

Sterilisable retractable assembly for pH/Redox measurement OPA475

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



Applications

The retractable pH assembly OPA475 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 certificate 3A 74-02
- For 120 mm gel electrodes or 225 mm liquid KCl electrodes as well as oxygen sensor OOS21
- 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
- Several adapter versions are available: dairy pipe, Varivent, APV, DN 50 / ANSI 2" flange or 2" clamp connection and DN 25 mounting adapter

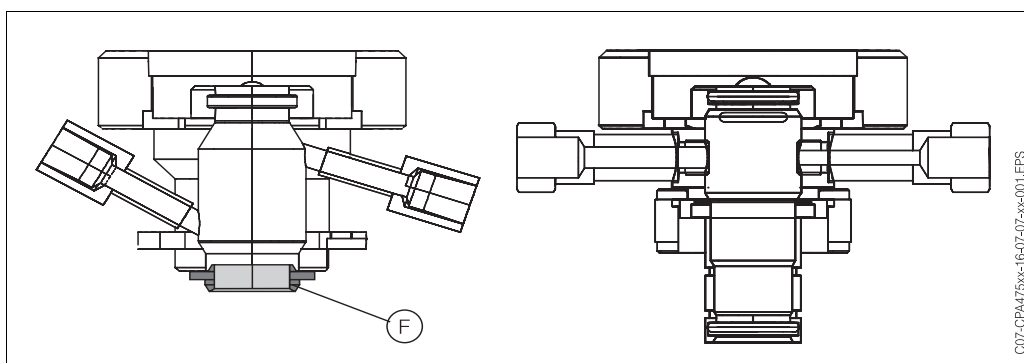
High-quality products are produced in the foodstuffs industry and in the fermentation processes of the pharmaceutical and biotech industries. Product yield and quality are affected by minimal deviations of the pH value. A pH control system optimally adapted to the measuring task at hand helps save on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

Function and system design

The retractable assembly OPA475 can be used for reliable in-process pH and Redox measurement. The assembly has been designed as a sterilisable retractable assembly for foodstuffs, biotechnology and pharmaceutical applications and other processes with maximum demands on sanitation and hygiene. Without having to interrupt the process, the electrode can be

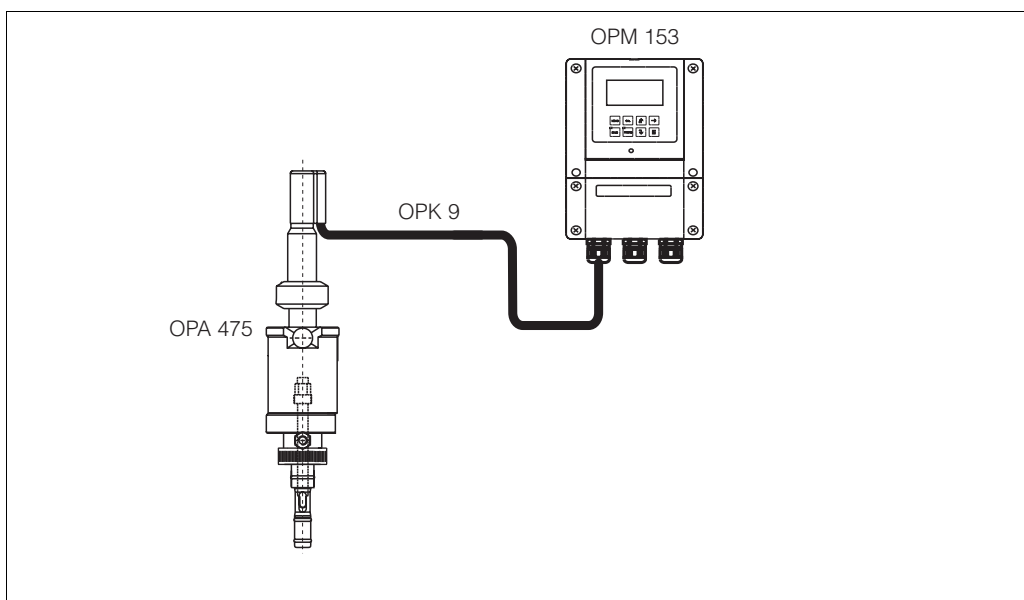
- separated from the process and moved to a rinse chamber manually or pneumatically;
- rinsed with water or cleaning solution;
- kept moist during interruptions in operation;
- removed;
- sterilised; or
- calibrated.

