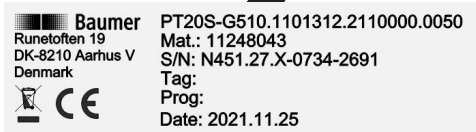
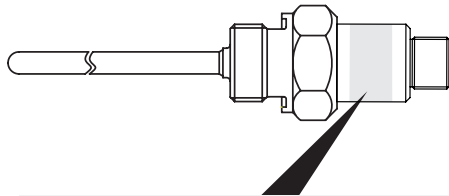







Operating Instructions


Type plate / Typenschild / Plaque d'identification





- Type ■ Type of sensor
- Matr. ■ Material number
- S/N ■ Serial number
- Tag ■ Tag number, customer-specific
- Prog ■ Programming, customer-specific
- Date ■ Date of manufacture
-  ■ Do not dispose of in household waste


 ■ Conformity with EU directives


 ■ Approvals, type-specific

- Version ■ Sensortyp
- Matr. ■ Materialnummer
- S/N ■ Seriennummer
- Tag ■ Kennnummer, kundenspezifisch
- Prog ■ Programmierung, kundenspezifisch
- Date ■ Herstellungsdatum
-  ■ Nicht im Hausmüll entsorgen

 ■ Konformität mit EU-Richtlinien

 ■ Zulassungen, typspezifisch

- Version ■ Type de capteur
- Matr. ■ Réf. mat.
- S/N ■ Numéro de série
- Tag ■ Identifiant, spécifique au client
- Prog ■ Programmation, selon le client
- Date ■ Date de fabrication
-  ■ Ne pas jeter avec les ordures ménagères

 ■ Conformité avec les directives européennes


 ■ Autorisations, selon le type

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1. Safety

Intended use

The sensor measures temperatures of liquids and solids within the range of $-50 \dots 250 \text{ }^{\circ}\text{C}$.

The sensor must only be used for media against which the housing material and sensor tip are resistant.

Staff qualification

Only use staff who are trained for the activities described. This applies in particular to assembly, installation, configuration and troubleshooting. Make sure that the staff have read and understood these instructions.

Technical condition

Only use sensor in perfect technical condition.

Only use Baumer accessories.

Baumer will accept no liability for other manufacturers' accessories.

Risk of burns from hot media

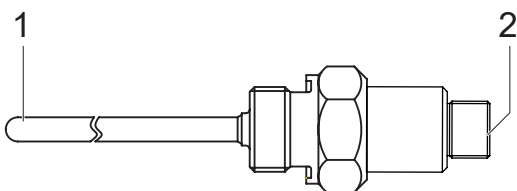
During operation the sensor housing may warm up to over $50 \text{ }^{\circ}\text{C}$. When working with hot media provide protection against burns.

UL Approval

For use in accordance with UL marking the device shall be connected to isolated Limited Energy Source per UL61010-1, 3rd ed cl. 9.4 or Limited Power Source per UL60950-1 or Class 2 per NEC through a CYJV/7, CYJV2/8, PVVA/7 or PVVA2/8 rated cable suitable for the application.

The sensor is approved for indoor use only.

2. Construction and function




- 1 Sensor tip
- 2 Electrical connection M12-A or DIN

The PT20 is a temperature sensor based on RTD technology. Temperature measurements up to $250 \text{ }^{\circ}\text{C}$ (with cooling neck only) can be made in an environment with a process pressure of up to 100 bar. The output signal is a $4 \dots 20 \text{ mA}$ output (with a built-in temperature transmitter). There are various connection options with a customer-defined tube length available.

