



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services

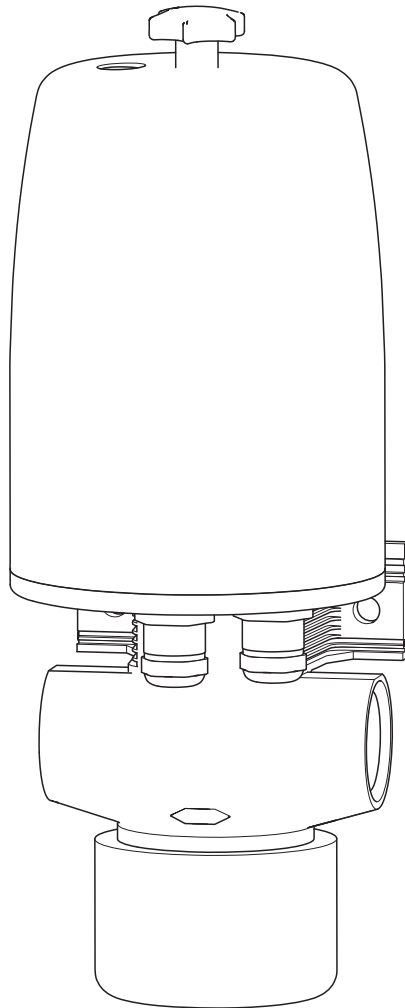


Solutions

Operating Instructions

Flowfit W CPA250

Flow assembly for pH/ORP sensors



Brief overview

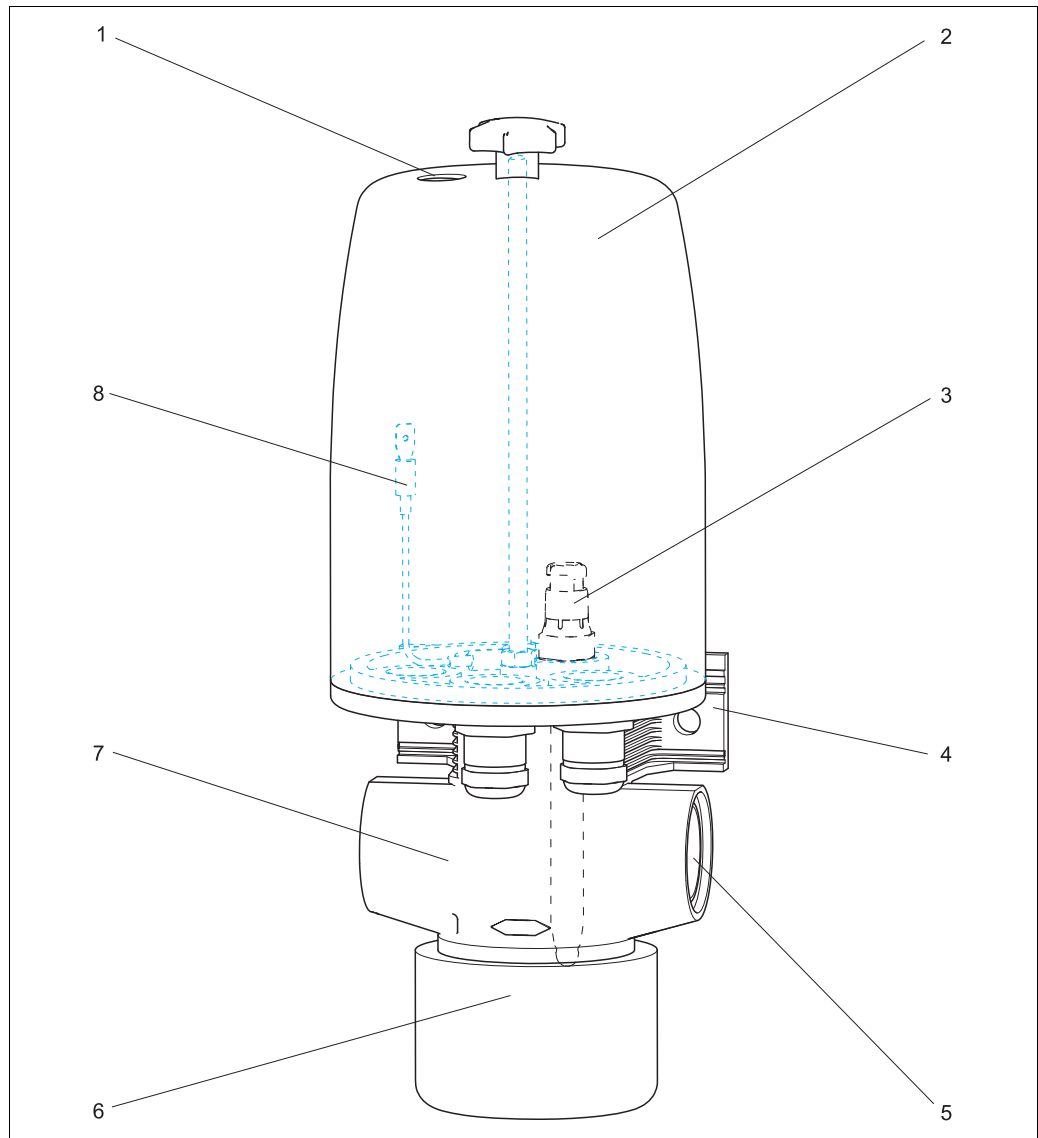


Fig. 1: CPA250 with Sensor

- 1 Reference bore¹⁾ for electrolyte supply from reservoir CPV7 (→ accessories, not in scope of delivery)
- 2 Protection cover
- 3 pH/ORP sensor (→ accessories, not in scope of delivery)²⁾
- 4 Fastening plate
- 5 Process connection (depending on version)
- 6 Calibration vessel
- 7 Cable gland(s)³⁾
- 8 PML connection

1) Before connecting the electrolyte supply you must break-through the reference bore (by using a screw driver).
2) There are 3 installation positions for pH/ORP sensors (combined or single electrodes).
3) 2 cable glands are in the scope of delivery and already mounted. The third cable entry is sealed by a dummy plug.

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1 Safety instructions

1.1 Designated use

The flow assembly has been designed for the installation of pH and ORP electrodes in pipes. Its mechanical design permits its use in pressurised systems (see "Technical data").

Any other use than the one described here compromises the safety of persons and the entire measuring system and is not permitted.

The manufacturer is not liable for damage caused by improper or non-designated use.

1.2 Installation, commissioning and operation

Please note the following items:

- Installation, commissioning, operation and maintenance of the measuring system must only be carried out by trained technical personnel.
Trained 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.
- Before commissioning the entire measuring point, check all the connections. Ensure that electrical cables and hose connections are not damaged.
