



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Cleanfit H CPA475

Retractable assembly for pH, ORP measurement under sterile conditions



Application

- Food industry
- Beverage industry
- Pharmaceutical industry
- Drinking water

The retractable assembly is used wherever very exacting sanitary and hygienic demands are placed on the measuring equipment.

Your benefits

- All parts in contact with the medium are made of stainless steel 1.4435 (AISI 316L), the seals consist of EPDM or Viton according to FDA recommendations
- With certificate 3A 74-
- Several adapter versions are available:
 - Dairy fitting
 - Varivent
 - APV
 - Flange DN 50 / ANSI 2"
 - Clamp 2"
 - Mounting adapter DN 25

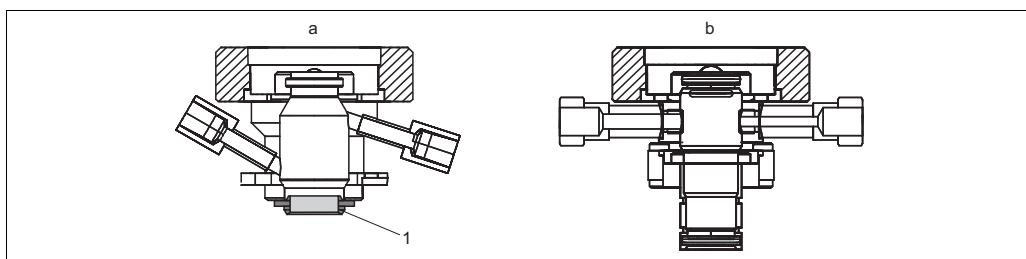
Function and system design

Function

With the retractable assembly Cleanfit H CPA475 you can realize reliable pH and ORP measurements. The assembly has been designed as a sterilizable retractable assembly for foodstuffs, biotechnology and pharmaceutical applications and other processes with maximum demands on sanitation and hygiene. Without interrupting the process you can perform the following manual or pneumatic operations for the electrode:

- separate from the process and move into the rinse chamber
- rinse with water or cleaning solution
- keep wet during operation pauses
- dismount
- sterilize
- or calibrate

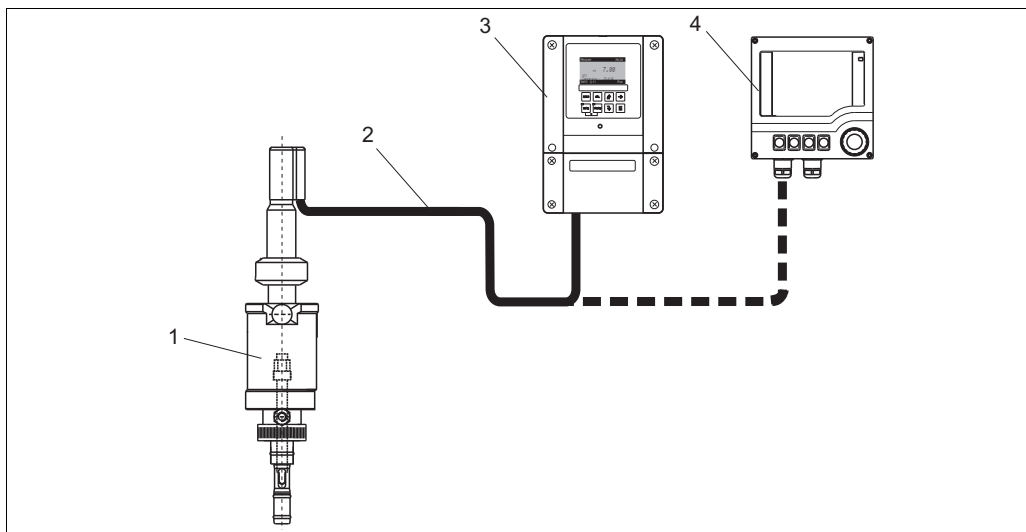
Those parts of the Cleanfit H CPA475 assembly which are in contact with the medium are executed in stainless steel 1.4435 (AISI 316L). The seals are made of EPDM or Viton® according to FDA recommendations. All common process connections are available (see Process connections section).



Rinse chamber versions (depending on the process connection)

- a Rinse chamber with welded rinse connectors, for Triclamp, dairy pipe, Varivent, APV, flanges
- b Rinse chamber with screwed rinse connectors, for G1 1/4 inner
- 1 Formed seal

