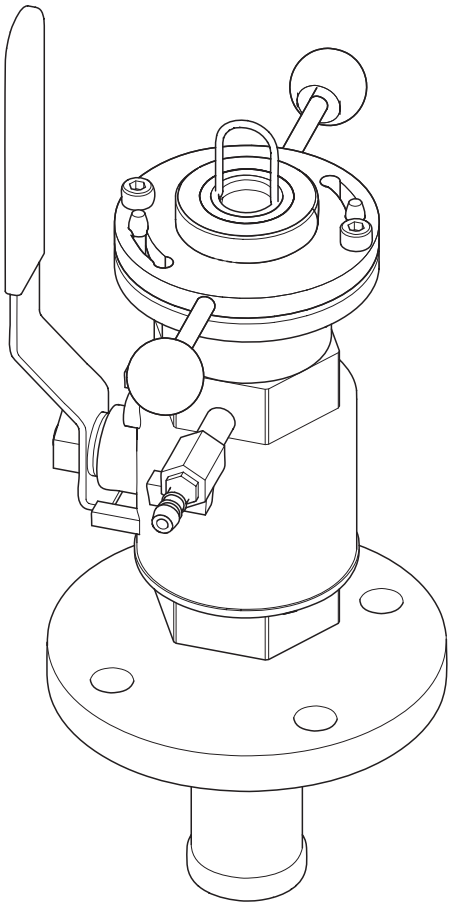
BA 368C/07/en/07.03
51512834

CleanFit COA 451
Retractable Process Assembly

Operating Instructions



Endress+Hauser
The Power of Know How

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1 Safety instructions

1.1 Designated use

The manually or pneumatically operated retractable assembly Cleanfit COA 451 is designed for installing oxygen sensors in tanks and pipes.
Its mechanical design permits its use in pressurised systems (see "Technical data").

Any other use than the one described here compromises the safety of persons and the entire measuring system and is, therefore, not permitted.
The manufacturer is not liable for damage caused by improper or non-designated use.

1.2 Installation, commissioning and operation

Please note the following items:
- Installation, electrical connection, commissioning, operation and maintenance of the measuring system must only be carried out by trained technical personnel.
  The technical personnel must be authorised for the specified activities by the system operator.
- Technical personnel must have read and understood these Operating Instructions and must adhere to them.
- Before commissioning the entire measuring point, check all the connections for correctness. Ensure that electrical cables and hose connections are not damaged.
- Do not operate damaged products and secure them against unintentional commissioning. Mark the damaged product as being defective.
- Measuring point faults may only be rectified by authorised and specially trained personnel.
- If faults can not be rectified, the products must be taken out of service and secured against unintentional commissioning.
- Repairs not described in these Operating Instructions may only be carried out at the manufacturer's or by the Endress+Hauser service organisation.

1.3 Operational safety

The assembly has been designed and tested according to the state of the art and left the factory in perfect functioning order.
Relevant regulations and European standards have been met.

As the user, you are responsible for complying with the following safety conditions:
- Installation instructions
- Local prevailing standards and regulations.

1.4 Return

If the assembly has to be repaired, please return it *cleaned* to the Endress+Hauser sales centre responsible.
Please use the original packaging, if possible.

Please enclose the completed Dangerous Goods sheet (copy the second last page of these Operating instructions) with the packaging and also the shipping documents.
No repair without completed Dangerous Goods sheet!

1.5 Notes on safety icons and symbols

Warning!
This symbol alerts you to hazards. They can cause serious damage to the instrument or to persons if ignored.

Caution!
This symbol alerts you to possible faults which could arise from incorrect operation. They could cause damage to the instrument if ignored.

Note!
This symbol indicates important items of information.

2 Identification

2.1 Device designation

2.1.1 Nameplate

You can recognise the assembly version from the order code on the nameplate. Please compare this with your order.

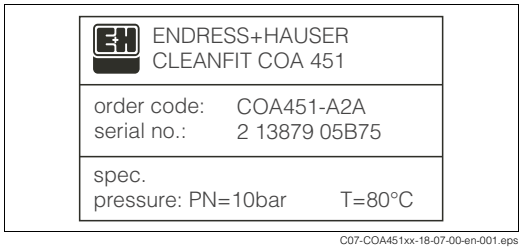

Fig. 1: Example of a nameplate

You can find the possible assembly versions and the resulting order code from the product structure.

2.1.2 Product structure

	Sensor lift / Immersion depth				
	A	Short lift, Immersion depth approx. 170 mm / 6.69" (process connections A and B only)			
	B	Long lift, Immersion depth approx. 270 mm / 10.63"			
		Sensor type / Connection			
		1	For COS 31 with G1, Sensor length approx. 200 - 220 mm / 7.87 - 8.66"		
		2	For COS 41 with G1, Sensor length approx. 140 - 160 mm / 5.51 - 6.30"		
			Process connection		
			A	G2 internal thread	
			B	G2 internal thread with welded fitting h = 50 mm / 1.97"	
			C	Flange DN 50 / PN 16 acc. to EN 1092/1	
			D	Flange ANSI 2" / 150 lbs	
COA 451-					complete order code

2.2 Scope of delivery

The scope of delivery comprises:
- CleanFit assembly (ordered version)
- Operating Instructions (english).

3 Installation

3.1 Incoming acceptance, transport, storage

- Make sure the packaging is undamaged!
  Inform the supplier about damage to the packaging.
  Keep the damaged packaging until the matter has been settled.
- Make sure the contents are undamaged!
  Inform the supplier about damage to the delivery contents.
  Keep the damaged products until the matter has been settled.
- Check that the scope of delivery is complete and agrees with your order and the shipping documents.
- The packaging material used to store or to transport the product must provide shock protection and humidity protection. The original packaging offers the best protection. Also, keep to the approved ambient conditions (see "Technical data").
- If you have any questions, please contact your supplier or your Endress+Hauser sales centre responsible (see back page of these Operating Instructions).

