

FlowFit W CPA 250

Flow Assembly for pH / Redox Measurement

Operating Instructions

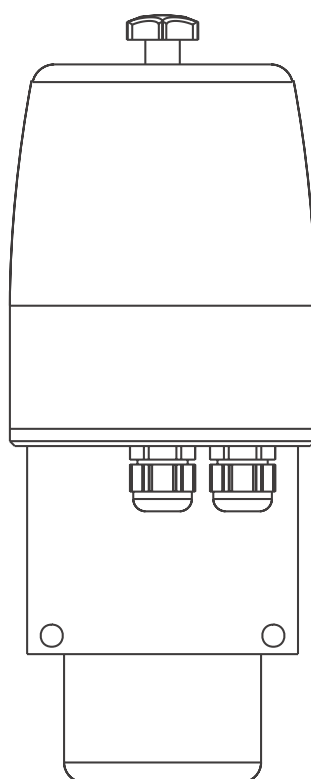


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2 Identification

2.1 Product designation

Nameplate

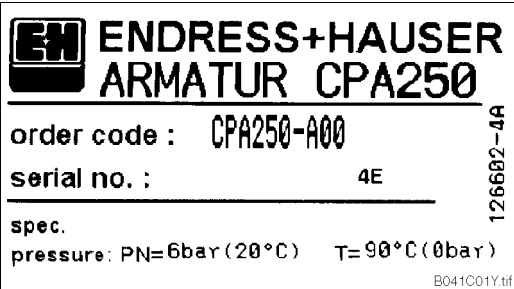


Fig. 2.1: Nameplate of CPA 250-A00

Product structure

Design		
	A	With 3 electrode mounting places
	S	For compact electrode system CPA 320
Material / connection		
	00	PP, potential matching pin of SS 316Ti / thread G 1
	01	PP, potential matching pin of titanium / thread G 1, design A only
	13	SS 316Ti / flange DN 25, design S only
	20	PVDF / thread G 1, design S only
CPA 250-		complete order code

2.2 Scope of supply



Caution!

- Verify that the packaging is undamaged! Inform the post office or freight carrier of any damage. Keep the original packaging material until the matter has been settled.
- Verify that the contents are undamaged! Inform the post office or freight carrier of any damage and consult your supplier. Keep damaged merchandise until the matter has been settled.
- Check that the delivery is complete and agrees with the shipping documents and your order (refer to nameplate for type and version).

The delivery includes:

- Assembly FlowFit W CPA 250
- Operating instructions BA 041C/07/en.

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 Installation

3.1 Installation at a glance

Measuring system

The complete measuring system comprises

- the flow assembly CPA 250 with up to 3 sensors (e.g. pH, redox, temperature) or with the compact electrode system CPA 320
 - the pH / redox measuring transmitter, e.g. Liquisys M CPM 223 or CPM 253
 - the pH / redox measuring cables, e.g. CPK 1, CPK 6, CPK 7 or CPK 9
- and optionally
- a junction box VBA or VBM
 - extension cables, e.g. CYK 71.

