

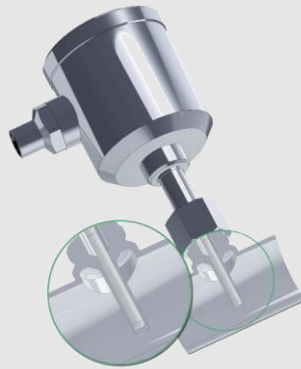
Process adaptors and fittings

PHARMA

Hygienic installation systems for pipes and tanks in pharmaceutical applications

PHARMadapt ESP

Temperature measurement without media contact



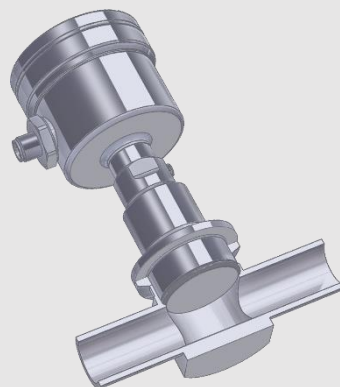
PHARMadapt EPA

Temperature / Point level measurement in narrow measuring points



Fitting system CPM

Pressure measurement with flush installation in smallest pipe diameters

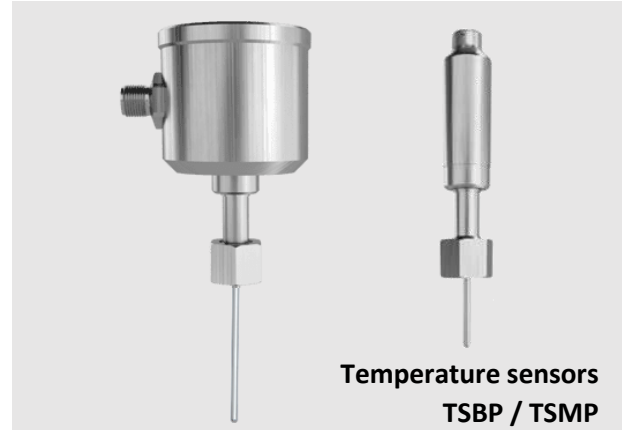


No process stop due to sensor removal during recalibration or replacement Temperature measurement without media contact

With the ESP installation system, an thermowell is **permanently installed** in the process. The slim tip of the sensor is inserted into this thermowell and held in contact by a spring. It is therefore **not in direct contact** with the medium.

The sensor can be removed at any time for **recalibration or replacement**, without electrical disconnection and without opening the process, and consequently **without necessity to shut down the plant or to stop the process**.

- **Tailored to requirements:** Special design for pharmaceutical applications
- **Variable:** Installation **in tanks** using welding sockets or adapters. Installation **in pipes** using tees or elbows with integrated thermowells
- **Fast and precise:** t50 response time from 4.4 seconds, measuring accuracy $<\pm 0,25\text{ }^{\circ}\text{C}$
- **One for all:** One sensor type with the same probe length can be used for differing pipe widths, thus **minimizing spare parts inventory** and planning requirements
- **Reliable:** Spring-mounted tip for perfect contact
- **Maximum hygiene:** No product contact = **No risk of contamination** by previous products, foreign bodies and germs via the sensor
- Easy to clean: **design without dead-legs** ensures easy CIP/SIP cleaning
- **Certified quality:** PHARMadapt ESP complies with current norms, specifications and standards such as 3-A, FDA, USP... (see product information)



Available temperature sensors

- **TSBP / TSMP**
- **Accuracy class:** A | AA (1/3B) | AAA (1/10B)
- **Options:** 2x Pt100 | LCD display | transmitter

Available installation systems for pipes and vessels

- **Weld-in thermowells**
- **Adapters** for diverse process connections (Tri-Clamp, Varivent...)
- **Extension sleeves** for insulated / double-walled vessels
- **Fittings with pipe sections** (designed for orbital welding, to reduce time and quality problems compared to sleeve welding):
 - **Tees** DN8...DN100
 - **Elbows** DN10...25 | DN 1/2" ...1"