Those parts of the OPA475 assembly which contact 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).

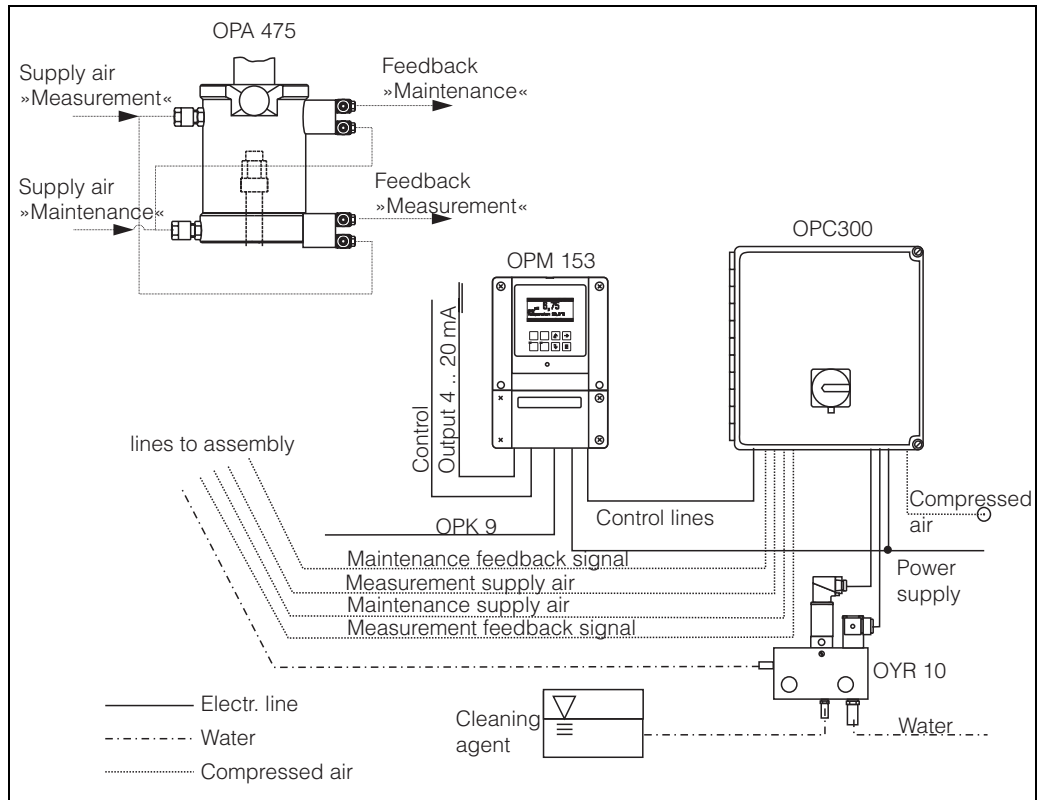


Left: Rinse chamber with formed seal (F)
Right: Rinse chamber for G 1 ¼ process connection

Measuring system without control



Measuring system with pneumatic control



Connections for pneumatic control of OPA475 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)

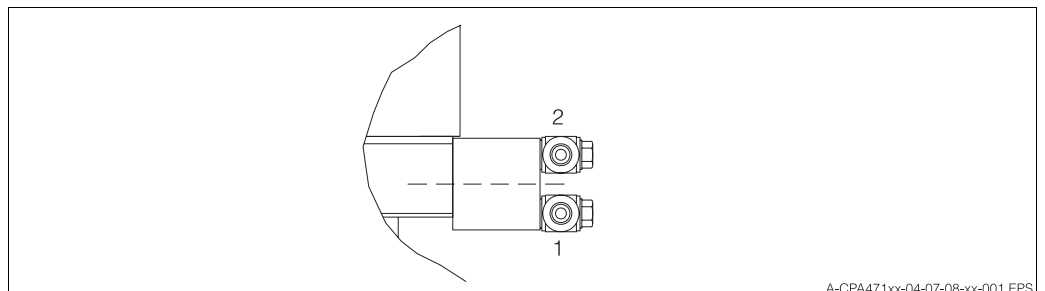
The OPA475 assembly is operated with an air pressure of 4 to 6 bar. The air must be filtered (40 µm) and free from water and oil. There is no continuous pressure demand. The air lines must have a minimum nominal diameter of 4 mm.



