

Applications

- Measuring range: -200 .. +150°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)

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, 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-TOPGB

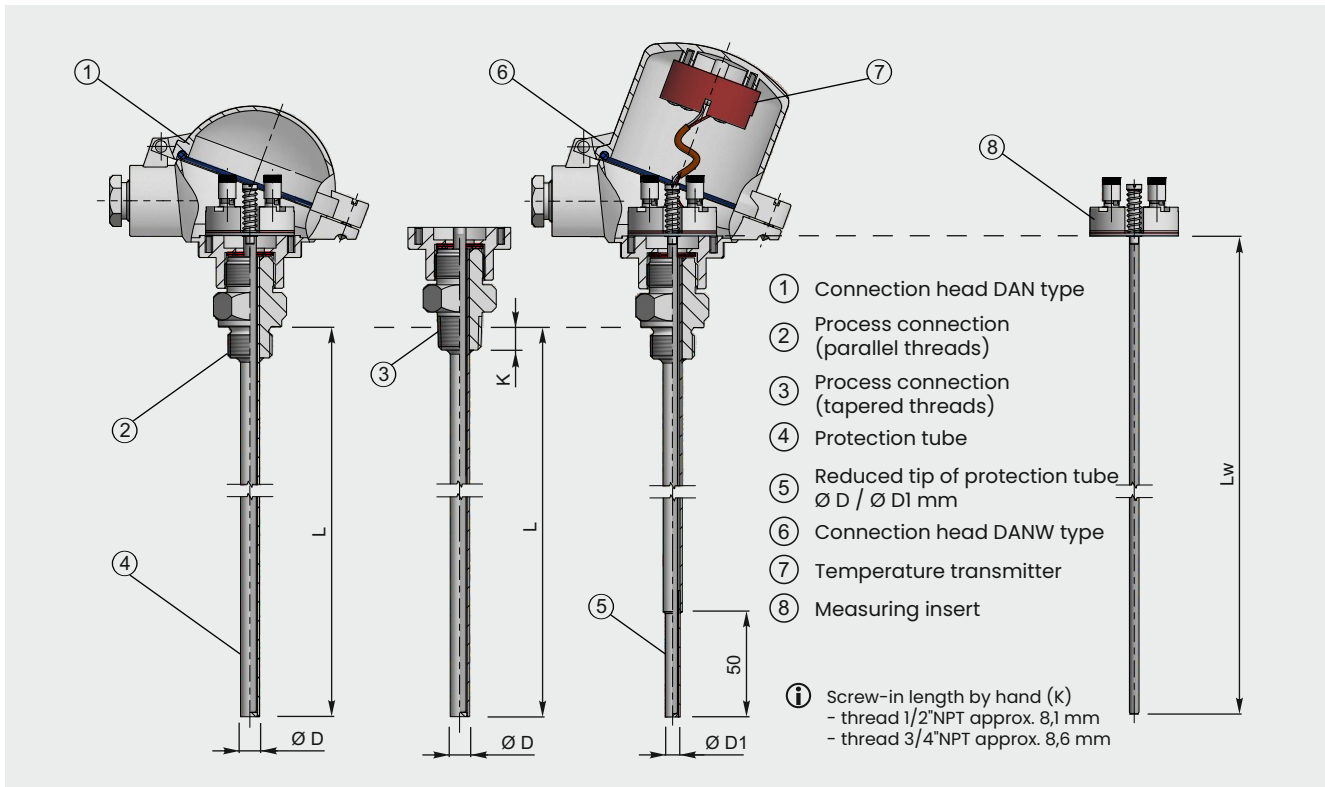
Flameproof (Exd) data sheet XD-TOPGB

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
$\varnothing 9$	$\varnothing 6$	✓	✓	✓	✓	✓	✓
$\varnothing 9 / 6$	$\varnothing 3$	✓	✓	✓	✓	✓	✗

Tolerances

Basic values and limiting errors for the platinum measurement resistances are laid down in PN-EN 60751

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

Max pressure (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	Measuring insert length Lw
100 mm	145 mm
160 mm	205 mm
200 mm	245 mm
250 mm	295 mm
400 mm	445 mm