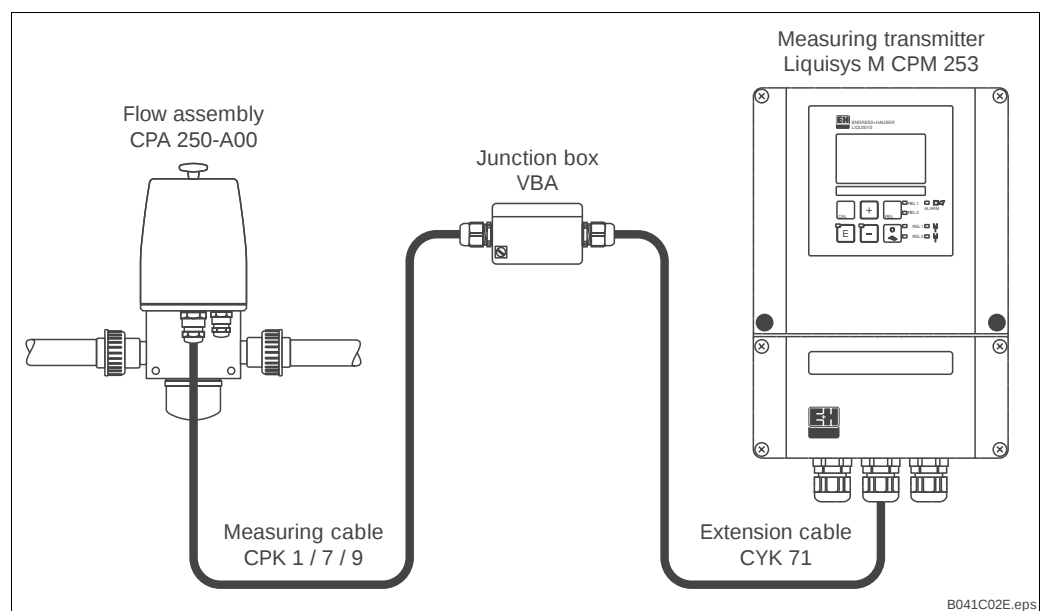


Fig. 3.1: Complete measuring system with CPA 250-A00

3.2 Mounting

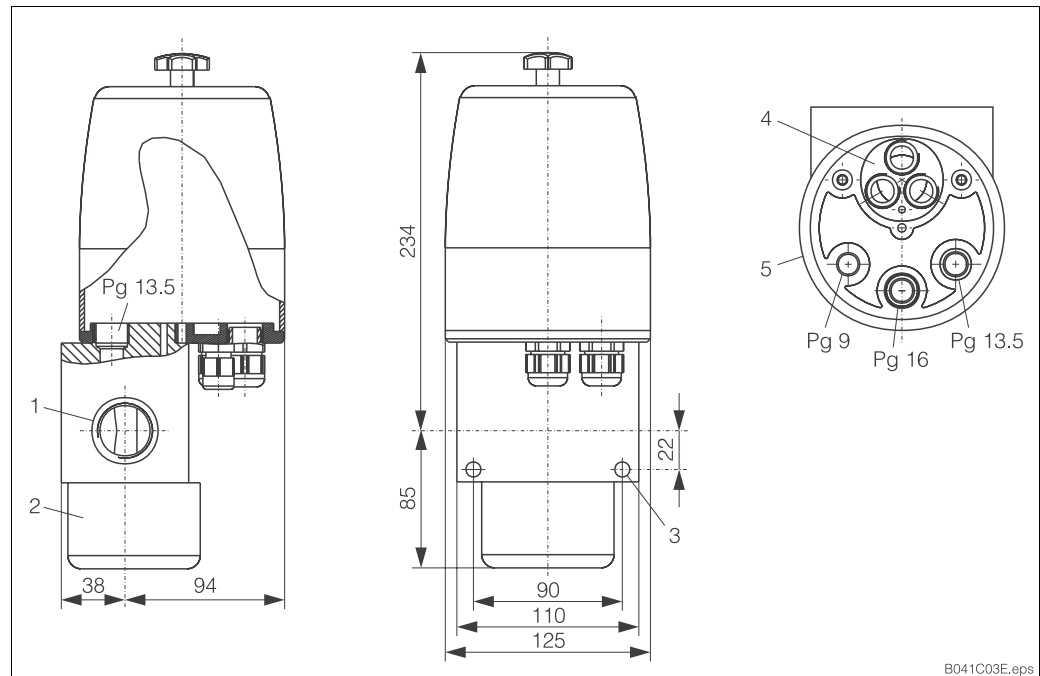


Fig. 3.2: CPA 250-A00/01 with three electrode mounting places, material PP, with connection thread G 1

