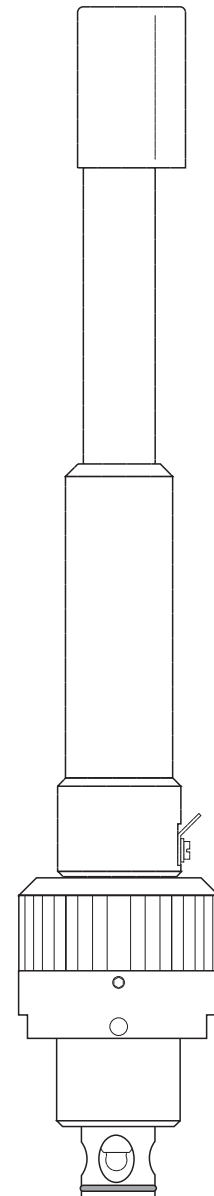
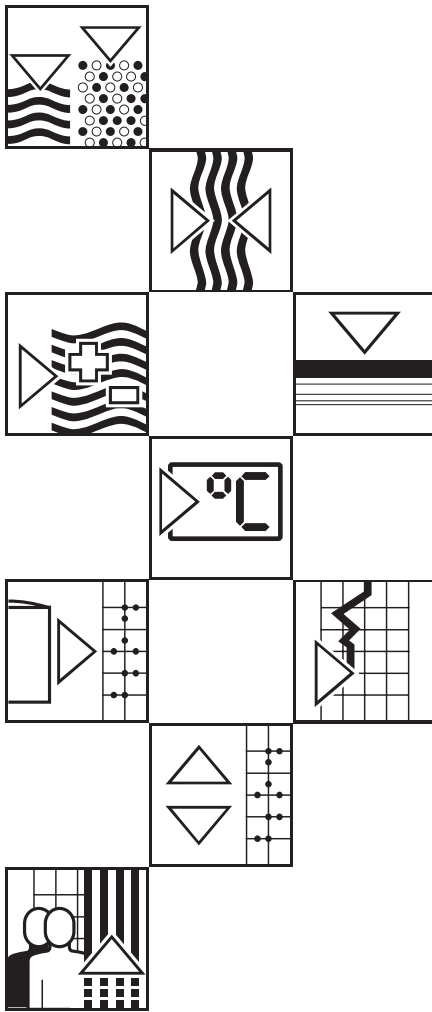


profit CPA 460 Retractable Assembly for pH/Redox Measurement

Operating Instructions



Quality made by
Endress+Hauser



ISO 9001

Endress + Hauser

The Power of Know How



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1 General information

1.1 Symbols used

**Warning:**

This symbol alerts to hazards. Failure to observe these warnings may result in injury or damage to equipment.

**Note:**

This symbol indicates important items of information. Ignoring this information may result in malfunction.

1.2 Storage and transport

The packaging material used to store or transport the assembly must provide shock protection. Optimal protection is provided by the original packaging materials.

The ambient conditions also have to meet the requirements (see Technical data).

1.3 Unpacking

Verify that the packaging and contents are undamaged! Inform the post office or freight carrier of any damage. Damaged merchandise must be retained until the matter has been settled.

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

Check that the delivery is complete and agrees with the shipping documents and your order (refer to nameplate for type and version).

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).

The delivery comprises:

- Assembly Probit CPA 460
- Size 17 socket wrench
- Built-in adapter, as per your order already mounted or separate
- Operating instructions BA 005C/07/en.

1.4 Packaging and disposal

Package the assembly properly for reuse at a later point in time. Optimal protection is provided by the original packaging materials.

Observe local regulations for disposal.

1.5 Product structure

Retractable pH/redox assembly Profit CPA 460	
<p>Protection guard and wetted materials</p> <p>11 Protection guard: screw-on; PVC, EPDM (mounting versions A, B, C only)</p> <p>13 Protection guard: screw-on; SS 316Ti, EPDM (mounting versions A, F, G only)</p>	
<p>Mounting version</p> <p>A Without adapter</p> <p>B Adapter PVC / DN 25, G 1¼ straight</p> <p>C Adapter PVC / DN 25, G 1¼ oblique</p> <p>F Adapter SS 316Ti / DN 25, G 1¼ straight</p> <p>G Adapter SS 316Ti / DN 25, G 1¼ oblique</p>	
CPA 460-	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; width: 30px; height: 15px; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 15px; margin-right: 5px;"></div> </div> <p style="margin-left: 100px;">complete order code</p>

2 Safety

2.1 Intended use

The retractable assembly Probit CPA 460 allows to manually withdraw a pH or redox combination electrode under process conditions. Subsequently the electrode can be cleaned, calibrated or replaced without need to interrupt the process.

