

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

100.10en

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 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	

OTHER PARAMETERS

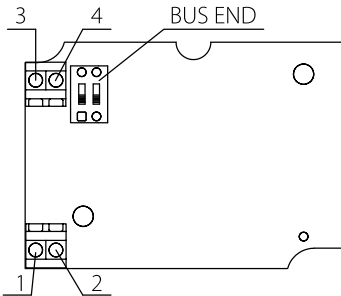
Consumption / Supply current	maximum: 500 mW typical: 300 mW	1 mA	30 μ A
Working conditions	ambient temperature: -30 to 100 °C relative air humidity: max. 100% atmospheric pressure: 70 to 107 kPa		
Ingress protection	IP 65 in accordance with EN 60529, as amended		
Time response	τ 0.5 < 9 s (0.2 m/s ¹ in running water)		
Standard stem lengths	70, 120, 180, 240 mm		
Standard stem diameter	6 \pm 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 M Ω at 500 V/DC, 25°C \pm 3 °C; humidity < 85 %		
Dimensions of the connection head	70 \times 63 \times 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. 170 g	min. 120 g	

*) 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 122A

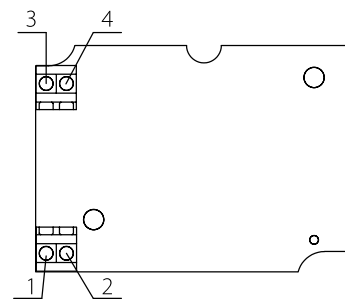
with a grommet



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

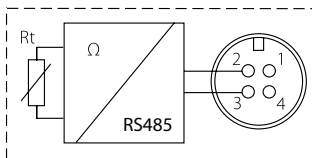
SD 124A

with a grommet

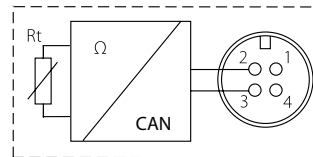


- 1 – power supply - U+
- 2 – power supply - GND
- 3 – data bus - CAN_L
- 4 – data bus - CAN_H

