

Operating Instructions

Flowfit CUA252

Flow assembly for CUS52D turbidity sensor

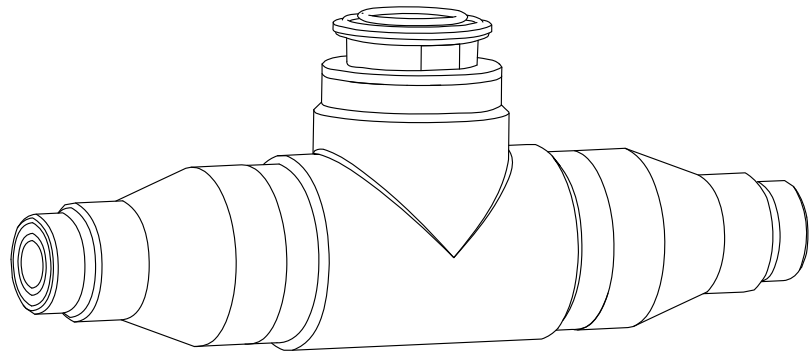





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1 About this document

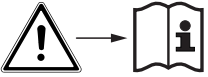
1.1 Warnings

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>

1.2 Symbols used

Symbol	Meaning
	Additional information, tips
	Permitted or recommended
	Not permitted or not recommended
	Reference to device documentation
	Reference to page
	Reference to graphic
	Result of a step


1.2.1 Symbols on the device

Symbol	Meaning
	Reference to device documentation


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 Designated use

The CUA252 flow assembly is designed for the installation of the CUS52D turbidity sensor. Its mechanical construction means that it can be operated in pressurized systems (see technical data →  22).

The main areas of application are:

- Final turbidity measurement in outlet of waterworks
- Turbidity measurement in inlet of waterworks
- Turbidity measurement at all process stages
- Turbidity measurement for filter monitoring and filter backwashing
- Turbidity measurement in drinking water networks

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-designated use.

2.3 Workplace safety

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

- 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.
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:
products must be taken out of service and protected against unintentional operation.

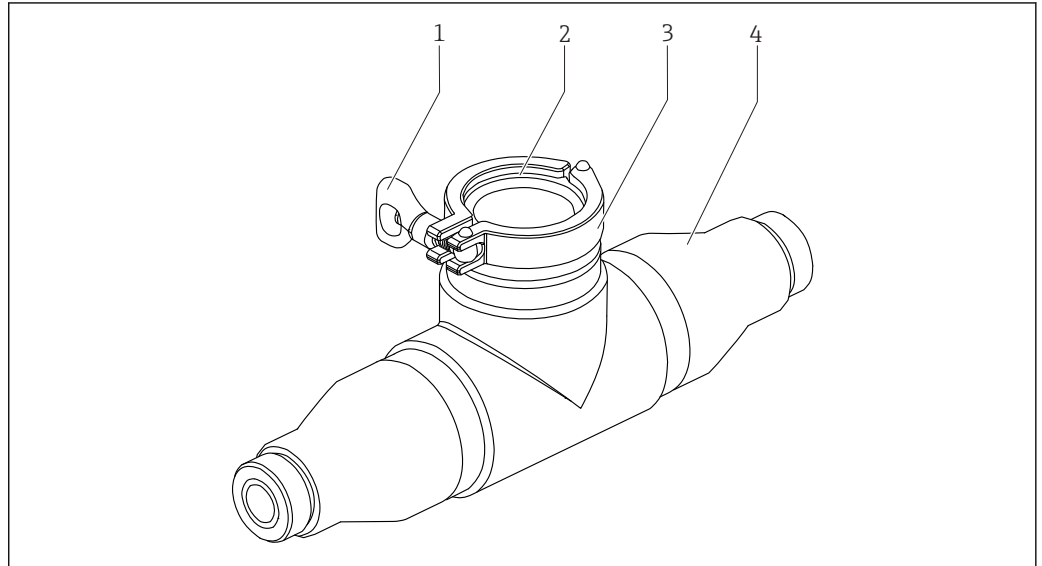
2.5 Product safety

2.5.1 State of the art

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.

3 Product description

3.1 Product design



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1 CUA252 flow assembly with locking clamp

1 Butterfly nut of locking clamp

2 Clamp seal

3 Locking clamp

4 Flow assembly CUA252

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 Product identification

4.2.1 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.

4.2.2 Product identification

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. Call up the site search (magnifying glass).
3. Enter a valid serial number.
4. Search.
 - ↳ The product structure is displayed in a popup window.
5. Click on the product image in the popup window.
 - ↳ A new window (**Device Viewer**) opens. All of the information relating to your device is displayed in this window as well as the product documentation.

