

# CleanFit P CPA 477

## Retractable Assembly for pH/Redox Measurement

### Rugged retractable Assembly for Installation of pH/ORP Electrodes in Tanks or Pipelines



This retractable assembly permits automatic cleaning, calibration and replacement of the electrode while the tank is full or under process conditions with pressures of up to 6 bar.

#### Areas of application

- Paper industry, chemical industry, waste water treatment
- Tanks and process vats
- Pipelines or pipes

#### Benefits at a glance

- Extremely rugged industrial assembly
- Electrode can be cleaned and calibrated without interrupting the process
- Extended electrode service life
- Reliable separation from process by ball valve without dead space
- Simple removal and installation of sensor during ongoing process
- Electrode is automatically kept wet
- With replaceable electrode holder for gel and liquid KCl electrodes
- Fully automatable

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## Area of application

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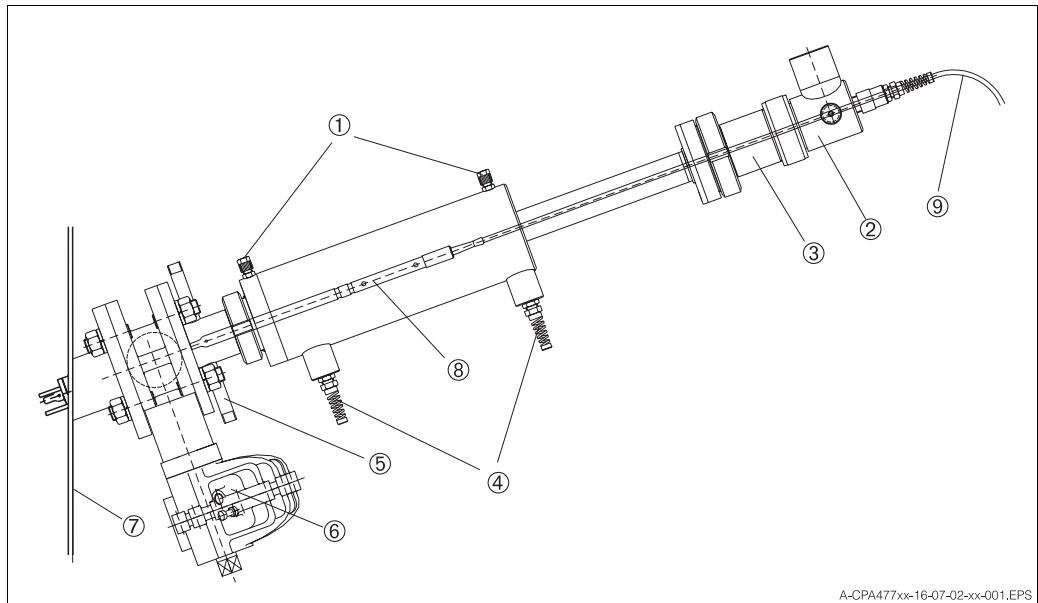
The retractable assembly CleanFit P CPA 477 has been designed specifically for pH measurement in the chemical industry, the paper industry (in backwater and low-density bleaching) and for effluent treatment stations or the foodstuffs industry. Without having to interrupt the process, the electrode can be

- separated from the process and moved to a rinse chamber pneumatically via a ball valve;
- rinsed with water or cleaning solution;
- kept moist during interruptions in operation;
- removed;
- sterilised; or
- calibrated.

The replaceable measuring insert in a pressure-resistant enclosure guarantees easy calibration and electrode replacement and prevents leakage in the event of electrode breakage.

