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ТЕРМОМЕТРЫ

ТТР 200, 300, 400, 500



Temperature sensor in stainless steel

The sensors of the **TTP** series are primarily used in hygienic areas such as food technology and pharmaceuticals.

With regard to installation, a distinction is made between devices with a defined insertion depth (**TTP 200** and **300**), penetration temperature sensors with a variable insertion depth (**TTP 400**) and surface temperature sensors (**TTP 500**). The latter are used where an insertion type sensor is not possible.

The sensor tip is spring loaded ensuring a tight connection with the weld-in sleeve, mounted flush in the tank wall. Anywhere that for process reasons a built-in sensor cannot be used. The sensor tip is spring loaded ensuring a tight connection with the weld-in sleeve, mounted flush in the tank wall.

Fast response sensor tips enable quick measurement of process temperatures. Standard DIN A single or double elements connected via 2, 3 or 4 wires can be supplied according to customer wishes.

Special process connections allow hygienic installation; these are screwed to the sensors without gaskets, and thus maintenance-free. See also the additional data sheet "Hygienic accessories".



- ① TTP 200
- ② TTP 300
- ③ TTP 400
- ④ TTP 500

Highlights

- Pt100 sensor, Class A
- Gasket-free, and thus maintenance-free
- Sensor tip in 6, 4 or 3 mm / 0.2", 0.16" or 0.1"
- Double sensor element (Pt100, optional)
- HART® or Profibus communication (optional)

Industries

- Food & beverages
- Pharmaceutical
- Cosmetics

Typical applications

- Pasteurization / UHT
- Wort coppers
- Evaporator temperature measurement
- Storage tanks
- CIP tanks

Options and variants



TTP 200

- Sensor in compact housing
- HART® or Profibus PA
- Double Pt100 (optional)



TTP 300

- Sensor in miniature housing
- Double Pt100 (optional)
- Electrical connection M12



TTP 400

- Plug-in sensor allows flexible insertion depth
- HART® or Profibus PA
- Double Pt100 (optional)
- Installation via clamping ring



TTP 500

- Surface sensor
- Installation only with special adapter
- HART® or Profibus PA

Technical data

TTP 200, 300, 400 & 500

Measuring system

Functional principle	Temperature sensor
Sensor type	Pt100, Class A

Accuracy

1/1 DIN A	$+(0.15 + 0.002 * t) \text{ } ^\circ\text{C}$
Temperature drift	Typically: 0.003% per $^\circ\text{C}$; max.: 0.01% per $^\circ\text{C}$
Warm-up time	10 s

Operating conditions

Operating pressure	$\leq 16 \text{ bar} / 232 \text{ psi}$
Media temperature	Standard: $-50...+250^\circ\text{C} / -58...+482^\circ\text{F}$ Surface temperature sensor TTP 500: $-20...+150^\circ\text{C} / -4...+302^\circ\text{F}$
Ambient temperature	$-20...+85^\circ\text{C} / -4...+185^\circ\text{F}$
Relative humidity	$< 100\%$, condensing

Materials

Sensor	Stainless steel 1.4404 / AISI 316 L
Housing	Stainless steel 1.4301 / AISI 304
Wetted parts	Stainless steel 1.4404 / AISI 316 L
	Other materials upon request
Insulation material	PEEK (FDA approved)
M16 cable gland	Plastic
M12 plug	Brass, nickel coated

Process connections

Thread (TTP 200 & 500)	G $\frac{1}{2}$ " hygienic
Thread (TTP 300)	M12 hygienic
Center to center length (TTP 200, 300 & 400)	50; 100;150; 250 mm / 2; 4; 6; 8"
Sensor tips (TTP 200, 300 & 400)	6; 4; 3 mm / 0,2; 0,16; 0,1"
Clamp screw (TTP 400)	On request
Protection category (EN 60529)	IP67
Vibration	IEC 68-2-6, GL test2

Electrical connection (output)

Signal output	Pt100 resistor or 4...20 mA, 2-wire
Measuring range	Fixed or freely programmable
Time constant t_{50} in water	Ø6 mm / 0.2": 3 s
	Ø6 mm / 0.2": 18 s (TTP 500)
	Ø4 mm / 0.16": 2.5 s
	Ø3 mm / 0.1": 1.3 s
Accuracy	<0.1% of signal output
Power supply	8...35 VDC
Load equation	$R_L < (V_{AC} - 8)/23$ [kOhm]
Up/down scaling limits	23 mA / 3.5 mA ①
Damping	0...30 s ①
Protection	Reversed polarity protection

