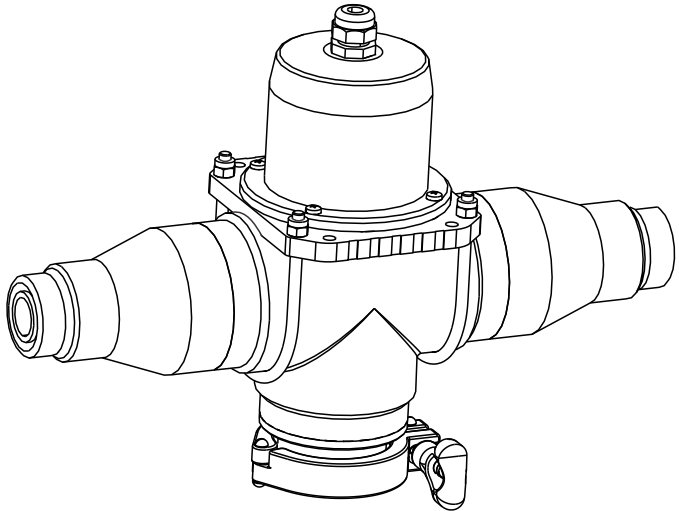


# Operating Instructions

## CYR52

Ultrasonic cleaning



# Document information

## Warnings

The structure, signal words and safety colors of the signs comply with the specifications of ANSI Z535.6 ("Product safety information in product manuals, instructions and other collateral materials").

Safety message structure	Meaning
<b>⚠ DANGER</b> <b>Causes (/consequences)</b> Consequences if safety message is not heeded ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the situation <b>will</b> result in a fatal or serious injury.
<b>⚠ WARNING</b> <b>Causes (/consequences)</b> Consequences if safety message is not heeded ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the situation <b>can</b> result in a fatal or serious injury.
<b>⚠ CAUTION</b> <b>Causes (/consequences)</b> Consequences if safety message is not heeded ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
<b>NOTICE</b> <b>Cause/situation</b> Consequences if safety message is not heeded ▶ Action/note	This symbol alerts you to situations that can result in damage to property and equipment.

## Symbols used



Additional information, tips



Permitted or recommended



Forbidden or not recommended


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# 1 Basic safety instructions

## 1.1 Requirements for personnel

- ▶ Installation, commissioning, operation and maintenance of the measuring system must only be carried out by specially trained technical personnel.
- ▶ The technical personnel must be authorized for the specified activities by the system operator.
- ▶ Electrical connection must only be carried out by a certified electrician.
- ▶ Technical personnel must have read and understood these Operating Instructions and must adhere to them.
- ▶ Faults at the measuring point may only be rectified by authorized and specially trained personnel.

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

## 1.2 Designated use

The CYR52 ultrasonic cleaning unit is used to clean turbidity sensors in liquid medium that are installed in pipes.

Any other use than the one described here compromises the safety of persons and 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:

- Explosion protection guidelines (only devices approved for use in explosion hazardous areas)
- Installation instructions
- Local prevailing standards and regulations

### Electromagnetic compatibility

The product has been tested for electromagnetic compatibility in accordance with the applicable European standards for industrial applications.

The electromagnetic compatibility indicated only applies to a product that has been connected in accordance with the instructions in these Operating Instructions.

## 1.4 Operational safety

- ▶ Before commissioning the entire measuring point, make sure all the connections are correct. Ensure that electrical cables and hose connections are not damaged.
- ▶ Do not operate damaged products, and secure them against unintentional commissioning. Label and identify the damaged product as defective.
- ▶ If faults cannot be rectified, you must take the products out of service and secure them 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.

Relevant regulations and European standards have been observed.

## 2 Incoming acceptance and product identification

### 2.1 Incoming acceptance

- Make sure the packaging is undamaged!
- Notify the supplier of any damage to the packaging. Keep the damaged packaging until the matter has been settled.
- Make sure the contents are not damaged!
- Notify the supplier of any damage to the delivery contents. Keep the damaged products until the matter has been settled.
- Check the delivery to make sure nothing is missing. Compare it against the shipping documents and your order.
- Pack the product for storage and transportation in such a way that it is reliably 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, contact your supplier or your local sales center.

### 2.2 Scope of delivery

The scope of delivery of the ultrasonic cleaning system comprises:

- 1 Ultrasonic generator
- 1 Ultrasonic transducer
- Mounting material depending on the order version
- 1 Set of Operating Instructions BA01300C/07/EN

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

## 2.3 Product identification

### 2.3.1 Nameplate

You can find the following information on the nameplate:


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

Compare the order code on the nameplate with your order.

### 2.3.2 Identifying the product

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

- On the nameplate
- In the shipping documents

 To find out the version of your product, enter the order code indicated on the nameplate in the search screen at the following address:  
[www.products.endress.com/order-ident](http://www.products.endress.com/order-ident)

## 2.4 Certificates and approvals

### 2.4.1 CE mark

#### Declaration of Conformity

The product meets the requirements of the harmonized European standards.

As such, it complies with the legal specifications of the EC directives.

The manufacturer confirms successful testing of the product by affixing to it the **CE** mark.

### 3 Installation

#### 3.1 Quick installation guide

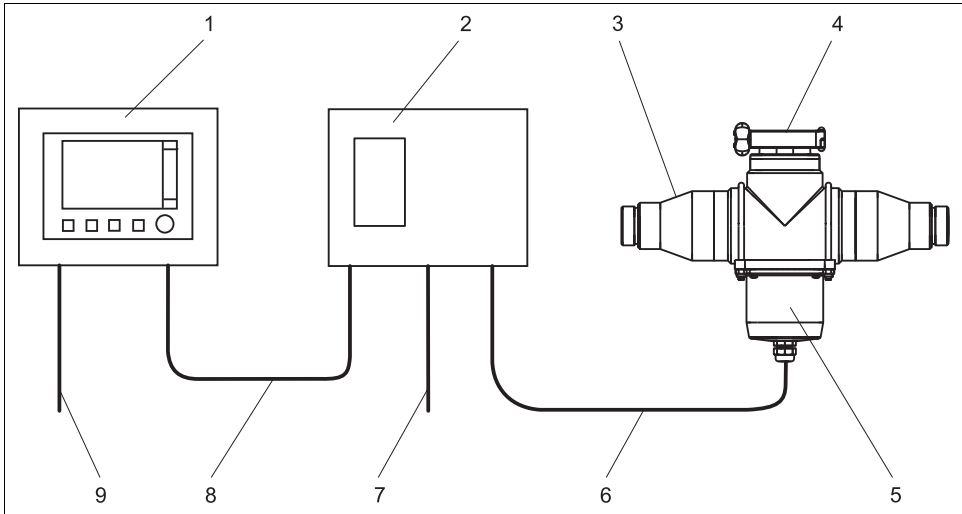
Proceed as follows for the full installation of the measuring point:

- Install the ultrasonic transducer face to face with the turbidity sensor (see the "Mounting the ultrasonic transducer" section).
- Install the ultrasonic generator (see the "Mounting the ultrasonic generator" section).
- Connect the ultrasonic transducer and the ultrasonic generator as illustrated in the graphic in the "Electrical connection" section.
- Put the ultrasonic cleaning system into operation as described in the "Commissioning" section.

