

## Pharma Process Connections



### Range of Applications

- process connection of sensors, even in very small tubes
- for pharmaceutical applications and biotechnology
- suitable for media with or without electrical conductivity (WFI water)

### Examples of Use

- monitoring of process and CIP- / SIP-cleaning
- point level, flow and temperature measurement with WFI water
- water and waste water treatment
- peripheral applications

### Functional Principle

Defined pressing of elastomer sealing by means of the cone in the build-in system, when the sensor has reached the metallic stop position. The coordinated dimensions guarantee a measurement point free of dead rooms and gaps.

Construction according to:

- EHEDG Guideline „Document 8: Hygienic Equipment Design Criteria“ (Sept.1997)
- EHEDG Guideline „Document 16: Hygienic Pipe Couplings (April 2004)

### Hygienic, Aseptic Design

By using Negele build-in system EPA-... will result a measurement point which is aseptic and easy to sterilize

- Pharma conform materials (SS 1.4435)
- CIP- / SIP-cleaning
- all materials FDA conform
- elastomer sealing, easy to replace
- no dead rooms and gaps

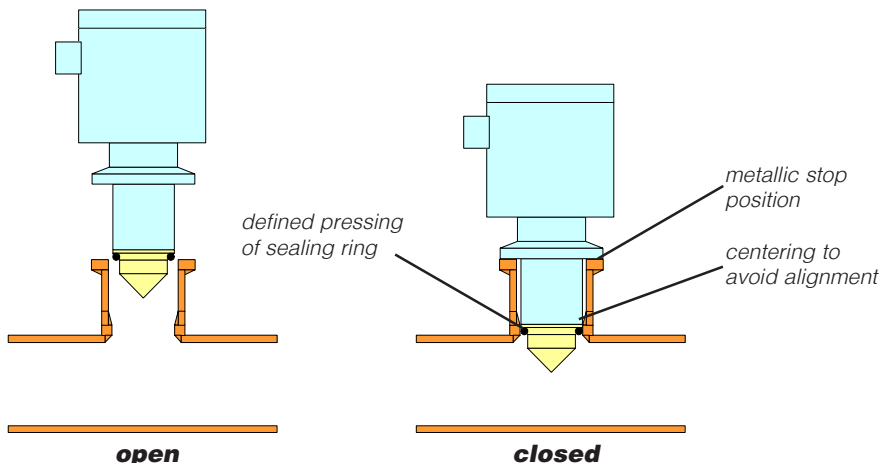
### Features

- suitable for tubes down to DN10
- every tube standard is deliverable
- very compact measurement point
- short mounting time with orbital welder
- integrated leakage monitoring hole
- easy cleanable with CIP and SIP
- material certificate 3.1.B for all mounting accessories included
- surface quality  $R_a \leq 0,8 \mu m$ , option: down to  $R_a \leq 0,4 \mu m$
- only two sizes of sleeves for different sensors
- sensors for point level, flow and temperature measurement, others on request
- very high type of protection IP69K
- sensor mounting with standard Clamp ring
- customized labellings, TAG-plates made of stainless steel

### Options / Accessories

- sensors: electrical connection with M12 plug-in
- readymade connecting cable for M12 plug-in

### Schematical description of Negele PHARMadapt-EPA system



**NWM-841 with EPA-18**



**TFP-641 with EPA-8**



**EPA-18**

## Specification

Pipe Specification	DIN 1	DIN 11850 series 1	Delta-Ferrite DF	standard	<1,0% (weld seam <3%)
	DIN 2	DIN 11850 series 2		option	<0,5% (weld seam <3%)
	ISO	DIN 11866 series A			Baseler Norm II
		DIN 11866 series B		ISO 1127	Sulfure content
ASME	DIN 11866 C	ISO 1127	acc. to ASME	0.005% min.	0.017% max.
	OD-Tube				(see descr. page 4)
Material	pipes and sleeves	stainless steel SS (1.4435, 316L) with 3.1.B	Nominal diameter	standard	see separate tables
Surfaces	product contacted areas	R <sub>a</sub> ≤ 0,8µm (not in welded areas)	Tolerances	DN10...DN40	DN: ±0,3; L: ±1,0mm
		electro-polished	DN50...	DN: ±0,5; L: ±1,0mm	
	option	R <sub>a</sub> ≤ 0,6µm	Sensor connection	EPA-8	Clamp ring DN10-20
		R <sub>a</sub> ≤ 0,4µm	EPA-18	Clamp ring DN25-40	
			Sealing principle	sealing ring	EPDM (FDA listed)
			Operating pressure		10bar max.

