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2022-04-15

Operating Instructions
CYR52

Ultrasonic cleaning

Endress+Hauser
People for Process Automation

Table of contents

1 About this document

1.1 Warnings

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

1.2 Symbols used

- 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

2 Basic safety instructions

2.1 Requirements for the personnel

- Installation, commissioning, operation and maintenance must only be carried out by technical personnel trained to perform these tasks.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults may be repaired only 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 CYR52 ultrasonic cleaning system is used to clean turbidity sensors in liquids that are installed in pipes.

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

Electromagnetic compatibility
- The product has been tested for electromagnetic compatibility in accordance with the applicable international standards for industrial applications.
- The electromagnetic compatibility indicated applies only to a product that has been connected in accordance with these Operating Instructions.

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 technology

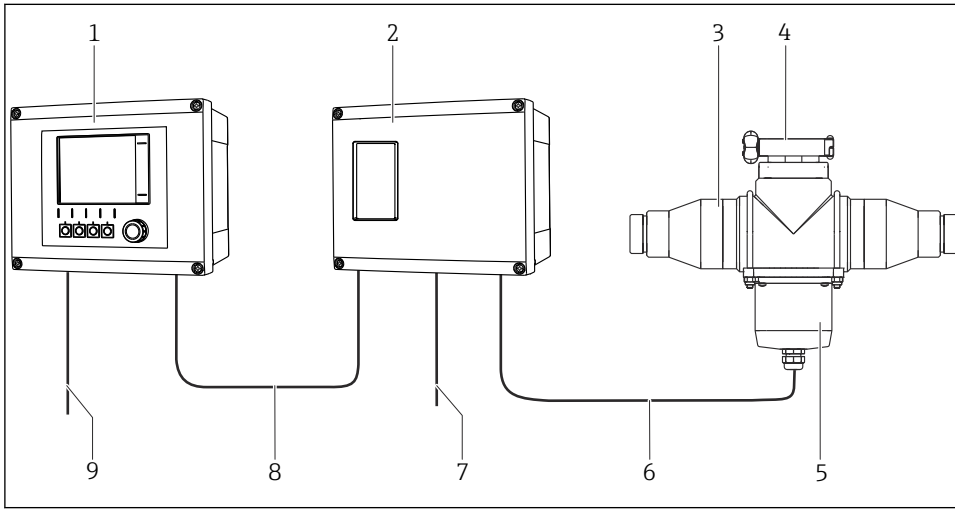
The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

3 Product description

3.1 Product design

3.1.1 Measuring system

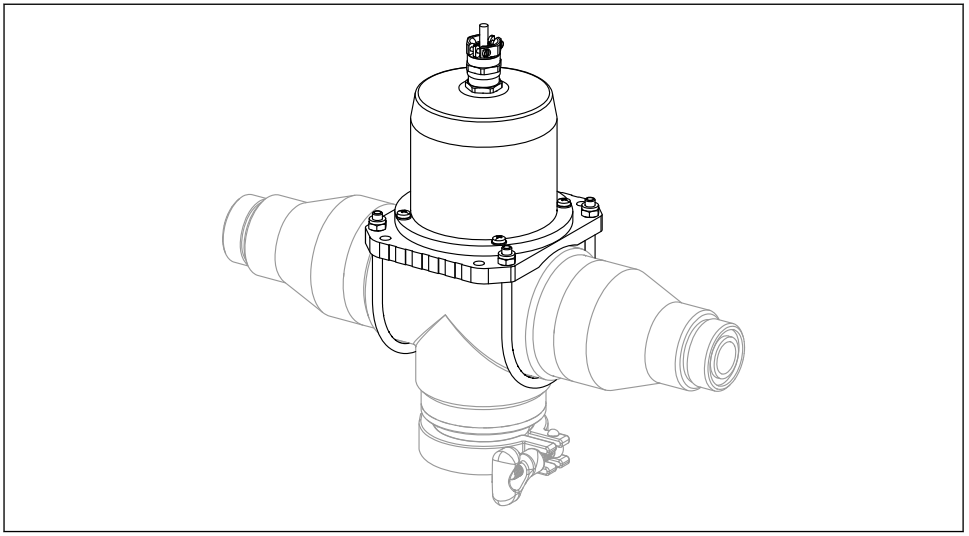
A complete measuring system comprises:
- Ultrasonic generator
- Ultrasonic transducer
- Assembly or pipe with turbidity sensor
- Liquiline CM44x transmitter



1 Ultrasonic cleaning with Flowfit CUA252 assembly

1 Liquiline CM44x transmitter
2 Ultrasonic generator
3 Flowfit CUA252 flow assembly
4 Clamp connection for turbidity sensor
5 Ultrasonic transducer
6 Power supply cable for ultrasonic transducer
7 Mains voltage cable for ultrasonic generator
8 Control cable
9 Mains voltage cable for transmitter

3.1.2 Ultrasonic transducer with Flowfit CUA252 flow assembly



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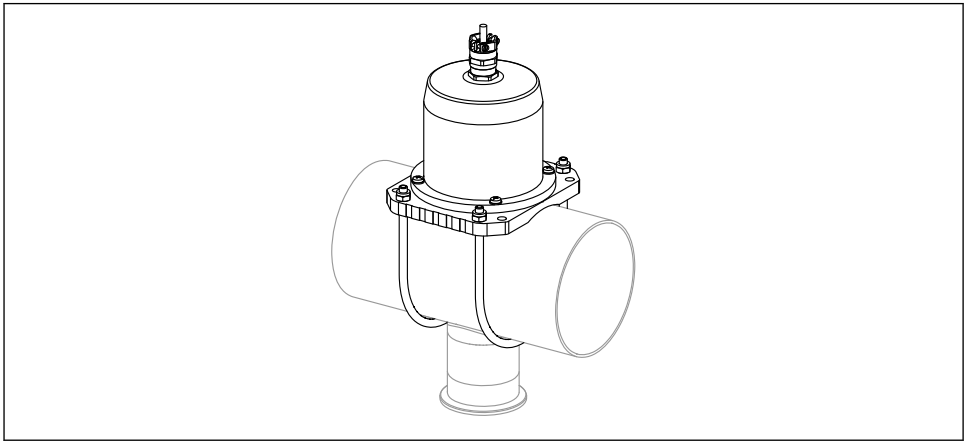
2 Ultrasonic transducer on Flowfit CUA252 assembly