- Do not operate damaged products and secure them against unintentional commissioning. Mark the damaged product as being defective.
- Measuring point faults may only be rectified by authorized and specially trained personnel.
- If faults can not be rectified, the products must be taken out of service and secured against unintentional commissioning.
- Repairs not described in these Operating Instructions may only be carried out at the manufacturer's or by the service organization.

1.3 Operational safety

The assembly has been designed and tested in accordance with the latest industry standards and left the factory in perfect functioning order.

Relevant regulations and standards have been met.

As the user, you are responsible for complying with the following safety conditions:

- Installation instructions
- Local prevailing standards and regulations.

1.4 Return

If the assembly has to be repaired, please return it **cleaned** to the appropriate sales center. Please use the original packaging, if possible.

Please enclose the completed "Declaration of contamination" (copy the second to last page of these Operating Instructions) with the packaging and the transportation documents.

No repair without completed "Declaration of contamination"!

1.5 Notes on safety icons and symbols



Warning!

This symbol alerts you to hazards that can cause serious damage to the instrument or to persons if ignored.



Caution!

This symbol alerts you to possible faults which could arise from incorrect operation. They could cause damage to the instrument if ignored.



Note!

This symbol indicates important items of information.

2 Identification

2.1 Nameplate

You can identify the assembly version by the order code on the nameplate. Please compare this code with your order.

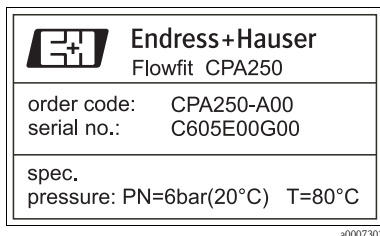


Fig. 2: Example of a nameplate

You can find possible assembly versions and the resulting order codes in the product structure.