3.2 Installation conditions

3.2.1 Dimensions

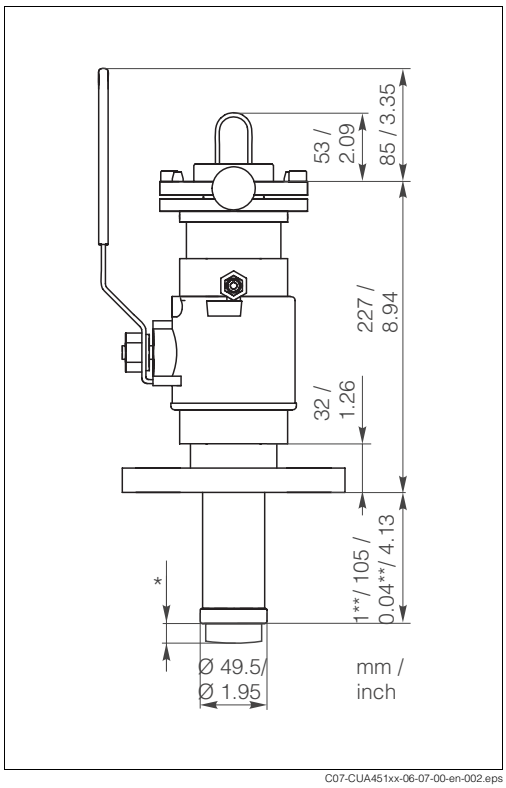

Abb. 2: *Assembly in operating position*

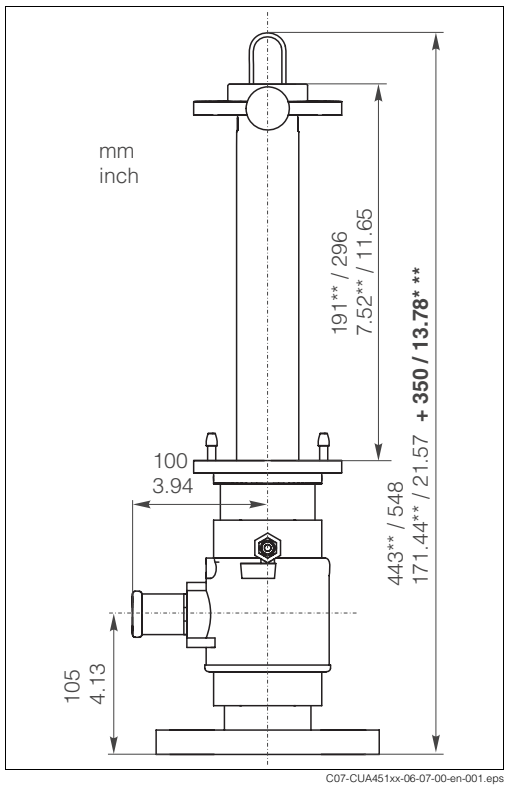

Abb. 3: *Assembly in service position*

* *Dimensions depend on sensor, see below*

** *Assembly version with long lift (see product structure)*

*** There must be additional space of 350 mm (13.78") for sensor installation!

** Dimension acc. to sensor type:*

COS 31: 8 mm (0.31")
COS 41: 11 mm (0.43")
COS 3: 16 mm (0.63")

3.2.2 Process connections

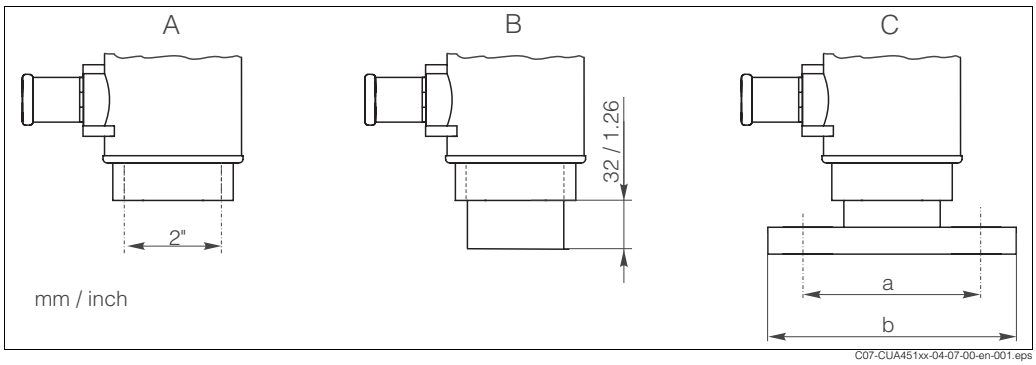

Abb. 4: Process connections

A Internal thread G2
B Internal thread G2 with welded fitting
C Flange DN 50 / PN 16 and Flange ANSI 2" / 150 lbs
a: DN 50: Ø 125 (4.92"), ANSI 2": Ø 120.7 (4.75")
b: DN 50: Ø 165 (6.50"), ANSI 2": Ø 152.4 (6.00")

3.2.3 Notes on installation

The assembly is designed for installation on tanks and pipes. Suitable nozzles must be available for this.

Installation place

Install the assembly at places with constant flow. The minimum pipe diameter is DN 80.

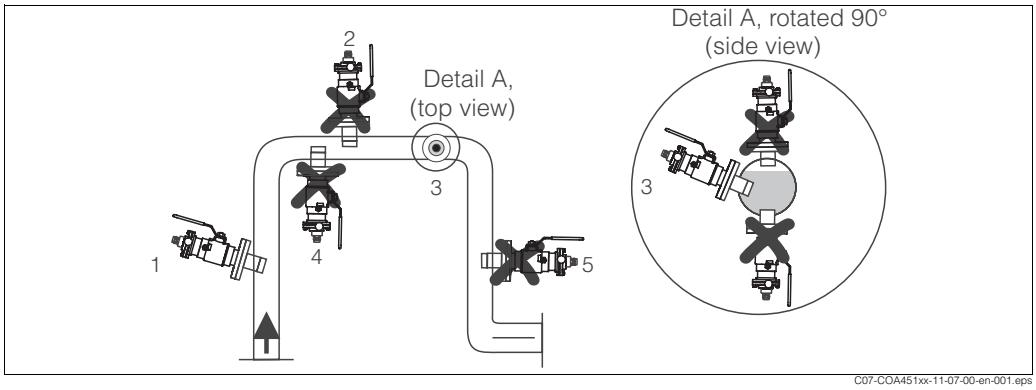

Fig. 5: Permissible and impermissible sensor installation positions

1 Ascending pipe, best position
2 Horizontal pipe, sensor top down, impermissible due to air cushion or foam bubble forming
3 Horizontal pipe, installation with permissible emitting angles (acc. to sensor version)
4 Overhead installation, impermissible due to missing electrolyte contact of the sensor electrodes
5 Down pipe, impermissible

Note!
- Do not install the assembly at places, where air cushions or foam bubbles can be formed or where suspended particles can settle on the sensor optics (→ Fig. 5).
- Measuring errors can occur, if:
  – the sensor is not immersed into the medium
  – suspended particles are settled on the sensor membrane
  – the sensor is installed overhead.

