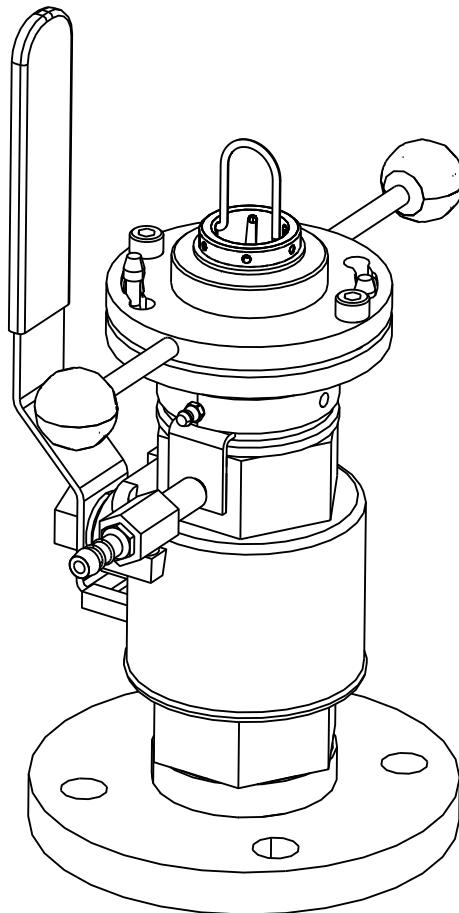


Operating Instructions

Cleanfit CUA451

Retractable process assembly



Document information

Safety information

The structure, signal words and color coding applied to safety information comply with the requirements of ANSI Z535.6 ("Product safety information in product manuals, instructions and other collateral materials").

Structure of information	Meaning
⚠ DANGER Cause (/Consequences) Possible consequences if ignored ▶ Preventive measures	This symbol alerts you to a dangerous situation. If you do not avoid this dangerous situation, it will result in death or serious injury.
⚠ WARNING Cause (/Consequences) Possible consequences if ignored ▶ Preventive measures	This symbol alerts you to a dangerous situation. If you do not avoid the dangerous situation, it may result in death or serious injury.
⚠ CAUTION Cause (/Consequences) Possible consequences if ignored ▶ Preventive measures	This symbol alerts you to a dangerous situation. If you do not avoid the dangerous situation, it may result in minor or more serious injuries.
NOTICE Cause/situation Possible consequences if ignored ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

Symbols used




-  additional information, tip
-  permitted or recommended
-  forbidden or not recommended

Table of contents

1	Basic safety instructions	4
1.1	Personnel requirements	4
1.2	Designated use	4
1.3	Workplace safety	4
1.4	Operational safety	4
1.5	Product safety	4
2	Incoming acceptance and product identification	5
2.1	Incoming acceptance	5
2.2	Product identification	5
2.3	Scope of delivery	5
3	Installation	6
3.1	Installation conditions	6
3.2	Installation instructions	10
3.3	Post-installation check	14
4	Operation	15
4.1	Initial commissioning	15
4.2	Operating elements	15
4.3	Assembly operation	16
5	Maintenance	17
5.1	Cleaning the assembly	17
5.2	Cleaning the sensor	17
5.3	Cleaning agent	17
5.4	Replacing seals	18
6	Troubleshooting	20
6.1	Replacing damaged components	20
6.2	Spare parts kits	21
6.3	Return	23
6.4	Disposal	23
7	Accessories	24
7.1	Accessory kits	24
7.2	Sensors	24
7.3	Welding socket	25
8	Technical data	27
8.1	Environment	27
8.2	Process	27
8.3	Mechanical construction	28
	Index	30

1 Basic safety instructions

1.1 Personnel requirements

- ▶ 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.
 - ▶ Measuring point faults may be rectified only by authorized and specially trained personnel.
- i** Repairs not described in the Operating Instructions provided may only be carried out directly by the manufacturer or by the service organization.

1.2 Designated use

The manually operated Cleanfit CUA451 retractable assembly is designed for the installation of turbidity sensors in tanks and pipelines. Its mechanical construction means that it can be operated in pressurized systems (see Technical data).

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 resulting from improper or non-designated use.

1.3 Workplace safety

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

- Regulations for explosion protection (Ex devices only)
- Installation guidelines
- Local standards and regulations

1.4 Operational safety

- ▶ Before commissioning the entire measuring point, verify that all connections are correct. Ensure that electrical cables and hose connections are not damaged.
- ▶ Do not operate damaged products, and safeguard them to ensure that they are not operated inadvertently. Mark the damaged product as defective.
- ▶ If faults cannot be rectified, the products must be taken out of service and secured against unintentional commissioning.

1.5 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 European standards have been observed.

2 Incoming acceptance and product identification

2.1 Incoming acceptance

- Verify that the packaging is not damaged.
- Notify your supplier of any damage to the packaging. Keep the damaged packaging until the matter has been settled.
- Verify that the contents are not damaged.
- Notify your supplier of any damage to the delivery contents. Hold on to the damaged goods until the matter has been settled.
- Check the delivery for completeness. Check it against the delivery papers and your order.
- 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. Furthermore, the permitted ambient conditions must also be observed (see "Technical data").
- If you have any questions, please contact your supplier or your local sales center.

2.2 Product identification


2.2.1 Nameplate

You can find the following information on the nameplate:

- Manufacturer details
- Order code
- Extended order code
- Serial number
- Operating conditions
- Safety information symbols

Compare the order code on the nameplate with your order.

2.2.2 Product identification

-  To establish your device version, enter the order code from the nameplate into the search field at the following address:
www.products.endress.com/order-ident

2.3 Scope of delivery

The scope of delivery comprises:

- Ordered version of the assembly
- Operating Instructions in English

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

3 Installation

3.1 Installation conditions

3.1.1 Dimensions

Assembly with G2 thread and weld-in adapter in measuring position (long and short stroke)

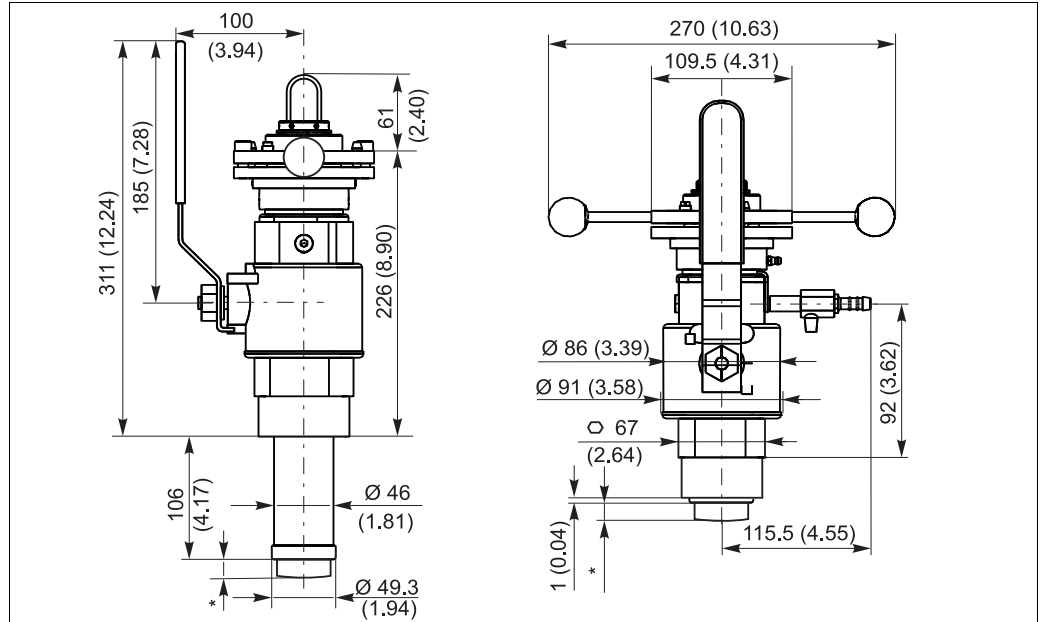


Fig. 1: Dimensions in mm (inch)

