Technical Information
Cleanfit CPA450

Retractable assembly for fitting and removing 12 mm sensors for pH, redox and oxygen measurement under process conditions

Application

- Universal flow assembly for pH/ORP, oxygen and conductivity sensors
- Power stations
- Chemical industry
- Industrial water treatment
- Supply technology

Your benefits

- Simple fitting and removal of the pH/redox or oxygen sensor for easy maintenance
- Sensor cleaned and calibrated without interrupting the process
- Process is reliably screened off by stainless steel ball valve, ensuring safety during maintenance work
- Use of ISFET sensors and standard gel electrodes 120 mm long
- Three immersion depths up to 700 mm (27.5")
- Safety equipment can be used up to 12 bar (175 psi)
- Integrated rinse connections
- Assembly available in stainless steel, ultra corrosion-resistant C22 nickel alloy and titanium

Endress+Hauser

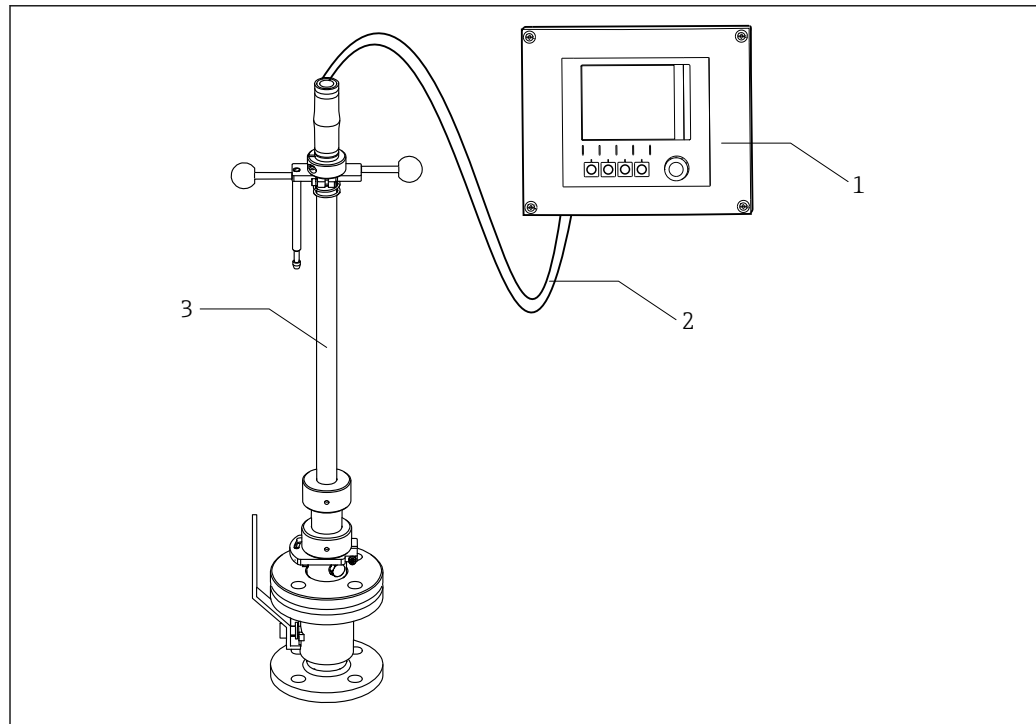People for Process Automation

Function and system design

Measuring system

A complete measuring system comprises:
- Assembly Cleanfit CPA450
- Oxygen/pH/ORP electrode, length 120 mm (4.72"), e.g. Orbisint CPS11D
- Transmitter, e.g. Liquiline CM44x or Liquiline CM42
- measuring cable, e.g. CYK10