3.1.3 Ultrasonic transducer with Flowfit CUA262 flow assembly



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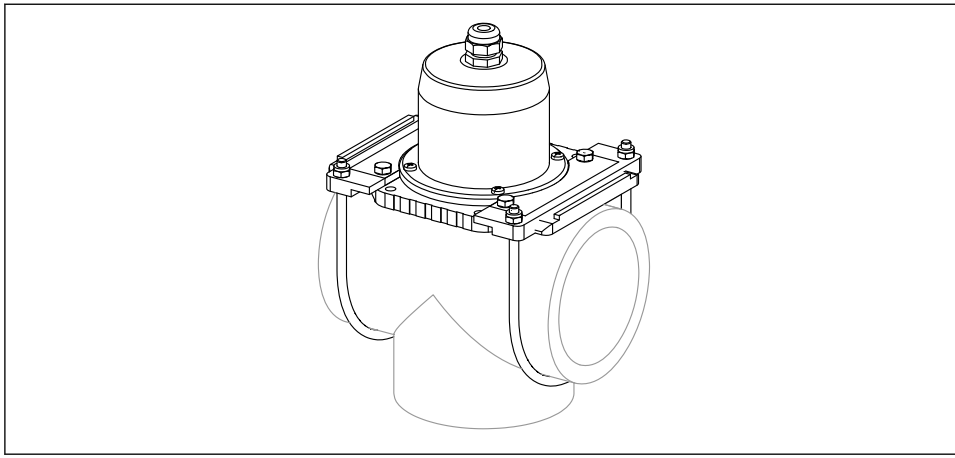
3 Ultrasonic transducer on Flowfit CUA262 assembly

3.1.4 Ultrasonic transducer with assembly of CUS31



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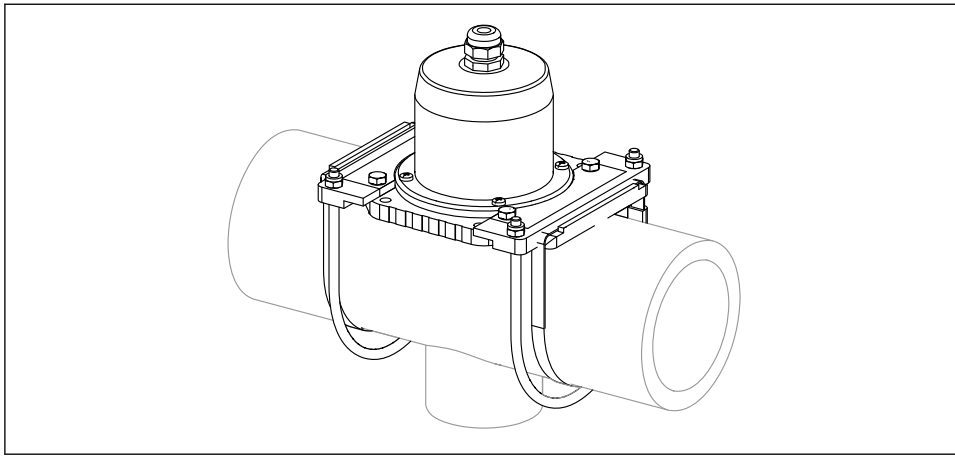
4 Ultrasonic transducer with assembly of CUS31

3.1.5 Ultrasonic transducer on pipe



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5 Ultrasonic transducer mounted on pipe

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
- Safety information and warnings

► Compare the information on the nameplate with the order.

4.2.2 Product identification

Product page

www.endress.com/cyr52

Order code

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.
   ↳ A new window opens. Here you fill information pertaining to your device, including the product documentation.

