

PT20H

Hygienic compact RTD temperature sensor

PT20H-####.1###2##.2#000##.####

Overview

- Precision measurement from -50 ... 250 °C
- Integrated 4 ... 20 mA transmitter with high accuracy
- Fast power-up time < 2 s
- All parts welded together
- Customer-specific immersion depth down to 3000 mm
- IO-Link Dual Channel for easy commissioning



Technical data

Performance characteristics

Pt100 accuracy class (EN 60751)	Standard response tip B ($\pm 0.3 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm (0.3 + 0.005 \times t) \text{ }^\circ\text{C}$ A ($\pm 0.15 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm (0.15 + 0.002 \times t) \text{ }^\circ\text{C}$ 1/3 B ($\pm 0.1 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm 1/3 \times (0.3 + 0.005 \times t) \text{ }^\circ\text{C}$ 1/6 B ($\pm 0.05 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm 1/6 \times (0.3 + 0.005 \times t) \text{ }^\circ\text{C}$
Max. output error	$\leq 0.06 \text{ } \%$ FSR @ $25 \text{ }^\circ\text{C}$ Including input accuracy, output accuracy and repeatability
Thermal response time, T90	RTD element and transmitter combined < 8.9 s, $\varnothing 6 \text{ mm}$
Temperature drift (by ambient)	< 0.025 K/K + 0.01 % FSR/K
Process temperature	Refer to section "Operating conditions"

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	$\varnothing 6 \text{ mm}$
Sensor tube material	AISI 316L (1.4404)
Surface roughness wetted parts	$R_a \leq 0.8 \text{ } \mu\text{m}$

Ambient conditions

Operating temperature range	-40 ... 85 °C
Storage temperature range	-50 ... 85 °C

Ambient conditions

Degree of protection (EN 60529)	Connector DIN EN 175301-803 A (DIN 43650 A), 4-pin: IP65 Connector M12-A, 4-pin: IP68, with appropriate cable (336 h @ 10 mH2O) IP69K, with appropriate cable
Humidity	$\leq 100 \text{ } \%$ RH, condensing
Vibration (sinusoidal) (EN 60068-2-6)	1.6 mm p-p (2 ... 25 Hz), 4 g (25 ... 100 Hz), 1 octave / min. GL, test 2

IO-Link interface

IO-Link version	1.1
Device profile	Smart Sensor Profile
IO-Link port type	Class A
Baud rate	38,4 kbaud (COM2)
Process data length	72 bit
SIO-mode	Yes
Process data (cyclic)	Switch state State of alert Process temperature Unit temperature Signal analog output 1
Dual Channel	IO-Link / Analogue

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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Technical data

Power supply

Voltage supply range	7 ... 35 V DC (Standard version)
	10 ... 35 V DC (Dual Channel version)
	18 ... 30 V DC (Dual Channel version, IO-Link communication)

Power-up time	< 2 s
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Reverse polarity protection	Yes
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Factory settings

Output range	0 ... 150 °C
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Factory settings

Damping	0 s
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Output at sensor fault	23 mA
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Compliance and approvals

EMC	EN 61326-1
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Hygiene	3-A (74-07) EHEDG EL Class I
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Safety	cULus listed, E527512
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Transmitter

Input

Min. measuring span	10 °C
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Sample time	< 0.1 s
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Accuracy	± 0.05 °C (-50 ... 200 °C)
	± 0.06 °C (200 ... 250 °C)

Error detection delay	< 2 s
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Output

Output type	PNP
	NPN
	Digital (push-pull)
	4 ... 20 mA, 2-wire
20 ... 4 mA, 2-wire	

Switching logic	Active high
	Active low

Voltage drop	PNP: (+Vs - 1,2 V) ± 0.5 V, Rload ≥ 10 kΩ
	NPN: (-Vs + 1,5 V) ± 0.5 V, Rload ≥ 10 kΩ

Resolution	14 bit
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Ripple immunity	< 1 % FSR (1 Vrms, 50Hz...1kHz)
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Shunt resistance	Rs ≤ (V DC - 7 V)/0.023 A (Standard version)
	Rs ≤ (V DC - 10 V)/0.023 A (Dual Channel version)

Current rating	100 mA , max.
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Off leak current	< 100 µA
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Short circuit protection	Yes
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Damping	0.0 ... 60.0 s , programmable
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Up/Down scaling limits	23 mA / 3.5 mA
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Operating conditions

Ordering key	Process connection	BCID	Process pressure (bar)	Continuous		
				Process temperature Standard @ Tamb ≤ 20 °C (° C)	Process temperature With cooling neck, Sensor tip Ø3 mm @ Tamb ≤ 20 °C (° C)	Process temperature With cooling neck, Sensor tip Ø6 mm @ Tamb ≤ 20 °C (° C)
A020	M12 x 1.5 hygienic	A02	-1 ... 40	-50 ... 125	-50 ... 200	-50 ... 250
A030	G 1/2 A hygienic	A03	-1 ... 40	-50 ... 125	-50 ... 200	-50 ... 250
B010	BHC 3A DN 38	B01	-1 ... 40	-50 ... 125	-50 ... 200	-50 ... 250
C040	ISO 2852 (Tri-Clamp), DN 33.7; 38, Ø 50.5	C04	-1 ... 40	-50 ... 125	-50 ... 200	-50 ... 250

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

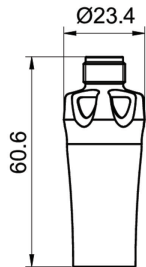
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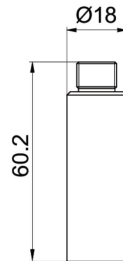
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Dimensional drawings (mm)

