

# Sterilisable retractable assembly for pH/Redox measurement *CleanFit H CPA 475*

## Retractable Assembly for pH/Redox Measurement in Tanks or Pipelines under sterile Conditions



### Applications

The retractable pH assembly CleanFit H CPA 475 is used wherever

- very exacting sanitary and hygienic demands are placed on the measuring equipment;
- the pH electrode is to be sterilised, calibrated or cleaned without interrupting the process;
- the pH electrodes are not to be removed between batches but must be kept wet;
- high-accuracy, low-maintenance, sterilisable pH electrodes are required.

### Features and Benefits

- With 3A certificate (EHEDG certification pending)
- For 120 mm gel electrodes or 225 mm liquid KCl electrodes as well as oxygen sensor COS 21
- All parts in contact with the medium are made of stainless steel 1.4404 (AISI 316L), the seals consist of EPDM or VITON according to FDA recommendations
- Several adapter versions are available: dairy pipe, Varivent, APV, DN 50 / ANSI 2" flange or 2" clamp connection and DN 25 mounting adapter

High-quality products are produced in the foodstuffs industry and in the fermentation processes of the pharmaceutical and biotech industries. Product yield and quality are affected by minimal deviations of the pH value. A pH control system optimally adapted to the measuring task at hand helps save on costs.

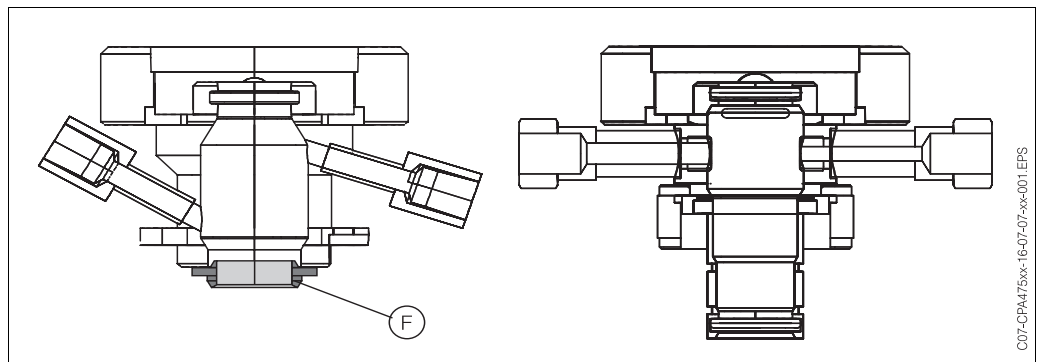


## Function and system design

The retractable assembly CleanFit H CPA 475 can be used for reliable in-process pH and Redox measurement. The assembly has been designed as a sterilisable retractable assembly for food-stuffs, biotechnology and pharmaceutical applications and other processes with maximum demands on sanitation and hygiene. Without having to interrupt the process, the electrode can be