4.2.3 Manufacturer address

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

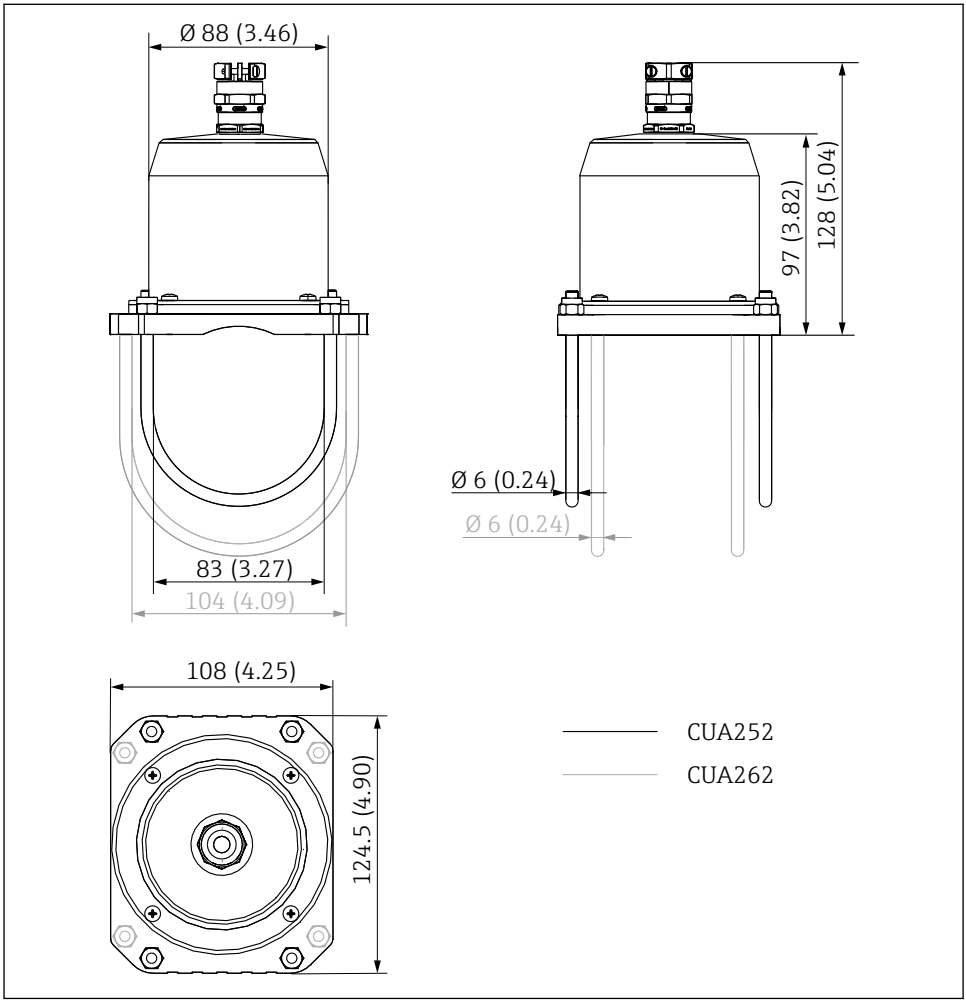
4.3 Scope of delivery

The scope of delivery comprises:
- 1 x ultrasonic generator
- 1 x ultrasonic transducer
- 1 x cleaning cloth
- 1 x tube of sealant
- Mounting material depending on the device version order
- 1 x Operating Instructions

