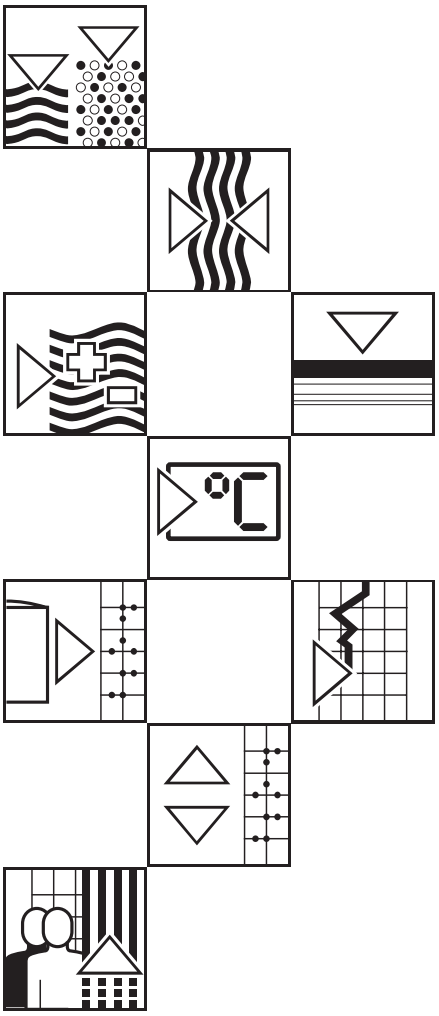
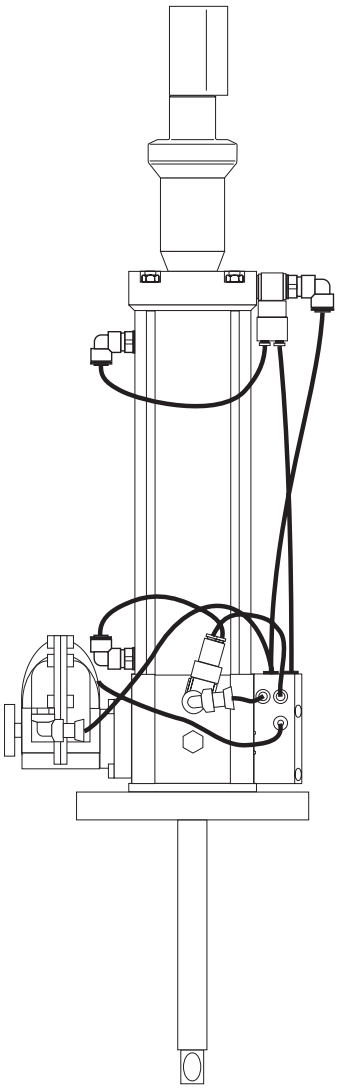
BA 007C/07/en/10.99
No. 50045842

probfit
CPA 463
Retractable Assembly for pH / Redox Measurement

Operating Instructions





Quality made by
Endress+Hauser

ISO 9001

Endress+Hauser

The Power of Know How

PA463E00.CHP

Table of contents

1 General information 2
1.1 Symbols used 2
1.2 Storage and transport 2
1.3 Unpacking 2
1.4 Packaging and disposal 2
1.5 Product structure 3

2 Safety 4
2.1 Intended application 4
2.2 General safety notes 4
2.3 Installation, start-up, operation 4
2.4 Safety features 5
2.5 Notes for installation in pressurised systems 5

3 Installation 6
3.1 Measuring system 6
3.2 Assembly parts 7
3.3 Dimensions 7
3.4 Assembly installation 8
3.5 Electrode installation and replacement 10
3.6 Measuring cable connection 12
3.7 Pneumatic connections, CPA 463-R / CPA 463-A 13
3.8 Rinse and sealing water connections 14

4 Operation 16
4.1 Manual operation of CPA 463-H 17
4.2 Pneumatic operation of CPA 463-R / CPA 463-A 18

5 Maintenance 19
5.1 Cleaning 19
5.2 Calibration 20
5.3 Maintenance work 22

6 Accessories and spare parts 23
6.1 Outlet valve 24
6.2 Retraction safety lock 25

7 Technical data 26

8 Index 28

1 General information

1.1 Symbols used

Warning:

This symbol alerts to hazards. Failure to observe these warnings may result in severe 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.

Conformance with the ambient conditions (see Technical data) must be assured.

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.

Check that the delivery is complete and agrees with the delivery papers and your order (refer to nameplate for type and variant).

The delivery includes:

- CPA 463 assembly
- Socket wrench (size 17) for electrode replacement
- Hose guidance clamp (CPA 463-Axxx only)
- Electrode support sleeve
- Operating instructions BA 007C/07/en.

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

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

The CPA 463 assembly is available in plastic and stainless steel variants with various process connections and immersion depths to cover a wide range of requirements in industrial measuring technology.

You can identify the assembly variant by the order code on the nameplate.

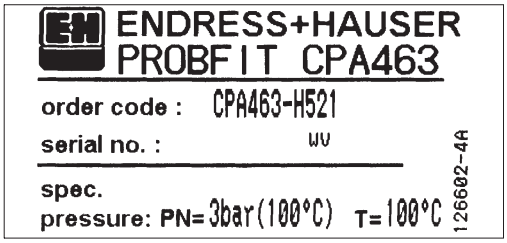


Fig. 1.1 Nameplate of CPA 463

Retractable assembly Probfit CPA 463

Actuation
H Manual
R Pneumatic, positively controlled
A For Airtrol CPC 200/210, with rinse port adapter

Immersion depth / material
0 90 mm / 3.5", PVC
1 190 mm / 7.5", PVC
2 90 mm / 3.5", PVDF
3 190 mm / 7.5", PVDF
4 90 mm / 3.5", 1.4571 / SS 316Ti
5 190 mm / 7.5", 1.4571 / SS 316Ti

O-ring material
1 EPDM
2 Viton
3 Chemraz
4 Fluoraz

Process connection
1 DN50 / PN10 DIN flange
2 2" ANSI flange, 150 lbs

CPA 463- [ ][ ][ ][ ] **complete order code**

2 Safety

2.1 Intended application

The retractable assembly CPA 463 is intended for the installation of pH/redox sensors in tanks and pipes. The assemblies from the Probfit CPA 463 family permit pH or redox electrodes to be sealed off from the medium, cleaned, calibrated or changed under process conditions. These assemblies can be operated manually or pneumatically.

Thanks to their special design, these assemblies can be used in pressurised systems (see Technical data).

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 CPA 463 assembly 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 for purposes other than 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 as described in these instructions may compromise the safety and function of the measuring system and is therefore impermissible.
- The notes and warnings in these operating instructions are to 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 is to 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.
- Repair work must be carried out directly by the manufacturer or by the Endress+Hauser Service Organization.

2.4 Safety features

Safety devices

The assembly is protected against external influences and damage by means of the following design measures:

- media-resistant material
- stopcock

2.5 Notes for installation in pressurised systems

Warning:

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

3 Installation

3.1 Measuring system

A measuring system comprises:

- The Probfit CPA 463 assembly
- A pH/redox electrode suitable for the assembly and medium to be measured
- A pH/redox measuring instrument, e.g. Airtrol CPC 200/210 or Autoclean CPC 20
- Measuring cable CPK 1 (terminated), measuring cable CPK 7 (terminated) or measuring cable CPK 9 (terminated)
- Connecting hoses for calibration buffer solutions and cleaning agent

