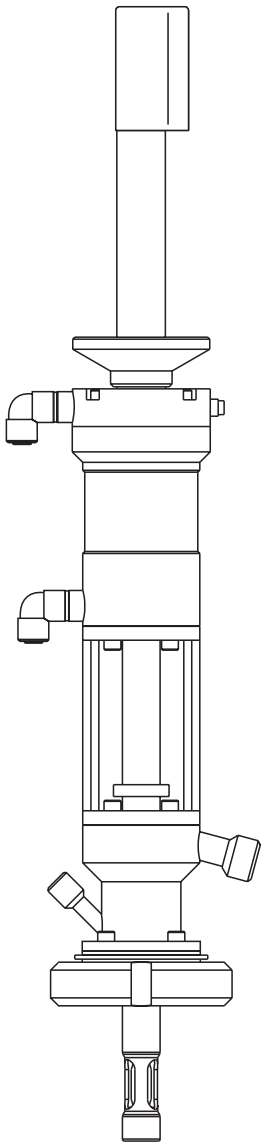
Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Operating Instructions

Probfit H CPA465

Retractable Process Assembly

74-



BA146C/07/en/11.05
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Endress+Hauser

People for Process Automation

Brief overview

Here is how to use these Operating Instructions to commission your assembly quickly and safely:

	Safety instructions
→ Page 4 ff.	General safety instructions
→ Page 5	Explanation of the warning symbols You can find special instructions at the appropriate position in chapter in question. The significance is indicated with the icons Warning ⚠, Caution ☝ and Note ✎.

▼

	Installation
→ Page 4 ff.	Here you can find installation conditions such as the dimensions of the assembly.
→ Page 15 ff.	Refer to these pages to connect compressed air hoses, limit position switches and rinse water lines.
→ Page 17 ff.	Here you can find how to install a sensor in the assembly.

▼

	Maintenance
→ Page 20 ff.	For normal operation of the assembly, it is absolutely essential to carry out maintenance tasks on a regular basis, such as sensor or assembly cleaning.
→ Page 23 ff.	On the given pages you can find the accessories for the assembly.
→ Page 26	Here you can find an overview of the spare parts which can be delivered.

▼

	Technical data
→ Page 10 ff.	Dimensions
→ Page 28	Environment and process, weight, materials etc.

▼

	Index
→ Page 29	You can find important terms and keywords on the individual sections here. Use the keyword index to find the information you need quickly and efficiently.

Table of contents

1 Safety instructions

1.1 Designated use

The manually or pneumatically driven retractable assembly Probfit H CPA465 is designed for installing pH/redox sensors in tanks and pipes. Its mechanical design permits its use in pressurized systems (see "Technical data").

The assembly facilitates automatic sensor cleaning and sterilization without interrupting the process in:
- The pharmaceutical industry
- Food technology
- The process industry

Any other use than the one described here compromises the safety of persons and the entire measuring system and is, therefore, not permitted.
The manufacturer is not liable for damage caused by improper or non-designated use.

1.2 Installation, commissioning and operation

Please note the following items:
- Installation, commissioning, operation and maintenance of the measuring system must only be carried out by trained technical personnel.
  The technical personnel must be authorised for the specified activities by the system operator.
- Electrical connection must only be carried out by a certified electrician.
- Technical personnel must have read and understood these Operating Instructions and must adhere to them.
- Before commissioning the entire measuring point, check all the connections for correctness. Ensure that electrical cables and hose connections are not damaged.
- Do not operate damaged products and secure them against unintentional commissioning. Mark the damaged product as being defective.
- Measuring point faults may only be rectified by authorised and specially trained personnel.
- If faults can not be rectified, the products must be taken out of service and secured against unintentional commissioning.
- Repairs not described in these Operating Instructions may only be carried out at the manufacturer's or by the service organisation.

1.3 Operational safety

The assembly has been designed and tested according to the state of the art and left the factory in perfect functioning order.
Relevant regulations and European standards have been met.

As the user, you are responsible for complying with the following safety conditions:
- Installation instructions
- Local prevailing standards and regulations.

1.4 Return

If the assembly has to be repaired, please return it *cleaned* to the sales centre responsible.
Please use the original packaging, if possible.

Please enclose the completed "Declaration of contamination" (copy the second last page of these Operating Instructions) with the packaging and the transportation documents.
No repair without completed "Declaration of contamination"!

1.5 Notes on safety icons and symbols

Warning!
This symbol alerts you to hazards. They can cause serious damage to the instrument or to persons if ignored.

Caution!
This symbol alerts you to possible faults which could arise from incorrect operation. They could cause damage to the instrument if ignored.

Note!
This symbol indicates important items of information.

2 Identification

2.1 Nameplate

You can identify the assembly version by the order code on the nameplate. Please compare this code with your order.

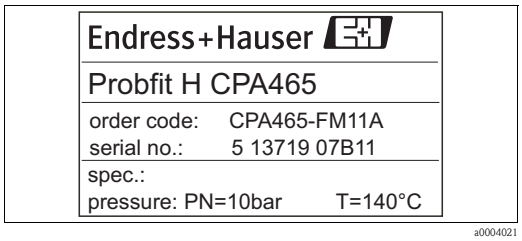


Fig. 1: Example of a nameplate

For possible assembly versions and the resulting order codes, see the product structure.

2.2 Product structure

	Version and type of installation					
	CA	Chemical version, flange ANSI 2" 150 lbs				
	CD	Chemical version, flange DN 50 PN 16				
	FA	Sanitary version, APV adapter DN 50 ... 100				
	FC	Sanitary version, Clamp 2" adapter				
	FM	Sanitary version, dairy fitting adapter DN 50 ***only permitted with adapter from SKS Siersma***				
	FV	Sanitary version, Varivent adapter DN 50 ... 125				
	PO	Pharmaceutical version, DN 25 no adapter				
	PF	Pharmaceutical version, built-in adapter DN 25, straight				
	PG	Pharmaceutical version, built-in adapter DN 25, inclined				
		Electrode type				
		1	Glass electrode + ISFET, gel			
		2	Glass electrode + ISFET, liquid KCl			
			O-ring material			
			1	EPDM		
			2	Viton		
				Equipment level		
				A	Standard equipment	
				B	Inspection certificate in accordance with EN 10204-3.1B	
CPA465-						complete order code

2.3 Scope of delivery

The scope of delivery comprises:
- Probfit H CPA465 assembly
- Socket wrench AF 17
- Splash protection cap
- PML stranded extension wire
- Distance sleeve for versions FA, FC, FV, CA and CD
- Operating Instructions BA146C/07/en.

If you have any questions, please contact your supplier or your sales center responsible.

2.4 Certificates and approvals

The sanitary version CPA465-F for Ceraliquid electrodes corresponds to standard 3A 74-.

3 Installation

3.1 Incoming acceptance, transport, storage

- Make sure the packaging is undamaged!
  Inform the supplier about damage to the packaging.
  Keep the damaged packaging until the matter has been settled.
- Make sure the contents are undamaged!
  Inform the supplier about damage to the delivery contents.
  Keep the damaged products until the matter has been settled.
- Check that the scope of delivery is complete and agrees with your order and the shipping documents.
- The packaging material used to store or to transport the product must provide shock protection and humidity protection. The original packaging offers the best protection. Also, keep to the approved ambient conditions (see "Technical data").
- If you have any questions, please contact your supplier or your sales center responsible.

3.2 Installation conditions

3.2.1 Notes on installation

Note!
When mounting the pharmaceutical or sanitary versions of the assembly, only use materials that comply with standards 3A 74-!

The assembly is designed for installation on tanks and pipes. Suitable nozzles must be available for this.
When using standard glass electrodes, only orientations are permitted in which the middle axis of the assembly lies at least at an angle of 15° to 75° from the horizontal (see Fig. 2). Otherwise, there will not be a reliable contact between the inner side of the pH membrane and the inner terminal leads via the electrolytes.
If the angle of installation is greater than 75° to the horizontal, air bubbles could gather in the chamber.

