



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services

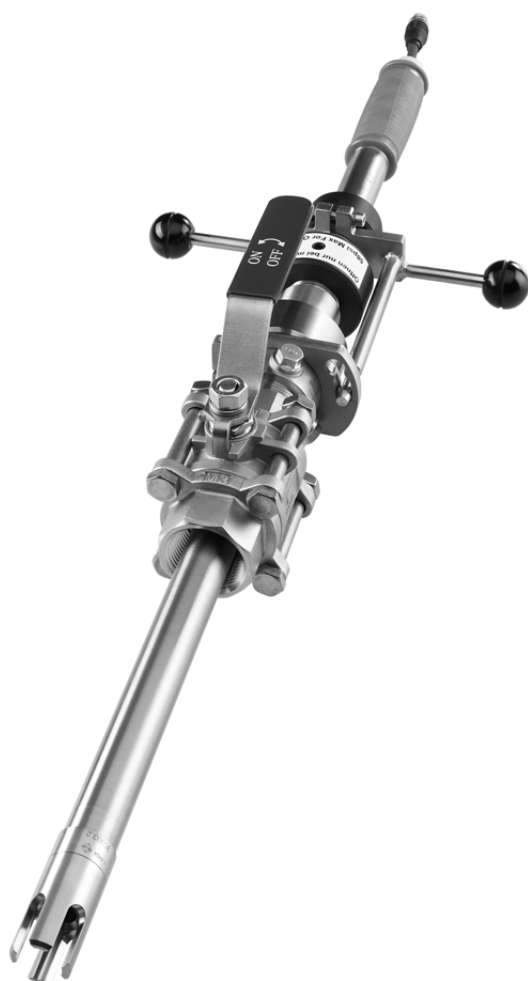


Solutions

Technical Information

Cleanfit W CPA450

Retractable assembly for 12 mm sensors for DO/pH/ORP measurement



Application

- Pulp and paper industry
- Chemical industry
- Measurement in fibrous or coating media
- Tanks and process vessels
- Pipelines
- Power plants
- Wastewater treatment

The retractable assembly permits replacement of pH/ORP or oxygen sensors while the tank is full or under process conditions.

Your benefits

- Easy installation and removal of the DO/pH/ORP sensor for easy service
- Sensor cleaning and calibration without process interruption
- Process is sealed off reliably by a ball valve made of stainless steel
- Uses standard and ISFET sensors of 120 mm length
- 3 immersion depths up to 700 mm (27.5"), adjustable
- Safety equipment for operation up to 12 bar (175 psi)
- Integrated rinse and calibration connections
- Available as stainless steel, alloy C4 and titanium version

Function and system design

Function principle

The assembly is manually operated.

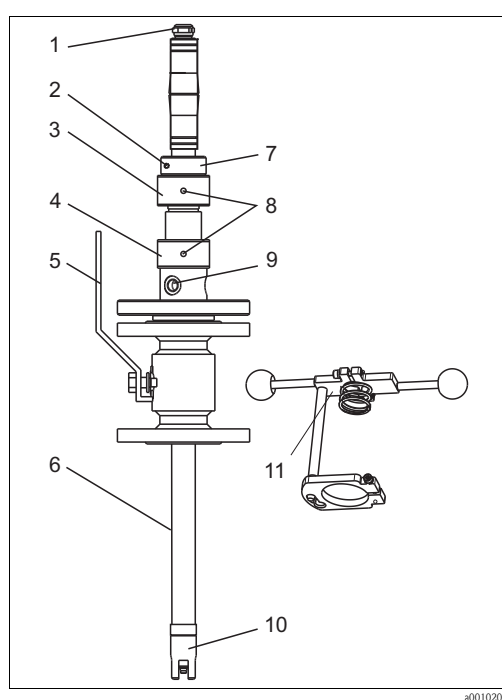
Caution!

The rinse connections are in open contact with the medium in the measuring position and are thus exposed to the process pressure. Make sure that the rinse connections are closed during measurement and when moving the assembly.

In the "Service" status (sensor moved back into the assembly and **ball valve closed**), the ball valve seals the assembly off from the process. This means that cleaning and calibration can take place and sensors can be changed under process conditions. In this "Service" status it is possible to clean the tank or pipe with a pressure up to 12 bar (175 psi).

