

Installation Instructions

CAV01

Flow assembly for optical sensors Viomax CAS51D
and Memosens Wave CAS80E



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1 Overview of spare part set

Approval	
AA	Non-hazardous area
	Sensor type
1	CAS51D
2	CAS80E
	Optical path length
A	2 mm (0.08 in)
B	8 mm (0.31 in)
C	10 mm (0.39 in)
D	40 mm (1.57 in)
E	50 mm (1.97 in)
	Cleaning connection
1	No cleaning
2	Compressed air (G1/8" DN4/6)
	Wetted housing material
A	POM-C
	Wetted seal
1	EPDM
	Optional
	Test, certificate, declaration
KT	Approved for use with drinking water according to UA assessment basis, declaration
	Accessory mounted
NA	Process connection POM G1/4" DN 6/8
CAV01-	Complete order code

2 Intended use

The flow assembly is suitable for the installation of the CAS51D and CAS80E optical sensors with different path lengths. Thanks to its design, it can be operated in pressurized systems.


The assembly is designed exclusively for use in liquid media.

Use of the device for any purpose other than that described poses a threat to the safety of people and of the entire measuring system, and is therefore not permitted.

The manufacturer is not liable for damage caused by improper or non-intended use.

3 Authorized installation 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 perform the stated tasks.
- The electrical connection may only be established by an electrical technician.
- The technical personnel must have read and understood the Operating Instructions and must follow the instructions contained therein.
- Measuring point faults may be repaired only by authorized and specially trained personnel.

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

4 Safety instructions

- ▶ Pay attention to the following safety instructions.

 Pay attention to Operating Instructions BA00459C (CAS51D) and BA02005C (CAS80E) of the measuring devices.

4.1 Workplace safety

CAUTION

Sensor UV light

The sensor's UV light can damage the eyes and skin!

- ▶ Never look into the measuring gap while the sensor is in operation.

As the user, you are responsible for complying with the following safety conditions:

- Installation guidelines
- Local standards and regulations

4.2 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.
3. Do not operate damaged products, and protect them against unintentional operation.
4. Label damaged products as defective.




During operation:

- ▶ If faults cannot be rectified:
Take products out of service and protect them against unintentional operation.







4.3 Product safety

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.

5 Symbols**5.1 Warnings**

Structure of information	Meaning
<p> DANGER</p> <p>Causes (/consequences) If necessary, Consequences of non-compliance (if applicable)</p> <ul style="list-style-type: none"> ▶ Corrective action 	<p>This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation will result in a fatal or serious injury.</p>
<p> WARNING</p> <p>Causes (/consequences) If necessary, Consequences of non-compliance (if applicable)</p> <ul style="list-style-type: none"> ▶ Corrective action 	<p>This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation can result in a fatal or serious injury.</p>
<p> CAUTION</p> <p>Causes (/consequences) If necessary, Consequences of non-compliance (if applicable)</p> <ul style="list-style-type: none"> ▶ Corrective action 	<p>This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.</p>
<p>NOTICE</p> <p>Cause/situation If necessary, Consequences of non-compliance (if applicable)</p> <ul style="list-style-type: none"> ▶ Action/note 	<p>This symbol alerts you to situations which may result in damage to property.</p>

5.2 Symbols

-  Additional information, tips
-  Permitted
-  Recommended
-  Forbidden or not recommended
-  Reference to device documentation
-  Reference to page



Reference to graphic

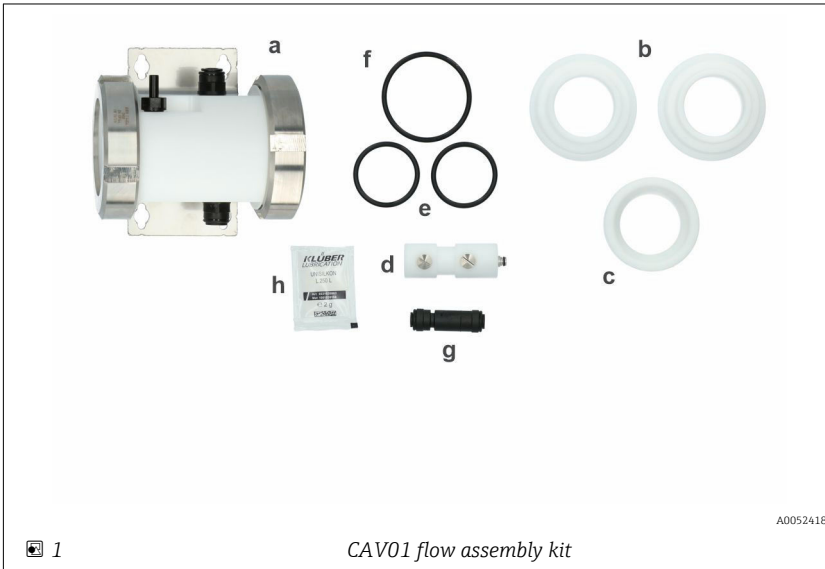


Result of a step

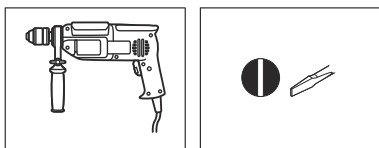
6 Scope of delivery

CAV01 - AAxxxA1 - xx

Item	Description	Quantity	Base unit
a	Flow vessel, pre-assembled	1	Piece
b	POM-C ring	2	Piece
c	POM-C lock ring	1	Piece
d	Air distributor, pre-assembled in the version ordered	1	Piece
e	O-ring ID 37.69 W 3.53 OD 44.75 EPDM	2	Piece
f	O-RING ID 53.57 W3.53 OD 60.63 EPDM	1	Piece
g	Check valve	1	Piece
h	Silicone grease, medium-viscosity 2 g (0.07 oz)	1	Piece
	Service kit instructions	1	Piece