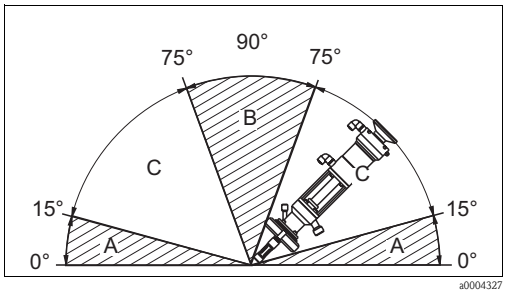


Fig. 2: Angle of installation for glass electrodes

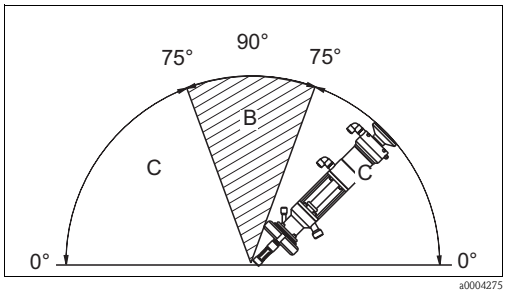


Fig. 3: Angle of installation for ISFET sensors

A Impermissible orientation
B Orientation permitted to a certain extent (air bubble formation)
C Recommended orientation

When using an ISFET Tophit sensor, there are, in principle, no restrictions for the orientation. An installation angle of 0 to 75° is recommended however. Overhead installation is possible.

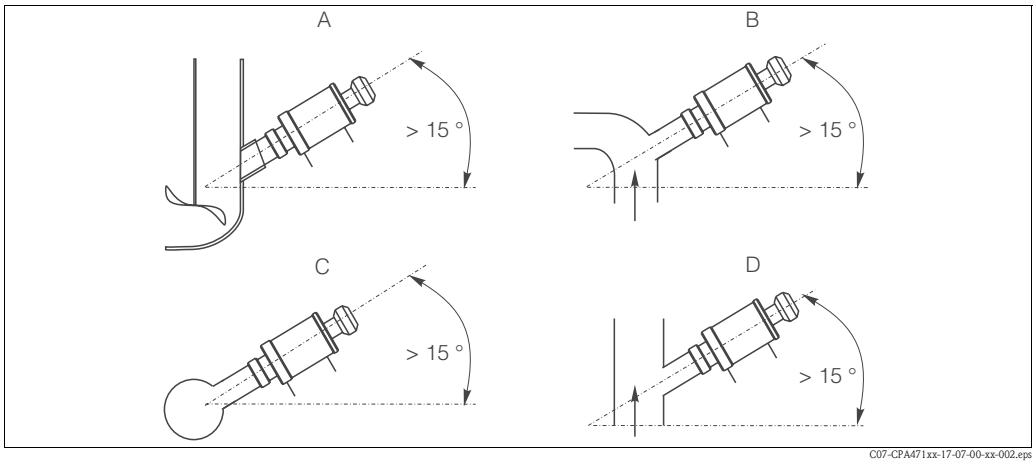


Fig. 4: Installation examples with recommended installation angle (glass electrodes)

A Tank
B Pipe bend
C Horizontal pipe
D Ascending pipe

Caution!
- For all assemblies with stainless steel pressure cylinders, we recommend to use a flanged version when installing with inclined orientation. Otherwise, the weight of the assembly could affect the safety of the process connection.
- Avoid a siphon effect[1] at the rinse chamber outlet when installing with inclined orientation. The inlet to the rinse chamber must be from below.

Note!
- The minimum diameter for direct installation in pipework is DN 80. This diameter is required so that the assembly has sufficient distance from the pipe wall when moved to the "Measuring" position.
- For smaller pipe diameters, use a flow vessel (see "Accessories") to install the Probfit assembly.
- When designing the installation nozzle, please observe the total immersion depth in operation. Ensure that the sensor is always immersed in the medium in operation (see "Dimensions")!

1) Siphon effect: line emptied by vacuum

3.2.2 Dimensions

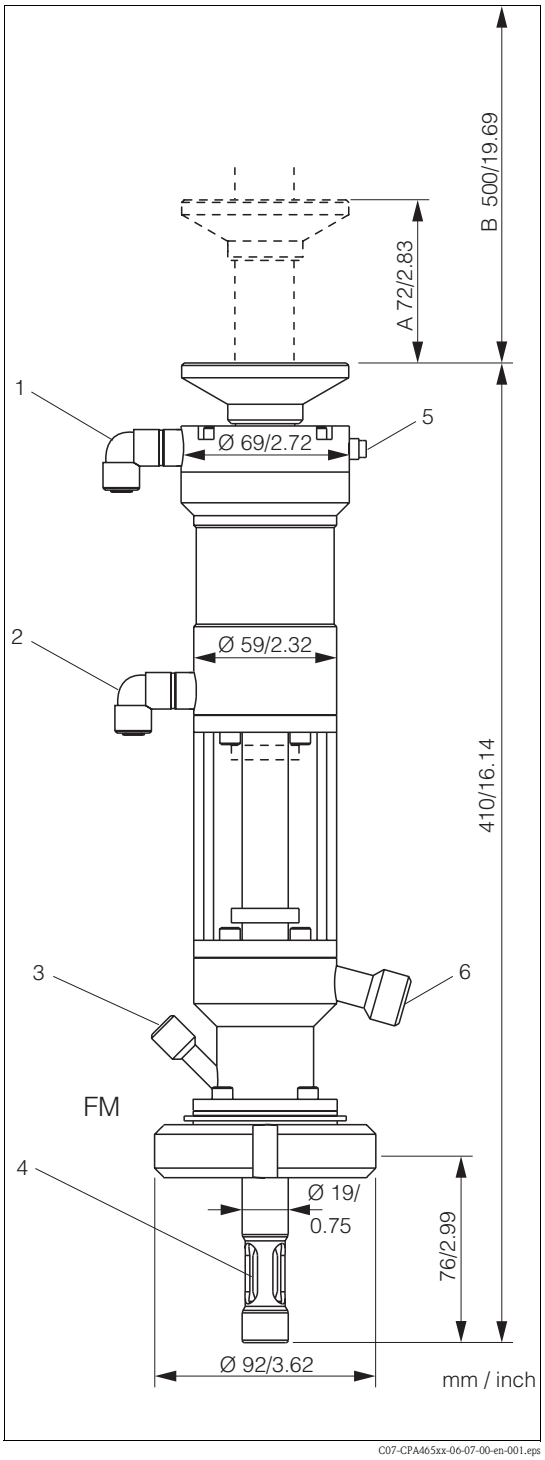


Fig. 5: Sanitary and chemical version

A Stroke in mm
B Necessary mounting clearance in mm
FM with dairy fitting adapter DN 50
1 Compressed air connection, measuring
2 Compressed air connection, service position
3 Rinse connection, inlet
4 Sensor protection guard
5 PML connection
6 Rinse connection, outlet

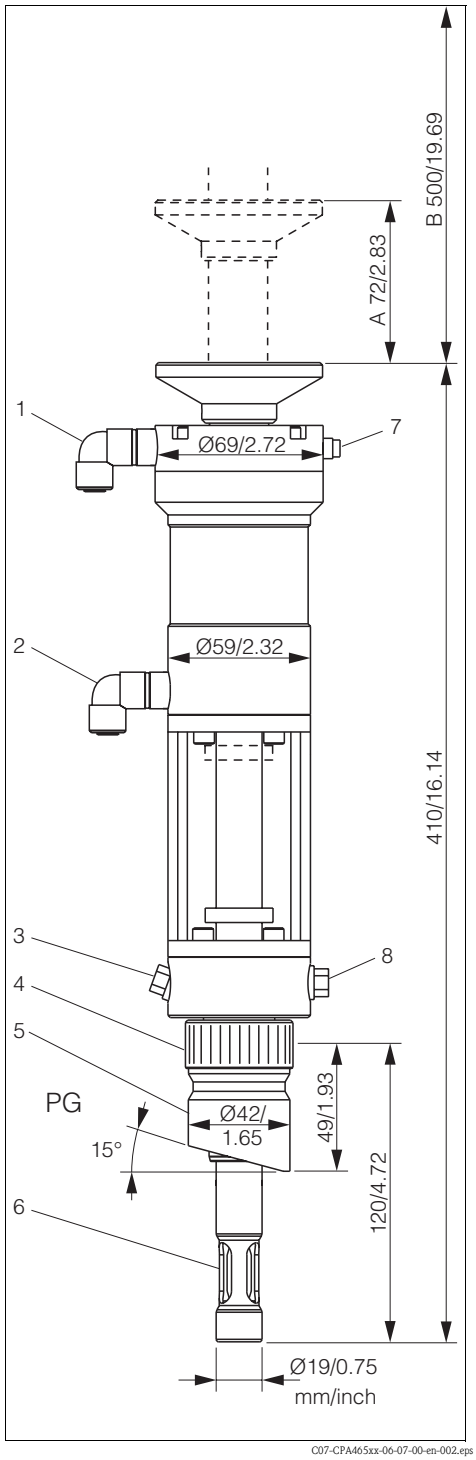


Fig. 6: Pharmaceutical version

A Stroke in mm
B Necessary mounting clearance in mm
PG With built-in adapter DN 25, inclined
1 Compressed air connection, measuring
2 Compressed air connection, service position
3 Rinse connection, inlet
4 Coupling nut G 1¼ (OD 45 mm)
5 Built-in adapter
6 Sensor protection guard
7 PML connection
8 Rinse connection, outlet

3.2.3 Process connections

The CPA465 assembly can be fixed directly to the process line with various adapters.

