

For each application the exactly fitting solution

# TSB – One Temperature sensor for All

## The new temperature class

With its flexibility, performance and almost proverbial reliability and durability, the new TSB, a further development of the successful TFP series, sets new standards in temperature measurement.

- **Extended process temperature range: -200...400°C**
- Greatly improved **measuring accuracy: <math>\pm 0.1\text{ °K}</math>**
- Higher ambient **temperature resistance: 90°C**
- One-piece design completely in stainless steel: **lasting stability and application reliability**
- **CLEANadapt with PEEK sealing edge:** the new hygienic screw process connection is based on the proven metal-to-metal solutions and is already **3-A approved**
- Dual Pt100: the **twin RTD sensor** enables redundant, parallel measurement and thus self-monitoring of sensor performance

## IO-Link & 4...20 mA with Flex-Hybrid

The **Flex-Hybrid technology** with **IO-Link** and **4...20 mA** combines the **best of both worlds**: Data can be transmitted in **digital or analogue** mode.

- Flexible plug & play communication: **installation and commissioning are time and cost-saving.**
- **Simple individual programming** with IO-Link master, e.g. for changing the measuring range or two-point adjustment using offset and span
- **Sensor replacement is easier than ever before** thanks to the "Smart Replace Design" with automatic sensor identification, configuration and parameterisation through IO-Link

## Fully modular and TFP compatible

Thanks to the **completely modular concept**, you can configure **your individual sensor** in just a few steps.

- For **new equipment**, Flex-Hybrid technology offers maximum flexibility and sustainability.
- For **retrofitting**, TSB can replace any TFP sensor in existing installations - with all additional benefits
- For the **replacement of third-party devices**, a suitable model is always possible due to the large selection of process adaptations and maximum flexibility in the configuration

## Also available as mini version TSM



## Technical specification at a glance

- **One Temperature sensor for all applications**
- **Flex-Hybrid Technology** with digital + analog interface (**IO-Link + 4...20 mA**)
- **Modular Design: step-by-step configuration** from the economic basic version to the high-end model
- With no, 1 or 2 **integrated transmitters**
- **Head orientation** vertical or horizontal, optional LCD Display
- **RTD as required:** Pt100 or Pt1000, single or double, accuracy class A, AA or AAA
- Insertion length **0...2000 mm, flush available**
- Slim sensor tip for **reduced response time**
- Installation with thermowell possible, thus **sensor removal without process opening**
- **Protection class IP 69K** for max. application safety
- **Two-point calibration** possible using offset and span

## Configurable design for Maximum flexibility





## SENSORS FOR FOOD AND BIOPHARMA.

## Order code

**TSBF** Temperatur Sensor Big for Food Applications, material wetted parts 1.4404 (AISI 316L)

**Standard temperature range (-50...250 °C / -58...482 °F)**  
**Process connection (⊗): 3-A conform)**

**T05** Tri-Clamp 1/2" and 3/4" (⊗ only for 3/4")  
**T10** Tri-Clamp DN10  
**TC1** Tri-Clamp 1" and 1½" ⊗  
**TC2** Tri-Clamp 2" ⊗  
**T25** Tri-Clamp 2½" ⊗  
**TC3** Tri-Clamp 3" ⊗  
**V10** Varivent type B DN10/15  
**V25** Varivent type F DN25 ⊗  
**V40** Varivent type N DN40/50 ⊗  
**C01** CLEANadapt M12  
**C02** CLEANadapt G1/2"  
**C03** CLEANadapt G1/2"-P (PEEK) ⊗  
**C04** CLEANadapt G1/2"-SP (short version, PEEK) ⊗  
**N01** Plain rod  
**G01** Thread G1/2"  
**G02** Thread G1/4"

**Ext. temperature range (-200...400 °C / -328...752 °F)**  
**Process connection**  
**CH1** CLEANadapt M12 (incl. spacer)  
**CH2** CLEANadapt G1/2" (incl. spacer)  
**GH1** Thread G1/2" (incl. spacer)  
**NH1** Plain rod (incl. spacer)

**Process connection without media contact**  
**M01** FLEXadapt ESF G3/8" with cap nut, sensor tip ø 3 mm, spring loaded  
**M02** FLEXadapt ESF G3/8" with cap nut, sensor tip ø 3 mm  
**M03** Sensor G3/8" with cap nut, sensor tip ø 4 mm  
**M04** FLEXadapt ESF G3/8" with cap nut, sensor tip ø 4 mm, spring loaded

**Spacer extension**  
**X** Without spacer (perm. process temp. ≤ 100 °C (212 °F), standard for extended temperature range)  
**S** Short spacer (permanent process temperature ≤ 150 °C (305 °F))  
**H** Long spacer (permanent process temperature ≤ 250 °C (482 °F))

**RTD type**  
**0** 1x Pt100 A, 2-wire (probe length ≤ 250 mm)  
**1** 1x Pt100 AA, 2-wire (probe length ≤ 150 mm)  
**2** 2x Pt100 A, 2-wire (probe length ≤ 250 mm)  
**3** 2x Pt100 AA, 2-wire (probe length ≤ 150 mm)  
**4** 1x Pt100 AA, 4-wire (probe length ≥ 50 mm)  
**5** 1x Pt100 AA, 4-wire (probe length ≥ 50 mm)  
**6** 1x Pt100 AAA, 4-wire  
**7** 2x Pt100 A, (3-) 4-wire (probe length ≥ 50 mm, 3-wire with sensor tip ø 3 mm)  
**8** 2x Pt100 AA, (3-) 4-wire (probe length ≥ 50 mm, 3-wire with sensor tip ø 3 mm)  
**9** 2x Pt100 AAA, 4-wire  
**A** 1x Pt1000 A, 2-wire  
**B** 1x Pt1000 AA, 2-wire  
**C** 2x Pt1000 A, 2-wire  
**D** 2x Pt1000 AA, 2-wire