7 Tool list



8 Installation

8.1 Technical data

8.1.1 Environment

Ambient temperature range

0 to 60 °C (32 to 140 °F)

8.1.2 Process

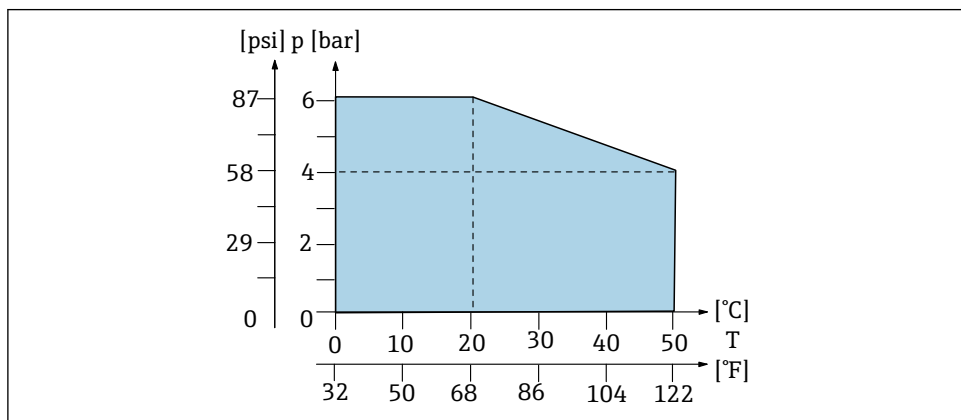
Process temperature range

0 to 50 °C (32 to 122 °F)

Process pressure range

- Maximum 6 bar (87 psi) at 20 °C (68 °F)
- Maximum 4 bar (58 psi) at 50 °C (122 °F)

Pressure/temperature ratings



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2 Pressure/temperature ratings

Flow limit

The flow limit depends on the sensor used and its properties. The data are based on water.

- Minimum 100 ml/h (0.026 gal/h)
- Maximum 10 l/h (2.64 gal/h)

8.1.3 Mechanical construction

Dimensions

→ Section "Installation"

Materials

Wetted materials

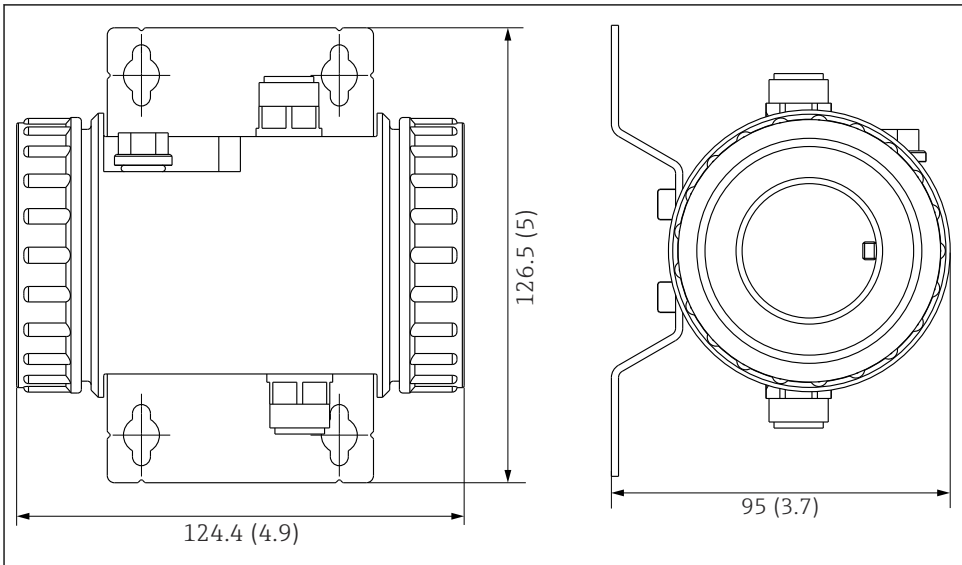
Housing:	POM-C
O-rings:	EPDM
Other parts:	Stainless steel 1.4404, PTFE

Process connections

G1/4" (for hoses with outer diameter 8 mm (0.31 in))