Optional:
- Junction box M12 socket/cable or cable/cable
- Extension cable CYK11

A0038005

☒ 1   Measuring system with CPA450

1   Transmitter Liquiline CM44x
*2   Measuring cable CYK10*
3   Assembly Cleanfit CPA450

Mounting

Installation instructions

The permitted orientation of the assembly depends on the sensor used:
- Digital sensors with Memosens technology, pH/ORP glass electrodes:
  Install the assembly at an angle of at least 15° to the horizontal → ☒ 2, 🖺 3.
- ISFET sensors:
  For ISFET sensors, there are basically no restrictions regarding orientation. The installation angle should be from 0 to 180°.
- All other sensors:
 Pay attention to the information in the relevant TI.
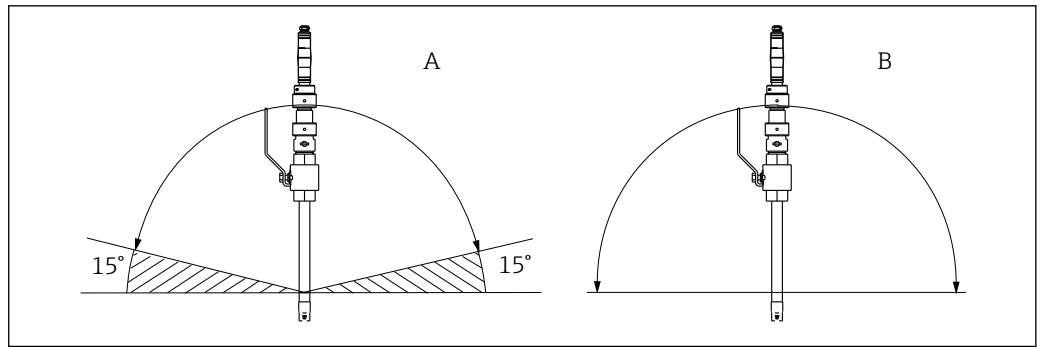
🖼 *2   Orientations*

A   Glass sensors: 15 ˚ to the horizontal
B   ISFET sensors: 0 to 180˚ recommended

Insert the immersion assembly into the vessel or pipe to a depth that will ensure that medium continuously washes around the electrode, even at the minimum level.
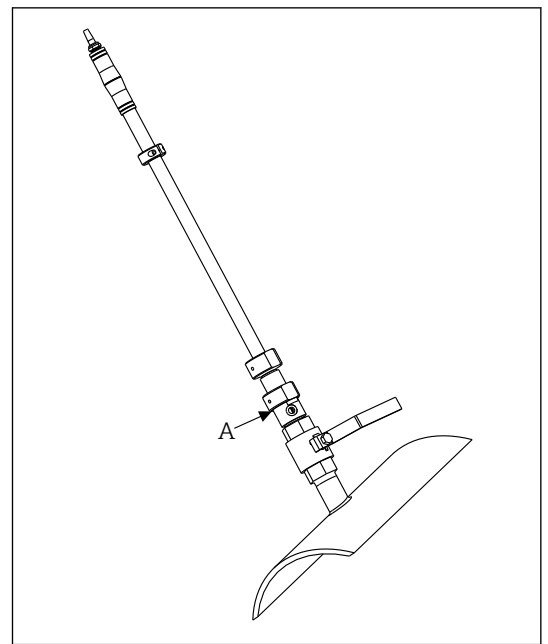
Installation with ball valve   To replace the sensor without interrupting the process, a ball valve is required. Depending on the version, the ball valve forms part of the assembly or must be installed by the customer.
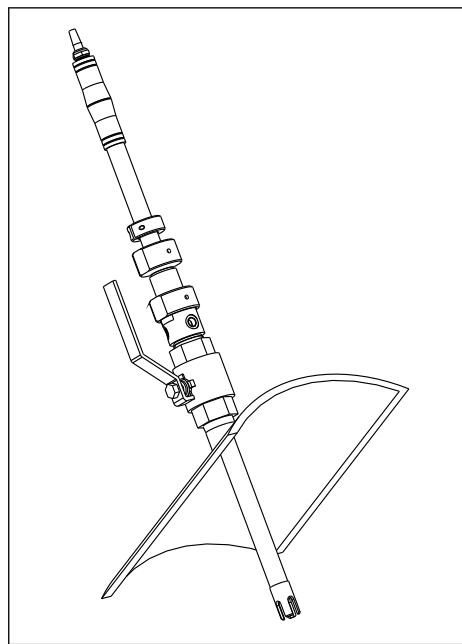
🖼 *3   Measuring mode (ball valve is open): assembly is retracted*

