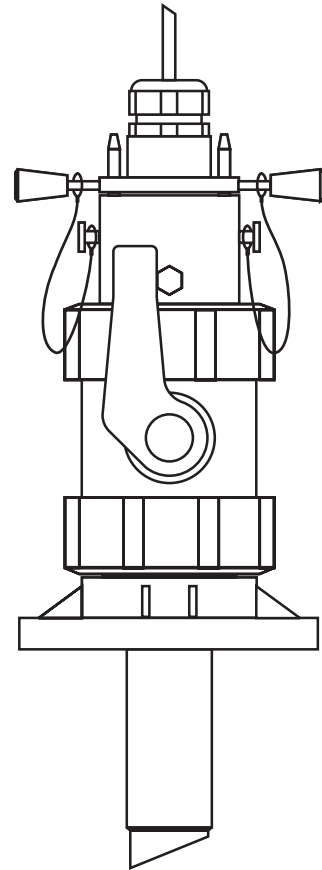
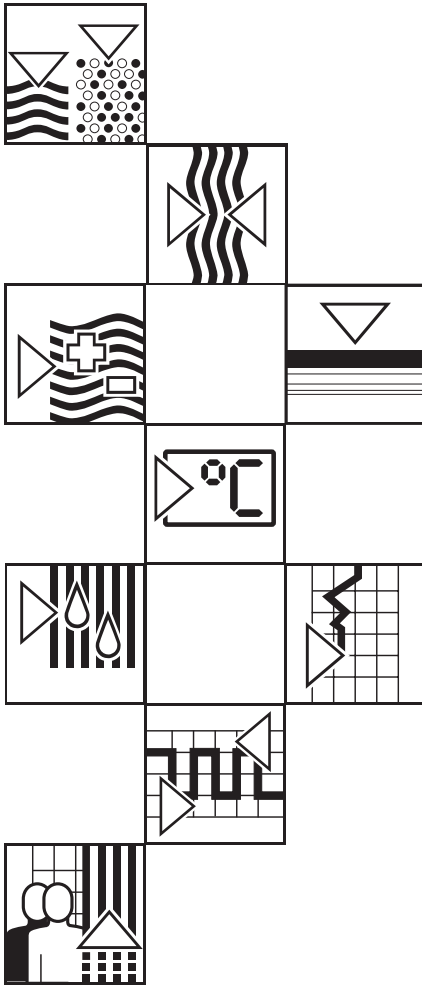


# *ProbFit* CUA 461 Retractable Assembly for Turbidity Measurement

## Operating Instructions



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# 1 General information

## 1.1 Symbols used

**Warning:**

This symbol alerts to hazards which may cause irreparable damage.

**Caution:**

This symbol alerts to possible malfunction due to operator error.

**Note:**

This symbol indicates important items of information.

## 1.2 Safety notes

**Warning:**

Operating the assembly in any way other than as intended may compromise the safety and function of the assembly and corresponding measuring system and is therefore impermissible.

This device may only be installed, commissioned, operated and serviced by properly trained specialist personnel authorised by the system operator.

The specialist personnel must be familiar with and adhere to these operating instructions.

## 2 Description

### 2.1 Areas of application

The retractable assembly ProbFit CUA 461 is primarily used in the water and sewage treatment areas.

It can be used to install a turbidity sensor CUS 1 or CUS 4 on a pipe or tank in such a manner as to permit sensor checks and cleaning without interrupting the process.

This manually operated assembly permits the sensor to be moved into and withdrawn from the process space under process conditions (up to 2 bar at 20 °C, up to 1 bar at 50 °C). All parts in contact with the medium are made of polypropylene (PP), the seals consist of EPDM or Viton. The process connection is established via a DN 50 DIN flange or a 2" ANSI flange.

