

Applications

- Measuring range: -200 .. +600°C
- Fine chemicals industry
- Light energy industry
- General industrial services
- Food industry

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
- Connection head with local LED display as an option (see model DANWdie-LED)

Description

The sensor consists of an exchangeable measuring insert, outer protective tube (thermowell) with neck 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.

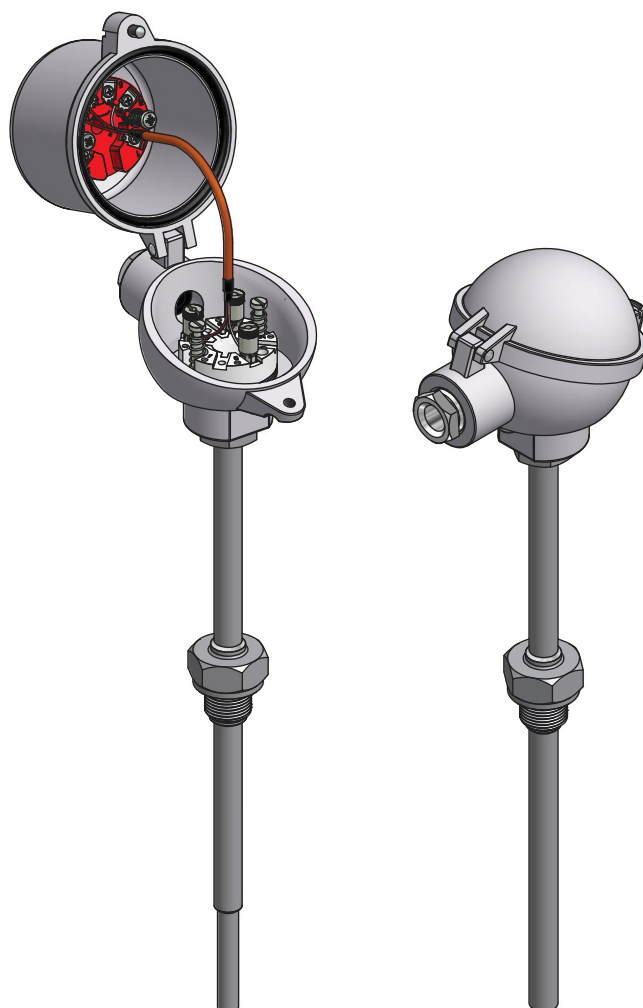
Insertion length, process connection, design of thermowell, connection head as well as type and number of sensors, accuracy and method of connection can be selected individually for the respective application.

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.
Thermowell with reduced tip.

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).

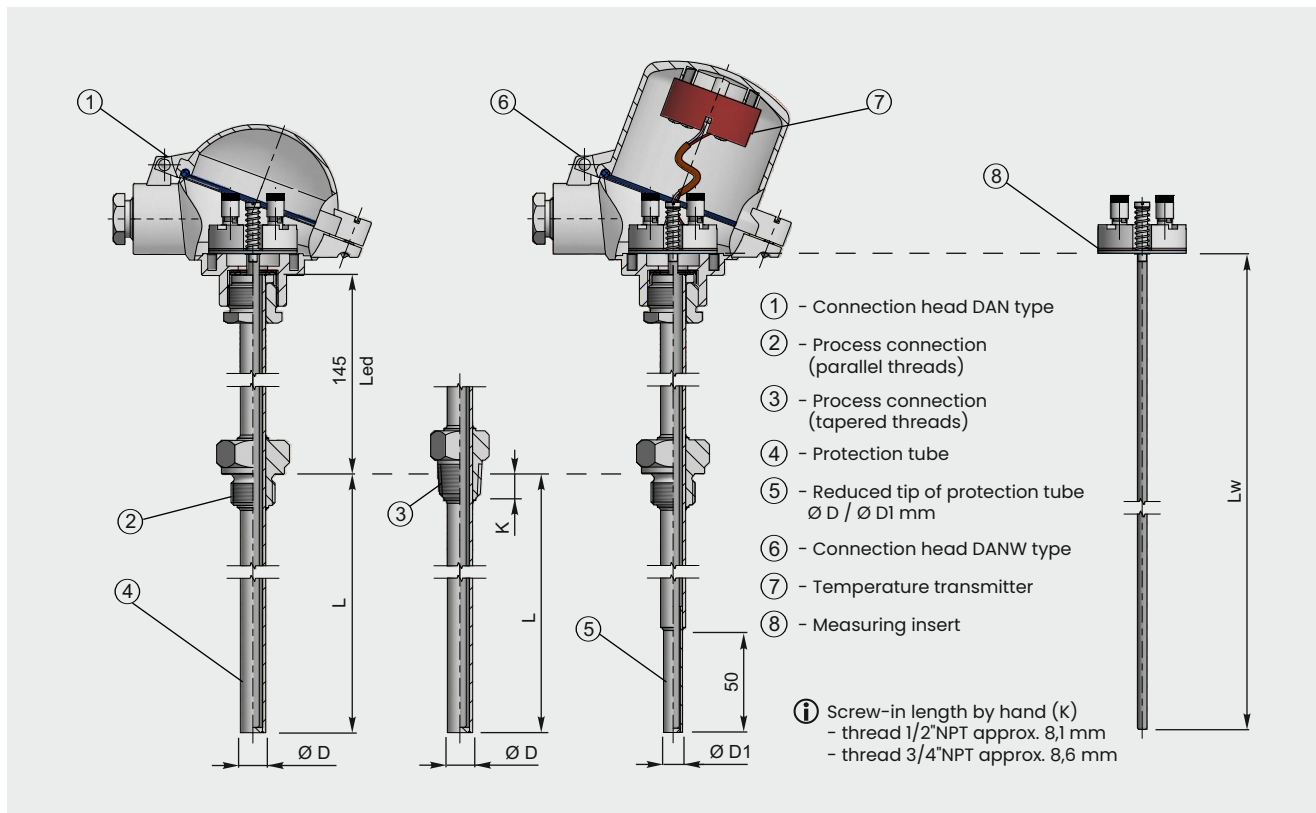
Intrinsically safe (Exi) data sheet XI-TOPG
Flameproof (Exd) data sheet XD-TOPG

