Product Information TFP-58P, -68P, -168P, -188P **PHARMA**

Pharma Temperature Sensor G3/8"

PHARMadapt esp

Application/Specified usage

- Aseptic temperature measurement, inline, high precise and fast – without product contact
- Temperature measuring in pipes and vessels without opening the process with prefabricated thermowells and build-in systems
- Demounting the sensor without opening the process and without electrical disconnection > avoiding downtime of the equipment at calibration and maintenance!
- Suitable at small pipe diameters with **build-in system ESP** (available for pipes DN25...DN100)

Application examples

- Flexible applicable for nearly every temperature measuring task in pipes and vessels
- Safe temperature measuring in hotsteam- and pressure pipes (enclosed process)
- Monitoring of CIP-/SIP-cleaning

Hygienic design/Process connection

- Hygienic and easy sterilizable installation by using Negele build-in system ESP
- CIP-/SIP-cleaning up to 140 °C
- All wetted materials compliant to FDA
- Sensor completely made of stainless steel
- 3-A approval for build-in system ESP-G ≥ DN25, ISO20, G1" and ESP-E available

Features

- Short reaction time, very compact measure point
- Integrated transmitter (optional)
- Spring mounted gauge slide at TFP-58P
- Spring mounted sensor tip at TFP-168P and TFP-188P
- Weight reduced connecting head: non-sensitive to vibrations, hygienic design
- Electrical connection via M12-plug
- Material (1.4435), inspection certificate 3.1 in scope of delivery (for all product contacting parts)
- Quick and easy to install with an orbital welding machine
- Temperature sensors and build-in system with predefined and concerted standard lengths reducing product variants and saving storage costs and simplify maintenance
- Protection class IP 69 K

Options/Accessories

- 2 x Pt100 (not retrofittable)
- 2 x Pt100 with two transmitters (not retrofittable)
- Programmable transmitter MPU-4 and MPU-M with output 4...20 mA, 2-wire
- Transmitter Profibus PA and HART protocol
- Programming adapter MPU-P 9701
- Transmitter MPU-LCD with integrated display in connecting head
- Pt100-chip with other classes of accuracy, (1/3 B, 1/10 B)
- Preassebled cable for M12-plug
- Fixed cable for TFP-188P in other length and material available

Authorisations

FDA

Temperature sensor TFP-58P

Temperature sesor TFP-168P with build-in system ESP-G

Temperature sensor		
Process connection	build-in system ESP	with G3/8" external thread and thermowell
Insertion length	standard	37 mm, 83 mm, 97 mm, 160 mm
Materialis	connection head protection tube cap nut spacer	stainless steel 1.4305 (303) stainless steel 1.4404 stainless steel 1.4571 stainless steel 1.4301, Ø 10 mm
Temperature ranges	ambient sensor tip	-50...+80 °C -50...+250 °C
Operating pressure		50 bar maximum
Sensing resistor	acc. to DIN EN 60751	1 x Pt100 class A
Electrical connection	cable gland cable connection fixed cable (2.5 m)	M16 x 1.5 M12-plug 1.4305, 4-pin PTFE 4 x 0.14 mm2
Protection type		IP 69 K (with electrical connection M12-plug)

Transmitter MPU-4, MPU-10, MPU-H, MPU-M		
Temperature ranges	ambient storage	-40...+85 °C -55...+90 °C
Measuring ranges	MPU-4, MPU-H, MPU-M MPU-10	standard: -10...40 °C, 0...50 / 100 / 150 / 200 °C special ranges free programable standard: -200...850 °C configuration occurs with Profibus
Accuracy	input	< ±0.25 °C
Temperature drift	zero, span	< 0.01 % / K
Supply	MPU-M, MPU-4 MPU-10 accuracy	8...35 V DC 9...32 V DC 0.01 % / V (reference: 12 V DC)
Output	signal accuracy burden	analog 4...20 mA (not for MPU-10) < ±0.1 % of measurement range < 600 Ω (at U_B = 24 V)
Humidity	without condensation	0...98 %

Accuracy classes of temperature sensors | Tolerances for Pt100 acc. to DIN EN 60751			
Pt100	**A**	**1/3 B**	**1/10 B**
0 °C / 100 Ω	±0.15 K / ±0.06 Ω	±0.10 K / ±0.04 Ω	±0.03 K / ±0.01 Ω
100 °C / 138.5 Ω	±0.35 K / ±0.13 Ω	±0.27 K / ±0.10 Ω	±0.08 K / ±0.03 Ω

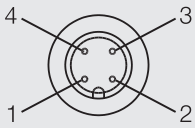
Table reaction time	ESF-G-DIN2-10	
Medium temperature 150 °C	t_{50}	4,4 s
Medium temperature 150 °C	t_{90}	13,1 s

Reaction time

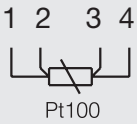
We recommend to use heat-conductive paste. This can reduce the response time up to 50 %.