### 2.2 Design of CUA 461 assembly

The following drawing shows the design of the CUA 461 assembly:

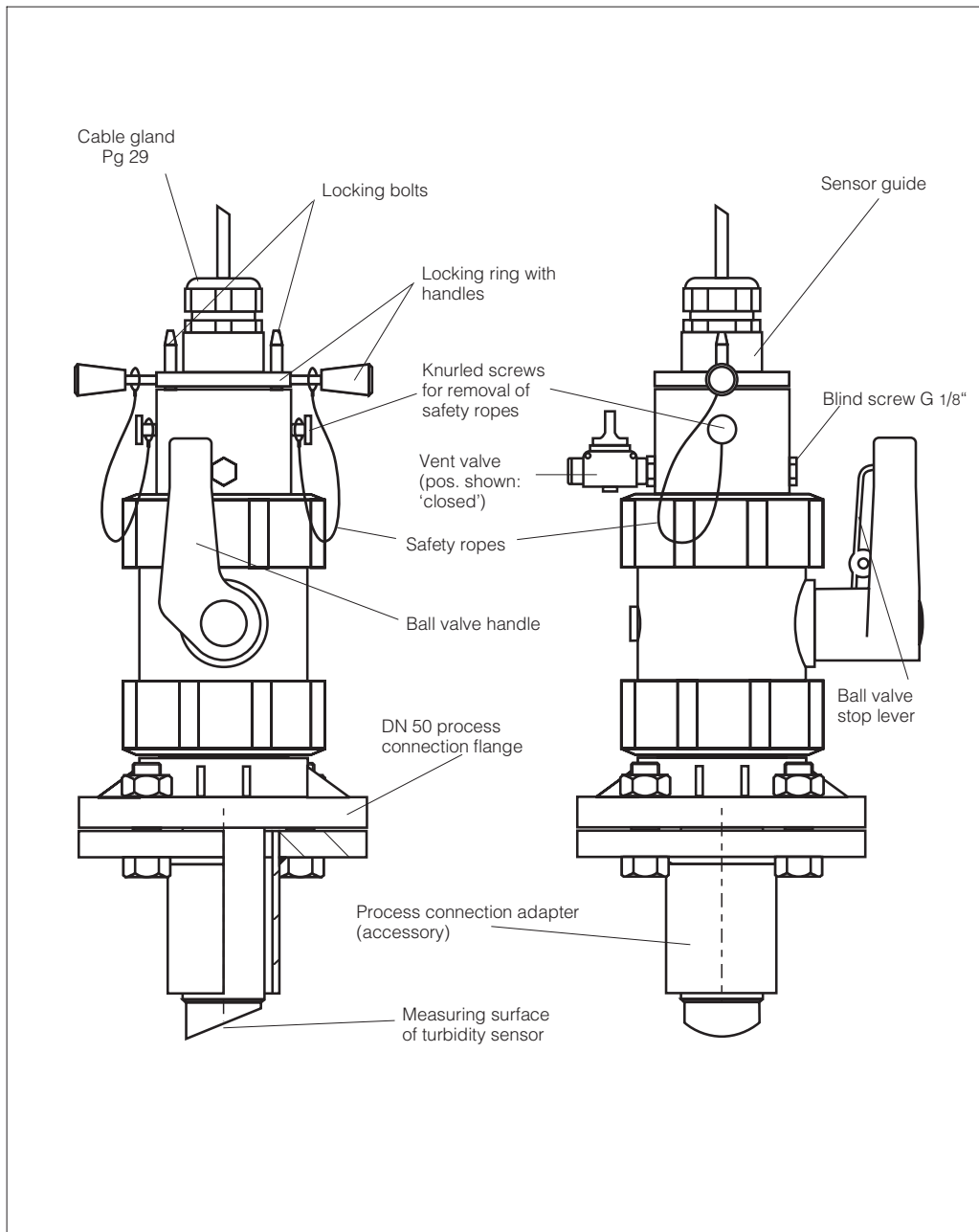


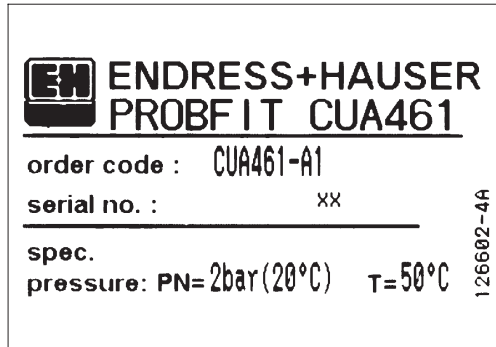
Fig. 2.1 Design of assembly ProbFit CUA 461