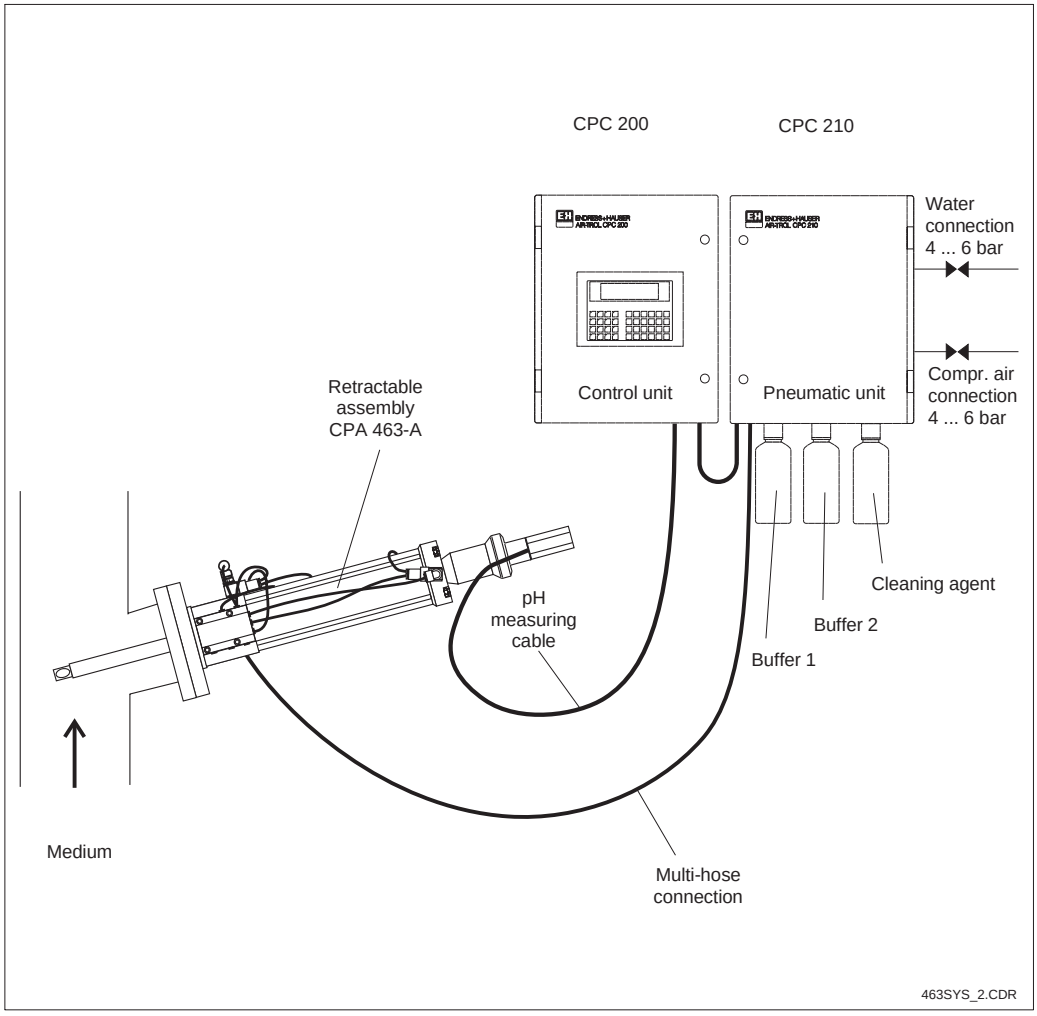


Fig. 3.1 Complete measuring system

3.2 Assembly parts

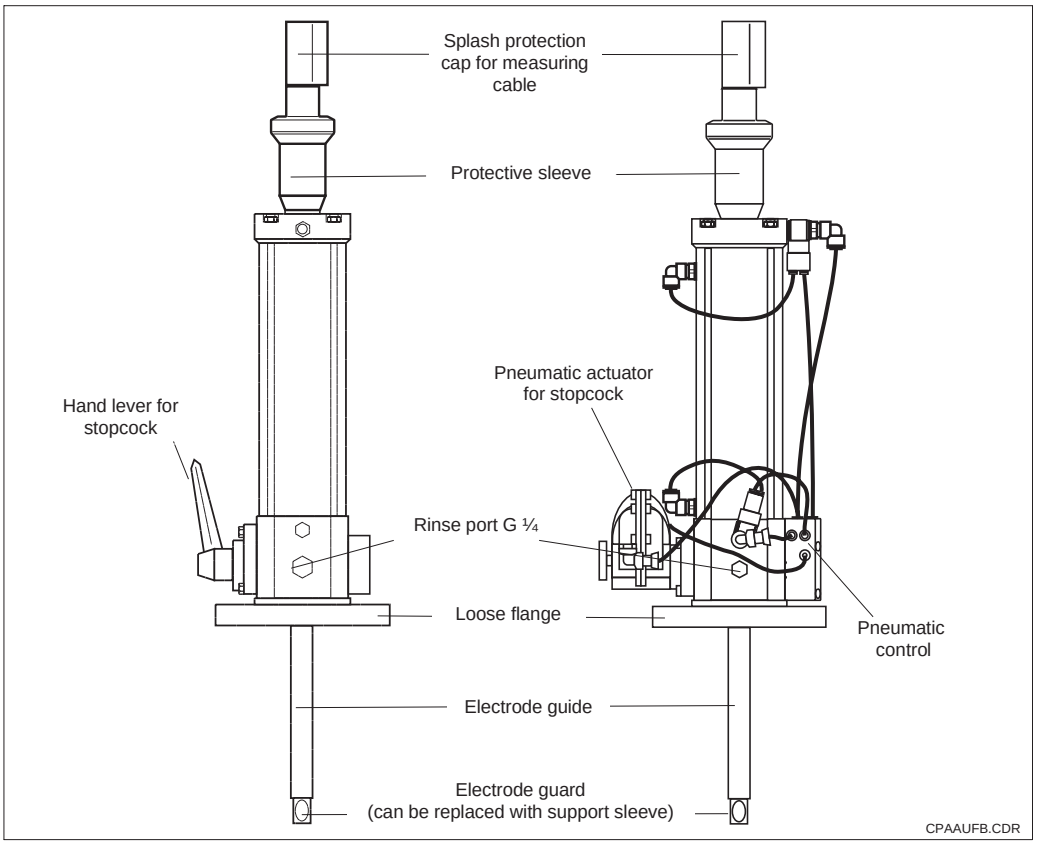


Fig. 3.2 Overview of assembly parts

Left:
CPA 463-H

Right:
CPA 463-R / -A

3.3 Dimensions

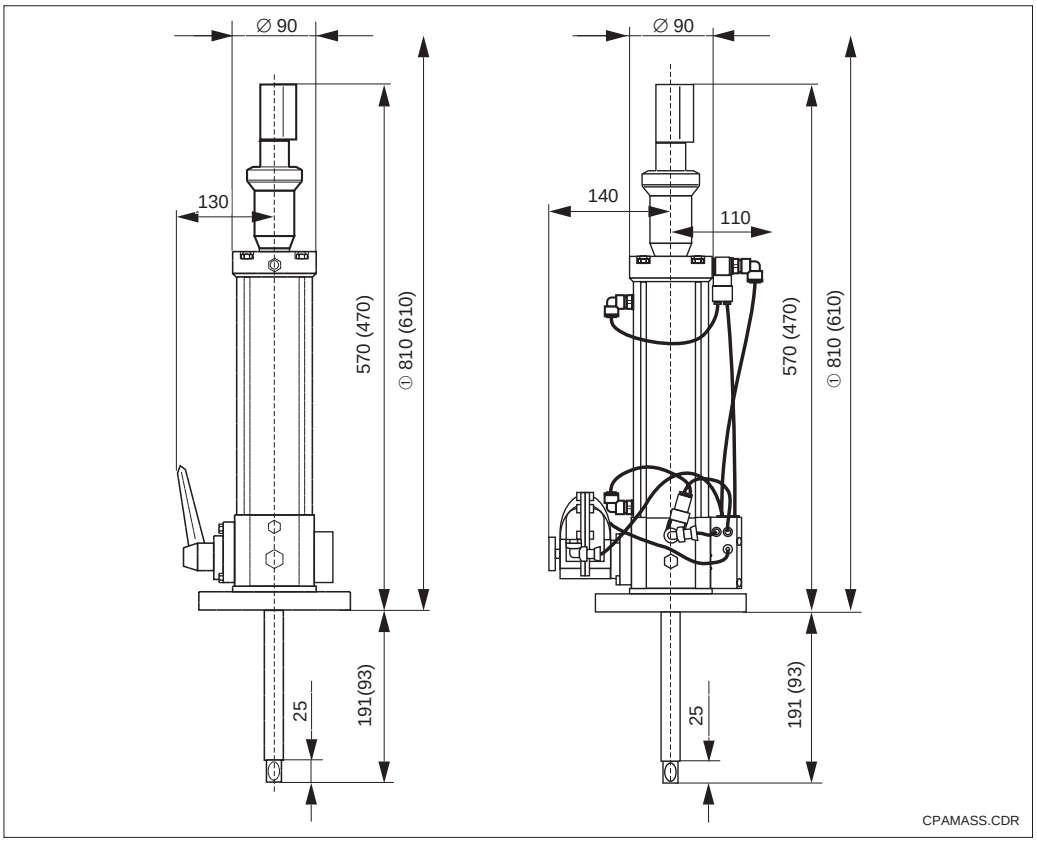


Fig. 3.3 Dimensions of CPA 463 assembly

Left:
CPA 463-H

Right:
CPA 463-R / -A

The values in parentheses are for the short version.

① Length in extended state

Required minimum mounting clearance in extended state: 1 m

3.4 Assembly installation

The retractable CPA 463 assemblies are mounted using a loose flange. The assembly is to be installed according to the examples shown in fig. 3.7 using M 16 bolts, nuts and washers. To facilitate bolt installation, the assembly can be rotated somewhat until firmly tightened.

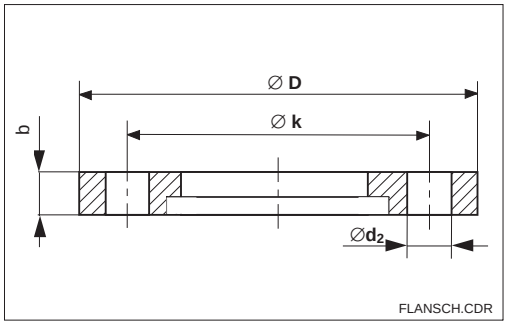


Fig. 3.4 Flange dimension

Flange	DN 50/PN10	ANSI 2", 150 lbs
ØD	165	152.4
Øk	125	120.6
Ød$_2$	18	19
b	18	19
Screws	M 16	M 16
Bores	8	4

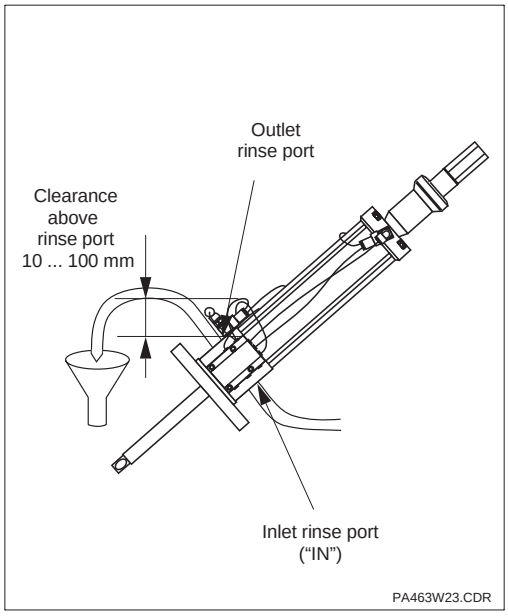


Bild 3.5 Assembly installation using the rinse port

Note:

- The minimum diameter of the hole in the mating flange must be 30 mm.
- The CPA 463-A is equipped with an additional rinse port adapter with 5 ports, which may be retro-fitted on the CPA 463-H and CPA 463-R versions.
- In order to avoid draining off of the rinse chamber the assembly has to be installed according to fig. 3.5.
- Extremely fibrous media: Unscrew the protection guard from the lower end of the electrode guide and screw on the supplied electrode support sleeve instead (see fig. 3.6). Make sure that the O-rings are inserted.