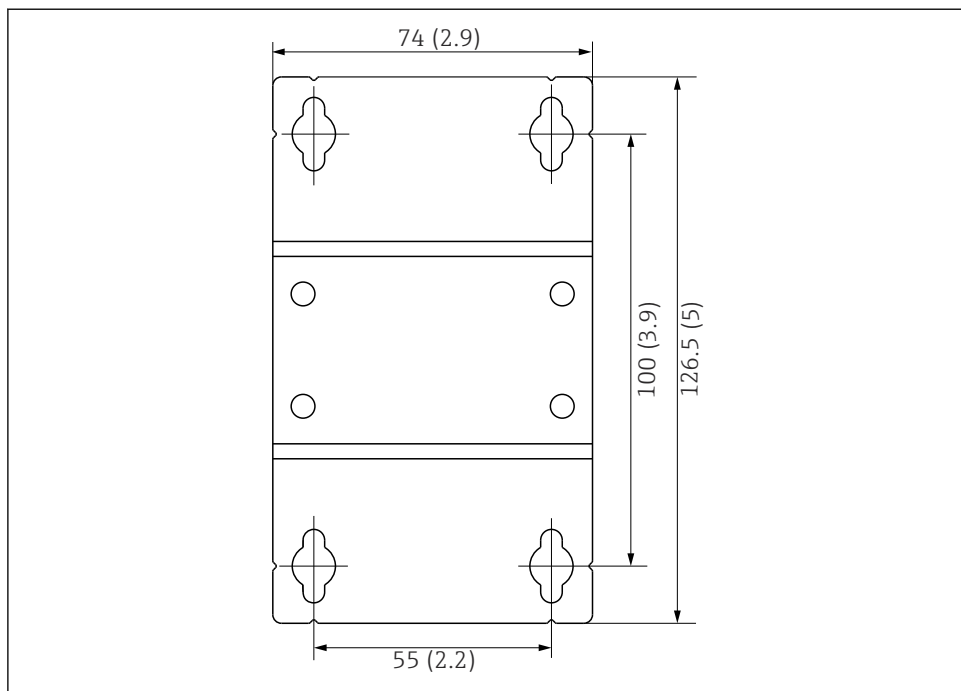
8.2 Installation conditions

8.2.1 Dimensions




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3 Dimensions. Dimensions: mm (in)




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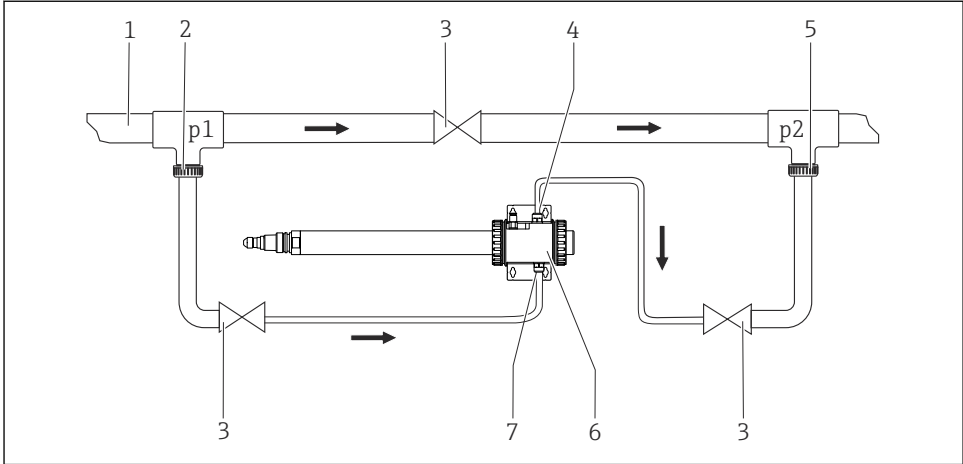
 4 Dimensions of wall holder. Dimensions: mm (in)

8.2.2 Orientation


 The following diagrams show the orientation of the CAS51D sensor in the assembly.

- ▶ Install the CAS80E sensor in the assembly with the reverse orientation. (See Section 8.3.3 Installation with CAS80E sensor) →  16

Assembly in the bypass



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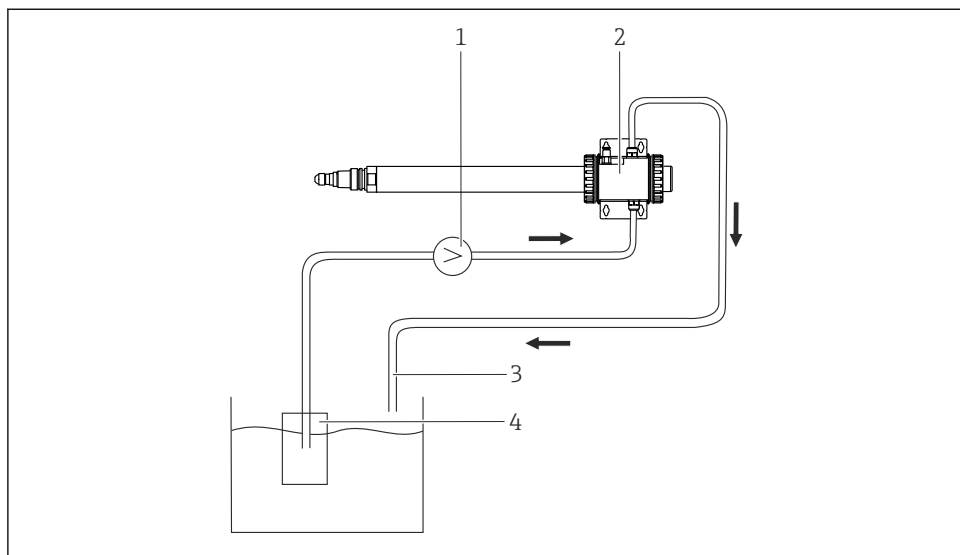
 5 Connection diagram with bypass

- 1 Main pipe
- 2 Medium sampling
- 3 Manually actuated or solenoid valves
- 4 Medium outlet
- 5 Medium return
- 6 Flow assembly
- 7 Medium inflow

To achieve flow through the assembly with a bypass, pressure p_1 must be higher than pressure p_2 . No measures to increase pressure are required for branch pipes that branch off from the main pipe (no return medium).

1. Connect the medium inflow and outlet to the hose connections of the assembly.
 - ↳ The assembly is filled from below and is therefore self-venting.
2. Install an orifice plate in the main pipe to ensure that pressure p_1 is higher than pressure p_2 .
3. Make sure that the flow is at least 100 ml/h (0.026 gal/h).
4. Take the extended response times into consideration.