**2.3 Function**

The sensor guide with the built-in turbidity sensor CUS 1 or CUS 4 is moved into the process space by hand for measurement.

The sensor guide can be withdrawn to the service position without interrupting the process. The interior of the assembly is sealed off from the process by closing the ball valve. The turbidity sensor can then be cleaned, calibrated or replaced.

**2.4 Assembly variants**



The order code on the rating plate can be used to identify the assembly variant by comparison with the following chart:

Fig. 2.2 Rating plate of CUA 461

**Retractable assembly ProbFit CUA 461**

**Version / mounting type**  
 A Process connection DN 50 DIN flange  
 B Process connection 2" ANSI flange

**O-ring seals**  
 1 Material EPDM  
 2 Material Viton

CUA 461-   ← complete order code

### 2.5 Accessories

Adapter for process connection:  
 Welded fitting for pipe diameters of more than 80 mm, with DN 50 / 2" ANSI combination flange, flange seal, 4 M16x60 screws, 4 M16 nuts and 4 M16 washers

Version	Order number
Special steel 1.4571	50080249
Polyvinyl chloride PVC	50080250
Polypropylene PP	50080251

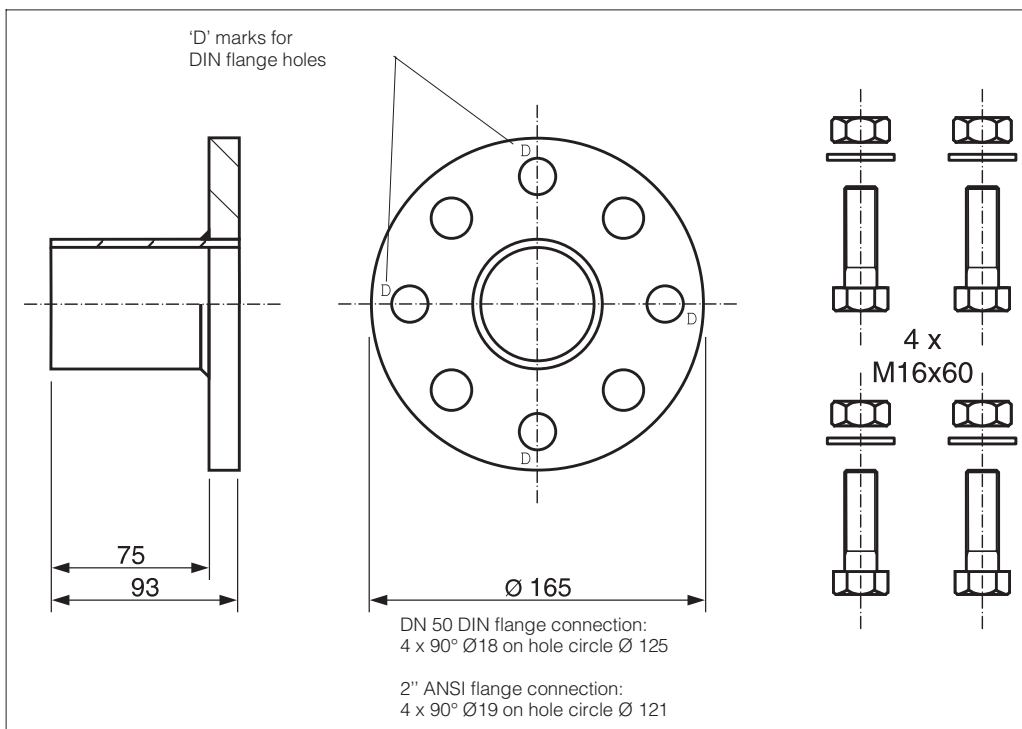


