

Brief Operating Instructions

Cleanfit CPA875

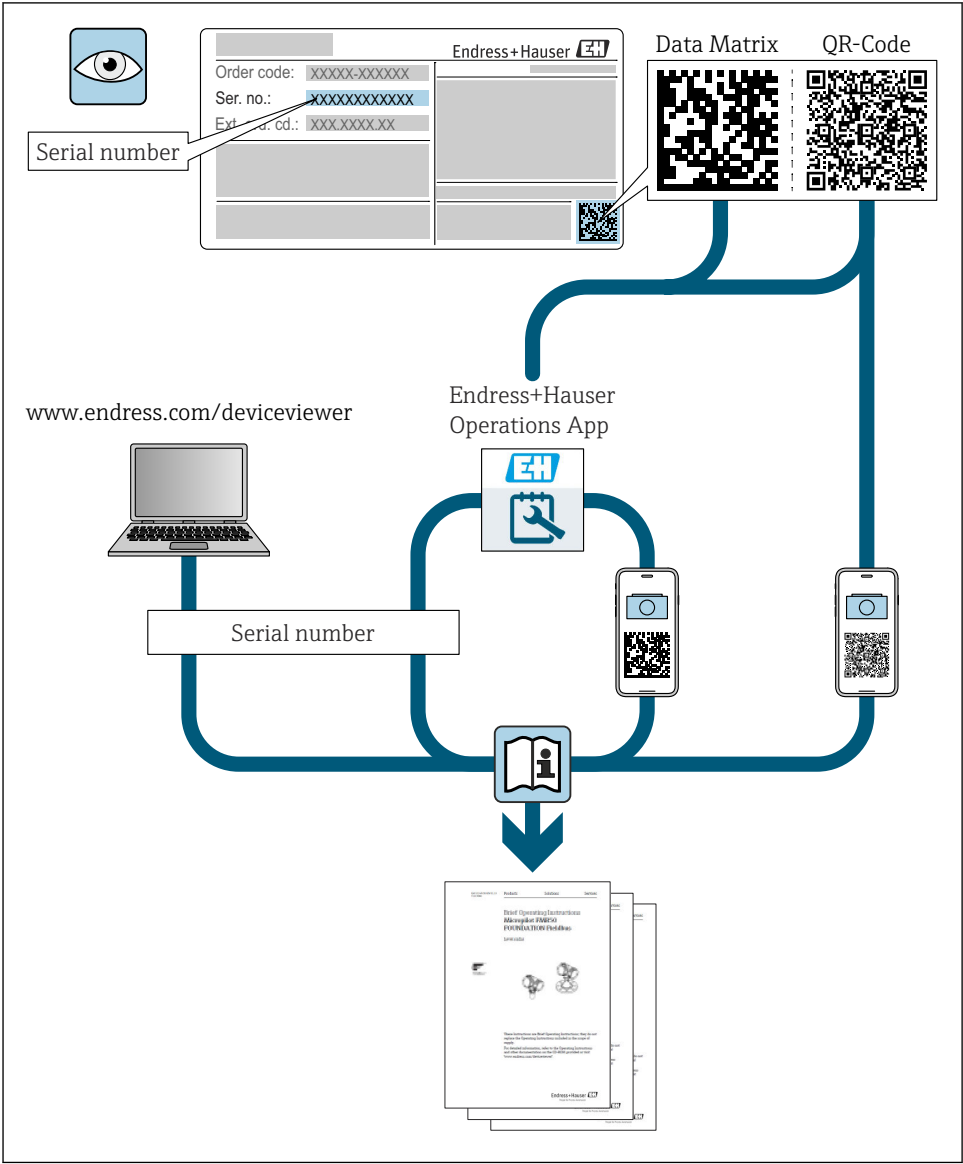
Retractable process assembly for sterile and hygienic applications



These instructions are Brief Operating Instructions; they are not a substitute for the Operating Instructions pertaining to the device.

Detailed information on the device can be found in the Operating Instructions and in the other documentation available at:

- www.endress.com/device-viewer
- Smart phone/tablet: Endress+Hauser Operations App



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1 About this document

1.1 Safety information

Structure of information	Meaning
<div> DANGER</div> <div>Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action</div>	<div>This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation will result in a fatal or serious injury.</div>
<div> WARNING</div> <div>Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action</div>	<div>This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation can result in a fatal or serious injury.</div>
<div> CAUTION</div> <div>Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action</div>	<div>This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.</div>
<div> NOTICE</div> <div>Cause/situation If necessary, Consequences of non-compliance (if applicable) ▶ Action/note</div>	<div>This symbol alerts you to situations which may result in damage to property.</div>

1.2 Symbols

-  Additional information, tips
-  Permitted
-  Recommended
-  Not permitted or not recommended
-  Reference to device documentation
-  Reference to page
-  Reference to graphic
-  Result of an individual step

1.2.1 Symbols on the device

-  Reference to device documentation
-  Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

1.3 Documentation



Special Documentation for hygienic applications, SD02751C

2 Basic safety instructions

2.1 Requirements for the personnel

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.



Repairs not described in the Operating Instructions provided must be carried out only directly at the manufacturer's site or by the service organization.

2.2 Intended use

The Cleanfit CPA875 retractable assembly, which can be manually or pneumatically operated, is designed for the installation of sensors in vessels and pipes.

Thanks to its design, it can be operated in pressurized systems ().

Any use other than that intended puts the safety of people and the measuring system at risk. Therefore, any other use is not permitted.

The manufacturer is not liable for harm caused by improper or unintended use.

2.2.1 Use in explosion-proof areas

As a manufacturer of products used for analysis, we declare that the product supplied has undergone an ignition risk assessment and may be used in hazardous atmospheres once the following conditions for safe usage have been met:

- The protective ring is labeled as follows: "CAUTION, DANGER DUE TO ELECTROSTATIC CHARGES, CLEAN USING ONLY AN ANTISTATIC CLOTH". This instruction must be observed.
- Assemblies comprising wetted parts made of non-conductive material, must not be used in potentially explosive atmospheres.
- The compressed air supply, sensors and limit position switches must comply with the applicable guidelines and standards for use in hazardous atmospheres, be labeled with the degree of protection and meet the requirements of the relevant range of application. The ambient temperatures must be observed. The limit position switch used in the product complies with this requirement.
- Ensure that the compressed air does not contain a potentially explosive atmosphere.
- Please ensure that movements associated with the retraction and insertion of the sensor do not damage the connection.
- The product must be incorporated into the local potential equalization system.
- The Operating Instructions for the product and in particular the conditions for safe usage must be read, understood and implemented.

The product does not need to be labeled with the degree of protection.

2.3 Workplace safety

The operator is responsible for ensuring compliance with the following safety regulations:

- Installation guidelines
- Local standards and regulations

2.4 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.

Procedure for damaged products:

1. Do not operate damaged products, and protect them against unintentional operation.
2. Label damaged products as defective.

During operation:

- If errors cannot be rectified,
take products out of service and protect them against unintentional operation.

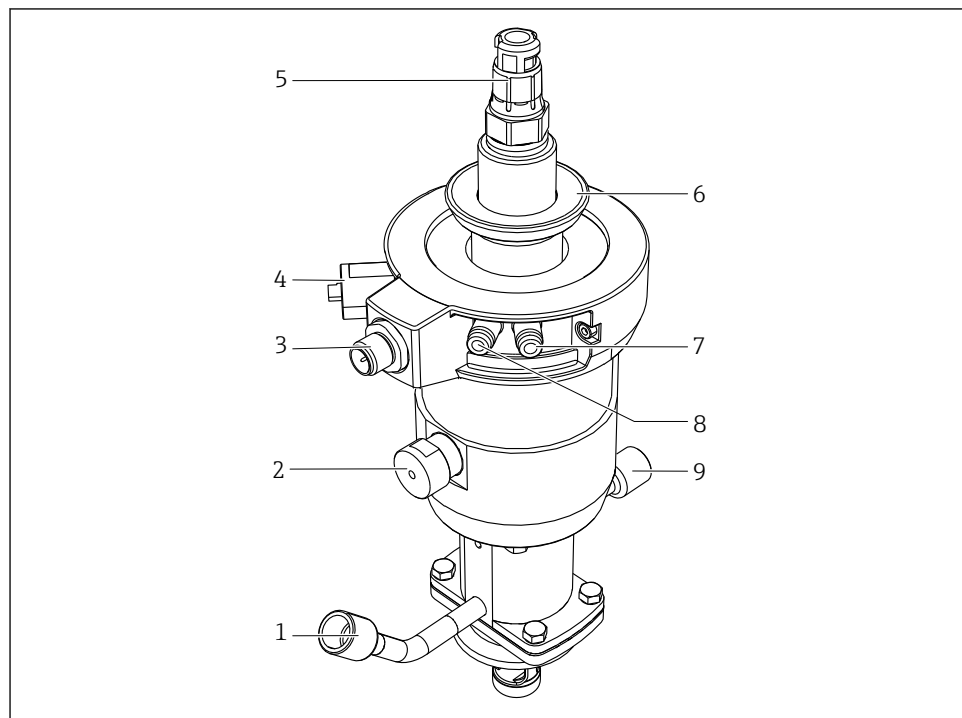
2.5 Product safety

2.5.1 State-of-the-art technology

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

3 Product description

3.1 Product design

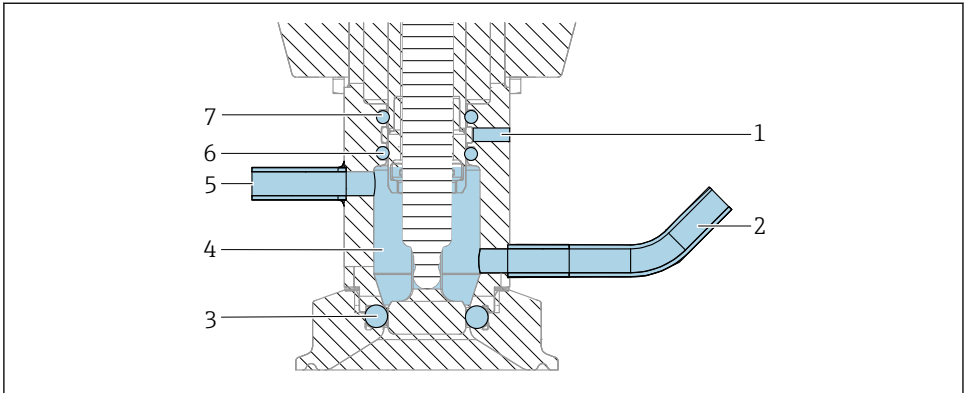


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1 Assembly with pneumatic drive (without protective cover)

- 1 Rinse connection (inlet)
- 2 Automatic limit position lock, process
- 3 Connection for limit position switch
- 4 Automatic limit position lock, service
- 5 Sensor head
- 6 Fastening ring for protective cover
- 7 Pneumatic connection (move to measuring position)
- 8 Pneumatic connection (move to service position)
- 9 Rinse connection (outlet)

3.1.1 Operating principle

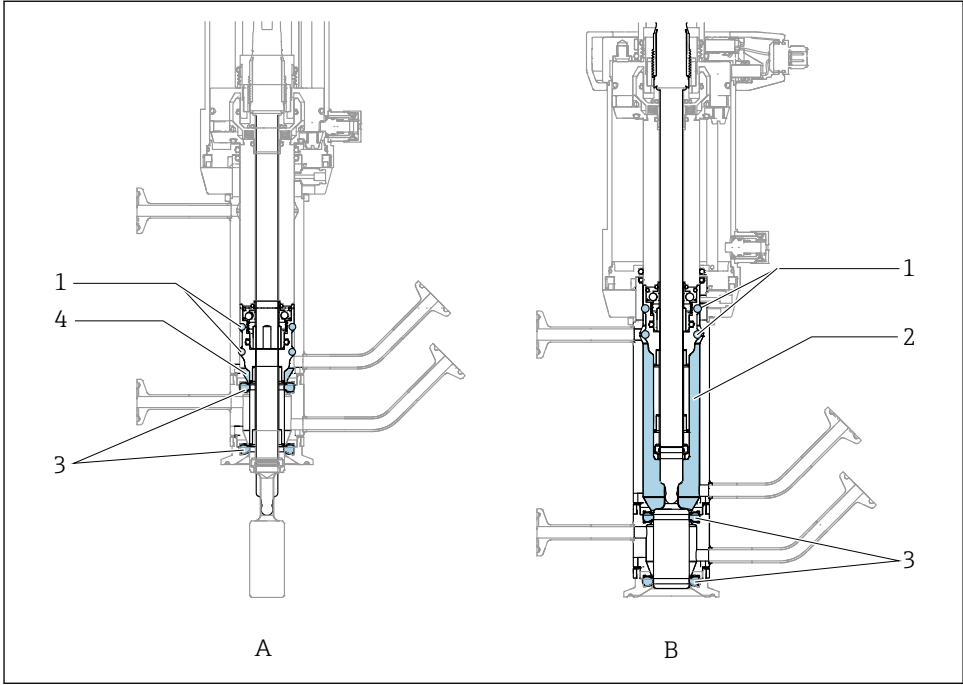


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2 Sealing system, assembly in service position

- 1 Leakage hole
- 2 Rinse chamber, inlet
- 3 Process seal, seal for DN25 with 1 x O-ring
- 4 Rinse chamber
- 5 Rinse chamber, outlet
- 6 Seal, rinse chamber (1 x O-ring)
- 7 Seal drive (1 x O-ring)

Process seal



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3 Moving sealing rings, only refers to the double chamber

A Measuring position

B Service position

1 "Moving" seals in the double chamber

2 Chamber volume in service position

3 Molded seal

4 Chamber volume in measuring position

4 Incoming acceptance and product identification

4.1 Incoming acceptance

1. Verify that the packaging is undamaged.
 - ↳ Notify the supplier of any damage to the packaging.
Keep the damaged packaging until the issue has been resolved.
2. Verify that the contents are undamaged.
 - ↳ Notify the supplier of any damage to the delivery contents.
Keep the damaged goods until the issue has been resolved.
3. Check that the delivery is complete and nothing is missing.
 - ↳ Compare the shipping documents with your order.
4. Pack the product for storage and transportation in such a way that it is protected against impact and moisture.
 - ↳ The original packaging offers the best protection.
Make sure to comply with the permitted ambient conditions.

If you have any questions, please contact your supplier or your local Sales Center.