Electrical connection without transmitter

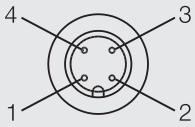
With 1 x M12 plug



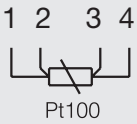
Configuration 1st M12 plug



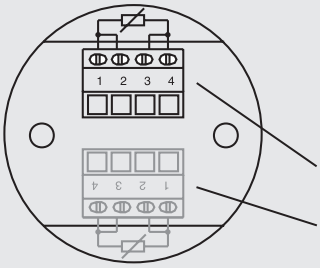
With 2 x M12 plug



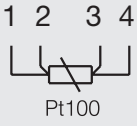
Configuration 2nd M12 plug



With cable gland



Configuration strip terminal



clamps for 1st Pt100

clamps for 2nd Pt100
(at version 2 x Pt100)

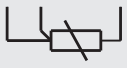
With fixed cable

Fixed cable connection with 1 x Pt100

wh	ye	bn gn	standard
rd	rd	wh wh	PTFE

Fixed cable connection with 2 x Pt100 (PTFE)

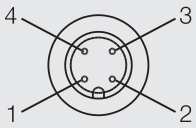
rd	rd	wh	1st Pt100
vt	vt	ye	2nd Pt100



Electrical connection with transmitter

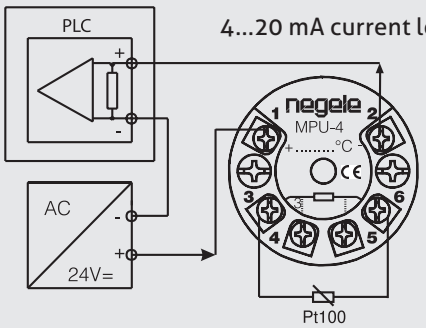
With M12 plug

Configuration M12 plug



1: + supply
2: - supply 4...20 mA
3: not connected
4: not connected

With cable gland

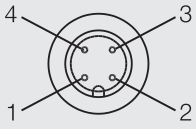


4...20 mA current loop

Electrical connection with two transmitter (TFP-68P)

With 1 x M12-plug (sensor 1 + sensor 2)

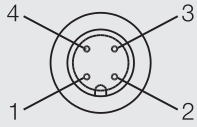
Configuration M12-plug



1: + supply (sensor 1)
2: - supply 4...20 mA (sensor 1)
3: - supply 4...20 mA (sensor 2)
4: + supply (sensor 2)

With 2 x M12-plug (sensor 1)

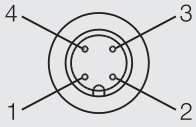
Configuration M12-plug



1: + supply (sensor 1)
2: - supply 4...20 mA (sensor 1)
3: not connected
4: not connected

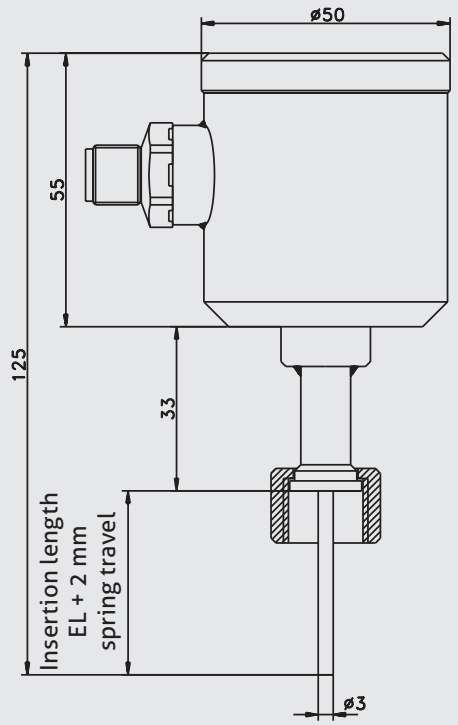
With 2 x M12-plug (sensor 2)