The perfect installation situation for every application, in all pipes and vessels

TSBP / TSMP Temperature sensors (Details see respective product information)

| | Type | Head Ø | Pt100 | Transmitter available | Electrical connection | Probe length in mm |
|---|----------------|---------|-----------------|-----------------------|----------------------------|-------------------------|
|  | TSBP | 57 mm | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 37 59 83 97 160 |
|  | TSBP (Display) | 63 mm | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 37 59 83 97 160 |
|  | TSMP | 18,5 mm | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 37 59 83 97 160 |

ESP Fitting system (Details see respective product information)

Material: 1.4435 (316L) with 3.1 certificate, surface Ra ≤ 0,8 µm / 0,6 µm / 0,4 µm

| | Type | Application | For probe length | Installation length |
|---|--------|---|---|---------------------------------------|
|  | ESP-E | Weld-in thermowell for pipes and tanks | 83 mm 160 mm | |
|  | ESP-C | Adapter with integrated thermowell for Tri-Clamp 1" ... 1 ½" | 83 mm | 66 mm |
|  | ESP-B | Adapter with integrated thermowell for BioControl DN25, DN50 and DN65 | 59 mm | 22 mm |
|  | ESP-V | Adapter with integrated thermowell for Varivent DN25 and DN40 | 37 mm 59 mm | 20 mm 42 mm |
|  | ESP-F | Adapter F52 / F46 with integrated thermowell for Fermenter | 83 mm | 19 mm |
|  | ESP-G | Tee pipe element with integrated thermowell DIN 2: DN10...DN100 ISO: DN8...DN80 ASME: ½" ... 4" | 37 mm With ESP-VL: 83 mm 160 mm | Pipe 70...310 mm |
|  | ESP-W | Elbow pipe element with integrated thermowell DIN 2: DN10...DN25 ISO: DN8...DN20 ASME: ½" ... 1" | 37 mm With ESP-VL: 83 mm 160 mm | Pipe 35...55 mm bzw. 62...88 mm |
|  | ESP-VL | Extension 46 or 123 mm, for ESP-G Tees or ESP-W elbows | Extension from 37 mm to 83 mm 160 mm | |

Aseptic clamp connection for pipes with nominal diameters from DN10 | ISO8 | 3/4" Hygienic sensors for narrow spaces

Especially in pipes with a **small nominal diameter**, the hygienic installation of a temperature or point level sensor is often difficult to realize.

The PHARMadapt EPA installation system, specially developed for pharmaceutical applications, makes this **integration simple and safe**: the **flow-optimized pipe tees** are simply and reproducibly **welded in** and the sensors are inserted by means of a clamp connection.

- **Installation with zero dead-leg or gap:** The design of the adapter creates a flow-optimised and easily cleanable process connection. Dead spaces as with weld-on sockets are avoided by design.
- **Two connection sizes, many pipe diameters:** connection with di= 8 mm or 18 mm, pipes from DN10 to DN100
- **Easy installation:** The EPA adapter can be welded safely and hygienically using the orbital method. The sensor itself is sealed with an O-ring and fixed with a standard clamp
- **Certified quality:** PHARMadapt EPA complies with current norms, specifications and standards such as 3-A, FDA, USP... (see product information)

Available sensors

- **TSBP / TSMP Temperature sensors** (head 57 / 63 mm or 18 mm), with 1x or 2x Pt100 or Pt1000
- **NCS point level sensors**

Variants of the PHARMadapt EPA fitting system

- **EPA-8** DN: DIN 10...100 | ISO 8...80 | ASME 3/4"...4"
Material: Stainless steel 1.4435 (316L)
Surface: Ra≤0,8 µm (Ra≤0,6 | 0,4 µm optional)
- **EPA-18** DN: DIN 25... 100 | ISO 20...80 | ASME 1"...4"
Material: Stainless steel 1.4435 (316L)
Surface: Ra≤0,8 µm (Ra≤0,6 | 0,4 µm optional)
- **Pipe standard:** DIN 11866 | ISO 1127 | ASME BPE