1 Connection thread G 1, nominal flow diameter DN 20

2 Cap (measuring chamber) for calibration and cleaning, unscrewable

3 Two mounting holes, Ø 9 mm

4 Three electrode mounting places

5 Mounting plate (drawn without cover and seal)

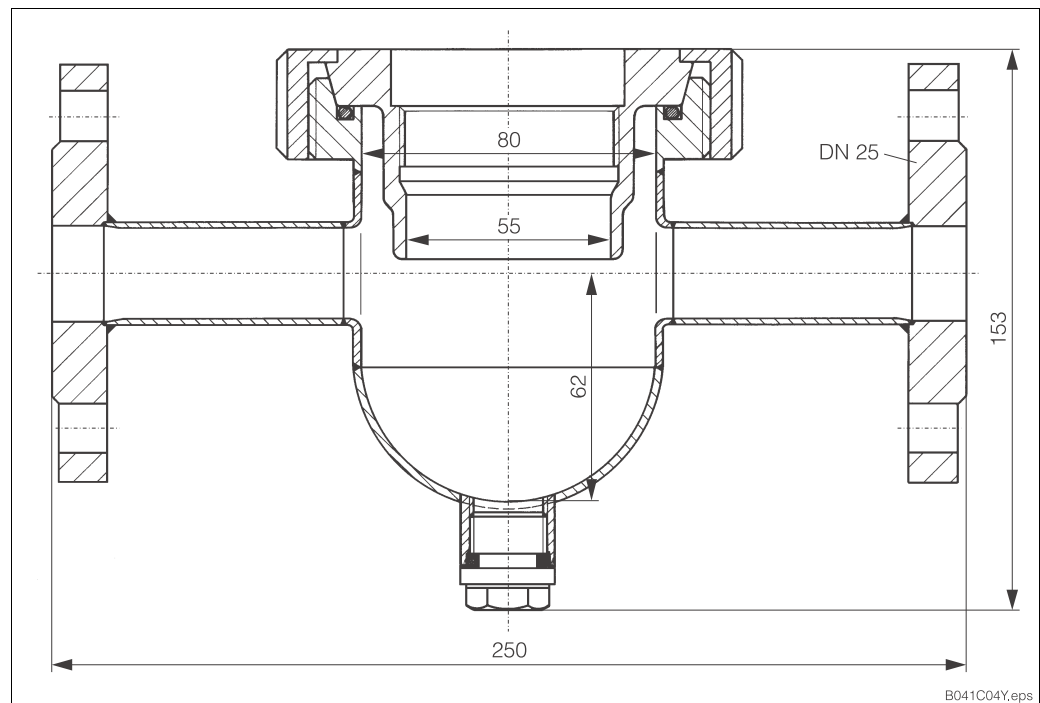


Fig. 3.3: CPA 250-S13 for compact electrode system CPA 320, material SS 316Ti, with flange DN 25