Configuration M12-plug

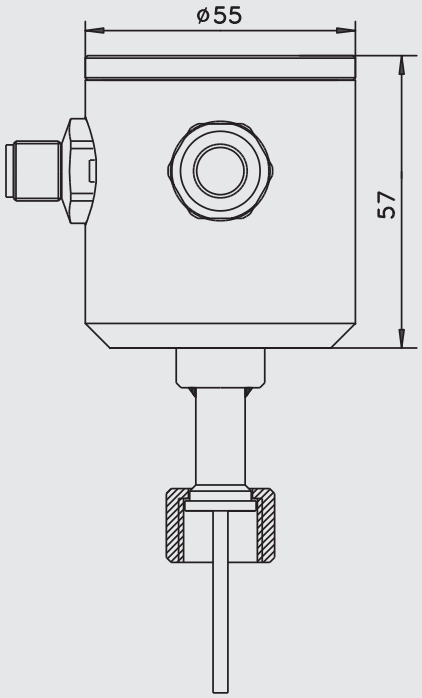


1: + supply (sensor 2)
2: - supply 4...20 mA (sensor 2)
3: not connected
4: not connected

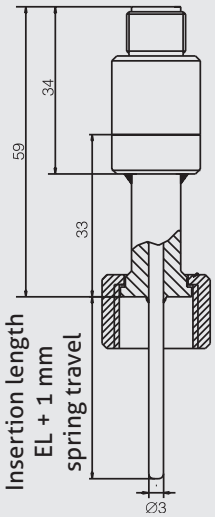
TFP-58P | TFP-58P.2



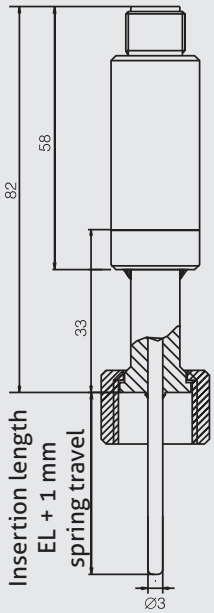
TFP-68P / ... / 2 x M12



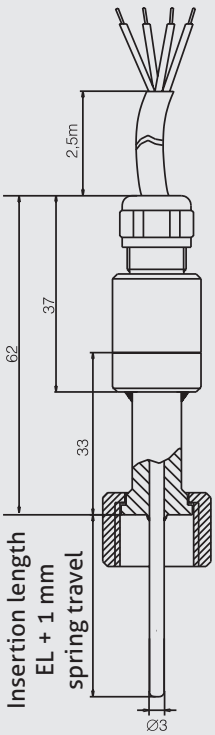
TFP-168P / ...



TFP-168P / ... / MPU-M



TFP-188P / ...



Mechanical connection/Installation

· To guarantee a definite function use the Negele **PHARMadapt ESP** system.

Conventional usage

· Not suitable for applications in explosive areas.

· Not suitable for applications in security-relevant equipments (SIL).

Transport/Storage

· No outdoor storage
· Dry and dust free
· Not exposed to corrosive media
· Protected against solar radiation
· Avoiding mechanical shock and vibration
· Storage temperature -55...+90 °C
· Relative humidity maximum 98 %

Reshipment

· Sensors shall be clean and must not be contaminated with dangerous media and / or heat-conductive paste.

· Use suitable transport packaging only to avoid damage of the equipment!

Cleaning/Maintenance

· In case of using pressure washers, dont't point nozzle directly to electrical connections!

Standards and guidelines

· You have to comply with applicable regulations and directives.

Disposal

· This instrument is not subject to the WEEE directive 2002/96/EC and the respective national laws.
· Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points.

Advice to EMC

· The device agrees to following standards: EMC directive 2004/108/EG.
· You have to guarantee the EMC directives for the entire equipement.

Conditions for a measuring point according to 3-A-Standard

· The sensors TFP-58P, -68P, -168P, -188P do not require 3-A certification as they do not come into contact with the product.

· The corresponding PHARMadapt ESP build-in system is 3-A certified.

· Details on the mounting position, self-draining and the position of the leakage hole can be found in the PHARMadapt ESP product information.