## Note

The technical specification of pipes is according to DIN 11865 if no other is defined. DF values are valid for delivery condition. Mechanical treatment after delivery can increment the DF value.

## Order Code

**EPA-8** (Pharma conform build-in system, for sensor diameter 8mm)  
**EPA-18** (Pharma conform build-in system, for sensor diameter 18mm)

### Pipe Specification

DIN1 DIN 11850 series 1

A DIN 11850 series 2  
DIN 11866 series A

B DIN 11866 series B  
ISO 1127

C DIN 11866 series C  
OD-Tube

### Diameter

see tables page 3

### Surface Quality

0,8 R<sub>a</sub> ≤ 0,8µm

0,6 R<sub>a</sub> ≤ 0,6µm

0,4 R<sub>a</sub> ≤ 0,4µm

### Certificate Surface Quality

X without

RAC Certificate surface quality

### Pressure Test

X without

DP Pressure test incl. certificate acc. to DIN EN 10204-3.1

### Delta-Ferrite Content

X <1,0% (weld-seam <3%)

DF <0,5% (weld-seam <3%)

BN Baseler Norm II

### Certificate Delta-Ferrite Content

X without

DFC Certificate Delta-ferrite content incl. measuring protocol

## Example:

**EPA-18 / A / 50 / 0,8 / RAC / DP / DF / DFC**

## DIN 11850 Series 1

DIN 11850 Series 1				
Order Code	DN	L [mm]	Pipe D <sub>xw</sub>	suitable for
EPA-8 / DIN1 / 10	10	70	12 x 1,0	NWM-641, TFP-6.. / 010
EPA-8 / DIN1 / 15	15	70	18 x 1,0	NWM-641, TFP-6.. / 010
EPA-8 / DIN1 / 20	20	80	22 x 1,0	NWM-641, TFP-6.. / 010
EPA-8 / DIN1 / 25	25	100	28 x 1,5	NWM-641, TFP-6.. / 025
EPA-8 / DIN1 / 32	32	110	34 x 1,5	NWM-641, TFP-6.. / 025
EPA-8 / DIN1 / 40	40	120	40 x 1,5	NWM-641, TFP-6.. / 025

DIN 11850 Series 1				
Order Code	DN	L [mm]	Pipe D <sub>xw</sub>	suitable for
EPA-18 / DIN1 / 25	25	100	28 x 1,5	NWM-841, TFP-8.. / 020
EPA-18 / DIN1 / 32	32	110	34 x 1,5	NWM-841, TFP-8.. / 020
EPA-18 / DIN1 / 40	40	120	40 x 1,5	NWM-841, TFP-8.. / 020
EPA-18 / DIN1 / 50	50	140	52 x 1,5	NWM-841, TFP-8.. / 020

