, TC K, TC J
Connection of sensing element	2wire
Connection of extension cables	2wire, 3wire, 4wire
Ingress protection	IP 52 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of case	1.5 mm
Length of case L	20 to 40 mm
Wires	2 x AWG 32
Length of the wires	80 mm (for case length 20 mm)
Time response	$\tau_{0.5}$ < 1.5 s (in flowing water > 1.5 m.s^{-1})
Weigth	0.005 kg to 0.01 kg 1 m wire length

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



TR 091.5 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K34.03en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of the temperature of gaseous and liquid or solid substances. The maximum temperature range -50 to 200 °C. The 1.5 mm diameter of the case ensures fast response to changes in temperature. Various cable materials with a PVC, silicone of teflon insulation can be used as lead-in cables.

The sensors are designed for universal use. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

The sensors are also designed for use in a chemically non-aggressive environment.

ACCESSORIES

- connectors

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, as amended) or in an Accredited laboratory.

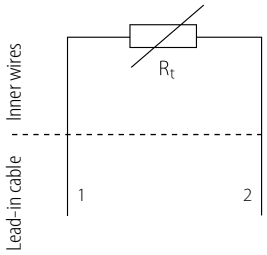
SPECIFICATIONS

Sensor type	TR 091.5
Measuring range	-50 to 200 °C
Type of sensing element	Pt 100, Pt 1000, TC K, TC J
Connection of sensing element	2wire (in part of case with ø 1,5 mm)
Connection of extension cables	2wire, 3wire, 4wire
Ingress protection	IP 65 in accordance with EN 60 529, as amended
Case material	stainless steel DIN 1.4301
Diameter of the case	1.5 mm
Length of case L	20 to 80 mm
Wires inside measuring part	2 x AWG 32
Lead-in cable	shielded silicone 2 x 0.34 mm^2 or 4 x 0.22 mm^2 shielded teflon 2 x 0.14 mm^2 or 4 x 0.14 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection (silicone cable) 0.254 Ω for 1 m of cable for 2-wire connection (teflon cable)
Response time	$\tau_{0,5} = 1.8$ s $\tau_{0,9} = 5.5$ s
Weight	0.06 kg for 50 mm housing length and 1 m cable

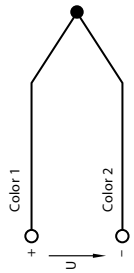
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

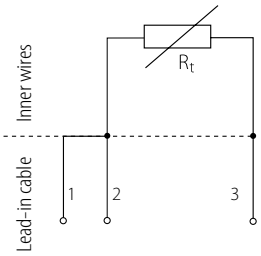
Two-wire



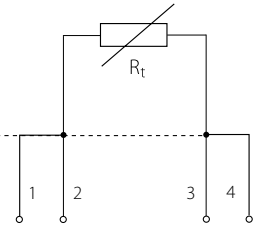
TC



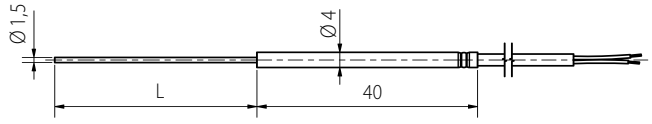
Three-wire



Four-wire



DIMENSIONAL DRAFT



TG 12 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K29.04en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of the temperature of gaseous and liquid or solid substances. The maximum temperature range is -50 to 200 °C. The 2 mm diameter of the case ensures fast response to changes in temperature. Used type of lead-in cable has teflon insulation without shielding. The sensors are designed for universal use. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

The sensors are also designed for use in a chemically non-aggressive environment.

ACCESSORIES

- connectors

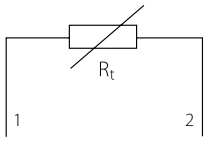
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

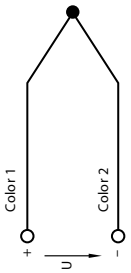
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

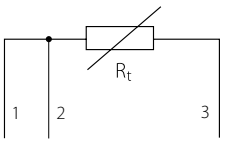
Two-wire



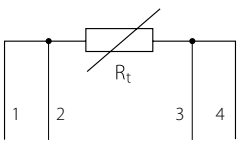
TC



Three-wire



Four-wire

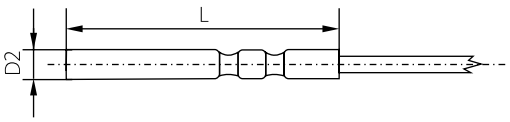


SPECIFICATIONS

Sensor type	TG 12
Measuring range	-50 to 200 °C
Type of sensing element	Pt 100, Pt 500, Pt 1000, TC K, TC J
Ingress protection	IP 52 in according with EN 60 529, as amended
Case material	stainless steel DIN 1.4301
Diameter of the case	2 mm
Length of case L	25 to 60 mm
Lead-in cable	teflon unshielded 4 x 0.02 mm^2 (4 x AWG 34)
Wire resistance	0.765 Ω for 1 m of 1 m wire
Time response	$\tau_{0.5}$ =1.5 s $\tau_{0.9}$ = 4.5 s
Weight	0.01 kg for 2 m cable length

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



TR 092.0 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K30.04en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of the temperature of gaseous and liquid or solid substances. The maximum temperature range is -50 to 200 °C. The 2 mm diameter of the case ensures fast response to changes in temperature. The used type of lead-in cable has teflon insulation without shielding. The sensors are designed for universal use. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable. The sensors are also designed for use in a chemically nonaggressive environment.

ACCESSORIES

- connectors

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, as amended) or in an Accredited laboratory.

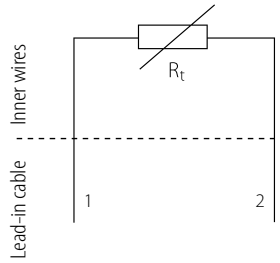
SPECIFICATIONS

Sensor type	TR 092.0
Measuring range	-50 to 200 °C
Type of sensing element	Pt 100, Pt 500, Pt 1000, TC K, TC J
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of case	2 mm
Length of case L	20 to 100 mm
Lead-in cable	silicone shielded 2 x 0.34 mm^2 silicone shielded 4 x 0.22 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5} = 1.8$ s $\tau_{0.9} = 5.5$ s
Weight	0.05 kg for 50 mm housing length and 1 m cable

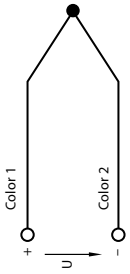
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

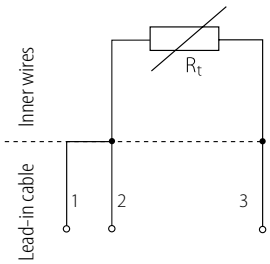
Two-wire



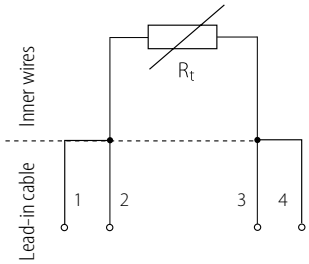
TC



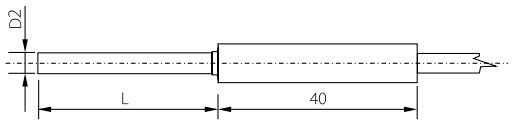
Three-wire



Four-wire



DIMENSIONAL DRAFT



TG 3 AND TG 3A – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K01.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of the temperature of gaseous and liquid or solid substances. The maximum temperature range of use is -50 to 200 °C for the TG 3 model, and -50 to 260 °C for the TG 3A model. The 3 mm diameter of the case ensures fast response to changes in temperature. The used type of lead-in cable has teflon insulation without shielding. The sensors are designed for universal use. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable. The sensors are also designed for use in a chemically non-aggressive environment.

ACCESSORIES

- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set
- connectors

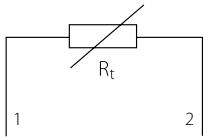
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

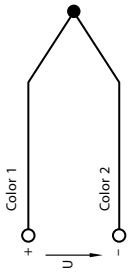
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

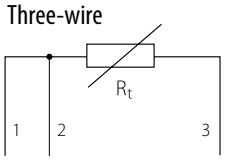
Two-wire



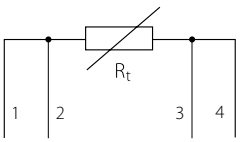
TC



Three-wire



Four-wire

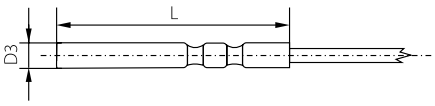


SPECIFICATIONS

Sensor type	TG 3	TG 3A
Measuring range	-50 to 200 °C	-50 to 260 °C (300 °C short-term)
Type of sensing element	Pt, Ni, NTC, TC K, TC J, TC T	
Ingress protection	IP 64 in accordance with EN 60529, as amended	IP 54 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301	
Diameter of case	3 mm	
Length of case L	25 to 60 mm	
Lead-in cable	teflon unshielded 2 x 0.205 mm^2 teflon shielded 2 x 0.14 mm^2 teflon shielded 4 x 0.051 mm^2	
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection	
Time response	$\tau_{0.5}$ = up to 3 s, $\tau_{0.9}$ = up to 9 s	
Weight	0.02 kg for 1 m cable length	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area - L length
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1=Ni 2226, thermistor NTC 20 kΩ)

TR 093.0 AND TR 093.0/A – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K05.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous and liquid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The 3 mm diameter of the case ensures fast response to changes in temperature. The used type of lead-in cable is PVC or with silicone insulation and shielding. The sensors are designed for universal use, the method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set
- connectors

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 (accordingto requirements of the EN ISO/IEC 17025 standard, as amended) or in an Accredited laboratory.

SPECIFICATIONS

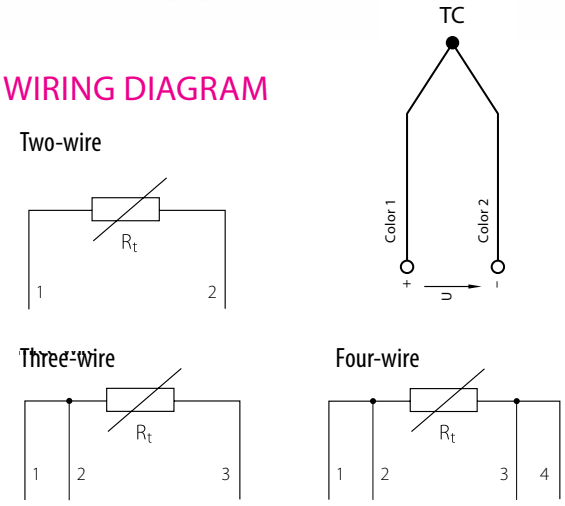
Sensor type	TR 093.0 and TR 093.0/A
Measuring range	-50 to 200 °C (can be limited by the sensing element and cable, determine in documentation)
Type of sensing element	Pt 100, Pt 500, Pt 1000, Ni 1000, NTC, TC K, TC J, TC T
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of case	3 mm
Length of case L	100-300 mm
Lead-in cable	shielded PVC 2 x 0.25 mm^2 or 4 x 0.25 mm^2 shielded silicone 2 x 0.22 mm^2 or 4 x 0.22 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection – silicone 0.14 Ω na 1 m of cable for 2-wire connection – PVC
Time response	$\tau_{0.5}$ < 4 s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.025 kg for housing length 80 mm, cable 1 m
Weight for case L	0.05 kg for housing length 50 mm and cable length 1 m

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

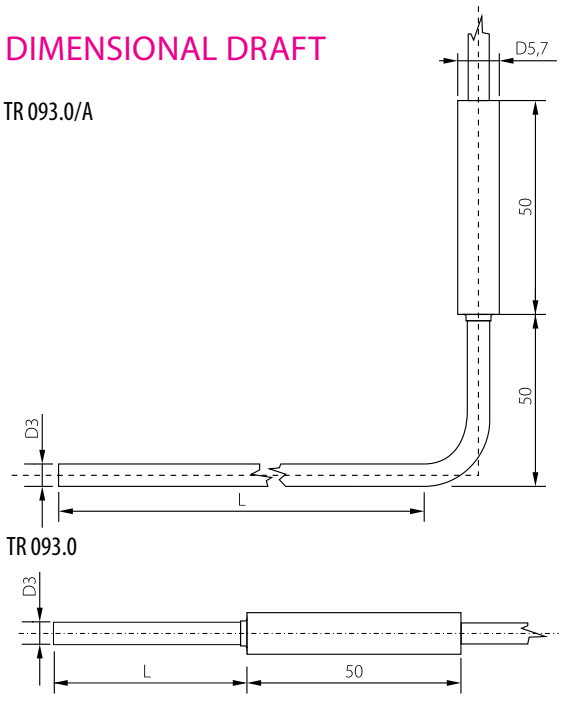
MODIFICATION AND CUSTOMIZATION

- variable stem design in the area – L length
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- increased temperature resistance up to 250°C in the model with a Teflon cable

WIRING DIAGRAM



DIMENSIONAL DRAFT



TR 024 AND TR 024A – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K02.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of the temperature of gaseous and liquid or solid substances. The maximum temperature range of use is -50 to 260 °C for the TR 024 model with a teflon cable, and -50 to 200 °C for the TR 024A model with a silicone cable. The diameter of the case ensures fast response to changes in temperature. The used type of of lead-in cable has silicone insulation and shielding. The sensors are designed for universal use. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

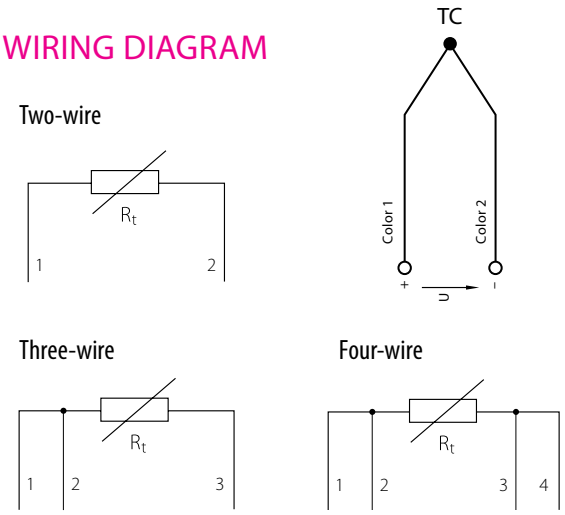
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

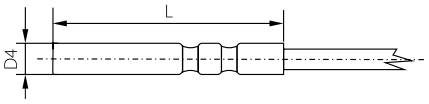


SPECIFICATIONS

Sensor type	TR 024	TR 024A
Measuring range	-50 to 250 °C	-50 to 200 °C
Type of sensing element	Pt, Ni, TC K, TC J, TC T	
Ingress protection	IP 64 in accordance with EN 60529, as amended	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4404	
Diameter of case	4 mm	
Length of case L	20 to 60 mm (in 10 mm)	
Lead-in cable	teflon shield. 2 x 0.14 mm^2 teflon shield. 4 x 0.14 mm^2	silicone shield 2 x 0.14 mm^2
Wire resistance	0.254 Ω for 1 m of cable for 2-wire connection	0.16 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5}$ < 5 s (in flowing water at 0.4 m.s^{-1})	
Weight	0.05 kg for length 60 mm and cable 1 m	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection for TR 024 variant

TG 4 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K03.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for contact measurement of the temperature of gaseous and liquid or solid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The material and diameter of the case ensure fast response to changes in temperature. The used type of lead-in cable has silicone insulation and shielding. The sensors are designed for use in chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

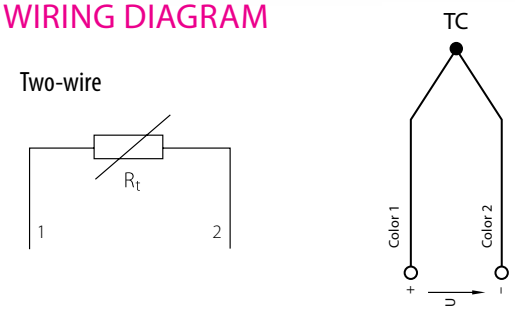
- connectors.

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

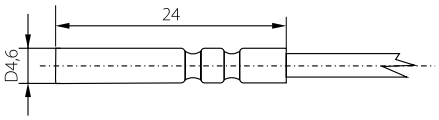


SPECIFICATIONS

Sensor type	TG 4
Measuring range	-50 to 200 °C (can be limited by the sensing element, determine in documentation)
Type of sensing element	Pt, Ni, NTC, TC K, TC J, TC T
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	brass
Diameter/length of case L	4.6 mm/24 mm
Lead-in cable shielded silicone	2 x 0.22 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Time response	τ0.5 < 7 s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.05 kg for 1 m cable length

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)

TR 125 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K04.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous and liquid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The used type of lead-in cable has silicone insulation and shielding. The sensors are designed for universal use, the method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- connectors

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, as amended) or in an Accredited laboratory.

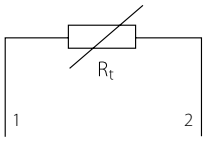
SPECIFICATIONS

Sensor type	TR 125
Measuring range	-50 to 200 °C (can be limited by the sensing element, determine in documentation)
Type of sensing element	Pt, Ni, NTC, TC K, TC J, TC T
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of the case	5 mm
Length of case L	30 to 200 mm
Lead-in cable	shielded silicone 2 x 0.22 mm^2 shielded silicone 4 x 0.15 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5} < 7$ s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.05 kg for 1 m cable length

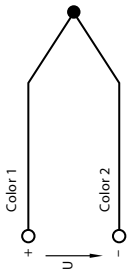
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

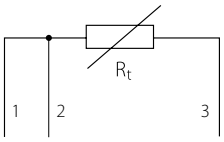
Two-wire



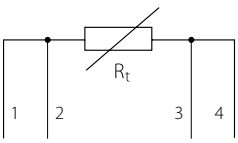
TC



Three-wire



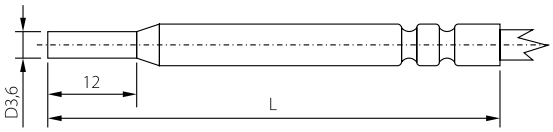
Four-wire



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection

DIMENSIONAL DRAFT



TG 9 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K06.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous and liquid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The shape of the case with tapering to 3.6 mm in diameter ensures fast response to changes in temperature. The lead-in cable has silicone insulation and shielding. The sensors are designed for universal use, the method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

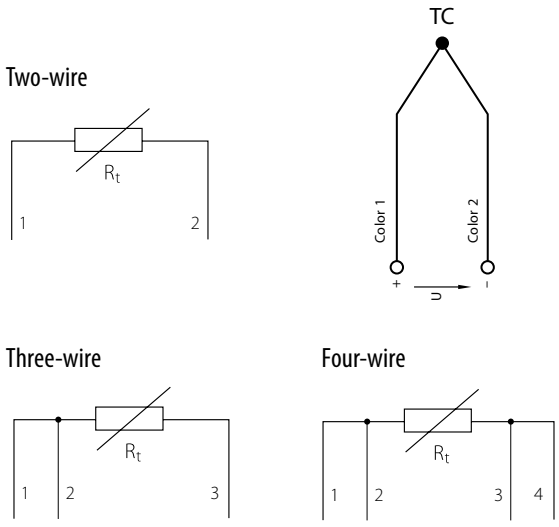
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

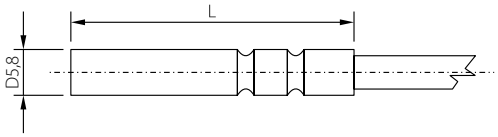


SPECIFICATIONS

Sensor type	TG 9
Measuring range	-50 to 200 °C (can be limited by the sensing element, determine in documentation)
Type of sensing element	Pt, Ni (except for T1 = Ni 2226 and Ni 10000), NTC, TC K, TC J, TC T
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of the case	5 mm
Diameter of case tip	3.6 mm
Length of case L	60 to 200 mm
Lead-in cable shielded silicone	2 x 0.22 mm^2
shielded silicone	4 x 0.15 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5}$ < 4 s (in flowing water at 0,2 $m.s^{-1}$)
Weight	0.05 kg for 40 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection

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TGL AND TGLJ – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K07.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous and liquid substances. The maximum temperature range of use of the sensors is -40 to 105 °C. The lead-in cable is a PVC type with insulation up to 80 °C with shielding up to 105 °C without shielding. The diameter of the case also enables the encasement of special temperature sensors – KTY, SMT 160, DS 18B20, TSiC etc. In combination with the stainless steel thermowell JTG 8, the sensor can be used for measuring the temperature in pipelines, as well as a pressure device as defined in Government Regulation No. 26/2003 Coll., as amended. The sensors are designed for universal use, the method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

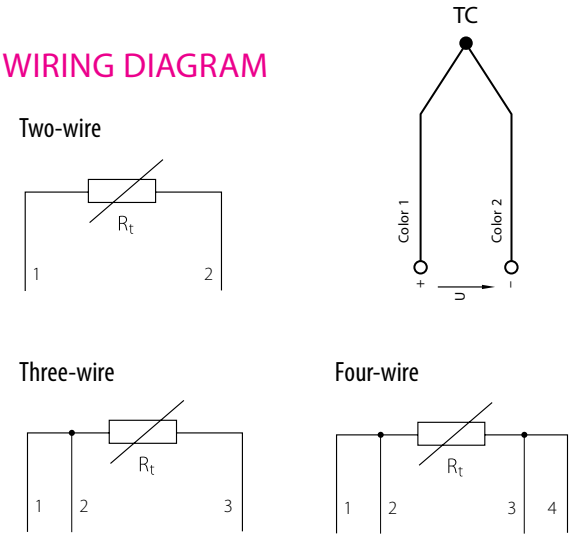
- stainless steel thermowell JTG 8
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM



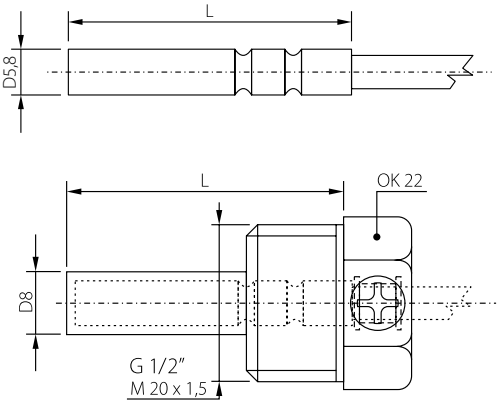
SPECIFICATIONS

Sensor type	TGL	TGLJ
Use	general	for JTG 8 thermowell
Measuring range	-40 to 105 °C (can be limited by the type of cable)	
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)	
Ingress protection	IP 67 in accordance with EN 60529, as amended	
Case material	stainless steel DIN 1.4301, DIN 1.4571	
Diameter of the case	5.8 mm	
Length of case L	40 mm and 60 mm	
Lead-in cable	PVC shielded 2 x 0.34 mm^2 or 4 x 0.25 mm^2 (-40 to 80 °C) PVC unshielded 2 x 0.35 mm^2 or 4 x 0.35 mm^2 (-40 to 105 °C)	
Wire resistance	0.11 Ω for 1 m of cable for 2-wire connection	
Time response	$\tau_{0.5}$ < 7 s (in flowing water at 0.4 $m.s^{-1}$)	$\tau_{0.5}$ < 45 s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.05 kg for 40 mm housing length and 1 m cable	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT

TGLJ sensor + JTG8 thermowell



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSiC, KTY, SMT, etc.)
- possibility of ingress protection IP 68 (1 bar)

TG 8 AND TG 8J – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K08.05en

DESCRIPTION AND APPLICATION

These sensors are designed to measure the temperature of gaseous and liquid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The lead-in cable is a type with silicone insulation and shielding. The diameter of the case also enables the encasement of special temperature sensors – KTY, SMT 160, DS 18B20, TSiC etc. In combination with the stainless steel thermowell JTG 8, the sensor can be used for measuring the temperature in pipelines, as well as a pressure device as defined in Government Regulation No. 26/2003 Coll., as amended. The sensors are designed for universal use, the method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- stainless steel thermowell JTG 8
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set
- connector

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, as amended) or in an Accredited laboratory.

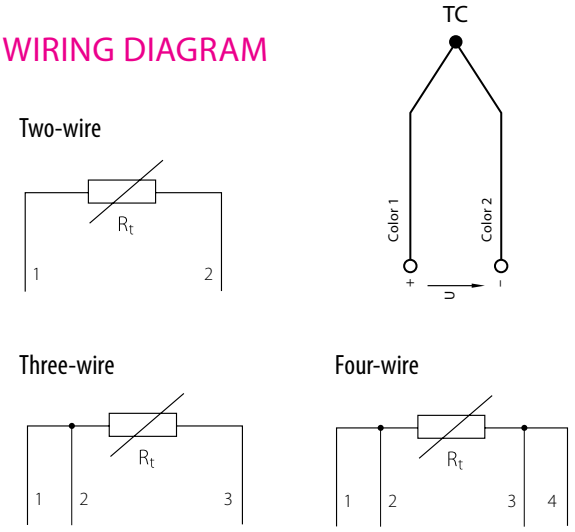
SPECIFICATIONS

Sensor type	TG 8	TG 8J
Use	general	for JTG 8 thermowell
Measuring range	-50 to 200 °C (can be limited by the type of cable, determine in documentation)	
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS,TC K, TC J, TC T and so on)	
Ingress protection	IP 67 in accordance with EN 60529, as amended	
Case material	stainless steel DIN 1.4301, DIN 1.4571	
Diameter of case	5.8 mm	
Length of case L	40 to 200 mm (in 20 mm)	
Lead-in cable	shielded silicone 2 x 0.34 mm^2 shielded silicone 4 x 0.22 mm^2	
Wire resistance	0.11 Ω for 1 m of cable for 2-wire connection	
Time response	$\tau_{0.5}$ < 7 s (in flowing water at 0.4 m.s^{-1})	$\tau_{0.5}$ < 45 s (in flowing water at 0.4 m.s^{-1})
Weight	0.05 kg for 40 mm housing length and 1 m cable	

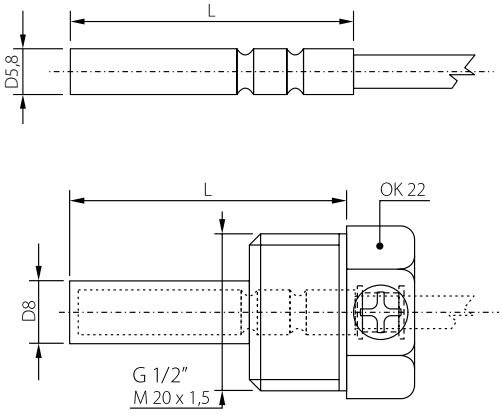
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

Temperature sensors TG 8 can be also supplied in special design for an explosive environment.

WIRING DIAGRAM



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- possibility to use other types of cables (PVC etc.)
- possibility of ingress protection IP 68 (1 bar)

TM 8 – TEMPERATURE SENSORS WITH A CABLE WITH HIGHER MECHANICAL RESISTANCE

K39.01en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous or solid substances. The maximum temperature range of use of the sensors is 0 to 200 °C, 250 °C short-term. Used type of lead-in cable has glass fibre insulation and metal braiding, the sensors are not resistant to the penetration of moisture inside the case and are intended for use in dry conditions. Cable with metal braiding ensures higher mechanical resistance of the sensor. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- connectors
- screw with collet or cutting rings – if different lengths of stem immersion of temperature sensor are set

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

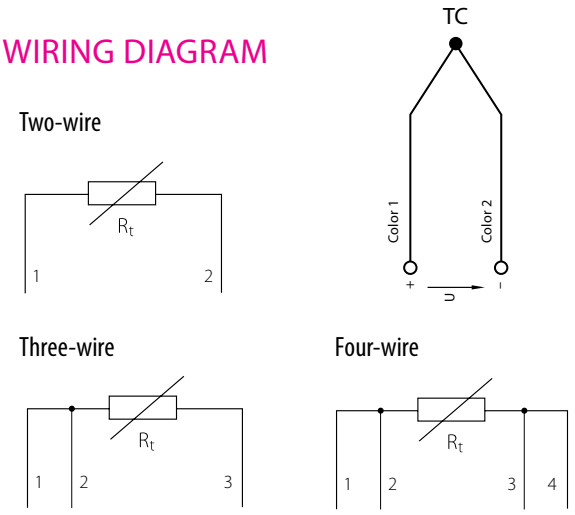
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

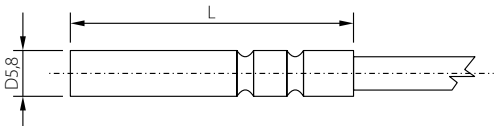
Sensore type	TM 8
Measuring range	-50 to 200 °C, 250 °C short-term (can be limited by the sensing element, determine in documentation)
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Ingress protection	IP 50 in accordance with EN 60529, as amended
Case material	40, 50, 60 mm – stainless steel DIN 1.4571 other lengths – stainless steel DIN 1.4301
Case length L	40 to 200 mm (in 20 mm)
Case diameter	5.8 mm
Lead-in cable	with glass fibre insulation and metal braiding 2 x 0.22 mm^2 with glass fibre insulation and metal braiding 4 x 0.22 mm^2
Wire resistance	0.161 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5}$ < 7 s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.05 kg for 40 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area - L length
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)

TG 68 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K09.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous and liquid substances. The maximum temperature range of use of the sensors is -40 to 200 °C for the model with a silicone cable and -40 to 105 °C for the model with a PVC cable. The lead-in cable is a type with silicone insulation and shielding. The diameter of the case also enables the encasement of special temperature sensors – KTY, SMT 160, DS 18B20, TSiC etc. In combination with a thermowell, the sensors meet the ingress protection of IP 68 (1 bar) in accordance with EN 60529, as amended and are designed for measuring the temperature below the surface of water for continuous immersion at a depth of up to 5 m. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

The sensors meet the ingress protection of IP 68 (1 bar) in accordance with EN 60529, as amended.

ACCESSORIES

- stainless steel thermowell JS 130
- connectors

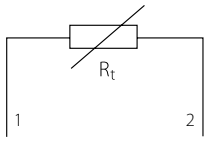
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

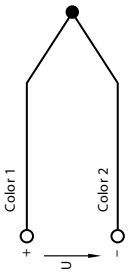
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

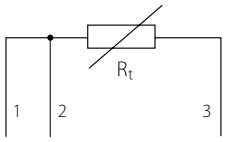
Two-wire



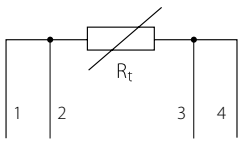
TC



Three-wire



Four-wire

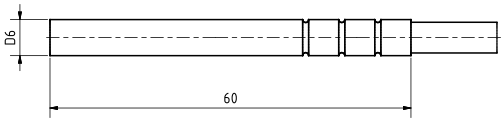


SPECIFICATIONS

Sensor type	TG 68
Measuring range	-40 to 105 °C PVC cable -40 to 200 °C silicone cable
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4404
Length of case L	60 mm
Diameter of case	6 mm
Lead-in cable	shielded silicone 2 x 0.34 mm^2 or 4 x 0.22 mm^2 unshielded PVC 2 x 0.35 mm^2 or 4 x 0.35 mm^2
Wire resistance	0.11 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5}$ < 12 s (in flowing water at 0.2 $m.s^{-1}$) $\tau_{0.9}$ < 35 s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.05 kg for 60 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors i1 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSiC, KTY, SMT, etc.)

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TR 046 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K10.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous and liquid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The lead-in cable is a type with silicone insulation and shielding. The diameter of the case also enables the encasement of special temperature sensors – KTY, SMT 160, DS 18B20, TSiC etc. The sensors are designed for universal use, the method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

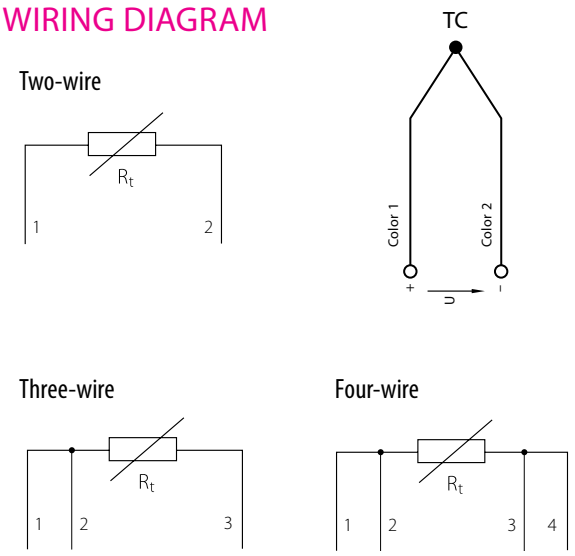
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

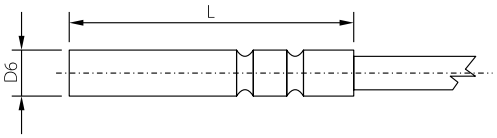


SPECIFICATIONS

Sensor type	TR 046
Measuring range	-50 to 200 °C (can be limited by the type of cable, determine in documentation)
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301, DIN 1.4404 or DIN 1.4571
Length of case L	40 to 200 mm (in 20 mm)
Diameter of case	6 + 0.1 mm
Lead-in cable	shielded silicone 2 x 0.34 mm^2 shielded silicone 4 x 0.22 mm^2
Wire resistance	0.11 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5} < 7$ s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.05 kg for 40 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSiC, KTY, SMT, etc.)
- possibility to use other types of cables (PVC etc.)

TR 050A AND TM 050A – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K11.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous or solid substances. The maximum temperature range of use of the sensors is 0 to 350 °C, 400 °C short-term. Used type of lead-in cable with glass fibre insulation and metal braiding, the sensors are not resistant to the penetration of moisture inside the case and are intended for use in dry conditions. Cable with metal braiding ensures higher mechanical resistance of the sensor. The sensors are designed for use in a chemically- non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and leadin cable.

ACCESSORIES

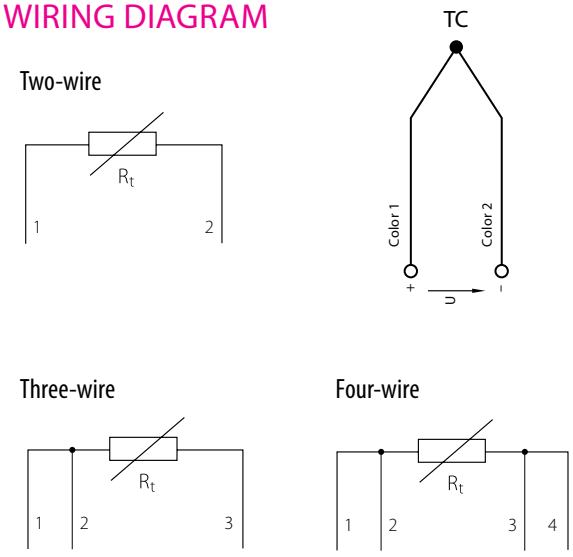
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

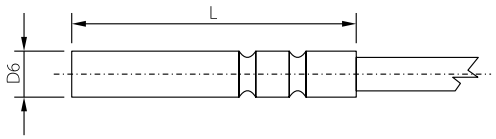


SPECIFICATIONS

Sensor type	TR 050A	TM 050A
Measuring range	0 to 350 °C (400 °C in a short-term)	0 to 300 °C (350 °C in a short-term)
Type of sensing element	Pt 100, Pt 500, Pt 1000, TC K, TC J	
Ingress protection	IP 50 in accordance with EN 60529, as amended	
Case material	stainless steel DIN 1.4301, DIN 1.4404	
Length of case L	40, 60, 100 and 200 mm	
Diameter of case	6 + 0.1 mm	
Lead-in cable	with glass fibre insulation and metal braid	
	2 x 0.35 mm^2 4 x 0.35 mm^2	2 x 0.22 mm^2 4 x 0.22 mm^2
Wire resistance	0.11 Ω	0.161 Ω
	for 1 m of cable for 2-wire connection	
Weight	0.05 kg for 40 mm housing length and 1 m cable	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area – L length, case material
- accuracy class A in the range of -50°C to 250°C
- possibility of three or four-wire connection

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TR 050H – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K12.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous or solid substances. The maximum temperature range of use of the sensors is 0 to 350 °C, 450 °C short-term for the active part of the sensor case. The type of lead-in cable used has silicone insulation, thus the temperature in the cable surroundings must not exceed 200 °C. The sensors are primarily designed for measuring the temperature of flue gases and combustion products in flues of fireplaces, stoves and boilers. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

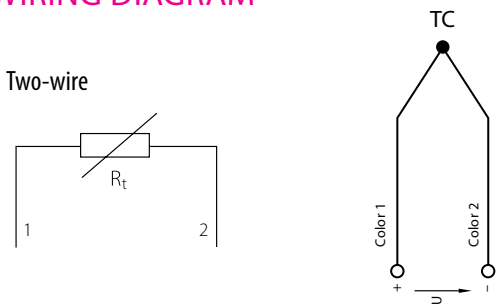
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

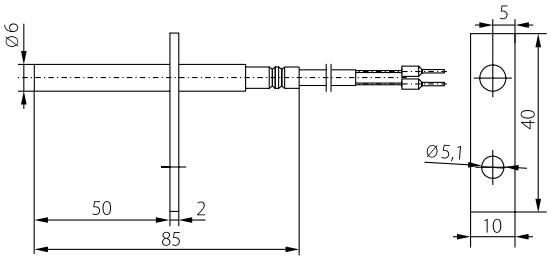


SPECIFICATIONS

Sensor type	TR 050H
Measuring range	0 to 350 °C (450 °C in a short-term) – measuring part of the case, up to 200 °C in the cable surrounding
Type of sensing element	Pt 100, Pt 500, Pt 1000
Ingress protection	IP 50 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Length of case L	50/85 mm
Diameter of case	6 + 0.1 mm
Lead-in cable	shielded silicone 2 x 0.22 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Weight	0.07 kg for 50 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area - L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)

TR 081 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K13.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous or liquid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The case material can be stainless steel DIN 1.4301 or DIN 1.4571. The type of lead-in cable used has silicone insulation and shielding. The diameter of the case is 8 mm and also enables the encasement of special temperature sensors – KTY, SMT 160, DS 18B20, TSiC etc. The sensors are designed for universal use. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

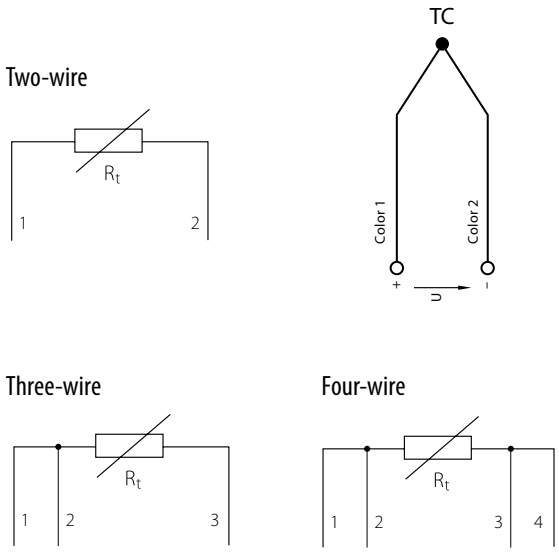
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

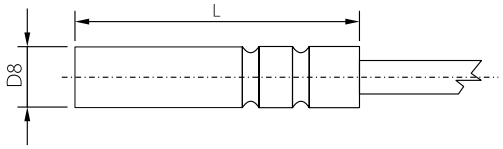


SPECIFICATIONS

Sensor type	TR 081
Measuring range	-50 to 200 °C (can be limited by the type of cable, determine in documentation)
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301, DIN 1.4571
Length of case L	60 to 200 mm (in 20 mm)
Diameter of case	8 ± 0.1 mm
Lead-in cable	shielded silicone 2 x 0.34 mm^2 shielded silicone 4 x 0.22 mm^2
Wire resistance	0.11 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5}$ < 7 s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.04 kg for 40 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



TG1 AND TG2 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K14.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous and liquid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The lead-in cable is a type with silicone insulation and shielding. The sensors are primarily designed for measuring the temperature in pipelines. There structure enables quicker response to changes in temperature and can be used as a pressure device as defined in Government Regulation No. 26/2003 Coll., as amended. The sensors are designed for universal use. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- connectors

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

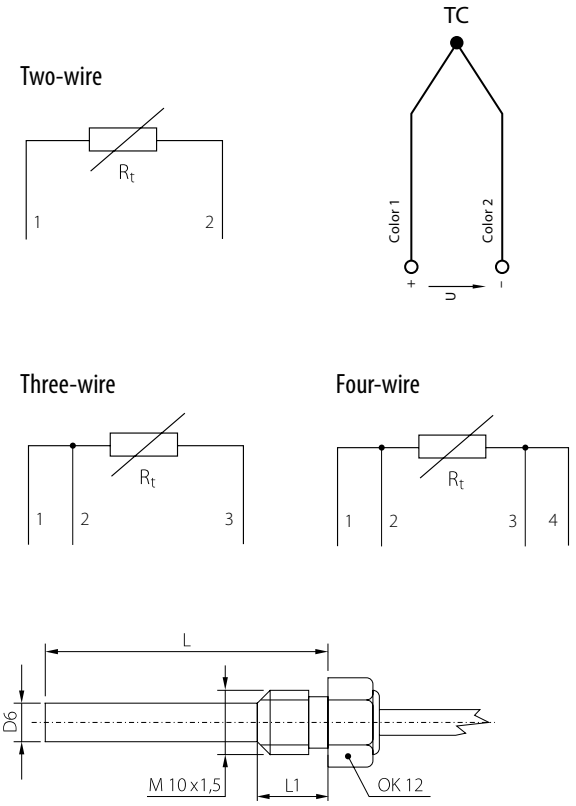
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

Sensor type	TG1	TG2
Measuring range	-50 to 200 °C (can be limited by the type of cable, determine in documentation)	
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T6, NTC, PTC, KTY, TSic, DALLAS, TC K, TC J, TC T and so on)	
Ingress protection	IP 67 in accordance with EN 60529, as amended	
Thread / OK	M 10 x 1.5 / OK 12	
Case material	brass	stainless steel DIN 1.4301
Case diameter	6 mm	
Length of case L	10 to 60 mm (in 10 mm)	10 to 100 mm (in 10 mm)
Length of thread L1	8 mm	10 mm
Lead-in cable	shielded silicone 2 x 0.22 mm^2 shielded silicone 4 x 0.15 mm^2	
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection	
Time response	$\tau_{0.5}$ < 7 s	$\tau_{0.5}$ < 9 s
	(in flowing water at 0.4 m.s^{-1})	
Weight	0.05 kg for 50 mm housing length and 1 m cable	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)

TR 011 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K15.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous, liquid or solid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The lead-in cable is a type with silicone insulation or PVC insulation and shielding or without shielding. The sensors are primarily designed for measuring the temperature in pipelines. There structure enables quicker response to changes in temperature and can be used as a pressure device as defined in Government Regulation No. 26/2003 Coll., as amended. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

Temperature sensors TR 011 can be also supplied in special design for an explosive environment.

ACCESSORIES

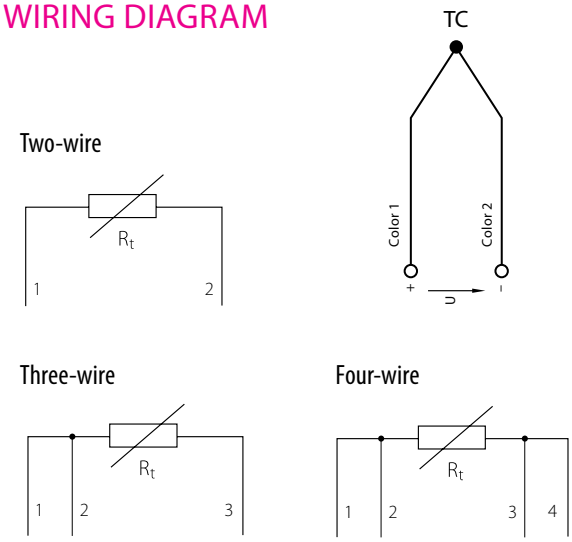
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

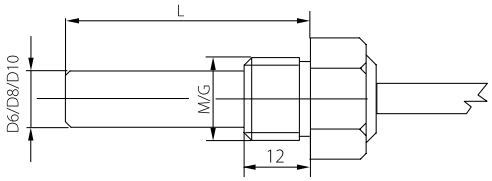


SPECIFICATIONS

Sensor type	TR 011
Measuring range	-50 to 200 °C (can be limited by the type of cable, determine in documentation)
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Ingress protection	IP 67 in accordance with EN 60529, as amended
Thread/OK	according to customer
Case material	stainless steel DIN 1.4301
Diameter of case	6 to 10 mm
Length of case L	40 to 500 mm
Lead-in cable	according to customer
Time response	$\tau_{0.5} < 9$ s (in flowing water at 0.4 m.s^{-1})
Weight	0.05 kg for 50 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)

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TR 080A – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K16.05en

DESCRIPTION AND APPLICATION

These resistance temperature sensors are designed to measure the temperature of gaseous, liquid or solid substances. The maximum temperature range of use of the sensors is -30 to 180 °C. The lead-in cable is a type with silicone insulation and shielding. The sensors are primarily designed for measuring the temperature in airconditioning ducts. The 4 mm case diameter enables quicker response to changes in temperature. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- connectors

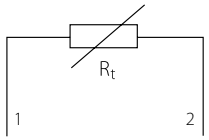
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

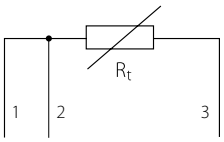
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

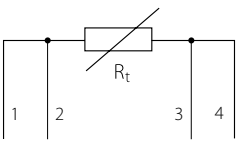
Two-wire



Three-wire



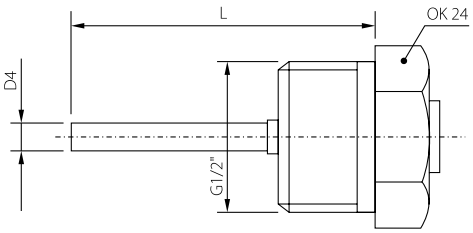
Four-wire



SPECIFICATIONS

Sensor type	TR 080A
Measuring range	-30 to 180 °C (can be limited by the type of cable, determine in documentation)
Type of sensing element	Ni 1000, Pt 100, Pt 500, Pt 1000, NTC
Ingress protection	IP 65 in accordance with EN 60529, as amended
Thread/OK	according to customer
Case material	stainless steel DIN 1.4301
Diameter of case	4 mm
Length of case L	30 to 200 mm
Lead-in cable	shielded silicone 2 x 0.22 mm^2 shielded silicone 4 x 0.15 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5} < 5$ s in flowing water at 0.4 $m.s^{-1}$
Weight	0.12 kg for 50 mm housing length and 1 m cable, G ½"

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection

TR 129 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K17.05en

DESCRIPTION AND APPLICATION

These resistance temperature sensors are designed to measure the temperature of gaseous or liquid substances. The maximum temperature range of use of the sensors is -50 to 250 °C. The lead-in cable is a type with silicone insulation and shielding. The production technology and diameter of the case enable quick response to changes in temperature even up to a temperature of 250 °C. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- connectors

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

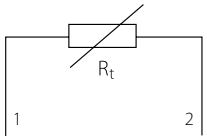
Sensor type	TR 129
Measuring range	-50 to 250 °C (can be limited by the type of cable, determine in documentation)
Type of sensing element	Pt, Ni, NTC, TCK, TCJ
Ingress protection	IP 67 in accordance with EN 60529, as amended
Thread/OK	according to customer
Case material	stainless steel DIN 1.4301
Diametre of case	4 mm
Length of case L	100 to 300 mm
Lead-in cable*)	shielded silicone 2 x 0.22 mm^2 shielded silicone 4 x 0.22 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5}$ < 5 s (in flowing water at 0.2 $m.s^{-1}$)
Weight	0.2 kg for 50 mm housing length and 5 m cable

**) The lead-in cable is in length of 50 cm protected with stainless steel armoured hose with 8 mm in diametre.*

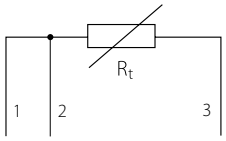
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.)

WIRING DIAGRAM

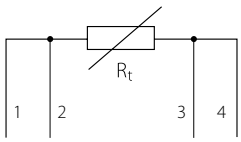
Two-wire



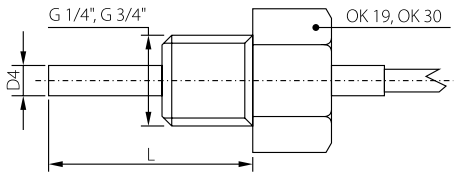
Three-wire



Four-wire



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection

TR 030 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K18.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous, liquid or solid substances. The maximum temperature range of use of the sensors is -50 to 200 °C. The resistance signal of the temperature sensor is led by a pair of cables with teflon insulation, whereby ensuring the minimization of heat transfer and thus achieving higher accuracy of measurement even at shallow immersion depths. The diameter of the case enables quick response to changes in temperature. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- connectors.

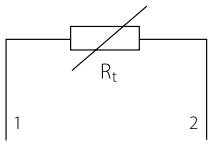
DECLARATION, CERTIFICATES, CALIBRATION

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

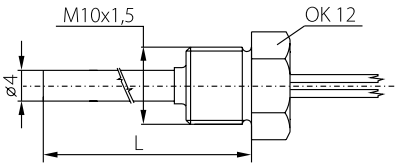
Two-wire



SPECIFICATIONS

Sensor type	TR 030
Measuring range	-50 to 200 °C (can be limited by the type of cable, determine in documentation)
Type of sensing element	P, Ni, NTC
Ingress protection	IP 52 in accordance with EN 60529, as amended
Thread/OK	M 10 x 1.5/OK 12
Case material	stainless steel DIN 1.4301
Diameter of case	4 mm
Length of case L	20 to 60 mm
Lead-in cable	2 x LT 0.07 mm2 with teflon insulation
Wire resistance	0.51 Ω for 1 m of cable
Time response	$\tau_{0.5} < 5$ s (in flowing water at 0,2 m.s^{-1})
Weight	0.03 kg for 20 mm sleeve length and 1 m wire length

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area – L length, case material
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)

TR 068C – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K19.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the temperature of gaseous substances. The maximum temperature range of use of the sensors is 0 to 400 °C, or 500 °C short-term for the active part of the sensor case after the thread. The type of lead-in cable used has teflon insulation with shielding. The temperature in the surroundings of the cable must not exceed 250 °C. The sensors are primarily designed for measuring the temperature of flue gases and combustion products in the flues of fireplaces, stoves and boilers. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

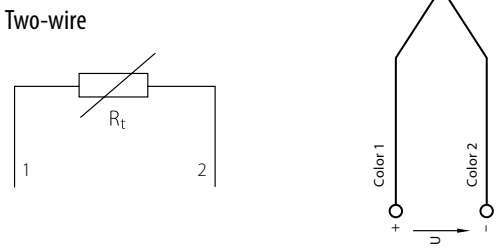
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

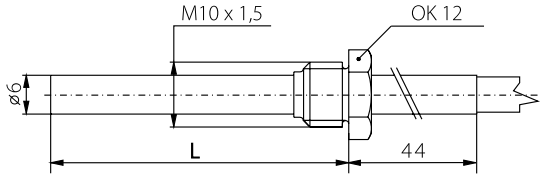


SPECIFICATIONS

Sensor type	TR 068C
Measuring range	0 to 400 °C (500 °C in a short-term)
Type of sensing element	Pt 100, Pt 500, Pt 1000, TC K, TC J
Ingress protection	IP 64 in accordance with EN 60529, as amended
Thread/OK	M 10 x 1.5/OK 12
Case material	stainless steel DIN 1.4301
Diameter of case	6.0 ± 0.1 mm
Length of case L	min. 60 mm, max. 130 mm
Lead-in cable	shielded teflon 2 x 0.14 mm^2
Wire resistance	0.3 Ω for 1 m of cable for 2-wire connection
Weight	0.07 kg for 60 mm housing length and 5 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area – L length, case material
- accuracy class A, which is limited for Pt sensors up to 250°C

TG 6 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K20.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the surface temperature of solid substances. The maximum temperature range of use of the sensors is -30 to 200 °C and these limits must not be exceeded even for a brief period. The structure of the sensors, which includes an M6 thread, enable the measurement of solid substances right below the surface. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

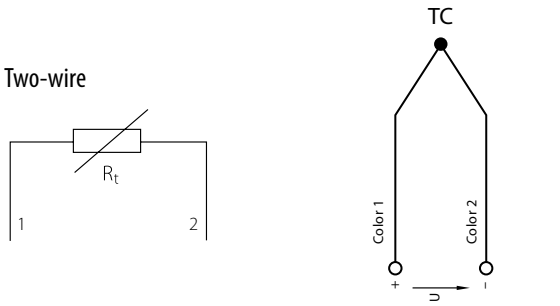
- connectors

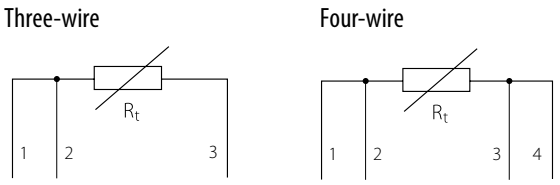
DECLARATION, CERTIFICATION, CALIBRATION

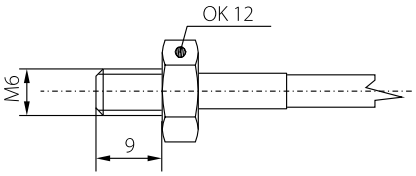
Manufacturer provides **EU Declaration of Conformity**.

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM







SPECIFICATIONS

Sensor type	TG 6
Measuring range	-30 °C to 200 °C (can be limited by the type of cable, determine in documentation)
Type of sensing element	Pt, Ni, NTC, TC K, TC J, TC T
Ingress protection	IP 67 in accordance with EN 60529, as amended
Thread/OK	M 6/OK 12
Case material	brass
Length of thread	9 mm
Lead-in cable	shielded silicone 2 x 0.22 mm^2
	shielded silicone 4 x 0.15 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5} < 4$ s (in flowing water at 0.2 $m.s^{-1}$)
Maximum allowable cable tension	1 kg
Weight	0.05 kg for 1 m length

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

MODIFICATION AND CUSTOMIZATION

- variable thread design, or size
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection

CONTACT TEMPERATURE SENSORS WITH A CABLE

012.10en

DESCRIPTION AND APPLICATION

These temperature sensors are intended for contact surface temperature measurement. The sensors, which are available including the fastening strap are suitable for temperature measurements on piping. The sensor dimmensions make it possible to place the sensor even under the pipe insulation. The standard operating temperature range is -50 to 130 °C. The sensing element is constructed to be isolated from the ambient influence. 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

- thermal conductive paste up to 200 °C, 5g.

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	NS 150A	NS 151A	NS 152A	NS 350A	NS 351A
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-50 to 130 °C				
Maximum measuring DC current	1 mA	1 mA	1 mA	0.3 mA	0.3 mA

Sensor type	NS 153A	PTS 150A	PTS 250A	PTS 350A	HS 150A
Type of sensing element	T1 = Ni 2226	PT 100/3850	PT 500/3850	PT 1000/3850	thermistor NTC 20 kΩ
Measuring range	-50 to 130 °C				
Maximum measuring DC current	0.7 mA	3 mA	1.5 mA	1 mA	10 mW *)

**) maximum power consumption*

Accuracy class **)	Ni sensing elements: B class, $t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Sensor connection	according to the wiring diagram
Time response sensor type	S 150A $\tau_{0.5} < 10$ sec, $\tau_{0.5} < 45$ sec (on the smooth surface without paste)
Insulation resistance	> 200 MΩ at 500 V DC, 25° ± 3 °C; humidity < 85 %
Ingress protection	IP 65 in accordance with EN 60529, as amended
Material of the case	brass
Lead-in cable	shielded silicone 2 x 0.22 mm^2 shielded silicone 4 x 0.15 mm^2
Standard length of the cable	2, 5, 10 m
Material of the case	POLYAMIDE
Standard length of the strap	40 cm
Minimum diameter of a pipe	20 mm

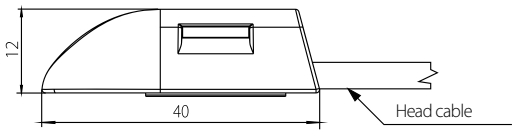
OTHER PARAMETERS

Operating conditions	ambient temperature: -50 to 130 °C relative humidity: max. 100 % (at the ambient temperature 25 °C) atmospheric pressure: 70 to 107 kPa
Weight approximately	0.15 kg

***) Regulated by immersing the sensor in a liquid, an error in method is not considered – the influence of the ambient temperature and environment, uneven surface, etc. In terms of two-wire connections, the impact of the resistance of the lead wire must be added. In a temperature of 20 °C, the impact of the lead resistance is 0.4 °C/1 m.*

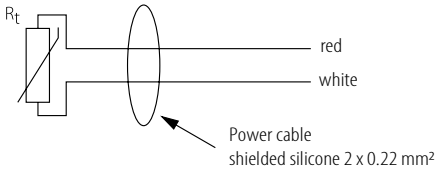
WIRING DIAGRAM

NS 150A



Note: Housing width = 12 mm

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

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.)
- Accuracy class A (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
- various length of the fastening strap

TG 7 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K21.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the surface temperature of solid substances. The maximum temperature range of use of the sensors is -50 to 200 °C and these limits must not be exceeded even for a brief period. The structure of the sensors enables fast response to changes in temperature, in particular when silicone grease or thermally conductive paste is applied between the measured surface and the sensor. The sensors are mounted to the surface using one or two M4 screws. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- thermal conductive paste up to 200 °C, 5g
- connectors

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, as amended) or in an Accredited laboratory.

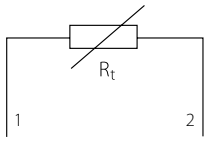
SPECIFICATIONS

Sensor type	TG 7
Measuring range	-50°C to 200°C (can be limited by the type of cable, determine in documentation)
Type of sensing element	Pt, Ni, NTC, TC K, TC J, TC T
Ingress protection	IP 65 in accordance with EN 60529, as amended
Case material	brass
Case dimensions	Ø19.5 mm, height 6 mm
Lead-in cable	shielded silicone 2 x 0.22 mm^2
	shielded silicone 4 x 0.15 mm^2
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5}$ < 7 s (on flat surface of Al prism without paste)
Maximum allowable cable	tension 2 kg
Recommendation	use thermal conductive paste for installation
Weight	0.05 kg for 1 m length

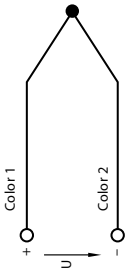
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

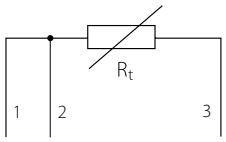
Two-wire



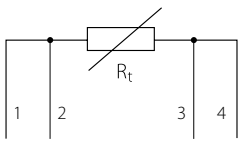
TC



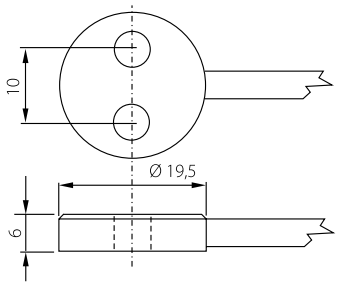
Three-wire



Four-wire



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSiC, KTY, SMT, etc.)

SENSIT s.r.o., Skolni 2610, 756 61 Roznov pod Radhostem, Czech Republic
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TG 70 – TEMPERATURE SENSOR WITH A CABLE AND METAL CASE

K35.02en

DESCRIPTION AND APPLICATION

The temperature sensors TG 70 are designed to measure the surface temperature of solid substances. The construction of the sensor enables fixed connection to the measured surface by using screw placed in to the hole in the sensor case. The structure of the sensors also enables fast response to the changes in temperature in particular when silicone grease is applied between the measured surface and the sensor. Maximum temperature range of sensor use is -50 to 350 °C (400 °C for a short time). The range for each design variant is reduced with a type of the temperature sensing element and the supply cable. The temperature sensors meet ingress protection from IP 50 to IP 67 according to the EN 60529, as amended, depending on the lead-in cable variant. The temperature sensors are intended for operation in chemically non-aggressive environment. By using temperature sensor is recommended to ensure striping sensor from the influence of ambient temperature and thus reduce the error method due to the impact of differences between the measured temperature ambient temperature.

