



TFP Ø 50 mm / 55 mm

Available until 31.03.2022

TFP Ø 18 mm

No longer available!



Successor: TSB

One sensor for all applications!

Successor: TSM

New, modular and better!



ANDERSON-NEGELE

All advantages at [anderson-negele.com](http://anderson-negele.com)

## Product Information TFP-47, -57, -67, -167

FOOD

# Temperature Sensor Tri-Clamp

### Application/Specified usage

- Temperature Measurement in vessels and pipes

### Application examples

- Monitoring of CIP-/SIP-process
- Temperature monitoring in milk vessels

### Hygienic design/Process connection

- Tri-Clamp sealing system without adapter
- Versions compliant to 3-A Standard 74- available
- Product contacting materials compliant to FDA
- Sensor completely made of stainless steel

### Features/Advantages

- Direct Connection without adapter
- Integrated transmitter optional
- Different electrical connections available

### Options/Accessories

- 2x Pt100 (not retrofittable)
- 2x Pt100 with two transmitters (not retrofittable)
- Pt100 chip with other classes of accuracy (A, AA, AAA)
- Programmable transmitters with output 4...20 mA, 2-wire
- Programming adapter MPU-P 9701
- Integrated transmitters for HART-protocol
- Integrated transmitter MPU-LCD with display in connecting head
- Fast response sensor tip 3 mm and 4 mm
- Pre-assembled connecting cable in other lengths and other material

### Temperature sensor TFP-47



# 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)



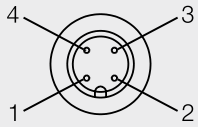
<b>Temperature sensor</b>		
<b>Process connection</b>		Tri-Clamp
<b>Materials</b>	connecting head thermowell and Tri-Clamp	stainless steel 1.4301 (AISI 304) stainless steel 1.4404 (AISI 316L)
<b>Surface quality</b>		$R_a \leq 0.8 \mu\text{m}$
<b>Insertion length EL</b>		20...500 mm in steps of 5 mm
<b>Operating pressure</b>		10 bar maximum
<b>Temperature ranges</b>	ambient process CIP-/SIP-cleaning	-50...80 °C (-58 °F...176 °F) -50...250 °C (-58 °F...482 °F) 150 °C (302 °F) max. for 120 minutes (with transmitter)
<b>Sensing resistor</b>	acc. to DIN EN 60751	Pt100
<b>Electrical connection</b>	cable gland cable connection	M16 x 1.5 M12 plug 1.4301 (AISI 304), 4-pins
<b>Protection class</b>	cable gland cable connection	IP 67 IP 69 K

<b>Transmitter MPU-4, MPU-H, MPU-M</b>		
<b>Temperature ranges</b>	ambient storage	-40...85 °C (-40...185 °F) -55...90 °C (-67...194 °F)
<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	$< \pm 0.25 \text{ °C}$
<b>Temperature drift</b>	zero, span	$< 0.01 \% / \text{K}$
<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 $< \pm 0.1 \%$ of measurement range $< 600 \Omega$ (at $U_B = 24 \text{ V}$ )
<b>Humidity</b>	without condensation	0...98 %

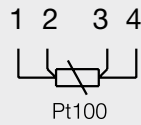
<b>Accuracy classes of temperature sensors   Tolerances for Pt100 acc. to DIN EN 60751</b>			
<b>Pt100</b>	<b>Class A</b>	<b>Class AA / 1/3 DIN B</b>	<b>Class AAA / 1/10 DIN B</b>
<b>0 °C / 100 Ω</b>	$\pm 0.15 \text{ K} / \pm 0.06 \Omega$	$\pm 0.10 \text{ K} / \pm 0.04 \Omega$	$\pm 0.03 \text{ K} / \pm 0.01 \Omega$
<b>100 °C / 138.5 Ω</b>	$\pm 0.35 \text{ K} / \pm 0.13 \Omega$	$\pm 0.27 \text{ K} / \pm 0.10 \Omega$	$\pm 0.08 \text{ K} / \pm 0.03 \Omega$