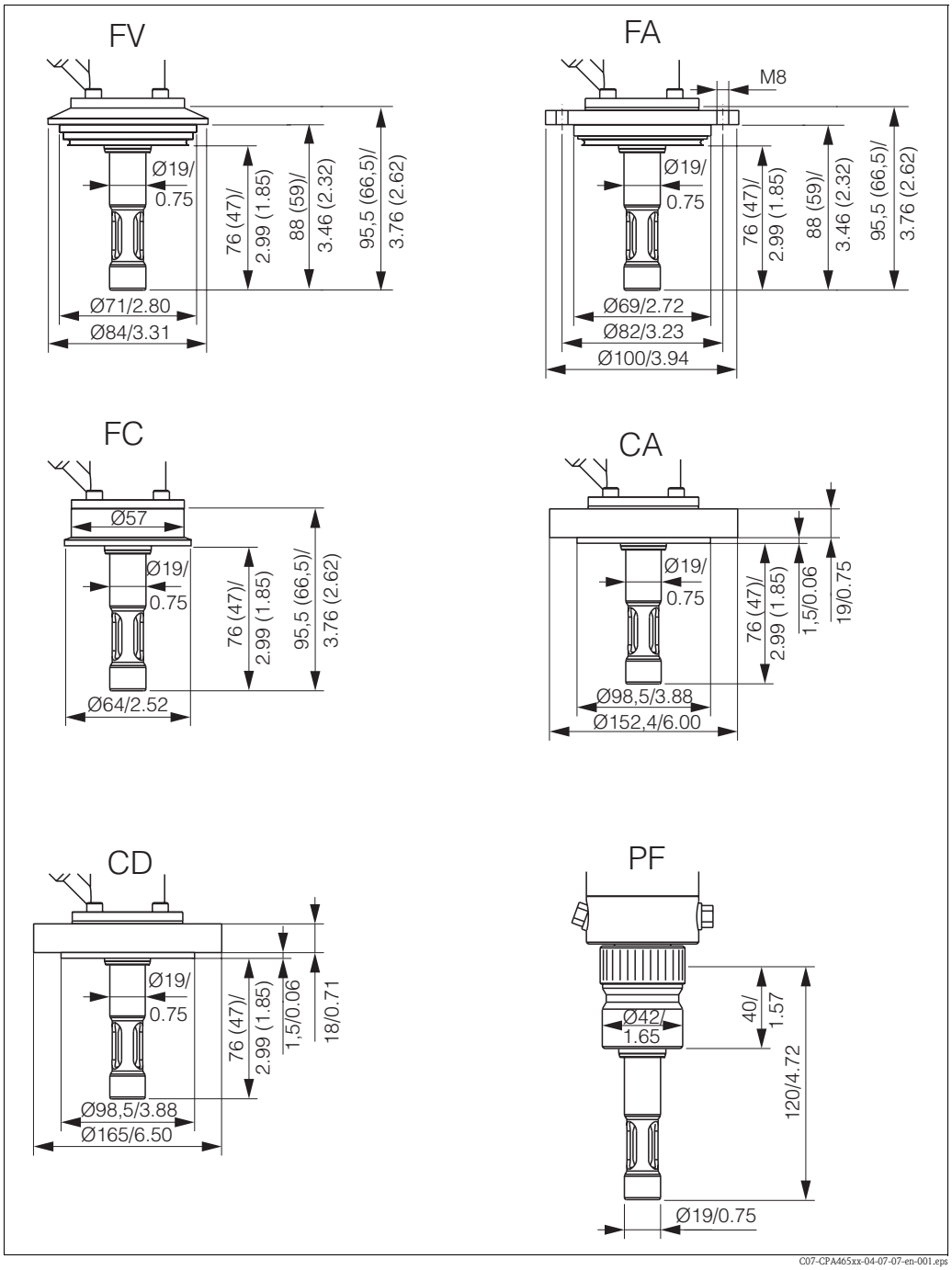


Fig. 7: Process connections CPA465 (dimensions in brackets for reduced immersion depth)

FV With Varivent adapter DN 50 ... 125
FA With APV adapter DN 50 ... 100
FC With Clamp 2" adapter
CA With flange ANSI 2"
CD With flange DN 50
PF With built-in adapter DN 25, straight

3.3 Installation

3.3.1 Measuring system

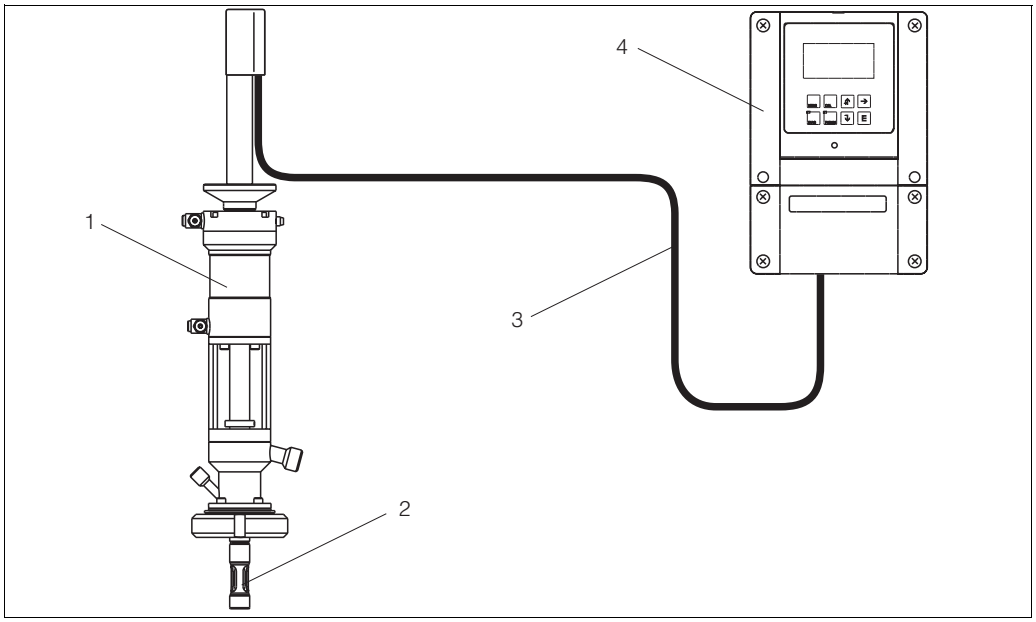


Fig. 8: Complete measuring system (example)

1 Probfit H assembly
2 pH sensor
3 Measuring cable, e.g. CPK9
4 Transmitter, e.g. Mycom S CPM153

3.3.2 Reduction of the immersion depth

In the case of small pipe diameters, the immersion depth can be reduced by 29 mm (1.14 ")on versions FA, FC, FV, CA and CD. To do so, insert the supplied distance sleeve into the compressed air chamber.

Disassembling the assembly

1. Remove the measuring cable from the sensor head connector. Unscrew the sensor with the socket wrench (AF 17).
2. Release the four screws on the process connection (item 1) and remove the process connection.
3. Release the four screws on the rinse chamber (item 2). Carefully remove the rinse chamber from the sensor guide (item 3).
4. Push down the position ring (item 4) until the O-ring under it appears. The position ring is now movable.
5. Release the four screws on the cover (item 5) of the compressed air chamber (item 6).
6. Now carefully remove the sensor guide (item 3) completely.