ACCESSORIES

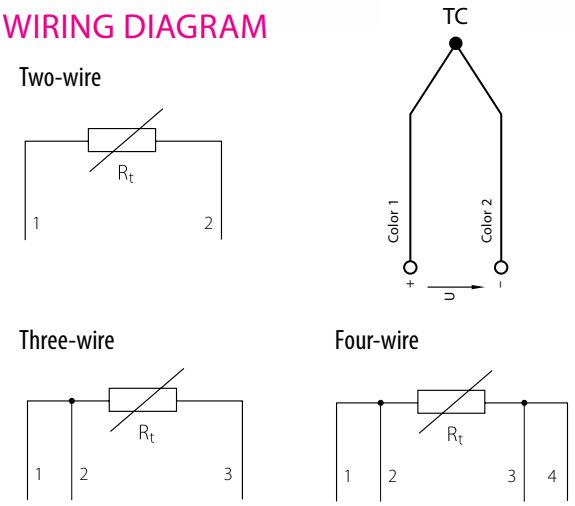
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM



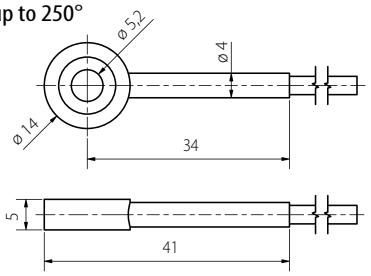
SPECIFICATIONS

Sensor type	TG 70	TG 70A
Type of sensing element	Pt, Ni, NTC, TC K, TC J, TC T	
Case dimension	outer Ø 14 mm inner Ø 5.2 mm	outer Ø 16 mm inner Ø 5.2 mm
Case material	stainless steel DIN 1.4301	
Supply cable variations / Temperature range (can be limited by type of sensing element – specified in manual)	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C Silicone shielded -50 to 200 °C Teflon shielded -50 to 250 °C With fibreglass 0 to 400 °C (with metal braiding)	
Ingress protection	from IP 50 to IP 67 in accordance with EN 60529, as amended - according to the type of cable	
Insulation resistance (between case and sensor)	>200 MΩ at 500 VDC, 25 ± 3°C	
Maximum permissible static pull on the supply cable	1 kg	
Weight	0.05 kg for 1 m length	

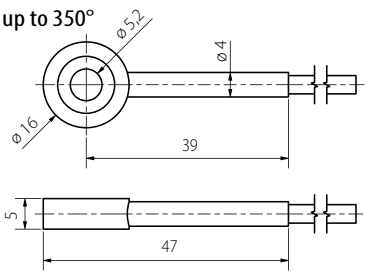
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT

TG 70 - up to 250°



TG 70A - up to 350°



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 k Ω)
- possibility of encasing non-standard temperature sensors (DALLAS, TSiC, KTY, SMT, etc.)

TR 141A AND TR 141E – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K23.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for measuring the surface temperature of solid substances with a flat and smooth surface. The maximum temperature range of use is -50 to 200 °C, when mounting with an M4 screw, it is recommended to apply silicone grease or thermally conductive to the measured surface, which ensures quicker response and minimizes error in the method of measurement. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- thermal conductive paste up to 200 °C, 5g
- connectors

DECLARATION, CERTIFICATES, CALIBRATION

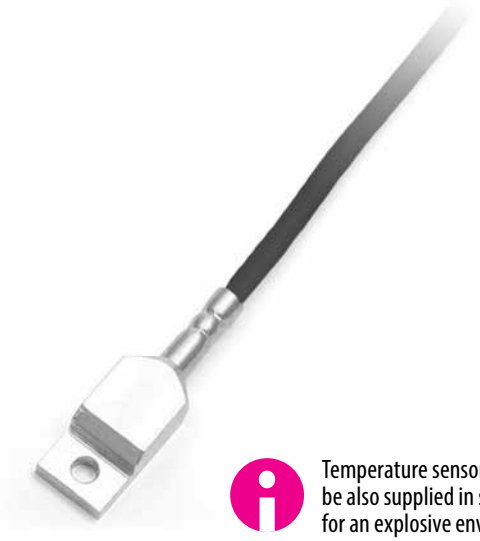
Manufacturer provides **EU Declaration of Conformity**.

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

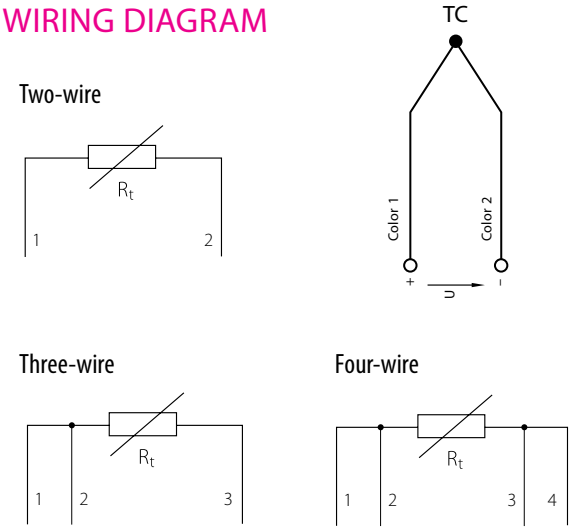
Sensor type	TR 141A	TR 141E
Measuring range	-50 °C to 200 °C (can be limited by the type of cable, determine in documentation)	
Type of sensing element	Pt 100, Pt 500, Pt 1000, TC K, TC J, TC T	
Ingress protection	IP 65 in accordance with EN 60529	
Case material	stainless steel DIN 1.4301 aluminium alloy	
Length of case	L 40 mm	
Lead-in cable	silicone shield. 2 x 0.22 mm^2	
	silicone shield. 4 x 0.15 mm^2	
Wire resistance	0.16 Ω for 1 m of cable for 2-wire connection	
Time response	$\tau_{0.5}$ < 10 s (on flat surface of Al prism withouth paste)	
Maximum allowable cable tension	1 kg	
Recommendation	use thermal conductive paste for installation	
Weigth	0.05 kg for 40 mm housing length and 1 m cable	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

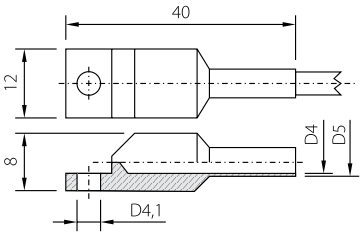


Temperature sensors TR 141A can be also supplied in special design for an explosive environment.

WIRING DIAGRAM



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility of encasing two sensing elements
- variable design of sensor case dimensions and materials
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSiC, KTY, SMT, etc.)

TR 141 and TR 141B, TM 141 and TM 14B
TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K22.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for measuring the surface temperature of solid substances with a flat and smooth surface. The maximum temperature range of use is 0 to 300 °C, 350 °C short-term. Due to used type of lead-in cable with glass fibre insulation and metal braiding, the sensors are not resistant against the penetration of moisture into the case and are designed for use in a dry environment. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

- thermal conductive paste up to 200 °C, 5g
- connectors

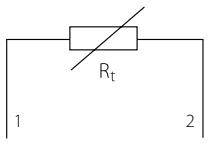
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

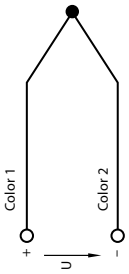
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

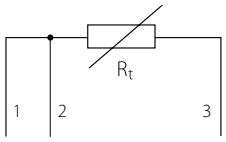
Two-wire



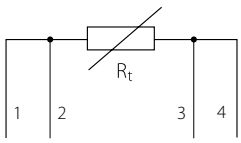
TC



Three-wire



Four-wire

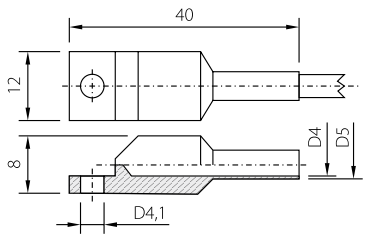


SPECIFICATIONS

Sensor type	TR 141	TR 141B
Measuring range	0 to 350 °C (400 °C short-term)	
Type of sensing element*	Pt 100, Pt 500, Pt 1000, TCK, TCJ	
Ingress protection	IP 50 in accordance with EN 60529, as amended	
Case material	aluminium alloy	stainless steel DIN 1.4301
Length of case L	40 mm	
End sleeves	H 0.25 / 10 mm	
Lead-in cable	with glass fibre and metal braiding 2 x 0.35 mm^2 with glass fibre and metal braiding 4 x 0.35 mm^2	
Wire resistance	0.11 Ω for 1 m of cable for 2-wire connection	
Maximum allowablecable tension	1 kg	
Recommendation	use thermal conductive paste for installation	
Weight	0.05 kg for 40 mm housing length and 1 m cable	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility of encasing two sensing elements
- variable design of sensor case dimensions and materials
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection
- possibility of encasing non-standard temperature sensors (DALLAS, TSiC, KTY, SMT, etc.)

SENSIT s.r.o., Skolni 2610, 756 61 Roznov pod Radhostem, Czech Republic
T +420 571 625 571 **F** +420 571 625 572 **E** obchod@sensit.cz

TR 158 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K24.05en

DESCRIPTION AND APPLICATION

These temperature sensors are designed to measure the surface temperature of ferromagnetic objects. The maximum temperature range of use of the sensors is -30 to 150 °C. In order to mount the sensor correctly, the measured surface must have a minimum diameter of 28 mm. The structure of the sensor ensures quick response to changes in temperature, in particular if silicone grease or thermally conductive paste is applied between the measured surface and the sensor. The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

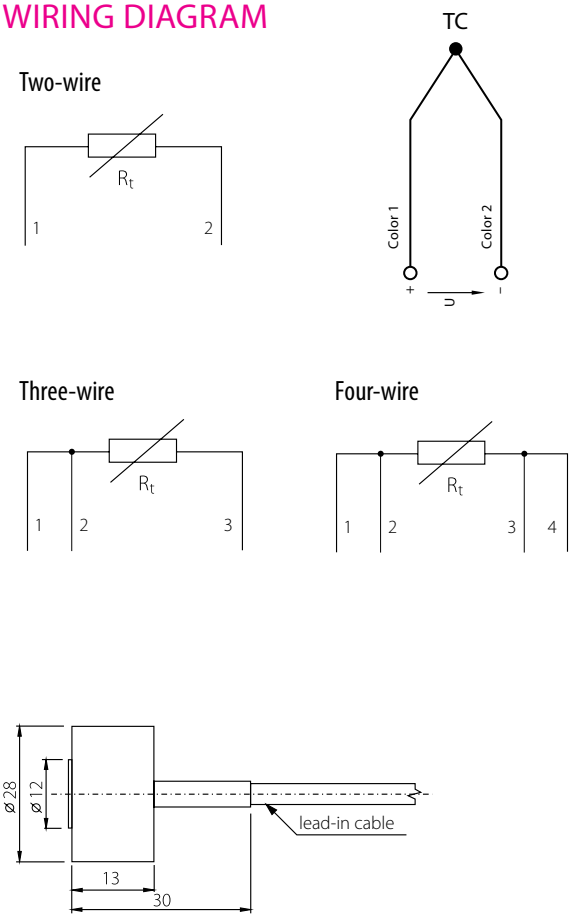
- thermal conductive paste up to 200 °C, 5g
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM



SPECIFICATIONS

Sensor type	TR 158
Measuring range	-30 °C to 150 °C
Type of sensing element	Pt, Ni, NTC, TC K, TC J
Ingress protection	IP 65 in accordance with EN 60529
Holding force of sensor	20 N
Measuring surface pressure	3 N
Case material	nickel plated steel 11373/alloy
Dimension of case	Ø 28 x 13 mm
Lead-in cable shielded silicone	2 x 0.34 mm^2
shielded silicone	2 x 0.22 mm^2
Standard cable length	2, 5, 10 m
Wire resistance	0.11 Ω for 1 m of cable for 2-wire connection
Weight	0.1 kg for 1 m

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

MODIFICATION AND CUSTOMIZATION

- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- possibility of three or four-wire connection

TG 5 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K38.01en

DESCRIPTION AND APPLICATION

These temperature sensors are designed for measuring the surface temperature of pipes with a smooth surface. The maximum temperature range of use is -50 to 200 °C, and must not be exceeded even for a brief period. The structure of the sensors enables fast response to changes in temperature, in particular when silicone grease or thermally conductive paste is applied between measured surface and the sensor. Temperature sensors meet ingress protection IP 65 in accordance with EN 60529, as amended.

The sensors are designed for use in a chemically non-aggressive environment. The method of use must be chosen with regard to the temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

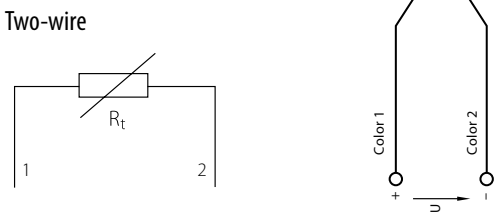
- thermal conductive paste up to 200 °C, 5 g
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

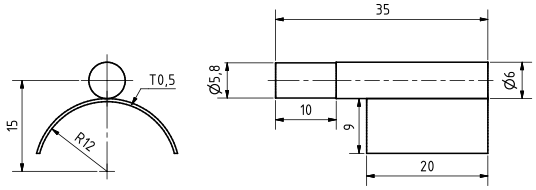


SPECIFICATIONS

Sensore type	TG 5
Measuring range	-50 to 200 °C (can be limited by the sensing element, determine in documentation)
Type of sensing element	Pt, Ni, NTC, TC K, TC J, TC T
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	brass
Case length L	35 mm
Case diameter	6 mm
Dimension of contact sheet	20 x 32 x R12
Lead-in cable	silicon shielded 2 x 0.34 mm^2
Wire resistance	0.105 Ω for 1 m of cable for 2-wire connection
Time response	$\tau_{0.5}$ < 15 s (on flat surface without paste)
Recommendation	use thermal conductive paste for installation
Weight	0.03 kg for 35 mm housing length and 2 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area - L length
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)

TR 024K – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K25.05en

DESCRIPTION AND APPLICATION

These resistance temperature sensors are designed for contact measurement of the temperature of gaseous, liquid or solid substances. Given the materials used and production technology, these sensors may also be used under very low temperatures. The maximum temperature range of use is -100 to 150 °C and must not be exceeded for a brief period. The diameter of the case ensures fast response to changes in temperature. The method of use must be chosen with regard to the temperature, chemical and mechanical resistance of the case and lead-in cable.

ACCESSORIES

- connectors

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

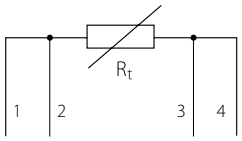
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

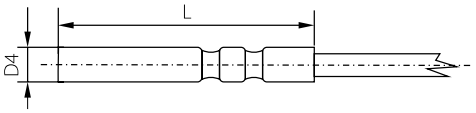
Sensor type	TR 024K
Measuring range	-100 °C to 150 °C (must not be exceeded even in short-term)
Type of sensing element	Pt 100, Pt 1000
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of case	4 mm
Length of case	L 50 to 100 mm (in 10 mm)
Lead-in cable	shielded teflon 4 x 0.14 mm^2
Time response	$\tau_{0.5} < 4$; $\tau_{0.9} < 12.5$ s (in flowing water at 0.4 $m.s^{-1}$)
Weight	0.05 kg for length 1 m

WIRING DIAGRAM

Four-wire



DIMENSIONAL DRAFT



TR 046S – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K26.05en

DESCRIPTION AND APPLICATION

These resistance temperature sensors are designed for contact measurement of the temperature of gaseous or solid substances. Given the materials used and production technology, these sensors may also be used under very low temperatures. The maximum temperature range of use is -100 to 150 °C and must not be exceeded for a brief period. The sensors are primarily designed for measuring the temperature in freezers, refrigerators etc. The resistive signal of the temperature sensor is led with individual conductors with Teflon insulation, which ensures their low volume, allowing them to be installed between door seals. The method of use must be chosen with regard to the temperature, chemical and mechanical resistance of the case and lead-in cable.

ACCESSORIES

- connectors

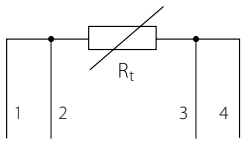
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

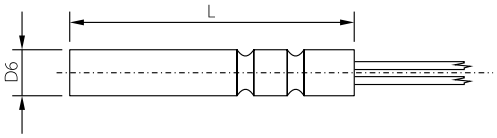
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

Four-wire



DIMENSIONAL DRAFT



SPECIFICATIONS

Sensor type	TR 046S
Measuring range	-100 °C to 150 °C (must not be exceeded even in short-term)
Type of sensing element	Pt 100, Pt 1000
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301, DIN 1.4404
Diameter of case	6.0 ± 0.1 mm
Length of case	L 40 to 200 mm (in 20 mm)
Lead-in cable	teflon APFA 0.22 mm^2
Time response	$\tau_{0.5} < 7$ s (in flowing water at 0,4 $m.s^{-1}$)
Weight	0.03 kg for 60 mm sleeve length and 1 m wire length

TR 099 – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K27.05en

DESCRIPTION AND APPLICATION

These resistance temperature sensors are designed for contact measurement of the temperature of gaseous, liquid or solid substances. Given the materials used and production technology, these sensors may also be used under very low temperatures. The maximum temperature range of use is -190 to 150 °C, where accuracy class B in accordance with EN 60751, as amended is ensured within the range of -100 to 150 °C. The method of use must be chosen with regard to the temperature, chemical and mechanical resistance of the case and lead-in cable.

ACCESSORIES

- connectors

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

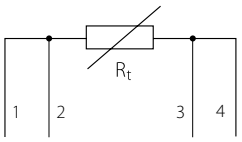
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

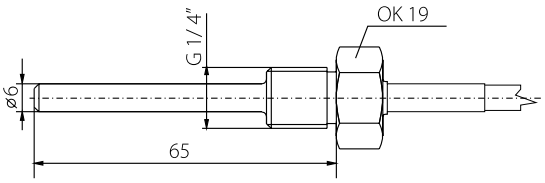
Sensor type	TR 099
Measuring range	-190 to 100 °C
Type of sensing element	Pt 100, Pt 1000
Ingress protection	IP 67 in accordance with EN 60529, as amended
Thread	M 10 x 1, M 10 x 1.5, M12, G 1/4
Case material	stainless steel DIN 1.4301, DIN 1.4404
Diameter of case	6.0 ± 0.1 mm
Length of case L	40 to 80 mm (in 10 mm); other customized lengths possible
Lead-in cable	shielded teflon 4 x 0.14 mm^2
Weight	0.07 kg for 1 m length

WIRING DIAGRAM

Four-wire



DIMENSIONAL DRAFT



TR 125B – TEMPERATURE SENSORS WITH A CABLE AND METAL CASE

K28.05en

DESCRIPTION AND APPLICATION

These resistance temperature sensors are designed for contact measurement of the temperature of gaseous, liquid or solid substances. Given the materials used and production technology, these sensors may also be used under very low temperatures. The maximum temperature range of use is -190 to 150 °C, where accuracy class B in accordance with EN 60751 is ensured within the range of -100 to 150 °C. The sensor case includes fittings allowing the use of sensor for measuring the temperature in pipes, armatures etc. The structure enables faster response to changes in temperature in comparison to sensors with a protective thermowell. The method of use must be chosen with regard to the temperature, chemical and mechanical resistance of the case and lead-in cable.

ACCESSORIES

- connectors

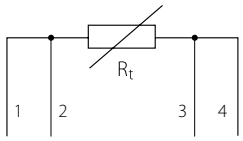
DECLARATION, CERTIFICATES, CALIBRATION

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

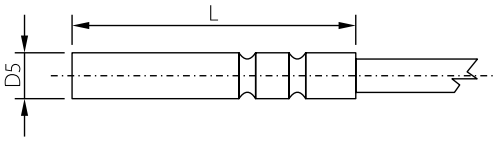
Four-wire



SPECIFICATIONS

Sensor type	TR 125B
Measuring range	-190 °C to 150 °C
Type of sensing element	Pt 100, Pt 1000
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of case	5 ± 0.1 mm
Length of case	L 50 to 80 mm (in 10 mm)
Lead-in cable	shielded teflon 4 x 0.14 mm²
Weight	0.05 kg for length 1 m

DIMENSIONAL DRAFT



SENSOR INSTALLATION AND SERVICING

1. Installation of the sensor in the measured place.

2. Connection of the wires of the lead-in cable according to the wiring diagram. After installing and connecting to the electrical measuring equipment, the sensor is ready for use. The sensor does not require any special servicing or maintenance. The work position is adjustable.

MINERAL INSULATED RESISTANCE TEMPERATURE SENSORS (MGO)

T04.02en

DESCRIPTION AND APPLICATION

Mineral insulated resistance temperature sensors (MGO) are designed for measuring the temperature of gaseous, liquid or solid substances. Their main advantage compared to the standard design of resistance temperature sensors is the possibility to form the shape of the sensor body. The temperature range of the measuring end of the sensor is up to 600 °C, according to the temperature sensor design. These mineral insulated resistance temperature sensors (MGO) can be used for all control systems compatible with the type of sensing element stated in the table of technical parameters. Mineral insulated resistance temperature sensors (MGO) meet the degree of protection of up to IP 67 according to EN 60529, as amended depending on the type of thermoelement and production technology used. The case diameter of 1.5 mm to 3 mm ensures very quick time response of the sensor to temperature changes. These sensors are designed for operation in chemically non-aggressive environments, the using must be chosen with regard to temperature and chemical resistant housing and a cable.

ACCESSORIES

- connectors
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

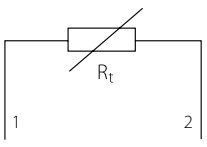
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

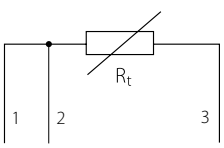
Sensor type	TR 09x.xP
Sensing element	Pt 100, Pt 500, Pt 1000
Ingress protection	up toIP 67 in accordance with EN 60529, as amended acc. to type of the cable
Design	jacket resistance sensor
Diameter of measuring part	1.5, 2, 3, 4.5 and 6 mm
Length of the measuring part	from 50 to 300 mm as standard, others acc. requested
Maximal temperature range (on measuring tip)	-50 to 500 °C for diameters up to 3 mm -50 to 600 °C for diameters from 3 mm (could be limited by length of the measuring tip or variant of lead-in cable)
Accuracy class	class B standard (class A on request)
Jacket material	stainless steel DIN1.4571
Body of sensor	flexible, shapeable
Minimum bend radius	10time of diameter
Lead-in cable variations/ Temperature range of the cable	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fibreglass 0 to 400 °C (with metal braiding)

WIRING DIAGRAM

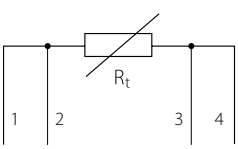
Two-wire



Three-wire

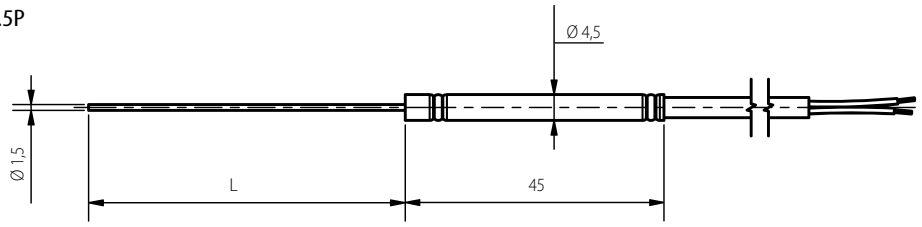


Four-wire

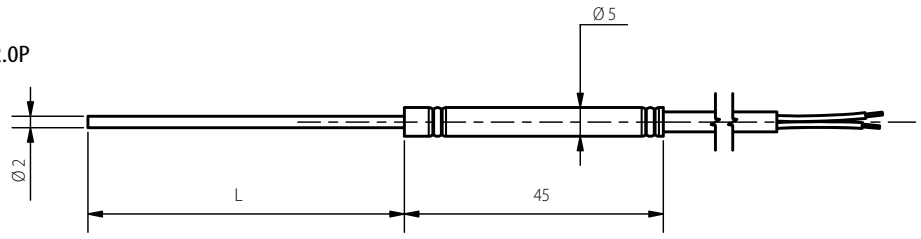


DIMENSIONAL DRAFT

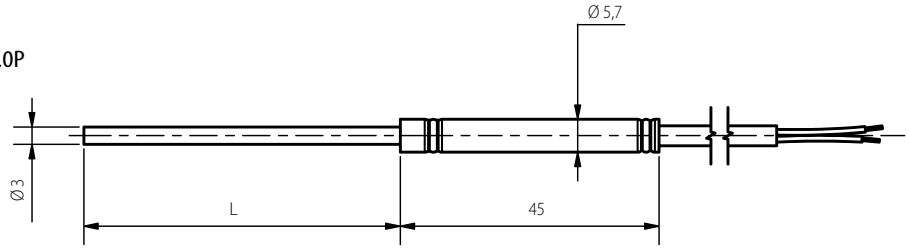
TR 091.5P



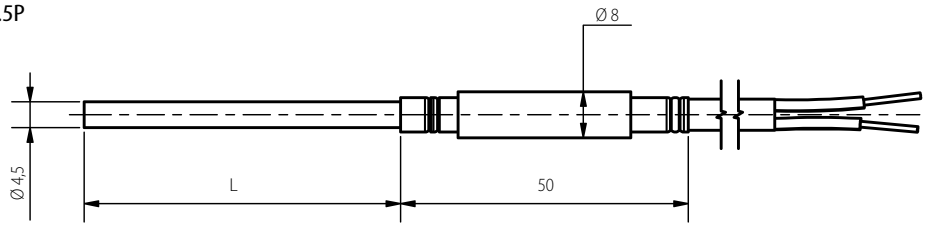
TR 092.0P



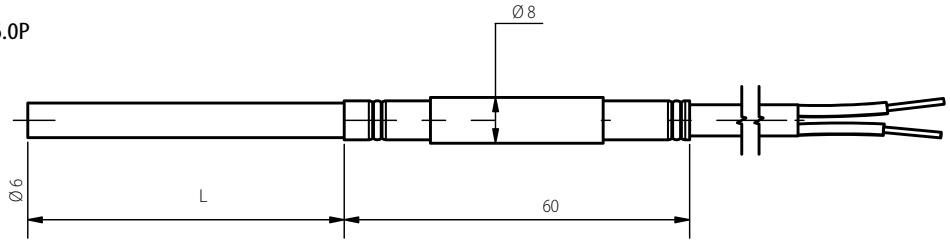
TR 093.0P



TR 094.5P



TR 096.0P



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area – L length,
- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, termistor NTC 20kΩ)

TR 151 AND TR 152 – TEMPERATURE SENSORS WITH CABLE AND PLASTIC CASE

K31.04en

DESCRIPTION AND APPLICATION

Temperature sensors in the plastic case are intended for temperature measurements of gaseous, eventually liquid materials. For long-lasting temperature measurements (especially at the temperatures over 90 °C) there is better to use sensor with thermowell combination. The sensors have always polastic polyamide case which in which is the temperature sensing element located. The case diameter of TR 151 is 6 mm and case diametre od TR 152 is 8 mm. All types of resistence sensing elements used by company SENSIT s.r.o. can be used. The wiring of the sensor is always 2-wire. Material of the case has medium resistivity to atmospheric aging, it resists to oils, fuels, hydraulic liquids, alifatic and aromatics hydrocarbons, esters, ketons and slight alcalis. Material is not resistant to acids, strong alcalis and chlorinated hydrocarbons.

ACCESSORIES

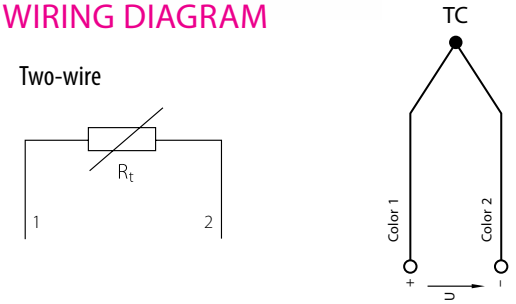
- connectors

DECLARATION, CERTIFICATES, CALIBRATION

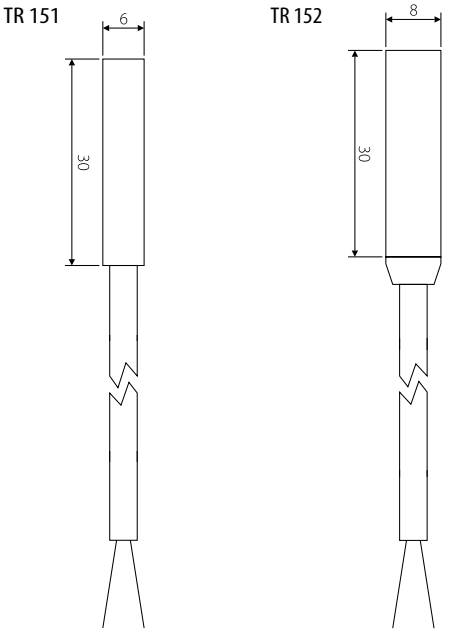
Manufacturer provides **EU Declaration of Conformity**.

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM



DIMENSIONAL DRAFT



SPECIFICATIONS

Sensor type	TR 151	TR 152
Measuring range	-20 to 105 °C (can be limited by the type of cable, determine in documentation)	
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)	
Ingress protection	IP 67 in accordance with EN 60529, as amended	
Case material	on the base of POLYAMIDE	
Diameter of case	6 mm	8 mm
Length of case	L 30 mm	
Lead-in cable	PVC unshielded 2 x 0.35 mm^2 up to 105 °C PVC shielded 2 x 0.25 mm^2 up to 80 °C	
Wire resistance	0.105 Ω for 1 m of cable for 2-wire connection - PVC up to 105 °C	
	0.159 Ω for 1 m cable for 2-wire connection - PVC up to 80 °C	
Time response	$\tau_{0,9} \leq 45$ s (in flowing water at 0.2 $m.s^{-1}$)	$\tau_{0,9} \leq 75$ s (in flowing water at 0.2 $m.s^{-1}$)
Weight	0.03 kg for length 1 m	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

MODIFICATION AND CUSTOMIZATION

- posibility of encasing non-standard temperature sensing elements (DALLAS, TSic, KTY, SMT, etc.)
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = 2226, thermistor NTC 20 k Ω)

TR 160, TR 161 AND TR 162 – TEMPERATURE SENSORS WITH CABLE AND PLASTIC CASE

K32.04en

DESCRIPTION AND APPLICATION

Temperature sensors TR 160, TR 161 and TR 162 are intended for temperature measurements of solid, loose groung, gaseous and liquid materials. The ingress protection of the sensor is IP 67 in accodrance with EN 60529. The sensors have a polyamide case with diameter 6, 8 and 10 mm in which the own sensing element hermeticaly encapsulated. All types of resistence sensing elements used by company SENSIT s.r.o. can be used. The wiring of the sensor is always 2-wire.

ACCESSORIES

- connectors

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

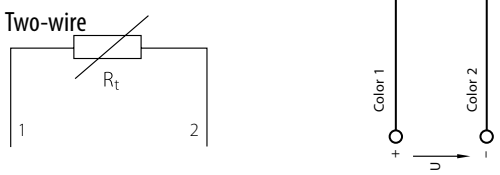
Sensor type	TR 160	TR 161	TR 162
Measuring range	-40 to 105 °C (can be limited by the type of cable, determine in documentation)		
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC Tand so on)		
Ingress protection	IP 67 in accordance with EN 60529, as amended		
Case material	on the base of POLYAMIDE		
Diameter of case	6 mm	8 mm	10 mm
Length of case L	20 mm	25 mm	25 mm
Lead-in cable	PVC unshielded 2 x 0.35 mm^2 up to 105 °C PVC shielded 2 x 0.14 mm^2 up to 80 °C		
Wire resistance	0.105 Ω for 1 m of cable for 2-wire connection - PVC up to 105 °C 0.14 Ω for 1 m cable for 2-wire connection - PVC up to 80 °C		
Time response	$\tau_{0,5} \leq 12$ s; $\tau_{0,9} \leq 32$ s (in flowing water at 0.2 $m.s^{-1}$)	$\tau_{0,5} \leq 18$ s; $\tau_{0,9} \leq 48$ s (in flowing water at 0.2 $m.s^{-1}$)	$\tau_{0,5} \leq 24$ s; $\tau_{0,9} \leq 64$ s (in flowing water at 0.2 $m.s^{-1}$)
Weight	0.03 kg for length 1 m		

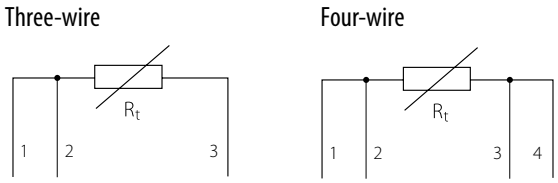
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

MODIFICATION AND CUSTOMIZATION

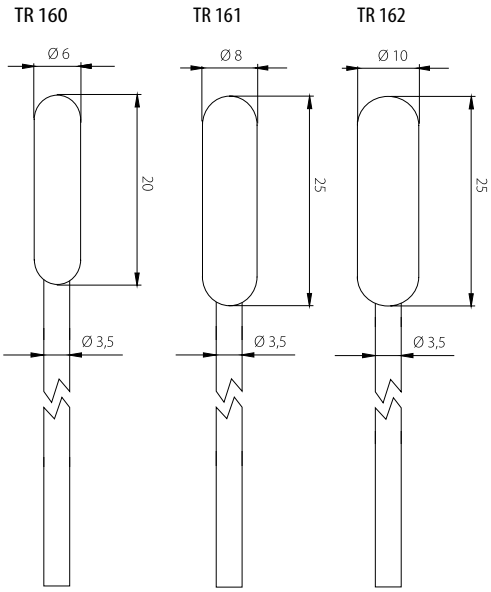
- posibility of encasing non-standard temperature sensing elements (DALLAS, TSic, KTY, SMT, etc.)
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = 2226, thermistor NTC 20 k Ω)

WIRING DIAGRAM





DIMENSIONAL DRAFT



TEMPERATURE SENSORS – FOR EXPLOSIVE ENVIRONMENTS WITH A CABLE

014.08en

DESCRIPTION AND APPLICATION

The sensors are designed to meet the requirements of EN 60079-0:2013+A11:2014, EN 60079-7:2016 and EN 60079-31:2014, as amended. Sensors marked on the nameplate with II3G Ex ec IIC T6. . .T2 Gc and II3D Ex tc IIIC T60°C. . .230°C DC can be used in potentially explosive environments – Equipment Group II, Zone 2 and Zone 22. The sensors operate on the principle of defined dependency of the change of property of the sensor and the change of temperature. They are not capable of generating sparks, arcs or high surface temperatures. The temperature range for use in potentially explosive environments is limited by the insulation of the cable used and specifically specified in the operating instructions – the specified measuring range must not be exceeded, even for a brief period. The supply cable may have an outer PVC, silicone or PTFE (Teflon) insulation and may be either shielded or unshielded. According to EN 60529, as amended the sensors meet IP 65 in the case of PTFE (Teflon) cable insulation and IP 67 in the case of other supply cables. 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 case and the supply cable. From the design perspective, there are two sensor variants:

TG8Ex – In combination with the JTG8 thermowell or central holder, supplied as accessories, the sensors can be used for temperature measurement of gaseous and liquid substances in piping or air conditioning ducts or separately for temperature measurement of solids. They consist of a metal measuring case with a diameter of 5.7 mm, 6 mm, 7 to 10 mm or 12 mm, which contains a temperature sensing element and supply cable. The metal sensor case can be made of stainless steel DIN 1.4301, DIN 1.4404, DIN 1.4571. The wiring of the sensors can be 2-wire, 3-wire or 4-wire. In the case of shielded supply cables, the shielding is not connected to the case or to the temperature sensing element. The case length can be selected from the range of 40 to 400 mm, depending on the sensor case diameter.

TR011Ex – The sensors can be used for temperature measurement of gaseous and liquid substances in piping or air conditioning ducts or separately for temperature measurement of solids. They consist of a metal measuring case with a diameter of 6 mm, 7 to 10 mm or 12 mm, which contains a temperature sensing element and supply cable. The metal sensor case can be made of stainless steel DIN 1.4301, DIN 1.4404, DIN 1.4571. The fixed part of the case is a mounting fitting with different thread sizes and OK hexagon, allowing direct installation in the measured location without the use of a thermowell. The wiring of the sensors can be 2-wire, 3-wire or 4-wire. In the case of shielded supply cables, the shielding is not connected to the case or to the temperature sensing element. The case length can be selected from the range of 40 to 400 mm, depending on the sensor case diameter.

TR141Ex – The sensors can be used to measure the surface temperature of solids with a smooth surface. They consist of a cuboid-shaped metal measuring case, which contains a temperature sensing element and supply cable. The metal sensor case can be made of stainless steel DIN 1.4301 or aluminium alloy (Duralumin). The case contains a mounting hole, allowing the sensor to be mounted on the to- -be-measured surface. The wiring of the sensors can be 2-wire, 3-wire or 4-wire. The supply cable may have an outer PVC, silicone or PTFE (Teflon) insulation and is either shielded or unshielded. In the case of shielded supply cables, the shielding is not connected to the case or to the temperature sensing element. The total case length can be selected from the range of 40 to 60 mm, depending on the sensor case design and type of the supply cable.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

The declaration is issued on the basis of the following certificates issued by the Physical-Technical Testing Institute Ostrava – Radvanice:

- **TG8Ex** Appendix No. 2 to Certificate No. FTZÚ 07 ATEX 0142X
- **TR011Ex** Appendix No. 2 to Certificate No. FTZÚ 07 ATEX 0143X
- **TR141Ex** Certificate No. FTZÚ 16 ATEX 0145X

Calibration – All temperature sensors pass through the final metrological inspection, which is carried out by comparing with standards or working gauges. Continuity of the standards and working gauges is ensured within the meaning of Section 5 of Act No. 505/1990 on metrology, as amended. The manufacturer offers the possibility to supply sensors calibrated in the laboratory of SENSIT s.r.o. (according to the requirements of EN ISO/IEC 17025) or in an accredited laboratory.

SPECIFICATIONS

Standard types of sensing elements	all types (Pt 100, Pt 500, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and others)
Measuring range	Y - T2: -40 ≤ Ta ≤ 230 °C cable PTFE (teflon) T3: -30 ≤Ta ≤ 180 °C cable SILICONE T5: -20 ≤ Ta ≤ 95 °C cable PVC up to 105 °C T6: -20 ≤ Ta ≤ 70 °C cable PVC
Recommended / maximum DC measuring current	1 mA / 3 mA for the sensor with the sensing element Pt 100 0.5 mA / 1.5 mA for the sensor with the sensing element Pt 500 0.3 mA / 0.8 mA for the sensor with the sensing element Pt 1000 0.3 mA / 1 mA for other sensors
Recommended / maximum DC power consumption of sensing element	0.05 mW / 1 mW for the sensor with the sensing element NTC 20 kΩ
Accuracy class	Ni sensing elements: class B, $\Delta t = \pm (0.4 + 0.007 \lvert t \rvert)$, for $t \geq 0$ in °C, $\Delta t = \pm (0.4 + 0.0028 \lvert t \rvert)$, for $t \leq 0$ in °C Pt sensing elements: class B according to EN 60751, $\Delta t = \pm (0.3 + 0.005 \lvert t \rvert)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Sensor connection	2-wire, 3-wire, 3-wire
Insulation resistence	min. 200 MΩ at 500 V DC, at the temperature 15 to 35 °C, max. relative humidity 80 %
Electric strenght ATEX	1 000 V DC during the period 1 s, at the temperature 15 to 35 °C, max. relative humidity 80% according to the article 6.8.1 of the EN 60079-15 ed. standard, as amended
Ingress protection	IP 67 for cables with PVC and SILICONE insulation in accordance with EN 60529, as amended IP 65 for cables with PTFE (teflon) insulation in accordance with EN 60529, as amended
Types of lead-in cables and their thermal resistivity	-50 to 200 °C MCBE-AFEP, 2 x 0.34 a 4 x 0.15 mm^2, silicone insulation -40 to 105 °C FLRYWYW, 2 x 0.35 a 4 x 0.35 mm^2, PVC insulation up to 105 °C -30 to 80 °C LiYCY 2 x 0.34 mm^2, PVC insulation -50 to 260 °C PTFE
Weight	according to the length of the cable, minimum 0.15 kg

SUPLEMENTERY DATA TO THE INDIVIDUAL TYPES

Serie TG8Ex

Stem diameter	5.7 mm, 6 mm, 7 to 10 mm, 12 mm
Stem length	40 to 400 mm
Stem material	stainles steel DIN 1.4301, DIN 1.4571, DIN 1.4404
Time response (in flowing water 0.2 m.s.-1)	$\tau_{0,5} \leq 5$ s, $\tau_{0,9} \leq 12$ s for stem ø 5.7 mm $\tau_{0,5} \leq 9$ s, $\tau_{0,9} \leq 20$ s for stem ø 6 mm $\tau_{0,5} \leq 14$ s, $\tau_{0,9} \leq 35$ s for stem ø 7 to 8 mm $\tau_{0,5} \leq 25$ s, $\tau_{0,9} \leq 60$ s for stem ø 9 to 10 mm $\tau_{0,5} \leq 35$ s, $\tau_{0,9} \leq 80$ s for stem ø 12 mm

Serie TR141Ex

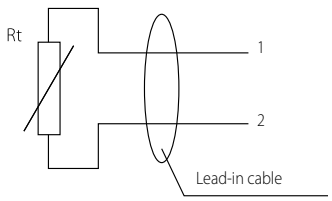
Basic cuboid size	12 x 8 mm
Inner diameter of the case in the cable sealing area	4.5 mm to 6 mm
Case length	40 to 60 mm
Case material	stainless steel DIN 1.4301, dural
Time response (on flat surface without paste)	stainless steel DIN 1.4301 $\tau_{0,5} \leq 10$ s dural $\tau_{0,5} \leq 8$ s

Serie TR011Ex

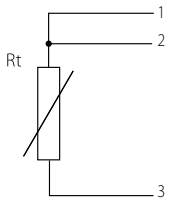
Stem diameter	6 mm, 7 to 10 mm, 12 mm
Stem length	40 to 400 mm
Stem material	stainless steel DIN 1.4301, DIN 1.4571, DIN 1.4404
Type of the thread	according to the customer´s requirement
Time response (in flowing water 0.2 m.s.-1)	$\tau_{0,5} \leq 9$ s, $\tau_{0,9} \leq 20$ s for stem ø 6 mm $\tau_{0,5} \leq 14$ s, $\tau_{0,9} \leq 35$ s for stem ø 7 to 8 mm $\tau_{0,5} \leq 25$ s, $\tau_{0,9} \leq 60$ s for stem ø 9 to 10 mm $\tau_{0,5} \leq 35$ s, $\tau_{0,9} \leq 80$ s for stem ø 12 mm

WIRING DIAGRAM

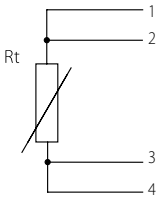
Two-wire



Three-wire

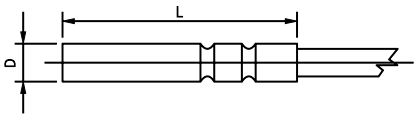


Four-wire

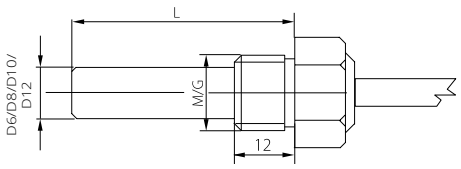


DIMENSIONAL DRAFT

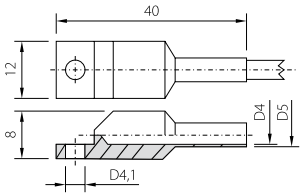
TG8Ex



TR011Ex



TR141Ex



MODIFICATION AND CUSTOMIZATION

- length of the case of the sensor
- possibility to encase two sensing elements
- A class of accuracy (except for the NTC 20kΩ sensing element)

TR 097J AND TR 097R – ELECTROMOTOR WINDING TEMPERATURE SENSORS

K36.02en

DESCRIPTION AND APPLICATION

The TR097J and TR 097R temperature sensors are designed to measure the temperature of gaseous or solid substances. The temperature range is -20 to 180 °C and these limits must not be exceeded even for a brief period. The sensors can be used for any control systems compatible with the types of sensing elements or output signals listed in the table of technical parameters. The sensors meet the ingress protection of IP 30 according to EN 60529, as amended and can therefore be used only in dry areas without the possibility of moisture condensation. The temperature sensor is placed in a protective sleeve ensuring high electric strength – the sensors meet the requirements on electric strength of 5 kV DC and can therefore be used also for measuring the temperature of electric motor windings, etc. The sensors are designed to be operated in a chemically non-aggressive environment. The use must be chosen with regard to the temperature, chemical and mechanical resistance of the temperature sensor..

ACCESSORIES

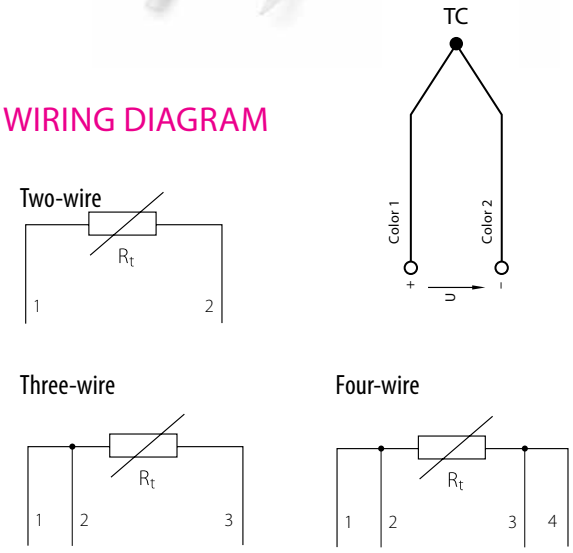
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM



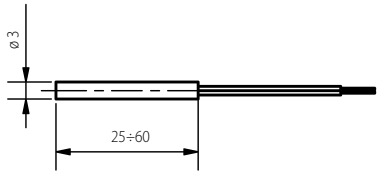
SPECIFICATIONS

Sensor type	TR 097J	TR 097R
Temperature range	-20 to 180 °C	-20 to 180 °C
	temperature class H	
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)	
Ingress protection	IP 30 in accordance with EN 60529, as amended	
Electric strenght	5 kV DC (higher acc. to requirement)	
Length of case	L 25 to 60 mm	
Lead in wires	0.22 mm^2 - teflon FEP or PFA	PTFE unshielded 2 x AWG24 PTFE shielded 4 x AWG30
Wire resistance	0.162 Ω / m at temperature 25 °C	0.178 Ω / m at temperature 25 °C
Weight	0.03 kg for length 1 m	

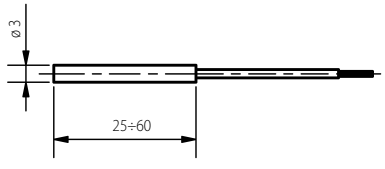
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT

TR 097J



TR 097R



SENSIT s.r.o., Skolni 2610, 756 61 Roznov pod Radhostem, Czech Republic
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TR 097V AND TR 097VA – ELECTROMOTOR WINDING TEMPERATURE SENSORS

K37.02en

DESCRIPTION AND APPLICATION

The TR 097V and TR 097VA resistance temperature sensors are designed to measure the temperature of gaseous or solid substances. The temperature range in working mode is -40 to 155 °C and can be used in temperaturre range -40 to 180 °C for short time. The sensors can be used for any control systems compatible with the types of sensing elements or output signals listed in the table of technical parameters. The sensors meet the ingress protection of IP 65 according to EN 60529, as amended. The temperature sensor is placed in a special plastic case from SCID - sklotextit material ensuring high electric strength – the sensors meet the requirements on electric strength of 5 kV DC and can therefore be used also for measuring the temperature of electric motor windings, etc.

The sensors are designed to be operated in a chemically non-aggressive environment. The use must be chosen with regard to the temperature, chemical and mechanical resistance of the temperature sensor.

ACCESSORIES

- connectors

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, as amended) or in an Accredited laboratory.

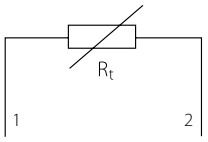
SPECIFICATIONS

Sensor type	TR 097V	TR 097VA
Temperature range	-40 to 180 °C, temperature class H	
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)	
Ingress protection	IP 65 in accordance with EN 60529, as amended	
Electric strenght	5 kV DC (higher acc. to requirement)	
Case dimensions	63 x 6 x 1.7 mm (other acc. to requirements)	63 x 6 x 3 mm (other acc. to requirements)
Case material	SCID - sklotextit	
Lead in wires	0.14 mm^2 - teflon FEP or PFA	PTFE shielded 4 x AWG30
Wire resistance	0.254 Ω / m at temperature 25 °C	
Weight	0.015 kg for length 1 m	

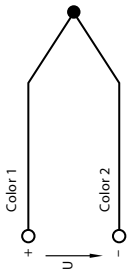
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

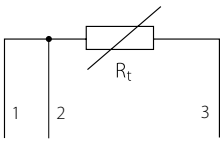
Two-wire



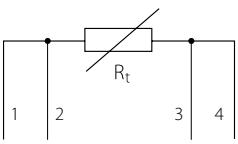
TC



Three-wire

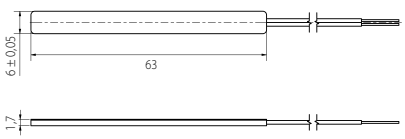


Four-wire

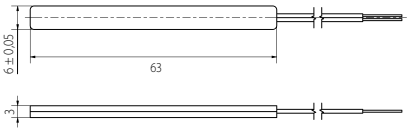


DIMENSIONAL DRAFT

TR 097V



TR 097VA



TG 60, TG 61 AND TG 62 – TEMPERATURE SENSORS WITH BAYONET MOUNT

B01.04en

DESCRIPTION AND APPLICATION

These temperature sensors are primarily designed for temperature measurement of solid substances, but can also be used for temperature measurement of liquids or gaseous substances. To mount the sensor to the measuring point, a bayonet nut is used that is screwed on a spring. The combination of a bayonet nut, spring and corresponding bayonet connector can provide higher contact pressure of the sensor to the measuring point or compensate any changes in the distance between the nut and measuring point during measurement.

The maximum temperature range of the sensors is -50 to 350 °C (short-term 400 °C). The range for individual design variations is narrowed down by the type of temperature sensing element and supply cable. The sensors meet the level of protection from IP 50 to IP 67 according to EN 60529, as amended, depending on the type of lead-in cable. The sensors are designed to operate in a non-aggressive environment. The method of use must be chosen with regard to temperature and chemical resistance of the case and supply cable.

ACCESSORIES

- stainless steel thermowell JS 130G
- bayonet adapter
- connectors

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

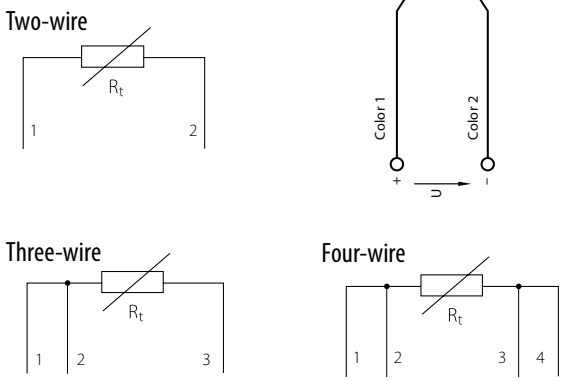
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

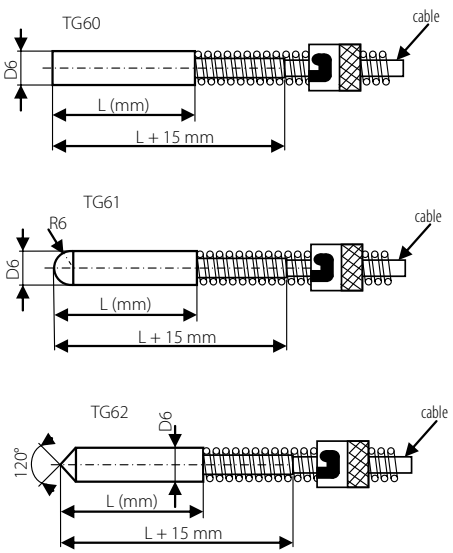
Sensor type	TG 60	TG 61	TG 62
Case end	straight	semisphere R6	apex 120°
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)		
Case material	stainless steel DIN 1.4301		
Diameter of case	6 mm		
Length of case L	10 to 85 mm (with addition of 15 mm for cable attachment)		
Lead-in cable variations/ temperature range (can be limited by type of sensing element – determine in documentation)	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fibreglass 0 to 350 °C (for short term 400 °C) (with metal braiding)		
Ingress protection	PVC and silicone cables IP 67 teflon cables IP 64 cables with glass fibre IP 50		
	with EN 60529, as amended		
Material / Dimension of bayonet nut	nickel-plated brass / L = 16 mm, inner ø 12,8 mm		
Material / Dimension of spring	stainless steel DIN 1.4301 / L = 200 mm, outer ø 6 mm, ø of wire 0,7 mm		
Insulation resistance	200 MΩ at 500 VDC, 25 °± 3 °C		
Maximum permissible static pull on the lead-in cable	1 kg		
Weight	0.04 kg for 40 mm housing length and 1 m cable		

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- optional design of case dimensions in terms of: diameter – 5 to 7 mm, L length, case material, case end design
- spring length
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 k Ω)

TG 80, TG 81 AND TG 82 – TEMPERATURE SENSORS WITH BAYONET MOUNT

B02.04en

DESCRIPTION AND APPLICATION

These temperature sensors are primarily designed for temperature measurement of solid substances, but can also be used for temperature measurement of liquids or gaseous substances. To mount the sensor to the measuring point, a bayonet nut is used that is screwed on a spring. The combination of a bayonet nut, spring and corresponding bayonet connector can provide higher contact pressure of the sensor to the measuring point or correct any changes in the distance between the nut and measuring point during measurement. The maximum temperature range of the sensors is -50 to 350 °C (short-term 400 °C). The range for individual design variations is narrowed down by the type of temperature sensing element and lead-in cable. The sensors meet the level of protection from IP 50 to IP 67 according to EN 60529, as amended depending on the type of lead-in cable. The sensors are designed to operate in a non-aggressive environment. The method of use must be chosen with regard to temperature and chemical resistance of the case and lead-in cable.

ACCESSORIES

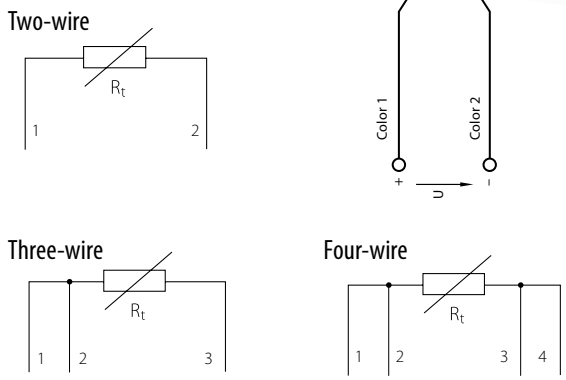
- stainless steel thermowell JS 130F
- bayonet adapter
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

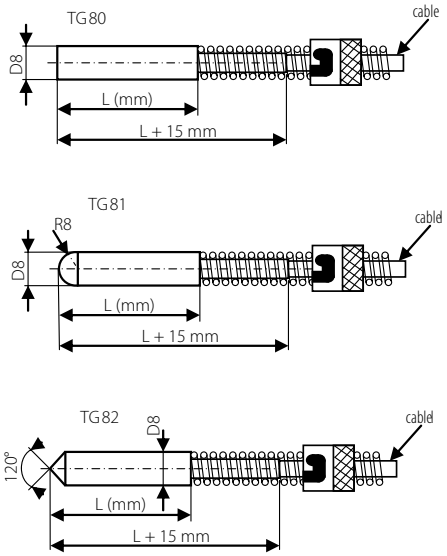


SPECIFICATIONS

Sensor type	TG 80	TG 81	TG 82
Case end	straight	semisphere R8	apex 120°
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC J, TC K, TC T and so on)		
Case material	stainless steel DIN 1.4301		
Diameter of case	8 mm		
Length of case L	10 to 85 mm (with addition of 15 mm for cable attachment)		
Lead-in cable variations/ temperature range (can be limited by type of sensing element – determine in documentation)	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fibreglass 0 to 350 °C (for short term 400 °C) (with metal braiding)		
Ingress protection	PVC and silicone cables IP 67 teflon cables IP 64 cables with glass fibre IP 50		
	with EN 60529, as amended		
Material / Dimension of bayonet nut	nickel-plated brass / L = 18 mm, inner ø 15 mm		
Material / Dimension of spring	stainless steel DIN 1.4301 / L = 200 mm, outer ø 8 mm, ø of wire 0,9 mm		
Insulation resistance	200 MΩ at 500 VDC, 25° ± 3 °C		
Maximum permissible static pull on the lead-in cable	1 kg		
Weight	0.06 kg for 40 mm housing length and 1 m cable		

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, thermistor NTC 20kΩ)
- encapsulation of other types of sensing elements (DALLAS, KTY, TSiC, SMT, etc.)
- optional design of case dimensions in terms of: diameter 8 to 10 mm, length L, case material, case end design
- variable spring length

TG 55 – TEMPERATURE SENSORS WITH BAYONET MOUNT

B03.03en

DESCRIPTION AND APPLICATION

These temperature sensors with a bayonet head TG 55 are designed to measure temperature of solid substances, however, they may be used also to measure temperature of liquid and gaseous substances.

To mount the temperature sensor to the measuring point, a bayonet nut is used that is screwed on a spring. Combination of the bayonet nut, the spring and the corresponding bayonet adapter can provide higher pressure of the temperature sensor with the bayonet into the measured point or can adjust any changes in the distance between the nut and the measured point during the measurement. Maximum temperature range of sensor use is -50 to 350 °C (400 °C for a short period). The range for each design variant is reduced with a type of the temperature sensing element and the lead-in cable. The temperature sensors meet ingress protection from IP 50 to IP 67 according to the EN 60529 standard, as amended depending on the lead-in cable variant.

The temperature sensors with a bayonet mount are intended for operation in chemically non-aggressive environment.