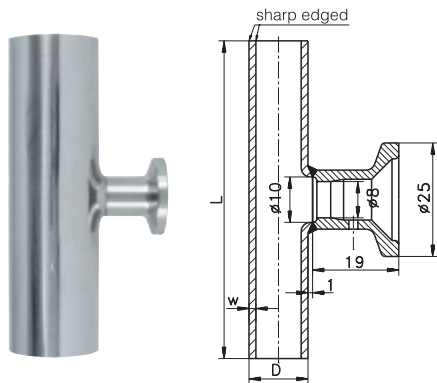
## DIN 11866 Series B ISO 1127

DIN 11866 Series B / ISO 1127				
Order Code	DN	L [mm]	Pipe D <sub>xw</sub>	suitable for
EPA-8 / B / 8	ISO8	64	13,5 x 1,6	NWM-641, TFP-6.. / 010
EPA-8 / B / 10	ISO10	68	17,2 x 1,6	NWM-641, TFP-6.. / 010
EPA-8 / B / 15	ISO15	72	21,3 x 1,6	NWM-641, TFP-6.. / 010
EPA-8 / B / 20	ISO20	110	26,9 x 1,6	NWM-641, TFP-6.. / 010
EPA-8 / B / 25	ISO25	120	33,7 x 2,0	NWM-641, TFP-6.. / 025
EPA-8 / B / 32	ISO32	130	42,4 x 2,0	NWM-641, TFP-6.. / 025
EPA-8 / B / 40	ISO40	130	48,3 x 2,0	NWM-641, TFP-6.. / 025
EPA-8 / B / 50	ISO50	180	60,3 x 2,0	NWM-641, TFP-6.. / 025
EPA-8 / B / 65	ISO65	220	76,1 x 2,0	NWM-641, TFP-6.. / 050
EPA-8 / B / 80	ISO80	260	88,9 x 2,3	NWM-641, TFP-6.. / 050

DIN 11866 Series B / ISO 1127				
Order Code	DN	L [mm]	Pipe D <sub>xw</sub>	suitable for
EPA-18 / B / 20	ISO20	110	26,9 x 1,6	NWM-841, TFP-8.. / 020
EPA-18 / B / 25	ISO25	120	33,7 x 2,0	NWM-841, TFP-8.. / 020
EPA-18 / B / 32	ISO32	130	42,4 x 2,0	NWM-841, TFP-8.. / 020
EPA-18 / B / 40	ISO40	130	48,3 x 2,0	NWM-841, TFP-8.. / 020
EPA-18 / B / 50	ISO50	180	60,3 x 2,0	NWM-841, TFP-8.. / 020
EPA-18 / B / 65	ISO65	220	76,1 x 2,0	NWM-841, TFP-8.. / 050
EPA-18 / B / 80	ISO80	260	88,9 x 2,3	NWM-841, TFP-8.. / 050

### Dimensioned Drawings of Pipes

(dimensions: see tables above)



**PHARMadapt  
EPA-8**

## DIN 11850 Series 2 DIN 11866 Series A

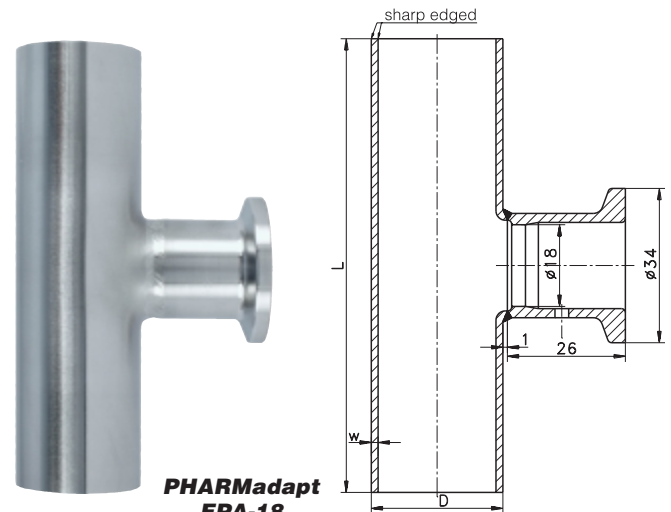
DIN 11866 Series A / DIN 11850 Series 2				
Order Code	DN	L [mm]	Pipe D <sub>xw</sub>	suitable for
EPA-8 / A / 10	10	70	13 x 1,5	NWM-641, TFP-6.. / 010
EPA-8 / A / 15	15	70	19 x 1,5	NWM-641, TFP-6.. / 010
EPA-8 / A / 25	25	100	29 x 1,5	NWM-641, TFP-6.. / 025
EPA-8 / A / 32	32	110	35 x 1,5	NWM-641, TFP-6.. / 025
EPA-8 / A / 40	40	120	41 x 1,5	NWM-641, TFP-6.. / 025
EPA-8 / A / 50	50	160	53 x 1,5	NWM-641, TFP-6.. / 025
EPA-8 / A / 65	65	210	70 x 2,0	NWM-641, TFP-6.. / 050
EPA-8 / A / 80	80	260	85 x 2,0	NWM-641, TFP-6.. / 050
EPA-8 / A / 100	100	310	104 x 2,0	NWM-641, TFP-6.. / 050