Gel-filled combination electrodes with a shaft length of 225 mm and a diameter of 12 mm are usable. Orbisint electrodes with a PTFE ring diaphragm are particularly protected against contamination by their integrated, silver-free bridge electrolyte system. Thus diaphragm blocking is prevented.

It is not necessary to remove the assembly or the electrode to refill. The pressure may be applied by compressed air or a manual pump.

It is the operator's responsibility to assure that the following safety regulations are observed:

- Regulations for explosion protection
- Regulations for installation
- Operating conditions for the device and its materials
- Local standards and regulations.

2.2 General safety notes

The assembly CPA 460 has been designed for safe operation according to the state of the art in engineering and according to current regulations and European standards (see Technical data).

However, if used improperly or other than for the intended purpose, it may be dangerous, e.g. due to incorrect installation or incorrect operating conditions.



Warning:

- Operating this assembly in any way other than described in these instructions may compromise the safety and function of the measuring system.
- The notes and warnings in these operating instructions must be strictly adhered to.

2.3 Installation, start-up, operation



Warning:

- This device may only be installed, connected electrically, commissioned, operated and serviced by properly trained personnel authorised by the system operator.
- The personnel must be familiar with these operating instructions and must adhere to the instructions contained therein.
- When this assembly is used in an explosive atmosphere, adherence to the applicable regulations is mandatory.
- Check that all connections have been properly made before powering up the system.
- Damaged assemblies that may be dangerous must not be operated and should be clearly identified as being defective.
- Any troubleshooting of the measuring system must be performed exclusively by authorised, trained personnel.
- If faults cannot be remedied, the assembly must be removed from service and secured to prevent accidental start-up.
- Repairs not described in these operating instructions may only be performed at the manufacturer's works or by the Endress+Hauser service organisation.



2.4 Safety features

Safety devices

The assembly is protected against external influences and damage by media-resistant materials.

2.5 Notes for installation in pressurised systems



Warning:

- The maximum operating pressure of the assembly must not be exceeded.
- The system must be depressurised before installation or removal of the assembly.
- Couplings, cocks and lines must be checked for leakage and damage at regular intervals.

3 Installation

3.1 Measuring system

A complete measuring system comprises:

- the Probit CPA 460 assembly
- a pH/redox electrode, length 225 mm
- a measuring cable CPK 1 or CPK 7 (terminated)
- a pH/redox measuring instrument

and optionally

- a junction box VBA and a measuring cable (not terminated) for measuring cable extension.