4.2 Scope of delivery

The scope of delivery comprises:

- Assembly in the version ordered
- Operating Instructions
- Adapter for plug-in connector, 6 mm (0.24 in) to 4 mm (0.16 in) (outer diameter)
- Optional accessories ordered

4.3 Product identification

4.3.1 Nameplate

The nameplate provides you with the following information on your device:

- Manufacturer identification
- Order code
- Extended order code
- Serial number
- Ambient and process conditions
- Safety information and warnings

- ▶ Compare the information on the nameplate with the order.

4.3.2 Identifying the product

The order code and serial number of your product can be found in the following locations:

- On the nameplate
- In the delivery papers

Obtaining information on the product

1. Go to www.endress.com.
2. Page search (magnifying glass symbol): Enter valid serial number.
3. Search (magnifying glass).
 - ↳ The product structure is displayed in a popup window.
4. Click the product overview.
 - ↳ Here you will find information pertaining to your device, including the product documentation.

Product page

www.endress.com/CPA875

Manufacturer address

Endress+Hauser Conducta GmbH+Co. KG
Dieselstraße 24
70839 Gerlingen
Germany

5 Installation

5.1 Installation requirements

5.1.1 Information regarding hygiene-compliant installation according to EHEDG

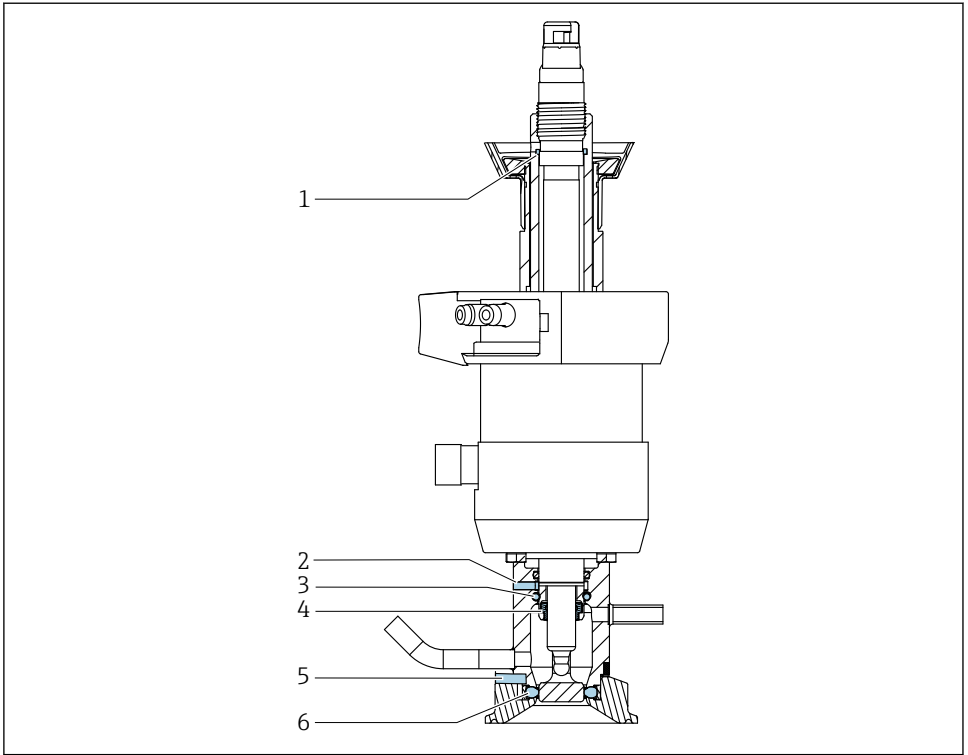
Easily cleanable installation of equipment according to the criteria of the EHEDG must be free of dead legs. If a dead leg is unavoidable, it shall be kept as short as possible. Under no circumstances shall the length of a dead leg L exceed the pipe's inner diameter D minus the equipment's enveloping diameter d . The condition $L \leq D - d$ applies. Furthermore, the dead leg must be self-draining, so neither product nor process fluids are retained therein. Within tank installations, the cleaning device must be located so that it directly flushes the dead leg.

For further reference, see the recommendations concerning hygienic seals and installations in EHEDG Doc. 10 and the Position Paper: "Easy cleanable Pipe couplings and Process connections".

5.1.2 Information regarding hygiene-compliant installation according to 3-A

For 3-A-compliant installation, please observe the following:

1. After mounting the device, ensure its hygienic integrity. For this purpose, the assembly must be installed in such a way that the leakage holes are located at the lowest point on the device.
2. Use 3-A-compliant process connections.



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4 Hygienic bores and seals according to 3A

- 1 Bore, sensor screw-in
- 2 Bore, rinse chamber
- 3 Drive seal
- 4 Sensor seal
- 5 Process connection bore
- 6 Process seal



Versions with the DA, DC, DF, EA and NA process connections only have a leakage hole on the rinse chamber.

5.1.3 Leakage paths for monitoring the process seals

The leakage paths serve as an indicator for damaged seals.

If medium escapes at one of the leakage paths:

- Perform maintenance work on the assembly.
- Replace the seals.
- Clean the assembly completely.

5.1.4 Rinse connections

CAUTION

There is a direct connection between the process and the service chamber when the assembly is inserted/retracted. Medium can escape through the service chamber connections.

Risk of injury from escaping process medium.

- Connect the service chamber connections.
- Check all connections for leaks prior to commissioning.

Due to the operating principle, there is a connection between the process and the service chamber during insertion/retraction. This serves a number of purposes:

- Prevention of contamination of the process: due to the pressure in the process, small volumes of process medium are flushed into the service chamber, thereby preventing any negative interference with the process.
- Implementation of the sealing water function: in applications with media that cake easily, suitable media (e.g. condensate) can be flushed into the process to extend the service life of the seals.

1. Connect the rinsing chamber connections accordingly.
2. Include the assembly in the maintenance concept.
3. Clean the assembly regularly.

5.1.5 Orientation

NOTICE

Frost damage to the assembly

- If used outdoors, ensure that water cannot penetrate the drive.

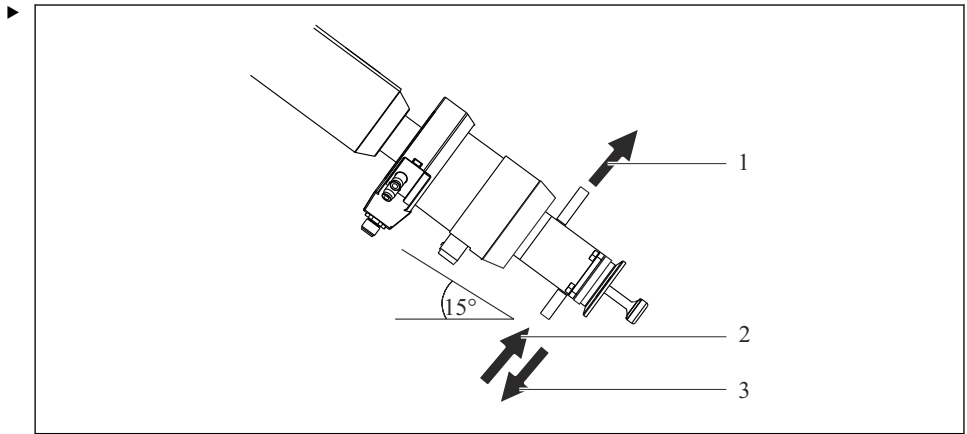
The assembly is designed to be mounted on vessels and pipes. Suitable process connections must be available for this.

The assembly is designed in such a way that there are no restrictions with regard to the orientation.



The sensor that is used can restrict the orientation.

The assembly can be installed in such a way that it can drain on its own.



5 Installation angle for self-draining

- 1 Rinsing
- 2 Rinsing
- 3 Draining

Install the assembly at an angle of $\geq 5^\circ$ and $\leq 15^\circ$ to the horizontal.

↳ The service chambers are now self-draining.

i Ensure compliance with the Operating Instructions of the sensor installed.

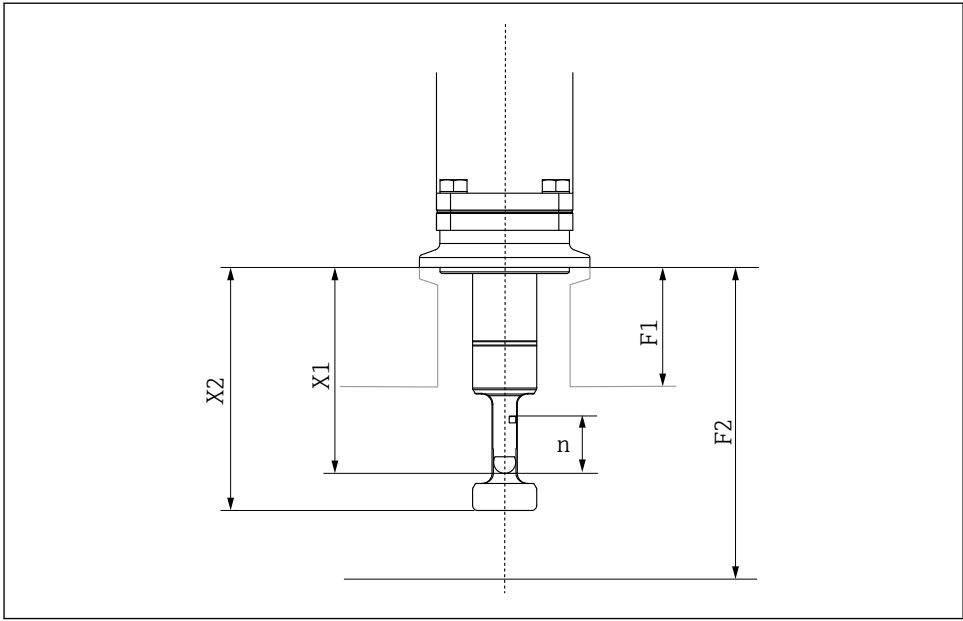
Installation free of dead space

A measurement in the dead space is inaccurate due to the low exchange of medium.

► Install the assembly in such a way that measurement is not possible in the dead space.

Configure the installation in such a way that dimension X1, reduced by the distance between the measuring elements n (in the case of pH sensors 20 mm (0.8 in)), exceeds dimension F1 (distance between the process connection support and the inside of the pipe).

When installing inside a pipe, make sure the sensor guide does not hit the opposite wall. To do this, ensure that dimension X2 is smaller than dimension F2 (distance between process connection and inside of pipe).

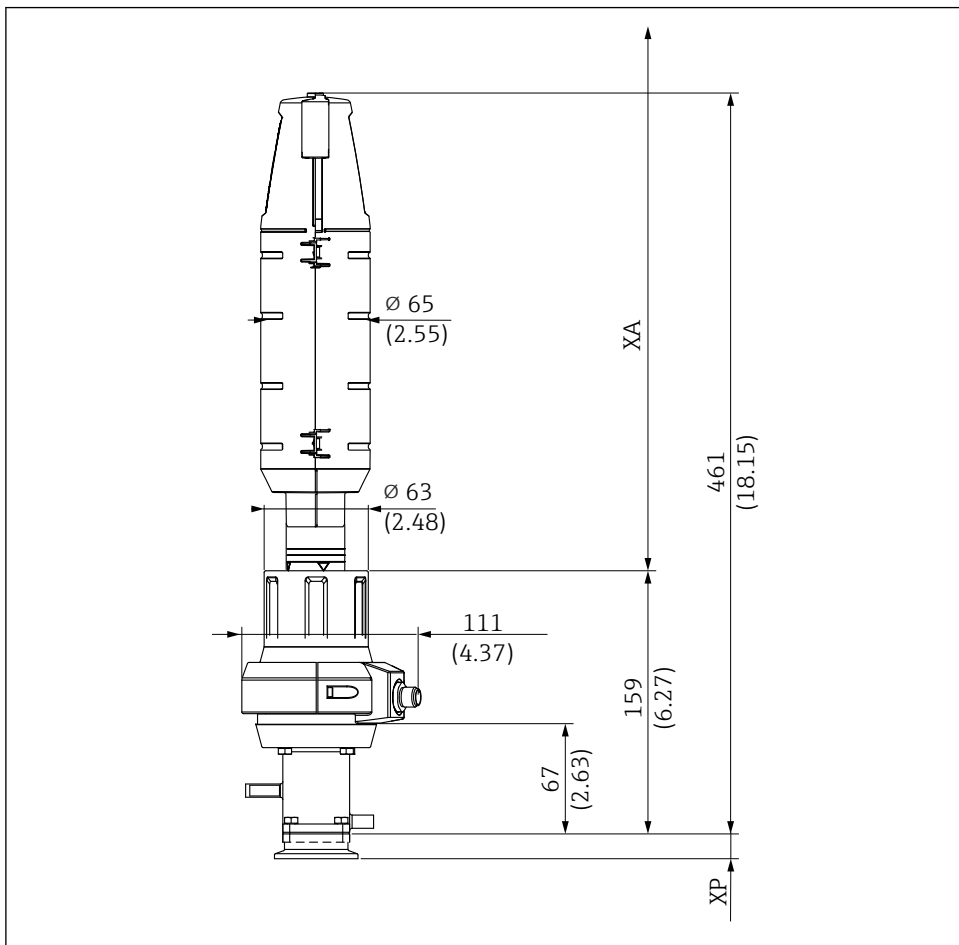


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- n* 20 mm (0.8 in)
- F1* Refers to the system; customer's specific situation
- F2* Refers to the system; customer's specific situation
- X1* Dimensions of process assemblies CPA87x
- X2* Dimensions of process assemblies CPA87x