Orientation

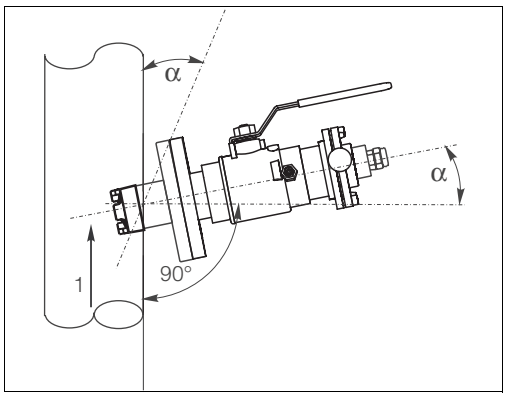

Fig. 6: Ascending pipe and tank side installation

α min 15°
1 Medium flow direction

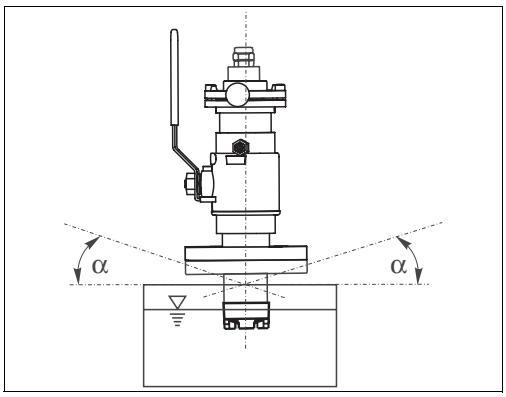

Fig. 7: Tank top installation

α min. 15°
1 Medium flow direction

Caution!
- Avoid a siphon effect[1] at the rinse chamber outlet when installing with inclined orientation. The inlet to the rinse chamber must be from below.

3.3 Installation instructions

3.3.1 Measuring system

A complete measuring system comprises:
- CleanFit COA 451 assembly
- OxiMax W COS 31 or OxiMax W COS 41 oxygen sensor
- Liquisys M COM 223/253 transmitter

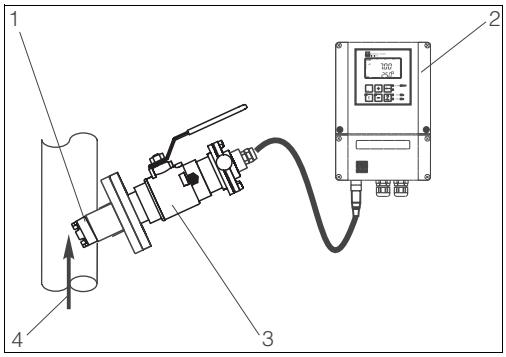

Fig. 8: Measuring system

1 COS 31 or COS 41
2 Liquisys M COM 253
3 COA 451
4 Medium flow direction

1) Siphon effect: line emptied by vacuum

3.3.2 Installing the assembly into the process

Move the assembly into the "Service" position (sensor holder inserted in the assembly) and secure the assembly to the tank or the piping using your selected process connection.

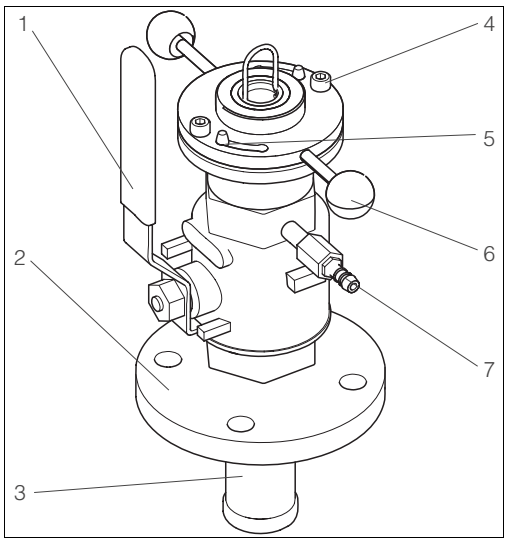

Fig. 9: Assembly in measuring mode

1 *Hand lever for ball valve open/close*
2 *Process connection (Flange DN 50 / PN 16)*
3 *Sensor holder*
4 *Fastening screws*
5 *Bayonet joint*
6 *Handle*
7 *Air relief valve resp. rinse water connection*

Note!
Depending on the process connection, please observe the following:
- Check the installation of the flange seal between the flanges.

3.3.3 Rinse water connection (optionally)

Connect the rinse water pipe to the designated rinse nozzle. Both rinse nozzles on the assembly are identical. Use one as an inlet and the other as an outlet.
Operate the rinse water connection of the assembly with a water pressure of 2 to max. 6 bar (29 to 87 psi). In addition, install a non-return valve and a dirt trap (100 µm) in the water supply line (at the inlet to the assembly).

Caution!
If it is possible for the water pressure to rise above 6 bar (87 psi, including any transient pressure surges), install a pressure reducing valve upstream. Otherwise the assembly may be damaged.

Besides water, other or additional cleaning solutions may be used in the rinse chamber. Pay attention to the material resistance of the assembly and comply with the maximum permitted temperatures and pressures.