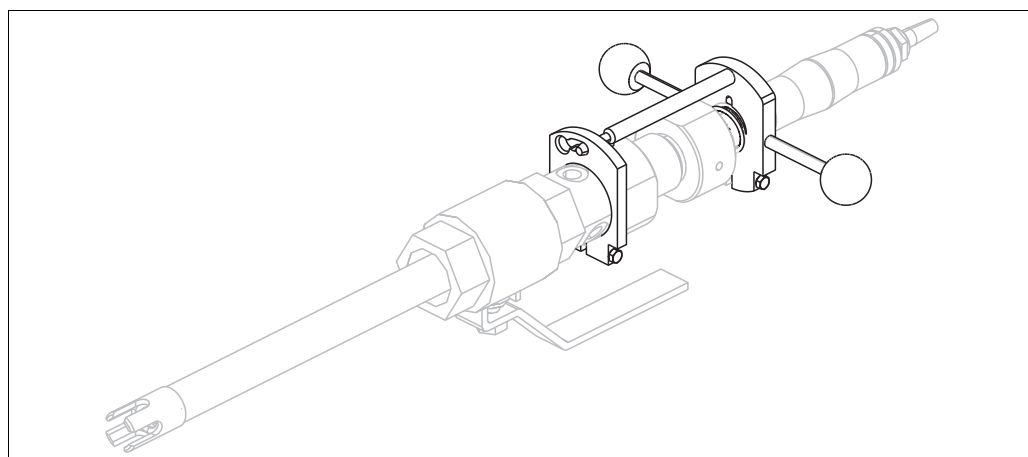
Caution!

Manually moving the assembly under process conditions is only advised at a process pressure up to 4 bar (58 psi).



- 1 Cable protection
- 2 Allen screw M5
- 3 Compression fitting (black)
- 4 Lock ring (metal)
- 5 Manual lever for ball valve opening and closing
- 6 Immersion tube
- 7 Setting collar for adjustment of immersion depth
- 8 Drill holes for hook wrench
- 9 Rinse connection G $\frac{1}{4}$ (316L) NPT $\frac{1}{4}$ " (Alloy C4 or titanium)
- 10 Sensor holder with protecting cage
- 11 Locking device safety kit

Assembly in "measuring" position (ball valve open)



Assembly with safety kit

Suitable sensors

The following sensors are suitable for installation in the CPA450:

- Digital sensors with Memosens technology, length 120 mm / 4.72"
- pH/ORP glass electrodes, length 120 mm / 4.72"
- ISFET sensors: only sensors listed in "Accessories" chapter
- DO sensors, length 120 mm / 4.72"
- For the conductivity sensor CLS15 a modification is available

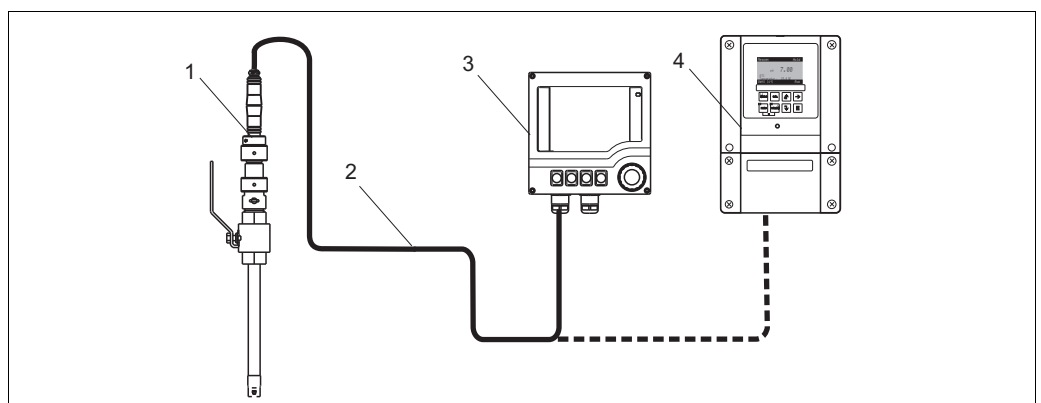
Measuring system

A complete measuring system consists of:

- Cleanfit W CPA450 assembly
- DO/pH/ORP sensor, length 120 mm (4.72"), e.g. Orbisint CPS11D
- Transmitter, e.g. Liquiline M CM42 or Mycom S CPM153
- Measuring cable, e.g. CYK10 or CPK9

Optional:

- RM junction box for use with extension cable (see chapter "Accessories")
- CYK81 measuring cable for extended cable runs



Measuring system with CPA450

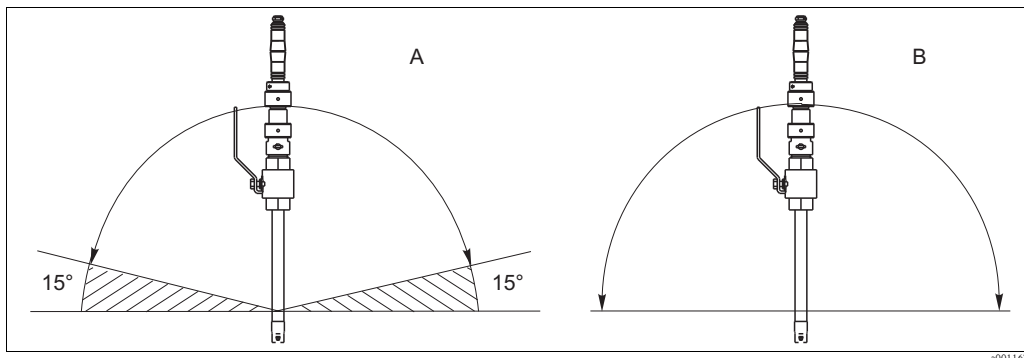
- 1 Cleanfit assembly with sensor
- 2 Measuring cable
- 3 Liquiline M CM42
- 4 Mycom S CPM153

Installation

Installation instructions

The permissible installation angle of the assembly depends on the sensor:

- Glass electrodes and digital sensors with Memosens technology:
Install the assembly at an angle of at least 15° from the horizontal.
- ISFET sensors:
When using an ISFET sensor, there are, in principle, no restrictions to the installation. An installation angle between 0° and 180° is, however, recommended.



Installation angle of the assembly

A Glass sensors: 15° to horizontal

B ISFET sensors 0 to 180° recommended

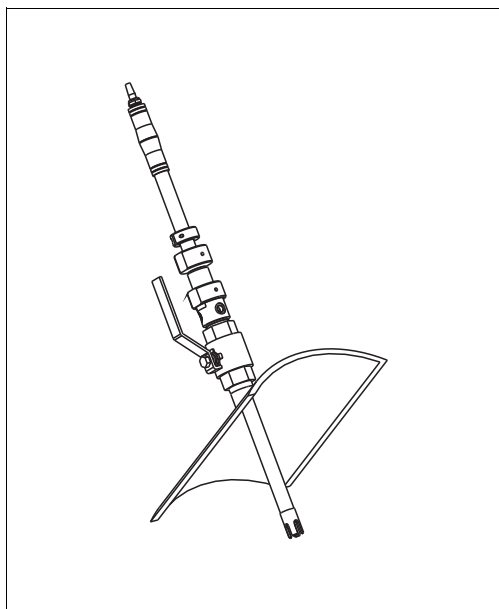
Install the assembly so that the sensor is kept wet at all times.

Installation with ball valve

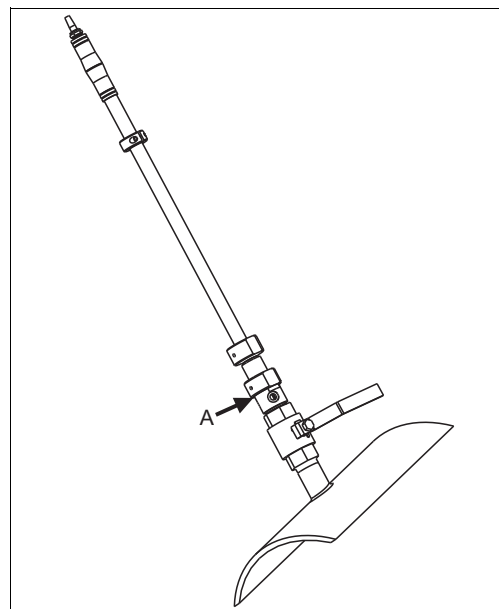
When replacing the sensor without switching off the process a ball valve is needed. The ball valve is part of the assembly (according to product structure) or has to be installed by the customer.

Note!

When used without ball valve switch off the process before removing the immersion tube or replacing the sensor. Danger of spraying liquid.



Assembly in inserted position = measuring mode (ball valve open)



Assembly in retracted position for electrode replacement, calibration, rinsing (ball valve closed)

A Top of adapter

Note!