Dead leg free installation for every application, with pipe Tees DN10...100



TSBP / TSMP temperature sensors (Details see respective product information)

| | Type | Head Ø in mm | PT100 | Transmitter available | Electrical connection | Probe length in mm | Fitting system |
|---|--------------------|--------------|-----------------|-----------------------|----------------------------|--------------------|----------------|
|  | TSBP-E08 | 57 | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 10 25 50 100 | EPA-8 |
| | TSBP-E08 (Display) | 63 | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 10 25 50 100 | EPA-8 |
|  | TSMP-E08 | 18 | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 10 25 50 100 | EPA-8 |
|  | TSBP-E18 | 57 | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 20 50 | EPA-18 |
| | TSBP-E18 (Display) | 63 | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 20 50 | EPA-18 |
|  | TSMP-E18 | 18 | Pt100 Pt1000 | ✓ | M12 Plug PG Cable gland | 20 50 | EPA-18 |

NCS Point level sensors (Details see respective product information)

| | Type | Head Ø in mm | Measuring range | Fitting system |
|---|---------|--------------|-----------------|-------------------|
|  | NCS-61P | 50 | Dk ≥ 20 | EPA-8 |
| | NCS-62P | 18 | Dk ≥ 5 | EPA-8 |
|  | NCS-81P | 50 | Dk ≥ 20 | EPA-18 EPA-18G |
| | NCS-82P | 18 | Dk ≥ 2 | EPA-18 EPA-18G |

PHARMadapt EPA Fitting systems (Details see product information)

| | Typ | Pipe standard | Pipe widths DN |
|---|-------------|----------------------|--|
|  | EPA -8 / A | Series A (DIN 11866) | DIN 10 15 25 32 40 50 65 80 100 |
| | EPA -8 / B | Series B (ISO 1127) | ISO 8 10 15 20 25 32 40 50 65 80 |
| | EPA -8 / C | Series C (ASME BPE) | ASME ¾" 1" 1½" 2" 2½" 3" 4" |
|  | EPA -18 / A | Series A (DIN 11866) | DIN 25 32 40 50 65 80 100 |
| | EPA -18 / B | Series B (ISO 1127) | ISO 20 25 32 40 50 65 80 |
| | EPA -18 / C | Series C (ASME BPE) | ASME 1" 1½" 2" 2½" 3" 4" |

Optimized pressure measurement for smallest pipe diameters Absolutely zero dead-leg, flush front installation

For **high-precision and hygienic pressure measurement**, the pressure diaphragm must be integrated into the process **as flush as possible and without dead space**. This is a particular challenge for pipes with **small nominal diameters**.

Here, the CPM installation system offers a **process connection that is easy and safe to install** and offers unique advantages due to its special design.

- **Zero dead-leg installation with perfect diaphragm position:**
Due to the design of the CPM adapter and the extension of the sensor nozzle, the pressure diaphragm sits inline precisely at the height of the media feed-through. This results in an absolutely flow-optimized and hygienic process adaptation. Due to the design of the CPM, dead spaces such as with Tees or weld-on sockets are excluded.
- **Pressure sensors with standard sizes:** Pressure sensors with standard diaphragm diameters of 22 or 38 mm are also used for the smallest nominal pipe diameters from ¼". Measurement tolerances such as those for smaller diaphragm diameters are avoided by design
- **Easy installation:** The CPM adapter is simply fixed in the process with Tri-Clamp or can be welded safely and hygienically with AWF welding collar in orbital process. The pressure sensor itself is sealed with an O-ring and mounted with a standard 1½" clamp

Available pressure transmitters and gauges

- D3 Differential pressure and level sensor
- L3 Pressure and level sensor
- MPP Modular pressure and level sensor
- PF Modular pressure sensor
- HA Pressure sensor (autoclavable)
- EK Pressure gauge 63 mm (autoclavable with CPM)
- EM Pressure gauge 90 mm (autoclavable)
- EP Pressure gauge with digital display

