HYGIENIC BY DESIGN

ANDERSON-NEGELE

Temperature Sensor PHARMadapt EPA

PHARMadapt epa

Application / Specified Usage

· Developed for applications in pharmaceutical industy and biotechnology
· Temperature measurement especially at small pipe diameters
· In connection with build-in system **PHARMadapt EPA** suitable for pipes DN10...100

Authorisations

FDA

A3
74-05

Application Examples

· Process monitoring
· Monitoring of CIP-/ SIP-cleaning

Hygienic Design / Process Connection

· Hygienic and easy sterilizable installation by using Negele build-in system **PHARMadapt EPA**
· CIP-/ SIP-cleaning up to 140 °C
· All product contacting materials compliant to FDA
· Sensor completely made of stainless steel
· Sealing ring according to USP Class VI
· Conforming to 3-A Sanitary Standard 74-05 for DIN 11866 series A with DN ≥ 25, DIN 11866 series B with DN ≥ 20, DIN 11866 series C with DN ≥ 1"

Temperature sensor TFP-641 with build-in system EPA-18

Features

· For small pipe diameters from DN10
· Easy demounting for cleaning and calibration by clamp system
· Short reaction time, very compact measure point with leackage control
· Integrated transmitter available
· Light weight sensor head, non-sensitive to vibrations
· Hygienic lid design
· Electrical connection via M12-plug
· Material 1.4435, material certificate 3.1 in scope of delivery (for all product contacting parts)
· Quick and easy to install with an orbital welding machine

Temperature sensor TFP-661 with transmitter MPU-M and TAG-number plate

Options / Accessories

· 2 x Pt100, optional (not retrofittable)
  2 x Pt100 with two transmitters (not retrofittable)
· Programmable transmitter MPU-4 and MPU-M with 4...20 mA output, 2-wire
· Transmitter Profibus PA MPU-10 and HART-Protocol MPU-H
· Programming adapter MPU-P 9701
· Integrated display MPU-LCD in connecting head
· Pt100-chip with other classes of accuracy (1/3 B, 1/10 B)
· Preassemled cable for M12-plug
· Fixed cable in other length or material available
· Calibration certificate (just available with order placement)
· Customer specific label and TAG-number plate (stainless steel)

Temperature sensor		
Process connection	gap free	with clamp-ring SRC-05 resp. SRC-10
Insertion length EL	TFP-6xx TFP-8xx	10 mm, 25 mm, 50 mm, 100 mm 20 mm, 50 mm
Materials	connection head protection tube sealing ring	stainless steel 1.4305 stainless steel 1.4435 EPDM, USP Class VI, FDA 21 CFR 177.2600
Temperature ranges	ambient sensor tip	-50...+80 °C -50...+250 °C
Operating pressure		10 bar max.
Sensing resistor	acc. to DIN EN 60751	Pt100
Electrical connection	TFP-64x, TFP-84x TFP-661, TFP-861 TFP-681, TFP-881	cable gland M16 x 1.5 (PG) or M12-plug 1.4305, 4-pin M12-plug 1.4305 (303) fixed cable (PTFE, 4 x 0.14 mm²), standard: 2.5 m
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
t_{50}	4.4 s
t_{90}	13.1 s

Reaction time

The mentioned times were measured by emersing a temperature sensor from room temperature into boiling water.

## Electrical connection without transmitter

With 1 x M12 plug
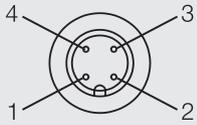
Configuration 1st M12 plug

1 2 3 4

Pt100

With 2 x M12 plug

Configuration 2nd M12 plug

1 2 3 4
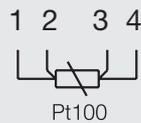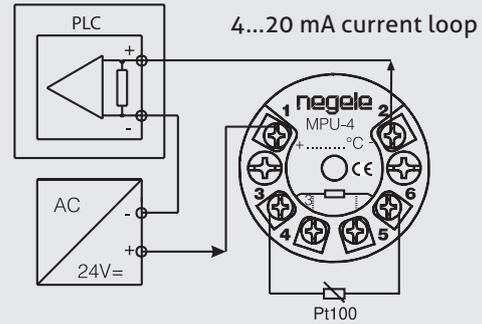
Pt100

With cable gland
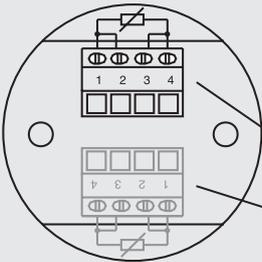
Configuration strip terminal

1 2 3 4
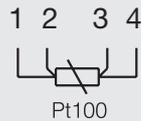
Pt100

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

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

PLC

4...20 mA current loop

negele
MPU-4

AC
24V=

Pt100

Electrical connection with two transmitter (TFP-642, -842)