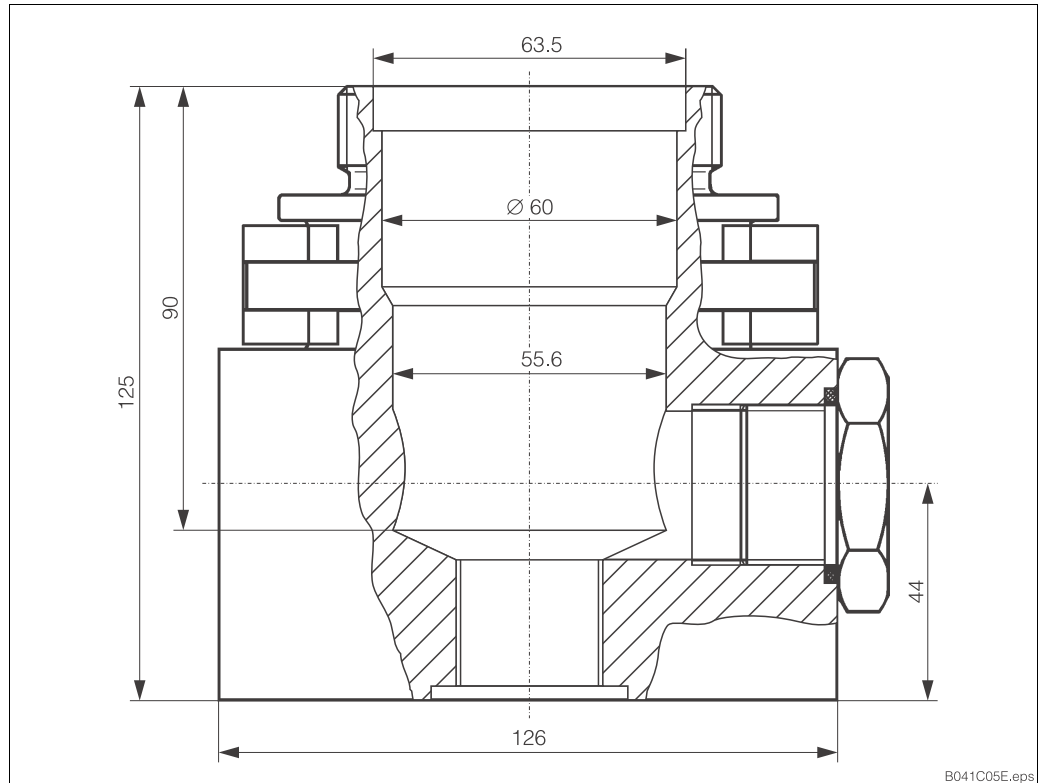


Fig. 3.4: CPA 250-S20 for compact electrode system CPA 320, material PVDF, with connection thread G 1

3.2.1 Mounting type

The flow assembly should be installed in horizontal pipes at locations where the pipe cannot run dry. Installation in the by-pass is preferable to installation in the process pipe as the by-pass pipe can be blocked off without process interruption. This permits maintenance of the electrodes without interrupting the process. The medium pressure in the pipe must not exceed the maximum permissible pressure of the flow assembly or electrodes.

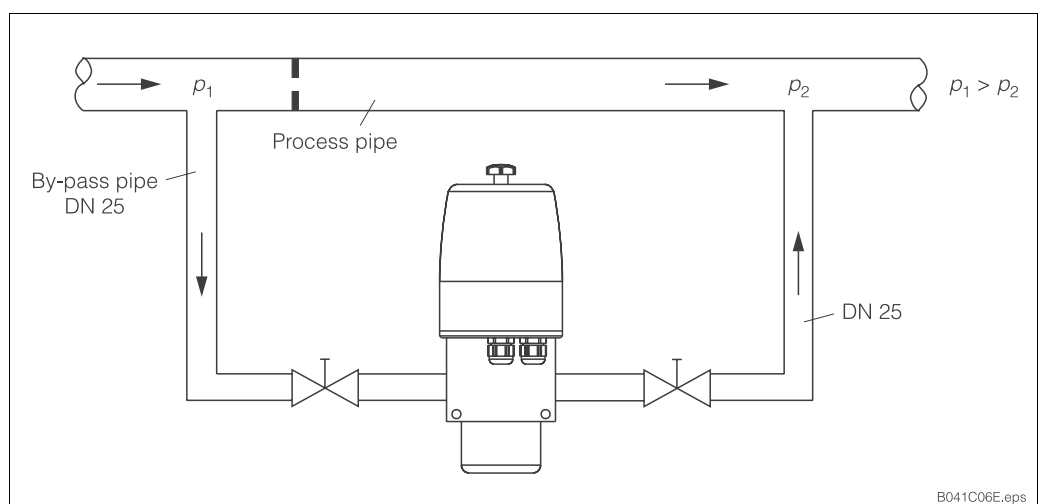


Fig. 3.5: Pipe by-pass

The pressure build-up required to produce flow through the sampling by-pass is produced by a plate orifice in the process pipe.