Assembly with G2 thread and weld-in adapter in service position (long and short stroke)

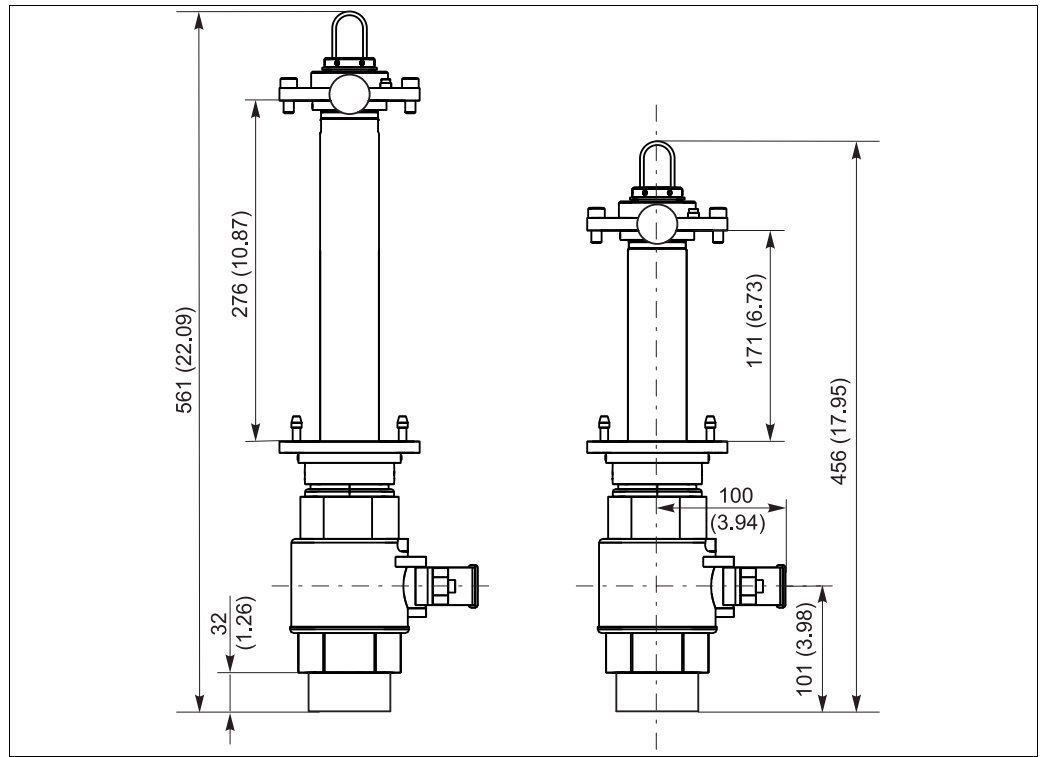
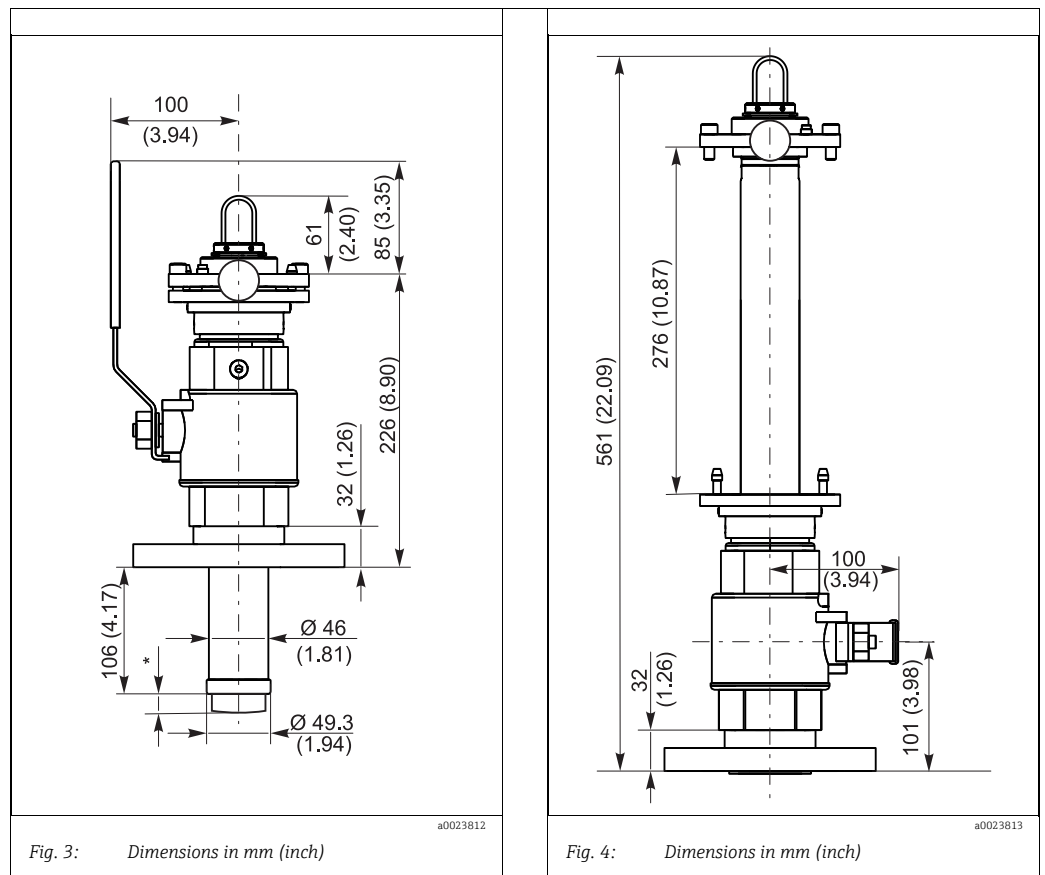


Fig. 2: Dimensions in mm (inch)

Assembly with flange connection



* Dimensions depend on sensor:
 CUS31/41: 14 mm (0.55") / 20 mm (0.79") (with wiper) CUS52D: 26.5 mm (1.04")
 CUS51D: 10.5 mm (0.41")

Additional space of 350 mm (13.8") is required to install and remove the sensor.

3.1.2 Process connections

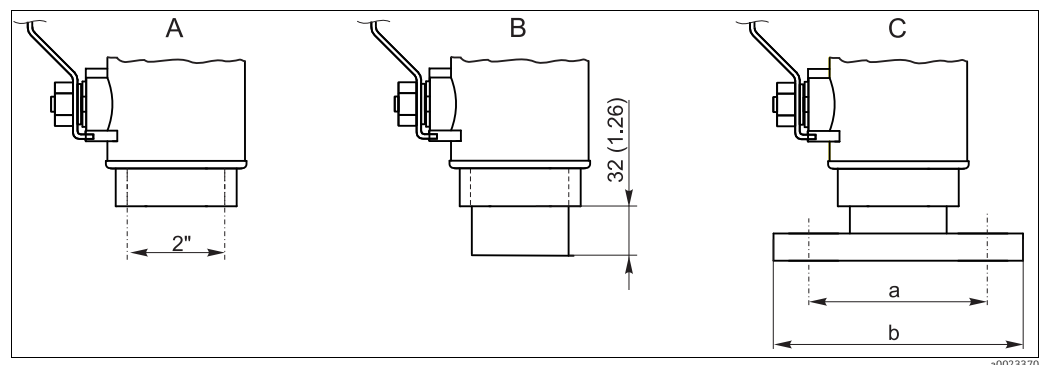


Fig. 5: Process connections. Dimensions in mm (inch)

A Internal thread G2
 B Internal thread G2 with weld-in adapter
 C Flange DN 50 / PN 16 (as per EN 1092-1) and flange ANSI 2" / 150 lbs
 a: DN 50: Ø 125 (4.92), ANSI 2": Ø 120.7 (4.75)
 b: DN 50: Ø 165 (6.50), ANSI 2": Ø 152.4 (6.00)

3.1.3 Installation instructions

The assembly is designed for installation on vessels and pipes. Suitable nozzles must be available for this. The minimum pipe diameter is DN 80.