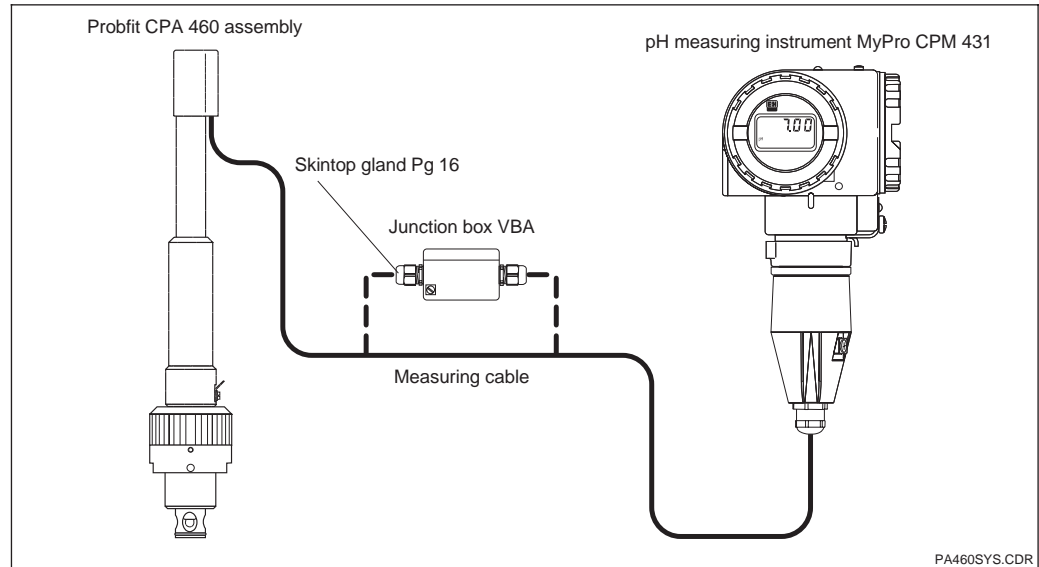


Fig. 3.1 Example of a complete measuring system

3.2 Dimensions

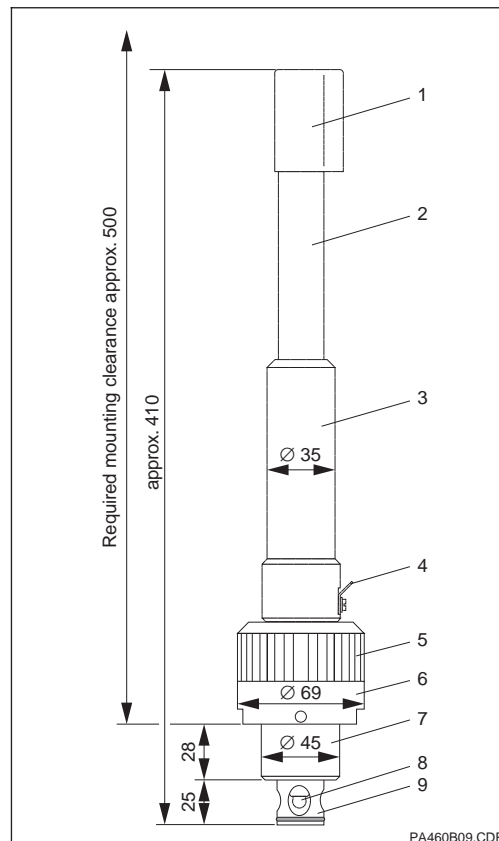
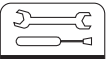


Fig. 3.2 Dimensioned drawing of Probit CPA 460 with protection guard and electrode



3.3 Mounting positions and built-in adapters

The Profit CPA 460 is installed with the selected adapter.



Note:

The permissible range of positions comprises inclinations of the central axis of the assembly that do not fall below 15° from the horizontal (see Fig. 3.3). Ensure that the electrode contacts the medium to be measured.

Protection guard

The electrode is separated from the process by a special protection guard, which is closed at the bottom and open at the side. When the assembly is withdrawn, the O-ring on the protection guard seals off from the firmly mounted adapter.

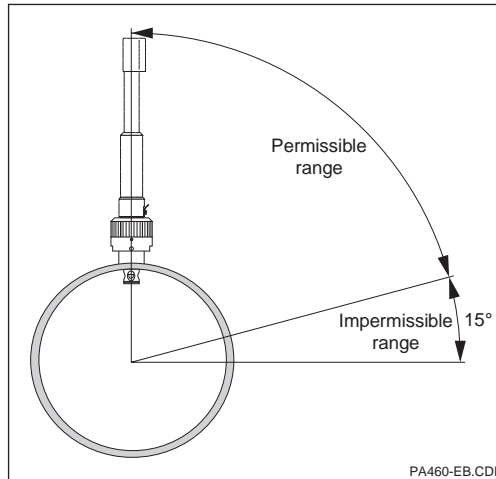


Fig. 3.3 Permissible mounting positions for CPA 460

Built-in adapters

The CPA 460 assembly is available with the following built-in adapters:

- *Straight built-in adapters*
DN 25, G 1¼
Material:
PVC or SS 316Ti
(see Fig. 3.4)
- *Oblique built-in adapters*
DN 25, G 1¼
Material:
PVC or SS 316Ti
(see Fig. 3.5).

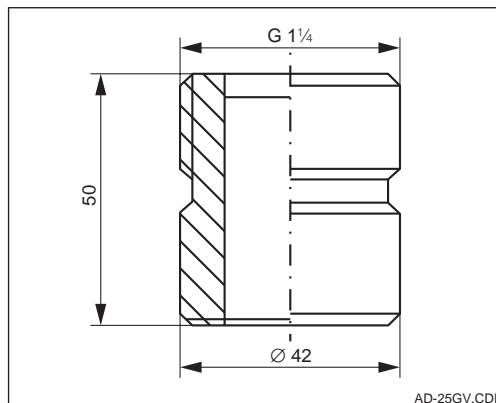


Fig. 3.4 Straight built-in adapter



Note:

- Measurement with potential matching is only possible with assemblies of stainless steel.
- Ensure for measurement without potential matching that no potentials arise in the medium to be measured. Ignoring this advice may result in measured errors.
- Potentials may be caused by agitators or plastic tanks. In such cases, a stainless steel assembly should be used.