5 Mounting

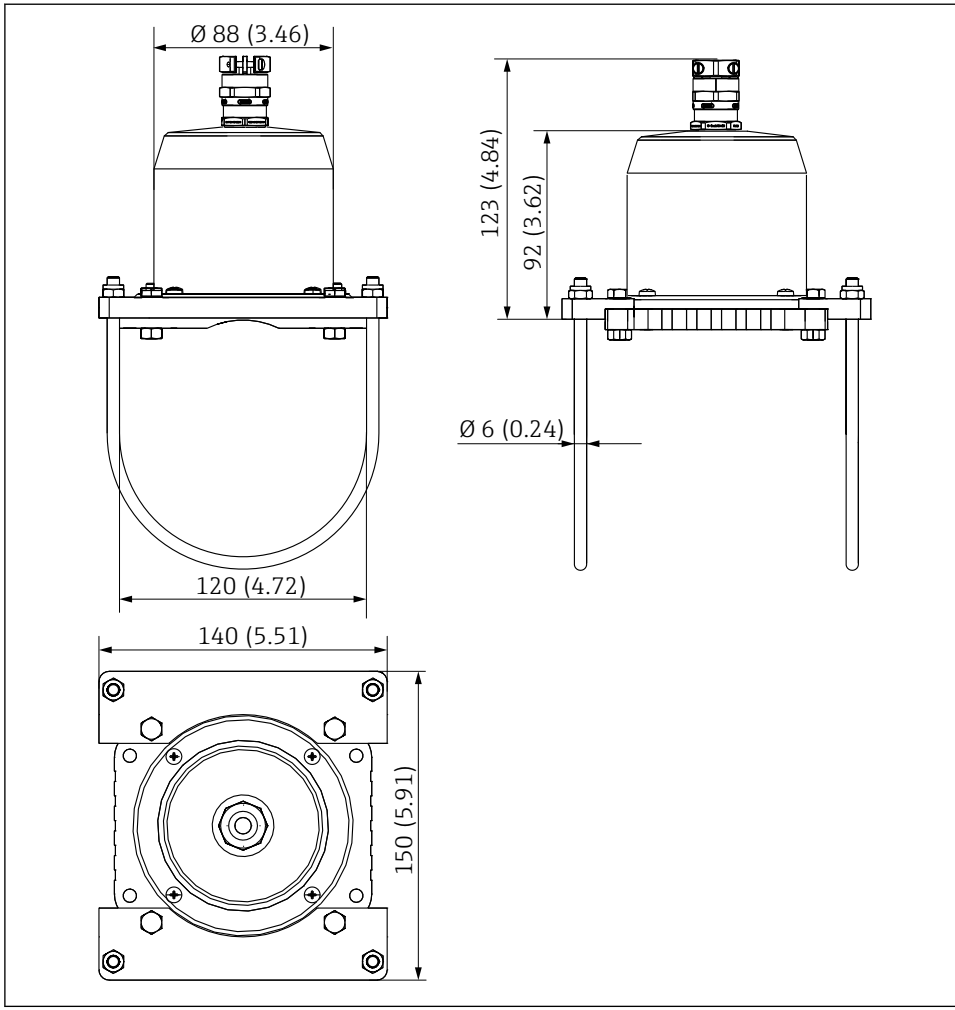
5.1 Mounting requirements

5.1.1 Dimensions of the ultrasonic transducer

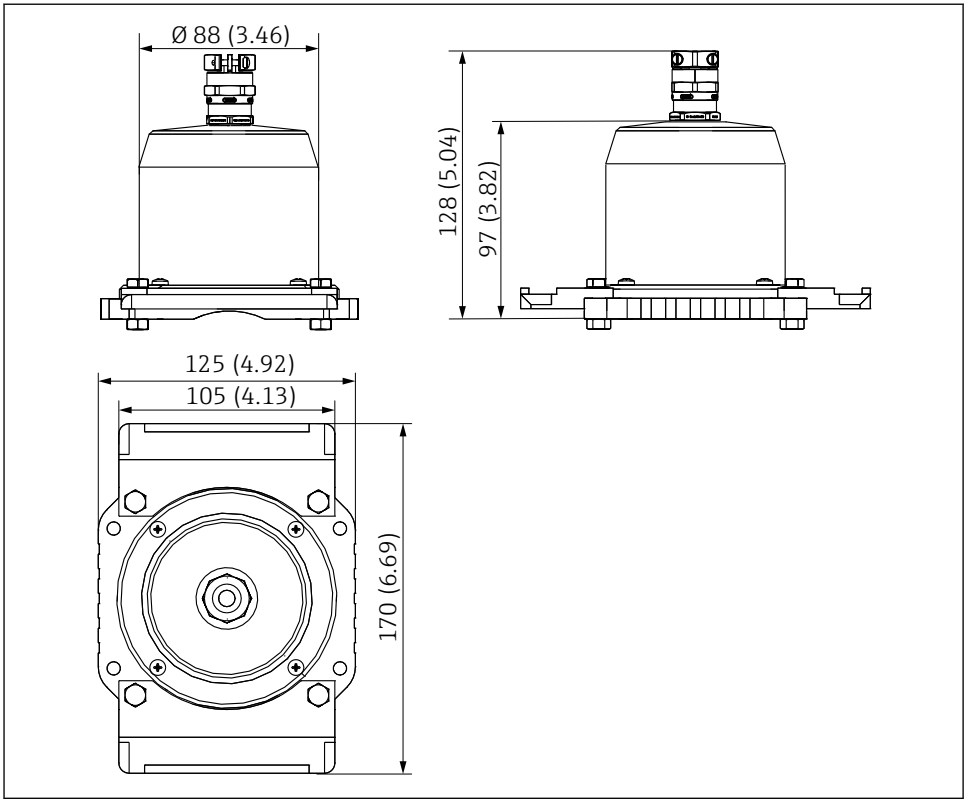


6 Dimensions for CUA252 and CUA262. Engineering unit: mm (in)

- In the case of the ultrasonic transducer, factor in a clearance of approx. 100 mm (3.9 in) above the cable gland for the power supply cable.

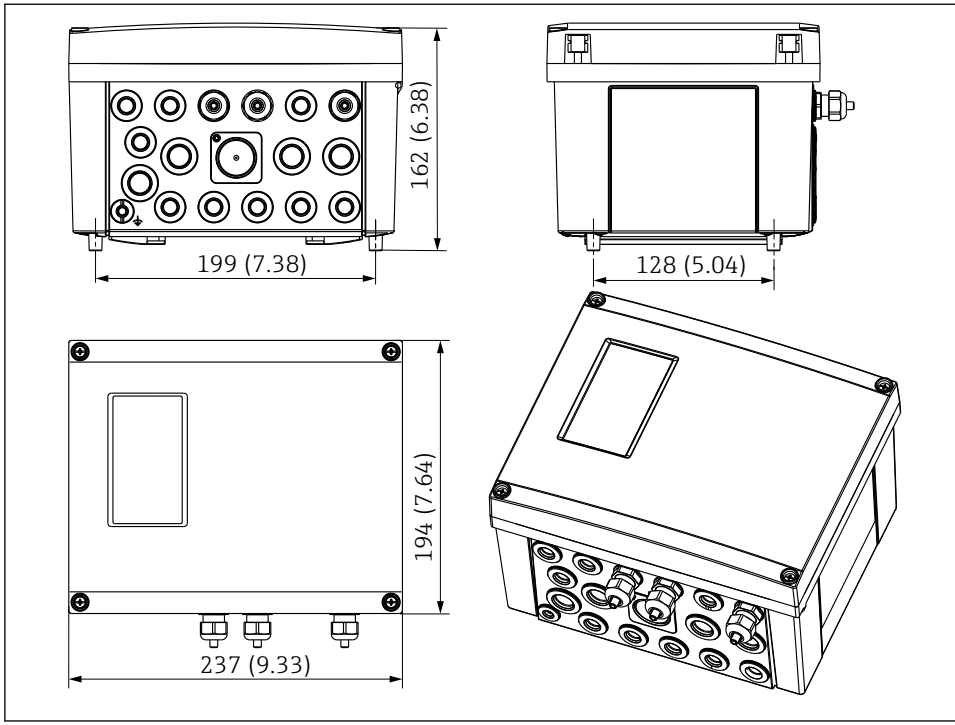


7 Dimensions for assembly of CUS31. Engineering unit: mm (in)



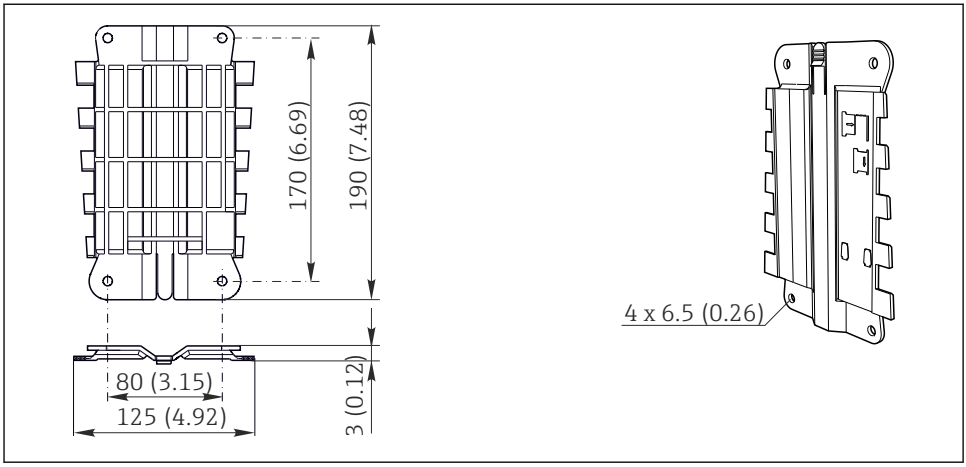
8 Dimensions for pipe mounting. Engineering unit: mm (in)

5.1.2 Dimensions of ultrasonic generator



9 Engineering unit: mm (in)

Mounting plate



10 *Mounting plate. Engineering unit: mm (in)*

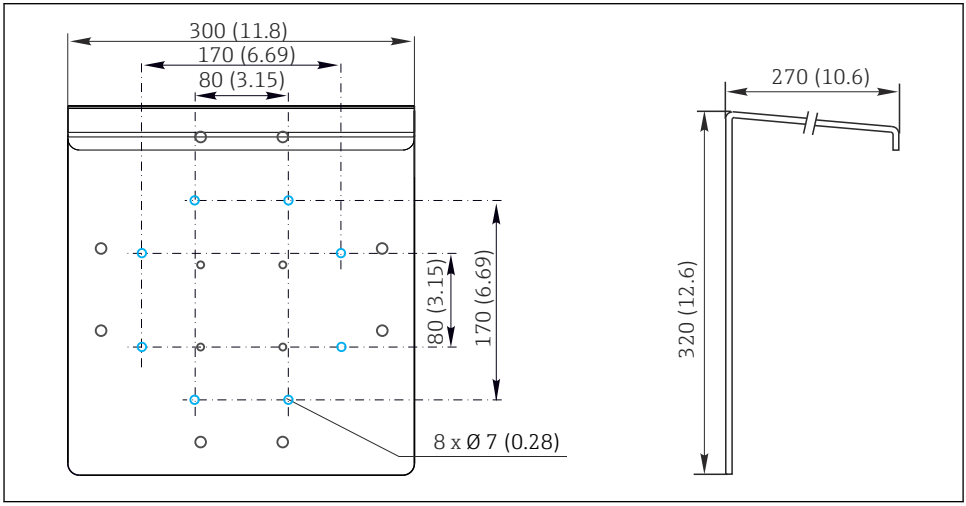
Weather protection cover

NOTICE

Effect of climatic conditions (rain, snow, direct sunlight etc.)

