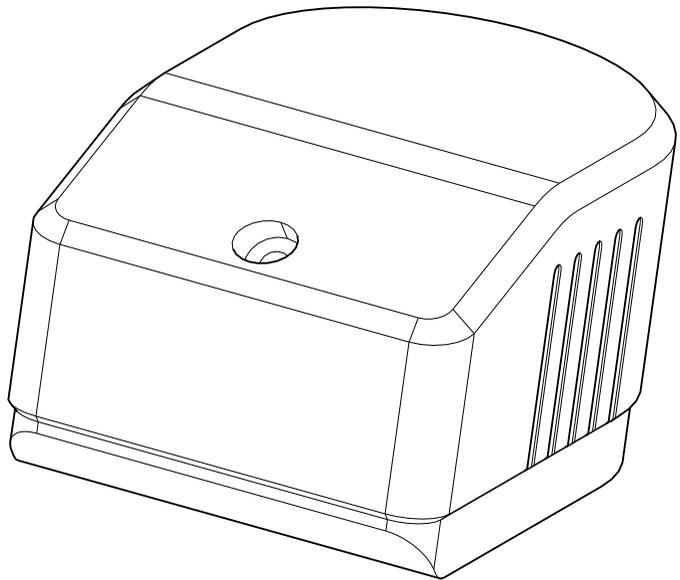


Operating Instructions

CUY52

Calibration set for turbidity sensor CUS52D



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
⚠ DANGER Causes (/consequences) Consequences if safety message is not heeded ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the situation will result in a fatal or serious injury.
⚠ WARNING Causes (/consequences) Consequences if safety message is not heeded ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the situation can result in a fatal or serious injury.
⚠ CAUTION Causes (/consequences) 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.
NOTICE Cause/situation 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 calibration set CUY52 is designed for the turbidity sensor CUS52D.

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 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 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

2.3 Scope of delivery

The scope of delivery comprises:

- Calibration set CUY52 in ordered version
- Operating Instructions BA01309C/07/EN

2.4 Certificates and approvals

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 Dimensions

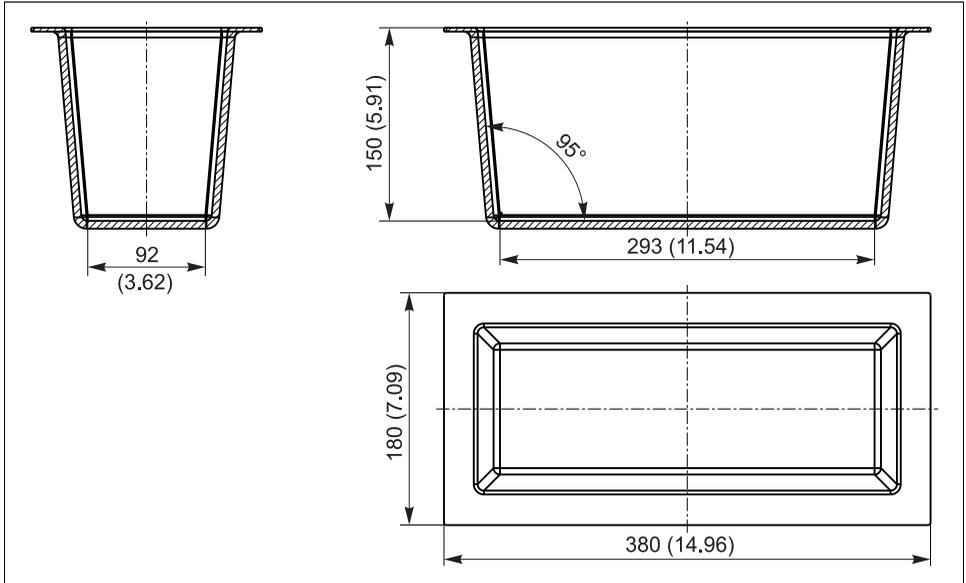
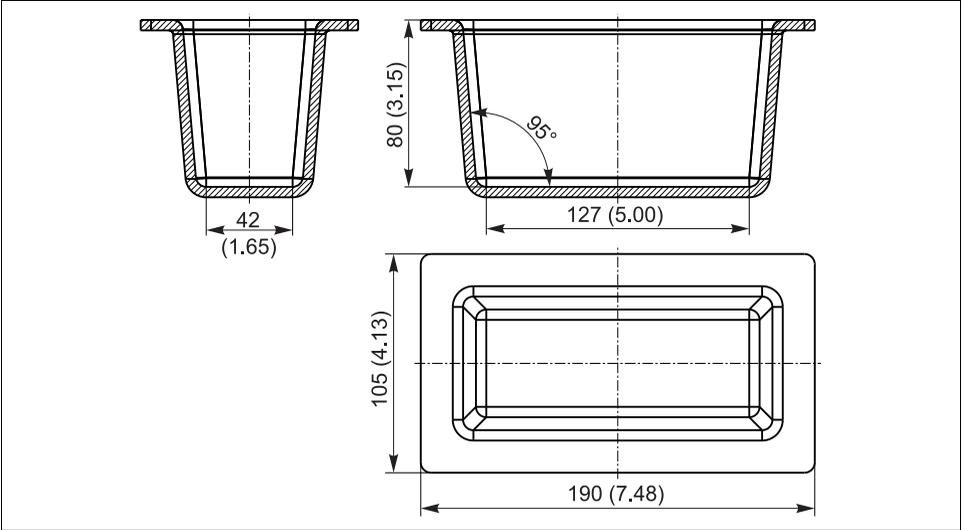