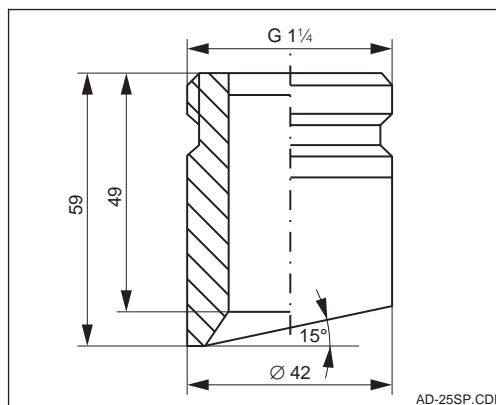


Fig. 3.5 Oblique built-in adapter

3.4 Mounting of the assembly

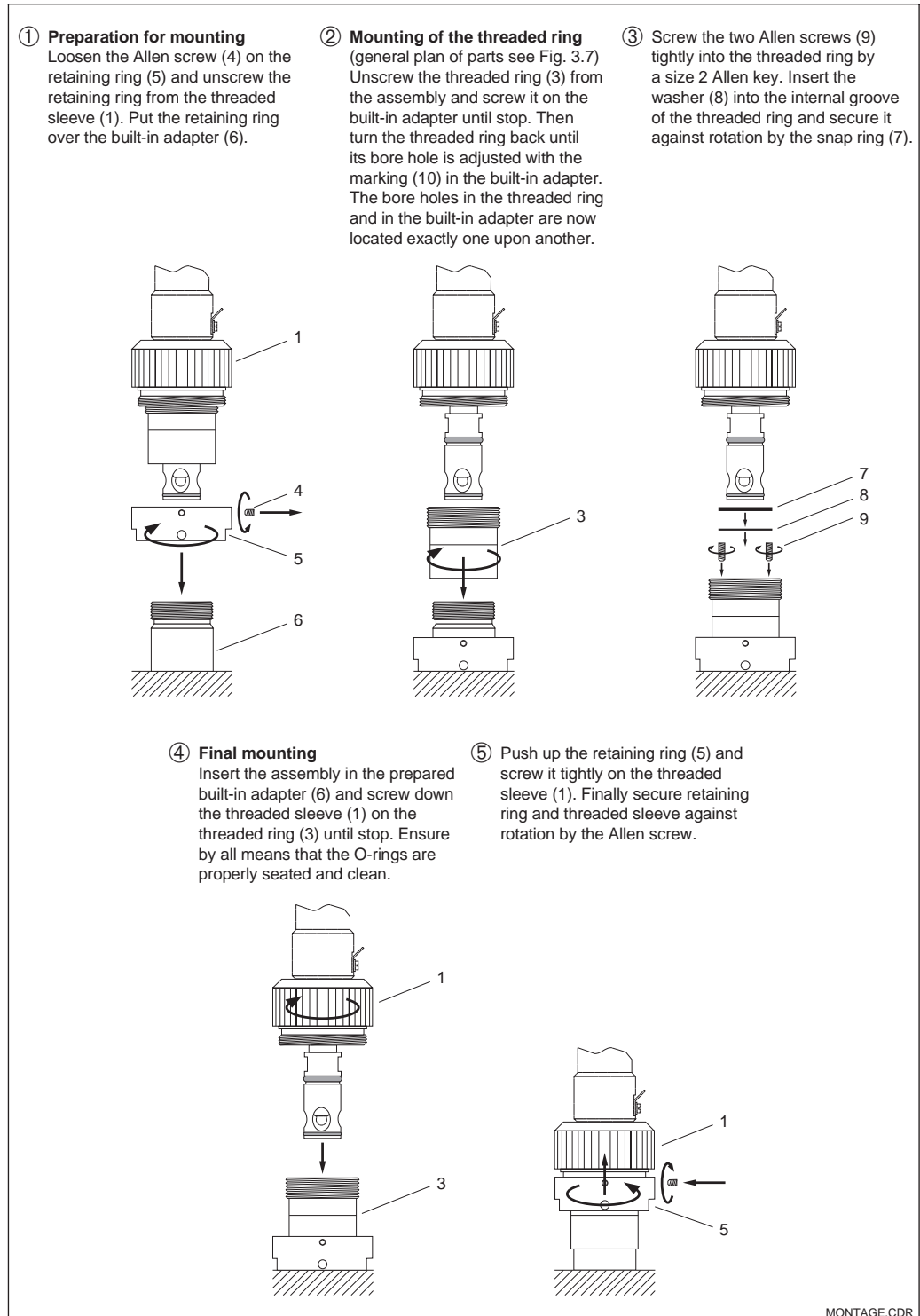
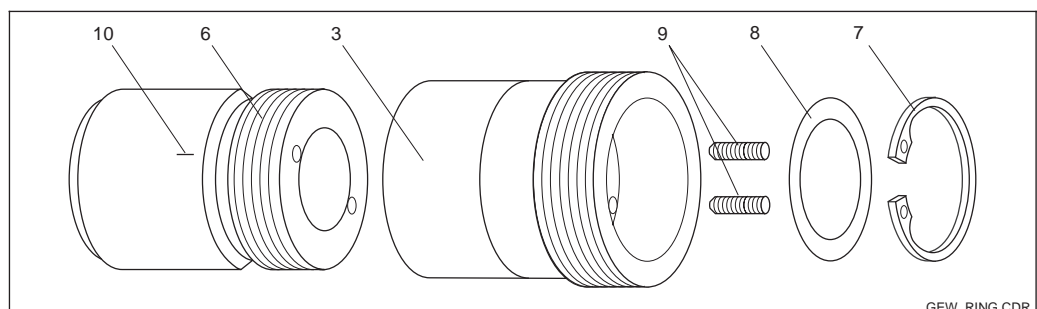