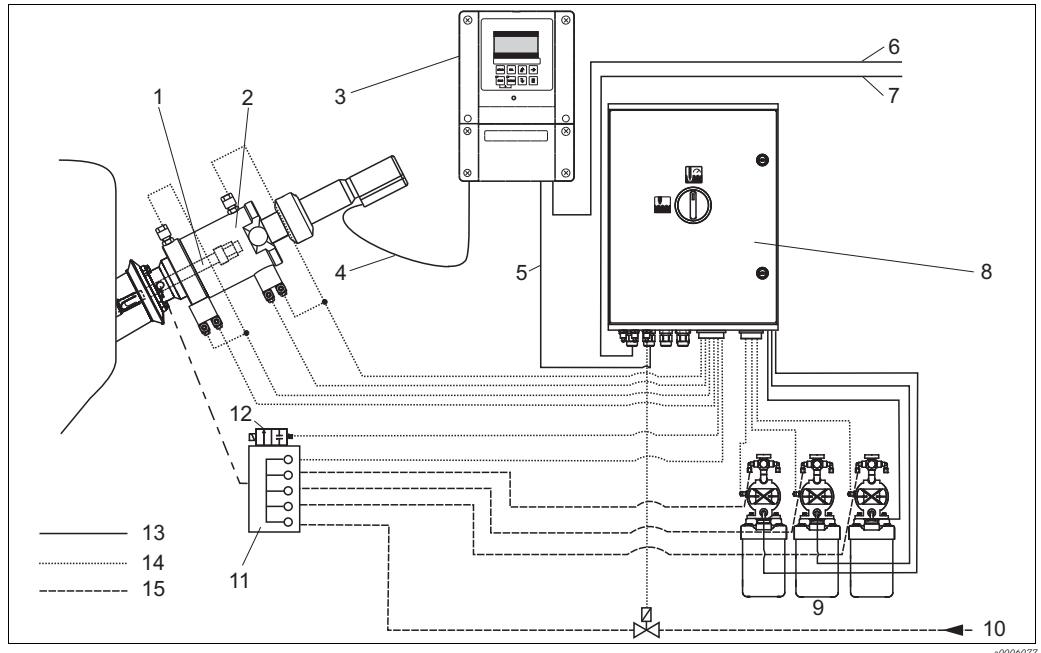
Measuring system without control



Measuring system without control (example)

- 1 Assembly Cleanfit
- 2 Special pH measuring cable, e.g. CYK10
- 3 Transmitter Mycom S CPM153 or
- 4 Transmitter Liquiline M CM42

**Measuring system with
pneumatic control**




Measuring system with pneumatic control

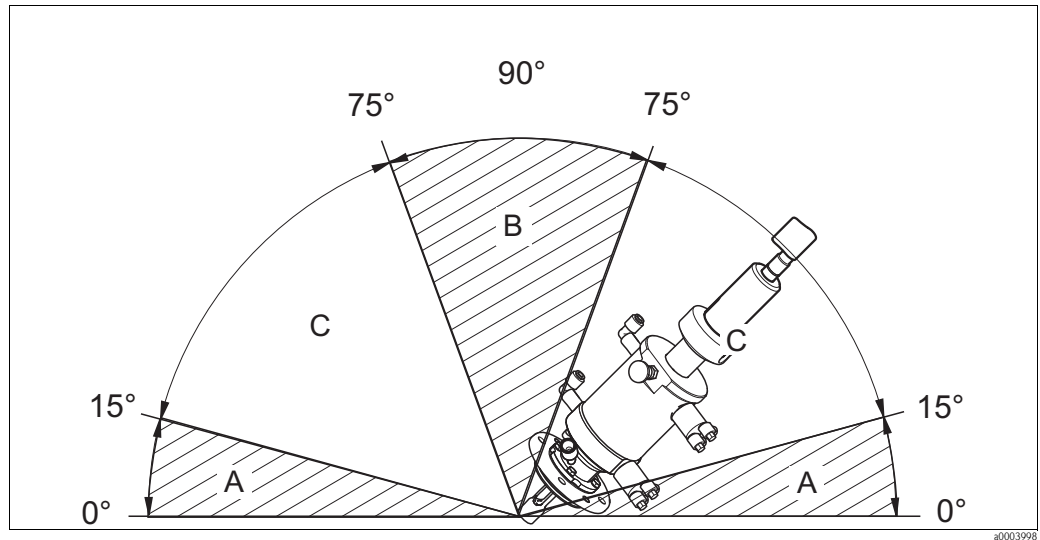
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- | | | | |
|---|------------------------------------|----|---|
| 1 | pH/ORP sensor | 9 | Canisters for cleaning and buffer solutions |
| 2 | Assembly Cleanfit | 10 | Superheated steam/water/cleaning solutions (optional) |
| 3 | Transmitter Mycom CPM153 | 11 | Rinse block |
| 4 | Special measuring cable | 12 | Rinse water valve |
| 5 | Communication / power supply cable | 13 | Power/signal cables |
| 6 | Power supply Mycom | 14 | Air hoses |
| 7 | Power supply CPG310 | 15 | Media |
| 8 | Control unit CPG310 | | |