2.2 Product structure

Design	
A	Mounting places for 3 sensors
Process connection, Material, Potential matching pin (PMP)	
00	G1, PP, PMP 1.4571 (316 Ti)
01	G1, PP, PMP titanium
02	NPT 1", PP, PMP 1.4571 (316 Ti)
03	NPT 1", PP, PMP titanium
04	NPT 1", PP, no PMP
05	G1, PP, no PMP
30	G1, PP LABS free, PMP titanium
CPA250-	complete order code

2.3 Scope of delivery

The scope of delivery comprises:

- Flowfit assembly (ordered version)
- Operating Instructions (English)

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

3 Installation

3.1 Incoming acceptance, transport, storage

- Make sure the packaging is undamaged!
Inform the supplier about any damage to the packaging.
Keep the damaged packaging until the matter has been settled.
- Make sure the contents are undamaged!
Inform the supplier about damage to the contents. Keep the damaged products until the matter has been settled.
- Check that the order is complete and agrees with your shipping documents.
- The packaging material used to store or to transport the product must provide shock protection and humidity protection. The original packaging offers the best protection. Also, keep to the approved ambient conditions (see "Technical data").
- If you have any questions, please contact your supplier or your local sales center.

3.2 Installation conditions

3.2.1 Dimensions

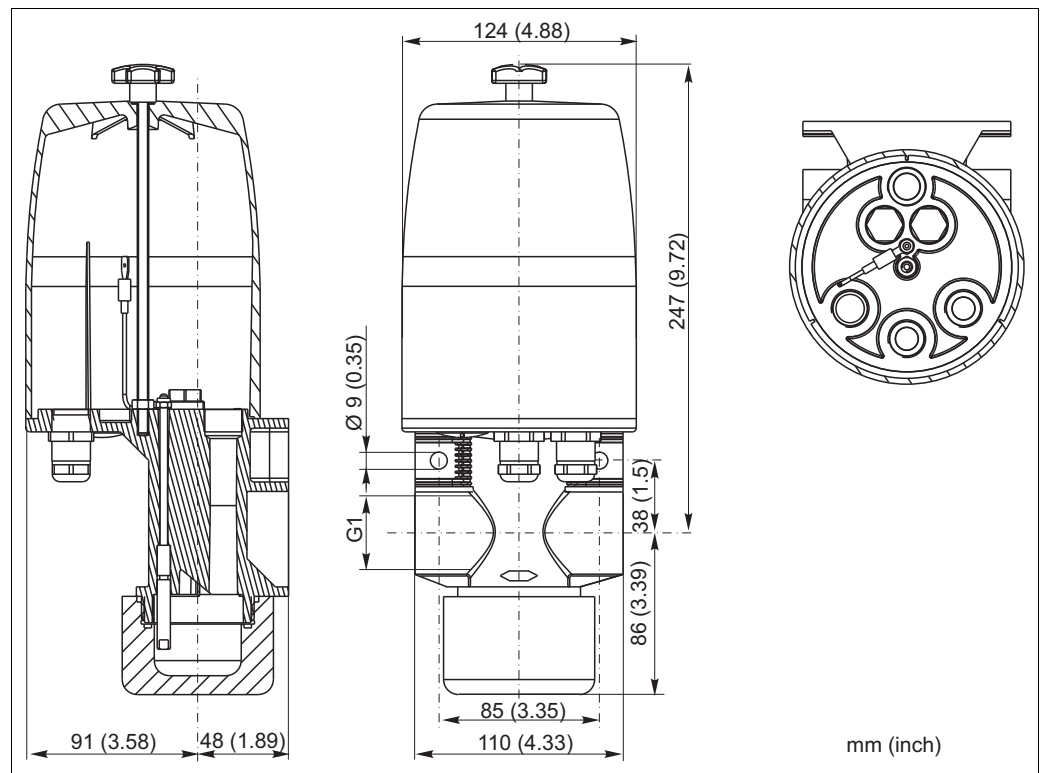


Fig. 3: Dimensions

3.2.2 Notes on installation

Parts description	used at ...
two shut-off valves	bypass version
one shut-off valve	version with open outlet

Parts description	used at ...
aperture in the main conduit	bypass version
particle filter	if the process water contains large dirt particles
pressure-relief valve	if the process water pressure is above the maximum value (see chapter " technical data")

3.3 Installation instructions

3.3.1 Measuring system

A complete measuring system comprises:

- Flowfit CPA250
- pH or ORP sensor, e.g. CPS71D
- Measuring cable, e.g. CYK10
- Transmitter, e.g. Liquiline M CM42

Optional:

- up to two more pH/ORP sensors or single electrodes or temperature sensors
- Junction box for cable extension, e.g. RM junction box