Installation location

The following figure illustrates various installation positions in pipes and indicates whether they are permitted or not.

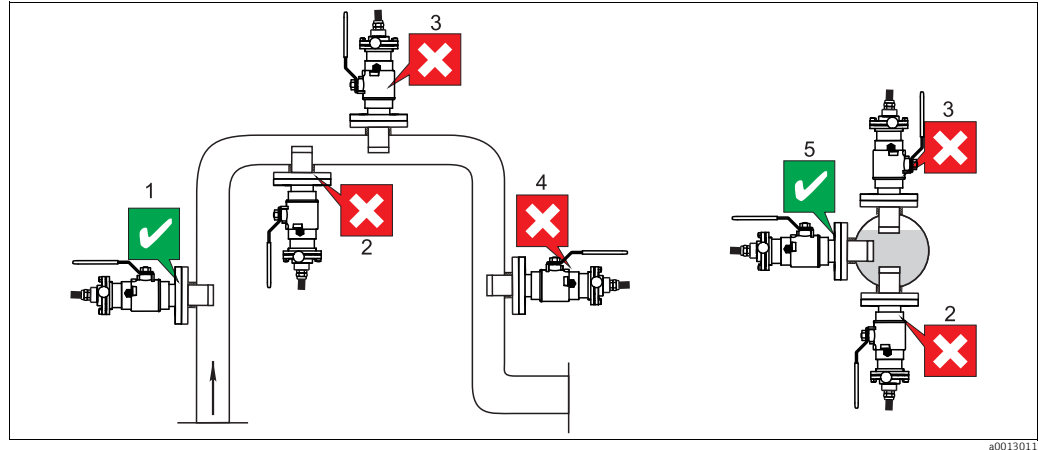
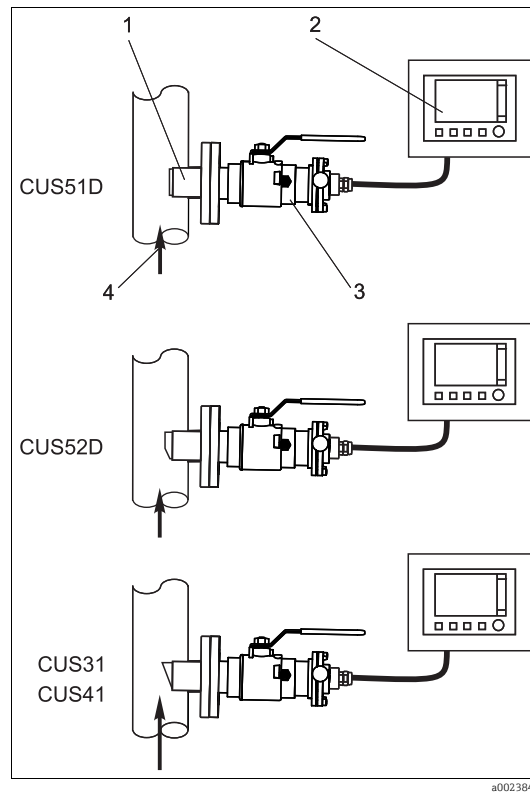


Fig. 6: Orientations and installation positions (with retractable assembly CUA451)

- The pipeline diameter must be at least 100 mm (4") if reflective materials (e.g. stainless steel) are used. An onsite calibration is recommended.
- Install the sensor in places with uniform flow conditions.
- The best installation location is in the ascending pipe (item 1). Installation is also possible in the horizontal pipe (item 5).
- Do not install the sensor in places where air may collect or foam bubbles form (item 3) or where suspended particles may settle (item 2).
- Avoid installation in the down pipe (item 4).
- Avoid installations downstream of pressure reduction steps that can result in outgassing.

Orientations



i Be sure to avoid a siphon effect at the rinse chamber outlet. The inflow to the rinse chamber is always from below.

Fig. 7: Orientations

- 1 Turbidity sensor
- 2 Liquiline CM44x multichannel transmitter
- 3 CUA451 retractable assembly
- 4 Flow direction

Clearance between sensor and pipe wall

If you install the sensor in pipes or very close to the wall, this causes backscatter and therefore a higher sensor signal.

Follow the instructions in the operating instructions for the sensor used.

3.2 Installation instructions

3.2.1 Measuring system

A complete measuring system comprises:

- Cleanfit CUA451 assembly
- Turbimax CUS41/CUS31/CUS51D or CUS52D turbidity sensor
- Liquiline CM44x or Liquisys M CUM223/253 transmitter

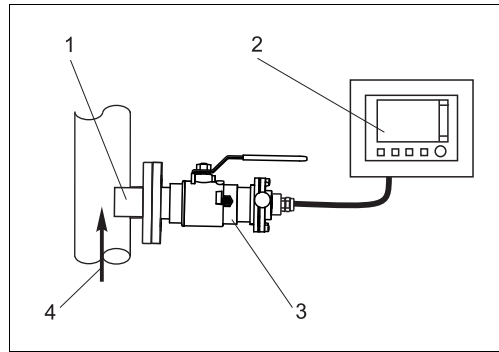


Fig. 8: Measuring system with CUS51D

- 1 Turbimax CUS51D turbidity sensor
- 2 Liquiline CM44x multichannel transmitter
- 3 Cleanfit CUA451 retractable assembly
- 4 Flow direction of the medium

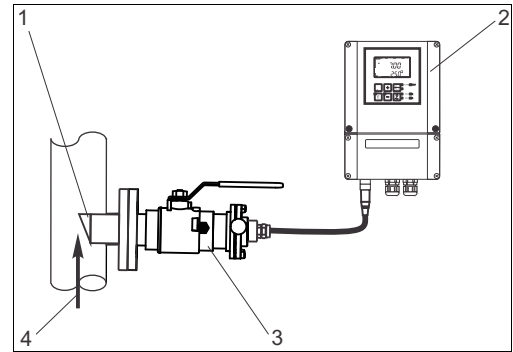


Fig. 9: Measuring system with CUS31 or CUS41

- 1 CUS31 or CUS41 turbidity sensor
- 2 Liquisys M CUM253
- 3 Cleanfit CUA451 retractable assembly
- 4 Flow direction of the medium

3.2.2 Installing the assembly in the process

Mount the hand lever (item 1) on the assembly.

Set the assembly to the "Service" position (retraction pipe inserted into the assembly) and secure the assembly to the vessel or pipe using your selected process connection.

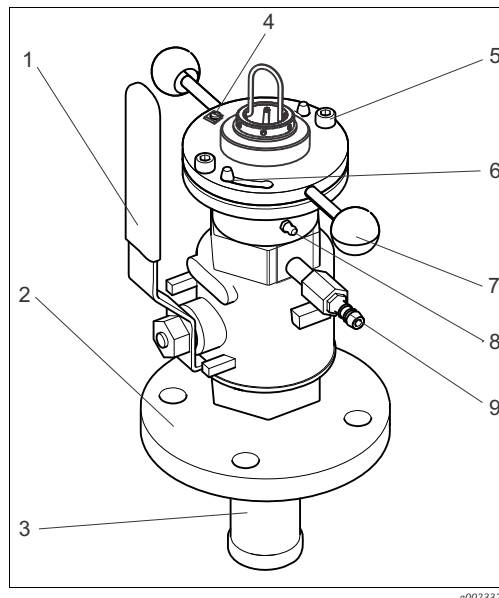


Fig. 10: Assembly in operational state (ball valve open)

- 1 Hand lever for opening/closing the ball valve
- 2 Process connection (flange DN 50 / PN 16; example)
- 3 Retraction pipe
- 4 Terminal for potential equalization
- 5 Securing screws
- 6 Bayonet lock
- 7 Handles
- 8 Grease nipple
- 9 Ball valve for venting or rinse connection



For flange process connection:

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

For G2 process connection:

Use a commercially available sealing agent (e.g. LOCTITE 561) to seal the G2 process connection.