Assembly in open outlet



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6 Connection diagram with open outlet, arrow points in the flow direction

- 1 Pump
- 2 Flow assembly
- 3 Open outlet
- 4 Filter unit

As an alternative to operation in the bypass, it is also possible to direct the sample flow from a filter unit with an open outlet through the assembly.

8.2.3 Environment

Technical precautions to protect the measuring point from the influence of environmental factors

The ambient conditions at the installation location must meet the technical specification of the assembly and sensor.

1. Protection against direct sunshine and UV radiation sources.
2. Protection against contamination.
3. At ambient temperatures below 0 °C (32 °F), the medium must not freeze. Supply and return lines must be insulated.

8.3 Installing the assembly

8.3.1 Mounting the wall holder with the flow vessel on the panel

NOTICE

Sharp threads and mounting plate.

- ▶ Wear gloves for the installation.



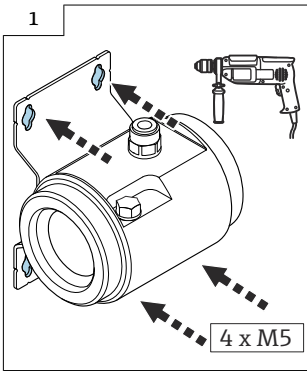
The wall holder and flow vessel are pre-assembled.



The mounting materials used to secure the wall holder are not included in the scope of delivery and must be supplied by the customer.

- ▶ Preferably align the assembly with the cleaning connection pointing upwards.

This makes it easier for any air remaining in the pipe after cleaning or maintenance to escape.



8.3.2 Installation with CAS51D sensor

⚠ CAUTION

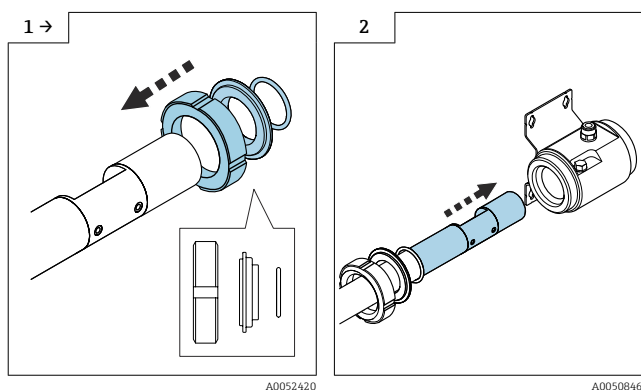
Residual medium and high temperatures

Risk of injury!

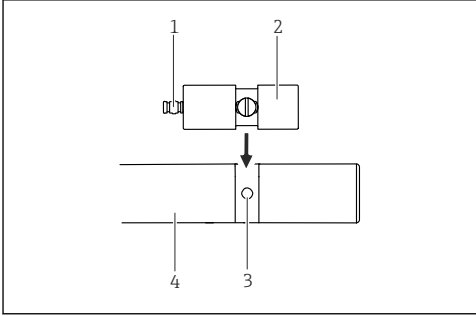
- ▶ When working with parts that are in contact with the medium, protect against residual medium and elevated temperatures.
- ▶ Wear protective goggles and safety gloves.

Preparatory steps:

1. Wet the O-rings with water or grease them before use.
 - ↳ The O-rings slide more easily over the sensor and do not twist.
2. Make sure that the optical windows do not come into contact with grease.



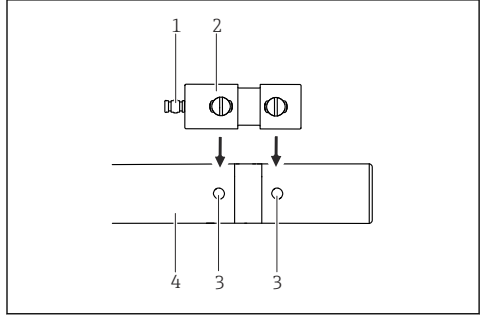
- ▶ Select the correct air distributor for the sensor gap width.



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▣ 7 Air distributor for gaps up to 10 mm (0.39 in)

- 1 Double nipple
- 2 Air distributor
- 3 Mounting holes
- 4 Sensor

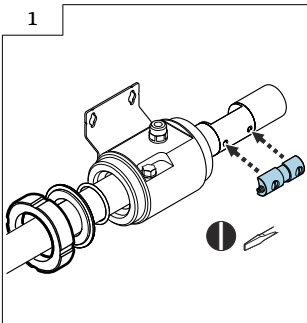


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▣ 8 Air distributor for gaps as of 40 mm (1.57)

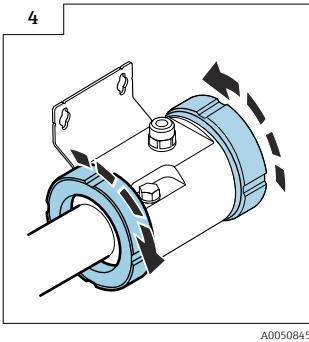
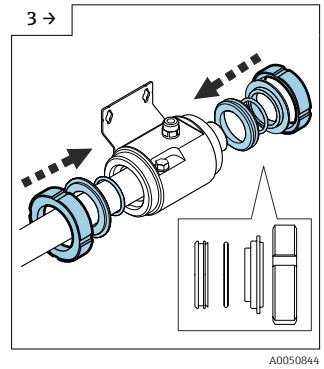
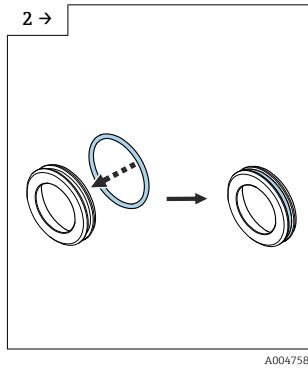
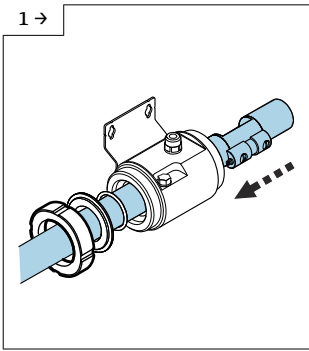
- 1 Double nipple
- 2 Air distributor
- 3 Mounting holes
- 4 Sensor

► Check whether the O-ring is located between the air distributor and banjo bolt.