3. Symbols

3.1 Symbols in warning signs

Symbol	Warning sign	Explanation
	DANGER	In situations which cause death or serious injuries.
	WARNING	In situations which can cause death or serious injuries.
	CAUTION	In situations which can cause light or medium injuries.
	ATTENTION	For material damage

3.2 Approvals



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



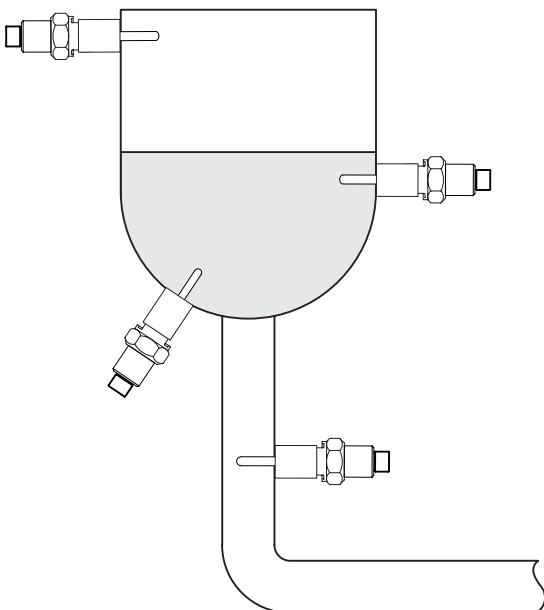
The EHEDG certificate is only valid in connection with the appropriate installation parts.

4. Transport and storage

- ▶ Check packaging and sensor for damage.
- ▶ In the event of damage: Do not use sensor.
- ▶ Store sensor where it will be secure against shock.
Storage temperature range: $-50 \dots +85 \text{ }^\circ\text{C}$
Relative humidity: $< 100 \%$

5. Mounting

5.1 Mounting conditions



The sensor can be mounted on any point in the vessel or pipe.

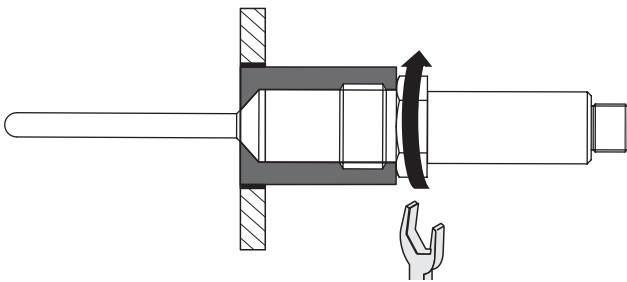
5.2 Mounting for hygienic applications



DANGER

Risk of injury from hazardous medium

- ▶ Only use weld-in sleeves or adapters from Baumer.
- ▶ Wear protective equipment for hazardous media (e.g. acids, alkaline solutions).
- ▶ Do not seal the process connections with Teflon Tape or elastomer.
- ▶ Empty vessel and pipe before mounting.



✓ Hole for mounting the sensor is easily accessible

▶ Mount weld-in sleeve or adapter as follows:

- 3-A mark or arrow points upwards
- Hygienically and internally flush

▶ Grind welding to $Ra \leq 0.8 \mu\text{m}$.

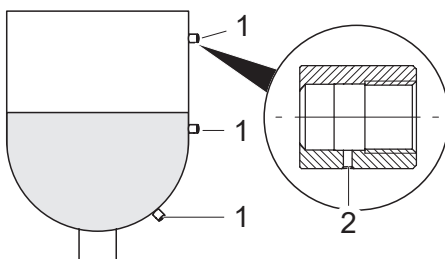
▶ Screw in sensor.

Tightning torque:

- G 1/2 A hygienic: 15 ... 20 Nm
- M12 x 1.5 hygienic: 12 ... 16 Nm

- ▶ Check leak-tightness of the sleeve.
- ▶ Check tightness of the M12 plug.

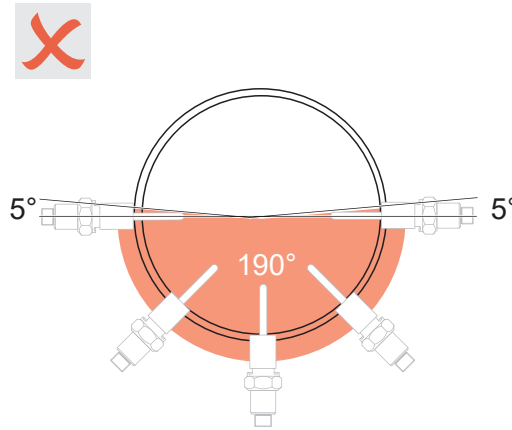
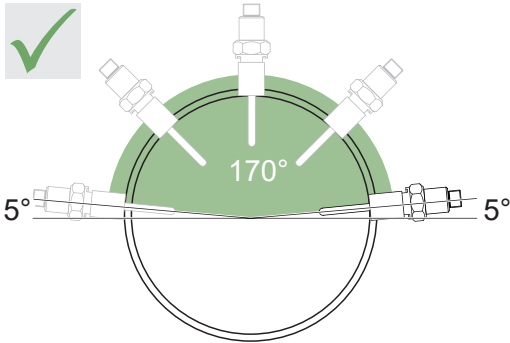
Example of mounting with weld-in sleeve ZPW3-321