Installation

Installation conditions

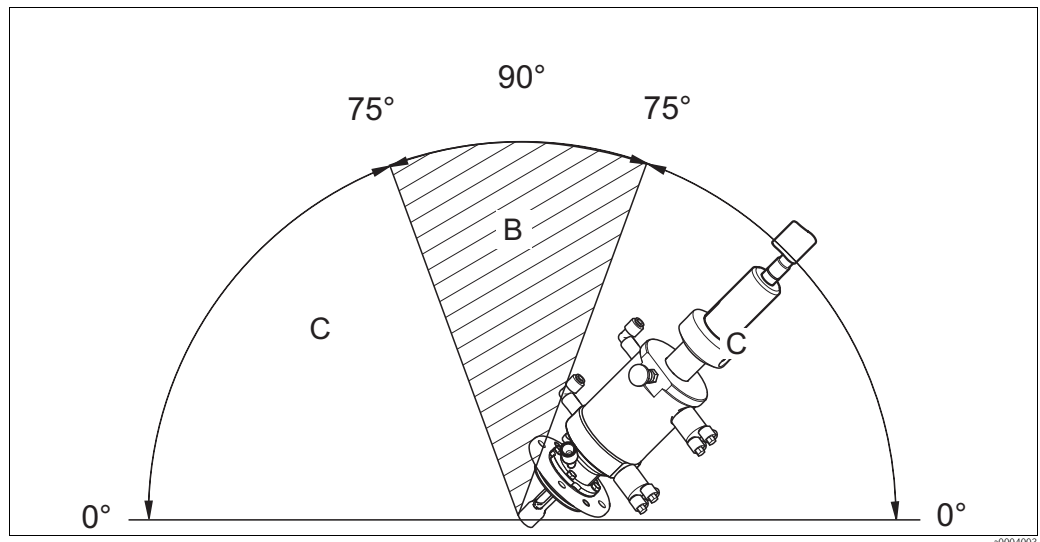
The assembly is designed for installation on tanks and pipes. Suitable nozzles must be available for this. When using standard glass electrodes, only installation positions are permitted in which the middle axis of the assembly lies at an angle greater than 15° from the horizontal (\rightarrow ). Otherwise, there will not be a reliable contact between the inner side of the pH membrane and the inner terminal leads via the electrolytes. Limited permissible angle of the installation position is above 75° from the horizontal, air bubbles can accumulate in the chamber.



Installation angle

- A *Inadmissible installation angle*
- B *Limited permissible angle (air bubbles can build up in the chamber)*
- C *Recommended installation angle*

When using an ISFET Tophit sensor, there are, in principle, no restrictions for the installation position. An installation angle of 0 to 75° is, however, recommended. An overhead installation is possible.



Installation angle for assemblies with ISFET sensors

- B *Limited permissible angle (air bubbles can build up in the chamber)*
- C *Recommended installation angle*

Pneumatic connections for automatic assembly actuation

Requirements:

- air pressure of 4 to 6 bar (60 to 90 psi)
- air must be filtered (40 µm) and be free of water and oil
- no continuous air consumption
- minimum nominal diameter of the air lines: 4 mm (0.16 inches).

NOTICE

Air pressure too high

The assembly may be damaged.

- There must be a pressure-reducing valve upstream if the air pressure can increase to above 6 bar (90 psi) (including any short pressure surges).



We recommend you also use a pneumatic throttle for lower pressures. This results in a smoother assembly operation. Endress+Hauser offers such a throttle as an accessory (see chapter "Accessories").

Rinse water connection

Rinse water pressure: 2 to 6 bar (29 to 87 psi)

2 x G ¼ (inner)

2 x NPT ¼" (inner)

Environment

Ambient temperature

Ambient temperature not below 0 °C (32 °F).

The maximum permissible temperature for electric limit position switches (NAMUR type) is 90 °C (194 °F).

Process

Process temperature

0 to 100 °C (32 to 210 °F)

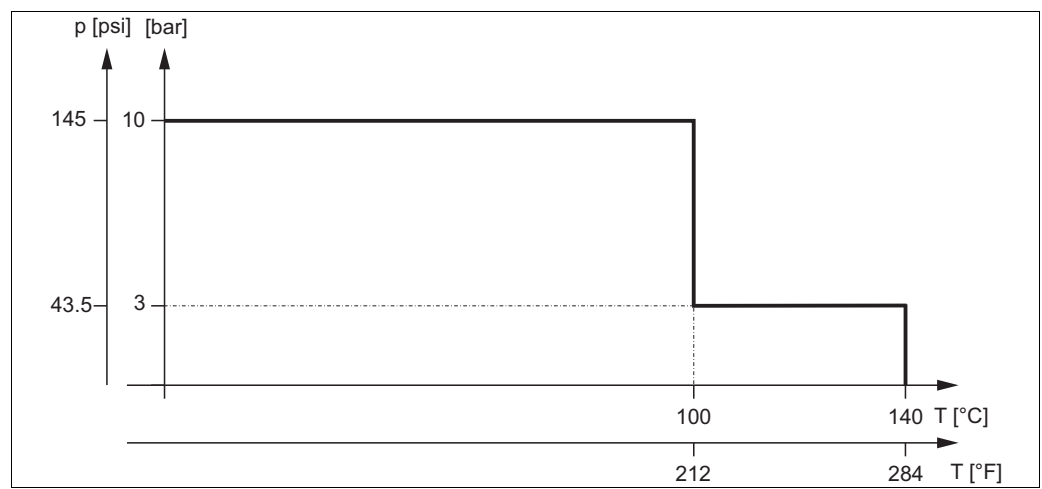
up to 140 °C (280 °F) at 3 bar (45 psi) for max. 1 hour

