

Operating Instructions

OUA260

Flow assembly for sensors OUSAFxx and OUSTF10

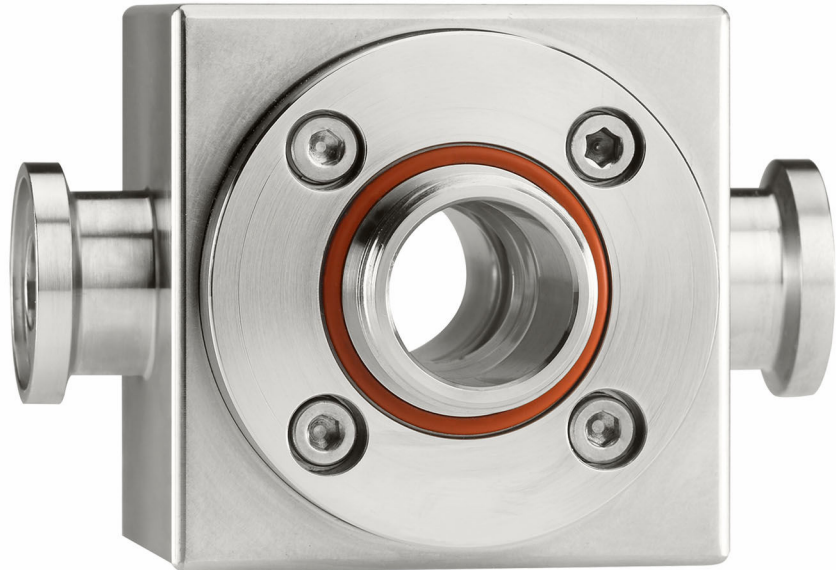





Table of contents








1	About this document	4
1.1	Warnings	4
1.2	Symbols used	4
1.3	Symbols on the device	4
2	Basic safety instructions	5
2.1	Requirements for personnel	5
2.2	Intended use	5
2.3	Workplace safety	5
2.4	Operational safety	5
2.5	Product safety	5
3	Incoming acceptance and product identification	6
3.1	Incoming acceptance	6
3.2	Product identification	6
3.3	Scope of delivery	7
4	Installation	8
4.1	Installation conditions	8
4.2	Dimensions	9
4.3	Installation	10
4.4	Post-installation check	11
5	Maintenance	12
5.1	Maintenance instructions	12
5.2	Replacing the sensor window and seals	12
6	Repair	15
6.1	Spare parts	15
6.2	Return	17
6.3	Disposal	17
7	Accessories	18
8	Technical data	19
8.1	Process	19
8.2	Mechanical construction	19
	Index	20

1 About this document


1.1 Warnings

Structure of information	Meaning
 DANGER Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation will result in a fatal or serious injury.
 WARNING Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation can result in a fatal or serious injury.
 CAUTION Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE Cause/situation If necessary, Consequences of non-compliance (if applicable) ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols used

	Additional information, tips
	Permitted or recommended
	Not permitted or not recommended
	Reference to device documentation
	Reference to page
	Reference to graphic
	Result of a step


1.3 Symbols on the device

	Reference to device documentation
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2 Basic safety instructions


2.1 Requirements for personnel

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

 Repairs not described in the Operating Instructions provided must be carried out only directly at the manufacturer's site or by the service organization.

2.2 Intended use

Flow assembly OUA260 has been developed for the installation of optical sensors (OUSAF44, OUSAF46, OUSAF12, OUSAF22 and OUSTF10) in pipes.

Thanks to its design, it can be used in pressurized systems (→  19).

Use of the device for any purpose other than that described, poses a threat to the safety of people and of the entire measuring system and is therefore not permitted.

The manufacturer is not liable for damage caused by improper or non-designated use.

2.3 Workplace safety

As the user, you are responsible for complying with the following safety conditions:

- Installation guidelines
- Local standards and regulations

2.4 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.
3. Do not operate damaged products, and protect them against unintentional operation.
4. Label damaged products as defective.