## Function and construction

### Function



Retractable assembly CleanFit P CPA 477

- |   |   |
|---|---|
| 1 | Compressed air connections for cylinder control |
| 2 | Pressure head                                   |
| 3 | KCl reservoir                                   |
| 4 | Limit switches                                  |
| 5 | Rinse fitting                                   |
| 6 | Ball valve drive                                |
| 7 | Tank wall                                       |
| 8 | Measuring electrode (pressurised, flooded)      |
| 9 | pH cable  |

## Auxiliary energy / connections

(if equipped accordingly)

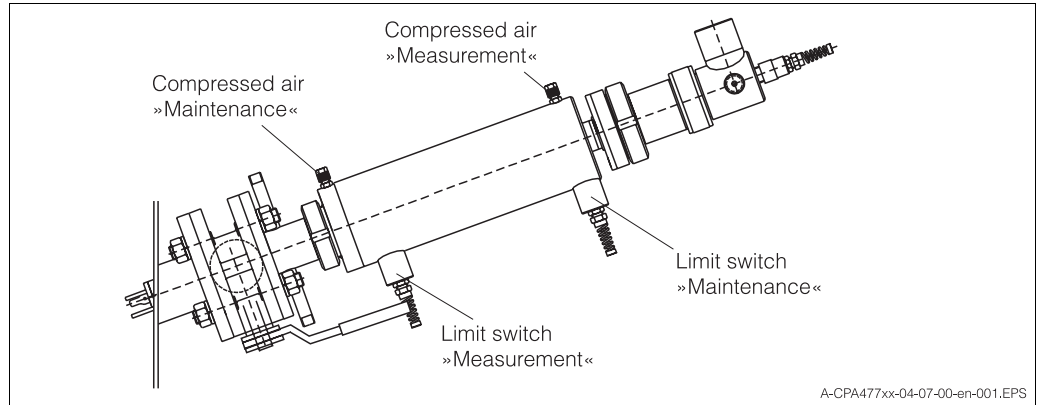
The CleanFit P CPA 477 assembly is operated with an air pressure of 4 to 8 bar. The air must be filtered (40 µm) and free from water and oil. There is no continuous pressure demand. The air lines must have a minimum nominal diameter of 4 mm.



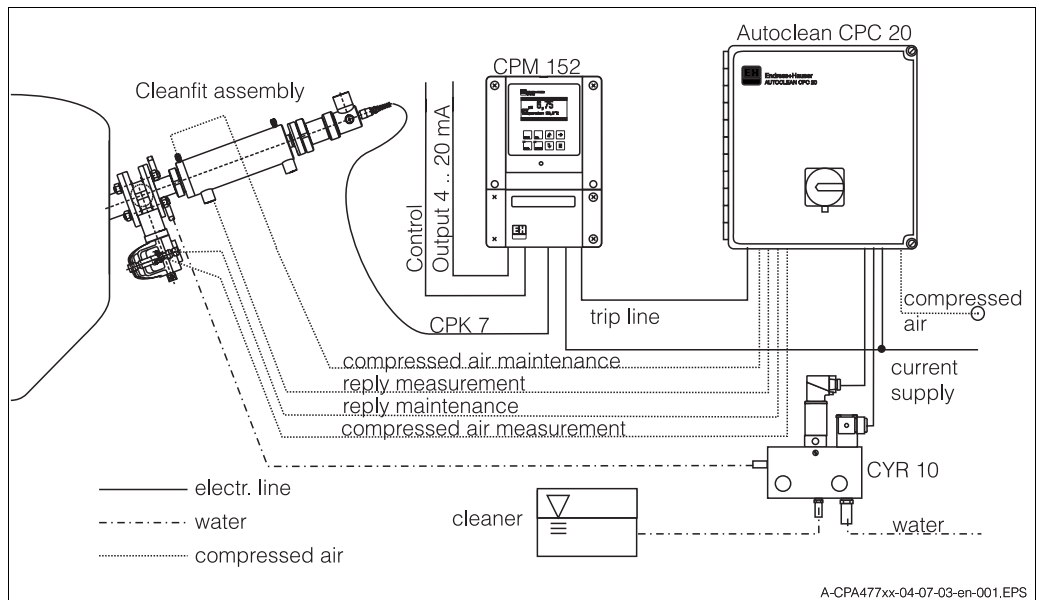
Note:

If pressure increases to above 8 bar are possible (including short peak pressures), a pressure reducer must be installed.