Process pressure

0 to max. 4 bar (0 to max. 58 psi) overpressure for manual actuation

0 to 10 bar (0 to 145 psi) overpressure for pneumatic actuation

Pressure/temperature diagram

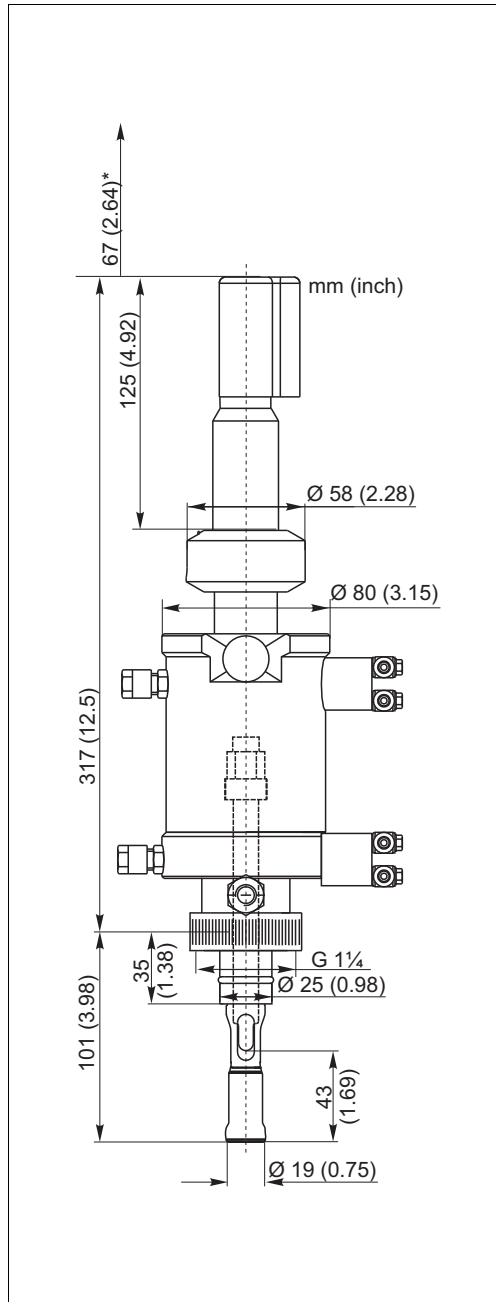


Pressure temperature diagram

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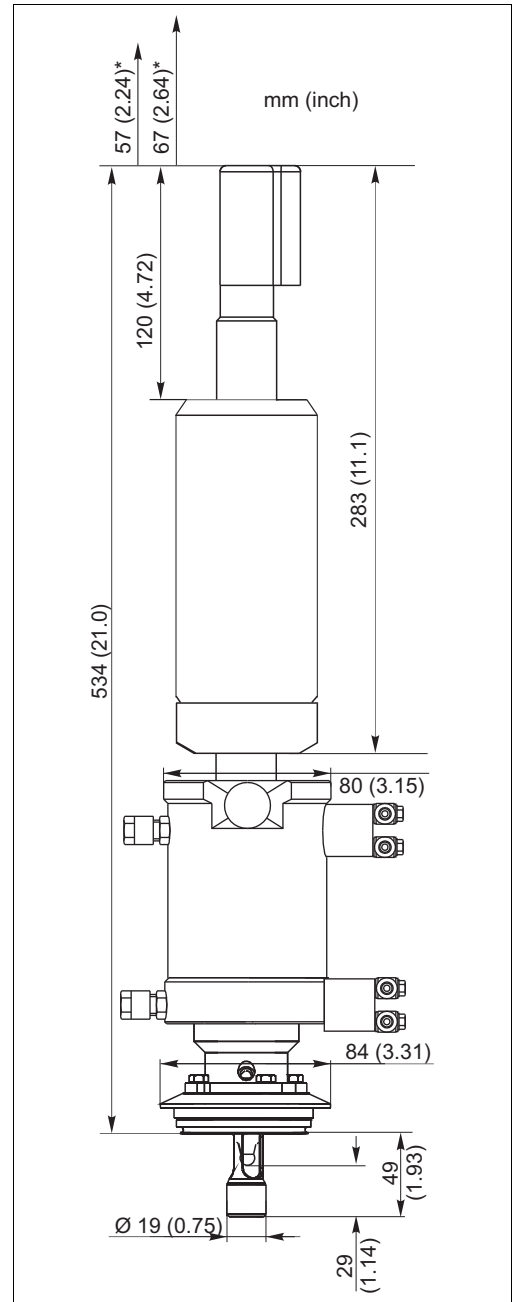
Mechanical construction