DIN 11866 Series A / DIN 11850 Series 2				
Order Code	DN	L [mm]	Pipe D <sub>xw</sub>	suitable for
EPA-18 / A / 25	25	100	29 x 1,5	NWM-841, TFP-8.. / 020
EPA-18 / A / 32	32	110	35 x 1,5	NWM-841, TFP-8.. / 020
EPA-18 / A / 40	40	120	41 x 1,5	NWM-841, TFP-8.. / 020
EPA-18 / A / 50	50	160	53 x 1,5	NWM-841, TFP-8.. / 020
EPA-18 / A / 65	65	210	70 x 2,0	NWM-841, TFP-8.. / 050
EPA-18 / A / 80	80	260	85 x 2,0	NWM-841, TFP-8.. / 050
EPA-18 / A / 100	100	310	104 x 2,0	NWM-841, TFP-8.. / 050

## DIN 11866 Series C OD-Tube

DIN 11866 Series C / OD-Tube / ASME BPE				
Order Code	DN	L [mm]	Pipe D <sub>xw</sub>	suitable for
EPA-8 / C / 3/4"	3/4"	102	19,05 x 1,65	NWM-641, TFP-6.. / 010
EPA-8 / C / 1"	1"	108	25,4 x 1,65	NWM-641, TFP-6.. / 010
EPA-8 / C / 1 1/2"	1 1/2"	120,5	38,1 x 1,65	NWM-641, TFP-6.. / 025
EPA-8 / C / 2"	2"	146	50,8 x 1,65	NWM-641, TFP-6.. / 025
EPA-8 / C / 2 1/2"	2 1/2"	160	63,5 x 1,65	NWM-641, TFP-6.. / 050
EPA-8 / C / 3"	3"	170	76,2 x 1,65	NWM-641, TFP-6.. / 050
EPA-8 / C / 4"	4"	210	101,6 x 2,11	NWM-641, TFP-6.. / 050

DIN 11866 Series C / OD-Tube / ASME BPE				
Order Code	DN	L [mm]	Pipe D <sub>xw</sub>	suitable for
EPA-18 / C / 1"	1"	108	25,4 x 1,65	NWM-841, TFP-8.. / 020
EPA-18 / C / 1 1/2"	1 1/2"	120,5	38,1 x 1,65	NWM-841, TFP-8.. / 020
EPA-18 / C / 2"	2"	146	50,8 x 1,65	NWM-841, TFP-8.. / 020
EPA-18 / C / 2 1/2"	2 1/2"	160	63,5 x 1,65	NWM-841, TFP-8.. / 050
EPA-18 / C / 3"	3"	170	76,2 x 1,65	NWM-841, TFP-8.. / 050
EPA-18 / C / 4"	4"	210	101,6 x 2,11	NWM-841, TFP-8.. / 050



**PHARMadapt  
EPA-18**

## Surface Quality



In order to provide favourable conditions for sterile production, the surface must be smooth and non-porous down into the microscale range. Overlapping areas, or material laminations, must be avoided as far as possible on account of the dead spaces that result, since these areas are difficult or impossible to clean and therefore represent ideal breeding grounds for germs and bacteria.

Moreover the dimensions (including height!) must be kept as small as

possible to minimise the influences of the surfaces in contact with the product. Such surfaces can be obtained by means of electropolishing. In the pharmaceutical sector, but not only there, the quality of the surface is generally defined in terms of the "R<sub>a</sub>" - roughness. A surface with R<sub>a</sub> ≤ 0.8µm is normal, in special cases also R<sub>a</sub> ≤ 0.6µm and even R<sub>a</sub> ≤ 0.4µm. All these qualities can be achieved by machining appropriately good quality steels and electropolishing them for a sufficiently long period of time. R<sub>a</sub> is the arithmetic average of all protuberances on the surface y over a certain measurement distance L in the x-direction.

## USP Class VI



Relative new and initialized from US market is a new qualification of product contacting plastics. Primary a requirement from the medical sector this will get a standard of the pharmaceutical industries in the future for a lot of applications. Plastics and elastomers according to the so called USP Class VI standard is suitable for implantation into the human body without any complications. Presently this is the highest requirement to material harmlessness.