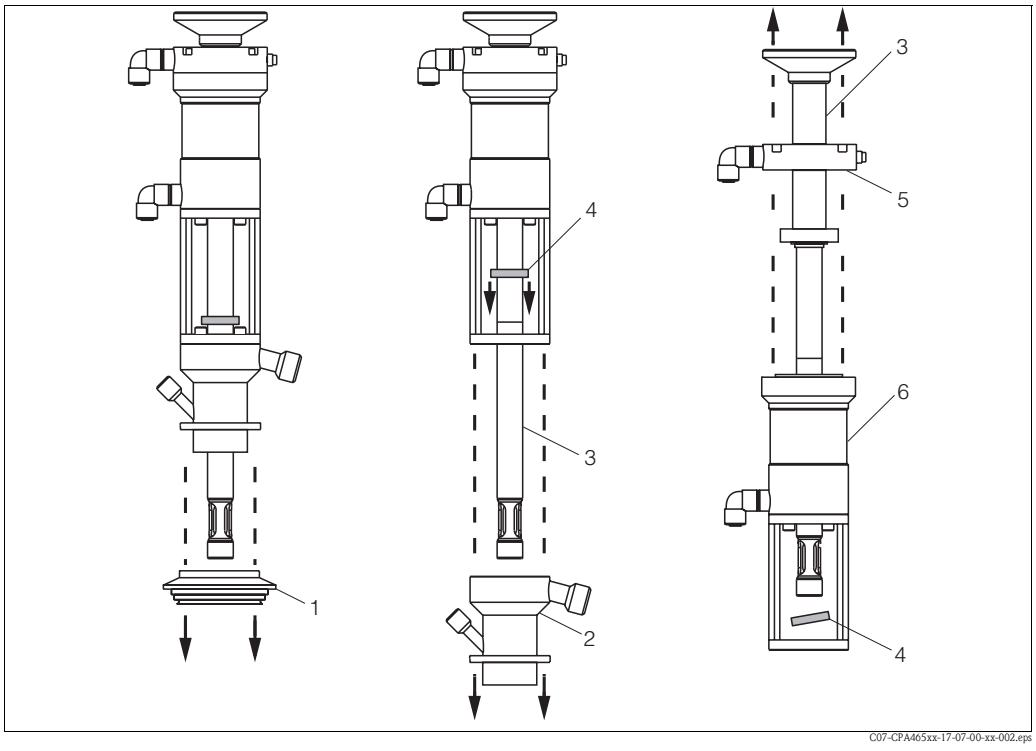


Fig. 9: Disassembling the assembly

Mounting the assembly with a distance sleeve

Warning!
The molded seals are not symmetrical. For this reason, make sure that the orientation is correct when mounting.
A different sequence when mounting can damage the molded seals.

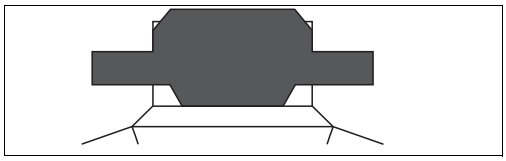


Fig. 10: Orientation of molded seal F1 at the top end of the rinse chamber (small diameter to rinse chamber)

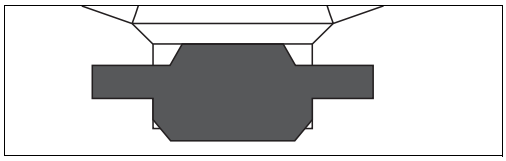


Fig. 11: Orientation of molded seal F2 at the bottom end of the rinse chamber (small diameter to rinse chamber)

1. Push the distance sleeve (item 7) onto the sensor guide (item 3) from the sensor protection guard side.
2. Push the sensor guide with the distance sleeve into the compressed air chamber (item 6).
3. Guide the sensor guide through the open intermediate section (item 8) and in doing so push the position ring (item 4) onto the sensor guide until it is firmly seated over the O-ring (item O).
4. Screw on the cover (item 5) of the compressed air chamber. Hand-tighten the four screws and then tighten them by a quarter turn.
5. Insert the molded seal (item F1) on the intermediate section (item 8). Pay attention to the orientation of the molded seal (see Fig. 10).
6. Now mount the rinse chamber (item 2) with the four associated screws.
7. Insert the second molded seal (item F2) into the process connection (item 1). Pay attention to the orientation of the molded seal (see Fig. 11).
8. Now you have to carefully position the process connection and screw it down.

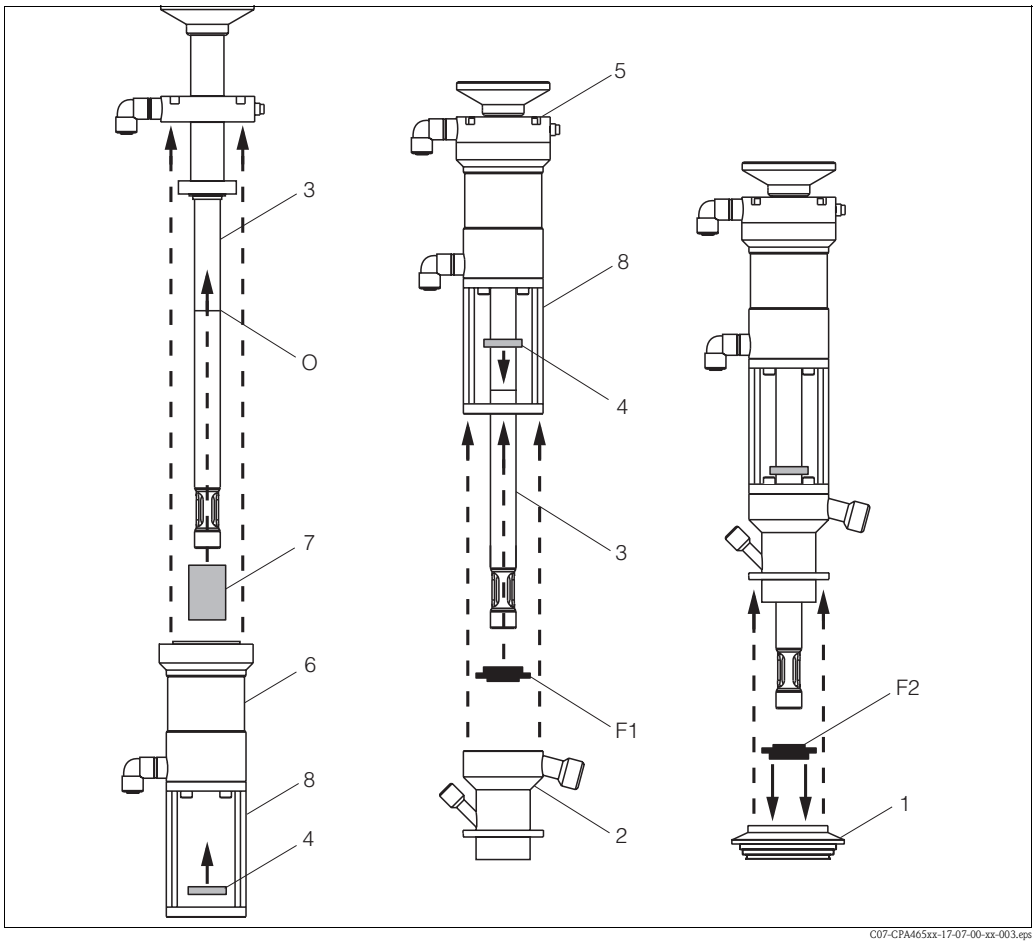
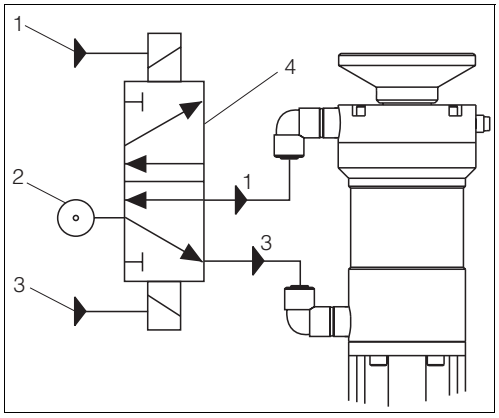


Fig. 12: Mounting the assembly with a distance sleeve

3.3.3 Compressed air connection

A 5/2-way valve is needed at the point of installation to control the CPA465 assembly pneumatically.



