RESISTANCE THERMOMETER

WITH EXCHANGEABLE MEASURING INSERT, TYPE TOPP

Data sheet TOPP | Edition 2023

Applications

- Measuring range: -200 .. +600°C
- Fine chemicals industry
- Light energy industry
- Blast furnaces, regenerating air heaters
- General industrial services

Features

- Stainless Steel AISI321 / 1.4541 or AISI316L / 1.4404, AISI316Ti / 1.4571 upon request
- Spring-loaded measuring insert provides ideal contact with protective tube
- Temperature transmitter can be installed inside connection head of sensor
- Gas tight process connection (compression fitting)
- Connection head with local LCD or LED display as an option (see models TWR01H, DANWdie-LED)

The sensor consists of an exchangeable measuring insert, outer protective tube (thermowell) and aluminum connection head where mounting a temperature transmitter with 4-20 mA/HART® or Profibus®PA output signal is possible.

The measuring insert represents the replaceable element of the complete sensor which reduces time and costs of maintenance of the measuring apparatus installed in the object. Spring fixation of the measuring insert provides perfect pressure to the bottom of the protecting tube, reduces time of reaction to changes of temperature and increases accuracy of measurement as well as reduces natural vibration thus mechanical and electrical defects can be avoided.

Insertion length, design of thermowell, connection head as well as type and number of sensors, accuracy and method of connection can be selected individually for the respective application.

Temperature Transmitter (Option)

Transmitter is mounted inside the connection head of the sensor: directly on measuring inset or in the high cap of head.

The second method is advantageous as it allows changing standard measuring inset quickly without a need to disassemble the transmitter; it means reduction of time and costs of maintenance of the sensor and protecting wires against any damage possible.

Mounting of two transmitters inside the connection head available upon request.

Sensor with connection head DANW

Sensor with connection head NA

ATEX and EAC Ex versions

Intrinsically safe and Flameproof designs are available for applications in hazardous areas. These models are provided with certificate for „intrinsically safe" and „flameproof" type of protection according to Directive 2014/34/UE (ATEX) and EAC Ex TR-CU 012/2011 (Eurasian Economic Union).
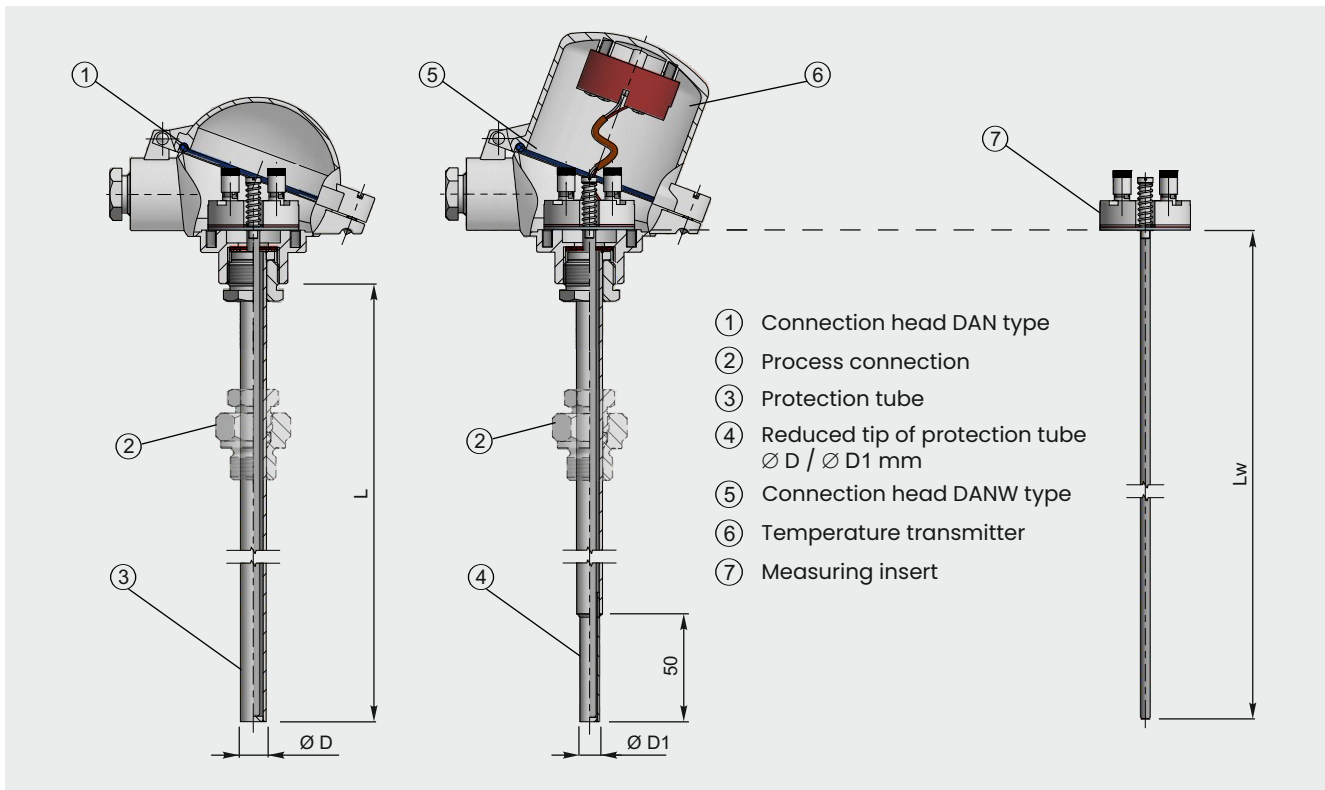
Intrinsically safe (Exi)   data sheet XI-TOPP