Dimensions



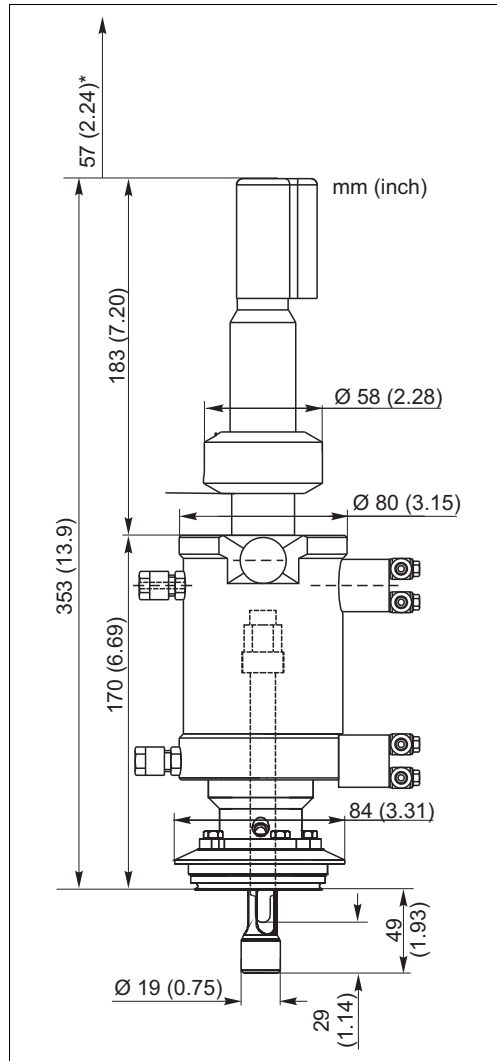
Standard version with G1 1/4 thread nut

* stroke



Liquid KCl electrolyte version

* stroke (depending on version)



a0017389

Version with Varivent

* stroke

Process connections

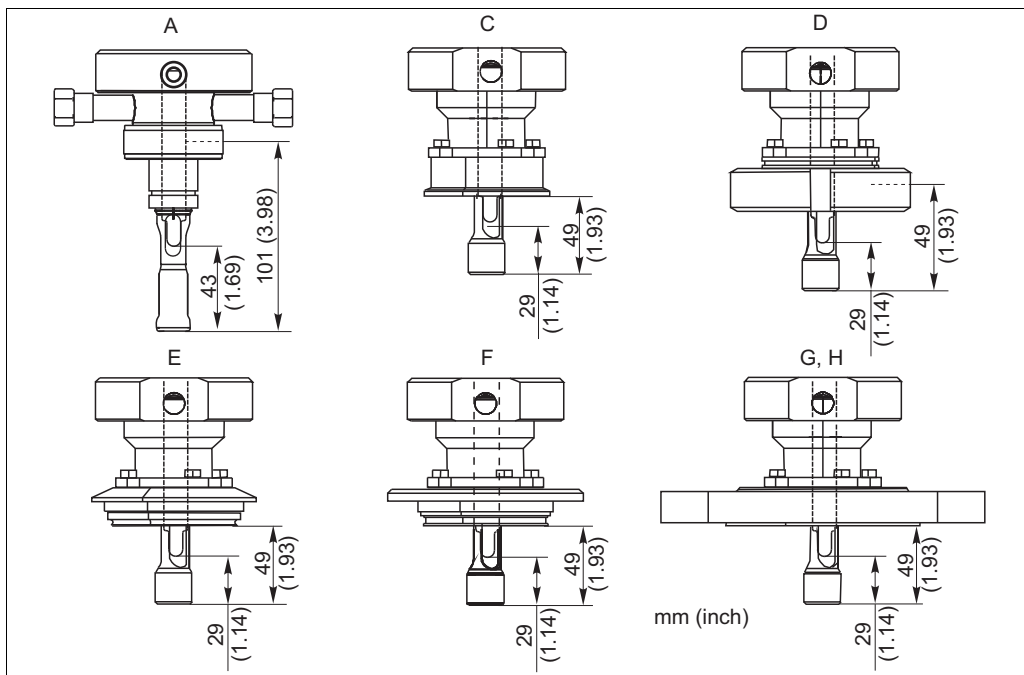


Fig. 1: Process connections

- | | | | |
|---|--------------------------------------|-----|--|
| A | G1 ¼ internal thread with thread nut | E | Varivent DN 50 to 125 |
| C | Triclamp 2" | F | APV DN 50 to 100 |
| D | DN 50 dairy fitting (DIN 11851) | G/H | DN 50 flange (DIN 1092-1) resp. ANSI 2" flange |

i Welding socket:
 For CPA475 with G1 ¼ process connection only Endress+Hauser welding sockets with length=35 mm are fitting. See accessories.