ACCESSORIES

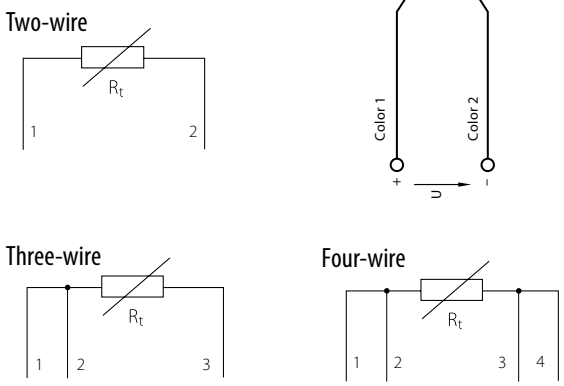
- bayonet adapter
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

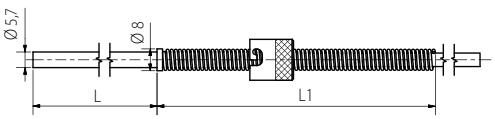


SPECIFICATIONS

Sensor type	TG 55
Case end	straight, semisphere R6 or apex 120°
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Case material	stainless steel DIN 1.4301
Diameter of case	6 mm
Length of case	L 60 to 200 mm
Lead-in cable variations/ temperature range (can be limited by type of sensing element - specified in documentation)	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fiberglass 0 to 350 °C (with metal braid) with fiberglass 0 to 400 °C (with metal braid)
Ingress protection	IP 50 to IP 67 according to the cable type - in accordance with EN 60529, as amended
Material / dimension of bayonet nut	nickel-plated brass / L = 16 mm, inner ø 12.8 mm
Material / dimension of spring	stainless steel DIN 1.4301 / L = 200 mm, outer ø 8 mm, ø of wire 1 mm
Insulation resistance	200 MΩ at 500 V DC, 25 ± 3 °C
Maximum permissible static pull on the lead-in cable	1 kg
Weight	0.05 kg for 70 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design – length L, diameter, case material, case ending
- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, thermistor NTC 20kΩ)
- encapsulation of other types of sensing elements (DALLAS, KTY, TSiC, SMT, etc.)
- optional design of case dimensions and materials
- variable spring length

TG 30 – RIGHT-ANGLE TEMPERATURE SENSORS

P01.03en

DESCRIPTION AND APPLICATION

These right-angle temperature sensors TG 30 are designed to measure temperature of solid substances, however, they may be used also to measure temperature of liquid and gaseous substances. Due to temperature sensor design, the cable is led out at right angle to measuring part of the sensor. On the place of case transition to cable, there is a spring that protects the cable from mechanical damage. Maximum temperature range of sensor use is -50 to 350 °C (400 °C for a short period). The range for each design variant is reduced with a type of the temperature sensing element and the lead-in cable. The temperature sensors meet ingress protection from IP 50 to IP 67 according to the EN 60529 standard, as amended depending on the lead-in cable variant. The rectangular temperature sensors are intended for operation in chemically non-aggressive

ACCESSORIES

- stainless steel thermowell JS 130
- connectors

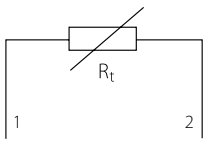
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

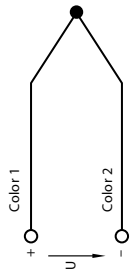
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

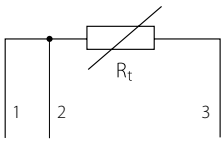
Two-wire



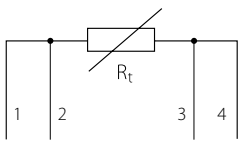
TC



Three-wire



Four-wire

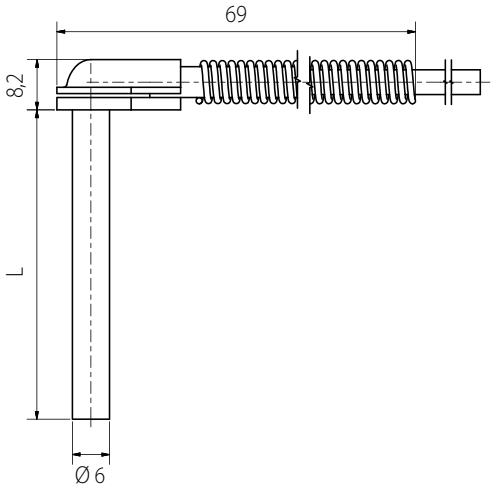


SPECIFICATIONS

Sensor type	TG 30	
Case end	straight, semisphere R6 or apex 120°	
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)	
Case material	stainless steel DIN 1.4301	
Diameter of case	6 mm	
Length of case L	60 to 200 mm	
Material of rectangular part	stainless steel	
Lead-in cable variations/ temperature range (can be limited by type of sensing element - specified in documentation)	PVC shielded PVC unshielded silicone shielded teflon shielded with fiberglass	-30 to 80 °C -40 to 105 °C -50 to 200 °C -50 to 250 °C 0 to 400 °C (with metal braid)
Ingress protection	IP 50 to IP 67 according to the cable type - in accordance with EN 60529, as amended	
Insulation resistance	200 MΩ at 500 V DC, 25 ± 3 °C	
Maximum permissible static pull on the lead-in cable	1 kg	
Weight	0.05 kg for 60 mm housing length and 1.5 m cable	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design – length L, diameter, case material, case ending
- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, thermistor NTC 20kΩ)
- encapsulation of other types of sensing elements (DALLAS, KTY, TSiC, SMT, etc.)
- variable spring length

TG 35 – RIGHT-ANGLE TEMPERATURE SENSORS

B04.03en

DESCRIPTION AND APPLICATION

These right-angle temperature sensors with a bayonet TG 35 are designed to measure temperature of solid substances, however, they may be used also to measure temperature of liquid and gaseous substances. Due to temperature sensor design, the cable is led out at right angle to measuring part of the sensor. To fasten the temperature sensor into a point to be measured, the bayonet head that is screwed onto a spring is used. Combination of the bayonet nut, the spring and the corresponding bayonet cap can provide higher pressure of the temperature sensor with the bayonet into the measured point or can adjust any changes in the distance between the nut and the measured point during the measurement. Maximum temperature range of sensor use is -50 to 350 °C (400 °C for a short period). The range for each design variant is reduced with a type of the temperature sensing element and the lead-in cable. The temperature sensors meet ingress protection from IP 50 to IP 67 according to the EN 60529 standard, as amended depending on the lead-in cable variant.

The rectangular temperature sensors with a bayonet mount are intended for operation in chemically non-aggressive environment.

ACCESSORIES

- bayonet adapter
- connectors

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

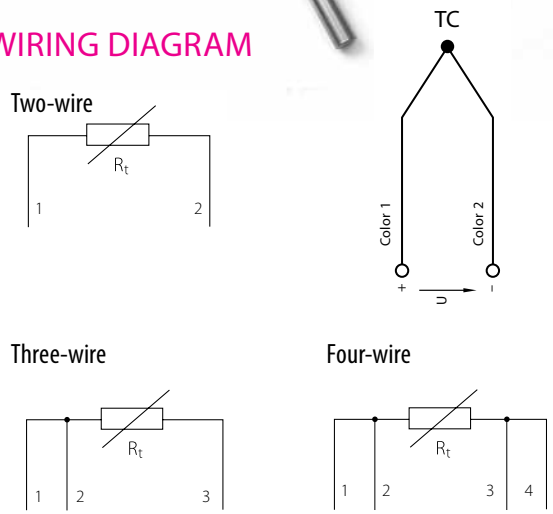
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

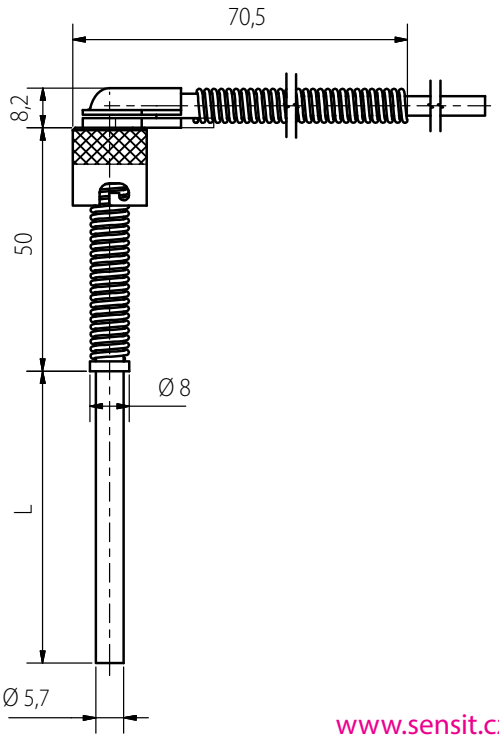
Sensor type	TG 35
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Case material	stainless steel DIN 1.4301
Diameter of case	6 mm
Case end	straight, semisphere R6 or apex 120°
Length of case L	60 to 200 mm
Material of rectangular part	stainless steel
Lead-in cable variations/ temperature range (can be limited by type of sensing element - specified in documentation)	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fiberglass 0 to 350 °C (with metal braiding) with fiberglass 0 to 400 °C (with metal braiding)
Ingress protection	IP 50 to IP 67 according to the cable type - in accordance with EN 60529, as amended
Material / dimension of bayonet nut	nickel-plated brass / L = 16 mm, inner ø 12.8 mm
Matetrial / dimension of spring	stainless steel DIN 1.4301 / L = 200 mm, outer ø 8 mm, ø of wire 1 mm
Insulation resistance	200 MΩ at 500 V DC, 25 ± 3 °C
Maximum permissible static pull on the lead-in cable	1 kg
Weigth	0.05 kg for 20/90 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design – length L, diameter, case material, case ending
- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, thermistor NTC 20kΩ)
- encapsulation of other types of sensing elements (DALLAS, KTY, TSiC, SMT, etc.)
- optional design of case dimensions and materials
- variable spring length

TG 40 – RIGHT-ANGLE TEMPERATURE SENSORS

B05.03en

DESCRIPTION AND APPLICATION

These right-angle temperature sensors with a bayonet TG 40 are designed to measure temperature of solid substances, however, they may be used also to measure temperature of liquid and gaseous substances. Due to temperature sensor design, the cable is led out at right angle to measuring part of the sensor. To fasten the temperature sensor into a point to be measured, the bayonet head that is screwed onto a spring is used. Combination of the bayonet nut, the spring and the corresponding bayonet adapter can provide higher pressure of the temperature sensor with the bayonet into the measured point. Maximum temperature range of sensor use is -50 to 350 °C (400 °C for a short period). The range for each design variant is reduced with a type of the temperature sensing element and the lead-in cable. The temperature sensors meet ingress protection from IP 50 to IP 67 according to the EN 60529 standard, as amended depending on the supply cable variant. The rectangular temperature sensors with a bayonet mount are intended for operation in chemically non-aggressive environment.

ACCESSORIES

- bayonet adapter
- stainless steel thermowell JS 130F
- connectors

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

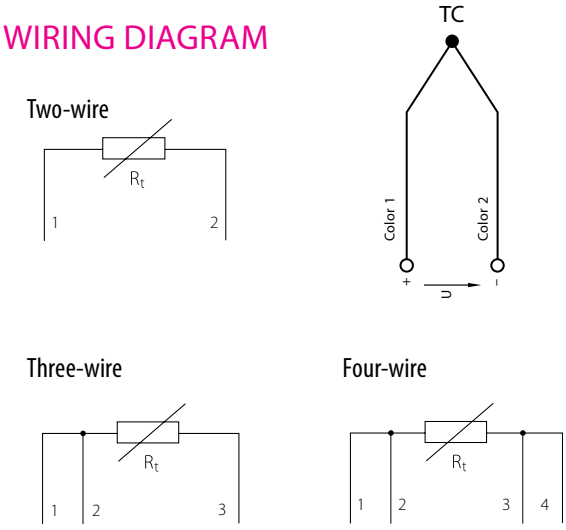
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

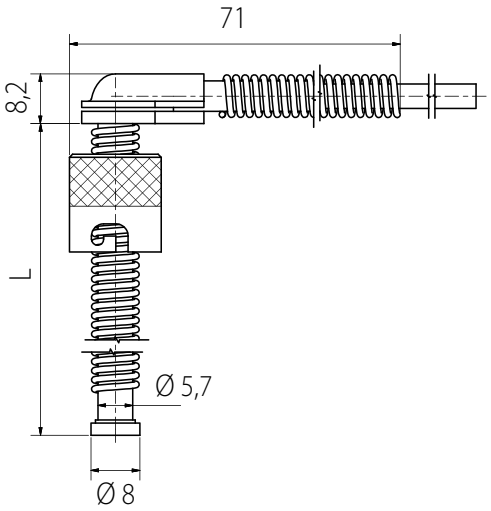
Sensor type	TG 40
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Case material	stainless steel DIN 1.4301
Diameter of case	6 mm or 8 mm
Diameter of case in contact part	8 mm or 10 mm
Length of case L	60 to 200 mm
Material of rectangular part	stainless steel
Case end	straight, semisphere R6 or apex 120°
Lead-in cable variations/ temperature range (can be limited by type of sensing element - specified in documentation)	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fiberglass 0 to 350 °C (with metal braiding) with fiberglass 0 to 400 °C (with metal braiding)
Ingress protection	IP 50 to IP 67 in accordance with EN 60529, as amended - according the type of cable
Material / dimension of bayonet nut	ø 6 mm: nickel-plated brass / L = 16 mm, inner ø 12.8 mm ø 8 mm: nickel-plated brass / L = 18 mm, inner ø 15 mm
Matetrial / dimension of spring	ø 6 mm: stainless steel DIN 1.4301 / L = 200 mm, outer ø 8 mm, ø of wire 1 mm ø 8 mm: stainless steel DIN 1.4301 / L = 200 mm, outer ø 10 mm, ø of wire 1 mm
Insulation resistance	200 MΩ at 500 V DC, 25 ± 3 °C
Maximum permissible static pull on the lead-in cable	1 kg
Weight	0.05 kg for 20/90 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design – length L, diameter, case material, case ending
- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, thermistor NTC 20kΩ)
- encapsulation of other types of sensing elements (DALLAS, KTY, TSiC, SMT, etc.)
- variable spring length

TG 47 – RIGHT-ANGLE TEMPERATURE SENSORS

P02.03en

DESCRIPTION AND APPLICATION

These right-angle temperature sensors with a threaded nut TG 47 are designed to measure temperature of solid substances, however, they may be used also to measure temperature of liquid and gaseous substances. Due to temperature sensor design, the cable is led out at right angle to measuring part of the sensor. To fasten the temperature sensor into a point to be measured, the threaded nut that is screwed onto a spring is used. Combination of the threaded nut, the spring and the corresponding counterpart can provide higher pressure of the temperature sensor into the measured point or can adjust any changes in the distance between the nut and the measured point during the measurement. Maximum temperature range of sensor use is -50 to 350 °C (400 °C for a short period). The range for each design variant is reduced with a type of the temperature sensing element and the lead-in cable. The temperature sensors meet ingress protection from IP 50 to IP 67 according to the EN 60529 standard, as amended depending on the lead-in cable variant. The rectangular temperature sensors with a threaded nut are intended for operation in chemically non-aggressive environment.

ACCESSORIES

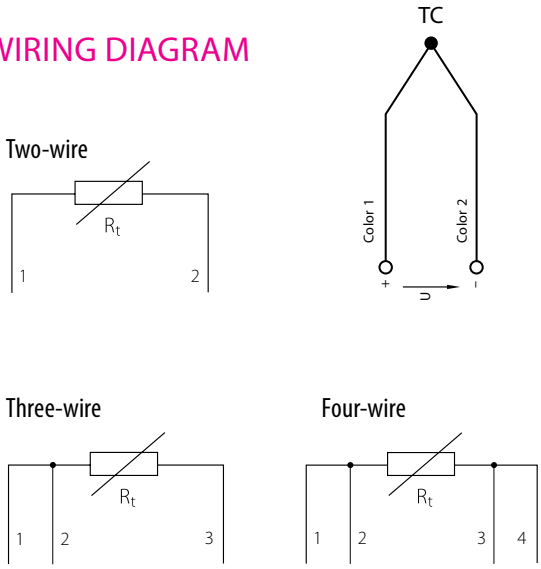
- welded-on pieces
- pipe reductions
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

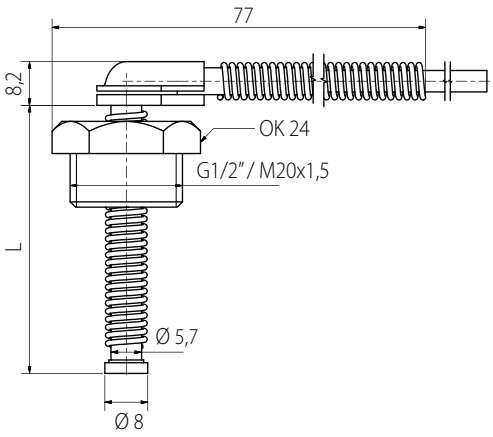


SPECIFICATIONS

Sensor type	TG 47
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Case material	stainless steel DIN 1.4301
Diameter of case	6 mm or 8 mm
Diameter of case in contact part	8 mm or 10 mm
Length of case L	60 to 200 mm
Material of rectangular part	stainless steel
Case end	straight, semisphere R6 or apex 120°
Thread / OK of fixing mounting	standardly
Material of fixing mounting	stainless steel DIN 1.4301
Lead-in cable variations/ temperature range (can be limited by type of sensing element - specified in documentation)	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fiberglass (with metal braiding) 0 to 400 °C
Ingress protection	IP 50 to IP 67 according to the cable type - in accordance with EN 60529, as amended
Insulation resistance	200 MΩ at 500 V DC, 25 ± 3 °C
Maximum permissible static pull on the lead-in cable	1 kg
Weight	0.34 kg for 80 mm housing length and 4 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design – length L, diameter, case material, case ending
- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, thermistor NTC 20kΩ)
- encapsulation of other types of sensing elements (DALLAS, KTY, TSiC, SMT, etc.)
- variable spring length

TG 50 – RIGHT-ANGLE TEMPERATURE SENSORS

P03.02en

DESCRIPTION AND APPLICATION

These right-angle, threaded temperature sensorsTG 50 are designed to measure surface temperature of solid substances. Due to temperature sensor design, the cable is led out at right angle to measuring part of the sensor and it enables to measure temperature just below the surface. To fasten the temperature sensor into a point to be measured, the thread is used. Maximum temperature range of sensor use is -50 to 350 °C (400 °C for a short period). The range for each design variant is reduced with a type of the temperature sensing element and the supply cable. The temperature sensors meet ingress protection from IP 50 to IP 67 according to the EN 60529 standard, as amended depending on the lead-in cable variant. The rectangular temperature sensors are intended for operation in chemically non-aggressive environment

ACCESSORIES

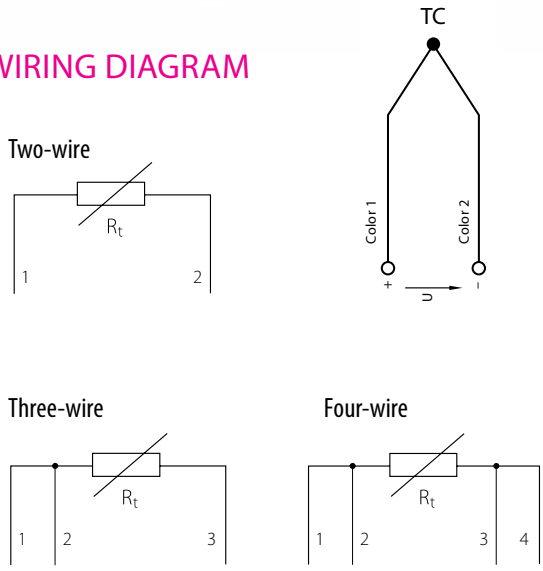
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

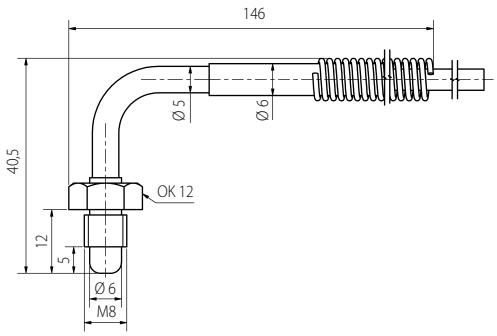


SPECIFICATIONS

Sensor type	TG 50
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Case material	stainless steel DIN 1.4301
Diameter of the case - measuring part	6 mm
Length of the case L - measuring part	15 to 200 mm
Case dimension	according to the dimensional draft
Thread / OK	M8/ SW 12
Lead-in cable variations/ temperature range (can be limited by type of sensing element - specified in documentation)	PVC shielded -30 to 80 °C PVC unshielded - 40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fiberglass 0 to 400 °C (with metal braiding)
Ingress protection	IP 50 to IP 67 according to the cable type - in accordance with EN 60529, as amended
Insulation resistance	200 MΩ at 500 V DC, 25 ± 3 °C
Maximum permissible static pull on the lead-in cable	1 kg
Weight	0.05 kg for 50 mm housing length and 1 m cable

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design – length L, diameter, case material, case ending
- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, thermistor NTC 20kΩ)
- encapsulation of other types of sensing elements (DALLAS, KTY, TSiC, SMT, etc.)

TG 85 – RIGHT-ANGLE TEMPERATURE SENSORS

P04.02en

DESCRIPTION AND APPLICATION

These right-angle temperature sensors TG 85 are designed for measuring the temperature of solids substances just below the surface. The structure of the sensor enables fast response to changes in temperature and higher accuracy of contact measurement comapare to standardly used contact temperature sensors, which are just attach to the measured surface. Placing of the sensing element into the tip of measuring part of case which is inserted to the measured surface ensures that measuring error is reduced. The sensor is fastened with one screw. Standard stem length is 12 mm. Maximum temperature range of sensor use is -50 to 350 °C (400 °C for a short period). The range for each design variant is reduced with a type of the temperature sensing element and the supply cable. The temperature sensors meet ingress protection from IP 50 to IP 67 according to the EN 60529 standard, as amended depending on the lead-in cable variant. By using temperature sensor is recommended to ensure striping sensor from the influence of ambient temperature and thus reduce the error method due to the impact of differences between the measured temperature ambient temperature.

The rectangular temperature sensors are intended for operation in chemically non-aggressive environment.

ACCESSORIES

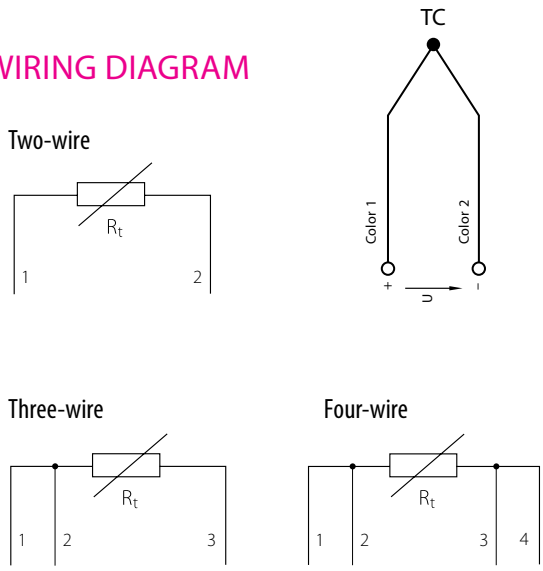
- connectors

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM

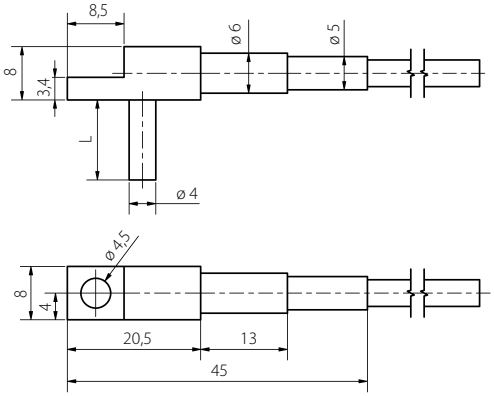


SPECIFICATIONS

Sensor type	TG 85
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Case material	stainless steel DIN 1.4301
Diameter of case - measuring part	4 mm
Length of case L - measuring part	10 to 20 mm
Case dimension	according to the dimensional draft
Lead-in cable variations/ temperature range (can be limited by type of sensing element - specified in documentation)	PVC shielded -30 to 80 °C PVC unshielded -40 to 105 °C silicone shielded -50 to 200 °C teflon shielded -50 to 250 °C with fiberglass 0 to 400 °C (with metal braiding)
Ingress protection	IP 50 to IP 67 according to the cable type - in accordance with EN 60529, as amended
Insulation resistance	200 MΩ at 500 V DC, 25 ± 3 °C
Maximum permissible static pull on the lead-in cable	1 kg
Weight	0.05 kg for length 1 m

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design – length L, diameter, case material, case ending
- possibility to encase two sensing elements
- accuracy class A (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 226, thermistor NTC 20kΩ)

TEMPERATURE SENSORS WITH A CABLE AND A DIGITAL OUTPUT

112.01en

DESCRIPTION AND APPLICATION

These temperature sensors with a cable are designed for contact temperature measurement of solid, liquid and gaseous substances in various industries, e.g. in the food industry, chemical and refrigeration industries etc. The sensors are either fitted with TSiC 206, 506 and 716 series of temperature sensors with a digital output, or, as a part of the supply cable, there is an electronic module converting signal from the Pt 100 resistance sensor to the 1-Wire output signal, corresponding to DS 18B20 sensors. The basic versions of digital outputs are:

- communication via 1-Wire bus
- ZACWire communication protocol – TSiC 206, 506 and 716 digital temperature sensors

The temperature range of sensor use is defined in the table of technical parameters for the individual versions of sensors and temperature sensors. The basic versions of these temperature sensors are:

- **TG 8 and TG 8J** – sensor versions with a smooth case
- **TG 2, TR 011** – sensor versions with a thread
- **TR 024, TR 024A** – sensor versions with a smooth case
- **TR 141A and TR 141E** – contact temperature sensor versions
- **TR 050A** – a sensor version with a smooth case up to 400 °C

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.

ACCESSORIES

- various versions of connectors – HIRSCHMANN, LEMO, MOLEX etc.
- fitting with a collet or with cutting rings – for setting of different immersion lengths of the sensor
- stainless steel thermowells – JTG8 etc.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory.

SPECIFICATIONS

Output signal / temperature sensing element	1-Wire communication / Pt 100	ZacWire communication / TSic x06
Type / Accuracy of the temperature sensing element	Pt 100 / ± (0.3 °C + 0.0005|t|)	TSic 206 ± 0.5 °C in the range of 10 to 90 °C TSic 306 ± 0.3 °C in the range of 10 to 90 °C TSic 506 ± 0.1 °C in the range of 5 to 45 °C TSic 716 ± 0.07 °C in the range of 25 to 45 °C
Accuracy of the electronics	± 0.2 °C	/
Converter case material	PA - MACROMELT	/
Connection of the temperature sensor	2-Wire or 4-Wire	3-Wire
Supply voltage (U)	4.5 to 5 V DC	3 to 5.5 V DC
Rated supply voltage (Un)	5 V DC	3.3 V DC
Supply current	6.5 mA	30 µA

OTHER PARAMETERS

Output signal / temperature sensing element	1-Wire communication / Pt 100	ZacWire communication / TSic x06
Insulation resistance	> 200 MΩ at 500 V DC, 25 °C ± 3 °C	
Supply cable types and their temperature resistance	silicone -50 to 200 °C PVC -40 to 105 °C PVC -30 to 80 °C PTFE -50 to 260 °C	
Weight	according to the design and the cable length; min. 0.15 kg	

TG 8, TG 8J series	1-wire communication/ Pt 100	Zac-Wire communication / TSic X06
Measuring range *)	1-Wire: -50 to 200 °C	TSic 206 and 306: -30 to 100 °C TSic 506 and 716: -10 to 60 °C
Diameter of the case	5.7 ± 0.1 mm	
Case length	40 to 200 mm	
Case material	40, 50, 60 mm: stainless steel DIN 1.4571 other: stainless steel DIN 1.4301 stainless steel	
Ingress protection **)	IP 67 in accordance with EN 60529, as amended (for a silicone cable)	
Resistance to pressure	without a thermowell PN 25	
(applied on the stem with the medium)	with a thermowell PN 63	
Time response	τ0.5 < 9 s (0.2 m.s-1 in running water)	

TG 2, TR 011 series	1-wire communication/ Pt 100	Zac-Wire communication / TSic X06
Measuring range *)	1-Wire: -100 to 250 °C	TSic 206 and 306: -30 to 100 °C TSic 506 and 716: -10 to 60 °C
Diameter of the case	4, 6, 8, 10 a 12 ± 0.1 mm	
Case length	20 to 500 mm	
Case material	stainless steel DIN 1.4301, DIN 1.4404, DIN 1.4571	
Ingress protection **)	IP 67 in accordance with EN 60529, as amended (for a silicone cable)	
Resistance to pressure (applied on the stem with the medium)	diameter 4 to 6 mm: PN 25 diameter 8 to 12 mm: PN 63	
Time response	diameter 4 mm: τ0,5 < 5 s (0.2 m.s-1 in running water) diameter 12 mm: τ0.5 < 35 s (0.2 m.s-1 in running water)	

TR 024, TR 024A series	1-wire communication/ Pt 100	Zac-Wire communication / TSic X06
Measuring range *)	1-Wire/TR 024: -100 to 250 °C	1-Wire/TR 024A: -50 to 200 °C
Diameter of the case	4.0 ± 0.1 mm	
Case length	40 to 200 mm	
Case material	stainless steel DIN 1.4301, DIN 1.4404, DIN 1.4571	
Ingress protection **)	IP 64 in accordance with EN 60529, as amended	IP 67 accoin accordance with EN 60529, as amended
Resistance to pressure (applied on the stem with the medium)	without a thermowell PN 25	
Time response	τ0.5 < 5 s (0.2 m.s-1 in running water)	

TR 141A, TR 141E series	1-wire communication/ Pt 100	Zac-Wire communication / TSic X06
Measuring range *)	1-Wire: -50 to 400 °C	TSic 206 and 306: -30 to 100 °C TSic 506 and 716: -10 to 60 °C
Case dimensions	cuboid-shaped, 12 x 8 mm	
Case length	40 to 60 mm	
Case material	stainless steel DIN 1.4301 or Al (Duralumin) alloy	
Ingress protection **)	IP 50 to IP 67 in accordance with EN 60529, as amended	
Time response (on smooth surface without paste)	stainless stee DIN 1.4301 I τ0.5 ≤ 10 s; Duralumin τ0.5 ≤ 8 s	

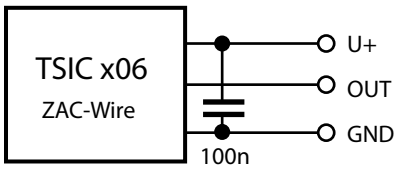
TR 050A series	1-wire communication/ Pt 100
Measuring range *)	1-Wire: -50 to 400 °C
Diameter of the case	6.0 ± 0.1 mm
Case length	40 to 200 mm
Case material	stainless steel DIN 1.4301
Ingress protection **)	IP 50 in accordance with EN 60529, as amended
Response time	τ0.5 < 20 s (0.2 m.s-1 in running water)

** Measuring range may be limited according to the type of the supply cable used*

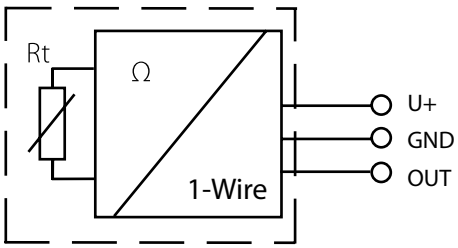
*** Ingress protection may be adjusted according to the type of the cable used*

WIRING DIAGRAM

TSiC sensors / ZAC Wire communication

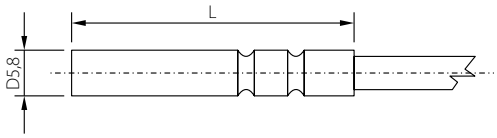


Pt 100 sensor / 1-Wire communication

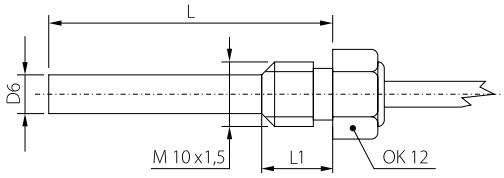


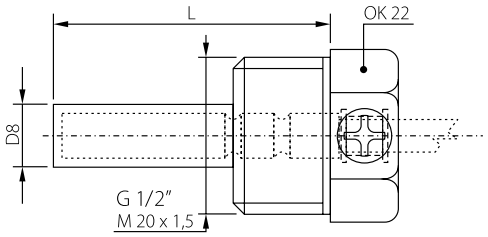
DIMENSIONAL DRAFT

TG 8, TG 8J

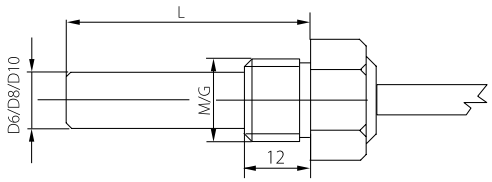


TG 2

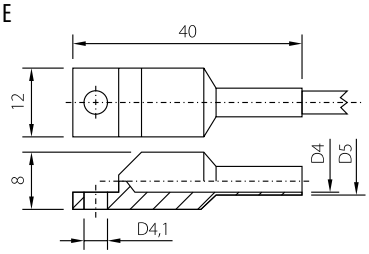




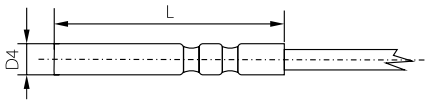
TR 011



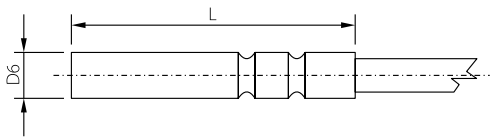
TR 141A, TR 141E



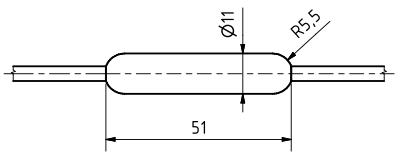
TR 024, TR 024A



TR 050A



Converter Pt 1000/1-Wire



MODIFICATION AND CUSTOMIZATION

- change of a sensor standard length and/or case material
- change of a version and a cable design type
- change of a case design according to specific requirements

TR 021F – TEMPERATURE SENSOR WITH A CONNECTOR

C01.04en

DESCRIPTION AND APPLICATION

These resistance temperature sensors TR021F with a connector are designed for temperature measurements of gaseous or liquid substances. The temperature range is -50 to 150 °C and these limits must not be exceeded even for a brief period. The temperature sensors consist of a metal case, in which the temperature sensing element is placed, and Lumberg M12 connector, which is an integral part of the case. The temperature sensors meet ingress protection IP 67 according to EN 60529, as amended and they are designed for temperature measurement in pipelines. The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to temperature and chemical resistance of the case and the connector.

ACCESSORIES

- stainless steel thermowell JS 130
- metal central holder K 120
- CONEC 43-00092 connector or stainless steel RKCS 4/9 connector
- connection cables with the direct RKT connector or rectangular RKWT connector

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	TR 021F
Measuring range	-50 to 150 °C (can be limited by the type of a sensor, determine in documentation)
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS and so on)
Ingress protection	IP 67 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of case	6.0 ± 0.1 mm
Length of case L	20 to 500 mm
Type of the connector	LUMBERG RSFM4, M12
Ambient temperature around connector	-25 to 80 °C
Wire resistance	0.254 Ω / 1 m at a temperature of 25 °C for 2-wire connection
Time response	τ0.5 < 7 s; τ0.9 < 9 s (in flowing water 0.4 m.s-1)
Weight	0.04 kg for length 60 mm

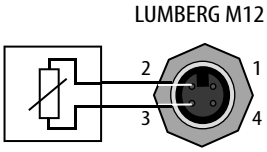
Operating conditions:

- Ambient temperature around connector: -25 to 80 °C
- Relative ambient humidity: 10 to 100%
- Atmospheric pressure: 70 to 106 kPa
- Maximum speed of water/air flow or water vapour flow when measuring the temperature in pipelines:

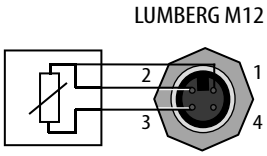
Length of the case in mm	Flow speed of water / air without thermowell	Flow speed of water / air with thermowell
> 70 to 120	1.5 / 15 m-1	3.0 / 30 m-1
> 120 to 180	1.0 / 8.0 m-1	2.0 / 15 m-1
> 180 to 240	0.6 / 2.5 m-1	1.2 / 5 m-1
> 240 to 420	0.3 / 0.6 m-1	0.8 / 1.6 m-1

WIRING DIAGRAM

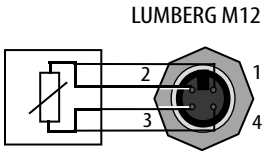
2-wire



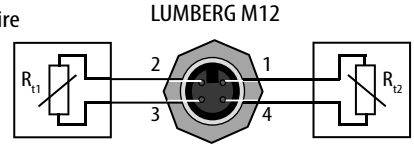
3-wire



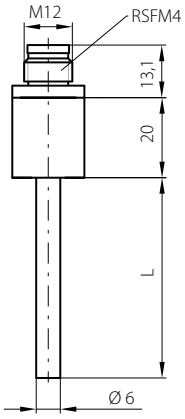
4-wire



2 x 2-wire



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in area – length L, material and diameter
- accuracy class A (except sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, Thermistor NTC 20 k Ω)
- non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.) are possible to encapsulate
- thread is possible to change compared to the types offered as standard

TR 021A – TEMPERATURE SENSOR WITH A CONNECTOR AND THREAD

C02.04en

DESCRIPTION AND APPLICATION

These resistance temperature sensors TR021A with a connector are designed for temperature measurements of gaseous or liquid substances. The temperature range is -50 to 150 °C and these limits must not be exceeded even for a brief period. The temperature sensors consist of a metal case, where the temperature sensing element is placed, and Lumberg M12 connector, which is an integral part of the case. The temperature sensors meet ingress protection IP 67 according to EN 60529, as amended and they are designed for temperature measurement in pipelines. Their design allows faster response to changes in temperature compared to sensors with a thermowell and they can be used as pressure equipment within the meaning of the government regulation No. 26/2003 Coll. as amended. The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to temperature and chemical resistance of the case and the connector.

ACCESSORIES

- CONEC 43-00092 connector or stainless steel RKCS 4/9 connector
- connection cables with the direct RKT connector, rectangular RKWT connector or PRKWT connector

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	TR 021A
Measuring range	-50 to 150 °C (can be limited by the type of a sensor, determine in documentation)
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS and so on)
Ingress protection	IP 67 in accordance with EN 60529, as amended
Thread	G ½; M 20 x 1.5; M 27 x 2 and other according to customer requirements
Case material	stainless steel DIN 1.43601
Diameter of case	6.0 ± 0.1 mm
Length of case L	20 to 500 mm
Type of the connector	LUMBERG RSFM4, M12
Ambient temperature around connector	-25 to 80 °C
Wire resistance	0.254 Ω for 1 m at a temperature of 25 °C for 2-wire connection
Time response	τ0.5 < 7 s; τ0.9 < 9 (in flowing water 0.4 m.s-1)
Weight	0.08 kg for length 120 mm

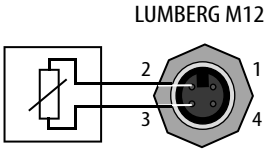
Operating conditions:

- Ambient temperature around connector: -25 to 80 °C
- Relative ambient humidity: 10 to 100%
- Atmospheric pressure: 70 to 106 kPa
- Maximum speed of water/air flow or water vapour flow when measuring the temperature in pipelines:

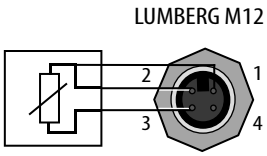
Length of case in mm	Water flow speed	Air flow speed
up to 60	2 m.s-1	20 m.s-1
> 60 to 100	1.5 m.s-1	15 m.s-1
> 100 to 160	1 m.s-1	8 m.s-1
> 160 to 220	0.6 m.s-1	2.5 m.s-1
> 220 to 400	0.3 m.s-1	0.6 m.s-1

WIRING DIAGRAM

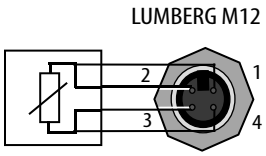
2-wire



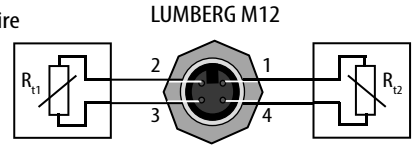
3-wire



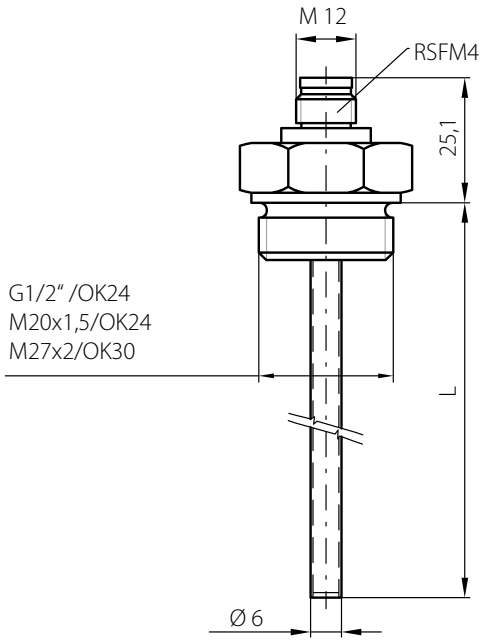
4-wire



2 x 2-wire



DIMENSIONAL DRAFT



MODIFICATION AND CUSTOMIZATION

- variable stem design in the area - L length, case material and diameter
- accuracy class A (except sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, Thermistor NTC 20 k Ω)
- possibility of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.
- thread is possible to change compared to the types offered as standard

TR 021 – TEMPERATURE SENSOR WITH A CONNECTOR

C03.04en

DESCRIPTION AND APPLICATION

These resistance temperature sensors TR 021 with a connector are designed for temperature measurements of gaseous or liquid substances. The temperature range is -50 to 150 °C and these limits must not be exceeded even for a brief period. The temperature sensors with a connector consist of a metal case, in which the temperature sensing element is placed, and DIN 43650 connector, which is an integral part of the case. The temperature sensors with a connector meet ingress protection IP 67 according EN 60529, as amended and they are designed for temperature measurent in pipelines. Their desing allows faster response to changes in temperature compared to sensors with a thermowell. They can be used as pressure accesories within the meaning of the government regulation No. 26/2003 Coll. as amanded.

The temperature sensors are designed to be operated in a chemically nonaggressive environment. The use must be chosen with regard to temperature chemical resistance of the case and the connector.

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	TR 021
Measuring range	-50 to 150 °C (can by limited by type of the sensor, determine in documentation)
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS and so on)
Ingress protection	IP 67 in accordance with EN 60529, as amended
Thread	G1/2; M 20 x 1.5; M 27 x 2 and others according to customers requirements
Case material	stainless steel DIN 1.4301
Diameter of the case	6,0 ± 0,1 mm
Length of the case L	20 to 500 mm
Connector	Hirschmann GDM/GSP (DIN 43650)
Ambient temperature around connector	-25 to 80 °C
Wire resistance	0.254 Ω / 1 m at the temperature 25 °C
Time response	t0.9 < 9 s (in flowing water at 0.4 m.s-1)
Weight	0.05 kg for length 50 mm and thread G ½"

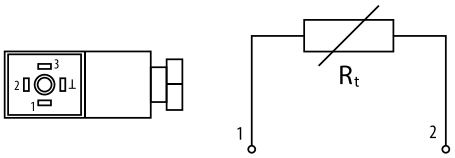
Operating conditions:

- Ambient temperature around connector: -25 to 80 °C
- Relative ambient humidity: 10 to 100%
- Atmospheric pressure: 70 to 106 kPa
- Maximum speed of water/air flow or water vapour flow when measuring the temperature in pipelines:

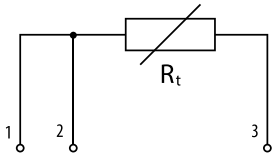
Length of case in mm	up to 60 mm	> 60 to 100	> 100 to 160	> 160 to 220	> 220 to 400
Water flow speed	2 m.s-1	1.5 m.s-1	1 m.s-1	0.6 m.s-1	0.3 m.s-1
Air flow speed	20 m.s-1	15 m.s-1	8 m.s-1	2.5 m.s-1	0.6 m.s-1

WIRING DIAGRAM

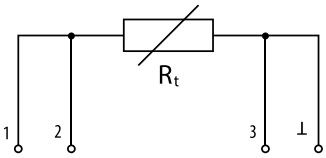
2-wire



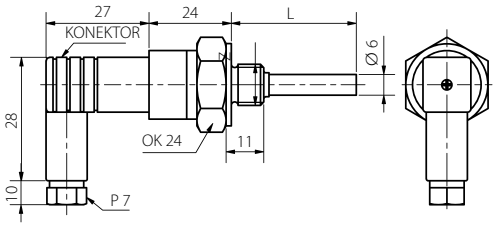
3-wire



4-wire



DIMENSIONAL DRAFT



TR 02 – TEMPERATURE SENSORS WITH CONNECTOR LEMO

C04.03en

DESCRIPTION AND APPLICATION

These resistance temperature sensors TR 02 with a connector are designed for temperature measurements of gaseous or liquid substances. The temperature range is -50 to 250 °C and these limits must not be exceeded even for a brief period. The temperature sensors with a connector consist of a metal case, in which the temperature sensing element is placed, and LEMO connector, which is an integral part of the case. The temperature sensors with a connector meet ingress protection IP 40 according to EN 60529, as amended and they are designed for temperature measurement in pipelines. The temperature sensors with a connector are intended to be used in operation in chemically non-aggressive environment.

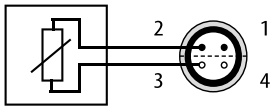
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

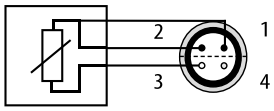
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM

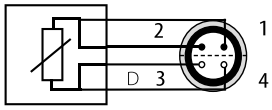
2-wire



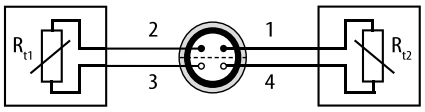
3-wire



4-wire



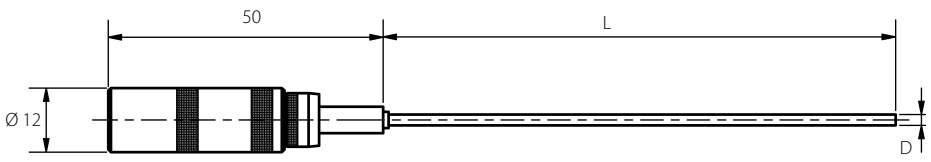
2 x 2-wire



SPECIFICATIONS

Sensor type	TR 02
Measuring range	-50 to 250 °C (can by limited by type of the sensor, determine in documentation)
Sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000, Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS and so on)
Ingress protection	IP 40 in accordance with EN 60529, as amended
Case material	stainless steel DIN 1.4301
Diameter of the case D	1.5; 2; 3; 4 and 5 mm
Length of the case L	20 to 500 mm
Connector	LEMO PCA.1S
Ambient temperature around connector	-50 to 120 °C
Weight	0.03 kg for housing length 250 mm

DIMENSIONAL DRAFT



THERMOCOUPLE TEMPERATURE SENSORS WITH CONNECTION HEAD UP TO 400 °C AND 600 °C

T01.03en

DESCRIPTION AND APPLICATION

These thermocouple temperature sensors are designed to measure temperatures up to 400 °C and 600 °C according to sensor type. When combining sensor and stainless steel central holder or thermowell, supplied as accessories, the sensors are possible to be used for temperature measurement in various applications in the industrial environment, for example even as pressure equipment within the meaning of the Government Regulation No. 26/2003 Coll. as amended. Maximum permitted operating pressure is 6.3 MPa (applies for case maximum length of up to 300 mm). The thermocouple temperature sensors are possible to be used for any control systems compatible with selected thermocouple type. Thermocouple temperature sensors type TCS 4x and TCS 6x meet ingress protection IP 54 in accordance with EN 60529, as amended. Thermocouple temperature sensors type TCS 64x and TCS 66x meet ingress protection IP 68 (1 bar) in accordance with EN 60529, as amended. Standard measuring range for temperature sensors TCS 4x and TCS 6x is -50 to 400 °C and for temperature sensors TCS 64x and TCS 66x is -50 to 600 °C. Temperature range can not be exceeded even for a brief period. Maximum ambient temperature around the conection head is 100 °C.

The thermocouple temperature sensors are intended for operation in chemically non-aggressive environment. The use must be chosen with regard to temperature resistance of connection head and chemical resistaqnce of connection head and stem of the sensor.

ACCESSORIES

- stainless steel thermowell JPTS 41 for types TCS 4K, TCS 4J, TCS 6K, TCS 6J
- stainless steel thermowell JPTS 641 for types TCS 64K, TCS 64J, TCS 66K, TCS66J
- metal central holder K 120
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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, as amended) or in an Accredited laboratory.

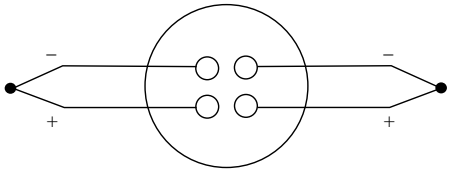
SPECIFICATIONS

Sensor type with smooth stem Sensor type with thread	TCS 4K TCS 6K	TCS 4J TCS 6J	TCS 64K TCS 66K	TCS 64J TCS 66J
Type of thermocouple	thermocouple "K"	thermocouple "J"	thermocouple "K"	thermocouple "J"
Measuring range	-50 to 400 °C		-50 to 600 °C, in a short time 650 °C	

Type of thermocouple	"J" and "K", single, double	
Accuracy class	standardly 2 in accordance with EN 60584 and DIN 43 710, further 1	
Version	with an isolated measuring point	
Diameter of the stem	6 mm	
Standard length of the stem	50, 100, 160, 220, 280, 340 and 400 mm	
Nominal pressure of the stem	PN 63 (with a thread) up to 400 °C and length of the stem 300 mm	
Thread types for variant with thread	G 1/2"; M 20 x 1.5; M 27 x 2; others on customer´s requirements	
Material of the stem	stainless steel DIN 1.4301	stainless steel DIN 1.4571
Reccommended wire cross section	0.35 to 1.5 mm^2	
Ingress protection	IP 54 in accordance with EN 60529, as amended	IP 68 (1 bar) in accordance with EN 60529, as amended
Type of connection head	LIMATHERM B	LIMATHERM NAA
Material of the connection head	aluminium alloy	
Ambient temperature around the connection head	-30 to 100 °C	-30 to 150 °C
Weight	0.25 kg for length 100 mm	0.2 kg for length 100 mm

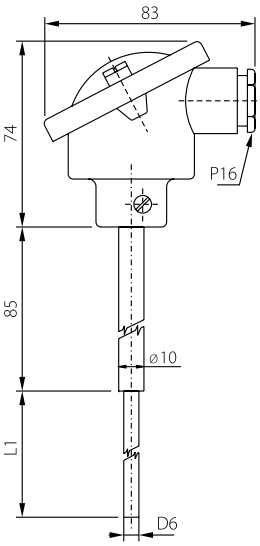
WIRING DIAGRAM

Wiring diamgram for temperature sensors
up to 400 and 600 °C

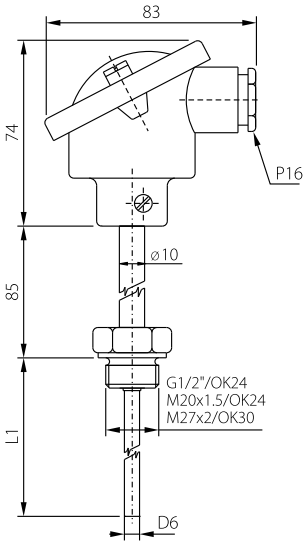


DIMENSIONAL DRAFT

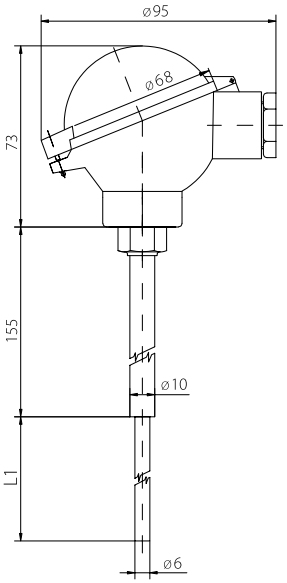
Temperature sensors up to 400 °C
TCS 4x



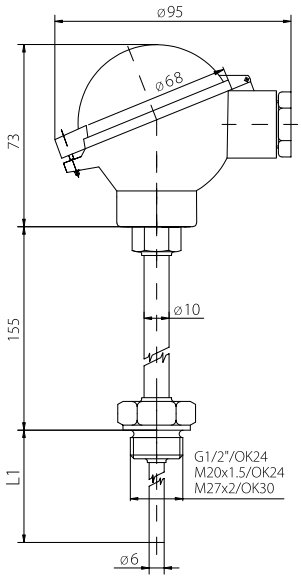
TCS 4x



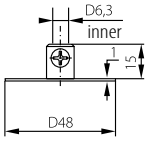
Temperature sensors up to 600 °C
TCS 64x



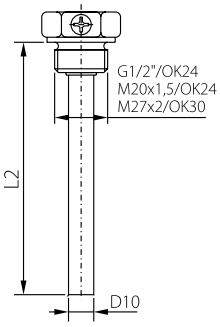
TCS 66x



Accessories



Metal central
holder K 120



Thermowell JPTS

MODIFICATION AND CUSTOMIZATION

- variable stem design – length L1, diameter, case material
- type of thermowell thread

JACKETED THERMOCOUPLES WITH CABLE

T02.03en

DESCRIPTION AND APPLICATION

Thermocouple temperature sensors with attached guidance are designed for measuring temperature of gaseous, liquid or solid substances. Temperature range is up to 1 100 °C depending to the thermocouple type and to the production technology used. The thermocouple temperature sensors are possible to be used for any control systems compatible with selected thermocouple type. The thermocouple temperature sensors meet ingress protection IP 67 in accordance with EN 60529, as amended depending to the thermocouple type and to the production technology used. The case diameter of 1 mm ensures a very fast sensor response to temperature changes. The thermocouple temperature sensors are intended for operation in chemically non-aggressive environment.

ACCESSORIES

- connectors
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

DECLARATION, CERTIFICATES, CALIBRATION

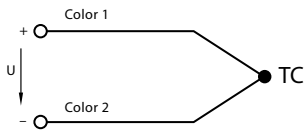
Manufacturer provides **EU Declaration of Conformity**.

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

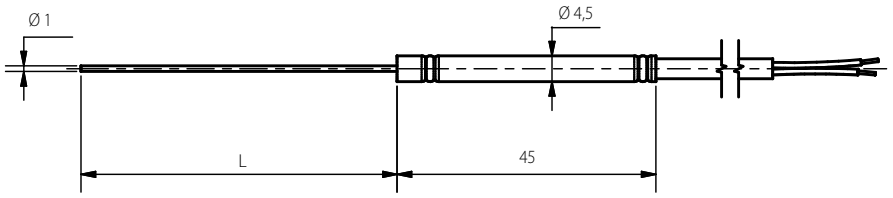
Sensor type	TC 09x.xP	TC 09x.xT
Thermocouple type	"J" and "K" (other on request)	
Ingress protection	IP 55, 54 and 50 in accordance with EN 60529, as amended	IP 67, 64 and 50 in accordance with EN 60529, as amended
Design	jacketed thermocouple with insulated measuring point	with stainless steel jacketing and internal thermocouple leads
Diameter of the jacket	1; 1.5; 2; 3; 4.5 and 6 mm	3; 4.5 and 6 mm
Length of the measuring part	from 20 to 300 mm standardly, other on customer´s requirement	
Measuring range - on a measuring point	"K" type up to 1 100 °C - according to the diameter of measuring part "J" type up to 700 °C other depending on the type	-200 to 600 °C
Accuracy class	standardly 2 in accordance with EN 60584 and DIN 43 710, further 1	
Jacket material / Case material	Inconel 2.4816 for TC "K", stainless steel DIN 1.4541 for TC "J"	stainless steel DIN 1.4571 and DIN 1.4301
Sensor body	flexible, shapeable	fixed, non-shapeable
Compensation lines	silicone unshielded 2 x 0.22 mm² up to 200 °C, IP 55 / IP 67 PTFE shielded 2 x 0.22 mm² up to 260 °C (in short time 300 °C), IP 54 / IP 64 glass + metal braiding 2 x 0.22 mm² up to 400 or 600 °C, IP 50 PVC unshielded 2 x 0.22 mm² up to 105 °C, IP 55 / IP 67 IP in accordance with EN 60529, as amended	

WIRING DIAGRAM

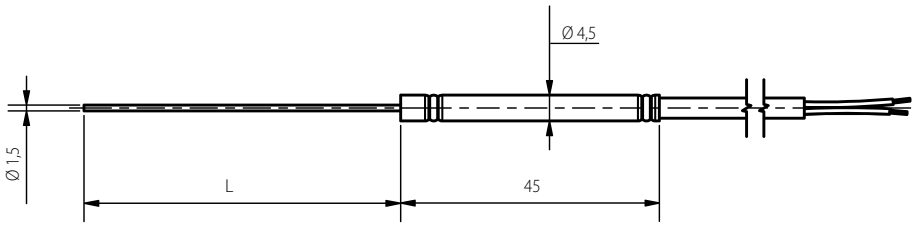


DIMENSIONAL DRAFT

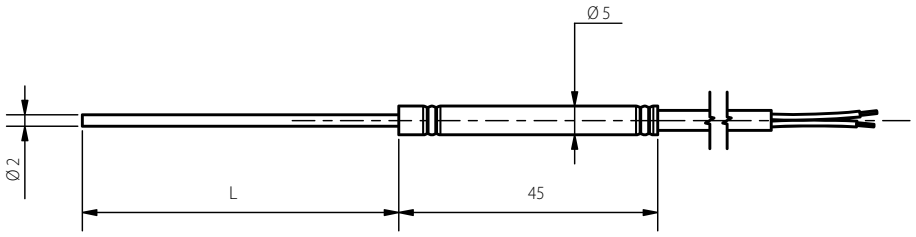
TC 091.0P



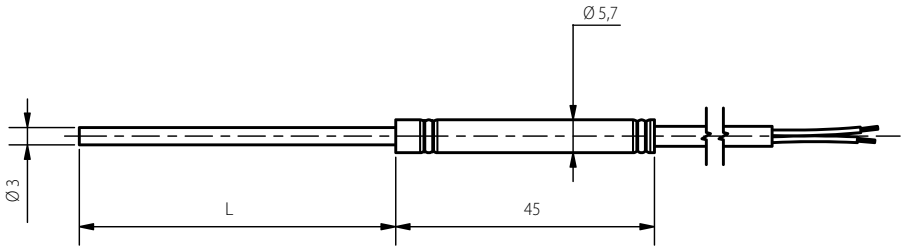
TC 091.5P



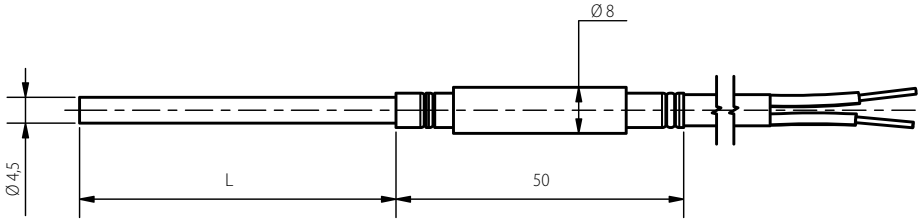
TC 092.0P
TC 092.0T



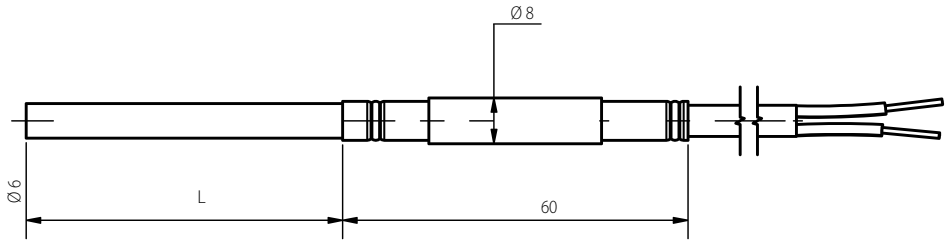
TC 093.0P
TC 093.0T



TC 094.5P
TC 094.5T



TC 096.0P
TC 096.0T



MODIFICATION AND CUSTOMIZATION

- variable stem design – length L1, diameter, case material

THERMOCOUPLES WITH CONNECTOR MINI

T03.03en

DESCRIPTION AND APPLICATION

These thermocouple temperature sensors with a connector are designed for temperature measurements of gaseous or liquid substances. Temperature range is up to 1 100 °C depending to the thermocouple type and to the production technology used. The temperature sensors with a connector consist of a thermocouple and connector, which is an integral part of the case. The temperature sensors with a connector meet ingress protection IP 50 in accordance with EN 60529, as amended.

The thermocouple temperature sensors with a connector are intended to be used in operation in chemically non-aggressive environment.

ACCESSORIES

- connectors
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

DECLARATION, CERTIFICATES, CALIBRATION

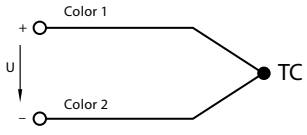
Manufacturer provides **EU Declaration of Conformity**.