Possibility of impaired operation to complete failure of the ultrasonic generator!

► Always use the weather protection cover (accessory) when installing the device outdoors.



11 *Weather protection cover for ultrasonic generator. Engineering unit: mm (in)*

5.2 Mounting the ultrasonic transducer

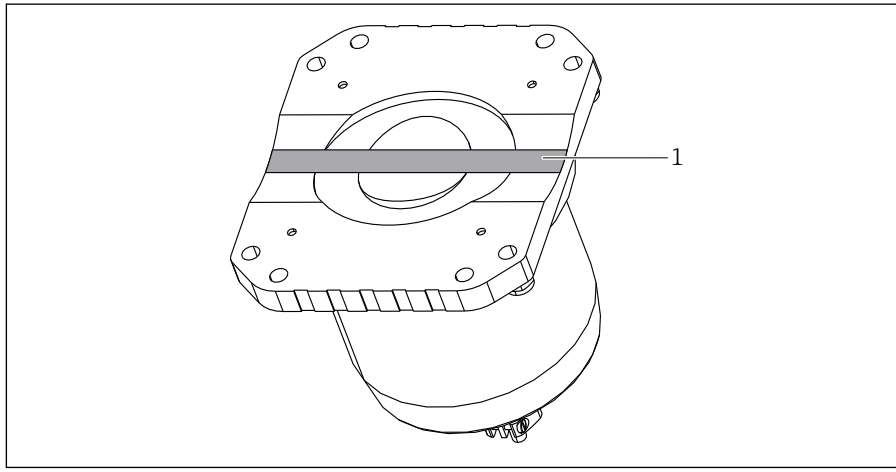
⚠ CAUTION

Substances in the sealant

Irritation to eyes and skin!

- ▶ Do not inhale aerosols if used.
- ▶ Avoid contact with the eyes and skin.
- ▶ Wear protective gloves, protective goggles and protective clothing when using the sealant.
- ▶ Do not swallow the sealant.
- ▶ Before using the sealant, read the Safety Datasheet of the manufacturer and the warnings and hazard information on the sealant packaging.

The ultrasonic transducer is secured to assemblies with two brackets that are supplied, and to pipes with two worm drive hose clips that are supplied.

1. Clean the contact surface of the ultrasonic transducer and the contact surface of the assembly or pipe using the cleaning cloth (included in the scope of delivery).
2. 

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1 Strip with sealant

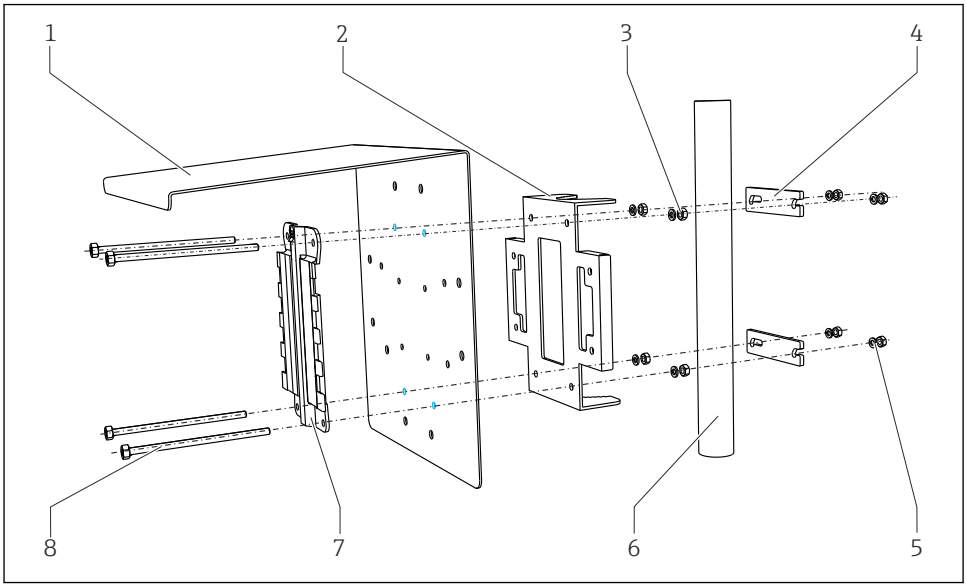
Apply a 5 mm (0.2 in) thick film of sealant to the contact surface of the ultrasonic transducer.

3. Mount the ultrasonic transducer opposite the turbidity sensor.
4. In the case of pipes: tighten the two worm drive hose clips with a torque of 2.5 Nm.
5. In the case of assemblies: tighten the nuts of the brackets with a torque of 2 Nm.

5.3 Mounting the ultrasonic generator

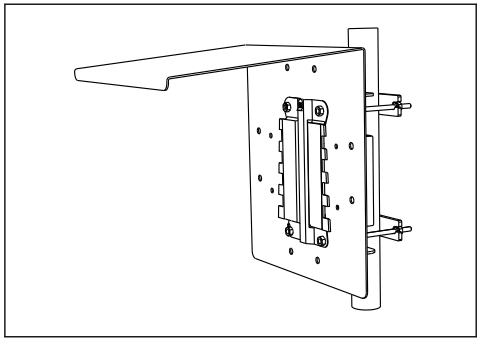
5.3.1 Post mounting

You require the post mounting kit (optional) to mount the unit on a pipe, post or railing (round or square, clamping range 20 to 60 mm (0.79 to 2.36 in)).