3.2.3 Rinse water connection (optional)

You can rinse the sensor in the service position with a second ball valve for the rinse chamber (see accessories).

1. Connect the rinse water pipe to the rinse nozzle provided. The two rinse nozzles on the assembly are identical. Use one as the inlet and the other as the outlet.
2. Operate the rinse water connection of the assembly with a water pressure of 2 bar to max. 6 bar (29 to 87 psi).
3. Also install a check valve and a dirt trap (100 µm, see "Accessories") in the water pipe (at the inlet to the assembly).

Apart from water you can also pass other or additional cleaning solutions through the rinse chamber. When doing so, pay attention to the material resistance of the assembly and comply with the maximum permitted temperatures and pressures.

NOTICE

Water pressure too high

The assembly can be damaged.

- ▶ A pressure-reducing valve must be connected in series upstream if the water pressure can increase to above 6 bar (87 psi).

3.2.4 Sensor installation

You require the following tools to install the sensor:

- Allen key 2.5 mm
- Allen key 6 mm

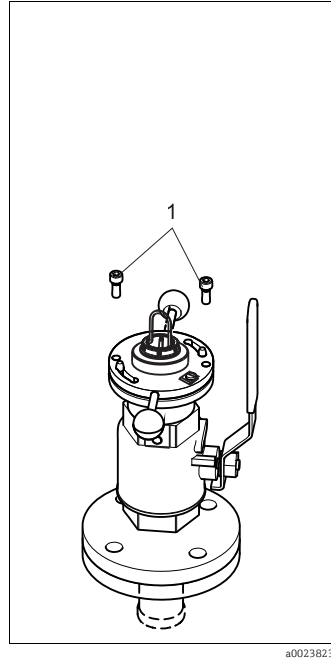


Fig. 11:

1 Securing screws

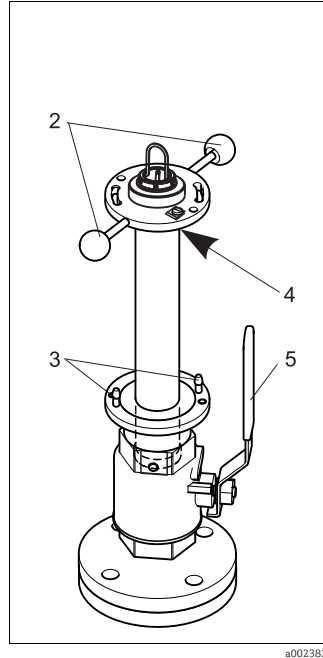


Fig. 12:

2 Handles
3 Bayonet lock
4 Grub screw
5 Hand lever

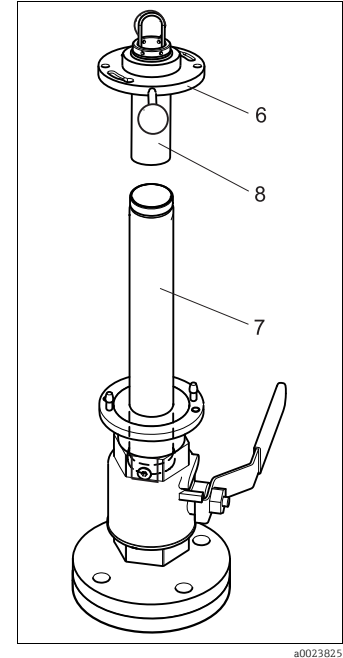



Fig. 13:

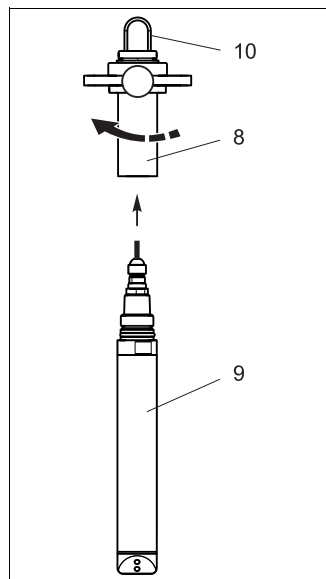
6 Bayonet nut
7 Retraction pipe
8 Sensor holder

1. Loosen the securing screws (item 1) and place them in a safe place within reach.
2. Release the bayonet lock (→  12) and taking the handles pull out the retraction pipe (item 7) together with the sensor holder (item 8) as far as possible.
3. Close the ball valve! To do so, push down the hand lever (item 5) as far as it will go (only possible in one direction!).
When the ball valve is closed the assembly is sealed off from the process.

CAUTION

Risk of injury from medium and high pressure in the rinse chamber

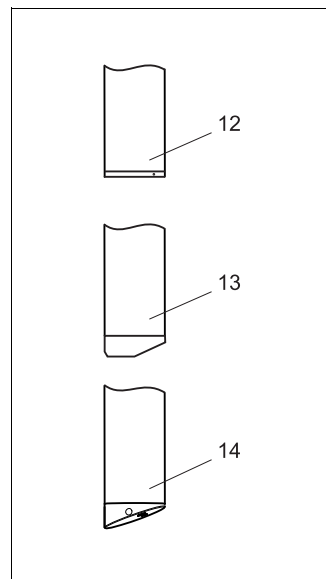
- Connect a hose to the vent valve and carefully vent the rinse chamber before you continue.
4. Release the grub screw (item 4) on the underside of the bayonet nut.
 5. Unscrew the bayonet nut and the sensor holder (item 8) from the retraction pipe by holding the retraction pipe tight (item 7) and turning the handles counterclockwise (approx. 9 rotations).
 6. Now pull the handles to remove the bayonet nut, along with the sensor holder, from the retraction pipe.



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Fig. 14:

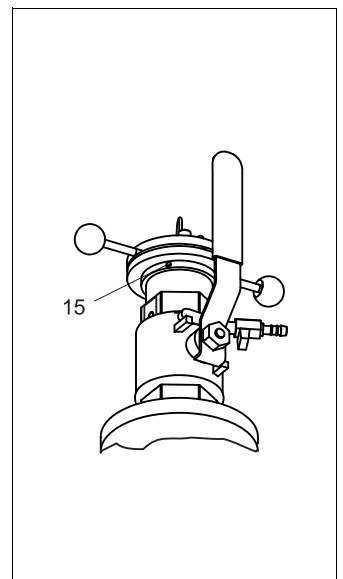
- 8 Sensor holder
9 Sensor
10 Bracket



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Fig. 15:

- 12 CUS51D
13 CUS52D
14 CUS31/41



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Fig. 16:

- 15 Fixing screws (2 screws, only one is visible in the graphic)

7. Screw the sensor (item 9) hand-tight into the internal thread of the sensor holder.
8. The bracket (item 12) on the sensor holder can be mounted in various positions at a distance of 60°. In this way, you can use the bracket to mark the position of the sensor in the retraction pipe.



Once the assembly is installed, the bracket is the only way you have of checking the alignment of the sensor in the process!

Observe the instructions on sensor alignment in the operating instructions for the sensor.

9.
 - a. CUS52D / CUS31 / CUS41 (→ 15):
If necessary, push the bracket out of the installation bore holes and align it according to the axis of the sensor head. Align the bracket mark to the short side (= flow side) of the sensor. In this way, you can determine the position of the inclined sensor surface in the process and align the sensor with the medium flow.
 - b. CUS51D:
Fluid can flow to this sensor version in any direction. Alignment is not necessary.
10. Push the bracket into the desired installation bore holes.
11. Fit the mounted sensor into the retraction pipe, hold the retraction pipe steady and tighten the bayonet nut (turn handles clockwise).
12. Tighten the grub screw of the bayonet nut.
13. Close the rinse chamber connection.
14. Open the ball valve and push the retraction pipe in the direction of the process as far as it will go. This is easier if you grease the retraction pipe somewhat. See the information in the "Maintenance" section.
15. Lock the bayonet lock and secure the retraction pipe using the securing screws.
16. Slacken the two screws (→ 16). Turn the entire top assembly part around its own axis until the sensor is in the right position in relation to the medium flow. Secure this position by tightening the two screws again until the assembly part cannot turn any more.