4.2.3 Manufacturer's address

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

4.3 Scope of delivery

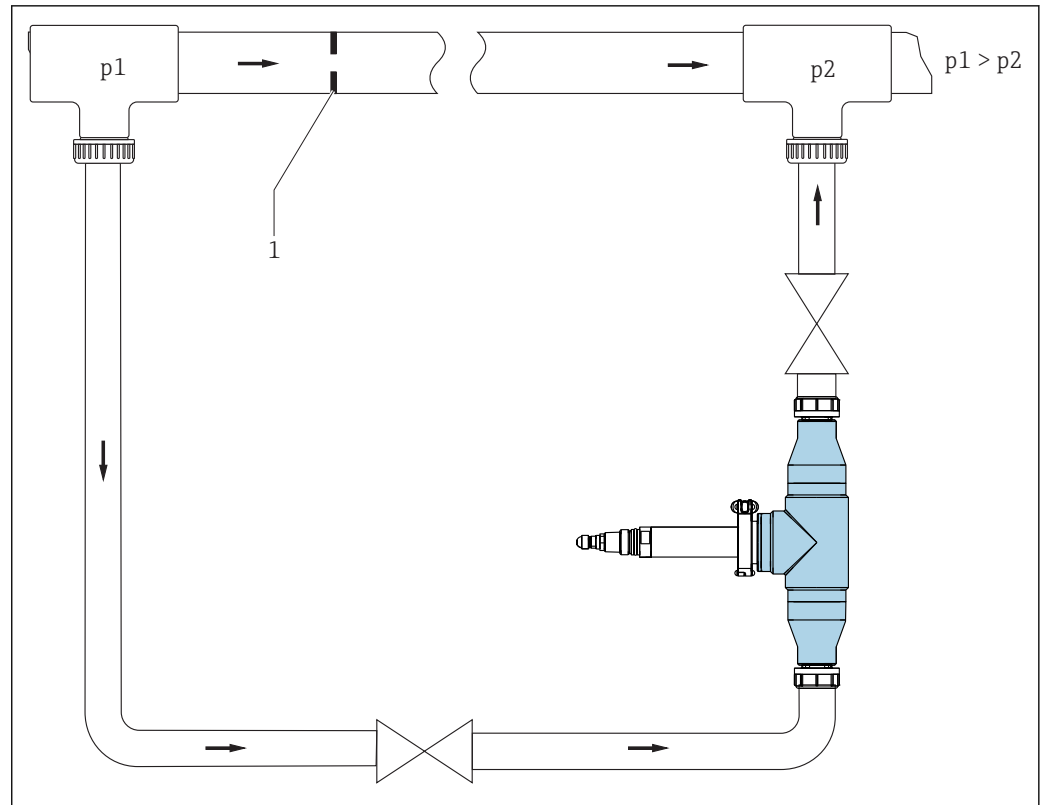
The scope of delivery comprises:

- 1 Flowfit CUA252 flow assembly, version as ordered
- 1 clamp seal and locking clamp
- 2 process connections, version as ordered
- 1 set of Operating Instructions

4.4 Certificates and approvals

DRGL- 2014/68/EU / PED- 2014/68/EU

The assembly has been manufactured according to good engineering practice as per Article 4, Paragraph 3 of the Pressure Equipment Directive 2014/68/EU and is therefore not required to bear the CE label.



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3 Connection example with bypass and orifice plate in the main pipe (supply from below)

1 Orifice plate

i No measures to increase pressure are required for branch pipes (pipes that branch off from the main pipe).

To achieve flow through the assembly with a bypass, pressure p_1 must be higher than pressure p_2 .

► Install the orifice plate in the main pipe → 3, 11.

The inlet and outlet connection of the flow assembly are always identical. The system is symmetrical.

1. Install the flow assembly vertically.
2. Connect the inflow at the bottom end (upward flow in the pipe).

i Avoid buckles and loops in the hose system.

i Pay attention to the installation instructions (flow direction) for the sensor.

