Pharma-Temperature Sensor M12 hygienic

CLEANadapt

Application/Specified usage

· Temperature measurement in pipes DN15...DN80
· Temperature measurement in thin-walled pipes and vessels

Application examples

· Process monitoring
· Monitoring of CIP-/SIP-process
· Temperature measurement in hot steam pipes

Hygienic design/Process connection

· Hygienic process connection with CLEANadapt
· All wetted materials are FDA-conform
· Sensor completely made of stainless steel
· Complete overview of process connections: see product information CLEANadapt
· The Anderson-Negele CLEANadapt system offers a flow-optimized, hygienic and easily sterilizable installation solution for sensors.

Features/Advantages

· CIP-/SIP-cleaning up to 140 °C
· Short reaction time, very compact measurement point
· Material 1.4435, inspection certificate 3.1 included in delivery (for procuct contacting components)
· Sensor e-polished $R_a \leq 0,8$ μm (on request)
· Integrated transmitter (optional)
· Different electrical connections available
· $R_a \leq 0,4$ μm or 0,6 μm (on request)

Options/Accessories

· 2 x Pt100 (not retrofittable)
· 2 x Pt100 with two transmitters (not retrofittable)
· Programmable transmitters MPU-4 and MPU-M with output 4...20 mA, 2-wire
· Integrated transmitters for HART-protocol
· Programming adapter MPU-P 9701
· Integrated transmitter MPU-LCD with display in connecting head
· Pt100 chip with other classes of accuracy (1/3B, 1/10B)
· Material certificate according to EN10204-3.1 for build-in systems, e.g. EHG
· Spacer for permanent temperatures up to 250 °C
  Resistance on permanent temperature up to 450 °C (on request)
· Pre-assembled connecting cable for M12 plug
· Fixed cable in other lengths and other material available
· Calibration certificate (optional with order)

Authorizations

FDA

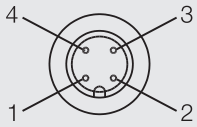## Temperature sensor TFP-42P

Temperature sensor TFP-162P with transmitter MPU-M

Temperature sensor		
Process connection	thread	M12 CLEANadapt; combined with Negele weld-in sleeves, build-in-systems, adapter sleeves
Tightening torque		10 Nm
Insertion length	standard	17 mm (special length up to 40 mm possible)
Materials	connecting head thermowell	stainless steel 1.4301 (AISI 304) stainless steel 1.4435 (AISI 316L)
Operating pressure		50 bar maximum
Temperature ranges	ambient sensor tip	-50...+80 °C -50...+250 °C
Sensing resistor	acc. to DIN EN 60751	Pt100
Electrical connection	cable gland cable connection fixed cable 2.5 m fixed cable 2.5 m (≥ 90 °C)	M16 x 1.5 M12 plug 1.4301 (AISI 304), 4-pins LIYY 4 x 0.25 mm² PTFE 4 x 0.14 mm²
Protection class		IP 69 K (with electrical connection M12 plug)

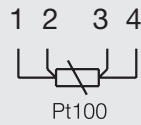| Transmitter MPU-4, MPU-H, MPU-M		
Temperature ranges	ambient storage	-40...+85 °C -55...+90 °C
Measuring ranges	MPU-4, MPU-H, MPU-M	standard: -10...40 °C, 0...50 / 100 / 150 / 200 °C special ranges free programable
Accuracy	input	< ±0.25 °C
Temperature drift	zero, span	< 0.01 % / K
Supply	MPU-4, MPU-H, MPU-M accuracy	8...35 V DC 0.01 % / V (reference: 12 V DC)
Output	signal accuracy burden	analog 4...20 mA < ±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

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
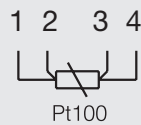
Pt100

With cable gland
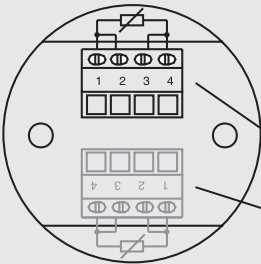
Configuration strip terminal