Variable probe length [mm]		Probe length for process connection [mm]	
<b>0</b>	Only for C03, C04	<b>M01,</b>	<b>M03,</b>
<b>10...50</b>	In steps of 5 mm	<b>M02</b>	<b>M04</b>
<b>51...250</b>	In steps of 5 mm	<b>37</b>	<b>68</b>
<b>251...500</b>	In steps of 10 mm	<b>59</b>	<b>148</b>
<b>501...1000</b>	In steps of 50 mm	<b>83</b>	<b>198</b>
<b>1001...2000</b>	In steps of 100 mm	<b>97</b>	<b>234</b>
<b>Intermediate lengths</b>	Not for M0x	<b>160</b>	<b>238</b>
			<b>249</b>

**Probe diameter**  
**03** 3 mm (standard for M01, M02, not for xHx)  
**04** 4 mm (standard for M03, M04)  
**06** 6 mm (standard for C03, C04)  
**08** 8 mm (not for T05, V10, C01, CH1)  
**10** 10 mm (not for Txx, Vxx, C01, C03, C04, G02, CH1)  
**12** 12 mm (not for Txx, Vxx, C01, C03, C04, G02, CH1)

TSBF / C01 / X / 0 / 100 /

06 /

4 /

0 /

0 /

0 /

000 /

4 /

X /

0

## Sensor tip diameter, only for probe length ≥ 50 mm

- X** Without reduction (standard for M0x)  
**3** For probe diameter 6 mm  
**4** For probe diameter 6 mm, 8 mm, 10 mm  
**6** For probe diameter 8 mm, 10 mm, 12 mm

## Material

- 0** 1.4404 (AISI 316L) without certificate (standard for C03, C04, G01, G02, M0x)  
**1** 1.4404 (AISI 316L) incl. material certificate

## Surface finish

- 0**  $R_a \leq 0.8 \mu\text{m}$  (32  $\mu\text{in}$ )

## Transmitter

- 0** Without transmitter  
**H** TTb.H (hybrid: analog and IO-Link)  
**D** TTb.D (hybrid: analog and IO-Link, display optional)  
**Z** TTb.Z (1st transmitter TTb.H, 2nd transmitter TTb.D)  
**Y** TTb.Y (1st transmitter TTb.H, 2nd transmitter TTb.H)

## Measurement range

- 000** Without transmitter  
**00C** Unit °C (only with transmitter)  
**00F** Unit °F (only with transmitter)  
**00K** Unit K (only with transmitter)  
**04C** -10...40 °C  
**05C** 0...50 °C  
**10C** 0...100 °C  
**15C** 0...150 °C  
**20C** 0...200 °C  
**25C** 0...250 °C  
**10F** 0...100 °F  
**15F** 0...150 °F  
**20F** 0...200 °F  
**23F** 30...230 °F  
**25F** 0...250 °F  
**M00** TTb custom configuration

## Electrical connection

- 1** 1x cable gland (only with RTD type 2, 3, 7, 8, 9, B, C, D)  
**2** 2x cable gland  
**4** 1x M12 plug (4 pin, only with RTD type 2, 3, 7, 8, 9, B, C, D)  
**5** 2x M12 plug (4 pin)

## Enclosure

- X** Opaque plastic cap  
**P** Clear plastic cap  
**M** Stainless steel cap without control window  
**W** Stainless steel with control window

## Orientation/display

- 0** Vertical no display  
**1** Vertical with display  
**2** Horizontal with display

## Order code

**TSBP** Temperatur Sensor Big for Pharma Applications, material wetted parts 1.4435 (AISI 316L)

**Standard temperature range (-50...250 °C / -58...482 °F)**  
**Process connection (⊗): 3-A approval)**

**T05** Tri-Clamp 1/2" and 3/4" (⊗ only for 3/4")  
**T10** Tri-Clamp DN10  
**TC1** Tri-Clamp 1" and 1½" ⊗  
**TC2** Tri-Clamp 2" ⊗  
**T25** Tri-Clamp 2½" ⊗  
**TC3** Tri-Clamp 3" ⊗  
**C01** CLEANadapt M12  
**C02** CLEANadapt G1/2"  
**N01** Plain rod  
**I46** Ingold 46 mm (Fermenter)  
**I52** Ingold 52 mm (Fermenter)  
**E08** PHARMadapt EPA-8 ⊗  
**E18** PHARMadapt EPA-18 ⊗

**Process connection without media contact**  
**G03** Thread G1/4", sensor tip ø 3 mm, spring loaded  
**M01** PHARMadapt ESP G3/8" with cap nut, sensor tip ø 3 mm, spring loaded  
**M04** Sensor G3/8" with cap nut, sensor tip ø 4 mm, spring loaded

## Accessories: IOM-01

IO-Link Master with USB connection for control and programming of all Anderson-Negele IO-Link devices