- 1 ZPW3-321
- 2 Leakage hole

Example of mounting with weld-in sleeve ZPW3-326

Some weld-in sleeves (e.g. ZPW3-326) must be mounted in the correct angle to allow automatic draining.



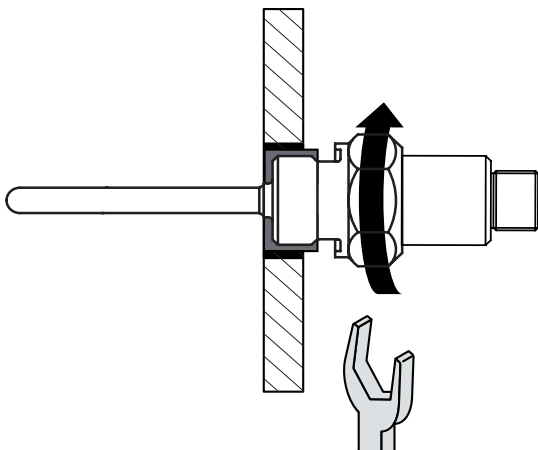
5.3 Mounting for industrial applications



DANGER

Risk of injury from hazardous medium

- ▶ Wear protective equipment for hazardous media (e.g. acids, alkaline solutions).
- ▶ Empty vessel and pipe before mounting.



- ✓ Vessel and pipe are free of media
- ▶ Seal thread on sensor with Teflon tape (PTFE) if the connection does not include a sealing ring.
- ▶ Screw in sensor.

Tightening torque:

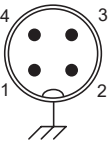
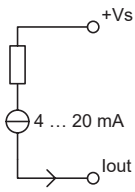
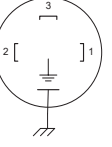
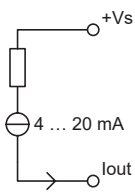
- G 1/2 A ISO 228-1: max. 30 Nm
- G 1/4 A DIN 3852-E: max. 30 Nm
- G 1/2 A DIN 3852-E: max. 30 Nm
- 1/2-14 NPT: max. 20 Nm

- ▶ Check leak-tightness of the sleeve.
- ▶ Check tightness of the M12 plug.

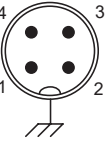
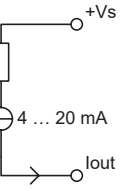
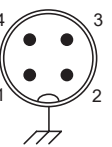
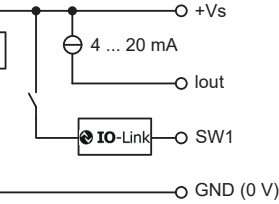

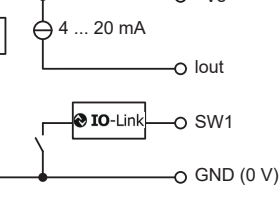

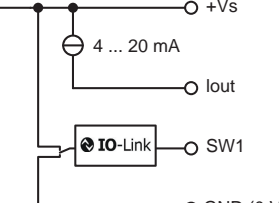
6. Electrical connection

- ▶ Switch off supply voltage.
- ▶ Connect sensor in accordance with the pin assignment.