Approvals

Immunity (EMC)	EN 61000-6-2
Emissions (EMC)	EN 50081-1

Accessories

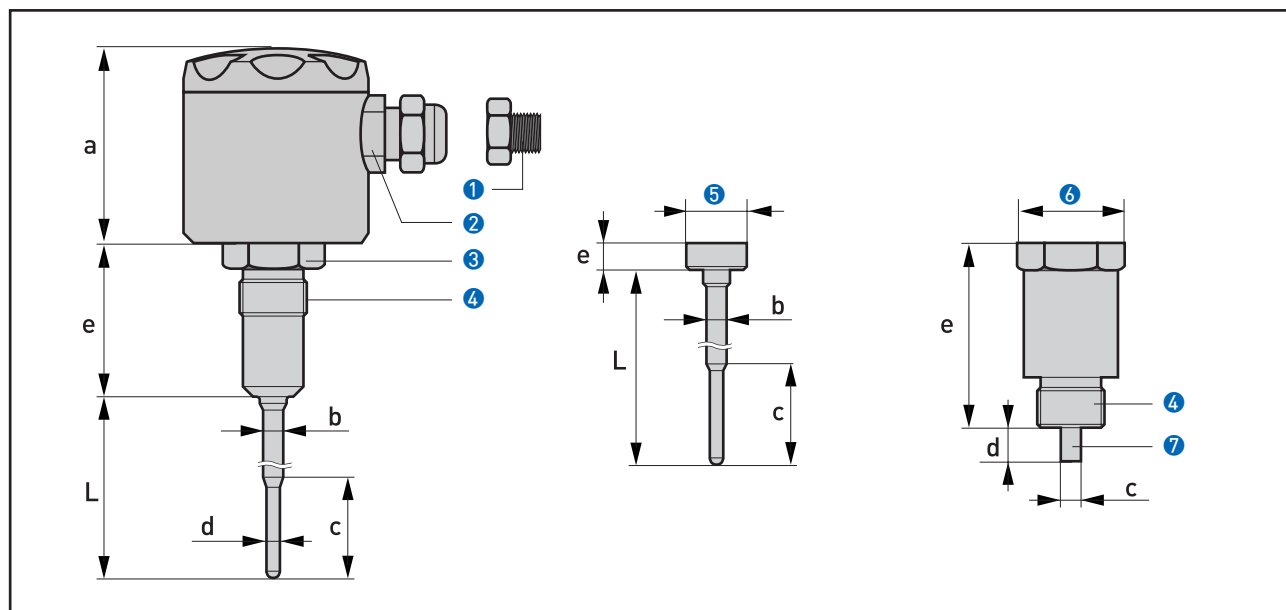
Hygienic adapter sleeves available for other process connections	Option ②
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① Configurable

② For additional information, see the additional data sheet "Hygienic accessories".

Dimensions

TTP 200, TTP 400 & TTP 500 (from left to right)



- ① M12 plug
- ② M16 cable gland
- ③ AF 22
- ④ G $\frac{1}{2}$ A
- ⑤ $\varnothing 18$
- ⑥ AF 27
- ⑦ Spring loaded sensor tip

Dimensions in mm

	a	b	c	d	L	e
TTP 200	58	$\varnothing 6$	30	depending on \varnothing ①	②	46
TTP 400	58	$\varnothing 6$	30	depending on \varnothing ①	②	8
TTP 500	-	-	$\varnothing 6$	9	-	55

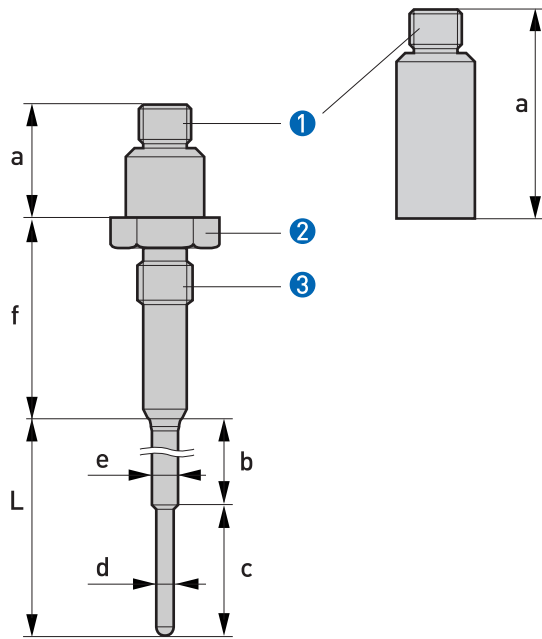
- ① $\varnothing 6$ = standard; $\varnothing 4$ or $\varnothing 3$ = optional
- ② Ordered sensor tube length

Dimensions in inches

	a	b	c	d	L	e
TTP 200	2.28	$\varnothing 0.24$	1.18	depending on \varnothing ①	②	1.81
TTP 400	2.28	$\varnothing 0.24$	1.18	depending on \varnothing ①	②	0.31
TTP 500	-	-	$\varnothing 0.24$	0.35	-	2.17

- ① $\varnothing 0.24$ = standard; $\varnothing 0.16$ or $\varnothing 0.13$ = optional
- ② Ordered sensor tube length

TTP 300 with stainless steel housing $\varnothing 18$ mm without (left) & with integrated signal converter (right)



- ❶ M12 plug
- ❷ AF 22
- ❸ M12 male nipple

Dimensions in mm

	a	b	c	d	L	e	f
TTP 300 without transmitter	26	0...270	30	depending on \varnothing ❶	❷	$\varnothing 6$	46
TTP 300 with integrated transformer	48	0...270	30	depending on \varnothing ❶	❷	$\varnothing 6$	46

- ❶ $\varnothing 6$ = standard; $\varnothing 4$ or $\varnothing 3$ = optional
- ❷ Ordered sensor tube length

Dimensions in inches

	a	b	c	d	L	e	f
TTP 300 without transmitter	1.02	0...10.63	1.18	depending on \varnothing ❶	❷	$\varnothing 0.24$	1.81
TTP 300 with integrated transformer	1.89	0...10.63	1.18	depending on \varnothing ❶	❷	$\varnothing 0.24$	1.81

- ❶ $\varnothing 0.24$ = standard; $\varnothing 0.16$ or $\varnothing 0.13$ = optional
- ❷ Ordered sensor tube length

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