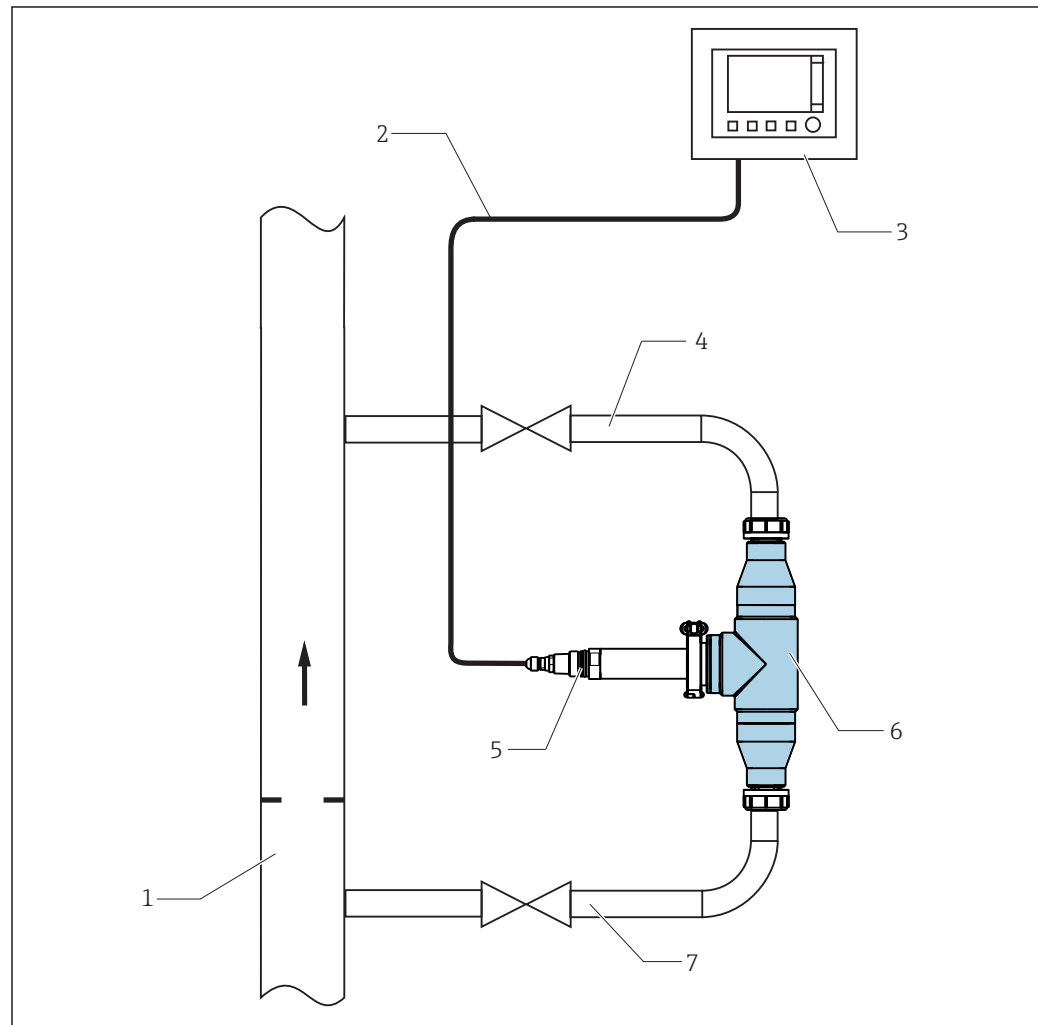
Many media tend to develop gas bubbles in a depressurized state. The operation of the flow assembly under pressure (adjustable valve after the flow assembly) prevents this behavior in many cases.

5.2 Mounting the flow assembly

5.2.1 Measuring system

A complete measuring system comprises:

- Flow assembly Flowfit CUA252
- Sensor Turbimax CUS52D
- Transmitter, e.g. Liquiline CM442
- Measuring cable

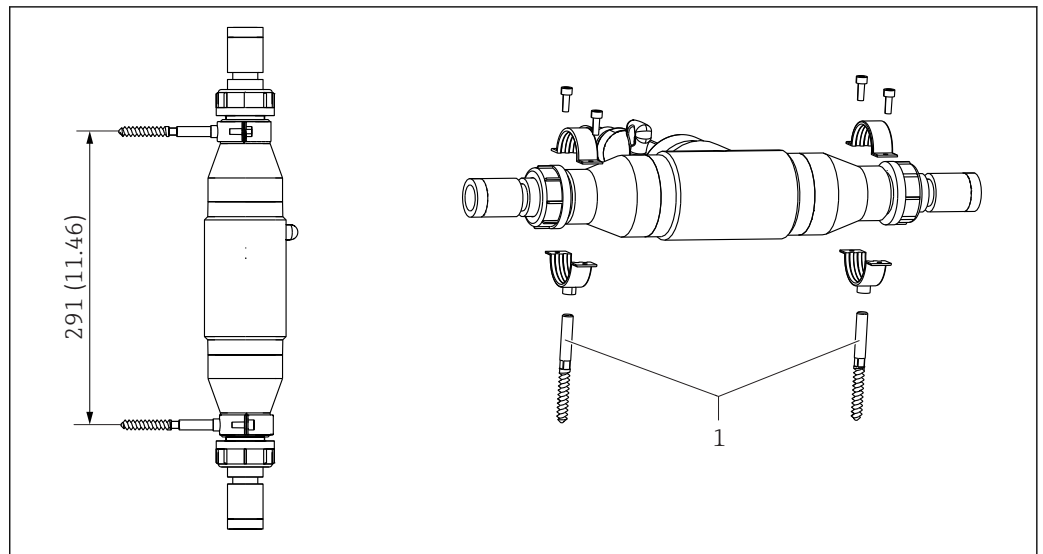


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4 Measuring system

- 1 Process pipe
- 2 Measuring cable
- 3 Liquiline CM442 transmitter
- 4 Return line with shut-off valve
- 5 Turbidity sensor CUS52D
- 6 Flow assembly CUA252
- 7 Inlet with shut-off valve