Please note that a mounting clearance of min. 700 or 1150 mm (27.6" or 45.3") from the top of the adapter is required depending on assembly version.

Environment

Ambient temperature 0 to 80 °C (32 to 176 °F)

Process

Process pressure max. 12 bar at 100 °C (175 psi at 212 °F)

Caution!

- The maximum advised pressure for assembly movement is 4 bar (58 psi)!
- Consider the process conditions of the applied sensor!

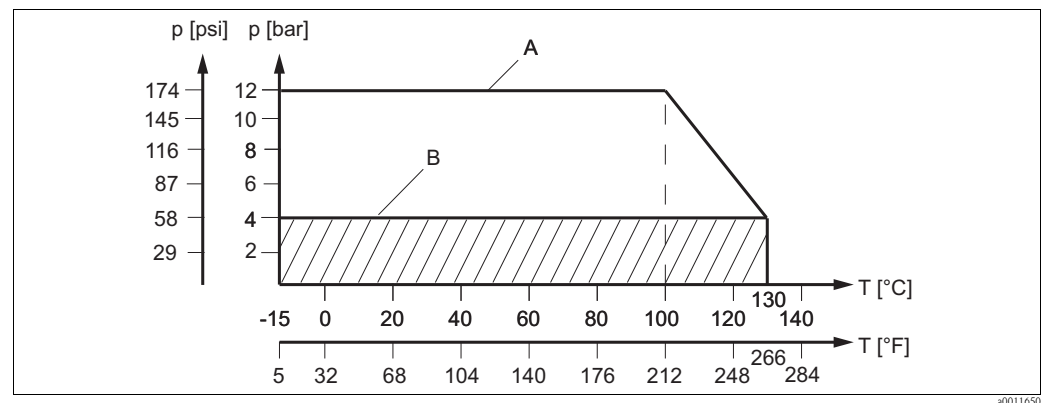
Process temperature -15 to 130 °C (5 to 266 °F)

Caution!

Consider the maximum process temperature of the sensor!

Pressure-temperature load curve

Pay attention to the specification of the process pressure!



Pressure-temperature diagram

- A Maximum process operating pressure (static), only for completely installed assembly
 B Advised upper insertion/retraction pressure (functional)

Warning!

The 4 bar (58 psi) line on the graph represents an advised upper insertion/retraction pressure. At 4 bar (58 psi) you have to apply (press/hold) approximately 20 kg (44 lbs) of force to the probe assembly.

For insertion/retraction of the assembly at any process pressure, consider the following:

- Make sure the service conditions are suitable for insertion/retraction at the process pressure.
- Use locking device safety kit (see chapter "Accessories").

Note!

Press/hold values are calculated based on ideal conditions (new assembly and clean fluid). Actual press/hold values could vary depending on process and/or assembly conditions.

Note!

To calculate the press/hold force use the following equation:

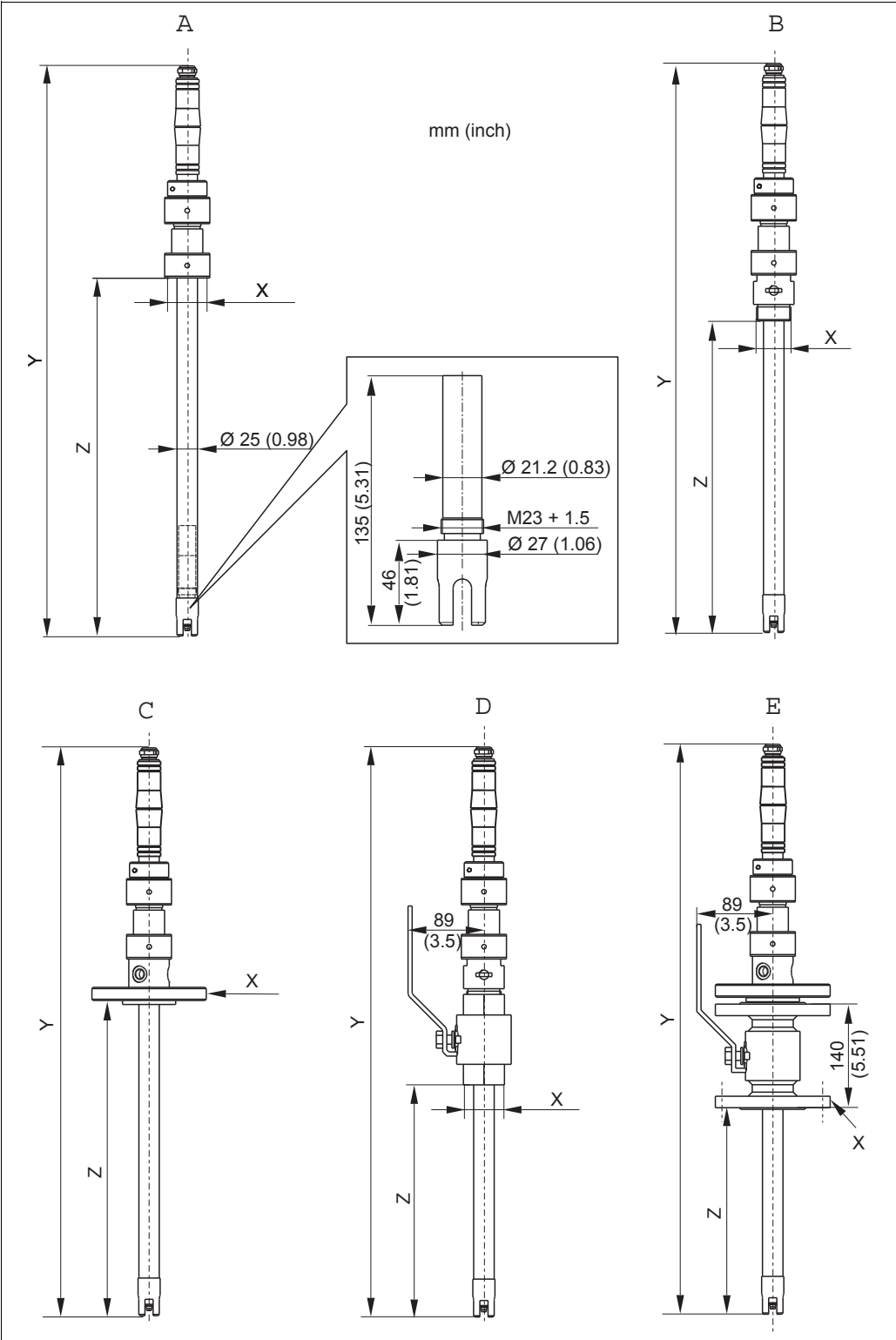
press/hold force = line pressure in bar multiplied by the surface area factor 5
 (e.g. 4 bar * 5 = 20 kg force)

or

press/hold force = line pressure in psi multiplied by the surface area factor 0.76
 (e.g. 58 psi * 0.76 = 44 lbs force)

Mechanical construction

Design, dimensions



Type	Assembly	Immersion depth mm (inch)	X Adapter	Y mm (inch)	Z mm (inch)
A	CPA450-*A***	100 (3.94) 250 (9.84) 700 (27.5)	G1½ internal	536 (21.1) 686 (27.0) 1136 (44.7)	276 (10.9) 425 (16.7) 875 (34.5)
B	CPA450-*B***	100 (3.94) 250 (9.84) 700 (27.5)	G1¼ external	536 (21.1) 686 (27.0) 1136 (44.7)	220 (9.06) 370 (14.9) 820 (32.6)
B	CPA450-*C***	100 (3.94) 250 (9.84) 700 (27.5)	NPT 1¼" external	536 (21.1) 686 (27.0) 1136 (44.7)	220 (9.06) 370 (14.9) 820 (32.6)
C	CPA450-*D***	100 (3.94) 250 (9.84) 700 (27.5)	Flange DN32	536 (21.1) 686 (27.0) 1136 (44.7)	220 (9.06) 370 (14.9) 820 (32.6)
C	CPA450-*E***	100 (3.94) 250 (9.84) 700 (27.5)	Flange ANSI 1¼"	536 (21.1) 686 (27.0) 1136 (44.7)	220 (9.06) 370 (14.9) 820 (32.6)
D	CPA450-*F*** and CPA450-*G***	100 (3.94) 250 (9.84) 700 (27.5)	G1¼ internal	536 (21.1) 686 (27.0) 1136 (44.7)	130 (5.12) 280 (11.0) 730 (28.7)
D	CPA450-*H***	100 (3.94) 250 (9.84) 700 (27.5)	NPT 1¼" internal	536 (21.1) 686 (27.0) 1136 (44.7)	130 (5.12) 280 (11.0) 730 (28.7)
E	CPA450-*I***	100 (3.94) 250 (9.84) 700 (27.5)	Flange DN32	536 (21.1) 686 (27.0) 1136 (44.7)	100 (3.94) 250 (9.84) 700 (27.5)
E	CPA450-*K***	100 (3.94) 250 (9.84) 700 (27.5)	Flange ANSI 1¼"	536 (21.1) 686 (27.0) 1136 (44.7)	100 (3.94) 250 (9.84) 700 (27.5)
B	CPA450-*M*** and CPA450-*Q***	700 (27.5)	M-NPT 1½ external	1143 (45.0)	830 (32.6)
C	CPA450-*N*** and CPA450-*R***	700 (27.5)	Flange ANSI 2"	1143 (45.0)	830 (32.6)

