TEMPERATURE SENSORS WITH CABLE AND PLASTIC TIP

TR 151 and TR 152

DESCRIPTION AND APPLICATION

Temperature sensors with a plastic tip are intended for temperature measurements of gaseous, eventually liquid materials. For long-lasting temperature measurements (especially at the temperatures over 90 °C) we recommend to use the sensor in combination with a thermowell. All sensors come with a plastic polyamid tip, in which the temperature sensing element is located.

The diameter of the case TR 151 is 6 mm, the case diameter for TR 152 is 8 mm. All types of thin layer resistence-type sensing elements (Ni 1000, Ni 891, T1 = Ni 2226, Pt 100, Pt 500, Pt 1000, NTC 20 kΩ) and also others can be used. **The wiring of the sensors is always 2-wire.**

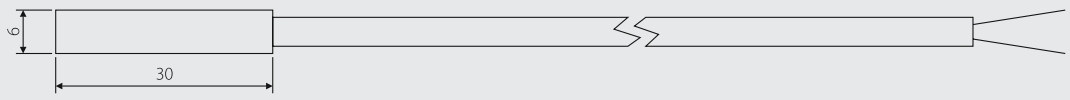
Material of the case has medium resistivity to atmospheric aging, it resists oils, fuels, hydraulic liquids, alifatic and aromatic hydrocarbons, esters, ketons and slight alcalis. Material is not resistant to acids, strong alcalis and chlorinated hydrocarbons.

SPECIFICATIONS

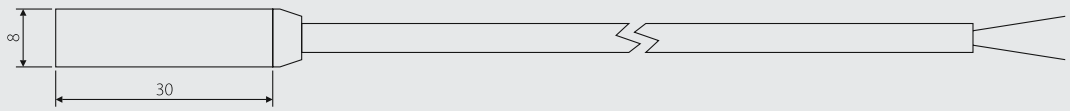
Type of sensing element	**Resistance temperature sensing element** – Pt 100/3850, Pt 500/3850, Pt 1000/3850, Ni 1000/5000, Ni 1000/6180, Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, Ni 891, NTC
	Thermocouple temperature sensing element – TCK, TCJ, TCT
	Special temperature sensing elements – KTY
Accuracy class of individual sensors	Ni sensing elements: class B, $\Delta t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $\Delta t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: class B in accordance with IEC 751, $\Delta t = \pm (0.3 + 0.005\|t\|)$ 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
Measuring range	-20 to 105 °C (according to the sensing element and lead-in cable)
Ingress protection	IP 67 according to EN 60 529
Response time	TR 151: $\tau_{0.9} < 45$ s (in streaming water at 0.4 m.s^{-1}) TR 152: $\tau_{0.9} < 75$ s (in streaming water at 0.4 m.s^{-1})
Sensor connection	2-wire
Material of the case	polyamid
Case length/diameter	TR 151: 30 mm / 6 mm TR 152: 30 mm / 8 mm
Lead-in cable	FLRYWYW 2 x 0.35 mm^2 PVC non shielded up to 105 °C; Rv = 0.105 Ω/m LiYY 2 x 0.25 mm^2 PVC non shielded up to 80 °C; Rv = 0.254 Ω/m LiYCY 2 x 0.14 mm^2 PVC non shielded up to 80 °C; Rv = 0.14 Ω/m

DIMENSIONAL DRAFT

TR 151



TR 152



TR 160, TR 161 and TR 162

DESCRIPTION AND APPLICATION

Temperature sensors TR 160, TR 161 and TR 162 are intended for temperature measurements of solid, loose ground, gaseous and liquid materials. The sensors meet the IP 67 rating according to EN 60 529 standard. The sensors have a polyamid tip with diameter 6, 8 or 10 mm in which the a sensing element is hermetically encapsulated.

All types of thin layer resistance-type sensing elements (Ni 1000, Ni 891, T1 = Ni 2226, Pt 100, Pt 500, Pt 1000, NTC 20 kΩ) and also others (NTC and PTC thermistors, KTY, DALLAS 18B20 and others) can be used. The sensors do come with a 2-wire connection as a standard.