Fig. 2.3: Process connection adapter for CUA 461

### 3 Installation

#### 3.1 Unpacking

- Verify that the contents are undamaged! Inform the post office or freight carrier as well as the supplier of any damage.
- Check that the delivery is complete and agrees with the shipping papers and your order:
  - Quantity delivered
  - Assembly type and version according to rating plate (cf. chapter 2.4)
  - Operating instructions
  - Accessories (process connection adapter)

- Keep the original packaging materials for future storage or shipping of the assembly.

If you have any questions, consult your supplier or the Endress+Hauser sales agency in your area (see back cover of these operating instructions for addresses).

#### 3.2 Dimensions

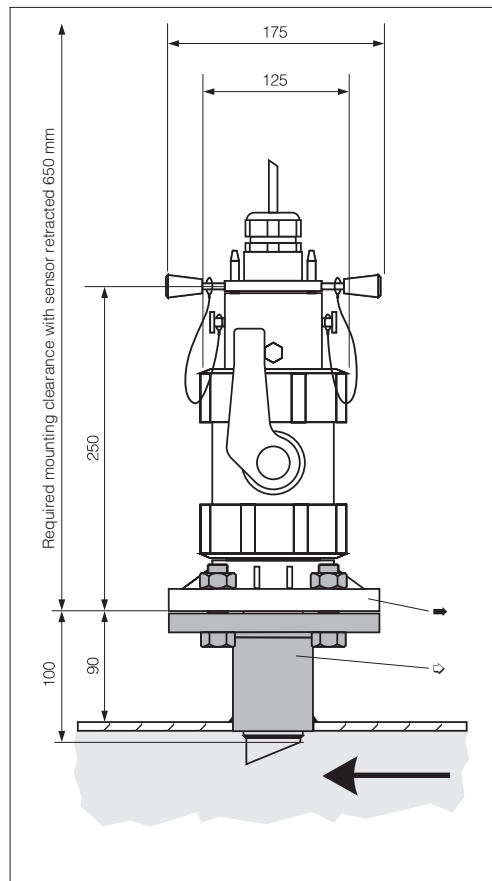
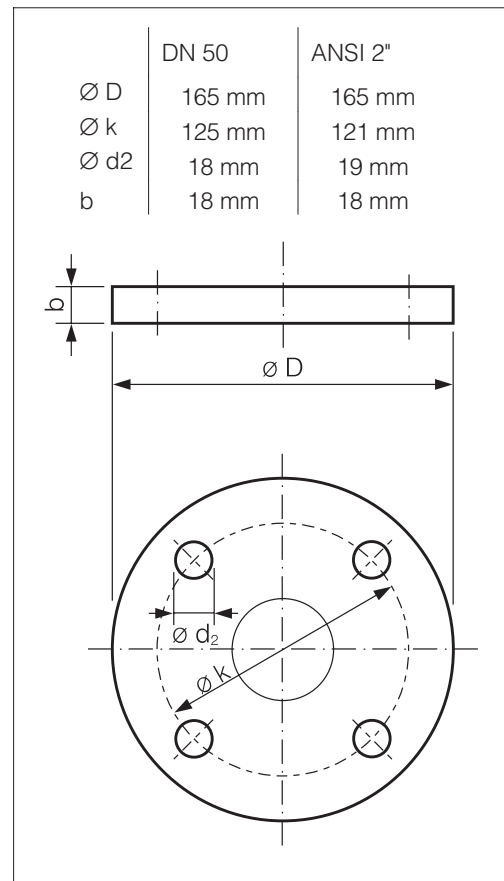


Fig. 3.1: Dimensions of ProbFit CUA 461  
 ■ Process connection: DIN flange DN 50 or 2" ANSI  
 ◊ Process connection adapter (accessory)

Fig. 3.2 Flange dimensions



### 3.3 Installation and application notes

The CUA 461 assembly with the built-in turbidity sensor should preferably be installed in places with uniform flow conditions. The minimum pipe diameter should be DN 80.