3.3.4 Sensor installation

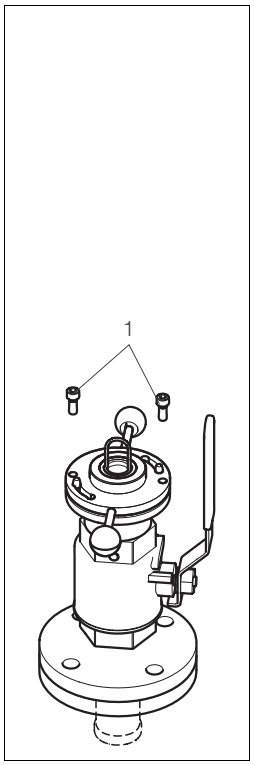

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Fig. 10:

1 Fastening screws

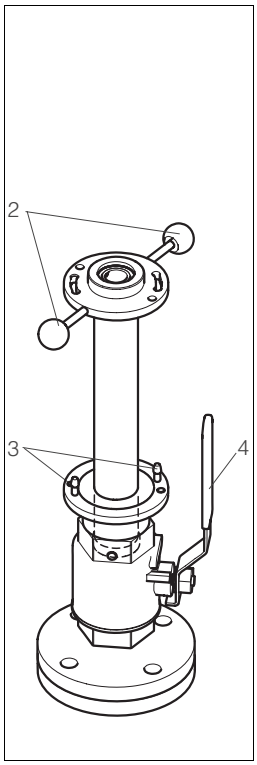

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Fig. 11:

2 Handles
3 Bayonet joint
4 Hand lever

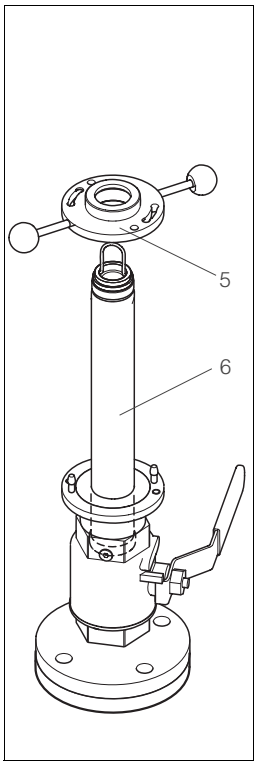

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Fig. 12:

5 Bayonet nut
6 Outer sleeve

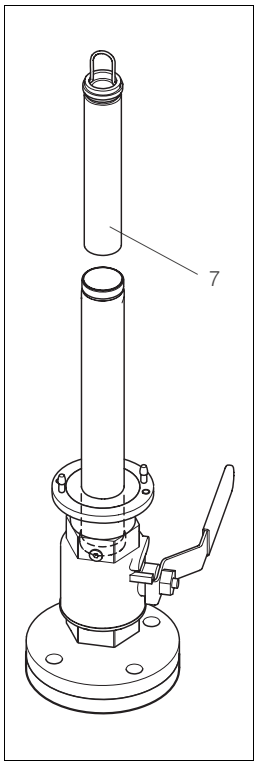

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Fig. 13:

7 Sensor holder

1. Loosen the fastening screws (Fig. 10) and place them somewhere within reach (and safely).
2. Loosen the bayonet joint (Fig. 11) and pull the outer sleeve (Fig. 12) including the sensor holder (Fig. 13) up as far as possible by the handles.
3. Close the ball valve! To do this, press the hand lever (pos. 4) down as far as possible (only possible in one direction!).
   When the ball valve is closed the assembly is sealed off from the process.
4. Unscrew the bayonet nut (pos. 5) from the sensor holder (pos. 7) by holding the outer sleeve (pos. 6) in place and turning the handles (pos. 2) anticlockwise.
5. Pull the sensor holder completely out of the outer sleeve. Use the bracket for pulling out the sensor holder. **Do not pull at the sensor cable!**

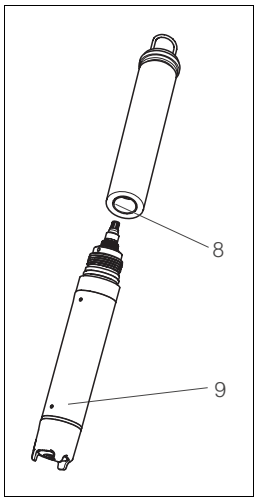

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Fig. 14:

8 Internal thread
9 Sensor

6. Screw the sensor (Fig. 14) firmly into the internal thread of the sensor holder.
7. Press the sensor holder back into the outer sleeve and screw the bayonet nut clockwise.
8. Open the ball valve and press the sensor holder as far as possible in the direction of the process.
9. Lock the bayonet joint and secure the sensor holder using the fastening screws.

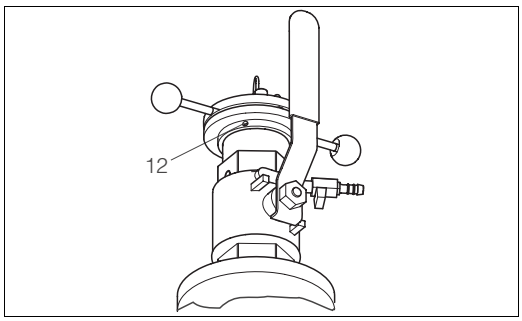

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Fig. 15:

12 Retaining screw(s)
(2 screws, only one is visible in the diagram)

10. You can change the position of the upper assembly part, e.g. for another position of the handles (due to the installation situation).
Loosen the retaining screws (Fig. 15) and turn the complete upper assembly part around its own axis to the desired position.
11. Lock this position by tightening the 2 screws until the assembly part cannot turn any more.

3.4 Post-installation check

- After installation, check that all connections are firmly in position and leak-tight.
- Ensure that the hoses of the rinse water connections (optionally) cannot be removed without force.
- Check all hoses for damage.

4 Operation

4.1 First commissioning

Before the first commissioning, make sure of the following items:
- all seals are correctly seated (on the assembly and process connection)
- the sensor is correctly installed and connected
- the water supply line is correctly connected to the rinse connections (if fitted)

⚠ Warning!
Danger of squirting medium.
Before applying the process pressure the assembly, make sure the connections are correctly fitted. If you use the delivered ball valve for the rinse chamber as a vent valve, ensure the counter side of the rinse chamber is closed by the dummy plug. Otherwise the assembly may **not** be put into the process!