5.1.6 Dimensions

Short version

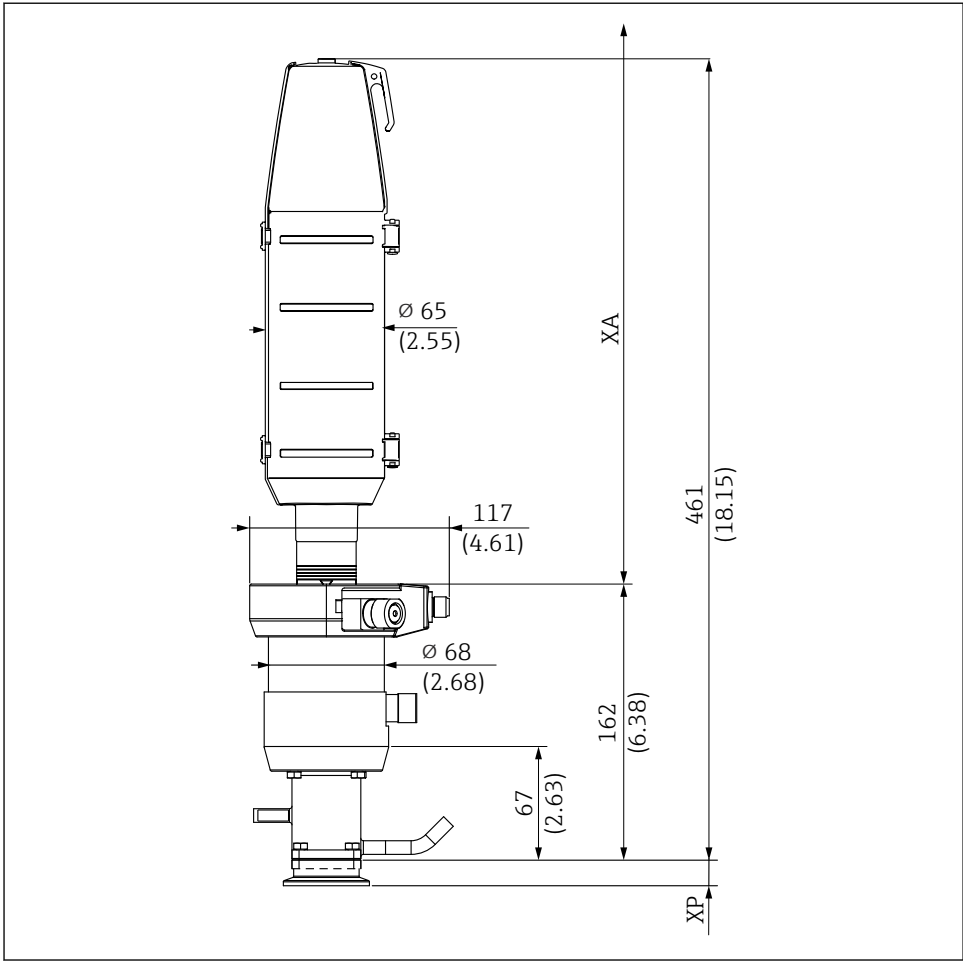


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6 Dimensions for short version (36 mm stroke) with manual drive in service position in mm (in)

XP Height of particular process connection (see table below)

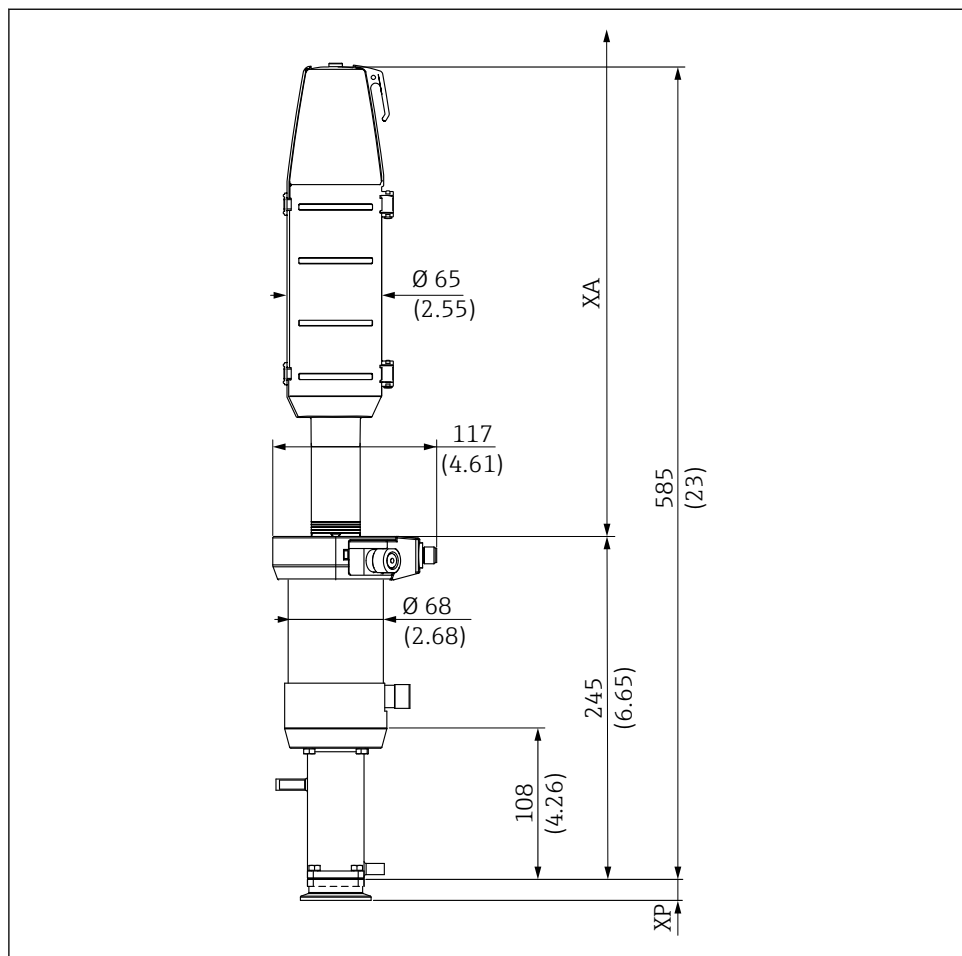
XA Necessary mounting distance for sensor replacement = 425 mm (16.73")



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7 Dimensions for short version (36 mm stroke) with pneumatic drive in service position in mm (in)
XP Height of particular process connection (see table below)
XA Necessary mounting distance for sensor replacement = 425 mm (16.73")

Long version

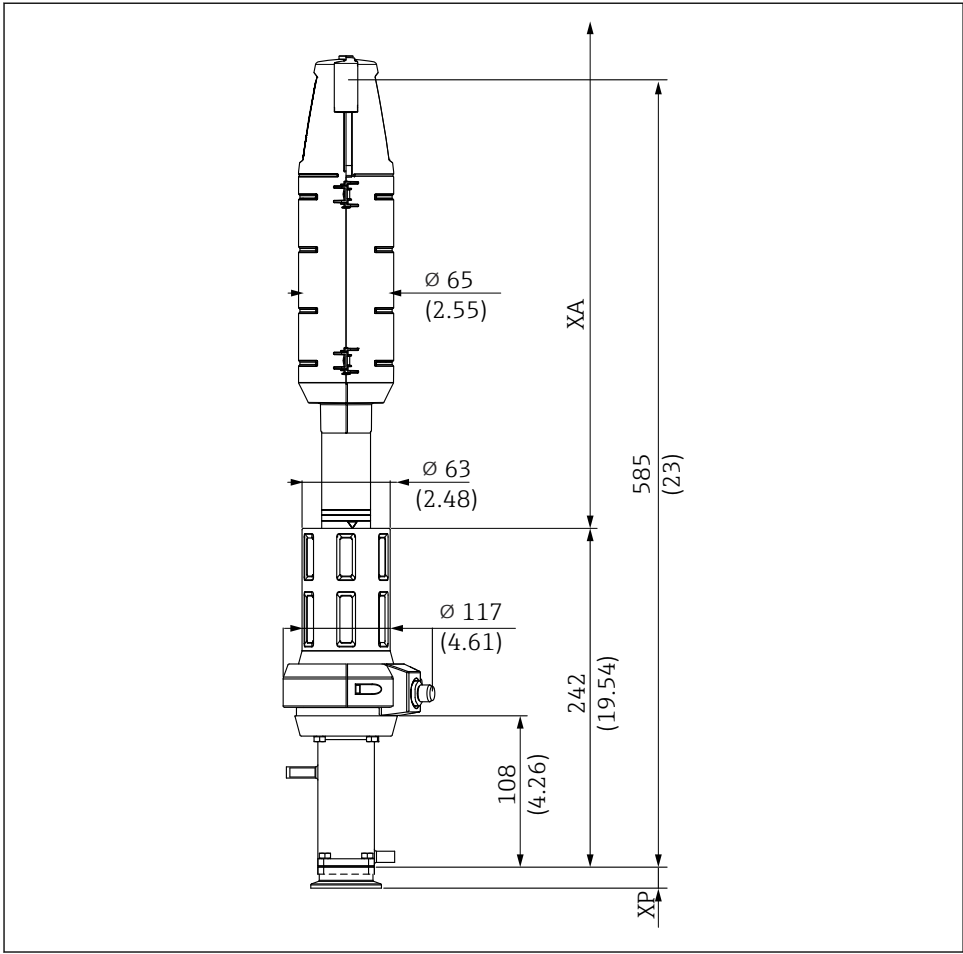


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-  8 Dimensions for long version (78 mm (3.1 in) stroke) with pneumatic drive in service position in mm (in)

XP Height of particular process connection (see table below)

XA Necessary mounting distance for sensor replacement



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9 Dimensions for long version (78 mm (3.1 in) stroke) with manual drive in service position in mm (in)

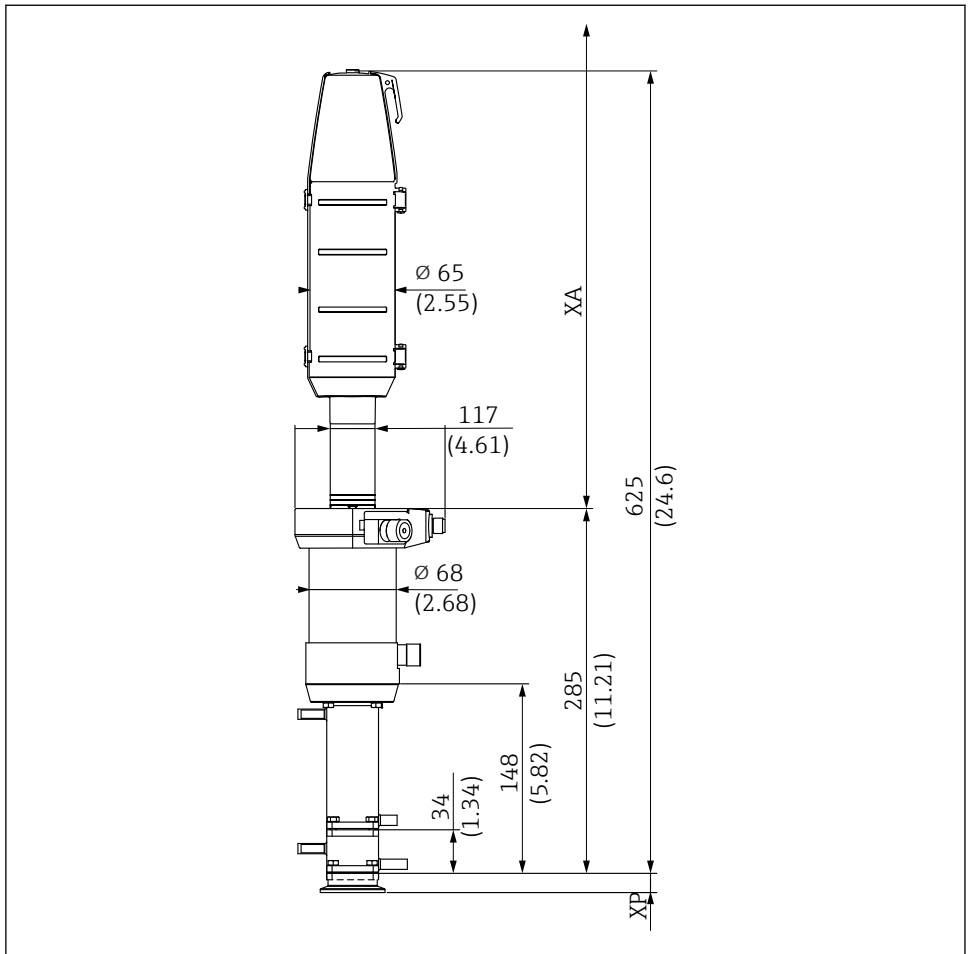
XP Height of particular process connection (see table below)

XA Necessary mounting distance for sensor replacement

A free path length XA above the drive is required to replace the sensors:

XA is 440 mm (17.3 in) for 225 mm sensors

XA is 610 mm (24.02 in) for 360 mm sensors

Double chamber

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10 Dimensions of double chamber in mm (in)

XP Height of particular process connection (see table below)

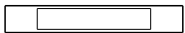
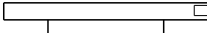
XA Necessary mounting distance for sensor replacement

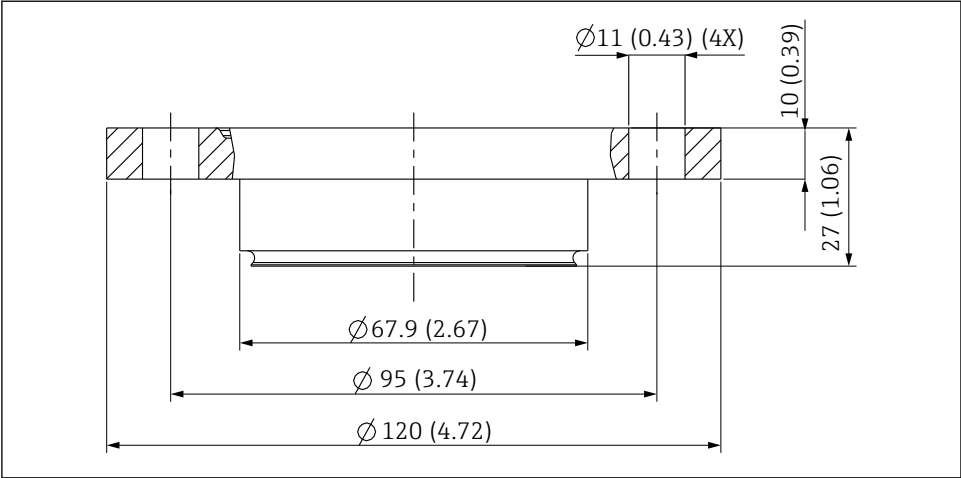
A free path length XA above the drive is required to replace the sensors:

XA is 440 mm (17.3 in) for 225 mm sensors

XA is 610 mm (24.02 in) for 360 mm sensors

Process connection height

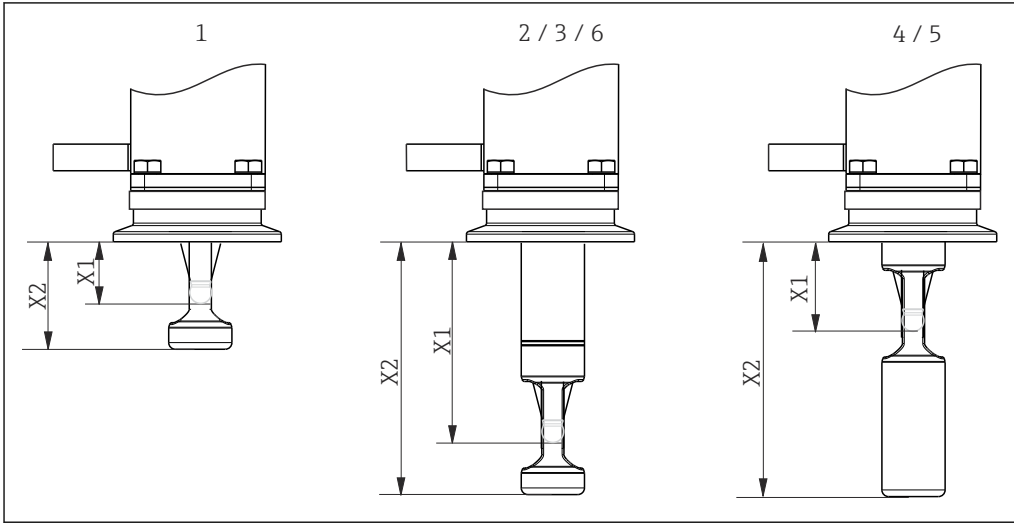
Process connection		Height XP in mm (in)
CA Clamp ISO 2852, ASME BPE-2012, 1½"	 A002.1866	14.9 (0.59)
CB Clamp ISO 2852, ASME BPE-2012, 2"	 A002.1867	19.5 (0.77)
CC Clamp ISO 2852, ASME BPE-2012, 2½"	 A002.1869	13.0 (0.51)
DA Aseptic DN 25 clampable DIN 11864-3 A, grooved clamp connector	 A002.1871	16.0 (0.63)
DC Aseptic DN 50 screw-in DIN 11864-1 A	 A002.1872	16.0 (0.63)
DF Aseptic DN 50 grooved flange DIN 11864-2 A	 A002.1874	14.2 (0.56)
EA NEUMO BioControl D 65	 A002.1875	25.0 (0.98)
MA Dairy fitting DN 50 DIN 11851 (EHEDG approval only with seal from Siersema)	 A002.1879	14.5 (0.57)
NA DN 25 <ul style="list-style-type: none"> ▪ Thread ISO 228 G1¼" ▪ Compatible with hook wrench, DIN 1810 flat face <div> NOTICE Mounting with pipe wrench causes damage. ► Use a hook wrench for mounting and removal. </div>	 A0054908	31.1 (1.22)
VA Varivent flange N (DN 40 to 100)	 A002.1873	19.0 (0.75)



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11 Dimensions of EA NEUMO BioControl D 65 in mm (in)

5.1.7 Immersion depths



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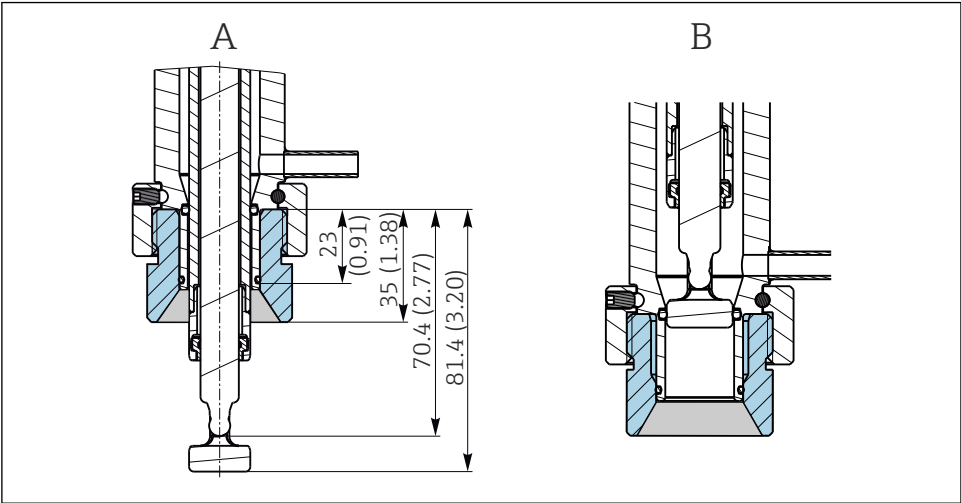
12 Immersion depths for different service chambers

- 1 Single chamber/36 mm stroke/225 mm sensor incl. KCI
- 2 Single chamber/78 mm stroke/225 mm sensor excl. KCI
- 3 Single chamber/78 mm stroke/360 mm sensor incl. KCI
- 4 Double chamber/78 mm stroke/225 mm sensor excl. KCI/service position, "inner" service chamber
- 5 Double chamber/78 mm stroke/360 mm sensor incl. KCI/service position, "inner" service chamber
- 6 Double chamber/78 mm stroke/360 mm sensor incl. KCI/service position, "front" service chamber

Immersion depths in mm (in)

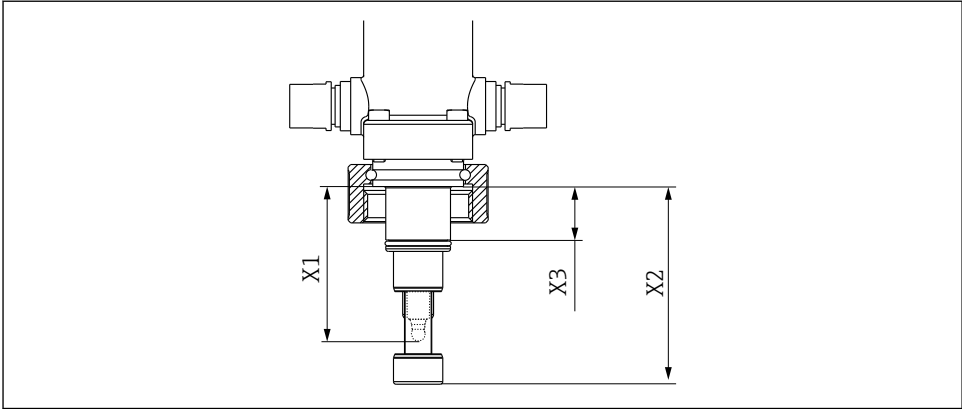
		Service chamber					
Process connection		1	2	3	4	5	6
CA Clamp ISO 2852 ASME BPE-2012 1½"	X1	20.6 (0.81)	62.1 (2.44)	62.1 (2.44)	28.1 (1.11)	28.1 (1.11)	62.1 (2.44)
	X2	31.6 (1.24)	73.1 (2.88)	73.1 (2.88)	73.1 (2.88)	73.1 (2.88)	73.1 (2.88)
CB Clamp ISO 2852 ASME BPE-2012 2"	X1	16.1 (0.63)	57.6 (2.27)	57.6 (2.27)	23.6 (0.93)	23.6 (0.93)	57.6 (2.27)
	X2	27.1 (1.07)	68.6 (2.70)	68.6 (2.70)	68.6 (2.70)	68.6 (2.70)	68.6 (2.70)
CC Clamp ISO 2852 ASME BPE-2012 2½"	X1	22.6 (0.89)	64.1 (2.52)	64.1 (2.52)	30.1 (1.19)	30.1 (1.19)	64.1 (2.52)
	X2	33.6 (1.32)	75.1 (2.96)	75.1 (2.96)	75.1 (2.96)	75.1 (2.96)	75.1 (2.96)
DA Aseptic DN 25 clampable DIN 11864-3 A	X1	19.6 (0.77)	61.1 (2.41)	61.1 (2.41)	27.1 (1.07)	27.1 (1.07)	61.1 (2.41)
	X2	30.6 (1.20)	72.1 (2.84)	72.1 (2.84)	72.1 (2.84)	72.1 (2.84)	72.1 (2.84)
DC Aseptic DN 50 screw-in DIN 11864-1 A	X1	27.1 (1.07)	68.6 (2.70)	68.6 (2.70)	34.6 (1.36)	34.6 (1.36)	68.6 (2.70)
	X2	39.0 (1.53)	79.6 (3.13)	79.6 (3.13)	79.6 (3.13)	79.6 (3.13)	79.6 (3.13)
DF Aseptic DN 50 Grooved flange DIN 11864-2 A	X1	21.4 (0.84)	62.9 (2.48)	62.9 (2.48)	28.9 (1.14)	28.9 (1.14)	62.9 (2.48)
	X2	32.4 (1.28)	73.9 (2.91)	73.9 (2.91)	73.9 (2.91)	73.9 (2.91)	73.9 (2.91)

Process connection		Service chamber					
		1	2	3	4	5	6
EA NEUMO BioControl D 65	X1	27.6 (1.09)	69.1 (2.72)	69.1 (2.72)	35.1 (1.38)	35.1 (1.38)	69.1 (2.72)
	X2	38.5 (1.51)	80.1 (3.15)	80.1 (3.15)	80.1 (3.15)	80.1 (3.15)	80.1 (3.15)
MA Dairy fitting DN 50 DIN 11851	X1	21.1 (0.83)	62.6 (2.46)	62.6 (2.46)	28.6 (1.13)	28.6 (1.13)	62.6 (2.46)
	X2	32.1 (1.26)	73.6 (2.90)	73.6 (2.90)	73.6 (2.90)	73.6 (2.90)	73.6 (2.90)
NA DN 25 Thread ISO 228 G1¼"	X1		70.4 (2.77)	70.4 (2.77)			
	X2		81.4 (3.20)	81.4 (3.20)			
VA Varivent flange N (DN 40 to DN 100)	X1	16.6 (0.65)	58.1 (2.29)	58.1 (2.29)	24.1 (0.95)	24.1 (0.95)	58.1 (2.29)
	X2	27.6 (1.09)	69.1 (2.72)	69.1 (2.72)	69.1 (2.72)	69.1 (2.72)	69.1 (2.72)

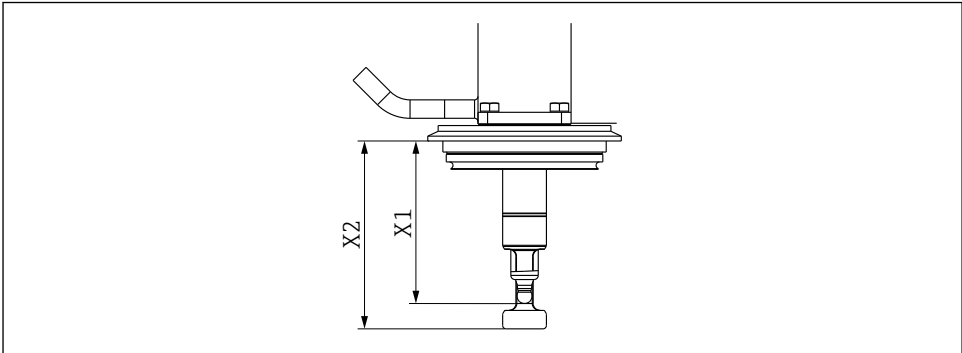


13 Immersion depth in mm (in) for process connection NA DN 25 male thread ISO 228 G1¼" (service chambers 2 and 3) in measuring and service position, mounted on weld-in adapter G1¼"

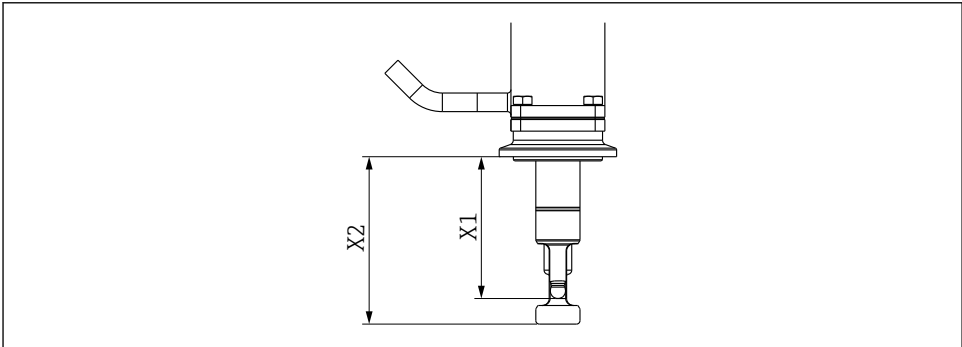
- A Measuring position
- B Service position



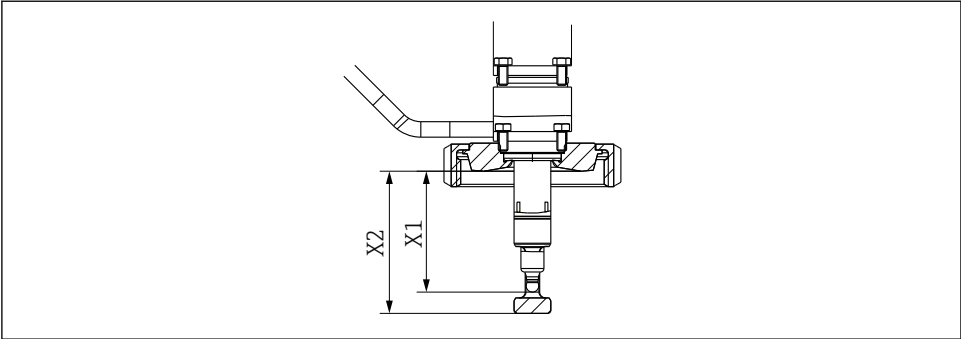
14 Immersion depth in mm (in) for process connection NA DN 25 male thread ISO 228 G1 1/4