Optimal installation conditions can be obtained by using the process connection adapter (see chapter 2.5 'Accessories').



**Caution:**

Do not install the assembly in places where air may collect, where foam bubbles are likely to form or where constituents may settle.

Inaccurate measurement may result if the sensor is not completely immersed in the medium or if the measuring optics are covered up by deposits.

Align the inclined measuring surface of the turbidity sensor installed in the assembly in the flow direction to obtain optimal measuring results and the desired self-cleaning effect.

Unscrew the upper union of the ball valve housing one quarter turn, align the measuring surface by rotating the guide body, and hand-tighten the union when finished.



**Warning:**

The sensor must only be aligned when the pipe is empty and unpressurised.

Proper access to the place of installation must be assured. To remove the sensor in its guide, a clearance of at least 650 mm, measured from the lower flange edge, is required. The ball valve locking handle, the locking ring and its handles and the places where the safety ropes are attached must also be easily accessible.

When mounting the assembly, the screws are to be inserted from the flange side towards the assembly. Adequate clearance is required.



**Note:**

After an appropriate period of time following the initial start-up, the sensor should be checked for soiling and deposits.

The sensor must be removed from the assembly for checks and cleaning. See chapter 5.1 for sensor cleaning.

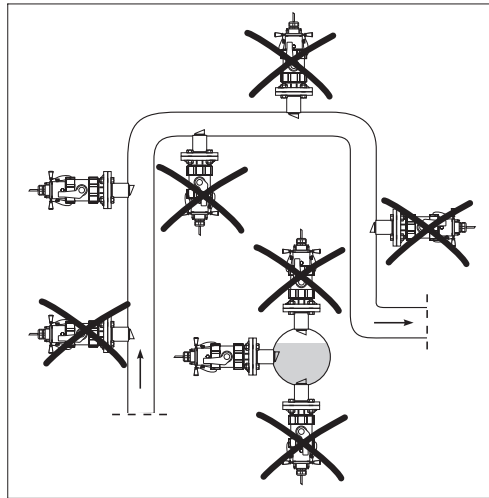


