

## INDOOR TEMPERATURE SENSORS



### DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for temperature measurement of gaseous substances in water-protected rooms. The standard temperature range in which the sensors are allowed to be utilised is -30 to 100 °C. The plastic enclosure is made of LEXAN 503RS (grey, ivory) or ABS (white) material.

The sensors can be utilised for 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

**Declaration of Conformity** – in accordance with EN ISO/IEC 17050-1 standard as amended for sensors with resistance output.

**EC Declaration of Conformity** – in accordance with Act No. 22/1997 Coll. as amended for sensors with an output of 4 to 20 mA and 0 to 10 V.

**Calibration** – we perform standard calibration of resistance temperature sensors in accordance with EN ISO/IEC 17025 standard in the temperature range of the stated type of sensor.

### SPECIFICATIONS

#### BASIC DATA

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 503RS 5 to 55 °C (for short period -20 to 75 °C) ABS				
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 503RS 5 to 55 °C (for short period -20 to 75 °C) ABS				
Maximum measuring DC current	0.7 mA	3 mA	1.5 mA	1 mA	1 mW *)

\*) maximum power consumption

Sensor type	NS 500	NS 700	Note
Type of sensing element	Pt 1000/3850	Pt 1000/3850	
Output	4 to 20 mA	0 to 10 V	
Measuring ranges	-30 to 60 °C	-30 to 60 °C	Enclosure ambient temperature -30 to 80 °C LEXAN 5 to 55 °C ABS (for short period -20 to 75 °C)
	0 to 35 °C	0 to 35 °C	
	0 to 100 °C	0 to 100 °C	
	0 to 150 °C	0 to 150 °C	
Voltage supply ( $V_{CC}$ )	11 to 30 V DC	15 to 30 V DC	Recommended value NS 500: 12 V DC NS 700: 24 V DC
Maximum ripple $V_{CC}$	0.5 %	0.5 %	
Load resistance	$50(V_{CC}-10) \Omega$	$> 50 \text{ k}\Omega$	
Sensing element break	$> 24 \text{ mA}$	$> 10.5 \text{ V}$	
Sensing element short	$< 3.5 \text{ mA}$	$\sim 0 \text{ V}$	

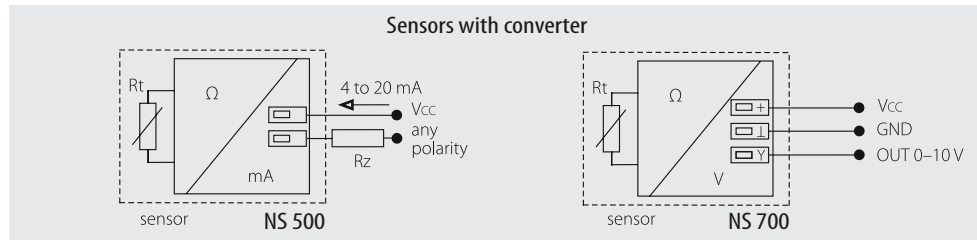
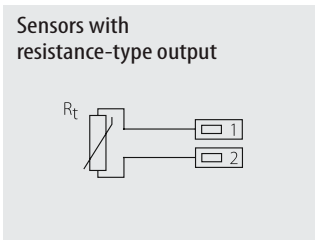
#### OTHER PARAMETERS

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 to IEC 751, $\Delta t = \pm (0.3 + 0.005 t )$ in °C NTC 20 kΩ: $\pm 1 \text{ °C}$ for the range 0 to 70 °C
Measuring error for NS 500	$\pm 1.5 \text{ °C}$
Measuring error for NS 700	$< 0.6 \%$ of the measuring range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Response time	$\tau_{0.5} < 8 \text{ s}$ (in air streaming at the velocity 1 m.s <sup>-1</sup> )
Recommended wire cross section	0.35 to 1.5 mm <sup>2</sup>
Ingress protection	IP 30 according to EN 60 529

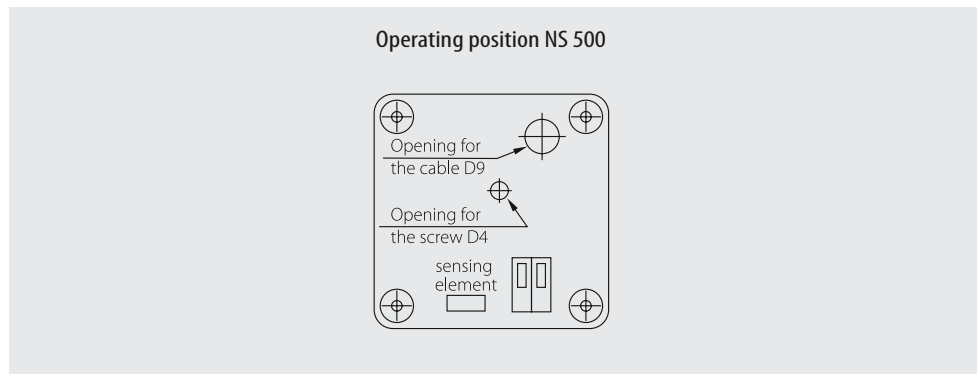
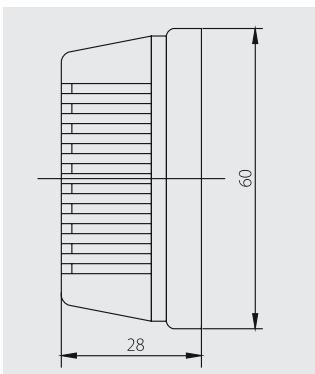
## INDOOR TEMPERATURE SENSORS

Material of the enclosure	LEXAN 503RS (grey, ivory), ABS (white colour)
Operating conditions	ambient temperature: -30 to 100 °C LEXAN
	-30 to 80 °C LEXAN with a converter
	5 to 55 °C (for a short period -20 to 75 °C) ABS
Weight	relative humidity: max 85 % (at the ambient temperature 25 °C)
	atmospheric pressure: 87 to 107 kPa
Weight	approximately 0.1 kg

### WIRING DIAGRAM



### DIMENSIONAL DRAFT



### SENSOR INSTALLATION AND SERVICING

Prior to connecting the supply lead-in cable, separate the perforated lid from the plastic box base. While doing this, proceed carefully not to mechanically damage the sensing element or the converter components. The lead-in cable is connected according to the wiring diagram by pushing it through the 9 mm opening and fastening it in the WAGO terminals. The recommended wire cross section is 0.35 to 1.5 mm<sup>2</sup>.

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.

After connecting the lead-in cable the box base is to be fastened to a plane surface by using a screw with a diameter of maximum 4 mm. In the last installation step the perforated lid is put into the corresponding base openings and snapped in.

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 service or maintenance. Except for the NS 500 type it can be situated in any operating position. The NS 500 operation position is illustrated in the paragraph 4.

### CUSTOMER SPECIFIC MODIFICATIONS

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

- option enclosing two sensors
- option enclosing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- class A precision type of temperature element (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, thermistor NTC 20 kΩ)
- option of three- or four-wire connection
- sensor head colour – ivory white, white, etc.