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

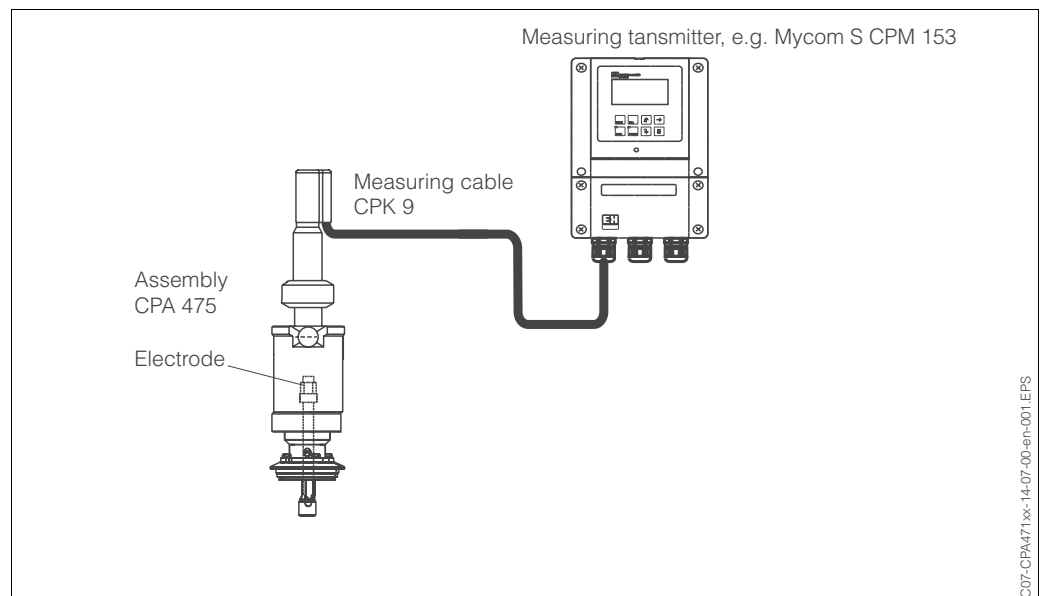
Those parts of the CleanFit H CPA 475 assembly which contact the medium are executed in stainless steel 1.4404 (AISI 316L). The seals are made of EPDM or Viton® according to FDA recommendations. Depending on the process connection, an 3A certificate (EHEDG certification is pending) is available for the assembly. All common process connections are available (see Process connections section).



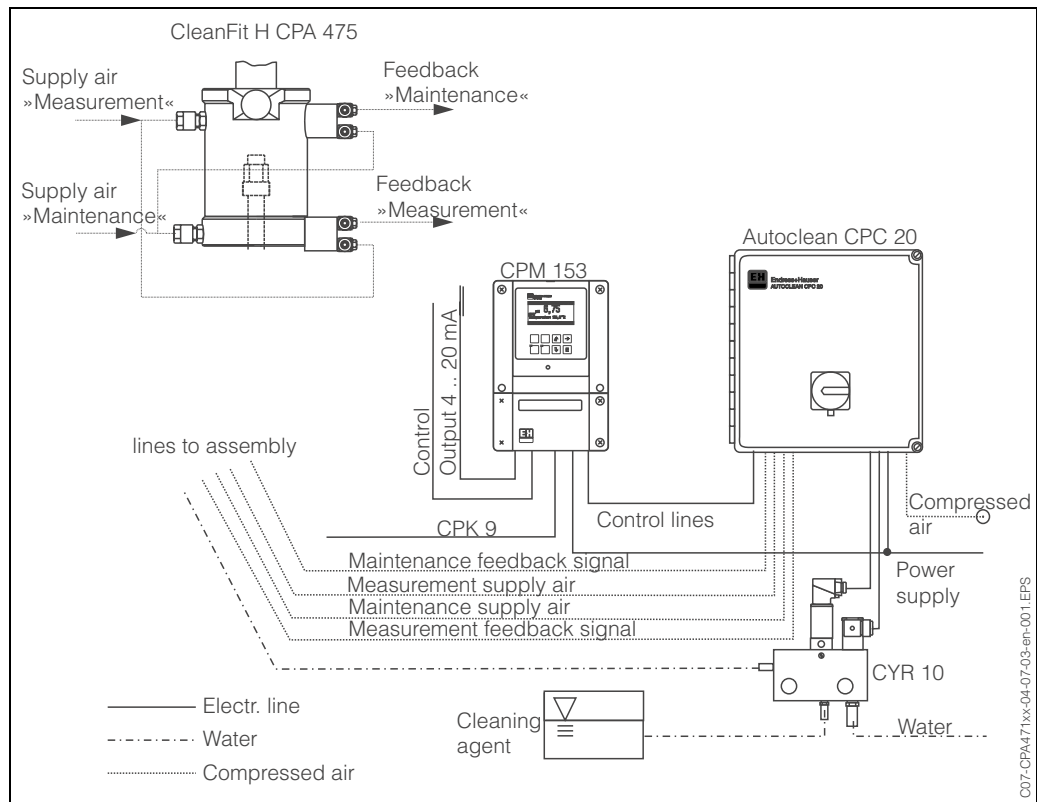
Left: Rinse chamber with formed seal (F)

Right: Rinse chamber for G 1/4 process connection

### Measuring system without control



**Measuring system with pneumatic control**



Connections for pneumatic control of CPA 475 assembly.