Sensors

- pH glass electrodes, gel 120 mm
- pH glass electrodes, KCl 225 mm
- pH ISFET sensors, gel, 120 mm
- pH ISFET sensors, KCl, 225 mm
- Oxygen sensors, 120 mm

Weight

approx. 4 kg (8.8 lbs), depending on cylinder material, on process connection and additional equipment, see product structure

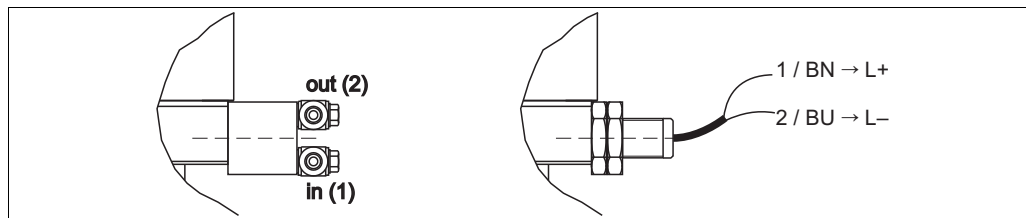
Materials

- | | |
|--------------------------------|--|
| in contact with medium | |
| Seals | EPDM / FPM (Viton®, FDA certified) |
| Sensor holder | SS 1.4435 (AISI 316L), electro-polished, Ra=0.8 µm |
| Rinse chamber | SS 1.4435 (AISI 316L), electro-polished, Ra=0.8 µm |
| Rinse fittings | SS 1.4435 (AISI 316L), electro-polished, Ra=0.8 µm |
| not in contact with medium | |
| Cylinder | SS 1.4404 (AISI 316L) |
| Electric limit position switch | fore-part PBT, cable PVC |

Limit position switches

Pneumatic: 3/2 way valve; thread M 12 x 1;
connection for hoses with OD = 6 mm (0.24")

Electric: inductive (NAMUR type); cable length: 10 m (32.8 ft);
housing material: stainless steel; thread M 12 x 1;
nominal voltage: 8 V
ⓈII 1G EEx ia IIC T6; switching distance: 2 mm, flush



Limit position switches, left: pneumatic (1 = compressed air inlet, 2 = compressed air outlet) right: electric (NAMUR)

i The position of the input resp. the output may be different from the figure. Please, refer to the marks at the limit position switch: "1" is the input (in), "2" is the output (out).

Certificates and approvals

3A

The following versions meet the requirements of the rule 3A 74-:

- CPA475-XXXXXXCX (process connection: triclamp)
- CPA475-XXXXXXDX (process connection: dairy fitting)
- CPA475-XXXXXXEX (process connection: varivent)
- CPA475-XXXXXXFX (process connection: APV)

Sterilizability

TNO report V3641:

"The retractable assembly for pH measurement Cleanfit H CPA475 – including the seals – is classified as in-line steam sterilizable by a 30 minute saturated steam treatment at a temperature of 120 °C." ¹⁾

1) acc. to the test method of the European Hygienic Design Group (EHEDG)

Ordering information

Order code

Enter the following address in your browser to access the product page:
www.products.endress.com/cpa475

- You can choose from the following options on the product page located on the right:

Product page function
:: Add to product list
:: Price & order information
:: Compare this product
:: Configure this product

- Click "Configure this product".
- The configurator opens in a separate window. You can now configure your device and receive the complete order code that applies for the device.
- Afterwards, export the order code as a PDF or Excel file. To do so, click the appropriate button at the top of the page.

Product structure



The following product structure represents the status of printing. You can create a complete and valid order code on the Internet using the configurator tool.