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

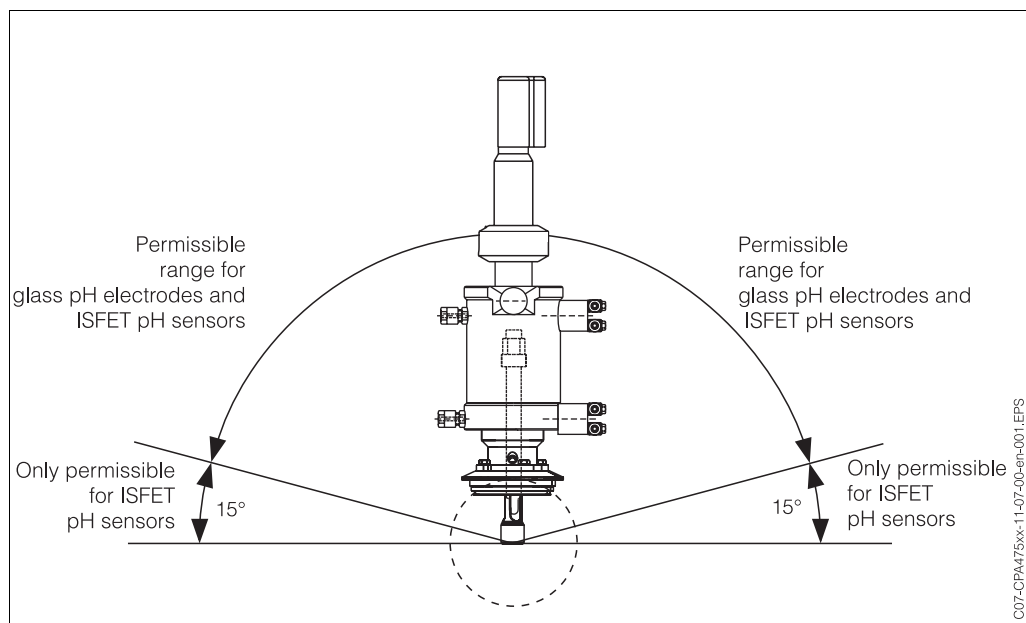


The OPA475 assembly is suitable for mounting on tanks or pipelines. A suitable socket must be available.

Note:

When glass electrodes are used, the minimum inclination of the centre axis of the assembly from the horizontal is 15° (see figure below). If the angle is less than 15° , 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.

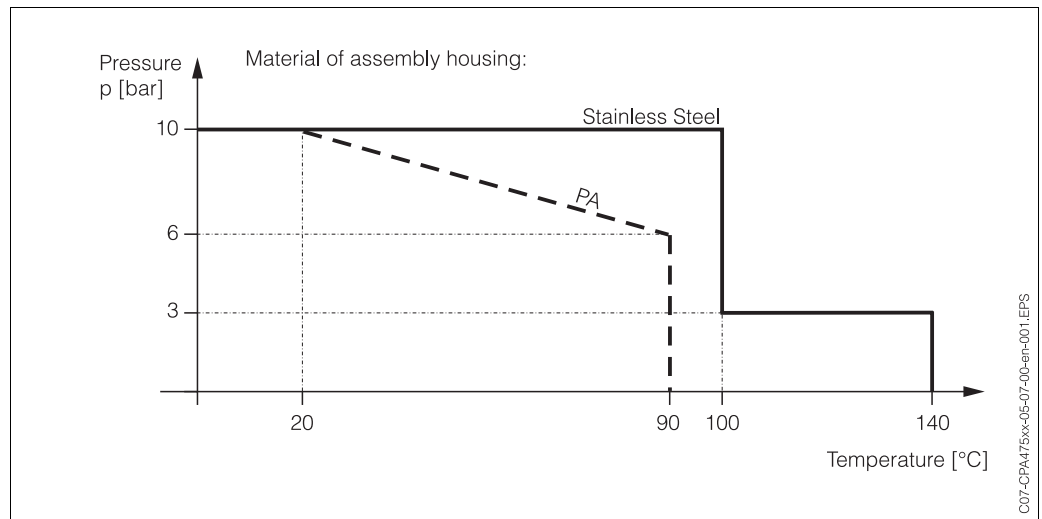
Operating conditions (process)

