

Temperature Sensors with M12 Hygienic

Application

- temperature measurement in pipes DN15...DN80
- measurement in thin-walled pipes and vessels

Application Examples

- process monitoring
- controlling of CIP- / SIP process
- temperature measurement in UHT-plants

Hygienic Design / Process Connection

- hygienic measurement point which is easy to sterilize (EHEDG, 3A-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
- adapters available for all current process connections

Features

- defined position of the cable entry
- available with and without integrated transmitter
- different kind of electrical connections available

Options / Accessories

- 2xPt100
- transmitter mpu-4 with output 4-20mA, 2-wire
- programmable transmitter mpu-4p
- insertion length from 15mm up to 2000mm available
- transmitters for PROFIBUS, HART, EX-zone
- integrated LC-display mpu-LCD in the connecting head
- Pt100 chip with other classes of accuracy, e.g. 1/3 DIN B, 1/10 DIN B
- fast response sensor tip 3mm und 4mm
- neck tube for temperature up to 250°C
- cables available in PTFE and other lengths



Order Code

Temperature sensor	Model head Ø55mm	Insertion length [mm]	Transmitter	Range	Electrical connection	Diameter sensor tip	Further options
TFP-42	neck tube	20, 50, 100, 150mm	without*	-10...+40°C	PG*	3mm	1/3B
TFP-52		250mm	mpu-4	0...50°C	M12	4mm	1/10B
TFP-... / ..2		special length	mpu-4p (programmable) mpu-10 (Profibus PA) mpu-4ex (EX-zone) mpu-H (HART protocol) mpu-LCD (integ. display)	0...100°C 0...150°C 0...200°C		6mm*	2xPG** 2xM12**
Order example:		TFP-42 / 100 / mpu-4 / 0...150°C / M12 / 4 mm / 1/3B				** only for model 2xPt100.	
Temperature sensor	Model head Ø19mm	Insertion length [mm]	Transmitter mpu-m	Range	Electrical connection	Diameter sensor tip	Further options
TFP-162	fixed cable	20, 50, 100, 150mm	.m	-10...+40°C	M12*	3mm	1/3B
TFP-182		250mm		0...50°C	cable*	4mm	1/10B
		special length		0...100°C 0...150°C 0...200°C		6mm*	PTFE cable (TFP-182 only)
Order example:		TFP-162 / 100 .m / 0...150°C / 4 mm				*standard, no declaration needed.	

Specification Temperature Sensor

Process connection	M12x1,5 hygienic	weld-in fitting e.g. EMK-032 or EHG-15/M12
	torque	5-10Nm
Insertion length	standard	20, 50, 100, 150, 250mm
Material	head	stainless steel 303 (1.4305)
	protection tube	316 L (1.4404)
Operating pressure		max. 16bar

Temperature range	ambient	-50...+80°C
	sensor tip	-50...+250°C
Sensing resistor	acc. ITS 90	1xPt100 class A
Electr. connection	cable junction	M16x1,5 (PG)
	plug-in	M12-plug
	fixed cable 2,5m	303 (1.4305) 4pins LIYY 4x0,25mm ²
	option (>90°C)	PTFE 4x0,14mm ²
Protection class		IP69K

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

Temperature range	standard	-10...+40, 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...35VDC
Output	analog	4-20mA
Temperature range	ambient	-40...+85°C
	storage	-40...+120°C
Humidity	without condensate	0...98%

Transmitter mpu-m

Temperature range	standard	-10...+40, 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...36VDC
Output	analog	4-20mA
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	±0,3K	±0,15K	±0,10K	±0,03K
100Ω	±0,12Ω	±0,06Ω	±0,04Ω	±0,01Ω
100°C	±0,8K	±0,35K	±0,27K	±0,08K
138,5Ω	±0,30Ω	±0,13Ω	±0,10Ω	±0,03Ω

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

Accessories



Simulator hsg-3



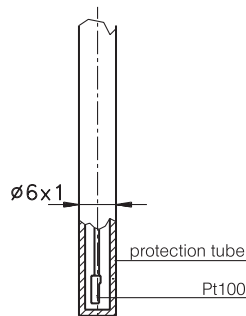
Calibration Device htr

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.