Note:  
The pneumatic version of the assembly is supplied with three-way connectors.



**Auxiliary energy**

**Pneumatic connections for automatic assembly actuation**

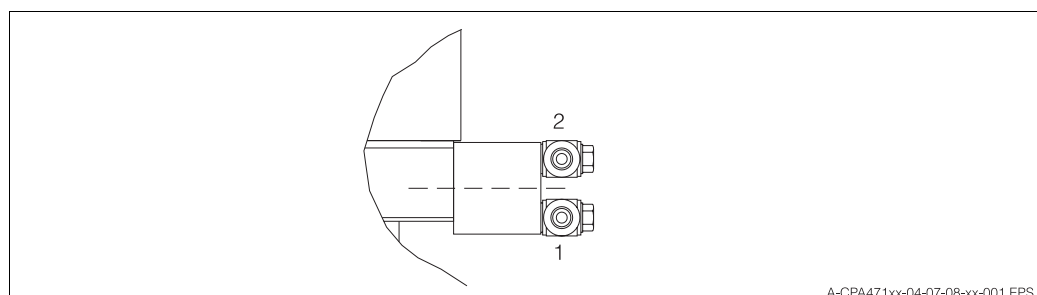
(if equipped accordingly)

The CleanFit H CPA 475 assembly is operated with an air pressure of 4 to 6 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 6 bar are possible (including short peak pressures), a pressure reducer must be installed.



**Connections for limit position detection (optional)**



Pneumatic limit switch (1: compressed air inlet, 2: compressed air outlet)

The lower limit switches are used for the »Measurement« function, the upper ones for the »Service« function.

## Operating conditions (installation)

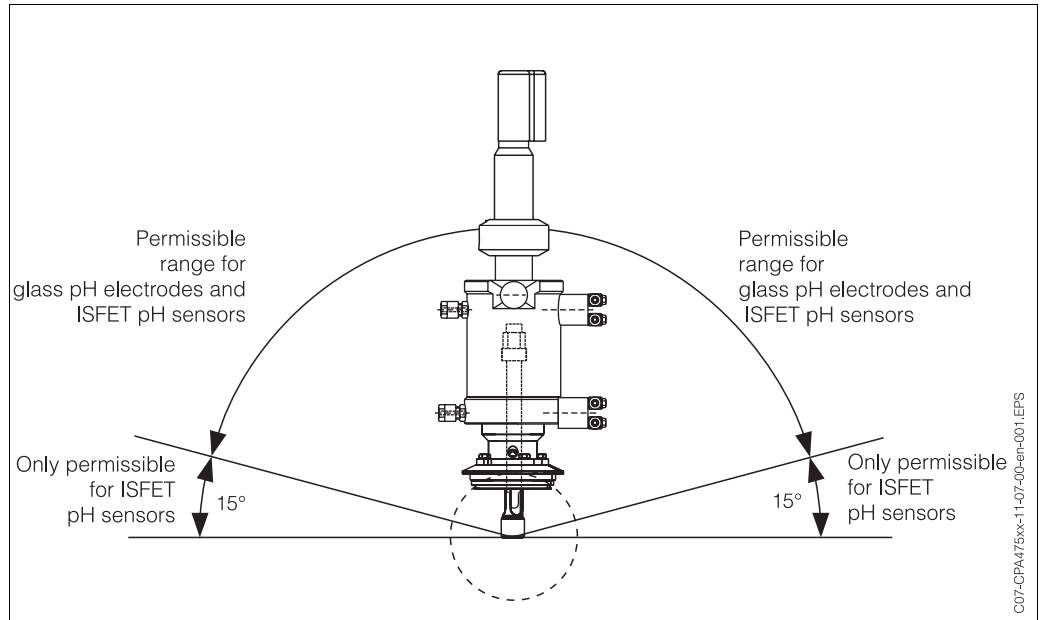
### Place of installation



The CleanFit H CPA 475 assembly is suitable for mounting on tanks or pipelines. A suitable socket must be available.