1 "Measuring" control signal
2 Compressed air supply
3 "Service" control signal
4 5/2-way valve

Fig. 13: Pneumatic connection

Position indicator

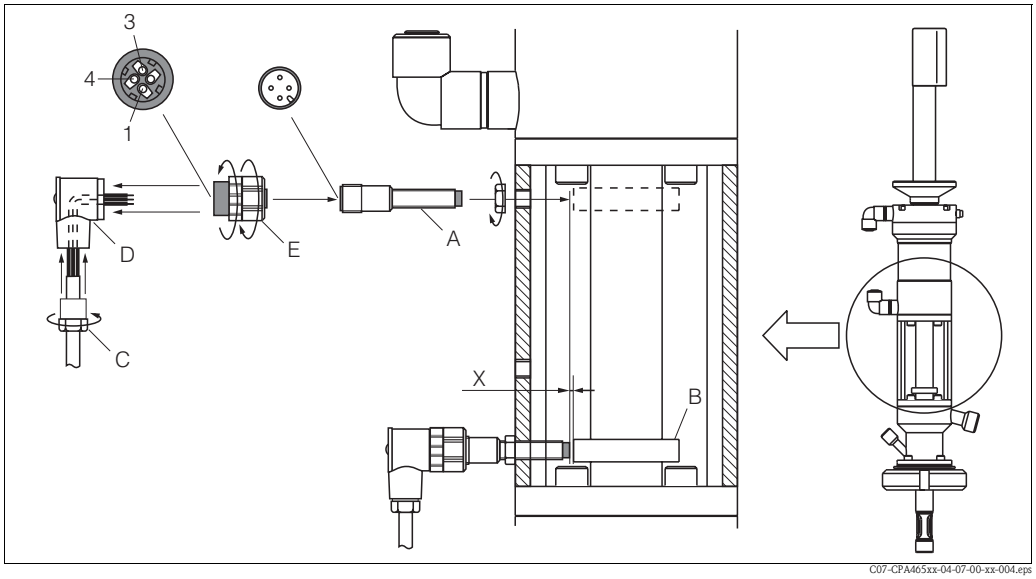


Fig. 14: Mounting the inductive limit position switches

Mounting the switches

1. Screw the limit position switches A into the appropriate housing bores.
2. Distance X between position ring B and limit position switch A should be approx. 0.5 mm (0.02 "). Adjust the limit position switch with the nuts supplied so that they observe this distance.

Mounting the connectors

1. Pull the cable through the strain relief C and through the angle piece D.
2. Connect the three cable cores into sockets 1, 3 and 4 for connector E.
3. Connect the angle piece D.
4. Tighten the strain relief C.

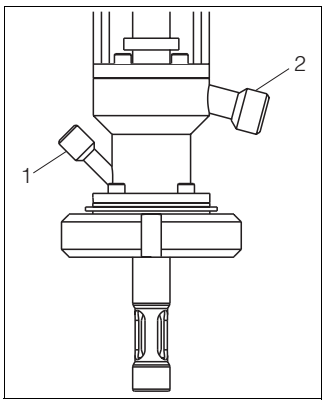
Electrical connection
When electrically connecting the inductive limit position switches, please refer to the notes in the Operating Instructions of the control unit and of the limit position switches themselves.

3.3.4 Rinse connection

You can rinse the cleaning chambers with the following media:
- Water
- Cleaner
- Sterilization steam
- Purging air
- Buffer solution

In doing so, observe the material resistance of the assembly and make sure the maximum permitted temperatures and pressures are observed.

The rinse connections of assembly CPA465:



Sanitary and chemical version
1 Rinse connection inlet: G ¼ – external thread (ID 6)
2 Rinse connection outlet: G ½ – external thread (ID 10)

Pharmaceutical version
1 Rinse connection inlet: G $^{1}/_{8}$ – internal thread
2 Rinse connection outlet: G $^{1}/_{8}$ – internal thread

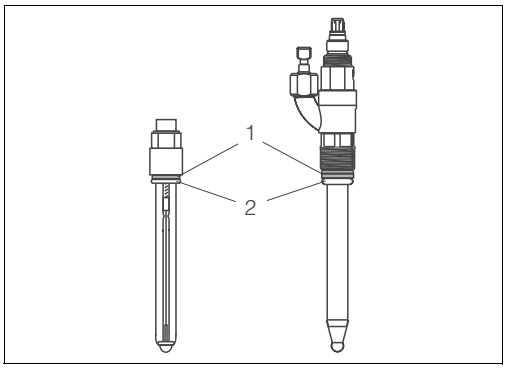
Fig. 15: Rinse connections

Operate the rinse connection of the assembly with a water pressure of 2 bar (29 psi) to maximum 6 bar (87 psi). In the water line (inlet side of the assembly), also install a check valve and a dirt trap (100 µm, see "Accessories").

Caution!
There must be a pressure-reducing valve upstream if water pressures can increase above 6 bar (87 psi)(even short pressure surges). Otherwise, this can result in damage to the assembly.

3.3.5 Sensor installation

Warning!
Make sure that the sensor is correctly installed before moving the assembly into the process.



(A) O-ring
(B) Thrust collar

Fig. 16: Sensor installation

Preparation

1. Remove the protection cap from the sensor.
2. Make sure that the O-ring (A) and the thrust collar (B) are present on the sensor shaft.
3. Wet the sensor shaft with water. This makes it easier to screw in the sensor.

Gel sensors

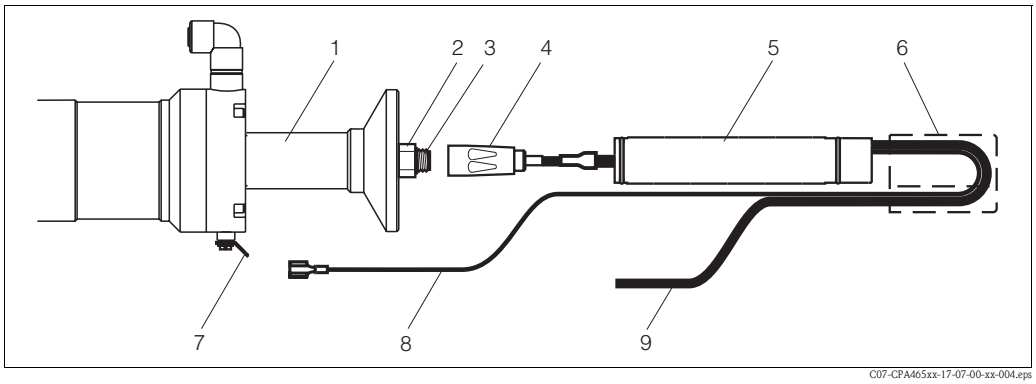


Fig. 17: Installation parts for installing Orbisint sensors

1	Sensor guide	6	Splash protection cap
2	Sensor	7	PML connection
3	Threaded plug-in head	8	Potential matching line (PML)
4	Sensor connector	9	Measuring cable, e.g. CPK9
5	Protective sleeve		

Install the sensor

1. Move the assembly to the "Service" position.
2. Remove the splash protection cap.
3. Unscrew the protective sleeve.
4. Screw the sensor **handtight** into the sensor guide.
5. Now tighten the sensor with a ¼ turn using a socket wrench (AF 17).

Connect the measuring cable to the sensor

1. Guide the measuring cable with the sensor connector through the protective sleeve.
2. Screw the sensor connector onto the threaded plug-in head of the sensor.
3. Screw the protective sleeve back on.
4. Bend the measuring cable appropriately Fig. 17 and attach the splash protection cap.
5. Extend the potential matching line (PAL) and attach it to the PML connection. The stranded extension wire is supplied with the assembly.

Sensors with liquid KCl electrolyte

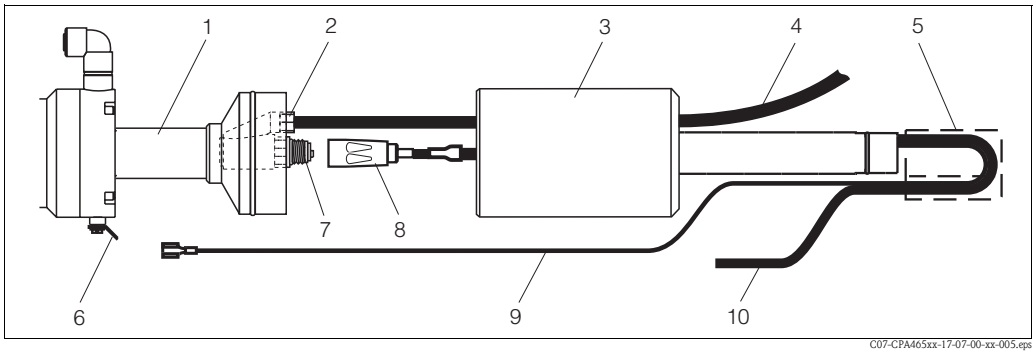


Fig. 18: Installation parts for installing Ceraliquid sensors

1	Sensor guide	6	PML connection
2	Sensor with electrolyte termination	7	Threaded plug-in head
3	Protective sleeve	8	Sensor connector
4	Electrolyte supply tube	9	Potential matching line (PML)
5	Splash protection cap	10	Measuring cable, e.g. CPK9

Install the sensor

1. Move the assembly to the "Service" position.
2. Remove the splash protection cap.
3. Remove the protective sleeve. It consists of two parts screwed together.
4. Screw the sensor **handtight** into the sensor guide.
5. Now tighten the sensor with a ¼ turn using a socket wrench (AF 17).

