

Temperature Sensors with G1/2" Hygienic

Application

- Temperature measurement in pipes and vessels
- Front flush mounting
- High accuracy temperature measurement

Application Examples

- Controlling of CIP- / SIP-process
- Measurement in vessels with agitators
- Temperature measurement in UHT-plants

Hygienic Design / Process Connection

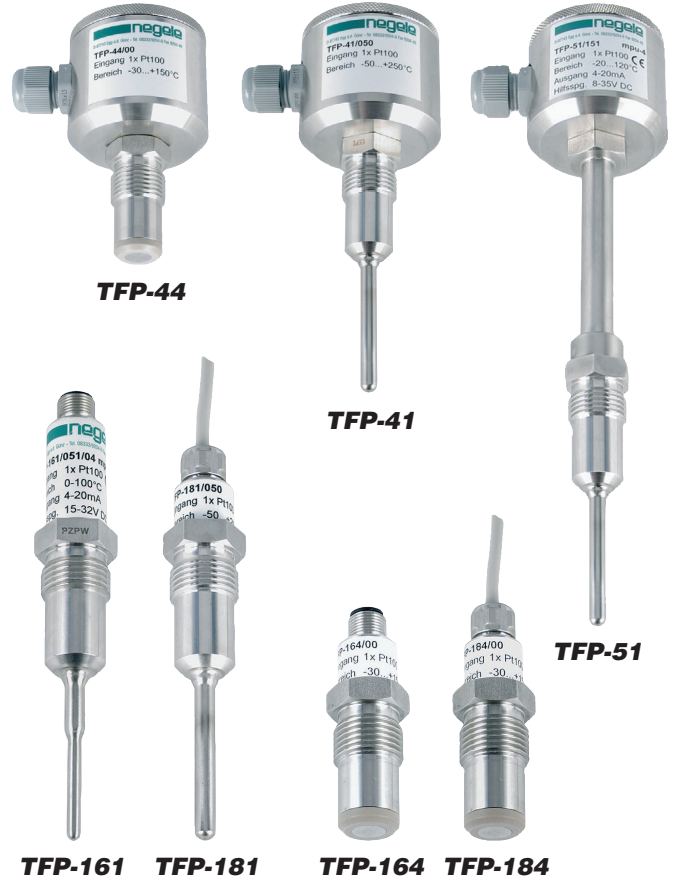
- Hygienic measurement point which is easy to sterilize (EHEDG, 3-A-certificates)
- Because of elastomer free sealing system, the connection will be without gaps and crevices
- CIP-/ SIP-cleaning up to 140 °C
- Food compatible materials according to FDA
- Sensor completely made of stainless steel resp. PEEK (only front flush)
- Adapters available for all current process connections

Features

- Front flush mounting available
- Available with and without integrated transmitter
- Defined position of the cable entry

Options / Accessories

- 2 x Pt100
- Programmable transmitter **MPU-4** for different ranges, output 4...20 mA
- Pt100 chip with other classes of accuracy, e.g. 1/3 DIN B, 1/10 DIN B
- Integrated LC-display **MPU-LCD** in the connecting head
- Transmitters for PROFIBUS, HART, EX-zone
- Fast response sensor tip 3 mm and 4 mm
- Spacer for temperature up to 250 °C
- Cables available in PTFE and other lengths



Order Code

Temperature sensor	Model head Ø55 mm	Insertion length [mm]	Transmitter	Range	Electrical connection	Diameter sensor tip	Further options
TFP-41		50, 100, 150, 250 mm	without*	-10...+40 °C	PG*	3 mm	1/3B
TFP-51	neck tube	special length	MPU-4	0...50 °C	M12	4 mm	1/10B
TFP-... / ..2	2 x Pt100	(for all sensors, except "front flush")	MPU-10 (Profibus PA)	0...100 °C		6 mm*	
TFP-44	front flush		MPU-4EX (EX-zone)	0...150 °C		(for all sensors except 'front flush')	2 x PG**
			MPU-H (HART Protocol)	0...200 °C			2 x M12**
			MPU-LCD (integ. display)				

Order example: **TFP-41/ 100 / MPU-4 / 0...150 °C / M12 / 4 mm / 1/3B** ** only for model 2 x Pt100.