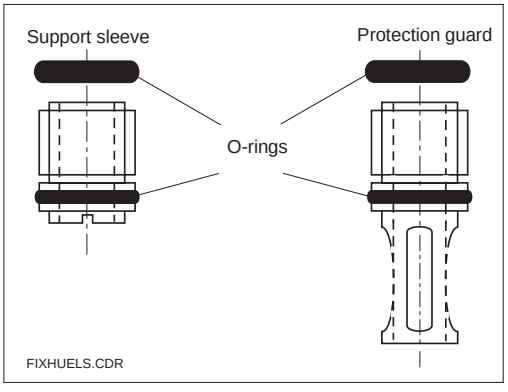


Bild 3.6 Support sleeve and protection guard

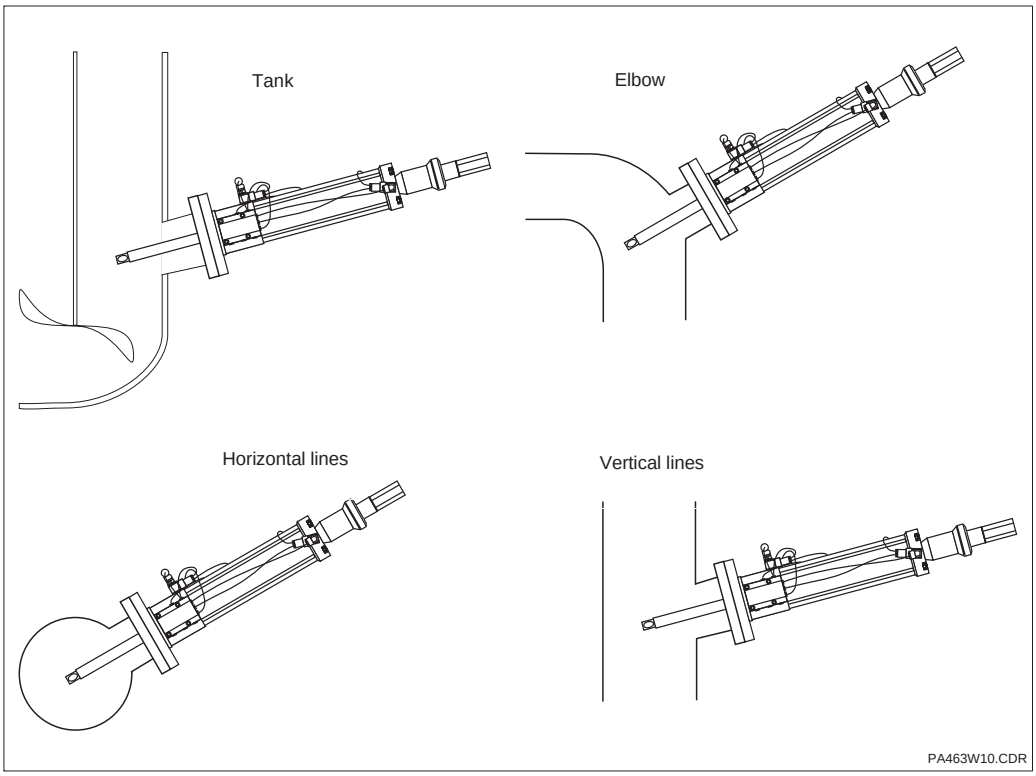


Fig. 3.7 Mounting examples for CPA 463 assembly

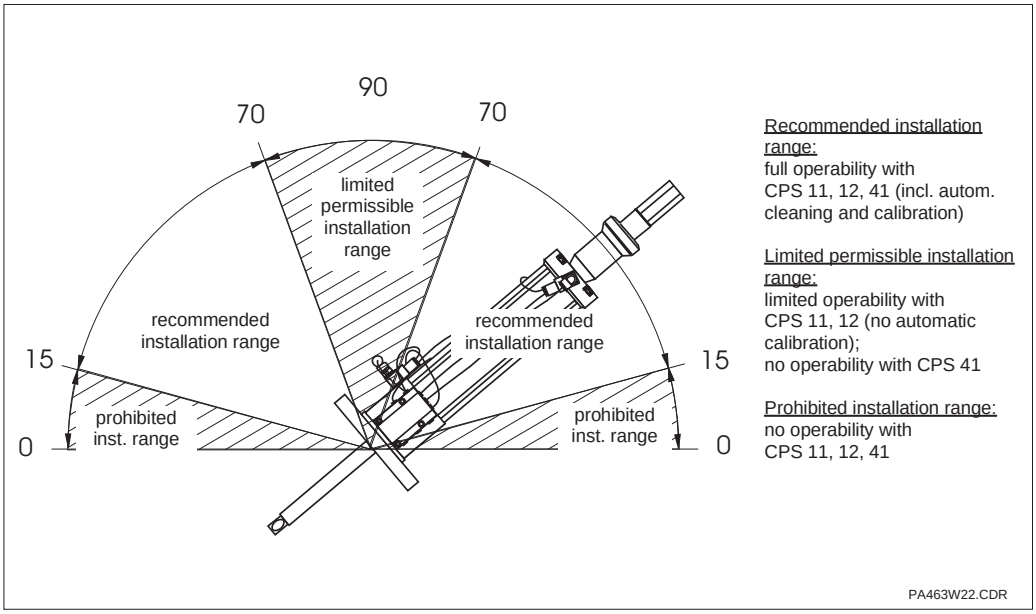


Bild 3.8 Installation angles of the assembly

Note:

- Install the assembly according to the recommended installation angles (fig. 3.8).
- The immersion depth is to be chosen such that the electrode is immersed in the medium at all times.

3.5 Electrode installation and replacement

Move the assembly to the service position to install or replace the electrode, i.e.

- move the electrode guide out of the medium, and
- close the stopcock.

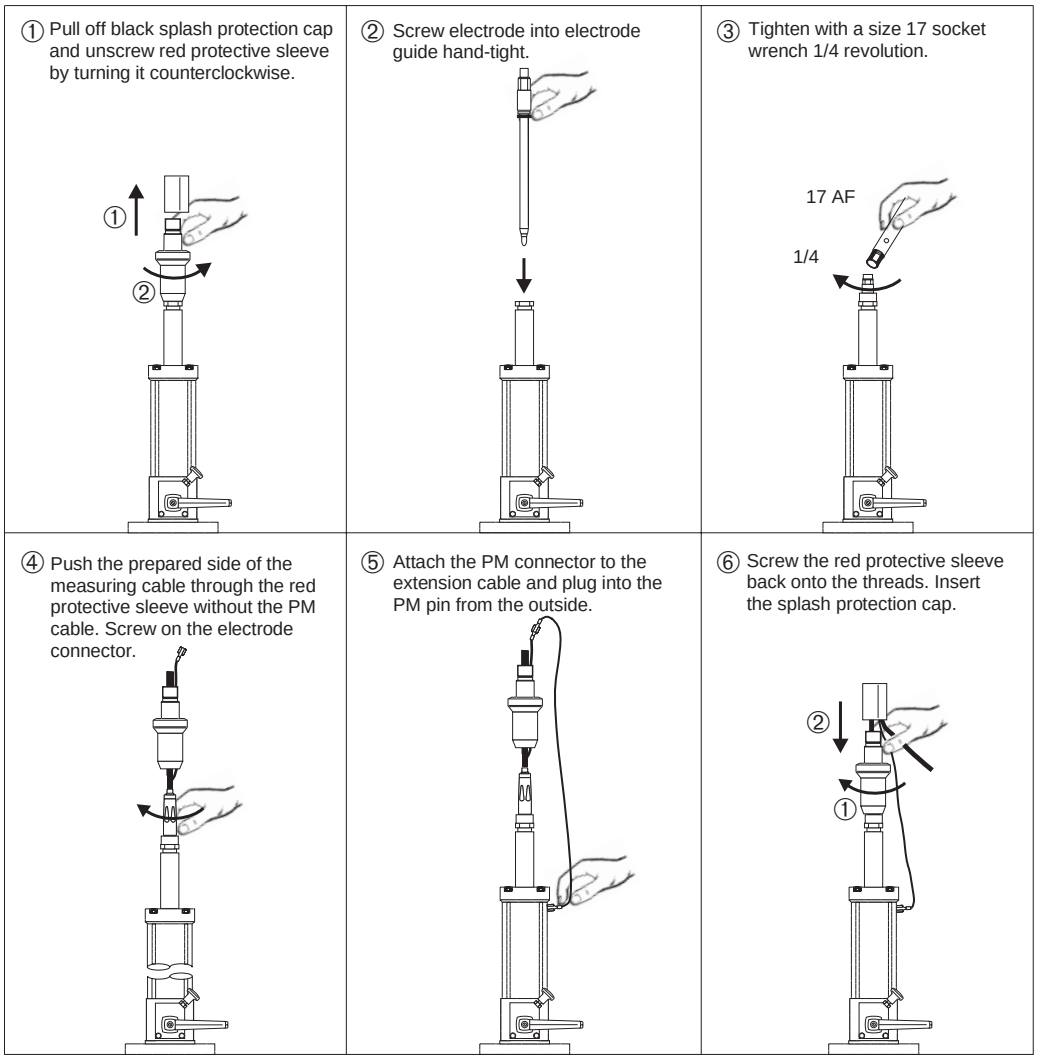
Warning:

The electrode must only be replaced with the assembly in “service” position.

Note:

- Electrodes with a threaded Pg 13.5 plug-in head, a shaft length of 360 mm and a diameter of 12 mm can be installed.
- Use the special splash protection cap (accessory) for liquid-filled electrodes (Ceraliquid series).
- Make sure that the O-ring and clamping ring are in place on the electrode shaft and that the electrode protection cap is removed before installation.
- Lubricate the electrode shaft threads before installation in the assembly. Simple wetting with water is sufficient.

Immersion depth 90 mm

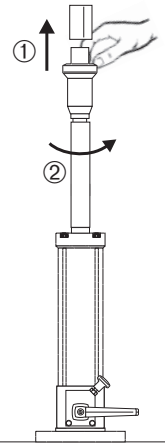


Note:

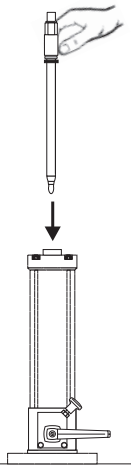
- **Liquid-filled Ceraliquid electrodes (CPS 41 / CPS 42) cannot be used in conjunction with an immersion depth of 190 mm.**
- The splash protection cap and protective sleeve on the long assembly version are adhered!
- Make sure that the O-ring and clamping ring are in place on the electrode shaft and that the electrode protection cap has been removed.
- Lubricate the electrode shaft threads before installation in the assembly. Simple wetting with water is sufficient.
- If the potential matching conductor (PMC) cannot be used (with plastic versions), cut off the brown potential matching wire directly behind the shrink-down plastic tubing.

Immersion depth 190 mm

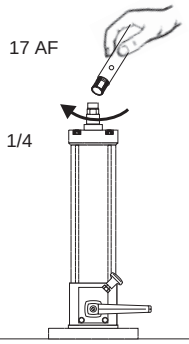
① Pull off the black splash protection cap. Unscrew the red protective sleeve and piston rod by turning them counterclockwise.



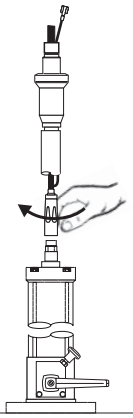
② Screw the electrode into the electrode guide hand-tight.



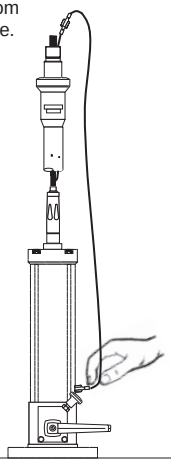
③ Tighten with a size 17 socket wrench 1/4 revolution.



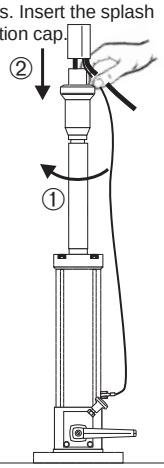
④ Pull the measuring cable without the PM cable through the red protective sleeve and piston rod. Screw on the electrode connector.



⑤ Attach the PM connector to the extension cable and plug into the PM pin from the outside.



⑥ Screw the red protective sleeve and piston rod back onto the threads. Insert the splash protection cap.



3.6 Measuring cable connection

The assembly is connected to the measuring instrument by means of measuring cable CPK 1 for pH electrodes without an integrated temperature sensor or by means of measuring cable CPK 7 or CPK 9 when pH combination electrodes with an integrated temperature sensor are used.