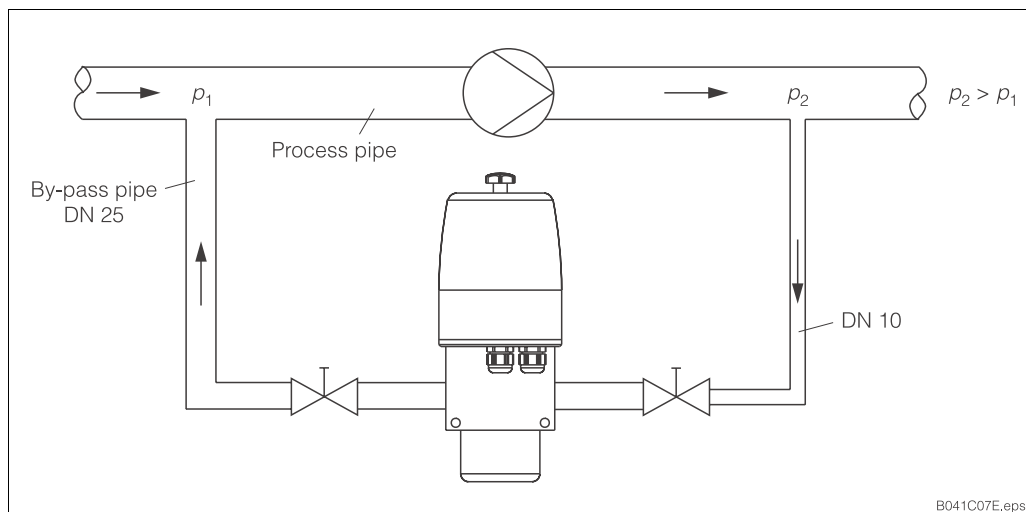


Fig. 3.6: Pump by-pass

The pressure build-up required to produce flow through the sampling by-pass is produced by a booster pump in the process pipe.

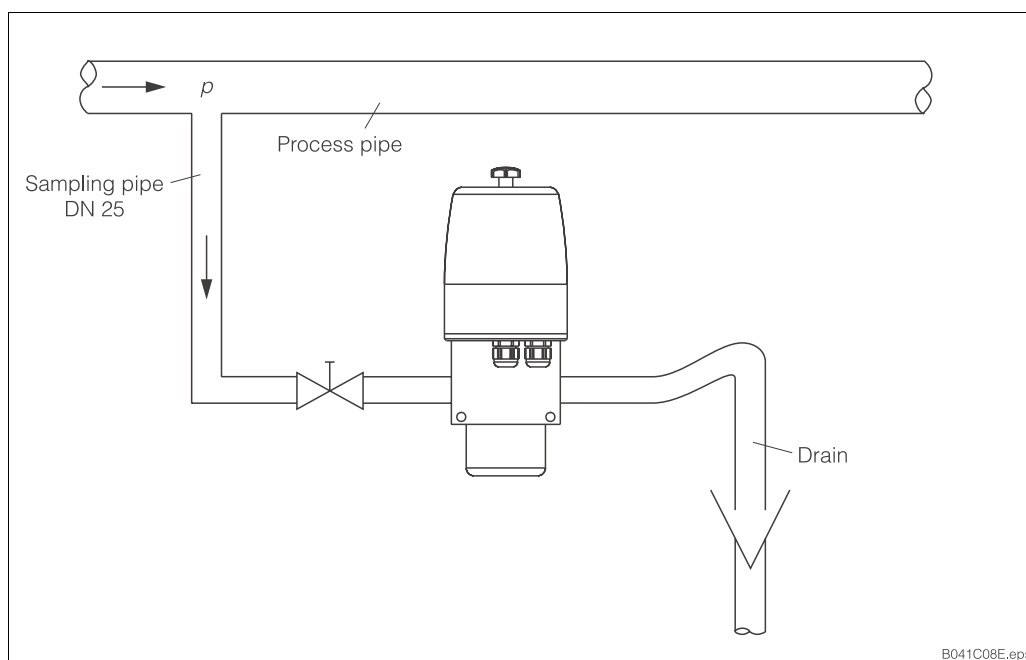


Fig. 3.7: Sampling pipe

Stub pipe branching off from the process pipe without raising pressure.

3.2.2 Mounting of measuring cables

Electrode cables of types CPK 1, CPK 7 and CPK 9 are fitted with electrode plugs on one side, the other side of the cable is free.

1. When the protective cover is open, lead the electrode cables through the Pg threads into the interior and put them on the electrode plug-in heads.
2. If cable glands are not used, then seal them off with dummy plugs.
3. Lay the electrode cables in the assembly in such a way that the electrodes can be removed without opening the Pg threads. A free cable length of approx. 30 mm has proved adequate.
4. Tighten the Pg threads.

3.2.3 Mounting of electrodes

First mounting of electrodes



Note!

- When fitting the electrodes, ensure that the O-rings are correctly positioned and that the sealing surfaces are clean.
- Mounting of two electrodes with liquid KCl and pipe connection is not possible.

1. Unscrew the star nut on the protective cover. Remove the protective cover. The electrode mounting places are now freely accessible.
2. The assembly allows mounting of three electrodes. Mounting places not in use must remain sealed off with dummy plugs. To use locked mounting places, unscrew the sealing plugs (complete with O-rings) from the electrode holder.
3. Remove the electrodes from the packaging, check them for damage, wet the glass shaft and then screw them into the Pg threads.
4. Hand-tighten the electrodes and then tighten them by a quarter turn with a socket wrench (16 AF).
5. Connect the electrodes as shown in the operating instructions of your measuring instrument.