Connect the measuring cable to the sensor

1. Guide the measuring cable from above with the sensor connector through the two-part protective sleeve.
2. Screw the sensor connector onto the threaded plug-in head of the sensor.
3. Laterally guide the electrolyte supply tube into the protective sleeve and connect it to the electrolyte connection of the sensor.
4. Fit the protective sleeve back on.
5. Bend the measuring cable appropriately Fig. 18 and attach the splash protection cap.
6. Extend the potential matching line (PAL) and attach it to the PML connection. The stranded extension wire is supplied with the assembly.

3.4 Post-installation check

- After installation, check that all connections are firmly in position and leak-tight.
- Ensure that the hoses cannot be removed without force.
- Check all hoses for damage.

4 Operation

4.1 First commissioning

Before the first commissioning, make sure of the following items:
- All seals are correctly seated (on the assembly and process connection).
- The sensor is correctly installed and connected.
- The water supply line is correctly connected to the rinse connections (if fitted).
- The limit position switches (according to assembly version) are correctly connected.

Warning!
Danger of squirting medium.
Before applying compressed air to the pneumatic assembly, make sure the connections are correctly fitted with either rinsing hoses or dummy plugs. Otherwise the assembly may **not** be put into the process!

4.2 Pneumatic operation

The operation of the assembly depends on the control system. Please refer to the instructions for the control system for the operating instructions.

5 Maintenance

Warning!
Risk of injury!
Before starting maintenance work on the assembly, make sure that the process line and the tank are depressurised, empty and rinsed.

5.1 Cleaning the assembly

To ensure a reliable measurement, the assembly and the sensor must be cleaned at regular intervals. The frequency and intensity of the cleaning operation depend on the process medium.

5.1.1 Manually operated assembly

All parts in contact with the medium, e.g. the sensor and the sensor holder, must be cleaned at regular intervals. Remove the sensor[1].

- Remove light dirt using suitable cleaning agents (see chapter "Cleaning agents").
- Remove severe fouling with a soft brush and a suitable cleaning agent.
- Remove persistant fouling by soaking in a liquid cleaner and if neccessary by cleaning with a soft brush.

5.1.2 Pneumatically operated assembly

Pneumatically-controlled cleaning can be carried out regularly via the rinse connection and the corresponding equipment, e.g. with the fully automatic cleaning and calibration system Topcal S CPC300.

5.2 Cleaning the sensor

You have to clean the sensor:

- before every calibration
- regularly during operation
- before being returned for repair

You can remove and clean the sensor manually or perform cleaning in automatic operation[2] via the rinse connection.

Note!

- Clean redox electrodes only mechanically and with water, do not use any chemical cleaning agents. These cleaning agents apply a potential to the electrode that takes several hours to decay. This potential causes measuring errors.
- Do not use any abrasive cleaning agents. This can lead to irreparable damage of the sensor.
- After cleaning the sensor, rinse the rinse chamber of the assembly with copious amounts of water (possibly distilled or de-ionised). Otherwise, remaining residues of cleaning agent can corrupt measurement.
- If required, re-calibrate after cleaning.

1) in reverse sequence of operations to the installation procedure
2) with the corresponding assembly equipment only

5.3 Cleaning agents

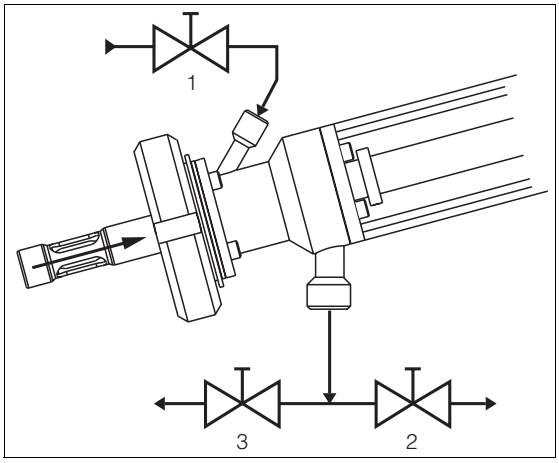
The selection of the cleaning agent is dependent on the degree and type of contamination. The most common contaminations and the suitable cleaning agents are listed in the following table.

Type of contamination	Cleaning agent
Greases and oils	Substances containing tensides (alkaline)[1] or water-soluble organic solvents (e.g. Ethanol)
Calciferous deposits, metal hydroxide deposits, lyophobic biological deposits	Approx. 3% hydrochloric acid
Sulphide deposits	Mixture of 3% hydrochloric acid and thiocarbamide (commercially available)
Protein deposits	Mixture of 3% hydrochloric acid and pepsin (commercially available)
Fibres, suspended substances	Water under pressure, poss. with surface-active agents
Light biological deposits	Water under pressure

1) do not use for Tophit ISFET sensors! Instead, use commercially available acidic cleaning agents for the food industry (e.g. P3-horolith CIP, P3-horolith FL, P3-oxonia active).

Caution!
Do not use organic solvents containing halogen or acetone. These solvents could destroy plastic components of the assembly or the sensor and it is also partly suspected that they cause cancer (e.g. Chloroform).

5.4 Sterilizing the sensor



1 Valve 1 - steam inlet

2 Valve 2 - rinsing water outlet

3 Valve 3 - condensate outlet

Fig. 19: Valve arrangement

Valve position when cleaning and sterilizing the sensor

Procedure	Valve 1	Valve 2	Valve 3
Moving out	Closed	Closed	Closed
Cleaning	Open	Open	Closed
Sterilizing	Open	Closed	Open

Warning!
Avoid temperature shock: Do not move a hot sensor into a cold medium!

Procedure

1. Make sure that valves 1, 2 and 3 are closed.
2. Move the assembly to the "Service" position.
3. Clean the rinse chamber and the sensor with steam until the rinse chamber is hot. In doing so, the steam is supplied via valve 1 and exits via valve 2.
4. Sterilize the rinse chamber and the sensor. In doing so, the steam is supplied via valve 1 and exits via valve 3.
   Steam temperature: max. 140 °C (284 °F)
   Sterilization time: approx. 30 min
5. After sterilization, vent the rinse chamber with sterile air so that the sensor cools down.

5.5 Notes on calibration

Regular sensor calibration is vital for reliable measurement. The calibration cycles depend on the range of application and the desired accuracy.
You have to define the calibration cycles separately for each application. At the start, perform calibration frequently (e.g. weekly) to determine the operating characteristics of the sensor.
Follow the corresponding instructions for calibration in the Operating Instructions of the transmitter used.

Note!
- The calibration cycles depend on the process conditions and the medium.
- When using a symmetrical connection, there must be an electrical connection between the potential matching (PML) and the buffer solution.
- Do not allow a glass electrode to stand dry or pH sensors (including ISFET) to stand in distilled water.
- Do not use compressed air to blow clear automatic calibration systems with ISFET sensors.