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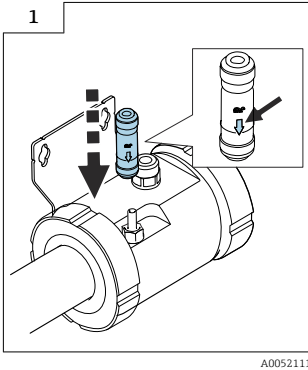
- Pull the sensor into the mounted flow vessel until the air distributor engages in the flow vessel.



- i** If the optional compressed air cleaning unit is ordered, the connection nozzle provided for this purpose is pre-installed and the check valve is enclosed.

- ▶ Fit the check valve on the connection nozzle according to the specified direction of the arrow.

i Once attached, the check valve is difficult to remove from the screw-in nozzle.



8.3.3 Installation with CAS80E sensor

⚠ CAUTION

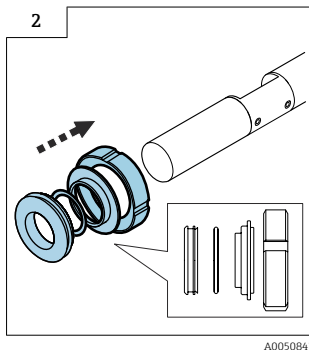
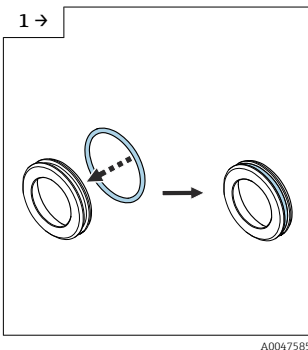
Residual medium and high temperatures

Risk of injury!

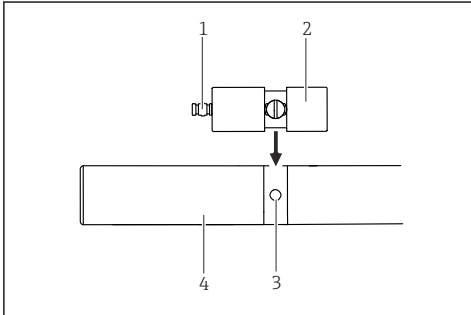
- ▶ When working with parts that are in contact with the medium, protect against residual medium and elevated temperatures.
- ▶ Wear protective goggles and safety gloves.

Preparatory steps:

1. Wet the O-rings with water or grease them before use.
 - ↳ The O-rings slide more easily over the sensor and do not twist.
2. Make sure that the optical windows do not come into contact with grease.



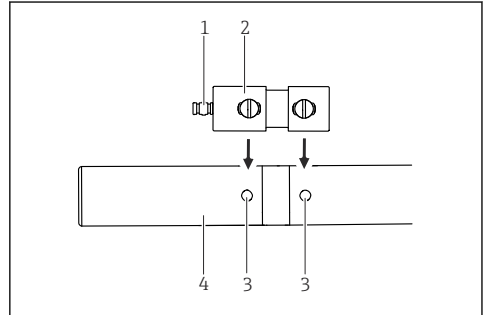
- Select the correct air distributor for the sensor gap width.



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- ▣ 9 Air distributor for gaps up to 10 mm (0.39 in)

- 1 Double nipple
- 2 Air distributor
- 3 Mounting holes
- 4 Sensor

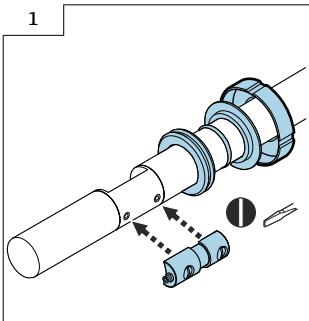


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- ▣ 10 Air distributor for gaps as of 40 mm (1.57)

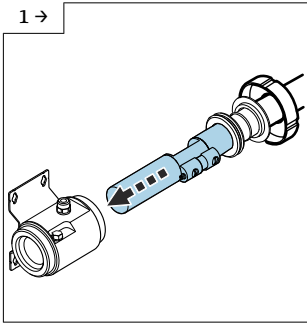
- 1 Double nipple
- 2 Air distributor
- 3 Mounting holes
- 4 Sensor

- Check whether the O-ring is located between the air distributor and banjo bolt.

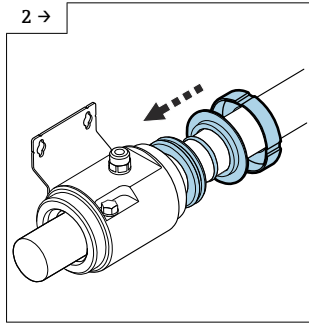


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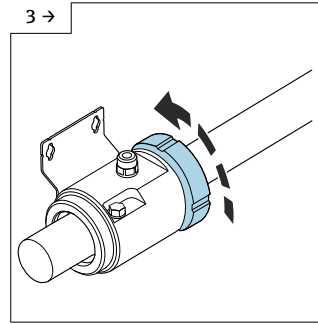
- Push the sensor into the mounted flow vessel until the air distributor engages in the flow vessel.