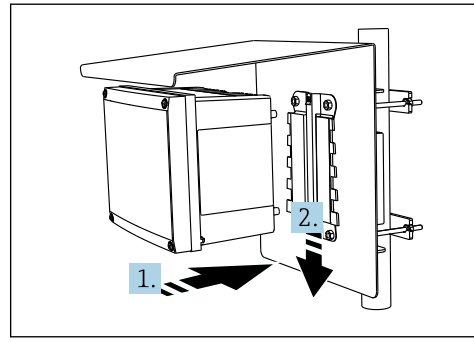


12 *Post mounting*

1	*Weather protection cover (optional)*	5	*Spring washers and nuts (post mounting kit)*
2	*Post mounting plate (post mounting kit)*	6	*Pipe or railing (round/square)*
3	*Spring washers and nuts (post mounting kit)*	7	*Mounting plate*
4	*Pipe clamps (post mounting kit)*	8	*Threaded rods (post mounting kit)*



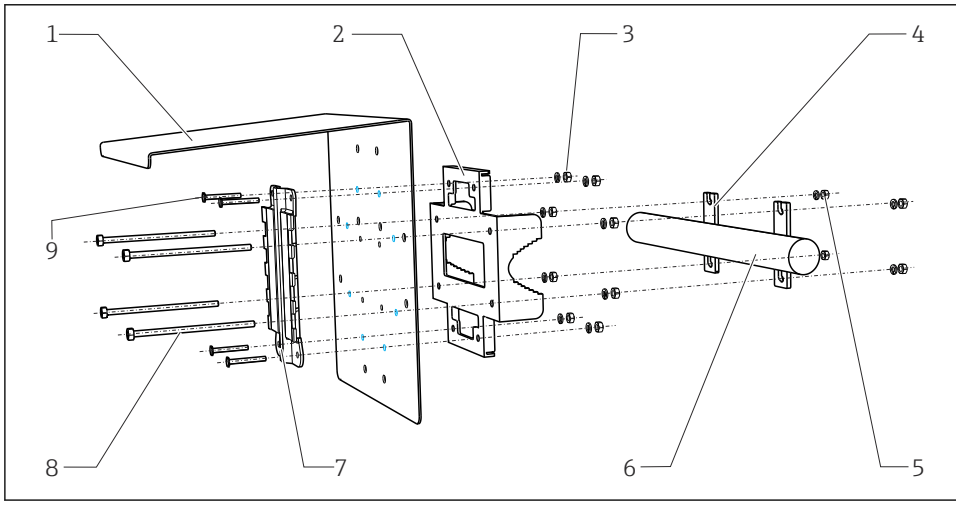
13 *Post mounting*



14 *Attach the device and click it into place*

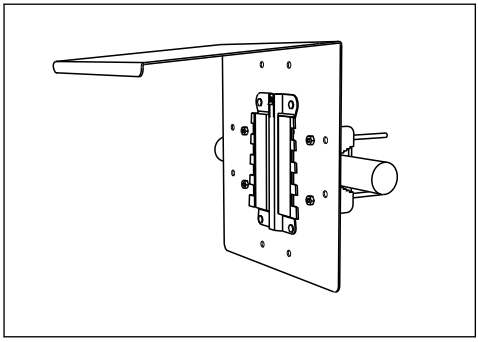
1. Place the device on the mounting plate.
2. Slide the device downwards in the guide on the mounting rail until it clicks into place.

5.3.2 Rail mounting

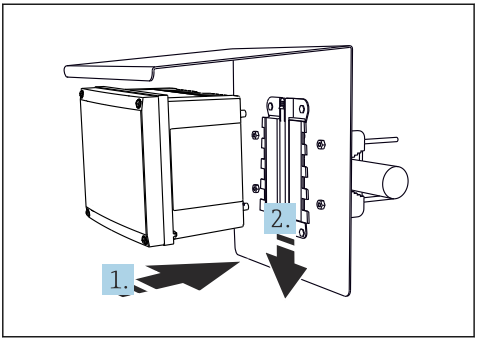


15 *Rail mounting*

1	*Weather protection cover (optional)*	6	*Pipe or railing (round/square)*
2	*Post mounting plate (post mounting kit)*	7	*Mounting plate*
3	*Spring washers and nuts (post mounting kit)*	8	*Threaded rods (post mounting kit)*
4	*Pipe clamps (post mounting kit)*	9	*Screws (post mounting kit)*
5	*Spring washers and nuts (post mounting kit)*		



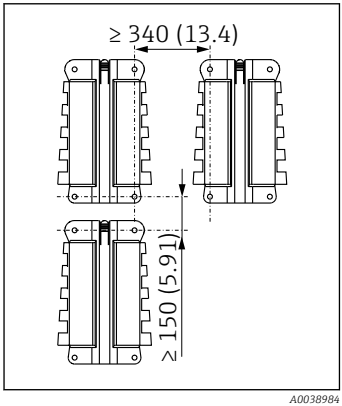
16 *Rail mounting*



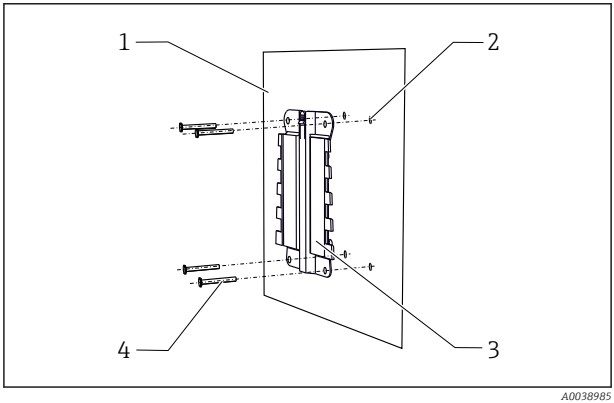
17 *Attach the device and click it into place*

1. Place the device on the mounting plate.
2. Slide the device downwards in the guide on the mounting rail until it clicks into place.