Replacement of electrodes

1. Unscrew the protection cover.
2. Loosen the electrode plug.
3. Depressurise the system and drain it by removal of the measuring cap.
4. Screw out the old sensor.
5. Mount the new sensor as described above.

Electrical connection

For connection diagrams and connection examples, refer to the operating instructions of the respective devices.

4 Maintenance

4.1 Cleaning

Soiling of the electrode may impair measurement up to malfunction:

- Coatings on the pH-sensitive part of the glass electrode cause poor response time and low sensitivity or slope.
- Soiling or blocking of the diaphragm causes poor response and unstable measurement.

Therefore all parts in contact with the medium (electrodes, lower parts of the holder block, measuring cap etc.) must be cleaned at regular intervals. The frequency and intensity of cleaning depend on the medium to be measured.



Caution!

- Do not use abrasive cleaning agents. These may cause irreparable damage to the glass membrane of the electrode.
- After cleaning, the complete system must be thoroughly rinsed with water (tap water, no distilled or deionised water). Cleaning agent residue not removed may impair measurement.
- Always recalibrate the measuring system after cleaning.

Manual cleaning

The procedure depends on the degree of soiling.

- Remove light soiling and coatings by rinsing with a suitable cleaning agent.
- To remove adherent dirt, use a soft brush and suitable cleaning agent. Soak in cleaning solution beforehand if required.

Automatic cleaning

Cyclic, automatic cleaning in an installed condition may be carried out by the automatic spray cleaning system Chemoclean. The complete system comprises:

- Spray head CPR 31 or CPR 3
- Cleaning injector CYR 10
- Cleaning control, e.g. programme sequencer CYR 20 or measuring transmitter Mycom CPM 152.

Selection of cleaning agents

The selection of cleaning agents depends on the type of soiling. The types of soiling most frequently encountered and the corresponding cleaning agents are listed in the following table.

Soiling, coating	Cleaning agent
Grease and oil	(Alkaline) agents containing surfactants or water-soluble organic solvents (e.g. alcohol)
Limestone deposits, metal hydroxide coatings, heavy biological coatings	<i>Manual cleaning:</i> Hydrochloric acid (3%) <i>Cleaning with Chemoclean:</i> Hydrochloric acid (10%), diluted to approx. 3% in the injector
Sulphide deposits	Mixture of hydrochloric acid (3%) and thiourea (commercial)
Protein coatings	Mixture of hydrochloric acid (0.1-molar) and pepsin (commercial)
Fibres, suspended substances	Pressure water, containing wetting agents if required
Light biological coatings	Pressure water

**Note!**

Redox electrodes may only be cleaned mechanically. Chemical cleaning forces a potential to the electrode. This potential takes several hours to decay and causes a measured error.

4.2 Calibration

Careful and regular calibration is indispensable for reliable and accurate measurement. The calibration cycles depend on the area of application and the desired accuracy. They must be determined individually for each case. More frequent calibration is recommended at the beginning, e.g. once a week, to study the behaviour of the application.

**Warning!**

- Ensure that the pipeline is unpressurised and free of flow.
- The measuring cap contains measuring fluid. Wear protective gloves when handling products injurious to health.

Calibration steps

1. Turn off the flow and depressurise the system.
2. Unscrew and discharge the measuring cap.
3. Clean the electrodes.
4. Check the electrodes for mechanical damage.
5. Clean and dry the measuring cap.
6. Fill the measuring cap with buffer solution.
7. Screw on the measuring cap.
8. Perform calibration according to the operating instructions of the measuring instrument.
9. Commission the pipe system again.

5 Accessories

☐ Electrolyte reservoir CPY 7

It is used to supply depressurised or pressurised electrodes filled with liquid electrolyte. If a reference electrode is installed, the reservoir can be used as an electrolyte bridge device.

The delivery includes:

- Distance tube
- Pg 9 gland with connection hose
- Pressure hose and hose couplings with check valve (version for pressurised applications)
- Wall mounting support (optional).

