DESCRIPTION AND APPLICATION

The temperature sensors are designed to meet the requirements of EN 60 079-15:2006 standard. They operate on the base of defined relationship between change of sensing element resistance and change of temperature.They are not able to form sparkles, electric arcs or high surface temperatures. The sensors that are identified on the type label by II 3G Ex nA II T6 code can be utilised in explosion endangered rooms, device group II, zone 2. The operating temperature range for using them in zone 2 is -20 °C to 80 °C. These limits must not be exceeded even for a short time. According to the location of the sensing element and utilization of the sensors there are following versions:

Serie S 110 – Temperature sensors for outdoor usage. Temperature sensing element is located in a metal stem of the 25 mm length, delivering with a plastic side holder.
Certificate FTZÚ 07 ATEX 0246X

Serie S 120 – Temperature sensors for using in air condition ducts or tubing. The sensing element is located in a metal stem of the standard length of 70, 120, 180 a 240 mm; it is delivered with a plastic holder, optionally the stainless steel thermowell JS 130 can be delivered.
Certificate FTZÚ 07 ATEX 0247X

Serie S 140 – Contact version for measurement on piping. Sensing element is located in the metal measure case protecting by protect case made of SILIKON and SILAMID. Delivering with fastening strap (length 40 cm) and closing device.
Certificate FTZÚ 07 ATEX 0249X

Serie S 160 – Fast response temperature sensors used in piping. Sensing element is located in a case the part of which is also screwing (thread G ½", M 20 x 1,5) which makes possible to assembly directly in piping.
Certifikát FTZÚ 02 ATEX 0251X

The plastic head is made of LEXAN 500R. The sensors meet the ingress protection requirements IP 65 according to EN 60529. The head is provided by a cable ending or a connector. The sensors are designed to be operated in a chemically non-aggressive environment and they **can be installed in places with low risk of mechanical stress.**

SPECIFICATIONS

BASIC DATA

Standard types of sensing elements	Ni 1000/5000, Ni 1000/6180, Ni 891, Pt 100/3850, Pt 500/3850, Pt 1000/3850, NTC 20 kΩ
Measuring range	-20 to 80 °C
Recommended/maximum DC measuring current	1 mA/3 mA for the sensors with the sensing element Pt 100 0,5 mA/1,5 mA for the sensors with the sensing element Pt 500 0,3 mA/1 mA for other sensors
Recommended/maximum DC power consumption of sensing element	0,05 mW/1 mW for the sensors with the sensing element NTC 20 kΩ
Accuracy class	Ni sensing elements: class B, $\Delta t = \pm (0{,}4 + 0{,}007t)$, for $t \geq 0$; $\Delta t = \pm (0{,}4 + 0{,}028\lvert t\rvert)$, for $t \leq 0$ in °C; Pt sensing elements: class B according to IEC 751, $\Delta t = \pm (0{,}3 + 0{,}005\lvert t\rvert)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Sensor connection	according to the wiring diagram
Type of terminal board (sensors with grommet)	WAGO 260 wire cross section 0,35 to 1,5 mm^2
Type of connector in the head (sensors with conn.)	RSFM4 – Lumberg
Insulation resistance	min. 200 MΩ at 500 V DC, at the temperature 15 to 35 °C, maximum rel. humidity 80 %
Dielectric strength	1 000 V DC during the period 1 s, at the temperature 15 to 35 °C, maximum rel. humidity 80 % according to the article 6.8.1. of the EN 60 079-15 ed. 2 standard
Ingress protection	IP 65 according to EN 60 529
Material of the head	LEXAN 500R
Dimmensions of the head	62 x 62 x 52 mm
Mass	approximately 0,2 kg

SUPPLEMENTARY DATA TO THE INDIVIDUAL TYPES

Serie S110	
Stem length	25 mm
Stem diameter	6 + 0,2 mm
Material of the stem	stainless steel EN X5CrNi18-10 (DIN 1.4301)
Time response	$\tau_{0,5} < 9$ s (in streaming air 1 m.s^{-1})
Sensor installation	by means of a plastic side holder

Serie S120	
Standard stem length	70, 120, 180 a 240 mm
Stem diameter	6 + 0,2 mm
Material of the stem	stainless steel EN X5CrNi18-10 (DIN 1.4301)
Time response	$\tau_{0,5} < 9$ s (in streaming water at 0,4 m.s^{-1})
Sensor installation	by means of a plastic central holder or stainless steel thermowell JS 130

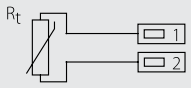
Serie S140	
Material of the case	brass 423223.31
Material of the protecting case	SILICONE and SILAMID
Minimum diameter of piping	20 mm
Time response	$\tau_{0,5} < 3$ s (in streaming water at 0,4 m.s^{-1})
Sensor installation	by fastening strap and closing device

Serie S160	
Standard stem length	50, 100, 160 a 220 mm
Stem diameter	4 + 0,1 mm
Material of the case	stainless steel EN X5CrNi18-10 (DIN 1.4301)
Standard threads	G 1/2", M 20 x 1,5
Time response	$\tau_{0,5} < 4$ s (in streaming water at 0,4 m.s^{-1})