#### Note:

When glass electrodes are used, the minimum inclination of the centre axis of the assembly from the horizontal is  $15^\circ$  (see figure below). If the angle is less than  $15^\circ$ , the contact between the inside of the pH membrane and the internal lead (established by the electrolyte) is unreliable. When an ISFET pH electrode is used, assembly inclinations all the way to the horizontal are allowed.



Assembly inclination ranges for glass pH and ISFET pH electrodes

## Operating conditions (ambient)

### Ambient temperature

The ambient temperature must not drop below 0 °C.



Caution:  
Risk of damage due to frost!

If temperatures below 0 °C are possible, heating of the assembly and any air and water lines is required.

### Suitability for CIP/SIP cleaning

The assembly can be sterilised and cleaned. Depending on the process connection you have ordered, you may or may not receive an 3A certificate (EHEDG certification pending).

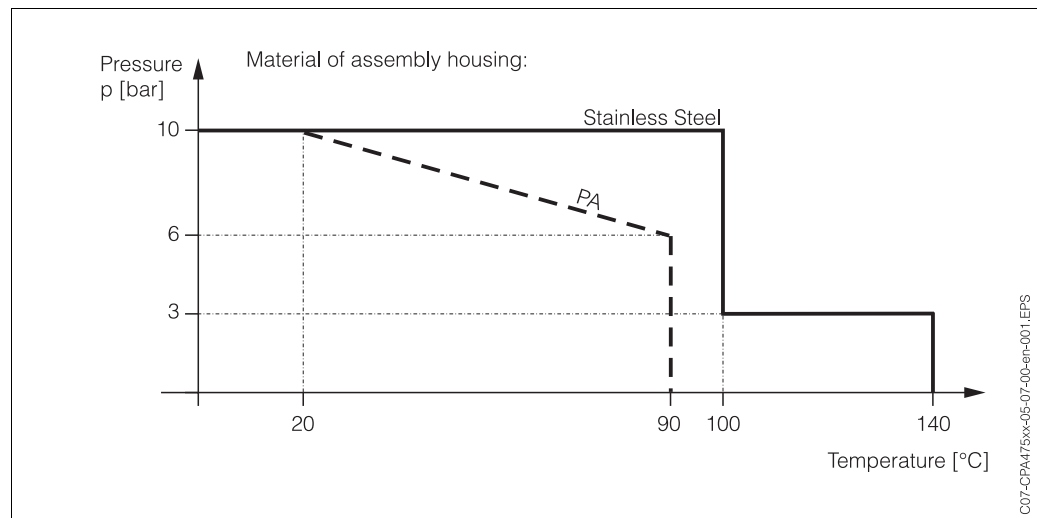
## Operating conditions (process)

### Process temperature range

0 ... 90 °C (depending on material selected and process pressure)  
up to 135 °C for version with stainless steel housing