3.3 Post-installation check

- Following installation, check all the connections to ensure that they are properly secured and sealed.
- Ensure that the hoses for the (optional) rinse water connections cannot be removed without effort.
These pipes are in open contact with the medium and must be secured accordingly.
- Check the hoses for damage.

4 Operation

4.1 Initial commissioning

Prior to initial 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).

▲ WARNING

If process medium leaks out, there is a risk of injury due to high pressure, high temperature or chemicals.

- ▶ Before subjecting the assembly to process pressure, verify that all connections are sealed!
- ▶ If you use a shutoff valve on the rinse chamber as a vent cock, the dummy plug on the outlet side of the rinse chamber must not be removed! Otherwise the assembly may **not** be introduced into the process!

4.2 Operating elements

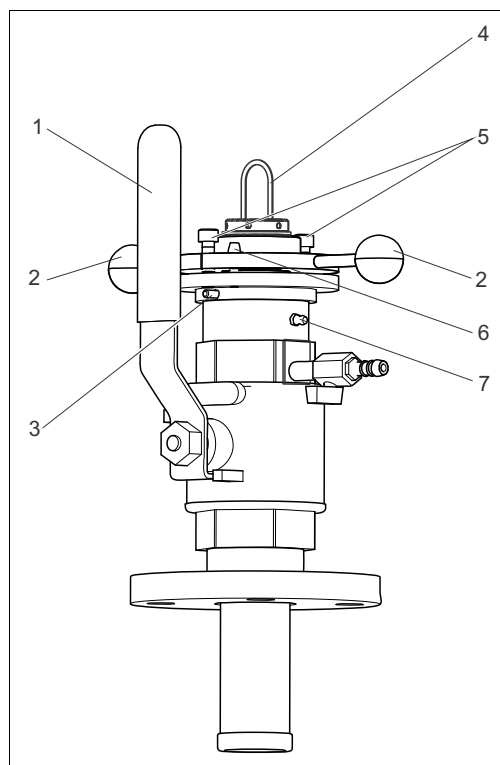


Fig. 17: Operating elements

- | | |
|---|------------------------------------|
| 1 | Hand lever |
| 2 | Handles |
| 3 | Fixing screw(s) (grub screw) |
| 4 | Bracket |
| 5 | Securing screws |
| 6 | Stop lock bolt of the bayonet lock |
| 7 | Grease nipple |

You have the following options for operation:

- Hand lever
This opens and closes the ball valve.
- Stop lock bolt and screws
This locks the retraction pipe in the "Measure" position.
- Handles
You change the alignment of the sensor in the process by turning the top part of the assembly around its own axis by the handles (bayonet lock engaged, securing screws screwed in and fixing screws released).
- Fixing screws
These lock the top part of the assembly in the desired position.
- Bracket
The bracket has a marking on one side. This enables you to identify the position of the sensor when installing the sensor in the assembly (see "Sensor installation" section).
- Grease nipple
You can grease parts of the retraction pipe here (see "Maintenance" section).

4.3 Assembly operation

▲ CAUTION

High pressure can cause injury

- ▶ You can only operate the retractable assembly manually up to a pressure of 2 bar (29 psi)! If the process pressure is higher, you must switch off the process before moving the assembly!
- ▶ Never release the securing screws at process pressures over 2 bar (29 psi)!
- ▶ At process pressures up to 2 bar (29 psi), make sure that the bayonet lock does not open when you release the securing screws, as otherwise there is the danger that the pressure could cause the screws to "shoot out" uncontrollably!
- ▶ Always use an Allen key to release and lock the screws and hold the Allen key in your hand from the first turn of the screw to the last. In this way you have control of the screws.
- ▶ Always lock the sensor holder with the bayonet lock **and** securing screws! Otherwise the sensor holder could exit in an uncontrolled manner as a result of the process pressure and injure someone.

Moving from the "Service" position to the "Measure" position

1. Check that the rinse chamber connections are closed.
2. Open the ball valve.
3. Push the sensor holder as far as possible in the direction of the process.
4. Lock the sensor holder using the bayonet lock and the securing screws. This prevents the sensor holder from returning inadvertently to the "Service" position.
5. If necessary, turn the top part of the assembly around its own axis by the handles in order to align the sensor. Lock the desired position with the fixing screws.

Moving from the "Measure" position to the "Service" position

1. Loosen the securing screws with an Allen key.
2. Open the bayonet lock.
3. Pull out the sensor holder as far as it will go ("Service" position).
4. Close the ball valve.
5. Vent the rinse chamber.
6. Perform the required service activities.

5 Maintenance

▲ WARNING

Risk of injury if medium escapes

- ▶ Before each maintenance activity, verify that the process piping and the tank are unpressurized, empty and have been rinsed.
- ▶ Move the assembly to the "Service" position and close the ball valve.

5.1 Cleaning the assembly

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

All parts in contact with the medium, such as the sensor and the sensor guide, must be cleaned regularly. To do so, you must remove the sensor¹⁾.

- Low levels of contamination are removed using suitable cleaning agents (see "Cleaning agent" section).
- High levels of contamination are removed using a soft brush and a suitable cleaning agent.
- For contamination that is difficult to remove, soak the parts in a cleaning solution. Then clean the parts using a brush.

i A typical example of a cleaning interval would be 6 months in the case of drinking water.

Grease the retraction pipe to ensure the assembly moves in and out smoothly. SYNTHESO GLEP 1 (from Klüber) is a suitable grease. If working in the food industry, PARALIQ GTE 703 (from Klüber) is suitable. Also grease the area between the O-rings with the aid of the grease nipple.

5.2 Cleaning the sensor

You must clean the sensor:

- before each calibration
- regularly during operation
- before returning it for repair

You can remove the sensor and clean it manually, or you can clean it in automatic mode²⁾ using the rinse water connection.

NOTICE

Incorrect measurement or damage to sensor due to incorrect cleaning

- ▶ Do not use abrasive cleaning agents. These may cause irreparable damage to the sensor.
- ▶ After the sensor has been cleaned, rinse the assembly's rinse chamber using an ample quantity of water. Otherwise, the residue from the cleaning agent may distort the measurement.
- ▶ If necessary, carry out a new calibration following cleaning.

5.3 Cleaning agent

The choice of cleaning agent depends on the degree and type of contamination. The most common types of contamination and the appropriate cleaning agents can be found in the following table.

1) same as sensor installation, but in reverse order
2) only if the assembly is fitted out accordingly

Type of contamination	Cleaning agent
Grease and oils	(Alkaline) media containing surfactants or water-soluble organic solvents (halogen-free, e.g. ethanol)
Limescale, metal hydroxide coatings, sparingly soluble biofilms	approx. 3% hydrochloric acid
Sulfide deposits	Mixture of 3% hydrochloric acid and thiocarbamide (commercially available)
Protein-based coatings	Mixture of 3% hydrochloric acid and pepsin (commercially available)
Fibers, suspended solids	Pressurized water, possibly surfactants
Thin biofilms	Pressurized water


⚠ CAUTION

Health hazard due to solvents

- ▶ Do not use any halogen-containing, organic solvents or acetone. These solvents may destroy plastic components of the sensor and are also suspected of causing cancer (e.g. chloroform).

5.4 Replacing seals

- Keep the sealing surfaces of the assembly dirt-free.
- Remove buildup from time to time.
- If leaks are discovered, contact your Endress+Hauser sales office.