Standard version

Plug	Output	Equivalent circuit	Function	Pin
M12-A, 4-pin 	4 ... 20 mA (2-wire)		+Vs Iout n.c. Frame ground	1 2, 3 4 Plug thread
DIN EN 175301-803 A 	4 ... 20 mA (2-wire)		+Vs Iout n.c. Frame ground	1 2 3 Grounding lug

Dual Channel version

Plug	Output	Equivalent circuit	Function	Pin
M12-A, 4-pin 	4 ... 20 mA (2-wire)		+Vs Iout n.c. Frame ground	1 2 3, 4 Plug thread
M12-A, 4-pin 	IO-Link + 4 ... 20 mA PNP		+Vs SW1 (IO-Link) Iout GND (0 V) Frame ground	1 4 2 3 Plug thread
M12-A, 4-pin 	IO-Link + 4 ... 20 mA NPN		+Vs SW1 (IO-Link) Iout GND (0 V) Frame ground	1 4 2 3 Plug thread
M12-A, 4-pin 	IO-Link + 4 ... 20 mA Digital (push-pull)		+Vs SW1 (IO-Link) Iout GND (0 V) Frame ground	1 4 2 3 Plug thread

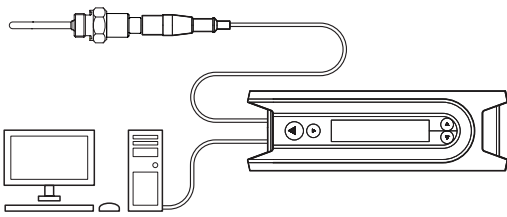
PT20

Compact RTD temperature sensor

7. Configuration

Configuration with FlexProgrammer

- ▶ Disconnect loop supply.
- ▶ Connect FlexProgrammer to sensor with the black head cable.
- ▶ Connect FlexProgrammer to PC and set parameters (see FlexProgrammer instructions).



Online Measuring

- Temperature graph
- Data logging

Configurations:

- Temperature range
- Measuring unit
- Sensor offset
- Damping
- Alarm value setting

Configuring with IO-Link Master

Temperature range, measuring unit, damping, etc. can be configured via IO-Link with an IO-Link Master.

- ▶ Connect IO-Link Master to sensor
- ▶ Connect IO-Link to PC and set parameters.

8. Troubleshooting

Fault	Cause	Action
No signals from transmitter	Sensor not correctly connected	▶ Check plug and power supply.
	Short circuit	▶ Remedy short circuit.
	Device error	▶ Dismount and send sensor to Baumer.
Incorrect signals from transmitter	Incorrect temperature range	▶ Check programmed range limits with FlexProgram.

9. Cleaning, maintenance and repair

Cleaning

- ▶ Clean, disinfect or sterilize sensor as needed (CIP/SIP).

Maintenance

Regular maintenance is not required.

Repair

- Do not repair the sensor yourself.
- ▶ Send damaged sensor to Baumer.

10. Disposal



- ▶ Do not dispose of in household waste.
- ▶ Separate materials and dispose of in compliance with nationally applicable regulations.

11. Accessories

For mounting aids and other accessories.

12. Technical data

12.1 Sensor

Response time T90 (in water)

Sensor tip Ø6 mm < 8.9 s

Sensor element DIN EN 60751

Pt100 1/1 B	$\pm (0.3 + 0.005 \times t) \text{ } ^\circ\text{C}$
Pt100 1/3 B	$\pm 1/3 \times (0.3 + 0.005 \times t) \text{ } ^\circ\text{C}$
Pt100 1/6 B	$\pm 1/6 \times (0.3 + 0.005 \times t) \text{ } ^\circ\text{C}$
Pt100 1/1 A	$\pm (0.15 + 0.002 \times t) \text{ } ^\circ\text{C}$
Single element	1 × Pt100
Connection	<ul style="list-style-type: none"> ■ 2-wire ■ 4-wire