##### 3.1.1 Overview

The complete ultrasonic cleaning system comprises:

- Ultrasonic generator
- Ultrasonic transducer
- Assembly or pipe with turbidity sensor
- Liquiline CM44x transmitter



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Fig. 1: Ultrasonic cleaning with Flowfit CUA252 assembly

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



### 3.1.2 Installation options

#### With Flowfit CUA252 flow assembly

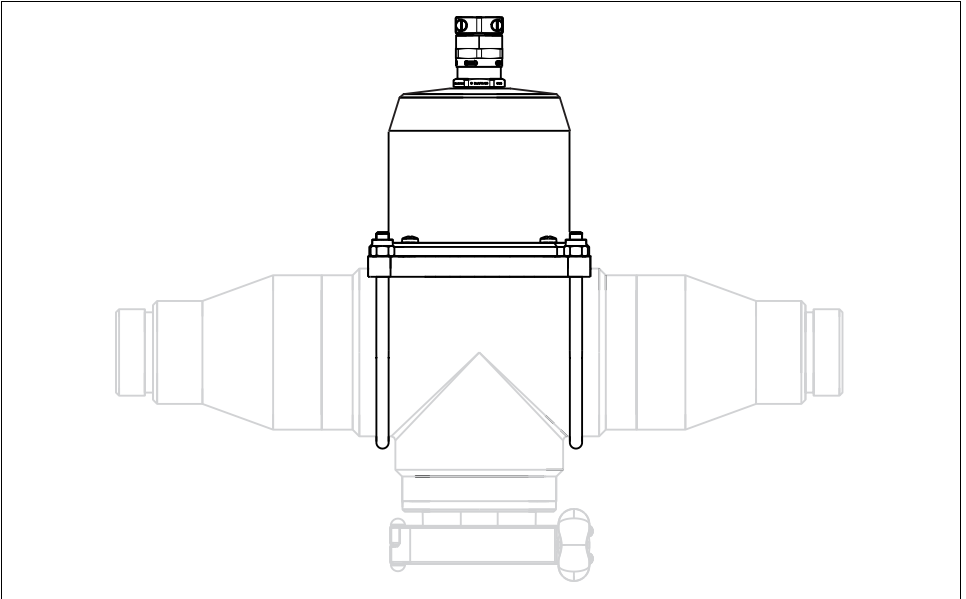
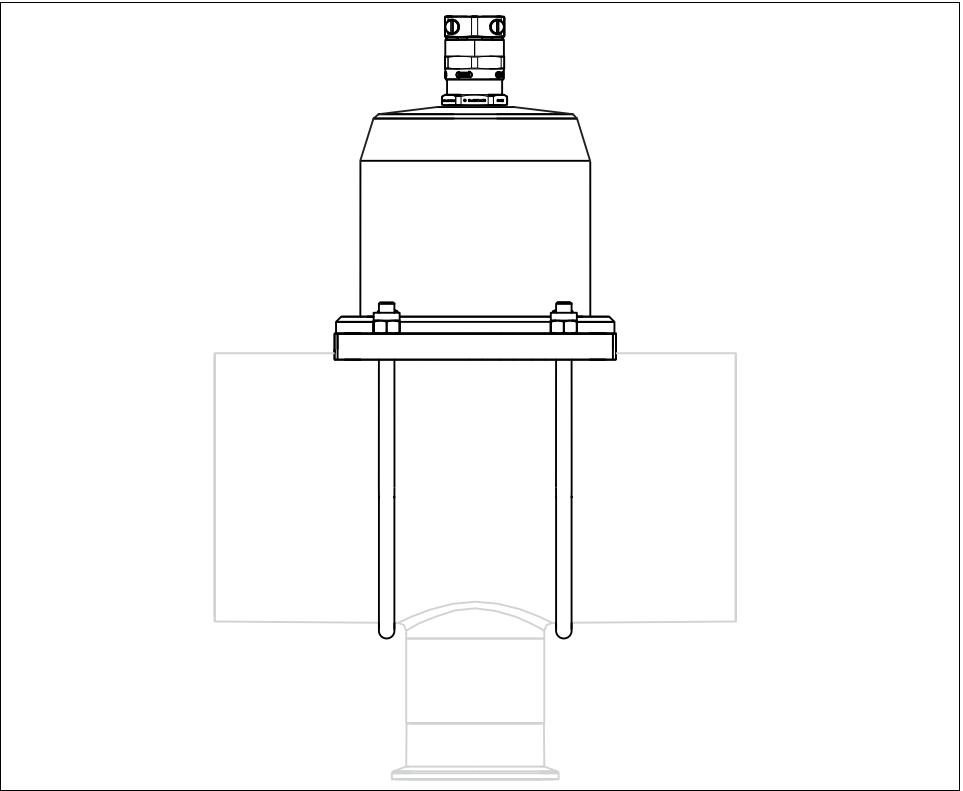


Fig. 2: Ultrasonic transducer on Flowfit CUA252 assembly

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**With Flowfit CUA262 flow assembly**



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Fig. 3: Ultrasonic transducer on Flowfit CUA262 assembly