5.2.2 Mounting the assembly with wall holder unit



5 Wall holder unit. Engineering unit: mm (in)

1 Hanger bolt STST 10x60 (included in scope of delivery of wall mounting kit)

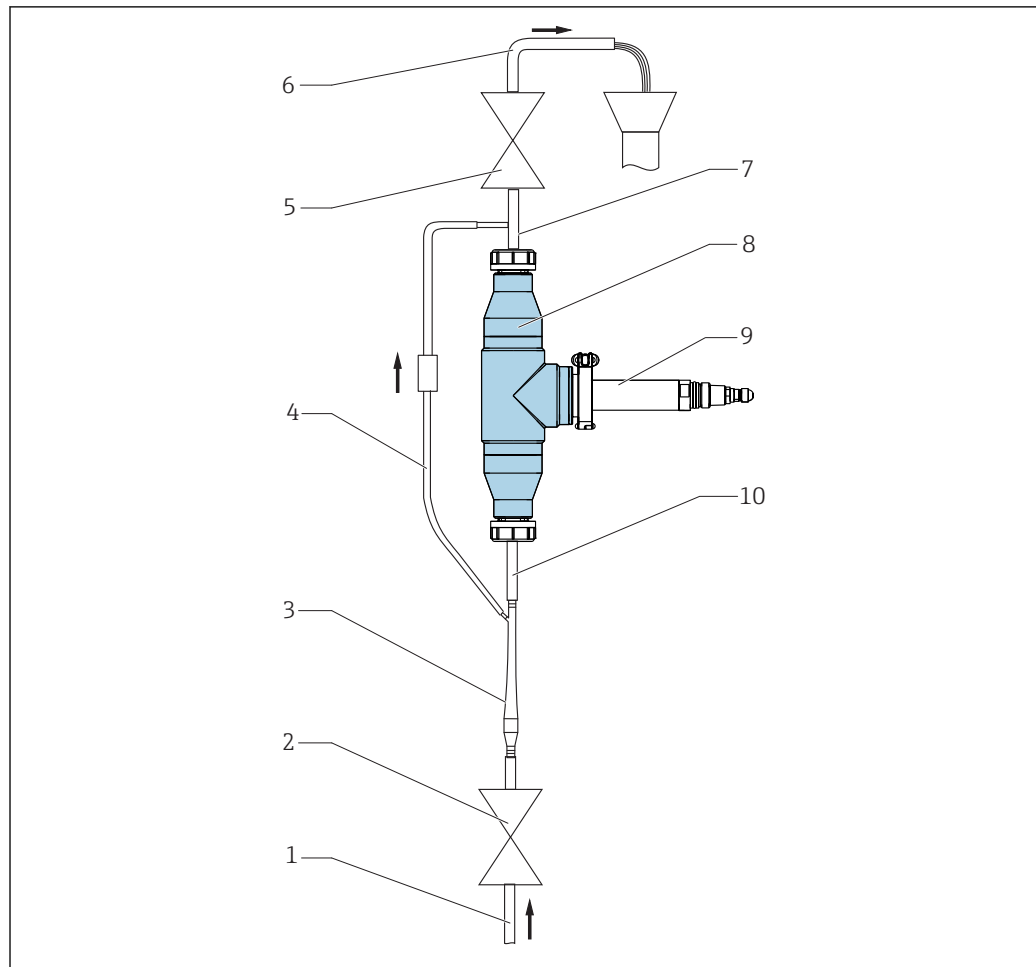
Mounting the flow assembly in a bypass

1. Install a shut-off valve upstream and downstream from the flow assembly in the bypass line.
 - ↳ This makes it possible to perform maintenance tasks, such as the cleaning of the sensor, without affecting the process.
2. Mount the assembly vertically.
3. Establish the medium connection using commercially available connection fittings.

Mounting the flow assembly in a branch pipe with an open outlet

1. Install a shut-off valve upstream from the flow assembly.
2. Mount the assembly vertically.
3. Establish the medium connection using commercially available connection fittings.

5.2.3 Mounting the assembly with a bubble trap



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6 Connection example with bubble trap

- 1 Inlet from below
- 2 Shutoff valve
- 3 Bubble trap
- 4 Venting of bubble trap (included in scope of delivery)
- 5 Shut-off valve (throttle for increasing pressure)
- 6 Outlet
- 7 D 12 adapter with connection for vent pipe (included in scope of delivery)
- 8 Flow assembly CUA252
- 9 Turbidity sensor CUS52D
- 10 D 12 adapter

i The wastewater from the bubble trap is not suitable for feeding back into the process.

1. For the hose system, use PVC hoses with an internal diameter of 12 mm (0.5 in).
2. Secure the hose system using worm drive hose clips (not included in scope of delivery).

The inlet and outlet connection of the flow assembly are always identical. The system is symmetrical.






Mounting the flow assembly

1. Install the flow assembly vertically. The inflow must be connected at the bottom end (upward flow in the pipe).

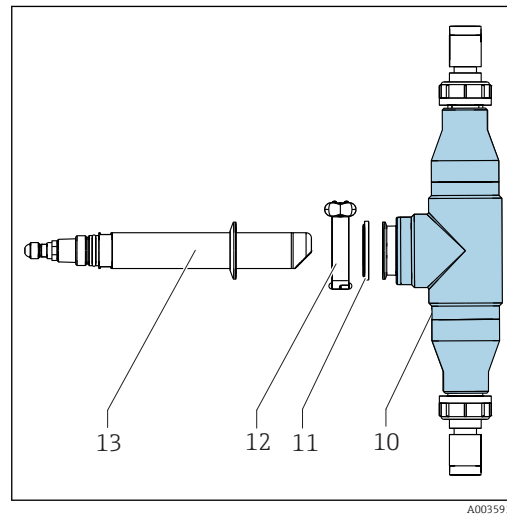
2. Insert an orifice plate into the upper assembly connection to obtain the desired volume flow (included in the delivery).