Temperature sensor	Model head Ø19 mm	Insertion length [mm]	Transmitter MPU-M	Range	Electrical connection	Diameter sensor tip	Further options
TFP-161		50, 100, 150, 250 mm	MPU-M	-10...+40 °C	M12*	3 mm	1/3B
TFP-181	cable	special length		0...50 °C	cable*	4 mm	1/10B
TFP-164	front flush	(for all sensors, except 'front flush')		0...100 °C		6 mm*	
TFP-184	cable and front flush			0...150 °C	M12* cable*		PTFE cable (TFP-181 and TFP-184 only)
				0...200 °C			

Order example: **TFP-161/ 100 / MPU-M / 0...150 °C / 4 mm** *standard, no declaration needed.



Specification Temperature Sensor

Process connection	G1/2" hygienic	weld-in sleeve e.g. EMK-132 or EHG-25 / 1/2"
Insertion length	standard	0, 50, 150, 250 mm
Material	head	stainless steel 303 (1.4305)
	protection tube	316 L (1.4404) TFP-44, -164, -184 PEEK
Sensing resistor	acc. ITS 90	1 x Pt100 class A
Protection class		IP69K

Temperature range	ambient	-50...+80 °C
	sensor tip	-50...+250 °C
Operating pressure		max. 10 bar
	TFP-44, -164, -184	max. 6 bar
Electrical connection	cable junction	M16x1,5 (PG)
	plug-in	M12-plug 303 (1.4305) 4pins.
	fixed cable 2,5 m option (> 90 °C)	LIYY 4x0,25 mm ² PTFE 4x0,14 mm ²

Transmitter mpu-4, -4p, -10, -4ex, -HART

Temperature range	standard	-10...+40°C, 0...50 °C 0...100 / 150 / 200 °C
Accuracy		< ± 0,1 % (full scale)
Temperature drift	zero, span	< 0,01 %/K (full scale)
Electrical connection	supply	8...35 V DC
Output	analog	4...20 mA
Temperature range	ambient	-40...+85 °C
	storage	-40...+120 °C
Humidity	without condensate	0...98 %

Transmitter mpu-m

Temperature range	standard	-10...+40 °C, 0...50 °C 0...100 / 150 / 200 °C
Accuracy		< ± 0,2 % full scale
Temperature drift	zero, span	< 0,02 % full scale /K
Electrical connection	supply	12...36 V DC
Output	analog	4...20 mA
Temperature range	ambient	-50...+80 °C

Accuracy Class Pt100

Tolerances of Pt100 acc. ITS 90

Pt100	class B	class A	class 1/3B	class 1/10B
0 °C	± 0,3 K	± 0,15 K	± 0,10 K	± 0,03 K
100 Ω	± 0,12 Ω	± 0,06 Ω	± 0,04 Ω	± 0,01 Ω
100 °C	± 0,8 K	± 0,35 K	± 0,27 K	± 0,08 K
138,5 Ω	± 0,30 Ω	± 0,13 Ω	± 0,10 Ω	± 0,03 Ω

Sensor tip diameter and response time

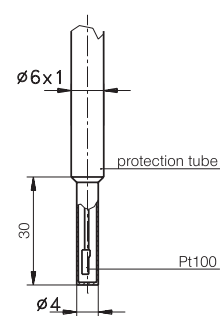
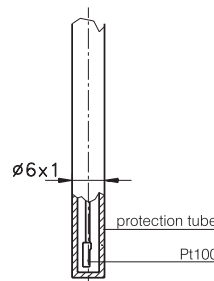
All temperature sensors are available with smaller sensor tips, to ensure a shorter response time. The below-mentioned times are according to a Pt100 sensor in boiling water.

Sensor tip ø 6 mm

validity: $t_{50} \leq 3,0$ s
90 %-time: $t_{90} \leq 8,0$ s

Sensor tip ø 4 mm

validity: $t_{50} \leq 2,4$ s
90 %-time: $t_{90} \leq 6,5$ s



Option: mpu-LCD

integrated LC-Display in the connection head

Specifications: please look on separate product informations



temperatur sensor
with **MPU-LCD**
(view from top)

Features

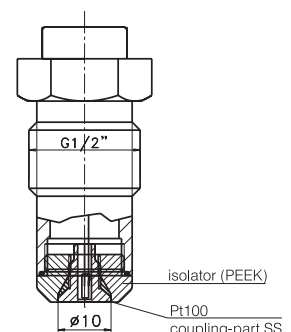
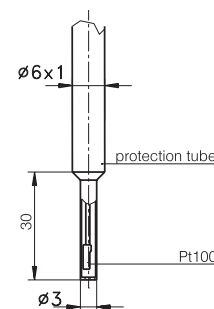
- 4-digit display with green backlight
- temperature measurement in °C und °F
- easy range select by one button
- direct connection to the PLC
- lower costs for wiring because of 2-wire technology
- suitable for sensor monitoring