You can replace the seals shown in →  18. The seals are available as an accessory kit, see the "Accessories" section

To replace the seals in the assembly, you must interrupt the process and remove the assembly completely.

⚠ CAUTION

Risk of injury due to residual medium and elevated temperatures

- ▶ When handling parts which are in contact with the medium, protect yourself from residual medium and elevated temperatures. Wear protective gloves and glasses.

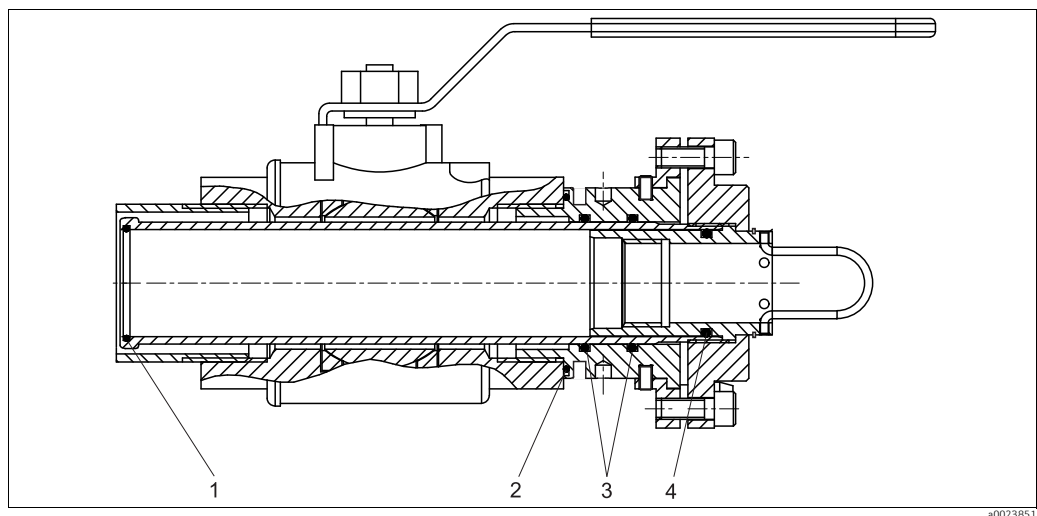



Fig. 18: Seals

- 1 O-ring Viton, retraction pipe
- 2 O-ring Viton, between ball valve and bottom part of bayonet lock
- 3 O-rings Viton, bottom part of bayonet lock
- 4 O-ring Viton, sensor holder

You require the following materials and tools:

- Teflon tape
- Grease (e.g. SYNTHESO GLEP 1 or PARALIQ GTE 703)
- Allen key 2.5 mm
- Allen key 6 mm
- Adjustable open-ended wrench (up to 45 mm)
- Open-ended wrench set (only for flange connection)
- Snap ring pliers
- Adjustable pin wrench DIN 1810 B, size 68 to 75

Disassembling the assembly

1. Switch off the process and empty the piping or the container.
2. Slacken both securing screws.
3. Open the bayonet lock.
4. Drive the assembly to the "Service" position.
5. Separate the assembly from the process connection (welding neck or flange).
6. Release the grub screw on the underside of the bayonet nut.
7. Unscrew the bayonet nut and the sensor holder from the retraction pipe by holding the retraction pipe tight and turning the handles counterclockwise (approx. 9 rotations).
8. Now pull the handles to remove the bayonet nut, along with the sensor holder, from the retraction pipe.
9. Wrap a few layers of Teflon tape around the thread of the retraction pipe. This protects the seals from damage when inserting and removing the retraction pipe.
10. Press the retraction pipe downwards out of the ball valve.
11. Using snap ring pliers, remove the snap ring above the bayonet nut.
12. Remove the bayonet nut from the sensor holder.
13. Only when replacing the O-ring, item 2 (→  18): unscrew the vent cock (with safety bracket).
14. Only when replacing the O-ring, item 2: using a sickle spanner unscrew the bottom part of the bayonet lock.

You can now access the seals.

Replacing the seals and assembling the assembly

1. Lightly grease the O-rings (e.g. with Syntheso Glep 1).
2. Replace the seals (O-rings).
3. If you have not already done so, wrap a few layers of Teflon tape around the thread of the retraction pipe. This protects the seals from damage when inserting the retraction pipe.
4. Grease the retraction pipe (see "Maintenance" section).
5. Reassemble the assembly. Remove the Teflon tape once you have inserted the retraction pipe.
6. Check for leaks before bringing the assembly back to the "Measuring" position.

6 Troubleshooting

6.1 Replacing damaged components

▲ CAUTION

Pressure safety is compromised

Risk of injury due to medium escaping and elevated temperature

- ▶ Damage to the assembly, which compromises pressure safety, must be repaired **only** by authorized and qualified personnel.
- ▶ Following each repair and maintenance task, the assembly must be checked for leaks using appropriate procedures. Following this, the assembly must again comply with the specifications in the technical data.

Replace all other damaged components immediately. To order accessories and spare parts, use the "Accessories" and "Spare parts" sections or contact your local Endress+Hauser sales office.

6.2 Spare parts kits

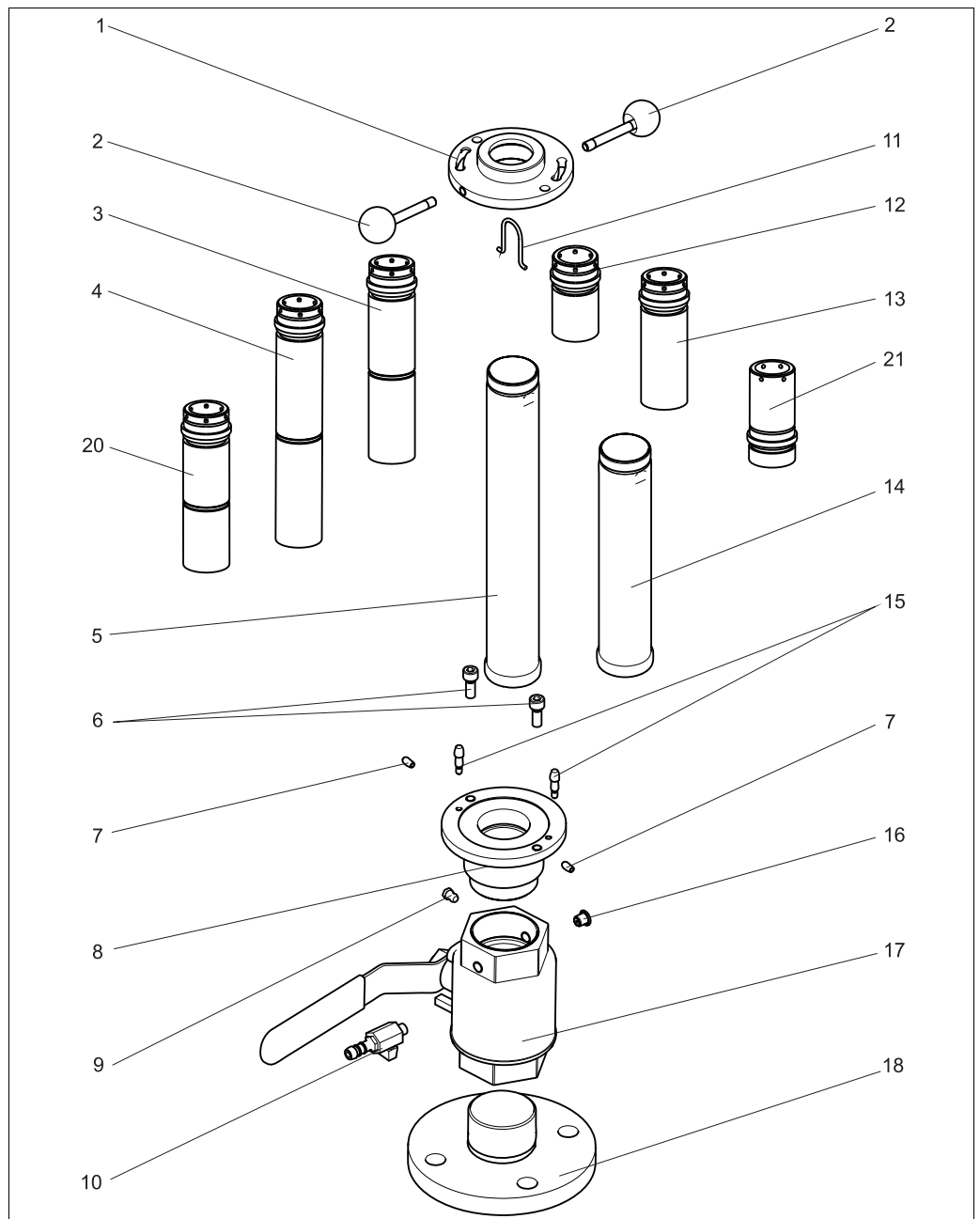


Fig. 19: Spare parts

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i The bayonet lock nut (item 1) and dummy plug (item 16) are not available as a spare part.