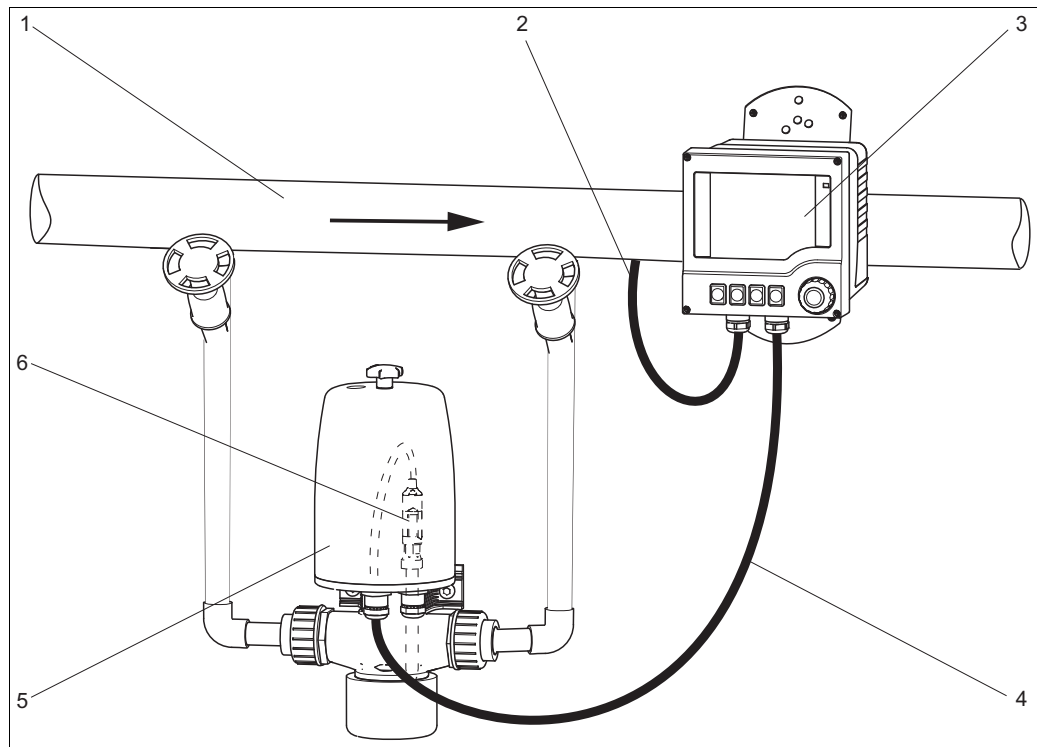



Fig. 4: Measuring system (bypass installation)

- 1 Process line with bypass and valves
- 2 Supply line of the transmitter
- 3 Transmitter Liquiline M CM42
- 4 Measuring cable CYK10
- 5 Flowfit CPA250
- 6 pH sensor CPS71D

3.3.2 Installing the assembly into the process

To get a flow through the by-pass, pressure p_1 has to be higher than pressure p_2 . Therefore, you have to install an aperture or a throttle in the main conduit (→  5).

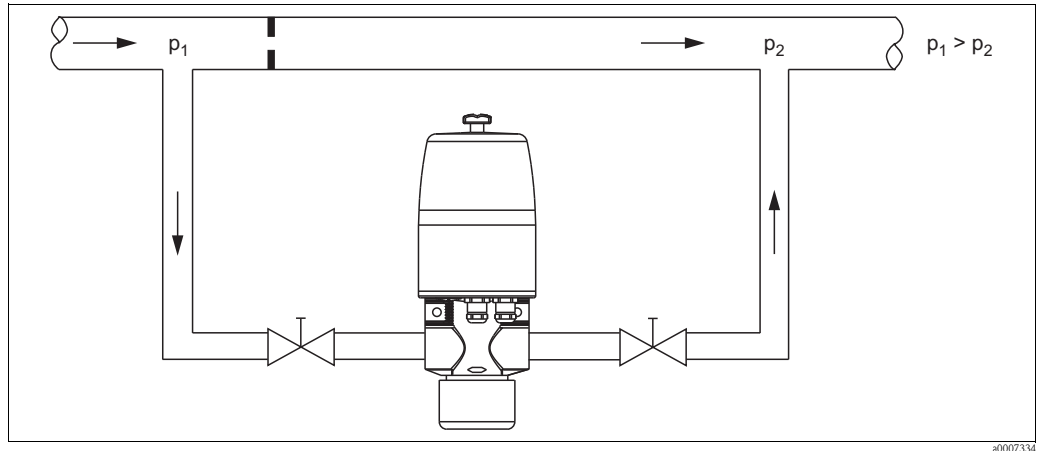


Fig. 5: Installation example with by-pass and aperture in the main conduit

Alternatively, you can install a booster pump in the bypass conduit to produce the required pressure (→  6).