Orifice plates:

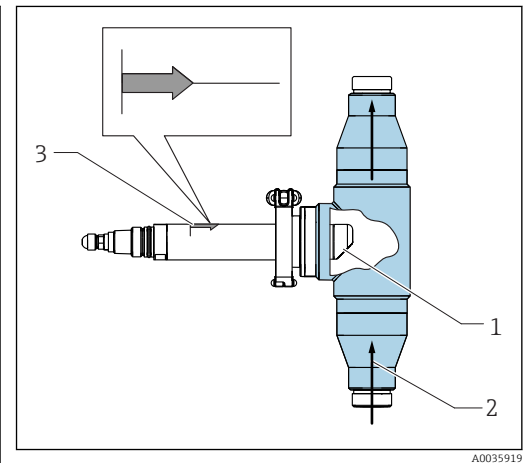
- 1 mm (0.04 in) for volume flow < 60 l/h (15.8 gal/h)
- 3 mm (0.12 in) for volume flow 60 to 100 l/h (15.8 to 26.4 gal/h)
- 5 mm (0.2 in) for volume flow > 100 l/h (26.4 gal/h)

-  Avoid buckles and loops in the hose system.
-  Pay attention to the installation instructions (flow direction) for the sensor →  10.
-  Note the maximum pressure and maximum temperature when operating the bubble trap →  22.

5.3 Mounting the sensor



-  7 Sensor installation
- 10 Flow assembly CUA252
- 11 Clamp seal
- 12 Locking clamp
- 13 Turbidity sensor CUS52D



-  8 Sensor orientation
- 1 Optical windows
- 2 Direction of flow
- 3 Installation marking

-  Only insert turbidity sensors into the assembly with a 2" clamp.

1. Install the sensor in such a way that the optical windows of the sensor are aligned against the direction of flow (item 2).
2. Use the installation marking (item 3) on the sensor to ensure the correct sensor orientation.

5.4 Post-installation check

- After mounting, check all the connections to ensure they are secure and leak-tight.
- Make sure that the orientation is correct.
- Ensure that the hoses cannot be removed without force.
- Check all hoses for damage.

6 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.

WARNING

Medium incorrectly connected to the assembly

Medium can escape!

- ▶ Before applying pressure to an assembly, ensure that the connection has been established correctly. Otherwise, do not introduce the assembly into the process.

7 Maintenance

- ▶ Perform maintenance tasks at regular intervals.

i We recommend setting the maintenance times in advance in an operations journal or log.

The maintenance cycle primarily depends on the following:

- The system
- The mounting conditions
- The medium in which measurement takes place

CAUTION


Escaping medium

Risk of injury to skin and eyes!

- ▶ Before the maintenance task, ensure that the process pipe is unpressurized, empty and rinsed.
- ▶ Wear protective gloves, protective goggles and protective clothing.

7.1 Maintenance tasks

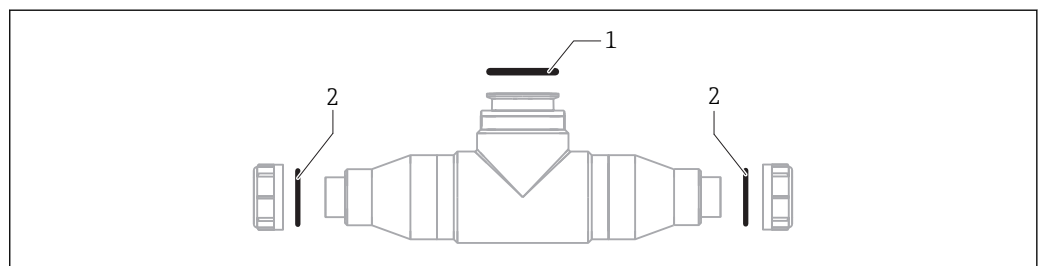
7.1.1 Cleaning the assembly

- Remove light dirt and fouling with suitable cleaning solutions. Cleaning agent →  18
- Remove heavy soiling using a soft brush and a suitable cleaning agent.
- For very persistent dirt, immerse the parts in a cleaning solution. Then clean the parts with a brush.

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

7.1.2 Checking and replacing the seals

1. Inspect seals at regular intervals.
2. Replace seals if necessary.



 9 Position of seals

- 1 Clamp seal
- 2 O-rings

i The seals are available as a spare parts kit.

7.2 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 cleaning agents used in each case are shown in the following table.

Type of soiling	Cleaning agent
Greases and oils	Hot water or tempered (alkaline) agents containing surfactants 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)
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 Repair

8.1 Spare parts

Order number	Description
71241882	Clamp seal, DN 50, FDA, 2 pcs
71241892	O-rings, EPDM, 2 sets

8.2 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

To ensure the swift, safe and professional return of the device:

- ▶ Refer to the website www.endress.com/support/return-material for information on the procedure and conditions for returning devices.

8.3 Disposal

- ▶ Please observe local regulations!

9 Accessories

The following are the most important accessories available at the time this documentation was issued.

- For accessories not listed here, please contact your Service or Sales Center.