☐ Chemoclean CPR 31 / CPR 3

Automatic spray cleaning systems for hydromechanical-chemical cleaning of the electrodes.



Fig. 5.1: Pressure electrolyte reservoir CPY 7 for wall mounting (left)
 Spray cleaning system CPR 31 (middle)
 CPA 250-A with spray head CPR 3 (right)

☐ NP

2 nipples for CPA 250-A, adapter to PP pipes without thread. External diameter 32 mm.
 Order no. 50003450

☐ NV

2 nipples for CPA 250-A, adapter to PVC pipes.
 – External diameter 32 mm.
 Order no. 50003454
 – External diameter 25 mm.
 Order no. 50003456

☐ BF

Wall mounting kit for CPA 250-A with 2 screws SS 316 with dowels.
 Order no. 50001130

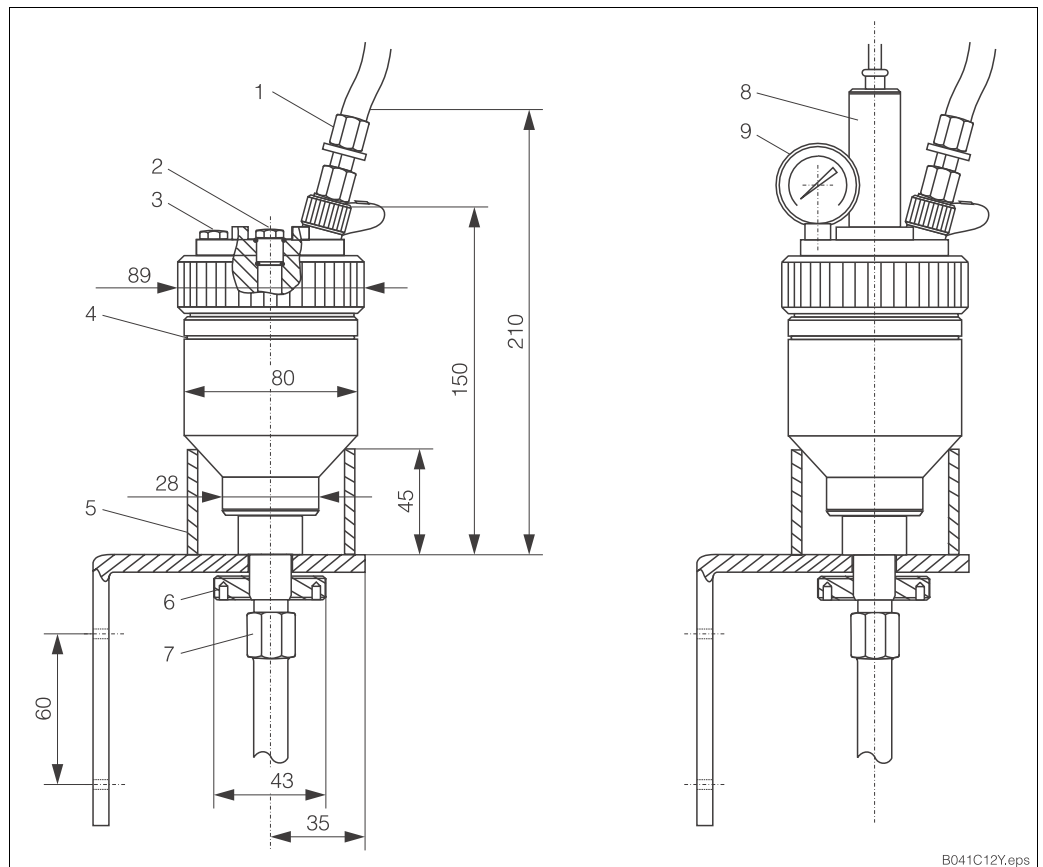


Fig. 5.2: Electrolyte reservoir CPY 7 with wall mounting support (left) or with wall mounting support, reference electrode and manometer (right)

- 1 Compressed-air supply with check valve (CPY 7-B only)
- 2 Dummy plug for reference electrode
- 3 Dummy plug for manometer (CPY 7-B only)
- 4 Filling mark
- 5 Distance tube
- 6 Fastening nut M 20 for electrolyte reservoir
- 7 Coupling nut 14 AF
- 8 Reference electrode
- 9 Manometer