Other versions

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

* other materials, see: "Thermowell materials"

Designs



Connection line

Protection tube [mm]	Measuring insert [mm]	Connection line					
		1 x Pt 100			2 x Pt 100		
		2-wire	3-wire	4-wire	2-wire	3-wire	4-wire
Ø 12	Ø 6	✓	✓	✓	✓	✓	✓
Ø 12 / 9	Ø 6	✓	✓	✓	✓	✓	✓

Tolerances

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

Class of tolerance	Tolerance
A	$\pm 0.15 + (0.002 \times t)$
B	$\pm 0.30 + (0.005 \times t)$

Max. pressure (at 100°C)

Admissible pressure of application for max. speed of flow of steam 25 m/s and water 3 m/s.

Length L	Max. pressure of application
160 mm	11.8 MPa
250 mm	6.9 MPa
< 400 mm	4.4 MPa

Standard lengths

Immersion length L	Measuring insert length Lw
100 mm	255 mm
160 mm	315 mm
200 mm	355 mm
250 mm	405 mm
400 mm	555 mm

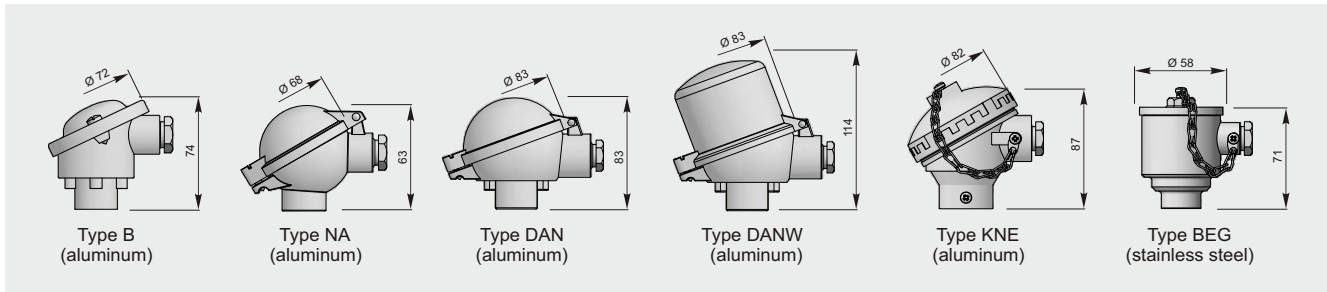
Response time

Average response time at mixed water 0.4 m/s (acc. to DIN EN 60751), at temperature change from 23 to 33°C.

Diameter of protection tube	Response time
Ø 12 mm	t ₅₀ = 38 s
	t ₉₀ = 125 s
Ø 12 / Ø 9 mm	t ₅₀ = 18 s
	t ₉₀ = 55 s