Flameproof (Exd)   data sheet XD-TOPP

Other versions

This data sheet contains only small part of our supplies program of resistance thermometers with fixed measuring insert. Upon the customer's request, other versions can also be delivered.

* other materials, see: "Thermowell materials"

Sensors with connection cable

Mineral insulated sensors

Sensors with GDM connectors

Sensors with MI2 connectors

Sensors with field transmitter

Stator RTDs

Ambient temperature sensors

Type **TOPP**

Designs

1. Connection head DAN type
2. Process connection
3. Protection tube
4. Reduced tip of protection tube ∅ D / ∅ D1 mm
5. Connection head DANW type
6. Temperature transmitter
7. Measuring insert

Connection line

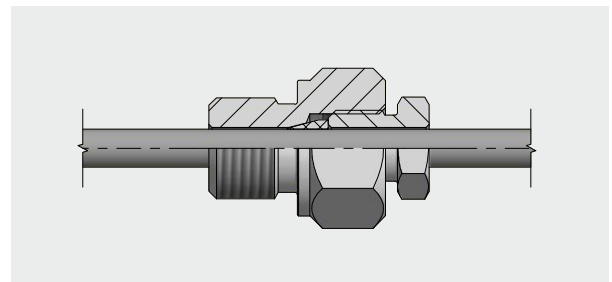| Protection tube [mm] | Measuring insert | Connection line | | | | | |
| | | 1 x Pt 100 | | | 2 x Pt 100 | | |
		2-wire	3-wire	4-wire	2-wire	3-wire	4-wire
∅ 15	∅ 8 / 6	✔	✔	✔	✔	✔	✔
∅ 15 / 9	∅ 6	✔	✔	✔	✔	✔	✔

Compression fittings

Allows simple adaptation to the required insertion length at the installation point.