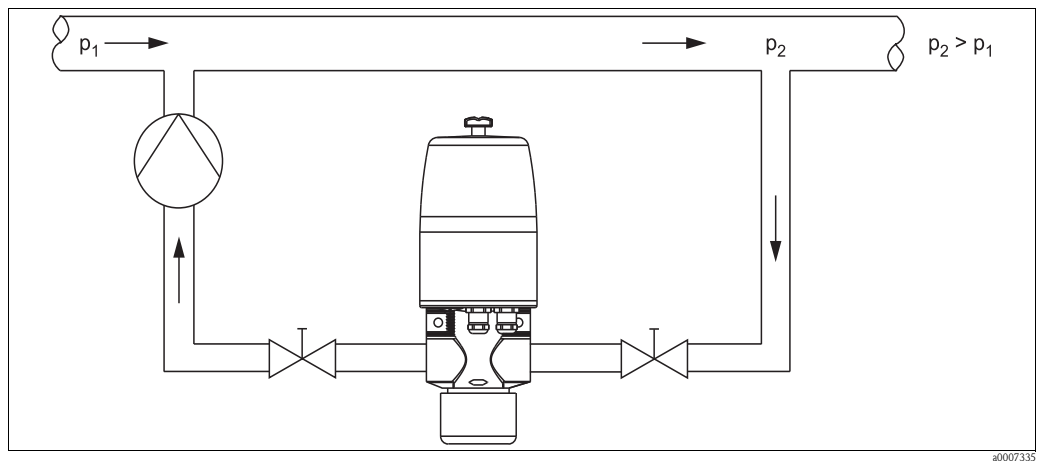


Fig. 6: Installation example with open outlet

In case of an open outlet installation, no pressure increasing procedure is needed (→  7).

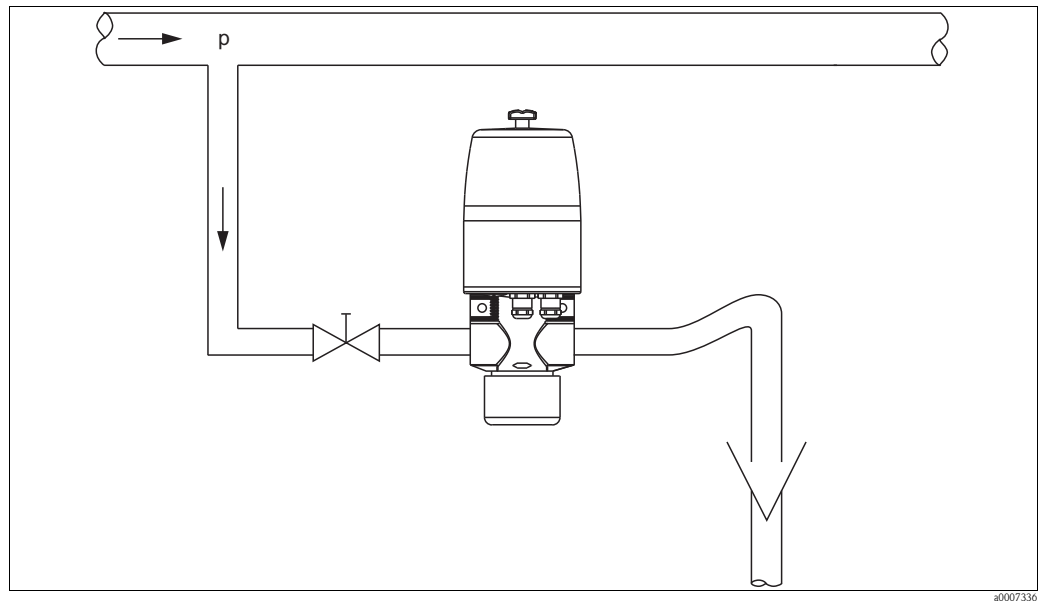


Fig. 7: Installation example with open outlet



Note!

- The flow assembly should be installed in horizontal pipes.
- Prefer installation 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 (you have to install shut-off valves upstream and downstream from the flow assembly). This permits maintenance of the sensors without interrupting the process.



Caution!