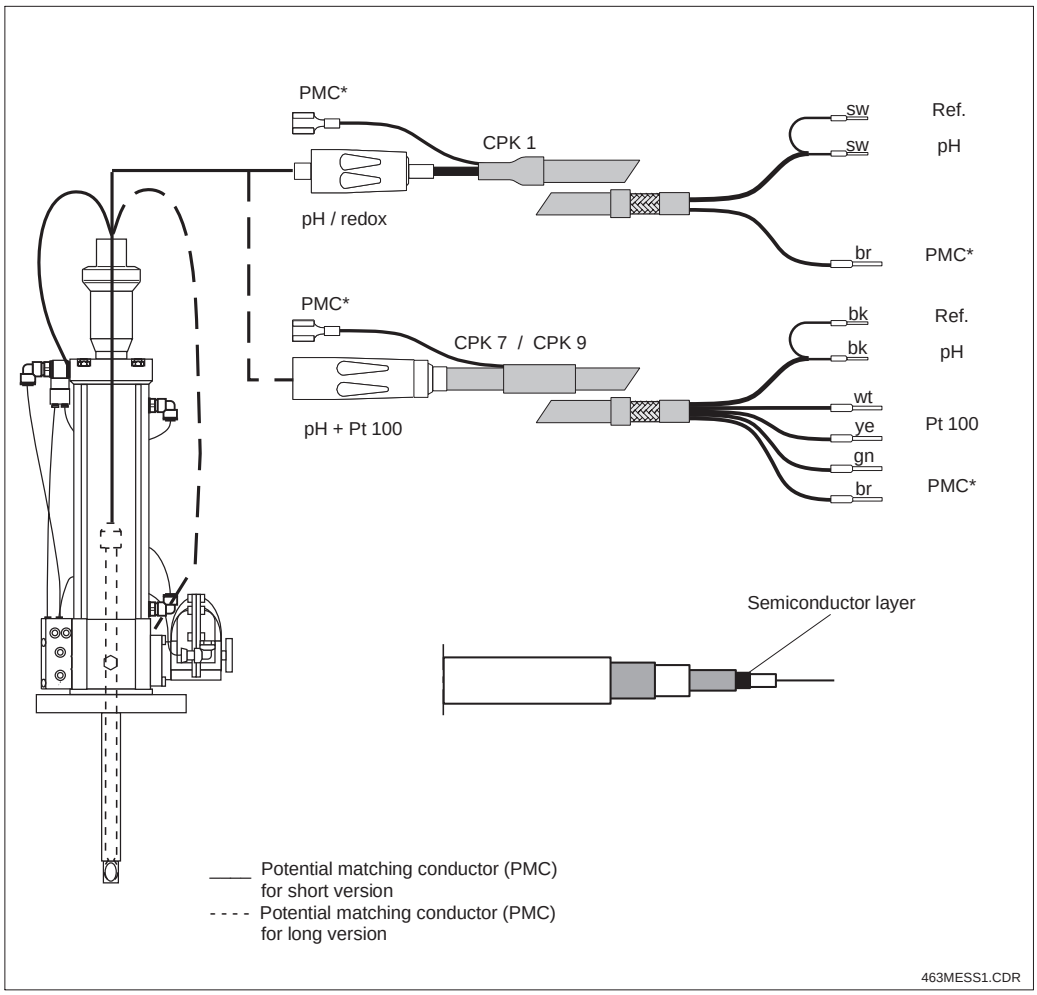
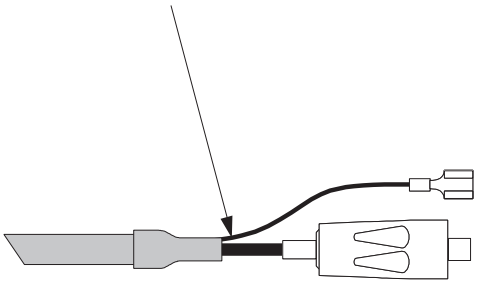


Fig. 3.9 Measuring cable connection

Note:

- If you make your own cable, the black semiconductor layer on the measuring cable must be stripped to the first screen!
- The potential matching conductor is only required for symmetrical electrode connection.
- In the case of an asymmetrical connection, cut off the brown potential matching wire directly behind the shrink-down plastic tubing.



3.7 Pneumatic connections, CPA 463-R / CPA 463-A

The pneumatic connection of the assembly is very simple since only 4 control lines are connected to the assembly. Establish the pneumatic connections, i.e. the compressed air connections for assembly control and "measurement" and "service" limit position feedback as shown in fig. 3.10. The control states of the inlets and outlets are shown in the table in fig. 3.11.

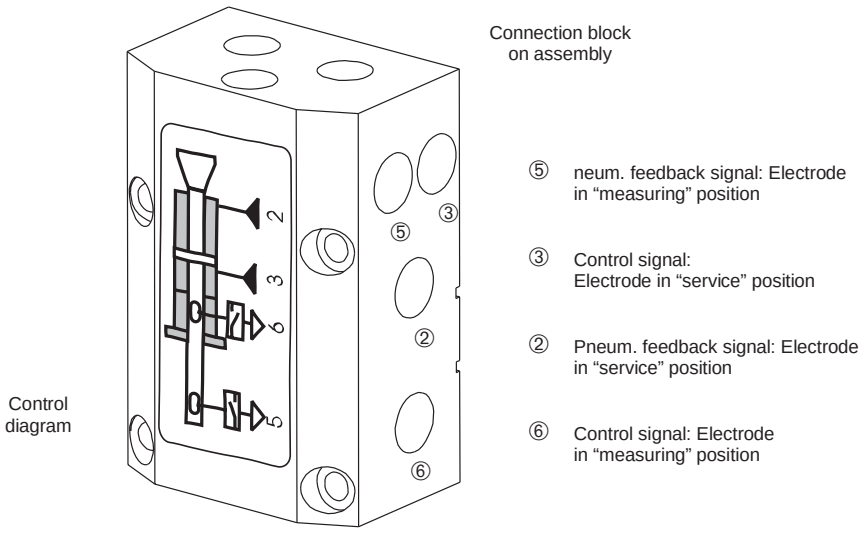
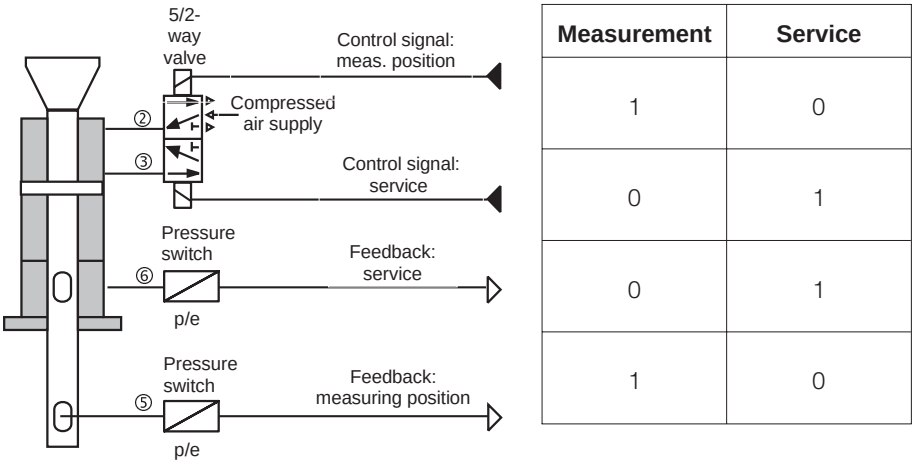


Fig. 3.10 Connection of pneumatic control



Measurement	Service
1	0
0	1
0	1
1	0

Fig. 3.11 Pneumatic control

Note:

- When the compressed air supply fails and the medium is under pressure, the assembly may not remain in the measuring position. Use the retraction safety lock (see Accessories in chapter 6) to maintain the assembly in the measuring position in the event of an air supply failure.
- The 5/2-way valve and the pressure switch are to be provided by the operator!
- Pneumatic/visual indicators may be installed in the field.

3.8 Rinse and sealing water connections

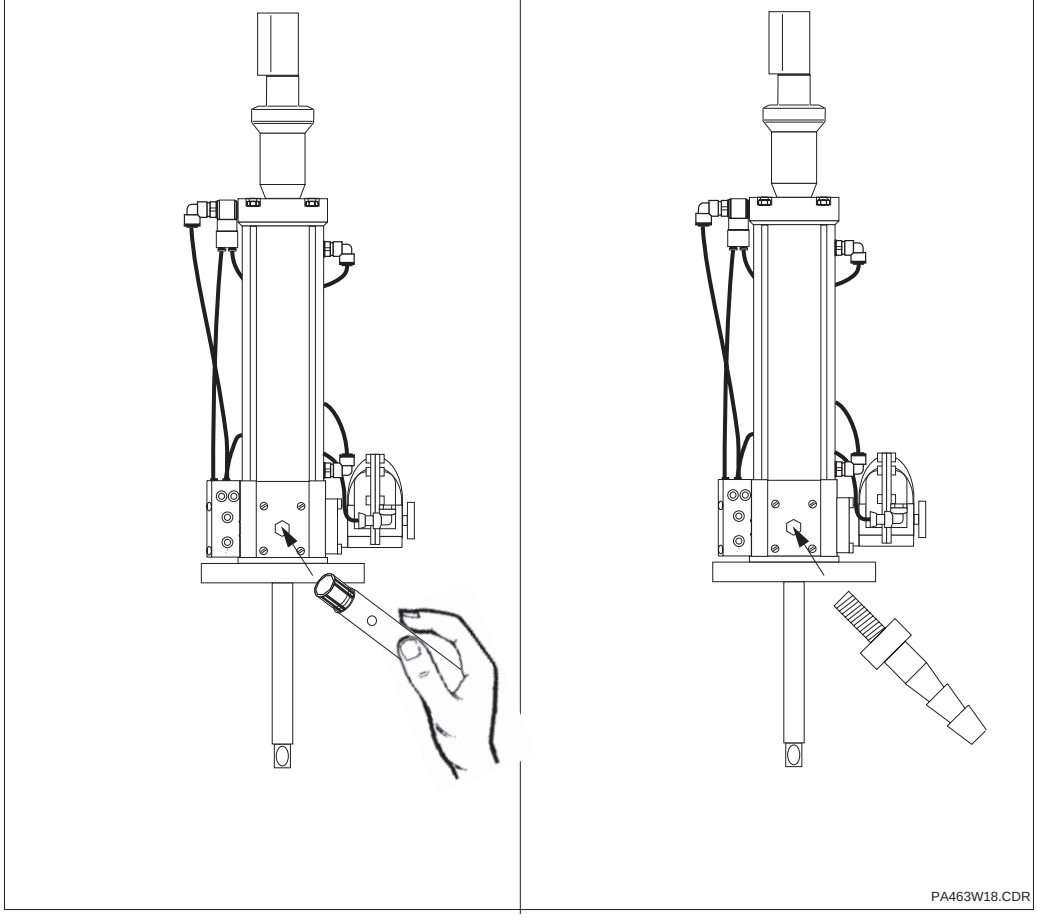
3.8.1 Rinse port G 1/4 for CPA 463-R

Rinse water or cleaning fluid can be manually supplied via the G 1/4 rinse port.

Proceed as described below to connect the G 1/4 rinse port:

① Remove filler plug.

② Screw in G 1/4 hose connector. Tighten with a size 17 socket wrench.



PA463W18.CDR

Note:

- If extremely fibrous media or highly concentrated salt solutions are measured, sealing water may be supplied via a control unit command during assembly retraction and extension in order to prevent medium from entering the rinse chamber. The sealing water pressure must be higher than the process pressure (see operating instructions of control unit in question).
- In the “service” sensor position, an additional outlet valve prevents medium from entering the drain (see Accessories in chapter 6).