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)
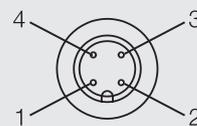
Configuration M12-plug

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

With 2 x M12-plug (sensor 2)
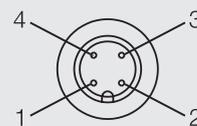
Configuration M12-plug

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

TFP-641 | TFP-641.2 with cable gland

ø50
55
ø25
18
EL
ø4

TFP-642 M12-plug

ø50
63
ø25
18
EL
ø4

TFP-661

ø18
25.5
ø25
18
EL
ø4

TFP-661 / ... / MPU-M

ø18
52
ø25
18
EL
ø4

TFP-681

2,5m
32
ø18
ø25
18
EL
ø4
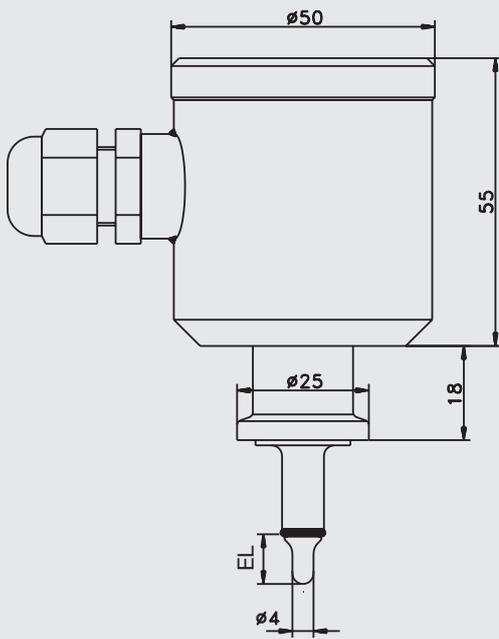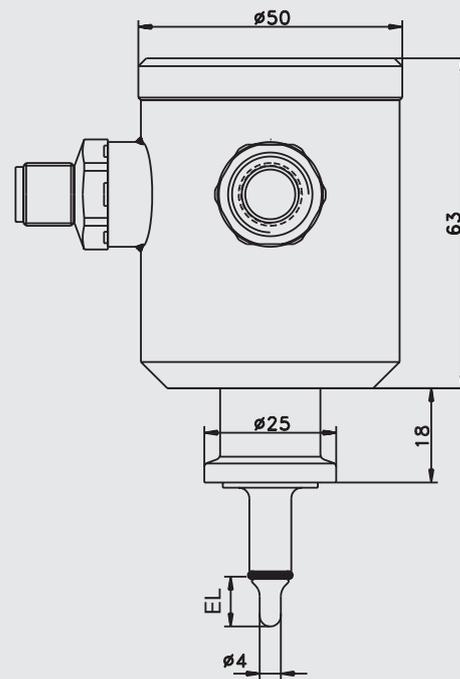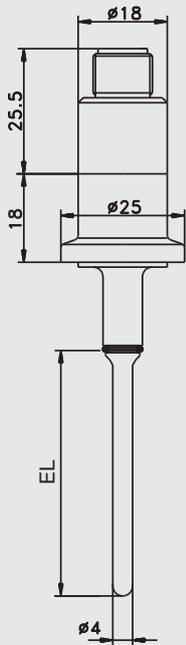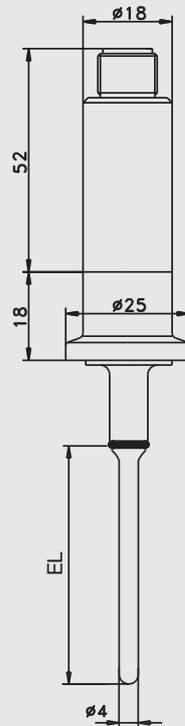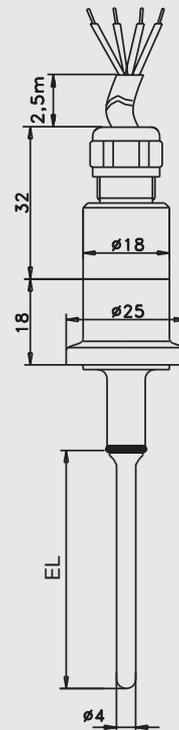
TFP-841 | TFP-841.2 with cable gland
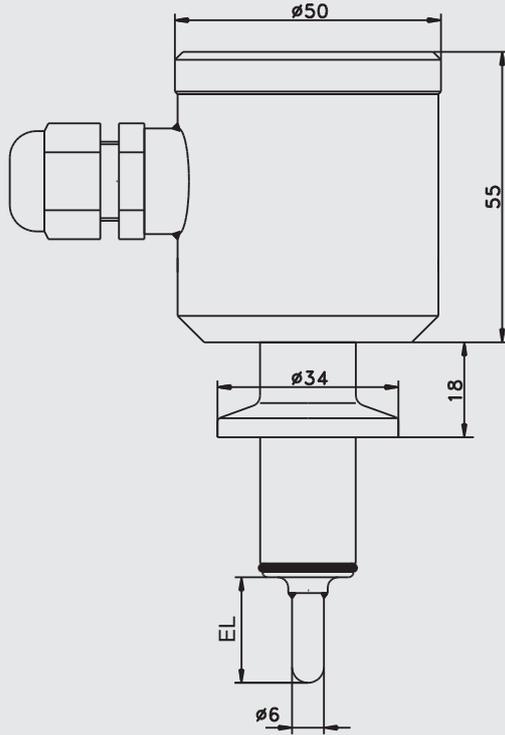
TFP-842 with M12-plug
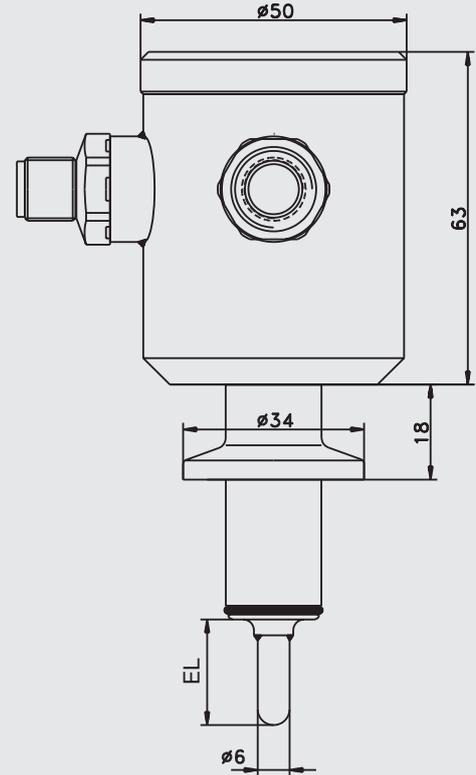
TFP-861
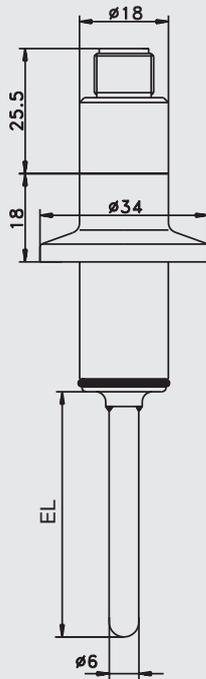
TFP-861 / ... / MPU-M
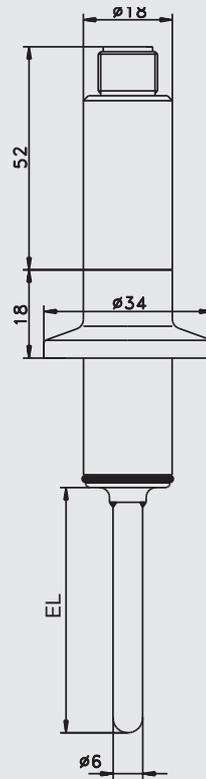