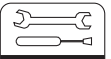
Fig. 3.6 Mounting of the Probit CPA 460 assembly

MONTAGE.CDR

Fig. 3.7 General plan of parts for mounting of the threaded ring
7 Snap ring
8 Washer
9 Allen screws
3 Threaded ring
6 Built-in adapter
10 Marking



GEW_RING.CDR



3.5 Retrofitting

The Probit CPA 460 assembly can also be mounted in an already existing DN 25 adapter. The bore holes required for mounting must be drilled out additionally as follows (see Fig. 3.8):

- Screw threaded ring on built-in adapter until stop.
- Spot-drill through threaded holes (M4) by twist drill \varnothing 3.2 mm.
- Unscrew threaded ring again.
- Finally drill 2 mm deep at spot-drilled positions by twist drill \varnothing 4.2 mm.

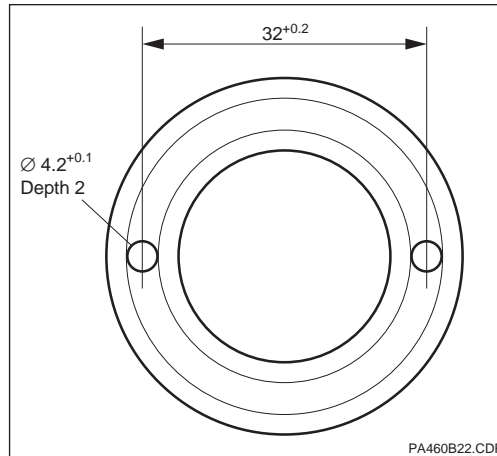


Fig. 3.8 Top view of built-in adapter DN 25

3.6 Installation or replacement of electrode and mounting of measuring cable

pH/redox electrodes with a Pg 13.5 threaded plug-in head, a shaft length of 225 mm and a shaft diameter of 12 mm can be fitted into the assembly.

- The sealing of the electrode is provided
- at the threaded plug-in head by an O-ring and a clamping ring
 - at the lower shaft end via the O-ring in the hole of the assembly.



Note:

- Make the electrode slidable before screwing in. Wetting with water is sufficient.
- During electrode installation, ensure that both O-rings are properly seated and clean.



Warning:

Installation and replacement of the electrode as well as commissioning require the assembly to be closed, i.e. to be in service position (see Chapter 3.7).