Weight	Without ball valve:	2 kg (4.4 lb.)
	With threaded ball valve:	5 kg (11 lb.)
	With flanged ball valve:	10 kg (22.1 lb.)
Materials in contact with medium	Immersion tube:	stainless steel AISI 316L, Alloy C4 or titanium
	O-rings:	EPDM / Viton / Kalrez
	Ball valve:	stainless steel 1.4404 (AISI 316L) or 1.4408 (AISI CF-8M)
	Ball valve sealings:	PTFE
Materials not in contact with medium	Screws:	Stainless steel AISI 316
	Safety kit:	Stainless steel AISI 316
	Compression fitting:	PA66GF
	Clamping ring:	PEEK
	Handle:	PVC
	Cable protection:	Thermoplastic elastomer (TPE)
Rinse connections	For material 316L: 3 x G ¼	
	For material Alloy C4 or titanium: 3 x NPT ¼"	

Ordering information

Product structure

Immersion depth; material			
A	100 mm (3.93");	titanium with safety locking device; only for CPA450-*M*** or CPA450-*N***	
B	250 mm (9.84");	titanium with safety locking device; only for CPA450-*M*** or CPA450-*N***	
C	700 mm (27.56");	titanium with safety locking device; only for CPA450-*M*** or CPA450-*N***	
H	100 mm (3.93");	Alloy C4 with safety locking device; only for CPA450-*Q*** or CPA450-*R***	
I	250 mm (9.84");	Alloy C4 with safety locking device; only for CPA450-*Q*** or CPA450-*R***	
K	700 mm (27.56");	Alloy C4 with safety locking device; only for CPA450-*Q*** or CPA450-*R***	
0	100 mm (3.93");	316L	
1	250 mm (9.84");	316L	
2	700 mm (27.56");	316L	
3	250 mm (9.84");	316L with safety locking device	
4	700 mm (27.56");	316L with safety locking device	
Process connection and stop cock			
A	Thread G 1¼ external,	316L; without adapter	
B	Thread G 1¼ external,	316L	
C	Thread NPT 1¼" external,	316L	
D	Flange DN 32 PN 16;	316L	
E	Flange ANSI 1¼", 150 lbs,	316L	
F	Ball valve 316;	thread G 1¼ internal	
G	Ball valve 316L;	thread G 1¼ internal	
H	Ball valve 316;	thread NPT 1¼" internal	
I	Ball valve 316;	flange DN 32 PN 16	
K	Ball valve 316;	Fflange ANSI 1¼"	
M	Thread M-NPT 1½",	titanium, without ball valve	
N	Flange ANSI 2",	titanium, without ball valve	
Q	Thread M-NPT 1½",	Alloy C4, without ball valve	
R	Flange ANSI 2",	Alloy C4, without ball valve	
Material: Seals			
1	EPDM		
2	FPM, Viton®		
3	FFKM, Kalrez® / PTFE		
Equipment, cable protection			
10	With cable protection		
16	Certificate EN 10204 3.1 for assembly without ball valve;	with cable protection	
20	Desiliconized,	with cable protection	
30	Certificate EN 10204 3.1 for assembly with ball valve (only for CPA450-*G***)		
40	With safety pressure test, 20 bar at T = 20 °C		
CPA450-			complete order code

Note!

The certificate EN 10204 3.1 is not available for the material titanium.

Versions with material Alloy C4 or titanium are delivered without ball valve. The ball valve has to be provided by the customer.

Note!

For sophisticated applications order the assembly with safety locking device.