Material: stainless steel
Sealing ring material: stainless steel or PTFE

Sealing rings of stainless steel can be adjusted once, after unscrewing, sliding along the sheath is no longer possible. Max. temperature at process connection 500°C

Sealing rings of PTFE can be adjusted several times, after unscrewing, repeated sliding along the sheath is still possible. Max. temperature at process connection 150 °C

More detailed information are available in the „Compression fittings UG" data sheet

Standard lengths

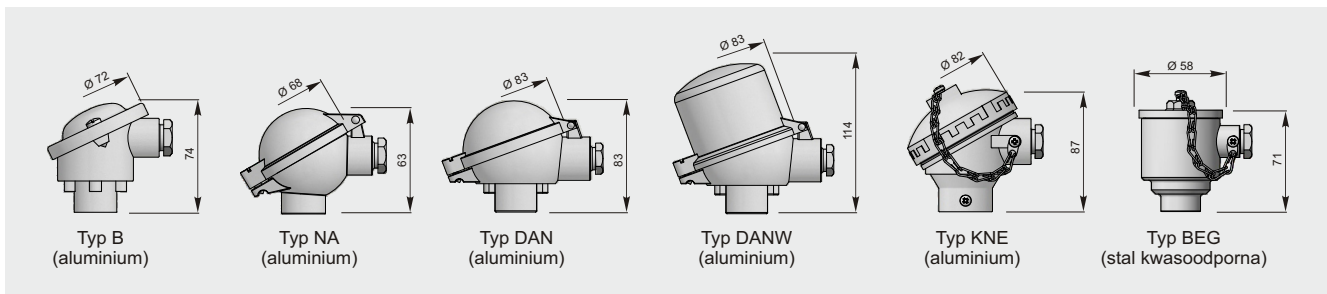| Length L	Measuring insert length Lw
500 mm	525 mm
710 mm	735 mm
1000 mm	1025 mm
1400 mm	1425 mm
2000 mm	2025 mm

Tolerances

Basic values and limiting errors for the platinum measurement resistances are laid down in PN-EN 60 751.

Class of Tolerance	Tolerance °C
A	± 0.15 + (0.002 x | t |)
B	± 0.30 + (0.005 x | t |)

Connection heads

This sensor can be fitted with one of the following connection heads. For more information about the connection heads see section "Accessories".

Typ B (aluminium)   Typ NA (aluminium)   Typ DAN (aluminium)   Typ DANW (aluminium)   Typ KNE (aluminium)   Typ BEG (stal kwasoodporna)
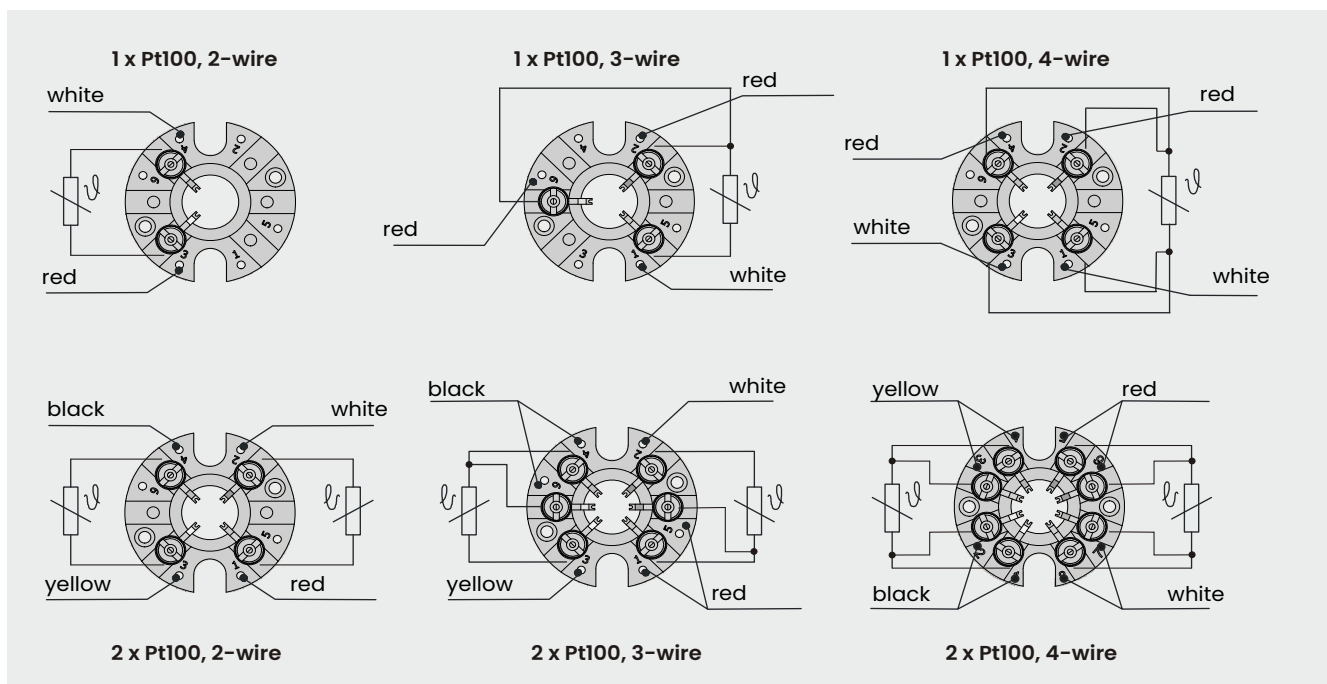
Connection head DANWdie with local LED display