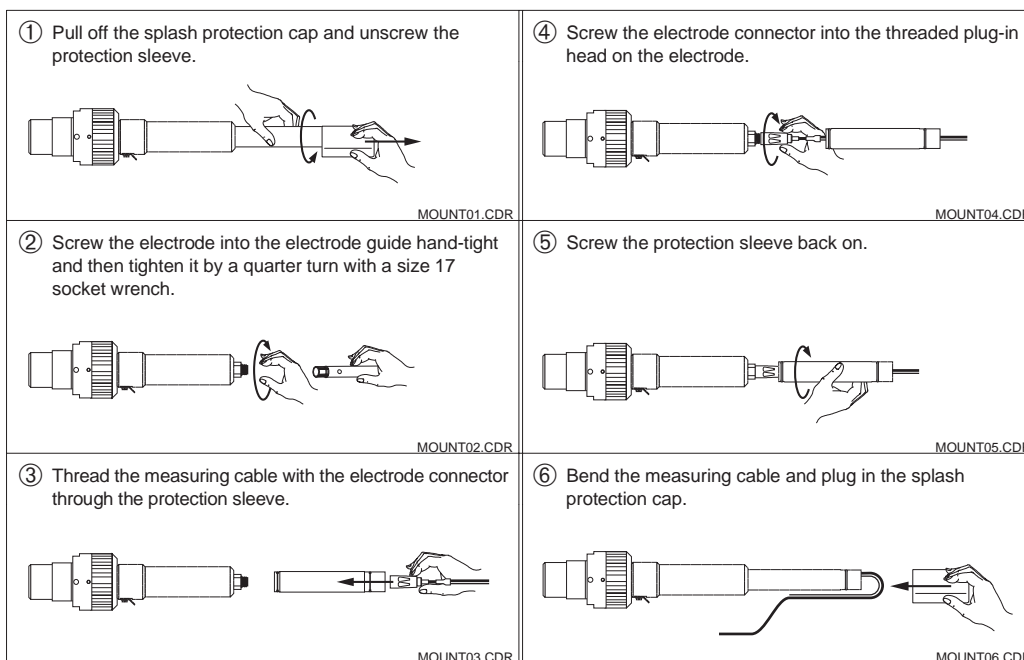


Fig. 3.9 Electrode installation and mounting of measuring cable

3.7 Actuation of the assembly

- To open the assembly, turn the threaded sleeve clockwise (“auf” = open) by approx. 13 revolutions until stop. Then the electrode is in contact with the medium, and the assembly has reached its operating position (see Fig. 3.10, ①).
- To close the assembly, turn the threaded sleeve counterclockwise (“zu” = closed) by approx. 13 revolutions until stop. This will draw the electrode from the medium into the assembly until the opening between the built-in adapter and the protection guard cover is closed. A milled notch below the retaining ring marks this final position, which corresponds to the service position of the assembly (see Fig. 3.10, ②).

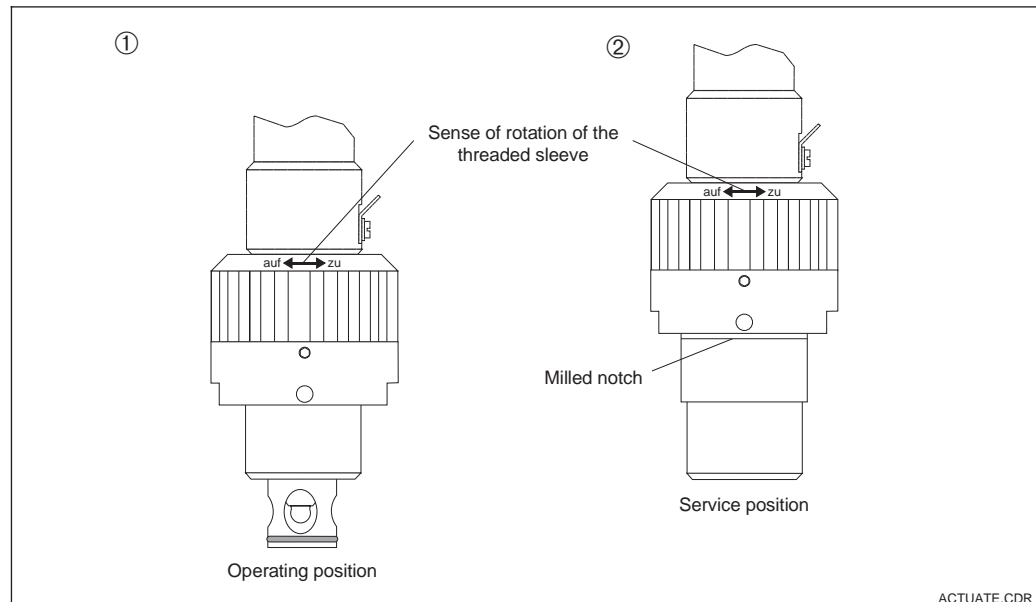


Fig. 3.10 Actuation of the Probfit CPA 460 assembly

ACTUATE.CDR



4 Maintenance

4.1 Assembly cleaning

The assembly must be removed at intervals dependent on the medium. The sealing O-rings must then be visually inspected and replaced if necessary. Complete cleaning of the side in contact with medium may be required.

4.2 Electrode cleaning

Soiling may impair the function of the electrode to such an extent that it ceases to work. For example, coatings on the pH sensitive glass membrane may cause poor response, low sensitivity/slope and unstable measured values. Therefore all parts of the electrode in contact with medium must be cleaned regularly. The frequency and intensity of cleaning depend on the medium to be measured.



Note:

Do not use abrasive cleaning agents! These may cause irreparable damage to the glass membrane.

- Remove light soiling and coatings by a soft brush and a suitable cleaning solution (see table below).
- Remove adhering coatings by a soft brush and a suitable cleaning solution. Soak in cleaning solution beforehand if necessary.
- Rinse the electrode with distilled water after cleaning! Cleaning agent residue not removed may impair the measurement.
- By all means recalibrate the measuring system after cleaning!

Soiling, coating	Cleaning agent
Grease and oil	(Alkaline) agents containing surfactants or water-soluble organic solvents (e.g. alcohol)
Limestone deposits, cyanide deposits, heavy biological and metal hydroxide coatings	Hydrochloric acid (10 %), diluted to approx. 3 % in the injector
Sulphide deposits	Mixture of hydrochloric acid (3 %) and thiourea (saturated)
Protein coatings	Mixture of hydrochloric acid (3 %) and pepsin (saturated)
Fibres, suspended substances	Pressure water, possibly containing wetting agents
Light biological coatings	Pressure water

4.3 Calibration

The pH/redox measuring system must be calibrated regularly and carefully to maintain accuracy.