4.2 Operating elements

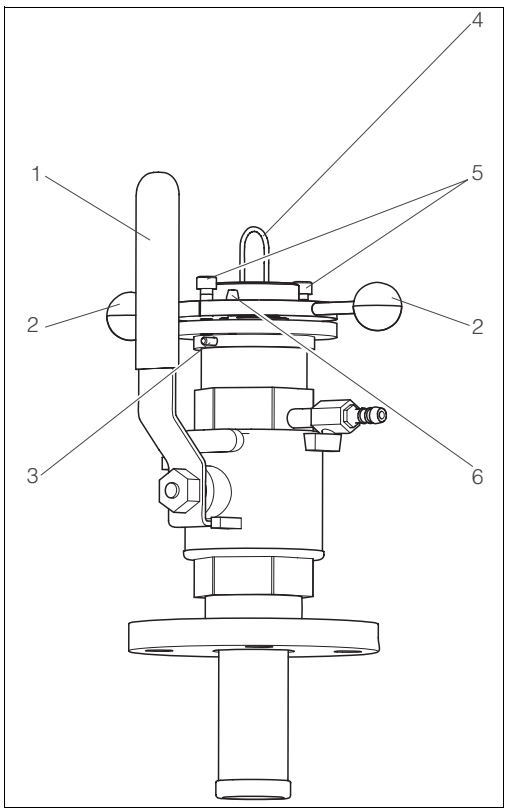

Fig. 16: Operating elements

1 Hand lever
2 Handles
3 Retaining screw(s)
4 Bracket
5 Fastening screws
6 Stop bolt lock on the bayonet joint

You have the following options for operating:
- Hand lever (Fig. 16)
  Use this to open or close the ball valve.
- Stop bolt locks and screws
  Use these to lock the sensor holder in the "measuring" position.
- Handles
  You can change the alignment of the sensor in the process by turning the upper part of the assembly around its own axis using the handles (bayonet joint engaged and fastening screws screwed in).
- Retaining screws
  Use these to lock the upper part of the assembly in the desired position.
- Bracket
  Use the bracket for pulling out the sensor holder. Never pull at the sensor cable!
  The bracket has a mark on one side. This enables you to identify the position of the sensor when installing it into the assembly (see "Sensor installation" chapter).

4.3 Assembly operation

Warning!
- You can only operate the retractable assembly manually up to a pressure of 2 bar (29 psi)! If the operating pressure is higher, you have to switch off the process before moving the assembly.
- Never loosen the fastening screws at process pressures above 2 bar (29 psi)!
- At process pressures of up to 2 bar (29 psi), ensure that the bayonet joint does not open when you loosen the fastening screws. Otherwise there is a risk of the screws uncontrollably "shooting out" as a result of the pressure!
- Always use an Allen key to loosen and lock the screws and keep it in your hand from turning the first screw until the last screw has been turned. This ensures that you have the screws under control.
- Always lock the sensor holder with the bayonet joint **and** the fastening screws. Otherwise, the sensor holder may exit uncontrolled as a result of the process pressure and injure somebody.

Move from the "Service" position to the "Measuring" position

1. Open the ball valve.
2. Push the sensor holder as far as possible in the direction of the process.
3. Lock the sensor holder using the bayonet joint and the fastening screws. This prevents the sensor holder from returning inadvertently into the "Service" position.
4. If necessary, turn the upper part of the assembly around its own axis using the handles to align the sensor. Lock the desired position with the retaining screws.

Move from the "Measuring" position to the "Service" position

1. Loosen the fastening screws using an Allen key.
2. Open the bayonet joint.
3. Pull the sensor holder out as far as possible ("Service" position).
4. Close the ball valve.
5. Complete the necessary service tasks.

5 Maintenance

Warning!
Risk of injury!
Before starting maintenance work on the assembly, make sure that the process line and the tank are depressurised, empty and rinsed.

Move the assembly to the "Service" position.

5.1 Cleaning of the assembly

To ensure a reliable measurement, the assembly and the sensor must be cleaned at regular intervals. The frequency and intensity of the cleaning operation depend on the process medium.

All parts in contact with the medium, e.g. the sensor and the sensor holder, must be cleaned at regular intervals. Remove the sensor[1].
- Remove light dirt using suitable cleaning agents (see chapter "Cleaning agents").
- Remove severe fouling with a soft brush and a suitable cleaning agent.
- Remove persistant fouling by soaking in a liquid cleaner and if neccessary by cleaning with a soft brush.

5.2 Cleaning of the sensor

You have to clean the sensor:
- before every calibration
- regularly during operation
- before being returned for repair

You can remove and clean the sensor manually or perform cleaning in automatic operation[2] via the rinse connection.

Note!
- Do not use any abrasive cleaning agents. This can lead to irreparable damage of the sensor.
- After cleaning the sensor, rinse the rinse chamber of the assembly with copious amounts of water (possibly distilled or de-ionised). Otherwise, remaining residues of cleaning agent can corrupt measurement.
- If required, re-calibrate after cleaning.

1) in reverse sequence of operations to the installation procedure
2) with the corresponding assembly equipment only

5.3 Cleaning agents

The selection of the cleaning agent is dependent on the degree and type of contamination. The most common contaminations and the suitable cleaning agents are listed in the following table.

Type of contamination	Cleaning agent
Greases and oils	Substances containing tensides (alkaline) or water-soluble organic solvents (e.g. Ethanol)
Calciferous deposits, metal hydroxide deposits, lyophobic biological deposits	approx. 3% hydrochloric acid
Sulphide deposits	Mixture of 3% hydrochloric acid and thiocarbamide (commercially available)
Protein deposits	Mixture of 3% hydrochloric acid and pepsin (commercially available)
Fibres, suspended substances	Water under pressure, poss. with surface-active agents
Light biological deposits	Water under pressure

Caution!
Do not use organic solvents containing halogen or acetone. These solvents could destroy plastic components on the assembly or the sensor and it is also partly suspected that they cause cancer (e.g. Chloroform).