				Drive type and limit contact switches		
	A				Manual (cannot be converted to pneumatic)	
	B				Pneumatic without limit contact switches (suitable for retrofitting)	
	C				Pneumatic with 2 pneumatic limit contact switches	
	D				Pneumatic with 2 electric limit contact switches (max. 90 °C / 194 °F)	
	E				Pneumatic with 2 electric Ex limit contact switches (max. 90 °C / 194 °F)	
				Assembly version		
	1				Standard version, electro-polished	
				Electrode holder		
	A				For 120 mm gel electrodes / ISFET sensors with Pg 13.5	
	B				For 225 mm liquid KCl electrodes / ISFET sensors with Pg 13.5 and hose connection head	
				Immersion depth / maximum stroke		
	1				Immersion depth / stroke: 101/65 mm resp. 48/23 mm (depending on process connection)	
	9				Special version acc. to customer	
				Assembly material (in contact with medium)		
	B				1.4435 (AISI 316L) in contact with medium, roughness Ra=0.8 µm, with stainless steel 1.4404 (AISI 316L) housing (max. 10 bar / 145 psi at 100 °C / 212 °F)	
	D				1.4435 (AISI 316L) in contact w. medium, roughness Ra=0.8 µm, with test certificate 3.1 acc. to EN10204, with 1.4404 (AISI 316L) housing	
				Seal material (in contact with medium)		
	1				EPDM FDA (preferred for food application)	
	2				FPM FDA (Viton®, preferred for process application)	
				Process connection		
	A				G 1¼ internal thread (union), for welding sockets of Endress+Hauser	
	C				Tri-Clamp 2", compatible with standard 3A 74-	
	D				Dairy fitting DN 50 (acc. to. DIN 11 851), only permissible with SKS Siersma adapter, compatible with standard 3A 74-	
	E				Varivent N, 68 mm, for pipe lines DN 50 to 125 and tank connection; compatible with standard 3A 74-	
	F				APV DN 50 to 100, compatible with standard 3A 74-	
	G				DN 50 flange (acc. to EN 1092-1), PN16	
	H				2" ANSI flange	
				Optional equipment		
	3				With rinse fitting 2 x G¼ internal thread	
	4				With rinse fitting 2 x NPT ¼" internal thread	
CPA475-						complete order code

Welding socket:

For CPA475 with G1¼ process connection only Endress+Hauser welding sockets with length = 35 mm are fitting. See accessories.

Surface roughness:

Versions with a lower roughness down to 0.4 µm are orderable as special version.

Scope of delivery

The scope of delivery comprises:

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

Accessories

Water filter and pressure reducer

Filter set CPC310

- Water filter (dirt trap) 100 µm, complete, incl. angle bracket;
- Order no. 71031661

Pressure reducer kit

- Complete, incl. manometer and angle bracket;
- Order no. 51505755

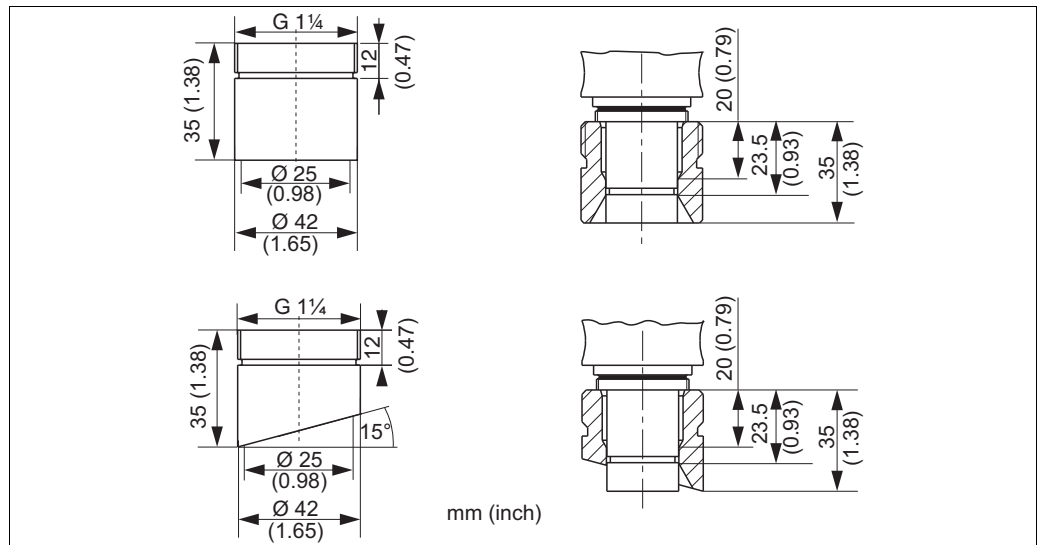
Welded fittings

Welded fitting G1¼, straight,

- SS 1.4435 (AISI 316L); order no. 51502798

Welded fitting G1¼, angular 15°,

- SS 1.4435 (AISI 316L); order no. 51502799



Welded fittings

Dummy plug

Dummy plug for G1¼ process connection,

- SS 1.4435 (AISI 316L), FPM (Viton®) seal, G1¼ internal thread; order no. 51502800

Hose nozzles

Hose nozzles for rinse connections G¼, DN 12

- SS 1.4404 (AISI 316L), 2 pieces
- Order no.: 51502808

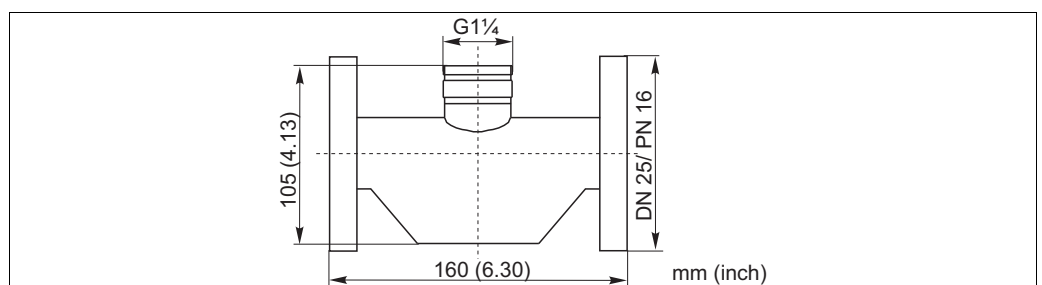
Hose nozzles for rinse connections G¼, DN 12