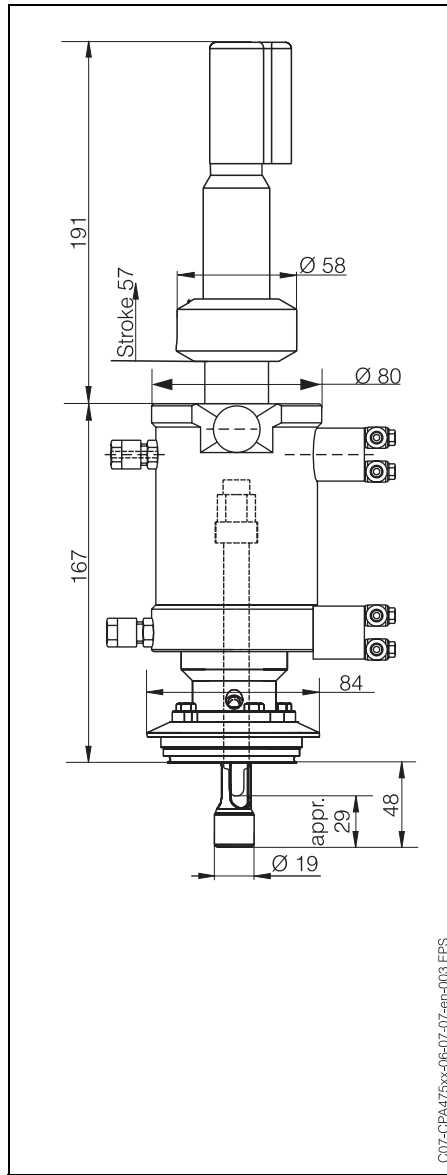
### Process pressure range

0 ... 4 bar gauge pressure with manual actuation  
0 ... 10 bar gauge pressure with pneumatic actuation

