

## Product Information TFP-414, -614, -814

## FOOD

# Temperature Sensor with Thread G1/4" FLEXadapt



## Application/Specified usage

- Temperature measurement in weld-in thermowells and adapter

## Application examples

- For mounting in existing weld-in thermowells and adapter with cap nut G1/4"

## Features

- Sensor made of stainless steel
- Sensor tip spring-loaded at TFP-414, -414.2 and TFP-614, -614.2
- Changing or demounting without opening the process and electrical disconnecting

## Options/Accessories

- 2x Pt100 (not retrofittable)
- Programmable transmitter
- Programming adapter MPU-P 9701
- Integrated transmitter for HART-Protocol
- Integrated transmitter MPU-LCD with display in connecting head
- Pt100-chip with other classes of accuracy, (1/3 B, 1/10 B)
- Electrical connection via M12 plug (standard at TFP-614, option for TFP-414)
- Pre-assembled connecting cable for M12 plug
- Fixed cable in other lengths and other materials available

## Authorisations



## Temperature sensor TFP-414



## Build-In systems



Suitable build-in systems for temperature sensors TFP-414, -614, -814 you will find in product information **Process Connection FLEXadapt ESF**.

## Temperature sensor TFP-614 with transmitter MPU-M



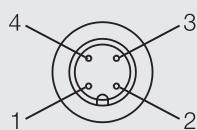
Temperature sensor		
<b>Process connection</b>	thread G1/4" standard	weld-in thermowell / screw-in thermowell e. g. Hengesbach Quicktemp-Hülse zeh / TP136 – T500
<b>Insertion length EL</b>	TFP-414, TFP-414.2, TFP-614 TFP-814	61 mm, 115 mm + 2 mm spring travel 61 mm, 115 mm
<b>Materials</b>	connection head pipe	stainless steel 1.4301 (AISI 304) stainless steel 1.4404 (AISI 316L)
<b>Operating pressure</b>		acc. to manufacturer information of the thermowell
<b>Temperature ranges</b>	ambient sensor tip	-50...+80 °C -50...+250 °C
<b>Measurement resistor</b>	acc. to DIN EN 60751	Pt100
<b>Electrical connection</b>	TFP-414, TFP-414.2  TFP-614 TFP-814	cable gland M16x1.5 M12 plug 1.4301 (AISI 304), as option M12 plug 1.4301 (AISI 304) fixed cable (LIYY 4x 0.25 mm <sup>2</sup> ) standard 2.5 m
<b>Protection class</b>		IP 69 K (with electrical connection M12 plug)

Transmitter MPU-4, MPU-H, MPU-M		
<b>Temperature ranges</b>	ambient storage	-40...+85 °C -55...+90 °C
<b>Measuring ranges</b>	MPU-4, MPU-H, MPU-M	standard: -10...40 °C, 0...50 / 100 / 150 / 200 °C special ranges free programmable
<b>Accuracy</b>	input	< ±0.25 °C
<b>Temperature drift</b>	zero, span	< 0.01 % / K
<b>Supply</b>	MPU-4, MPU-H, MPU-M accuracy	8...35 V DC 0.01 % / V (reference: 12 V DC)
<b>Output</b>	signal accuracy burden	analog 4...20 mA < ±0.1 % of measurement range < 600 Ω (at U <sub>B</sub> = 24 V)
<b>Humidity</b>	without condensation	0...98 %

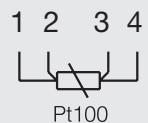
Accuracy classes of temperature sensors   Tolerances for Pt100 acc. to DIN EN 60751			
<b>Pt100</b>	<b>A</b>	<b>1/3 B</b>	<b>1/10 B</b>
<b>0 °C / 100 Ω</b>	±0.15 K / ±0.06 Ω	±0.10 K / ±0.04 Ω	±0.03 K / ±0.01 Ω
<b>100 °C / 138.5 Ω</b>	±0.35 K / ±0.13 Ω	±0.27 K / ±0.10 Ω	±0.08 K / ±0.03 Ω

## Electrical connection without transmitter

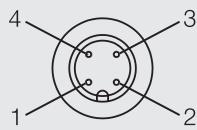
## With 1x M12 plug



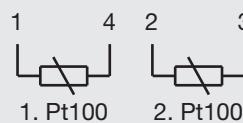
## Configuration 1st M12 plug



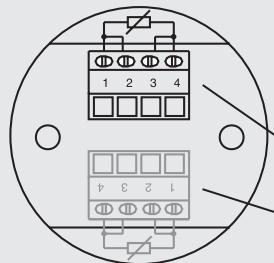
## With 1x M12 plug and 2x Pt100



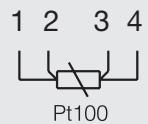
## Configuration 2nd M12 plug



## With cable gland



## Configuration strip terminal



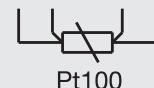
clamps for 1st Pt100  
clamps for 2nd Pt100 (at version 2x Pt100)

## With fixed cable



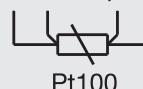
## Fixed cable connection with 1x Pt100

wh ye    bn gn    standard  
rd rd    wh wh    PTFE



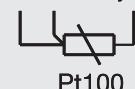
## Fixed cable connection with 2x Pt100 (LIYY)

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



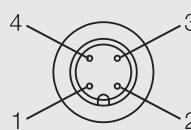
## Fixed cable connection with 2x Pt100 (PTFE)