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

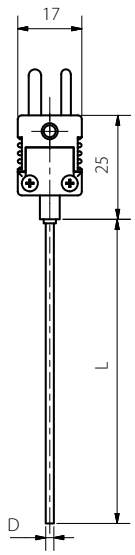
Sensor type	TC 02F	TC 03F	TC 02M	TC 03M
Thermocouple type	"J" and "K" (others on request), single and double			
Ingress protection	IP 50 in accordance with EN 60529, as amended			
Design	jacketed thermocouple with insulated measuring point			
Diameter of the jacket D	1.5; 2; 3; 4.5 and 6 mm			
Length of the measuring part L	from 20 to 300 mm standardly, other on customer´s requirements			
Measuring range - on a measuring point	"K" type up to 1 100 °C - according to the diameter of measuring part "J" type up to 700 °C others depending on the type			
Accuracy class	standard 2 in accordance with EN 60584 and DIN 43 710			
Jacket material	Inconel 2.4816 for TC "K", stainless steel DIN 1.4571 for TC "J"			
Sensor body	flexible, shapeable			
Type of the connector	female		male	
Ambient temperature around connector	-30 to 220 °C			

WIRING DIAGRAM

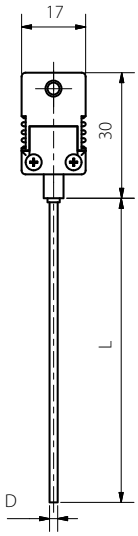


DIMENSIONAL DRAFT

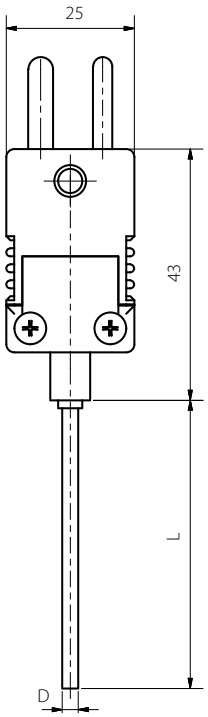
TC 091.0P



TC 091.SP



TC 092.0P
TC 092.0T



TC 093.0P
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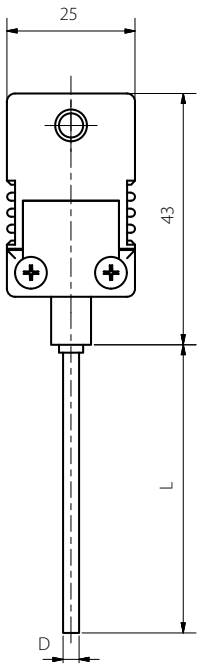


TEMPERATURE PROBES

DESCRIPTION AND APPLICATION

Temperature probes are designed for the measurement of temperature of solid, liquid or gaseous substances in various industries, e.g. in the food-processing industry, chemical industry, cooling technique, etc.

Temperature probes consist of metal measuring tip, handle and lead-in cable. All types of resistance sensors and thermocouples offered by SENSIT s.r.o. can use sensig elements, i.e. - Pt 100, Pt 500, Pt 1000, Ni 1000, Ni 891, T1 = Ni 2226, NTC, PTC, TC K, TC J, etc., as well as other types of sensing elements, such as elements KTY, SMT 160, DALLAS, TSic, etc. Design of the temperature probe is limited by size of sensing element and by diameter of measuring tip of the probe. The following table of specifications state the basic types of sensing elements, cables and materials of handle. Based on the design of the temperature probe and type of the sensor connection can be 2-wire, 3-wire and 4-wire.

According to customer´s requirements we can produce also temperature probe with multiple measuring points.

The basic material for measuring tip is stainless steel DIN 1.4301 with atest for use in food processing industry. Temperature range for use of the probes is in measuring range -50 to 280 °C (300 °C short time), concrete temperature range is stated by each temperature probe. Temperature probes are intended for operation in chemically non-aggressive environment.

SPECIFICATIONS

Type of sensing element	Ni 1000/5000, Ni 1000/6180, Ni 891 Pt 100, Pt 500, Pt 1000, NTC 20kΩ (specified for individual probes) TC K, TC J
Accuracy class	Ni sensing elements: B class, $\Delta t = \pm(0.4 + 0.007t)$, for ≥ 0; $\Delta t = \pm(0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class in accordance with EN 60751, as amended, $\Delta t = \pm(0.3 + 0.005\|t\|)$ in °C NTC 20kΩ: ± 1 °C for measuring range 0 to 70 °C TC K and TC J: class 2 in accordance with EN 60584-2
Maximum measuring DC current	Pt 100 - 3mA; Pt 500 - 1.5 mA; Pt 1000, Ni 1000, Ni 891 - 1 mA; NTC 20kΩ - max. power dissipation 1 mW
Connection of probes	RTD: 2-wire, 3-wire and 4-wire; TC: 2-wire
Insulation resistance	>200 MΩ at 500 V DC, 25 ± 3 °C, relative humidity < 85%
Variants of cable isolation	silicone -50 to 200 °C teflon -190 to 260 °C (in a short time 300 °C)
Variants of handle material	silicone -50 to 150 °C teflon -190 to 260 °C (in a short time 300 °C) PEEK -190 to 260 °C (in a short time 300 °C)

S 51/150 and TC 51/150
-50 to 150 °C, STICK-IN TEMPERATURE PROBE

S01.04en

DESCRIPTION AND APPLICATION

These resistance and thermocouple temperature probes **S 51/150** and **TC 51/150** are designed for the measurement of temperature of loose materials and solid substances, consistency of which is such so the metal tip cannot be damaged. They can be used also for measuring of liquid and gaseous substances. The temperature range for the use of the probe is -50 to 150°C. The temperature probes consist of a metal tip (stainless steel DIN 1.4301), a handle and a lead-in cable. Material composition of the probe conforms to the requirements of Decree 38/2001 Coll. as amended. The design allows easy cleaning, thanks to which the temperature probes can be used in the food industry. The resistance sensing element is located in the tip of the stainless steel case. The probes are intended for operation in chemically non-aggressive environment.

UP TO 6 MEASURING POINTS

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, as amended) or in an Accredited laboratory.

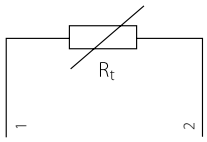
SPECIFICATIONS

Probe type	S 51/150	TC 51/150
Measuring range	-50 to 150 °C	-40 to 150 °C
Type of sensing element	all types TC K, TC J	
Nr. of measuring points	up to 3 measuring points (Pt)	up to 6 measuring points (TC K)
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended	
Material of the probe tip	stainless steel DIN 1.4301	
Diameter of the probe tip	4 mm	
Length of the probe tip	145 mm	
End of the probe tip	sharp - standard; bevelled round, flat	
Material of the handle	silicone	
Temperature resistance of the handle	up to 150 °C	
Lead-in cable	silicone shielded	silicone unshielded
Weight	0.1 kg for length 1 m	

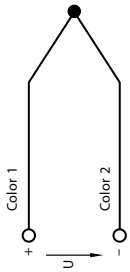
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

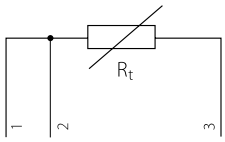
Two-wire



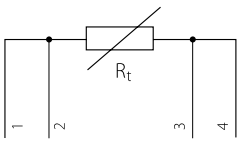
1x TC (up to 6x TC)



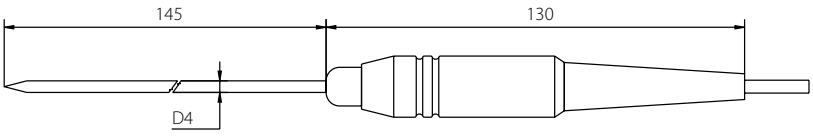
Three-wire



Four-wire



DIMENSIONAL DRAFT



S 61/200 and TC 61/200
-50 to 200 °C, STICK-IN TEMPERATURE PROBE

S02.04en

DESCRIPTION AND APPLICATION

These resistance and thermocouple temperature probes **S 61/200** and **TC 61/200** are designed for the measurement of temperature of loose materials and solid substances, consistency of which is such so the metal tip cannot be damaged. They can be used also for measuring liquid and gaseous substances. The temperature range for the use of the sensor is -50 to 200 °C. The probes consist of a metal tip (stainless steel DIN 1.4301), a handle and a lead-in cable. Material composition of the probe conforms to the requirements of Decree 38/2001 Coll. as amended. The design allows easy cleaning, thanks to which the temperature probes can be used in the food industry. The resistance sensing element is located in the tip of the stainless steel case. The probes are intended for operation in chemically non-aggressive environment.

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, as amended) or in an Accredited laboratory.

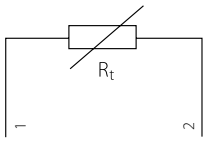
SPECIFICATIONS

Probe type	S 61/200	TC 61/200
Measuring range	-50 to 200 °C	-40 to 200 °C
Type of sensing element	all types	TC K, TC J, TCT
Nr. of measuring points	up to 3 measuring points (Pt)	up to 6 measuring points (TC K)
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended	
Material of the probe tip	stainless steel DIN 1.4301	
Diameter of the probe tip	4 mm - standard; 1.5 to 6 mm - modification	
Length of the probe tip	125 mm - standard; 50 to 500 mm - modification	
End of the probe tip	sharp - standard; bevelled, round, flat	
Material of the handle	teflon D14/57 mm or D11/57	
Temperature resistance of the handle	up to 200 °C	
Lead-in cable	silicone shielded	silicone or FEP unshielded
Weight	0.13 kg for 600 mm housing length and 2 m cable	

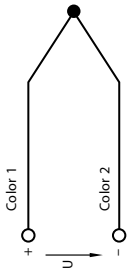
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

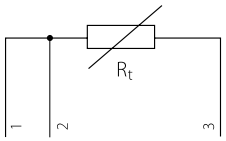
Two-wire



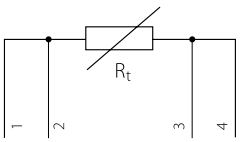
1x TC (up to 6x TC)



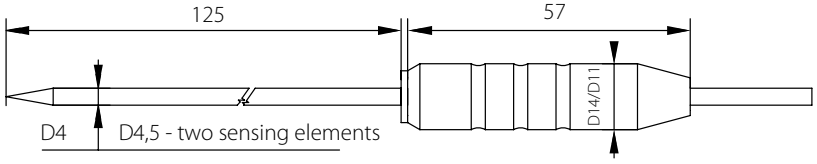
Three-wire



Four-wire



DIMENSIONAL DRAFT



S 61/260 and TC 61/280 -50 to 280 °C (FOR A SHORT TIME 300 °C), STICK-IN TEMPERATURE PROBE

S03.04en

DESCRIPTION AND APPLICATION

These resistance and thermocouple temperature probe **S 61/200** and **TC 61/280** are designed for the measurement of temperature of loose materials and solid substances, consistency of which is such so the metal tip cannot be damaged. They can be used also for measuring liquid and gaseous substances. The temperature range for the use of the probe is -50 to 280 °C. The sensors consist of a metal tip (stainless steel DIN 1.4301), a handle and a lead-in cable. Material composition of the probe conforms to the requirements of Decree 38/2001 Coll. as amended. The design allows easy cleaning, thanks to which the temperature probe can be used in the food industry. The resistance sensing element is located in the tip of the stainless steel case.

The probes are intended for operation in chemically non-aggressive environment.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

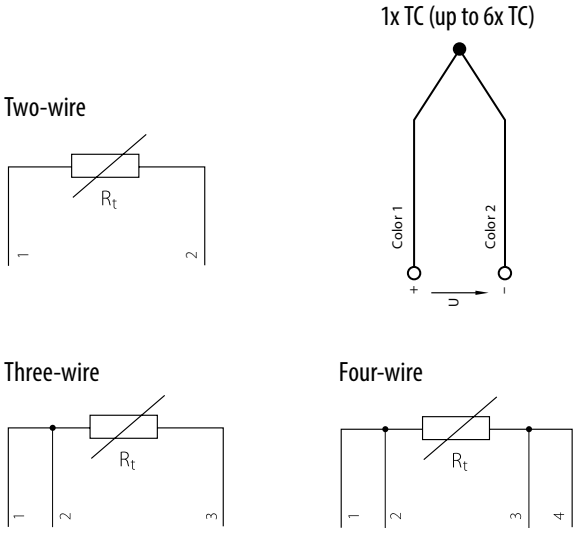
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

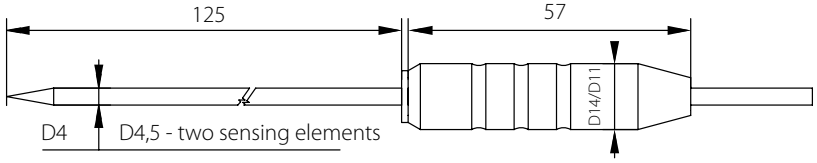
Probe type	S 61/260	TC 61/280
Measuring range	-50 to 260 °C (for a short time 300 °C)	-40 to 280 °C (for a short time 300 °C)
Type of sensing element	all types	TC K
Nr. of measuring points	up to 3 measuring points (Pt)	up to 6 measuring points (TC K)
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended	
Material of the probe tip	stainless steel DIN 1.4301	
Diameter of the probe tip	4 mm - standard; 1.5 to 6 mm - modification	
Length of the probe tip	125 mm - standard; 50 to 500 mm - modification	
End of the probe tip	sharp - standard; bevelled, round, flat	
Material of the handle	teflon D14/57 mm or D11/57 mm	
Temperature resistance of the handle	up to 260 °C	
Lead-in cable	teflon shielded	teflon shielded or unshielded
Weight	0.07 kg for length 1 m	

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM



DIMENSIONAL DRAFT



S 91/260 and TC 91/280 -50 to 280 °C (FOR A SHORT TIME 300 °C), STICK-IN TEMPERATURE PROBE

S05.04en

DESCRIPTION AND APPLICATION

These resistance and thermocouple temperature probes **S 91/260** and **TC 91/280** are designed for the measurement of temperature of loose materials and solid substances, consistency of which is such so the metal tip cannot be damaged. They can be used also for measuring liquid and gaseous substances. The temperature range for the use of the sensor is -50 to 280 °C (300 °C for a short time). The sensors consist of a metal tip (stainless steel DIN 1.4301), a handle and a lead-in cable. Material composition of the probes conforms to the requirements of Decree 38/2001 Coll. as amended. The design allows easy cleaning, thanks to which the temperature probes can be used in the food industry. The resistance sensing element is located in the tip of the stainless steel case. The probes are intended for operation in chemically non-aggressive environment.

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, as amended) or in an Accredited laboratory.

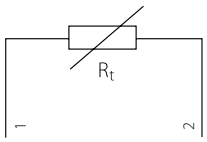
SPECIFICATIONS

Probe type	S 91/260	TC 91/280
Measuring range	-50 to 260 °C (for a short time 300 °C)	-40 to 280 °C (for a short time 300 °C)
Type of sensing element	all types	TC K
Nr. of measuring points	up to 3 measuring points (Pt)	up to 6 measuring points (TC K)
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended	
Material of the probe tip	stainless steel DIN 1.4301	
Diameter of the probe tip	4 mm	
Length of the probe tip	145 mm - standard, 100 to 200 mm - modification	
End of the probe tip	sharp - standard, bevelled, round, flat	
Material of the handle	PEEK	
Temperature resistance of the handle	up to 280 °C	
Lead-in cable	teflon shielded or unshielded	
Weight	0.07 kg for length 1 m	

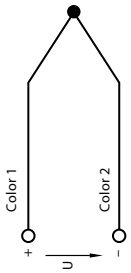
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

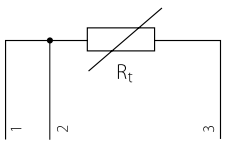
Two-wire



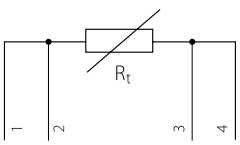
1x TC (up to 6x TC)



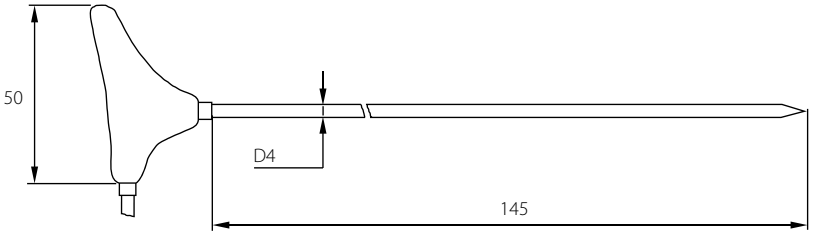
Three-wire



Four-wire



DIMENSIONAL DRAFT



S 101/260 and TC 101/280 -50 to 280 °C (FOR A SHORT TIME 300 °C), STICK-IN TEMPERATURE PROBE

S11.02en

DESCRIPTION AND APPLICATION

These resistance and thermocouple temperature probes **S 101/260** and **TC 101/280** are designed for the measurement of temperature of loose materials and solid substances, consistency of which is such so the metal tip cannot be damaged. They can be used also for measuring of liquid and gaseous sustances. The temperature range for the use of the probe is -50 to 280 °C (short time 300 °C). The temperature probes consist of a metal tip (stainless steel DIN 1.4301), a handle and a lead-in cable. Material composition of the probe conforms to the requirements of Decree 38/2001 Coll. as amended. The design allows easy cleaning, thanks to which the temperature probes can be used in the food industry. The resistance sensing element is located in the tip of the stainless steel case.

The probes are intended for operation in chemically non-aggressive environment.

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, as amended) or in an Accredited laboratory.

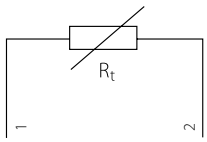
SPECIFICATIONS

Probe type	S 101/260	TC 101/280
Measuring range	-50 to 260 °C (for a short time 300 °C)	-40 to 280 °C (for a short time 300 °C)
Type of sensing element	all types	TC K
Nr. of measuring points	up to 3 measuring points (Pt)	up to 6 measuring points (TC K)
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended	
Material of the probe tip	stainless steel DIN 1.4301	
Diameter of the probe tip	4 mm	
Length of the probe tip	145 mm - standard, 100 to 200 mm - modification	
End of the probe tip	sharp - standard, bevelled, round, flat	
Material of the handle	PEEK	
Temperature resistance of the handle	up to 280 °C	
Lead-in cable teflon shielded	teflon shielded or unshielded	

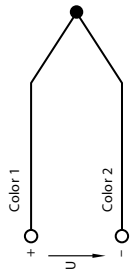
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

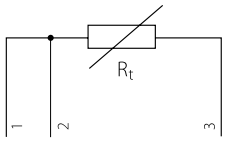
Two-wire



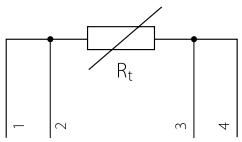
1x TC (up to 6x TC)



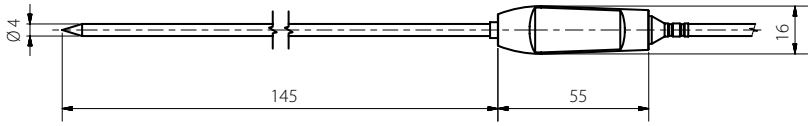
Three-wire



Four-wire



DIMENSIONAL DRAFT



TC 151/280
- 40 to 280 °C , VACUUM TEMPERATURE PROBE

S12.01en

DESCRIPTION AND APPLICATION

These thermocouple temperature sensors **TC 151/280** are designed for the measurement of temperature of soft or loose materials and solid substances, consistency of which is such so the metal tip cannot be damaged. They can also be used for measuring liquid and gaseous substances. The temperature range for the use of the sensor is -40 to 280 °C (300°C for a short time). The sensors consist of a metal tip (stainless steel DIN 1.4301), where the thermocouple measuring point is located, a grip made of high-temperature resistance plastic and thermocouple leads. Material composition of the sensors conforms to the requirements of Decree 38/2001 Coll., as amended. The design allows easy cleaning, thanks to which the temperature sensors can be used in the food industry.

The sensors are intended for operation in chemically non-aggressive environment

DECLARATION, CERTIFICATES, CALIBRATION

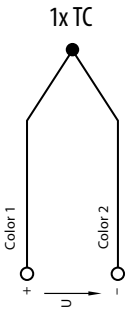
Manufacturer provides **EU Declaration of Conformity.**

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, as amended) or in an Accredited laboratory.

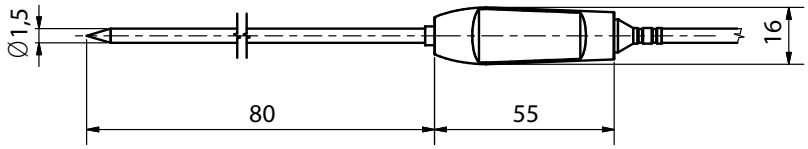
SPECIFICATIONS

Probe type	TC 151/280
Measuring range	-40 to 280 °C (for a short time 300 °C)
Type of sensing element	TC K
Nr. of measuring points	1 measuring point, insulated from the case
Ingress protection	IP 68 (1 bar) in accordance with EN 60529, as amended
Material of the probe tip	stainless steel DIN 1.4301
Diameter of the probe tip	1.5 mm
Length of the probe tip	80 mm - standard, 50 to 100 mm - modification
End of the probe tip	sharp – standard; flat, round - modification
Material of the handle	PEEK
Temperature resistance of the handle	up to 280 °C
Lead-in cable	teflon shielded
Weight	0.09 kg for 1 m cable length

WIRING DIAGRAM



DIMENSIONAL DRAFT



S 34/150
-30 to 150 °C, CONTACT TEMPERATURE PROBE

S06.04en

DESCRIPTION AND APPLICATION

These resistance temperature probes **S 34/150** are designed for contact measurement of solid substances with flat and smooth surface. The temperature range for the use of the probe is -30 to 150 °C. The probes consist of a metal case terminated by a special cup to contact the measured surface, a handle, and a lead-in cable. The resistance sensing element is located in a brass (duralumin) cup, which is firmly placed in a special rubber case reducing the influence of the surrounding environment on the measurement. The temperature probes are intended for operation in chemically non-aggressive environment.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

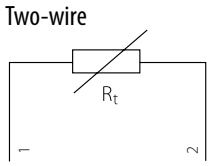
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

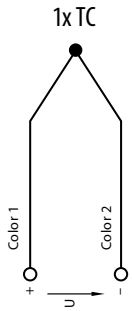
SPECIFICATIONS

Probe type	S 34/150
Measuring range	-30 to 150 °C
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Ingress protection	IP 43 in accordance with EN 60529, as amended
Material of the case	stainless steel DIN 1.4301
Material of the contact cup	brass
Length of the case	70 mm
Material of the handle	teflon ø 11 mm
Temperature resistance of the handle	-30 to 150 °C
Lead-in cable	silicone shielded
Weight	0.05 kg for 1 m cable length

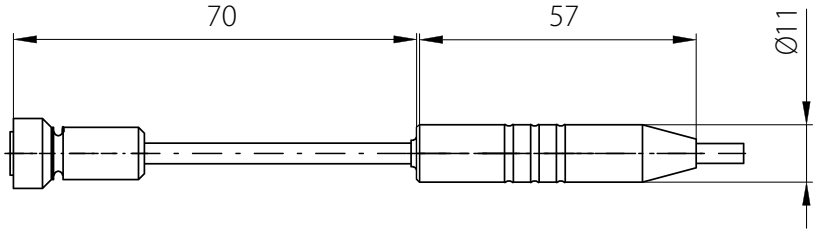
Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM





DIMENSIONAL DRAFT



S 33/250
-30 TO 250 °C, CONTACT TEMPERATURE PROBE

S07.04en

DESCRIPTION AND APPLICATION

These resistance temperature probes **S 33/250** are designed for contact measurement of solid substances with flat and smooth surface. The temperature range for the use of the probe is -30 to 250 °C. The probes consist of a metal case terminated by a special cup to contact the measured surface, a handle, and a lead-in cable. The resistance sensing element is located in a brass (duralumin) cup, which is firmly placed in a special rubber case reducing the influence of the surrounding environment on the measurement. The temperature probes are intended for operation in chemically non-aggressive environment.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

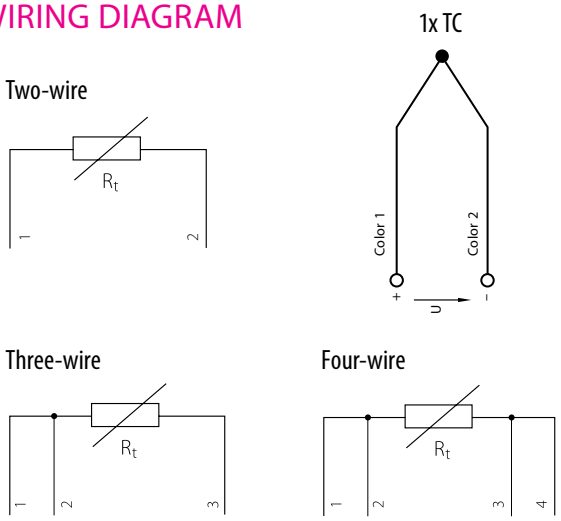
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

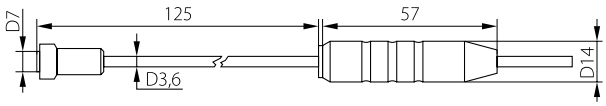
Probe type	S 33/250
Measuring range	-30 to 250 °C
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Ingress protection	IP 43 in accordance with EN 60529, as amended
Material of the case	stainless steel DIN 1.4301
Material of the contact cup	dural 424554.61
Length of the case	125 mm
Material of the handle	teflon
Temperature resistance of the handle	up to 200 °C
Lead-in cable	silicone shielded
Weight	0.06 kg for for 1 m cable length

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM



DIMENSIONAL DRAFT



S 42/150
0 to 150 °C, AMBIENT TEMPERATURE PROBE

S08.04en

DESCRIPTION AND APPLICATION

These resistance temperature probes **S 42/150** are designed for contact measurement of gaseous substances. The temperature range for the use of the probe is 0 to 150°C. The sensor consists of a metal open case (stainless steel DIN 1.4301), a handle and a lead-in cable. Material composition of the probe conforms to the requirements of Decree 38/2001 Coll. as amended. The design allows easy cleaning, thanks to which the temperature sensors can be used in the food industry. The resistance sensing element is located in the open case and it´s providing the direct contact with gaseous substance to be measured and the quick response to change in temperature. The sensors are intended for operation in chemically non-aggressive environment.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

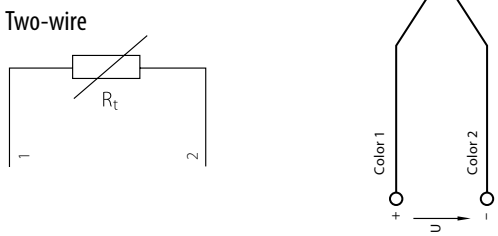
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

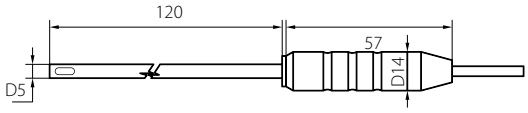
Probe type	S 42/150
Measuring range	0 to 150 °C
Type of sensing element	all types (Pt 100, Pt 1000, Ni 1000, Ni 10000,Ni 2226=T1, NTC, PTC, KTY, TSiC, DALLAS, TC K, TC J, TC T and so on)
Ingress protection	IP 20 in accordance with EN 60529, as amended
Material of the case	stainless steel DIN 1.4301
Length of the case	120 mm
Diameter of the case	5 mm
Material of the handle	teflon
Temperature resistance of the handle	up to 250 °C
Lead-in cable	silicone shielded
Weight	0.06 kg for 1 m cable length

Note: Certain technical specifications of thermocouple sensors (lead wires, IP rating, etc.) may differ with different types.

WIRING DIAGRAM

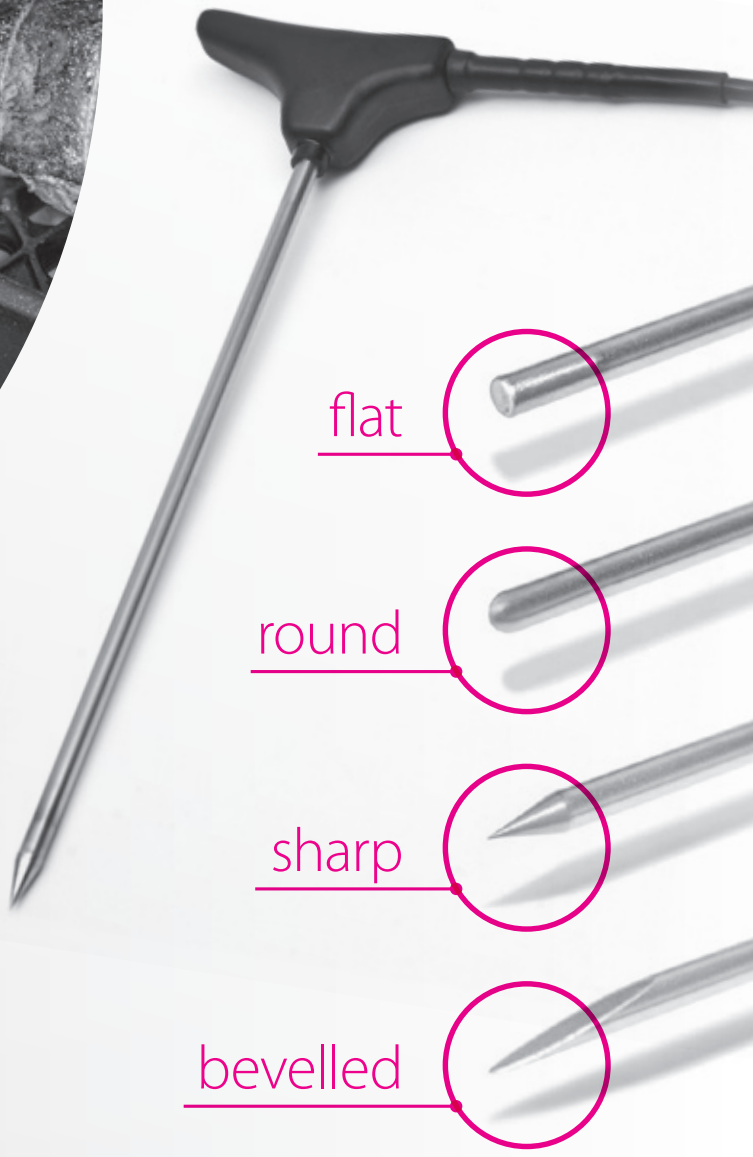


DIMENSIONAL DRAFT



Stick-in Temperature Probes

6 measuring points



- Up to 300 °C
- Up to 6 measuring points
- PEEK, Stainless steel, PTFE, PFA
- ø from 1.5 mm
- **Compliant with EU requirements for food contact.**

PAIRED TEMPERATURE SENSORS TP 11E

037.22en

DESCRIPTION AND APPLICATION

heat-quantity meters. They are produced with the Pt 100, Pt 500 and Pt 1000 temperature sensing elements. The sensors are compatible with heat-quantity meters manufactured by SIEMENS, LANDIS+GYR, KAMSTRUP, ITRON, CODEA, CO-MAC CAL, SENSUS METERING, BTU and others. The sensors are intended for installation in thermowells. The standard operating temperature range is 0 to 180 °C. The sensors are designed to operate in a chemically non-aggressive environment.

ACCESSORIES

- stainless steel thermowell JTP 11

DECLARATION, CERTIFICATES, CALIBRATION

The sensors are compliant with the requirements of the EN 60751, as amended and EN 1434, as amended standards and have an EU-Type Examination Certificate No. TCM 321/17 - 5471.

EU Declaration of Conformity – the sensors are manufactured in conformity with the Directive of the European Parliament and of the Council 2014/32/EU on Measuring Instruments (so-called MID). All sensor dimensions and tolerances comply with the requirements of EN 1434, as amended.

SPECIFICATIONS

Sensor type	TP 11E
Type of sensing element	Pt 100, Pt 500, Pt 1000
Maximum measuring DC current	3 mA (Pt 100); 1.5 mA (Pt 500); 1 mA (Pt 1000)
Recommended measuring DC current	1 mA (Pt 100); 0.5 mA (Pt 500); 0.1 mA (Pt 1000)
Measuring range	0 to 180 °C
$\Delta\Theta$ min	3 °C
$\Delta\Theta$ max	180 °C
Accuracy class of individual sensors	B according to EN 60751, as amended
Sensor connection	according to the wiring diagram

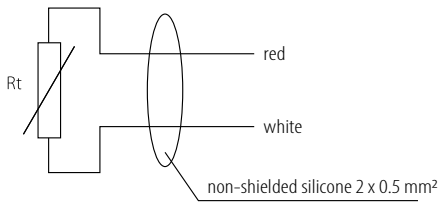
OTHER PARAMETERS

Length of the case	40 ± 5 mm (37 mm as a standard)
Diameter of the case	5.5 ± 0.5 mm
Material of the case and the thermowell	stainless steel DIN 1.4571
Lead-in cable	2-wire non-shielded silicone 2 x 0.5 mm^2 4-wire non-shielded silicone 4 x 0.25 mm^2
Lengths of the cable	according to the standard EN 1434-2, art. 4.3.4, chart 2, as amended
Wire resistance	0.07 Ω for 1 m of 2-wire cable
Temperature resistance of the cable	-25 to 180 °C
Ingress protection	IP 67 in accordance with EN 60529, as amended
Insulation resistance	> 100 MΩ at 100 V DC, 15 to 35 °C, relative humidity < 80 %
Time response	$\tau_{0.5}$ < 8 s (in flowing water at 0.4 m.s^{-1})
Recommended minimum immersion	75 mm
Lengths of thermowells	36, 86, 136, 176 mm
Thermowell thread	G ½", M 20 x 1.5
Maximum overpressure for a thermowell	6.3 MPa
Weight	0.1 kg for 1 m cable length/1 couple

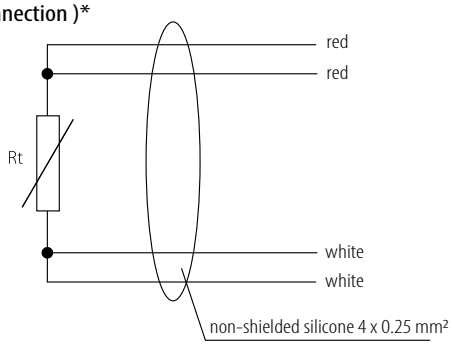
The variable location of the plug allows the use of these short cases even in longer existing thermowells.

WIRING DIAGRAM

2-wire connection

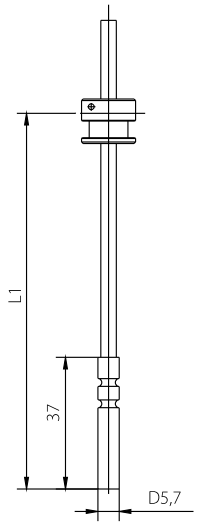


4-wire connection)*

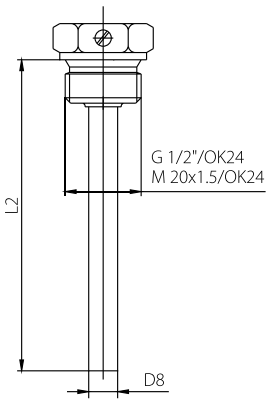


DIMENSIONAL DRAFT

TP 11E



Accessories



Thermowell JTP 11

L1 Distance of the fixing plug for TP 11E)**	L2 thermowell length for JTP 11
47 ***	36
97	86
147	136
187	176

) In the 4-wire connection the wire colour design can be red, red / white, white*

*)** By means of the length L1 the distance of the fixing plug is defined and the length of a spacer is defined by the length of the thermowell*

*)*** Producer does not recommend to use this length due to insufficient immersion of the sensor and inaccurate measurement.*

PAIRED TEMPERATURE SENSORS TP 13, TP 13A

080.10en

DESCRIPTION AND APPLICATION

These paired temperature sensors are used as component parts of the electrical heat-quantity meters. They are produced with the Pt 100, Pt 500 and Pt 1000 temperature sensing elements. The structure of the case allows for direct installation of sensors into pipes without the need for a thermowell, thus ensuring a quick response to changes in temperature. The sensors are compatible with heat-quantity meters manufactured by SIEMENS, LANDIS+GYR, KAMSTRUP, ITRON, CODEA, COMAC CAL, SENSUS METERING, BTU and others. The standard operating temperature range is 0 to 180 °C. The sensors are designed to operate in a chemically non-aggressive environment.

ACCESSORIES

- sealing from TEMASIL material

DECLARATION, CERTIFICATES, CALIBRATION

The sensors are compliant with the requirements of the EN 60751, as amended and EN 1434 standards, as amended and have an EC-Type Examination Certificate No. TCM 321/17 - 5471.

EU Declaration of Conformity – the sensors are manufactured in conformity with the Directive of the European Parliament and of the Council 2014/32/EU on Measuring Instruments (so-called MID). All sensor dimensions and tolerances comply with the requirements of EN 1434, as amended.

SPECIFICATIONS

Sensor type	TP 13; TP 13 A
Type of sensing element	Pt 100, Pt 500, Pt 1000
Maximum measuring DC current	3 mA (Pt 100); 1.5 mA (Pt 500); 1 mA (Pt 1000)
Recommended measuring DC current	1 mA (Pt 100); 0.5 mA (Pt 500); 0.1 mA (Pt 1000)
Measuring range	0 to 180 °C
ΔΘ min	3 °C
ΔΘ max	180 °C
Accuracy class of individual sensors	B according to EN 60751, as amended
Sensor connection	according to the wiring diagram

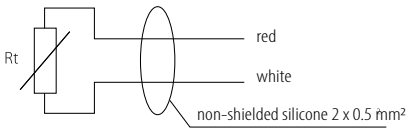
OTHER PARAMETERS

Length of the case	27.5 mm
Diameter of the case	3.5 mm (TP 13); 5 mm (TP 13A)
Material of the case	stainless steel DIN 1.4301
Material of the fastening nut	brass
Lead-in cable	2-wire shielded silicone 2 x 0.22 mm² 4-wire shielded silicone 4 x 0.15 mm²
Lengths of the cable	according to EN 1434-2, art. 4.3.4, chart 2, as amended
Wire resistance	0.16 Ω per 1 m of the 2-wire cable
Temperature resistance of the cable	-25 to 180 °C
Ingress protection	IP 67 in accordance with EN 60529, as amended
Insulation resistance	> 100 MΩ at 100 V DC, 15 to 35 °C, relative humidity < 80 %
Time response	TP 13: $\tau_{0.5}$ < 3 s (in flowing water at 0.4 m.s^{-1}) TP 13A: $\tau_{0.5}$ < 8 s (in flowing water at 0.4 m.s^{-1})
Weight	0.14 kg for 1 m cable length/ 1 couple

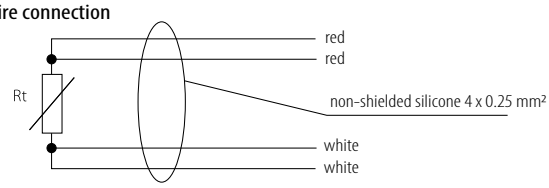
Quick response to changes in temperature.

WIRING DIAGRAM

2-wire connection

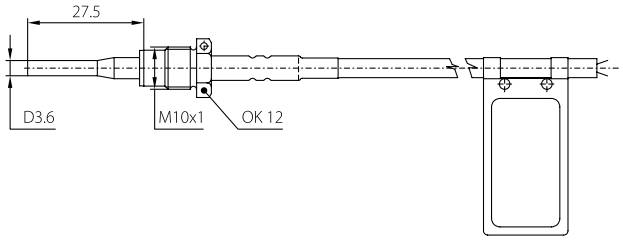


4-wire connection

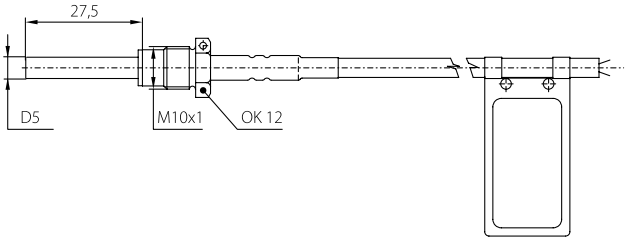


DIMENSIONAL DRAFT

TP 13



TP 13A



PAIRED TEMPERATURE SENSORS TP 15, TP 15A, TP 15B

079.11en

DESCRIPTION AND APPLICATION

These paired temperature sensors are used as component parts of the electrical heat-quantity meters. They are produced with the Pt 100, Pt 500 and Pt 1000 temperature sensing elements. The sensors are compatible with heat-quantity meters manufactured by SIEMENS, LANDIS+GYR, KAMSTRUP, ITRON, CODEA, COMAC CAL, SENSUS METERING, BTU and others. The sensors are intended for installation in thermowells. The standard operating temperature range is 0 to 180 °C. The sensors are designed to operate in a chemically non-aggressive environment.

ACCESSORIES

- stainless steel thermowell JTP 15

DECLARATION, CERTIFICATES, CALIBRATION

The sensors are compliant with the requirements of the EN 60751, as amended and EN 1434 standards, as amended and have an EC-Type Examination Certificate No. TCM 321/17 - 5471.

EU Declaration of Conformity – the sensors are manufactured in conformity with the Directive of the European Parliament and of the Council 2014/32/EU on Measuring Instruments (so-called MID). All sensor dimensions and tolerances comply with the requirements of EN 1434, as amended.

SPECIFICATIONS

Sensor type	TP 15, TP 15A, TP 15B
Type of sensing element	Pt 100, Pt 500, Pt 1000
Maximum measuring DC current	3 mA (Pt 100); 1.5 mA (Pt 500); 1 mA (Pt 1000)
Recommended measuring DC current	1 mA (Pt 100); 0.5 mA (Pt 500); 0.1 mA (Pt 1000)
Measuring range	0 to 180 °C
$\Delta\Theta$ min	3 °C
$\Delta\Theta$ max	180 °C
Accuracy class of individual sensors	B according to EN 60751, as amended
Sensor connection	according to the wiring diagram

OTHER PARAMETERS

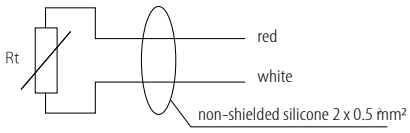
The standard length of the case	TP 15: 65 *, 105, 140, 230 mm TP 15A: 120/91; 175/146 mm TP 15B: 120/90; 120/91; 175/146 mm
Diameter of the case	5.9 ± 0.3 mm (with tolerance d10 in the length 50 mm)
Material of the case and of the thermowell	stainless steel DIN 1.4301
Lead-in cable	2-wire non-shielded silicone 2 x 0.5 mm² 4-wire non-shielded silicone 4 x 0.25 mm²
Cable lengths	according to EN 1434-2, art. 4.3.4, chart 2, as amended
Wire resistance	0.07 Ω per 1 m of the 2-wire cable
Temperature resistance of the cable	-25 to 180 °C
Ingress protection	IP 67 in accordance with EN 60529, as amended
Insulation resistance	> 100 MΩ at 100 V DC, 15 to 35 °C, relative humidity < 80 %
Time response	$\tau_{0.5}$ < 8 s (in flowing water at 0.4 m.s^{-1}) $\tau_{0.5}$ < 12 s in thermowell
Lengths of the thermowells	65*, 105, 140, 230 mm (TP 15); 91, 146 mm (TP 15 A)
Thermowell thread	G1/2", M 20 x 1.5
Maximum overpressure of the thermowell	6.3 MPa
Weight	0.18 kg for length 105 mm, cable 1 m/ 1 couple

) Producer does not recommend to use this length due to insufficient immersion of the sensor and inaccurate measurement.*

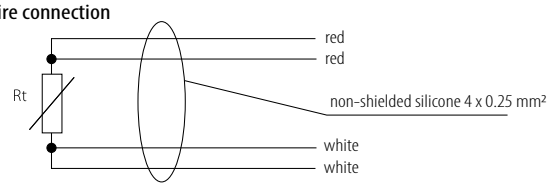
Variable design of temperature sensors allows for precise installation and helps achieve quick time responses even for sensors installed in thermowells.

WIRING DIAGRAM

2-wire connection

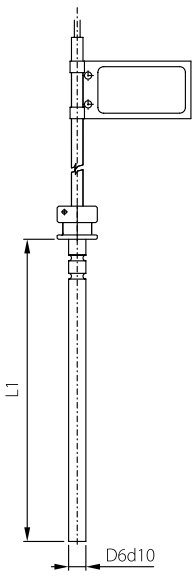


4-wire connection

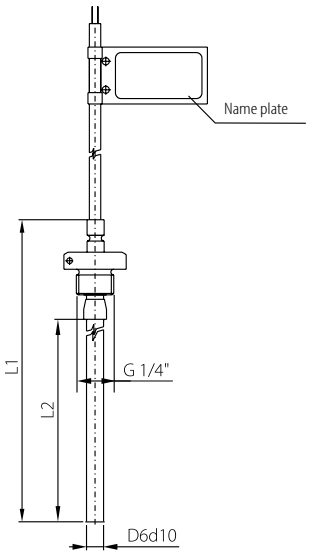


DIMENSIONAL DRAFT

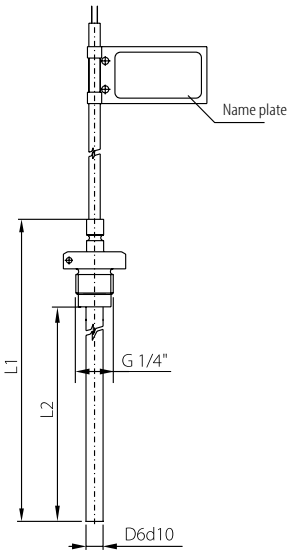
TP 15



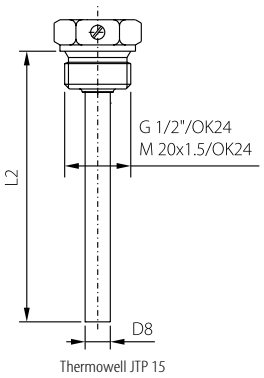
TP 15A



TP 15B



Accessories



L1 Case length for TP 15	Thermowell length L2 – JTP 15
65*	65
105	105
140	140
230	230

L1 Case length for TP 15A, TP 15B	Thermowell length L2 – JTP 15A, JTP 15B
120	91
175	146

) Producer does not recommend to use this length due to insufficient immersion of the sensor and inaccurate measurement.*

PAIRED TEMPERATURE SENSORS TP 16, TP 16A

118.08en

DESCRIPTION AND APPLICATION

These paired temperature sensors are used as component parts of the electrical heat-quantity meters. They are produced with the Pt 100, Pt 500 and Pt 1000 temperature sensing elements. Two-wire or four-wire circuits can be connected to the sensors (the inner circuit is always two-wire). The sensors are compatible with heat-quantity meters manufactured by SIEMENS, LANDIS+GYR, KAMSTRUP, ITRON, CODEA, COMAC CAL, SENSUS METERING, BTU and others. The sensors are designed for installation in thermowells. The standard operating temperature range is 0 to 180 °C. The sensors are designed to operate in a chemically non-aggressive environment.

ACCESSORIES

- stainless steel thermowell JTP 16 or JTP 16A

DECLARATION, CERTIFICATES, CALIBRATION

The sensors are compliant with the requirements of the EN 60751, as amended and EN 1434 standards, as amended and have an EC-Type Examination Certificate No. TCM 321/17 - 5471.

EU Declaration of Conformity – the sensors are manufactured in conformity with the Directive of the European Parliament and of the Council 2014/32/EU on Measuring Instruments (so-called MID). All sensor dimensions and tolerances comply with the requirements of EN 1434, as amended.

Type TP 16A ensures fast time response to changes in temperature.

SPECIFICATIONS

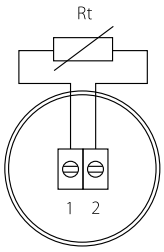
Sensor type	TP 16, TP 16A
Type of sensing element	Pt 100, Pt 500, Pt 1000
Maximum measuring DC current	3 mA (Pt 100); 1.5 mA (Pt 500); 1 mA (Pt 1000)
Recommended measuring DC current	1 mA (Pt 100); 0.5 mA (Pt 500); 0.1 mA (Pt 1000)
Measuring range	0 to 180 °C
$\Delta\Theta$ min	3 °C
$\Delta\Theta$ max	180 °C
Accuracy class of individual sensors	B according to EN 60751, as amended
Sensor connection	according to the wiring diagram
Maximum overpressure of the thermowell	6.3 MPa

OTHER PARAMETERS

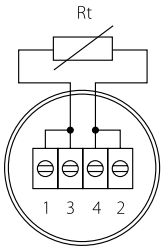
Length of the case	TP 16: 105, 140, 230 mm; TP 16A: 97, 133 mm
Diameter of the case	TP 16: 5.9 mm ± 0.3 mm; TP 16A: 3.6 mm ± 0.05 mm
Material of the case and of the thermowell	stainless steel DIN 1.4301
Type of the connection head	LIMATHERM MA
Material of the connection head	aluminium alloy
Temperature resistance of the connection head	-25 to 100 °C
Internal wiring resistance	TP 16: 0.015 Ω / 105 mm TP 16A: 0.034 Ω / 97 mm 0.018 Ω / 140 mm 0.043 Ω / 133 mm 0.027 Ω / 230 mm
Recommended wire cross section	0.35 to 1.5 mm^2
Ingress protection	IP 54 in accordance with EN 60529, as amended
Insulation resistance	> 100 MΩ at 100 V DC, 15 to 35 °C, relative humidity < 85 %
Time response	TP 16: $\tau_{0.5}$ < 5 s (in flowing water at 0.4 $m.s^{-1}$) TP 16A: $\tau_{0.5}$ < 3 s (in flowing water at 0.4 $m.s^{-1}$)
Lengths of thermowells	105, 140, 230 mm (TP 16); 88, 124 mm (TP 16A)
Thermowell thread	G ½", M 20 x 1.5
Weight	0,22 kg/ couple for length 105 mm

WIRING DIAGRAM

2-wire connection

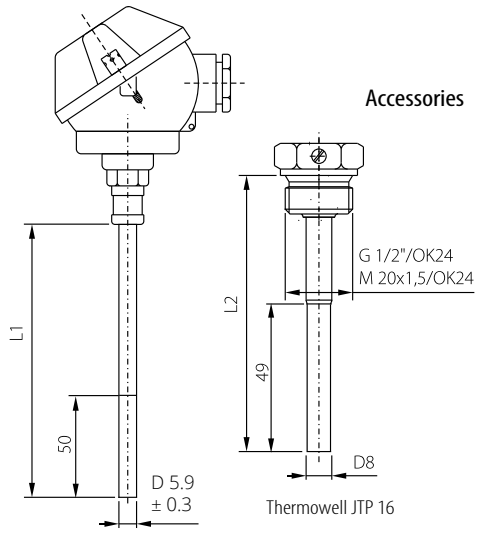


4-wire connection



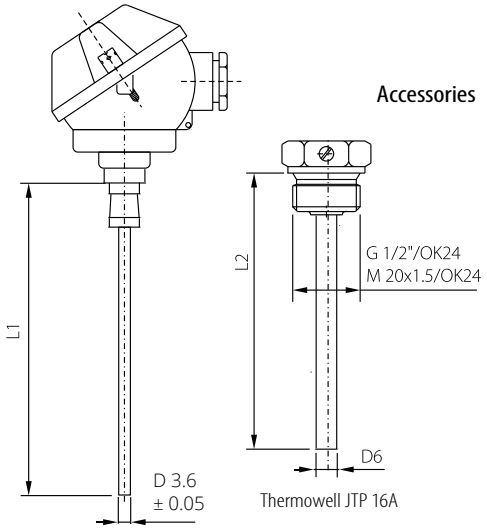
DIMENSIONAL DRAFT

TP 16



L1 Case length for TP 16	L2 thermowell length for JTP 16
105	105
140	140
230	230

TP 16A



L1 Case length for TP 16A	L2 thermowell length for JTP 16A
97	84
133	120

W10009 – WIRELESS TEMPERSTURE SENSOR

W01.01en

DESCRIPTION AND APPLICATION

W10009 is a wireless, battery powered temperature sensor. Native modbus map grants seamless integration into the DDC/SCADA system. The communication is based on the encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis. Protection level IP 65 in accordance with EN 60529, as amended ensures reliable function of the sensor even in harsh environment.

Application

- HVAC control
- measurement of temperature
- wireless integration into SCADA control systems

FUNCTION

The wireless temperature sensor W10009 measures temperature in non-aggressive environments using the probe situated outside the device body. The values are transmitted through the 868 MHz unlicensed band to the WCOM51, or WCOM01 gateways. The device has factory-set values to ensure the correct default function and allows direct reading and writing of values to the Modbus map, which is available in a separate document. All settings are also stored in the Modbus map directly in the device. Before using the device for the first time, it is necessary to pair it and it is recommended to perform individual configuration, especially to enter the encryption password.

SCADA SYSTEM INTEGRATION

The sensor can be integrated into DDC or SCADA systems directly via the WCOM51 wireless gateway.

PAIRING

To pair your own sensors with the WCOM51 GSM gateway, the freely downloadable KFP-Lite software is available, which communicates with the gateway using the WUSB01 wireless USB configurator. Both devices must be powered and placed in close proximity to each other. Using the search function in the software interface, you can view a list of all available devices in range and assign or modify parameters based on the wireless identification code for each individual device.

Using KFP-Lite, it is possible to change the communication frequency (default value 868.95 MHz).

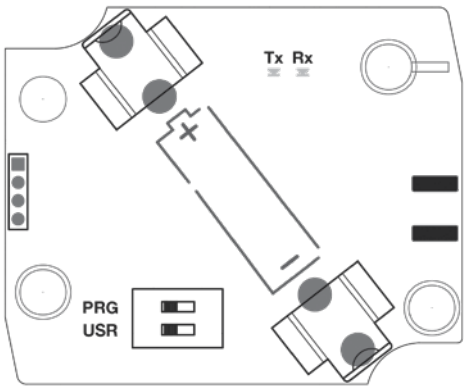
BATTERY CHANGE

Remove the front cover lid of the sensor. Use wide flat screw driver or appropriate plastic tool which fits into slots between the cover and body of the sensor. Remove old battery from the bracket and place new battery. Observe the battery type and polarity. Always replace battery with fresh one. Then put the sensor cover back and press both parts of the sensor tight to ensure the IP protection again.

SPECIFICATIONS

Sensor type	W10009
Power supply	3V, 1 main alkaline battery 1.5V, type AAA, not included
Consumption	Idle: < 2 uA, avg. typical: 5 uA, max.: 25 mA
Battery life	up to 5 years – batteries are not supplied with the device
Communication	868.950 MHz, 100 kbps, KFP 868.300 MHz, 32 kbps, KFP 868.100 MHz, 100 kbps, KFP 869.525 MHz, 100 kbps, KFP
Protocol	KFP (dual stack)
Encryption	AES 128 PCBC, EN 13757-4
RF power	+10 to - 20 dBm, step 5 dB
Antenna	SMA female connector for external antenna
Communication range	1000 m in free space, 300 m in buildings
Mechanical and dimensions	154×33×63 mm (incl. antenna and measurement probe), polyamide enclosure, IP 65 in accordance with EN 60529, as amended 1×clamp switch (INIT mode)
Temperature measurement range	-20 až 55 °C, ± 0,5 °C
Ambient conditions	-20 to 55 °C, 5 % to 95 % rH, (non condesated), atmospheric pressure 70 to 107 kPa

WIRING DIAGRAM



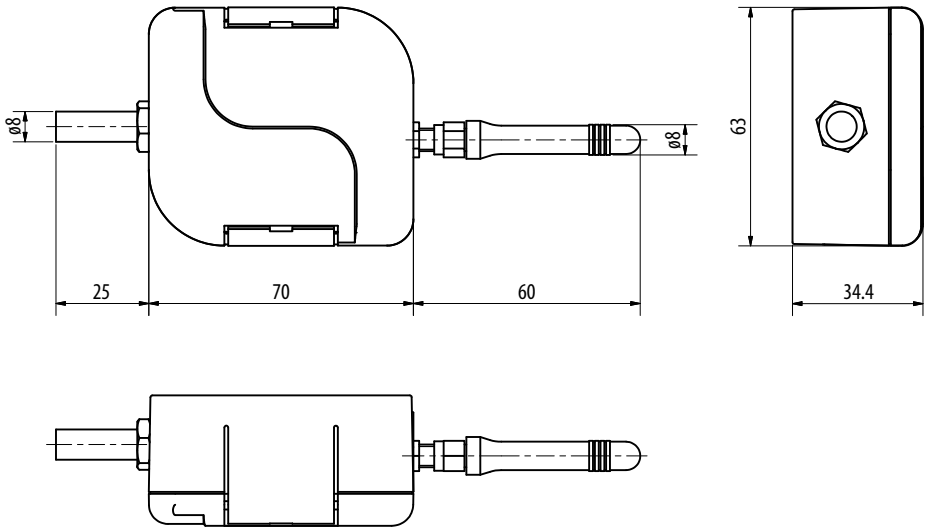
Tx Red LED, 10s after power on intermittently on, indicates data transmission during operation

Rx Green LED, indicates receipt of a request from a remote device

PRG Without clamp – user defined frequency and password

With clamp – default frequency and password

DIMENSIONAL DRAFT



W10019 – WIRELESS TEMPERSTURE AND RELATIVE HUMIDITY SENSOR

W02.01en

DESCRIPTION AND APPLICATION

W10019 is a wireless, battery powered temperature and humidity sensor. Native modbus map grants seamless integration into the DDC/SCADA system. The communication is based on the encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis. Ingress protestion IP 65 in accordance with EN 60529, as amended ensures reliable function of the sensor even in harsh environment.

Application

- HVAC control
- measurement of temperature and humidity
- wireless integration into SCADA control systems

FUNCTION

The wireless temperature/humidity sensor W10019 measures temperature and relative humidity in non-aggressive environments using the probe situated outside the device body. The values are transmitted through the 868 MHz unlicensed band to the WCOM51, or WCOM01 gateways. The device has factory-set values to ensure the correct default function and allows direct reading and writing of values to the Modbus map, which is available in a separate document. All settings are also stored in the Modbus map directly in the device. Before using the device for the first time, it is necessary to pair it and it is recommended to perform individual configuration, especially to enter the encryption password.

SCADA SYSTEM INTEGRATION

The sensor can be integrated into DDC or SCADA systems directly via the WCOM51 wireless gateway.

PAIRING

To pair your own sensors with the WCOM51 GSM gateway, the freely downloadable KFP-Lite software is available, which communicates with the gateway using the WUSB01 wireless USB configurator. Both devices must be powered and placed in close proximity to each other. Using the search function in the software interface, you can view a list of all available devices in range and assign or modify parameters based on the wireless identification code for each individual device.

Using KFP-Lite, it is possible to change the communication frequency (default value 868.95 MHz).

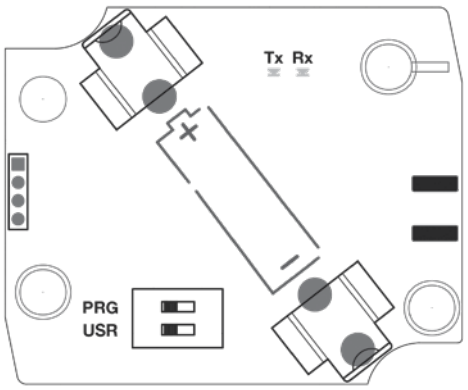
BATTERY CHANGE

Remove the front cover lid of the sensor. Use wide flat screw driver or appropriate plastic tool which fits into slots between the cover and body of the sensor. Remove old battery from the bracket and place new battery. Observe the battery type and polarity. Always replace both battery with fresh one. Then put the sensor cover back and press both parts of the sensor tight to ensure the IP protection again.