During operation:

- ▶ If faults cannot be rectified:
products must be taken out of service and protected against unintentional operation.

2.5 Product safety

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

3 Incoming acceptance and product identification

3.1 Incoming acceptance

1. Verify that the packaging is undamaged.
 - ↳ Notify the supplier of any damage to the packaging.
Keep the damaged packaging until the issue has been resolved.
2. Verify that the contents are undamaged.
 - ↳ Notify the supplier of any damage to the delivery contents.
Keep the damaged goods until the issue has been resolved.
3. Check that the delivery is complete and nothing is missing.
 - ↳ Compare the shipping documents with your order.
4. Pack the product for storage and transportation in such a way that it is protected against impact and moisture.
 - ↳ The original packaging offers the best protection.
Make sure to comply with the permitted ambient conditions.

If you have any questions, please contact your supplier or your local Sales Center.

3.2 Product identification

3.2.1 Nameplate

The nameplate provides you with the following information on your device:

- Manufacturer identification
 - Order code
 - Extended order code
 - Serial number
 - Ambient and process conditions
 - Safety information and warnings
- ▶ Compare the information on the nameplate with the order.

3.2.2 Product identification

Product page

www.endress.com/oua260

Interpreting the order code

The order code and serial number of your product can be found in the following locations:

- On the nameplate
- In the delivery papers

Obtaining information on the product

1. Open www.endress.com.
2. Call up the site search (magnifying glass).
3. Enter a valid serial number.
4. Search.
 - ↳ The product structure is displayed in a popup window.

5. Click on the product image in the popup window.
 - ↳ A new window (**Device Viewer**) opens. All of the information relating to your device is displayed in this window as well as the product documentation.

Manufacturer address

Endress+Hauser Conducta GmbH+Co. KG
Dieselstraße 24
D-70839 Gerlingen

3.3 Scope of delivery

The scope of delivery comprises:

- Assembly in the version ordered
- Operating Instructions
- Certificates of Life Science Package (optional)
 - Inspection certificate 3.1
 - Pharma CoC
 - Certificate of conformity with pharmaceutical requirements, conformity with biological reactivity test USP Class VI, FDA material conformity, TSE-/BSE-free
 - Pressure test
 - Certificate for surface roughness