6 Accessories

6.1 Accessories kits

❑Ball valve for rinse connection; order no. 51512982
❑O-ring set, Viton; order no. 51512981

6.2 Sensors

❑OxiMax W COS 31
oxygen sensor for drinking water and wastewater measurements, SS 1.4571 (AISI 316Ti), potentiostatic amperometric principle
ordering acc. to product structure, see Technical Information
❑OxiMax W COS 41
oxygen sensor for drinking water and wastewater measurements, POM, potentiostatic amperometric principle
ordering acc. to product structure, see Technical Information

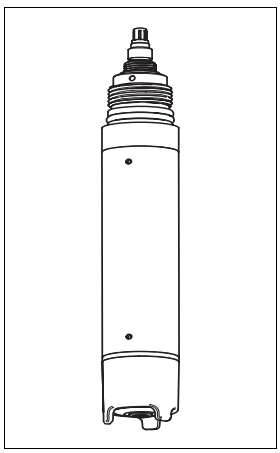

Fig. 17: OxiMax W COS 31

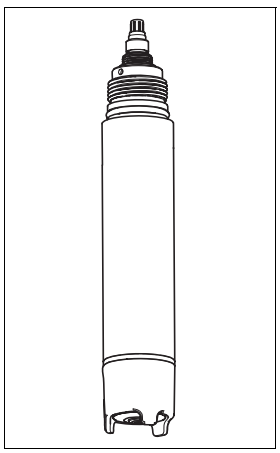

Fig. 18: OxiMax W COS 41

6.3 Documentation

❑Technical Information OxiMax W COS 31, TI 285C/07 (order no. 51506693)
❑Technical Information OxiMax W COS 41, TI 284C/07 (order no. 51506689)

6.4 Profiling plates

❑Profiling plates for welded fittings;
order no. 51513623

6.5 Welded fitting

❑Welded fitting for pipe diameters of more than 80 mm (3.15"), with combination flange DN 50 / ANSI 2":
– Bore holes for DN 50 flange: 4 x 90° Ø18 (0.71") on hole circle Ø125 (4.92")
– Bore holes for ANSI 2" flange: 4 x 90° Ø19 (0.75") on hole circle Ø121 (4.76")
Flange seal, 4 screws M16x60, 4 nuts M16 incl. washers, stainless steel 1.4571 (AISI 316Ti);
order no. 50080249

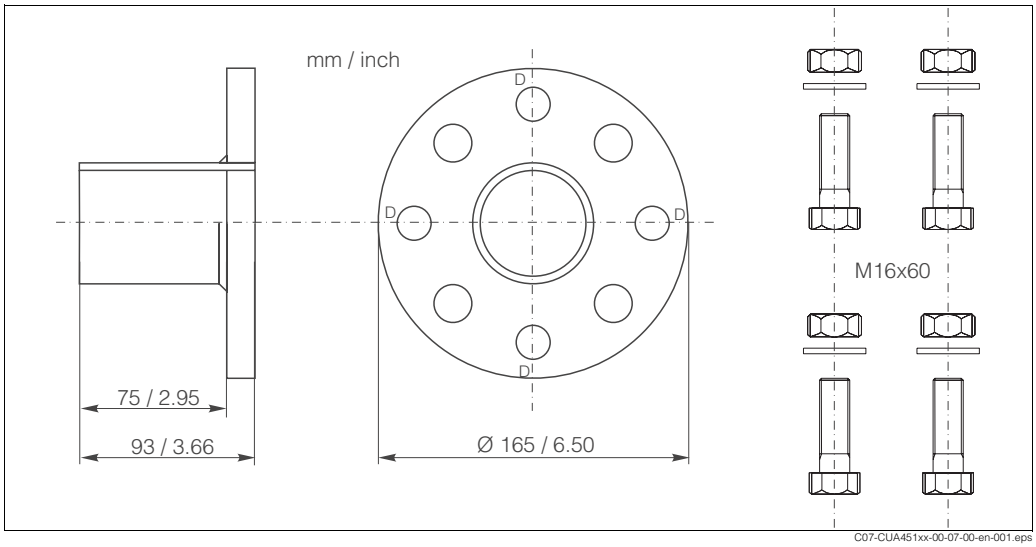

Fig. 19: Welded fitting

D: Marks for the bore holes of the DN 50 flange

7 Trouble-shooting

7.1 Replacing damaged parts

Warning!
Damage to the assembly which affects the pressure safety must **only** be repaired by authorised technical personnel.
After every repair and maintenance activity, suitable measures must be taken to test whether the assembly shows any signs of leaking. The assembly must then correspond to the specifications stated in the technical data.

Replace all other damaged components immediately. To order accessories and spare parts, please use the "Accessories" and "Spare parts" chapters or contact your E+H Sales Center.

7.2 Replacing seals

- Keep the sealing surfaces of the assembly free of dirt.
- Remove deposits clinging to the assembly from time to time.
- In the event of leakages, contact your E+H Sales Center.

Warning!
Risk of medium leaking out!
Seals must **only** be replaced by authorised technical personnel.

You can replace the following seals (Fig. 20):
- O-ring Viton, in contact with the medium
- O-rings Viton, not in contact with the medium

Warning!
Replacement is possible when the process is running. The ball valve on the assembly **must** be **closed**!