The periods between the calibrations depend on the operating conditions and the desired accuracy. They must be determined individually for each application. More frequent calibration, e.g. once a week, is recommended at the beginning to study the performance in service.

Clean the electrode before each calibration!



Note:

- Do not leave the electrode in distilled water.
- Do not allow the electrode to stand dry. Keep the electrode tip moist, e.g. in KCl solution (3 mol/l).



Warning:

In case of a symmetrical electrode connection, establish by all means an electrical connection between the buffer solution and the PM connection.

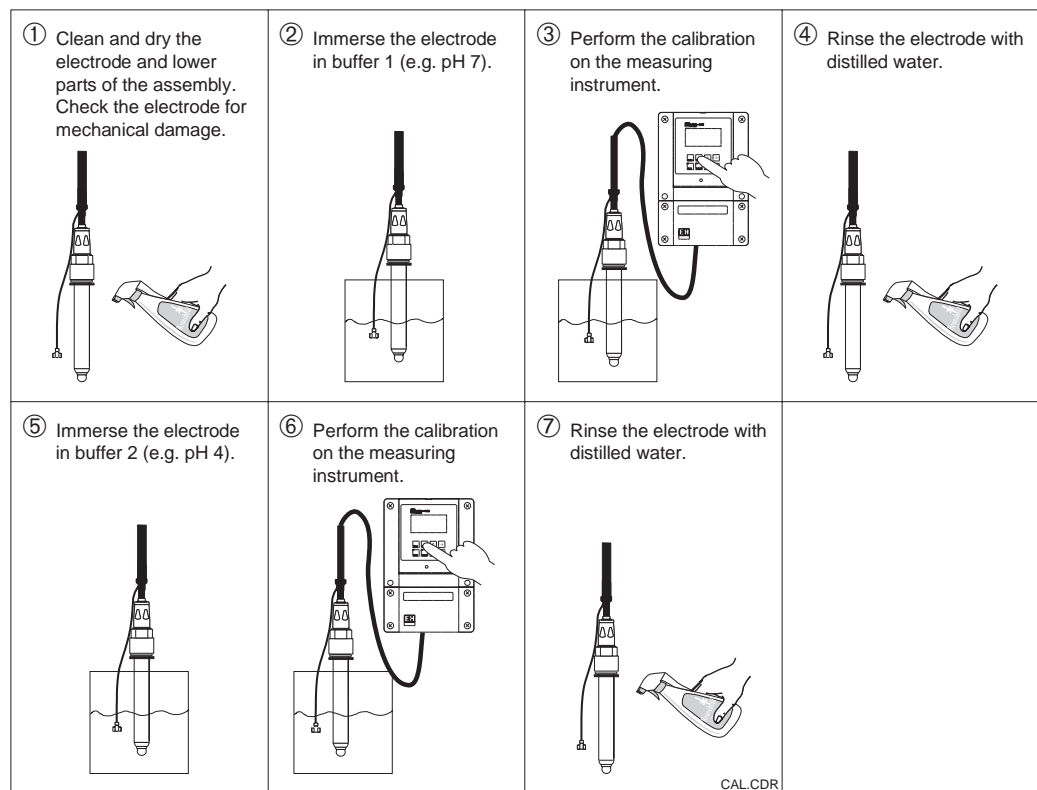


Fig. 4.1 Calibration

4.4 O-ring replacement

All O-rings of the assembly (see Fig. 4.2) should be examined for damage from time to time. The standard material for O-rings in contact with medium is EPDM.



Note:

- Should an O-ring replacement become necessary, then avoid any damage to the new O-rings and to the O-ring seat. Ensure that a special O-ring material is used if required by the medium.
- To grease polycarbonate parts (e.g. couplings), only use lubricants approved for this plastic material. Otherwise there is a risk of stress cracks on the polycarbonate parts. Observe by all means the instructions of the lubricant manufacturer.

Example of a suitable lubricant:

ISOFLEX Topas AK 50
(art. no. 004151)

Manufacturer:
Klüber Lubrication KG, Munich

- Any other interventions in and modifications of the assembly are impermissible and will void the warranty.