15 Immersion depth in mm (in) for process connection VA Varivent flange N

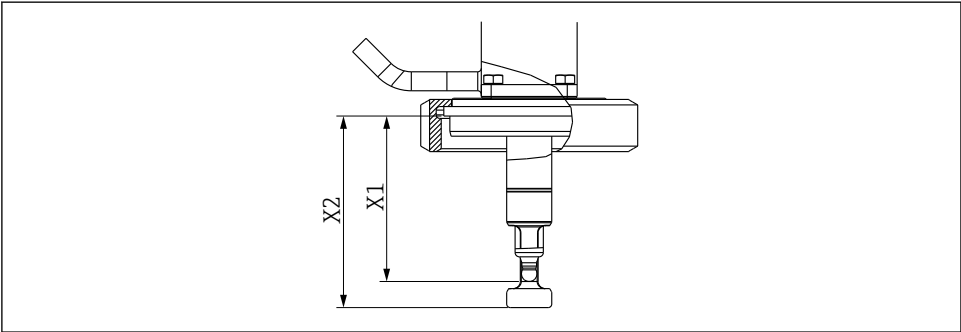


16 Immersion depth in mm (in) for process connections CA, CB, CC, DA clamp (sample illustration)



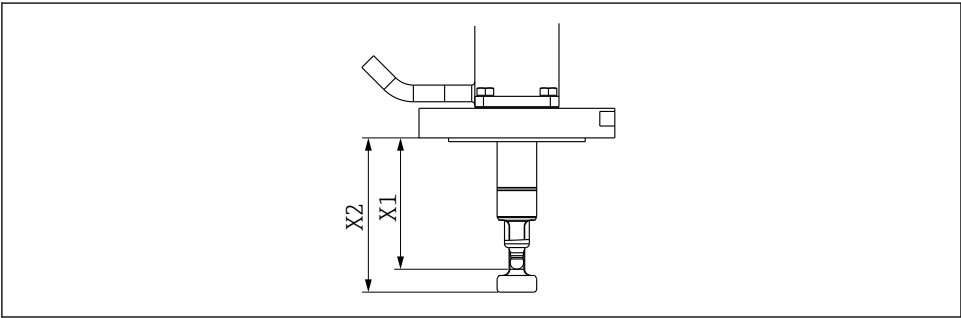
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17 Immersion depth in mm (in) for process connection MA Dairy fitting DN 50 DIN 11851



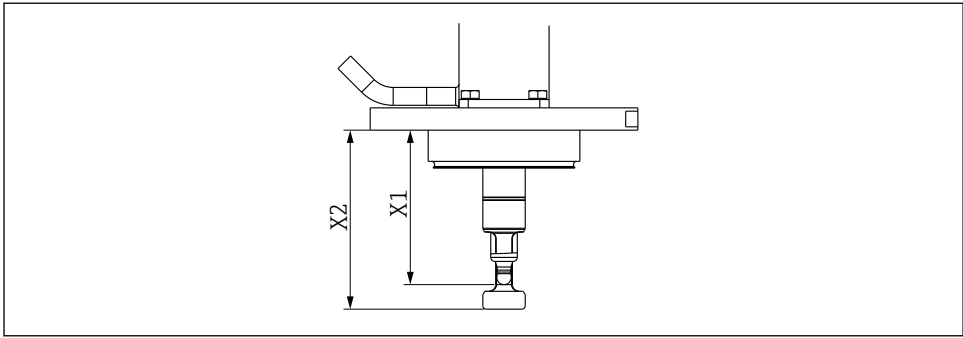
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18 Immersion depth in mm (in) for process connection DC Aseptic DN 50 screw-in DIN 11864-1 A



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19 Immersion depth in mm (in) for process connection DF Aseptic DN 50 grooved flange DIN 11864-2 A



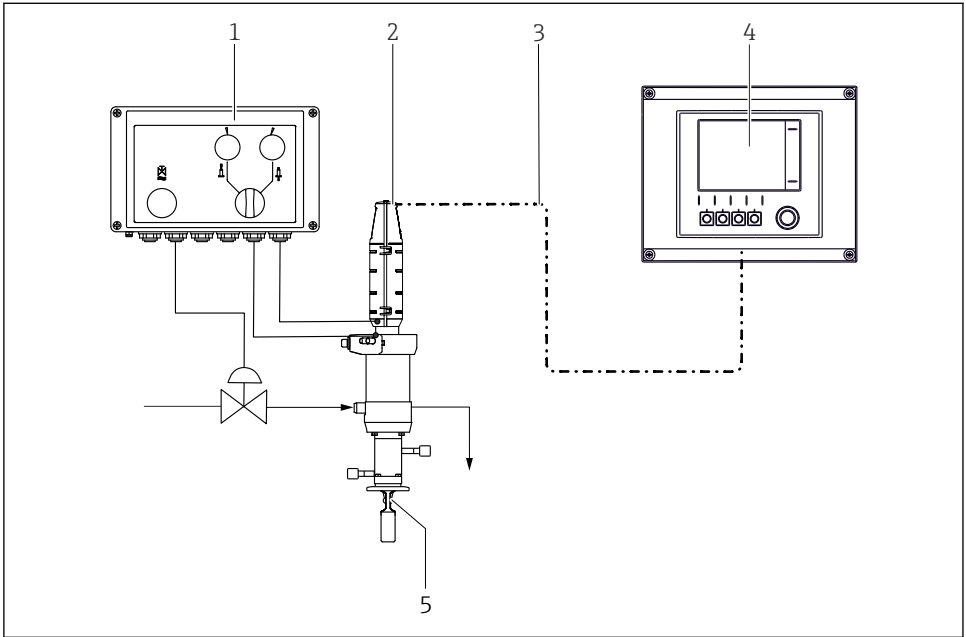
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 20 Immersion depth in mm (in) for process connection EA NEUMO Biocontrol D65

5.2 Installing the assembly

5.2.1 Installation procedure

Measuring system with single chamber

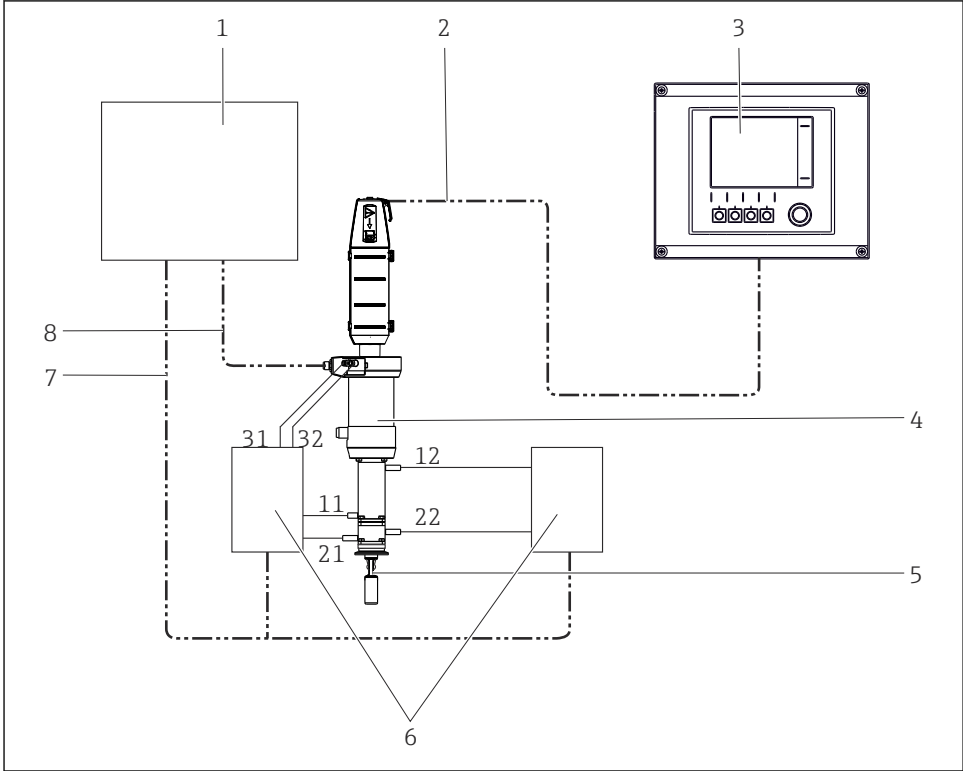


A0017811

21 Measuring system (example)

- 1 Air-Trol CYC10 control unit
- 2 Cleanfit CPA875 assembly
- 3 Measuring cable
- 4 Liquiline CM44x transmitter
- 5 Sensor

Measuring system with double chamber



A0022821

22 Measuring system with pneumatic drive and double chamber (example)

- | | | | |
|---|-----------------------------|-------|---|
| 1 | Control unit | 7 | Control signals (electric/pneumatic) |
| 2 | Measuring cable | 8 | Limit position switch relay signal |
| 3 | Transmitter Liquiline CM44x | 11/12 | Inlet/outlet of "inner" service chamber |
| 4 | Assembly Cleanfit CPA875 | 21/22 | Inlet/outlet of "front" service chamber |
| 5 | Sensor | 31/32 | Drive control |
| 6 | Manifold | | |

Installation recommendation

⚠ CAUTION

There is a direct connection between the process and the service chamber when the assembly is inserted/retracted. Medium can escape through the service chamber connections.

Risk of injury from escaping process medium.

- ▶ Connect the service chamber connections.
- ▶ Check all connections for leaks prior to commissioning.

NOTICE

There is a connection between the process and the service chamber during insertion/retraction.

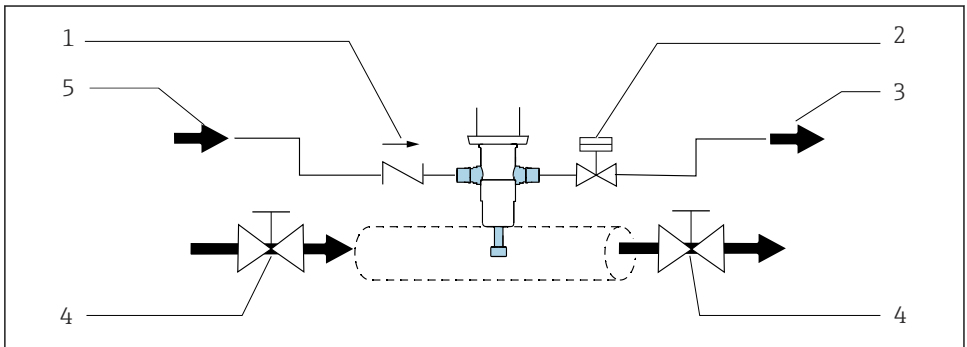
Contamination of the assembly.

- ▶ Include the assembly in the cleaning concept.
- ▶ Ensure regular cleaning.

The process seals seal the process in the relevant end position. The assembly is open to the process during insertion/retraction; the rinse connections must either be pipe-fitted or sealed.



The connection between the service chamber and the process is open during movement; the sealing water function can be used as a result. The rinse chamber outlet must be blocked (e.g., with a shutoff valve) to implement the sealing water function.



A0039105

23 Installation suggestion for seal system using a bypass

- 1 Check valve
- 2 Valve open/closed, sealing water function
- 3 Wastewater
- 4 Shutoff valve open/closed (optional)
- 5 Water/cleaning agent

The seals must be checked and serviced regularly. Therefore measures must be taken to separate the assembly from the process, e.g., by installing in a bypass.

Installing/removing the assembly from the process

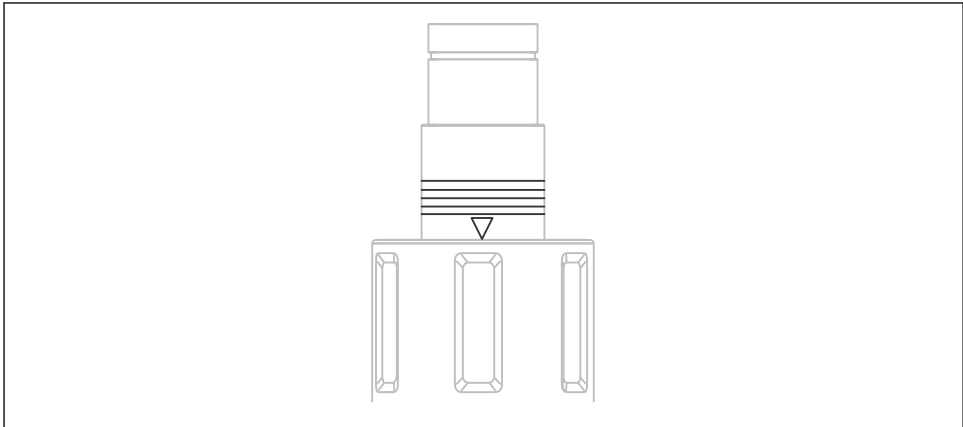
⚠ WARNING

Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes.

- ▶ Wear protective gloves, protective goggles and protective clothing.
- ▶ Mount the assembly only if vessels or pipes are empty and unpressurized.

i Prior to installation, check the flange seal between the flanges.

1. Move the assembly to the service position.
↳ (The triangle position marking is visible (→  24)).
2. Secure the assembly on the tank or piping via the process connection.
3. Follow the instructions in the next section to connect pipes for compressed air and rinse water (for the relevant assembly version).



A0023307

 24 Position markings (service position)

Pneumatic connection for automatic operation

Prerequisites:

- Air pressure 5 to 8 bar (72 to 116 psi) (absolute) or air pressure 4 to 7 bar (58 to 102 psi)(relative)
- Compressed air quality in accordance with ISO 8573-1:2001 Quality class 3.3.3 or 3.4.3
- Solids class 3 (max. 5 µm, max. 5 mg/m³, contamination with particles)
- Water content for temperatures ≥ 15 °C (59 °F): Class 4 pressure dew point 3 °C (37 °F) or lower
- Water content for temperatures 5 to 15 °C (41 to 59 °F): Class 3 pressure dew point -20 °C (-4 °F) or lower
- Oil content: Class 3 (max. 1 mg/m³)
- Air temperature: 5 °C (41 °F) or higher
- Minimum nominal diameter of the air lines: 2 mm (0.08 in)

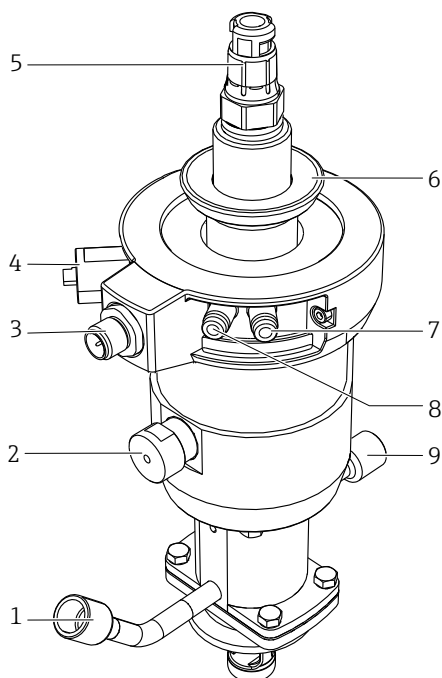
Connection: Plug-in connector M5, hose 4/2 mm OD/ID (adapter for 6/4 mm OD/ID enclosed)

NOTICE

Air pressure too high

Damage to seals.

- Install a pressure-reducing valve upstream if the air pressure is likely to increase to more than 7 bar (102 psi) (absolute) (even short pressure surges).