🖼 *4   Service position (ball valve is closed): assembly is extended for electrode replacement, calibration, rinsing*

A   Top edge of adapter

ℹ Depending on the assembly version, a mounting clearance of at least 700 or 1150 mm (27.6" or 45.3") is required from the top edge of the adapter.

Environment

Ambient temperature range   0 to 80 ℃ (32 to 176 ℉)

Storage temperature   0 to 80 ℃ (32 to 176 ℉)
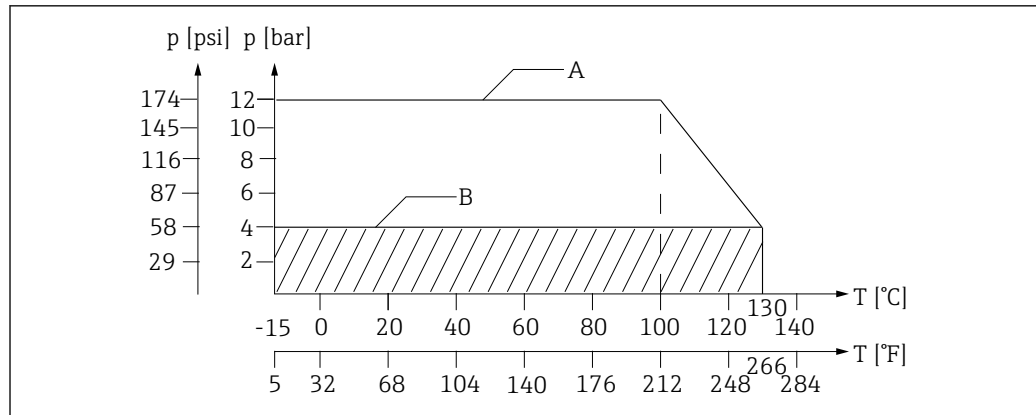
Process

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

Process pressure

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

ℹ️ At pressures above 4 bar (58 psi) the use of a safety kit is strongly recommended.

Pressure-temperature chart
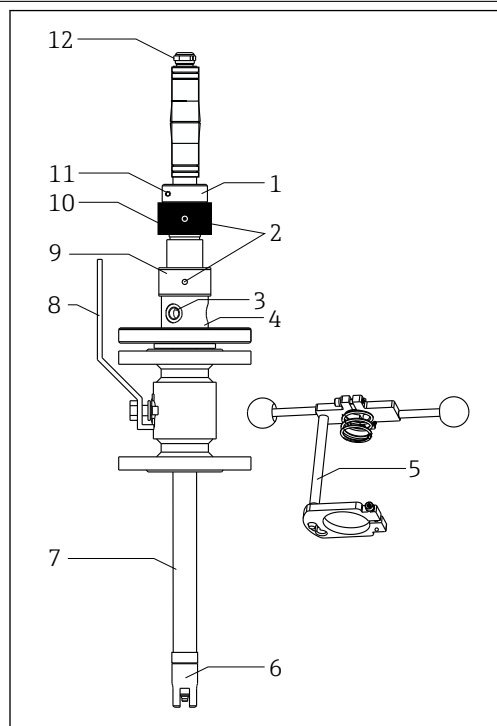
🖾 5 *Pressure/temperature ratings*

A   Maximum process pressure (static), only for fully installed assembly
B   Maximum pressure for moving the assembly (functional)

ℹ️ Observe the maximum permitted process temperature and process pressure of the sensor.