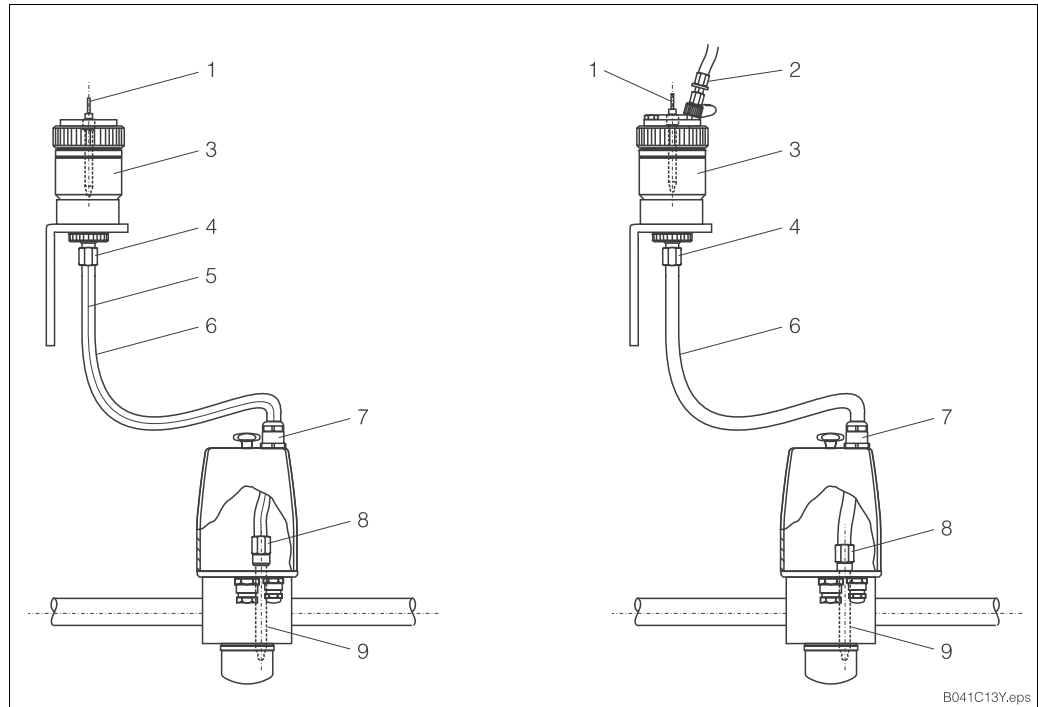


Fig. 5.3: CPA 250 with electrolyte reservoir CPY 7 as an electrolyte bridge for unpressurised (left) and pressurised applications (right)

- 1 Reference electrode
- 2 Compressed-air supply with check valve
- 3 CPY 7-A0 (left) or CPY 7-B0 (right)
- 4 Coupling nut for hose connection of the electrolyte reservoir
- 5 Special wick
- 6 Silicon hose (left) or PE pressure hose (right)
- 7 Pg 9 gland
- 8 Coupling nut for hose connection of the diaphragm tube
- 9 Diaphragm tube

6 Technical data

General specifications	
<i>Manufacturer</i>	Endress+Hauser
<i>Product designation</i>	FlowFit W CPA 250
Connection to medium	
<i>PP and PVDF versions</i>	screw socket G 1 DN 20
<i>Stainless steel version</i>	flange DN 25
Materials in contact with medium	
<i>CPA 250-A0x</i>	PP
<i>CPA 250-S13</i>	stainless steel SS 316Ti
<i>CPA 250-S20</i>	PVDF
<i>O-rings</i>	EPDM
<i>Potential matching pin</i>	stainless steel SS 316Ti, at CPA 250-A01 titanium
Operating pressure and temperature	
<i>PP and PVDF versions</i>	6 bar at 20 °C, unpressurised 90 °C
<i>Stainless steel version</i>	6 bar at 115 °C
Mechanical data	
<i>Cable entry</i>	Pg 16, Pg 13.5, dummy plug for Pg 9
<i>Electrode mounting places</i>	max. 3
<i>Usable spray heads</i>	CPR 31, CPR 3
<i>Measuring chamber cap for calibration and cleaning</i>	unscrewable

Subject to modifications.

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