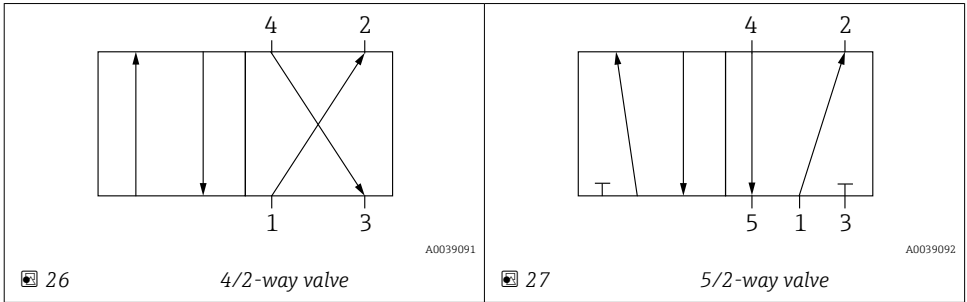
A0029435

 25 Assembly with pneumatic drive (without protective cover)

- 1 Rinse connection (inlet)
- 2 Automatic limit position lock, process
- 3 Connection for limit position switch
- 4 Automatic limit position lock, service
- 5 Sensor head
- 6 Fastening ring for protective cover
- 7 Pneumatic connection (move to measuring position)
- 8 Pneumatic connection (move to service position)
- 9 Rinse connection (outlet)



Use a pneumatic pilot valve (4/2-way or 5/2-way) to insert/retract the assembly. Connect the two inputs of the assembly.



Connection 1 is attached to the compressed air supply.

Connections 2 and 4 are used to attach to the pneumatic drive.

Connection 3 and, if present, connection 5 are not attached; they are used to vent the drive.

Rinse connections

The service chamber connections of the sterile CPA875 retractable assembly make it possible to rinse the chamber (including the sensor) with water or cleaning solution or to sterilize it with steam (SIP) at a maximum pressure of 6 bar (87 psi).

The retractable assembly can be selected with a single-chamber system or double-chamber system. If the double-chamber system is used, all four connections must be connected to inlet and outlet lines.



Install a pressure-reducing valve upstream if there is the possibility that water pressures can exceed the specified sealing water pressure (8 bar (116 psi) or 16 bar (232 psi)).

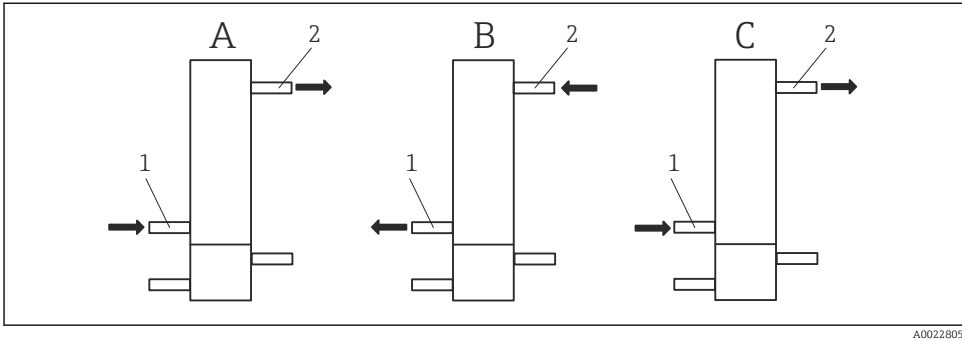
NOTICE

Pressure difference too high between process and wastewater system or if rinse connections are not properly connected.

Damage to seals

- ▶ Close rinse connections.
- ▶ Pipe-fit rinse connections.
- ▶ Use sealing water function.

Assignment of rinse connections for double chamber



 28 Assignment of rinse inlet and outlet

- A "Clean" function: connection and water/cleaner flow direction
 B Aeration/de-aeration when moving from the service position to the measuring position
 C Aeration/de-aeration when moving from the measuring position to the service position
 1 Service chamber inlet
 2 Service chamber outlet

Service chambers I and II

The double-chamber assembly has 2 service chambers that can be controlled independently of each other:

- Service chamber I on the process connection side
- Service chamber II on the drive side

Process-side service chamber I performs the same function as the service chamber of the standard CPA875. Service chamber II on the drive side operates according to the spraying principle. During insertion/retraction, a piston completely displaces the contents from the chamber so that the volume on this side approaches zero, while it increases steadily on the other side of the piston. This change in volume in service chamber II must be compensated by switching the inlet and outlet of the service chamber during extension and retraction of the assembly.

In the "Cleaning" state (A), the inlet and outlet of drive-side service chamber II are used as follows (the internal volume of the "front" service chamber does not change, and so no pressure compensation measures are required here):

- Depending on the cleaning method, cleaning agent and purge gas are supplied via the inlet (1).
- These media are removed via the outlet (2).

In the "Move from service position to measuring position" state (B), the pressure conditions in the service chamber must be balanced when moving. The inlet and outlet of the service chamber are assigned as follows:

- The air is removed via the inlet (1) (inlet is open).
- Air is supplied via the outlet (2).

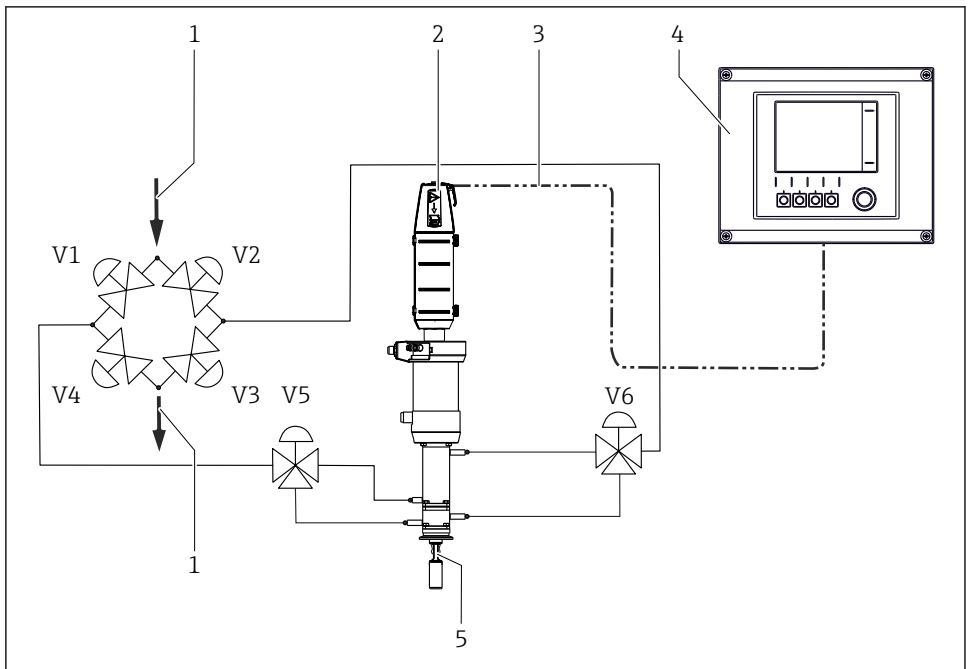
In the "Move from measuring position to service position" state (C), the pressure conditions in the service chamber must be balanced when moving. The inlet and outlet of drive-side service chamber II are assigned as follows:

- The air is supplied via the inlet (1).
- The air is removed via the outlet (2) (outlet is open).



The drive must be controlled simultaneously with the inlets and outlets of service chamber II.

The controller for the inlets, outlets and the drive is installed at the place of installation. It is not included in the assembly delivery.



A0061190

- 1 Media supply
- 2 Assembly
- 3 Measuring cable
- 4 Liquiline CM44x transmitter
- 5 Sensor

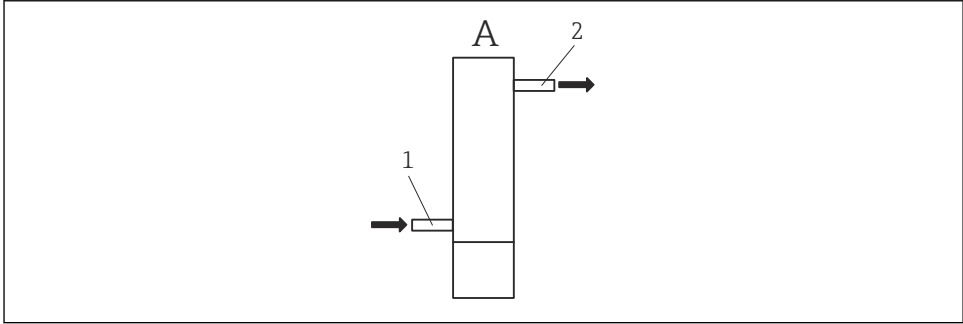
Control of the double-chamber assembly

The double-chamber assembly can be controlled using the following configuration, for example:

Valves V1, V2, V3, and V4 enable targeted switching of the inlet and outlet of the two service chambers. Two three-way valves V5 and V6 allow independent control of process-side service chamber I and drive-side service chamber II.

This configuration allows flexible switching between the two chambers and use of their specific functions – taking into account, in particular, the changing volume of the drive-side chamber during insertion/retraction.

Assignment of rinse connections for single chamber



A0043570

 29 Connection and water/cleaner flow direction

A "Clean" function: connection and water/cleaner flow direction

1 Service chamber inlet

2 Service chamber outlet

In the "Cleaning" state (A), the inlet and outlet of the service chamber are used as follows (the internal volume of the service chamber does not change, and so no pressure compensation measures are required here):

- Depending on the cleaning method, cleaning agent is supplied via the inlet (1).
- These media are removed via the outlet (2).
- When self-draining is used, draining occurs via (1) and must be taken into account when connecting the system.

Connecting the limit position switches

With limit position detection, you can notify a system located downstream (transmitter, switching amplifier, output interface terminal) whether the assembly is in the measuring or service position (in the case of manual drive, only the measuring position is queried).

The limit position switches must be connected to output interface terminals (can be ordered as accessories for the non-hazardous area) to enable power supply.

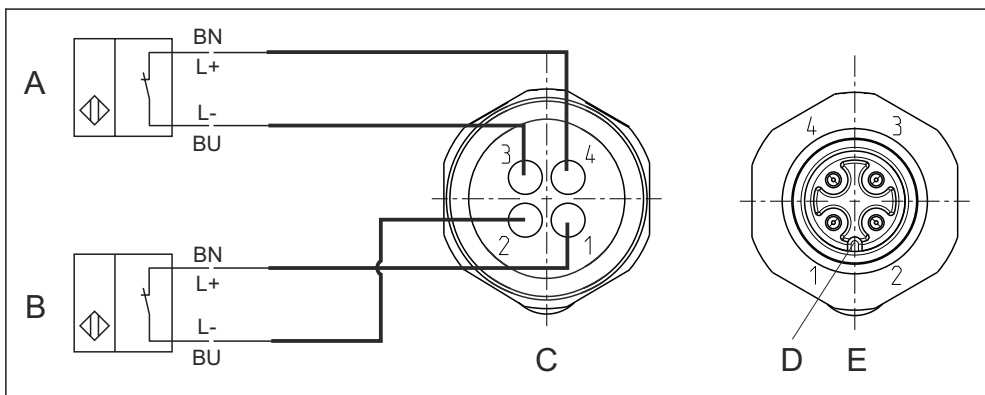
The assembly can be ordered directly with limit position detection, or it can be retrofitted at a later stage. The cable for the limit position switches must be ordered as an accessory.

Feedback devices

The feedback devices are intrinsically safe. The approval for the feedback devices is no longer valid if they are not installed or connected correctly.

1. Ensure full compliance with manufacturer documentation.
2. Connect the feedback devices in accordance with the relevant instructions.

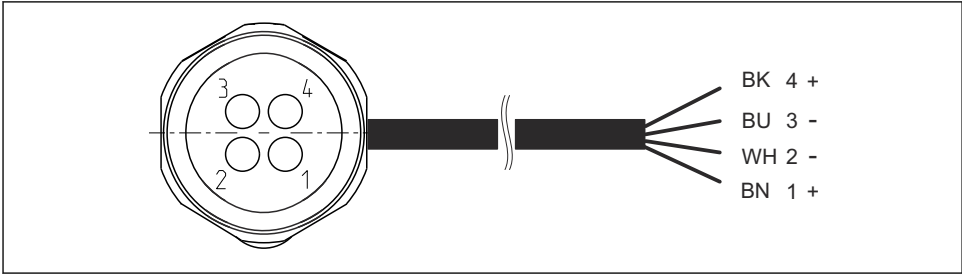
Switching element function:	NAMUR NC contact (inductive)
Switching distance:	1.5 mm (0.06 in)
Nominal voltage:	8 V DC
Switching frequency:	0 to 5000 Hz
Housing material:	Stainless steel



A0017831

30 Inductive limit position switches, internal cabling in the blue protective ring

- A Limit position switch, service position
- B Limit position switch, measuring position
- C Connector, M12, solder side (inside of assembly)
- D Coding
- E Connector, pin side (outside of assembly)



A0022.163

31 Connecting cable for limit position switch on transmitter, switching amplifier, output interface terminal etc.

- 1 Measuring position
- 2 Measuring position
- 3 Service position
- 4 Service position

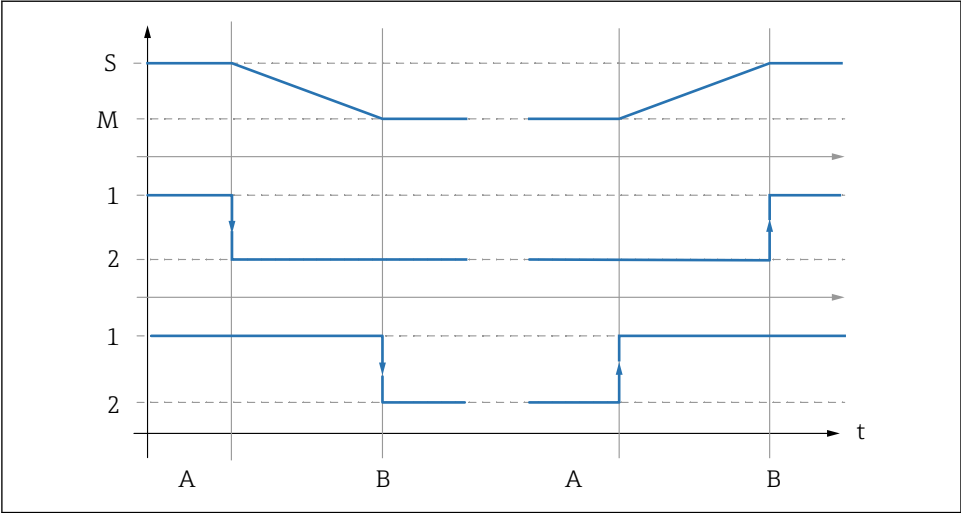
i Only pins 1 and 2 are assigned for manually activated assemblies with one switch (measuring position).

i If the feedback devices are operated with a 24 V DC power supply, e.g. at Liquiline CM442/CM444/CM448, NAMUR terminals must be used. NAMUR terminal (8 V DC) for the non-hazardous area available as an accessory. The NAMUR terminal must have its own power supply and cannot be powered by a current output of the CM44.

i For versions CPA87x-AB* for use in hazardous areas, the enclosed manufacturer's declaration and the operating instructions for the installed Pepperl+Fuchs NJ1.5-6.5-15-N-Y180094 feedback devices must be observed.