## Delta-Ferrite



The higher the Delta-Ferrite content (DF), the more magnetic phases are present in the austenitic structure. These arise as a result of thermal effects, e.g. during welding and turning. The strain-induced martensite that is formed here leads to increased susceptibility to corrosion for the workpiece and is therefore undesirable.

According to DIN 11866 Table B.1 differentiation can be made between three DF classes:

- Class 1: < 3.0 % Delta-Ferrite in the as-supplied state
- Class 2: < 1.0 % Delta-Ferrite in the as-supplied state
- Class 3: < 0.5 % Delta-Ferrite in the as-supplied state

In order to achieve DF Classes 2 and 3, the tubes must in general be "solution annealed" before delivery. The solution annealing takes place at temperatures between 1020°C and 1150°C, depending on the material.

1.4435 stainless steel has a reduced Delta-Ferrite content much lower than 1 % compared with 1.4404. The increase caused by welding processes can be minimised by the use of suitable welding materials, shielding gas, and the correct current, so that the Delta-Ferrite content at least remains below 3 %.

If the whole work piece is required to have a Delta-Ferrite content less than 0.5 %, it must be ordered in accordance with "Baseler Norm II".

The reduction of the Delta-Ferrite must not be too excessive, however, because with too low a content there is a tendency for the stainless steel to form cracks during machining or welding. Specified Delta-Ferrite values are valid for delivery condition. Mechanical treatments after delivery can increment the Delta-Ferrite.

## Identification of Sensors, Pipes and Packaging



### Pipe identification:

- material, electro polished
- pipe dimensions
- charge number of the pipe, serial number
- charge number of the weld-on bushing

### Customised labelling of the packaging

Basel-Nr.: 994559967/310  
Typ: TFP-58p150 m 0-150°C  
Modernisierung H84,  
Warenrnn. Baufeld, G74, Halle 1  
Gewicht: 550g

TYP: SSP-G-ASME-G 1.5"  
Teilenummer: 2EW 611  
Modernisierung H84,  
Warenrnn. Baufeld, G74, Halle 1  
Inhalt: 10 Stück

Anlieferung Projekt  
Modernisierung H84,  
Warenrnn. Baufeld, G74, Halle 1

## Inspection Certificate Weld Seam



Optionally there is a qualification of the weld seam available. In this case the weld seam is stressed with 20bar water pressure for 10 minutes and tested for leaks. If the test is passed an inspection certificate is issued according to DIN EN 10204-3.1 guideline 97/23/EG, AD2000 HP 100R. Every work piece will be tested (no random examination)!

## 3A-Standards



In 1920 three US associations published directives for milk pipe connections. Hence the name 3A, for 3 Associations. These organisations are:

- International Association of Milk, Food and Environmental Sanitarians (IAMFES)
- United Public Health (UPH)
- Dairy Industry Committee (DIC)

In 1944 the body of regulations, which in the intervening period had become more comprehensive, was accredited by the US Government. Over 50 standards have been published, primarily for the milk industry. Other sectors, in particular the pharmaceutical industry, are oriented towards these standards or prescribe them as mandatory.

## FDA



The "Food and Drug Administration" (FDA) is a US authority that issues approvals for agents, foodstuffs, cosmetics and pharmaceutical products. In addition it generates recommendations for the use of materials in facilities in the foodstuffs and pharmaceutical industries. This supplementary task is administered because the individual components, materials and design details have significant influence on the quality of the end product.

An "FDA Approval" can only be issued for a product generated in the particular

facility in question. For components and materials there is no FDA approval; these parts are "FDA listed" in terms of their innocuousness if in direct contact with the product.

The FDA directives are published as so-called "Codes of Federal Regulations" (CFR...). The 21 CFR 170 - 199 directives have a special significance, in particular with regard to material selection for sensor manufacturers. They contain a listing of specifications for plastics. Thus, 21 CFR 177.2415, for example, contains the plastic PEEK that is often used in the food and pharmaceutical market sectors.

## ASME

In the pharmaceutical sector one often comes across the requirement to deliver tubes in 1.4435 to meet ASME. In most cases what is meant here is simply the tube dimensions with regard to diameter and wall thickness. In this event ASME is identical with the ODT dimensions.