## Electrical connection without transmitter

## With 1 x M12 plug

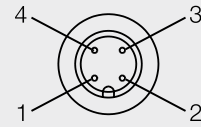


## Configuration 1st M12 plug



## Electrical connection with transmitter

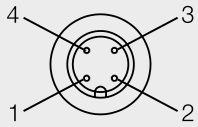
## With M12 plug



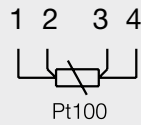
## Configuration M12 plug

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

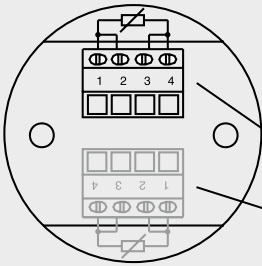
## With 2 x M12 plug



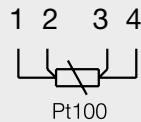
## Configuration 2nd M12 plug



## With cable gland



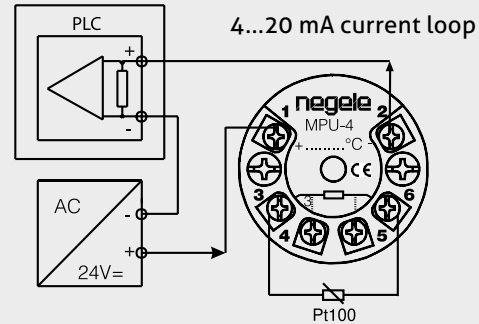
## Configuration strip terminal



clamps for 1st Pt100

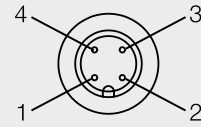
clamps for 2nd Pt100  
(at version 2 x Pt100)

## With cable gland



## Electrical connection with two transmitter (TFP-67)

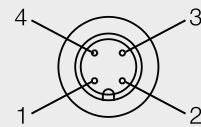
## With 1 x M12 plug (sensor 1 + sensor 2)



## 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)

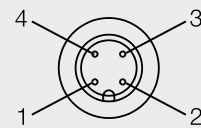
## With 2 x M12 plug (sensor 1)



## Configuration M12 plug

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

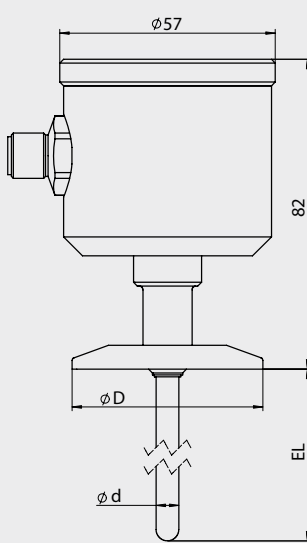
## With 2 x M12 plug (sensor 2)