The safety locking device can also be ordered as locking device safety kit (see chapter "Accessories")

Scope of delivery

The scope of delivery comprises:

- Cleanfit W CPA450 assembly (ordered version)
- PMC (potential matching) mounting kit
- Hook wrench
- Allen key
- Operating Instructions (English)

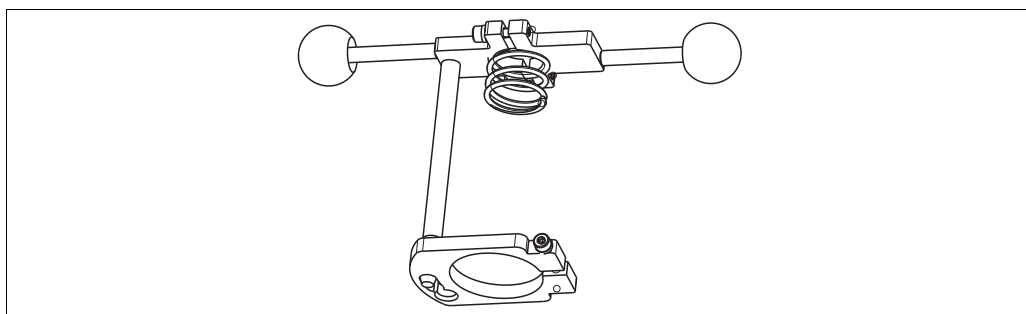
If you have any question, please contact your supplier or your local sales representatives.

Accessories

Locking device safety kit

Locking device safety kit

- Mechanical lock of the measuring position
- For applications in dusty or sooty areas
- For applications with vibrations or pressure surges
- Order no.: 71098681



#0015065

Assembly

Hose nozzles for rinse connections G $\frac{1}{4}$, DN 12

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

Hose nozzles for rinse connections G $\frac{1}{4}$, DN 12

- PVDF, 2 pieces
- Order no.: 50090491

Manometer

- Installation in rinse connection for checking the process pressure
- 0 to 16 bar (0 to 232 psi); G $\frac{1}{4}$
- Order no.: 71082362

Drain ball-valve for rinse chamber

- To drain residual medium; G $\frac{1}{4}$; stainless steel 1.4408 (AISI CF-8M)
- Order no.: 71083041

Hook wrench DIN 1810 design B

- D 58 - 68 mm
- Order no.: 50090687

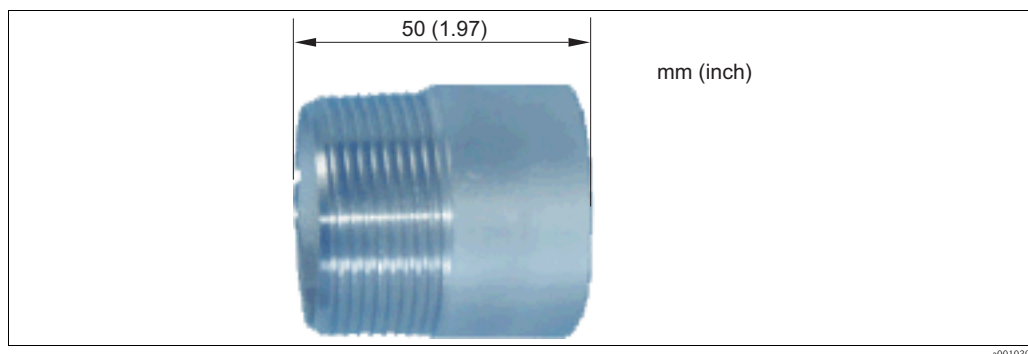


#0010362

Process connection adapter

Welding socket G 1 ¼ straight

- For process connections F and G
- Material: stainless steel 1.4571 (AISI 316Ti)
- Order no.: 51502284



a0010390

Sensors**Glass electrodes****Note!**

When ordering electrodes, please note that only electrodes with a shaft length of 120 mm (4.72") and diameter of 12 mm (0.47") are suitable for the CPA450 assembly. The most common sensors are listed below.