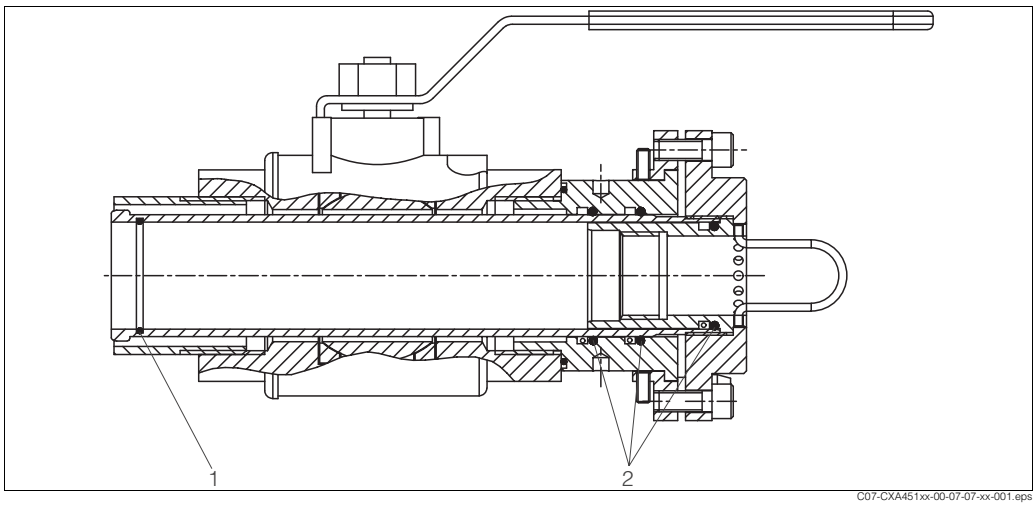

Fig. 20: Seals

1 O-ring Viton, in contact with the medium
2 O-rings Viton, not in contact with the medium

Warning!
- **Never** remove the assembly body when the process is running with an open ball valve ("Assembly measuring")! Also ensure that the ball valve cannot be opened inadvertently.
- Otherwise, there is a risk of injury through escaping medium.
- The manufacturer is not liable for damage caused by improper or non-designated use.
- Beware of medium residues and higher temperatures when handling components that were in contact with medium. Wear protective gloves and protective glasses.

When the ball valve is closed ("Assembly service", Fig. 21), you can remove the upper part (above the ball valve) and replace components. You do not have to interrupt the process for this.

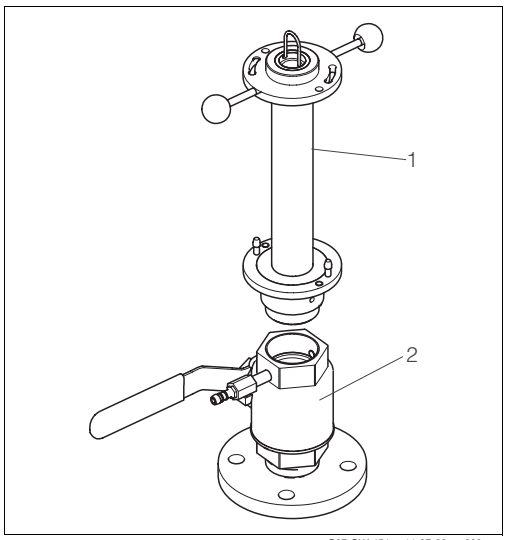

Fig. 21: Assembly parts

1 Upper part including outer sleeve and sensor holder
2 Ball valve including process connection

1. To do this, move the assembly into the "Service" position.
2. Close the ball valve.
3. Unscrew the upper part including the outer sleeve and the sensor holder out of the G2 thread on the ball valve.
4. Disassemble the upper part further, as described in the "Sensor installation" chapter.
5. Replace the seals (5 O-rings, see sectional drawing above).
6. Reassemble the assembly.
7. Check the leak-tightness before you move the assembly back into the "Measure" position.

7.3 Spare part kits

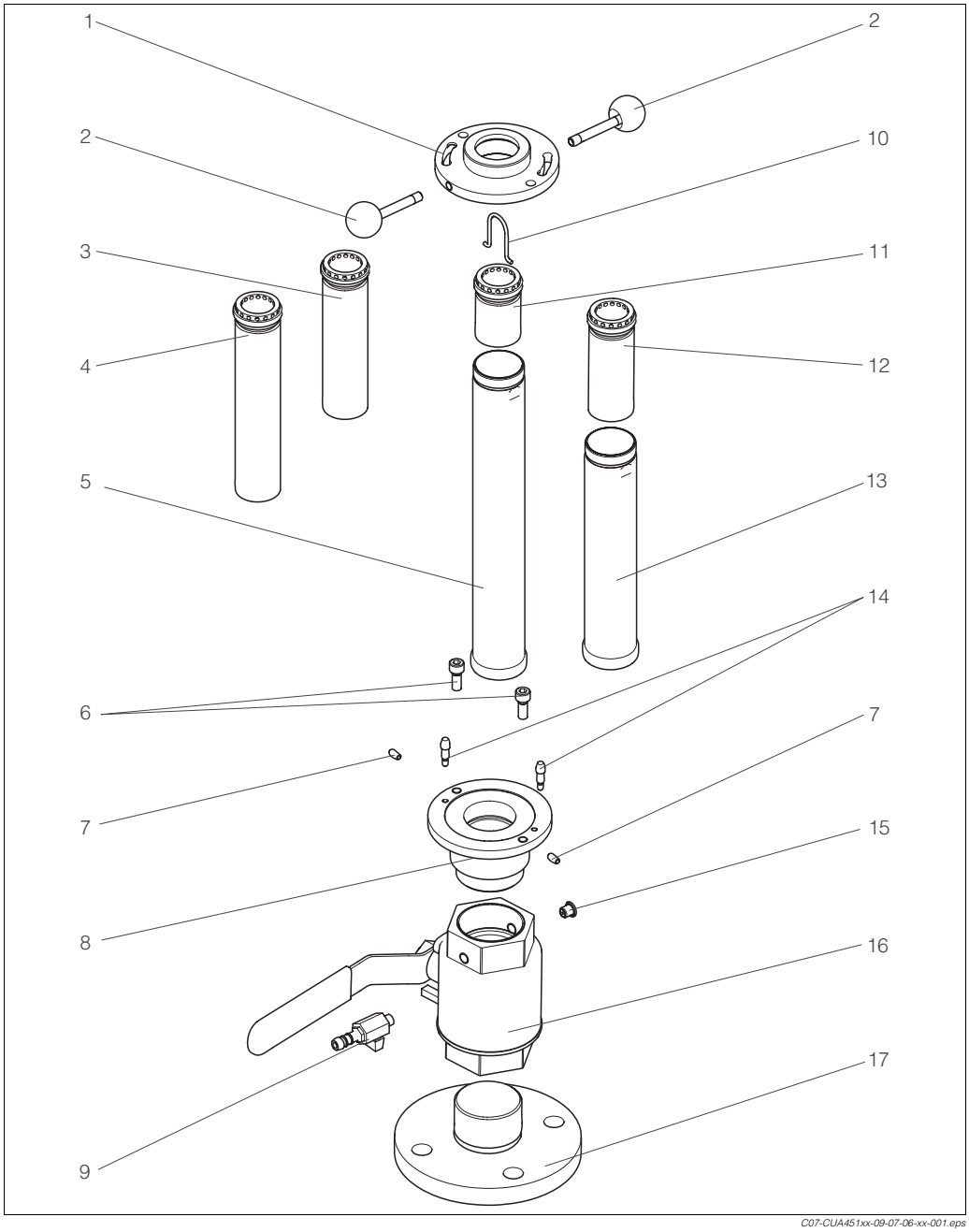

Fig. 22: Spare parts (all assembly versions)[1]

1) Pos. 1 (bayonet joint nut) and pos. 15 (blind stopper) are only in scope of delivery, not a spare part!