Process temperature range

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

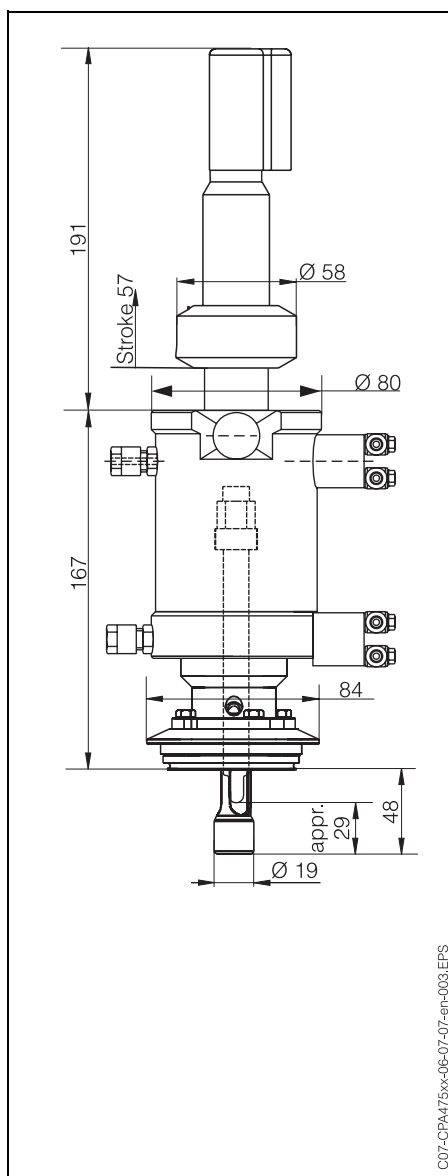
Process pressure range

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

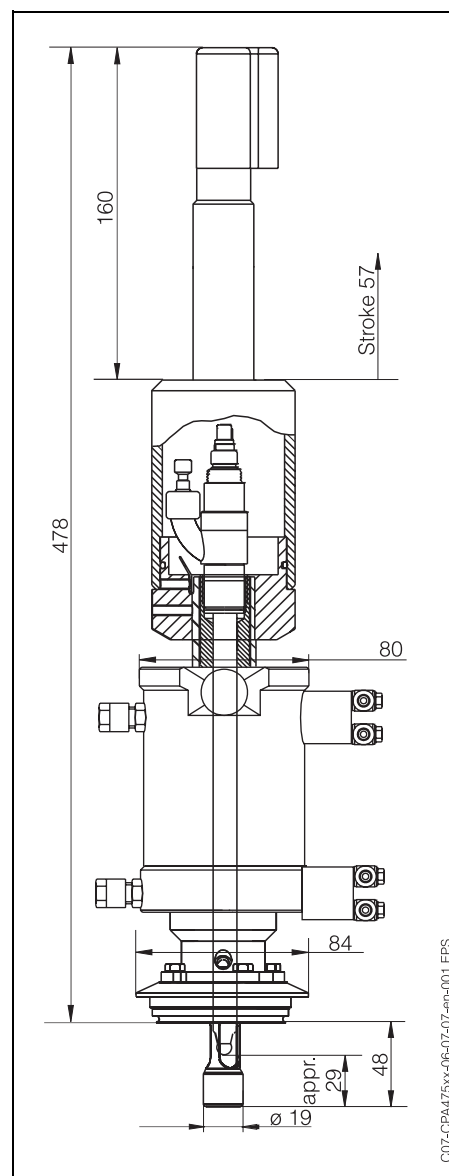


Design

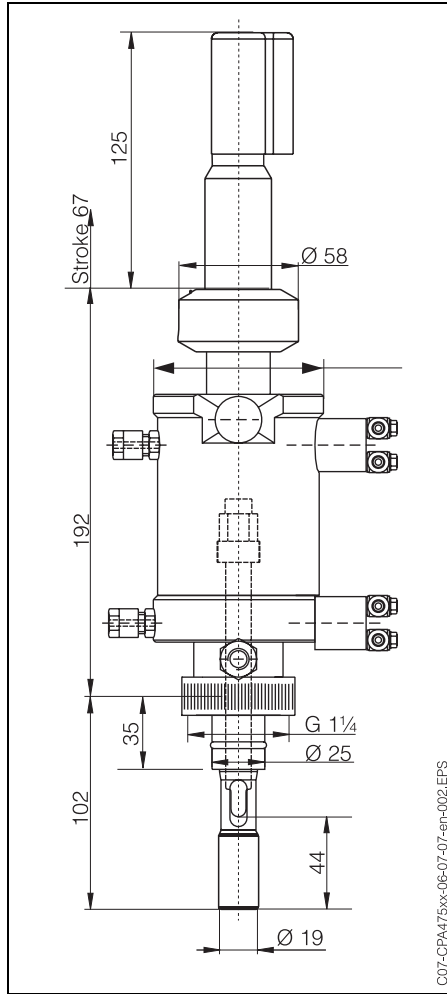
Design, dimensions



OPA475 for electrode length of 120 mm, gel electrodes
OPS11, OPS71, ISFET OPS471



OPA475 for electrode length of 225 mm, liquid KCl
electrode OPS41

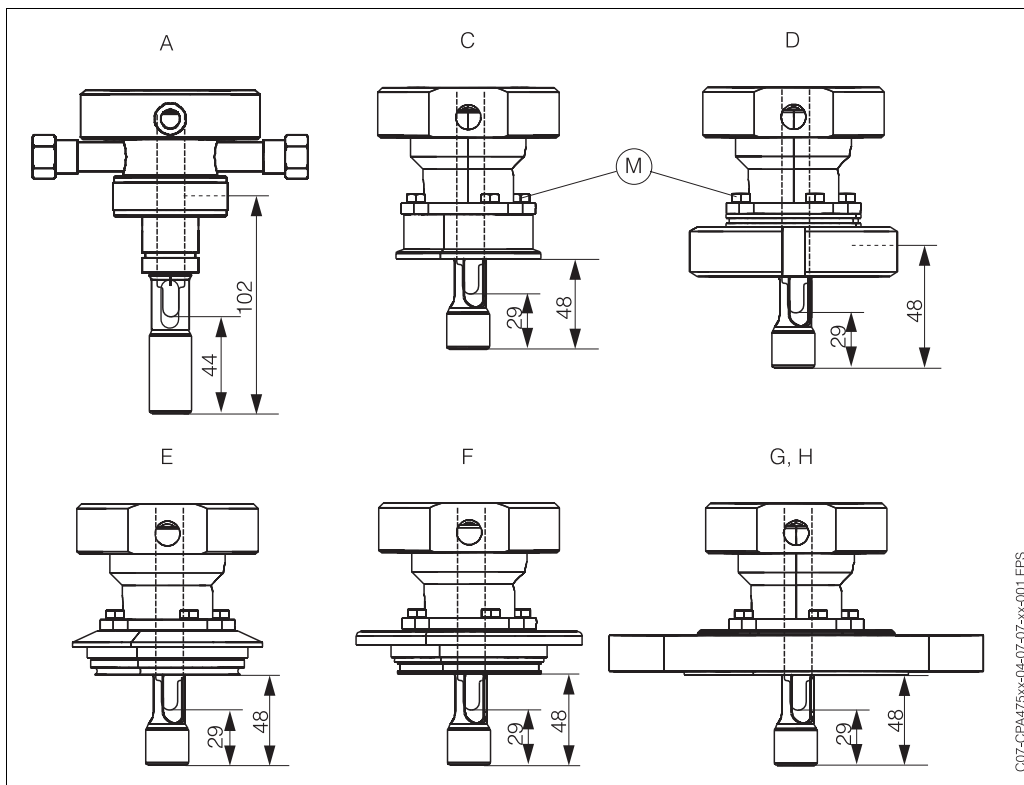


OPA475 assembly with G 1 1/4 thread adapter nut

Weight	approx. 4 kg
Materials in contact with medium	Electrode holder, standard: stainless steel 1.4435 (AISI 316L), surface roughness $R_a=0.8 \mu\text{m}$ Seals: EPDM, VITON [®] with FDA approval
Materials not in contact with medium	Housing: PA, stainless steel 1.4404 (AISI 316L) Lubricant: PARALIQ [®] GTE 703 (mineral oil-free grease with USDA-H1 approval; manuf.: Klüber) Splash protection cover: POM
Rinse connections	Rinse water pressure 2 ... 6 bar 2 x G 1/4 (internal), 2 x NPT 1/4" (internal)
Pneumatic connections / requirements	Pressure 4 ... 6 bar (gauge pressure) Filtered air (40 μm), water-free, oil-free The air lines must have a min. nominal diameter of 4 mm.
Limit switches	Pneumatic 3/2-way valve Electric limit switches
Electrodes	Gel electrodes: 120 mm (e.g. OPS11, OPS 71) Liquid KCl electrode: 225 mm (e.g. OPS41) ISFET-pH-Sensor: 120 mm (e.g. OPS471) Oxygen sensor: 120 mm (e.g. OOS21)

Process connection

A: G 1 ¼ 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).