However, ASME BPE 2002 also defines a minimum and maximum content for elemental sulphur, which in fact must lie between 0.005% and 0.017%. According to ASME regulations this requirement applies, however, just to tube ends that are still to be automatically welded, and not to those that are already welded. The definition of a certain range for the sulphur content makes total sense, since parts with strongly differing sulphur content would deflect the arc during welding and as a result would lower the quality of the weld seam.

Otherwise the value prescribed in the German Key to Steel for 1.4435, or the value defined in AISI for 316L of 0.030% sulphur content applies.

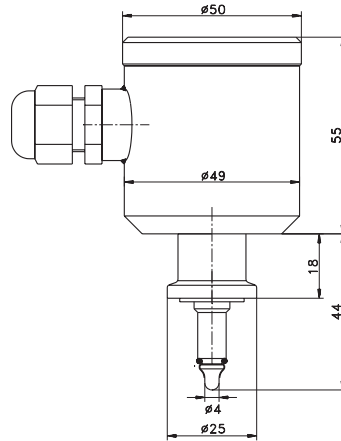
Comment: ASME BPE 2002 specifies not only the sulphur content of the work piece, but also the contents of other materials contained in the steel such as nickel, molybdenum, etc. These however essentially correspond to the values in the German Key to Steel, which applies in Europe.

**Order Code for Certificates:** see page 2.

## Level Switch NWM-641 with EPA-8 DN10



### Dimensioned Drawing NWM-641



### Clamp Ring SRC\*

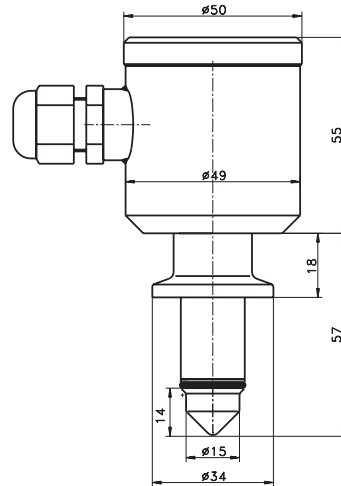


**SRC-05** for NWM-641  
**SRC-10** for NWM-841

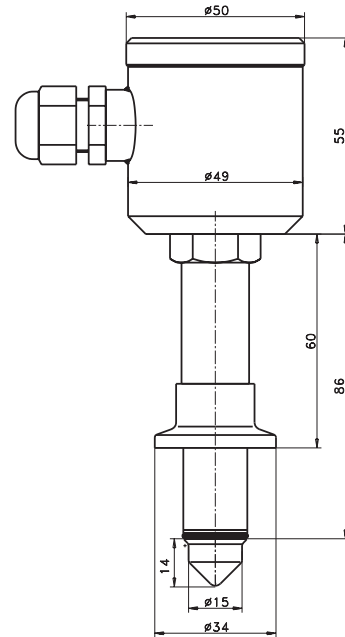
## Level Switch NWM-841 with EPA-18 DN25



### Dimensioned Drawing NWM-841



### Dimensioned Drawing NWM-841 / H



### Specification Highlights of NWM-641, -841 (details see separate product information in chapter 4)

Function	full- / empty detection	set by the polarity of supply voltage
Delay time	fixed	0,1s
	optional adjustable	0,1; 2,5; 5s
Materials	connector head /	SS (1.4305) Ø55mm
	sensor tip NWM	PEEK
	sensor tip NWM-USP	PEEK-USP class VI
	sealing ring	EPDM (FDA conform)
Pressure		10bar max.
Temperature range	ambient	-10...60°C
	process	0...100°C
	CIP-/ SIP-cleaning	0...150°C max. 30min
Power supply voltage		18...36V DC

Electr. connection	cable entry	PG (M16x1,5) 2 pin 1,5mm <sup>2</sup>
	cable connection	M12 plug-in SS (1.4305)
	output	PNP (active 50mA) option: NPN (max. 50mA)
Switching output	selectable	short circuit proof
		high active (sensor wetted -> high) low active (sensor not wetted -> high)