Variants of the CPM fitting system

- CPM (Ø 38,1 mm), for nominal widths ½" - 4"
- CPM Mini (Ø 22,2 mm), for nominal widths ¼" - ½"
- Tri-Clamp connection, for nominal widths ½" bis 4"
- AWF (butt weld), for nominal widths ¼" bis 4"
- **Material: Stainless steel 316L** (Option: Hastelloy)
- **Surface: Ra = 0,4 | 0,5 | 0,6 µm** (see table)





Zero dead-leg, flush front inline process connection for pipes from ¼" to 4"

CPM Fitting systems (Details see product information)

Materials:





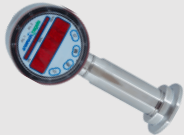



Stainless steel 316L with 3.1 Certificate with batch number | (Hastelloy (Option)

O-Ring EPDM USP Class VI (Standard) | Silicon or Viton (Option)

| | Type | Pipe size | Connection | Surface Ra Ep=electropolished | Length in mm |
|--|----------|-----------|-----------------|----------------------------------|--------------|
|  | CPM Mini | ¼" | AWF (butt weld) | Ra≤0,5 (ep) | 101,6 |
| | CPM Mini | ½" | AWF (butt weld) | Ra≤0,4 (ep) | 101,6 |
| | CPM Mini | ½" | Tri-Clamp | Ra≤0,4 (ep) | 152,4 |
|  | CPM | ½" | AWF (butt weld) | Ra≤0,4 (ep) | 133,4 |
| | CPM | ½" | Tri-Clamp | Ra≤0,4 (ep) | 114,3 |
| | CPM | ¾" | AWF (butt weld) | Ra≤0,4 (ep) | 133,4 |
| | CPM | ¾" | Tri-Clamp | Ra≤0,4 (ep) | 120,7 |
| | CPM | 1" | AWF (butt weld) | Ra≤0,4 (ep) | 120,7 |
| | CPM | 1" | Tri-Clamp | Ra≤0,4 (ep) | 133,4 |
| | CPM | 1-½" | AWF (butt weld) | Ra≤0,4 (ep) | 139,7 |
| | CPM | 1-½" | Tri-Clamp | Ra≤0,4 (ep) | 146,1 |
| | CPM | 2" | AWF (butt weld) | Ra≤0,4 (ep) | 177,8 |
| | CPM | 2" | Tri-Clamp | Ra≤0,4 (ep) | 171,5 |
| | CPM | 2-½" | AWF (butt weld) | Ra≤0,6 | 184,2 |
| | CPM | 2-½" | Tri-Clamp | Ra≤0,6 | 184,2 |
| | CPM | 3" | AWF (butt weld) | Ra≤0,6 | 196,9 |
| | CPM | 3" | Tri-Clamp | Ra≤0,6 | 196,9 |
| | CPM | 4" | AWF (butt weld) | Ra≤0,6 | 241,3 |
| | CPM | 4" | Tri-Clamp | Ra≤0,6 | 241,3 |



Available pressure transmitters and gauges (Details see respective product information)

| | Type | Application | Connection | | Type | Application | Connection |
|---|------|--|-----------------|--|------|---|-----------------|
|  | D3 | Differential pressure and level sensor | CPM |  | HA | Pressure sensor (autoclavable only with CPM) | CPM CPM Mini |
|  | L3 | Pressure and level sensor | CPM |  | EK | Pressure gauge 63 mm (autoclavable only with CPM) | CPM CPM Mini |
|  | MPP | Modular pressure and level sensor | CPM CPM Mini |  | EM | Pressure gauge 90 mm (autoclavable) | CPM |
|  | PF | Modular pressure sensor | CPM |  | EP | Pressure gauge with digital display | CPM CPM Mini |

Illustrations partly not with CPM connection

Process adaptors and fittings

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