1 2   3 4
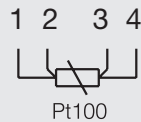
Pt100

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

**Fixed cable connection
with 2 x Pt100 (LIYY)**

| wh | ye | bn | gn | 1st Pt100 |
| rd | bu | pk | gy | 2nd Pt100 |

Pt100

**Fixed cable connection
with 2 x Pt100 (PTFE)**

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

Pt100

Electrical connection with transmitter

With M12 plug

Configuration M12 plug

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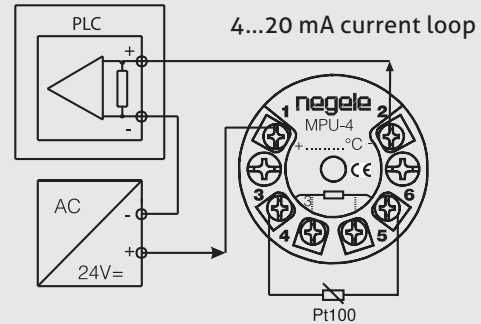2: - supply 4...20 mA
3: not connected
4: not connected

With cable gland

4...20 mA current loop

Electrical connection with two transmitter (TFP-62P)
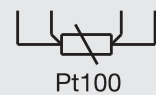
With 1 x M12 plug (sensor 1 + sensor 2)

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)
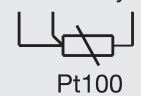
With 2 x M12 plug (sensor 1)
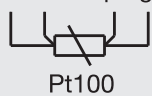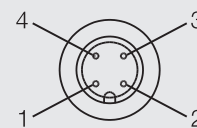

Configuration M12 plug

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

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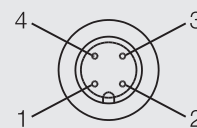
Configuration M12 plug

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

TFP-42P | TFP-42P.2

ø50

55

SW16

M12 x 1,5

19

EL
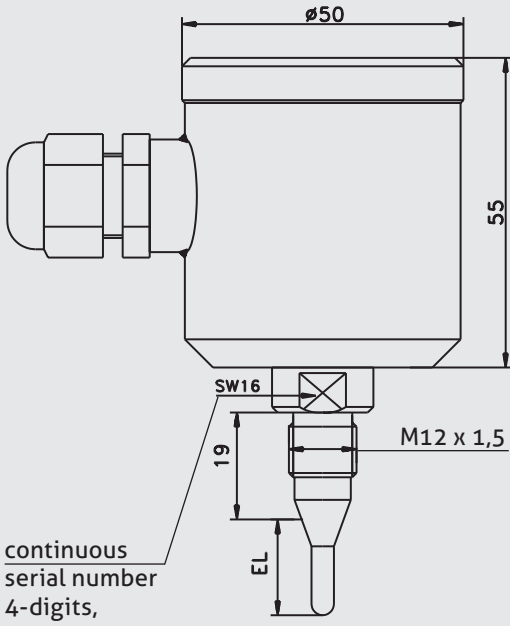
continuous
serial number
4-digits,
3.1 charge number
labeled by laser