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



## Electrical connection with transmitter

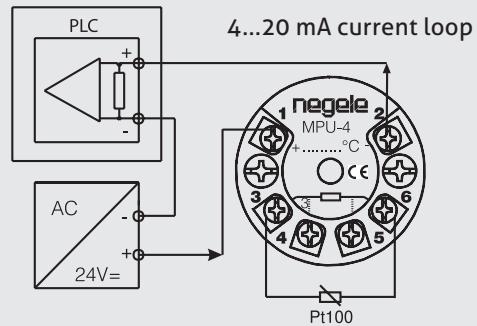
## With M12 plug



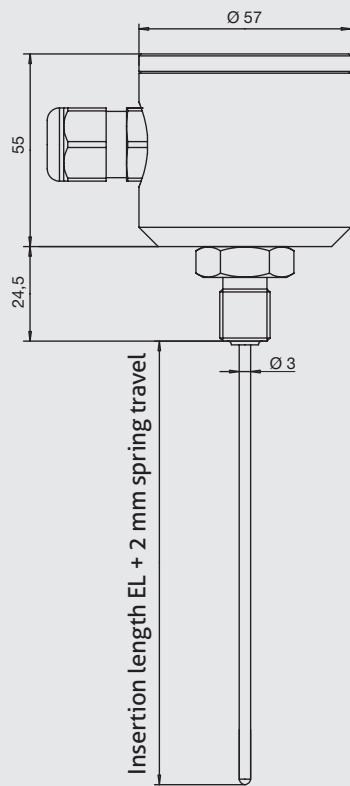
## Configuration M12 plug

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

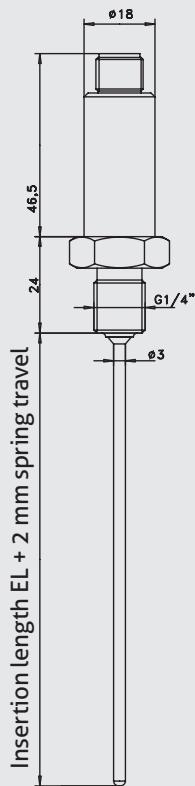
## With cable gland



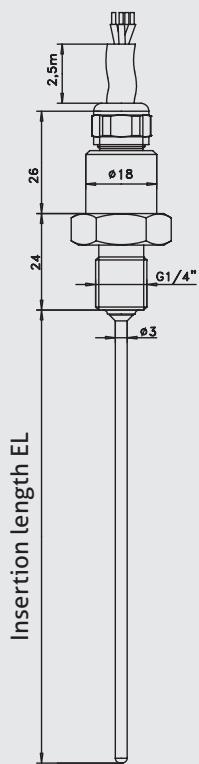
TFP-414 | TFP-414.2



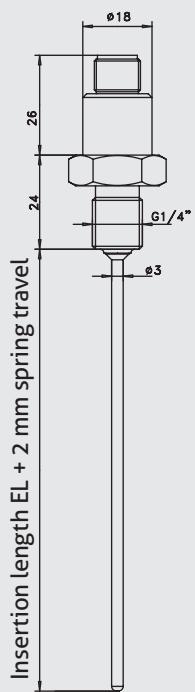
TFP-614 with MPU-M



TFP-814



TFP-614 | TFP-624



**Mechanical connection/Installation**

- Check the compatibility of the sensor to the used immersion sleeve.

**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 °C...+90 °C
- Relative humidity max. 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!

**Cleaning/Maintenance**

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

**Standards and guidelines**

- You have to comply with applicable regulations and directives.

**Disposal**

- 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.

**Note on CE**

- 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...20 mA 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



## Order code for version with 1x Pt100

TFP-414

(connection head Ø 57 mm and spring-loaded sensor tip)

TFP-614

(connection head Ø 18 mm and spring-loaded sensor tip, electrical connection via M12 plug)

TFP-814

(connection head Ø 18 mm, electrical connection 2.5 m PVC-cable)

## Sensor length EL

61 (length 61 mm)

115 (length 115 mm)

xxx (special length)

## Diameter thermowell in mm

3

## Diameter sensor tip in mm

3

## Accuracy class Pt100

A

1/3B

1/10B

## Electrical connection (only selectable for TFP-414)

PG (cable gland M16x1.5)

M12 (M12 plug, standard with MPU-LCD)

## Transmitter only for TFP-414

X (without)

MPU-4 (programmable)

MPU-H (HART-protocol)

MPU-LCD (with display)

## Transmitter only for TFP-614

X (without)

MPU-M (programmable)

## Measurement range (only for types with transmitter; not at 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-414 /

115 /

3 /

3 /

A /

M12 /

MPU-4 /

0...150

## Order code for version with 2x Pt100

**TFP-414.2** (connection head Ø 57 mm and spring-loaded sensor tip, no transmitter possible!)  
**TFP-614.2** (connection head Ø 18 mm and spring-loaded sensor tip, electrical connection via M12 plug, no transmitter possible!)

**Sensor length EL**

**61** (length 61 mm)  
**115** (length 115 mm)  
**XXX** (special length)

**Diameter thermowell in mm****3****Diameter sensor tip in mm****3****Accuracy class Pt100**

**A**  
**1/3B**  
**1/10B**

**Electrical connection (only selectable for TFP-414.2)**

**PG** (cable gland M16x1.5)  
**M12** (M12 plug)

↓  
**TFP-414.2 /**↓  
**115 /**↓  
**3 /**↓  
**3 /**↓  
**A /**↓  
**M12**