

PT20S

Industrial compact RTD temperature sensor

PT20S-####.#####.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)	1/1 B $\pm (0.3 + 0.005 \times t)^\circ\text{C}$ 1/1 A $\pm (0.15 + 0.002 \times t)^\circ\text{C}$ 1/3 B $\pm 1/3 \times (0.3 + 0.005 \times t)^\circ\text{C}$ 1/6 B $\pm 1/6 \times (0.3 + 0.005 \times t)^\circ\text{C}$
Max. output error	$\leq 0.06\%$ FSR @ 25 °C Including input accuracy, output accuracy and repeatability
Thermal response time, T90	RTD element and transmitter combined < 3.0 s, Ø3 mm < 8.5 s, Ø6 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	≤ 3000 mm
Sensor diameter outside	Ø 6 mm
Mounting position	Any, top, bottom, side
Standard response tip	Ø 6 mm
Fast response tip	Ø 3 mm
Sensor tube material	AISI 316L (1.4404)
Surface roughness wetted parts	Ra ≤ 0.8 µm

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	$\leq 100\%$ 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
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 61326-1
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	Continuous			
			Process pressure	Process temperature Standard @ Tamb ≤ 20 °C	Process temperature With cooling neck, Sensor tip Ø3 mm @ Tamb ≤ 20 °C	Process temperature With cooling neck, Sensor tip Ø6 mm @ Tamb ≤ 20 °C
			(bar)	(° C)	(° C)	(° C)
T650	Sleeve Ø 6	T65	-1 ... 40	-50 ... 125	-50 ... 200	-50 ... 250
G060	G 1/2 A ISO 228-1	G06	-1 ... 100	-50 ... 125	-50 ... 200	-50 ... 250
G500	G 1/4 A DIN 1179-2	G50	-1 ... 100	-50 ... 125	-50 ... 200	-50 ... 250
G510	G 1/2 A DIN 1179-2	G51	-1 ... 100	-50 ... 125	-50 ... 200	-50 ... 250
N020	1/2-14 NPT	N02	-1 ... 100	-50 ... 125	-50 ... 200	-50 ... 250

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

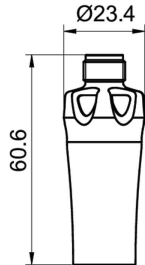
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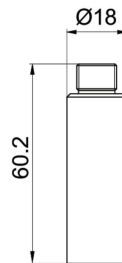
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Dimensional drawings (mm)

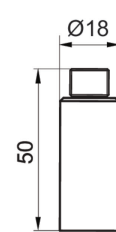
Housing



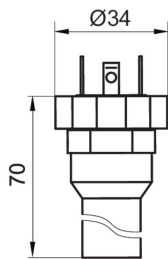
Housing with Dual Channel transmitter and KingCrown connector M12-A, 4-pin (with LED)



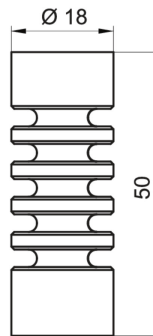
Housing with Dual Channel transmitter and connector M12-A, 4-pin



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

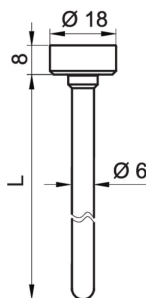


Housing with transmitter and connector DIN EN 175301-803 A (DIN 43650 A), 4-pin

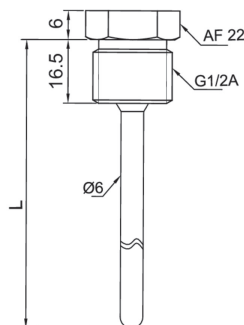


Cooling neck

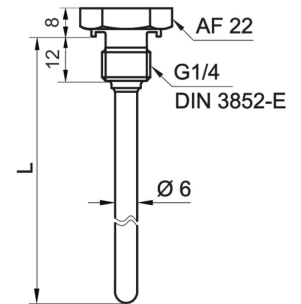
Process connection



Without thread (BCID: T65)



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



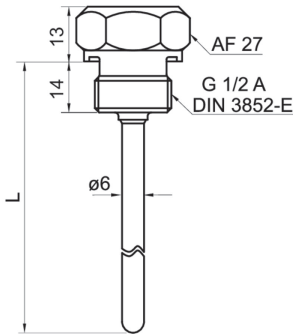
G 1/4 A DIN EN ISO 1179-2 (3852-E) (G50)

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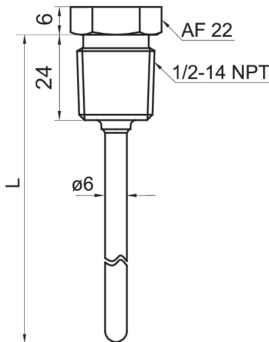
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Dimensional drawings (mm)

Process connection



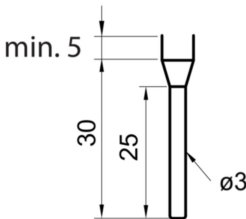
G 1/2 A DIN EN ISO 1179-2 (3852-E) (G51)



1/2-14 NPT (BCID: N02)

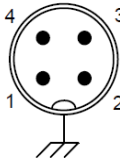
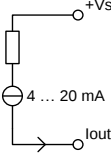
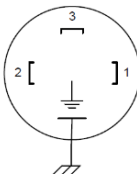
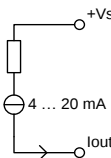


Standard response tip



Fast 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			+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			+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

		PT20S	-	####	.	#	#	#	#	#	#	#	.	2	#	#	0	0	0	#
Product		PT20S																		
Process connection																				
Sleeve (T65)																				
G 1/2 A ISO 228-1 (G06)																				
G 1/4 A DIN EN ISO 1179-2 (3852-E) (G50)																				
G 1/2 A DIN EN ISO 1179-2 (3852-E) (G51)																				
1/2-14 NPT (N02)																				
Sensor tip																				
Standard tip (Ø6 mm)																				1
Fast response tip (Ø3 mm)																				3
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...200°C																				2
-50...250°C																				3
Max. process pressure																				
40 bar																				2
100 bar																				3
Interface																				
4...20 mA																				1
IO-Link Dual Channel, 4...20 m																				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

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Ordering information

Ordering key - Configuration possibilities see website

	PT20S	-	####	.	#	#	#	#	#	#	#	.	2	#	#	0	0	0	#
Gasket material																			
	Without																0		
	NBR																1		
	FKM																2		
	EPDM																3		
Explosion protection																			
	Without																0		
Industrial approvals																			
	Standard																0		
Special approvals																			
	Standard																0		
Configuration																			
	Factory settings																	0	
	Customer-specific																	1	

(1) Including female power connector