TFP-52P | TFP-52P.2

ø50

55

100

spacer

SW16

M12x1,5

19

EL

TFP-62P / ... / 2 x M12

ø 57

59

8

SW16

19

M12x1,5

EL
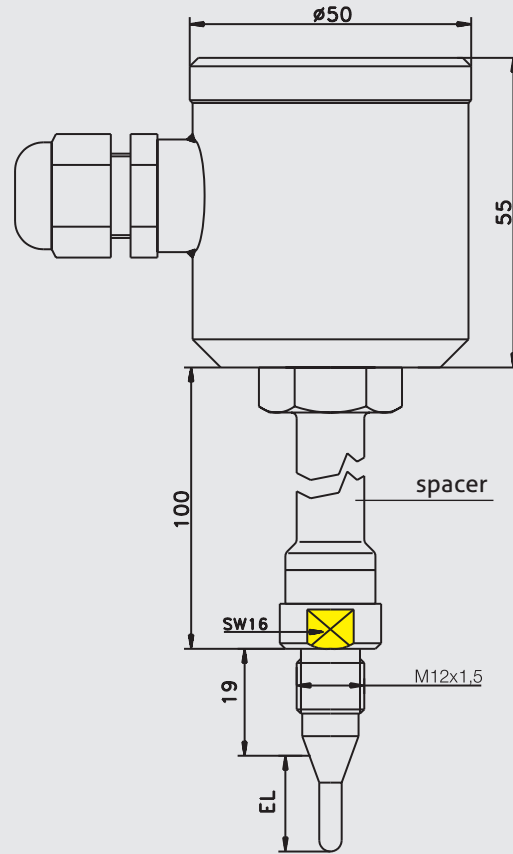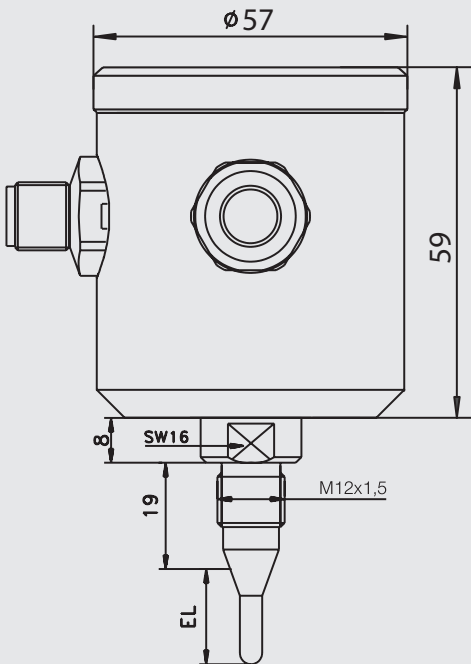
Important installation advice

Tighten the sensor only at the lower spanner flat (WW16)!
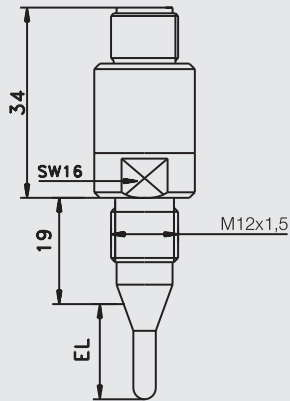
TFP-162P

TFP-162P / ... / MPU-M
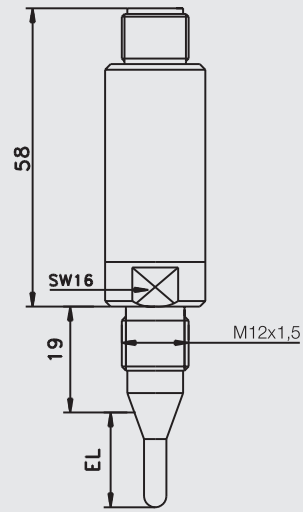
TFP-182P
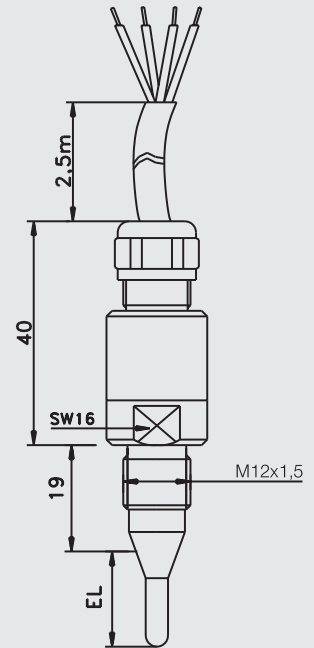
Sensor tip diameter and response time

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

Sensor tip Ø 4 mm

50 %-time: $t_{50} \leq 2,4$ s
90 %-time: $t_{90} \leq 6,5$ s
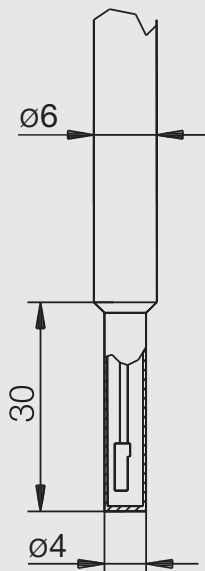
Mechanical Connection / Installation ⚠

· Use only Negele CLEANadapt system for safe operation of measuring point!