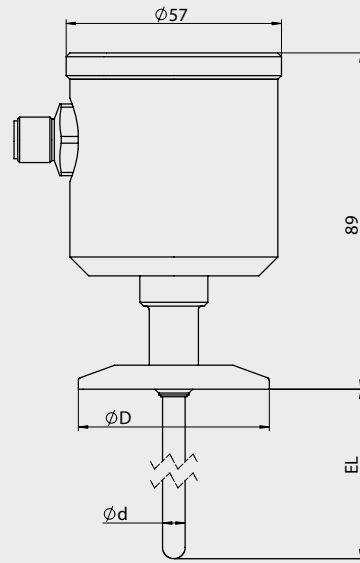
## Configuration M12 plug

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

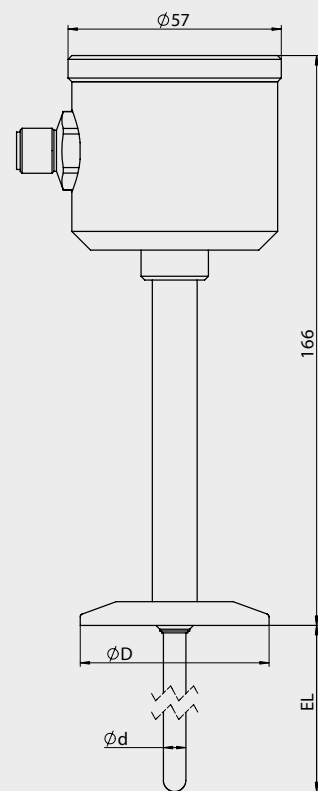
TFP-47 | TFP-47.2



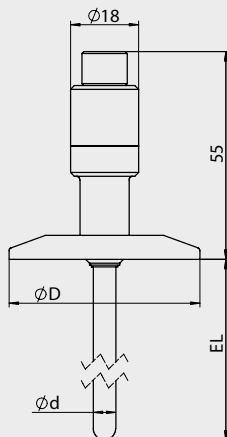
TFP-67



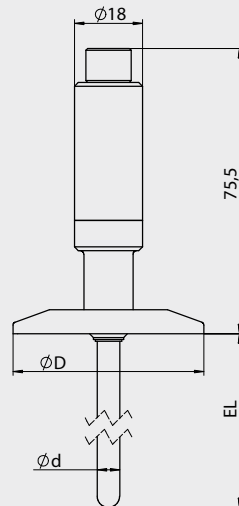
TFP-57 | TFP-57.2



TFP-167



TFP-167 / ... / MPU-M

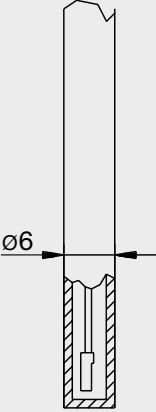
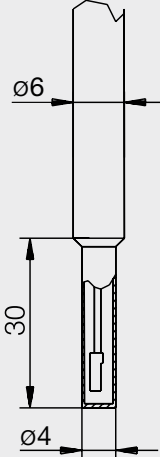
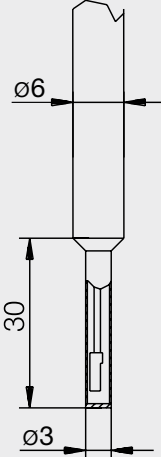


Dimension table Tri-Clamp

Type	Order code	Clamp size D [mm]	Suitable for pipe diameter	Pipe style
C25	TFP-.../C25	25.0	DN 6...8 ISO 6...10 1/4", 3/8", 1/2", 3/4"	DIN 11866 series A DIN 11866 series B / ISO 1127 DIN 11866 series C
C34	TFP-.../C34	34.0	DN 10...20	DIN 11866 series A
C50	TFP-.../C50	50.5	DN 25...40 ISO 15...25 1" + 1 1/2"	DIN 11866 series A DIN 11866 series B / ISO 1127 DIN 11866 series C
C64	TFP-.../C64	64.0	DN 50 2"	DIN 11866 series A DIN 11866 series C
C77	TFP-.../C77	77.5	2 1/2"	DIN 11866 series C
C91	TFP-.../C91	91.0	DN 65 3"	DIN 11866 series A DIN 11866 series C

### 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 were measured by emerging a temperature sensor from room temperature into boiling water.

Sensor tip $\varnothing$ 6 mm	Sensor tip $\varnothing$ 4 mm	Sensor tip $\varnothing$ 3 mm
50 %-time: $t_{50} \leq 3.0$ s 90 %-time: $t_{90} \leq 8.0$ s	50 %-time: $t_{50} \leq 2.4$ s 90 %-time: $t_{90} \leq 6.5$ s	50 %-time: $t_{50} \leq 0.5$ s 90 %-time: $t_{90} \leq 1.5$ s
		

### Accessories | Spare parts

Diameter pipe		Clamp size D [mm] (see page 4)			
DIN 11866 series A	DIN 11866 series C		Clamp ring Tri-Clamp	Sealing ring Tri-Clamp	
DN10		34.0	SRC-10	DRC-10	
DN15		34.0	SRC-10	DRC-15	
DN20		34.0	SRC-10	DRC-20	
DN25		50.5	SRC-25	DRC-25	
DN32		50.5	SRC-25	DRC-32	
DN40		50.5	SRC-25	DRC-40	
DN50		64.0	SRC-50	DRC-50	
DN65		9.0	SRC-65	DRC-65	
	1/2"	25.0	SRC-5	DRC-1/2"	
	3/4"	25.0	SRC-5	DRC-3/4"	
	1"	50.5	SRC-25	DRC-1"	
	2"	64.0	SRC-50	DRC-50	
	2½"	77.5	SRC-2½"	DRC-2½"	
	3"	91.0	SRC-65	DRC-65	

**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 (-67...194 °F)
- Relative humidity maximum 98 %

**Cleaning / Maintenance**

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

**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 3-A Sanitary Standard 74-**

Information on installation according to 3-A standard is available on our website:  
[www.anderson-negele.com/3A74.pdf](http://www.anderson-negele.com/3A74.pdf)

Click on the PDF icon to download the document.