6 Accessories

6.1 Installation accessories

- Varivent tank connection adapter
  Order No.: 50080515

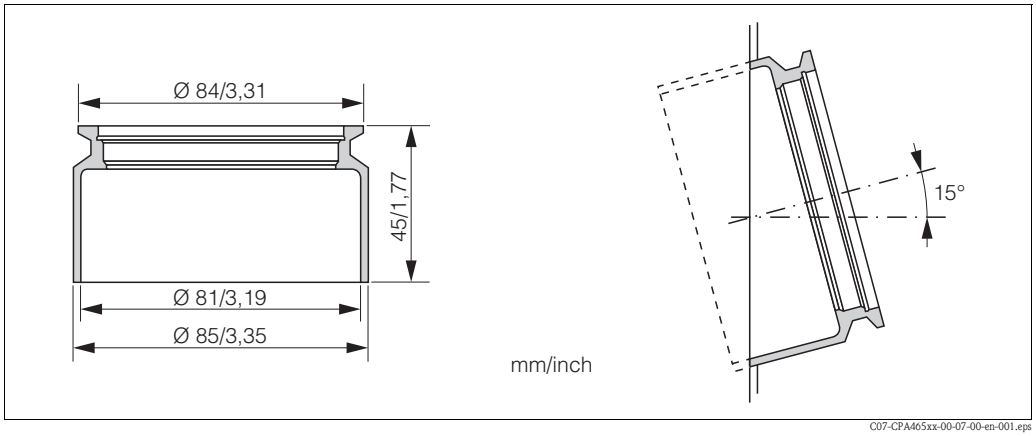


Fig. 20: Varivent tank connection adapter

- Built-in adapter DN 25
  Stainless steel 1.4404
  "Straight" version – Order No.: 51500328
  "Inclined" version – Order No.: 51500327

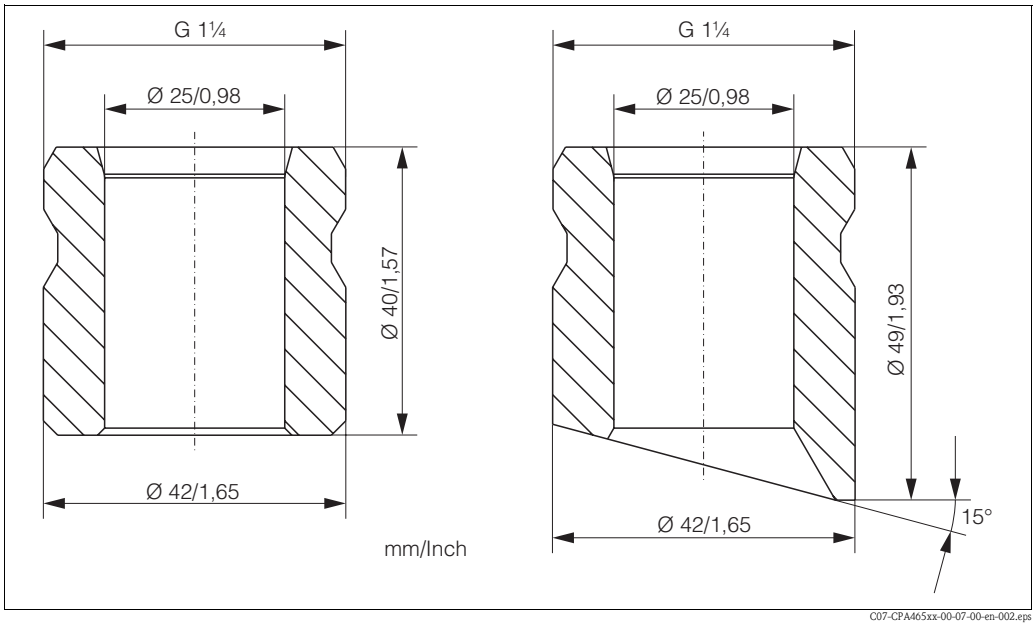


Fig. 21: G 1¼ build-in adapter, straight and inclined

- Conversion retrofit set for Ceraliquid sensors
  Order No.: 50080516

6.2 Limit position switch

- Inductive proximity switches, NAMUR Ex
  2-part set with elbow plugs, connection thread M8x1
  Order No.: 50087313

6.3 Pneumatic throttle

- Pneumatic throttle for the reduction of the assembly moving speed,
  order no. 51511990

6.4 Sensors

6.4.1 Glass electrodes

- Orbisint CPS11/CPS11D
  pH electrode for process applications, with PTFE diaphragm, Memosens technology as option;
  Ordering acc. to product structure, see Technical Information (TI028/C07/en)
- Orbisint CPS12/CPS12D
  ORP electrode for process applications, with PTFE diaphragm, Memosens technology as option;
  Ordering acc. to product structure, see Technical Information (TI367/C07/en)
- Ceraliquid CPS41/CPS41D
  pH electrode with ceramics diaphragm and KCl liquid electrolyte, Memosens technology as option;
  Ordering acc. to product structure, see Technical Information (TI079/C07/en)
- Ceraliquid CPS42/CPS42D
  ORP electrode with ceramics diaphragm and KCl liquid electrolyte, Memosens technology as option;
  Ordering acc. to product structure, see Technical Information (TI079/C07/en)
- Ceragel CPS71/CPS71D
  pH electrode with double chamber reference system and integrated bridge electrolyte, Memosens technology as option;
  Ordering acc. to product structure, see Technical Information (TI245/C07/en)
- Ceragel CPS72/CPS72D
  ORP electrode with double chamber reference system and integrated bridge electrolyte, Memosens technology as option;
  Ordering acc. to product structure, see Technical Information (TI374/C07/en)
- Orbipore CPS91/CPS91D
  pH electrode with open aperture for media with high dirt load, Memosens technology as option;
  Ordering acc. to product structure, see Technical Information (TI375C/07/en)

6.4.2 ISFET sensors

- Tophit CPS471
  Sterilisable and autoclavable ISFET sensor for food and pharmaceuticals, process technology, water treatment and biotechnology;
  Ordering acc. to product structure, see Technical Information (TI283/C07/en)
- Tophit CPS441
  Sterilisable ISFET sensor for media with low conductivity, with liquid KCl electrolyte;
  Ordering acc. to product structure, see Technical Information (TI352/C07/en)
- Tophit CPS491
  ISFET sensor with open aperture for media with high dirt load;
  Ordering acc. to product structure, see Technical Information (TI377/C07/en)

6.5 Calibration solutions

6.5.1 pH

Technical buffer solutions, accuracy 0.02 pH, acc. to NIST/DIN
- pH 4.0 red, 100 ml (3.4 fl.oz.), order no. CPY2-0
- pH 4.0 red, 1000 ml (34 fl.oz.), order no. CPY2-1
- pH 7.0 green, 100 ml (3.4 fl.oz.), order no. CPY2-2
- pH 7.0 green, 1000 ml (34 fl.oz.), order no. CPY2-3

Technical buffer solutions for single use, accuracy 0.02 pH, acc. to NIST/DIN
- pH 4.0 20 x 20 ml (0.68 fl.oz.), order no. CPY2-D
- pH 7.0 20 x 20 ml (0.68 fl.oz.), order no. CPY2-E

6.5.2 Redox

Technical buffer solutions for ORP electrodes
- +220 mV, pH 7.0, 100 ml (0.026 US gal.); order no. CPY3-0
- +468 mV, pH 0.1, 100 ml (0.026 US gal.); order no. CPY3-1

6.6 Measuring cables

- CPK9 special measuring cable
  For sensors with TOP68 plug-in head, for high-temperature and high-pressure applications, IP 68
  Ordering acc. to product structure, see Technical Information (TI118C/07/en)
- CPK12 special measuring cable
  For pH/ORP glass electrodes and ISFET sensors with TOP68 plug-in head
  Ordering acc. to product structure, see Technical Information (TI118C/07/en)
- CYK10 Memosens data cable
  For digital pH sensors with Memosens technology (CPSxxD)
  Ordering according to product structure, see Technical Information (TI376C/07/en)

6.7 Transmitters

- Liquiline M CM42
  Modular two-wire transmitter, stainless steel or plastic, field or panel instrument,
  various Ex approvals (ATEX, FM, CSA, Nepsi, TIIS),
  HART, PROFIBUS or FOUNDATION Fieldbus available
  Ordering acc. to product structure, see Technical Information (TI381C/07/en)
- Liquisys M CPM223/253
  Transmitter for pH and redox, field or panel-mounted housing,
  HART or PROFIBUS available
  Ordering acc. to product structure, see Technical Information (TI194C/07/en)
- Mycom S CPM153
  Transmitter for pH and redox, one or two channel version, Ex or Non-Ex,
  HART or PROFIBUS available
  Ordering acc. to product structure, see Technical Information (TI233C/07/en)

6.8 Measuring, cleaning and calibration systems

- Topcal S CPC300
  Fully automatic measuring, cleaning and calibration system; Ex or Non-Ex,
  in-situ cleaning and calibration, automatic sensor monitoring
  Ordering acc. to product structure, see Technical Information (TI236C/07/en)
- Topclean S CPC30
  Fully automatic measuring and cleaning system; Ex or Non-Ex,
  in-situ cleaning, automatic sensor monitoring
  Ordering acc. to product structure, see Technical Information (TI235C/07/en)

7 Trouble-shooting

7.1 Replacing damaged parts

Warning!
Damage to the assembly which affects the pressure safety must **only** be repaired by authorised technical personnel.
After every repair and maintenance activity, suitable measures must be taken to test whether the assembly shows any signs of leaking. The assembly must then correspond to the specifications stated in the technical data.