Connection heads

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



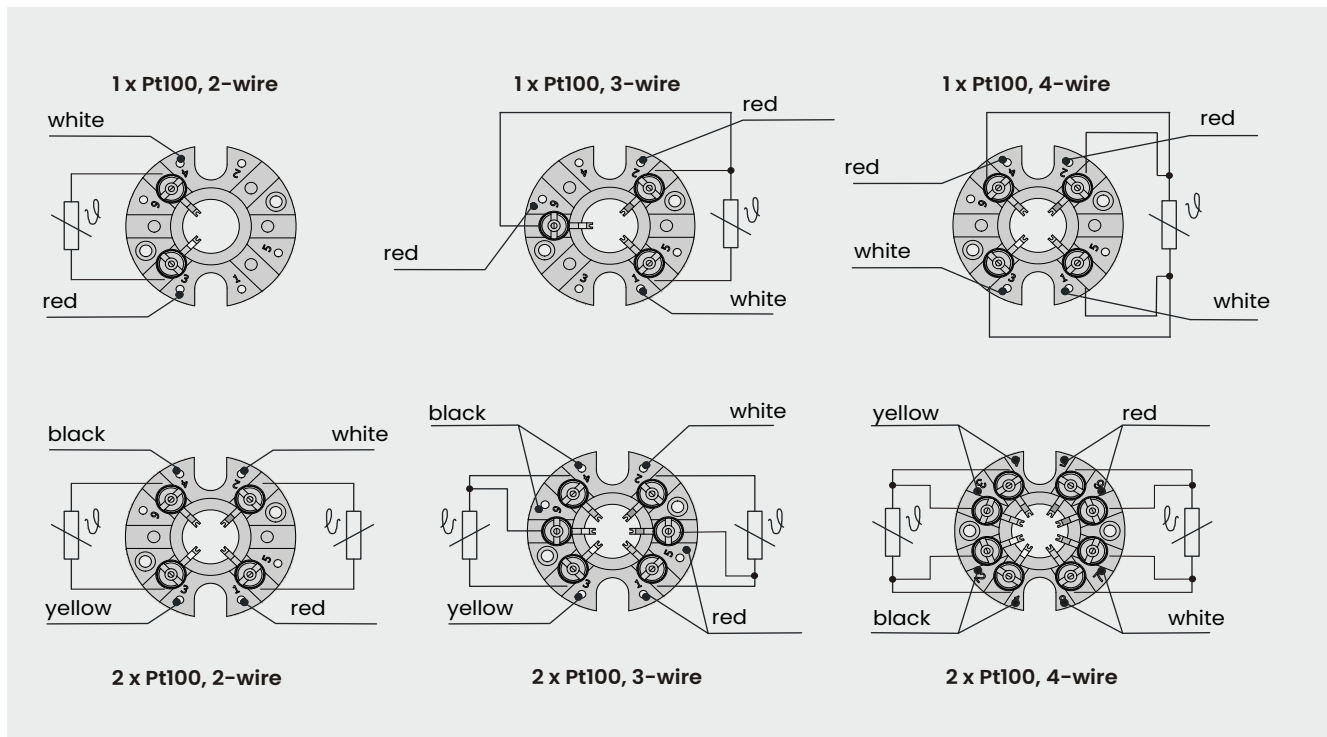
Connection head DANWdie with local LED display

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 millimeter 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..20mAon measuring insert is necessary for proper use. It also works with temperature transmitters with HART® protocol.



Electrical connection on Ceramic Block



Ordering code

1 2 3 4 5 6 7 8 9 10 11

TOPG - - - - - - - - - -

1	<input type="text"/>	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	<input type="text"/>	Length of neck Led				
		1	Neck length Led=145 mm			
		2	Neck length Led=80 mm			
		3	Neck length Led=250 mm			
3	<input type="text"/>	Closing method of connection head				
		1	closing by screw			
		3	closing by clamp			
4	<input type="text"/>	Connection head				
		NA	Type NA	Aluminum	Cable gland: M20x1.5	IP65
		DAN	Type DAN	Aluminum	Cable gland: M20x1.5	IP65
		DANW	Type DANW	Aluminum	Cable gland: M20x1.5	IP65
		B	Type B	Aluminum	Cable gland: M20x1.5	IP65
		BEG	Type BEG	Stainless Steel	Cable gland: M20x1.5	IP65
		xxx	other, please specify			
5	<input type="text"/>	Length L [mm]				
		100	100 mm			
		160	160 mm			
		200	200 mm			
		250	250 mm			
		400	400 mm			
		xxx	other, please specify			
6	<input type="text"/>	Protection tube (thermowell) diameter [mm]				
		6	Ø 6 mm			
		9	Ø 9 mm			
		9/6	Ø 9 mm with reduced tip Ø 6 mm			
		xxx	other, please specify			
7	<input type="text"/>	Process connection				
		M20x1.5	M20x1.5			
		G1/2"	G1/2"			
		xxx	other, please specify			
8	<input type="text"/>	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			
9	<input type="text"/>	Connection line				
		2	2-wire			
		3	3-wire			
		4	4-wire			
10	<input type="text"/>	Measuring range of temperature transmitter				
		0..100	input signal for 4..20mA: 0..100°C			
		xxx	other, please specify			
11	<input type="text"/>	Type of temperature transmitter				
		PR5333A	Output signal 4..20 mA			
		PR5335A	Output signal 4..20 mA, with HART® communication protocol			
		PR5350A	Output signal Profibus® PA / Foundation Fieldbus			
		xxx	other, please specify			

Example

Temperature sensor APWTOPG11-DANWdie-500-12/9-M20x1.5-A-3-0..100°C-PR5335A
 (sensor 1xPt100 with transmitter 4..20mA, connection head DANWdie with local LED display, closing by screw, length L=500mm, process connection M20x1.5, thermowell Ø12 with reduced tip Ø9mm, class A 3-wire, temperature transmitter PR5335A).