**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**

- 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.

**Accessories****PVC-cable with M12-connection made of 1.4305 (AISI 303), 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 (Ⓐ: 3-A compliant)

**TFP-47** connecting head ø 57 mm  
**TFP-57** connecting head ø 57 mm, with spacer  
**TFP-167** connecting head ø 18 mm, electrical connection via M12 plu

## Sensor length EL in mm

**020...500** in steps of 5 mm  
**xxx** special length

## Diameter thermowell in mm

**6**  
**8**

## Diameter sensor tip in mm

**X** no reduction  
**3** only for thermowell 6 mm  
**4** only for thermowell 6 mm and 8 mm  
**6** only for thermowell 8 mm

## Accuracy class Pt100

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

## Electrical connection (not selectable for TFP-167)

**PG** cable gland M16x1.5  
**M12** M12 plug, standard with MPU-LCD

## Transmitter

**X** without

## only for TFP-47, -57

**MPU-4** programmable  
**MPU-H** HART-protocol  
**MPU-LCD** with display

## only for TFP-167

**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

## Tri-Clamp size

**C25** Pipe diameter: see "Dimension  
**C34** Ⓐ Table Tri-Clamp" on page 4  
**C50** Ⓐ  
**C64** Ⓐ  
**C77** Ⓐ  
**C91** Ⓐ



**TFP Ø 50 mm / 55 mm**  
 Available until 31.03.2022

**TFP Ø 18 mm**  
 No longer available!



**Successor: TSB**  
 One sensor for all applications!

**Successor: TSM**  
 New, modular and better!

All advantages at [anderson-negele.com](http://anderson-negele.com)

**TFP-47/ 100/ 6/ X/ A/ PG/ MPU-4/ 0...100/ C25**

Order code for version with 2x Pt100 (A: 3-A compliant)

**TFP-47.2** connecting head  $\varnothing$  57 mm, 2x Pt100, no transmitter possible  
**TFP-57.2** connecting head  $\varnothing$  57 mm, 2x Pt100, with spacer, no transmitter possible!  
**TFP-67** high connecting head  $\varnothing$  57 mm, 2x Pt100, prepared for 2x transmitter

#### Sensor length EL in mm

**020...500** in steps of 5 mm  
**xxxx** special length

#### Diameter thermowell in mm

**6**  
**8**

#### Diameter sensor tip in mm

**X** no reduction  
**3** only for thermowell 6 mm  
**4** only for thermowell 6 mm and 8 mm  
**6** only for thermowell 8 mm

#### Accuracy class Pt100

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

#### Electrical connection (only for TFP-47.2 and 57.2)

**PG** cable gland M16x1.5  
**2PG** 2x cable gland M16x1.5  
**2M12** 2x M12 plug

#### Electrical connection (only for TFP-67)

**M12** M12 plug  
**2M12** 2x M12 plug

#### 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

#### Tri-Clamp size

**C25** Pipe diameter:  
**C34** (A) see "Dimension  
**C50** (A) table Tri-Clamp"  
**C64** (A) on page 4  
**C77** (A)  
**C91** (A)



**TFP  $\varnothing$  50 mm / 55 mm**  
 Available until 31.03.2022

**TFP  $\varnothing$  18 mm**  
 No longer available!



**Successor: TSB**  
 One sensor for all applications!

**Successor: TSM**  
 New, modular and better!

All advantages at [anderson-negele.com](http://anderson-negele.com)

TFP-67/ 100/ 6/ X/ A/ M12/ MPU-4/ 0...100/ MPU-4/ 0...100/ C25