

Overview

- Compact and rugged design
- Customer-specific immersion depth down to 3000 mm
- Precision measurement from -50 ... 250 °C
- Integrated 4 ... 20 mA transmitter or Pt100 output
- Easy process implementation from DN 25 or in tank



EN 50155

Technical data

Performance characteristics

Pt100 accuracy class (EN 60751)	B ($\pm 0.3 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm (0.3 + 0.005 \times t)^\circ\text{C}$ A ($\pm 0.15 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm (0.15 + 0.002 \times t)^\circ\text{C}$ 1/3 B ($\pm 0.1 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm 1/3 \times (0.3 + 0.005 \times t)^\circ\text{C}$ 1/6 B ($\pm 0.05 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm 1/6 \times (0.3 + 0.005 \times t)^\circ\text{C}$
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Response time, T50	$\leq 1.0 \text{ s}$, conical sensor $\leq 1.3 \text{ s}$, $\varnothing 3 \text{ mm}$ $\leq 2.5 \text{ s}$, $\varnothing 4 \text{ mm}$ $\leq 3.0 \text{ s}$, $\varnothing 6 \text{ mm}$
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Process temperature	Refer to section "Operating conditions"
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Process connection

Connection variants	Refer to section "Dimensional drawings"
Sensor length	$\leq 3000 \text{ mm}$
Sensor diameter outside	$\varnothing 6 \text{ mm}$
Mounting position	Any, top, bottom, side
Standard response tip	$\varnothing 6 \text{ mm}$
Fast response tip	$\varnothing 3 \text{ mm}$ $\varnothing 4 \text{ mm}$

Sensor tube material	AISI 316L (1.4404)
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Surface roughness wetted parts	$R_a \leq 0.8 \text{ } \mu\text{m}$
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Ambient conditions

Operating temperature range	-40 ... 125 °C, with Pt100 -40 ... 85 °C, with transmitter
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Storage temperature range	-55 ... 90 °C
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Degree of protection (EN 60529)	IP 65, with DIN EN 175301-803 A (DIN 43650 A), 4-pin IP 67, with M12-A, 4-pin
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Humidity	$\leq 100 \text{ } \%$ RH, condensing
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Ambient conditions

Long-term test (transmitter)	IEC 770 6.3.2
Vibration (sinusoidal) (EN 60068-2-6)	1.6 mm p-p (2 ... 25 Hz), 4 g (25 ... 100 Hz), 1 octave / min.

Output signal

Without transmitter	1 x Pt100, 4-wire
With transmitter	4 ... 20 mA, 2-wire

Housing

Style	Compact transmitter
Overall size	Refer to section "Dimensional drawings"
Material	AISI 304 (1.4301)

Electrical connection

Connector	DIN EN 175301-803 A (DIN 43650 A), 4-pin M12-A, 4-pin
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Power supply

Voltage supply range	8 ... 35 V DC
Power-up time	$< 20 \text{ s}$
Reverse polarity protection	Yes

Factory settings

Output range	0 ... 150 °C
Damping	0 s
Output at sensor fault	23 mA

Compliance and approvals

EMC	EN 61000-6-2 EN 61000-6-3 EN 61326-1 NE21
Hygiene	FDA (21 CFR 177.2415) 3-A (74-07)
Railway applications	EN 50155
Explosion protection	Ex ia Simple apparatus, gas and dust

TE2

Compact RTD temperature sensor

TE2-#.###.####.####.0

Transmitter

Input		Output	
Measuring unit	°C °F	Output signal	4 ... 20 mA , 2-wire
Min. measuring span	25 °C	Accuracy	< 0.1 % , measuring span < 0.016 mA
Sample time	< 0.7 s	Temperature drift	< 0.003 %/K , typ. < 0.01 %/K , max.
Accuracy	< 0.25 °C , @ ≤ 100 °C	Resolution	12 bit
Repeatability	< 0.1 °C	Effect of variations in supply voltage	< 0.01 %/V
Resolution	14 bit	Ripple immunity	3 Vrms
Ripple immunity	IEC 770 6.2.4.2	Shunt resistance	$R_s \leq (V_{DC} - 8 V)/0.023 A$
Error detection delay	< 10 s	Damping	0.0 ... 30.0 s , programmable
Offset adjustment	± 10 °C , max.	Up/Down scaling limits	23 mA / 3.5 mA
Isolation, sensor to case	50 V AC , test 500V		
Protection	± 35 V DC		
Suppression	50 Hz 60 Hz		