Note!
Please see the following table for the order numbers of the spare parts kits using the item numbers in Fig. 22.

Item no.	Designation and contents	Order number Spare parts kit
2	Ball handle with bolts 2 of each	51513168
3	Sensor holder for COS 31/41 For assembly version: – long, immersion depth approx. 270 mm	51513164
4	Sensor holder for COS 3 For assembly version: – long, immersion depth approx. 270 mm (10.63 inch)	51513167
5	Outer sleeve For assembly version: – long, immersion depth approx. 270 mm (10.63 inch)	51513158
6, 7, 10, 14	Kit: – Bracket (10), 5 units – Allen screws M8 x 20 (6), 10 units – Stop bolt lock (14), 2 units – Grub screws (7), 10 units	51513169
8, 16	Ball valve (16): without process connection, with G2 internal thread and lower section of bayonet joint (8)	51513159
8, 16, 17	Ball valve (16): with flange DN 50, welding adapter (17) and lower section of bayonet joint (8)	51513154
	Ball valve (16): with flange ANSI 2", welding adapter (17), lower section of bayonet joint (8)	51513155
9	Ball valve for rinse chamber as rinse connection or ventilation, hose connection OD 9	51512982
11	Sensor holder for COS 31/41 For assembly version: – short, immersion depth approx. 170 mm (6.69 inch)	51513163
12	Sensor holder for COS 3 For assembly version: – short, immersion depth approx. 170 mm (6.69 inch)	51513166
13	Outer sleeve For assembly version: – short, immersion depth approx. 170 mm (6.69 inch)	51513156

7.4 Return

If the assembly has to be repaired, please return it *cleaned* to the Endress+Hauser sales centre responsible.
Please use the original packaging, if possible.

Please enclose the completed Dangerous Goods sheet (copy the second last page of these Operating instructions) with the packaging and also the shipping documents.
No repair without completed Dangerous Goods sheet!

7.5 Disposal

You have to separately dispose of ball valve, sensor holder and other components according to their material.
Please observe local regulations.

8 Technical data

8.1 Environment

Ambient temperature	0 ... 50 °C (32 ... 122 °F)

8.2 Process

Process pressure	max. 10 bar (145 psi)
Process temperature	0 to 80 °C (32 to 176 °F) Caution! Please consider the maximum sensor process temperature!
Pressure temperature diagram	

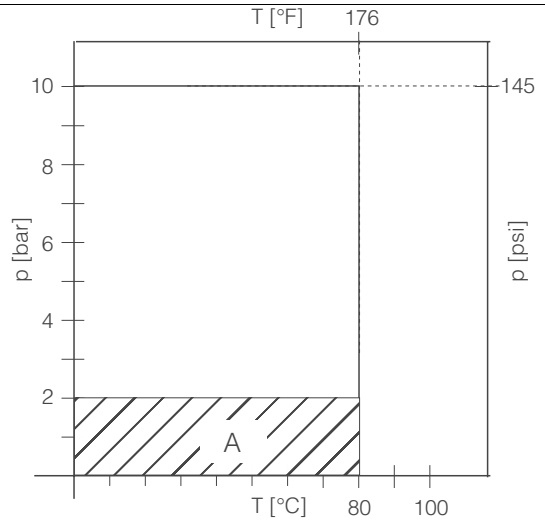

Fig. 23: Pressure-temperature diagram

A Manual operation range

Caution!
- The maximum process pressure is 2 bar (29 psi) for manual assembly operation!
- Please consider the sensor process conditions!

8.3 Mechanical construction

Design, dimensions	see chapter "Installation"
Weight	8 - 11 kg (17.6 ... 24.3 lb) depending on the assembly version
Material (in contact with medium)	Viton (seals) stainless steel 1.4404 (AISI 316L) nickeled brass (air relief valve resp. rinse connection)
Material (not in contact with medium)	stainless steel 1.4404 (AISI 316L)
Rinse connection socket	2 x G1/8 (internal) Connection options: – 2 x ball valve with hose connection OD 9 mm (0.35"), see accessories (One ball valve is in the scope of delivery. When used alone, it is an air relief valve.) – customer specific solution, rinse connections with G1/8 external thread
Vent valve	Hose connection OD 9 mm (0.35")

Index

Declaration of contamination

Dear customer,
Because of legal determinations and for the safety of our employees and operating equipment we need this "Declaration of contamination" with your signature before your order can be handled. Please put the completely filled in declaration to the instrument and to the shipping documents in any case. Add also safety sheets and/or specific handling instructions if necessary.

type of instrument / sensor: _____ serial number: _____

medium / concentration: _____ temperature: _____ pressure: _____

cleaned with: _____ conductivity: _____ viscosity: _____

Warning hints for medium used:

☐ radioactive ☐ explosive ☐ caustic ☐ poisonous ☐ harmful to health ☐ biologically hazardous ☐ inflammable ☐ safe

Please mark the appropriate warning hints.

Reason for return:

_____

_____

Company data:

company: _____ contact person: _____

_____ _____

_____ department: _____

address: _____ phone number: _____

_____ fax / e-mail: _____

_____ your order no.: _____

I hereby certify that the returned equipment has been cleaned and decontaminated acc. to good industrial practices and is in compliance with all regulations. This equipment poses no health or safety risks due to contamination.

_____ _____

(Date) (company stamp and legally binding signature)

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