

## 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 LCD or LED display as an option  
(see models TWR01H, DANWdie-LED)

## Description

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

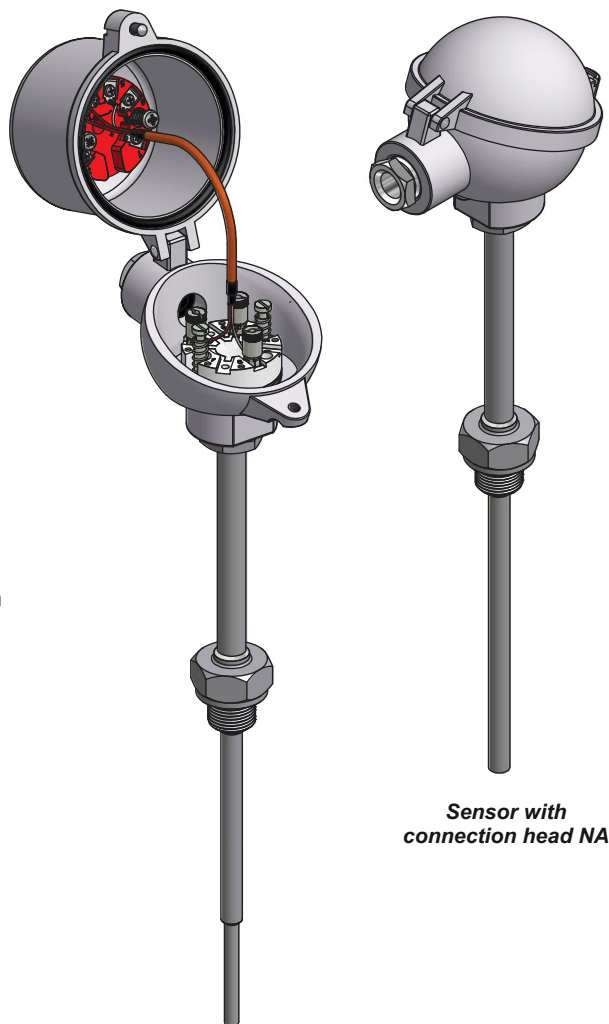
Insertion length, process connection, design of thermowell, connection head as well as type and number of sensors, accuracy and method of connection can be selected individually for the respective application.

### 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)  
Flameproof (Exd)

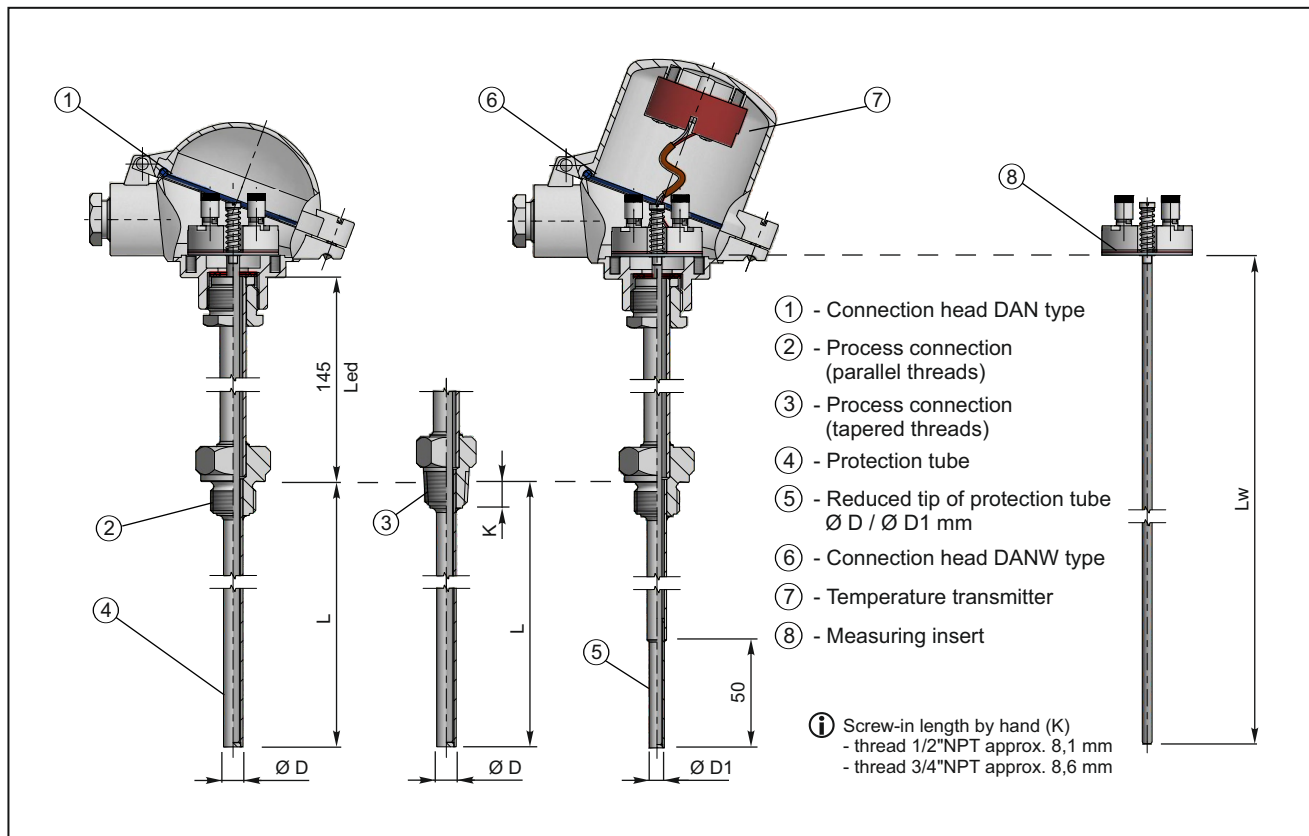
data sheet XI-TOPGN  
data sheet XD-TOPGN