Mechanical construction

Design

🖾 6 *Assembly in operational state (ball valve open)*

1   Setting collar for fixing the immersion depth
2   Bore for hook wrench
3   Rinse connection thread ¼ (316L) NPT ¼" (alloy C22 or titanium)
4   Service chamber
5   Safety kit
6   Sensor holder with basket protector
7   Immersion tube
8   Lever for opening/closing the ball valve
9   Lock ring (metal)
10   Thread adapter nut (black)
11   M5/SW4 hexagon socket
12   Cable protector/cable gland
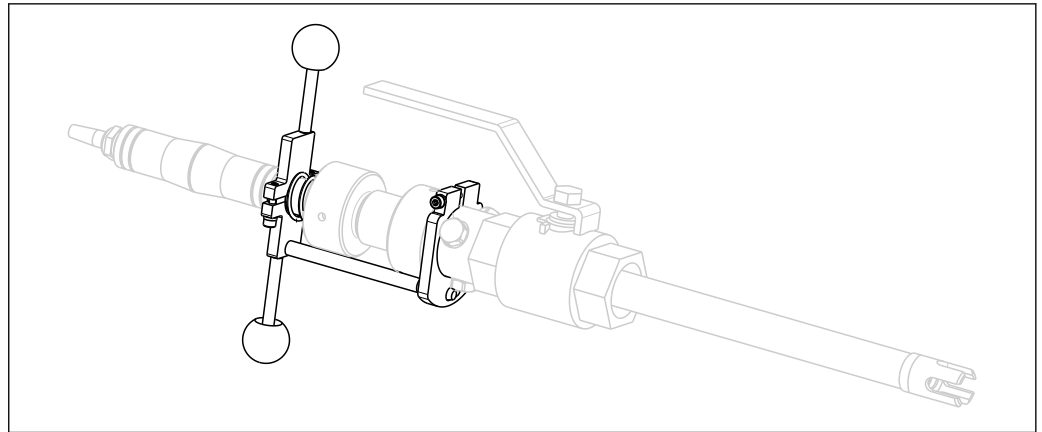
❼ *7   Assembly with safety kit*

Dimensions

Ø 25 (0.98)

135 (5.31)

Ø 21.2 (0.83)

M23 + 1.5
Ø 27 (1.06)

46
(1.81)

89
(3.5)

89
(3.5)