SPECIFICATIONS

Sensor type	W10019
Power supply	3V, main alkaline battery 1.5V, type AAA, not included
Consumption	Idle: < 2 uA, avg. typical: 5 uA, max.: 25 mA
Battery life	up to 5 years – batteries are not supplied with the device
Communication	868.950 MHz, 100 kbps, KFP 868.300 MHz, 32 kbps, KFP 868.100 MHz, 100 kbps, KFP 869.525 MHz, 100 kbps, KFP
Protocol	KFP (dual stack)
Encryption	AES 128 PCBC, EN 13757-4
RF power	+10 to - 20 dBm, step 5 dB
Antenna	SMA female connector for external antenna
Communication range	1000 m in free space, 300 m in buildings
Mechanical and dimensions	154×33×63 mm (incl. antenna and measurement probe), polyamide enclosure, IP 65 in accordance with EN 60529, as amended 1× clamp switch (INIT mode) 1×DIP switch (PRG)
Temperature measurement range	-20 až 55 °C, ± 0,5 °C
Humidity measuring range	10 to 90 % rH, ±3% rH
Ambient conditions	-20 to 55 °C, 5 % to 95 % rH, (non condesated), atmospheric pressure 70 to 107 kPa

WIRING DIAGRAM



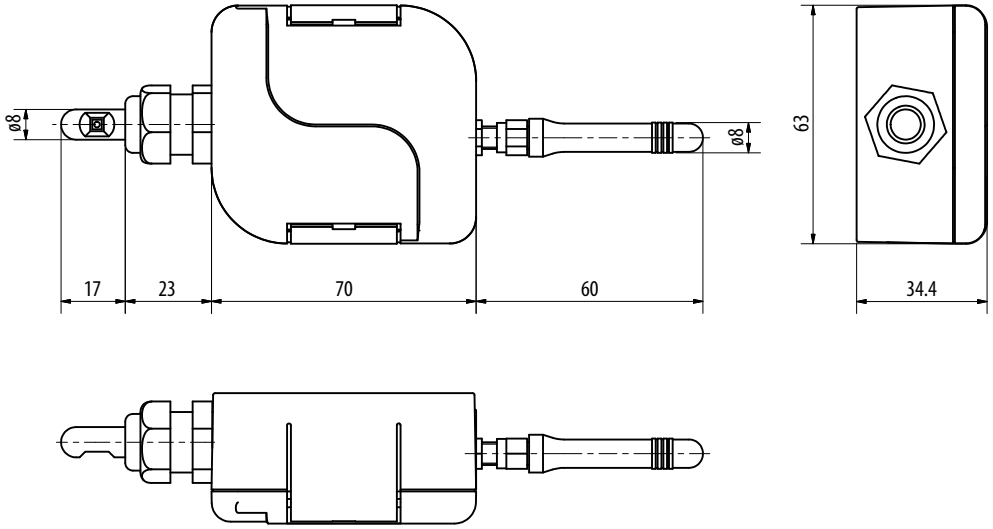
Tx Red LED, 10s after power on intermittently on, indicates data transmission during operation

Rx Green LED, indicates receipt of a request from a remote device

PRG Without clamp – user defined frequency and password

With clamp – default frequency and password

DIMENSIONAL DRAFT



WRU90001 – WIRELESS ROOM UNIT WITH TEMPERATURE, RELATIVE HUMIDITY AND CO_2 SENSOR

W03.01en

CE

DESCRIPTION AND APPLICATION

WRU90001 is a wireless, battery powered HMI unit. The device features temperature, humidity and CO_2 sensors, the values of which can be displayed to user on a large LCD display. It features a native modbus map that grants seamless integration into the DDC/SCADA system. The communication is based on the encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis.

Application

- HVAC control
- measurement of temperature, humidity and CO_2
- display of status values
- wireless integration into SCADA control systems

FUNCTION

The wireless room unit measures temperature and relative humidity. It allows to set the desired temperature setpoint and operating modes using the rotating knob. The values are transmitted through the 868 MHz unlicensed band to the WCOM51 gateway. There is also an option without rotationg know and display available. The room unit features a native modbus map with the direct read and write functionality. The modbus map is available in a separate document. All settings and configuration are also stored in a modbus register, directly in the device. It is necessary to pair the device before first use and to enter the encryption password.

SCADA SYSTEM INTEGRATION

The controller can be integrated into DDC or SCADA systems directly via the WCOM51 wireless gateway.

PAIRING

To pair your own sensors with the WCOM51 GSM gateway, the freely downloadable KFP-Lite software is available, which communicates with the gateway using the WUSB01 wireless USB configurator. Both devices must be powered and placed in close proximity to each other. Using the search function in the software interface, you can view a list of all available devices in range and assign or modify parameters based on the wireless identification code for each individual device.

Using KFP-Lite, it is possible to change the communication frequency (default value 868.95 MHz).

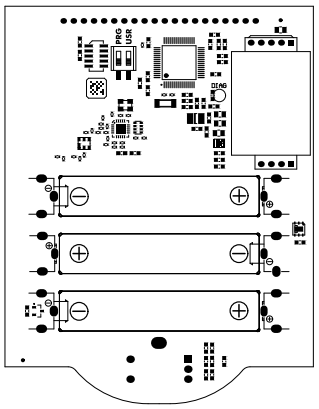
BATTERY CHANGE

Remove the base lid of the controller by gently pressing it on the sides. Remove old batteries from the bracket and place new batteries. Observe the battery type and polarity. Always replace both bateries with fresh ones. Then put both parts together and close the controller again.

SPECIFICATIONS

Wireless room unit	WRU90001
Power supply	4,5V, 3× main alkaline battery 1,5V, type AA
Consumption	Idle: <10 uA, avg. typical: 90 uA, max.: 25 mA
Battery life	up to 3 years – batteries are not supplied with the device
Communication	868.950 MHz, 100 kbps, WMBUS T1, KFP 868.300 MHz, 32 kbps, WMBUS S1, KFP 868.100 MHz, 100 kbps, KFP 869.525 MHz, 100 kbps, WMBUS C, KFP 868.300 MHz, 38 kbps, KFP
Protocol	WMBUS (EN 13757-4), KFP (dual stack)
Encryption	AES 128 PCBC, EN 13757-4
RF power	+10 to - 20 dBm, step 5 dB
Antenna	Integrated
Communication range	100 m in free space, 30 m in buildings
Mechanical and dimensions	90×115×30 mm enclosure ABS, IP 20 in accordance with EN 60529, as amended 2 × DIP switch (INIT mode, USR mode)
Temperature measurement range	-20 to 55 °C, ± 0,5 °C
Humidity measuring range	10 to 90 % rH, ±3% rH
CO_2 measuring range	400 to 5000 ppm (secondary output 0-100%)
CO_2 measuring method	NDIR (Non-dispersive Infra Red)
CO_2 measuring accuracy	± 30ppm, ± 3% of measured value (defined conditions for at least 3 calibration ACDL completed over the past 3 weeks). ACDL (automatic calibration in dimming light mode).
Temperature setpoint	configurable, ± 10 to ± 1 K
Display	reflexive segmented LCD 60×60 mm
Ambient conditions	-5 to 45 °C, 5 % to 95 % rH (EN 60721-3-3 class 3K5)

WIRING DIAGRAM



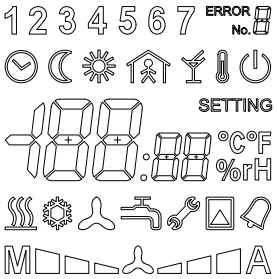
PRG Default frequency, power and password is used in ON position

USR Not used

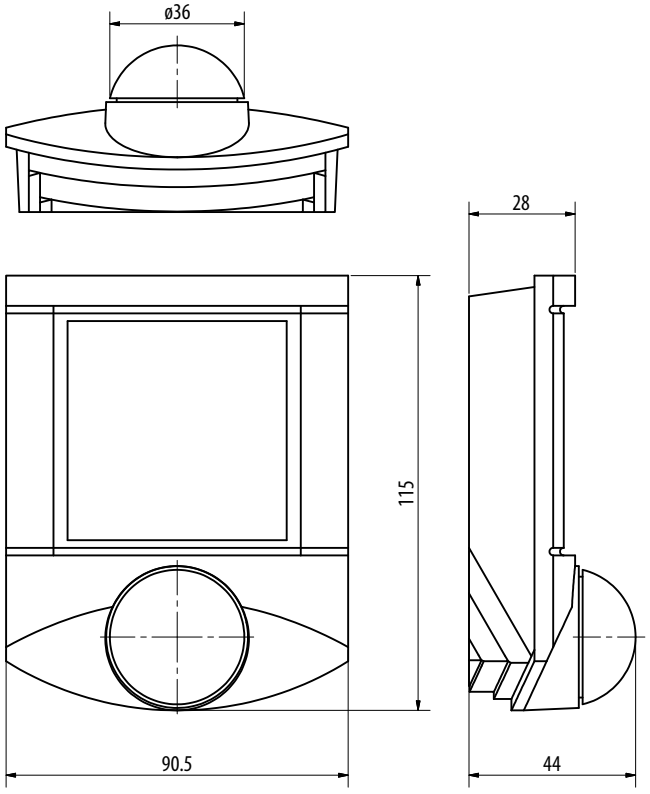
DIAG LED indication, sending data

DISPLAY

The large LCD shows the current temperature, humidity and fancoil controller status using segment symbols, standard symbols for day and night mode, time programs and activated output. At the top of the display there are symbols indicating the day of the week. The bell symbol indicates a communication error, while the side wrench symbol indicates weak batteries.



DIMENSIONAL DRAFT



WRU01001 – WIRELESS ROOM UNIT FOR MEASURING TEMPERATURE, HUMIDITY

W06.01en

DESCRIPTION AND APPLICATION

WRU01001 is a wireless, battery powered HMI unit. The device features temperature and humidity sensors, the values of which can be displayed to user on a large LCD display. It features a native modbus map that grants seamless integration into the DDC/SCADA system. The communication is based on the encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis.

Application

- HVAC control
- measurement of temperature and humidity
- display of status values
- wireless integration into SCADA control systems

FUNCTION

The wireless room unit measures temperature and relative humidity. It allows to set the desired temperature setpoint and operating modes using the rotating knob. The values are transmitted through the 868 MHz unlicensed band to the WCOM51 gateway. There is also an option without rotationg know and display available. The room unit features a native modbus map with the direct read and write functionality. The modbus map is available in a separate document. All settings and configuration are also stored in a modbus register, directly in the device. It is necessary to pair the device before first use and to enter the encryption password.

SCADA SYSTEM INTEGRATION

The controller can be integrated into DDC or SCADA systems directly via the WCOM51 wireless gateway.

PAIRING

To pair your own sensors with the WCOM51 GSM gateway, the freely downloadable KFP-Lite software is available, which communicates with the gateway using the WUSB01 wireless USB configurator. Both devices must be powered and placed in close proximity to each other. Using the search function in the software interface, you can view a list of all available devices in range and assign or modify parameters based on the wireless identification code for each individual device.

Using KFP-Lite, it is possible to change the communication frequency (default value 868.95 MHz).

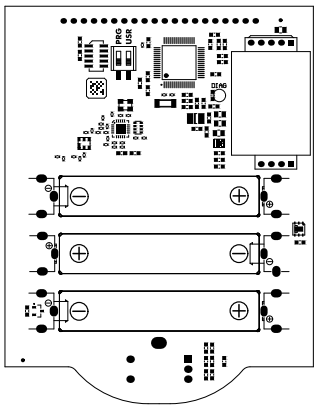
BATTERY CHANGE

Remove the base lid of the controller by gently pressing it on the sides. Remove old batteries from the bracket and place new batteries. Observe the battery type and polarity. Always replace both bateries with fresh ones. Then put both parts together and close the controller again.

SPECIFICATIONS

Wireless room unit	WRU01001
Power supply	4,5V, 3× main alkaline battery 1,5V, type AA
Consumption	idle: <5 uA, avg. typical: 10 uA, max.: 25 mA
Battery life	up to 3 years – batteries are not supplied with the device
Communication	868.950 MHz, 100 kbps, WMBUS T1, KFP 868.300 MHz, 32 kbps, WMBUS S1, KFP 868.100 MHz, 100 kbps, KFP 869.525 MHz, 100 kbps, WMBUS C, KFP 868.300 MHz, 38 kbps, KFP
Protocol	WMBUS (EN 13757-4), KFP (dual stack)
Encryption	AES 128 PCBC, EN 13757-4
RF power	+10 to - 20 dBm, step 5 dB
Antenna	Integrated
Communication range	100 m in free space, 30 m in buildings
Mechanical and dimensions	90×115×30 mm enclosure ABS, IP 20 in accordance with EN 60529, as amended 2 × DIP switch (INIT mode, USR mode)
Temperature measurement range	-20 to 55 °C, ± 0,5 °C
Humidity measuring range	10 to 90 % rH, ±3% rH
Temperature setpoint	configurable, ± 10 to ± 1 K
Display	reflexive segmented LCD 60×60 mm
Ambient conditions	-5 to 45 °C, 5 % to 95 % rH (EN 60721-3-3 class 3K5)

WIRING DIAGRAM



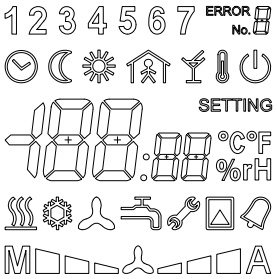
PRG Default frequency, power and password is used in ON position

USR Not used

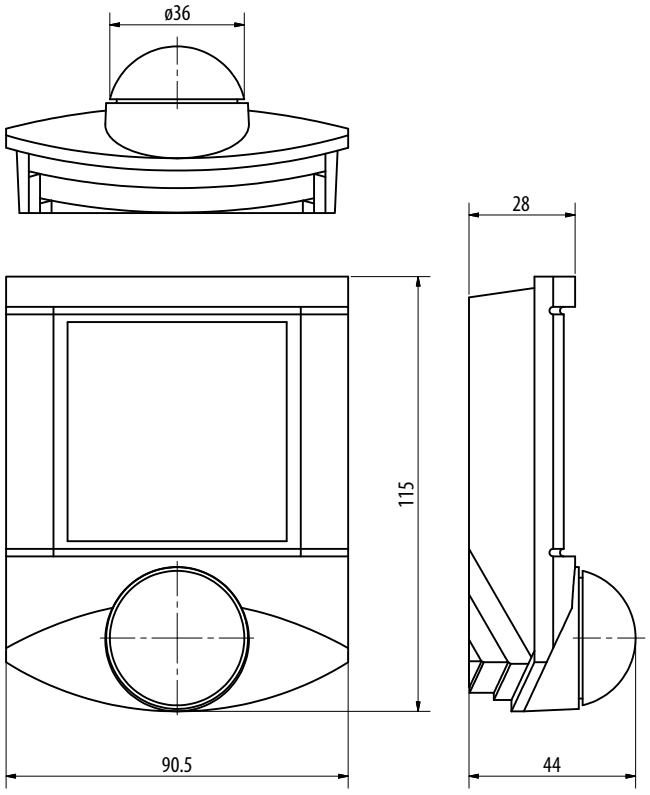
DIAG LED indication, sending data

DISPLAY

The large LCD shows the current temperature, humidity and fancoil controller status using segment symbols, standard symbols for day and night mode, time programs and activated output. At the top of the display there are symbols indicating the day of the week. The bell symbol indicates a communication error, while the side wrench symbol indicates weak batteries.



DIMENSIONAL DRAFT



WCOM51 – WIRELESS GATEWAY / REPEATER

W04.01en

DESCRIPTION AND APPLICATION

WCOM51 is the router/repeater for integration of up to 75 wireless devices. The communication is based on the encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis across the wireless network topology. Native modbus map grants seamless integration into the DDC/SCADA systems. Thanks to the „dual stack radio" technology, it can read values from WMbus based devices simultaneously.

Application

- Modbus RTU to wireless Midam KFP protocol
- integration of up to 75 Midam KFP devices
- integration of up to 75 WMbus devices
- wireless coverage extension
- wired or wireless integration into SCADA systems

FUNCTION

WCOM51 has built-in 128-bit AES encryption, the most secure encryption standard for wireless connections. WCOM51 can work in two modes. Direct communication or cached mode. Each device is mapped to Modbus RTU register area. Up to 75 devices can be mapped with configurable offset and length. Communication status is available through timestamp, comm error and status. Wireless coverage area can be extended using the mesh functionality, which is possible thanks to connection of more WCOM51 devices i a row on a RS485 bus. Configuration and data message are exchanged between repeaters on a real time basis. Wireless communication uses higher radio frequency transmitter power up to +27 dBm and receiver contains +12 dB preamplifier. SMA antenna connector makes implementation of high gain external antenna possible. Direct mounting flex antenna, or external antenna on coaxial cable with SMA connector can be installed, for example for mounting outside switchboard in order to gain better radio signal reception. Gateway configuration is made by software tools over wireless network, or over wired RS485 terminals. PLC/DDC and SCADA driver is available. The device has factory-set values to ensure the correct default function and allows direct reading and writing of values to the Modbus map, which is available in a separate document. All settings are also stored in the Modbus map directly in the device. Before using the device for the first time, it is necessary to pair it and it is recommended to perform individual configuration, especially to enter the encryption password.

SCADA SYSTEM INTEGRATION

Direct integration into various SCADA systems through wired Modbus RTU (RS485) protocol is possible.

PAIRING

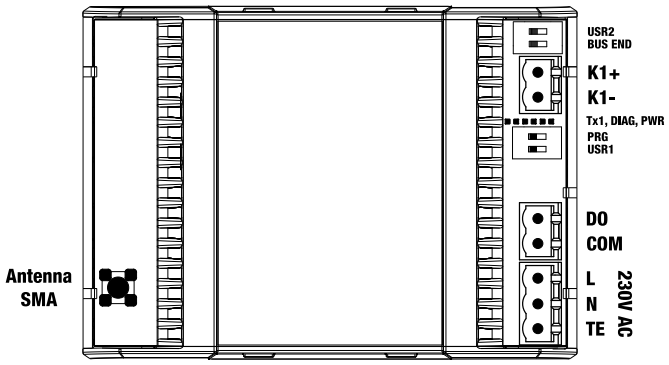
To pair your own sensors with the WCOM51 GSM gateway, the freely downloadable KFP-Lite software is available, which communicates with the gateway using the WUSB01 wireless USB configurator. Both devices must be powered and placed in close proximity to each other. Using the search function in the software interface, you can view a list of all available devices in range and assign or modify parameters based on the wireless identification code for each individual device.

Using KFP-Lite, it is possible to change the communication frequency (default value 868.95 MHz).

SPECIFICATIONS

Wireless gateway/repeater	WCOM51
Power supply	24 to 240 V AC/DC
Consumption	4 W max., 2 W typical average
Communication	868.950 MHz, 100 kbps, WMBUS T1, KFP 868.300 MHz, 32 kbps, WMBUS S1, KFP 868.100 MHz, 100 kbps, KFP 869.525 MHz, 100 kbps, WMBUS C, KFP 868.300 MHz, 38 kbps, KFP RS485, 300 to 115200 bps, galvanic isolation 1 kV
Protocol	WMBUS (EN 13757-4), KFP (dual stack), Modbus RTU, 256 node (RS485)
Encryption	AES 128 PCBC, EN 13757-4
RF power	+27 to -20 dBm
Antenna	SMA female connector for external antenna
Communication range	500 m in free space, 150 m in buildings
Output	230 V AC, max. 4 A, AC1 general use, non-inductive load (EN60947-4-1), contact lifespan > 10^5 cycles
Mechanical and dimensions	98×70×61mm, polycarbonate enclosure, IP 20 in accordance with EN 60529, as amended 3× LED (PWR, DIAG, TX) 4× Jumper (PRG/USR mode, RS485 bus end) 7× terminal M3 (power, output, RS485 communication) 1× SMA jack
Ambient conditions	-5 to 45 °C, 5 % to 95 % rH (EN 60721-3-3 class 3K5)

WIRING DIAGRAM

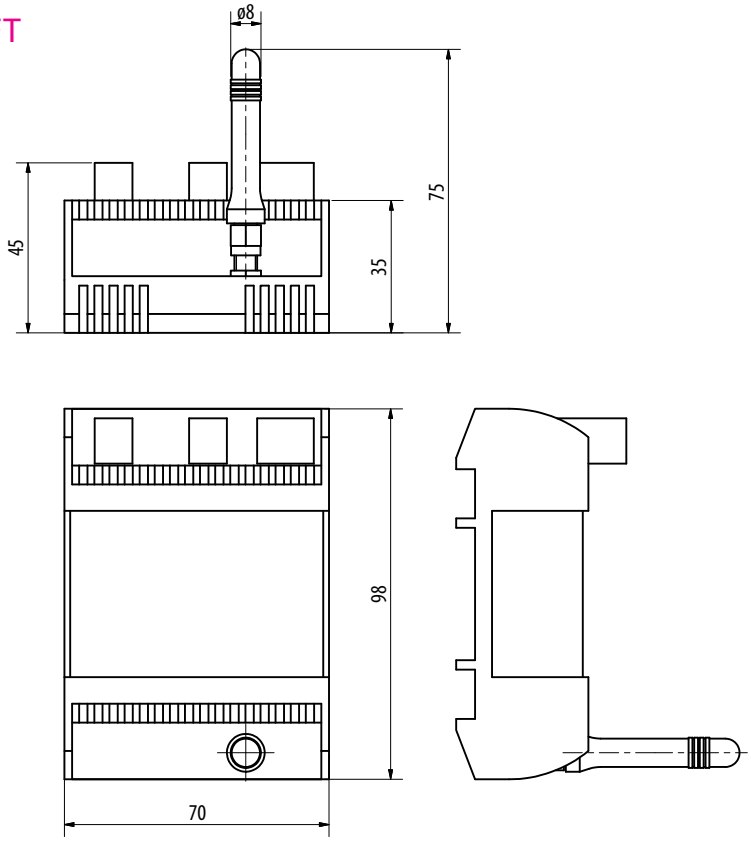


Antenna SMA External antenna connector
K1+ Serial line RS 485 +
K1- Serial line RS 485 -
DO Digital output, NO (normally open)
COM Common terminal
L, N Power supply, 230 V AC
TE Technical ground

LED INDICATION AND DIP SWITCHES

USR2 Not used
BUS END Bus end RS 485, the first and last deviceson the bus should have bus end in ON position
TX1 Red LED – RS 485 transmitting data to the field bus
DIAG Red LED – diagnostic, wireless radio indication
PWR Green LED – power supply indicator
PRG In ON position – default frequency, power and password is used
USR1 Not used

DIMENSIONAL DRAFT



WUSB01 – WIRELESS USB HID CONFIGURATION DONGLE

W05.01en

DESCRIPTION AND APPLICATION

WUSB01 is a wireless USB configurator dongle designed for set up and direct communication with MIDAM wireless devices. It uses Midam KFP encrypted protocol, which allows wireless firmware update on connected devices. The configurator features the USB Human Interface Design (HID) functionality for easy operation on PC platform without the need to install device drivers.

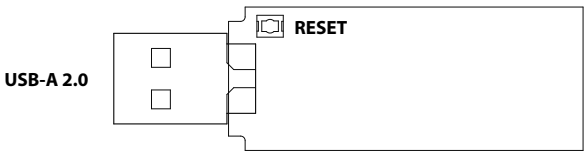
Application

- configuration, monitoring and maintenance of wireless devices communicating through Midam KFP
- monitoring and maintenance of wireless devices communicationg through WMbus protocol
- wireless firmware update for connected Midam KFP devices
- direct data acquisition from Midam KFP devices

FUNCTION

The wireless USB configurator acts as a communication interface between PC application and other wireless devices. Wireless communication takes place in the unlicensed 868 MHz band. Built-in 128-bit AES encryption provides the most secure encryption standard for wireless connections. The USB side uses the HID standard, which does not require any physical installation of the drivers on a Windows based PC. It allows to update the device firmware in the wireless network, and the firmware of its own USB configurator WUSB01 at the same time. Since all Midam wireless modules feature a native modbus map with the direct read and write functionality, this configurator is the perfect device for direct intervention or while maintaining/ configuring the already installed wireless solution project. It is recommended to perform individual configuration, especially to enter the encryption password.

WIRING DIAGRAM



SPECIFICATIONS

USB configurator	WUSB01
Power supply	USB 5 V
Consumption	100 mA max.
Communication	868.950 MHz, 100 kbps, WMBUS T1, KFP 868.300 MHz, 32 kbps, WMBUS S1, KFP 868.100 MHz, 100 kbps, KFP 869.525 MHz, 100 kbps, WMBUS C, KFP 868.300 MHz, 38 kbps, KFP
Protocol	WMBUS (EN 13757-4), KFP (dual stack)
Encryption	AES 128 PCBC, EN 13757-4
RF power	+13 to -20 dBm, step 5 dB
Antenna	integrated
Communication range	80 m in free space, 20 m in buildings
Mechanical and dimensions	71×23×9 mm, polycarbonate enclosure, UL94-V0, IP 20 in accordance with EN 60529, as amended
Ambient conditions	-5 to 45 °C, 5 % to 95 % rH (EN 60721-3-3 class 3K5)

SENSIT s.r.o., Skolni 2610, 756 61 Roznov pod Radhostem, Czech Republic
T +420 571 625 571 **F** +420 571 625 572 **E** obchod@sensit.cz

ACCESSORIES FOR SENSORS

040.11en

THERMOWELLS

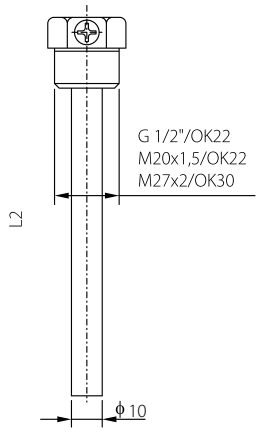
Thermowells are component parts that are usually screwed in or welded in a pipe line. They protect the measuring part of the sensors against the influence of the liquid being measured. Thermowells enable the replacement of the temperature sensors while the technological equipment is in operation. All of the thermowell types manufactured by SENSIT s.r.o. are made of high-quality stainless steel 1.4301. They are standardly provided with G1/2" thread, but is also possible to deliver them with the G 3/8", M 20 x 1.5, M 27 x 2 threads or even others if necessary. In addition to the standard lenghts listed in catalogues, thermowhells can also be manufactured in non-standard lenghts. Temperature sensors are locked in the thermowhell with a M4 x 10 screw.

AND WATER VAPOUR / WATER [m.s^{-1}]

Thermowell length L2 (mm) Thermowell diametre (mm)	up to 60	> 60 to 100	> 100 to 160	> 160 to 220	> 220 to 400
Ø 6 and Ø 8	20 / 2.0	15 / 1.5	8.0 / 1.0	2.5 / 0.6	0.6 / 0.3
Ø 10 and Ø 12	35 / 3.5	30 / 3.0	15 / 2.0	5.0 / 1.2	1.6 / 0.8

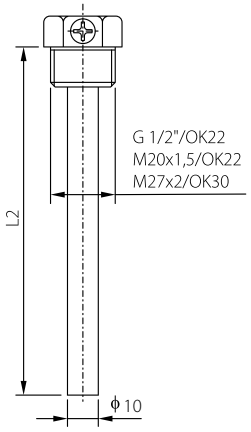
DIMENSIONAL DRAFT

Thermowell JS 130



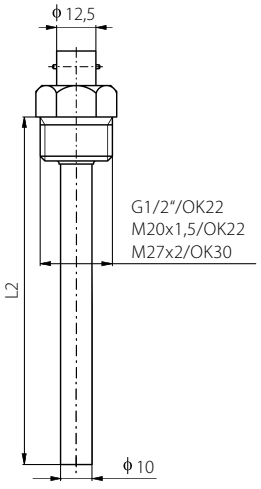
Use: temperature sensors with stem, temperature sensors with metal connection head, PTS 580P, PTS 580K
Temperature renage: -100 to 450 °C
Standard lengths L2: 50, 100, 160, 220, 280, 340, 400 mm
Max. stem diametre: 6.2 mm

Thermowell JS 130B



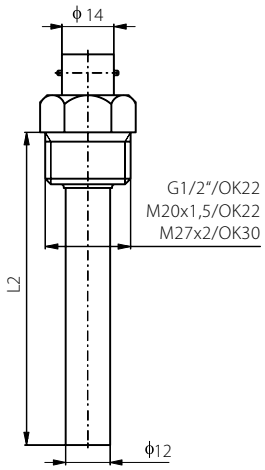
Use: temperature sensors with stem, temperature sensors with metal connection head, PTS 580P, PTS 580K
Temperature renage: -100 to 450 °C
Standard lengths L2: 50, 100, 160, 220 mm
Max. stem diametre: 7 mm

Thermowell JS 130G



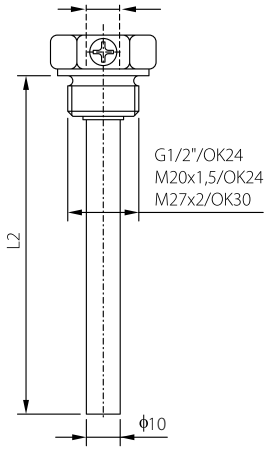
Use: cable temperarure sensors with bayonet TG 60, TG 61, TG 62
Temperature renage: -100 to 450 °C
Standard lengths L2: 50, 100, 160, 220, 280 and 400 mm
Max. stem diametre: 6.2 mm

Thermowell JS 130F



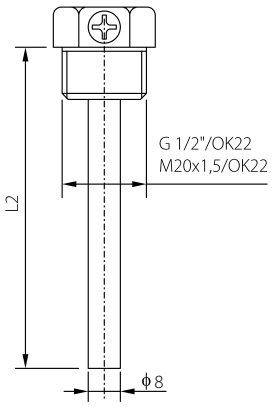
Use: cable temperarure sensors with bayonet TG 80, TG 81, TG 82
Temperature renage: -100 to 450 °C
Standard lengths L2: 50, 100, 160, 220, 280, 400 mm
Max. stem diametre: 8.9 mm

Thermowell JPTS 41



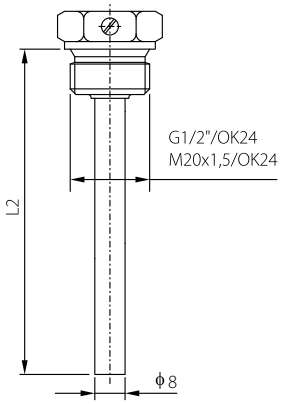
Use: platinum temperature sensors up to 400 °C PTS 41, PTS 43, PTS 45, PTS 51, PTS 81
Temperature renage: -100 to 450 °C
Standard lengths L2: 50, 100, 160, 220, 280, 400 mm
Max. stem diametre: 6.2 mm

Thermowell JTG 8



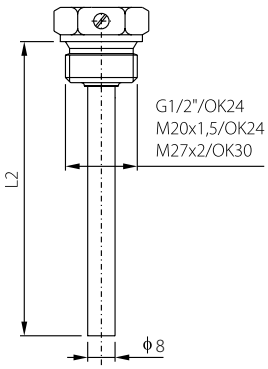
Use: sensing elements in case of TG 8
Temperature renage: -100 to 450 °C
Standard lengths L2: 40, 60, 80, 100 mm
Max. stem diametre: 5.9 mm
(part of the sensor has to be fixing ring TG 8)

Thermowell JTP 11



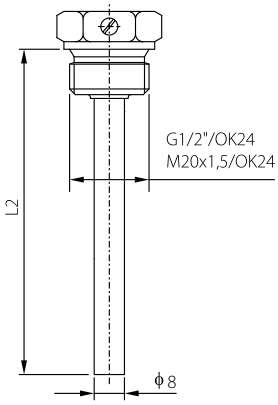
Use: only for paired temperature sensors TP 11
Temperature renage: -100 to 450 °C
Standard lengths L2: 86, 136, 176 mm
Max. stem diametre: 5.8 mm

Thermowell JTP 15



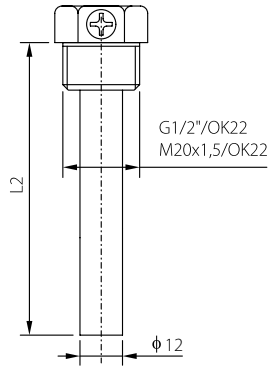
Use: paired temperature sensors TP 15
Temperature renage: -100 to 450 °C
Standard lengths L2: 65, 105, 140, 230 mm
Max. stem diametre: has to be smaller than 6 mm (tolerance according to standard EN 1434, as amended)

Thermowell JTP 16



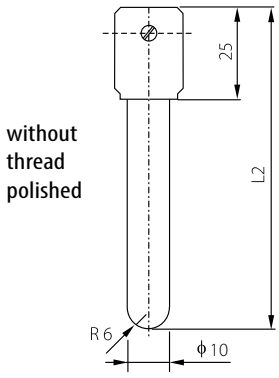
Use: paired temperature sensors TP 16
Temperature renage: -100 to 450 °C
Standard lengths L2: 105, 140, 230 mm
Max. stem diametre: has to be smaller than 6 mm (tolerance according to standard EN 1434, as amended)

Thermowell J 001



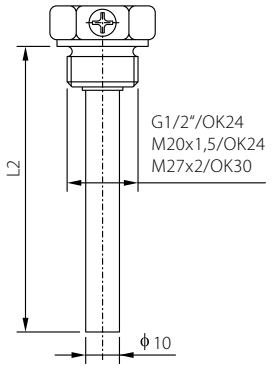
Use: for temperature sensors with diametre 8 mm
Temperature renage: -100 to 450 °C
Standard lengths L2: 65, 105, 165 mm
Max. stem diametre: 8.9 mm

Thermowell J 010



Use: to food-processing industry, e.g. for temperature sensors PTS 580P and PTS 580K
Temperature renage: -100 to 450 °C
Standard lengths L2: 110, 170, 250 mm
Max. stem diametre: 6.3 mm

Thermowell JPTS 641



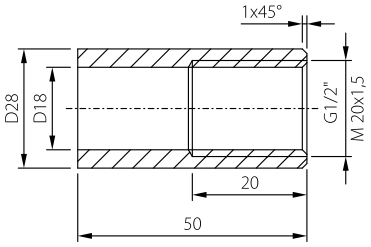
Use: platinum temperature sensors up to 600 °C with protection IP 68 PTS 641, PTS 645, PTS 651
Temperature renage: -100 to 450 °C
Material: stainless steel DIN 1.4571
Standard lengths L2: 50, 100, 160, 220, 280, 400 mm
Max. stem diametre: 6.9 mm

WELDED-ON PIECES

Welded-on piece is designed for direct mounting in pipes or for direct measuring by temperature sensor in medium. We standardly produce the welded-on pieces of a material stainless steel DIN 1.4301 or iron DIN 1.0254.

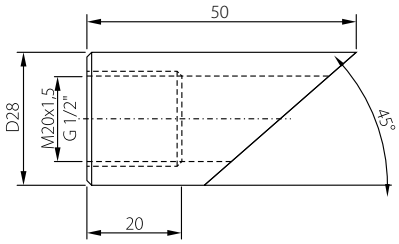
Direct welded - on piece

- stainless steel DIN 1.4301
- iron DIN 1.0254



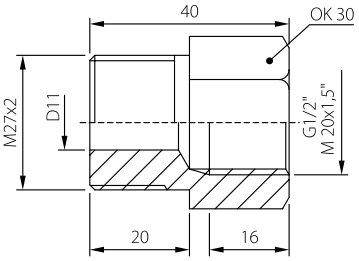
Skew welded - on piece -

- stainless steel DIN 1.4301
- iron DIN 1.0254



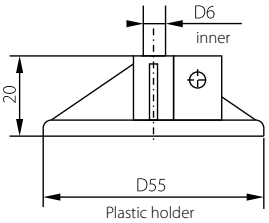
REDUCERS

Reducer - iron DIN 1.0737

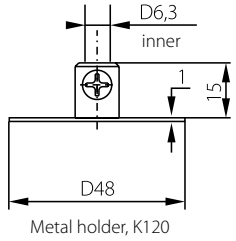


HOLDERS

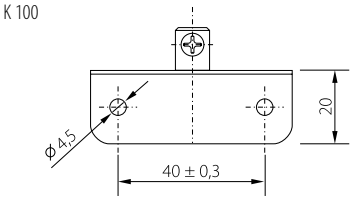
Plastic holder

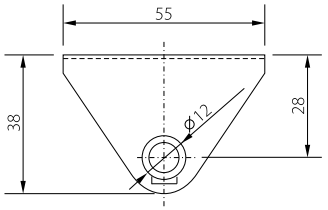


Metal holder K 120

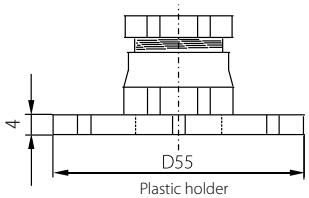


Metal holder K 110, K 110 C

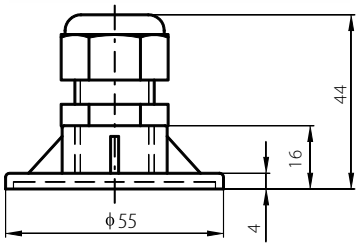




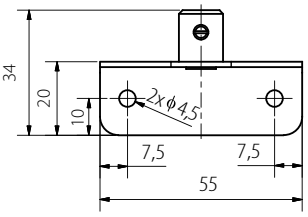
Plastic holder - humidity

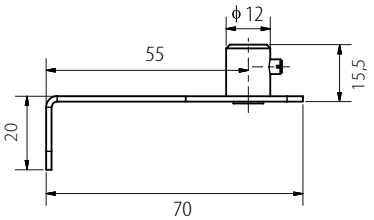


Plastic holder - flow



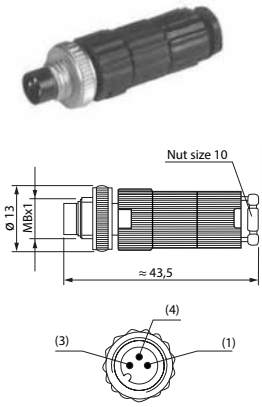
K 110C - explosive environment



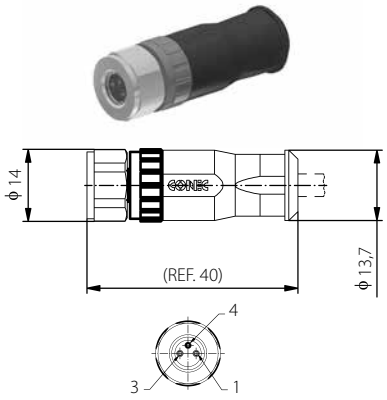


CONNECTORS

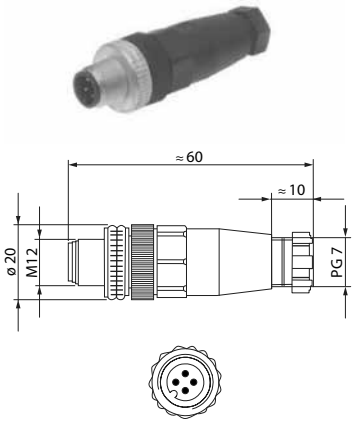
Connector ELST 3008V for cable MALE



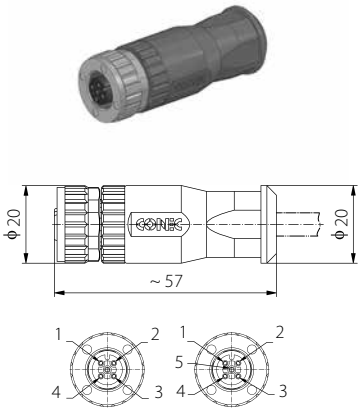
Terminal connector CONEC 42-00010 for cable FEMALE



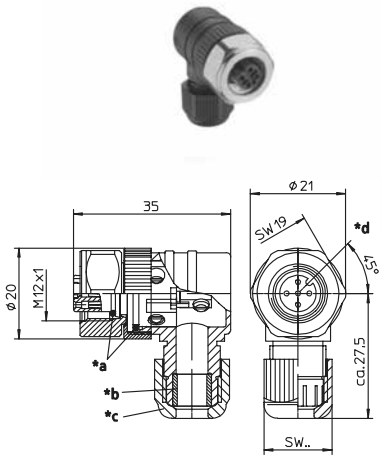
Connector ELST 4012 for cable MALE



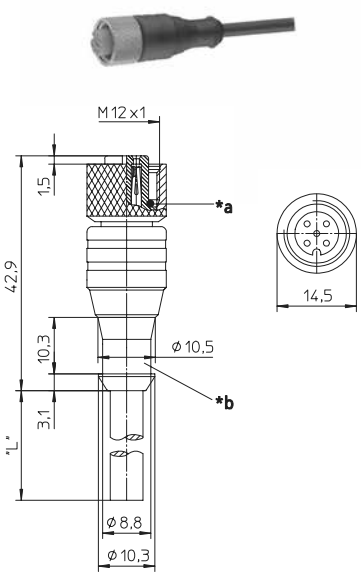
Terminal connector CONEC 43-00092 for cable FEMALE



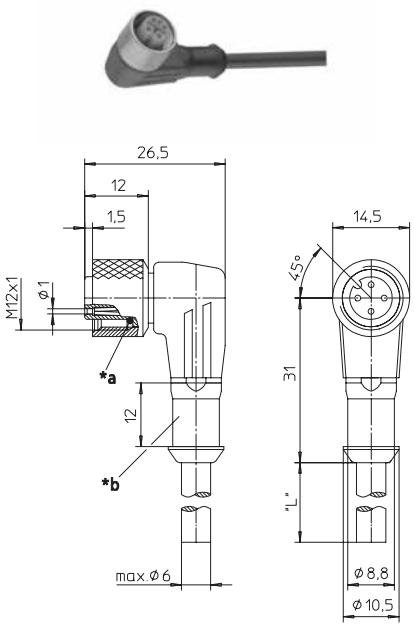
Rectangular connector RKCWN for cable FEMALE



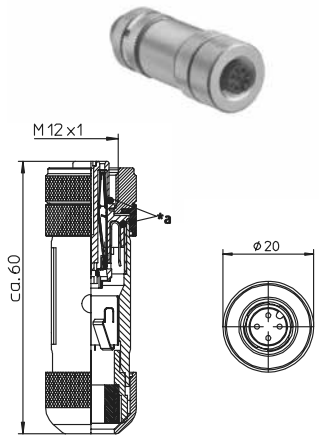
Direct connector RKT with 5 m of cable FEMALE



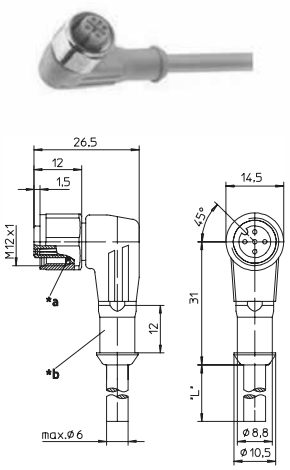
Right-angle connector RKWT with 5 m of cable FEMALE



Terminal connector RKCS 4/9 stainless steel for cable FEMALE

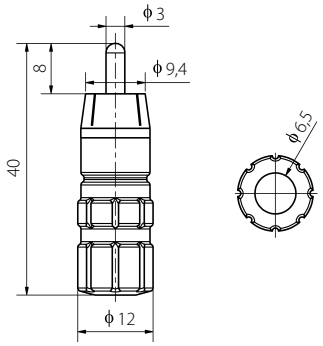


Right-angle connector PRKWT stainless steel with 5 m of cable FEMALE

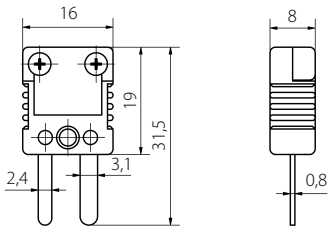


CONNECTORS

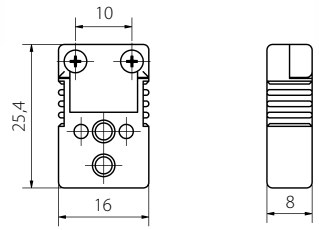
Connector CINCH VK – for cable FEMALE



Thermocouple connector – jack



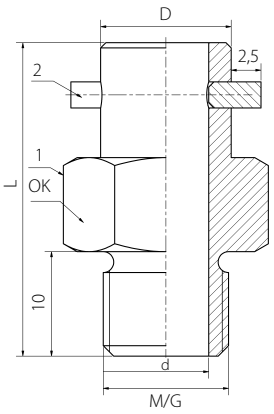
Thermocouple connector – plug



BAYONET ADAPTERS

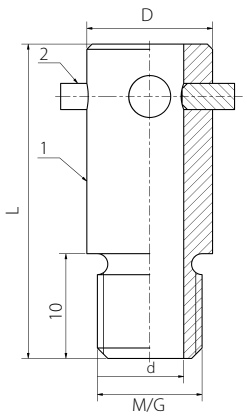
Bayonet adapter with a nut – BAM

Bayonet adapter - BAM				
OK	Thread M/G	Hole diameter d	Length of adapter L	Diameter of adapter D
17	M10 x 1	7 mm	25 -100 mm	12 / 14 mm
	M12 x 1			
	M12			
	M14 x 1,5	7 / 9 mm		
	G 1/4			
22	G 3/8			
24	G 1/2			



Bayonet adapter smooth – BAH

Bayonet adapter - BAH			
Thread M/G	Hole diameter d	Length of adapter L	Diameter of adapter D
M10 x 1	7 mm	25 - 100 mm	12 / 14
M12 x 1			
M12			
M14 x 1,5			
G 1/4	7 / 9 mm		
G 1/2			



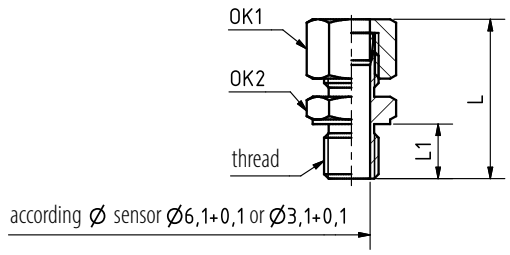
SLIDING FITTING

The POS compression fitting with a notched ring is an accessory designed for installation of temperature sensors with 3 - 8 mm diameters into thermowells, boreholes and various systems (gearboxes, bearings, etc.), and allows you to adjust a required immersion depth of the sensor in the measured medium. The compression fitting can be made of stainless steel DIN 1.4301 or DIN 1.4571. The fitting consists of three parts – mounting fitting for securing in a measured point, a notched sealing ring and a cap nut to tighten the ring. The selected immersion depth cannot be changed anymore after the tightening. The inner diameter of the compression fitting is always bigger by 0.1 - 0.2 mm than the sensor diameter.

Sizes, materials and threads of the compression fitting can be changed if required by the customer.

Fitting specification	Sensor diameter	Mounting fitting					Total length after tightening L
		Thread type	Thread length L1	Size OK	Thread type	Size OK1	
POS 30	3 mm	M 8x1	10 mm	12	M 8x1	12	35 mm
POS 30	3 mm	M 10x1,5	10 mm	14	M 8x1	12	35 mm
POS 30	3 mm	G 1/4"	10 mm	17	M 12x1	17	35 mm
POS 40	4 mm	M 8x1	10 mm	12	M 8x1	12	35 mm
POS 40	4 mm	M 10x1,5	10 mm	14	M 8x1	12	35 mm
POS 40	4 mm	G 1/4"	10 mm	17	M 12x1	17	35 mm
POS 60	6 mm	M 10x1,5	10 mm	14	M 8 x1	12	35 mm
POS 60	6 mm	M 12x1,5	10 mm	17	M 12x1	17	35 mm
POS 60	6 mm	M 20x1,5	15 mm	24	M 12x1	17	40 mm
POS 60	6 mm	G 1/2"	15 mm	24	M 12x1	17	40 mm
POS 80	8 mm	M 12x1,5	10 mm	17	M 12x1	17	35 mm
POS 80	8 mm	G 3/8	15 mm	22	M 12x1	17	40 mm
POS 80	8 mm	M 20x1,5	15 mm	24	M 12x1	17	40 mm
POS 80	8 mm	G 1/2"	15 mm	24	M 12x1	17	40 mm

DIMENSIONAL DRAFT



TEMPERATURE TO CURRENT CONVERTERS STI AND STID (4 to 20 mA)

020.17en

DESCRIPTION AND APPLICATION

CE

STI and STID converters are intended for converting the signal of Ni 1000/6180, Pt 100/3850 or Pt 1000/3850 resistance-type temperature sensing elements to the unified signal 4 to 20 mA. These converters can be utilised in any control system compatible with 4 to 20 mA current output. standard Measuring ranges of the converter are listed in the specifications table. Operating temperature range is -30 to 70 °C. These limits must not be exceeded even for a short time. The sensors are designed to be operated in a chemically non-aggressive environment. Two variants exist regarding to the design of the converter case:

1. STI Pt and STI Ni converters: the plastic case is made of POLYAMIDE material, and is identical to, for example, the connection head of S 120 sensors. It is provided with a wall bracket or with a clip for attaching to a DIN rail. The terminal board casing meets the IP 65 ingress protection requirements according to the EN 60529 standard, as amended.

2. STID Pt: the plastic box is made of TARFLON - IRY 2200, which meets requirements of UL 90 V-0 standard, as amended. It is intended for installation directly to a switchboard on a DIN rail.

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.

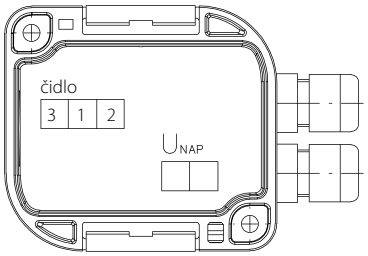
SPECIFICATIONS

Converter type	STI Ni	STI Pt 100 STID Pt 100	STI Pt 1000 STID Pt 1000
Input signal	Ni 1000/6180	Pt 100/3850	Pt 1000/3850
Output signal	4 to 20 mA		
Power supply (U)	11 to 30 V DC (recomended value 24 V DC)		
Maximum voltage ripple	0.5 %		
Standard measuring ranges*)	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C 0 to 250 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 400 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 400 °C
STI and STID ingress protection	STI: IP 65 in accordance with EN 60529, as amended STID: IP 20 (plastic case) / IP 00 (terminal board) in accordance with EN 60529, as amended		
Ambient temperature	-30 to 70 °C		
Measuring error	< 0.6 % of the measuring range, minimum 0.5 °C		
Load resistance	150 Ω for power supply 12 V DC 700 Ω for power supply 24 V DC		
Output current for sensing element break	> 24 mA		
Output current for sensing element short	< 3.5 mA		
Sensor connection	according to the wiring diagram		
Recommended wire cross section	STI: 0.35 to 1.5 mm^2 STID: 0.35 to 2.5 mm^2		
Material of case	STI: POLYAMIDE STID: TARFLON - IRY 2200 - meets requirements of UL 94 V-0, as amended		
Operating conditions	ambient temperature: -30 to 70 °C relative humidity: max. 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa		
Weight	0.15 kg		

**)According to the customer's requirement, it is possible to provide a customized measuring range from -40 to 150 °C; the minimum span of the range must be 35 °C (e.g. -20 to 15 °C; -30 to 80 °C)*

WIRING DIAGRAM

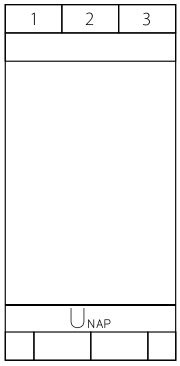
STI Ni, STI Pt 100, STI Pt 1000



UNAP – power supply
arbitrary polarity,
output4 to 20 mA

1, 2, 3 – sensor connection terminals

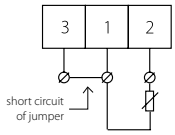
STID Pt 100, STID Pt 1000



UNAP – power supply
arbitrary polarity,
output4 to 20 mA

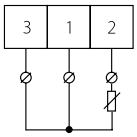
1, 2, 3 – sensor connection terminals

STI - 2-wire connection



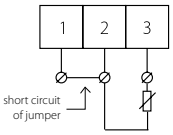
Ni 1000, Pt 100, Pt 1000

STI - 3-wire connection



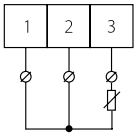
Pt 100, Pt 1000

STID - 2-wire connection



Pt 100, Pt 1000

STID - 3-wire connection



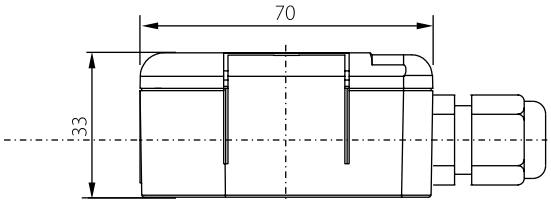
Pt 100, Pt 1000

Note: for 2-wire connection must be short circuit of jumper between terminals 3 and 1 plugged in.

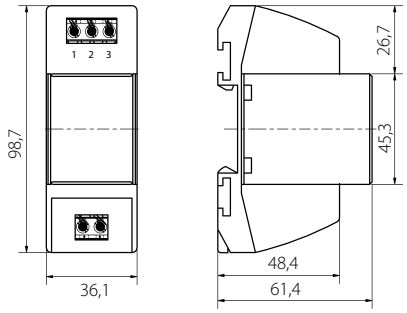
Note: for 2-wire connection must be short circuit of jumper between terminals 3 and 1 plugged in.

DIMENSIONAL DRAFT

STI



STID



TEMPERATURE TO VOLTAGE CONVERTERS STU (0 to 10 V)

021.14en

DESCRIPTION AND APPLICATION

Converters STU and are intended for converting the signal of the Pt 100/3850 or Pt 1000/3850 resistance-type temperature sensing elements to a unified signal 0 to 10 V. These converters can be utilised in any control system compatible with 0 to10 V voltage output. The case is provided by the console for wall-mounting or a bracket for mounting to the DIN rail. Their standard measuring ranges are listed in the specifications table, Their operating temperature range is -30 to 70 °C. These limits must not be exceeded even for a short time. The sensors are designed to be operated in a chemically non-aggressive environment. Two variants exist regarding to the design of the converter case:

STU Pt: the plastic case is made of POLYAMIDE material, and is identical to, for example, the connection head of S 120 sensors. It is provided with a wall bracket or with a clip for attaching to a DIN rail. The terminal board casing meets the IP 65 ingress protection in accordance with EN 60529 standard, as amended.

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.

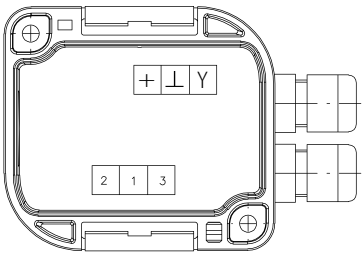
SPECIFICATIONS

Converter type	STU Pt 100	STU Pt 1000
Input signal	Pt 100/3850	Pt 1000/3850
Power supply (U)	15 to 30 V DC (recommended value 24 V DC)	
Measuring ranges*)	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 250 °C 0 to 400 °C	-30 to 60 °C 0 to 35 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 250 °C
STU and ingress protection	STU: IP 65 in accordance with EN 60529, as amended	
Ambient temperature	-30 to 70 °C	
Measurement error	< 0.6 % of the measuring range, minimum 0.5 °C	
Load resistance min	10 k Ω	
Current consumption	< 8 mA	
Sensing element break	> 14 V	
Sensing element short	~ 0 V	
Sensor connection	according to the wiring diagram	
Recommended wire cross section	STU: 0.35 to 1.5 mm^2	
Material of the case	STU: POLYAMIDE	
Weight	0.15 kg	

**) According to the customer's requirement, it is possible to provide a customized measuring range from -40 to 150 °C; the minimum span of the range must be 35 °C (e.g. -20 to 15 °C; -30 to 80 °C)*

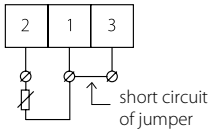
WIRING DIAGRAM

STU Pt 100, STU Pt 1000



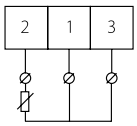
Y - output 0 to 10 V
⊥ - negative pole of power supply
+ - positive pole of power supply
1, 2, 3 - sensor connection terminals

STU - 2-wire connection



Pt 100, Pt 1000

STU - 3-wire connection

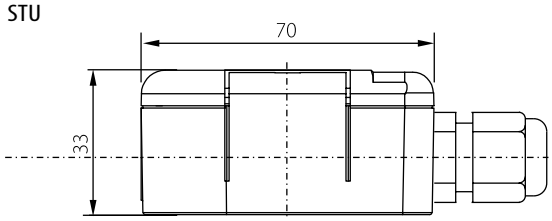


Pt 100, Pt 1000

Note: for 2-wire connection must be short circuit of jumper between terminals 1 and 3 plugged in.

DIMENSIONAL DRAFT

STU



TEMPERATURE CONVERTERS – RS 485

022.05en

DESCRIPTION AND APPLICATION

ST 485 and STD 485 converters are intended for converting the signal of Pt 1000/3850 resistance-type temperature sensing elements to the digital signal of RS485 serial bus. The standard temperature range is -50 to 150°C. Communication inputs are protected to overvoltage. In case the module is placed as terminal on the line, a terminating resistor can be attached to the wiring by shorting the contacts (the switch SW placed next to terminals for communication lines connection). All settings are stored in EEPROM memory. The electronic module is equipped with the WATCHDOG circuit, which safeguards proper program functioning in the microprocessor. These converters can be utilised in any control system compatible with communication protocol MODBUS RTU. Easy mounting of the converters is ensured by the unique "S head" design invented by SENSIT s.r.o. The converters are designed to be operated in a chemically non-aggressive environment. The converters are made in basic variant:

ST 485C – the command structure corresponds with the ModBus RTU communication protocol.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

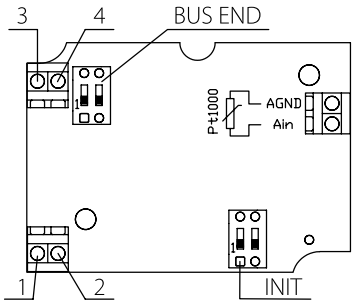
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers 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.

CONVERTERS

SPECIFICATIONS

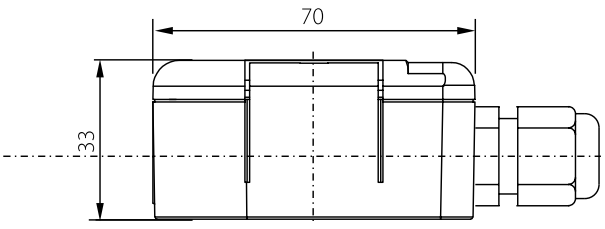
Converter type	ST 485C STD 485C
Input signal	Pt 1000/3850
Power supply (U)	10 to 35 V DC (unstabilized) 14 to 24 V AC
Power consumption	max. 1000 mW
Measuring range	-50 to 150 °C
Communication properties	communication via RS 485, maximum segment length is 1200 m, asynchronous transfer
	preset transfer speed 9600 Bd optional transfer speeds 1200, 2400, 4800,19200, 57600, 115200 Bd - DIP switch
	247 modules / 1 serial port
	protocol ModBus RTU 1 stop bit, without parity
Accuracy of electronics	0.05 %
Resolution	0.01 °C
Ingress protection	IP 65 in accordancec with EN 60529, as amended
Recommended wire cross section	0.14 to 1.5 mm^2
Material of the sensor stem	stainless steel DIN 1.4301
Material of the connection head	POLYAMIDE
Operating conditions	ambient temperature: -10 to 70 °C relative humidity: max. 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa
Weight	0.2 kg

WIRING DIAGRAM



Marking	Description
1	power supply
2	power supply
3	+ data bus RS 485
4	- data bus RS 485
INIT	INIT mode initialization
BUS END	connection for bus ending

DIMENSIONAL DRAFT



CONVERTER (GATEWAY) 1-WIRE (DALLAS) to RS 485 MODBUS RTU 1-WIRE-GWY-MOD

129.01en

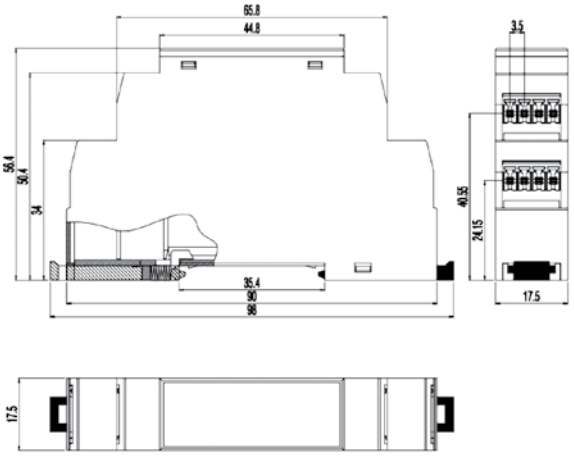
DESCRIPTION AND APPLICATION

Gateway **1-WIRE-GWY-MOD** is designed to convert 1-WIRE signals from temperature and humidity sensors or contact access chips to output buses RS 485 or RS 232 with the MODBUS RTU communication protocol. It can be connected to up to 40 temperature sensors and combined temperature and humidity sensors or contact access chips through two buses with 1-WIRE (DALLAS) communication. One bus can accommodate either 20 temperature and humidity sensors or 20 access chips (i.e. a total of 40 sensors / 1 unit). Gateway 1-WIRE-GWY-MOD offers a simple and variable solution for measurement in buildings, equipment or remote measurement through a bus, including simple installation in switchboards. Complete gateway management is implemented through SW application 1-WIRE-GWY Tool, which includes baud rate and address settings, sensor position addressing, value display, firmware upgrade and other necessary functions. The comprehensive service also contains SW support = ready library elements (programs) for control systems of various manufacturers.