With assembly of CUS31

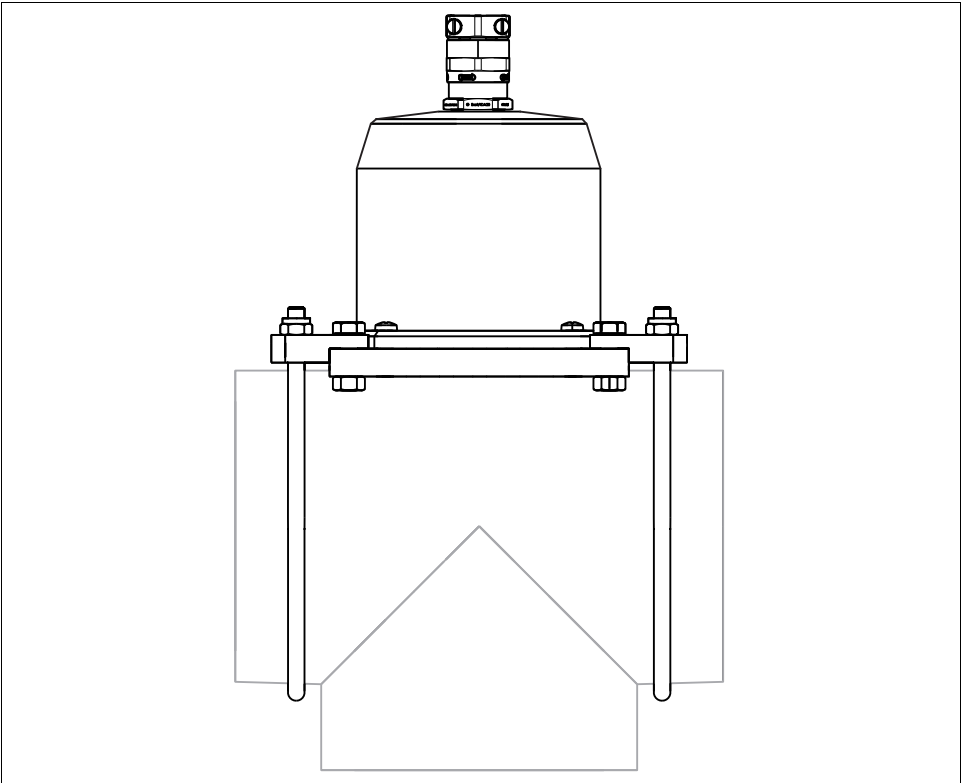
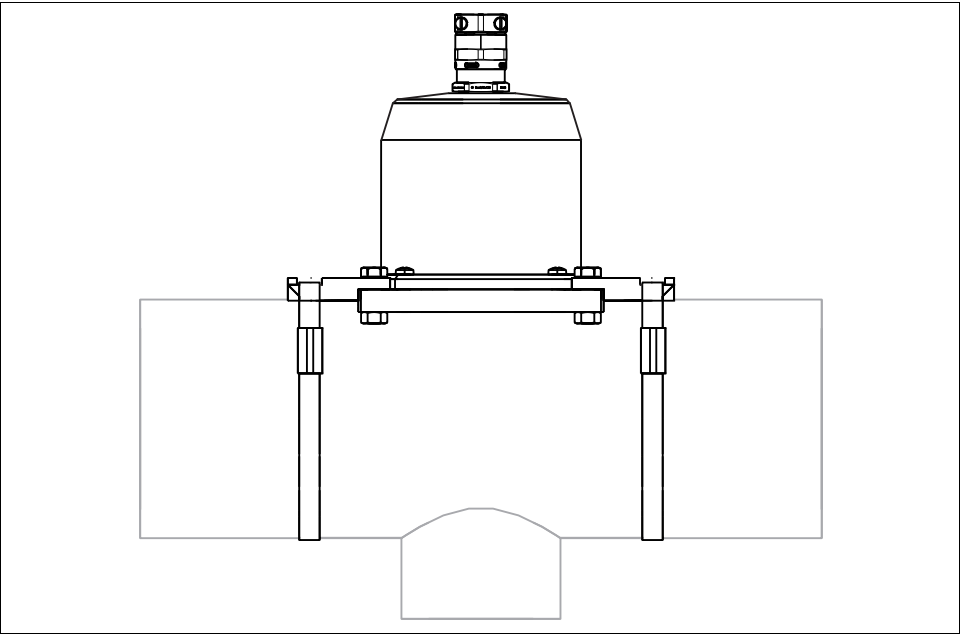


Fig. 4: Ultrasonic transducer with assembly of CUS31

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**Mounted on a pipe**

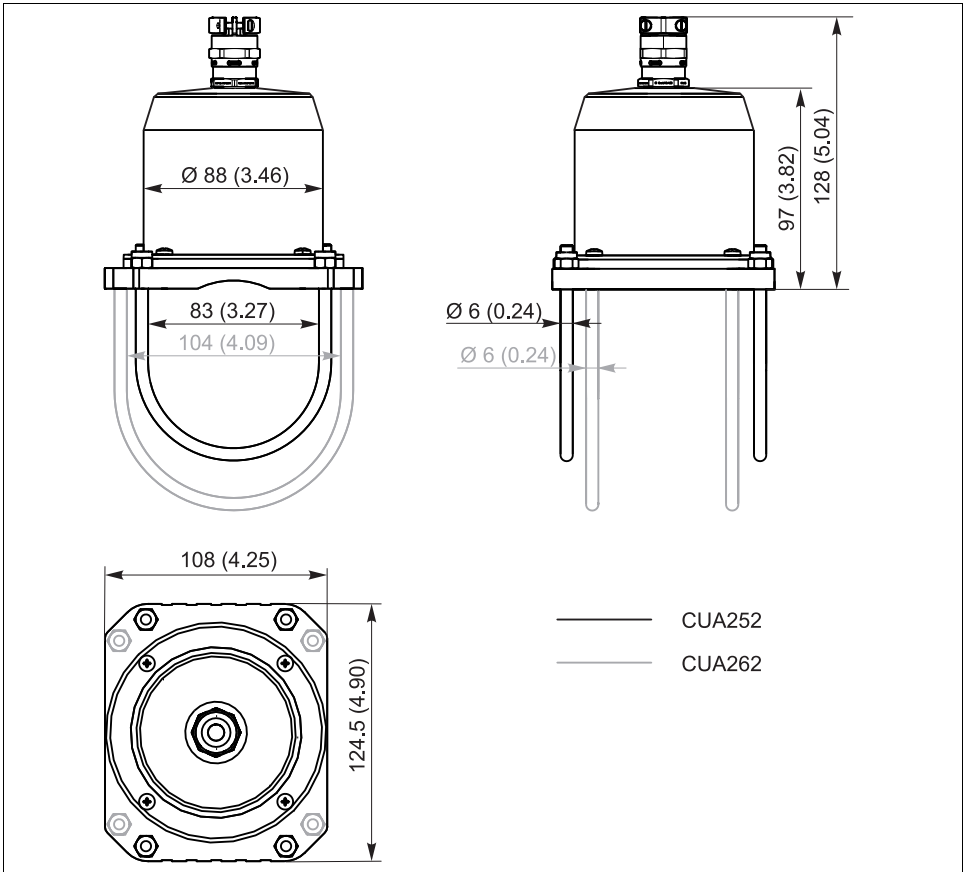


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*Fig. 5: Ultrasonic transducer mounted on a pipe*

### 3.2 Installation conditions

#### 3.2.1 Ultrasonic transducer



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Fig. 6: Dimensions in mm (inch) for CUA252 and CUA262



In the case of the ultrasonic transducer factor in a clearance of approx. 100 mm (4 inch) above the cable gland for the power supply cable.