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 %

Cleaning / Maintenance ⚠

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

Disposal ℹ

· Electrical devices should not be disposed of with household trash. They must be recycled in accordance with national laws and regulations.
· Take the device directly to a specialized recycling company and do not use municipal collection points.

Conventional Usage ⚠

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

Reshipment ⚠

· Sensors shall be clean and free of media or heat-conductive paste and must not be contaminated with dangerous media!
· Use suitable transport packaging only to avoid damage of the equipment!

Standards and Guidelines ⚠

· You have to comply with applicable regulations and directives.

Note on CE ℹ

· Applicable directives: Electromagnetic Compatibility Directive 2014/30/EU
· Compliance with the applicable EU directives is identified by the CE label on the product.
· The operating company is responsible for complying with the guidelines applicable to the entire installation.

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 ℹ

See product information „MPU-LCD" for details.

Option MPU-LCD (display in the connection head)

Order code for version with 1 x Pt100; inclusive 3.1 certificate

TFP-42P   (sensor with connecting head Ø 50 mm, non-sensitive design to vibrations)
TFP-52P   sensor with connecting head Ø 50 mm, non-sensitive design to vibrations, with spacer)
TFP-162P   (sensor with connecting head Ø 18 mm, electrical connection M12 plug)
TFP-182P   (sensor with connecting head Ø 18 mm, electrical connection 2,5 m PTFE-cable,
               other lengths: see at accessories)

Sensor length EL in mm
017
xxx   special length (up to 40 mm maximal)

Diameter sensor tip in mm
4
6   (on request)

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

Electrical connection (not selectable at TFP-162P and -182P)
PG   (cable gland M16x1,5)
M12   (M12 plug, standard with MPU-LCD)

Transmitter

X   (without)

for TFP-42P and -52P
MPU-4   (programmable)
MPU-H   (HART-protocol)
MPU-LCD (with display)

only for TFP-162P

MPU-M   (programmable)

Measuring range MPU (only for types with transmitter; not for MPU-LCD)
-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)

TFP-42P /	017 /	6 /	A /	PG /	MPU-4 /	0...100

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

Order code for version with 2 x Pt100; inclusive 3.1 certificate

TFP-42P.2   (connecting head Ø 50 mm, 2 x Pt100, non-sensitive design to vibrations)
TFP-52P.2   (connecting head Ø 50 mm, 2 x Pt100, non-sensitive design to vibrations, with spacer)
TFP-62P   (higher connecting head Ø 57 mm, 2 x Pt100, prepared for 2 x transmitter)
TFP-62P-H   (like TFP-62P, but with spacer)
TFP-182P.2   (connecting head Ø 18 mm, electrical connection 2,5 m PTFE-cable; other lengths: see at accessories)

Sensor length EL in mm
017
xxx   special length (up to 40 mm maximal)

Diameter sensor tip in mm
4
6   (on request)

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

Electrical connection only for TFP-42P.2 and TFP-52P.2
PG   (cable gland M16x1,5)
2PG   (2 x cable gland M16x1,5)
2M12   (2 x M12 plug)

Electrical connection only for TFP-62P and TFP-62P-H
M12   (M12 plug)
2M12   (2 x M12 plug)

Continue if TFP-62P or TFP-62P-H is selected!
No further options for TFP-42P.2, -52P.2 and -182P.2!

1st Transmitter
MPU-4   (programmable)

Measuring range 1st transmitter
-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)

2nd Transmitter
MPU-4   (programmable)

Measuring range 2nd transmitter
-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-62P /   017 /   4 /   A /   M12 /   MPU-4 /   0...50 /   MPU-4 /   0...50