### 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 9	Ø 6	x	x	x	x	x	x
Ø 9 / 6	Ø 3	x	x	x	x	x	-

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	$\pm 0.15 + ( 0.002 \times   t   )$
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	6.4 MPa
250 mm	4.9 MPa
< 400 mm	2.0 MPa

Standard lengths

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

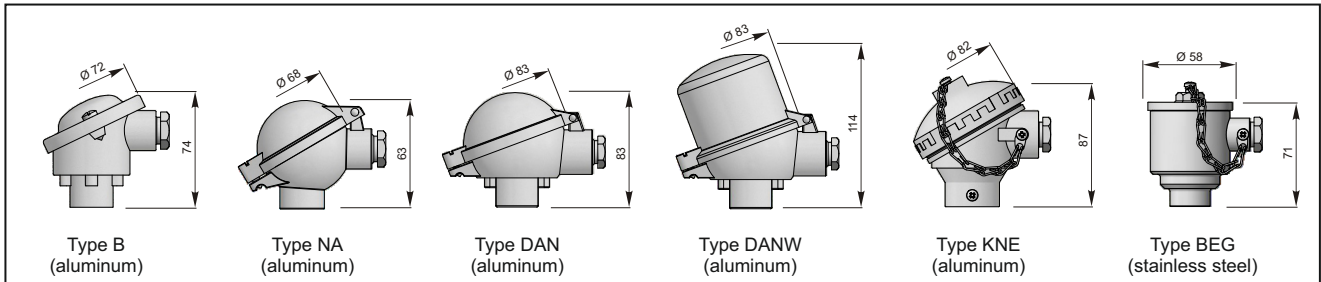
Response time

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 9 mm	t <sub>50</sub> = 18 s
	t <sub>90</sub> = 55 s
Ø 9 / Ø 6 mm	t <sub>50</sub> = 8 s
	t <sub>90</sub> = 22 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