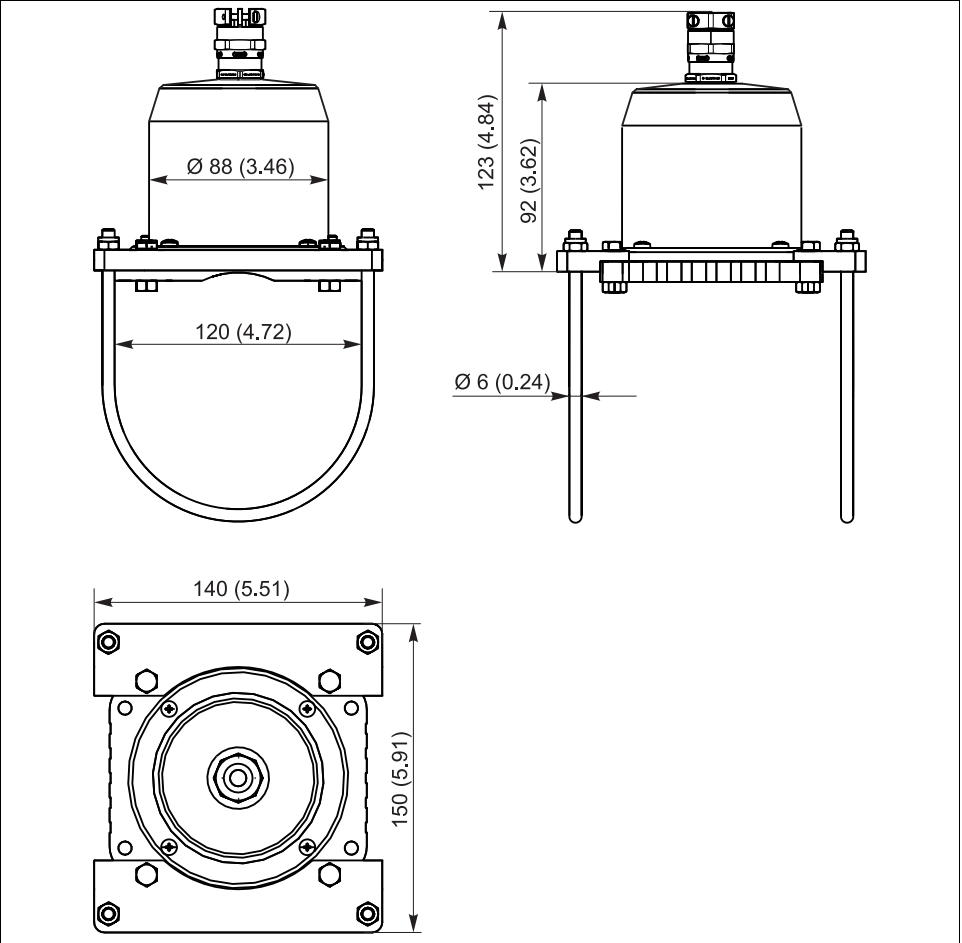
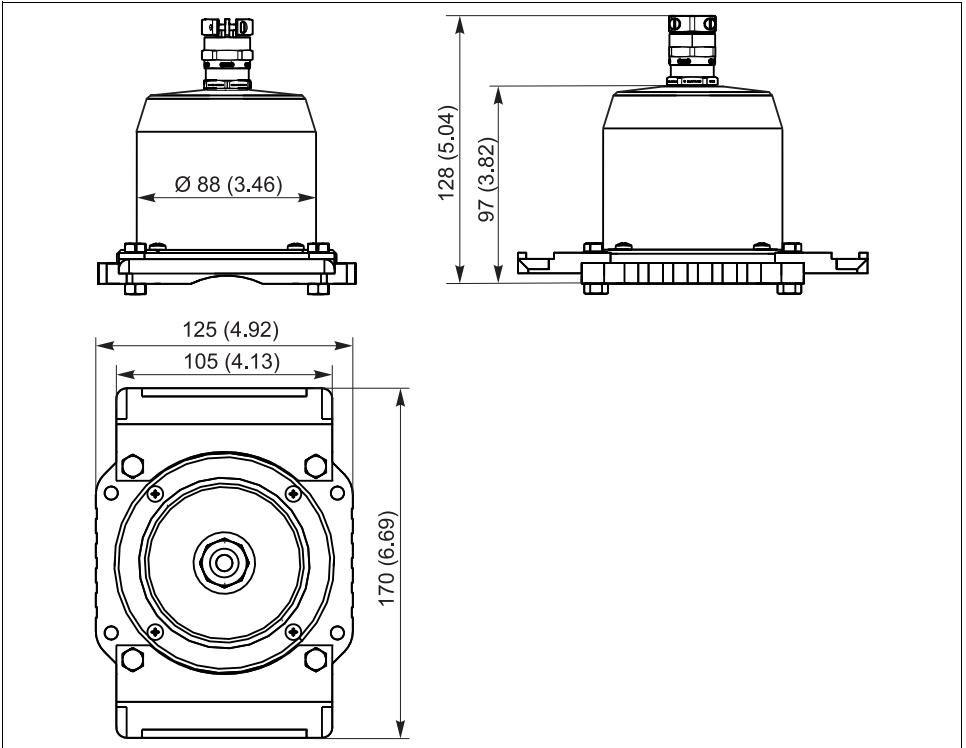


Fig. 7: Dimensions in mm (inch) for assembly of CUS31

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Fig. 8: Dimensions in mm (inch) for pipe mounting