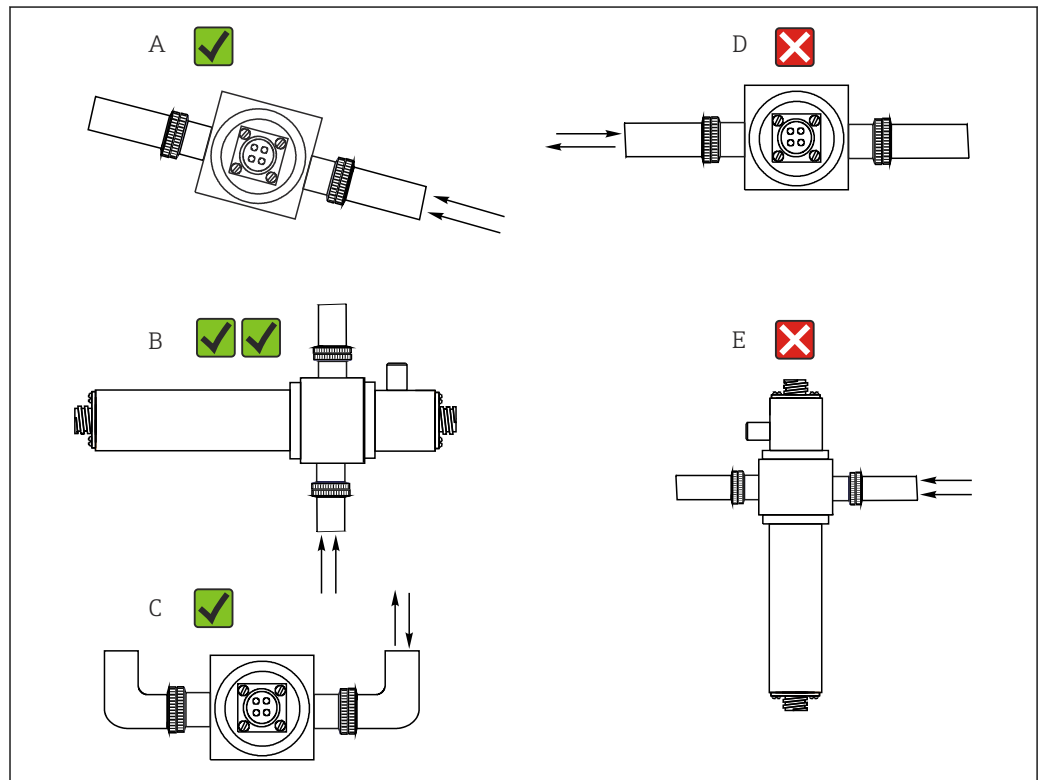
4 Installation

4.1 Installation conditions

4.1.1 Installation instructions

The assembly is available with a range of process connections. It can be installed either directly in a process line or in a bypass line.

- ▶ Make sure that the optical windows of the assembly are fully immersed in the medium.
- ▶ Avoid installation positions in which air bubbles can form.
- ▶ Install the flow assembly upstream from the pressure regulators.



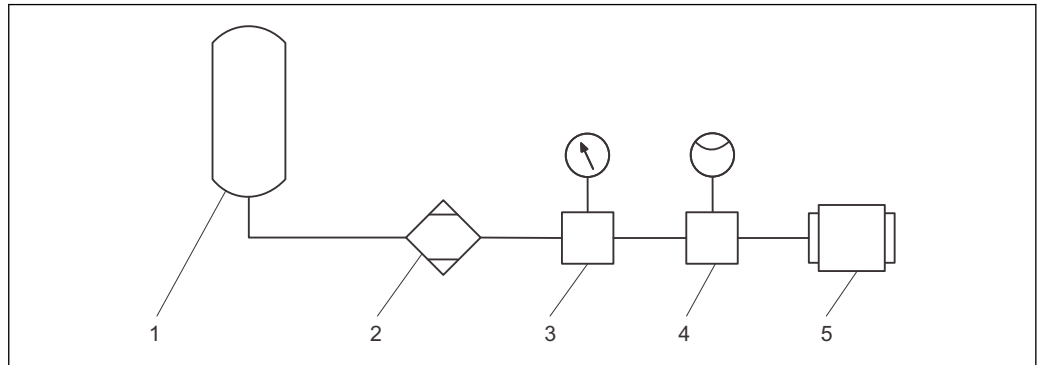
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1 Mounting angles. The arrows indicate the direction of medium flow in the pipe.

- A Suitable installation position, better than C
- B Ideal, best installation position
- C Acceptable installation position
- D Installation position to be avoided
- E Unacceptable installation position

4.1.2 Air purge

The optical windows can be purged with dry air or nitrogen through pneumatic ports, preventing the formation of condensate on the optical windows.