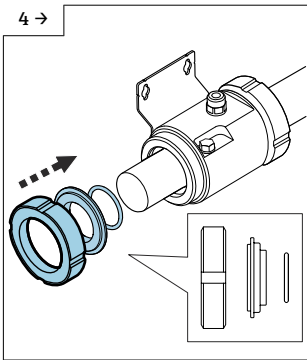
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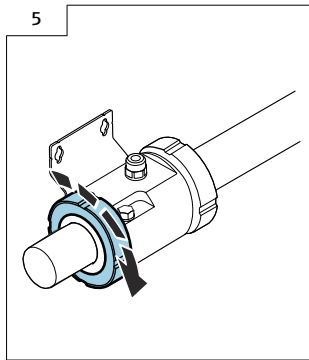
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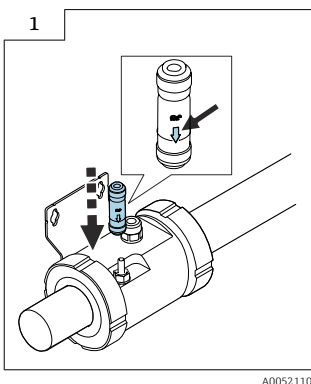


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- i** If the optional compressed air cleaning unit is ordered, the connection nozzle provided for this purpose is pre-installed and the check valve is enclosed.

- ▶ Fit the check valve on the screw-in nozzle according to the specified direction of the arrow.

i Once attached, the check valve is difficult to remove from the screw-in nozzle.



8.4 Post-installation check

1. After mounting, check all the connections to ensure they are secure.
2. Check the tight sealing of all the seals on the assembly (no leaks).
3. Check whether the sensor is installed and connected correctly.

8.5 Commissioning

⚠ WARNING

Risk of injury if medium escapes!

- ▶ Before applying pressure to the assembly, ensure that the medium is correctly connected.
- ▶ If the medium connection is not correct, do not introduce the assembly into the process.
- ▶ Before commissioning, check the chemical compatibility of materials, the temperature range and the pressure range.

8.5.1 Preparations

The flow assembly is optionally fitted with a cleaning connection.

NOTICE

Process pressure too high for compressed air cleaning

- ▶ Maximum process pressure for compressed air cleaning 10 bar (145 psi)

Connect the compressed air hose:

- ▶ Connect a compressed air hose (outer diameter 6 mm (0.24 in)) to the cleaning connection with the enclosed adapter (G1/4", 6 mm (0.24 in)).

8.6 Maintenance

⚠ WARNING

Risk of injury if medium or cleaner escapes!

- ▶ Before each maintenance task, ensure that the process pipe is unpressurized, empty and rinsed.
- ▶ Switch off the cleaning unit before removing the sensor from the medium.

8.6.1 Maintenance tasks

⚠ CAUTION

Risk of injury due to residual medium and elevated temperatures!

- ▶ When handling parts that are in contact with the medium, protect against residual medium and elevated temperatures.
- ▶ Wear protective goggles and safety gloves.

8.6.2 Cleaning agent

⚠ WARNING

Organic solvents containing halogens

Limited evidence of carcinogenicity! Dangerous for the environment with long-term effects!

- ▶ Do not use organic solvents that contain halogens.

⚠ WARNING

Thiocarbamide

Harmful if swallowed! Limited evidence of carcinogenicity! Possible risk of harm to the unborn child! Dangerous for the environment with long-term effects!

- ▶ Wear protective goggles, protective gloves and appropriate protective clothing.
- ▶ Avoid all contact with the eyes, mouth and skin.
- ▶ Avoid discharge into the environment.

The most common types of soiling and the appropriate cleaning agents in each case are shown in the following table.

i Pay attention to the material compatibility of the materials to be cleaned.

Type of soiling	Cleaning agent
Greases and oils	Hot water or tempered, surfactant-containing (basic) agents or water-soluble organic solvents (e.g. ethanol)
Limescale deposits, metal hydroxide buildup, lyophobic biological buildup	approx. 3% hydrochloric acid
Sulfide deposits	Mixture of 3% hydrochloric acid and thiocarbamide (commercially available)
Protein buildup	Mixture of 3% hydrochloric acid and pepsin (commercially available)


Type of soiling	Cleaning agent
Fibers, suspended substances	Pressurized water, possibly surface-active agents
Light biological buildup	Pressurized water

- Choose a cleaning agent to suit the degree and type of soiling.

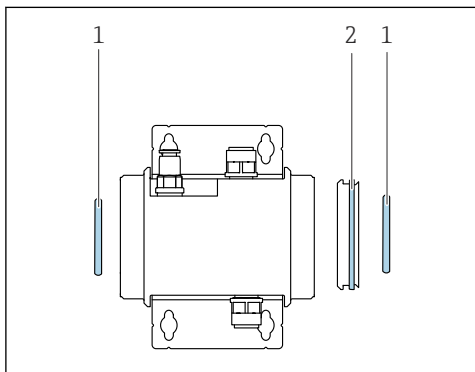
8.6.3 Cleaning the assembly

To ensure stable and reliable measurements, the assembly and the sensor must be cleaned regularly. The frequency and intensity of the cleaning process depend on the medium.