Operating conditions

Ordering key	Process connection	BCID	Process pressure (bar)	Continuous	Process temperature
				Process temperature Standard @ Tamb ≤ 20 °C (° C)	With cooling neck @ Tamb ≤ 20 °C (° C)
TE2-#.1.####.####.#	Sleeve Ø 6	T65	-1 ... 40	-50 ... 125	-50 ... 250
TE2-#.3.####.####.#	G 1/2 A ISO 228-1	G06	-1 ... 100	-50 ... 125	-50 ... 250
TE2-#.4.####.####.#	G 1/2 A hygienic	A03	-1 ... 40	-50 ... 125	-50 ... 250
TE2-#.5.####.####.#	M12 x 1.5 hygienic	A02	-1 ... 40	-50 ... 125	-50 ... 250
TE2-#.6.####.####.#	M12 x 1.5 hygienic, with PEEK cone	A02	-1 ... 10	-50 ... 115	N/A
TE2-#.7.####.####.#	G 1/8 female thread hygienic	A01	-1 ... 40	-50 ... 205	-50 ... 250
TE2-#.8.####.####.#	G 1/4 A DIN 3852-E	G50	-1 ... 100	-50 ... 125	-50 ... 250
TE2-#.9.####.####.#	ISO 2852 (Tri-Clamp), DN 33.7; 38, Ø 50.5	C04	-1 ... 40	-50 ... 125	-50 ... 250
TE2-#.A.####.####.#	Tri-Clamp Ø 24.9	C01	-1 ... 40	-50 ... 125	-50 ... 250
TE2-#.B.####.####.#	BHC 3A DN 38	B01	-1 ... 40	-50 ... 125	-50 ... 250
TE2-#.D.####.####.#	1/2-14 NPT	N02	-1 ... 100	-50 ... 125	-50 ... 250
TE2-#.E.####.####.#	1/4-18 NPT	N01	-1 ... 100	-50 ... 125	-50 ... 250
TE2-#.F.####.####.#	G 1/2 A DIN 3852-E	G51	-1 ... 100	-50 ... 125	-50 ... 250
TE2-#.G.####.####.#					

For further information on permissible process and ambient temperatures, please refer to the operating instructions.

TE2

Compact RTD temperature sensor

TE2-#.###.#####.0

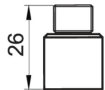
Compliance and approvals

Ordering key	Process connection	BCID	EN 10/2011	EN 1935/2004 EN 2023/2006	FDA	3-A
TE2-#.1.#####.#	Sleeve Ø 6	T65				
TE2-#.3.#####.#	G 1/2 A ISO 228-1	G06				
TE2-#.4.#####.#	G 1/2 A hygienic	A03		■		
TE2-#.5.#####.#	M12 x 1.5 hygienic	A02		■		
TE2-#.6.#####.#	M12 x 1.5 hygienic, with PEEK cone	A02	■	■	■	
TE2-#.7.#####.#	G 1/8 female thread hygienic	A01		■		
TE2-#.8.#####.#	G 1/4 A DIN 3852-E	G50				
TE2-#.9.#####.#	ISO 2852 (Tri-Clamp), DN 33.7; 38, Ø 50.5	C04		■		■
TE2-#.A.#####.#	Tri-Clamp Ø 24.9	C01		■		
TE2-#.B.#####.#	BHC 3A DN 38	B01		■		■
TE2-#.D.#####.#	1/2-14 NPT	N02				
TE2-#.E.#####.#	1/4-18 NPT	N01				
TE2-#.F.#####.#						
TE2-#.G.#####.#	G 1/2 A DIN 3852-E	G51				

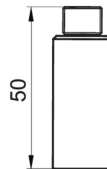
The requirements of the respective 3-A Sanitary Standard will be only fulfilled in combination with appropriate mounting accessories. Those are marked with the 3-A logo.