Fig. 3.3: Recommended mounting positions for ProbFit CUA 461

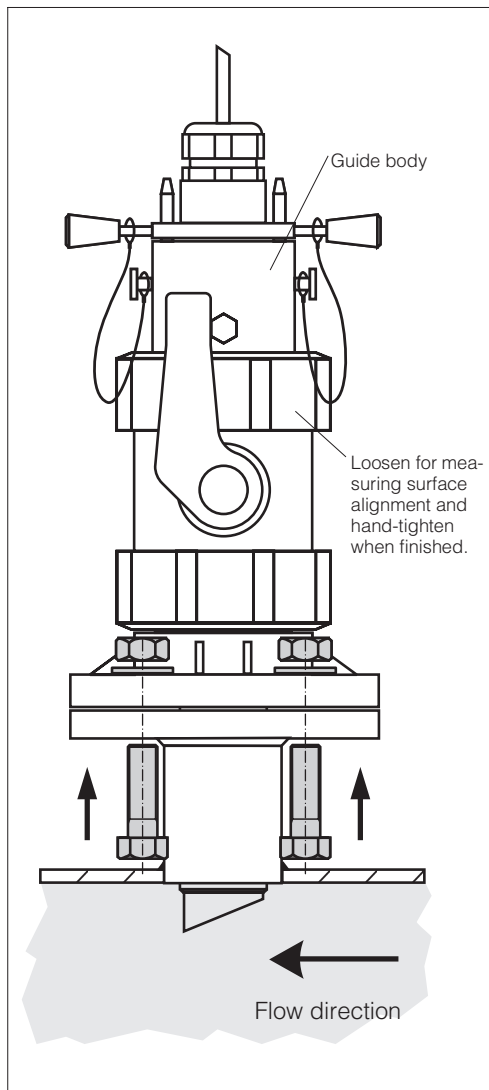
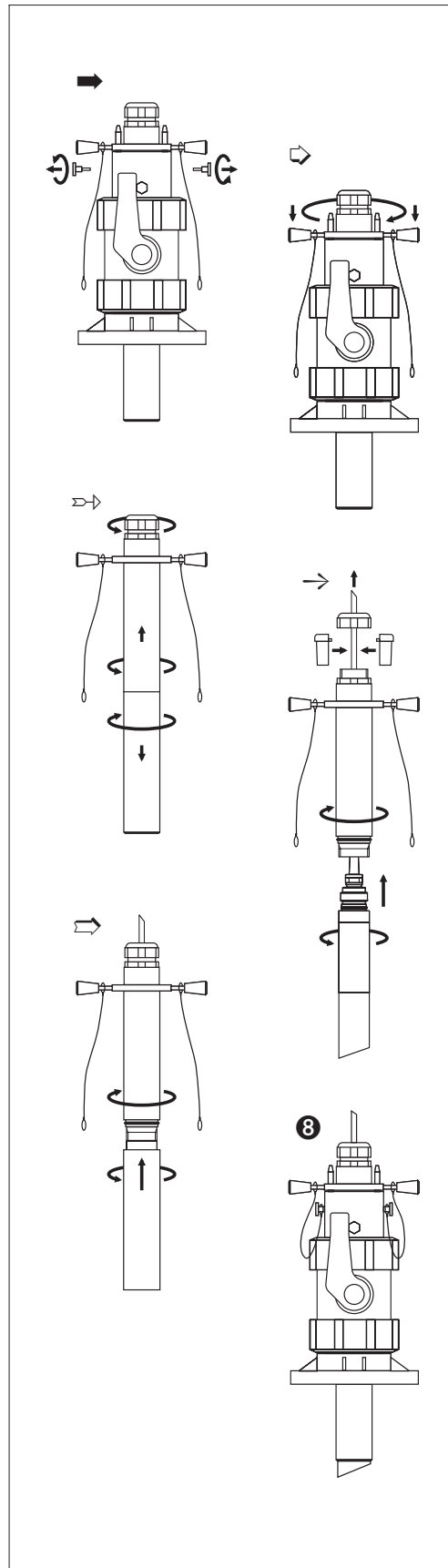


Fig. 3.4: Insertion of screws for process connection from the flange to the assembly



### 3.4 Installation of turbidity sensor in assembly

Turbidity sensors CUS 1 or CUS 4 can be installed.



Proceed as follows to install the turbidity sensor in the unmounted assembly:

- ➔ Loosen the knurled screws that are used to attach the safety ropes to the assembly.
- ⇨ Push the locking ring down slightly by exerting pressure on its two handles and turn clockwise all the way (top view of assembly). Hold the assembly by the process connection flange and pull the sensor guide out all the way by the locking ring handles.
- ⇒ Remove the screws that hold together the two parts of the sensor guide. Unscrew the cap from the Pg 29 cable gland and remove the split clamping insert.
- Insert the sensor cable through the top of the guide **and** the cable gland from below and screw the sensor into the sensor holding thread. Make sure the O-ring on the sensor is properly seated. Place the two halves of the cable gland clamping insert around the sensor cable and insert in the union. Do not pull the sensor cable tight! Install and tighten the top part of the cable gland.
- ⇨ Screw the bottom of the sensor guide back on. Make sure the O-rings are properly seated. Carefully insert the sensor guide in the assembly and push down approx. 100 mm.
- ⑧ Reattach the safety ropes with the knurled screws. Close the vent valve before mounting the assembly.

The turbidity sensor is now installed, and the assembly can be mounted.