### 3.2.2 Ultrasonic generator

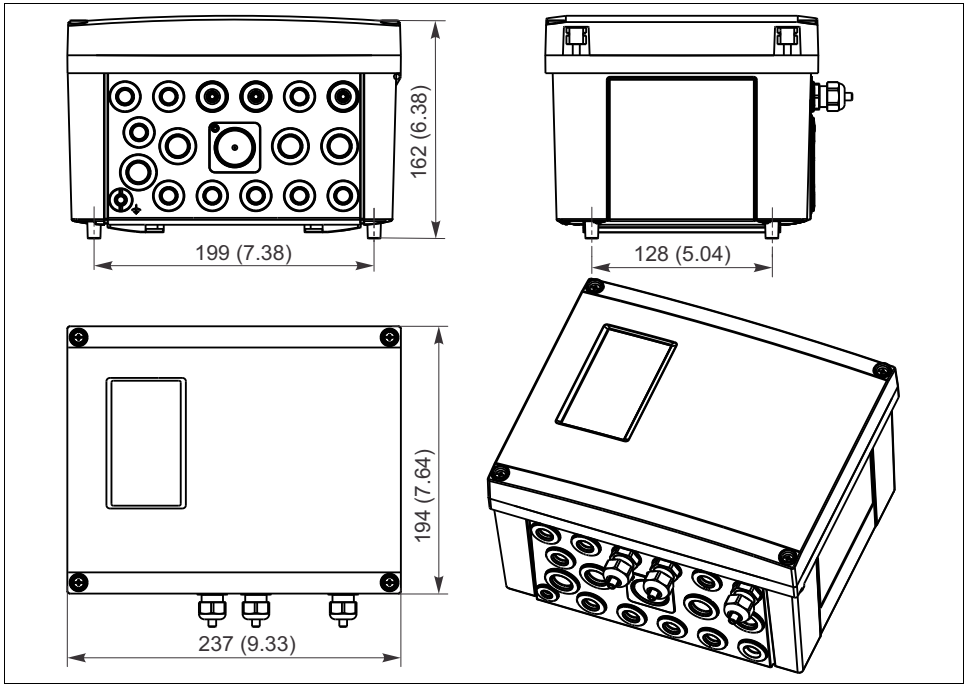


Fig. 9: Dimensions in mm (inch)

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### 3.3 Mounting the ultrasonic transducer

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.

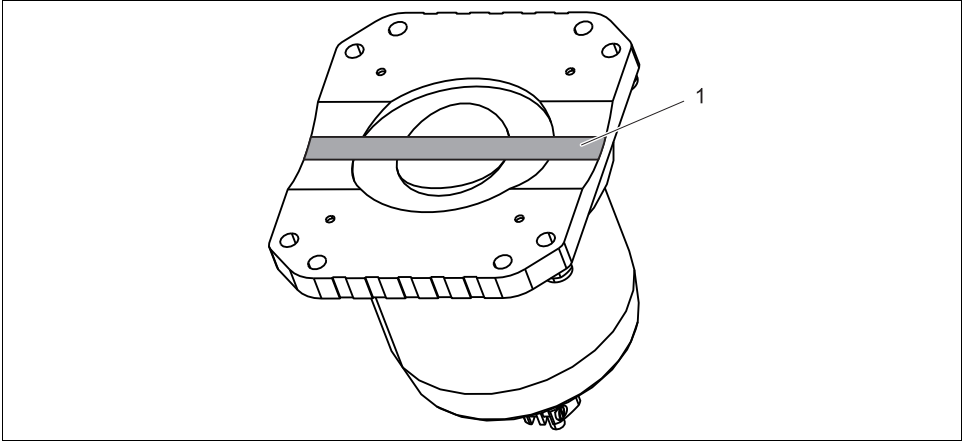



Fig. 10: Ultrasonic contact paste(1)

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Mount the ultrasonic transducer as follows:

1. Using the cleaning cloth (scope of delivery) clean the contact surface of the ultrasonic transducer and the contact surface of the assembly or pipe.
2. Coat the contact surface of the ultrasonic transducer (→  10, item 1) with a 5 mm (0.2") stripe ultrasonic contact paste.
3. Mount the ultrasonic transducer face to face with the turbidity sensor.
4. In the case of pipes:  
Tighten the two worm drive hose clips with a torque of 2.5 Nm (1.85 lbf ft).  
In the case of assemblies:  
Tighten the nuts of the brackets with a torque of 2 Nm (1.47 lbf ft).

### 3.4 Mounting the ultrasonic generator

#### 3.4.1 Mounting plate

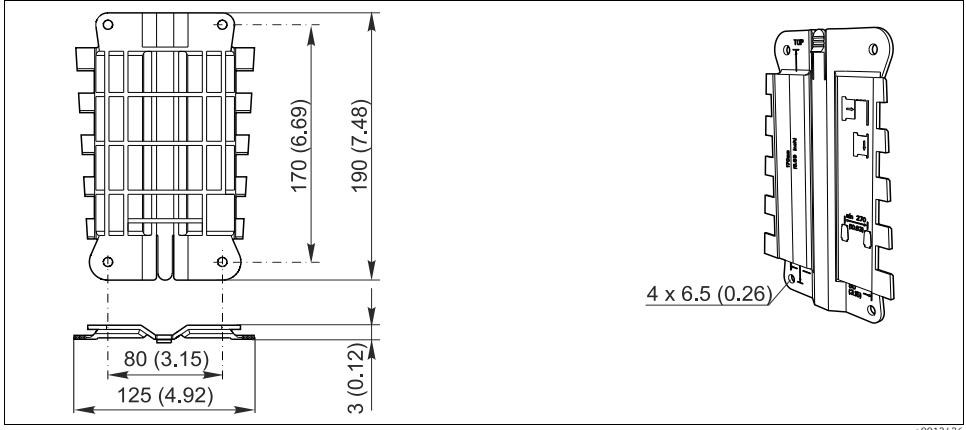


Fig. 11: Dimensions in mm (inch)

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#### 3.4.2 Weather protection cover (optional)

**NOTICE**

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

Impaired operation to complete failure of the ultrasonic generator

- ▶ When installing outside, always use the weather protection cover (accessory)

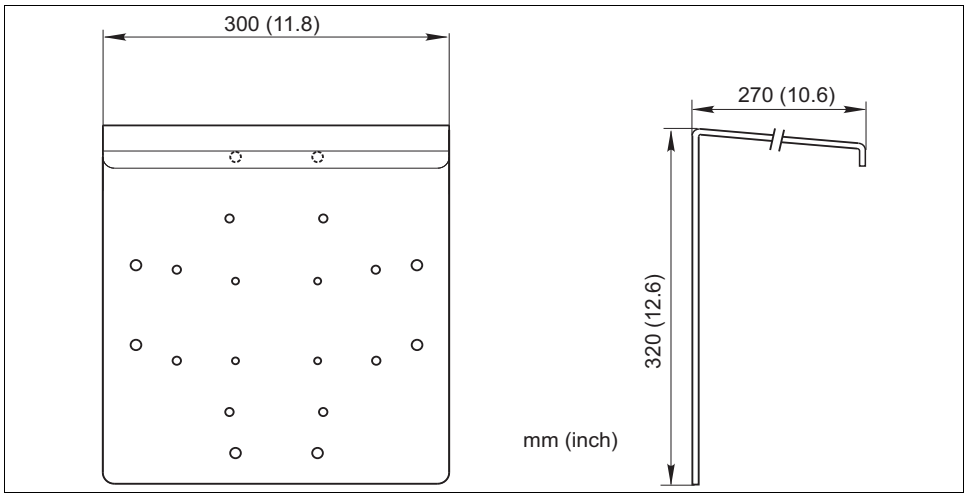


Fig. 12: Weather protection cover for ultrasonic generator

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### 3.4.3 Mounting the ultrasonic generator

#### Post mounting

You require the post mounting kit (optional) to mount the unit on a pipe, post or railing (square or round, clamping range 20 to 61 mm (0.79 to 2.40")).