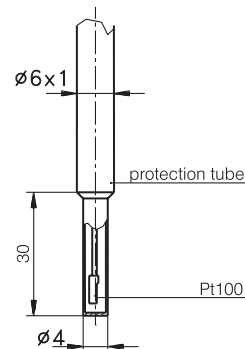
Sensor tip ø6mm

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



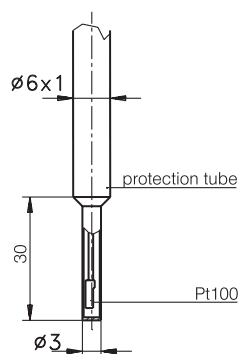
Sensor tip ø4mm

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

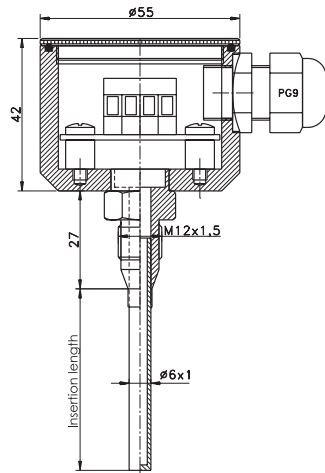


Sensor tip ø3mm

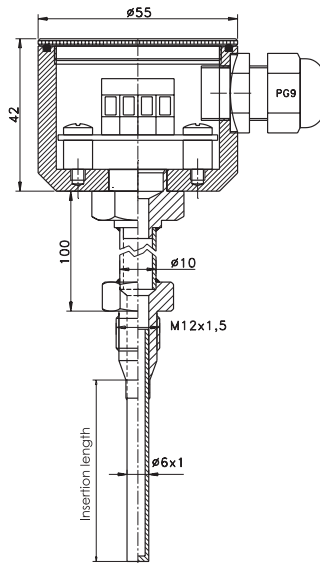
validity: $t_{50} \leq 0,5s$
90%-time: $t_{90} \leq 1,5s$