Dimensional drawings (mm)

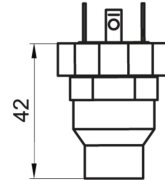
Housing



Housing with connector M12-A, 4-pin



Housing with transmitter and connector M12-A, 4-pin



Housing with connector DIN EN 175301-803 A (DIN 43650 A), 4-pin

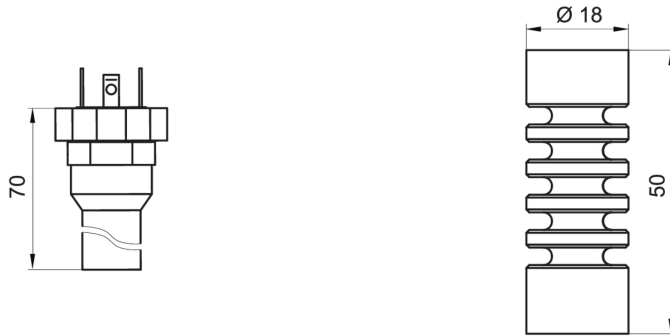
TE2

Compact RTD temperature sensor

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Dimensional drawings (mm)

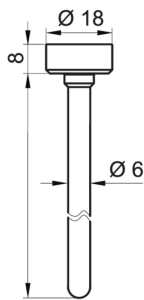
Housing



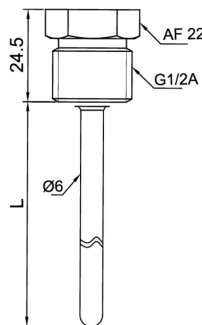
Housing with transmitter and connector DIN EN 175301-803 A (DIN 43650 A), 4-pin

Cooling neck

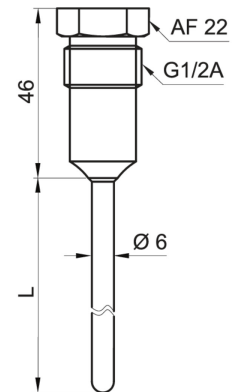
Process connection



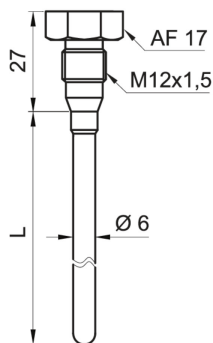
Without thread (BCID: T65)



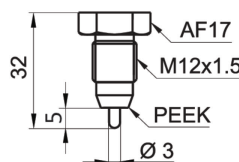
G 1/2 A ISO 228-1 (BCID: G06)



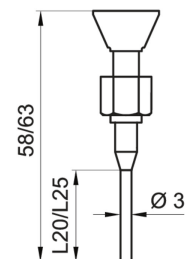
G 1/2 A hygienic (BCID: A03)



M12 × 1.5 hygienic (BCID: A02)



M12 × 1.5 hygienic, PEEK cone, tip Ø 3 x 5 mm (BCID: A02)



G 1/8 female thread hygienic (BCID: A01)

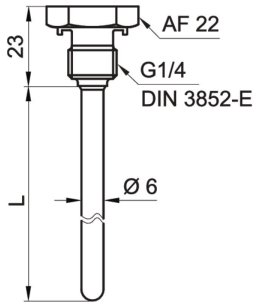
TE2

Compact RTD temperature sensor

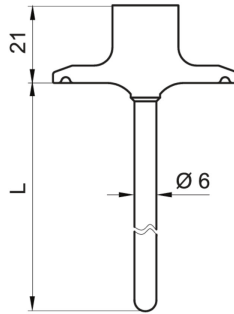
TE2-#.###.#.###.#.0

Dimensional drawings (mm)