Description	Order number
Dummy cover for clamp connection; 1 pc	71242180
Adapter, internal thread, RP ¾", material: PE; 1 pc	71242172
Adapter, internal thread, NPT ¾", material: PE; 1 pc	71242173
Adapter, welded connection, D 25, material: PE; 1 pc	71242174
Adapter, hose connection nipple, D 25, material: PE; 1 pc	71242175
Adapter, hose connection nipple, D 12, material: PE; 1 pc	71242176
Adapter, flange ANSI 2", 1 pc	71242177

Ultrasonic cleaning system CYR52

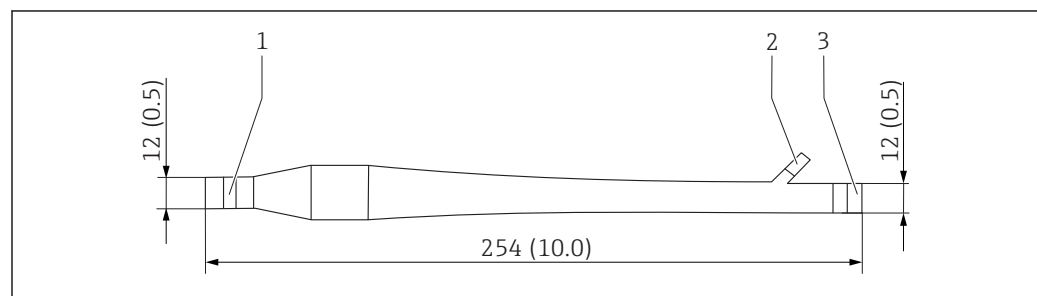
- For attachment to assemblies and pipes
- Product Configurator on the product page: www.endress.com/cyr52



Technical Information TI01153C

Bubble trap

- For the CUS52D sensor
- Process pressure: up to 3 bar (43.5 psi)
- Process temperature: 0 to 50 °C (32 to 122 °F)
- D 12 adapter with connection for degassing line (upper connection on the CUA252) is included in the scope of delivery.
- Orifice plates for the following volume flows:
 - < 60 l/h (15.8 gal/h)
 - 60 to 100 l/h (15.8 to 26.4 gal/h)
 - > 100 l/h (26.4 gal/h)
- The degassing line is fitted with a PVC hose, backpressure hose valve and luer lock adapter.
- Order number, suitable for CUA252 assembly: 71242170

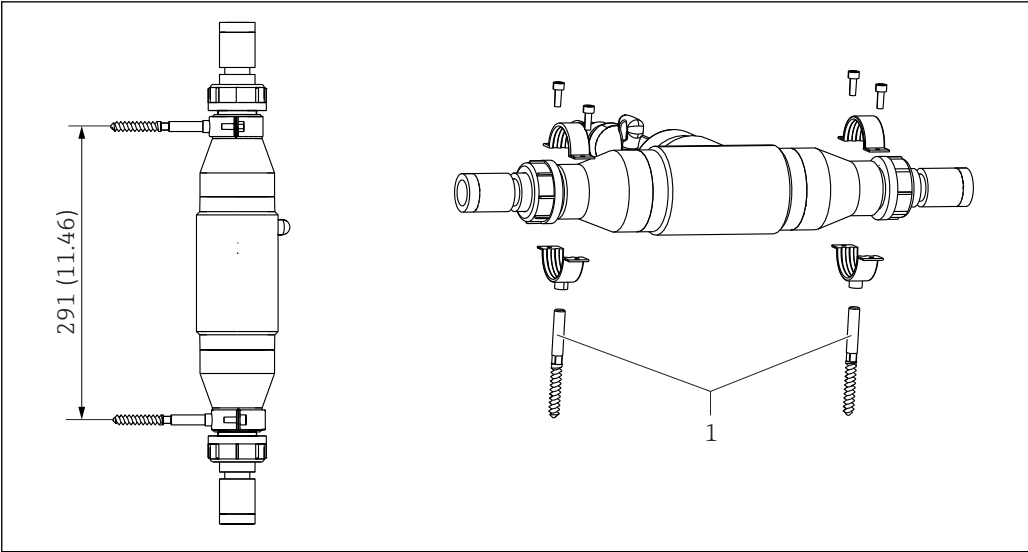


10 Bubble trap. Engineering unit: mm (in)

- 1 Inlet for medium (without hose system)
- 2 Outlet for bubbles (hose system is included in scope of delivery)
- 3 Outlet for medium (without hose system)

Wall mounting kit for CUA252

Order number: 71242171



A0022264

11 Wall mounting kit. Engineering unit: mm (in)

- 1 Hanger bolt STST 10 x 60 mm (included in scope of delivery)

10 Technical data

10.1 Environment

Ambient temperature range 0 to 55 °C (32 to 131 °F)