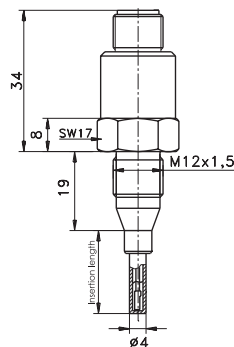
Drawings



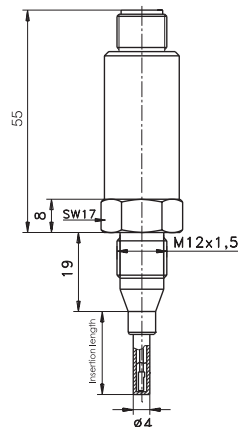
TFP-42



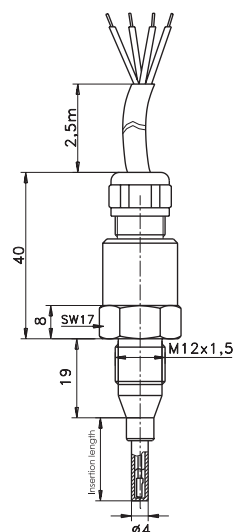
TFP-52



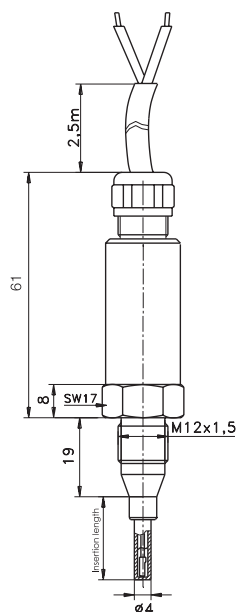
TFP-162



TFP-162.m



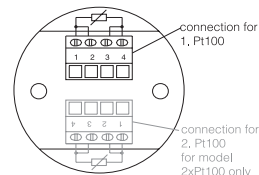
TFP-182



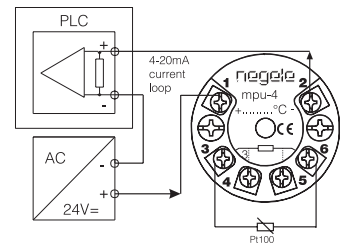
TFP-182.m

Electrical Connection

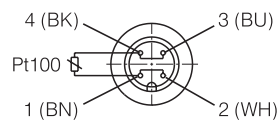
without transmitter



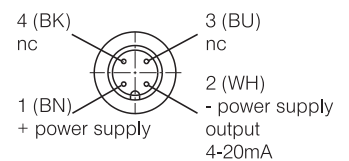
with transmitter mpu-4, -4p, -4ex, -10, -HART



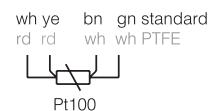
without transmitter M12 connection (view from the top)



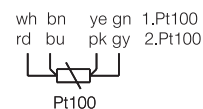
with transmitter mpu-m M12 connection (view from the top)



without transmitter cable connection



option 2xPt100 cable connection



with transmitter mpu-m cable connection

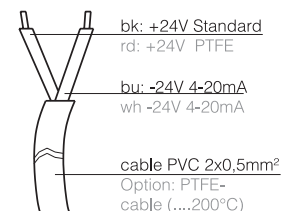
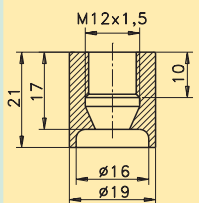
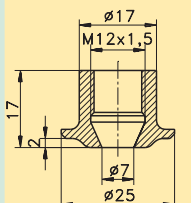
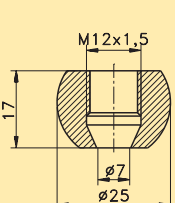
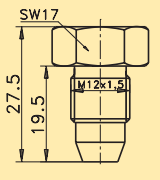


Table Torque

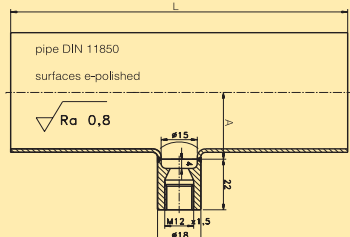
Thread size	Sealing system	Torque min. [Nm]	Torque max. [Nm]
M12x1,5	SS / SS	5	10

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

Process connection M12 hygienic

Cylindrical weld-in fitting (standard)	Cyl. fitting with weld-on ring (standard) for installation in pulled-out pipes	Cylindrical fitting with control-holes	Weld-in fitting with collar for thin-walled vessels and pipes	Weld-in ball for sloped installation	Dummy flange BST to close existing measurement point
  EMS-032			  EMK-032	  KEM-032	  BST-030

Dimension table EHG-... / M12

Type	DN	L[mm]	A[mm]		
EHG-15 / M12	15	70	10		
EHG-25 / M12	25	100	15		
EHG-40 / M12	40	120	22		
EHG-50 / M12	50	140	29		
EHG-65 / M12	65	160	38		
EHG-80 / M12	80	180	46		

Overview of all available process connections

Thread size	TriClamp	Dairy flange (DIN11851)	DRD	Varivent-Inline	APV-Inline	BioControl	
M12 adapter							
Pipe size							
DN10	AMC-032/10			-	-		
DN15	AMC-032/10			-	-		
DN25	-			AMV-032/25	-		
DN40	-			AMV-032/40	AMA-032		
DN50	-			AMV-032/40	AMA-032		
DN65	-			AMV-032/40	AMA-032		
DN80	-			AMV-032/40	AMA-032		
DN100	-			AMV-032/40	AMA-032		