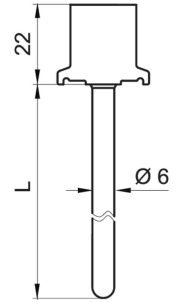
Process connection



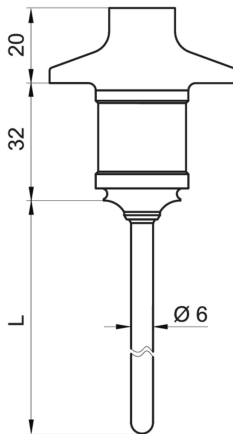
G 1/4 A DIN 3852-E (BCID: G50)



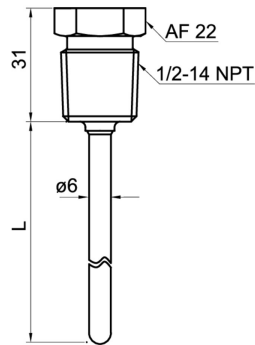
Tri-Clamp Ø 50.5 (BCID: C04)



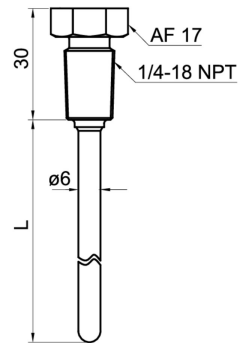
Tri-Clamp Ø 24.9 (BCID: C01)



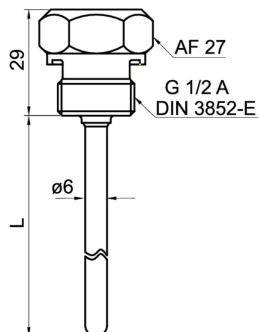
BHC 3A DN 38 (BCID: B01)



1/2-14 NPT (BCID: N02)



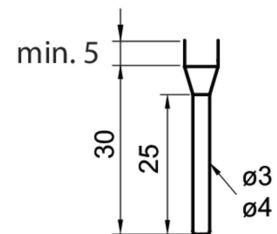
1/4-18 NPT (BCID: N01)



G 1/2 A DIN 3852-E (BCID: G51)



Standard response tip



Fast response tip

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Electrical connection

Output type	Electrical connection	Equivalent circuit	Function	Pin assignment									
M12-A, 4-pin, stainless steel													
Pt100 (Single element)			<table border="1"> <tr><td>Pt100 11</td><td>1, 2</td></tr> <tr><td>Pt100 12</td><td>3, 4</td></tr> <tr><td>Frame ground</td><td>Plug thread</td></tr> </table>	Pt100 11	1, 2	Pt100 12	3, 4	Frame ground	Plug thread				
Pt100 11		1, 2											
Pt100 12		3, 4											
Frame ground		Plug thread											
Pt100 (Double element)		<table border="1"> <tr><td>Pt100 11</td><td>1</td></tr> <tr><td>Pt100 12</td><td>4</td></tr> <tr><td>Pt100 21</td><td>2</td></tr> <tr><td>Pt100 22</td><td>3</td></tr> <tr><td>Frame ground</td><td>Plug thread</td></tr> </table>	Pt100 11	1	Pt100 12	4	Pt100 21	2	Pt100 22	3	Frame ground	Plug thread	
Pt100 11	1												
Pt100 12	4												
Pt100 21	2												
Pt100 22	3												
Frame ground	Plug thread												
4 ... 20 mA, 2-wire, Iout at pin 2		<table border="1"> <tr><td>+Vs</td><td>1</td></tr> <tr><td>Iout</td><td>2</td></tr> <tr><td>N.C.</td><td>3, 4</td></tr> <tr><td>Frame ground</td><td>Plug thread</td></tr> </table>	+Vs	1	Iout	2	N.C.	3, 4	Frame ground	Plug thread			
+Vs	1												
Iout	2												
N.C.	3, 4												
Frame ground	Plug thread												
4 ... 20 mA, 2-wire, Iout at pin 2, 3		<table border="1"> <tr><td>+Vs</td><td>1</td></tr> <tr><td>Iout</td><td>2, 3</td></tr> <tr><td>N.C.</td><td>4</td></tr> <tr><td>Frame ground</td><td>Plug thread</td></tr> </table>	+Vs	1	Iout	2, 3	N.C.	4	Frame ground	Plug thread			
+Vs	1												
Iout	2, 3												
N.C.	4												
Frame ground	Plug thread												
DIN EN 175301-803 A (DIN 43650 A), 4-pin													
Pt100 (Single element)			<table border="1"> <tr><td>N.C.</td><td>1</td></tr> <tr><td>Pt100 11</td><td>2</td></tr> <tr><td>Pt100 12</td><td>3</td></tr> <tr><td>Frame ground</td><td>Grounding lug</td></tr> </table>	N.C.	1	Pt100 11	2	Pt100 12	3	Frame ground	Grounding lug		
N.C.		1											
Pt100 11	2												
Pt100 12	3												
Frame ground	Grounding lug												
4 ... 20 mA, 2-wire		<table border="1"> <tr><td>+Vs</td><td>1</td></tr> <tr><td>Iout</td><td>2</td></tr> <tr><td>N.C.</td><td>3</td></tr> <tr><td>Frame ground</td><td>Grounding lug</td></tr> </table>	+Vs	1	Iout	2	N.C.	3	Frame ground	Grounding lug			
+Vs	1												
Iout	2												
N.C.	3												
Frame ground	Grounding lug												