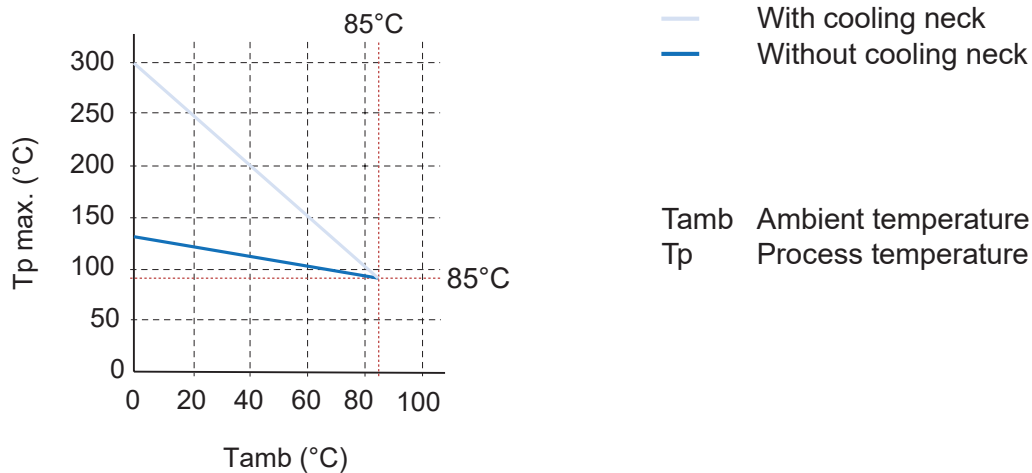
Ambient conditions

Operating temperature range	−40 ... 85 °C
Degree of protection (EN 60529)	<ul style="list-style-type: none"> ■ DIN: IP65 ■ M12: IP68 IP69K (with appropriate cable)
Humidity	< 100 % RH, condensing
Vibrations (sinusoidal) (IEC 60068-2-6)	1.6 mm p-p (2 ... 25 Hz), 4g (25 ... 100 Hz), 1 octave/min

Process conditions

Process connection	BCID	Con- nection code	Process pressure [bar]	Process temperature, standard	Process tem- perature, with cooling neck Ø6 mm tip
				[°C] T _{amb} = 20 °C	[°C] T _{amb} = 20 °C
Sleeve Ø6	T65	T650	−1 ... 40	−50 ... 125	−50 ... 250
M12 × 1.5 hygienic	A02	A020	−1 ... 40	−50 ... 125	−50 ... 250
G 1/2 A hygienic	A03	A030	−1 ... 40	−50 ... 125	−50 ... 250
BHC 3A DN 38	B01	B010	−1 ... 40	−50 ... 125	−50 ... 250
ISO 2852 (Tri-Clamp), DN 33.7; 38, Ø 50.5	C04	C040	−1 ... 40	−50 ... 125	−50 ... 250
G 1/2 A ISO 228-1	G06	G060	−1 ... 100	−50 ... 125	−50 ... 250
G 1/4 A DIN 3852-E	G50	G500	−1 ... 100	−50 ... 125	−50 ... 250
G 1/2 A DIN 3852-E	G51	G510	−1 ... 100	−50 ... 125	−50 ... 250
1/2-14 NPT	N02	N020	−1 ... 100	−50 ... 125	−50 ... 250

Process temperature as a function of ambient temperature



12.2 Transmitter

Power supply

Voltage supply range	<ul style="list-style-type: none"> ■ 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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Reverse polarity protection Yes

Power-up time < 2 s

Factory settings

Output range	0 ... 150 °C
Current limits	<ul style="list-style-type: none"> ■ Lower: 3.5 mA ■ Upper: 20.5 mA
Output at sensor fault	23 mA
Damping	0.0 s

Output signal

Current output	4 ... 20 mA (2-wire)
Shunt resistance	$R_s \leq (V \text{ DC} - 7 \text{ V}) / 0.023 \text{ A}$
Min. output span	10 °C
Damping	0.0 ... 60.0 s (programmable)
Max. output error	< 0.06 % FSR, @ 25 °C
Temperature drift (by ambient)	< 0.025 °C + 0.01 % FSR / °C

12.3 KingCrown LED function (Dual Channel version)

LED indicator (IO-Link)

Normal operation	■ Green
SW1 active	■ Yellow
Out of range	■ Flashing red/green
Error	■ Flashing red
Short circuit	■ Red

LED indicator (4 ... 20 mA, 2-wire)

Normal operation	■ Green
Error / short circuit	■ Flashing green