- PVDF, 2 pieces
- Order no.: 50090491

Flow vessel

DN 25 flow vessel,

- G1¼ external thread, SS 1.4404 (AISI 316L);
- order no. 51502801



Flow vessel

Limit switches	<p>Set of pneumatic limit position switches (2 pieces);</p> <ul style="list-style-type: none"> ■ order no. 51502874 <p>Set of electric limit position switches, Ex and non-Ex (2 pieces);</p> <ul style="list-style-type: none"> ■ order no. 51502873
Pneumatic throttle	<p>Pneumatic throttle for the reduction of the assembly moving speed,</p> <ul style="list-style-type: none"> ■ G1/8 threaded connection ■ order no. 50036864
Sensors	<p>Glass electrodes</p> <p>Orbisint CPS11/CPS11D</p> <ul style="list-style-type: none"> ■ pH sensor for process applications ■ Optional SIL version for connection to SIL approved transmitters ■ With dirt-repellent PTFE diaphragm ■ Ordering per product structure (→ Online configurator, www.products.endress.com/cps11 or www.products.endress.com/cps11d) ■ Technical Information TI028C/07/EN <p>Orbisint CPS12/CPS12D</p> <ul style="list-style-type: none"> ■ ORP electrode for process applications ■ With dirt-repellent PTFE diaphragm ■ Ordering per product structure (→ Online configurator, www.products.endress.com/cps12 or www.products.endress.com/cps12d) ■ Technical Information TI367C/07/EN <p>Ceraliquid CPS41/CPS41D</p> <ul style="list-style-type: none"> ■ pH sensor ■ With ceramics diaphragm and liquid KCl electrolyte ■ Ordering per product structure (→ Online configurator, www.products.endress.com/cps41 or www.products.endress.com/cps41d) ■ Technical Information TI079C/07/EN <p>Ceraliquid CPS42/CPS42D</p> <ul style="list-style-type: none"> ■ ORP electrode ■ With ceramics diaphragm and liquid KCl electrolyte ■ Ordering per product structure (→ Online configurator, www.products.endress.com/cps42 or www.products.endress.com/cps42d) ■ Technical Information TI373C/07/EN <p>Ceragel CPS71/CPS71D</p> <ul style="list-style-type: none"> ■ pH sensor ■ With double chamber reference system and integrated bridge electrolyte ■ Ordering per product structure (→ Online configurator, www.products.endress.com/cps71 or www.products.endress.com/cps71d) ■ Technical Information TI245C/07/EN <p>Ceragel CPS72/CPS72D</p> <ul style="list-style-type: none"> ■ ORP electrode ■ With double chamber reference system and integrated bridge electrolyte ■ Ordering per product structure (→ Online configurator, www.products.endress.com/cps72 or www.products.endress.com/cps72d) ■ Technical Information TI374C/07/EN <p>Orbipore CPS91/CPS91D</p> <ul style="list-style-type: none"> ■ pH sensor ■ With open aperture for media with high dirt load ■ Ordering per product structure (→ Online configurator, www.products.endress.com/cps91 or www.products.endress.com/cps91d) ■ Technical Information TI375C/07/EN <p>Orbipore CPS92/CPS92D</p> <ul style="list-style-type: none"> ■ ORP sensor ■ With open aperture for media with high dirt load ■ Ordering per product structure (→ Online configurator, www.products.endress.com/cps92 or www.products.endress.com/cps92d) ■ Technical Information TI435C/07/EN

ISFET sensors

Tophit CPS471/CPS471D

- Sterilizable and autoclavable ISFET sensor for food and pharmaceuticals, process technology, water treatment and biotechnology;
- Ordering per product structure (→ Online configurator, www.products.endress.com/cps471 or www.products.endress.com/cps471d)
- Technical Information TI283C/07/EN

Tophit CPS441/CPS441D

- Sterilizable ISFET sensor for media with low conductivity, with liquid KCl electrolyte;
- Ordering per product structure (→ Online configurator, www.products.endress.com/cps441 or www.products.endress.com/cps441d)
- Technical Information TI352C/07/EN

Tophit CPS491/CPS491D

- ISFET sensor with open aperture for media with high dirt load;
- Ordering per product structure (→ Online configurator, www.products.endress.com/cps491 or www.products.endress.com/cps491d)
- Technical Information TI377C/07/EN

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