F, G
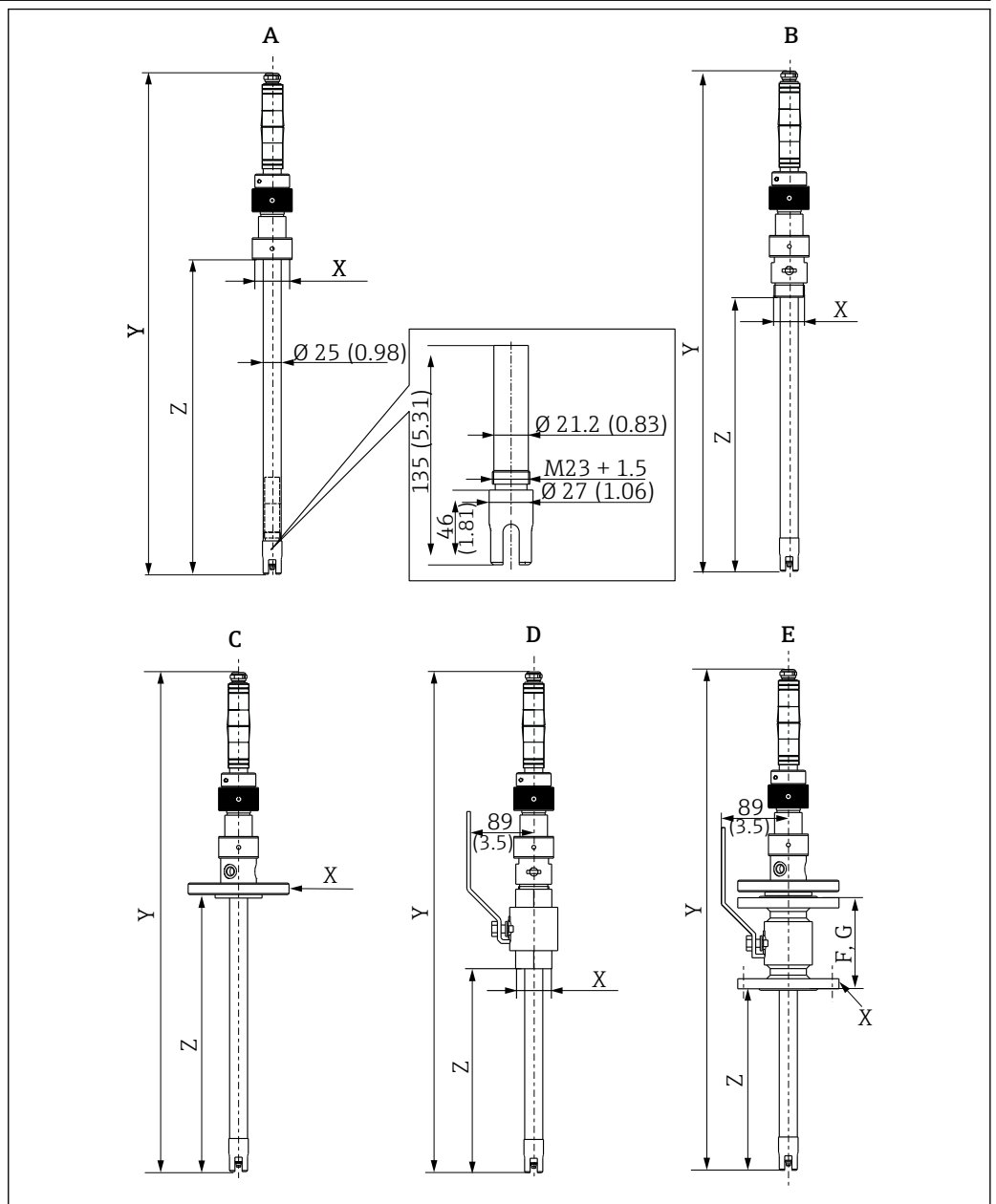
❽ *8   Dimensions (see the following table). Engineering unit in mm (inch)*

F   130 mm (5.12 in) (flange DN32)
G   140 mm (5.51 in) (flange ANSI 1¼")

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	558 (21.97) 708 (27.87) 1158 (45.59)	275 (10.83) 425 (16.7) 875 (34.5)
B	CPA450-*B***	100 (3.94) 250 (9.84) 700 (27.5)	G1¼ external	558 (21.97) 708 (27.87) 1158 (45.59)	220 (9.06) 370 (14.9) 820 (32.6)
B	CPA450-*C***	100 (3.94) 250 (9.84) 700 (27.5)	NPT 1¼" external	558 (21.97) 708 (27.87) 1158 (45.59)	220 (9.06) 370 (14.9) 820 (32.6)
C	CPA450-*D***	100 (3.94) 250 (9.84) 700 (27.5)	Flange DN32 (as per DIN EN 1092-1)	558 (21.97) 708 (27.87) 1158 (45.59)	225 (8.86) 375 (14.76) 825 (32.48)
C	CPA450-*E***	100 (3.94) 250 (9.84) 700 (27.5)	Flange ANSI 1¼" (as per ASME B16.5)	558 (21.97) 708 (27.87) 1158 (45.59)	225 (8.86) 375 (14.76) 825 (32.48)
D	CPA450-*F***	100 (3.94) 250 (9.84) 700 (27.5)	G1¼ internal	558 (21.97) 708 (27.87) 1158 (45.59)	130 (5.12) 280 (11.2) 730 (28.7)
D	CPA450-*H***	100 (3.94) 250 (9.84) 700 (27.5)	NPT 1¼" external	558 (21.97) 708 (27.87) 1158 (45.59)	130 (5.12) 280 (11.2) 730 (28.7)
E	CPA450-*I***	100 (3.94) 250 (9.84) 700 (27.5)	Flange DN32 (as per DIN EN 1092-1)	558 (21.97) 708 (27.87) 1158 (45.59)	92 (3.62) 242 (9.53) 792 (31.18)
E	CPA450-*K***	100 (3.94) 250 (9.84) 700 (27.5)	Flange ANSI 1¼" (as per ASME B16.5)	558 (21.97) 708 (27.87) 1158 (45.59)	82 (3.23) 232 (9.13) 782 (30.79)
B	CPA450-*M*** and CPA450-*Q***	100 (3.94) 250 (9.84) 700 (27.5)	M-NPT 1½ external	558 (21.97) 708 (27.87) 1158 (45.59)	220 (8.66) 370 (14.57) 820 (32.28)
C	CPA450-*N*** and CPA450-*R***	100 (3.94) 250 (9.84) 700 (27.5)	Flange ANSI 2" (as per ASME B16.5)	558 (21.97) 708 (27.87) 1158 (45.59)	225 (8.86) 375 (14.76) 825 (32.48)