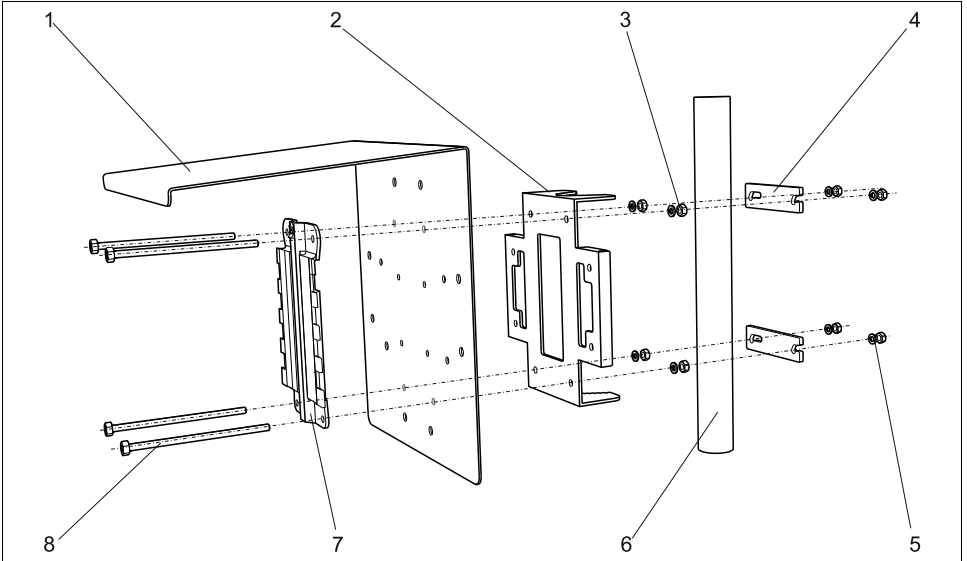


Fig. 13: Post mounting

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

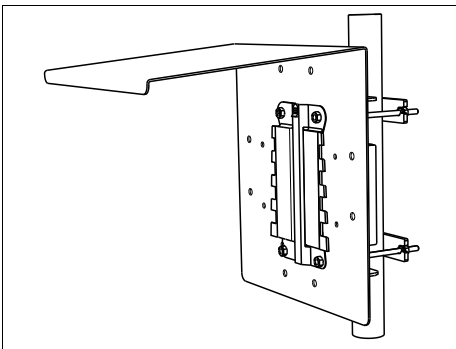


Fig. 14: Post mounting

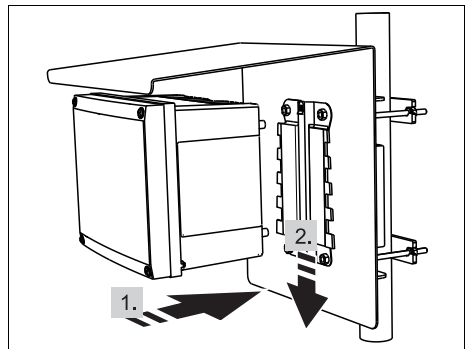
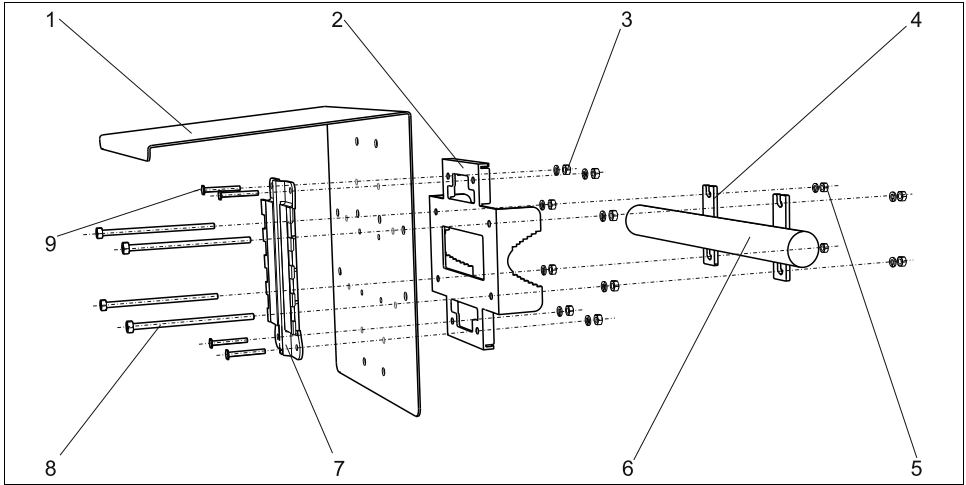


Fig. 15: Attach the device and click it into place

### Rail mounting

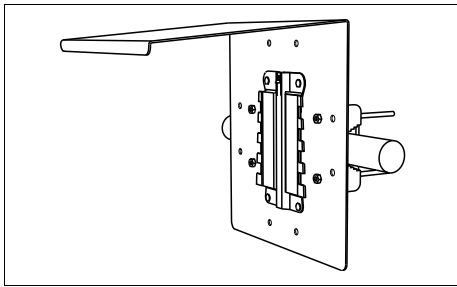


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Fig. 16: Rail mounting

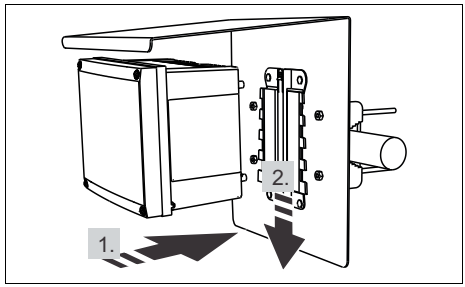
- 1 Weather protection cover (optional)
- 2 Post mounting plate (post mounting)
- 3 Spring washers and nuts (post mounting kit)
- 4 Pipe clamps (post mounting kit)
- 5 Spring washers and nuts (post mounting kit)