TE2

Compact RTD temperature sensor

TE2-#. #. #####. #####.0

Ordering information

Ordering key - Configuration possibilities see website

	TE2	-	#	.	#	.	#	#	#	#	.	####	.	#
Product	TE2													
Sensor tip														
Not specified														0
Standard response tip, Ø 6 mm														1
Fast response tip, Ø 4 mm														2
Fast response tip, Ø 3 mm														3
Process Connection														
Tube without connection														1
G 1/2 A ISO 228-1 (G06)														3
G 1/2 A hygienic (A03)														4
M12 × 1.5 hygienic (A02)														5
M12 × 1.5 hygienic, PEEK cone, sensor tip Ø 3x5 mm (A02)														6
G1/8 ISO 228/1 female thread, Hygienic (A01)														7
G 1/4 A DIN 3852-E, with NBR seal (G50)														8
ISO 2852 (Tri-Clamp), DN 25; 33.7; 38, Ø 50.5 (C04)														9
DIN 32676-C (Tri-Clamp), DN 3/4, Ø 24.9 (C01)														A
BHC 3A DN 38 (B01)														B
1/2-14 NPT (N02)														D
1/4-18 NPT (N01)														E
G 1/2 A DIN 3852-E, with FKM seal (G51)														F
G 1/2 A DIN 3852-E, with EPDM seal (G51)														G
Sensor element														
1/1 B EN 60751, single														1
1/1 B EN 60751, duplex														2
1/3 B EN 60751, single														3
1/3 B EN 60751, duplex														4
1/6 B EN 60751, single														5
1/6 B EN 60751, duplex														6
1/1 A EN 60751, single														7
1/1 A EN 60751, duplex														8
Cooling neck														
Without cooling neck														0
With cooling neck														4
Electrical connection														
M12-A, 4-pin, stainless steel														1
M12-A, 4-pin, stainless steel, with integrated transmitter														2
DIN EN 175301-803 A (DIN 43650 A), 4-pin														4
DIN EN 175301-803 A (DIN 43650 A), 4-pin, with integrated transmitter														5
M12-A, 4-pin, stainless steel, with integrated transmitter, out pin 2+3														A
Certificates														
Not specified														0
Railway EN 50155														4
Ex ia Simple apparatus, gas and dust														9
Sensor tube length (mm)														
5 - 3000														####

TE2

Compact RTD temperature sensor

TE2-#.#.####.####.0

Ordering information

Ordering key - Configuration possibilities see website

TE2 - # . # . # # # # . #### . #

Configuration

No configuration	0
Configuring according to customer specification	C