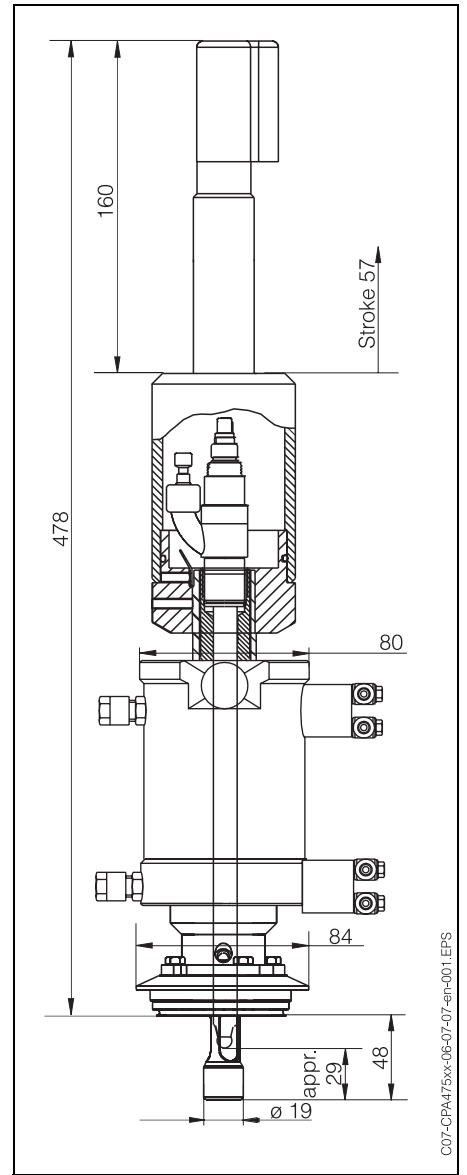


# Design

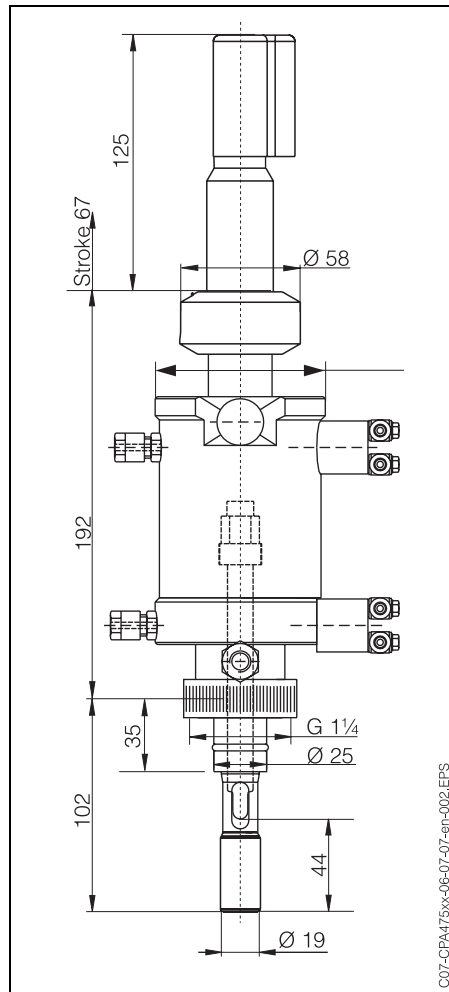
## Design, dimensions



CleanFit H CPA 475 for electrode length of 120 mm, gel electrodes CPS 11, CPS 71, ISFET CPS 401