- The medium pressure must not exceed the maximum permissible pressure of the flow assembly or of the sensors.
- If the medium pressure exceeds the maximum permissible pressure, you have to install a pressure-relief valve. The permissible pressure depends on the medium temperature (see "Technical Data").

3.3.3 Sensor installation



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 and remove the protective cover.
2. Screw the sensor into the Pg thread of the chosen mounting position.



Note!

You have to wet the glass shaft of a glass electrode before installing it into the assembly.

3. Connect the measuring cable to the sensor.
4. Lay the electrode cables in the assembly in such a way that the electrodes can be removed without opening the Pgthreads. A free cable length of approx. 30mm (1.2 inch) has proved adequate.
5. Lead the sensor cable (transmitter side) through the Pg threads out of the assembly.
6. If cable glands are not used, then seal them off with dummy plugs.
7. Tighten the cable glands.

8. Put on the protective cover and tighten the star nut.

3.4 Post-installation check

- After installation, check that all connections are firmly in position and leak-tight.
- Ensure that the hose of the spray nozzle (optionally) cannot be removed without force.
- Check all hoses for damage.

4 Commissioning

Before the first commissioning, make sure of the following items:

- all seals are correctly seated (on the assembly and process connection)
- the sensor is correctly installed and connected



Warning!

Danger of squirting medium.

Before applying the process pressure to the assembly, make sure the connections are correctly fitted.

5 Maintenance



Warning!

Risk of injury!

Before starting maintenance work on the assembly, make sure that the process line is depressurised, empty and rinsed.

5.1 Cleaning the assembly

To ensure a reliable measurement, the assembly and the sensor must be cleaned at regular intervals. The frequency and intensity of the cleaning operation depend on the process medium.

All parts in contact with the medium, e.g. the sensor and the sensor holder, must be cleaned at regular intervals. Remove the sensor⁴⁾.

- Remove light dirt using suitable cleaning agents (see chapter "Cleaning agents").
- Remove severe fouling with a soft brush and a suitable cleaning agent.
- Remove persistent fouling by soaking in a liquid cleaner and if necessary by cleaning with a soft brush.

5.2 Cleaning the sensor

You have to clean the sensor:

- before every calibration
- regularly during operation
- before being returned for repair

Cyclic, automatic cleaning in an installed condition may be carried out by the automatic spray cleaning system Chemoclean (has to be ordered separately). The complete system comprises:

- spray head CPR31 or CPR3
- Cleaning injector CYR10
- Cleaning control, e.g. programme sequencer CYR20



Note!

- Do not use any abrasive cleaning agents. This can lead to irreparable damage of the sensor.
- After cleaning the sensor, rinse the rinse chamber of the assembly with copious amounts of water. Otherwise, remaining residues of cleaning agent can corrupt measurement.
- If required, re-calibrate after cleaning.

5.3 Cleaning agents

The selection of the cleaning agent is dependent on the degree and type of contamination. The most common contaminations and the suitable cleaning agents are listed in the following table.

Type of contamination	Cleaning agent
Greases and oils	Substances containing tensides (alkaline) or water-soluble organic solvents (e.g. Ethanol)
Calciferous deposits, metal hydroxide deposits, lyophobic biological deposits	approx. 3% hydrochloric acid
Sulphide deposits	Mixture of 3% hydrochloric acid and thiocarbamide (commercially available)
Protein deposits	Mixture of 3% hydrochloric acid and pepsin (commercially available)
Fibres, suspended substances	Water under pressure, poss. with surface-active agents
Light biological deposits	Water under pressure

4) in reverse sequence of operations to the installation procedure



Caution!

Do not use organic solvents containing halogen or acetone. These solvents could destroy plastic components on the assembly or the sensor and it is also partly suspected that they cause cancer (e. g. Chloroform).



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.

6 Accessories



Note!

In the following sections, you find the accessories available at the time of issue of this documentation.

For information on accessories that are not listed here, please contact your local service.