WIRING DIAGRAM

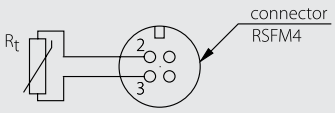
SENSORS WITH A GROMMET:

With resistance output



SENSORS WITH A CONNECTOR:

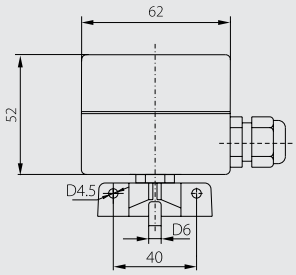
With resistance output



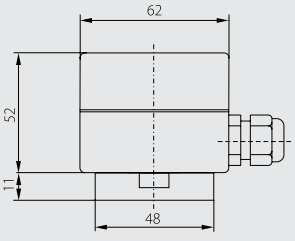
DIMENSIONAL DRAFT

SENSORS WITH THE GROMMET:

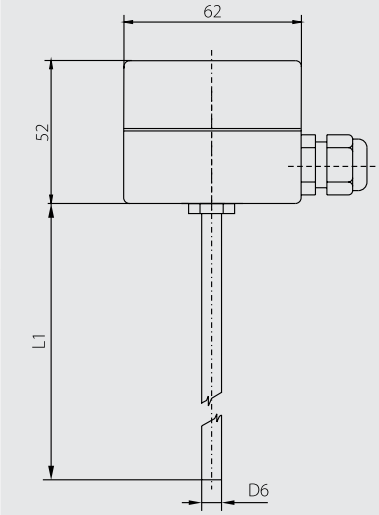
S 110



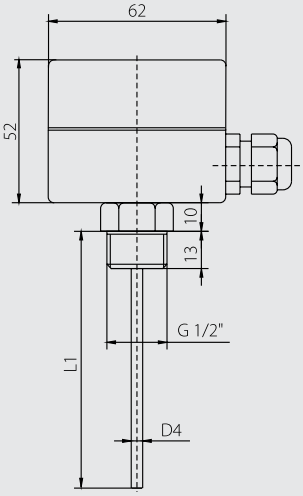
S 140



S 120



S 160



The grommet can be replaced by the connector RSFM 4, M12.

SENSOR INSTALLATION AND SERVICING

SENSORS WITH GROMMET:

Before connecting the supply lead-in cable, screw off the upper part of the plastic connection head. The lead-in cable is connected to the WAGO terminals according to the wiring diagram through the loosened grommet. **The recommended wire cross section is 0.35 to 1.5 mm², the outer diameter of the circular cross-section cable should be between 4 and 8 mm. Only one lead-in cable can be lead through the grommet. To insure hermetic properties the grommet has to be tightened and the upper part of the head has to be screwed on by all screws after connecting the lead-in cable.**

SENSORS WITH CONNECTOR:

Before connecting the supply lead-in cable place the sensor in the location in which the temperature to be measured. The lead-in cable **with prescribed connector RKT or RKWT** is connected to the connector RSFM4, which is the part of the sensor head. The connectors RKT and RKWT can be delivered as an accessory. **To insure ingress protection IP 65 it is necessary to check the proper tightening of the connectors and proper bolting of the upper part of the head by all screws.**

In case the lead-in cable is laid in the vicinity of high voltage conductors or those supplying equipment creating disturbing electromagnetic field (e.g. inductive load equipment), a shielded cable should be used. In the case of using a holder or a stainless steel thermowell there is necessary to locate it at the place in which the temperature is measured and then to insert the sensor into the holder, resp. to the bottom of the thermowell and to fix it by a screw. Openings for the assembly of the central holder are drilled by the enclosed pattern in which diameters of the openings are marked, too.

After installing and connecting the sensor to the sequential evaluating electrical equipment the sensor is ready to use. The sensor does not require any special servicing or maintenance. The device can be operated in any working position, but the grommet must not be directed upwards.
Safe using: sensor can be installed in places with low risk of mechanical stress.

CUSTOMER SPECIFIC MODIFICATIONS

REGARDING TO SENSORS MANUFACTURED IN A STANDARD VERSION THE FOLLOWING PARAMETERS CAN BE MODIFIED:

- length of the sensor
- possibility of encapsulation of two sensing elements
- possibility to use a 3-wire or a 4-wire connection
- A class of accuracy (except for the NTC 20 kΩ sensing elements)
- encapsulation of other types of sensing elements KTY, DALLAS, SMT 160 etc.
- type of thread by the sensors of serie S 160

HOW TO ORDER

WHEN ORDERING GOODS, THE FOLLOWING DATA ARE REQUIRED:

Type name of sensor serie	S 110, S 120, S 140, S 160
Type of sensing element	
Connection	2, 3 or 4-wire
Version	with grommet, with connector
Stem length, case length	only for S 120 and S 160
Type of a thread	only for S 160
Accessory	according to needs.