Sensor tip ø 3 mm

validity: $t_{50} \leq 0,5$ s
90 %-time: $t_{90} \leq 1,5$ s

Sensor front flush

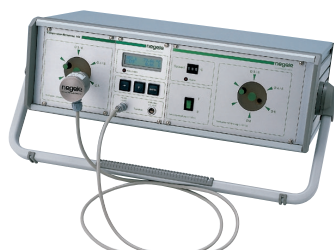
validity: $t_{50} \leq 5,7$ s
90 %-time: $t_{90} \leq 33,2$ s



Accessories

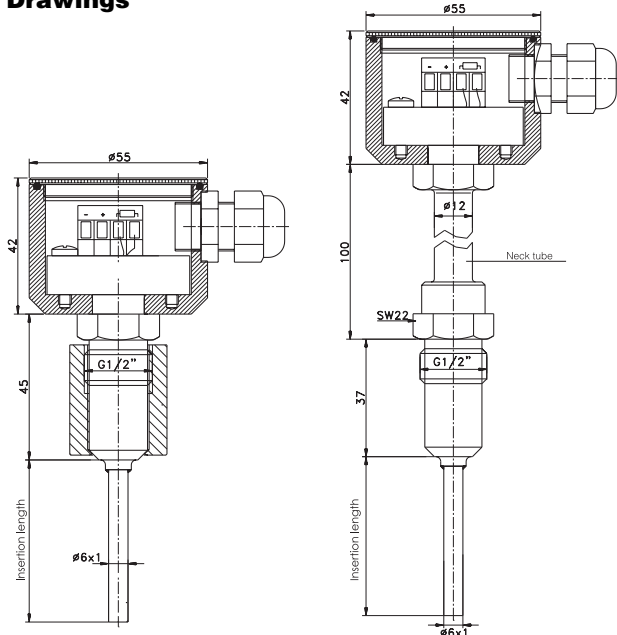


Simulator **HSG-3**



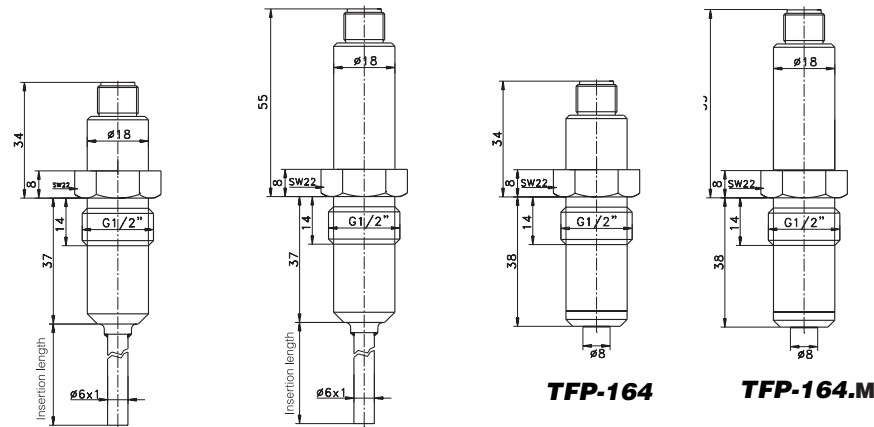
Calibration Device **HTR**

Drawings



TFP-41

TFP-51

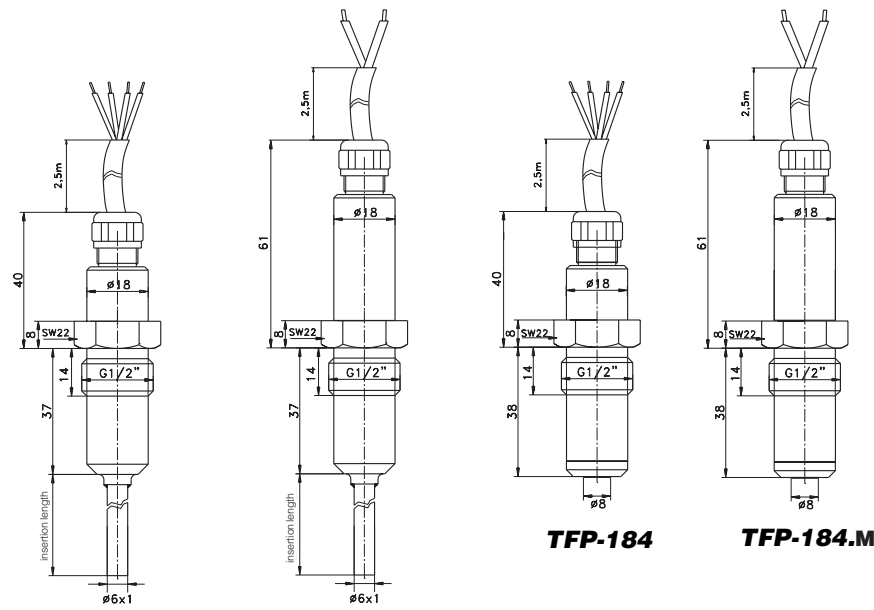


TFP-161

TFP-161.M

TFP-164

TFP-164.M



TFP-181

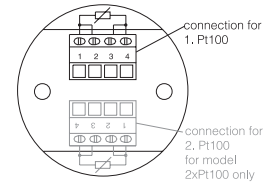
TFP-181.M

TFP-184

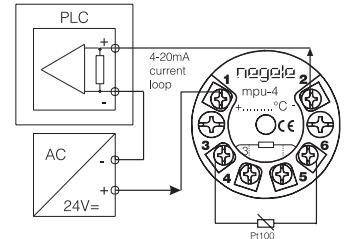
TFP-184.M

Electrical connections

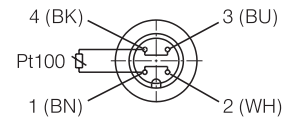
without transmitter



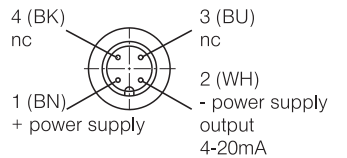
with transmitter
mpu-4, -4EX, -10, -HART



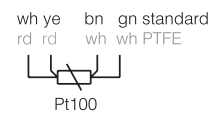
without transmitter
M12 connection
(view from the top)



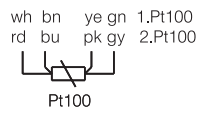
with transmitter **MPU-M**
M12 connection
(view from the top)



without transmitter
cable connection



option 2xPt100
cable connection



with transmitter **MPU-M**
cable connection

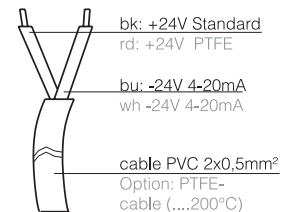


Table Torque

Thread size	Sealing system	Torque min. [Nm]	Torque max. [Nm]
G1/2"	PEEK / SS	5	10
G1/2"	SS / SS	5	20

Important information: Use only Negele weld-in systems, to guarantee a safe function of the measurement point!

Process connection G1/2" hygienic