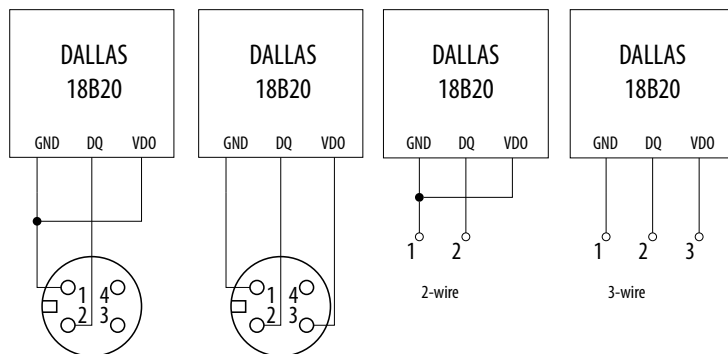
with a connector



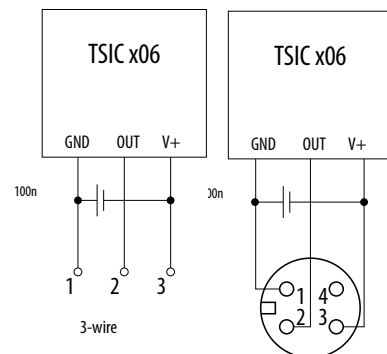
with a connector



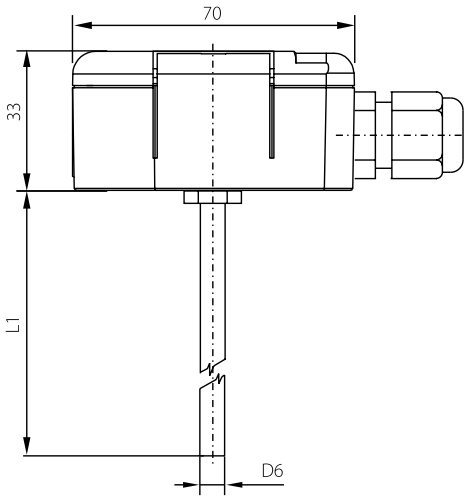
SD125A



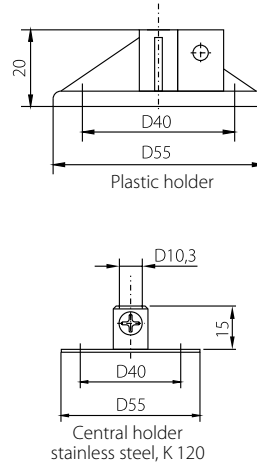
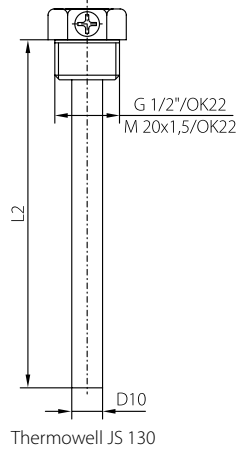
SD126A



DIMENSIONAL DRAFT



Accessory



CONTACT TEMPERATURE SENSORS WITH A DIGITAL OUTPUT

096.01en

DESCRIPTION AND APPLICATION

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

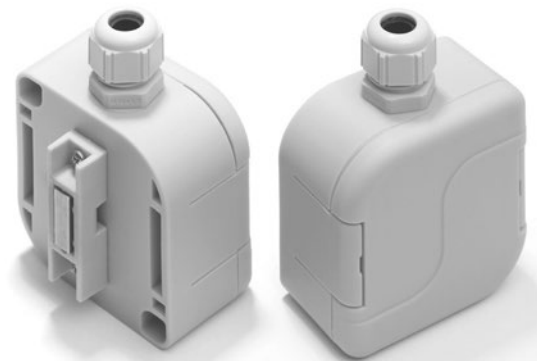
DECLARATION, CERTIFICATES, CALIBRATION

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 RTU	CAN / CANOpen-CIA DS 301	1-Wire / DS18B20	ZacWire / TSic x06
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
Accuracy of the electronics	± 0.2 °C			



OTHER PARAMETERS

Type / Accuracy of the sensing element *, **)	Pt 1000 / $\pm (0.3 \text{ }^\circ\text{C} + 0.0005 t)$ Pt 1000 / $\pm (0.3 \text{ }^\circ\text{C} + 0.0005 t)$	Pt 100 / $\pm (0.3 \text{ }^\circ\text{C} + 0.0005 t)$ Pt 100 / $\pm (0.3 \text{ }^\circ\text{C} + 0.0005 t)$	$\pm 0.5 \text{ }^\circ\text{C}$ in the range of -10 to 80 $^\circ\text{C}$ $\pm 2 \text{ }^\circ\text{C}$ in the range of -30 to 100 $^\circ\text{C}$	TSic 206 $\pm 0.5 \text{ }^\circ\text{C}$ in the range of 10 to 90 $^\circ\text{C}$ TSic 306 $\pm 0.3 \text{ }^\circ\text{C}$ in the range of 10 to 90 $^\circ\text{C}$ TSic 506 $\pm 0.1 \text{ }^\circ\text{C}$ in the range of 5 to 45 $^\circ\text{C}$ TSic 716 $\pm 0.07 \text{ }^\circ\text{C}$ in the range of 25 to 45 $^\circ\text{C}$ TSic 206 $\pm 0.5 \text{ }^\circ\text{C}$ in the range of 10 to 90 $^\circ\text{C}$ TSic 306 $\pm 0.3 \text{ }^\circ\text{C}$ in the range of 10 to 90 $^\circ\text{C}$ TSic 506 $\pm 0.1 \text{ }^\circ\text{C}$ in the range of 5 to 45 $^\circ\text{C}$ TSic 716 $\pm 0.07 \text{ }^\circ\text{C}$ in the range of 25 to 45 $^\circ\text{C}$
Supply voltage (U)	15 to 30 V DC 15 to 30 V DC		3 to 5.5 V DC 3 to 5.5 V DC	
Rated supply voltage (Un)	24 V DC 24 V DC		5 V DC 5 V DC 3.3 V DC 3.3 V DC	
Consumption / Supply current	maximum: 500 mW typical: 300 mW maximum: 500 mW typical: 300 mW		1 mA 1 mA 30 μA 30 μA	
Working conditions	ambient temperature: -30 to 100 $^\circ\text{C}$ relative air humidity: max. 100% atmospheric pressure: 70 to 107 kPa			
Ingress protection	IP 65 in accordance with EN 60529, as amended			
Time response	$\tau 0.5 < 13 \text{ s}$ (on smooth surface without paste) $\tau 0.5 < 13 \text{ s}$ (on smooth surface without paste)			
Case material	brass			
Insulation resistance	$> 200 \text{ M}\Omega$ at 500 V/DC, 25 $^\circ\text{C} \pm 3 \text{ }^\circ\text{C}$; humidity $< 85 \%$ $> 200 \text{ M}\Omega$ at 500 V/DC, 25 $^\circ\text{C} \pm 3 \text{ }^\circ\text{C}$; humidity $< 85 \%$			
Protective case material	POLYAMIDE			
Dimensions of the connection head	70 \times 63 \times 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. 190 g		min. 140 g	

