

## TEMPERATURE SENSORS WITH MAGNETIC FIXING



### DESCRIPTION AND APPLICATION

The sensors are intended for contact temperature measurements of ferromagnetic materials. The sensor's contact element does contain a springing mechanism, which ensure a reliable contact to the surface to be measured. The plastic enclosure is provided with a cable outlet ending (the terminal board is placed in the enclosure) or a connector. The standard operating temperature range is -30 to 130 °C. 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.

### ACCESSORIES

- For the version with connector:
  - led-in connector ELKA 4012 or RKCS 4/9
  - connection cable with the straight-type RKT connector
  - connection cable with the rectangular-type RKWT connector




### 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, 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.

Cable sensors with magnetic fixing are a possible alternative to the S 190 line of sensors, see catalogue data sheet no. 06.14.



### SPECIFICATIONS

#### BASIC DATA

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	-30 to 60 °C	Enclosure ambient temperature -30 to 80 °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	
Power supply (V <sub>CC</sub> )	11 to 30 V DC	15 to 30 V DC	Recommended value 24 V DC
Maximum voltage ripple V <sub>CC</sub>	0.5 %	0.5 %	
Load resistance	50(V <sub>CC</sub> -10) Ω	> 50 kΩ	
Output signal - sensing element break	> 24 mA	> 10.5 V	
Output signal - sensing element short	< 3.5 mA	~ 0 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: $\pm 1$ °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

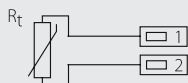
## TEMPERATURE SENSORS WITH MAGNETIC FIXING

Recommended wire cross section - sensors with the grommet	0.35 to 1.5 mm <sup>2</sup>
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 according to EN 60 529
Material of the head	LEXAN 503RS
Operating conditions	ambient temperature: -30 to 100 °C; -30 to 80 °C with a converter
	relative humidity: max. 85 % (at the ambient temperature 25 °C)
	atmospheric pressure: 87 to 107 kPa
Weight	approximately 0.1 kg (NS 590, NS 790); 0.08 kg (passive)

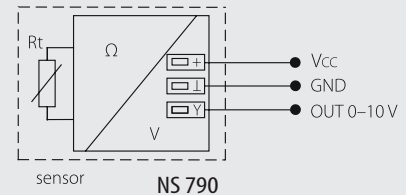
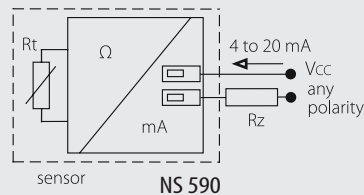
### WIRING DIAGRAM

#### SENSORS WITH THE GROMMET:

##### With resistance output

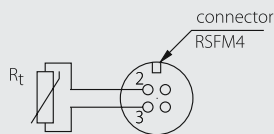


##### With a converter

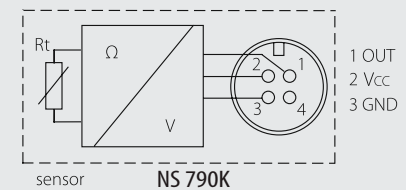
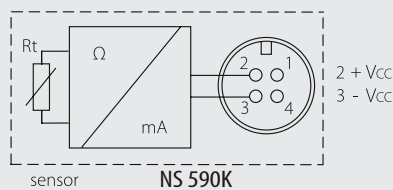


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##### With resistance output

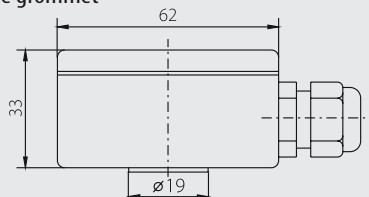


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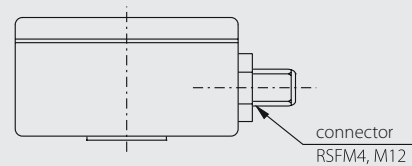


### DIMENSIONAL DRAFT

#### Sensors with the grommet



#### Sensors with the connector



### SENSOR INSTALLATION AND SERVICING

**SENSORS WITH GROMMET:** Before connecting the supply lead-in cable, lift off the lid of the plastic enclosure by means of a flat screwdriver. The lead-in cable is connected to the terminals according to the wiring diagram through the loosened grommet. The recommended wire cross section is 0.35 to 1.5 mm<sup>2</sup>, the outer diameter of the circular cross-section cable can range between 4 and 8 mm.

**SENSORS WITH CONNECTOR:** The lead-in cable with corresponding connector is connected to the connector RSFM4, which is part of the sensor head. Optionally the stand-alone connector ELKA 4012, or a lead-in cable equipped with a straight connector of RKT type, or with a rectangular connector of RKWT type may be delivered. 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 installing and connecting the sensor to the appropriate evaluating electrical equipment the sensor is ready to use. The sensor does not require any special service or maintenance. The device can be operated in any working position, but the grommet must not be directed upwards.

### 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