Signal table for limit position switches

Position of assembly	Limit position switch, measuring position	Limit position switch, service position
Measuring	Active LOW ($\geq 3\text{ mA}$)	Active LOW ($\geq 3\text{ mA}$)
Service	Active HIGH ($\leq 1\text{ mA}$)	Active HIGH ($\leq 1\text{ mA}$)



A0039144

32 Description of switching function

- S Service
- M Measuring
- 1 High
- 2 Low
- A Movement starts
- B Limit position reached

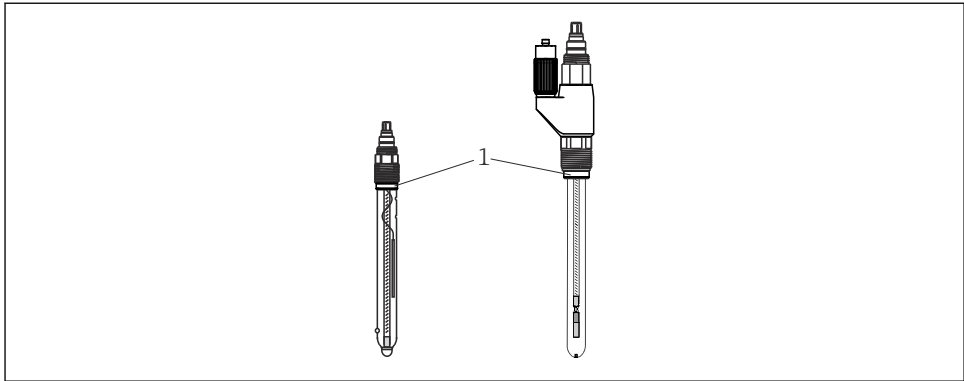
5.2.2 Sensor installation

Preparing the sensor and assembly

NOTICE

Danger of medium penetrating if a defective sensor is installed.

- Inspect the sensor and use a new, intact sensor if necessary.



A0030154

33 Sensor installation

1 Thrust collar with O-ring

1. Remove the protective cap from the sensor. Make sure that the O-ring and thrust collar (→ 33, item 1) are provided.
2. To aid installation, immerse the sensor shaft in water.
3. Move the assembly to the service position.

3-A versions

Leakage path at sensor screw connection for 3-A versions → 12:

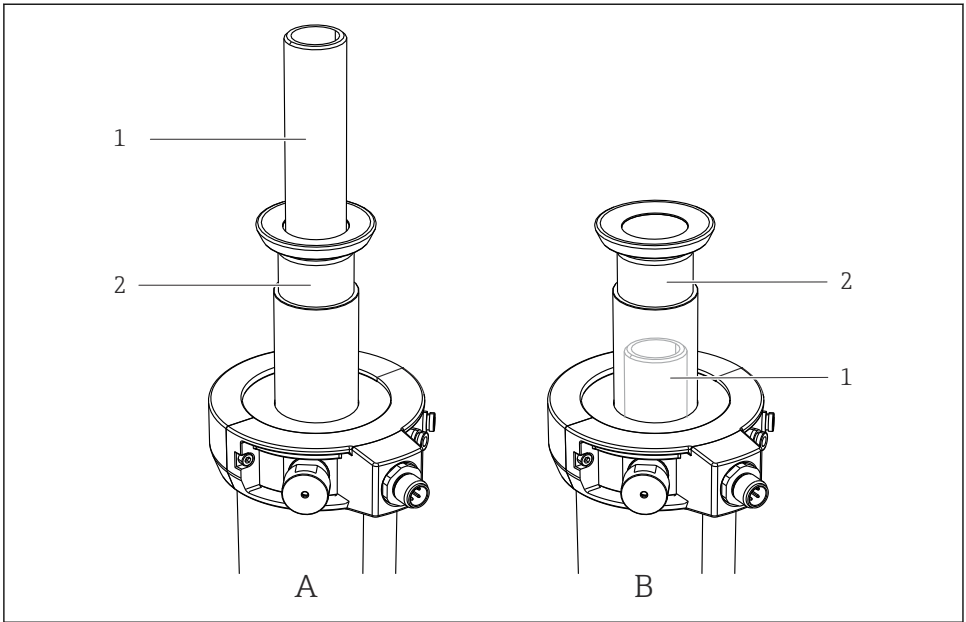
- Replace the thrust collar of the sensor with the slotted thrust collar enclosed.

Installing and removing sensors

⚠ WARNING

Risk resulting from temperature, pressure and chemical composition!

- Establish pressure compensation in the service chamber.
- Before removing, clean and rinse the sensor adequately in the rinse chamber.
- Check process seals. (There can be no leakage of medium from the rinse chamber in limit position when rinsing is disabled)



A0030155

34 Sensor installation options

1 Sensor adapter

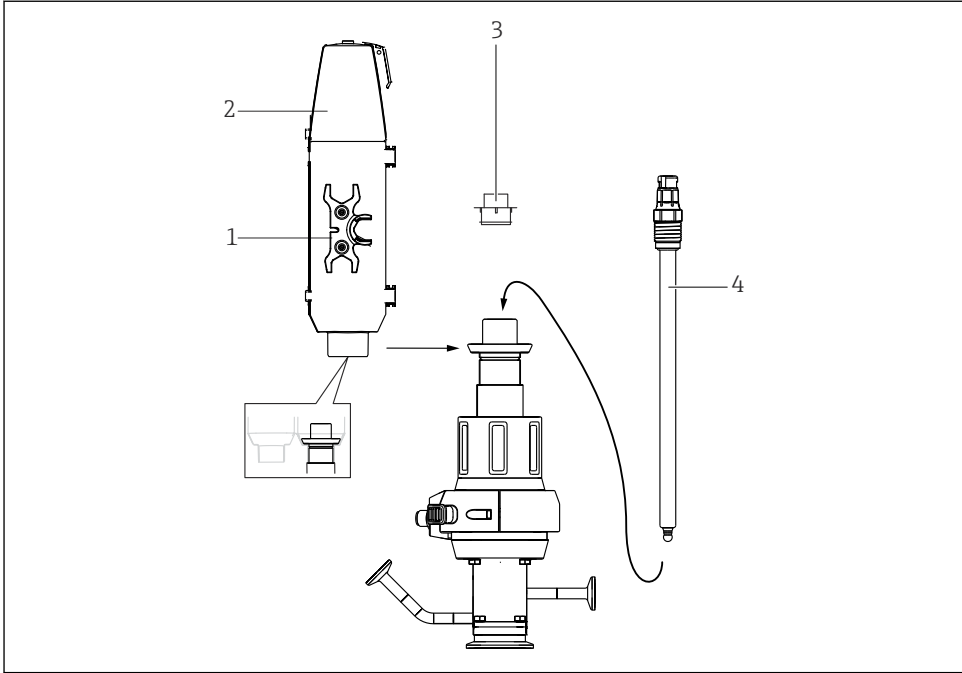
2 Retraction tube

A Sensor adapter is on top of the retraction tube

B Sensor adapter is below the retraction tube (not visible)

Depending on the assembly version, the sensor adapter is visible (, item A) or is positioned within the retraction tube and is not visible (item B). As a result, the procedures for installing and removing the sensors differ as follows:

Installing and removing sensors if the sensor adapter is visible (item A)



A0030186

35 *Sensor installation*

- 1 *Open-ended wrench (AF 17/19 mm)*
- 2 *Protective cover*
- 3 *Dummy plug*
- 4 *Sensor*

i Gel and KCl sensors can be installed in this version.

Install the sensor as follows:

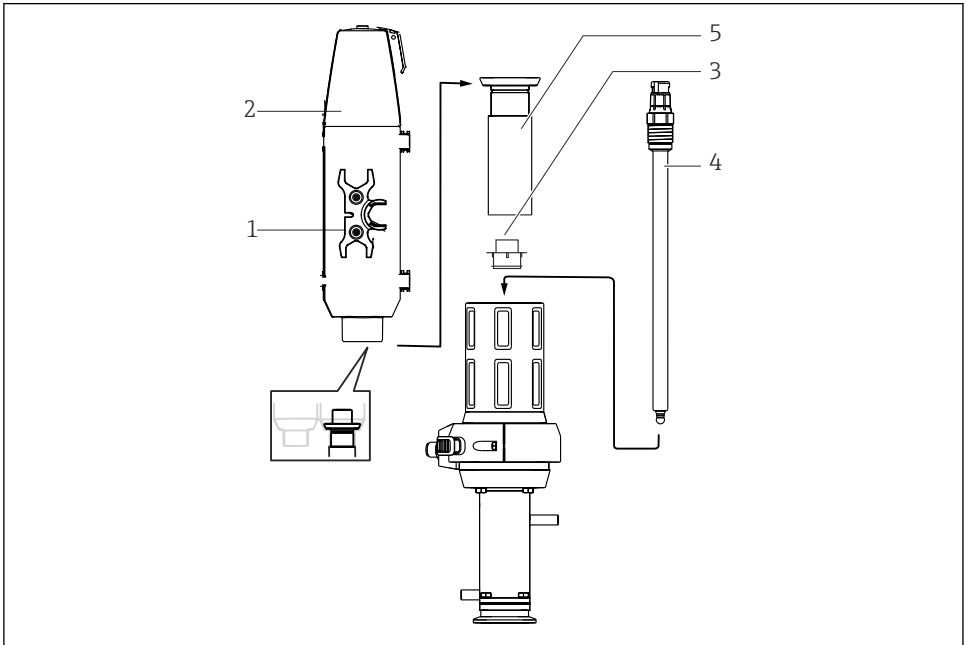
1. Remove the protective cover (→ **35**, item 2) (this is only possible if the assembly is in service position).
2. Remove the yellow dummy plug (item 3).
3. Use the open-ended wrench (item 1) to screw in the sensor (item 4) in place of the dummy plug and hand-tighten (3 Nm (2.2 lbf ft)).
4. Attach the open-ended wrench back into the protective cover.

5. Mount the protective cover on the assembly. When doing so, guide the measuring cable through the cable run (top of protective cover).



Always install the protective cover before moving the assembly to measuring position. The protective cover cannot be removed in measuring position. This prevents the sensor from being removed.

Installing and removing sensors if the sensor adapter is not visible (item B)



A0030187

36 Sensor installation

- 1 Socket wrench (AF 17/19 mm)
- 2 Protective cover
- 3 Dummy plug (protective cap)
- 4 Sensor
- 5 Retraction tube



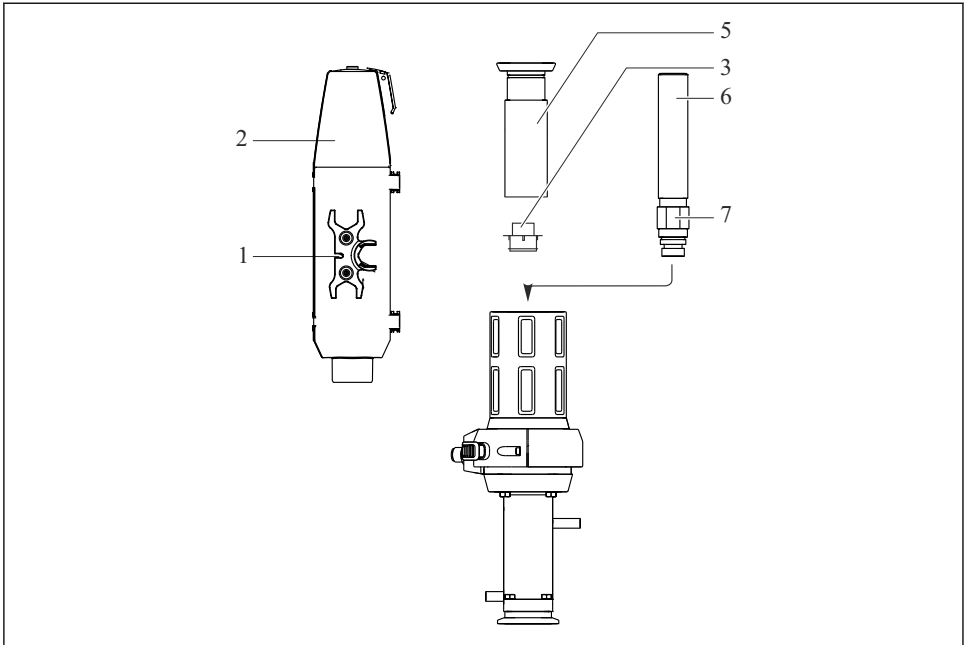
Gel sensors can be installed in this version. To install KCl sensors, you will need a "Gel - KCl adapter".

Install the sensor as follows:

1. Remove the protective cover (→ 36, item 2) (this is only possible if the assembly is in service position).
2. Unscrew the retraction tube (item 5) in a counterclockwise direction.

3. Remove the yellow dummy plug (item 3).
 4. Use the open-ended wrench (item 1) to screw in the sensor (item 4) in place of the dummy plug and hand-tighten (3 Nm (2.2 lbf ft)).
 5. Screw in the retraction tube again.
 6. Attach the open-ended wrench back into the protective cover.
 7. Mount the protective cover on the assembly. When doing so, guide the measuring cable through the cable run (top of protective cover).
-  Always install the protective cover before moving the assembly to measuring position. The protective cover cannot be removed in measuring position. This prevents the sensor from being removed.

Installation of 360 mm gel and KCl sensors with the "Gel - KCl adapter"



A0030188

37 Sensor installation, Part 1

- 1 Open-ended wrench (AF 17/19 mm)
- 2 Protective cover
- 3 Dummy plug (protective cap)
- 5 Retraction tube
- 6 Gel - KCl adapter
- 7 Lock nut



Gel and KCl sensors can be installed in this version.

