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: < ±0.1 K**
· Higher **ambient temperature resistance (95 °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

IO-Link   4...20 mA

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**
· T_{90} **response time < 1.5 s** 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)

Code	Description
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

Code	Description
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

Code	Description
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

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

RTD type

Code	Description
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]

Range	Steps
0...50	In steps of 5 mm
51...250	In steps of 5 mm
251...500	In steps of 10 mm
501...1000	In steps of 50 mm
1001...2000	In steps of 100 mm
Intermediate lengths	Not for M02, M03, C03, C04

Probe length for process connection [mm]

	M02	M03	C03, C04
	37	68	0
	59	148	10
	83	198	
	97	234	
	160	238	
		249	

Probe diameter

Code	Description
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

Code	Description
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

Code	Description
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

Code	Description
0	R_a ≤ 0.8 µm / 32 µin

Transmitter

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

Measurement range

Code	Description
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

Code	Description
4	M12 plug (4 pin)

Electrical connection without transmitter

Code	Description
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)

Code	Description
1...50	

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

Order code

TSMP — 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)

Code	Description
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

Code	Description
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