5.3.3 Wall mounting



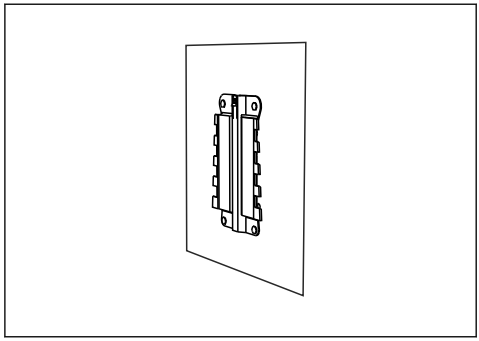
18 *Installation clearance in mm (in)*



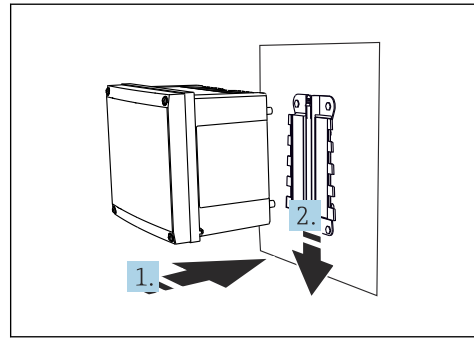
19 *Wall mounting*

1 *Wall*
2 *4 drill holes* [1)]
3 *Mounting plate*
4 *Screws Ø 6 mm (0.24 in) (not included in the scope of delivery)*

[1)] *The size of the drill holes depends on the wall plugs used. The wall plugs and screws must be provided by the customer.*



20 *Wall mounting*



21 *Attach the device and click it into place*

1. Place the device on the mounting plate.
2. Slide the device downwards in the guide on the mounting rail until it clicks into place.

5.4 Post-mounting check

1. After installation, check the ultrasonic transducer and ultrasonic generator for damage.
2. Check whether the ultrasonic generator is protected against moisture and direct sunlight.

6 Electrical connection

⚠ WARNING

Device is live!

Incorrect connection may result in injury or death!

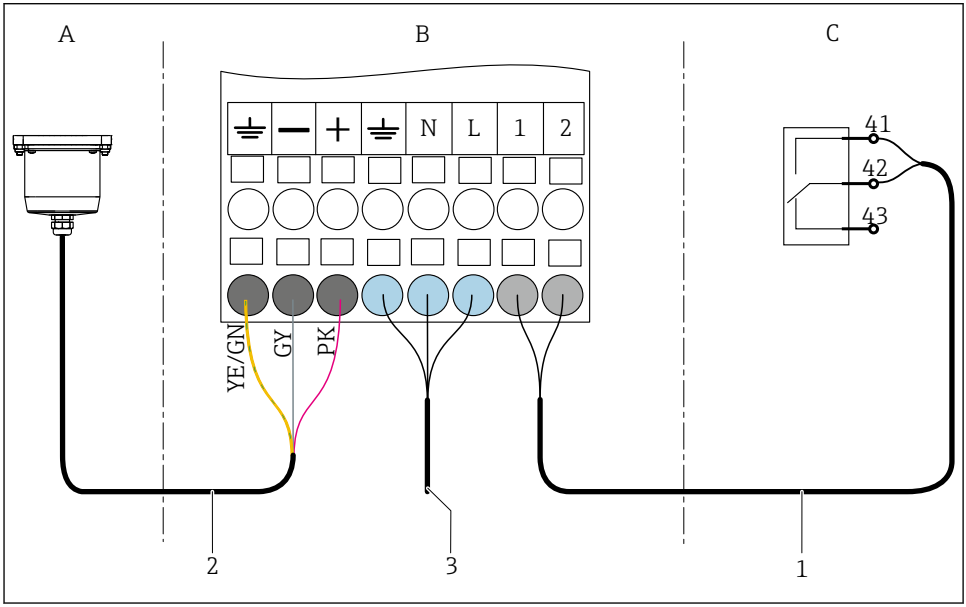
- The electrical connection may be performed only by an electrical technician.
- The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- **Prior** to commencing connection work, ensure that no voltage is present on any cable.

6.1 Connecting the device

NOTICE

The device does not have a power switch

- A protected circuit breaker must be provided in the vicinity of the device at the place of installation.
- The circuit breaker must be a switch or power switch, and you must label it as the circuit breaker for the device.



22 *Connection diagram*

A Ultrasonic transducer
B Terminal block in ultrasonic generator
C Relay in transmitter
1 Control cable
2 Power supply line
3 Power connection

Connect the ultrasonic cleaning system in the following order:

1. Connect the control cable (not included in the scope of delivery, H03VV-F 2x0.75 is recommended) to terminals 1 and 2 at the ultrasonic generator.
2. Connect the control cable to a free relay at the transmitter at terminals 41 and 42.

The assignment of the individual wires is not relevant here. The maximum cable length is 3 m (9.84 ft).

Connect the cable secured to the ultrasonic transducer to the terminal block of the ultrasonic generator as follows:

3. Connect the yellow-green protective conductor.
4. Connect the gray cable to the negative end (minus).
5. Connect the pink cable to the positive end (plus).
6. Connect the mains connection cable (not included in the scope of delivery, H05VV-F3 G0.75 is recommended) to the corresponding terminals of the ultrasonic generator (item 3).

6.2 Post-connection check

WARNING

Connection errors

The safety of people and of the measuring point is at risk! The manufacturer does not accept any responsibility for errors that result from failure to comply with the instructions in this manual.

- Put the device into operation only if you can answer **yes** to **all** the following questions.

Device condition and specifications

- Are the device and all the cables free from damage on the outside?
- Do the mains voltage and nameplate specifications match?

Electrical connection

- Are the mounted cables strain relieved?
- Are the cables routed without loops and cross-overs?
- Are the cables correctly connected as per the wiring diagram?
- Are all the screw terminals connected as per the wiring diagram?

7 Commissioning

7.1 Function check

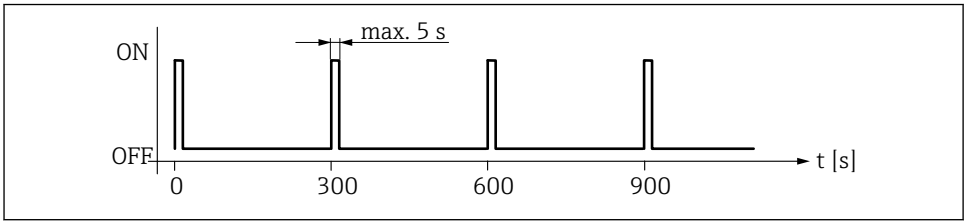
WARNING

Incorrect connection, incorrect supply voltage
Safety risks for staff and device malfunctions!
- ▶ Check that all connections have been established correctly in accordance with the wiring diagram.
- ▶ Ensure that the supply voltage matches the voltage indicated on the nameplate.