SPECIFICATIONS

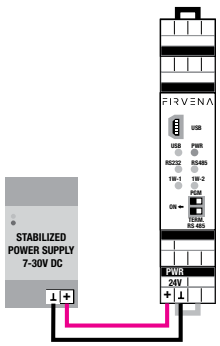
Converter type		1-WIRE-GWY-MOD
Input signal	Type	1-WIRE (DALLAS)
	Protocol	1-WIRE (DALLAS)
	Number of temp. sensors per bus	20
	Number of buses (lines)	2
	Galvanic isolation from power supply	yes
	Bus (line) status identification	yes - LED
Output signal	Type	RS 485 (TIA / EIA-485-A), RS 232
	Protocol	MODBUS RTU, slave, supported functions 03, 06, 16
	Communication speed for RS 485 and RS 232	optional (kBd) 1200, 1800, 2400, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 56000, 57600, 76800, 115200, 128000, 230400
	Address	1-247
	Number of devices on RS 485 line	32
	Parity	no, even, odd
	Stopbit	1, 2
	Galvanic isolation from power supply	ano
	Indication	yes, yellow LED on top panel
Electrical data	Power supply	8 to 27 / DC (tolerance ± 10 %)
	Own consumption	1,5 W
	Indication	yes, green LED on top panel
Operating hours	Ingress protection	IP 20 in accordance with EN 60529, as amended
	Operating temperature range	0 to 40 °C
	Relative humidity of the air	max. 80 %
	Outer dimensions (H x W x D)	98 x 17.5 x 56.4 mm

WIRING DIAGRAM

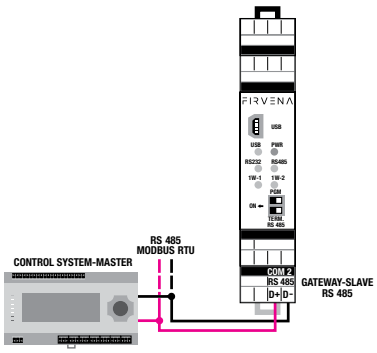


DIMENSIONAL DRAFT

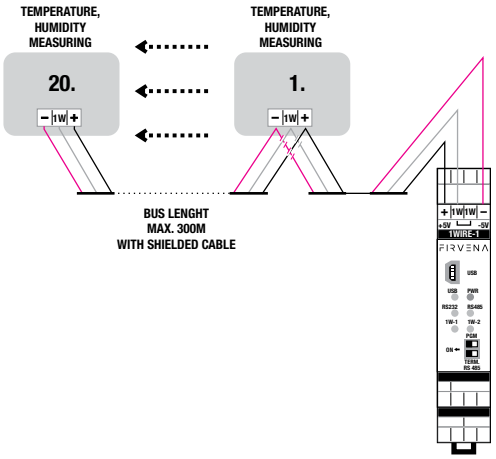
Power supply 24V, DC



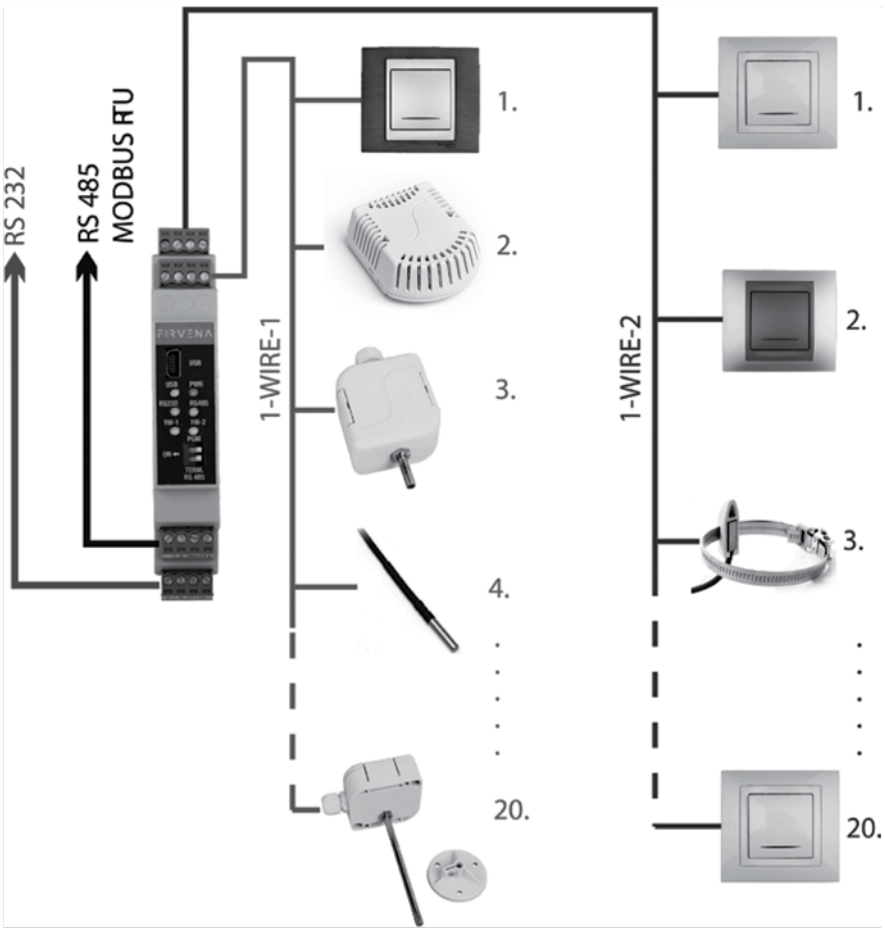
Communication RS 485



Example of 1-wire sensor connection



EXAMPLE OF INTERFACING OF INDIVIDUAL INTERFACES



PROGRAMMABLE CONVERTERS

201.04en

INOR CONVERTERS

APAQ-H ANALOGUE PROGRAMMABLE CONVERTER

Use	APAQ-H is a series of multi-range two-wire temperature converters for thermometer heads
Input	Pt100 (-HRF, -HRFX), thermocouple J, L, T, K, N (-HCF, -HCFX)
Output	4 to 20 mA
Measuring range	Adjustable; -HRF, -HRFX: 50/100/150/200/300/400/500 °C
	-HCF, -HCFX: 10 to 50 mV continuously
Accuracy	-HRF, -HRFX: ±0.15 % of the temperature range -HCF, -HCFX: ±0.5 % to ±1.0 % of the temperature range
Maximum operating temperature range	-40 to 85°C
Power supply (U)	6.5 to 32 VDC (-HRF, -HCF), 8.5 to 30 VDC (-HRFX, -HCFX)

-HRFX, -HCFX: designed for explosive environments

MINIPAQ-H BASIC PROGRAMMABLE CONVERTER

Use	Basic, programmable, uninsulated, two-wire converter for thermometer heads
Input	Pt100, Pt1000, thermocouple B, E, J, L, T, K, N, R, S, U
Output	4 to 20 mA
Measuring range	Programmable
Accuracy	±0.15 %
Maximum operating temperature range	-40 to 85 °C
Power supply (U)	8 to 36 VDC

-HX: designed for explosive environments

IPAQ-H UNIVERSAL PROGRAMMABLE CONVERTER

Use	IPAQ-H/-HX are universal insulated, two-wire, programmable converters for thermometer heads
Input	Pt100, Pt1000, potentiometer, thermocouple B, E, J, L, T, K, N, R, S, U
Output	4 to 20 mA
Measuring range	Programmable
Accuracy	±0.1 % of the temperature range
Maximum operating temperature range	-40 to 85 °C
Power supply (U)	6.5 to 36 VDC (-H), 8.0 to 30 VDC (-HX)

-HX: designed for explosive environments

UNIVERSAL

MESO-H UNIVERSAL HART COMPATIBLE PROGRAMMABLE CONVERTER

Use	MESO-H/-HX are intelligent, universal, fully linearized and insulated two-wire converters for thermometer heads
Input	Pt100, Pt1000, thermocouple B, E, J, L, T, K, N, R, S, U
Output	4 to 20 mA
Measuring range	Programmable
Accuracy	±0.1 % of the temperature range
Maximum operating temperature range	-40 to 85 °C
Power supply (U)	MESO-H: 10 to 42 VDC, MESO-HX: 12 to 30 VDC

MESO-HX: designed for explosive environments

HART

IPAQ-C520 UNIVERSAL PROGRAMMABLE CONVERTER

Use	IPAQ-C520/-C520X are insulated programmable converters for heads with HART 6 protocol and double input
Input	Pt100, Pt1000, potentiometer, thermocouple B, C, D, J, K, L, N, R, S, T, U
Output HART	Measuring range Programmable
Accuracy	±0.05 % of the temperature range, max. ±0.1 °C
Maximum operating temperature range	-40 to 85 °C
Power supply (U)	10 to 36 V

-C520X: designed for explosive environments

HART

IPAQ-HPLUS UNIVERSAL PROGRAMMABLE CONVERTER

Use	IPAQ-HPLUS/HXPLUS are efficient insulated, two-wire programmable converters for thermometer heads
Input	Pt100, potentiometer, thermocouple B, E, J, L, T, K, N, R, S, U
Output	4 to 20 mA
Measuring range	Programmable
Accuracy	±0.05 % of the temperature range
Maximum operating temperature range	-40 to 85 °C
Power supply (U)	-HPLUS: 6.5 to 36 VDC, -HXPLUS: 8.0 to 30 VDC

-HXPLUS: designed for explosive environments

EXTREMELY FAST AND ACCURATE

PROFIPAQ-H UNIVERSAL PROFIBUS-PA CONVERTER

Use	PROFIPAQ-H/-HX are highly efficient and very resistant converters for thermometer heads
Input	Pt100, Pt1000, Ni100, Ni1000, potentiometer, thermocouple B, E, J, L, T, K, N, R, S, U
Output	Digital Profibus – up to 125 converters in one network
Measuring range	Programmable
Accuracy	Pt100: ±0.1 °C
Maximum operating temperature range	-40 to 85 °C
Power supply (U)	PROFIPAQ-H: 9 to 32 VDC, PROFIPAQ-HX: 9 to 17.5 VDC

PROFIPAQ-HX: designed for explosive environments

PROFIBUS

INTELLIGENT PROGRAMMABLE CONVERTERS FOR HEADS

DESCRIPTION

PP and SH1 heads are programmable converters for heads and they are designed for converting industrial signals from resistant temperature sensors (SH1, SLM) or thermocouples into a unified industrial signal of 4 to 20 mA.

Converter type	PP200	PMA300	PP300
Input	PT 100/3850 PT 1000/3850 Ni 100/5000 and 6180, Ni 1000/5000 and 6180	PT 100/3850 PT 1000/3850 Ni 100/5000 and 6180 Ni 1000/5000 and 6180	PT 100/3850 PT 1000/3850 Ni 100/5000 and 6180 Ni 1000/5000 and 6180 Thermocouple J, L, K, T, S, B, E...
Input connection	2 or 3-wire	2-wire	
Output		4 to 20 mA, programmable range	
Measuring range	Random, min. 10 °C margin	Random, min. 10 °C margin	According to the thermocouple type
Linearization	Yes	Yes	Yes
Power supply (U)	8 to 28 V on output loop	8 to 28 V on output loop	8 to 30 V on output loop
Accuracy	0.15 %	0.15 %	0.15 %
Maximum operating temperature range	-25 to 80 °C	-25 to 80 °C	-25 to 80 °C

**) Errors in percentage are related to the range.*

UNIVERSAL PROGRAMMABLE CONVERTERS FOR DIN RAILS

DESCRIPTION

Programmable measuring converters are designed for converting industrial signals from resistant temperature sensors (PP210, PSTID, SUG2) or thermocouples (PSTID, SUG2) into a unified industrial signal of 4 to 20 mA.

Converter type	PP210	SUG2
Input	PT 100/3850 PT 1000/3850 Ni 100/5000 and 6180 Ni 1000/5000 and 6180	PT 100/3850 PT 1000/3850 Ni 100/ 6180 Ni 1000/ 6180 Thermocouple J, L, K, T, S, B, E...
Input connection	2 or 3-wire	2 or 3-wire
Output	4 to 20 mA	4 to 20 mA
Galvanically separated output	No	Yes
Measuring range	Random, min. 10 °C margin	Random, min. range in °C according to the sensor type
Linearization	Yes	Program-controlled
Power supply (U)	8 to 28 V	9 to 30 V
Maximum operating temperature range	-20 to 80 °C	-20 to 80 °C

EVO MINI – PROGRAMMABLE CONVERTERS FOR CABLES

DESCRIPTION

The programmable converter is designed for converting industrial signals from resistance temperature sensors Pt 100/3850 into the unified signal of 4–20 mA. Its structure makes it suitable for connecting to cable sensors.

Input	Pt 100/3850
Input connection	3-wire
Connector	M12 4-pin
Output	4 to 20 mA
Measuring range	Programmable, max. -50 to 800 °C, min. 50 °C margin
Power supply (U)	8.5 to 32 V
Accuracy	0.2 %
Size	Diameter 14 mm, length 55 mm
Maximum operating temperature range	-40 to 80 °C (for plastic body)

TEMPERATURE SWITCHES TSDD

107.05en

DESCRIPTION AND APPLICATION

TSDD switches are built as two-state regulators (ON/OFF regulation), which compare the set and immediate temperature and enable switching galvanically isolated relay contacts when the set temperature value is reached. The sensors consists of a plastic connection head with the transparent lid. In the connection head is located electronic equipment with LED display. The switches meet the IP 65 ingress protection requirements according to the EN 60529 standard, as amended. Easy mounting of the switches is ensured by the unique "S head" design invented by SENSIT s.r.o.

Regarding sensing element location and switch application the following versions are available:

TSDD A – temperature switch for sensing temperature in the switch ambient. The sensing element is placed in the metal stem. TSDD P – contact version switch for fixing on pipeline surfaces for surface temperature measurements. The sensing element is housed in a measuring case made of metal. It is delivered with the fastening tape of the length 40 cm and with closure device.

TSDD K – the sensing element is placed in the metal stem for use in air condition equipment or in tubings. This temperature switch version is available with a plastic mounting clip. Stainless steel thermowell or metal holder can be delivered as an acsessory.

TSDD C – the sensing element is protected by the TG 8 case, 40 mm long, and provided with a cable 1 m long. Another case type or another cable length should be specifi ed in the order.

Standard temperature ranges, in which the temperature set point can be adjusted, are given in the specifications table. For the TSDD A the maximum allowable operation temperature is 70 °C, for the TSDD P this temperature limit is 110 °C. For applications above 140 °C the TSDD K may be used. However, in this case the switch version with the stem elongated by 60 mm and the metal centric fixing clip must be used. These switches are designed to be used in a chemically non-aggressive environment.

ACCESSORIES

- stainless steel thermowell JS 130
- metal central holder K 120
- plastic holder
- lead-in connector 43000-92 - for all types
- connecting cables with direct connector RKT or rectangular connector RKWT
- thermal copnductive paste up to 200 °C, 5 g for TSDD P type
- screw nwith collet or cutting rings - if different lengths of stem immersion of the temperature sensor are set

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

Output	1 switch relay
Type of sensing element	Pt 1000/3850
Power supply (U)	12 or 24 V DC
Maximum switched voltage / current	30 V DC / 5 A
Maximum temperature range	-50 to 300 °C
Hysteresi	1 to 15 °C
Electronics equipment error	± (0.2 % of values + 1 dig.)

OTHER PARAMETERS

Output	1 switch relay
Accuracy class of Pt sensor	class B according to EN 60751, t = ± (0,3 + 0,005|t|) in °C
Connection head dimension	70 x 63 x 34 mm
Material of the connection head	POLYAMIDE
Ingress protection	IP 65 in accordance with EN 60529, as amended
Ambient temperature around the connection head	-30 to 70 °C
Recommended wire cross section	0.2 to 1 mm2
Insulation resistance	> 200 MΩ at 500 V DC, 25°C ± 3 °C

ADDITIONAL DATA FOR INDIVIDUAL SENSOR TYPES

TSDD A	
Standard length of the stem L1	50 mm
Diameter of the stem	6 + 0.2 mm
Material of the stem	stainless steel DIN 1.4301
Maximum temperature range	-25 to 70 °C
Weight	0.12 kg

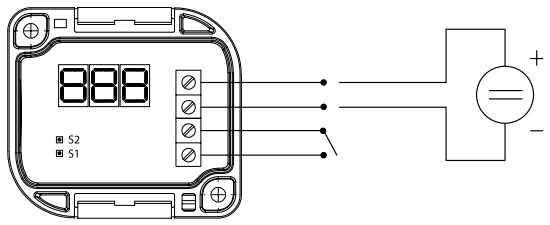
TSDD K	
Standard length of the stem L1	70, 120, 180, 240 mm
Diameter of the stem	6 + 0.2 mm
Material of the stem	stainless steel DIN 1.4301
Switch installation	by means of a plastic or stainless steel holder or a stainless steel thermowell
Maximum temperature range	-50 to 200 °C (using an elongated stem above 140 °C)
Weight	0.13 kg for length 120 mm

TSDD P	
Material of the measuring case	brass
Material of protection case	SILICONE and SILAMID
Maximum temperature range	-30 to 130 °C
Ambient temperature around the connection head	-30 to 80 °C
Switch installation	by means of fastening tape with closure
Standard length of the tape	40 cm
Minimum diameter of tubing	20 mm
Weight	0.12 kg

TSDD C	
Standard type of sensor	TG 8 – 40, cable 1 m
Diameter of the case	5.7 ± 0.1 mm
Material of the case	stainless steel DIN 1.4301
Lead-in cable	shielded silicone 2 x 0.34 mm^2
Sensor ingress protection	IP 67 in accordance with EN 60529, as amended
Maximum temperature range	-50 to 200 °C
Weight	0.1 kg

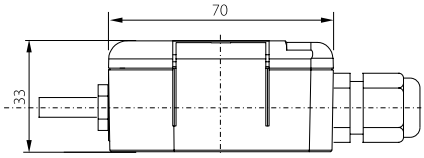
WIRING DIAGRAM

2-wire connection

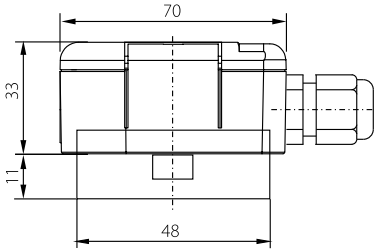


DIMENSIONAL DRAFT

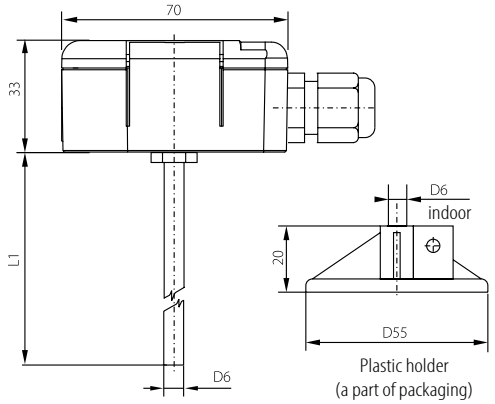
TSDD A



TSDD P

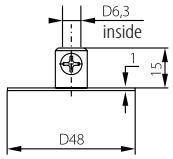


TSDD K

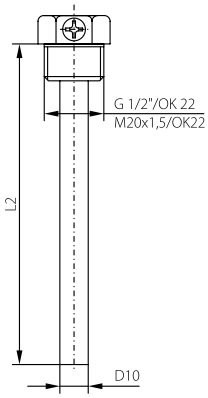


Plastic holder
(a part of packaging)

Accessories

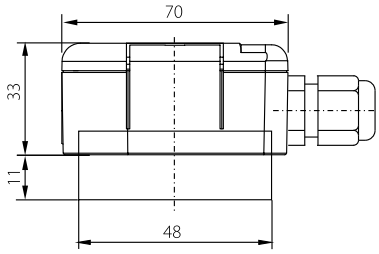


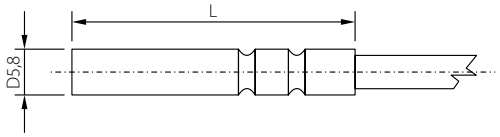
Central holder
stainless steel, K 120



Thermowell JS 130

TSDD C





TEMPERATURE SWITCH TSZ4H

104.09en

DESCRIPTION AND APPLICATION

These temperature switches TSZ4H with display are designed for using as two- -state controllers (on/off type control). They compare the temperature set-point with the actual temperature value and enable switching the galvanically separated (electrically insulated) contacts of a connected relay when the set temperature is reached. Supply voltage of the switches is 10 to 33 V DC or 9 to 24 V AC (by the type). Two temperature sensing elements can be connected to the switches. The display indicates the present value of the measuring temperature during measure process. Setting of individual parameters is executed by two control buttons.

The switch can be used in 5 different modes:

Mode no. 1: the switch operates as a single controller which switches the first relay by the set temperature interval and the second relay is switched at the exceeding set emergency temperature (only one sensing element is used)

Mode no. 2: the switch operates as a single controller which switches each relay by the set temperature interval (only one sensing element is used)

Mode no. 3: the switch operates as a double controller, which switch each relay separately according to temperature interval (two sensing elements are used, each separately for each relay)

Mode no. 4: the switch operates as a differential controller which switches on the base of temperature difference of two sensing elements (analogous to mode no. 1)

Mode no. 5: the switch operates as a differential controller which switches on the base of temperature difference of two sensing elements (analogous to mode no. 2)

The time delay of switching-off for the relay 1 within the limits 0–300 s can be set in each mode.

The switches are intended for assembly to the DIN slat. the temperature range of the switch applications depends on used temperature sensing element type (for example for the sensor in the TG8 case the range is -50 to 400 °C). Maximum operating temperature range of the switch is -50 to 400 °C.

The switches are intended for operating in a chemically non-aggressive environment.

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

Switch type	TSZ4H-24	TSZ4H-230
Connection of temperature sensor	**Models of temperature switch 1 to 2** 1 sensor - 2wire or 4wire **Models of temperature switch 3 to 5** 1 sensor - 2wire or 4wire 2 sensor - 2wire	
Output	2 relays	
Type of sensing element	Pt 100/3850 and Pt 1000/3850 - standard Ni 1000/6180 - modification	
Maximum temperature operating range	-50 to 400 °C (acc. to sensing element type and temperature sensor variant)	
Power supply	10 to 33 V DC, 9 to 24 V AC	230 V AC
Maximum switched voltage	250 V AC / 10 A	
Maximum error of the switch*	± (0.15 % from the value +1 dig) -min error 0.2 °C	
Resolution	0.1 °C	
Hysteresis	adjustable, min. 1 ° C	
Setting range	-50 to 400 °C, step 0.1 °C	
Display	4 digits – red LED, high of the digits 10 mm	

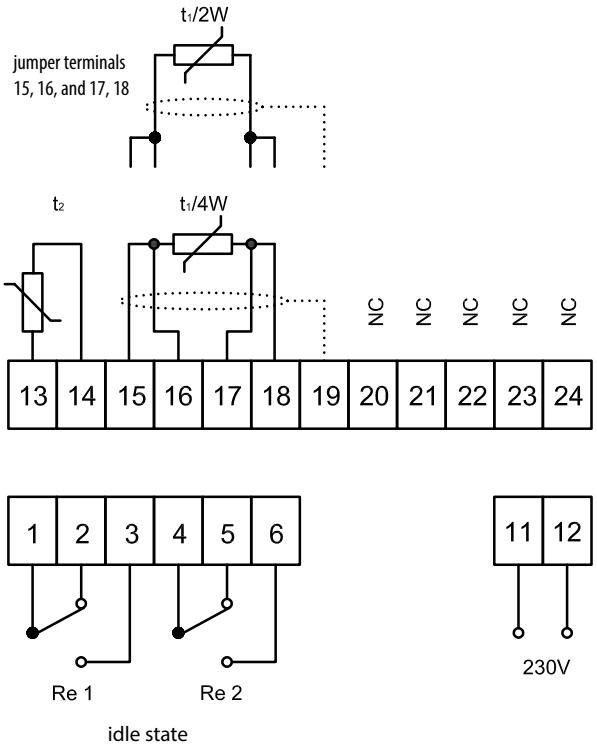
OTHER PARAMETERS

Brightness of the display setting	4 levels	
Updating of the display	< 0.2 s	
Type of terminal board	terminal board ARK 210, wire cross section 0.35 to 1.5 mm^2	
Material of the case	LEXAN	
Case dimensions	98 x 71 x 61 mm	
Ingress protection	IP 20 in accordance with EN 60529, as amended	
Operating conditions	ambient temperature: -5 to 60 °C relative humidity: max 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa	
Weight	0.15 kg (without sens. el.)	0.25 kg (without sens. el.)

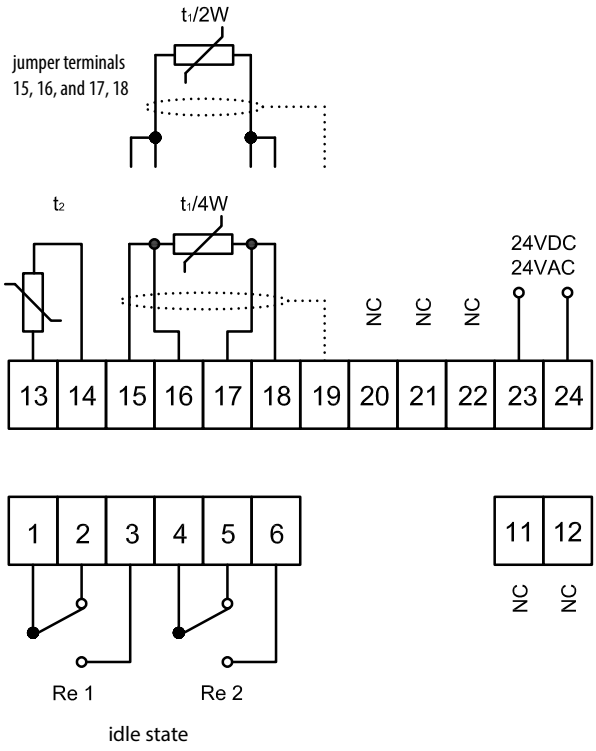
**error of the sensing element is not incorporated*

WIRING DIAGRAM

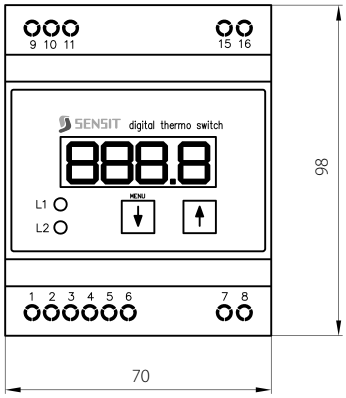
TSZ4H-230



TSZ4H-24



DIMENSIONAL DRAFT



TEMPERATURE SWITCH TSZ4H – RS485

106.06en

DESCRIPTION AND APPLICATION

Temperature switch TSZ4H-RS 485 with display is designed for using as two-state controllers (on/off type control). This switch compares the temperature set-point with the actual temperature value and enable switching the galvanically separated (electrically insulated) contacts of a connected relay when the set temperature is reached. Supply voltage of the switches is 10 to 33 V DC or 9 to 24 V AC (by the type). Two temperature sensing elements can be connected to the switches. The display indicates present value of the measuring temperature during measure process. Setting of individual parameters is executed by two control buttons. The switch can be used in 5 different modes:

Mode no. 1: the switch operates as a single controller which switches the first relay by the set temperature interval and the second relay is switched at the exceeding set emergency temperature (only one sensing element is used) Mode no. 2: the switch operates as a single controller which switches each relay by the set temperature interval (only one sensing element is used)

Mode no. 3: the switch operates as a double controller, which switch each relay separately according to temperature interval (two sensing elements are used, each separately for each relay)

Mode no. 4: the switch operates as a differential controller which switches on the base of temperature difference of two sensing elements (analogous to mode no. 1)

Mode no. 5: the switch operates as a differential controller which switches on the base of temperature difference of two sensing elements (analogous to mode no. 2)

The time delay of switching-off for the relay 1 within the limits 0–300 s can be set in each mode. Measurements and setting all parameters can be done by means of the industrial bus RS485 with the protocols ModBus RTU (standardly). With a simple converter RS485/RS232 the switch can be connected to the PC-serial port and so various settings can be made. For this purpose the software placed on the web site www.sensit.cz/download can be used. The switches are intended for assembly to the DIN slat. The temperature range of the switch applications depends on used temperature sensing element type (for example for the sensor in the TG8 case the range is -50 to 200 °C). Maximum operating temperature range of the switch is -50 to 400 °C.

The switches are intended for operating in a chemically non-aggressive environment.

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

Switch type	TSZ4H-24 – RS 485	TSZ4H-230 – RS 485
Connection of temperature sensor	**Models of temperature switch 1 to 2** 1 sensor - 2wire or 4wire **Models of temperature switch 3 to 5** 1 sensor - 2wire or 4wire 2 sensor - 2wire	
Output	2 relays	
Type of sensing element	Pt 100/3850 and Pt 1000/3850 - standard Ni 1000/6180 - modification	
Measuring range	-50 to 400 °C (acc. to sensing element type and temperature sensor variant)	
Power supply	10 to 33 V DC, 9 to 24 V AC	230 V AC
Maximum switched voltage	250 V AC / 6 A	
Maximum error of the switch*	± (0.2 % from the value + 2 dig)	
Resolution	0.1 °C	
Setting range	-50 to 400 °C, step 0.1 °C	
Display	4 digits – red LED, high of the digits 10 mm	

OTHER PARAMETERS

Brightness of the display setting	4 levels	
Updating of the display	< 0.2 s	
Type of terminal board	terminal board ARK210, wire cross section 0.35 to 1.5 mm^2	
Material of the case	LEXAN	
Case dimensions	98 x 71 x 61 mm	
Ingress protection	IP 20 in accordance with EN 60529, as amended	
Operating conditions	ambient temperature: -5 to 60 °C relative humidity: max 85 % (at the ambient temperature 25 °C) atmospheric pressure: 87 to 107 kPa	
Weight	0.15 kg (without sensing element)	0.25 kg without sensing element

**error of the sensing element is not incorporated*

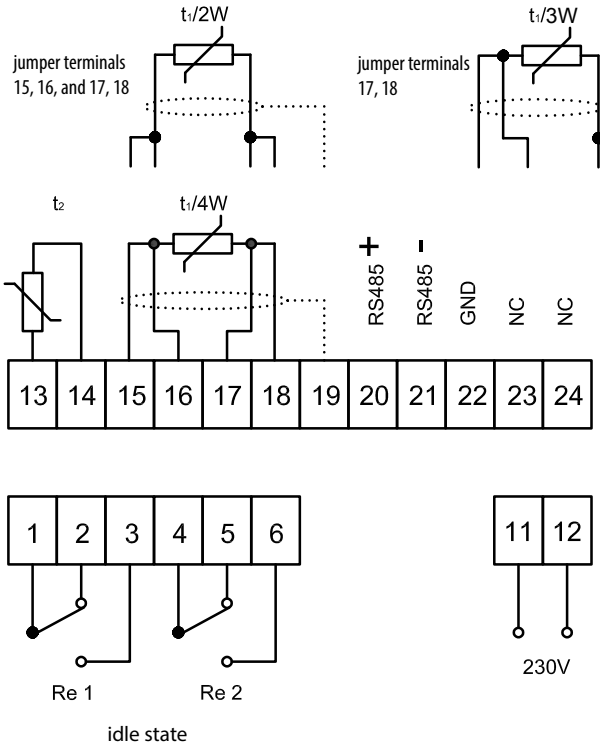
COMMUNICATON PROPERTIES

communication via RS 485, maximum segment length is 1200 m, asynchronous transfer

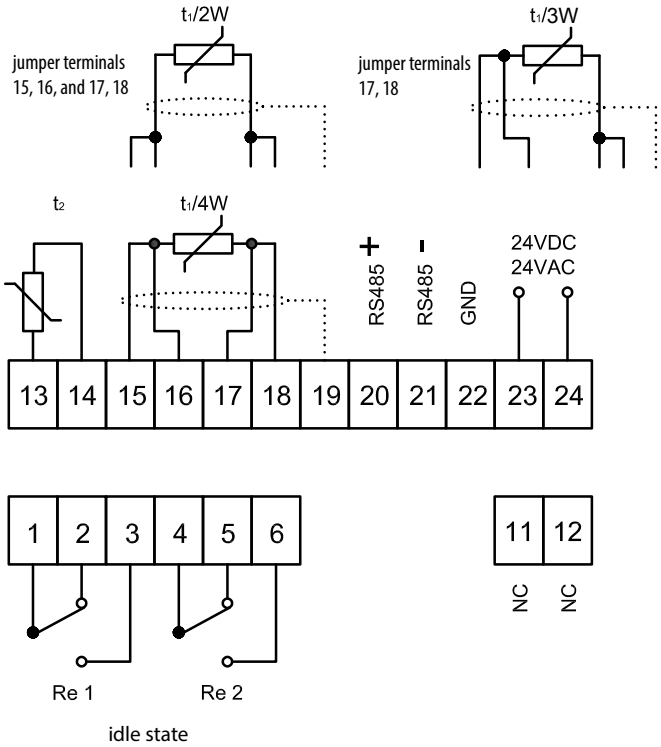
- transfer speeds 1200, 2400, 4800 Bd
- 32 modules / 1 serial port
- protocol ModBus 1 stop bit, without parity

WIRING DIAGRAM

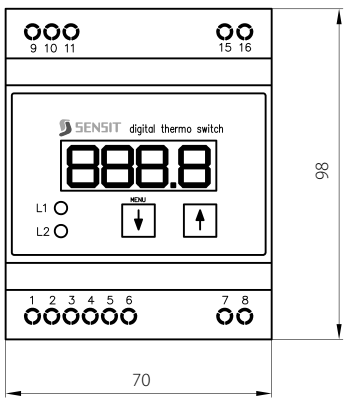
TSZ4H-230-RS485



TSZ4H-24-RS485



DIMENSIONAL DRAFT



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T +420 571 625 571 **F** +420 571 625 572 **E** obchod@sensit.cz

TEMPERATURE SWITCHES TSA

015.18en

DESCRIPTION AND APPLICATION

These temperature switches are designed for using as two-state controllers (ON/OFF type control). They compare the temperature set-point with the actual temperature value. They cause the galvanically separated (electrically insulated) contacts of a connected relay to switch, when the set temperature is reached. The temperature set point is adjusted by a potentiometer. Regarding sensing element location and switch application the following versions are available:

TSA 220 A – Temperature switch for sensing temperature in the switch ambient. The sensing element is placed in the metal stem of the 60 mm length.

TSA 220 K – The sensing element is placed in the metal stem for use in air condition equipment or in tubings. This temperature switch version is available with a plastic holder. Stainless steel thermowell or metal holder can be delivered as an acsessory.

TSA 220 C – The sensing element is protected by the TG 8 case, 40 mm long, and provided with a cable 1 m long. Another case type or another cable length should be specified in the order.

TSA 220 P – Contact version switch for fixing on pipeline surfaces for surface temperature measurements. The sensing element is housed in a measuring case made of metal, which is protected by a protection case made of SILICONE and SILAMID. It is delivered with the fastening tape of the length 40 cm and with closure device.

Standard temperature ranges, in which the temperature set point can be adjusted, are given in the specifications table. For the TSA 220 A the maximum allowable operation temperature is 70 °C, for the TSA 220 P this temperature limit is 110 °C. For applications above 140 °C the TSA 220 K may be used. However, in this case the switch version with the stem elongated by 60 mm and the metal central fixing holder must be used. These switches are designed to be used in a chemically non-aggressive environment.

ACCESSORIES

- stainless steel thermowell JS 130
- metal central holder K 120
- thermal conductive paste up to 200 °C, 5 g for TSA 220 P type
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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

Switch type	TSA			
Type of sensing element	Ni 1000/5000			
Operating temperature ranges (°C)	-25 to 15 °C 10 to 34 °C	0 to 40 °C 20 to 60 °C	0 to 80 °C 40 to 80 °C	60 to 140 °C 120 to 160 °C
Power supply	230 V / 50 Hz			
Maximum switched voltage	250 V AC / 6 A			
Set point adjustment failure	± 0.5 °C			
Standard hysteresis	2 °C			
Connection of the switch	according to the wiring diagram			
Recomended wire cross section	0.35 to 1.5 mm^2			
Material of the connection head	LEXAN 500R			

OTHER PARAMETERS

Connection head dimensions	62 x 62 x 95 mm (including the control button)
Ambient temperature around the connection head	-25 to 70 °C
Ingress protection	IP 54 in accordance with EN 60529, as amended
Grommet type	M 16 x 1.5
Weight	depending on design, min. 0.2 kg

ADDITIONAL DATA FOR INDIVIDUAL SENSOR TYPES

TSA 220 A

Standard length of the stem L1	60 mm
Diameter of the stem	6 + 0.2 mm
Material of the stem	stainless steel DIN 1.4301
Switch installation	on the wall, by means of a metal holder
Maximum temperature range	-25 to 70 °C

TSA 220 K

Standard length of the stem	L1 70, 120, 180, 240 mm
Diameter of the stem	6 + 0.2 mm
Material of the stem	stainless steel DIN 1.4301
Switch installation	by means of a plastic or stainless steel holder or a stainless steel thermowell
Maximum temperature range	-25 to 200 °C (using an elongated stem above 120 °C)

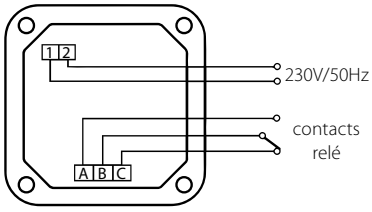
TSA 220 C

Standard type of sensor	TG 8 – 40, cable 1 m
Diameter of the case	5.7 ± 0.1 mm
Material of the case	stainless steel DIN 1.4301
Lead-in cable	shielded silicone 2 x 0.34 mm²
Sensor ingress protection	IP 67 in accordance with EN 60529, as amended
Switch installation	on the wall, by means of a metal holder
Maximum temperature range	-30 to 200 °C

TSA 220 P

Material of the measuring case	brass
Switch installation	by means of fastening tape with closure
Standard length of the tape	40 cm
Minimum diameter of tubing	20 mm

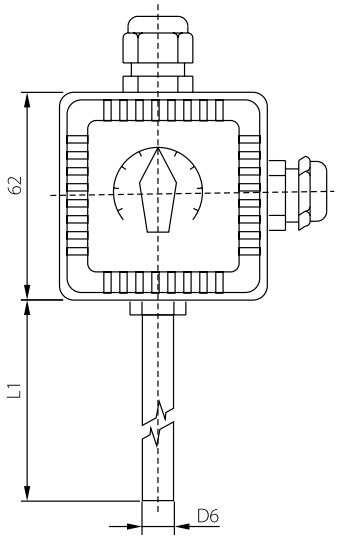
WIRING DIAGRAM



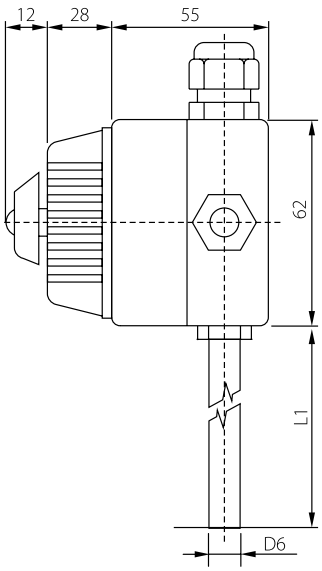
The terminal board for sensing element connection is installed for the TSA 220 C version only. The version is delivered without any sensing element or with an other type than the TG8 - 40.

DIMENSIONAL DRAFT

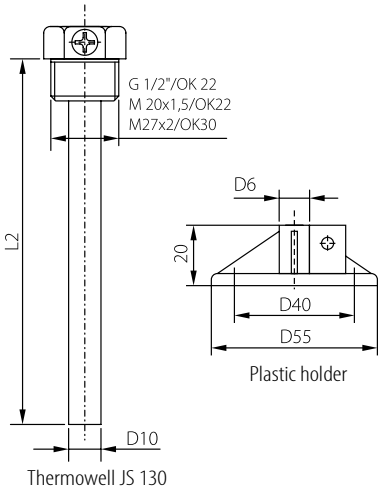
TSA 220 K – front view



TSA 220 K – lateral view



Accessories



OPERATION DESCRIPTION

Suppose the switching temperature set point is 20 °C. When the measured temperature value is above the set point, then the output relay's B and C terminals are closed. When the measured temperature value goes down below 18 °C, then the output relay's A and B terminals are closed. The difference of 2 °C is determined by the switch hysteresis.

MODIFICATION AND CUSTOMIZATION

- supply voltage 24 V AC or 24 V DC
- changing the range of temperatures to be compared
- adding a clip for fixing the device on the DIN bar instead of the metal holder for fixing the device on the wall
- removing the control button and shortening the potentiometer shaft
- in the TSA 220 A and the TSA 220 K versions changing the stem length; in the TSA 220 C changing the case and cable lengths
- customer specified stem or case design, e. g. in the fast-response TSA 220 R version
- hysteresis value modification
- the function of a differential switch

TEMPERATURE SWITCHES TFA

039.15en

DESCRIPTION AND APPLICATION

TFA temperature switches are designed as two-state controllers (ON / OFF control) that compare set temperature with momentary temperature and switch galvanically separated relay contacts when the set temperature is reached. The required temperature is setting in the device according to the customer requirement and cannot be changed later. Regarding sensing element location and switch application the following versions are available:

TFA 220 A – Temperature switch for sensing temperature in the switch ambient. The sensing element is placed in the metal stem of the 60 mm length.

TFA 220 K – The sensing element is placed in the metal stem for use in air condition equipment or in tubings. This temperature switch version is available with a plastic holder. Stainless steel thermowell or metal holder can be delivered as an acsessory.

TFA 220 C – The sensing element is protected by the TG 8 case, 40 mm long, and provided with a cable 1 m long. Another case type or another cable length should be specified in the order.

TFA 220 P – Contact version switch for fixing on pipeline surfaces for surface temperature measurements. The sensing element is housed in a measuring case made of metal, which is protected by a protection case made of SILICONE and SILAMID. It is delivered with the fastening strap of the length 40 cm and with closure device. The switches are designed for operating in a chemically non-aggressive environment.

Temperature switches TFA must not be used as an emergency switch.

ACCESSORIES

- stainless steel thermowel JS 130
- metal central holder K 120
- thermal conductive paste up to 200 °C, 5 g for TFA 220 P type
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set

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

Switch type	TFA
Type of sensing element	Ni 1000/5000
Power supply	230 V / 50 Hz
Maximum switched current / voltage	250 V AC / 6 A
Set point adjustment failure	± 0.5 °C
Standard hysteresis	2 °C
Connection of the switch	according to the wiring diagram
Recomended wire cross section	0.35 to 1.5 mm^2
Material of the connection head	LEXAN 500R
Connection head dimensions	62 x 62 x 55 mm
Ambient temperature around the connection head	-25 to 70 °C
Ingress protection	IP 65 in accordance with EN 60529, as amended
Grommet type	M 16 x 1.5
Weight	depending on design, min. 0.2 kg

SUPPLEMENTARY DATA TO PARTICULAR TYPES

TFA 220 A

Standard length of the stem L1	60 mm
Diameter of the stem	6 + 0.2 mm
Material of the stem	stainless steel DIN 1.4301
Switch installation	on the wall, by means of a metal holder
Maximum temperature range	-25 to 70 °C

TFA 220 K

Standard length of the stem L1	70, 120, 180, 240 mm
Diameter of the stem	6 + 0.2 mm
Material of the stem	stainless steel DIN 1.4301
Switch installation	by means of a plastic or stainless steel holder or a stainless steel thermowell
Maximum temperature range	-25 to 200 °C (using an elongated stem above 120 °C)

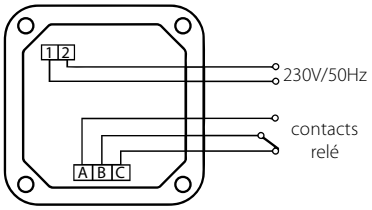
TFA 220 C

Standard type of sensor	TG8 – 40, cable 1 m
Diameter of the case	5.7 ± 0.1 mm
Material of the case	stainless steel DIN 1.4301
Lead-in cable shielded silicone	2 x 0.34 mm^2
Sensor ingress protection	IP 67 in accordance with EN 60529, as amended
Switch installation	on the wall, by means of a metal holder
Maximum temperature range	-30 to 200 °C

TFA 220 P

Material of the measuring case	brass
Switch installation	by means of fastening tape
Standard length of the tape	40 cm
Minimum diameter of tubing	20 mm

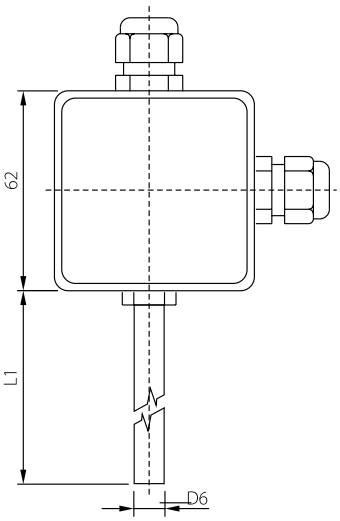
WIRING DIAGRAM



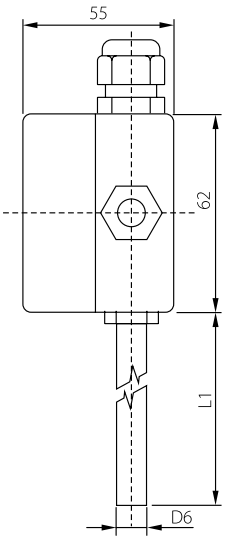
The terminal board for sensing element connection is installed for the TFA 220 C version only. The version is delivered without any sensing element or with an other type than the TG8 - 40.

DIMENSIONAL DRAFT

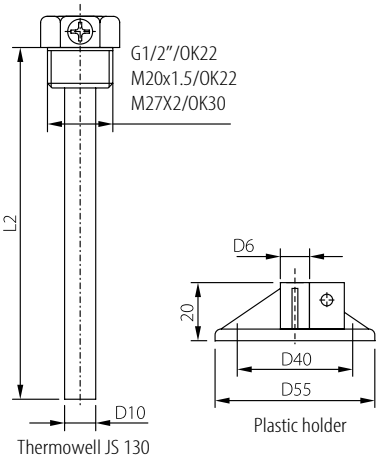
TFA 220 K – lateral view



TFA 220 K – lateral view



Accessories



OPERATION DESCRIPTION

Suppose the switching temperature set point is 20 °C. When the measured temperature value is above the set point, then the output relay's B and C terminals are closed. When the measured temperature value goes down below 18 °C, then the output relay's A and B terminals are closed. The difference of 2 °C is determined by the switch hysteresis.

MODIFICATION AND CUSTOMISATION

- supply voltage 24 V AC or 24 V DC
- changing the range of temperatures to be switched
- adding a clip for fixing the device on a DIN console instead of the metal holder for fixing the device on the wall
- for the TFA 220 A and TFA 220 K versions changing the stem length; for the TFA 220 C changing the case and cable lengths
- customer specified stem or case design
- functioning of the differential switch can be modified

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039.15en
04/2024

BIMETAL SWITCHES WITH CABLE TSB 087

127.01en

DESCRIPTION AND APPLICATION

Bimetal temperature switches series TSB 087 are designed as two-state controllers (ON/OFF control) that compare the preset and instantaneous temperature and immediately disconnect the contact when a defined temperature is reached. The required temperature of switching is defined according to the customer's needs by the selection of a bimetal thermal cutoff and cannot be changed. Bimetal switches TSB 087 series consist of a stainless steel housing containing a bimetal switch (thermal cutoff) and supply cable. These temperature switches are used to signal exceeded temperature in various industrial applications, e.g. to protect transformers, power semiconductor stages, motors and powerful batteries.

The bimetal switches TSB 087 series are intended for operation in chemically non-aggressive environments.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

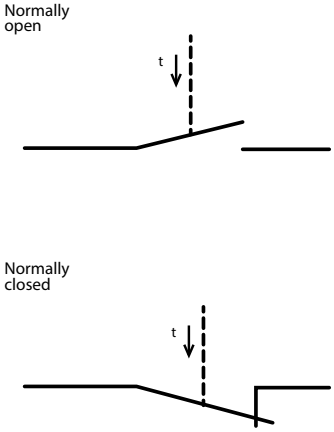
Calibration – Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer 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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

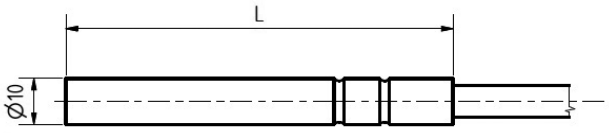
Temperature switch type	TSB 087
Temperature switch sensing element	bimetal TMC – C1B
Temperature range (selection of the tripping temperature)	70 to 180 °C (in 10 °C steps) *
Switching tolerance	± 5°C
Contact design	normally closed (snap action)
Maximum switching voltage/current	10 000 cycles 250 VAC / 2.5A
3 000 cycles 250 VAC / 6.3A	
Case material	stainless steel DIN 1.4301
Case diameter	10 mm
Case length	60 mm
Working range	-25 to 180 °C
Ingress protection	IP 67 in according with EN 60529, as amended
Insulation resistance in normal environment	min. 20 MΩ
Dielectric strength of insulation	2 kVAC/1 min.
Contact connection	2wire
Supply cable	silicone shielded 2 x 0.34 mm^2
Weight	min. 0,2 kg acc. to design

**) in 5 steps on request*

WIRING DIAGRAM



DIMENSIONAL DRAFT



BIMETAL SWITCHES WITH THREAD AND CABLE TSB 060

128.01en

DESCRIPTION AND APPLICATION

Series TSB 060 Bimetal temperature sensors series TSB 060 are designed as two-state controllers (ON/OFF control) that compare the preset and instantaneous temperature and immediately disconnect the contact when a defined temperature is reached. The required temperature is defined according to the customer's needs by the selection of a bimetal thermal cutoff and cannot be changed. These bimetallic temperature switches consist of a stainless steel housing containing a bimetal switch (thermal cutoff) and supply cable. Bimetal switches TSB 060 series are used to signal exceeded temperature in various industrial applications, e.g. to protect transformers, power semiconductor stages, motors and powerful batteries.

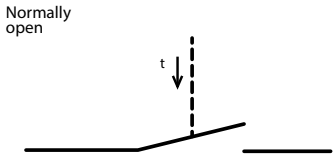
The bimetal switches TSB 060 series are intended for operation in chemically non-aggressive environments.

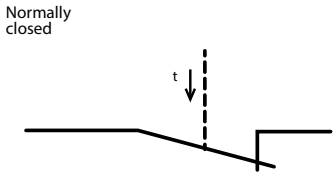
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity.**

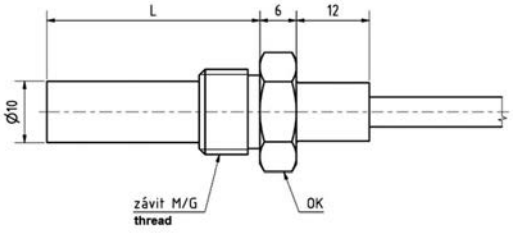
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

WIRING DIAGRAM





DIMENSIONAL DRAFT



SPECIFICATIONS

Temperature switch type	TSB 060
Temperature switch sensing element	bimetal TMC – C1B
Temperature range (selection of the tripping temperature)	70 to 180 °C (in 10 °C steps) *
Switching tolerance	± 5°C
Contact design	normally closed (snap action)
Maximum switching voltage/current	10 000 cycles 250 VAC / 2.5A 3 000 cycles 250 VAC / 6.3A
Case material	stainless steel DIN 1.4301
Case diameter	10 mm
Case length	35 mm including thread
Thread type / OK	M14 x 1.25 / OK17
Working range	-25 to 180 °C
Ingress protection	IP 67 in according with EN 60529, as amended
Insulation resistance in normal environment	min. 20 MΩ
Dielectric strength of insulation	2 kVAC/1 min.
Contact connection	2wire
Supply cable	silicone shielded 2 x 0.34 mm^2
Weight	min. 0,2 kg acc. to design

**) in 5 steps on request*

STH 102 – TEMPERATURE AND RELATIVE HUMIDITY SENSOR TO THE INTERIOR WITH RS 485 OUTPUT (MODBUS)

H01.02en

DESCRIPTION AND APPLICATION

The sensor of temperature and relative humidity - STH 102 is designed to measure the temperature and relative humidity of the air in spaces protected against water. This combined sensor consists of a plastic ribbing head, where a printed circuit board with the individual sensors and a converter is placed to establish a communication via the RS 485 bus. The temperature and relative humidity are measured by a common internal sensor whose signal is processed in a microprocessor and is converted to an output signal of MODBUS RTU. The sensors meet ingress protection IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensors do not feel disturbing even in the interiors with high aesthetic requirements. The installation is recommended on an inner wall at the height of 1.5 m, in areas with moving persons, not exposed to direct sunlight and not influenced by heat from walls, heat sources or lighting. The sensor of temperature and relative humidity - STH 102 is 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 and of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature in the vicinity of the sensor: - 40 to 80 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 106 kPa

DECLARATION, CERTIFICATES, CALIBRATION

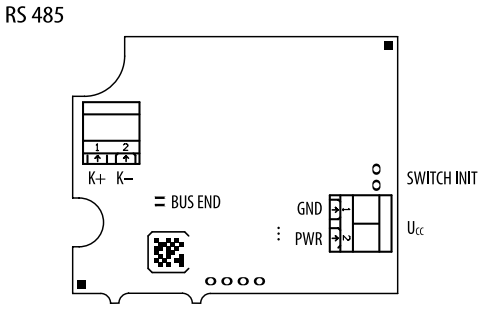
Manufacturer provides **EU Declaration of Conformity**.

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

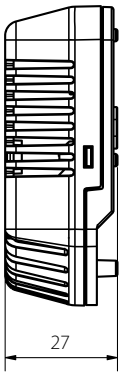
Sensor type	STH 102
Temperature measurement range	-40 to 80 °C
Temperature measurement accuracy	± 0.5 °C in the range from 0 to 65 °C ± 0.7 °C in the range from 65 to 80 °C ± 1.1 °C in the range from -40 to 0 °C
Relative humidity measurement range	0 to 95 %
Relative humidity measurement accuracy	± 3 % in the range from 10 to 90 % ± 4.5 % in the range from 0 to 10 % and 90 to 95 %
Output signal	RS 485 / MODBUS RTU
Galvanicaly separated	no, possible on request
Supply voltage U	15 to 30 V DC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 in accordance with EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight min	0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

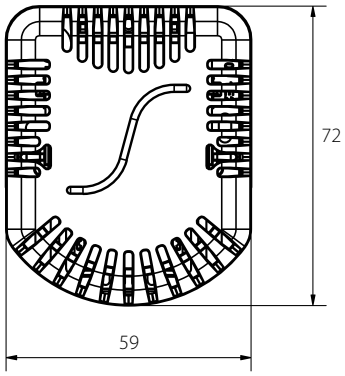
WIRING DIAGRAM

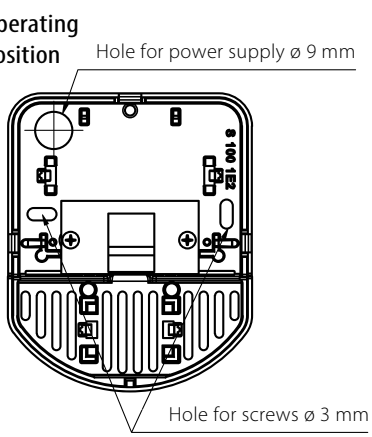


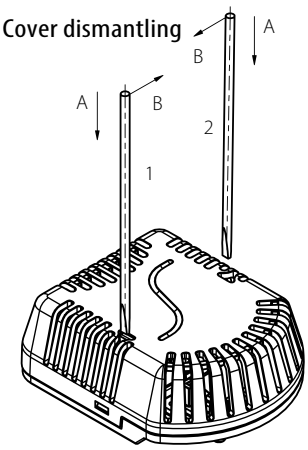
GND, PWR – U_{cc} supply voltage
K+/K- – communication line
BUS END – RS 485 termination

DIMENSIONAL DRAFT









STH 104 – TEMPERATURE AND RELATIVE HUMIDITY SENSOR TO THE INTERIOR WITH CAN OUTPUT PROTOCOL (CANOPEN)

H02.02en

DESCRIPTION AND APPLICATION

The STH 104 temperature and relative humidity sensor is designed to measure the temperature and relative humidity of the air in spaces protected against water. The STH 104 temperature and relative humidity sensor consists of a plastic ribbing head where a printed circuit board with the individual sensors and a converter is placed to establish a communication via the CAN bus. The temperature and relative humidity are measured by a common internal sensor whose signal is processed in a microprocessor and is converted to a CANopen output signal with CiA DS 301 specification. The sensors meet the ingress protection of IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensor does not feel disturbing even in the interiors with high aesthetic requirements.

The STH 104 temperature and relative humidity sensor is designed to be operated in a chemically non-aggressive environment; its use must be chosen with regard to temperature and chemical resistance of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature in the vicinity of the sensor: - 40 to 80 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 106 kPa

DECLARATION, CERTIFICATES, CALIBRATION

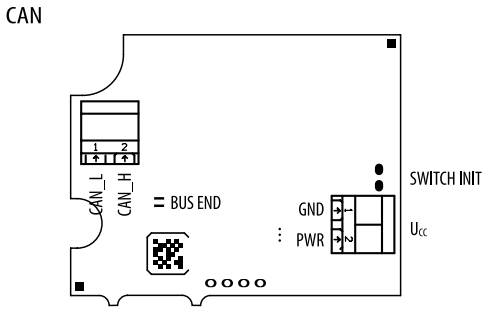
Manufacturer provides **EU Declaration of Conformity**.

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

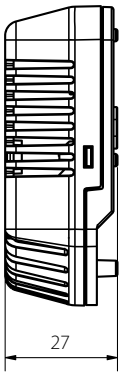
Sensor type	STH 104
Temperature measurement range	-40 to 80 °C
Temperature measurement accuracy	± 0.5 °C in the range from 0 to 65 °C ± 0.7 °C in the range from 65 to 80 °C ± 1.1 °C in the range from -40 to 0 °C
Relative humidity measurement range	0 to 95 %
Relative humidity measurement accuracy	± 3 % in the range from 10 to 90 % ± 4.5 % in the range from 0 to 10 % and 90 to 95 %
Output signal	CAN / CANopen – CiA DS 301
Galvanicaly separated	no, possible on request
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 in accordance with EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight min	0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

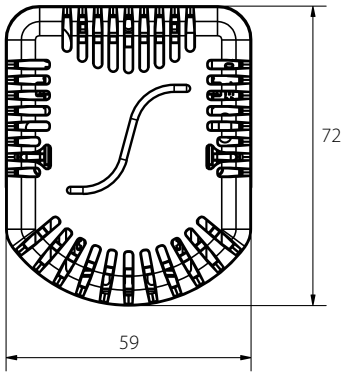
WIRING DIAGRAM



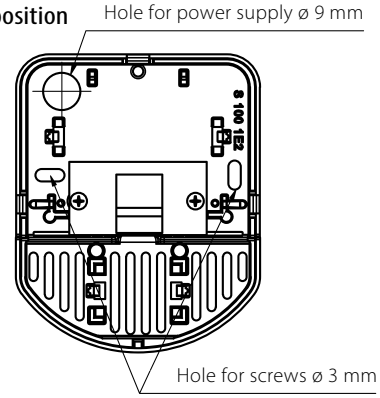
GND, PWR – U_{cc} supply voltage
CAN_L/CAN_H – communication line

DIMENSIONAL DRAFT

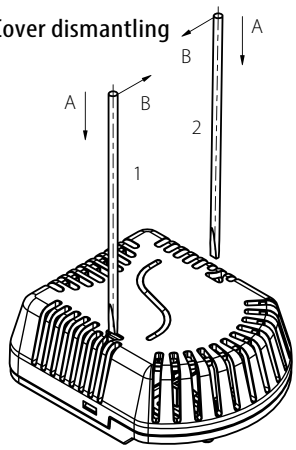




Operating position



Cover dismantling



PTSV 110 – TEMPERATURE AND HUMIDITY SENSORS FOR INTERIOR AND OUTDOOR USAGE WITH 4 TO 20 mA OUTPUT

124.06en

DESCRIPTION AND APPLICATION

CE

The sensor is intended for temperature measurement and measurement of relative humidity of air. The sensors enable to measure temperature and humidity in food, pharmaceuticals and raw material stores, museums, archives, galleries, meteorological stations etc. Easy mounting of the temperature sensor is ensured by the unique "S head" design invented by SENSIT s.r.o.