Weight

Depends on version:

Without ball valve:	2 kg (4.41 lbs)
With threaded ball valve:	5 kg (11 lbs)
With flanged ball valve:	10 kg (22.1 lbs)

Materials

In contact with medium	
Immersion tube:	stainless steel 1.4404 (AISI 316 L), Alloy C22, titanium 3.7035
O-rings:	EPDM / Viton / Kalrez
Ball valve:	stainless steel 1.4404 or 1.4408 (AISI 316 L or CF-8M)
Ball valve seals:	PTFE

Not in contact with medium	
Screws:	stainless steel 1.4401 (AISI 316)
Coupling nut (black):	PA66GF
Clamping ring:	PEEK
Handle:	PVC
Cable protector:	thermoplastic elastomer (TPE)

Rinse connection nozzles	For material 316L:	3 x G ¼
	For titanium or Alloy C22:	3 x NPT ¼"

Ordering information

Product page	www.endress.com/cpa450

Product configurator	On the product page there is a **Configure** button to the right of the product image.

1. Click this button.
   ↳ The Configurator opens in a separate window.
2. Select all the options to configure the device in line with your requirements.
   ↳ In this way, you receive a valid and complete order code for the device.
3. Export the order code as a PDF or Excel file. To do so, click the appropriate button on the right above the selection window.

For many products you also have the option of downloading CAD or 2D drawings of the selected product version. Click the **CAD** tab for this and select the desired file type using picklists.

Scope of delivery	The scope of delivery comprises:

- Assembly in the version ordered
- PAL mounting kit
- Hook wrench
- Operating Instructions

▸ If you have any queries:
Please contact your supplier or local sales center.

Accessories

The following are the most important accessories available at the time this documentation was issued.

▶ For accessories not listed here, please contact your Service or Sales Center.

Accessory kit	**Hose nozzles for rinse connections G ¼, DN 12** • Stainless steel 1.4404 (AISI 316 L) x 2 • Order number: 51502808 **Hose nozzles for rinse connections G ¼, DN 12** • PVDF (2 x) • Order number: 50090491 **Manometer** • Mount in rinse connection to monitor process pressure • 0 - 16 bar (0 to 232 psi); G¼ • Order number: 71082362 **Drain ball valve** • for draining residual medium; G¼; stainless steel 1.4408 (AISI CF-8M) • Order number: 71083041 **Hook wrench DIN 1810 flat face** • D 58 - 68 mm • Order number: 50090687
Welding socket	**Welding socket G 1¼ straight** • for process connection F • Dimensions: length 50 mm (1.97 in), Ø 42.6 mm (1.68 in) • Material: stainless steel 1.4571 (AISI 316 Ti) • Order number: 51502284
Safety kit	• Mechanical device for securing the measuring position • For applications in dusty or sooty environments • For applications involving vibrations or pressure surges • Order number: 71098681
Sensors	**Glass electrodes, analog and digital with Memosens technology**

Sensors (continued)

Glass electrodes, analog and digital with Memosens technology

ℹ️ When ordering sensors, please note that only electrode versions with a shaft length of 120 mm (4.72") and a diameter of 12 mm (0.47") are suitable for assembly CPA450. The most commonly used sensors are listed as follows.