6.1 Accessories kits

- NP
 - 2 nipples for adaption of CPA250-A* to PP pipe without thread
 - OD 32 mm (1.26 inch)
 - order no. 50003450
- NV
 - Adapter for adaption of CPA250-A* to PVC pipe
 - OD 32 mm (1.26 inch), order no. 50003454
 - OD 25 mm (0.98 inch), order no. 50003456
- BF
 - Wall mounting kit for CPA250-A*
 - 2 long V4A screws, incl. screw anchors
 - order no. 50001130

6.2 Sensors

Orbisint CPS11/11D

- pH electrode for process applications with dirt-repellent PTFE diaphragm
- Optional Memosens technology (CPS11D)
- Ordering acc. to product structure, see Technical Information (TI028C/07/en)

Ceraliquid CPS41/CPS41D

- pH electrode with ceramic diaphragm and liquid KCl electrolyte
- Optional Memosens technology (CPS41D)
- Ordering acc. to product structure, s. Technical Information (TI079C/07/en)

Ceragel CPS71/CPS71D

- pH electrode with double junction reference system and integrated bridge electrolyte
- Optional with Memosens technology (CPS71D)
- Ordering acc. to product structure, see Technical Information (TI245C/07/en)

Ceragel CPS72/CPS72D

- Redox sensor with double junction reference system and integrated bridge electrolyte
- Optional with Memosens technology (CPS72D)
- Ordering acc. to product structure, see Technical Information (TI374C/07/de)

6.3 Cleaning systems

Chemoclean CPR31 / CPR3

- Automatic spray cleaning system for sensors
- CPR31 is installed in one of the three sensor mounting places of the assembly
- order no. on request



Note!

When installing CPR31 remove the metal pin and align the spray nozzles.

Chemoclean

- Injector CYR10 and program sequencer CYR20
- Ordering acc. to product structure, see Technical Information (TI046C/07/en)

7 Trouble-shooting

7.1 Replacing damaged parts



Warning!

Damage to the assembly which affects the pressure safety must **only** be repaired by authorized technical personnel.

After every repair and maintenance activity, suitable measures must be taken to test whether the assembly shows any signs of leaking. The assembly must then correspond to the specifications stated in the technical data.

Replace all other damaged components immediately. To order accessories and spare parts, please use the "Accessories" and "Spare parts" chapters or contact your local sales center.

7.2 Return

If the assembly has to be repaired, please return it **cleaned** to the appropriate sales center. Please use the original packaging, if possible.

Please enclose the completed "Declaration of contamination" (copy the second to last page of these Operating Instructions) with the packaging and the transportation documents.

No repair without completed "Declaration of contamination"!

7.3 Disposal

Please dispose of the device in accordance with the local regulations.

8 Technical data

8.1 Environment

Ambient temp. range 0 to 50 °C (32 to 120 °F)

Storage temperature 0 to 50 °C (32 to 120 °F)

8.2 Process

Process temperature 0 to 80 °C (32 to 170 °F, 6 bar (87 psi) at 20 °C (68 °F) and pressureless at 80 °C (176 °F)

Process pressure max. 6 bar (87 psi) at 20 °C (68 °F)

Temperature-pressure-diagram

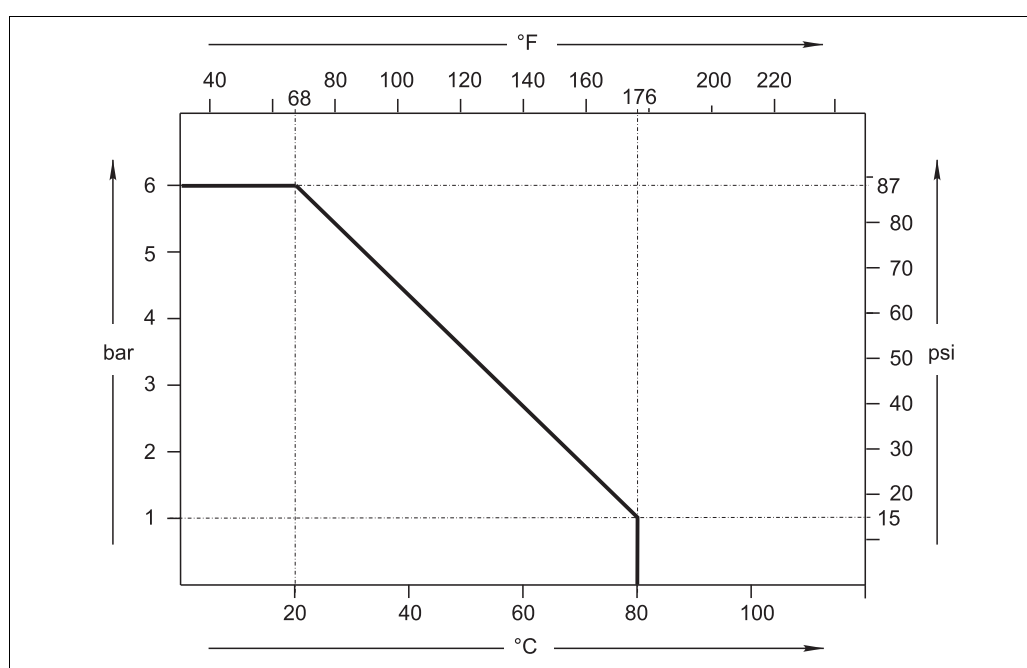


Fig. 8: Temperature-Pressure diagram

8.3 Mechanical construction

Design, dimensions see chapter "Installation"

