

# 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



Picture similar



## 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)
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Power-up time	< 2 s
Reverse polarity protection	Yes

### Factory settings

Output range	0 ... 150 °C
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### Factory settings

Damping	0 s
Output at sensor fault	23 mA

### Compliance and approvals

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

## Transmitter

### Input

Min. measuring span	10 °C
Sample time	< 0.1 s
Accuracy	± 0.05 °C (-50 ... 200 °C) ± 0.06 °C (200 ... 250 °C)
Error detection delay	< 2 s

### 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
Ripple immunity	< 1 % FSR (1 Vrms, 50Hz...1kHz)
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.
Off leak current	< 100 µA
Short circuit protection	Yes
Damping	0.0 ... 60.0 s, programmable
Up/Down scaling limits	23 mA / 3.5 mA

## Operating conditions

Ordering key	Process connection	BCID	Process pressure (bar)	Continuous	Process temperature With cooling neck, Sensor tip Ø6 mm
				Process temperature Standard @ Tamb ≤ 20 °C (° C)	Process temperature @ Tamb ≤ 20 °C (° C)
A020	M12 × 1.5 hygienic	A02	-1 ... 40	-50 ... 125	-50 ... 250
A030	G 1/2 A hygienic	A03	-1 ... 40	-50 ... 125	-50 ... 250
B010	BHC 3A DN 38	B01	-1 ... 40	-50 ... 125	-50 ... 250
C040	ISO 2852 (Tri-Clamp), DN 33.7; 38, Ø 50.5	C04	-1 ... 40	-50 ... 125	-50 ... 250
C010	Tri-Clamp, DN3/4", Ø25.0 (C01)	C01	-1 ... 40	-50 ... 125	-50 ... 250

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

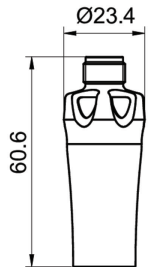
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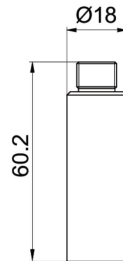
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## Dimensional drawings (mm)

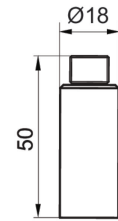
### Housing



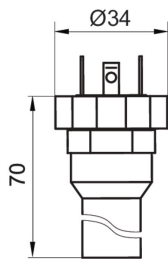
Housing with Dual Channel transmitter and King Crown connector M12-A, 4-pin (with LED)



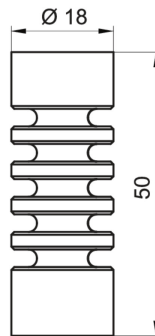
Housing with Dual Channel transmitter and connector M12-A, 4-pin



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

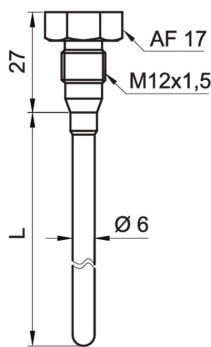


Housing with transmitter and connector DIN EN 175301-803 A (DIN 43650 A), 4-pin

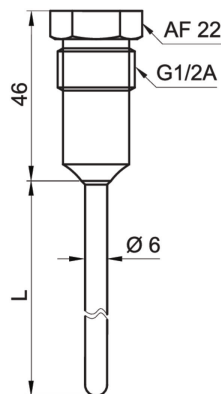


Cooling neck

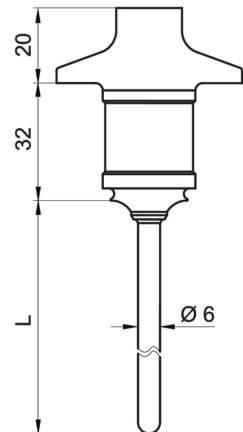
## Process connection



M12 × 1.5 hygienic (BCID: A02)



G 1/2 A hygienic (BCID: A03)



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

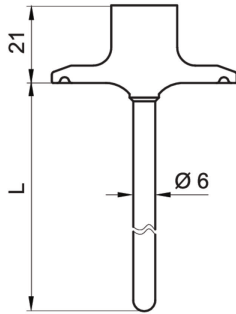
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## Dimensional drawings (mm)

### 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								
	<b>M12-A, 4-pin, stainless steel</b>											
Standard version 4 ... 20 mA, 2-wire			<table border="1"> <tr><td>+Vs</td><td>1</td></tr> <tr><td>lout</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	lout	2, 3	N.C.	4	Frame ground	Plug thread	
+Vs	1											
lout	2, 3											
N.C.	4											
Frame ground	Plug thread											
	<b>DIN EN 175301-803 A (DIN 43650 A), 4-pin</b>											
Standard version 4 ... 20 mA, 2-wire			<table border="1"> <tr><td>+Vs</td><td>1</td></tr> <tr><td>lout</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	lout	2	N.C.	3	Frame ground	Grounding lug	
+Vs	1											
lout	2											
N.C.	3											
Frame ground	Grounding lug											

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## Electrical connection

Output type	Electrical connection	Equivalent circuit	Function	Pin assignment
	<b>M12-A, 4-pin, stainless steel</b>			
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

Product	PT20H	-	####	.	1	#	#	#	2	#	#	.	2	#	0	0	0	#	#	.	####
<b>Product</b>	PT20H																				
<b>Process connection</b>																					
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
DIN 32676-C (Tri-Clamp), DN 3/4, Ø 25.0 (C01)																					C010
<b>Sensor tip</b>																					
Standard tip (Ø6 mm)																					1
<b>Sensor element</b>																					
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
<b>Cooling neck</b>																					
Without cooling neck																					0
With cooling neck																					4
<b>Process temperature</b>																					
-50...125°C																					1
-50...250°C																					3
<b>Max. process pressure</b>																					
40 bar																					2
<b>Interface</b>																					
4...20 mA																					1
IO-Link Dual Channel, 4...20 mA																					2
<b>Electrical connection</b>																					
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
<b>Wetted parts material</b>																					
AISI 316L (1.4404)																					2
<b>Surface roughness</b>																					
Ra ≤ 0.8 µm																					1
Ra ≤ 0.4 µm																					2
Electropolished, Ra ≤ 0,8 µm																					3
Electropolished, Ra ≤ 0,4 µm																					4
<b>Gasket material</b>																					
Without																					0
<b>Explosion protection</b>																					
Without																					0
<b>Industrial approvals</b>																					
Standard																					0

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## Ordering information

Ordering key - Configuration possibilities see website

	PT20H	-	####	.	1	#	#	#	2	#	#	.	2	#	0	0	0	#	#	.	####
<b>Special approvals</b>																					
	Standard																				0
	3-A / EHEDG																				3
<b>Configuration</b>																					
	Factory settings																				0
	Customer-specific																				1
<b>Sensor tube length (mm)</b>																					
	20 - 3000																				####

(1) Including female power connector