### Order Code

Sensor	Model	Output	Neck tube	Switching delay	Status-LED	Electr. connection
NWM-641 (for EPA-8)	X (FDA conform)	PNP	X without	X (0,1s fixed)	X without	X (cable entry)
NWM-841 (for EPA-18)	USP (USP Cl. VI)	NPN	H with (42mm)	T (adjustable: 0,1; 2,5; 5s)	KF lid with window	M12 (M12-plug)
SRC-05 (for EPA-8, 1.4301 bright)						
SRC-10 (for EPA-18, 1.4301 bright)						

Order example: **NWM-641 / X / PNP / H / T / KF / M12**



# Temperature Sensor TFP-641, -661, -681

**TFP-641 / 010**



**TFP-661 / 010 / MPU-M**



**TFP-681 / 010**



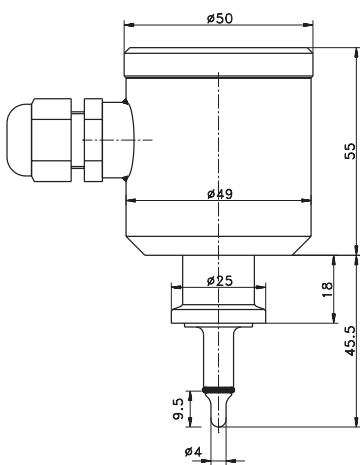
**Clamp Ring SRC\***



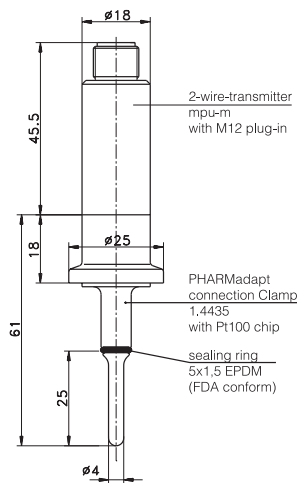
**SRC-05** for TFP-6xx

**Dimensioned Drawings**

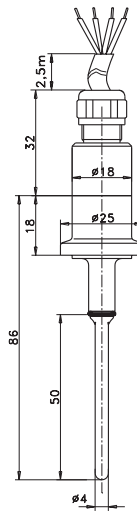
**TFP-641 / 010**



**TFP-661 / 025 / MPU-M**



**TFP-681 / 050**



**\*Note:**  
the Clamp ring is not included in delivery and must be ordered separately.

**Insertion lengths:**

- EL=10mm
- EL=25mm
- EL=50mm

**Specification Highlights of TFP-641, -661, 681** (details see separate product information in chapter 2)

Process connection	gap free	with Clamp ring DN10-20
Insertion length	standard	10, 25, 50mm
Materials	connection head	1.4305
	protection tube	1.4435 with 3.1.B
Temperature ranges	ambient	-50...+80°C
	sensor tip	-50...+250°C
Sensing resistor	acc. to DIN IEC 751	1xPt100 class A*
Electr. Connection	<b>TFP-641</b>	PG (M16x1,5) or M12-plug
	<b>TFP-661</b>	M12-plug
	<b>TFP-681</b>	fixed cable (PTFE)
Operating pressure		10 bar max.
Type of protection		IP69K

<b>Transmitter MPU-M</b>		
Accuracy		<±0,2% of full scale
Temperature drift	zero point, slope	<0,02% of f. s. / K
Electr. connection	power supply	12...36VDC
Output	analog	4...20mA

<b>Transmitter MPU-4, -4-EX, -10, -10-EX, -H, -H-EX</b>		
Accuracy		<±0,1% of full scale
Temperature drift	zero point, slope	<0,01% of f. s. / K
Electr. connection	power supply	8...35VDC
Output	analog	4...20mA

\* TFP-641 with 2xPt100 incl. 2 transmitters is also available.

**Order Code**

Sensor	Model	Insertion length	Transmitter	Ranges MPU	Electr. Connection
TFP-641 (for EPA-8)	head ø55mm	010 10mm	X without	-10...+40°C	PG or M12
TFP-661 (for EPA-8)	M12-plug	025 25mm	MPU-M	0...50°C	M12
TFP-681 (for EPA-8)	fixed cable	050 50mm	MPU-4, MPU -4-EX	0...100°C	cable (2,5m)
			MPU-10 (Profibus)	0...150°C	
			MPU-10-EX	0...200°C	
SRC-05 (for EPA-8)	Clamp ring for TFP-6xx		MPU-H (HART)	xx...yy°C (special)	
	1.4301 bright		MPU-H-EX		
			MPU-LCD (int. disp.)		