The sensor holders are used to adapt the length of the different sensors to a standard installation length. To distinguish between the individual sensor holders, their lengths are listed in the following table.

Item No.	Designation and content	Order number Spare parts kit
2	Ball handle with bolts 2 of each	51513168
3	Sensor holder for CUS51D and CUS41 (incl. Viton O-ring and snap ring) For assembly version: – long stroke, length: 178 mm (7.01")	51513164
4	Sensor holder for CUS65 (incl. Viton O-ring and snap ring) For assembly version: – long stroke, length: 221 mm (8.70")	51513167
5	Retraction pipe (incl. FPM O-ring) For assembly version: – long stroke	51513158
6, 7, 11, 15	Kit: – Bracket (11), 5 pcs. – Allen key M8 x 20 (6), 10 pcs. – Stop bolt (15), 2 pcs. – Grub screws (7), 10 pcs.	51513169
8, 17	Ball valve (17): Without process connection, with G2 internal thread and bottom part of bayonet lock (8) with Viton O-rings	51513159
8, 17, 18	Ball valve (17): With flange DN 50, welding adapter (18) and bottom part of bayonet lock (8) with Viton O-rings	51513154
	Ball valve (17): With flange ANSI 2", welding adapter (18) and bottom part of bayonet lock (8) with Viton O-rings	51513155
9	Grease nipple H1 M6x1	51514843
10	Ball valve for rinse chamber as rinse connection or venting, hose connection OD 9	51512982
12	Sensor holder for CUS51D and CUS41 (incl. Viton O-ring and snap ring) For assembly version: – short stroke, length: 73 mm (2.87")	51513163
13	Sensor holder for CUS65 (incl. Viton O-ring and snap ring) For assembly version: – short stroke, length: 116 mm (4.57")	51513166
14	Retraction pipe (incl. FPM O-ring) For assembly version: – short stroke	51513156
20	Sensor holder for CUS52D (incl. Viton O-ring and snap ring) For assembly version: – long stroke, length: 145 mm (5.71")	71254976
21	Sensor holder for CUS52D (incl. Viton O-ring and snap ring) For assembly version: – short stroke, length: 85 mm (3.35")	71254975

6.3 Return

The product must be returned if it is in need of repair or a factory calibration, or if the wrong product was ordered or delivered. Legal specifications require Endress+Hauser, as an ISO-certified company, to follow certain procedures when handling all returned products that have been in contact with the medium.

To ensure that your device is returned swiftly, safely and in an appropriate manner, please read the procedures and conditions on the Endress+Hauser website at www.services.endress.com/return-material

6.4 Disposal

The ball valve, sensor holder and other parts must be disposed of separately, based on the material they are made of.

Please observe local regulations.

7 Accessories

7.1 Accessory kits

Ball valve for rinse chamber

- As rinse connection complementing or replacing the venting ball cock supplied;
- Order No. 51512982

O-ring set

- Viton + FPM
- Order No. 51512981

7.2 Sensors

Turbimax W CUS31

- Turbidity sensor for drinking water and industrial water measurement according to the 90° scattered light principle
- Order as per product structure, www.products.endress.com/cus31
- Technical Information TI00176C/07/EN

Turbimax W CUS41

- Turbidity sensor for industrial water and solids measurement according to the 90° scattered light principle
- Order as per product structure, www.products.endress.com/cus41
- Technical Information TI00177C/07/EN

Turbimax CUS51D

- For nephelometric measurements of turbidity and solids in wastewater
- Four-beam alternating light method based on scattered light
- With Memosens protocol
- Order as per product structure, www.products.endress.com/cus51d
- Technical Information TI00461C/07/EN

Turbimax CUS52D

- Turbidity sensor for very low to average turbidity
- With Memosens protocol
- Order as per product structure, www.products.endress.com/cus52d
- Technical Information TI01136C/07/EN

7.3 Welding socket

Welding socket

- Welding socket for pipe diameter from 80 mm, with combination flange DN 50 / ANSI 2":
 - Bores for flange DN 50: 4 x 90° Ø18 on bolt circle Ø125 (4.92)
 - Bores for flange ANSI 2": 4 x 90° Ø19 on bolt circle Ø121 (4.75)
- Flange seal, 4 screws M16x60, 4 nuts M16 incl. washers,
- Stainless steel 1.4571 (AISI 316 Ti)
- Order No. 50080249

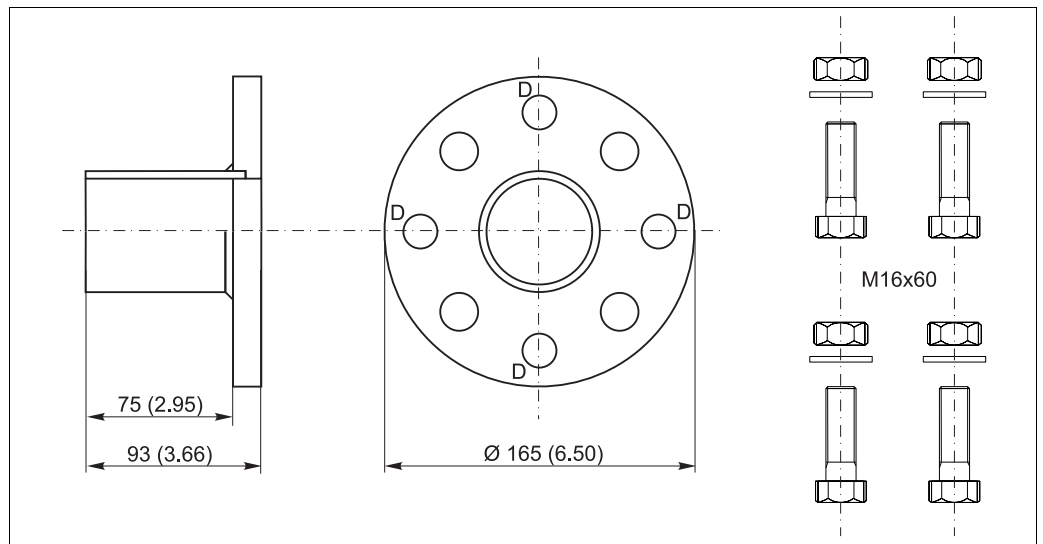


Fig. 20: Welding socket, dimensions in mm (inch)

D: Markings for bores, flange DN 50

Welding nipple

- Welding nipple for 2" thread
- Stainless steel 1.4404 (AISI 316L)
- Order No. 71265347