Digital conception with microprocessor provides long-term stability of parameters, temperature compensation of the humidity sensing element and failure state signaling. The most up to date polymeric sensing element for humidity guarantees stability of indication and resistance to condensation water.

Two galvanically separated current signals 4 to 20 mA are available as output signals of the measured variables; the outputs are set by the producer as follows:

the value on the output I1: relative humidity, range 4 to 20 mA is related to 0 to 100 % RH

the value on the output I2: temperature, range 4 to 20 mA is related to -30 to 80 °C

A calibration sheet is included in the sensor price.

The sensors are designed to be operated in a chemically non-aggressive environment.

ACCESSORIES

- USB cable SP003

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.

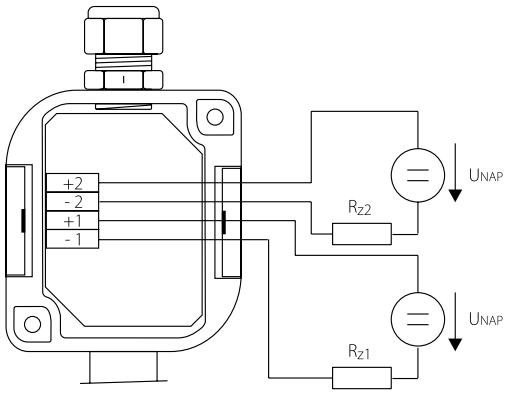
SPECIFICATIONS

Type of sensor	PTSV 110
Type of sensing element	Pt 1000/3850
Analog outputs	two galvanically separated signals 4 to 20 mA
Current output in the case of error	< 3.8 mA or > 24 mA
Power supply (VCC)	9 to 30 V DC, maximum ripple 0.5 %
Range of temperature measurement*	-30 to 80 °C
Accuracy	± 0.4 °C in the range 0 to 100 °C, otherwise 0.4 % of the measuring value
Range of relative humidity measurement **	0 to 100 % RV (the reading is temperature compensated in all temperature range)
Accuracy	± 2.5 % RV in the range 5 to 95 % RV at 23 °C
Ingress protection	electronics IP 65 in accordance with EN 60529, as amended sensors are placed behind the cover with ingress protection IP 40 in accordance with EN 60529, as amended
Dust filter of the sensors	filtration efficiency 0.025 mm
Operating temperature range of the device	-30 to 80 °C
Operating humidity range of the device	0 to 100 % RV
Working position	the measure stem downwards
Electromagnetic compatibility	in accordance with EN 61326-1, as amended
Storage conditions temperature	-30 to 80 °C, humidity 0 to 100 % RH without condensation
Weight approximately	0.15 kg
Material of the box	POLYAMIDE

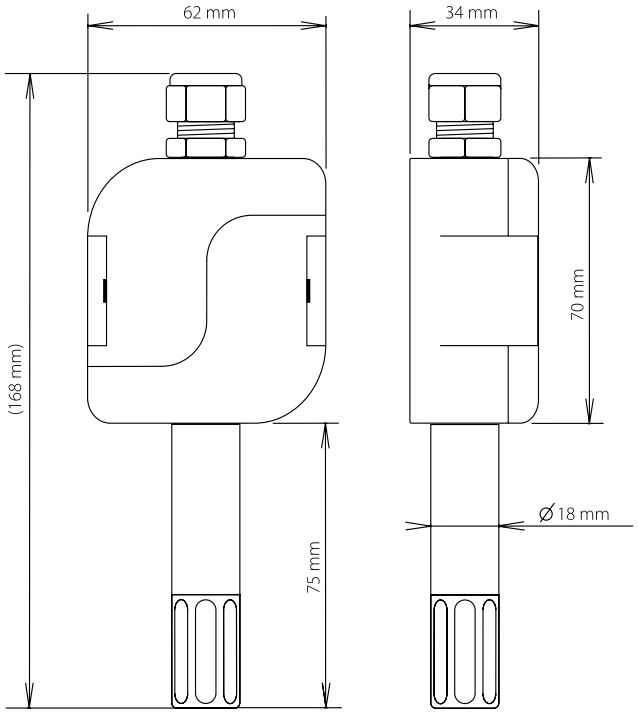
** Maximum temperature is valid only for the measure ending with the sensing elements. At the temperatures above +85 °C the relative humidity in continuous operation must not go over the allowed limit according to the diagram for the range limitation of temperature and humidity measurements.*

*** Any kind of value – temperature, relative humidity, temperature of a condensation point, absolute humidity, specific humidity, proportion of mixture or specific enthalpy can be assigned to the each output of the 2-output-sensor. The same value can be assigned to the both of outputs, too. The outputs are set by the producer for the maximum range. The range of the outputs can be set by user by means of PC using the cable SP003 which is delivered as optional accessory at extra cost. Other than standard setting of outputs (RH, T, Trb, ..) and their ranges is possible - it must be specified in the order.*

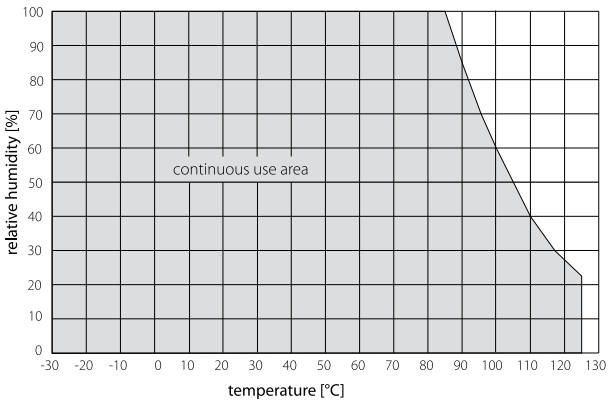
WIRING DIAGRAM



DIMENSIONAL DRAFT



LIMITATION OF THE MEASURING RANGE FOR TEMPERATURE AND HUMIDITY



TEMPERATURE AND HUMIDITY SENSORS FOR USAGE INTO AIR CONDITION DUCTS WITH 4 TO 20 mA OUTPUT

125.06en

CE

DESCRIPTION AND APPLICATION

The sensors are intended for temperature measurements and measurements of relative humidity of air in air conditioning ducts. The plastic connection head is provided by the cable ending. Easy mounting of the temperature sensor is ensured by the unique "S head" design invented by SENSIT s.r.o.

Digital conception with microprocessor provides long-term stability of parameters, temperature compensation of the humidity sensing element and failure state signaling. The most up to date polymeric sensing element for humidity guarantees stability of indication and resistance to condensation water.

Two galvanically separated current signals 4 to 20 mA are available as output signals of the measured variables; the outputs are set by the producer as follows: the value on

the output I1: relative humidity, range 4 to 20 mA is related to 0 to 100 % RH the

value on the output I2: temperature, range 4 to 20 mA is related to -30 to 120 °C

A calibration sheet is included in the sensor price.

The sensors are designed to be operated in a chemically non-aggressive environment.

ACCESSORIES

- plastic central holder
- USB cable SP003

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

Type of sensor	PTSV 120
Type of sensing element	Pt 1000/3850
Analog outputs	two galvanically separated signals 4 to 20 mA
Current output in the case of error	< 3.8 mA or > 24 mA
Power supply (U)	9 to 30 V DC, maximum ripple 0.5 %
Standard length of the stem	150 mm
Range of temperature measurement*	-30 to 125 °C
Accuracy	± 0.4 °C in the range 0 to 100 °C, otherwise 0.4 % of the measuring value
Range of relative humidity measurement **	0 to 100 % RH (the reading is temperature compensated in all temperature range)
Accuracy	± 2.5 % RH in the range 5 to 95 % RH at 23 °C
Ingress protection electronics	IP 65 in accordance with EN 60529, as amended
sensors are placed behind the cover with ingress protection	IP 40 in accordance with EN 60529, as amended
Dust filter of the sensors	filtration efficiency 0.025 mm
Operating temperature range of the device	-30 to 80 °C
Operating humidity range of the device	0 to 100 % RH
Working position	the measure stem downwards
Elektomagnetic compatibility	in accordance with EN 61326-1, as amended
Storage conditions	temperature -30 to 80 °C, humidity 0 to 100 % RH without condensation

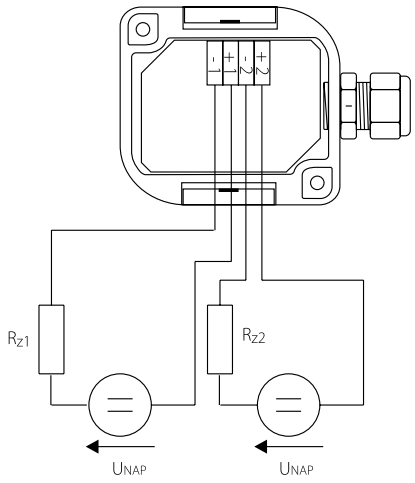
OTHER PARAMETERS

Material of the stem	stainless steel DIN 1.4301
Weight approximately	0.225 kg
Material of the box	POLYAMIDE

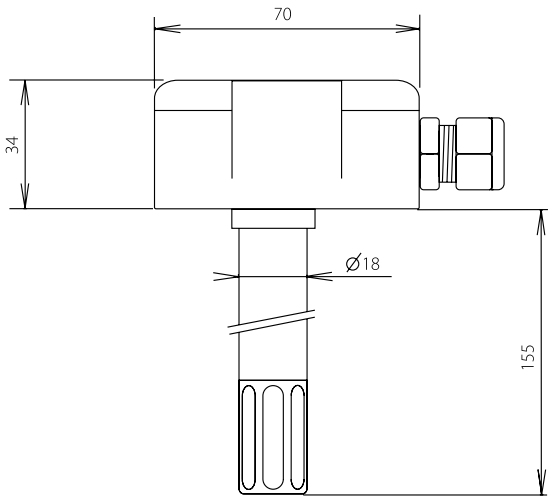
** Maximum temperature is valid only for the measure ending with the sensing elements. At the temperatures above +85 °C the relative humidity in continuous operation must not go over the allowed limit according to the diagram for the range limitation of temperature and humidity measurements.*

*** Any kind of value - temperature, relative humidity, temperature of a condensation point, absolute humidity, specific humidity, proportion of mixture or specific enthalpy can be assigned to the each output of the 2-output-sensor. The same value can be assigned to the both of outputs, too. The outputs are set by the producer for the maximum range. The range of the outputs can be set by user by means of PC using the cable SP003 which is delivered as optional accessory at extra cost. Other than standard setting of outputs (RH, T, Trb, ..) and their ranges is possible - it must be specified in the order.*

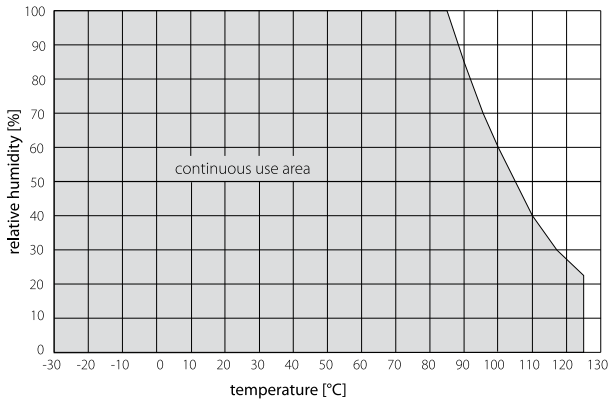
WIRING DIAGRAM



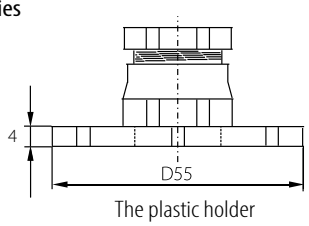
DIMENSIONAL DRAFT



LIMITATION OF THE MEASURING RANGE FOR TEMPERATURE AND HUMIDITY



Accessories



The plastic holder
(it is not the part of packing)

TEMP. AND HUMIDITY SENSORS FOR INTERIOR AND OUTDOOR USAGE WITH AN EXTERNAL PROBE AND THE OUTPUTS 4 TO 20 mA

126.06en

DESCRIPTION AND APPLICATION

The programmable sensors enable to measure of temperature and humidity in food, pharmaceuticals and raw material stores, museums, archives, galleries, meteorological stations etc. The measuring sensors are located in an external probe that is connected with a connection head of electronics by a cable. The probe of the sensor is placed to a measured space and cannot be disconnected from the connection head with electronic circuits. The connection head with the sensor electronic is designed for wall mounting. Easy mounting of the temperature sensor is ensured by the unique "S head" design invented by SENSIT s.r.o.

Digital conception with microprocessor provides long-term stability of parameters, temperature compensation of the humidity sensing element and failure state signaling. The most up to date polymeric sensing element for humidity guarantees stability of indication and resistance to condensation water.

Two galvanically separated current signals 4 to 20 mA are available as output signals of the measured variables; the outputs are set by the producer as follows:

the value on the output I1: relative humidity, range 4 to 20 mA is related to 0 to 100 % RH

the value on the output I2: temperature, range 4 to 20 mA is related to -30 to 105 °C

A calibration sheet is included in the sensor price.

The sensors are designed to be operated in a chemically non-aggressive environment.

ACCESSORIES

- USB cable SP003

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Type of sensor	PTSV 130
Type of sensing element	Pt 1000/3850
Analog outputs	two galvanically separated signals 4 to 20 mA
Current output in the case of error	< 3.8 mA or > 24 mA
Power supply (U)	9 to 30 V DC, maximum ripple 0.5 %
Lengths of cross-connecting cables	2 m a 4 m
Range of temperature measurement*	-30 to 105 °C
Accuracy	± 0.4 °C in the range 0 to 100 °C, otherwise 0.4 % of the measuring value
Range of relative humidity measurement **	0 to 100 % RH (the reading is temperature compensated in all temperature range)
Accuracy	± 2.5 % RH in the range 5 to 95 % RH at 23 °C
Ingress protection	electronics IP 65 in accordance with EN 60529, as amended sensors are placed behind the cover with ingress protection IP 40 in accordance with EN 60529, as amended
Dust filter of the sensors	filtration efficiency 0,025 mm
Operating temperature range of the device	-30 to 80 °C
Operating humidity range of the device	0 to 100 % RH
Working position	the measure stem downwards

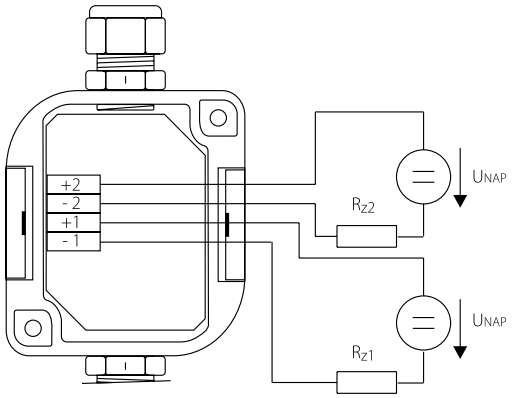
OTHER PARAMETERS

Elektomagnetic compatibility	in accordance with EN 61326-1, as amended
Storage conditions temperature	-30 to 80 °C, humidity 0 to 100 % RH without condensation
Weight	approximately 0.2 kg and 0.3 kg
Material of the box	POLYAMIDE

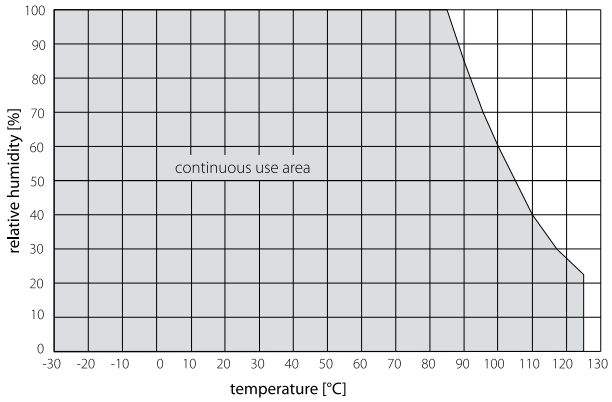
** Maximum temperature is valid only for the measure ending with the sensing elements. At the temperatures above +85 °C the relative humidity in continuous operation must not go over the allowed limit according to the diagram for the range limitation of temperature and humidity measurements.*

*** Any kind of value - temperature, relative humidity, temperature of a condensation point, absolute humidity, specific humidity, proportion of mixture or specific enthalpy can be assigned to the each output of the 2-output-sensor. The same value can be assigned to the both of outputs, too. The outputs are set by the producer for the maximum range. The range of the outputs can be set by user by means of PC using the cable SP003 which is delivered as optional accessory 220 at extra cost. Other than standard setting of outputs (RH, T, Trb, ..) and their ranges is possible - it must be specified in the order.*

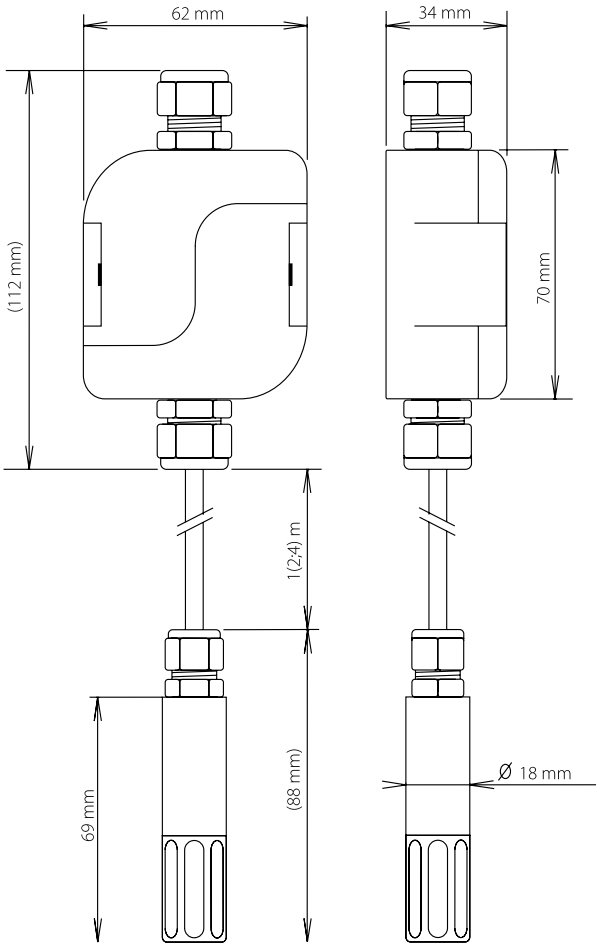
WIRING DIAGRAM



LIMITATION OF THE MEASURING RANGE FOR TEMPERATURE AND HUMIDITY



DIMENSIONAL DRAFT



TH 161 – TEMPERATURE AND HUMIDITY SENSORS WITH CABLE AND I2C DIGITAL OUTPUT

130.01en

DESCRIPTION AND APPLICATION

CE

The temperature and relative humidity sensors are designed to measure temperature and relative humidity of the air in spaces protected against ingress of water. The sensors consist of a polyamide case containing an SHT30F temperature and relative sensor and an input cable with PVC insulation. Free access of air is ensured to the temperature and relative humidity sensor, which ensures its very fast response to changes in both measured variables. Communication with the sensor is ensured by means of an I2C bus with the communication speed up to 1 MHz and with the possibility of up to two distinguishable and user-selectable addresses.

Recommended operating conditions for ensuring the most precise output values:

- ambient temperature around the sensor: 5 to 60 °C
- relative ambient humidity: 20 to 80%
- atmospheric pressure: 87 to 106 kPa

The temperature and relative humidity sensor is protected by a special PTFE membrane, which increases the resistance of the sensor against the impact of dust and water, ensures the minimum protection level of IP 65 according to EN 60759. as amended and enables the sensor to be used in severe conditions with higher occurrence of dust or spraying water.

The temperature and relative humidity sensors are designed for operation in chemically non-aggressive environments; their manner of use must be chosen with regard to the temperature and chemical resistance of the case and the supply cable.

Warnings and restrictions:

The sensors shall not be used for temperature measurement in areas:

- where the specified technical parameters and operating conditions are not adhered to
- where there is a mechanical impact on the sensor
- with a risk of explosion
- with chemically aggressive environment
- where the sensor could be exposed to permanent immersion in a liquid
- where the sensor could be exposed to the impact of electrostatic discharge (ESD)

A failure to observe the stated recommendations and a long-term exposure to conditions outside the recommended operating conditions will have a negative impact on measurement accuracy and the service life of the temperature sensor. Especially at high humidity there can be an offset of RH output signal (e.g., + 3 % RH after 60 hours maintained above the value of 80 % of RH). When the standard range of temperature and humidity is re-established, the sensor automatically returns to the calibrated status.

ACCESSORIES

- different variants of connectors --- HIRSCHMANN, LEMO, MOLEX, JST, etc.

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

Calibration – The entire production passes through a final metrological inspection, which is carried out by comparing with standards or working measuring instruments. Continuity of the standards and working measuring instruments is ensured within the meaning of Section 5 of Act No. 505/1990 on Metrology. The manufacturer offers to supply the sensors calibrated in the SENSIT s.r.o. laboratory (according to requirements of the EN ISO/IEC 17025 standard, as amended) or in an accredited laboratory

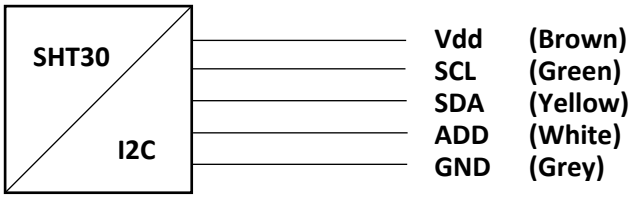
Type of sensor	TH 161
Type of T + RH sensing element	SHT30F
Communication bus	I2C, maximum communication speed 1 MHz
Temperature measuring range	maximum: -20 to 80 °C recommended: 5 to 60 °C
Temperature measuring accuracy	± 0.2 °C in the range of 0 to 65 °C ± 0.5 °C in the range of -20 to 80 °C

SPECIFICATIONS

Relative humidity measuring range	maximum: 0 to 100 % recommended: 20 to 80 °C
Relative humidity measuring accuracy	± 2 % in the range of 10 to 90 % ± 4 % in the range of 0 to 100 %
Vdd power supply	2.15 to 5.5 V
Ingress protection	IP 65 in accordance with EN 60529, as amended (with an applied PTFE membrane only)
Time response (25°C, 1m/s)*	temperature: $\tau_{0.63} > 2$ s relative humidity: $\tau_{0.63} > 8$ s
Case material	polyamide-based plastic - THERMELT 867
Diameter of the case	8 ± 0.1 mm
Case length	40 mm
Supply cable type	PVC unshielded 5 x AWG 28, diameter 4.0 ± 0.3 mm
Supply cable length	maximum 3 m
Weight	0.03 kg fo 1 m cable

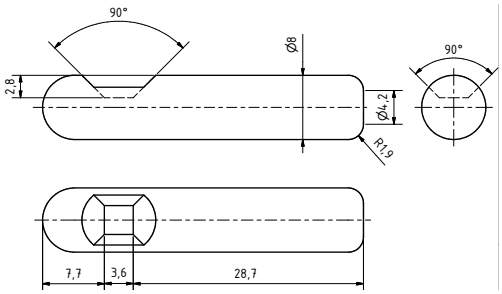
**) response time is influenced by the sensor case design and sensor position in a specific application*

WIRING DIAGRAM



The assignment of wire insulation colours is specified in the user manual under the individual sensor versions.

DIMENSIONAL DRAFT



STHC 102 – TEMPERATURE, RELATIVE HUMIDITY AND CO2 TO THE INTERIOR WITH RS 485 OUTPUT (MODBUS)

H03.02en

DESCRIPTION AND APPLICATION

CE

The STHC 102 temperature, relative humidity and CO_2 sensor is designed to measure the carbon dioxide concentration, temperature and relative humidity of the air in spaces protected against water. This combined sensor consists of a plastic ribbing head where a printed circuit board with the individual sensors and a converter is placed to establish a communication via the RS 485 bus. The temperature and relative humidity are measured by a common internal sensor whose signal is processed in a microprocessor and is converted to an output signal of MODBUS RTU. The CO_2 value is measured by a NDIR module whose digital signal is also converted to an output signal of MODBUS RTU. For the CO_2 concentration sensor, there is an autocalibration function available to set the sensor at the minimum CO_2 value corresponding to the outside concentration level. The STHC 102 temperature, relative humidity and CO_2 sensor meets the ingress protection of IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensor does not feel disturbing even in the interiors with high aesthetic requirements. The STHC 102 temperature, relative humidity and CO_2 sensor is designed to be operated in a chemically non-aggressive environment; its use must be chosen with regard to temperature and chemical resistance of the head and of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature in the vicinity of the sensor: 0 to 45 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 106 kPa

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.

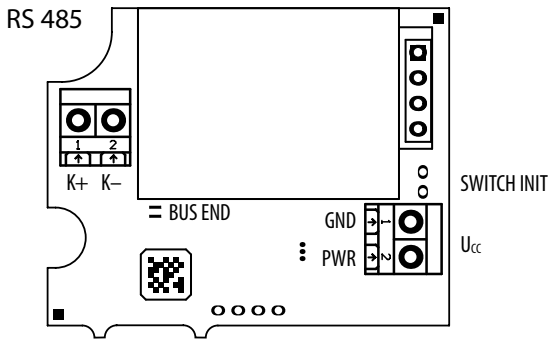
SPECIFICATIONS

Sensor type	STHC 102
Temperature measurement range **	0 to 45 °C with guaranteed accuracy of CO_2 measurement - 30 to 70 °C without guaranteed accuracy of CO_2 measurement
Temperature measurement accuracy *	± 0.5 °C
Relative humidity measurement range *	0 to 85 % with guaranteed accuracy of CO_2 measurement 0 to 95 % without guaranteed accuracy of CO_2 measurement
Relative humidity measurement accuracy *	± 3 % in range 10 to 85 % ± 4.5 % in range 0 to 10 %
CO_2 measuring range *	400 to 5000 ppm
CO_2 measuring accuracy *	± 100 ppm *
Time response CO_2 (90%)	90 s
Output signal	RS 485 / MODBUS RTU
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 acc. to EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight min	0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

** The stated measurement ranges and accuracies for the individual sensors refer to operating conditions when the supply voltage is connected.*

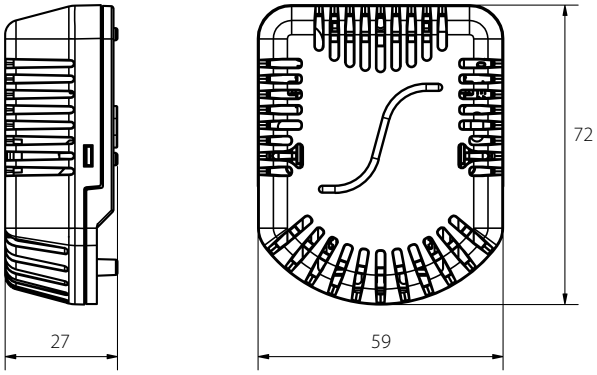
***Temperature sensor can be used in temperature range -40 to 80 °C for a short time.*

WIRING DIAGRAM

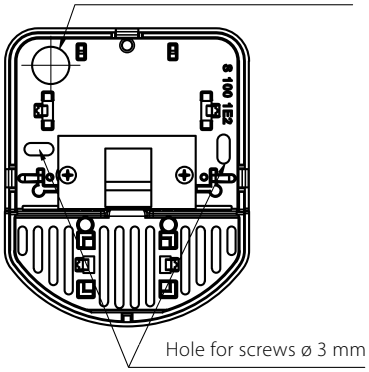


GND, PWR – U_{CC} supply voltage
K+/K– – communication line
BUS END – RS 485 termination

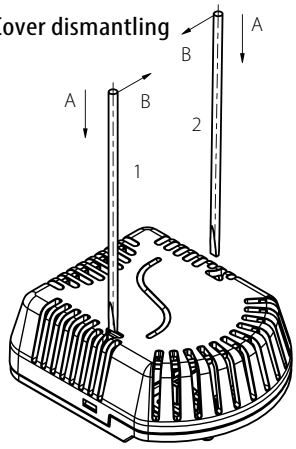
DIMENSIONAL DRAFT



Operating position



Cover dismantling



STHC 104 – TEMPERATURE, RELATIVE HUMIDITY AND CO2 SENSOR TO THE INTERIOR WITH CAN OUTPUT PROTOCOL (CANOPEN)

H04.02en

DESCRIPTION AND APPLICATION

CE

The STHC 104 temperature, relative humidity and CO_2 sensor is designed to measure the carbon dioxide concentration, temperature and relative humidity of the air in spaces protected against water.

This combined sensor consists of a plastic ribbing head where a printed circuit board with the individual sensors and a converter is placed to establish a communication via the CAN bus. The temperature and relative humidity are measured by a common internal sensor whose signal is processed in a microprocessor and is converted to a CANopen output signal with CiA DS 301 specification. The CO_2 value is measured by a NDIR module whose digital signal is also converted to CANopen output signal with CiA DS 301 specification. For the CO_2 concentration sensor, there is an autocalibration function available to set the sensor at the minimum CO_2 value corresponding to the outside concentration level.

The STHC 104 temperature, relative humidity and CO_2 sensor meets the ingress protection of IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensor does not feel disturbing even in the interiors with high aesthetic requirements. The STHC 104 temperature, relative humidity and CO_2 sensor is designed to be operated in a chemically non-aggressive environment; its use must be chosen with regard to temperature and chemical resistance of the head and of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature in the vicinity of the sensor: 0 to 45 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 106 kPa

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

Sensor type	STHC 104
Temperature measurement range **	0 to 45 °C
Temperature measurement accuracy *	± 0.5 °C
Relative humidity measurement range *	0 to 85 %
Relative humidity measurement accuracy *	± 3 % in range 10 to 85 % ± 4.5 % in range 0 to 10 %
CO_2 measuring range *	400 to 5000 ppm
CO_2 measuring accuracy *	± 100 ppm *
Time response CO_2 (90%)	90 s
Output signal	CAN / CANopen - CiA DS 301
Galvanicaly separated	no, possible on request
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 acc. to EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm

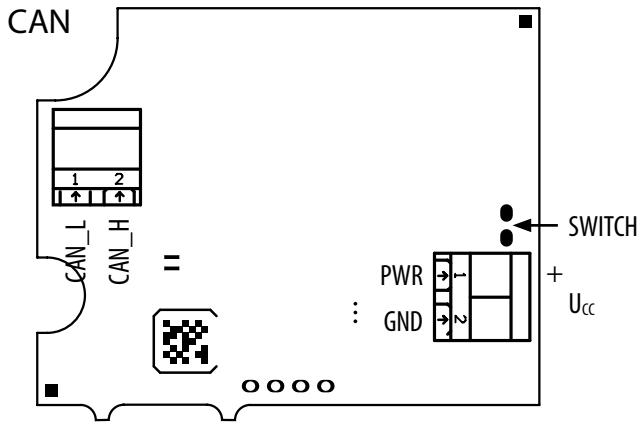
OTHER PARAMETERS

Material of the head	LEXAN
Weight	min 0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

** The stated measurement ranges and accuracies for the individual sensors refer to operating conditions when the supply voltage is connected.*

***Temperature sensor can be used in temperature range -40 to 80 °C for a short time.*

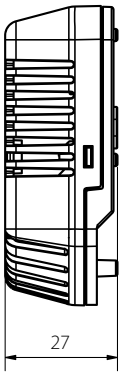
WIRING DIAGRAM

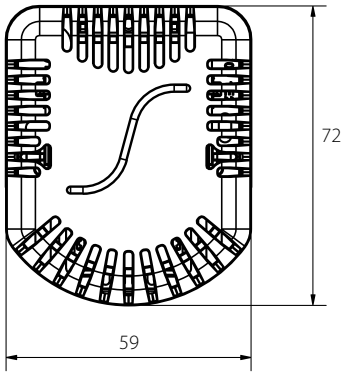


GND, PWR – U_{CC} supply voltage

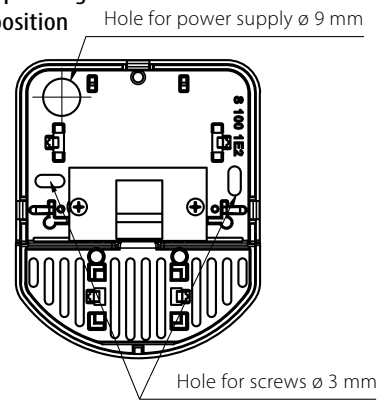
CAN_L, CAN_H – communication line

DIMENSIONAL DRAFT

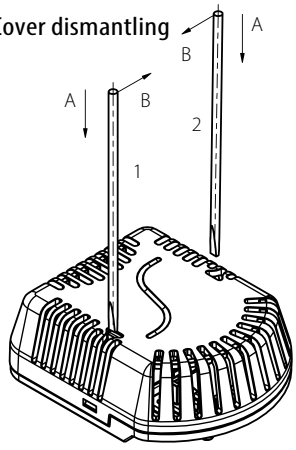




Operating position



Cover dismantling



STHPV 102 – TEMPERATURE, RELATIVE HUMIDITY, ATM. PRESSURE AND VOC SENSOR TO THE INTERIOR WITH RS 485 (MODBUS) OUTPUT

H05.01en

DESCRIPTION AND APPLICATION

Temperature, relative humidity, atmospheric pressure and VOC interior sensor with RS 485 (MODBUS) output - STHPV 102 is designed to measure air temperature, air relative humidity, atmospheric pressure and concentration of VOC (volitale organic compounds) in the air in spaces protected against water. This combined interior sensor STHPV 102 consists of a plastic ribbing head, where a printed circuit board with the individual sensors and a converter is placed to establish a communication via the RS 485 bus. Temperature, relative humidity, atmospheric pressure and VOC are measured by a common internal sensing element whose signal is processed in a microprocessor and is converted to an output signal of MODBUS RTU.

Combined interior sensor STHPV 102 meet ingress protection IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensors do not feel disturbing even in the interiors with high aesthetic requirements. The installation is recommended on an inner wall at the height of 1.5 m, in areas with moving persons, not exposed to direct sunlight and not influenced by heat from walls, heat sources or lighting. Combined interior sensor - STHPV 102 is 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 and of the individual sensors.

The operating conditions to establish the correct function are:

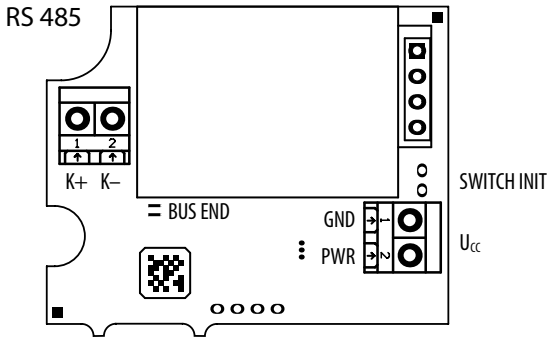
- ambient temperature around the sensor: - 30 to 70 °C, for short period - 40 to 80 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 110 kPa

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, as amended) or in an Accredited laboratory.

WIRING DIAGRAM



GND, PWR – U_{CC} supply voltage
K+/K– – communication line
BUS END – RS 485 termination

SPECIFICATIONS

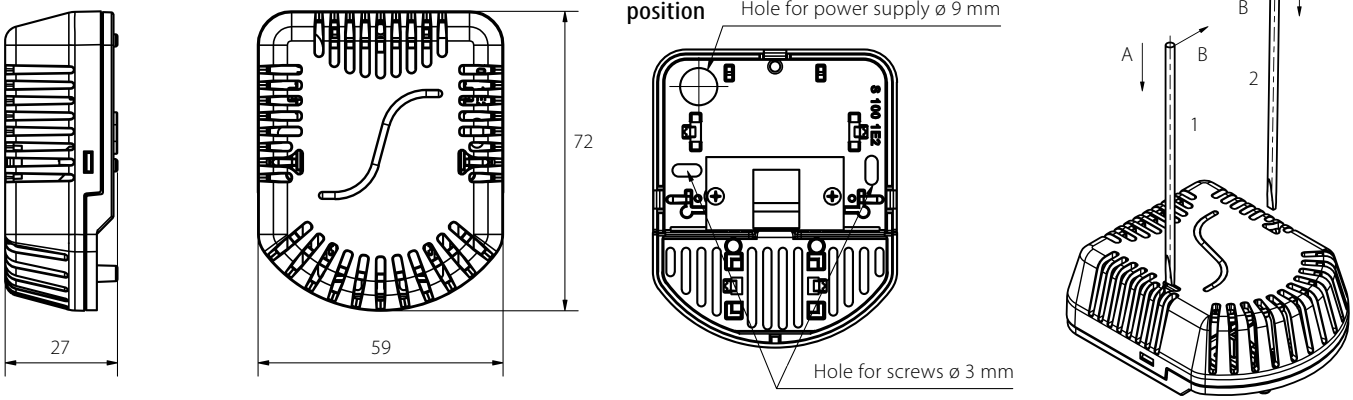
Sensor type	STHPV 102
Temperature measurement range *	- 30 to 70 °C - 40 to 80 °C short-term
Temperature measurement accuracy *	± 0.5 °C at 25 °C ± 1.0 in range 0 to 65 °C
Relative humidity measurement range *	0 to 95 %
Relative humidity measurement accuracy *	± 3 % in range 20 to 80 % ± 4.5 % in range 0 to 19 % and 81 to 95 %
VOC measurement range (IAQ index) *	0 to 500
VOCmeasurement accuracy *	± 15 %
Atmospheric pressure measuring range *	300 to 1100 hPa

OTHER PARAMETERS

Atm. pressure measurement accuracy * (in temp. range 0 to 65 °C in range 300 - 1100 hPa)	absolute deviation: ± 0.6 hPa long-term temperature stability: ± 1.0 hPa
Atm. pressure measurement accuracy * (in temp. range 25 to 40 °C in range 700 - 1100 hPa)	absolute deviation: ± 0.12 hPa
Output signal	RS 485 / MODBUS
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 250 mW
Ingress protection	IP 30 in accordance with EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight	min 0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

**) The stated measurement ranges and accuracies for the individual sensors refer to operating conditions when the supply voltage is connected.*

DIMENSIONAL DRAFT



STHPV 104 – TEMPERATURE, RELATIVE HUMIDITY, ATM. PRESSURE AND VOC SENSOR TO THE INTERIOR WITH CAN PROTOCOL (CANopen) OUTPUT

H06.01en

DESCRIPTION AND APPLICATION

CE

Temperature, relative humidity, atmospheric pressure and VOC interior sensor with CAN (CAN open) output - STHPV 104 is designed to measure air temperature, air relative humidity, atmospheric pressure and concentration of VOC (volitale organic compounds) in the air in spaces protected against water. This combined interior sensor STHPV 104 consists of a plastic ribbing head, where a printed circuit board with the individual sensors and a converter is placed to establish a communication via the CAN bus. Temperature, relative humidity, atmospheric pressure and VOC are measured by a common internal sensing element whose signal is processed in a microprocessor and is converted to a CANopen output signal with CiA DS 301 specification output signal.

Combined interior sensor - STHPV 104 meet ingress protection IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensors do not feel disturbing even in the interiors with high aesthetic requirements. The installation is recommended on an inner wall at the height of 1.5 m, in areas with moving persons, not exposed to direct sunlight and not influenced by heat from walls, heat sources or lighting.

Combined interior sensor – STHPV 104 is 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 and of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature around the sensor: - 30 to 70 °C, for short period – 40 to 80 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 110 kPa

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

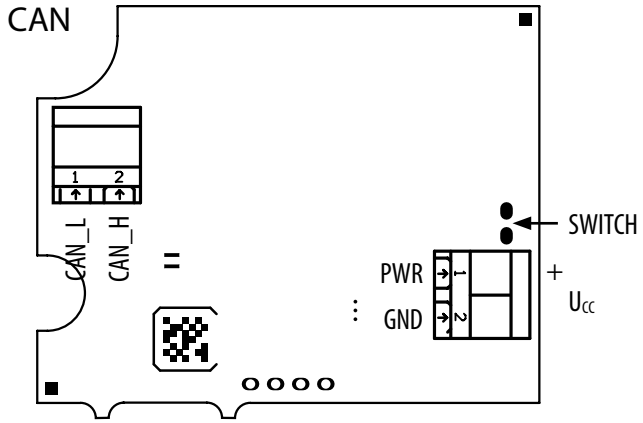
Sensor type	STHPV 104
Temperature measurement range *	- 30 to 70 °C - 40 to 80 °C short-term
Temperature measurement accuracy *	± 0.5 °C at 25 °C ± 1.0 in range 0 to 65 °C
Relative humidity measurement range *	0 to 95 %
Relative humidity measurement accuracy *	± 3 % in range 20 to 80 % ± 4.5 % in range 0 to 19 % and 81 to 95 %
VOC measurement range (IAQ index) *	0 to 500
VOCmeasurement accuracy *	± 15 %
Atmospheric pressure measuring range *	300 to 1100 hPa
Atm. pressure measurement accuracy * (in temp. range 0 to 65 °C in range 300 - 1100 hPa)	absolute deviation: ± 0.6 hPa long-term temperature stability: ± 1.0 hPa
Atm. pressure measurement accuracy * (in temp. range 25 to 40 °C in range 700 - 1100 hPa)	absolute deviation: ± 0.12 hPa

OTHER PARAMETERS

Output signal	CAN / CAN open - CiA DS 301
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 in accordance with EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight	min 0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

**) The stated measurement ranges and accuracies for the individual sensors refer to operating conditions when the supply voltage is connected.*

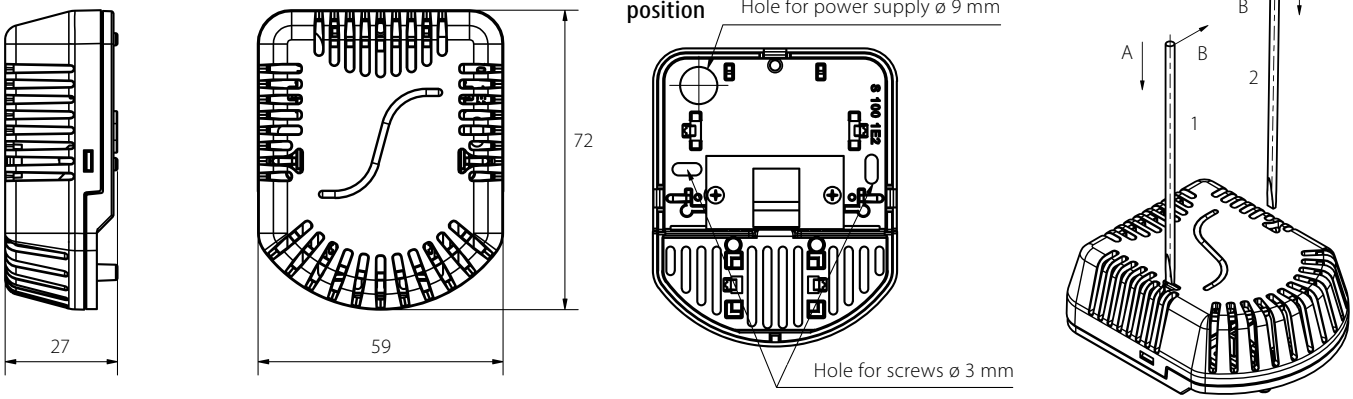
WIRING DIAGRAM



GND, PWR – U_{CC} supply voltage

CAN_L, CAN_H – communication line

DIMENSIONAL DRAFT



STHCPV 102 – TEMPERATURE, RELATIVE HUMIDITY, CO2, ATM. PRESSURE AND VOC SENSOR TO THE INTERIOR WITH RS 485 (MODBUS) OUTPUT

H07.01en

DESCRIPTION AND APPLICATION

CE

Combined temperature, relative humidity, CO_2, atmospheric pressure and VOC interior sensors with RS 485 (MODBUS) output - STHCPV 102 is designed to measure the carbon dioxide concentration, air temperature, air relative humidity, atmospheric pressure and VOC (volatile organic compounds) concentration in spaces protected against water. Combined interior sensor consists of a plastic ribbing head where a printed circuit board with the individual sensors and a converter is placed to establish a communication via the RS 485 bus. The temperature, relative humidity, atmospheric pressure and VOC are measured by a common internal sensor whose signal is processed in a microprocessor and is converted to an output signal of MODBUS RTU. The CO_2 value is measured by a NDIR module whose digital signal is also converted to an output signal of MODBUS RTU. For the CO_2 concentration sensor, there is an autocalibration function available to set the sensor at the minimum CO_2 value corresponding to the outside concentration level. Combined interior sensor meets the ingress protection of IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensor does not feel disturbing even in the interiors with high aesthetic requirements.

The STHCPV 102 temperature, relative humidity, CO_2, atmospheric pressure and VOC interior sensor is designed to be operated in a chemically non-aggressive environment; its use must be chosen with regard to temperature and chemical resistance of the head and of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature in the vicinity of the sensor: 0 to 45 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 106 kPa

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	STHCPV 102
Temperature measurement range **	0 to 45 °C with guaranteed accuracy of CO_2 measurement - 30 to 70 °C without guaranteed accuracy of CO_2 measurement - 40 to 80 °C short-term
Temperature measurement accuracy *	± 0.5 °C in temperature 25 °C ± 1.0 °C in temperature 0 to 65 °C
Relative humidity measurement range *	0 to 85 % with guaranteed accuracy of CO_2 measurement 0 to 95 % without guaranteed accuracy of CO_2 measurement
Relative humidity measurement accuracy *	± 3 % in range 20 to 85 % ± 4.5 % in range 0 to 19 % and 81 to 95 %
CO_2 measuring range *	400 to 5000 ppm
CO_2 measuring accuracy *	± 100 ppm *
Time response CO_2 (90%)	90 s
VOCmeasurement range (IAQ index)*	0 to 500
VOCmeasurement accuracy *	± 15 %

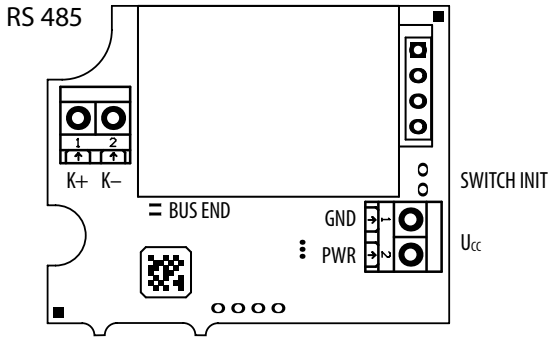
OTHER PARAMETERS

Atm. pressure measurement range *	300 to 1100 hPa
Atm. pressure measurement accuracy * (in tempereature range 0 to 65 °C, in range of 300 - 1100 hPa)	absolute deviation: ± 0.6 hPa long term temperature stability: ± 1.0 hPa
Atm. pressure measurement accuracy * (in temperature range 25 to 45 °C, in range 700 - 1100 hPa)	absolute deviation: ± 0.12 hPa
Output signal	RS 485 / MODBUS RTU
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 acc. to EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight	min 0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

** The stated measurement ranges and accuracies for the individual sensors refer to operating conditions when the supply voltage is connected.*

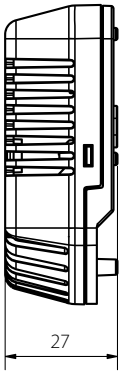
***Temperature sensor can be used in temperature range -40 °C to 80 °C for a short time.*

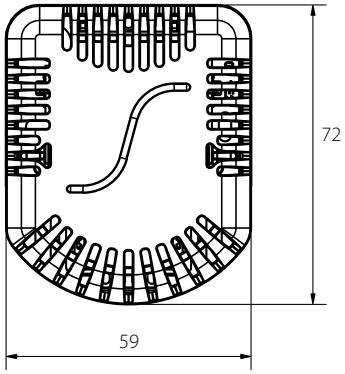
WIRING DIAGRAM



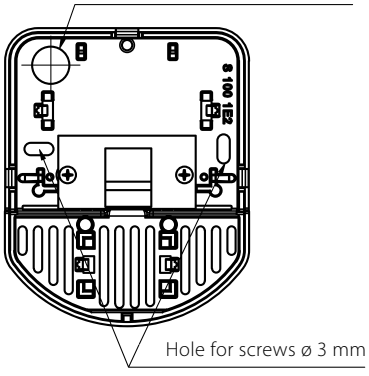
GND, PWR – U_{CC} supply voltage
K+/K– – communication line
BUS END – RS 485 termination

DIMENSIONAL DRAFT

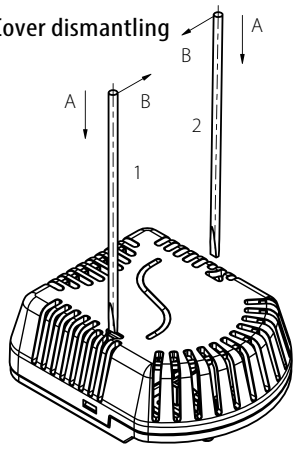




Operating position



Cover dismantling



STHCPV 104 – TEMPERATURE, RELATIVE HUMIDITY, CO2, ATM. PRESSURE AND VOC SENSOR TO THE INTERIOR WITH CAN PROTOCOL (CANopen) OUTPUT

H08.01en

DESCRIPTION AND APPLICATION

CE

Combined temperature, relative humidity, CO_2, atmospheric pressure and VOC interior sensors with CAN (CAN open) output - STHCPV 104 is designed to measure the carbon dioxide concentration, air temperature, air relative humidity, atmospheric pressure and VOC (volatile organic compounds) concentration in spaces protected against water. Combined interior sensor STHCPV 104 consists of a plastic ribbing head where a printed circuit board with the individual sensors and a converter is placed to establish a communication via the CAN open bus. The temperature, relative humidity, atmospheric pressure and VOC are measured by a common internal sensor whose signal is processed in a microprocessor and is converted to CAN open with CiA DS 301 specification output signal. The CO_2 value is measured by a NDIR module whose digital signal is also converted to an output signal of CAN open. For the CO_2 concentration sensor, there is an autocalibration function available to set the sensor at the minimum CO_2 value corresponding to the outside concentration level. Combined interior sensor STHCPV 104 meets the ingress protection of IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensor does not feel disturbing even in the interiors with high aesthetic requirements.

Combined interior sensoe STHCPV 104 is designed to be operated in a chemically non-aggressive environment; its use must be chosen with regard to temperature and chemical resistance of the head and of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature in the vicinity of the sensor: 0 to 45 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 106 kPa

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, as amended) or in an Accredited laboratory.

SPECIFICATIONS

Sensor type	STHCPV 104
Temperature measurement range **	0 to 45 °C with guaranteed accuracy of CO_2 measurement - 30 to 70 °C without guaranteed accuracy of CO_2 measurement - 40 to 80 °C short-term
Temperature measurement accuracy *	± 0.5 °C in temperature 25 °C ± 1.0 °C in temperature 0 to 65 °C
Relative humidity measurement range *	0 to 85 % with guaranteed accuracy of CO_2 measurement 0 to 95 % without guaranteed accuracy of CO_2 measurement
Relative humidity measurement accuracy *	± 3 % in range 20 to 85 % ± 4.5 % in range 0 to 19 % and 81 to 95 %
CO_2 measuring range *	400 to 5000 ppm
CO_2 measuring accuracy *	± 100 ppm *
Time response CO_2 (90%)	90 s
VOCmeasurement range (IAQ index)*	0 to 500
VOCmeasurement accuracy *	± 15 %
Atm. pressure measurement range *	300 to 1100 hPa

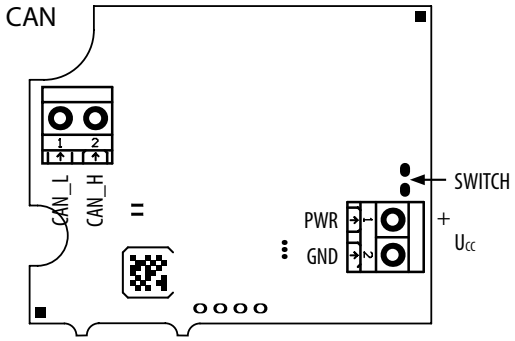
OTHER PARAMETERS

Atm. pressure measurement accuracy * (in tempereature range 0 to 65 °C, in range of 300 - 1100 hPa)	absolute deviation: ± 0.6 hPa long term temperature stability: ± 1.0 hPa
Atm. pressure measurement accuracy * (in temperature range 25 to 45 °C, in range 700 - 1100 hPa)	absolute deviation: ± 0.12 hPa
Output signal	CAN / CANopen - CiA DS 301
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 acc. to EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight	min 0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

** The stated measurement ranges and accuracies for the individual sensors refer to operating conditions when the supply voltage is connected.*

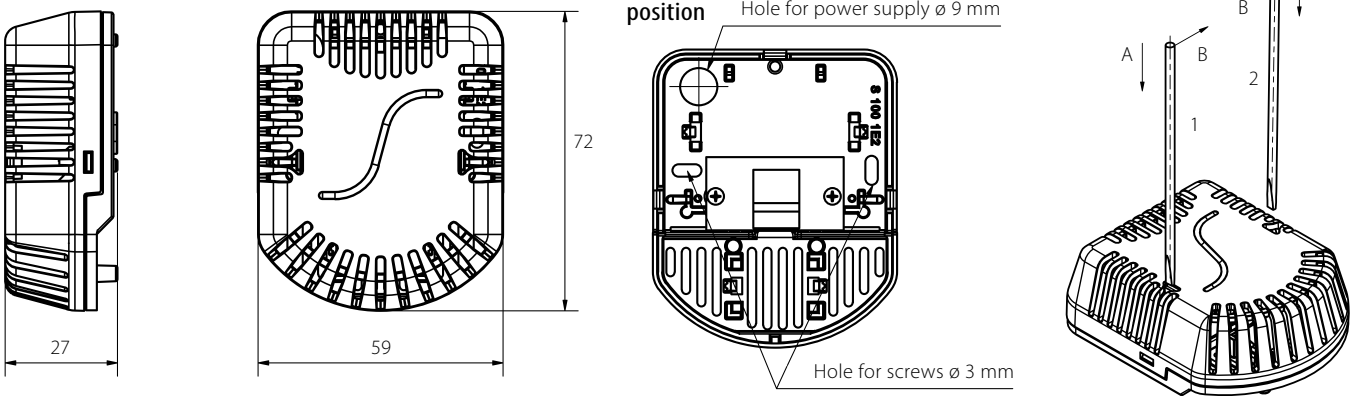
***Temperature sensor can be used in temperature range -40 °C to 80 °C for a short time.*

WIRING DIAGRAM



GND, PWR – U_{CC} supply voltage
CAN_L, CAN_H – communication line

DIMENSIONAL DRAFT



SC 102 – CO2 SENSORS TO THE INTERIOR WITH RS 485 (MODBUS) OUTPUT

H09.01en

CE

DESCRIPTION AND APPLICATION

The SC 102 - CO_2 sensor is designed to measure the carbon dioxide concentration of the air in spaces protected against water. This CO_2 sensor consists of a plastic ribbing head where a printed circuit board with the CO_2 sensor and a converter is placed to establish a communication via the RS 485 bus. The CO_2 value is measured by a NDIR module whose digital signal is also converted to an output signal of MODBUS RTU. For the CO_2 concentration sensor, there is an autocalibration function available to set the sensor at the minimum CO_2 value corresponding to the outside concentration level. The SC 102 - CO_2 sensor meets the ingress protection of IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensor does not feel disturbing even in the interiors with high aesthetic requirements.

The SC 102 - CO_2 sensor is designed to be operated in a chemically non-aggressive environment; its use must be chosen with regard to temperature and chemical resistance of the head and of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature in the vicinity of the sensor: 0 to 45 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 106 kPa

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

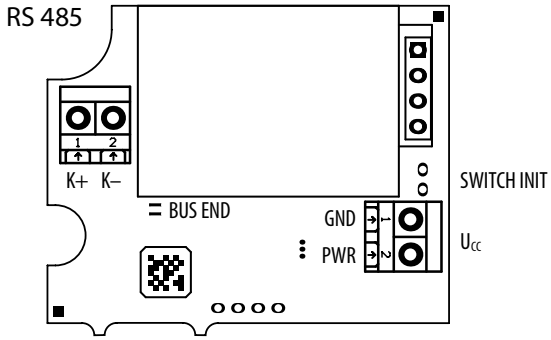
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

Sensor type	SC 102
CO_2 measuring range *	400 to 5000 ppm
CO_2 measuring accuracy *	± 100 ppm *
Time response CO_2 (90%)	90 s
Output signal	RS 485 / MODBUS RTU
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 acc. to EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight	min 0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

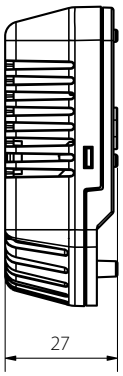
** The stated measurement ranges and accuracies for the individual sensors refer to operating conditions when the supply voltage is connected.*

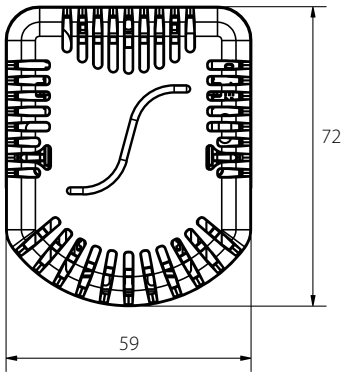
WIRING DIAGRAM



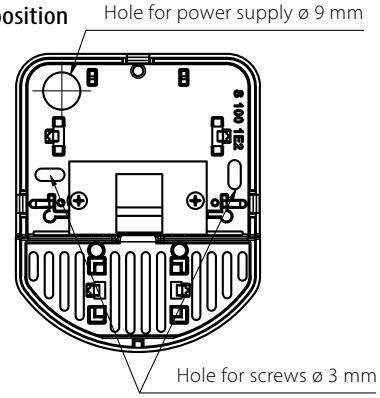
GND, PWR – U_{CC} supply voltage
K+/K– – communication line
BUS END – RS 485 termination

DIMENSIONAL DRAFT

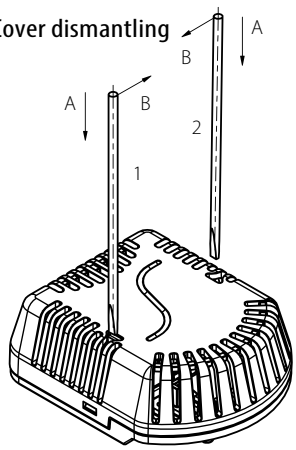




Operating position



Cover dismantling



SC 104 – CO2 SENSORS TO THE INTERIOR WITH CAN PROTOCOL (CANopen) OUTPUT

H10.01en

CE

DESCRIPTION AND APPLICATION

The SC 104 - CO_2 sensor is designed to measure the carbon dioxide concentration of the air in spaces protected against water. This CO_2 sensor consists of a plastic ribbing head where a printed circuit board with the sensor and a converter is placed to establish a communication via the CAN bus. The CO_2 value is measured by a NDIR module whose digital signal is also converted to an output signal of CAN / CANopen - CiA DS 301. For the CO_2 concentration sensor, there is an autocalibration function available to set the sensor at the minimum CO_2 value corresponding to the outside concentration level. The SC 104 - CO_2 sensor meets the ingress protection of IP 30 according to EN 60529, as amended. Suitable design and high-quality material ensure that the sensor does not feel disturbing even in the interiors with high aesthetic requirements.