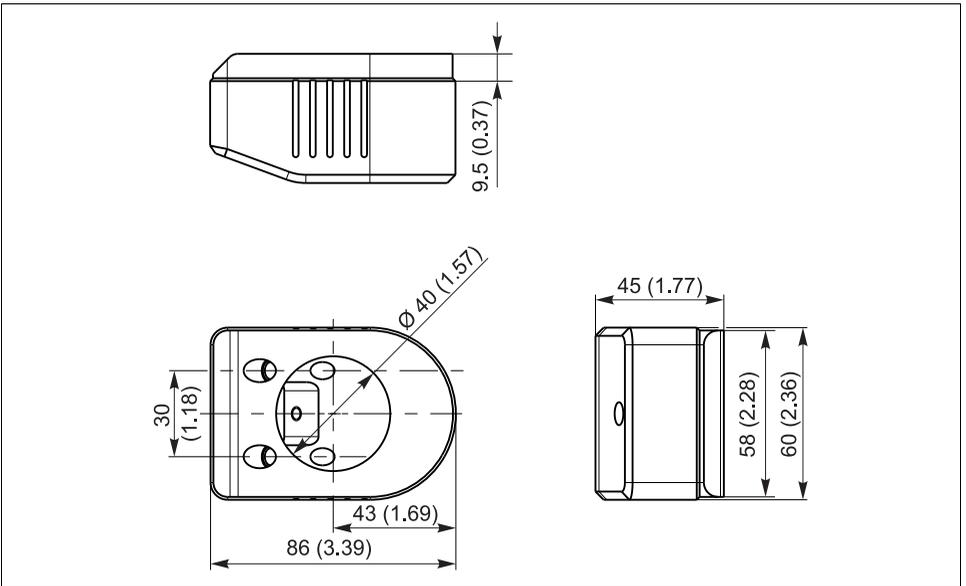
Fig. 1: Large calibration vessel, dimensions in mm (inch)

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Fig. 2: Small calibration vessel, dimensions in mm (inch)



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Fig. 3: Solid state reference, dimensions in mm (inch)

4 Commissioning

4.1 Solid state reference

The solid state reference with approx. 4.0 FNU /NTU is used to check the function of any CUS52D sensor. The solid state reference is not assigned to a particular sensor. It produces measured values in the range of 4.0 FNU /NTU \pm 1.5 FNU / NTU with any CUS52D sensor.