Fig. 3.5: First installation of turbidity sensor

### 3.5 Rinse ports

Remove the blind screw and the vent valve to use the resulting two openings (G 1/8") as rinse ports. These can be used to pass water, cleaning agent or flushing air through the assembly.

## 4 Operation

### 4.1 Moving the sensor into the process space, measurement



**Warning:**

Make sure that the turbidity sensor has been properly installed before moving the assembly into the process space. Fasten the safety ropes properly and close the vent valve before opening the ball valve.

- To open the ball valve, push down on the locking lever on the ball valve handle.
- Push the sensor guide all the way in by the locking ring handles.
- Push the locking ring down vertically and turn counterclockwise to latch the locking ring in under the locking bolts.

### 4.2 Withdrawing the sensor from the ongoing process

#### Withdrawal from the process space



**Warning:**

Before retracting the assembly, make sure that the safety ropes are properly fastened. When you loosen the locking ring, the process pressure may push out the sensor guide.

- Push the locking ring down slightly by its two handles and turn clockwise all the way (top view of assembly).
- Pull out the sensor guide until the safety ropes are tight.
- Close the ball valve. It is locked in the closed position.
- Open the vent valve and wait until the overpressure is released, then close the valve once more.

#### Sensor removal and cleaning

Now you can remove and clean or calibrate the sensor guide and the turbidity sensor as described in chapter 3.4.



**Caution:**

Flush the assembly with water after sensor guide removal.

Do not allow medium residue, e.g. activated sludge, to dry on the assembly and turbidity sensor.

Dried-up residue may impair the function of the assembly and the sensor and is difficult to remove.

### 4.3 Calibration

To assure the reliability of the turbidity measurement, the measuring system must be calibrated regularly and carefully. The calibration intervals depend on individual operating conditions and the desired accuracy.

The turbidity sensor must be removed from the assembly for calibration (see chapters 4.2 and 3.4).

Calibrate the sensor as described in the operating instructions for the turbidity sensor.

## 5 Maintenance

### 5.1 Cleaning of turbidity sensor and assembly

Deposits on the sensor optics can render the measurement inaccurate. Therefore the sensor must be cleaned at specific time intervals. These intervals depend on each individual system and are to be determined based on operator experience.



**Caution:**

Do not scratch the optics with sharp objects.

The sensor optics and assembly are to be cleaned with the following agents according to the type of soiling:

- Short-term treatment with a commercially available delimiting agent in the case of deposits containing calcium.
- Remove general soiling with water and a brush.
- Oily and greasy soiling can be removed with a cleaning agent based on water-soluble surfactants, e.g. household dish detergents.

### 5.2 Seals and spare parts

A spare parts kit comprising four O-ring seals and one vent valve is available for the

CUA 461 assembly.

Version	Order number
EPDM	50082663
Viton	50082665

To replace the O-ring seals, dismantle the assembly as described in chapters 4.2 and 3.4.

Lubricate the seals and sensor guide with a suitable assembly grease during assembly.

### 5.3 Repairs

Repairs may be performed at the manufacturer's works or by the Endress+Hauser Service Organization only. Refer to the back cover of these operating instructions for an overview of the Endress+Hauser service network.

## 6 Appendix

### 6.1 Technical data

Materials in contact with medium . . . . .	PP, partially glass fibre-reinforced
O-ring seals in contact with medium . . . . .	EPDM / Viton
Dimensions of O-rings in sensor guide . . . . .	48.9 x 2.62
Dimensions of O-rings in sensor sleeve	41.0 x 1.78
Locking ring, bolts . . . . .	special steel
Safety ropes . . . . .	special steel 1.4301, tensile strength 200 kp
Process connection . . . . .	DN 50 DIN flange / 2" ANSI flange
Process pressure . . . . .	max. 2 bar at 20 °C or max. 1 bar at 50 °C
Temperature	max. 50 °C
Rinse ports . . . . .	G 1/8"
Dimensions:	
Sensor moved out	installation height: 300 mm
Sensor retracted . . . . .	required clearance above flange: 650 mm

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