

An Anderson-Negele Temperature sensor cannot be made better? It can!

TSM – One Temperature sensor for All

NEW: IO-Link and 4...20 mA with Flex-Hybrid Technology

The Flex Hybrid Technology with IO-Link and 4...20 mA combines the best of two worlds: Data transmission from the sensor in **digital, analog, or parallel mode**.

- Thanks to its flexible communication with plug and play, **installation and commissioning are time- and cost-saving**.
- **Simple individual programming** with IO-Link Master, e.g., for changing the measuring range or for two-point calibration using offset and span
- Sensor replacement is **easier than ever before**, thanks to the "Smart Replace Design" with automatic sensor identification, configuration, and parameter setting.

The new standard for temperature: Further improved quality

The Anderson-Negele TFP temperature sensors are already **synonymous with quality, reliability, and durability**. The new TSM series can outperform even this.

- **Extended process temperature range: -200...400°C**
- Considerably **improved measuring accuracy: $\pm 0.1\text{ }^\circ\text{C}$**
- Higher **ambient temperature resistance (90 °C)**
- **Robust One-piece design** entirely in stainless steel: Long-term stability and application reliability

Consistently modular and compatible with TFP

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

- For **new equipment**, Flex-Hybrid technology offers maximum flexibility and sustainability.
- For **retrofitting**, TSM can replace any TFP mini-sensor in existing installations - with all the 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

Alternative version: TSB (head Ø 55 mm) with extended functions



Technical specification at a glance

- **One Temperature sensor for all applications**
- Extremely **compact Mini version** (Head Ø 18 mm)
- **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
- Insertion length from **0 up to 2000 mm**
- **Version for flush installation available**
- **T₉₀ response time <math>< 1.5\text{ s}</math>** with sensor tip 3 mm
- 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

Modular design: Maximum flexibility for easy individual configuration



Order code

TSMF Temperatur Sensor Mini 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, spring loaded, sensor tip ø 3 mm
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, spring loaded, sensor tip ø 4 mm

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 A, 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

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

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

Sensor tip diameter, only for probe length ≥ 50 mm
X Without reduction (standard for M02, M03)
3 For probe diameter 6 mm
4 For probe diameter 6, 8, 10 mm
6 For probe diameter 8, 10, 12 mm

Material
0 1.4404 (AISI 316L) without certificate (standard for C03, C04, G01, G02, M02, M03)
1 1.4404 (AISI 316L) incl. material certificate

Surface finish
0 R_a ≤ 0.8 µm / 32 µin

Transmitter
0 Without transmitter
I TTM.I (IO-Link only)
H TTM.H (hybrid: analog and IO-Link)

Measurement range
000 Without transmitter
00C Unit °C (only for TTM.I)
00F Unit °F (only for TTM.I)
00K Unit K (only for TTM.I)
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 TTM custom configuration

Electrical connection with transmitter
4 M12 plug (4 pin)

Electrical connection without transmitter
4 M12 plug (4 pin) 1x RTD
8 M12 plug (8 pin) 2x RTD
P PVC-cable (≤ 90 °C / 194 °F)
T PTFE-cable (≤ 250 °C / 482 °F)

Cable length [m] (with hardwired cable only)
1...50

TSMF / C01 / X / 0 / 100 / 06 / 4 / 0 / 0 / 0 / 000 / P / 12

Order code

TSMF Temperatur Sensor Mini for Pharma Applications, material wetted parts 1.4435 (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" (Ⓐ)
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