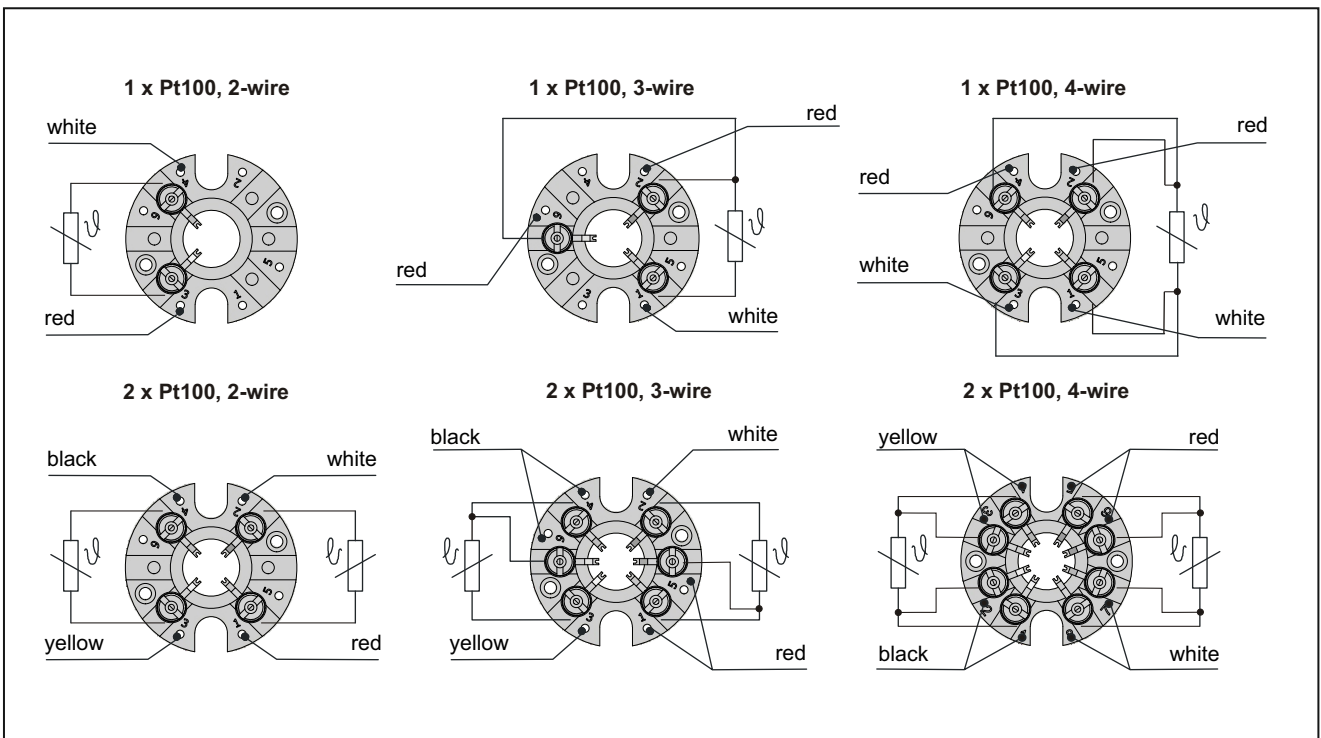
The display is mounted in connection head cover with glass window which allows preview of measuring temperature. 4 digits with a height of 9.5 millimeter ensure clear reading of values.

Programming of measure range can be performed via three buttons placed on the back of display panel.

Mounted temperature transmitter 4..20mA on 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
<input type="checkbox"/>	<b>TOPGN</b>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	p-	<input type="checkbox"/>	-	<input type="checkbox"/>

1		<b>Resistance element</b>	
	<input type="checkbox"/>		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
		<small>* available only with connection head DANWdie</small>	
		<b>Length of neck Led</b>	
2	<input type="checkbox"/>	1	Neck length Led=145 mm
		2	Neck length Led=80 mm
		3	Neck length Led=250 mm
		<b>Closing method of connection head</b>	
3	<input type="checkbox"/>	1	closing by screw
		3	closing by clamp
		<b>Connection head</b>	
4	<input type="checkbox"/>	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
		<b>Length L [mm]</b>	
5	<input type="checkbox"/>	100	100 mm
		160	160 mm
		200	200 mm
		250	250 mm
		400	400 mm
		xxx	other, please specify
		<b>Protection tube (thermowell) diameter D [mm]</b>	
6	<input type="checkbox"/>	6	Ø 6 mm
		9	Ø 9 mm
		9/6	Ø 9 mm with reduced tip Ø 6 mm
		xxx	other, please specify
		<b>Process connection</b>	
7	<input type="checkbox"/>	M20x1.5	M20x1.5
		G1/2"	G1/2"
		xxx	other, please specify
		<b>Tolerance</b>	
8	<input type="checkbox"/>	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
		<b>Connection line</b>	
9	<input type="checkbox"/>	2	2-wire
		3	3-wire
		4	4-wire
		<b>Measuring range of temperature transmitter</b>	
10	<input type="checkbox"/>	0..100	input signal for 4..20mA: 0..100°C
		xxx	other, please specify
		<b>Type of temperature transmitter</b>	
11	<input type="checkbox"/>	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 TOPGN11-DAN-200-9-G1/2-A/4p  
( sensor 1xPt100, connection head DAN closing by screw, length L=200mm, process connection G1/2", class A 4-wire ).

Temperature sensor APWTOPGN11-DANWdie-500-9/6-M20x1.5-A/3p-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 Ø9 with reduced tip Ø6mm, class A 3-wire, temperature transmitter PR5335A ).