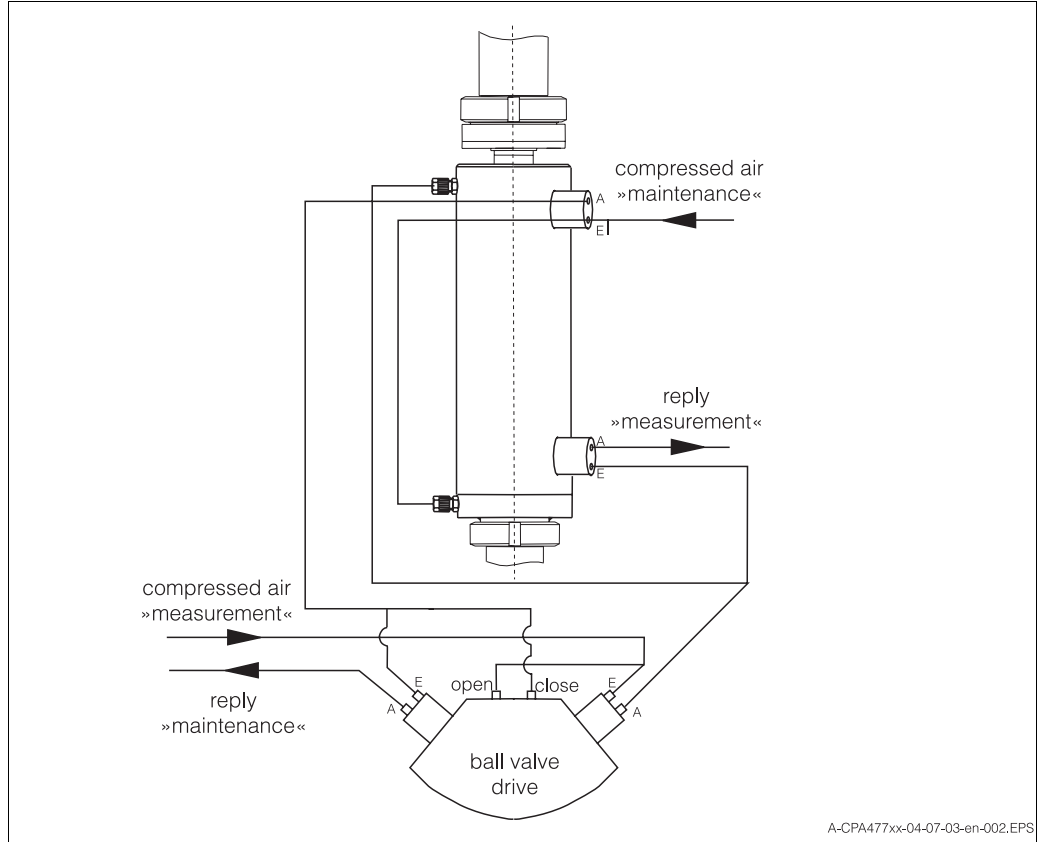
### Auxiliary energy connections for manually actuated assembly



### Auxiliary energy connections for assembly with pneumatic ball drive



Overview over the connections to the CleanFit P assembly CPA 477 with force controlled drive

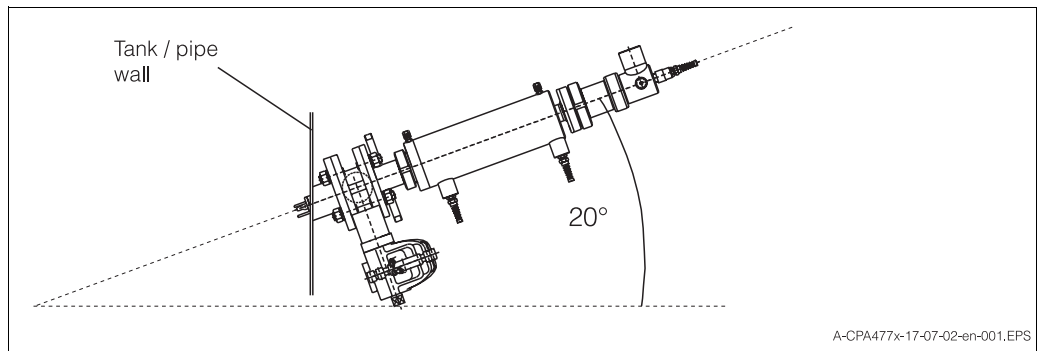


*pneumatic connections to the CleanFit P assembly CPA 477 with force controlled drive*  
 E: input  
 A: output