- 6 Pipe or railing /round/square)
- 7 Mounting plate
- 8 Threaded rods /post mounting kit)
- 9 Screws (post mounting kit)



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Fig. 17: Rail mounting



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Fig. 18: Attach the device and click it into place

## Wall mounting

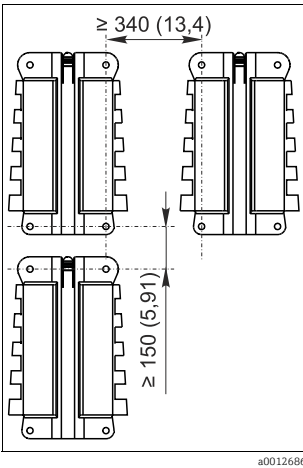


Fig. 19: Mounting distance in  
mm (inch)

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

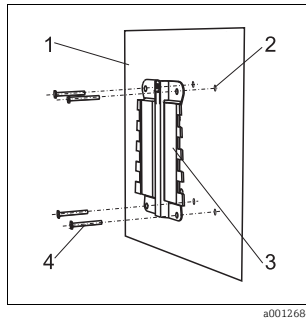


Fig. 20: Wall mounting

- 1 Wall
- 2 4 drill holes<sup>1)</sup>
- 3 Mounting plate
- 4 Screws  $\varnothing$  6 mm (not included in the delivery)

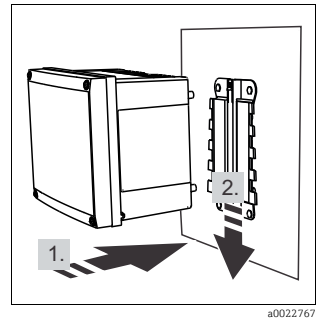


Fig. 21: Attach the device and click it  
into place

## 3.5 Post-installation check

- After installing, check the ultrasonic transducer and ultrasonic generator for damage.
- Check whether the ultrasonic generator is protected against moisture and direct sunlight.

# 4 Electrical connection

## ⚠ WARNING

### The device is live!

Incorrect connection may result in injury or death.

- ▶ The electrical connection may only be established by an electrical technician.
- ▶ The electrical technician must have read and understood these Operating Instructions and must follow the instructions they contain.
- ▶ **Prior** to beginning any wiring work, make sure voltage is not applied to any of the cables.
- ▶ It is absolutely imperative to observe the order in which the individual components are connected.

## 4.1 Wiring

### NOTICE

#### The device does not have a mains switch

- ▶ The customer must provide a protected circuit breaker in the vicinity of the device.
- ▶ The circuit breaker must be a switch or a power-circuit breaker, and you must label it as the circuit breaker for the device.

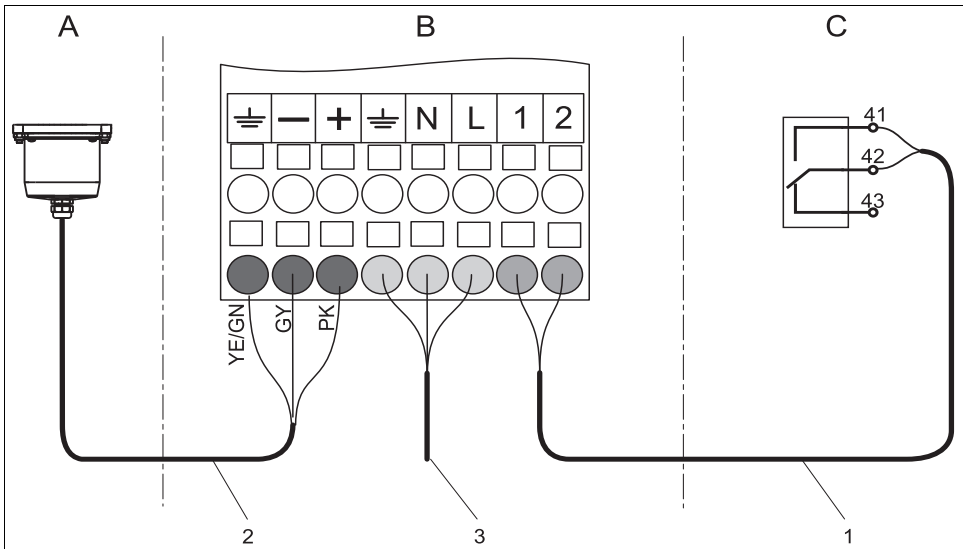



Fig. 22: Wiring diagram

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

Connect the ultrasonic cleaning system in the following order:

1. Connect the control cable (not included in the delivery, H03VV-F 2x0.75 is recommended) to terminals 1 and 2 at the ultrasonic generator, and 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). Make sure that the control cable is strain-relieved in both devices.
2. Connect the cable secured to the ultrasonic transducer to the terminal block of the ultrasonic generator as follows: connect the yellow-green protective conductor first. Then connect the gray cable to the negative end (minus) and then the pink cable to the positive end (plus). Ensure strain relief in the ultrasonic generator.
3. Connect the mains connection cable (not included in the delivery, H05VV-F3 G0.75 is recommended) to the appropriate terminals of the ultrasonic generator (→  22, item 3). Ensure strain relief in the ultrasonic generator.

## 4.2 Post-connection check

Carry out the following checks after electrical connection:

Device condition and specifications	Notes
Are the devices and cables free from damage on the outside?	Visual inspection
Does the mains voltage match the specifications on the nameplate?	

Electrical connection	Notes
Are the mounted cables strain-relieved?	
Cable runs without loops and cross-overs?	
Are the cables correctly connected according to the wiring diagram?	
Are all the screw terminals firmly tightened?	

## 5 Commissioning

### 5.1 Function check

#### ⚠ WARNING

##### Incorrect connection, incorrect supply voltage

Safety risks for staff and incorrect operation of the device

- ▶ Check that all connections have been established correctly in accordance with the wiring diagram.
- ▶ Make sure that the supply voltage matches the voltage indicated on the nameplate.

#### NOTICE

##### Electrostatic discharge (ESD)

Damage to electronic components

- ▶ Take personal protective measures to avoid ESD, such as discharging beforehand at PE or permanent grounding with a wrist strap.

### 5.2 Configuration

For optimum cleaning performance, the ultrasonic generator is switched on cyclically for a few seconds. The cleaning cycle is configured in the "Cleaning" menu in the transmitter (see Operating Instructions of the transmitter).