CleanFit H CPA 475 for electrode length of 225 mm, liquid KCl electrode CPS 41

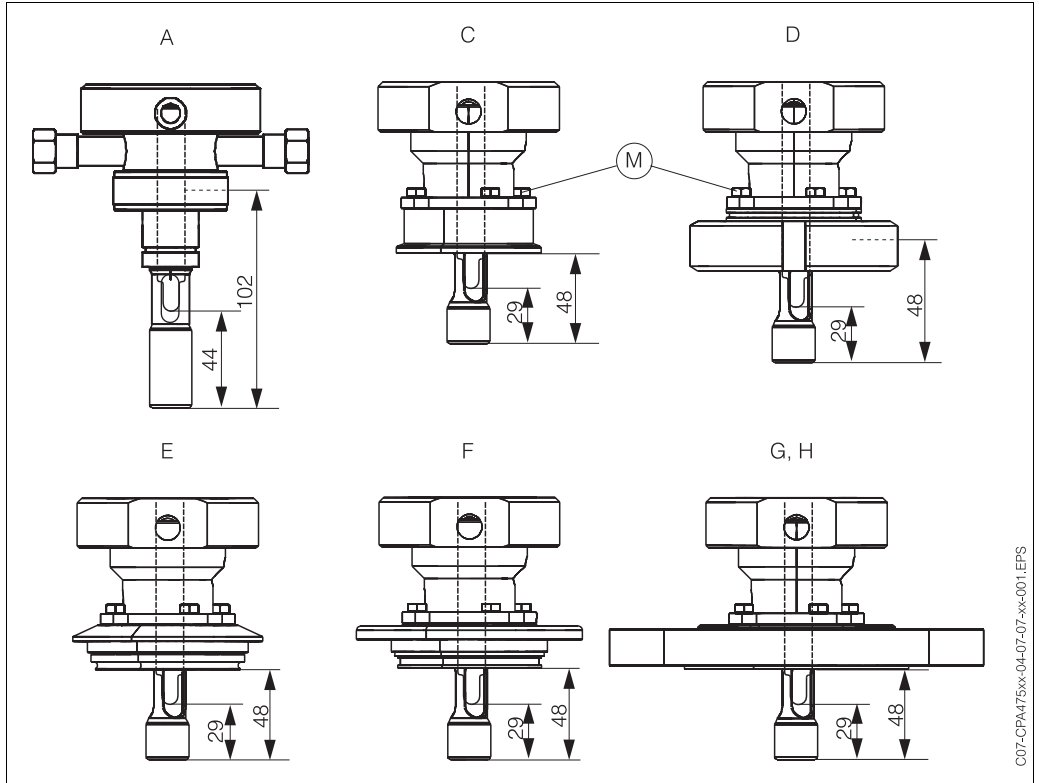


CleanFit H CPA 475 assembly with G 1 1/4 thread adapter nut

<b>Weight</b>	approx. 4 kg
<b>Materials in contact with medium</b>	Electrode holder, standard: stainless steel 1.4404 (AISI 316L), surface roughness $R_a=0.8 \mu\text{m}$ Seals: EPDM, VITON® with FDA approval
<b>Materials not in contact with medium</b>	Housing: PA, stainless steel 1.4301 (AISI 304) Lubricant: PARALIQ® GTE 703 (mineral oil-free grease with USDA-H1 approval; manuf.: Klüber) Splash protection cover: POM
<b>Rinse connections</b>	Rinse water pressure 2 ... 6 bar 2 x G 1/4 (internal), 2 x NPT 1/4" (internal)
<b>Pneumatic connections / requirements</b>	Pressure 4 ... 6 bar (gauge pressure) Filtered air (40 $\mu\text{m}$ ), water-free, oil-free The air lines must have a min. nominal diameter of 4 mm.
<b>Limit switches</b>	Pneumatic 3/2-way valve Electric limit switches
<b>Electrodes</b>	Gel electrodes: 120 mm (e.g. Orbisint CPS 11, ISFET CPS 401, CPS 71) Liquid KCl electrode: 225 mm (e.g. Ceraliquid CPS 41) Oxygen sensor: 120 mm (e.g. COS 21)

**Process connection**

**A:** G 1¼ internal thread (mounting adapter DN 25, straight or inclined), **C:** 2" clamp, **D:** dairy fitting DN 50 (DIN 11851), **E:** Varivent DN 50 ... 125, **F:** APV connection DN 50 ... 100, **G, H:** DN 50 PN 10 / ANSI 2" flange, 150 lbs



Immersion depths in mm



**Note:**

Process connections C, D, E, F, G and H are exchangeable (by removing the nuts; very simple replacement).

**Certificates and approvals**

**Suitability for food applications**

3A approvals (EHEDG certification pending)



## Ordering information

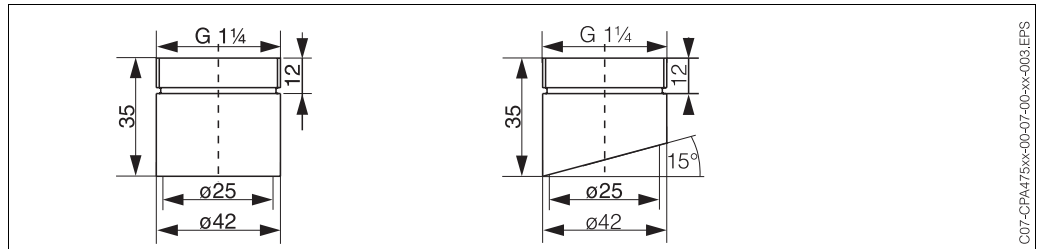
### Product overview for CleanFit H CPA 475

							<b>Drive type and limit switches</b>	
						A	Manual drive (cannot be converted to pneumatic actuation)	
						B	Pneumatic without limit switches (suitable for retrofitting)	
						C	Pneumatic with 2 pneumatic limit switches	
						D	Pneumatic with 2 electric limit switches	
						E	Pneumatic with 2 electric Ex limit switches	
						Y	Special version to customer specifications	
							<b>Assembly version</b>	
						1	Standard version	
						9	Special version to customer specifications	
							<b>Electrode holder</b>	
						A	For gel electrodes with Pg 13.5	
						B	For KCl electrodes with Pg 13.5 hose connection head	
						Y	Special version to customer specifications	
							<b>Immersion depth</b>	
						1	Up to 50 mm (depending on process connection) (possible electrode lengths: gel el. = 120 mm, liquid KCl el. = 225 mm)	
						9	Special version to customer specifications	
							<b>Assembly material (in contact with medium)</b>	
						A	In contact with medium: 1.4404 (316L), with PA housing	
						B	In contact with medium: 1.4404 (AISI 316L), with 1.4571 (AISI 316Ti) housing	
						C	In contact with medium: 1.4404 (316L), with test certificate 3.1B to EN10204 with PA housing	
						D	In contact with medium: 1.4404 (316L), with test certificate 3.1B to EN10204 with 1.4571 (AISI 316Ti) housing	
						Y	Special version to customer specifications	
							<b>Seal material (in contact with medium)</b>	
						1	EPDM	
						2	VITON®	
						9	Special version to customer specifications	
							<b>Process connection</b>	
						A	G 1¼ internal thread (union nut), no certificate	
						C	Tri-Clamp, 2"	
						D	Dairy fitting DN 50 (DIN 11851)	
						E	Varivent DN 50 ... 125	
						F	APV DN 50 ... 100	
						G	Flange, DN 50	
						H	Flange, ANSI 2"	
						Y	Special version to customer specifications	
							<b>Optional equipment</b>	
						3	With rinse fitting, 2 x G ¼ internal thread	
						4	With rinse fitting, 2 x NPT ¼" internal thread	
CPA 475-							complete order code	