## Operating conditions (installation)

### Place of installation

The CleanFit P CPA 477 assembly is suitable for mounting on tanks or pipelines. The installation angle from the horizontal should be at least 20°.



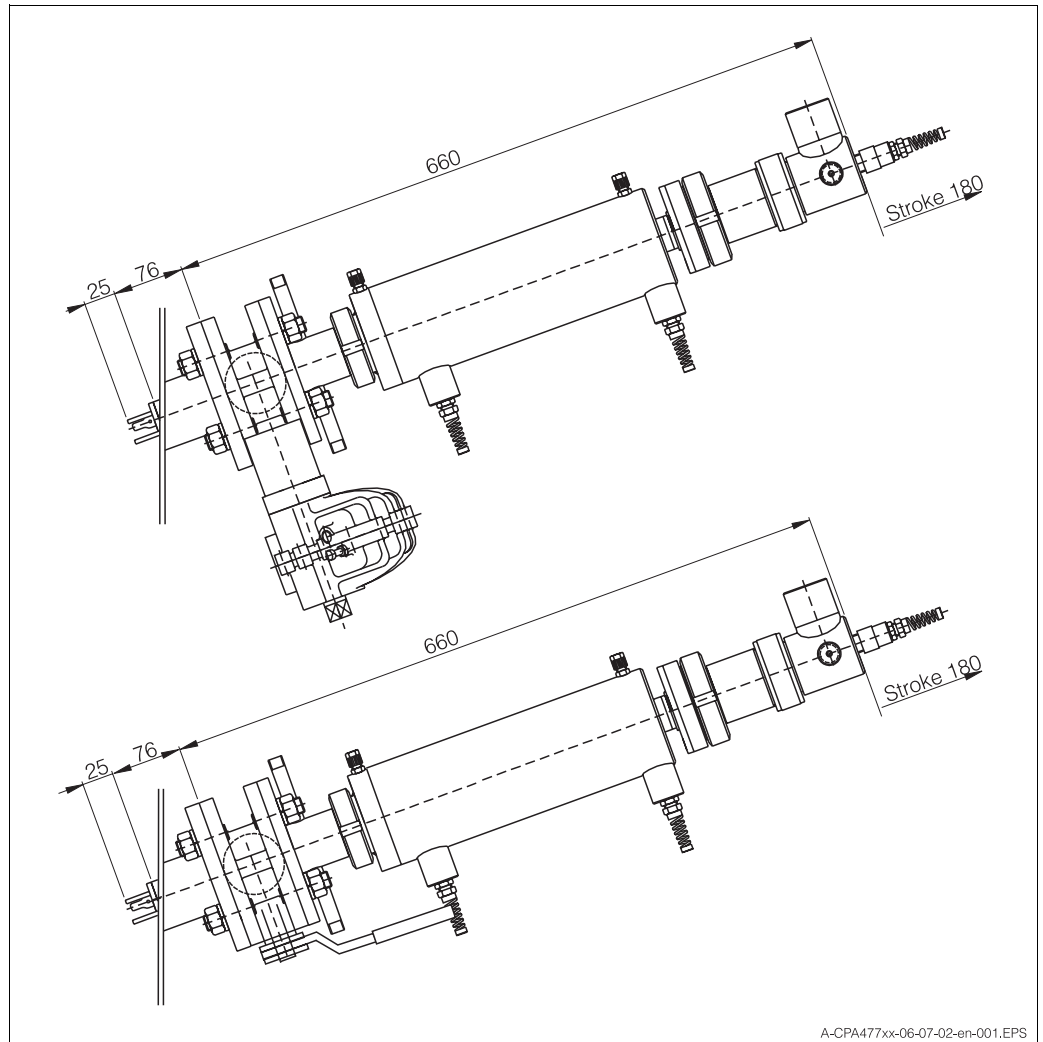
## Operating conditions (process)