Orbisint CPS11/CPS11D

- pH electrode for process applications, with PTFE diaphragm
- Memosens functionality as option
- Ordering acc. to product structure, see Technical Information (TI028C/07/en)

Orbisint CPS12/CPS12D

- ORP electrode for process applications, with PTFE diaphragm
- Memosens functionality as option
- Ordering acc. to product structure, see Technical Information (TI367C/07/en)

Ceragel CPS71/CPS71D

- pH electrode with double chamber reference system and integrated bridge electrolyte
- Memosens functionality as option
- Ordering acc. to product structure, see Technical Information (TI245C/07/en)

Ceragel CPS72/CPS72D

- ORP electrode with double chamber reference system and integrated bridge electrolyte
- Memosens functionality as option
- Ordering acc. to product structure, see Technical Information (TI374C/07/en)

Orbipore CPS91/CPS91D

- pH electrode with open aperture for media with high dirt load
- Memosens functionality as option
- Ordering acc. to product structure, see Technical Information (TI375C/07/en)

ISFET sensors for CPA450**Tophit CPS471D**

- Sterilisable and autoclavable ISFET sensor with Memosens technology for food and pharmaceutical industries, process technology, water treatment and biotechnology
- Ordering acc. to product structure, see Technical Information (TI283C/07/en)

Tophit CPS491D

- ISFET sensor with Memosens technology, open aperture for media with high dirt load
- Ordering acc. to product structure, see Technical Information (TI377C/07/en)

CPS471-ESA

- pH sensor with ISFET technology, ceramic diaphragm, chip seal: perfluorelastomer
- TOP68 / ESA plug-in head, 120 mm / 4.72"
- Order no.: 51513079

CPS491-ESA

- pH sensor with ISFET technology, open aperture, chip seal: perfluorelastomer
- TOP68 / ESA plug-in head, 120 mm / 4.72"
- Order no.: 51512562

Oxygen sensors**Oxymax H COS21D**

- Sterilizable sensor for dissolved oxygen, with Memosens technology
- Ordering acc. to product structure, see Technical Information (TI402C/07/en)

Cables**CPK1 special measuring cable**

- For pH/ORP electrodes with GSA plug-in head
- Ordering acc. to product structure, see Technical Information (TI118C/07/en)

CPK9 special measuring cable

- For sensors with TOP68 plug-in head, for high-temperature and high-pressure applications, IP 68
- Ordering acc. to product structure, see Technical Information (TI118C/07/en)

CPK12 special measuring cable

- For pH/ORP glass electrodes and ISFET sensors with TOP68 plug-in head
- Ordering acc. to product structure, see Technical Information (TI118C/07/en)

CYK10 Memosens data cable

- For digital sensors with Memosens technology
- Ordering according to product structure, see Technical Information (TI376C/07/en)

CYK71 measuring cable

- Non-terminated cable for the connection of pH sensors and COS41 oxygen sensor or the extension of sensor cables
- Sold by the meter, order number:
 - non-Ex version, black: 50085333
 - Ex version, blue: 51506616

CYK81 measuring cable

- Non-terminated measuring cable for extension of sensor cables of e.g. Memosens sensors, CUS31/CUS41
- 2 wires, twisted pair with shield and PVC-sheath (2 x 2 x 0.5 mm² + shield)
- Sold by the meter, order no.: 51502543

Junction box VBA

- For cable extension of pH/ORP sensors
- 10 terminals, protection class: IP 65 (≅ NEMA 4X)
- Cable entries: 2 x Pg 13.5, 2 x Pg 16
- Material: polycarbonate
- Order no.: 50005276

Junction box RM

- For cable extension (e.g. for Memosens sensors)
- 5 terminals
- Cable entries: 2 x Pg 13.5
- Material: PC
- Ingress protection: IP 65
- Order no.: 51500832

Transmitters

Liquiline CM42

- Modular two-wire transmitter, stainless steel or plastic, field or panel instrument
- Various Ex approvals (ATEX, FM, CSA, Nepsi, TIIS)
- HART, PROFIBUS or FOUNDATION Fieldbus available
- Ordering acc. to product structure, see Technical Information (TI381C/07/en)

Liquisys CPM223/253

- Transmitter for pH and ORP, field or panel-mounted housing
- HART or PROFIBUS available
- Ordering acc. to product structure, see Technical Information (TI194C/07/en)

Mycom CPM153

- Transmitter for pH and ORP, one or two channel version, Ex or non-Ex
- HART or PROFIBUS available
- Ordering acc. to product structure, see Technical Information (TI233C/07/en)

Instruments International

Endress+Hauser
Instruments International AG
Kaegenstrasse 2
4153 Reinach
Switzerland

Tel.+41 61 715 81 00
Fax+41 61 715 25 00
www.endress.com
info@ii.endress.com