Replace all other damaged components immediately. To order accessories and spare parts, please use the "Accessories" and "Spare parts" chapters or contact your sales centre responsible.

7.2 Replacing seals

- Keep the sealing surfaces of the assembly free of dirt.
- Remove stubborn deposits from time to time.
- In the event of leakages, contact your Endress+Hauser sales center.

Warning!
Risk of medium escaping.
Seals must **only** be replaced by authorized technical personnel.

The procedure for replacing the molded seals is explained in the "Reducing the immersion depth" section.

7.3 Spare parts

- EPDM seal set,
  Sanitary version for CPA465
  Up to June 2005, Order No. 50079989
  As of June 2005, Order No. 51518388
- Viton seal set,
  Sanitary version for CPA465
  Up to June 2005, Order No. 50079988
  As of June 2005, Order No. 51518389
- EPDM seal set,
  Pharmaceutical version for CPA465
  Up to June 2005, Order No. 50079987
  As of June 2005, Order No. 51518391
- Viton seal set,
  Pharmaceutical version for CPA465
  Up to June 2005, Order No. 50079986
  As of June 2005, Order No. 51518392

7.4 Return

If the assembly has to be repaired, please return it *cleaned* to the sales centre responsible.
Please use the original packaging, if possible.

Please enclose the completed "Declaration of contamination" (copy the second last page of these Operating Instructions) with the packaging and the transportation documents.
No repair without completed "Declaration of contamination"!

7.5 Disposal

Remove electronic components, e.g. electric limit position switches. Dispose of these components in accordance with regulations on the disposal of electronic waste.
You have to separately dispose of pressure cylinder, sensor holder and other components according to their material.
Please observe local regulations.

8 Technical data

8.1 Environment

Ambient temperature	The ambient temperature may not drop below 0 °C (32 °F). The maximum permitted temperature for the limit position switches (NAMUR type) is 90 °C (194 °F).

8.2 Process

Pressure and temperature	Medium pressure	Max. 10 bar (145 psi) to 140°C (284 °F)
	Steam sterilization	Approx. 30 min at 140°C (284 °F) Steam pressure max. 3 bar (43.5 psi)

Pressure-temperature diagram

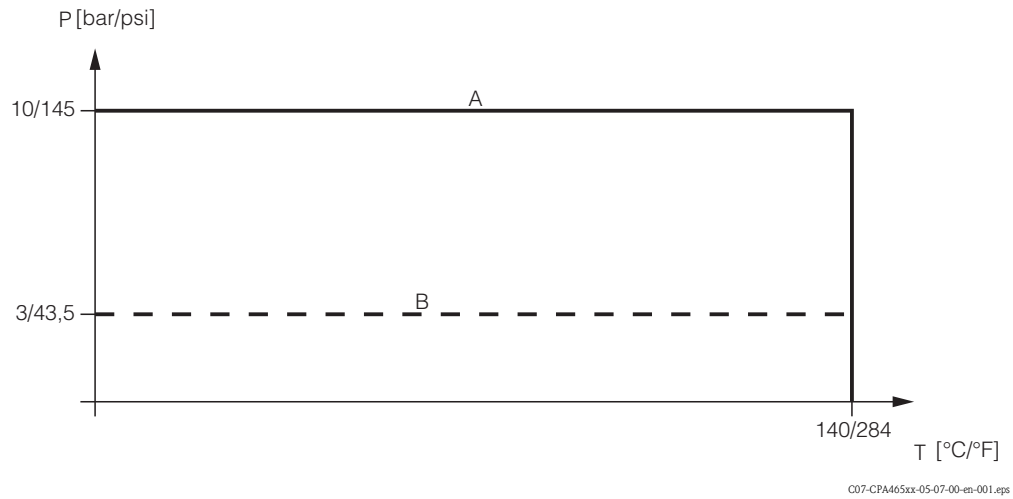


Fig. 22: Pressure-temperature diagram

A Process
B Steam

8.3 Mechanical construction

Design, dimensions	See "Installation" section	
Weight	Approx. 4 kg (8.8 lb)	
Material (in contact with medium)	Seals Material	EPDM or Viton with FDA approval Stainless steel 1.4404
Material (not in contact with medium)	Housing Splash protection cover	Stainless steel 1.4301 POM
Rinse connection nozzles	Sanitary version/chemical version	Inlet G ¼, ID 6 Outlet G ½, ID 10
	Pharmaceutical version	G $^{1}/_{8}$

Index

Endress+Hauser

People for Process Automation

Declaration of Hazardous Material and De-Contamination

Erklärung zur Kontamination und Reinigung

RA No. ☐☐☐☐☐☐☐☐

Please reference the Return Authorization Number (RA#), obtained from Endress+Hauser, on all paperwork and mark the RA# clearly on the outside of the box. If this procedure is not followed, it may result in the refusal of the package at our facility.
Bitte geben Sie die von E+H mitgeteilte Rücklieferungsnummer (RA#) auf allen Lieferpapieren an und vermerken Sie diese auch außen auf der Verpackung. Nichtbeachtung dieser Anweisung führt zur Ablehnung ihrer Lieferung.

Because of legal regulations and for the safety of our employees and operating equipment, we need the "Declaration of Hazardous Material and De-Contamination", with your signature, before your order can be handled. Please make absolutely sure to attach it to the outside of the packaging.
Aufgrund der gesetzlichen Vorschriften und zum Schutz unserer Mitarbeiter und Betriebseinrichtungen, benötigen wir die unterschriebene "Erklärung zur Kontamination und Reinigung", bevor Ihr Auftrag bearbeitet werden kann. Bringen Sie diese unbedingt außen an der Verpackung an.

Type of instrument / sensor
Geräte-/Sensortyp _____

Serial number
Seriennummer _____

☐ **Used as SIL device in a Safety Instrumented System /** *Einsatz als SIL Gerät in Schutzeinrichtungen*

Process data/ *Prozessdaten*

Temperature / *Temperatur* _____ [°F] _____ [°C]
Conductivity / *Leitfähigkeit* _____ [µS/cm]
Pressure / *Druck* _____ [psi] _____ [Pa]
Viscosity / *Viskosität* _____ [cp] _____ [mm^2/s]

Medium and warnings
Warnhinweise zum Medium

	Medium /concentration *Medium /Konzentration*	Identification CAS No.	 flammable *entzündlich*	 toxic *giftig*	 corrosive *ätzend*	 harmful/ irritant *gesundheits-schädlich/ reizend*	 other * *sonstiges**	 harmless *unbedenklich*
Process medium *Medium im Prozess*								
Medium for process cleaning *Medium zur Prozessreinigung*								
Returned part cleaned with *Medium zur Endreinigung*								

* explosive; oxidising; dangerous for the environment; biological risk; radioactive
* *explosiv; brandfördernd; umweltgefährlich; biogefährlich; radioaktiv*

Please tick should one of the above be applicable, include safety data sheet and, if necessary, special handling instructions.
Zutreffendes ankreuzen; trifft einer der Warnhinweise zu, Sicherheitsdatenblatt und ggf. spezielle Handhabungsvorschriften beilegen.

Description of failure / *Fehlerbeschreibung* _____

_____

_____

Company data / *Angaben zum Absender*

Company / *Firma* _____

_____

Address / *Adresse*

_____

_____

Phone number of contact person / *Telefon-Nr. Ansprechpartner:*

_____

Fax / E-Mail _____

Your order No. / *Ihre Auftragsnr.* _____

"We hereby certify that this declaration is filled out truthfully and completely to the best of our knowledge.We further certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free of any residues in dangerous quantities."
"Wir bestätigen, die vorliegende Erklärung nach unserem besten Wissen wahrheitsgetreu und vollständig ausgefüllt zu haben. Wir bestätigen weiter, dass die zurückgesandten Teile sorgfältig gereinigt wurden und nach unserem besten Wissen frei von Rückständen in gefahrbringender Menge sind."

(place, date / *Ort, Datum)*

Name, dept./*Abt.* (please print / *bitte Druckschrift*)

Signature / *Unterschrift*

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