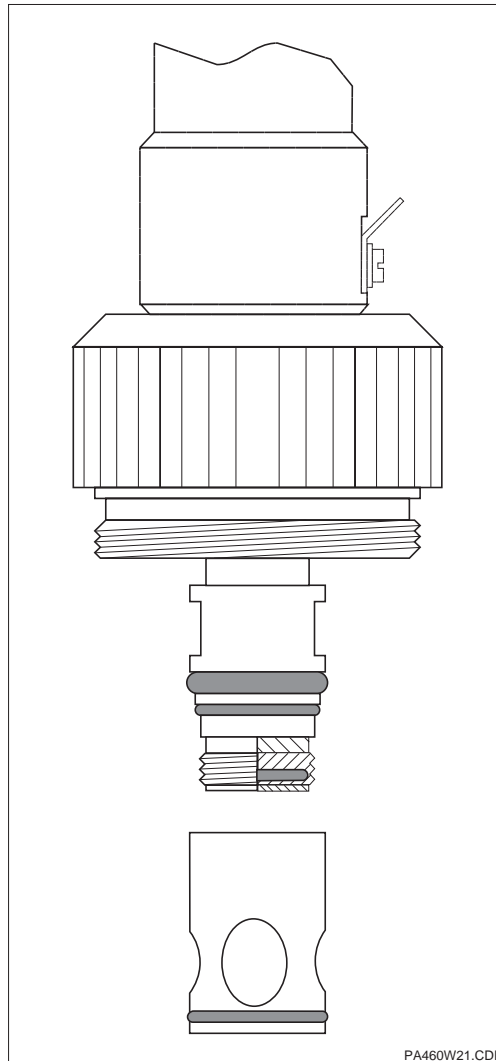


Fig. 4.2 O-rings of the CPA 460

5 Accessories and spare parts

The following spare parts may be ordered separately:

pH combination electrodes

Electrode type	Temperature	pH range
CPS 11-1 AA4 GSA	-15 ... 80 °C	1 ... 12
CPS 11-2 AA4 TSA with Pt 100	-15 ... 80 °C	1 ... 12
CPS 11-1 BA4 GSA	10 ... 130 °C	0 ... 14
CPS 11-2 BA4 TSA with Pt 100	10 ... 130 °C	0 ... 14

Redox combination electrode

CPS 12-0 PA4 GSA with platinum ring	-15 ... 130 °C	0 ... 14
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Built-in adapter DN 25

Material, version	Order no.
PVC, straight	50005193
PVC, oblique	50047270
SS 316Ti, straight	50005192
SS 316Ti, oblique	50028446

Protection guard

SS 316Ti, screw-on	50036125
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O-ring set

EPDM	50036127
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Dummy plug

SS 316Ti, DN 25	50028491
-----------------	----------

Measuring cable CPK 1 for pH/redox combination electrodes

Cable length	Order code
5 m	CPK 1-050A
10 m	CPK 1-100A
15 m	CPK 1-150A
20 m	CPK 1-200A
25 m	CPK 1-250A
30 m	CPK 1-300A
40 m	CPK 1-400A

Measuring cable CPK 7 for pH/redox combination electrodes with Pt 100

5 m	CPK 7-05A
10 m	CPK 7-10A
15 m	CPK 7-15A
20 m	CPK 7-20A
25 m	CPK 7-25A

Junction box VBA

Features	Order no.
For extension of measuring cable connection between assembly and measuring instrument; ingress protection IP 65	50005276

6 Technical data

General specifications

Manufacturer	Endress+Hauser
Product designation	Profit CPA 460

Materials in contact with medium

Electrode holder	PVC, SS 316Ti
O-rings	EPDM
Shaft	Noryl
Protection guard of PVC version	screw-on, PVDF
Protection guard of stainless steel version	screw-on, SS 316Ti
Threaded sleeve, retaining ring	PVDF

Mounting versions

Without adapter	PVC, SS 316Ti
Built-in adapter DN 25, straight or oblique	PVC, SS 316Ti

Operating pressure and temperature

PVC version	6 bar at 20 °C, 0 bar at 50 °C
Stainless steel version	6 bar at 90 °C, 0 bar at 130 °C

Measures and weight

Electrode installation	via Pg 13.5 thread
Electrode shaft length	225 mm
Electrode diameter	12 mm
Weight	approx. 1 kg

Supplementary documentation

Technical Information Orbisint CPS 11/12/13	Order no. 50054649
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Subject to modifications



Note:

The operating limits of the entire system are determined by the operating limits of the individual components used (assembly, sensors, cables, accessories, etc.).

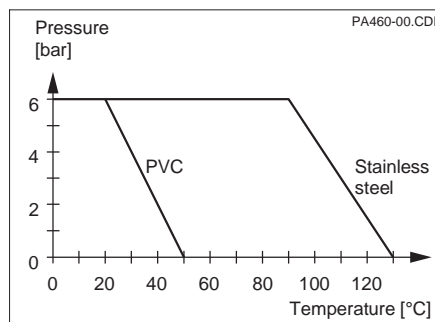


Fig. 6.1 Pressure and temperature resistance of the Profit CPA 460 assembly

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