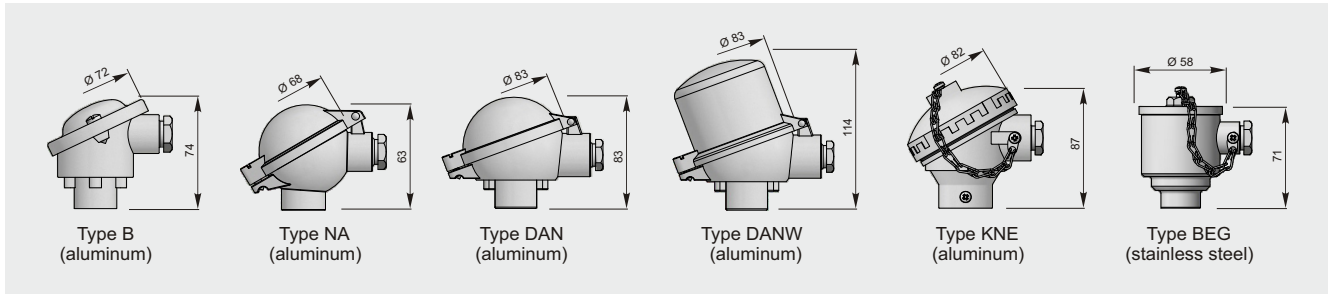
Response time

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
$\varnothing 9$ mm	$t_{50} = 18$ s
	$t_{90} = 55$ s
$\varnothing 9 / \varnothing 6$ mm	$t_{50} = 8$ s
	$t_{90} = 22$ 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".



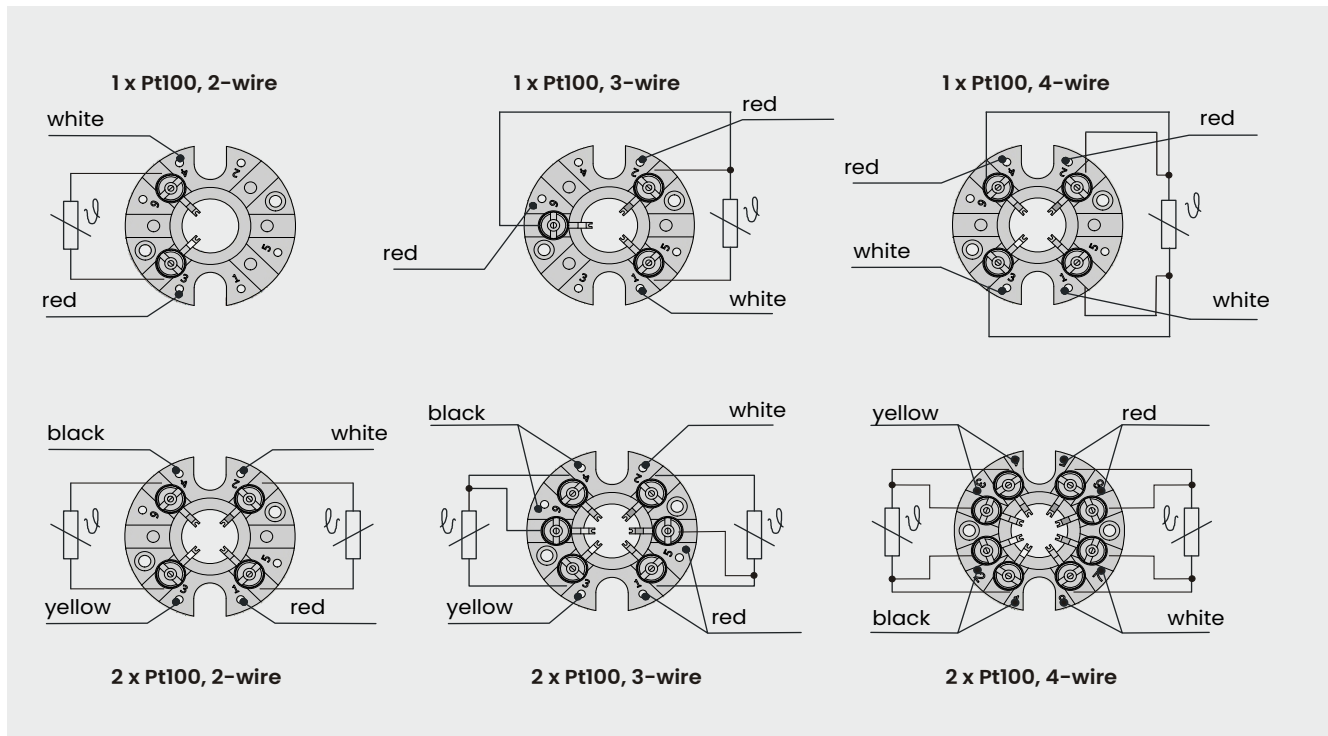
Connection head DANWdie with local LED display

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..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
 TOPGBI - - - - - - - - - -

Resistance element									
1	<table border="1"> <tr> <td><input type="text"/></td> <td>1 x Pt100</td> </tr> <tr> <td>AP</td> <td>1 x Pt100, with installed transmitter 4..20 mA</td> </tr> <tr> <td>APW</td> <td>1 x Pt100, with installed transmitter 4..20 mA and local LED display*</td> </tr> <tr> <td>2</td> <td>2 x Pt100</td> </tr> </table>	<input type="text"/>	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
<input type="text"/>	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