1. Remove the sensor.
2. Clean the assembly depending on the degree of fouling.
3. Remove light dirt and fouling using suitable cleaning agents → 20.
4. Remove heavy soiling using a soft brush and a suitable cleaning agent.
5. For very persistent dirt, soak the parts in a cleaning solution.
6. After soaking the parts, clean them with a brush.
7. Rinse the parts thoroughly with water.

 A typical cleaning interval for drinking water, for example, is 6 months.

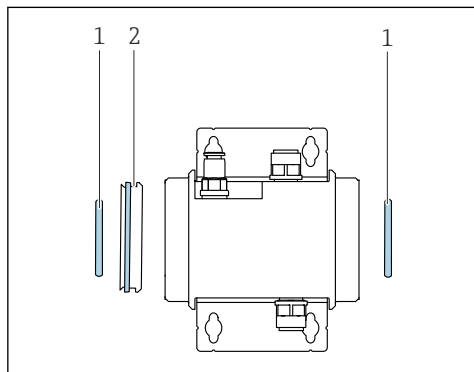
8.6.4 Replacing O-rings




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 11 Arrangement of the O-rings on the assembly with CAS51D

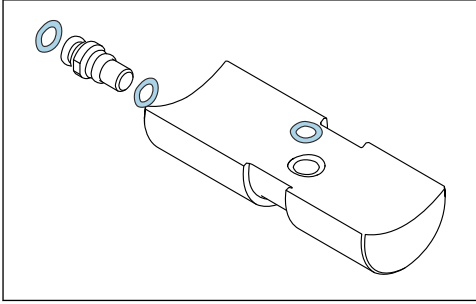
- 1 O-ring
- 2 O-ring on lock ring



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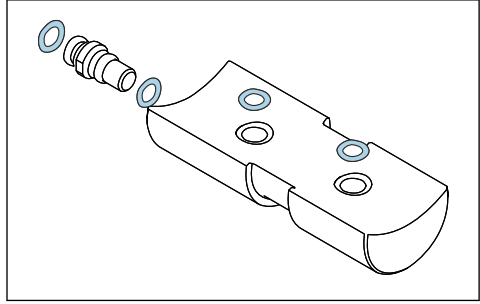
 12 Arrangement of the O-rings on the assembly with CAS80E

- 1 O-ring
- 2 O-ring on lock ring



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- 13 O-rings on air distributor with one mounting hole



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- 14 O-rings on air distributor with 2 mounting holes

i The air distributor for the sensors with a gap width of 40 mm (1.57 in) or 50 mm (1.97 in) has 2 mounting holes, each with an O-ring. It is recommended to replace the O-rings annually.

Replacement of the O-rings on the assembly with CAS51D

1. Remove the O-rings as described in Section 9.1.1. → 23
2. Replace the used O-rings with new O-rings.
3. Wet the new O-rings with water or grease them before use.
 - ↳ The O-rings slide more easily over the sensor and do not twist.
4. Make sure that the optical windows do not come into contact with grease.
5. Install the O-rings and mount the assembly as described in Section 8.3.2. → 13

Replacement of the O-rings on the assembly with CAS80E

1. Remove the O-rings as described in Section 9.1.2. → 25
2. Replace the used O-rings with new O-rings.
3. Wet the new O-rings with water or grease them before use.
 - ↳ The O-rings slide more easily over the sensor and do not twist.
4. Make sure that the optical windows do not come into contact with grease.
5. Install the O-rings and mount the assembly as described in Section 8.3.3. → 16

9 Removal

9.1 Removing the assembly

9.1.1 Removal with CAS51D sensor

⚠ WARNING

Risk of injury if medium or cleaner escapes!

- ▶ Before each maintenance task, ensure that the process pipe is unpressurized, empty and rinsed.
- ▶ Switch off the cleaning unit before removing the sensor from the medium.

⚠ CAUTION

Residual medium and high temperatures

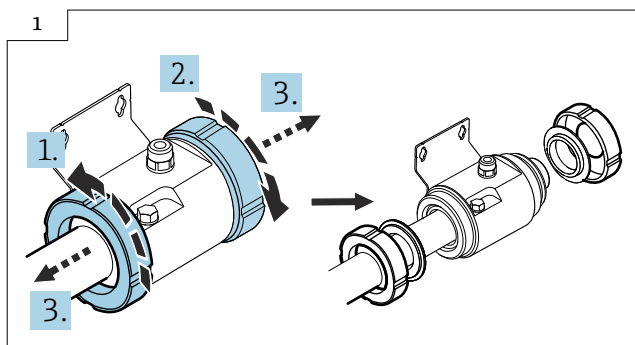
Risk of injury!

- ▶ When working with parts that are in contact with the medium, protect against residual medium and elevated temperatures.
- ▶ Wear protective goggles and safety gloves.

NOTICE

The sensor and assembly can be damaged if dropped.

- ▶ When performing the removal, secure the sensor and assembly in such a way that nothing can fall or drop.



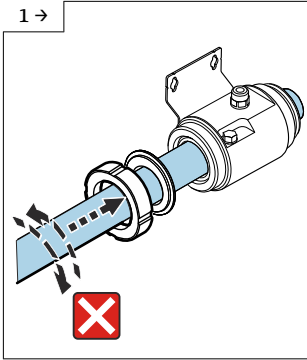
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NOTICE

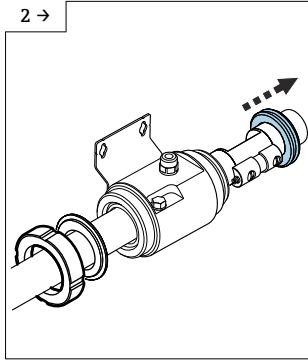
Do not turn the sensor in the flow cell.