Weight 0.5 to 0.8 kg (1.1 to 1.8 lbs), depending on process connection

Material

In contact with medium:

- Assembly body: PP-H
- O-rings: Viton/FPM

Potential matching pin:

- CPA250-A00/01/02/03/30: titane or stainless steel
- CPA250-A04/05: no potential matching pin

Process connection depending on the version: G1, NPT 1"

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Declaration of Hazardous Material and De-Contamination *Erklärung zur Kontamination und Reinigung*

RA No.

Please reference the Return Authorization Number (RA#), obtained from Endress+Hauser, on all paperwork and mark the RA# clearly on the outside of the box. If this procedure is not followed, it may result in the refusal of the package at our facility.
Bitte geben Sie die von E+H mitgeteilte Rücklieferungsnummer (RA#) auf allen Lieferpapieren an und vermerken Sie diese auch außen auf der Verpackung. Nichtbeachtung dieser Anweisung führt zur Ablehnung ihrer Lieferung.

Because of legal regulations and for the safety of our employees and operating equipment, we need the "Declaration of Hazardous Material and De-Contamination", with your signature, before your order can be handled. Please make absolutely sure to attach it to the outside of the packaging.

Aufgrund der gesetzlichen Vorschriften und zum Schutz unserer Mitarbeiter und Betriebseinrichtungen, benötigen wir die unterschriebene "Erklärung zur Kontamination und Reinigung", bevor Ihr Auftrag bearbeitet werden kann. Bringen Sie diese unbedingt außen an der Verpackung an.

Type of instrument / sensor

Geräte-/Sensortyp _____

Serial number

Seriennummer _____

Used as SIL device in a Safety Instrumented System / Einsatz als SIL Gerät in Schutzeinrichtungen

Process data/ Prozessdaten

Temperature / Temperatur _____ [°F] _____ [°C]

Pressure / Druck _____ [psi] _____ [Pa]

Conductivity / Leitfähigkeit _____ [µS/cm]

Viscosity / Viskosität _____ [cp] _____ [mm²/s]

Medium and warnings

Warnhinweise zum Medium



	Medium /concentration <i>Medium /Konzentration</i>	Identification CAS No.	flammable <i>entzündlich</i>	toxic <i>giftig</i>	corrosive <i>ätzend</i>	harmful/ irritant <i>gesundheitsschädlich/ reizend</i>	other * <i>sonstiges*</i>	harmless <i>unbedenklich</i>
Process medium <i>Medium im Prozess</i>								
Medium for process cleaning <i>Medium zur Prozessreinigung</i>								
Returned part cleaned with <i>Medium zur Endreinigung</i>								

* explosive; oxidising; dangerous for the environment; biological risk; radioactive

* *explosiv; brandfördernd; umweltgefährlich; biogefährlich; radioaktiv*

Please tick should one of the above be applicable, include safety data sheet and, if necessary, special handling instructions.

Zutreffendes ankreuzen; trifft einer der Warnhinweise zu, Sicherheitsdatenblatt und ggf. spezielle Handhabungsvorschriften beilegen.

Description of failure / Fehlerbeschreibung _____

Company data / Angaben zum Absender

Company / Firma _____	Phone number of contact person / Telefon-Nr. Ansprechpartner: _____
Address / Adresse _____	Fax / E-Mail _____
_____	Your order No. / Ihre Auftragsnr. _____

"We hereby certify that this declaration is filled out truthfully and completely to the best of our knowledge. We further certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free of any residues in dangerous quantities."

"Wir bestätigen, die vorliegende Erklärung nach unserem besten Wissen wahrheitsgetreu und vollständig ausgefüllt zu haben. Wir bestätigen weiter, dass die zurückgesandten Teile sorgfältig gereinigt wurden und nach unserem besten Wissen frei von Rückständen in gefahrbringender Menge sind."

(place, date / Ort, Datum)

Name, dept./Abt. (please print / bitte Druckschrift)

Signature / Unterschrift

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