TFP-881
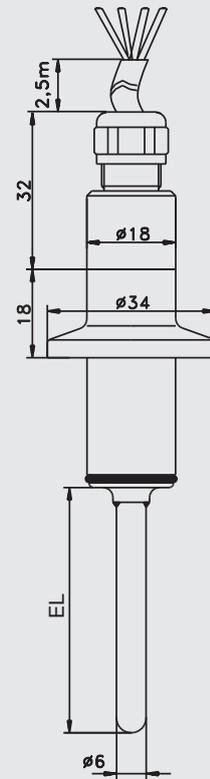
Mechanical Connection / Installation

· The sensors are only for use with pharmaceutical build-in system **PHARMadapt EPA**.

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

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.

Mounting Advice

· The suitable insertion length depends on the pipe diameter of the measuring point. See dimension tables in product information **PHARMadapt EPA**.

Conventional Usage

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

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.

Advice to EMC

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

Conditions for a measuring point according to 3-A Sanitary Standard 74-05

· The sensors TFP-641, -642, -661, -681, -841, -842, -861, -881 conforming to the 3-A Sanitary Standard.

· The sensors are designed for CIP-/ SIP-cleaning. Maximum 140 °C / 120 minutes.

· Only with the build-in system **PHARMadapt EPA** allowed.