## Accessories

### Welding socket

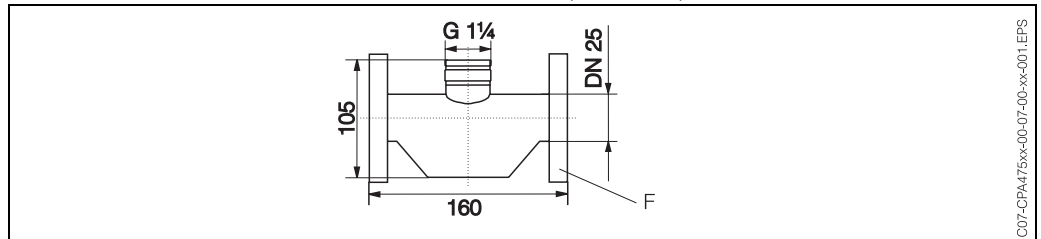
G 1¼, straight, stainless steel 1.4404 (AISI 316L) ; order no.: 51502798  
 G 1¼, inclined 15°, stainless steel 1.4404 (AISI 316L); order no.: 51502799



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### Flow vessel

Flow vessel for thinner pipes than DN 80. (F = flange DN 25 / PN 16),  
 DN 25, G 1¼ external thread, stainless steel 1.4404 (AISI 316L), order no.: 51502801



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### pH/redox combination electrodes, length 120 mm

Gel electrode OrbiSint W CPS 11/12 (glass electrode)  
 Gel electrode CeraGel P CPS 71 (glass electrode)  
 IsFET pH sensor TopHit H CPS 401 (plastic electrode)

### pH/redox combination electrodes, length 225 mm

Gel electrode OrbiSint CPS 11/12  
 Liquid KCl electrode CeraLiquid P CPS 41/42 (with SSA or ESS head)  
 Gel electrode CeraGel P CPS 71

### Limit switches

Inductive limit switches, M 8 x 1, 2 pcs., with right-angle plugs:  
 NC contact, NAMUR, order no.: 50087313  
 NO contact, NAMUR, order no.: 50073993  
 Pneumatic limit switches, 2 pcs., order no.: 51502874

### Hose connectors for hose connections

G ¼, DN 12, stainless steel 1.4404 (AISI 316L) (2 pcs.); order no.: 51502808  
 G ¼, DN 12, PVDF (2 pcs.); order no.: 51506680

### pH measuring cable

e.g. pH measuring cable CPK 9 (for high-temperature applications, IP 68 / NEMA 6X, also for Ex)

## Supplementary documentation

### Supplementary documentation

- Technical Information OrbiSint CPS W 11/12/13, TI 028C/07 (order no. 50052557)
- Technical Information CeraLiquid P CPS 41/42/43, TI 079C/07 (order no. 50058726)
- Technical Information CeraGel P CPS 71, TI 245C/07 (order no. 51505836)
- Technical Information TopHit H CPS 401, TI 283C/07 (order no. 51506689)



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