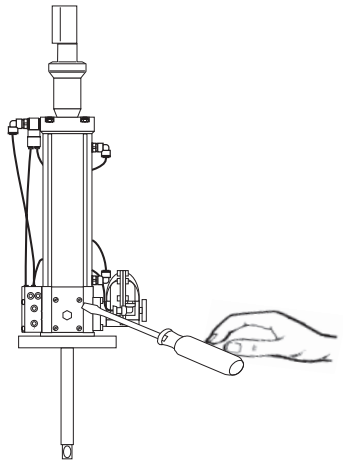
3.8.2 Rinse port adapter for CPA 463-A

The rinse port adapter makes available the following connections to flush the electrode (dimensions for hose connection: ID4 / OD6):

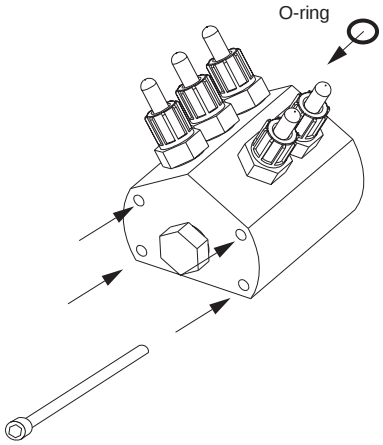
- Water
- Rinse air
- Cleaner
- Buffer 1
- Buffer 2

Proceed as follows to connect the rinse port adapter:

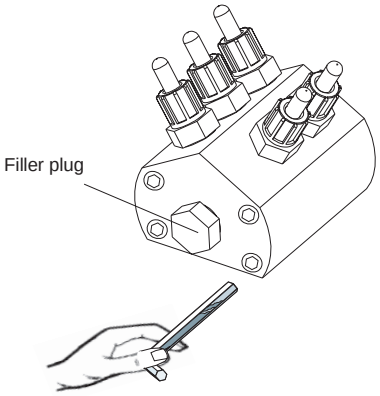
① Remove the plastic filler screws.



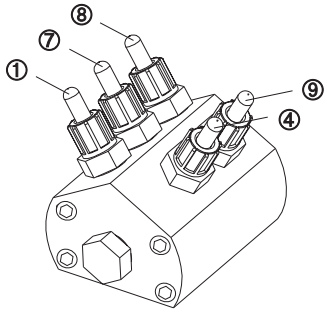
② Insert supplied socket-head cap screws in holes. Insert O-ring in recess.



③ Place the rinse port adapter on the assembly side marked “IN” and tighten the screws with a size 3 socket wrench.



④ Establish hose connections according to drawing.



① Water
④ Flushing air
⑦ Cleaner
⑧ Buffer 2
⑨ Buffer 1

PA463W13.CDR

Note:

- When the stopcock is opened or closed, there may be a brief overlap between the process medium and the outlet phase. An outlet valve (see Accessories in chapter 6) prevents medium from escaping through the outlet.
- The material of the inlet and outlet hoses connected to the rinse adapter must be resistant to the cleaning agent as well as the process medium.
- Keep unused connections closed up!

4 Operation

The electrode guide with the built-in pH/ redox electrode can be moved into the measuring position by hand or pneumatically and retracted into the service position for calibration, cleaning or electrode replacement.

In the service position, the assembly is sealed off from the process by the stopcock, permitting cleaning, calibration and electrode replacement to be performed in a simple manner and without interrupting the process.

The retractable assembly CPA 463-H is operated manually. The operation of the manually actuated assembly CPA 463-H is described in chapter 4.1.

The retractable assemblies CPA 463-R and CPA 463-A are remote-controlled pneumatically and are distinguished by the following features:

- The control logic assures the correct electrode guide and stopcock motion sequence.
- Two pneumatic signal outputs for the “measurement” and “service” positions are available for control or visual indication.

This greatly facilitates controlling the assembly. In essence, a pneumatic changeover switch is all that is needed. The control logic guarantees safe operation because the motion sequence is positively controlled.

The operation of the remote-controlled assemblies CPA 463-A / -R is described in chapter 4.2.

Warning:

Start-up with the assembly installed, i.e. opening of the stopcock, is only permissible when an electrode is installed.

4.1 Manual operation of CPA 463-H

The control elements stopcock, electrode guide handle, electrode guide and stopcock stop bolt can only be operated in turn. This eliminates any risk of operator error.

The operation of the CPA 463-H assembly is shown in the table below.

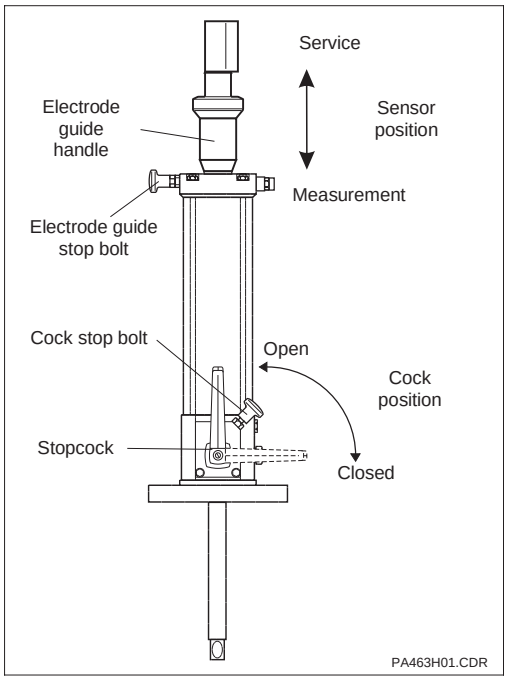


Fig. 4.1 Control elements of CPA 463-H

Position shown: 'measurement'

Manual operation of Probfit CPA 463-H			
Step seq.	**Sensor position**	**Measure**	**Cock position**
1	**Meas.**	Electrode guide stop bolt engaged (locked).	OPEN
2	–	Pull the electrode guide stop bolt, turn 90° and release.	OPEN
3	–	Pull out the electrode guide by the electrode guide handle.	OPEN
4	**Service**	Close the stopcock all the way by turning it clockwise. The stopcock stop bolt latches in.	CLOSED
5	-	Clean, flush, calibrate sensor (remove electrode for calibration if necessary).	CLOSED
6	–	Pull the stopcock stop bolt to release, open the stopcock all the way by turning it counterclockwise.	OPEN
7	**Meas.**	Push the electrode guide towards the medium.	OPEN
8	–	Pull the electrode guide stop bolt, turn 90° and release.	OPEN

Warning:

The electrode may only be replaced with the assembly in "service" position.

4.2 Pneumatic operation of CPA 463-R / CPA 463-A

The control and measuring systems Airtrol CPC 200/210 and Autoclean CPC 20 by Endress+Hauser permit fully automatic pH measurement in conjunction with retractable assemblies from the Probfit family.

The pneumatic actuation of the stopcock and electrode guide is positively controlled in the correct sequence. This is assured by the integrated control block. A simple pneumatic changeover switch (5/2-way valve) suffices to remote-control the assembly.

When using the manual operating unit Airtrol 500, operating the assembly merely requires an external compressed air connection and the hose connection to the assembly.

Refer to chapter 3.7 for the setup of a control system provided by the operator.

The pneumatic feedback signals can be evaluated by simple pressure switches.

The operation of the CPA 463-R / -A assemblies is described in the table below.

Pneumatic operation of Probfit CPA 463-R / CPA 463-A			
Step seq.	**Sensor position**	**Measure**	**Cock position**
1	**Meas.**	Control connection 2 (measurement) and pneumatic feedback “measurement” (connection 5) are supplied with compressed air.	OPEN
2	–	Compressed air is supplied to control connection 3 (connection 2 unpressurised) to move the electrode guide to the “service” position.	OPEN
3	–	The electrode guide moves back into the assembly.	OPEN
4	**Service**	The pneumatically operated stopcock closes automatically as soon as the electrode guide has been withdrawn all the way. Pneumatic feedback “service” (connection 6) is supplied with compressed air. To prevent medium from the process from entering the rinse chamber, sealing water can be supplied via the control unit.	CLOSED
5	–	Clean, flush, calibrate sensor (remove electrode for calibration if necessary).	CLOSED
6	–	Compressed air is supplied to control connection 2 (connection 3 is unpressurised) to move the electrode guide to the “measurement” position.	CLOSED
7	–	The pneumatically operated stopcock opens automatically.	OPEN
8	–	The electrode guide moves into the process.	OPEN
9	**Meas.**	Pneumatic feedback “measurement” (connection 5) is supplied with compressed air.	OPEN

.

5 Maintenance

Electrode soiling may impair measurement to such an extent that the electrode ceases to function at all, e.g. due to:

- coatings on the pH-sensitive part of the glass electrode → this causes poor response time and low sensitivity or slope.
- soiling or blocking of the diaphragm → this causes poor response and unstable measurement.

In order to guarantee reliable measurement, the electrodes must be cleaned regularly. The frequency and intensity of cleaning will depend on the type of medium to be measured.

5.1 Cleaning

The electrode is to be cleaned:

- before each calibration,
- at regular intervals during operation where necessary.

Cleaning can be performed manually by removing the electrode or via the rinse port adapter.

Note:

- Do not use any abrasive cleaning agents! These may result in irreparable damage to the measuring surface of the electrode.
- After cleaning, the rinse chamber is to be flushed with ample water (distilled or deionised as necessary). Traces of cleaning agent not removed may result in extremely inaccurate measurement.
- Always recalibrate the measuring system after cleaning.

Manual cleaning

All parts in contact with the medium, e.g. the electrode, electrode tube and protection guard, must be cleaned. Please note the following:

- Remove light soiling using a suitable cleaning solution.
- Use a soft brush and suitable cleaning solution to remove adhering dirt.
- Stubborn dirt must be dissolved by soaking in a cleaning fluid.

Cleaning via the rinse port adapter

Automatic cleaning is possible via the rinse port (see Accessories), e.g. with Autoclean CPC 20 or Airtrol CPC 200 / 210.

Selection of cleaning agents

The selection of cleaning agents will depend on the type of soiling. The types of soiling most frequently encountered and the appropriate cleaning agents are listed in the following table:

Type of soiling	Cleaning agent
Grease, oil	Detergents or water-soluble organic solvents (e.g. alcohol)
Limestone deposits or metal hydroxides	3% HCl
Sulphide deposits from precipitation reactions	Mixture of 3% HCl with 1% Titripex (EDTA)
Protein deposits (foodstuffs industry)	Mixture of 3% HCl and pepsin (saturated)
Fibres, suspended substances	Pressure water, possibly containing wetting agents
Thin biological coatings	Pressure water

Note:

Do not use solvents containing halogens for cleaning. These may destroy the plastic components of the assembly (e.g. the rinse block).

5.2 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.

The calibration cycles are 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.

Refer to the operating instructions of the measuring transmitter in question for the calibration procedure to be used.

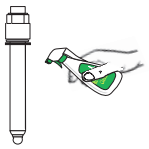
Calibration with the electrode removed

① Remove electrode from assembly by reversing steps 6 to 2 in chapter 3.5.

Warning:

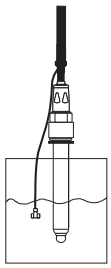
Remove electrode in unpressurised state only!

② Clean and dry the electrode, inspect for mechanical damage.

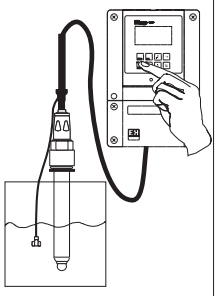


③ Screw the electrode connector back onto the electrode head.

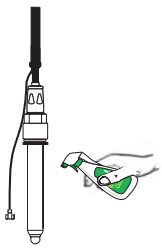
④ Immerse the electrode in buffer solution 1 (with or without PMC).



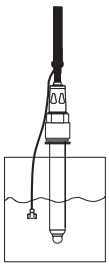
⑤ Select required settings on measuring instrument.