**Process temperature range** 5 °C ... 90 °C

**Process pressure** 0 ... 6 bar

## Design

### Design, dimensions



A-CPA477xx-06-07-02-en-001.EPS

Top: CleanFit P CPA 477 with pneumatic ball valve drive in measuring position

Bottom: CleanFit P CPA 477 with manually actuated ball valve in measuring position



**Note:**

A minimum clearance of 1,510 mm for installation is to be assured when designing the measuring point!

#### Materials in contact with medium

|                   |                           |
|-------------------|---------------------------|
| Rinse chamber:    | stainless steel 316Ti     |
| Ball valve:       | stainless steel 316Ti     |
| Electrode holder: | stainless steel 316Ti     |
| Seals:            | VITON <sup>®</sup> , EPDM |

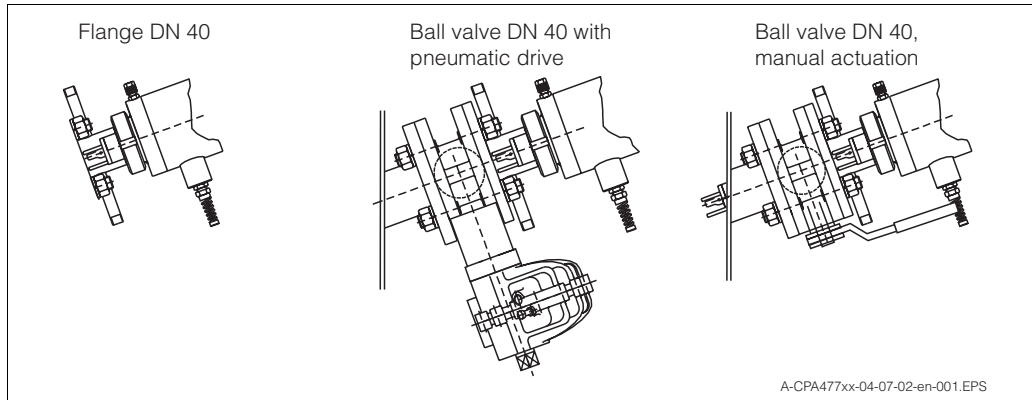
#### Materials not in contact with medium

|                       |                 |
|-----------------------|-----------------|
| Housing:              | PA              |
| KCl electrode holder: | PVDF            |
| Gel electrode holder: | stainless steel |

#### Rinse connections

|  |  |
|--|--|
| For rinse water:                       | 1 x G ¼ and 1 x G ½ external thread<br>1 x NPT ¼" and 1 x NPT ½" external thread |
| For rinse water and cleaning solution: | 2 x G ¼ and 1 x G ½ external thread<br>2 x NPT ¼" and 1 x NPT ½" external thread |

|   |  |
|---|--|
| <b>Pneumatic connections / requirements</b> | 2 compressed air connections on the electrode positioning cylinder<br>2 compressed air connections on the ball valve actuator<br>1 compressed air connection on the pressure head (for pressurisation of KCl electrode)<br>Pressure 4 ... 7 bar (pressure on pressure head must be at least 0.5 bar above process pressure)<br>Air must be water-free and oil-free |
| <b>Limit switches</b>                       | 2 electric limit switches<br>2 pneumatic limit switches  |
| <b>Rinse medium</b>                         | Warm water (approx. 60 °C or above)<br>Min. 2 bar, max. 6 bar  |
| <b>Cleaning medium</b>                      | To be selected depending on type and degree of soiling   |
| <b>Weight</b>                               | 21,5 kg (with pneumatic drive)   |
| <b>Electrodes</b>                           | Gel electrode 120 mm<br>Special pressurised KCl electrode, 270 mm  |
| <b>Process connection</b>                   | Flange DN 40 (ball valve to be provided by the customer),<br>ball valve DN 40 with manual actuation, pneumatic ball valve DN 40  |