Cylindrical weld-in fitting (standard)	Cyl. fitting with weld-on ring (standard)	Cylindrical fitting with control-holes	Weld-in fitting with collar	Weld-in ball	Dummy flange BST
for vessels	for installation in pulled-out pipes	for vessels, with leakage detection	for thick-walled vessels	for sloped installation	to close existing measurement point
EMZ-132	EMS-132	EMZ-131	EMK-132	KEM-132	BST-130

Dimension table EHG... / 1/2"

Type	DN	L [mm]	A [mm]
EHG-25 / 1/2"	25	100	15
EHG-40 / 1/2"	40	120	22
EHG-50 / 1/2"	50	140	29
EHG-65 / 1/2"	65	160	38
EHG-80 / 1/2"	80	180	46

Further process connections you will find in the product information CLEANadapt in chapter 1.

Conditions for a measuring point according to 3-A-Standard 74-03:

- The sensors TFP-44A, -54A, -164A, -184A are approved according to the 3-A-Standard.
- Only with the build-in system CLEANadapt (EMZ, EMK, EHG with tube > DN25, ISO 20 and 1", Adapter AMC, AMV, AMA und AMB) allowed.
- The welding seam by using of EMZ, EMK has to correspond with 3-A-Standard 74-03, D6.1.4: "The minimum radii for fillets of welds in product contact surfaces shall be not less than 1/4 in. (6.35 mm) except that the minimum radii for such welds may be 1/8 in. (3.18 mm) when the thickness of one or both parts joined is less than 3/16 in. (4.76 mm).
- Self draining has to be warranted by the build-in position (pos. 1, 2, or 3).
- The process connection needs a self-draining leakage hole.