The SC 104 - CO_2 sensor is designed to be operated in a chemically non-aggressive environment; its use must be chosen with regard to temperature and chemical resistance of the head and of the individual sensors.

The operating conditions to establish the correct function are:

- ambient temperature in the vicinity of the sensor: 0 to 45 °C
- relative ambient humidity: 0 to 95% (non-condensing humidity)
- atmospheric pressure: 87 to 106 kPa

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

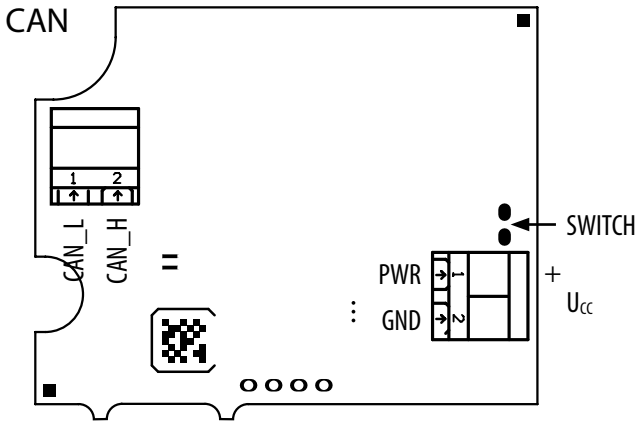
Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers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

SPECIFICATIONS

Sensor type	SC 104
CO_2 measuring range *	400 to 5000 ppm
CO_2 measuring accuracy *	± 100 ppm *
Time response CO_2 (90%)	90 s
Output signal	CAN / CANopen - CiA DS 301
Galvanicaly separated	no, possible on request
Supply voltage U	15 to 30 VDC
Rated supply voltage Un	24 VDC
Consumption	maximum: 500 mW typical: 300 mW
Ingress protection	IP 30 acc. to EN 60529, as amended
Dimension of the head	71.9 x 59 x 27 mm
Material of the head	LEXAN
Weight	min 0.035 kg
Recommended wire cross section	0.14 to 1 mm^2

** The stated measurement ranges and accuracies for the individual sensors refer to operating conditions when the supply voltage is connected.*

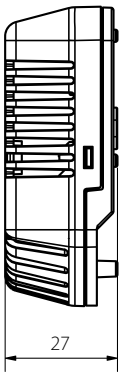
WIRING DIAGRAM

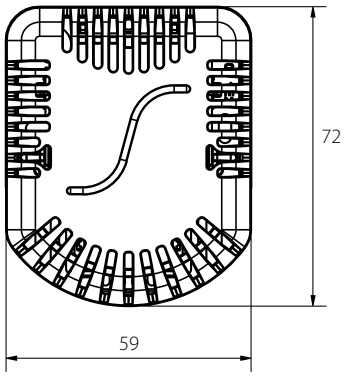


GND, PWR – U_{CC} supply voltage

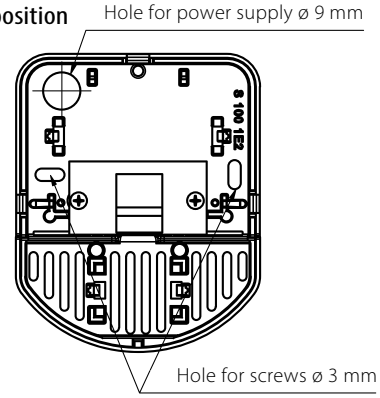
CAN_L, CAN_H – communication line

DIMENSIONAL DRAFT

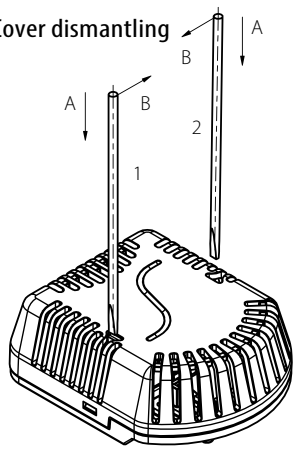




Operating position



Cover dismantling



INDUSTRIAL TEMPERATURE, HUMIDITY, ATMOSPHERIC PRESSURE, C02 SENSORS

202.03en

USE

- storage of food, medication
- museums, galleries, depositories
- flats, living space, offices
- technological operations, clean rooms
- industry
- data centres, server rooms

Measured quantities:		**Computed quantities:**	
Temperature	(°C)	Dew point temperature	(°C)
Humidity	(%RH)	Absolute humidity	(g/m3)
Atmospheric pressure	(hPa)	Specific humidity	(g/kg)
CO_2	(ppm)	Mixing ratio	(g/kg)
		Specific enthalpy	(kJ/Kg)

GENERAL TECHNICAL PARAMETERS

Temperature measuring range:	-30 ... +80°C (+125 °C)
Humidity measuring range:	0 ... 100 % RH
Atmospheric pressure measuring range:	600 ... 1100 hPa
C02 measuring range:	0 ... 2000 ppm
Temperature measurement accuracy:	± 0.4 °C
Humidity measurement accuracy:	± 2.5% RH
Atmospheric pressure measurement accuracy:	± 1.3 hPa
C02 measurement accuracy:	± (50 ppm + 2 % of the measured value) at 25 °C and 1013 hPa
Protection:	IP40 – IP65 (depending on the model)
Power:	9–30 VDC, sensors with 0–10V are supplied 15–30 VDC; PoE

SPECIFICATIONS

Measured quantity/output	4–20mA	0–10V	RS232	RS485	Ethernet
Temperature + 3 bin. output	T0110 T4111 P0120 P0132 Px1x1	T4211	T0310 T4311	T0410 T4411	T0510 T4511 P8510 P8610 P8511 P8541 P8631
Humidity	T1110				
Atmospheric pressure	T2114	T2214	T2314	T2414	T2514
Temperature + humidity	T3110 T3113 T3117 T3111 T3111P	T0210 T0213 T0211 T0211P	T3311 T3313 T3319 T3319P	T3411 T3413 T3417 T3419 T3419P	T3510 T3511 T3511P
Temperature + atmospheric pressure				T5410	
Temperature + humidity + atmospheric pressure			T7310 T7311	T7410 T7411	T7510 T7511
C02	T5140 T5141	T5240 T5241	T5340 T5341	T5440 T5441	T5540 T5541
Temperature + humidity + C02			T6340	T6440	T6540

P8610, P8631 – PoE (Power over Ethernet). Pxxxx – types without display. TxxxxP – model with pressure probe for up to 25 bars.
Each device includes a calibration certificate from the manufacture, which is in compliance with the requirements of EN ISO/IEC 17025.

SENSIT s.r.o., Skolni 2610, 756 61 Roznov pod Radhostem, Czech Republic
T +420 571 625 571 F +420 571 625 572 E obchod@sensit.cz

INDUSTRIAL TEMPERATURE, HUMIDITY, ATMOSPHERIC PRESSURE, C02 REGULATORS

203.03en

USE

- storage of food, medication
- museums, galleries, depositories
- flats, living space, offices
- technological operations, clean rooms
- industry
- telecommunication devices, servers

Measured quantities:		**Computed quantities:**	
Temperature	(°C)	Dew point temperature	(°C)
Humidity	(%RH)	Absolute humidity	(g/m3)
Atmospheric pressure	(hPa)	Specific humidity	(g/kg)
CO_2 (ppm)		Mixing ratio	(g/kg)
		Specific enthalpy	(kJ/Kg)

GENERAL TECHNICAL PARAMETERS

Temperature measuring range:	-30 ... +80°C (+125 °C)
Humidity measuring range:	0 ... 100 % RH
Atmospheric pressure measuring range:	600 ... 1100 hPa
C02 measuring range:	0 ... 2000 ppm
Temperature measurement accuracy:	± 0to4 °C
Humidity measurement accuracy:	± 2to5 % RH
Atmospheric pressure measurement accuracy:	± 1to3 hPa
C02 measurement accuracy:	± (50 ppm +2 % of the measured value) at 25 °C and 1013 hPa,
Protection:	IP40 – IP65 (depending on the model)
Power:	9–30 VDC, sensors with 0–10 V are supplied 15–30 VDC; PoE

SPECIFICATIONS

Measured quantity/output	2x Relay	2x Relay + RS232	2x Relay	2x Relay + Ethernet
Temperature + 3 bin. output		H4331 H4431	H0430	H0530 H4531 H4531R
Temperature + humidity	H3060 H3061 H3061P H3020 H3021 H3021P H3023			
Temperature + humidity + 3 bin. Output		H3331 H3331P	H3430 H3431 H3431P H3433	H3530 H3531 H3531P H3531R
Temperature + humidity + pressure + 3 bin. output		H7331	H7430 H7431	H7530 H7531 H7531R
C02	H5021 H5024	H5321 H5324	H5421 H5424	H5521 H5524
Temperature + humidity + C02	H6020	H6320	H6420	H6520

HxxxxP – model with pressure probe for up to 25 bars

Each device includes a calibration certificate from the manufacture, which is in compliance with the requirements of EN ISO/IEC 17025.

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SHV1
FLOOD DETECTORS (LEVEL SENSORS)

L01.02en

DESCRIPTION AND APPLICATION

Level sensors (flood sensors) consist of metal sensing electrodes and a plastic head containing evaluation electronics. The connection of 24 VDC or 24 VAC supply voltage as well as the resting state of the relay or transistor output are indicated by a green LED. The failure state (forming of a conductive connection between the electrodes) is indicated by a red LED inside the box and a change of the state of the output transistor or relay contact. The selection of the relay output is done through the placement of a jumper on the PCB. All metal parts are made of stainless steel DIN 1.430, the basic length of the sensing electrodes is 50 mm. The supply cables are connected to the terminal board through bushings, which are part of the plastic head. The basic material of the head is POLYAMIDE.

Level sensors (flood sensors) operates on the principle of different conductivity of air and water. Water becomes conductive to a certain extent due to dissolved mineral and organic substances. Under normal conditions (rain water), it has a conductivity of 5 mS/m and higher. This value reflects also on the setting of the sensitivity of the sensor with a margin (less than 1 mS/m). Once the electrodes are connected by a conductive medium, current starts to flow through the circuit (of the order of µA), which is then detected by evaluation electronics. This leads to state indication by a red LED, activation of the output transistor (open collector) or closing/opening of relay contacts.

Level sensors (flood sensors) indicate fault conditions associated with water leakage in industrial plants as well as in rooms, offices or production halls within the range of 0 to 80 °C. The level sensors (flood sensors) meet the ingress protection of IP 65 according to EN 60529, as amended and satisfy the conditions for operation in a normal, non-aggressive environment. The method of use must be chosen with regard to the temperature resistance of the sensor head and chemical resistance of the sensor housing and head.

Possible applications:

- pump shutdown upon reaching a required level
- flooding of buildings by groundwater, floods, sewage
- flooding of sumps, pump activation upon reaching a certain level
- indication of water leakage from a washing machine, boiler, pump unit, etc.
- flooding of a room in the event of various equipment failures – broken toilet water supply line, overflowed bathtub, sink
- monitoring of condensate in a ventilation duct

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

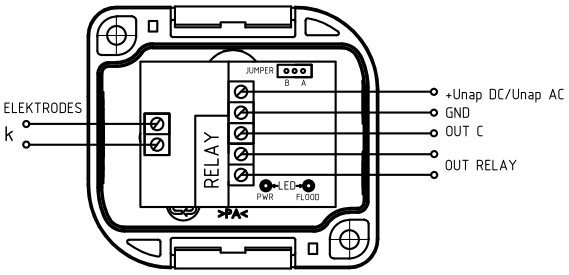
SPECIFICATIONS

Level sensor type	SHV1 OUT R	SHV1 OUT C
Supply voltage	15 to 30 V DC/V AC for rele output; recommended 24 V DC/V AC	12 to 30 V DC/V AC for open collector output; recommended 24 V DC/V AC
Temperature range	around the head: 0 to 80°C sensing elektrode: max. 100 °C	
Output signal	relay output	output terminal of the open collector type
Max. consumption without load	approx. 15 mA	
Max. consumption with load	approx. 35 mA	
Max. switching current	6 A	
Switching voltage	up to 24 V DC/V AC	
Indication	red LED – alarm state green LED – in operation, inactive alarm state	
Switching sensitivity	alarm function active at fluid conductivity above 1 mS/m-1	
Insulation resistance	between electrodes ≥ 500 V DC (between electrodes not connected to the PCB)	

OTHER PARAMETERS

Ingress protection of the head	IP65 acc. to EN 60529, as amended
Head material	POLYAMIDE
Electrode amterial	stainless steel DIN 1.4301
Dimensions	head 90 x 63 x 34 mm including electrodes 141 x 63 x 34 mm
Weight	0.125 kg

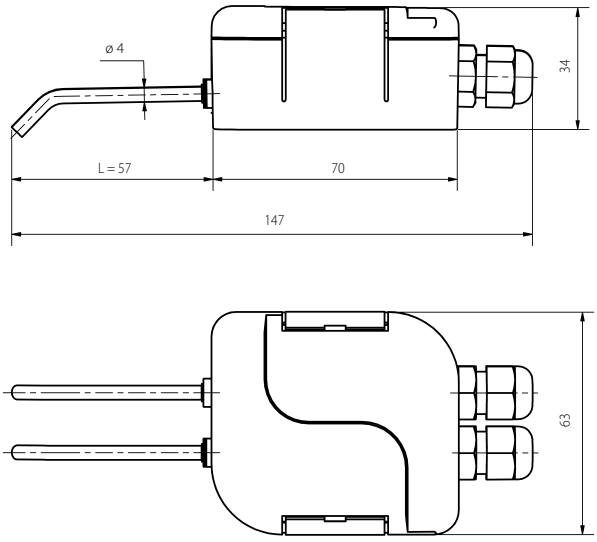
WIRING DIAGRAM



POSITION A: during flooding the outputs are active

POSITION B: during flooding the outputs are not active

DIMENSIONAL DRAFT



SHV2 – FLOOD DETECTORS (LEVEL SENSORS)

L02.02en

DESCRIPTION AND APPLICATION

Level sensors (flood sensors) consists of a plastic head containing evaluation electronics and an external probe formed by a silicone cable, at the end of which is a plastic box with sensing electrodes. Metal electrodes are made of stainless steel DIN 1.4301, the length of the sensing electrodes is 50 mm, standard length of the connection cable is 2 m. The connection of 24VDC or 24VAC supply voltage as well as the resting state of the relay or transistor output are indicated by a green LED. The failure state (forming of a conductive connection between the electrodes) is indicated by a red LED inside the box and a change of the state of the output transistor or relay contact. The selection of the relay output is done through the placement of a jumper on the PCB. The supply cables of the power supply and output contacts are connected to the terminal board through bushings, which are part of the plastic head. The basic material of the head is POLYAMIDE.

Level sensors (flood sensors) operates on the principle of different conductivity of air and water. Water becomes conductive to a certain extent due to dissolved mineral and organic substances. Under normal conditions (rain water), it has a conductivity of 5 mS/m and higher. This value reflects also on the setting of the sensitivity of the sensor with a margin (less than 1 mS/m). Current flows between immersed electrodes (of the order of µA), which is then detected by the evaluation electronics. This leads to state indication by a red LED, activation of the output transistor (open collector) or closing/opening of the relay (according to the jumper settings).

Level sensors (flood sensors) with an external probe is to indicate fault conditions associated with water leakage in industrial plants as well as in rooms, offices or production halls within the range of 0 to 80 °C. The level sensors (flood sensors) meet the ingress protection of IP 65 according to EN 60529, as amended and satisfy the conditions for operation in a normal, non-aggressive environment. The method of use must be chosen with regard to the temperature resistance of the sensor head and chemical resistance of the sensor housing and head.

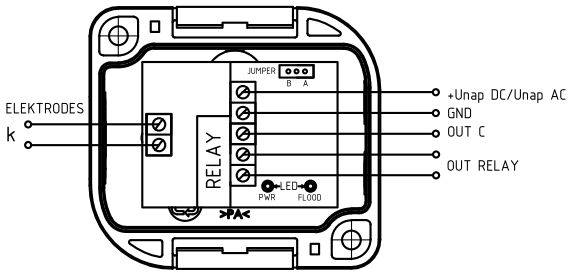
DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

SPECIFICATIONS

Level sensor type	SHV2 OUT R	SHV2 OUT C
Supply voltage	15 to 30 V DC/V AC for rele output; recommended 24 V DC/V AC	12 to 30 V DC/V AC for open collector output; recommended 24 V DC/V AC
Temperature range	around the head: 0 to 80°C sensing elektrode: max. 100 °C	
Output signal	relay output	output terminal of the open collector type
Max. consumption without load	approx. 15 mA	
Max. consumption with load	approx. 35 mA	
Max. switching current	6 A	
Switching voltage	up to 24 VvDC/VvAC	
Indication	red LED – alarm state green LED – in operation, inactive alarm state	
Switching sensitivity	alarm function active at fluid conductivity above 1 mS/m-1	
Insulation resistance	between electrodes ≥ 500 V DC (between electrodes not connected to the PCB)	
Ingress protection of the head	IP65 acc. to EN 60529, as amended	
Ingress protection of the external probe	IP67 acc. to EN 60529, as amended	
Head material	POLYAMIDE	
Electrode amterial	stainless steel DIN 1.4301	
External box material	SILAMID	
External probe cable length standard	2 m, custom up to 15 m	
External probe cable type	silicone unshielded 2 x 0.22 mm^2	
Dimensions	head 90 x 63 x 34 mm external probe 61 x 24 x 25 mm	
Weight	0.19 kg (with a 2m external probe)	

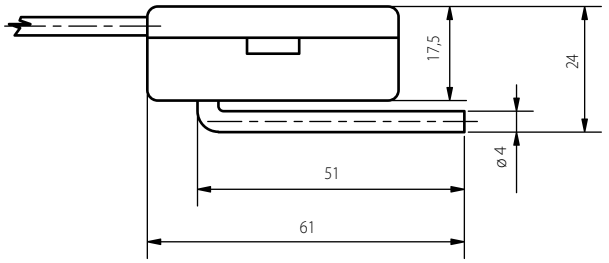
WIRING DIAGRAM

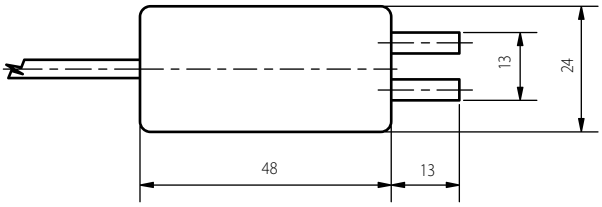


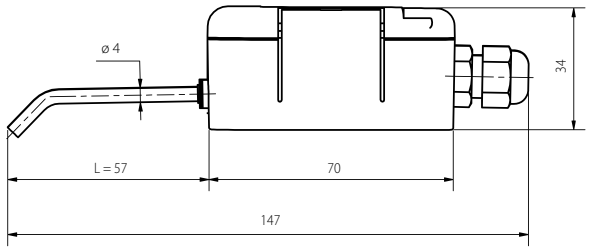
POSITION A: during flooding the outputs are active

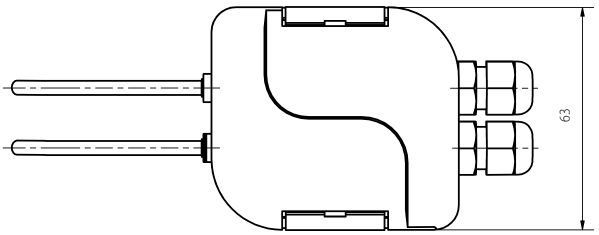
POSITION B: during flooding the outputs are not active

DIMENSIONAL DRAFT









CALORIMETRIC FLOW SWITCHES FS 10/11/15/20

217.01en

DESCRIPTION AND APPLICATION

It is a device that monitors the flow of fluid based on calorimetry principle. If the flow rate drops below a limit set by user, the status output is changed. The flow rate is displayed by ten LEDs and it is possible to select a boundary for contact making/breaking in the same graduation. The measuring cycle takes from 4 sec to 8 sec with the recommended measurement range 4 to 150 cm/sec. In case of an empty pipeline, the sensor behaves in the same way as with zero flow.

These calorimetric flow switches are available in four versions:

- FS 10 – 1× status output (depending on flow velocity)
- FS 11 – 2× status output (depending on flow velocity)
- FS 15 – 2× status output (1× depending on flow velocity and 1× depending on temperature)
- FS 20 – 1× status and 1× current output (depending on flow velocity)

Meter states displayed

The flow switch point on LED scale can be implemented using two colours (red LED or amber LED), indicating at the same time which contact is normally closed or normally, open. In case of FS15, the temperature switch point is indicated by the LED located between the control push buttons. If the temperature of media is above/below the set-point, the LED is red, indicating that PIN2 is open at the same time (the sensor supplied as standard is configured open at a temperature above the set limit with the LED turned ON). If the logic of the normally open/normally closed point is changed by the user, the logic of both outputs is changed at the same time (applicable to FS 11 and FS15 versions).

The flow switch has two flush-type control buttons, making it possible:

- the switching point/points for flow velocity (temperature in some case)
- to change the logic of the N.O./N.C. output
- to calibrate the minimum and maximum flow values of the monitoring device
- to reset the original parameters from factory

ACCESSORIES

- FS adapter block

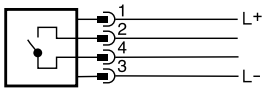
SPECIFICATIONS

Sensor type	FS 10/11/15/20
Power supply	24 V ± 10 % DV with polarity reversal protection
Input power	1.5 / 4 VA
Electrical connection	connector M12/1 (4 PIN)
Process connection	according to DIN 2353 with the M16 x 1.5 union nut through the 24° ring into the direct socket with pipe thread (G1/2"; G1/4"; M14 x 1.5; NPT1/4")
Sensor design	compact, separated (standard 3 m cable)
Display	10 x three-colour LED (flow velocity) 1 x LED (temperature - for FS 15 version only)
Outputs types relay	relay (for FS 10 version only), PNP, NPN, 4 to 20 mA (for FS 20 version only)
Contact rating	130 mA / 60 V / 500 mW
Time response *	1 to 6 s
Velocity flow range	4 to 400 cm/s
Accuracy	± 2 to ± 8 cm/s
Hysteresis	2 to 8 cm/s
Control	2 x flush-mounted buttom
Temperature of liquid	-10 to 80 °C
Ambient temperature	-20 to 55 °C
Material in contact with medium	stainless steel DIN 1.4404
Maximum pressure	64 bar
Ingress protection	IP 67 in accordance with EN 60529, as amended
Ambient humidity	max. 90 %
Status contact	SSR, passive, potential free, max. 350 V, AC/DC, 150 mA, 400 mW
Weight	0.29 kg
Dimensions (h x w x d)	91 x 74 x 60 mm (v případě dlouhé verze je celková výška 151 mm)

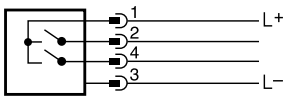
** for water (25 °C)*

WIRING DIAGRAM

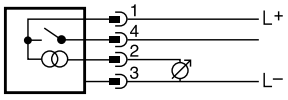
FS 10 – RELAY



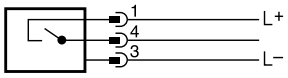
FS 11 / FS 15 – PNP



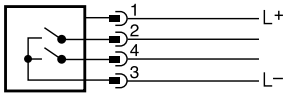
FS 20 – PNP



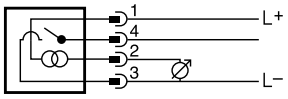
FS 10 – PNP



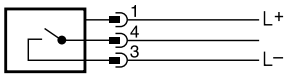
FS 11 / FS 15 – NPN



FS 20 – NPN



FS 10 – NPN



FS 10
RELAY

PIN 1 – Supply voltage +24 V
PIN 2 – Relay contact switch point
PIN 3 – Supply voltage GND
PIN 4 – Relay contact switch point

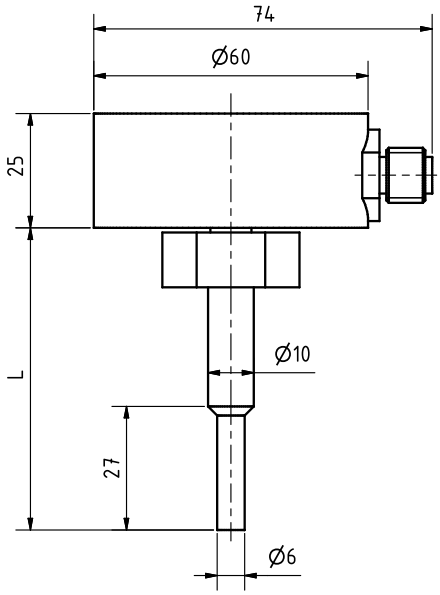
FS 10/FS 11/FS 15
PNP/NPN

PIN 1 – Supply voltage +24 V
PIN 2 – PNP/NPN contact of the flow switch point (FS 11 only) / / temp. (FS 15 only)
PIN 3 – supply voltage GND
PIN 4 – PNP/NPN contact of the flow switch point

FS 20
PNP/NPN

PIN 1 – Supply voltage +24 V
PIN 2 – 4–20 mA output
PIN 3 – Supply voltage GND
PIN 4 – PNP/NPN contact switch point

DIMENSIONAL DRAFT



CALORIMETRIC FLOW SWITCHES FOR EX ENVIRONMENT FS Ex 10/11/15/20

218.01en

DESCRIPTION AND APPLICATION

It is a device that monitors the flow of fluid based on calorimetry principle. If the flow rate drops below a limit set by user, the status output is changed. The flow rate is displayed by ten LEDs and it is possible to select a boundary for contact making/breaking in the same graduation. The measuring cycle takes from 4 sec to 8 sec with the recommended measurement range 4 to 150 cm/sec. In case of an empty pipeline, the sensor behaves in the same way as with zero flow.

These calorimetric flow switches are available in four versions:

- FS 10Ex – 1 × status output (depending on flow velocity)
- FS 11Ex – 2 × status output (depending on flow velocity)
- FS 15Ex – 2 × status output (1 × depending on flow velocity and 1 × on temperature)
- FS 20Ex – 1 × status output and 1 × current output (depending on flow velocity

Meter states displayed

The flow switch point on LED scale can be implemented using two colours (red LED or amber LED), indicating at the same time which contact is normally closed or normally, open. In case of FS 15Ex, the temperature switch point is indicated by the LED located between the control push buttons. If the temperature of media is above/below the set-point, the LED is red, indicating that PIN2 is open at the same time (the sensor supplied as standard is configured open at a temperature above the set limit with the LED turned ON). If the logic of the normally open/normally closed point is changed by the user, the logic of both outputs is changed at the same time (applicable to FS 11Ex and FS 15Ex versions).

The flow switch has two flush-type control buttons, making it possible:

- the switching point/points for flow velocity (temperature in some case)
- to change the logic of the N.O./N.C. output
- to calibrate the minimum and maximum flow values of the monitoring device
- to reset the original parameters from factory

I M1 Ex ia I Ma
II 1G Ex ia IIC T6 Ga
II 1D Ex ia III T85°C Da

ACCESSORIES

- FS adapter block

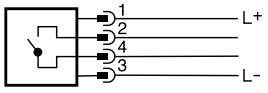
SPECIFICATIONS

Sensor type	FS 10Ex/11Ex/15Ex/20Ex
Power supply	24 V ± 10 % DV with polarity reversal protection
Input power	1.5 / 4 VA
Electrical connection	connector M12x1 (4 PIN)
Process connection	according to DIN 2353 with the M16 x 1.5 union nut through the 24° ring into the direct socket with pipe thread (G1/2"; G1/4"; M14 x 1.5; NPT1/4")
Sensor design	compact, separed (standard 3 m cable)
Display	10 x three-colour LED (flow velocity) 1 x LED (temperature – for FS 15Ex version only)
Output types	relay (for FS 10Ex version only), PNP, NPN, 4 to 20 mA (for FS 20Ex version only)
Contact rating	130 mA / 60 V / 500 mW
Time response *	1 to 6 s
Velocity flow range	4 to 400 cm/s
Accuracy	± 2 to ± 8 cm/s
Hysteresis	2 to 8 cm/s
Control	2 x flush-mounted buttom
Temperature of liquid	-10 to 80 °C
Ambient temperature	-20 to 55 °C
Material in contact with medium	stainless steel DIN 1.4404
Maximum pressure	64 bar
Ingress protection	IP 67 in accordance with 60529, as amended
Ambient humidity	max. 90 %
Status contact	SSR, passive, potential free, max. 350 V AC/DC, 150 mA, 400 mW
Weight	0.29 kg
Dimensions (h x w x d)	91 x 74 x 60 mm (in case of the longer version, the height is 151 mm)

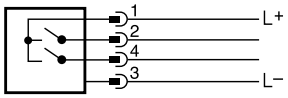
**) for water (25 °C)*

WIRING DIAGRAM

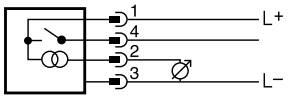
FS 10 – RELAY



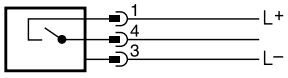
FS 11 / FS 15 – PNP



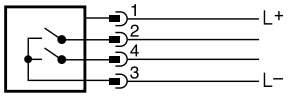
FS 20 – PNP



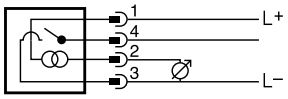
FS 10 – PNP



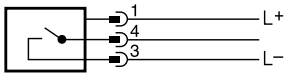
FS 11 / FS 15 – NPN



FS 20 – NPN



FS 10 – NPN



FS 10
RELAY

PIN 1 – Supply voltage +24 V
PIN 2 – Relay contact switch point
PIN 3 – Supply voltage GND
PIN 4 – Relay contact switch point

FS 10/FS 11/FS 15
PNP/NPN

PIN 1 – Supply voltage +24 V
PIN 2 – PNP/NPN contact of the flow switch point (FS 11 only) / / temp. (FS 15 only)
PIN 3 – supply voltage GND
PIN 4 – PNP/NPN contact of the flow switch point

FS 20
PNP/NPN

PIN 1 – Supply voltage +24 V
PIN 2 – 4–20 mA output
PIN 3 – Supply voltage GND
PIN 4 – PNP/NPN contact switch point

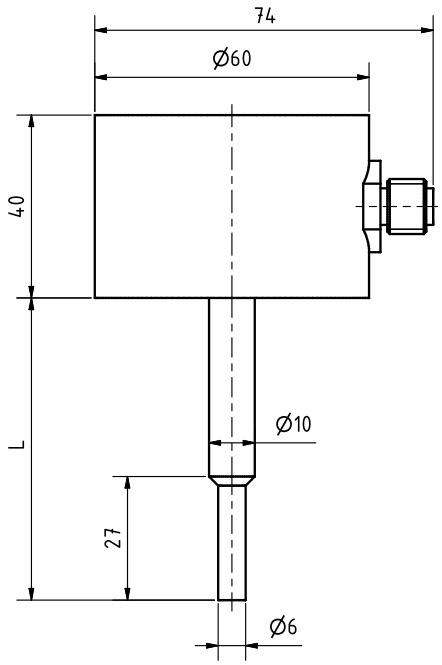
ELECTRICAL SAFETY PARAMETERS

The flow switch is normally delivered for 24 V DC ± 20% power supply. It must be fed from an intrinsically safe power supply with parameters compatible with our sensor and with regard to applicable classification according to the environment in which it will be used. Signal outputs of the flow switch can only be connected to devices with necessary protection degree for use in explosive atmospheres and their parameters correspond to applicable safety parameters for connection to our flow switch.

	Group devices I	Group IIC and IIIC devices
Power	Ui: 28.5 V Ci: 0 Li: 0	Ui: 28.5 V Ii: max. 115 mA Ci: 0 Li: 0
Relay output, passive	Ui: max. 28.5 V Ii: max. 115 mA Pi: max. 0.330 W Ci: 0 Li: 0	Ui: max. 28.5 V Ii: max. 115 mA Pi: max. 0.330 W Ci: 0 Li: 0
Realay output, active	Uo: max. Uo source Io: max. 115 mA Co: * LO: *	Uo: max. 115 mA Io: max. 115 mA Co: * LO: *
Current loop 4 to 20 mA active	Uo: max. 10.8 V Io: max. 196 mA Po: max. 0.529 W Co: < 10 mF LO: < 0.2 mH	Uo: max. 10.8 V Io: max. 196 mA Po: max. 0.529 W Co: < 1 mF LO: < 0.015 mH

** values are identical to those of the power supply*

DIMENSIONAL DRAFT



INDUCTIVE PROXIMITY SWITCHES

209.02en

DESCRIPTION AND APPLICATION

Inductive proximity switches are used for the monitoring of the presence of metal objects. They function as contact less substitution for the mechanical limit switches. Depending on a switch mode (normally open / normally closed), the output closes or opens, when the conductive objects approaching the active switching zone.

Operation

Operation of the sensor is maintenance-free. For a fault free operation it is however necessary to keep the following principes: surfaces of the active switching zone have to be kept free, clean. It is necessary to prevent sediments and other foreign particles from touching and setting up the active surface of the sensor, especially when mounted in upright position (active surface upwards). High electromagnetic field intensity devices (e.g. radiophone) must not be used in the immediate vicinity of the sensor.

Connection of the switch

Inductive proximity switches are delivered with 2 x 0.25 mm^2, 3 x 0.25 mm^2 or 4 x 0.25 mm^2 PVC cable in length of 2 m. This type meets ingress protection IP 68. variant of inductive proximity sensor with connector meets ingress protection IP 67.

Flush sensor with cable

Sensor	Flush with cable / with connector	Variants
	Diameter 6,5 mm	series PDI 3wires series PSI 3wires

Flush sensor with connector

Sensor	Flush with cable / with connector	Variants
	Diameter 6,5 mm	series PDI 3wires series PSI 3wires

Non-flush sensor with cable

Sensor	Non-flush with cable / with connector	Variants
	Diameter 6,5 mm	series PDI 3wires series PSI 3wires

Non-flush sensor with connector

Sensor	Non-flush with cable / with connector	Variants
	Diameter 6,5 mm	series PDI 3wires series PSI 3wires

Flush sensor with cable

Sensor	Flush with cable / with connector	Variants
	Diameter 6,5 mm	series PDI 3wires series PSI 3wires

Flush sensor with connector

Sensor	Flush with cable / with connector	Variants
	Diameter 6,5 mm	series PDI 3wires series PSI 3wires

Non-flush sensor with cable

Sensor	Non-flush with cable / with connector	Variants
	Diameter 6,5 mm	series PDI 3wires series PSI 3wires

Non-flush sensor with connector

Sensor	Non-flush with cable / with connector	Variants
	Diameter 6,5 mm	series PDI 3wires series PSI 3wires

Flush sensor with cable

Sensor	Flush with cable / with connector	Variants
	Thread M 12	series PSI 2wires series PDI 3wires series PSI 3wires series PDI 4wires series PSI 4wires

Flush sensor with connector

Sensor	Flush with cable / with connector	Variants
	Thread M 12	series PSI 2wires series PDI 3wires series PSI 3wires series PDI 4wires series PSI 4wires

Non-flush sensor with cable

Sensor	Non-flush with cable / with connector	Variants
	Thread M 12	series PSI 2wires series PDI 3wires series PSI 3wires series PDI 4wires series PSI 4wires

Non-flush sensor with connector

Sensor	Non-flush with cable / with connector	Variants
	Thread M 12	series PSI 2wires series PDI 3wires series PSI 3wires series PDI 4wires series PSI 4wires

Flush sensor with cable

Flush sensor with connector

Non-flush sensor with cable

Non-flush sensor with connector

Sensor	Flush with cable / with connector	Variants
	Thread M 18	series PSI 2wires series PDI 3wires series PSI 3wires series PDI 4wires series PSI 4wires

Sensor	Non-flush with cable / with connector	Variants
	Thread M 18	series PSI 2wires series PDI 3wires series PSI 3wires series PDI 4wires series PSI 4wires

Flush sensor with cable

Flush sensor with connector

Non-flush sensor with cable

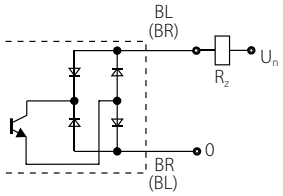
Non-flush sensor with connector

Sensor	Flush with cable / with connector	Variants
	Thread M 30	series PSI 2wires series PDI 3wires series PSI 3wires series PDI 4wires series PSI 4wires

Sensor	Non-flush with cable / with connector	Variants
	Thread M 30	series PSI 2wires series PDI 3wires series PSI 3wires series PDI 4wires series PSI 4wires

DIMENSIONAL DRAFT

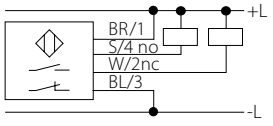
2wires



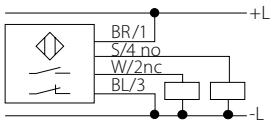
BR - brown, BL - blue

4wires

with cable
NPN n.o. / NPN n.c.



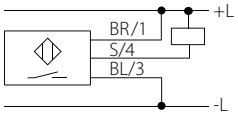
with cable
NPN n.o. / NPN n.c.



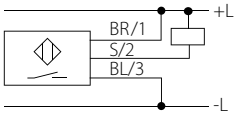
BR - brown / S - black / W - white BL - blue

3wires

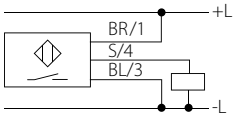
with cable / NPN n.o.



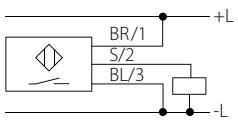
with cable / NPN n.c.



with cable / PNP n.o.

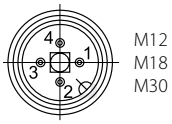


with cable / PNP n.c.

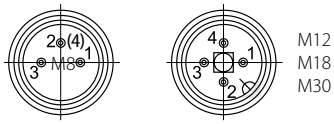


BR - brown / BL - blue

4wires with connector



3wires with connectors konektorem



SENSIT s.r.o., Skolni 2610, 756 61 Roznov pod Radhostem, Czech Republic
T +420 571 625 571 F +420 571 625 572 E obchod@sensit.cz

INDUCTIVE ROTATION SENSORS

211.03en

DESCRIPTION AND APPLICATION

Inductive rotation sensors are intended for monitoring of revolutions or speed. They are suitable especially in case of decentralized control.
Inductive rotation sensors perform contactless monitoring of changes (decrease or increase) of revolutions compared with their reference value.

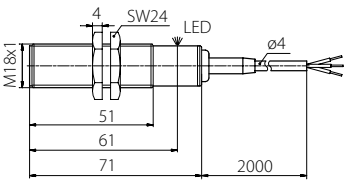
M18 flush

M18 non-flush

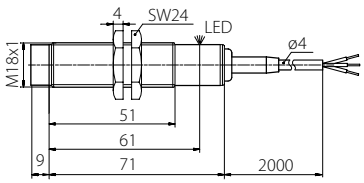
M30 flush

M 30 non-flush

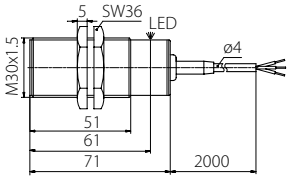
With cable



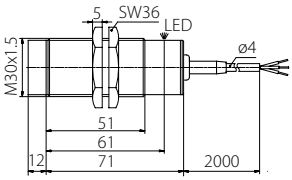
With cable



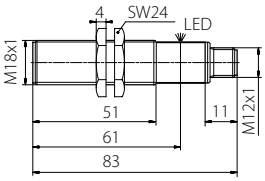
With cable



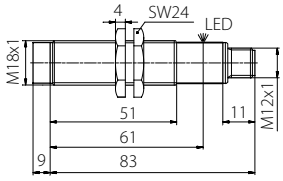
With cable



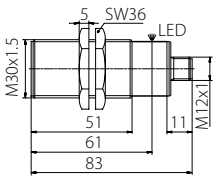
With connector



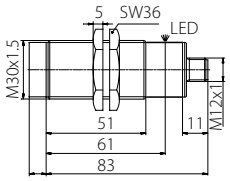
With connector



With connector



With connector



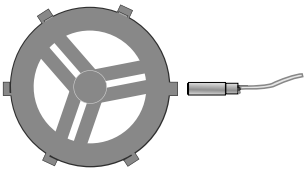
SPECIFICATIONS

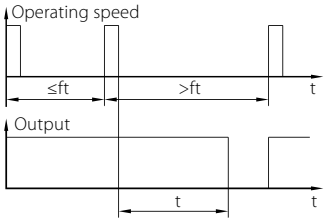
Sensor	Flush M18	Non-flush M18	Flush M30	Non-flush M30
	with cable / with connector	with cable / with connector	with cable / with connector	with cable / with connector
Nominal sensing distance Sn	5 mm	8 mm		
Real sensing distance Sr	4 – 6 mm	6 – 10 mm		
Case	M18		M30	
Case material	stainless steel			
Mounting	YES	NO	YES	NO
Switching frequency ft	0,5 Hz or up on request			
Maximum frequency sensed	200 Hz	100 Hz	200 Hz	100 Hz
Hysterezis Sa	(0,01 – 0,15) x Sn			
Nominal voltage Un	24 V DC			
Power supply Uc	15 – 30 V DC			
Supply current Ic	< 20 mA			
Output current Iz	< 200 mA			
Shielding indicator	green LED			
Output indicator	yellow LED			
Ambient temperature range T	-25 to 70 °C			
Ingress protection	IP 68 / IP 67, in accordance with EN 60529, as amended			
Connection type	cable PVC 3 x 0,25 mm^2 / connector M12			

ORDER NUMBER

Output		Cable version		Cable version	
NPN	normaly open	PSI DI 186 391	PSI DI 188 391	PSI DI 306 391	PSI DI 308 391
PNP	normaly open	PSI DI 186 393	PSI DI 188 393	PSI DI 306 393	PSI DI 308 393
Output		Connector version		Connector version	
NPN	normaly open	PSI DI 186 491	PSI DI 188 491	PSI DI 306 491	PSI DI 308 491
PNP	normaly open	PSI DI 186 493	PSI DI 188 493	PSI DI 306 493	PSI DI 308 493

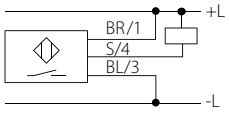
OPERATING PRINCIPLE



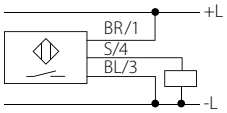


WIRING DIAGRAM

with cable / NPN n.o.



with cable / PNP n.o.



BR - brown / S - black / BL - blue

OPTICAL LIQUID LEVEL SENSORS

210.02en

DESCRIPTION AND APPLICATION

Optical liquid level sensors are intended for measurement, regulation and control of production in foodstuff (e.g. beverages production) or pharmaceutical industry. They are used also in applications of sensing of a tank filling or emptying, min. and max. liquid level detection, a pump dry run protection etc.

Variants of optical liquid level sensors:

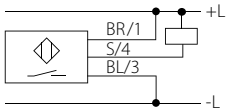
- **Type „A"** – suitable for oil liquids (e.g. cooling emulsions, oil, crude oil, hydraulic oil, milk, etc.)
- **Type „B"** – suitable for liquids with foam (e.g. beer, „cola" type soft drinks) and other liquids (e.g. water)

SPECIFICATIONS

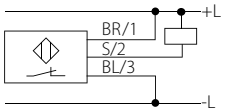
Sensor	With temperature range up to 100 °C		With temperature range up to 140 °C	
	with cable	with connector	with cable	with connector
Nominal voltage Un	24 V DC			
Supply voltage Uc	12 – 30 V DC			
Supply current Ic	< 25 mA			
Output current Iz	≤ 200 mA			
Output indicator	LED			
Reversed polartity protection	YES			
Switching distance (% of a dipped setting tip)	< cca 50 %			
Switching frequency	35 Hz			
Temperature range T	-25 °C to 100 °C – temperature in a process -25 °C to 80 °C – ambient temperature		-25 °C to 140 °C –temperature in a process -25 °C to 80 °C – ambient temperature	
Case material / sensing tip	stainless steel / crystall glass			
Maximum operating pressure	2 MPa			
Ingress protection	IP 68	IP 67	IP 68	IP 67
	in accordance with EN 60529, as amended			
Connection type	cable PVC 3 x 0,25 mm²; 2 m	connector M12	cable PUR 3 x 0,25 mm²; 2 m	connector M12

WIRING DIAGRAM

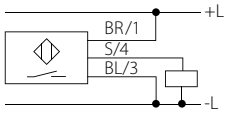
With cable / NPN normally open



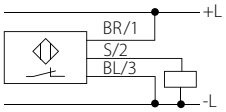
With cable / NPN normally closed



With cable / PNP normally open

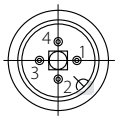


With cable / PNP normally closed



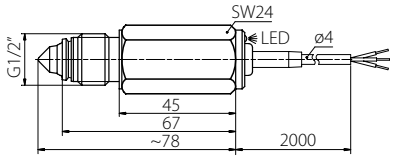
BR - brown / S - black / BL - blue

with connector

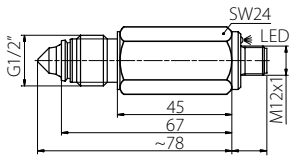


DIMENSIONAL DRAFT

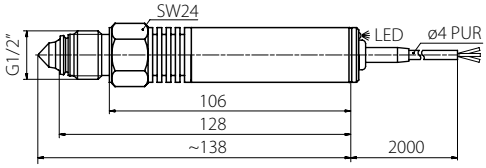
With temperature range up to 100 °C, with cable



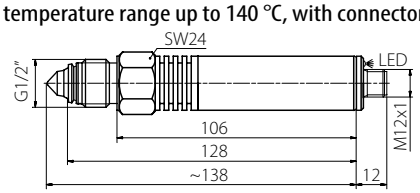
With temperature range up to 100 °C, with connector



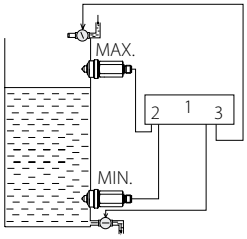
With temperature range up to 140 °C, with cable



With temperature range up to 140 °C, with connector

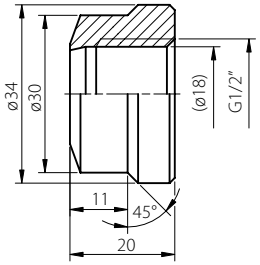


OPERATING PRINCIPLE



1/ CONTROL UNIT, 2/ INPUT, 3/ OUTPUT

MOUNTING NUT



ORDER REFERENCE NUMBER

Version		With temperature range up to 100 °C				With temperature range up to 140 °C			
Output		Cable version		Connector version		Cable version		Connector version	
		TYPE „A“	TYPE „B“	TYPE „A“	TYPE „B“	TYPE „A“	TYPE „B“	TYPE „A“	TYPE „B“
NPN	normally open	POS 187 311 A	POS 187 311 B	POS 187 411 A	POS 187 411 B	POS 287 311 A	POS 287 311 B	POS 287 411 A	POS 287 411 B
	normaly closed	POS 187 312 A	POS 187 312 B	POS 187 412 A	POS 187 412 B	POS 287 312 A	POS 287 312 B	POS 287 412 A	POS 287 412 B
PNP	normally open	POS 187 313 A	POS 187 313 B	POS 187 413 A	POS 187 413 B	POS 287 313 A	POS 287 313 B	POS 287 413 A	POS 287 413 B
	normaly closed	POS 187 314 A	POS 187 314 B	POS 187 414 A	POS 187 414 B	POS 287 314 A	POS 287 314 B	POS 287 414 A	POS 287 414 B

INTERROGATOR FOR OPTICAL SENSORS

The interrogation unit for measurement, evaluation and logging of the temperature by FBG (Fiber Bragg Grating) optical sensors. The unit is based on the unique hardware solution which allows significantly lower cost in comparison with competitive devices while maintaining high measurement accuracy. The unit is compact sized with robust aluminium case. Maximum temperature range is 650 °C per channel. Number of channels can be extended up to 16 via optical MEMS switch.

KEY FEATURES

- Compact measurement platform with unique hardware solution
- Long-term stability, accuracy and repeatability of measurements.
- Measurement accuracy linear over the entire range of measured temperatures.
- Large dynamic range, sensors can be located up to several kilometres from the evaluation unit.
- Data logging with time stamp
- Real-time measurement and parallel data logging mode
- WEB interface for sensors configuration and measurement.

ACCESSORIES

- Interconnecting fibre optic cable between interrogator and sensors
- Fibre optic MEMS switch
- Interconnecting fibre optic cable between interrogator and switch
- Converter to RS485 (or other standards)
- 4G LTE modem
- Holder for DIN rail.

SPECIFICATIONS

Absolute measuring range	650 °C
Sensor type	FBG (Fiber Bragg Grating)
Number of measuring channels*	4 / 8,16 with switch
Measuring period*	3.5 s (4 channels)
Settling time	30 min
Accuracy class	A
Measurement resolution	0.1 °C
Absolute accuracy over the entire range	± 0.5 °C
Fibre optic interface	LC/APC
Maximum optical power per channel	1 mW@1550 nm
Laser class (classified by IEC 60825-1 ed.3)	1M
Wavelength band	C-band
Power supply	230 VAC / 50 Hz
Input power	Max. 10 W
Communication interface**	Ethernet (RJ-45), RS-485 (Modbus)
User interface	WEB, FTP
Data format**	TCP/IP, csv
Operating temperature	10 °C – 40 °C
Weight	1.5 kg
Dimensions	230 × 115 × 80 mm

OTHER PARAMETERS

Ingress protection	IP 40 according to EN 60529, as amended
Warranty	1 year
Recommended recalibration period	Every year
Applied technical standards	EN 61326; EN 60825

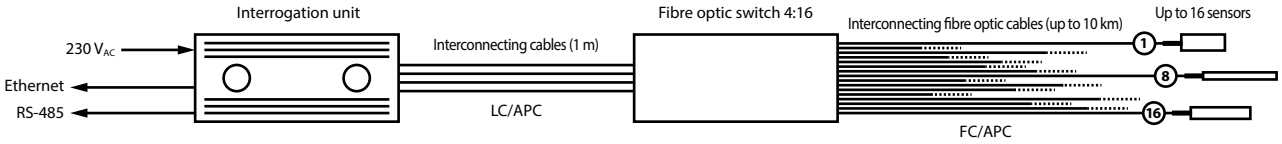
** Depending on used fibre optic switch.*
*** Depending on the specific configuration.*

DECLARATION, CERTIFICATES

Manufacturer provides EU Declaration of Conformity.
The declaration is issued on the basis of the following certificates issued by the Electrotechnical Testing Institute, Pod lisem 129/2 182 00 Prague 8:

- EN 61326 (Electrical equipment for measurement, control and laboratory use - EMC)
- EN 60825 (Safety of laser products)

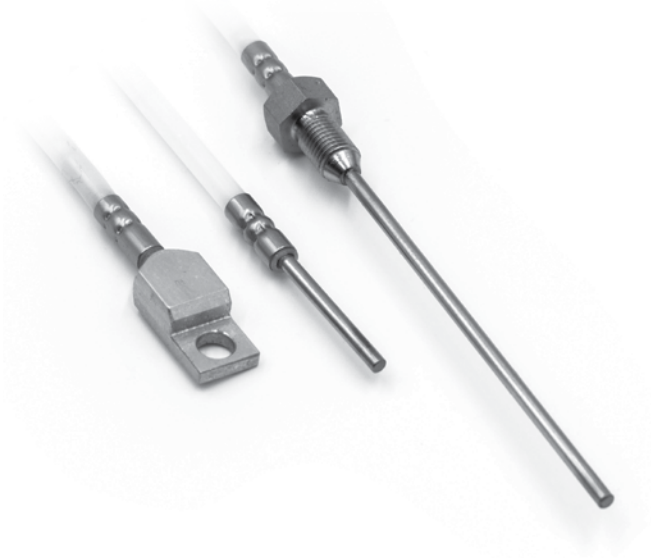
WIRING DIAGRAM



FIBER-OPTIC TEMPERATURE SENSORS

Point temperature sensors based on FBGs (Fiber Bragg Gratings). Designed to measure the temperature of gaseous, liquid and solid substances. Maximum temperature range is -50 up to 200 °C. These fully dielectric sensors are designed for specialized measurements in highly electromagnetically disturbed environments.

CE



APPLICATION

- Advanced industrial applications.
- Power industry (temperature measurement of transformer windings, electric motors, generators, etc.).
- High voltage applications
- Automotive (temperature measurement of charging stations, batteries).
- Microwave applications (drying in chemical industry)
- Chemical industry (chemical reactors)
- Wind industry
- Medical applications (magnetic resonation)
- Oil & Gas

KEY FEATURES

- Long-term stability, accuracy and repeatability.
- Measurement accuracy linear over the entire range of measured temperatures.
- Completely dielectric sensor – galvanic isolation of the measuring point with the evaluation electronics.
- Measurement without necessity of power supply at measurement point

SPECIFICATIONS

	OTG3 OE	OTR 148Z 1E	OTR 141R 1E
Measuring range	-50 °C up to 200 °C		
Sensor type	FBG (Fiber Bragg Grating)		
Accuracy class	A		
Measurement resolution	0.1 °C		
Absolute accuracy over the entire range	± 0.5 °C		
Ingress protection	IIP 67 according to EN 60529, as amended		
Housing material	DIN 1.4571, DIN 1.4301 stainless steel		
Sensor design	Smooth stem	Threaded	Contact sensor
Diametr	3 mm	3 mm	-
Length	from 30 mm	from 40 mm	55 mm
Response time	< 7 s		
Lead-in cable length	3 m		
Type of lead-in cable and its thermal resistivity	-50 to 260 °C PTFE		
Thread type	-	M8	-
Fibre optic connectors	FC/APC		
Weight	minimum 0.15 kg		

MODIFICATION AND CUSTOMIZATION

- length of the case of the sensor

ACCESSORIES

- Optical patch cable

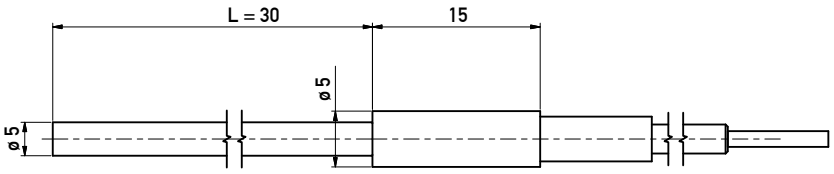
DECLARATION, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

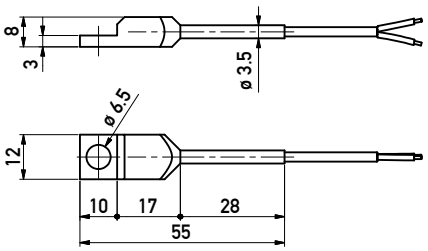
Calibration – All temperature sensors pass through the final metrological inspection, which is carried out by comparing with standards or working gauges. Continuity of the standards and working gauges is ensured within the meaning of Section 5 of Act No. 505/1990 on metrology, as amended. The manufacturer offers the possibility to supply sensors calibrated in the laboratory of SENSIT s.r.o. (according to the requirements of EN ISO/IEC 17025) or in an accredited laboratory.

DIMENSIONAL DRAFT

OTG3 0E



OTR 141R 1E



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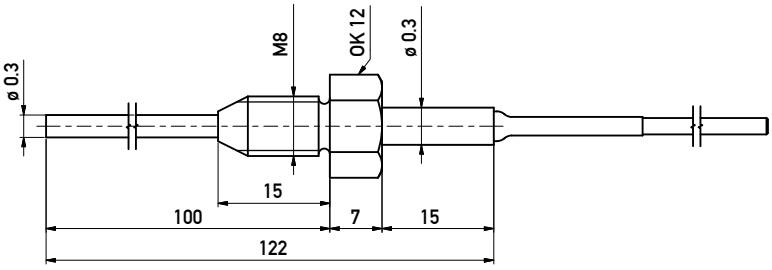
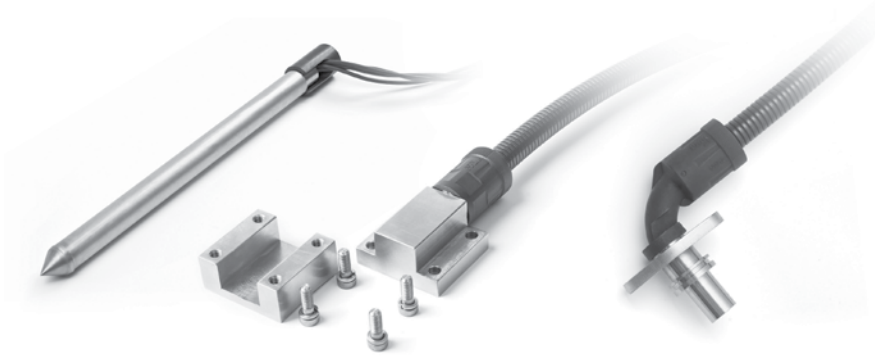


CUSTOM PRODUCTION OF TEMPERATURE SENSORS



Custom production of temperature sensors is a natural part of company SENSIT s.r.o. This means design and production of unit quantities of special temperature sensors for specific customer applications, including all relevant standards for railway vehicles or rubber and plastic industries.

WE CAN OFFER

1. Cooperation, our experience and support for the development of suitable sensors for your application. The personal negotiation with our technician in your company.

2. Ensure the required certification, norm declarations in english, german, russian and other languages.

3. Design and production of temperature sensors in "customs case"
   - production of sensors according to samples or drawings
   - modification of the standard cases
   - production of sensors with difficult and unusual case design
   - production of sensors with small case diameter from 1.5 mm
   - proposing of assembly according to the application

4. Encapsulation of special sensing element
   - KTY ■ NTC ■ TSic
   - SMT 160
   - two and more sensing elements to the case

5. Sensors compliant with special requirement for
   - resistance to vibration
   - high resistance to abrasive action
   - use at cryogenic temperatures
   - frequent repeatibility and stability
   - required high accuracy
   - execution and compliance standards (tests) el. strenght and puncture
   - very fast response to temperature change

6. Standardly used materials are replaced according to your requirements, as for example in areas such as housing material
   - tin bronze CuSn9 ■ plastics - makromelt ■ aluminium (alloy)
   - stainless steel DIN 1.4571 ■ brass

   For cable, shrinking tubes
   - PFA ■ Viton ■ Kynar ■ flame retardant cable – FM 4910
   - cables for application under soil, and so on

COMPLEX SERVICE INCLUDES

- technical support and consulting to design the sensor which you need, personal approach
- production and delivery of samples
- our quotation is calculated on the base of your required quantity
- production of sensors including control of every sensor, for every piece
- delivery date between 7 to 21 days
- express production and delivery within possibilities of technological process

NOTES

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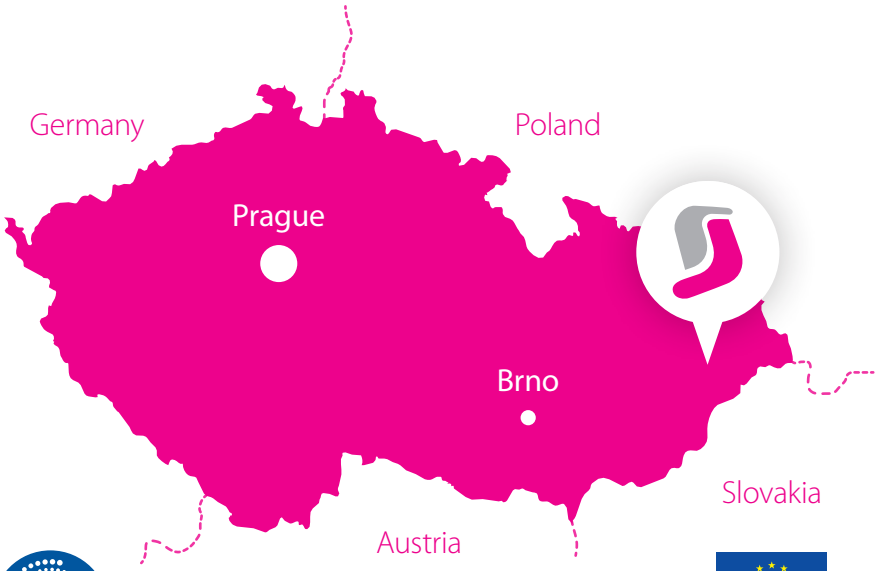

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