Orbisint CPS11D / CPS11
• pH sensor for process technology
• Optional SIL version for connecting to SIL transmitter
• With dirt-repellent PTFE diaphragm
• Product Configurator on the product page: www.endress.com/cps11d or www.endress.com/cps11

📖 Technical Information TI00028C

Orbisint CPS12D / CPS12
• ORP sensor for process technology
• Product Configurator on the product page: www.endress.com/cps12d or www.endress.com/cps12

📖 Technical Information TI00367C

Ceragel CPS71D / CPS71
• pH electrode with reference system including ion trap
• Product Configurator on the product page: www.endress.com/cps71d or www.endress.com/cps71

📖 Technical Information TI00245C

Ceragel CPS72D / CPS72
• ORP electrode with reference system including ion trap
• Product Configurator on the product page: www.endress.com/cps72d or www.endress.com/cps72

📖 Technical Information TI00374C

Orbipore CPS91D / CPS91
- pH electrode with open aperture for media with high dirt load
- Product Configurator on the product page: www.endress.com/cps91d or www.endress.com/cps91

Technical Information TI00375C

ISFET sensors for CPA450

Memosens CPS47D
- Sterilizable and autoclavable ISFET sensor for pH measurement
- Refillable KCl liquid electrolyte
- Product Configurator on the product page: www.endress.com/cps47d

Technical Information TI01412C

Memosens CPS77D
- Sterilizable and autoclavable ISFET sensor for pH measurement
- Product Configurator on the product page: www.endress.com/cps77d

Technical Information TI01396

Memosens CPS97D
- ISFET sensor for pH measurement with long-term stability in media with high dirt loads
- Product Configurator on the product page: www.endress.com/cps97d

Technical Information TI01405C

Oxygen sensors

Oxymax COS22D
- Sterilizable sensor for dissolved oxygen
- With Memosens technology or as an analog sensor
- Product Configurator on the product page: www.endress.com/cos22d

Technical Information TI00446C

Memosens COS81D
- Sterilizable, optical sensor for dissolved oxygen
- With Memosens technology
- Product Configurator on the product page: www.endress.com/cos81d

Technical Information TI01201C

Connection accessories	**CPK1** For pH/ORP electrodes with GSA plug-in head Ordering information is available from your sales office or at www.endress.com.

Measuring cable CPK9
- Terminated measuring cable for connecting analog sensors with TOP68 plug-in head
- Selection in accordance with product structure
- Ordering information: Endress+Hauser sales office or www.endress.com.

Measuring cable CPK12
- Terminated measuring cable for connecting analog ISFET sensors with TOP68 plug-in head
- Selection in accordance with product structure
- Ordering information: Endress+Hauser sales office or www.endress.com

Memosens data cable CYK10
- For digital sensors with Memosens technology
- Product Configurator on the product page: www.endress.com/cyk10

Technical Information TI00118C

Measuring cable CYK71
- Unterminated cable for connecting analog sensors and for extending sensor cables
- Sold by the meter, order numbers:
  - Non-Ex version, black: 50085333
  - Ex-version, blue: 50085673

Measuring cable CYK81
- Unterminated cable for extending sensor cables (e.g. Memosens, CUS31/CUS41)
- 2 x 2 cores, twisted with shielding and PVC sheath (2 x 2 x 0.5 mm^2 + shielding)
- Sold by meter, Order No.: 51502543

VBA
- Junction box for cable extension
- 10 terminal strips
- Cable entries: 2 x Pg 13.5, 2 x Pg 16
- Material: polycarbonate
- Degree of protection: IP 65
- Order number: 50005276

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www.addresses.endress.com