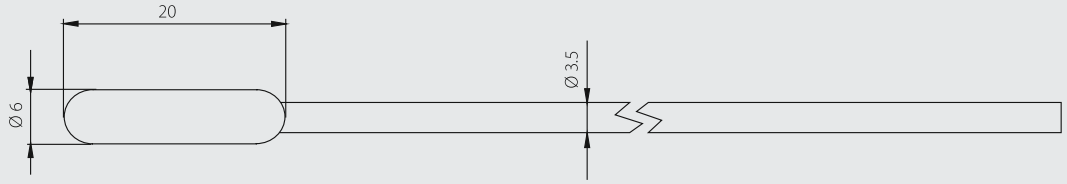
Material of the tip is highly resistive against motor-car oils.

SPECIFICATIONS

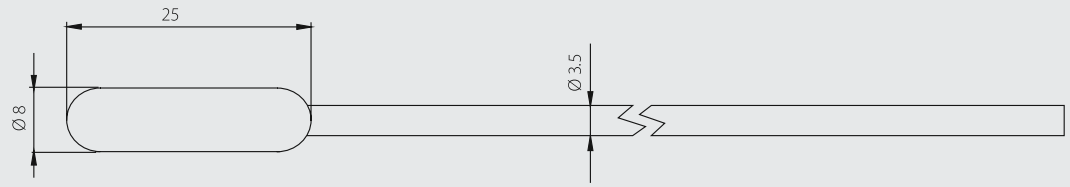
Type of sensing element	**Resistance temperature sensing element** – Pt 100/3850, Pt 500/3850, Pt 1000/3850, Ni 1000/5000, Ni 1000/6180, Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, Ni 891, NTC
	Thermocouple temperature sensing element – TCK, TCJ, TCT
	Special temperature sensing elements – KTY, SMT 160, DALLAS, TSic, etc.
Accuracy class of individual sensors	Ni sensing elements: class B, $\Delta t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $\Delta t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: class B in accordance with IEC 751, $\Delta t = \pm (0.3 + 0.005\|t\|)$ 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
Measuring range	-40 to 105 °C (according to the sensing element)
Ingress protection	IP 67 according to EN 60 529
Response time	$\tau_{0.5} \leq 12$ s, $\tau_{0.9} \leq 32$ s (in streaming water at 0.4 m.s^{-1})
Sensor connection	standardly 2-wire
Material of the case	on the base of polyamid
Length/diameter of the case	20 mm / 6 mm; 25 mm / 8 mm; 25 mm / 10 mm
Lead-in cable	FLRYWYW 2 x 0.35 mm^2 PVC non shielded up to 105 °C; Rv = 0.105 Ω/m LiYY 2 x 0.25 mm^2 PVC non shielded up to 80 °C; Rv = 0.254 Ω/m LiYCY 2 x 0.14 mm^2 PVC non shielded up to 80 °C; Rv = 0.14 Ω/m

DIMENSIONAL DRAFT

TR 160

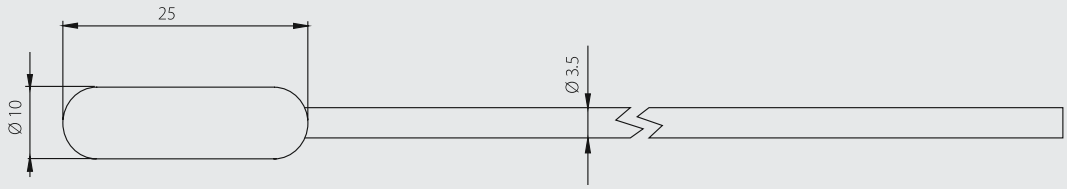


TR 161



TEMPERATURE SENSORS WITH CABLE AND PLASTIC TIP

TR 162



CUSTOMER SPECIFIC MODIFICATIONS

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

- 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