Order example: **TFP-641 / 025 / MPU-4 / 0...100°C / PG**

# Temperature Sensors TFP-841, -861, -881

**TFP-841/ 020 mit EPA-18**



**TFP-861 / 020 / MPU-M**



**TFP-881 / 020**



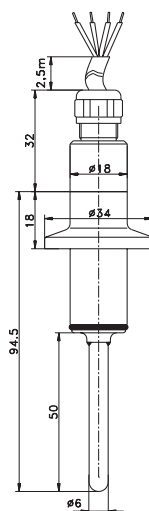
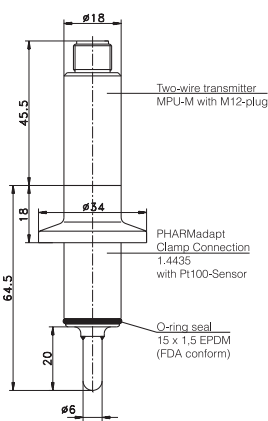
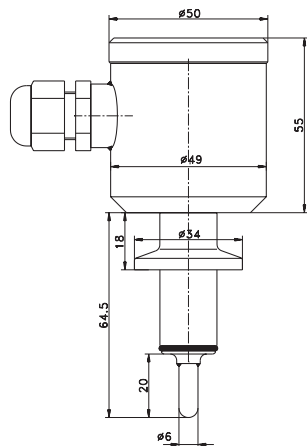
**Clamp Ring SRC\***



**SRC-10** for TFP-8xx

**\*Note:**  
the Clamp ring is not included in delivery and must be ordered separately.

**Dimensioned Drawings**



**Insertion lengths:**  
EL=20mm  
EL=50mm

**Technical Highlights of TFP-841, -861, -881** (Details: see separate product information in chapter 2)

Process connection	without gaps	with Clamping
		DN25-40
Insertion length	standard	20, 50mm
Materials	connection head	1.4305
	protection tube	1.4435 with 3.1.B
Temperature range	ambient	-50...+80°C
	sensor tip	-50...+250°C
Sensing resistor	acc. to DIN IEC 751	1xPt100 Class A*
Electr. connection	<b>TFP-841</b>	PG (M16x1,5) or M12 plug-in V2A
	<b>TFP-861</b>	M12 plug-in V2A
	<b>TFP-881</b>	fixed cable (PTFE)
Operating pressure		10 bar max.
Type of protection		IP69K

<b>Transmitter MPU-M</b>		
Accuracy		<±0,2% of full scale
Temperature drift	zero point, slope	<0,02% of f. s. / K
Electr. connection	power supply	12...36VDC
Output	analog	4...20mA

<b>Transmitter MPU-4, -4-EX, -10, -10-EX, -H, -H-EX</b>		
Accuracy		<±0,1% of full scale
Temperature drift	zero point, slope	<0,01% of f. s. / K
Electr. connection	power supply	8...35VDC
Output	analog	4...20mA

\*TFP-841 with 2xPt100 incl. 2 transmitters is also available.

**Order Code**

Device	Model	Insertion length	Transmitter	Range MPU	Electr. connection
TFP-841 (for EPA-18)	head ø55mm	010 10mm	X without	-10...+40°C	PG or M12
TFP-861 (for EPA-18)	M12 plug-in	025 25mm	MPU-M	0...50°C	M12 plug-in
TFP-881 (for EPA-18)	fixed cable	050 50mm	MPU-4, MPU-4-EX MPU-10 (Profibus) MPU-10-EX MPU-H (HART) MPU-H-EX MPU-LCD (int. disp.)	0...100°C 0...150°C 0...200°C xx...yy°C (special)	fixed cable (2,5m)
SRC-10 (for EPA-18)	Clamp ring for TFP-8xx 1.4301 bright				

Order Example: **TFP-841 / 020 / MPU-4 / 0...100°C / PG**