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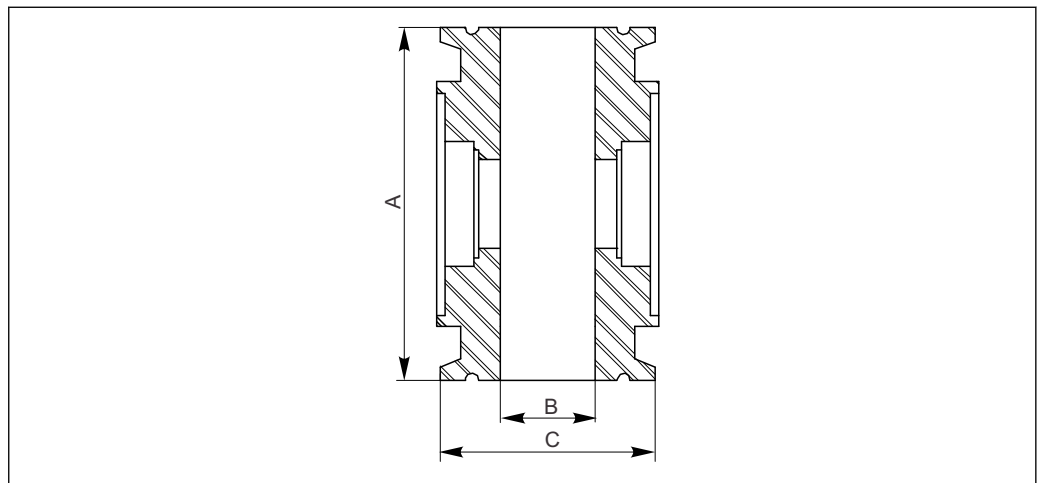
2 Example of purge air supply

- 1 Compressed air or nitrogen supply
- 2 Air drier (not required for nitrogen)
- 3 Pressure regulator
- 4 Flow controller
- 5 Assembly OUA260

The purge gas must be clean and dry (ultra zero air).

Maximum pressure:	0.07 bar (1 psi)
Flow rate:	50 to 100 ml/min

4.2 Dimensions



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3 Dimensions of flow assembly OUA260

- A Flange spacing
- B Internal diameter
- C Flange diameter

Process connection	Pipe size	A	B	C
Tri-Clamp	¼"	82.5 mm (3.25")	4.6mm (0.18")	25 mm (0.98")
Clamp ASME	¼"	82.5 mm (3.25")	4.6mm (0.18")	25 mm (0.98")
Tri-Clamp	½"	82.5 mm (3.25")	9.4 mm (0.37")	25 mm (0.98")