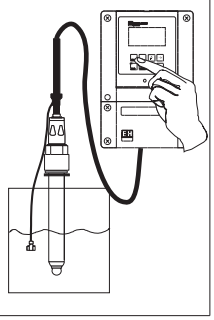
⑥ Rinse the electrode with distilled water.



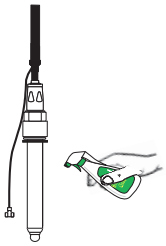
⑦ Immerse the electrode in buffer solution 2.



⑧ Select required settings on measuring instrument.



⑨ Rinse the electrode with distilled water.



⑩ Reinstall the electrode in the assembly by following steps 2 to 6 in chapter 3.5.

PA463W15.CDR

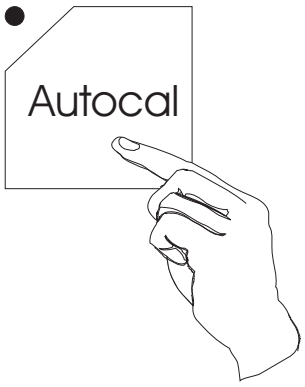
Note:

- The calibration cycles depend on the process conditions and the medium measured.
- In case of a symmetrical high-impedance connection, an electric connection between the potential matching connector (PMC) and the buffer solution is required.
- Do not leave the electrode in distilled water.
- The electrode should not remain dry any longer than necessary.

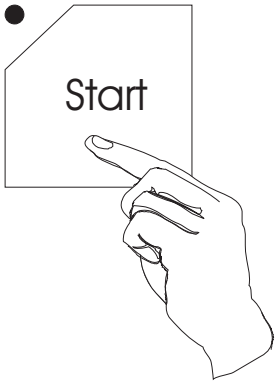
Calibration under process conditions

Cleaning and calibration is possible with the CPA 463-A variant (rinse port adapter). In the “service” position, the electrode is sealed off from the medium. Cleaning and calibration fluids are automatically supplied to that part of the electrode which is in contact with the medium via the rinse port.

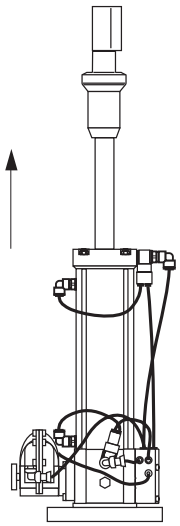
① Select “Autocal” via the keypad.



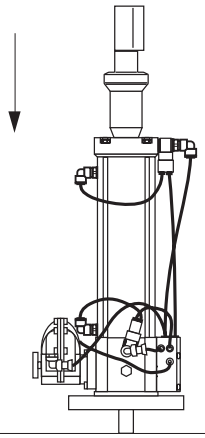
② Start the automatic calibration procedure.



③ The assembly automatically moves to the service position.



④ Following calibration, the assembly automatically returns to the measuring position.



PA463W21.CDR

Note:

- The calibration cycles depend on the process conditions and the medium measured.
- The outlet hose should form a ‘swan neck’ to prevent buffer solution from being sucked out of the rinse chamber (see chapter 3.4 Assembly installation).

5.3 Maintenance work

The retractable assembly Probfit CPA 463 requires very little maintenance. However, the following maintenance work is required to guarantee safe operation:

- Replace damaged assembly parts.
- Keep O-rings and sealing surfaces free of dirt.
- Grease dry O-rings.
- Inspect O-rings for damage regularly and replace at appropriate intervals.
- Replace adhering coatings from time to time.

Note:

To facilitate the maintenace work described above, detailed exploded views of the assembly in question can be obtained from Endress+ Hauser service personnel.

Warning:

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

6 Accessories and spare parts

The range of special accessories for the Probfit CPA 463 assemblies available from Endress+Hauser includes:

- Rinse port adapter
  Order no. 50092132
- Hose connection set
  for G 1/4 rinse connection
  Order no. 50090491
- Outlet valve
  Order no. 50053655
  (see chapter 6 for parts included and mounting information)
- Retraction safety lock
  Order no. 50051999
  (see chapter 6 for parts included and mounting information)
- Splash protection cap for liquid-filled electrodes Ceraliquid CPS 41
  Order no. 50080932
- Calibration solution CPY 2
- Measuring cable CPK 1, CPK 7 or CPK 9

pH / redox combination electrodes according to the following tables

pH combination electrodes, length 360 mm:

Electrode type/ order no.	Temperature	pH range
CPS 11-1AA5GSA	-15 ... 80 °C	1 ... 12
CPS 11-2AA5TSA	-15 ... 80 °C	1 ... 12
CPS 11-1AA5ESA	10 ... 130 °C	0 ... 14
CPS 11-2BA5GSA	10 ... 130 °C	0 ... 14
CPS 11-2BA5TSA	10 ... 130 °C	0 ... 14
CPS 11-2BA5 ESA	10 ... 130 °C	0 .. 14
CPS 41-2BB5TSS	10 ...130 °C	0 ... 14
CPS 41-2BB5ESS	10 ... 130 °C	0 ... 14

Redox combination electrode, length 360 mm:

Electrode type/ order no.	Temperature	pH range
CPS12-0PA5GSA	–15 ... 130 °C	0 ... 14
CPS12-0PA5ESA	–15 ... 130 °C	0 ... 14

The following spare parts can be ordered:

- Protection guard
  Order no. 50048071
- Gasket set for side of piston not in contact with medium
  Order no. 50052451
- Gasket sets for side of piston in contact with medium

Gasket material	Order no.
EPDM	50052452
Viton	50052453
Chemraz	50090512
Fluoraz	50052454

The following equipment is available from Endress+Hauser to control the retractable assembly and for automated cleaning / calibration:

- Autoclean CPC 20
  Automatic cleaning control for retractable Probfit assemblies. Control cabinet with pneumatic valves, switches for position feedback, terminal strip for status signals. Protection type IP 54.
  Technical Information TI 161C/07/en
  Order no. 50089137
- Airtrol CPC 200 / 210
  Operating unit and pneumatic unit for fully automatic calibration, cleaning and quick checking of pH measurement. Protection type IP 54.
  Technical Information TI 095C/07/en
  Order no. 50061485
- Airtrol 500
  Manual operating unit for control of retractable Probfit assemblies
  Technical Information TI 038C/07/en
  Order no. 50059401
- Mycom CPM 152
  pH/redox field transmitter. Integrated electrode function monitoring, alpha value compensation, calibration messages, history storage, menu guidance and communication display. Protection type IP 65.
  Technical Infomation TI 143C/07/en
  Order no. 50077399

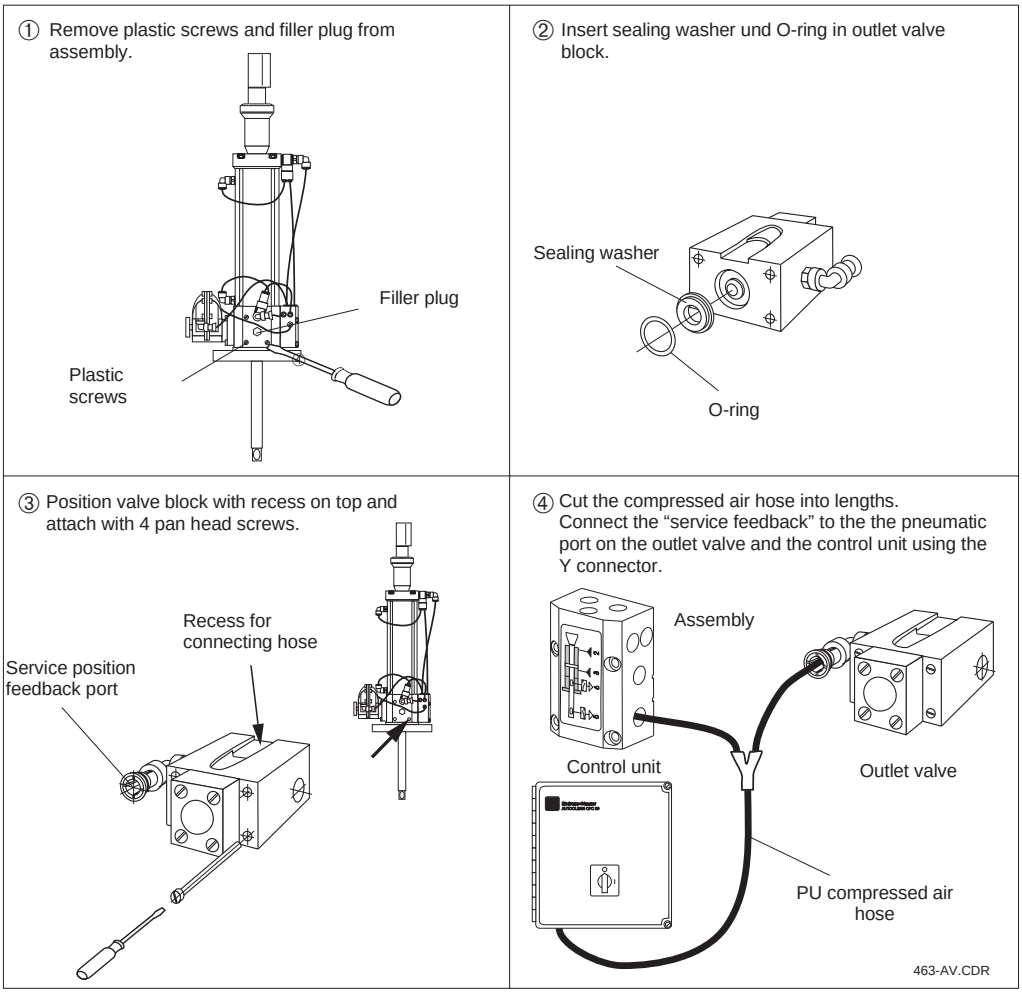
6.1 Outlet valve

The outlet valve is used in pressurised systems to prevent medium from being expelled when the assembly moves from the measuring to the service position.

Parts included in delivery

- 1 outlet valve
- 4 M4 x 55 pan head screws with washers
- 1 O-ring
- 1 sealing washer
- 1 Y connector for hose OD6/ID4
- 1 PU compressed air hose OD6/ID4

Installation of outlet valve



Technical data of outlet valve (50053655)

Physical data	Dimensions	35 mm x 55 mm x 65 mm
	Weight	180 g

Materials	Housing	PP
	Valve plunger	PVDF
	Sealing washer	PTFE
	O-rings	EPDM

Operating data	Temperature continuous duty max.	80 °C 100 °C
	Compressed air	3 ... 6 bar
	Compressed air connection	ID4 / OD6

Subject to modifications.