· Mounting position, self draining and the position of the leackage hole must be in accordance to current 3-A Sanitary Standard.

Accessories

PVC-cable with M12-connection made of 1.4305, IP 69 K, unshielded
M12-PVC/4   PVC-cable 4-pin, length 5 m, 10 m, 25 m

PVC-cable with M12-connection, brass nickel-plated, IP 67, shielded
M12-PVC/4G   PVC-cable 4-pin, length 5 m, 10 m, 25 m

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

Sealing ring
DRE-5   Sealing ring for EPA-8, Ø 5 x 1.5 mm, material EPDM (FDA compliant, USP class VI)
DRE-15   Sealing ring for EPA-18, Ø 15 x 1.5 mm, material EPDM (FDA compliant, USP class VI)

Order code for version with 1 x Pt100

TFP-641	(for PHARMadapt EPA-8, connection head Ø 55 mm, non-sensitive to vibrations)
TFP-661	(for PHARMadapt EPA-8, connection head Ø 18 mm, electrical connection via M12-plug)
TFP-681	(for PHARMadapt EPA-8, connection head Ø 18 mm, electrical connection via 2.5 m PTFE-cable)
TFP-841	(for PHARMadapt EPA-18, connection head Ø 55 mm, non-sensitive to vibrations)
TFP-861	(for PHARMadapt EPA-18, connection head Ø 18 mm, electrical connection via M12-plug)
TFP-881	(for PHARMadapt EPA-18, connection head Ø 18 mm, electrical connection via 2.5 m PTFE-cable)

Sensor Length EL for TFP-6xx in mm
- **010** (length 10 mm)
- **025** (length 25 mm)
- **050** (length 50 mm)
- **100** (length 100 mm)

Sensor Length EL for TFP-8xx in mm
- **020** (length 20 mm)
- **050** (length 50 mm)

Accuracy Class Pt100
- **A**
- **1/3B**
- **1/10B**

Electrical Connection for TFP-641 and TFP-841
- **PG** (cable gland M16x1.5)
- **M12** (M12-plug 1.4305, standard with MPU-LCD)

Transmitter
- **X** (without)

Transmitter for TFP-641 and TFP-841
- **MPU-4** (programmable)
- **MPU-10** (Profibus PA)
- **MPU-H** (HART-protocol)
- **MPU-LCD** (with display)

Transmitter for TFP-661 and TFP-861
- **MPU-M** (programmable)

Measurement 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-641 /	025 /	A /	M12 /	MPU-4 /	0...100

Note

The clamp ring is not included in scope of delivery and must be ordered separately.

SRC-05	Clamp-tension ring for EPA-8, material 1.4301
SRC-10	Clamp-tension ring for EPA-18, material 1.4301

Build-In systems

Suitable build-in systems for temperature sensors TFP-641, -642, -661, -681, -841, -842, -861, -881 you will find in product information **Process Connection PHARMadapt EPA**.

Order code for version with 2 x Pt100

TFP-641.2   (for PHARMadapt EPA-8, connection head Ø 55 mm, 2 x Pt100, non-sensitive to vibrations, no transmitter possible!)

TFP-642   (for PHARMadapt EPA-8, like TFP-641.2, but higher connection head and prepared for 2 x transmitter)

TFP-841.2   (for PHARMadapt EPA-18, connection head Ø 55 mm, 2 x Pt100, non-sensitive to vibrations, no transmitter possible!)

TFP-842   (for PHARMadapt EPA-18, like TFP-841.2, but higher connection head and prepared for 2 x transmitter)

Sensor Length EL for TFP-6xx in mm
010   (length 10 mm)
025   (length 25 mm)
050   (length 50 mm)

Sensor Length EL for TFP-8xx in mm
020   (length 20 mm)
050   (length 50 mm)

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

Electrical Connection for TFP-641.2 and TFP-841.2
PG   (cable gland M16x1.5)
2xPG   (2x cable gland M16x1.5)
2xM12   (2x M12-plug)

Electrical Connection for TFP-642 and TFP-842
M12   (M12-plug)
2xM12   (2x M12-plug)

Continue if TFP-642 or TFP-842 is selected!
No further options for TFP-641.2 or TFP-841.2!

1. Transmitter

MPU-4   (programmable)

Measurement Range 1. MPU
-10...40   (measurement range -10...+40 °C)
0...50   (measurement range 0...+50 °C)
0...100   (measurement range 0...+100 °C)
0...150   (measurement range 0...+150 °C)
0...200   (measurement range 0...+200 °C)
xx...yy   (special range)

2. Transmitter

MPU-4   (programmable)

Measurement 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-642 /   **025 /**   **A /**   **M12 /**   **MPU-4 /**   **0...50 /**   **MPU-4 /**   **0...50**