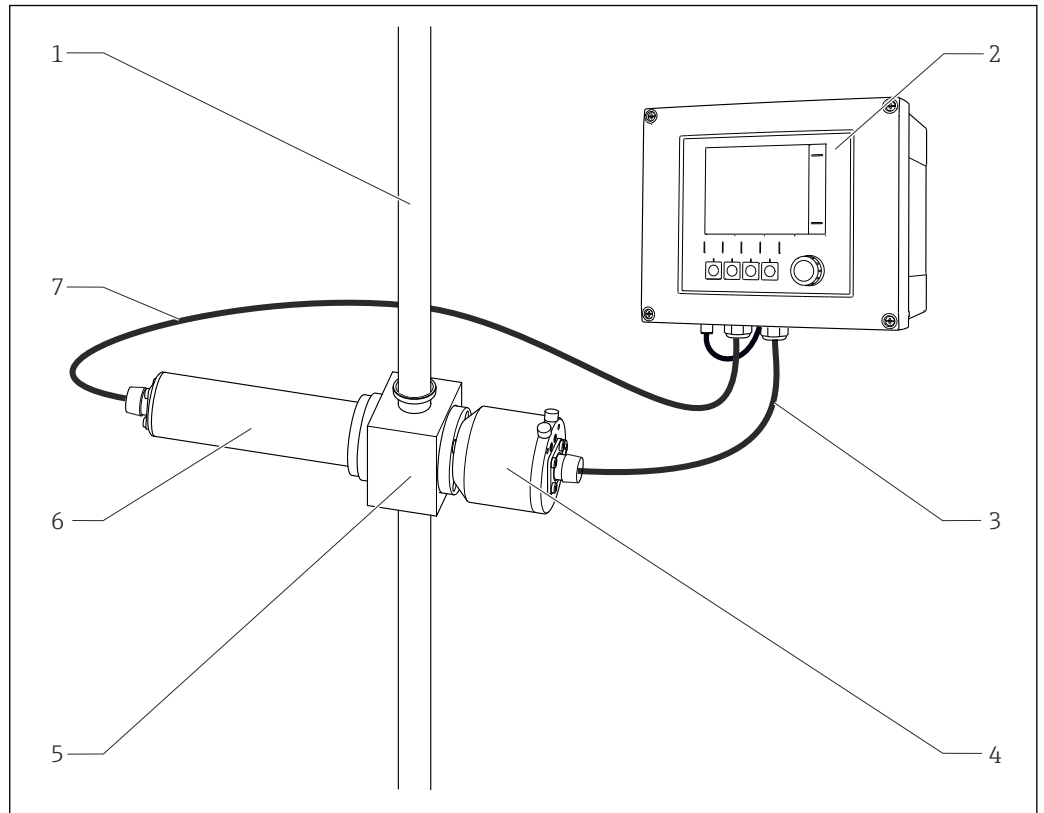
Process connection	Pipe size	A	B	C
Clamp ASME	½"	82.5 mm (3.25")	9.4 mm (0.37")	25 mm (0.98")
Tri-Clamp	¾"	82.5 mm (3.25")	15.2 mm (0.60")	25 mm (0.98")
Clamp ASME	¾"	82.5 mm (3.25")	15.7 mm (0.62")	25 mm (0.98")
Tri-Clamp	1"	82.5 mm (3.25")	22.1 mm (0.87")	50.3 mm (1.98")
Clamp ASME	1"	82.5 mm (3.25")	22.1 mm (0.87")	50.3 mm (1.98")
Tri-Clamp	1½"	82.5 mm (3.25")	36.1 mm (1.42")	50.3 mm (1.98")
Clamp ASME	1½"	82.5 mm (3.25")	34.8 mm (1.37")	50.3 mm (1.98")
Tri-Clamp	2"	82.5 mm (3.25")	47.2 mm (1.86")	64 mm (2.52")
Clamp ASME	2"	82.5 mm (3.25")	47.5 mm (1.87")	64 mm (2.52")
Tri-Clamp	2½"	88.9 mm (3.50")	59.9 mm (2.36")	77.5 mm (3.05")
Tri-Clamp	3"	114.3 mm (4.50")	72.6 mm (2.86")	90.9 mm (3.58")
Tri-Clamp	4"	124.0 mm (4.88")	96.8 mm (3.81")	118.9 mm (4.68")
RFF150	1"	174.7 mm (6.88")	25.4 mm (1.00")	107.9 mm (4.25")
RFF150	2"	190.5 mm (7.50")	47.5 mm (1.87")	152.4 mm (6.00")
RFF150	3"	203.2 mm (8.00")	69.8 mm (2.75")	190.5 mm (7.50")
RFF150	4"	228.6 mm (9.00")	95.2 mm (3.75")	228.6 mm (9.00")
RFF300	1"	174.7 mm (6.88")	25.4 mm (1.00")	124.0 mm (4.88")
RFF300	2"	190.5 mm (7.50")	47.5 mm (1.87")	165.1 mm (6.50")
RFF300	3"	203.2 mm (8.00")	69.8 mm (2.75")	209.6 mm (8.25")
RFF300	4"	228.6 mm (9.00")	95.2 mm (3.75")	254.0 mm (10.00")
Flange RF EN 1092-1 PN16	DN 25	174.7 mm (6.88")	26 mm (1.02")	115 mm (4.53")
Flange RF EN 1092-1 PN16	DN 50	190.5 mm (8.00")	50 mm (1.97")	165 mm (6.50")
NPT-SS	½"	148.6 mm (5.85")	½" Standard NPT	N/A
NPT-SS	1"	101.6 mm (4.00")	1" Standard NPT	N/A
NPT-SS	2"	101.6 mm (4.00")	2" Standard NPT	N/A
NPT-PVDF	½"	71.1 mm (2.80")	½" Standard NPT	N/A
NPT-PVDF	1"	101.6 mm (4.00")	1" Standard NPT	N/A

4.3 Installation

4.3.1 Measuring system

A complete measuring system comprises:

- Liquiline CM44P transmitter
- Photometer sensor, e.g. OUSAF44
- Flow assembly OUA260
- Cable set CUK80



4 Measuring system with OUA260

- 1 Pipe
- 2 Transmitter CM44P
- 3 Cable set CUK80
- 4 Sensor: detector
- 5 Flow assembly OUA260
- 6 Sensor: light source (lamp)
- 7 Cable set CUK80

4.3.2 Installing the assembly in the process

⚠ WARNING

Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes.