Function check with solid state reference

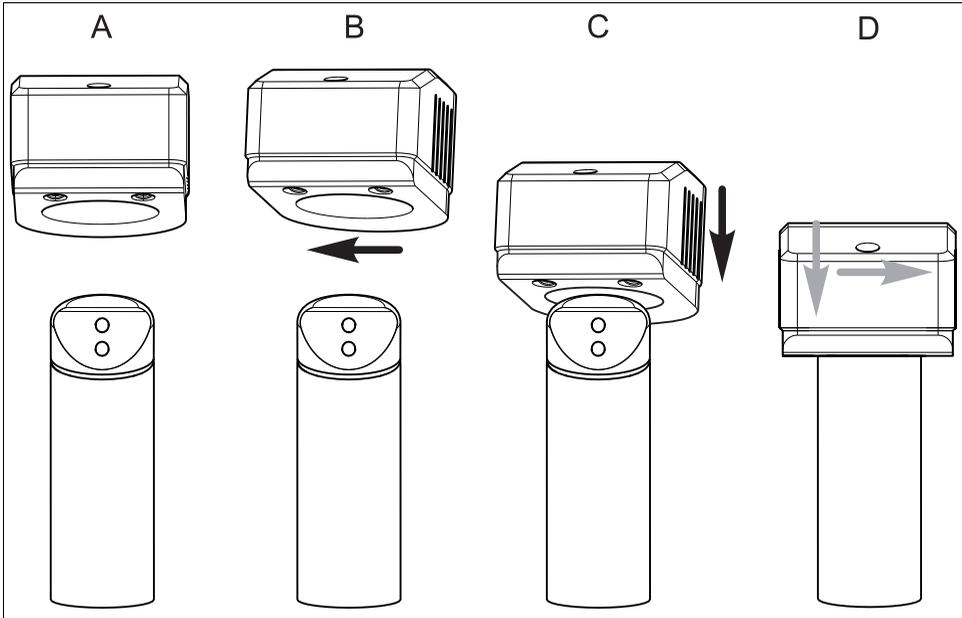


Fig. 4: Put the solid state reference onto the sensor

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Preparation:

1. Clean the sensor (see Operating Instructions of the sensor).
2. Fix the sensor (e.g. with a laboratory stand).
3. Put the solid state reference slightly twisted l (\rightarrow  4, B) and smoothly onto the sensor (C).
4. Let the solid state reference slip into the end position (D).

Function check:

1. Activate the factory calibration on the transmitter.
2. Read the measured value on the transmitter (depending on the signal-filter settings it will take 2 to 25 seconds until the measured value is correct).



Activating an application calibration will result in different measured values. Therefore, always select the factory calibration (formazine) for a function check with the solid state reference.

Recommendations for the laboratory stand:

Length of stand:	250 mm, 12 mm diameter
Plate of stand:	300 x 150 x 15 mm with bore hole on front face
Extension clamp:	Stainless steel, jaw width 0 to 80 mm

4.2 Large calibration vessel

The large calibration vessel is recommended for measurements or calibrations in the lower turbidity range (<200 FNU / NTU). Design and material allow measurements without wall effects. Consequently, the calibration vessel can be used for calibration / adjustment of the sensor with ultrapure water.

To avoid measurement errors caused by wall effects position the sensor in the following way:

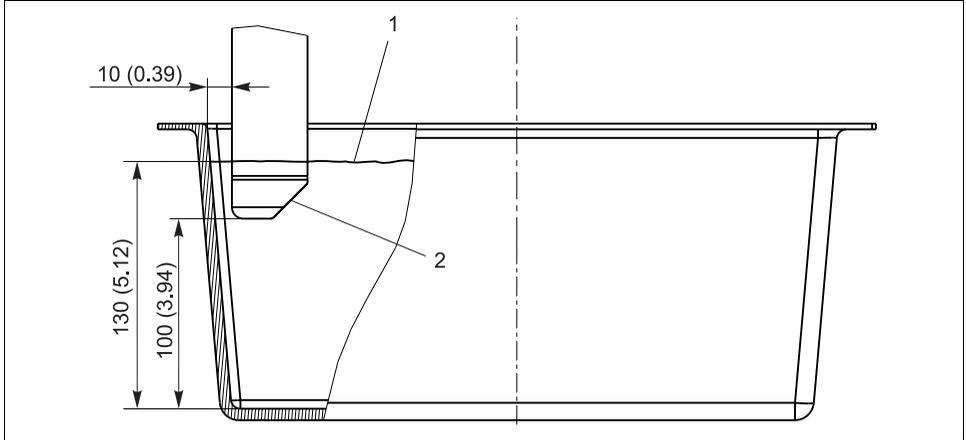


Fig. 5: Sensor position, specifications in mm (inch)