The sensor tube is unscrewed and liquid enters the sensor.

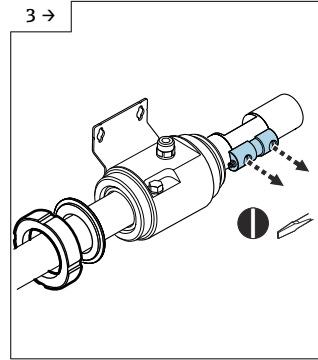
- Only pull or push the sensor in the flow cell.



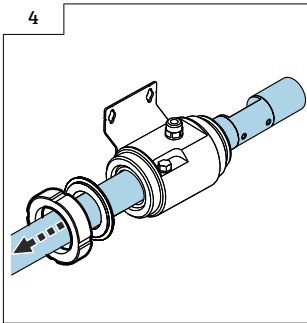
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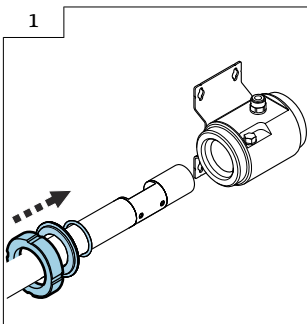


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- Make sure that the optical windows do not come into contact with grease.



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9.1.2 Removal with CAS80E sensor

⚠ WARNING

Risk of injury if medium or cleaner escapes!

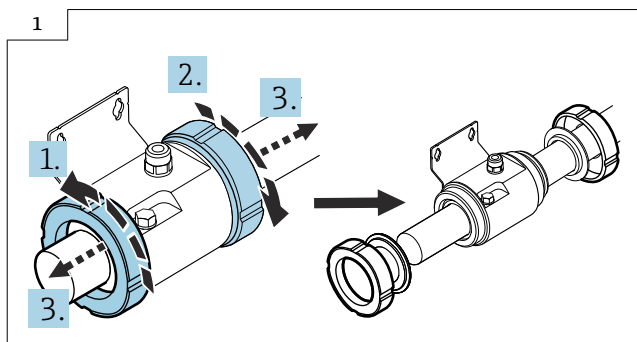
- ▶ Before each maintenance task, ensure that the process pipe is unpressurized, empty and rinsed.
- ▶ Switch off the cleaning unit before removing the sensor from the medium.

⚠ CAUTION

Residual medium and high temperatures

Risk of injury!

- ▶ When working with parts that are in contact with the medium, protect against residual medium and elevated temperatures.
- ▶ Wear protective goggles and safety gloves.



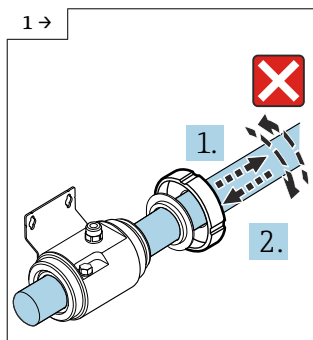
A0050860

NOTICE

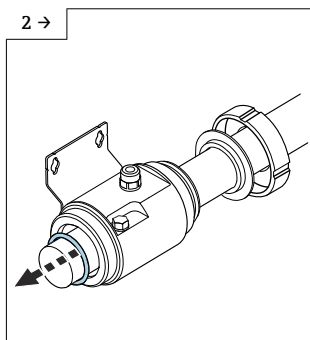
Do not turn the sensor in the flow cell.

The sensor tube is unscrewed and liquid enters the sensor.

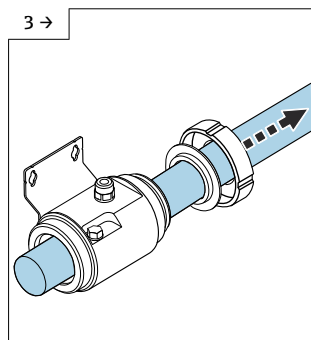
- ▶ Only pull or push the sensor in the flow cell.



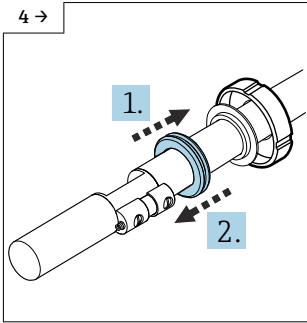
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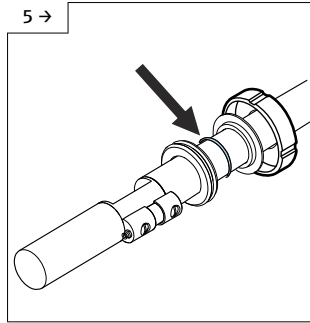
A0050862



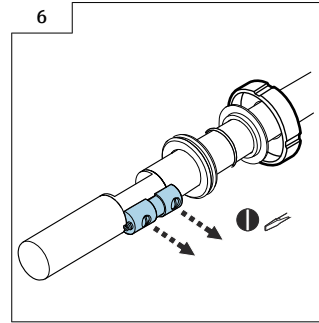
A0050863



A0050864

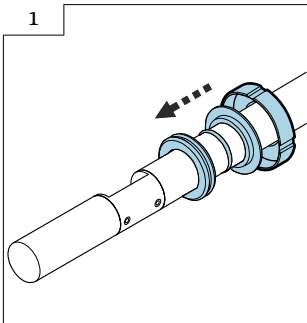


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- Make sure that the optical windows do not come into contact with grease.



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10 Disposal

- Observe the local regulations.



If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.



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