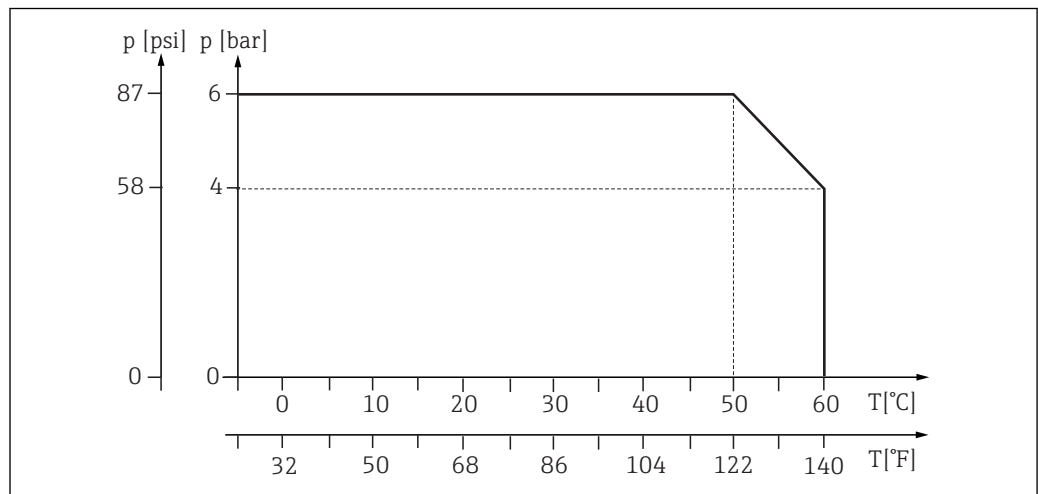
Storage temperature 0 to 60 °C (32 to 140 °F), in the original packaging

10.2 Process

Process temperature range 0 to 60 °C (32 to 140 °F)

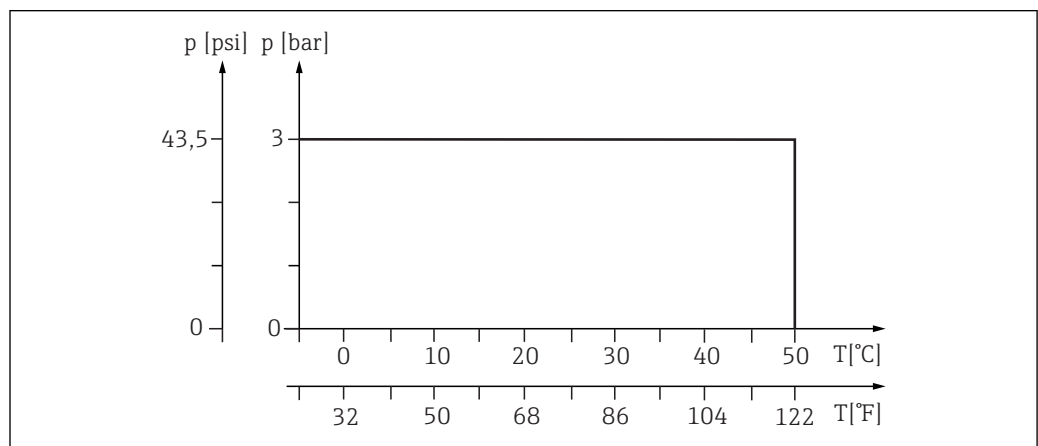
Process pressure range 0 to 6 bar (0 to 87 psi)
0 to 3 bar (0 to 43.5 psi)

Pressure/temperature ratings



A0035922

12 Pressure/temperature ratings



A0039233

13 Pressure/temperature ratings for bubble trap

Flow velocity Max. 2 m/s (6.6 ft/s) for low-viscosity media in pipes NW 50

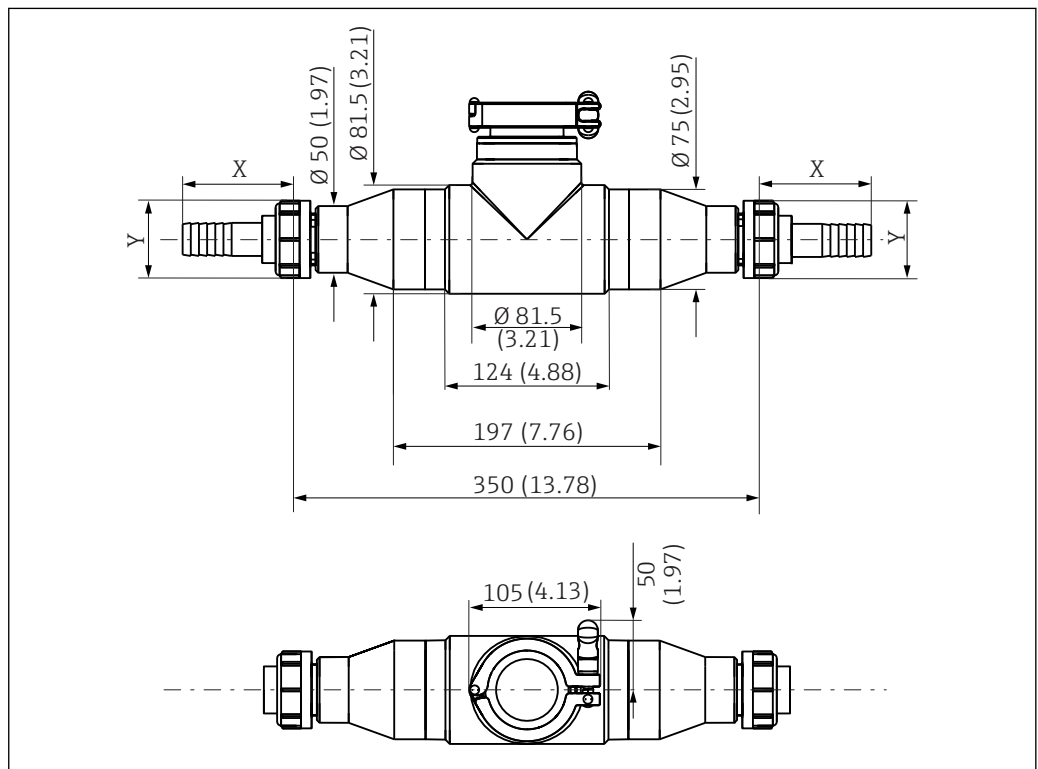
Flow limit	Recommended flow:	60 l/h (15.8 gal/h)
	Range:	10 to 100 l/h (2.64 to 26.4 gal/h)