Temperature Transmitter MPU-LCD with Display

Application/Specified usage

· 4...20mA transmitter with LCD for Pt100 temperature sensor
· For installation in temperature sensor
· Sensor monitoring

Features

· 4-digit display with green backlight
· Temperature measurement in °C and °F
· Easy range select by one button
· Lower costs for wiring because of 2-wire technology

Note

See product information "MPU-LCD" for details.

Option MPU-LCD (display in the connection head)

Accessories

PVC-cable with M12-connection made of 1.4305, IP 69 K, unshielded

M12-PVC / 4-5 m	PVC-cable 4-pin, length 5 m
M12-PVC / 4-10 m	PVC-cable 4-pin, length 10 m
M12-PVC / 4-25 m	PVC-cable 4-pin, length 25 m

PVC-cable with M12-connection, brass nickel-plated, IP 67, shielded

M12-PVC / 4G-5 m	PVC-cable 4-pin, length 5 m
M12-PVC / 4G-10 m	PVC-cable 4-pin, length 10 m
M12-PVC / 4G-25 m	PVC-cable 4-pin, length 25 m

Programming adapter MPU-P 9701	Programming adapter for MPU-4, MPU-H and MPU-M

PVC-cable with M12-connection

Programming adapter MPU-P 9701

Build-In systems

Suitable build-in systems for temperature sensors TFP-58p, -68P, 168P, and -188P you will find in product information **Process Connection** PHARMadapt ESP.

Temperature sensor version with 1 x Pt100

TFP-58P (connecting head Ø 55 mm, 1 x Pt100, non-sensitive design to vibrations)
TFP-168P (connecting head Ø 18 mm, 1 x Pt100, electrical connection via M12-plug)
TFP-188P (connecting head Ø 18 mm, 1 x Pt100, electrical connection via 2,5 m PTFE-cable; no transmitter possible)

Sensor length EL in mm
037
059
083
160

Accuracy class
A
1/3B
1/10B

Electrical connection only for TFP-58P
PG (cable gland M16x1,5)
M12 (M12-plug 1.4305, standard with MPU-LCD)

Transmitter only for TFP-58P
X (without)
MPU-4 (programmable)
MPU-10 (Profibus PA)
MPU-H (HART-protocol)
MPU-LCD (with display)

Transmitter only for TFP-168P
X (without)
MPU-M (programmable)

Measuring range (only for types with transmitter; not selectable at MPU-LCD)
-10...40 (measuring range -10...40 °C)
0...50 (measuring range 0...50 °C)
0...100 (measuring range 0...100 °C)
0...150 (measuring range 0...150 °C)
0...200 (measuring range 0...200 °C)
xx...yy (special range)

TFP-58P / 083 / A / M12 / MPU-4 / 0...100

Temperature sensor version with 2 x Pt100

TFP-58P.2 (connecting head Ø 55 mm, 2 x Pt100, non-sensitive design to vibrations)
TFP-68P (like TFP-58P.2, but with higher connecting head and prepared for 2 x transmitter)

Sensor length EL in mm
037
059
083
160

Accuracy class Pt100
A
1/3B
1/10B

Electrical connection only for TFP-58P.2
PG (cable gland M16x1,5)
2 x PG (2 x cable gland M16x1,5)
2 x M12 (2 x M12-plug 1.4305)

Electrical connection only for TFP-68P
M12 (M12-plug 1.4305)
2 x M12 (2 x M12-plug 1.4305)

Continue if TFP-68P is selected! No further options for TFP-58P.2!

1st Transmitter

MPU-4 (programmable)

Measuring range 1. MPU

-10...40 (measuring range -10...40 °C)
0...50 (measuring range 0...+50 °C)
0...100 (measuring range 0...+100 °C)
0...150 (measuring range 0...+150 °C)
0...200 (measuring range 0...+200 °C)
xx...yy (special range)

2nd Transmitter

MPU-4 (programmable)

Measuring range 2.MPU

-10...40 (range -10...40 °C)
0...50 (range 0...+50 °C)
0...100 (range 0...+100 °C)
0...150 (range 0...+150 °C)
0...200 (range 0...+200 °C)
xx...yy (special range)

TFP-68P / 083 / A / M12 / MPU-4 / 0...100 / MPU-4 / 0...100

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