7.2 Configuration management

To enable optimum cleaning performance, the ultrasonic generator is switched on cyclically for a few seconds. The cleaning cycle is configured in the transmitter in the **Menu/Setup/Additional functions/Cleaning** menu.

Follow the Operating Instructions for the transmitter.



23 Cleaning interval (example)

Enter the following parameters to prevent the ultrasonic transducer from overheating:

Cleaning duration:	Max. 5 seconds
Cleaning interval:	Min. 5 minutes

- ▶ Do not operate the cleaning system without medium in the pipe.

As soon the transmitter activates the cleaning cycle, the ultrasonic generator starts generating the sound waves.

8 Diagnostics and troubleshooting

8.1 General troubleshooting

Error	Possible cause	Test
Cleaning effect diminishes	Ultrasonic cleaning system is defective	Acoustic check (if the ultrasonic transducer hums during the cleaning process, the cleaning is working)
	The position of the ultrasonic transducer has changed	Check the installation, pay attention to torque specifications

9 Maintenance

⚠ WARNING

Process pressure and temperature, contamination, electrical voltage
Risk of serious or fatal injury
- ▶ If the sensor has to be removed during maintenance work, avoid hazards posed by pressure, temperature and contamination.
- ▶ De-energize the device before opening it.
- ▶ Power can be supplied to switching contacts from separate circuits. De-energize these circuits before working on the terminals.

Take all the necessary precautions in time to ensure the operational safety and reliability of the entire measuring point.

The maintenance of the measuring point comprises:
- Cleaning the transmitter, assembly, ultrasonic generator and ultrasonic transducer
- Checking cables and connections.

When performing any work on the device, bear in mind any potential impact this may have on the process control system or on the process itself.

9.1 Cleaning

NOTICE

Cleaning agents not permitted
Damage to the
- ▶ Never use concentrated mineral acids or alkaline solutions for cleaning.
- ▶ Never use organic cleaners such as acetone, benzyl alcohol, methanol, methylene chloride, xylene or concentrated glycerol cleaner.
- ▶ Never use high-pressure steam for cleaning.

- ▶ Clean the front of the housing using commercially available cleaning agents only.

The front of the housing is resistant to the following in accordance with DIN 42 115:
- Ethanol (for a short time)
- Diluted acids (max. 2% HCl)
- Diluted bases (max. 3% NaOH)
- Soap-based household cleaning agents

Clean the housing of the ultrasonic transducer with a damp cloth only.

10 Repair

10.1 General information

- Only use spare parts from Endress + Hauser to guarantee the safe and stable functioning of the device.

Detailed information on the spare parts is available at:
www.endress.com/device-viewer

10.2 Spare parts

For more detailed information on spare parts kits, please refer to the "Spare Part Finding Tool" on the Internet:

www.products.endress.com/spareparts_consumables

10.3 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.

10.4 Disposal

The device contains electronic components. The product must be disposed of as electronic waste.

- 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.

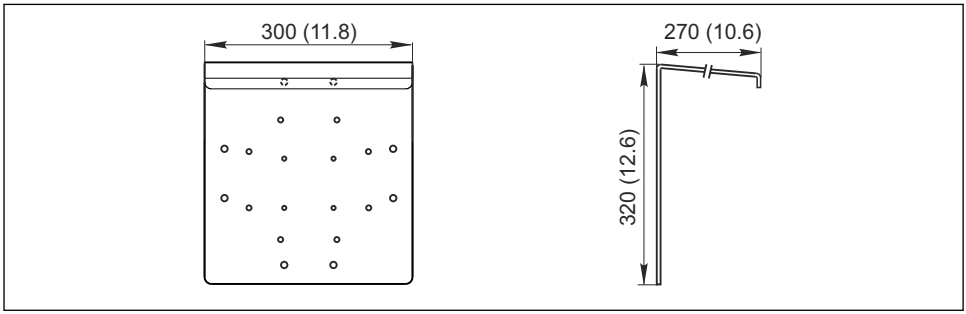
11 Accessories

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.

CYY101

- Weather protection cover for field devices
- Absolutely essential for field installation
- Material: stainless steel 1.4301 (AISI 304)
- Order No. CYY101-A



24 Dimensions in mm (inch)

12 Technical data

12.1 Output

12.1.1 Operating frequency

Operating frequency of the ultrasonic cleaning system: approx. 40 kHz

12.2 Power supply

12.2.1 Supply voltage

Depends on the order version:
- 230 VAC ± 10 %, 50/60 Hz
- 115 VAC ± 10 %, 50/60 Hz

12.2.2 Power consumption

Max. 50 VA

12.3 Environment

12.3.1 Ambient temperature range

−10 to 60 °C (+14 to 140 °F), non-condensing

12.3.2 Storage temperature

−20 to 60 °C (−4 to 140 °F)

12.3.3 Relative humidity

10 to 95 %, non-condensing

12.3.4 Degree of protection

Ultrasonic transducer:	IP 68
Ultrasonic generator:	IP 66/67

12.3.5 Electromagnetic compatibility (EMC)

Interference emission and interference immunity as per EN 61326-1:2006, EN 61326-2-3:2006

12.4 Mechanical construction

12.4.1 Dimensions

→ Section "Installation"

12.4.2 Weight

Ultrasonic transducer: 0.72 kg (1.59 lb), with 3 m (9.8 ft) cable
Ultrasonic generator: 2.2 kg (4.85 lb)

12.4.3 Materials

Ultrasonic transducer	
Cover:	PE
Floor:	Aluminum
Cable:	TPE-U mix; 3xLi9Y 0.75; sheath: Ø 6.6 mm (0.26 in) Minimum bending radius: 66 mm (2.6 in)66 mm (2.6 inch) when cable can move freely 33 mm (1.3 in) when cable cannot move freely

Ultrasonic generator	
Housing:	PC-FR
Housing seal:	EPDM
Cable glands:	Polyamide

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