Ordering information

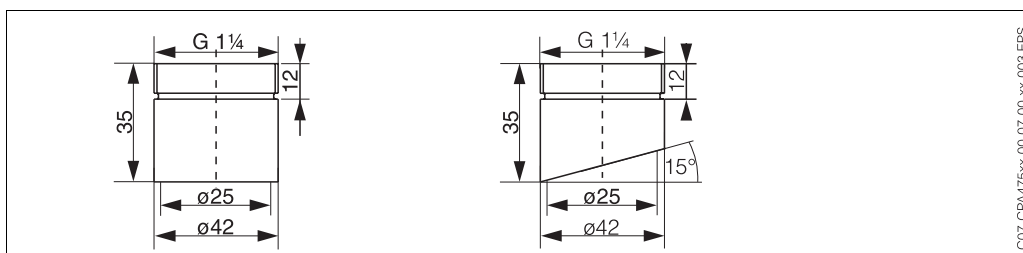
Product overview for OPA475

		Drive type and limit switches	
	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	
		Assembly version	
	1	Standard version	
	9	Special version to customer specifications	
		Electrode holder	
	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	
		Immersion depth	
	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	
		Assembly material (in contact with medium)	
	A	In contact with medium: 1.4435 (316L), with PA housing	
	B	In contact with medium: 1.4435 (AISI 316L), with 1.4404 (AISI 316L) housing	
	C	In contact with medium: 1.4435 (316L), with test certificate 3.1B to EN10204 with PA housing	
	D	In contact with medium: 1.4435 (316L), with test certificate 3.1B to EN10204 with 1.4404 (AISI 316L) housing	
	Y	Special version to customer specifications	
		Seal material (in contact with medium)	
	1	EPDM	
	2	VITON®	
	9	Special version to customer specifications	
		Process connection	
	A	G 1¼ internal thread (union nut), no certificate	
	C	Tri-Clamp, 2"	
	D	Dairy fitting DN 50 (DIN 11851) ***only permissible with SKS Siersma adapter	
	E	Varivent DN 50 ... 125	
	F	APV DN 50 ... 100	
	G	Flange, DN 50	
	H	Flange, ANSI 2"	
	Y	Special version to customer specifications	
		Optional equipment	
	3	With rinse fitting, 2 x G ¼ internal thread	
	4	With rinse fitting, 2 x NPT ¼" internal thread	
OPA475-		complete order code	

Accessories

Welding socket

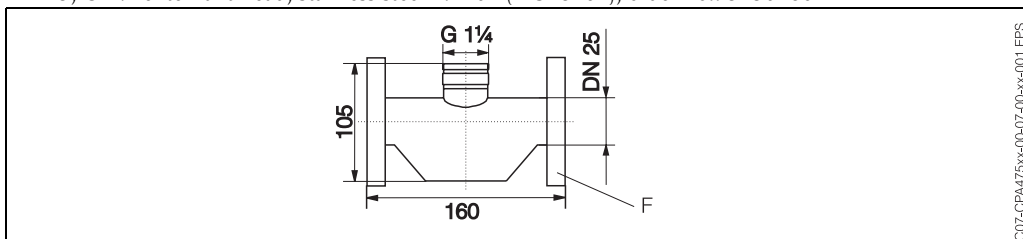
G 1¼, straight, stainless steel 1.4435 (AISI 316L) ; order no.: 51502798
 G 1¼, inclined 15°, stainless steel 1.4435 (AISI 316L); order no.: 51502799



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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 OPS1 I (glass electrode)
 Gel electrode OPS71 (glass electrode)
 ISFET pH sensor OPS471 (plastic electrode)

pH/redox combination electrodes, length 225 mm

Liquid KCl electrode OPS41 (with ESS head)

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 OPK9 (for high-temperature applications, IP 68 / NEMA 6X, also for Ex)