If operating with lost sample (water loss)

Pressure loss < 0.05 bar (0.7 psi) for flow up to 100 l/h (26.4 gal/h)

10.3 Mechanical construction

Dimensions



14 Dimensions. Engineering unit: mm (in)

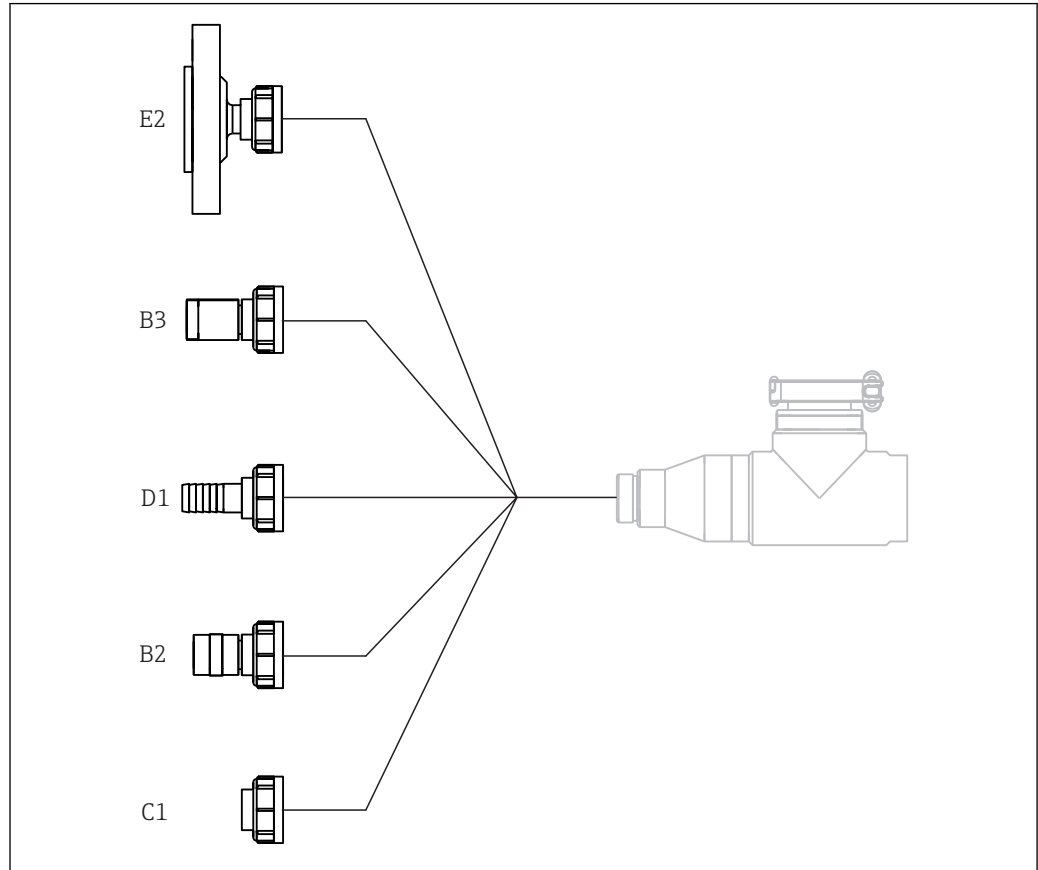
Connections	NPT 3/4"	Rp 3/4	Glue-in port D 25	ANSI 2"	Hose D 25	Hose D 12	G1 3/4
X mm (in)	70 (2.76)	64 (2.52)	22 (0.87)	71 (2.80)	74 (2.91)	74 (2.91)	0
Y mm (in)	Ø 58(2.28)	Ø 58(2.28)	Ø 58(2.28)	Ø 152 (5.98)	Ø 58(2.28)	Ø 58(2.28)	Ø 58(2.28)

Weight 1.17 kg (2.58 lb) without process connection

Materials	Assembly housing:	PE100
	Seals:	EPDM
	Flange:	PP-GF
	Dummy cover:	Stainless steel 1.4404 (AISI 316 L)

Bubble trap:	Polycarbonate
Process connections:	PE
Process connection for bubble trap:	PVC

Process connections



A0035923

15 Process connections

- B2 Internal thread Rp 3/4"
- B3 Internal thread NPT 3/4"
- C1 Glue-in port D 25
- D1 Hose D 25
- E2 Flange ANSI 2"

It is also possible to use an external thread G1 1/4 (standard) or a D 12 hose.

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