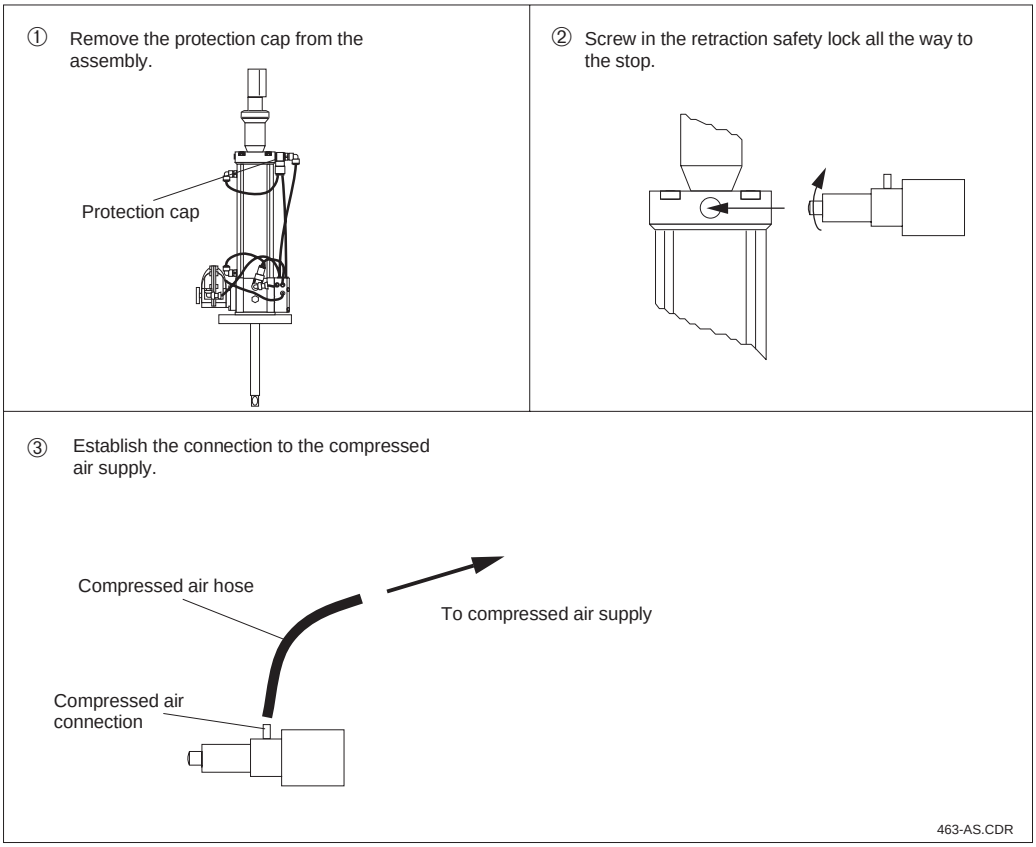
6.2 Retraction safety lock

When the compressed air supply fails, the retraction safety lock stop bolt moves into the groove in the electrode guide, thereby preventing the pH electrode from moving out of the medium when exposed to high medium pressures.

Parts included in delivery

1 retraction safety lock

Installation of retraction safety lock



Technical data of retraction safety lock (50051999)

Physical data	Dimensions	78 mm x ∅ 25 mm
	Weight	130 g
Materials	Housing	stainless steel 1.4571
	Locking piston	stainless steel 1.4571
	O-rings	EPDM
Operating data	Compressed air	3 ... 6 bar
	Compressed air connection	ID4 / OD6

Subject to modifications.

7 Technical data

General specifications

Manufacturer	Endress+Hauser
Designation	Probfit CPA 463

Installation

Immersion depth *	90 mm, 190 mm
Required mounting clearance	min. 1 m
No. of electrode positions in holder	1 position for pH combination electrode
Electrode length *	360 mm
Electrode plug-in head	Pg 13.5

Mounting

Flange version 1	4-hole flange DN50/PN10 acc. to DIN 2501
Flange version 2	ANSI 2" flange, 150 lbs

Process connections

Rinse port for CPA 463-A	inlet G 1/4, outlet G 1/4
Rinse adapter ports	5 hose connections OD6 / ID4
Compressed air connection	4 hose connections OD6 / ID4

Weight

PVC version	3.5 kg / 5 kg
PVDF version	3.5 kg / 5 kg
SS 316Ti version	5.5 kg / 8 kg

Materials in contact with medium

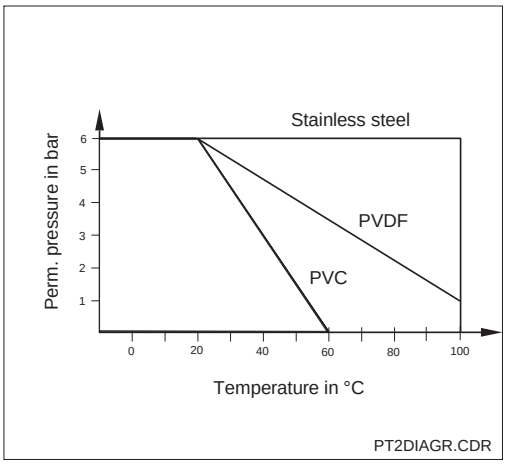
CPA 463-H / -R / -A versions:	**PVC**	**PVDF**	**SS 316Ti**
Pneumatic cylinder	PVC	PVC	PVC-C
Housing	PVC	PVDF	PVDF
Stopcock plug	PVC	PVDF	PVDF
Electrode guide and flanged sleeve	PVC	PVDF	SS 316Ti
Flange	PVC	UP-GF	SS 316Ti
Seals	EPDM, Viton, Chemraz, Fluoraz		

Operating data

CPA 463-H PVC PVDF SS 316Ti	**Pressure / temperature:** 3 bar / 20 °C; 0 bar / 60 °C 3 bar / 20 °C; 1 bar / 100 °C 3 bar / 100 °C
CPA 463-R / -A PVC PVDF SS 316Ti	**Pressure / temperature:** 6 bar / 20 °C; 0 bar / 60 °C 6 bar / 20 °C; 1 bar / 100 °C 6 bar / 100 °C
Compressed air	3 ... 6 bar
Compressed air quality	filtered (5 µm), water-free, oil-free

* Immersion depth of 190 mm does not permit installation of Ceraliquid electrode (CPS 41 / CPS 42).

Subject to modifications.



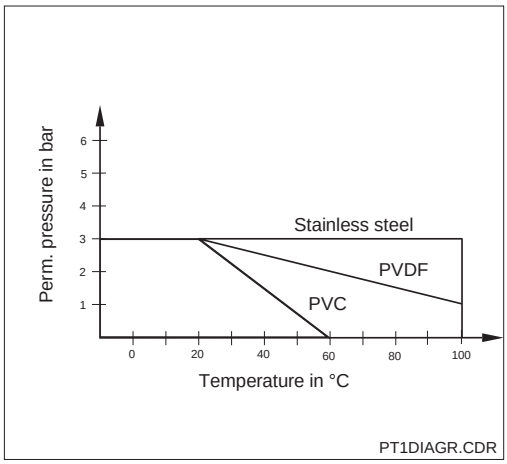


Bild 7.1 Pressure/temperature diagram

Left:
CPA 463-R / -A versions

Right:
CPA 463-H version

Note:

The operating limits of the total system are determined by the operating limits of the components used (assembly, electrode, cable, accessories, etc.).

8 Index

A
Accessories 23-25
Actuation 3
Air supply failure 13
Airtrol 500 . . . . . 18, 23
Airtrol CPC 200/210 . . . . . 6, 18, 23
ANSI flange 3
Assembly 6
Assembly installation 8
Assembly parts 7
Assembly variant 3
Asymmetrical connection 12
Autoclean CPC 20 . . . . . 6, 18, 23

B
Buffer solution 6, 20

C
Calibration 20
Calibration cycles 20
Calibration solution CPY 2 23
Ceraliquid electrodes 10-11, 23, 26
Clamping ring 10-11
Cleaning 19
Cleaning agents 19
Cleaning cycles 19
Cleaning, automatic 19
Cleaning, manual 19
Compressed air connection 6, 26
Compressed air supply 13
Connecting hoses 6
Control block 18
Control connections 13
Control diagram 13
Control elements of CPA 463-H 17
Control logic 16
Control signals 13
Control states 13

D
Damage 2
Delivery, completeness 2
Dimensions 7
DIN flange 3
Disposal 2

E
Electrode 10-11, 23
Electrode connector 10-11
Electrode guide 10, 16-17
Electrode installation 10
Electrode length 26
Electrode replacement 10-11

F
Feedback connections 13
Feedback signals 13, 18
Flange 26
Flushing 15
Flushing adapter 8

G
Gasket sets 23
General information 2-3
General safety notes 4

H
Hazards 2
Hose connection 18
Hose connection set 23

I
Immersion depth 3, 9, 26
Installation 4-15
Installation angle 9
Intended application 4

L
Loose flange 7-8

M
Maintenance 19-22
Maintenance work 22
Manual operating unit Airtrol 500 18
Manual operation 17
Materials 3, 26
Measuring cable connection 12
Measuring cable CPK 1 . . . . . 6, 12
Measuring cable CPK 7 . . . . . 6, 12
Measuring cable CPK 9 . . . . . 6, 12
Measuring system 6
Mounting 26
Mounting examples 8
Mycom CPM 152 23

N
Nameplate 3

O
O-rings 3, 10-11, 22
Operating data 26
Operating limits 27
Operation 4, 16-18
Operator error 17
Orbisint electrodes 23
Order code 3
Outlet valve 14, 23
Overlap 15

P
Packaging 2
pH combination electrodes CPS 11, CPS 41 23
PM cable 10-11
PM connector 10-11
Pneumatic actuator 7
Pneumatic connections 13
Pneumatic control 7
Pneumatic operation 18
Potential matching 11, 20
Pressure switch 13, 18
Pressurised systems 4-5
Probfit CPA 463 6
Problems 4
Process connection 3, 26
Process pressure 14
Product structure 3
Protection guard 7, 23
Protective sleeve 7, 11

R
Redox combination electrode CPS 12 23
Regulations 4
Regulations for installation 4
Repairs 4
Retraction safety lock 13, 23
Rinse port 7, 14, 26
Rinse port adapter 19, 23
Rinse water connection 14
Rinsing 15

S
Safety 4-5
Safety devices 5
Safety features 5
Sealing water connection 14
Sealing water function 14, 18
Sealing water pressure 14
Service position 10
Soiling 19
Spare parts 23-25
Splash protection cap 7, 10-11
Start-up 4, 16
Stop bolt 17
Stopcock 7, 17
Storage 2
Support sleeve 7
Symbols 2
Symbols used 2
Symmetrical connection 12

T
Technical data 26-27
Temperature sensor 12
Transport 2
Troubleshooting 4

U
Unpacking 2

V
Variant 3

W
Water connection 6
Weight 26

Europe

Austria
❏ Endress+Hauser Ges.m.b.H.
Wien
Tel. ++43 (1) 880 56-0, Fax (1) 880 56-35

Belarus
Belorgsintez
Minsk
Tel. ++375 (172) 26 31 66, Fax (172) 26 31 11

Belgium / Luxembourg
❏ Endress+Hauser S.A./N.V.
Brussels
Tel. ++32 (2) 248 06 00, Fax (2) 248 05 53

Bulgaria
INTERTECH-AUTOMATION
Sofia
Tel. ++359 (2) 66 48 69, Fax (2) 963 13 89

Croatia
❏ Endress+Hauser GmbH+Co.
Zagreb
Tel. ++385 (1) 663 77 85, Fax (1) 663 78 23

Cyprus
I+G Electrical Services Co. Ltd.
Nicosia
Tel. ++357 (2) 48 47 88, Fax (2) 48 46 90

Czech Republic
❏ Endress+Hauser GmbH+Co.
Praha
Tel. ++420 (26) 6 78 42 00, Fax (26) 6 78 41 79