Closing method of connection head					
2	<table border="1"> <tr> <td><input type="text"/></td> <td>1 closing by screw</td> </tr> <tr> <td></td> <td>3 closing by clamp</td> </tr> </table>	<input type="text"/>	1 closing by screw		3 closing by clamp
<input type="text"/>	1 closing by screw				
	3 closing by clamp				

Connection head						
3	<input type="text"/>	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			

Length L [mm]																			
4	<table border="1"> <tr> <td><input type="text"/></td> <td>100</td> <td>100 mm</td> </tr> <tr> <td></td> <td>160</td> <td>160 mm</td> </tr> <tr> <td></td> <td>200</td> <td>200 mm</td> </tr> <tr> <td></td> <td>250</td> <td>250 mm</td> </tr> <tr> <td></td> <td>400</td> <td>400 mm</td> </tr> <tr> <td></td> <td>xxx</td> <td>other, please specify</td> </tr> </table>	<input type="text"/>	100	100 mm		160	160 mm		200	200 mm		250	250 mm		400	400 mm		xxx	other, please specify
<input type="text"/>	100	100 mm																	
	160	160 mm																	
	200	200 mm																	
	250	250 mm																	
	400	400 mm																	
	xxx	other, please specify																	

Protection tube (thermowell) diameter [mm]													
5	<table border="1"> <tr> <td><input type="text"/></td> <td>6</td> <td>Ø 6 mm</td> </tr> <tr> <td></td> <td>9</td> <td>Ø 9 mm</td> </tr> <tr> <td></td> <td>9/6</td> <td>Ø 9 mm with reduced tip Ø 6 mm</td> </tr> <tr> <td></td> <td>xxx</td> <td>other, please specify</td> </tr> </table>	<input type="text"/>	6	Ø 6 mm		9	Ø 9 mm		9/6	Ø 9 mm with reduced tip Ø 6 mm		xxx	other, please specify
<input type="text"/>	6	Ø 6 mm											
	9	Ø 9 mm											
	9/6	Ø 9 mm with reduced tip Ø 6 mm											
	xxx	other, please specify											

Process connection										
6	<table border="1"> <tr> <td><input type="text"/></td> <td>M20x1.5</td> <td>M20x1.5</td> </tr> <tr> <td></td> <td>G1/2"</td> <td>G1/2"</td> </tr> <tr> <td></td> <td>xxx</td> <td>other, please specify</td> </tr> </table>	<input type="text"/>	M20x1.5	M20x1.5		G1/2"	G1/2"		xxx	other, please specify
<input type="text"/>	M20x1.5	M20x1.5								
	G1/2"	G1/2"								
	xxx	other, please specify								

Tolerance													
7	<table border="1"> <tr> <td><input type="text"/></td> <td>A</td> <td>Class A according to PN-EN 60751</td> </tr> <tr> <td></td> <td>B</td> <td>Class B according to PN-EN 60751</td> </tr> <tr> <td></td> <td>1/3B</td> <td>Class 1/3B DIN</td> </tr> <tr> <td></td> <td>xxx</td> <td>other, please specify</td> </tr> </table>	<input type="text"/>	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
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Connection line										
8	<table border="1"> <tr> <td><input type="text"/></td> <td>2</td> <td>2-wire</td> </tr> <tr> <td></td> <td>3</td> <td>3-wire</td> </tr> <tr> <td></td> <td>4</td> <td>4-wire</td> </tr> </table>	<input type="text"/>	2	2-wire		3	3-wire		4	4-wire
<input type="text"/>	2	2-wire								
	3	3-wire								
	4	4-wire								

Measuring range of temperature transmitter							
9	<table border="1"> <tr> <td><input type="text"/></td> <td>0..100</td> <td>input signal for 4..20mA: 0..100°C</td> </tr> <tr> <td></td> <td>xxx</td> <td>other, please specify</td> </tr> </table>	<input type="text"/>	0..100	input signal for 4..20mA: 0..100°C		xxx	other, please specify
<input type="text"/>	0..100	input signal for 4..20mA: 0..100°C					
	xxx	other, please specify					

Type of temperature transmitter													
10	<table border="1"> <tr> <td><input type="text"/></td> <td>PR5333A</td> <td>Output signal 4..20 mA</td> </tr> <tr> <td></td> <td>PR5335A</td> <td>Output signal 4..20 mA, with HART® communication protocol</td> </tr> <tr> <td></td> <td>PR5350A</td> <td>Output signal Profibus® PA / Foundation Fieldbus</td> </tr> <tr> <td></td> <td>xxx</td> <td>other, please specify</td> </tr> </table>	<input type="text"/>	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
<input type="text"/>	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 TOPGBI1-DAN-200-9-G1/2-A-4
 (sensor 1xPt100, connection head DAN closing by screw, length L=200mm, process connection G1/2", class A 4-wire).

Temperature sensor APWTOPGBI1-DANWdie-500-9/6-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 Ø9 with reduced tip Ø6mm, class A 3-wire, temperature transmitter PR5335A).