NOTICE

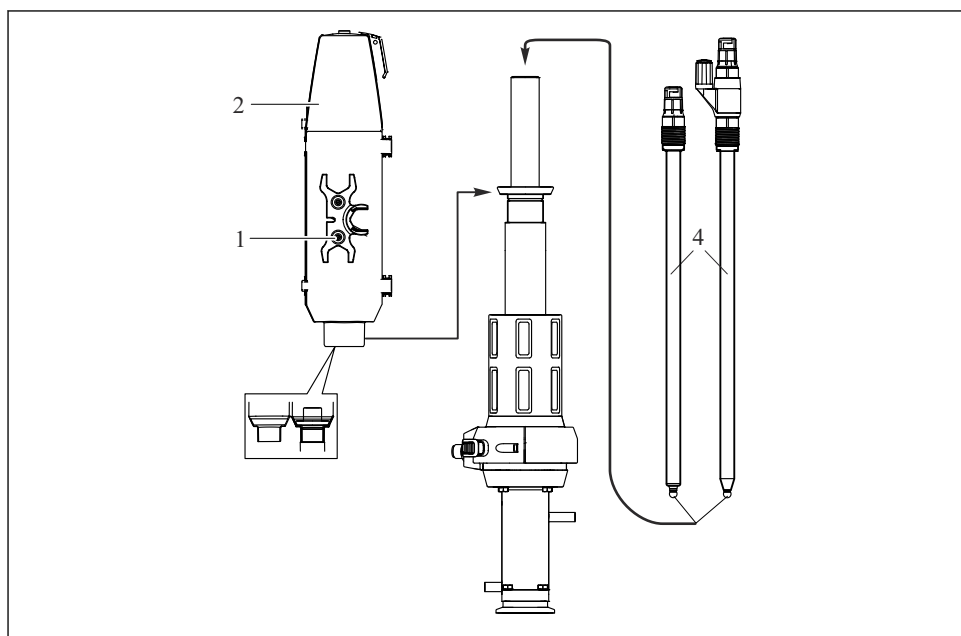
The protective cover cannot be removed in measuring position. This prevents the sensor from being removed.

- ▶ Always install the protective cover before moving the assembly to measuring position.
- ▶ There is an opening prepared at the top of the cover which can be broken out if necessary to feed the hose through

Install the sensor as follows:

1. Remove the protective cover (→ 37, item 2) (this is only possible if the assembly is in service position).

2. Unscrew the retraction tube (item 5) (in a counterclockwise direction).
3. Turn the lock nut (item 7) on the "Gel - KCl adapter" (item 6) as far as it will go in an upward direction.
4. Remove the yellow dummy plug (item 3).
5. Screw in the "Gel - KCl adapter" (item 6) in place of the dummy plug and hand-tighten (3 Nm (2.2 lbf ft)).
6. Hand-tighten the lock nut in a clockwise direction, and then use an open-ended wrench (AF 24 mm) to tighten it by ¼ turn.
7. Screw in the retraction tube again.
8. Use the open-ended wrench (item 1) to screw in the sensor (→ ☐ 38, item 4) and hand-tighten (3 Nm (2.2 lbf ft)).
9. Attach the open-ended wrench back into the protective cover.
10. Mount the protective cover on the assembly. When doing so, guide the measuring cable through the cable run (top of protective cover).



A0030189

☐ 38 Sensor installation, Part 2

- 1 Open-ended wrench
- 2 Protective cover
- 4 360 mm gel or KCl sensor

5.3 Post-installation check

Put the sensor into operation only if you can answer "yes" to the following questions:

- Are the sensor and cable undamaged?
- Is the orientation correct?
- Is the sensor installed in an assembly and not suspended from the cable?

5.3.1 Checking that the sealing system is intact

Check the seals after mounting or removing the sensor, and when maintenance work is carried out at regular intervals.

1. Move the assembly to the service position
2. If provided, open the ball valve of the service chamber outlet
 - ↳ It is normal for a slight amount of medium to escape (connection between the service chamber and process during insertion/retraction).
3. If provided, rinse the service chamber/sensor.
4. Observe the outlet. No more medium should escape after a short period of time.
5. If medium continues to escape, the sealing system is damaged; take the measuring point out of service and perform maintenance on the assembly.

6 Commissioning

6.1 Preliminaries

Before commissioning, ensure that:

- all seals are correctly seated (on the assembly and on the process connection).
- the sensor is correctly installed and connected.
- the water connection at the rinse connections is correct (if present) or the rinse connections are sealed.

WARNING

Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes.

- ▶ Check the connections to ensure they are sealed tightly.

⚠ WARNING

Process medium may escape during insertion/retraction of the assembly.

- ▶ Check that the process seal is intact.
- ▶ Pipe-fit the rinse chamber outlet accordingly.
- ▶ Seal the rinse connections with dummy plugs.



Note that when the assembly is inserted/retracted, an open connection exists for a short period between the process and service chamber. This intermediate position can be used for what is known as "sealing water" or for the third rest position (see "Optional cleaning/sterilization of process seal").

Install the service chamber connections accordingly.

7 Operation

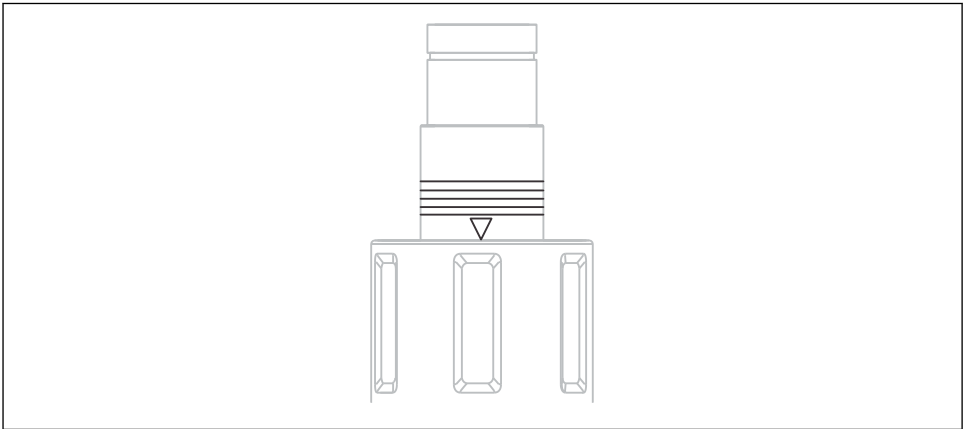
7.1 Adapting the assembly to the process conditions

⚠ CAUTION

Due to the operating principle, there is a connection between the process and the service chamber. The service chamber can be pressurized as a result.

Process medium may escape during insertion/retraction.

- ▶ Check that the process seal is intact.
- ▶ Pipe-fit the rinse chamber outlet accordingly.
- ▶ Seal the rinse connections with dummy plugs.

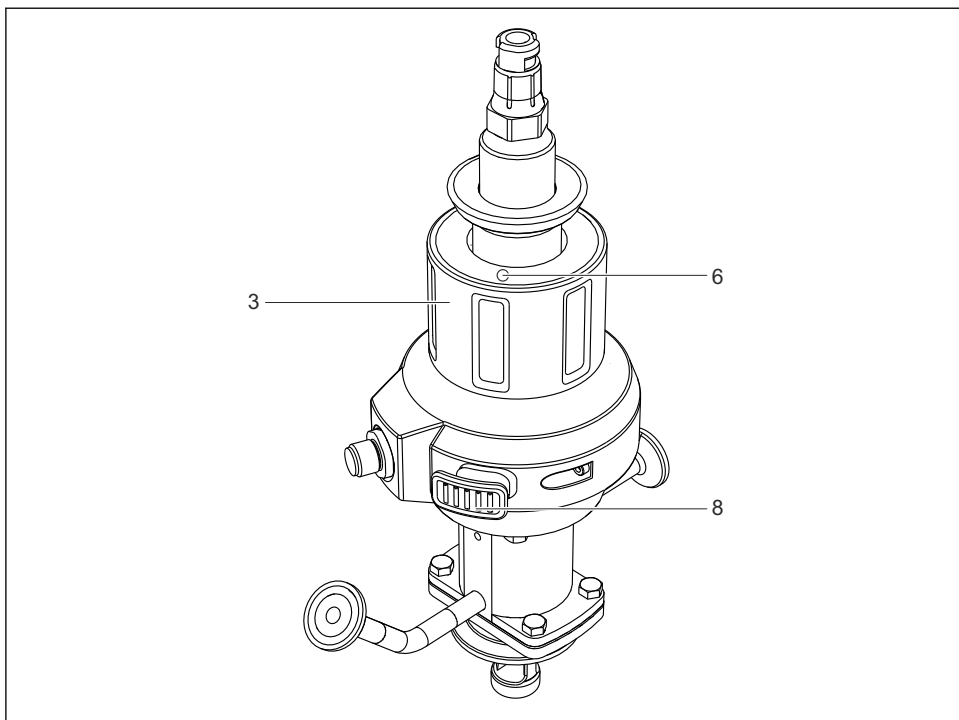


A0023307

39 Position markings (service position)



The assembly with pneumatic drive does not have any operating elements.

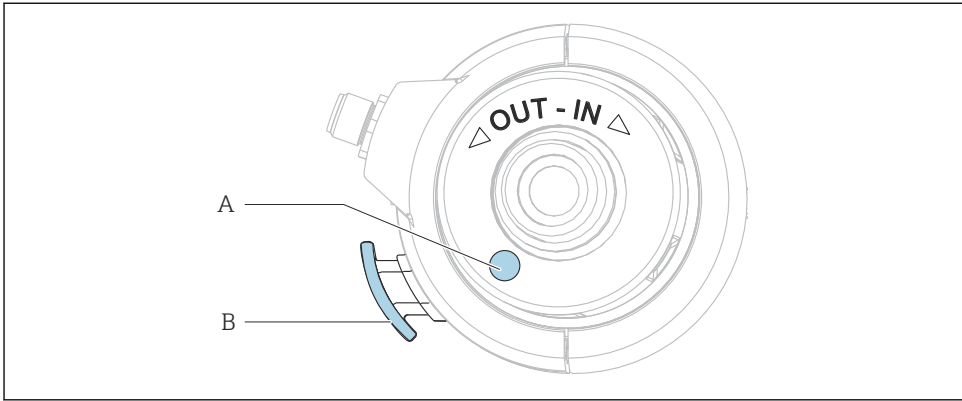


A0030299

40 Assembly with manual operation, operating elements

- 3 Manual drive
- 6 Unlocking button (service position)
- 8 Unlocking button (measuring position)

7.1.1 Manual operation



41 Direction of rotation

- A Unlocking button (service position)
 B Unlocking button (measuring position)

Moving the assembly from the service position to the measuring position

The assembly can only be inserted/retracted if a sensor is installed.

1. Press the unlocking button (A).
2. With the unlocking button (A) pressed during the first quarter turn, rotate the drive in a clockwise direction so that the sensor holder enters the process (this is possible only if a sensor is installed). You can release the button for any continued movement.
3. Rotate the drive until the lock engages.

Moving the assembly from the measuring position to the service position

1. Press the unlocking button (B).
2. With the unlocking button (B) pressed during the first quarter turn, rotate the drive in a counterclockwise direction until the stop (service position).
3. Perform the necessary service work.

7.1.2 Pneumatic operation

The assembly can only be inserted/retracted if a sensor is installed.

Operation of the pneumatic version depends on the controller in question. Consult the controller manual for instructions.

Use a pneumatic pilot valve (4/2-way or 5/2-way) to insert/retract the assembly.

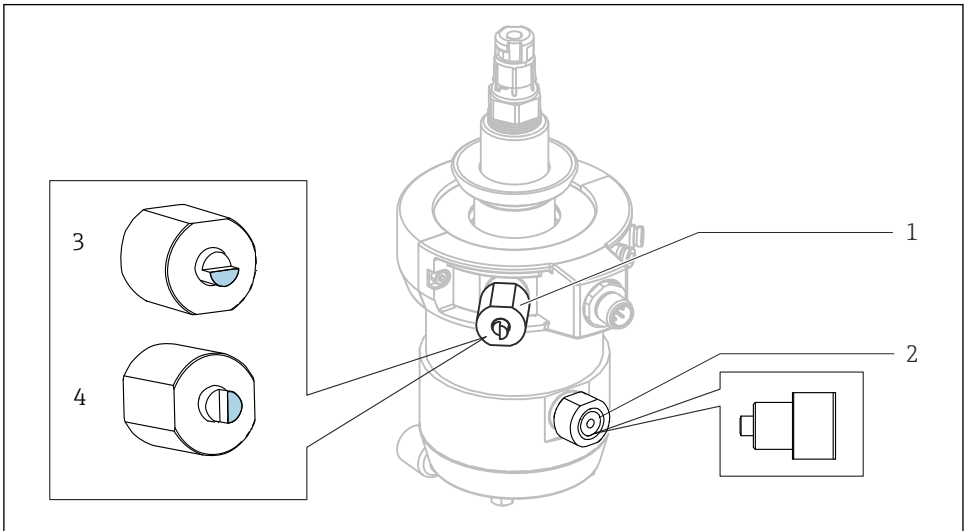
- ▶ Connect the two inputs.
 - ↳ If only one input is connected, the piston is blocked as the sensor guide moves before the limit position lock is disabled.

Inserting/retracting the assembly if the compressed air supply fails

⚠ CAUTION

Risk of injury due to high medium pressure

- ▶ Depressurize the system.



A0046095

42 Failure of compressed air supply

- 1 Limit position lock for service position
- 2 Limit position lock for measuring position
- 3 Normal position (flat side is on top)
- 4 Position for optional sterilization of seal (flat side is on left)

If the compressed air supply fails, you can still move the assembly manually. Proceed as follows here:

1. Use an open-ended wrench (AF 17 mm (0.67 in)) to unscrew both limit position locks (items 1 and 2).
2. Move the assembly to the desired position manually (only possible with sensor installed).
3. Screw the limit position lock back in (Only in the case of optional sterilization of the process seal: Re-install the lock in the normal position (item 3)).

Optional cleaning/sterilization of process seal

In this version, you can clean and sterilize the process seal. To do so, proceed as follows:

1. Move the assembly to service position.
2. Use the open-ended wrench to rotate the pin for the limit position lock (item 1) from item 3 to item 4.
3. Move the assembly to measuring position.
 - ↳ The assembly now moves in the direction of the measuring position and remains in the "third lock position". When cleaning/sterilizing the service chamber, the process seal is now also cleaned/sterilized.
4. Following cleaning/sterilization, move the assembly to service position.
5. Use the open-ended wrench to rotate the pin for the limit position lock from item 4 to item 3.

Move the assembly to measuring position and continue measuring.

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