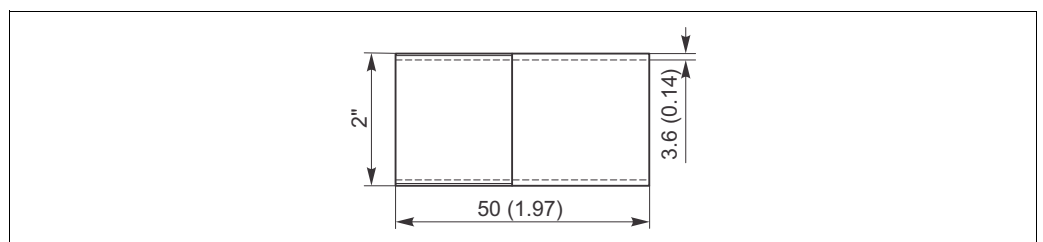


Fig. 21: Welding nipple, dimensions in mm (inch)

Welding rinse socket DN 65

- For the automatic spray cleaning of sensors CUS51D/31/41 in pipes and containers:
 - Bores for flange DN 50: 4 x 90° Ø18 on bolt circle Ø125
 - Bores for flange ANSI 2": 4 x 90° Ø19 on bolt circle Ø121
- Rinse connection: R $\frac{1}{4}$ external thread
- With removable rinse nozzle
- Up to 6 bar (87 psi), 80 °C (176 °F)
- Order No. 51500912

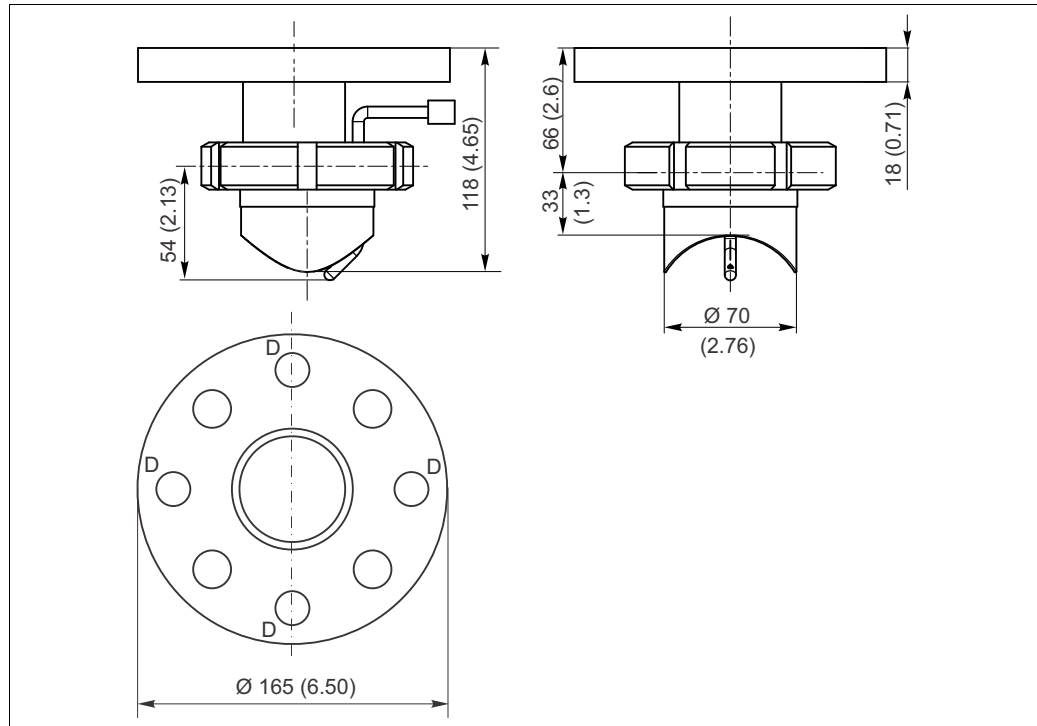


Fig. 22: Welding rinse socket, dimensions in mm (inch)

D: Markings for bores, flange DN 50

8 Technical data

8.1 Environment

Ambient temperature range 0 to 50 °C (32 to 122 °F)

8.2 Process

Medium pressure Max. 10 bar (145 psi)

- i** For manual insertion/retraction of the assembly the medium pressure may not exceed 2 bar (29 psi)!
Also take the process conditions of the sensor used into consideration!

Medium temperature 0 to 80 °C (32 to 176 °F)

- i** Take the maximum medium temperature for the sensor into consideration!

Pressure-temperature ratings

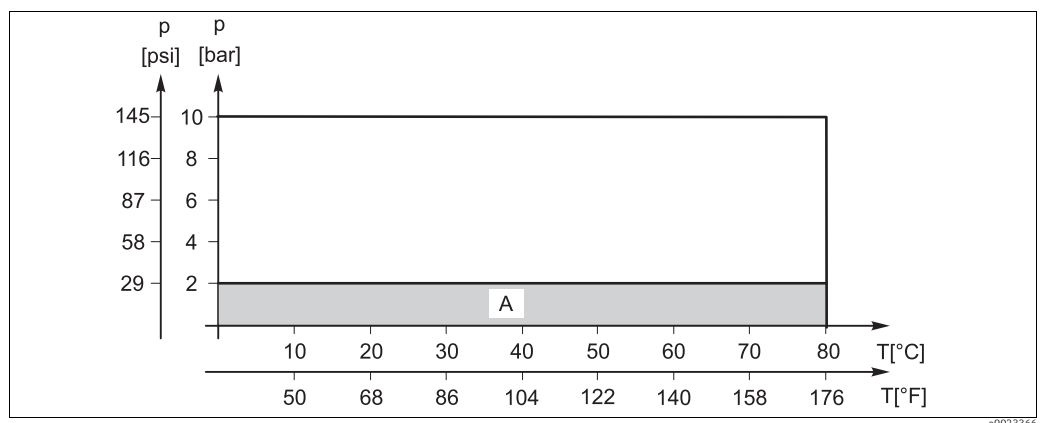


Fig. 23: Pressure-temperature ratings

A Range in which the assembly can be operated manually

8.3 Mechanical construction

Design, dimensions	See "Installation" section	
Weight	Depending on version: 8 to 11 kg (17.6 to 24.3 lbs)	
Materials	Wetted:	Viton (seals) Stainless steel 1.4404 (AISI 316L) Nickel-plated brass (vent cock or rinse connection)
	Not wetted:	Stainless steel 1.4404 (AISI 316L)
Rinse connection nozzles	2 x G1/8 (internal) Connection options: – 2 x ball valve with hose connection OD 9 mm (see "Accessories") (A ball valve is included in the delivery for the assembly. On its own it acts as a vent cock.) – Customer's own rinse connections with G1/8 external thread	
Vent cock	Ball valve with hose connection OD 9 mm	

Index

A

Accessories	24
Kits	24
Sensors	24
Welding socket	25

C

Check	
Installation	14
Cleaning	
Assembly	17
Cleaning agent	17
Sensor	17
Cleaning interval	17
Connection	
Process	7
Rinse water	11

D

Designated use	4
Dimensions	6
Disposal	23

F

Faults	20
--------------	----

G

Grease nipple	15
---------------------	----

I

Incoming acceptance	5
Initial commissioning	15
Installation	6
Check	14
Installation instructions	8
Installation location	8
Orientations	9
Process	10
Sensor	12
Wall clearance	9
Installation instructions	10

M

Maintenance	17
Maintenance interval	17
Measuring	16
Measuring system	10
Mechanical construction	28
Mode	
Measuring	16
Service	16

N

Nameplate	5
-----------------	---

O

Operating elements	15
Operation	
Manual	16
Operational safety	4

P

Personnel requirements	4
Product safety	4

R

Replacing	
Damaged parts	20
Seals	18
Retractable pipe	12
Rinse water connection	11

S

Scope of delivery	5
Seals	18
Sensor	
Cleaning	17
Installation	12
Sensor holder	12, 17
Sensors	24
Service	16
Spare parts	21
Splash protection cap	12
Stop lock bolt	12, 15

T

Technical data	27–28
----------------------	-------

U

Use	4
-----------	---

W

Wall clearance	9
Welding socket	25
Workplace safety	4



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