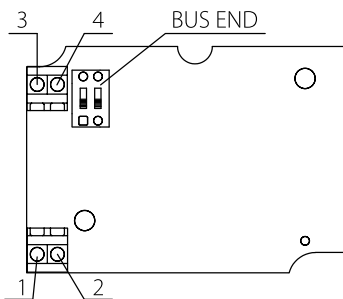
*) A temperature sensor measurement error depends on the ambient temperature and environment and the properties of the measured surface (method error) and can be within $\pm 1 \text{ }^\circ\text{C}$.

**) 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 142A

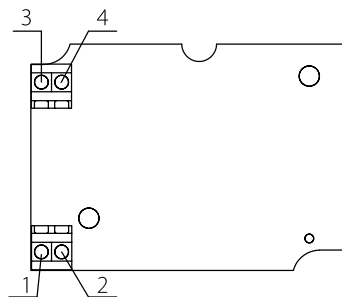
with a grommet



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

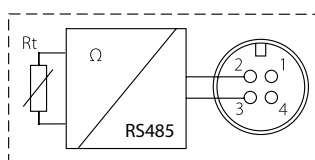
SD 144A

with a grommet

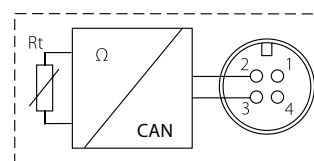


- 1 – power supply - U+
- 2 – power supply - GND
- 3 – data bus - CAN_L
- 4 – data bus - CAN_H

with a connector

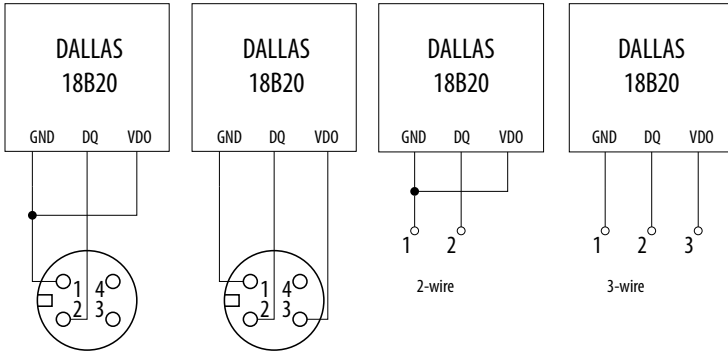


with a connector

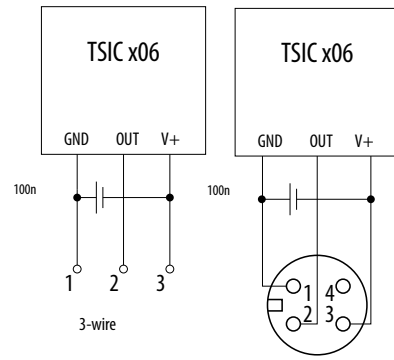


WIRING DIAGRAM

SD145A

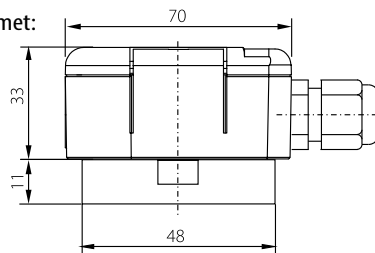


SD146A

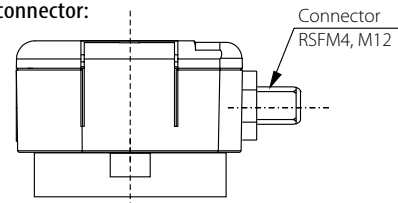


DIMENSIONAL DRAFT

Sensors with the grommet:



Sensors with the connector:



MODIFICATION AND CUSTOMIZATION

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