## Certificates and approvals

|                    |   |
|--------------------|---|
| <b>Ex approval</b> | The electric limit switches are protection type EEx ia IIC T1 / T2 / T3 / T4 / T5 / T6<br>(approval number: PTB no. Ex - 83 / 2023 X)                         |
| <b>CE mark</b>     | The measuring system fulfills the stipulations of the EC directives. Endress+Hauser certifies successful testing of the device by application of the CE mark. |



## Product overview

### Product overview for CleanFit P CPA 477

| Drive type assembly / limit switches |   |
|--------------------------------------|---|
| B                                    | Pneumatic without limit switches (suitable for retrofitting)  |
| C                                    | Pneumatic with 2 pneumatic limit switches   |
| D                                    | Pneumatic with 2 electric limit switches  |
| Y                                    | Special version to customer specifications  |
| Electrode holder                     |   |
| A                                    | Stainless steel 316Ti, for gel electrodes with Pg 13.5 (length 120 mm)  |
| B                                    | PVDF, for special pressurised KCl electrodes (length 270 mm)  |
| Y                                    | Special version to customer specifications  |
| Assembly material                    |   |
| A                                    | in contact with medium stainless steel 316Ti; housing PA  |
| Y                                    | Special version to customer specifications  |
| Seal material                        |   |
| 1                                    | EPDM  |
| 2                                    | VITON®  |
| 9                                    | Special version to customer specifications  |
| Process connection / Shut off        |   |
| A                                    | Flange DN 40<br>(ball valve to be provided by the customer)   |
| B                                    | Ball valve 1.4401 / 1.4408 DN 40 flange with manual actuation   |
| C                                    | Pneumatic ball valve 1.4401 / 1.4408 DN 40 flange with pneumatic forced control<br>(only drive type/limit switches version C) |
| Y                                    | Special version to customer specifications  |
| Optional equipment                   |   |
| 2                                    | With rinse fitting 1 x G ¼ and 1 x G ½ external thread  |
| 3                                    | With rinse fitting 2 x G ¼ and 1 x G ½ external thread  |
| 4                                    | With rinse fitting 1 x NPT ¼" and 1 x NPT ½" external thread  |
| 5                                    | With rinse fitting 2 x NPT ¼" and 1 x NPT ½" external thread  |
| 9                                    | Special version to customer specifications  |
| CPA 477-                             | complete order code   |

## Accessories

|   |  |
|---|--|
| <b>Welding socket</b>                       | DN 40 flange, stainless steel 316Ti; order no.: 51502935   |
| <b>Calibration vessel</b>                   | PP holder and plexiglass calibration vessel for electrode holder; order no.: 51502944  |
| <b>Measuring inserts</b>                    | Electrode holder for special pressurised KCl electrode (270 mm), PVDF; order no.: 51502936<br>Electrode holder for gel electrode (120 mm), SS 316Ti; order no.: 51502937 |
| <b>Seals</b>                                | Set of seals for electrode holder: EPDM; order no.: 51502938<br>VITON®; order no.: 51502939  |
| <b>pH/ORP Gel electrodes, length 120 mm</b> | OrbiTex W CPS 21, CeraTex W CPS 31   |
| <b>Special pressurised electrode</b>        | Special pressurised KCl electrode (270 mm), with 10 m fixed cable; order no.: 51502943   |
| <b>Limit switch retrofitting sets</b>       | Pneumatic limit switch retrofitting set (2 limit switches); order no.: 51502940<br>Electric Ex limit switch retrofitting set (2 limit switches); order no.: 51502941     |

# Supplementary documentation

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## Supplementary documentation

- TI OrbiTex W CPS 21 (order no. 50052558)
- TI CeraTex W CPS 31 (order no. 50052561)

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