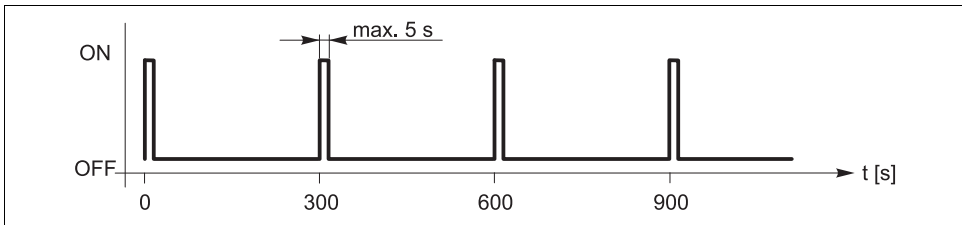


Fig. 23: Cleaning interval (example)

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

Cleaning time: max. 5 seconds

Cleaning interval: min. 5 minutes

**i** Operate the cleaning system only with medium in the pipe system (not dry!).

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



## 6 Diagnostics and troubleshooting

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

## 7 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. Also 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.

Maintenance of the measuring point comprises:

- Cleaning the transmitter, assembly, ultrasonic transducer and ultrasonic generator
- 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.

### **NOTICE**

#### **Electrostatic discharge (ESD)**

Damage to electronic components

- ▶ Take personal protective measures to avoid ESD, such as discharging beforehand at PE or permanent grounding with a wrist strap.
- ▶ For your own safety, only use genuine spare parts. With genuine parts, the function, accuracy and reliability are also ensured after maintenance work.

### 7.1 Cleaning the transmitter, ultrasonic transducer and ultrasonic generator

Clean the front of the housing with commercially available cleaning agents only.

The front is resistant to the following as per DIN 42 115:

- Ethanol (short periods)
- Diluted acids (max. 2% HCl)
- Diluted bases (max. 3% NaOH)
- Soap-based household cleaners

### **NOTICE**

#### **Prohibited cleaning agents**

Danger of damaging the housing surface or housing seal

- ▶ For cleaning purposes, never use concentrated mineral acids or bases.
- ▶ Never use organic cleaners such as benzyl alcohol, methanol, methylene chloride, xylene or concentrated glycerol cleaner.
- ▶ Never use high-pressure steam for cleaning purposes.

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

## 8 Repair

### 8.1 Spare part kits

Order number	Description
71247412	Ultrasonic transducer with 3 m cable
71247419	Ultrasonic transducer with 7 m cable
71247421	Ultrasonic transducer with 15 m cable
71247422	Electronic module 230 V
71247423	Electronic module 115 V

### 8.2 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product has been ordered or delivered. According to legal regulations Endress+Hauser, as an ISO-certified company, is required to follow certain procedures when handling returned products that are in contact with the medium.

To ensure swift, safe and professional device returns:

Visit our website to obtain information about the return procedure and basic conditions.  
[www.services.endress.com/return-material](http://www.services.endress.com/return-material)

### 8.3 Disposal

The device contains electronic components, and must therefore be disposed of in accordance with regulations on the disposal of electronic waste.  
 Please observe local regulations.

## 9 Accessories

Description	Order number
Mounting paste for CYR52	71242140
Mounting kit for CUA252	71242141
Mounting kit for CUA262	71242142
Mounting kit for flow assembly CUS31 E/S	71242143
Mounting kit, variable	71242145
Post mounting kit for securing the ultrasonic generator to horizontal and vertical posts and pipes	71096920

The CYY101 weather protection cover for field devices is absolutely essential

- Material: stainless steel 1.4301 (AISI 304)
- Order No. CYY101-A

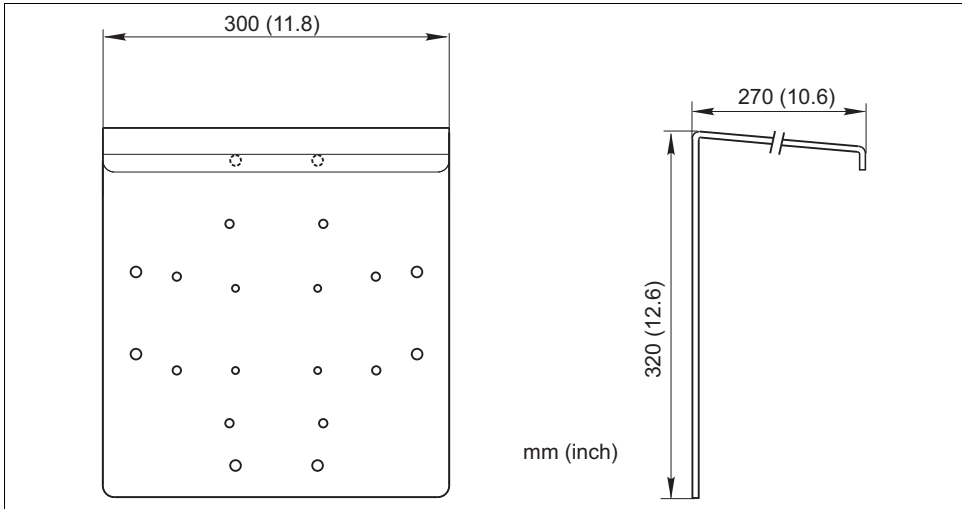


Fig. 24: Weather protection cover for field devices

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## 10 Technical data

### 10.1 Output

#### 10.1.1 Operating frequency of the ultrasonic cleaning system

Approx. 40 kHz

### 10.2 Power supply

#### 10.2.1 Supply voltage

Depends on the order version:

230 VAC / 50 Hz

115 VAC / 60 Hz

#### 10.2.2 Power consumption

Max. 50 VA

### 10.3 Environment

#### 10.3.1 Ambient temperature range

Ultrasonic transducer: 0 to 60 °C (32 to 140 °F), non-freezing, non-condensing

Ultrasonic generator: -10 to +60 °C (+14 to 140 °F), non-condensing

#### 10.3.2 Storage temperature

0 to 60 °C (32 to 140 °F)

#### 10.3.3 Electromagnetic compatibility

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

#### 10.3.4 Degree of protection

Ultrasonic transducer: IP 68

Ultrasonic generator: IP 66/67

#### 10.3.5 Humidity

10 to 95 %, non-condensing

## 10.4 Mechanical construction

### 10.4.1 Dimensions

See the "Installation" section

### 10.4.2 Weight

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

### 10.4.3 Material

Ultrasonic transducer

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

Ultrasonic generator

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

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### C

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