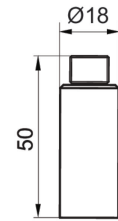
Housing



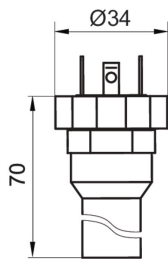
Housing with Dual Channel transmitter and King Crown connector M12-A, 4-pin (with LED)



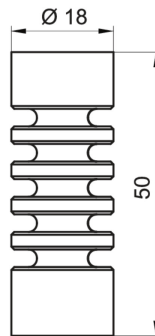
Housing with Dual Channel transmitter and connector M12-A, 4-pin



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

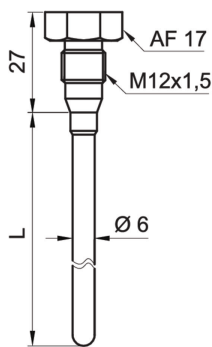


Housing with transmitter and connector DIN EN 175301-803 A (DIN 43650 A), 4-pin

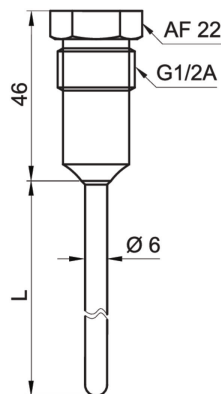


Cooling neck

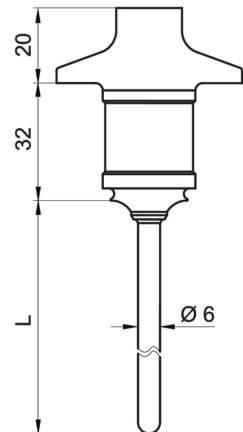
Process connection



M12 × 1.5 hygienic (BCID: A02)



G 1/2 A hygienic (BCID: A03)



BHC 3A DN 38 (BCID: B01)
3-A / EHEDG certified

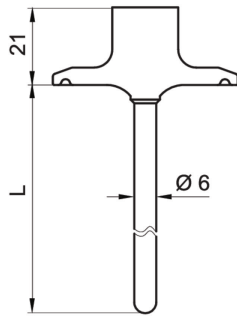
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Dimensional drawings (mm)

Process connection



Tri-Clamp Ø 50.5 (BCID: C04)
3-A / EHEDG certified

Standard response tip

Electrical connection

Output type	Electrical connection	Equivalent circuit	Function	Pin assignment								
	M12-A, 4-pin, stainless steel											
Standard version 4 ... 20 mA, 2-wire			<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											
Standard version 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	
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Electrical connection

Output type	Electrical connection	Equivalent circuit	Function	Pin assignment
	M12-A, 4-pin, stainless steel			
Dual Channel version 4 ... 20 mA, 2-wire			+Vs lout N.C. Frame ground	1 2 3, 4 Plug thread
Dual Channel version IO-Link + 4 ... 20 mA PNP			+Vs SW1 (IO-Link) lout GND (0 V) Frame ground	1 4 2 3 Plug thread
Dual Channel version IO-Link + 4 ... 20 mA NPN			+Vs SW1 (IO-Link) lout GND (0 V) Frame ground	1 4 2 3 Plug thread
Dual Channel version IO-Link + 4 ... 20 mA Digital (push-pull)			+Vs SW1 (IO-Link) lout GND (0 V) Frame ground	1 4 2 3 Plug thread

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Ordering information

Ordering key - Configuration possibilities see website

PT20H - #### . 1 # # # 2 # # . 2 # 0 0 0 # # . ####	
Product	PT20H
Process connection	
M12 x 1.5 hygienic (A02)	A020
G 1/2 A hygienic (A03)	A030
BHC 3A DN38 (B01)	B010
ISO 2852 (Tri-Clamp) DN38 (C04)	C040
Sensor tip	
Standard tip (Ø6 mm)	1
Sensor element	
Pt100 1/1 B EN 60751, single, 2-wire	1
Pt100 1/3 B EN 60751, single, 2-wire	3
Pt100 1/6 B EN 60751, single, 2-wire	5
Pt100 1/1 A EN 60751, single, 2-wire	7
Pt100 1/1 B EN 60751, single, 4-wire	A
Pt100 1/3 B EN 60751, single, 4-wire	B
Pt100 1/6 B EN 60751, single, 4-wire	C
Pt100 1/1 A EN 60751, single, 4-wire	D
Cooling neck	
Without cooling neck	0
With cooling neck	4
Process temperature	
-50...125°C	1
-50...250°C	3
Max. process pressure	
40 bar	2
Interface	
4...20 mA	1
IO-Link Dual Channel, 4...20 mA	2
Electrical connection	
M12-A, 4 pin, stainless steel, with integrated transmitter	2
M12-A, 4 pin, stainless steel KingCrown, with integrated transmitter (with LED)	3
DIN EN 175301-803 A (DIN 43650 A), 4-pin, with integrated transmitter	5
Wetted parts material	
AISI 316L (1.4404)	2
Surface roughness	
Ra ≤ 0.8 µm	1
Ra ≤ 0.4 µm	2
Electropolished, Ra ≤ 0,8 µm	3
Electropolished, Ra ≤ 0,4 µm	4
Gasket material	
Without	0
Explosion protection	
Without	0
Industrial approvals	
Standard	0
Special approvals	
Standard	0
3-A / EHEDG	3

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Ordering information

Ordering key - Configuration possibilities see website

PT20H - #### . 1 # # # 2 # # . 2 # 0 0 0 # # . ####

Configuration

Factory settings	0
Customer-specific	1

Sensor tube length (mm)

20 - 3000	####
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(1) Including female power connector