Denmark
❏ Endress+Hauser A/S
Søborg
Tel. ++45 (70) 13 11 32, Fax (70) 13 21 33

Estonia
Elvi-Aqua
Tartu
Tel. ++372 (7) 42 27 26, Fax (7) 42 27 27

Finland
❏ Endress+Hauser Oy
Espoo
Tel. ++358 (9) 8 59 61 55, Fax (9) 8 59 60 55

France
❏ Endress+Hauser
Huningue
Tel. ++33 (3) 89 69 67 68, Fax (3) 89 69 48 02

Germany
❏ Endress+Hauser Meßtechnik GmbH+Co.
Weil am Rhein
Tel. ++49 (7621) 9 75 01, Fax (7621) 9 75 55 55

Great Britain
❏ Endress+Hauser Ltd.
Manchester
Tel. ++44 (161) 286 50 00,
Fax (161) 998 18 41

Greece
I & G Building Services Automation S.A.
Athens
Tel. ++30 (1) 924 15 00, Fax (1) 922 17 14

Hungary
Mile Ipari-Elektro
Budapest
Tel. ++36 (1) 261 55 35, Fax (1) 261 55 35

Iceland
Vatnshreinsun HF
Reykjavik
Tel. ++354 (5) 61 96 16, Fax (5) 61 96 17

Ireland
Flomeaco Company Ltd.
Kildare
Tel. ++353 (45) 86 86 15, Fax (45) 86 81 82

Italy
❏ Endress+Hauser Italia S.p.A.
Cernusco s/N Milano
Tel. ++39 (02) 92 10 64 21,
Fax (02) 92 10 71 53

Latvia
Raita Ltd.
Riga
Tel. ++371 (7) 31 28 97, Fax (7) 31 28 94

Lithuania
Agava Ltd.
Kaunas
Tel. ++370 (7) 20 24 10, Fax (7) 20 74 14

Netherlands
❏ Endress+Hauser B.V.
Naarden
Tel. ++31 (35) 695 86 11, Fax (35) 695 88 25

Norway
❏ Endress+Hauser A/S
Tranby
Tel. ++47 (32) 85 98 50, Fax (32) 85 98 51

Poland
❏ Endress+Hauser Polska Sp. z o.o.
Warszawy
Tel. ++48 (22) 7 20 10 90, Fax (22) 7 20 10 85

Portugal
Tecnisis - Tecnica de Sistemas Industriais
Linda-a-Velha
Tel. ++351 (1) 4 17 26 37, Fax (1) 4 18 52 78

Romania
Romconseng SRL
Bucharest
Tel. ++40 (1) 4 10 16 34, Fax (1) 4 10 16 34

Russia
❏ Endress+Hauser Moscow Office
Moscow
Tel.++7 09 (5) 1 58 75 71, Fax (5) 1 58 98 64

Slovak Republic
Transcom Technik s.r.o.
Bratislava
Tel. ++421 (74) 4 88 86 84, Fax (74) 4 88 71 12

Slovenia
❏ Endress+Hauser D.O.O.
Ljubljana
Tel. ++386 (61) 1 59 22 17, Fax (61) 1 59 22 98

Spain
❏ Endress+Hauser S.A.
Barcelona
Tel. ++34 (93) 4 80 33 66, Fax (93) 4 73 38 39

Sweden
❏ Endress+Hauser AB
Sollentuna
Tel. ++46 (8) 55 51 16 00, Fax (8) 55 51 16 00

Switzerland
❏ Endress+Hauser AG
Reinach/BL 1
Tel. ++41 (61) 7 15 75 75, Fax (61) 7 11 16 50

Turkey
Intek Endüstriyel Ölcü ve Kontrol Sistemleri
Istanbul
Tel. ++90 (212) 2 75 13 55,
Fax (212) 2 66 27 75

Ukraine
Industria Ukraïna
Kiev
Tel. ++380 (44) 2 68 81, Fax (44) 2 69 08

Yugoslavia
Meris d.o.o.
Beograd
Tel. ++381 (11) 4 44 61 64, Fax (11) 4 44 19 66

Africa

Egypt
Anasia
Heliopolis/Cairo
Tel. ++20 (2) 4 17 90 0, Fax (2) 4 17 90 0

Morocco
Oussama S.A.
Casablanca
Tel. ++212 (2) 24 13 38, Fax (2) 40 26 57

Nigeria
J F Technical Invest. Nig. Ltd.
Lagos
Tel. ++234 (1) 62 23 45 46, Fax (1) 62 23 45 48

South Africa
❏ Endress+Hauser Pty. Ltd.
Sandton
Tel. ++27 (11) 4 44 13 86, Fax (11) 4 44 19 77

Tunisia
Controle, Maintenance et Regulation
Tunis
Tel. ++216 (1) 79 30 77, Fax (1) 78 85 95

America

Argentina
❏ Endress+Hauser Argentina S.A.
Buenos Aires
Tel. ++54 (1) 1 45 22 79 70,
Fax (1) 1 45 22 79 09

Bolivia
Tritec S.R.L.
Cochabamba
Tel. ++591 (42) 5 69 93, Fax (42) 5 09 81

Brazil
❏ Samson Endress+Hauser Ltda.
Sao Paulo
Tel. ++55 (11) 5 03 13 455,
Fax (11) 5 03 13 067

Canada
❏ Endress+Hauser Ltd.
Burlington, Ontario
Tel. ++1 (905) 6 81 92 92,
Fax (905) 6 81 94 44

Chile
DIN Instrumentos Ltda.
Santiago
Tel. ++56 (2) 2 05 01 00, Fax (2) 2 25 81 39

Colombia
Colsein Ltd.
Bogota D.C.
Tel. ++57 (1) 2 36 76 59, Fax (1) 6 10 78 68

Costa Rica
EURO-TEC S.A.
San Jose
Tel. ++506 (2) 96 15 42, Fax (2) 96 15 42

Ecuador
Insetec Cia. Ltda.
Quito
Tel. ++593 (2) 26 91 48, Fax (02) 46 18 33

Guatemala
ACISA Automatizacion Y Control Industrial S.A.
Ciudad de Guatemala, C.A.
Tel. ++502 (3) 34 59 85, Fax (2) 32 74 31

Mexico
❏ Endress+Hauser I.I.
Mexico City
Tel. ++52 (5) 56 89 65, Fax (5) 56 84 18

Paraguay
Incoel S.R.L.
Asuncion
Tel. ++595 (21) 21 39 89, Fax (21) 22 65 83

Uruguay
Circular S.A.
Montevideo
Tel. ++598 (2) 92 57 85, Fax (2) 92 91 51

USA
❏ Endress+Hauser Inc.
Greenwood, Indiana
Tel. ++1 (317) 5 35 71 38,
Fax (317) 5 35 84 89

Venezuela
H. Z. Instrumentos C.A.
Caracas
Tel. ++58 (2) 9 44 09 66, Fax (2) 9 44 45 54

Asia

China
❏ Endress+Hauser Shanghai
Instrumentation Co. Ltd.
Shanghai
Tel. ++86 (21) 54 90 23 00,
Fax (21) 54 90 23 03

❏ Endress+Hauser Beijing Office
Beijing
Tel. ++86 (10) 68 34 40 58,
Fax (10) 68 34 40 68

❏ Endress+Hauser (H.K.) Ltd.
Hong Kong
Tel. ++852 (2) 5 28 31 20, Fax (2) 8 65 41 71

India
❏ Endress+Hauser India Branch Office
Mumbai
Tel. ++91 (22) 8 52 14 58, Fax (22) 8 52 19 27

Indonesia
PT Grama Bazita
Jakarta
Tel. ++62 (21) 7 97 50 83, Fax (21) 7 97 50 89

Japan
❏ Sakura Endress Co., Ltd.
Tokyo
Tel. ++81 (422) 54 06 11, Fax (422) 55 02 75

Malaysia
❏ Endress+Hauser (M) Sdn. Bhd.
Petaling Jaya, Selangor Darul Ehsan
Tel. ++60 (3) 733 48 48, Fax (3) 733 88 00

Pakistan
Speedy Automation
Karachi
Tel. ++92 (21) 7 72 29 53, Fax (21) 7 73 68 84

Papua New Guinea
SBS Electrical Pty Limited
Port Moresby
Tel. ++675 (3) 25 11 88, Fax (3) 25 95 56

Philippines
Brenton Industries Inc.
Makati Metro Manila
Tel. ++63 (2) 638 80 41, Fax (2) 638 80 42

Singapore
❏ Endress+Hauser (S.E.A.) Pte., Ltd.
Singapore
Tel.++65 (5) 66 82 22, Fax (2) 66 68 48

South Korea
❏ Endress+Hauser (Korea) Co., Ltd.
Seoul
Tel. ++82 (2) 6 58 72 00, Fax (2) 6 59 28 38

Taiwan
Kingjarl Corporation
Taipei R.O.C.
Tel. ++886 (2) 27 18 39 38, Fax (2) 27 13 41 90

Thailand
❏ Endress+Hauser Ltd.
Bangkok
Tel. ++66 (2) 9 96 78 11 20, Fax (2) 9 96 78 10

Vietnam
Tan Viet Bao Co. Ltd.
Ho Chi Minh City
Tel. ++84 (8) 8 33 52 25, Fax (8) 8 33 52 27

Iran
Telephone Technical Services Co. Ltd.
Tehran
Tel. ++98 (21) 8 74 67 50, Fax (21) 8 73 72 95

Israel
Instrumetrics Industrial Control Ltd.
Tel-Aviv
Tel. ++972 (3) 6 48 02 05, Fax (3) 6 47 19 92

Jordan
A.P. Parpas Engineering S.A.
Amman
Tel. ++962 (6) 4 64 32 46, Fax (6) 4 64 57 07

Kingdom of Saudi Arabia
Anasia
Jeddah
Tel. ++966 (2) 6 71 00 14, Fax (2) 6 72 59 29

Kuwait
Kuwait Maritime & Mercantile Co. K.S.C.
Safat
Tel.++965 (2) 44 14 81, Fax (2) 44 14 86

Lebanon
Nabil Ibrahim
Jbeil
Tel. ++961 (3) 25 40 52, Fax (9) 54 80 38

Sultanate of Oman
Mustafa & Jawad Science & Industry Co.
L.L.C.
Ruwi
Tel. ++968 (60) 20 09, Fax (60) 70 66

United Arab Emirates
Descon Trading EST.
Dubai
Tel. ++971 (4) 65 36 51, Fax (4) 65 32 64

Yemen
Yemen Company for Ghee and Soap Industry
Taiz
Tel. ++976 (4) 23 06 64, Fax (4) 21 23 38

Australia + New Zealand

Australia
ALSTOM Australia Ltd.
Sydney
Tel. ++61 (2) 97 22 47 77, Fax (2) 97 22 48 88

New Zealand
EMC Industrial Instrumentation
Auckland
Tel. ++64 (9) 4 15 51 10, Fax (9) 4 15 51 15

All other countries

❏ Endress+Hauser GmbH+Co.
Instruments International
D-Weil am Rhein
Germany
Tel. ++49 (7621) 9 75 02, Fax (7621) 9 75 345

❏ Members of the Endress+Hauser group

50045842

Endress+Hauser
The Power of Know How

BA 007C/07/en/10.99
Printed in Germany / CV5 / DT