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- 1 Level of media
- 2 Orientation of the optical windows

Recommendations for the laboratory stand:

- Length of stand: 250 mm, 12 mm diameter
- Plate of stand: 300 x 150 x 15 mm with bore hole on front face
- Extension clamp: Stainless steel, jaw width 0 to 80 mm

4.3 Small calibration vessel

⚠ CAUTION

Formazine is harmful

- ▶ Do not swallow!
- ▶ Do not inhale!
- ▶ Avoid contact with eyes and skin!
- ▶ Wear protective goggles and protective gloves!

The small calibration vessel is recommended for measurements or calibrations in the upper turbidity range (200 ... 1000 FNU / NTU). Wall effects will result in wrong measured values when used in the lower turbidity range.

To avoid measurement errors caused by wall effects, position the sensor in the following way:

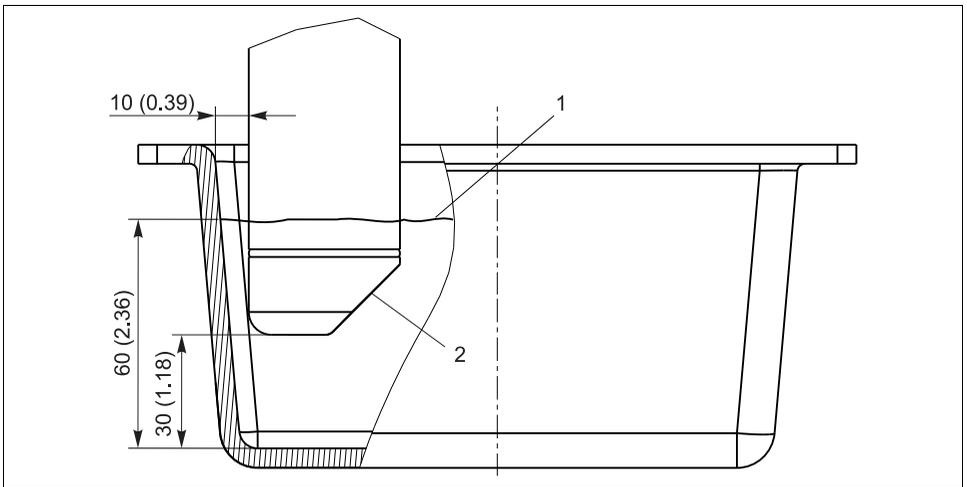


Abb. 6: Sensor position, specifications in mm (inch)

Use a magnetic stirrer to ensure the homogeneity of the medium. Position the magnetic stirrer as far away from the sensor as possible.

Recommendations for the laboratory stand:

- Length of stand: 250 mm, 12 mm diameter
- Plate of stand: 300 x 150 x 15 mm with bore hole on front face
- Extension clamp: Stainless steel, jaw width 0 to 80 mm

Recommendations for the magnetic stirrer:

- Motor power rating: 9 W
- RPM range: 0/50 to 150 rpm
- Length of swizzle stick: 80 mm
- Stirring capacity of H₂O: max 20 liter

5 Maintenance

Solid state reference

The solid state reference is an optical instrument and has to be treated accordingly. Store the solid state reference dustproof and moistureproof in the original packaging.

Calibration vessels

Clean the calibration vessels after each usage. To protect the vessels from light and dust, store them in the original packaging.

6 Repair

6.1 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

6.2 Disposal

Please observe local regulations for the disposal of the product.

7 Technical data

7.1 Performance characteristics

7.1.1 Solid state reference

approx. 4.0 ± 1.5 FNU / NTU with CUS52D

7.2 Environment

7.2.1 Ambient temperature range

0 to 55 °C (32 to 131 °F)

7.2.2 Storage temperature

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

7.3 Mechanical construction

7.3.1 Dimensions

See the "Installation" section

7.3.2 Weight

Vessel, large:	approx. 512 g (18.1 oz)
Vessel, small:	approx. 136 g (4.8 oz)
Solid state reference:	approx. 232 g (8.2 oz)

7.3.3 Materials

Vessels:	ABS black
Solid state reference:	POM black

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