The display is mounted in connection head cover with glass window which allows preview of measuring temperature. 4 digits with a height of 9.5 milimeter ensure clear reading of values. Programming of measure range can be performed via three buttons placed on the back of display panel.

Mounted temperature transmitter 4..20mA on measuring insert is necessary for proper use. It also works with temperature transmitters with HART® protocol.

Electrical connection on Ceramic Block

1 x Pt100, 2-wire   **1 x Pt100, 3-wire**   **1 x Pt100, 4-wire**

2 x Pt100, 2-wire   **2 x Pt100, 3-wire**   **2 x Pt100, 4-wire**

Type **TOPP**

| Ordering code

1		2	3	4	5	6	7	8	9	10

TOPP1 ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐

1 — Resistance element

	1 x Pt100
AP	1 x Pt100, with installed transmitter 4..20 mA
APW	1 x Pt100, with installed transmitter 4..20 mA and local LED display*
2	2 x Pt100

* available only with connection head DANWdie

2 — Closing method of connection head

1	closing by screw
3	closing by clamp

3 — Connection head

NA	Typ NA	Aluminum	Cable gland: M20x1.5	IP65
DAN	Typ DAN	Aluminum	Cable gland: M20x1.5	IP65
DANW	Typ DANW	Aluminum	Cable gland: M20x1.5	IP65
B	Typ B	Aluminum	Cable gland: M20x1.5	IP65
BEG	Typ BEG	Stainless Steel	Cable gland: M20x1.5	IP65
xxx	other, please specify			

4 — Length L [mm]

500	500 mm
700	710 mm
1000	1000 mm
1400	1400 mm
2000	2000 mm
xxx	other, please specify

5 — Protection tube (thermowell) diameter D [mm]

15	Ø 15 mm
12	Ø 12 mm
15/9	Ø 15 mm with reduced tip Ø 12 mm
xxx	other, please specify

6 — Protection tube material

	Stainless Steel 1H18N9T (1.4541, AISI321)
1.4404	Stainless Steel 00H17N14M2 (1.4404, AISI316L)
xxx	other please specify

7 — Tolerance

A	Class A according to PN-EN 60751
B	Class B according to PN-EN 60751
1/3B	Class 1/3B DIN
xxx	other, please specify

8 — Connection line

2	2-wire
3	3-wire
4	4-wire

9 — Measuring range of temperature transmitter

0..100	input signal for 4..20mA: 0..100ºC
xxx	other, please specify

10 — Type of temperature transmitter

PR5333A	Output 4..20 mA
PR5335A	Output 4..20 mA, with HART® communication protocol
PR5350A	Output Profibus® PA / Foundation Fieldbus
xxx	other, please specify

| Example

Temperature sensor TOPP11-DAN-500-15-A-4
(sensor 1xPt100, connection head DAN closed by screw, length L=500mm, protection tube material 1.4541, class A 4-wire).