- ▶ Wear protective gloves, protective goggles and protective clothing.
- ▶ Only mount the assembly if the pipes are empty and unpressurized.
- ▶ Mount the assembly via the process connections.

4.4 Post-installation check

- ▶ After mounting, check all the connections to ensure they are secure and leak-tight.

5 Maintenance

5.1 Maintenance instructions

Take all the necessary precautions in time to ensure the operational safety and reliability of the entire measuring system.

NOTICE

Effects on process and process control!

- ▶ When carrying out any work on the system, bear in mind any potential impact this could have on the process control system and the process itself.
- ▶ For your own safety, only use genuine accessories. With genuine parts, the function, accuracy and reliability are also ensured after maintenance work.

NOTICE

Sensitive optical components

If you do not proceed with care, you can damage or severely dirty the optical components.

- ▶ Maintenance work may only be carried out by appropriately qualified staff.
- ▶ Use ethanol and a lint-free cloth which is suitable for cleaning lenses to clean all the optical components.

5.2 Replacing the sensor window and seals

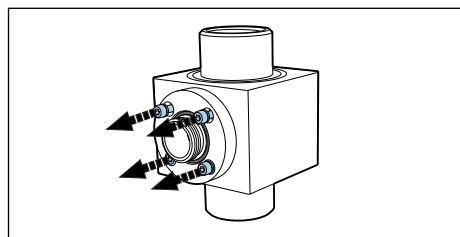
Removing optical windows and seals

Always replace windows with windows of the same type in order to maintain the path length.

1. Remove the lamp and detector housing.

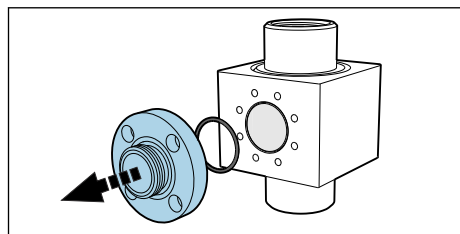
The following description applies for both sides, i.e. the detector side and the lamp side. Always change O-rings or optical windows ¹⁾ on both sides.

- 2.



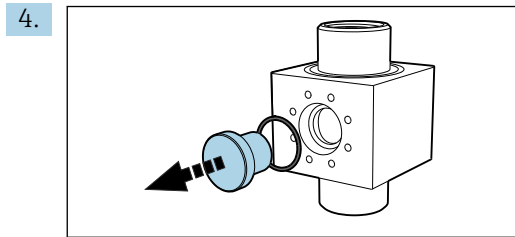
Remove the 4 Allen screws (1/8" or 3 mm) from the window ring. Make sure to loosen the screws evenly and alternately around the window ring.

- 3.



Remove the window ring .

1) Optical windows only need to be replaced if they are damaged.



If the window jams, apply some acetone around the window seal (O-ring) and wait a few minutes for it to take effect. This should help release the window. **The seal cannot be reused afterwards!**

Checking or replacing optical windows and seals

1. Check the window area for residue or fouling. Clean if necessary.
2. Check the optical windows for signs of chipping or abrasion.
 - ↳ Replace the windows if signs of chipping/abrasion are found.
3. Dispose of all the O-rings and replace them with new O-rings from the relevant maintenance kit.
4. Mount the optical window and then the window ring, along with the new seals, . Make sure to tighten the screws of the window ring uniformly in a diagonally opposite sequence. In this way, you ensure that the ring is seated correctly.

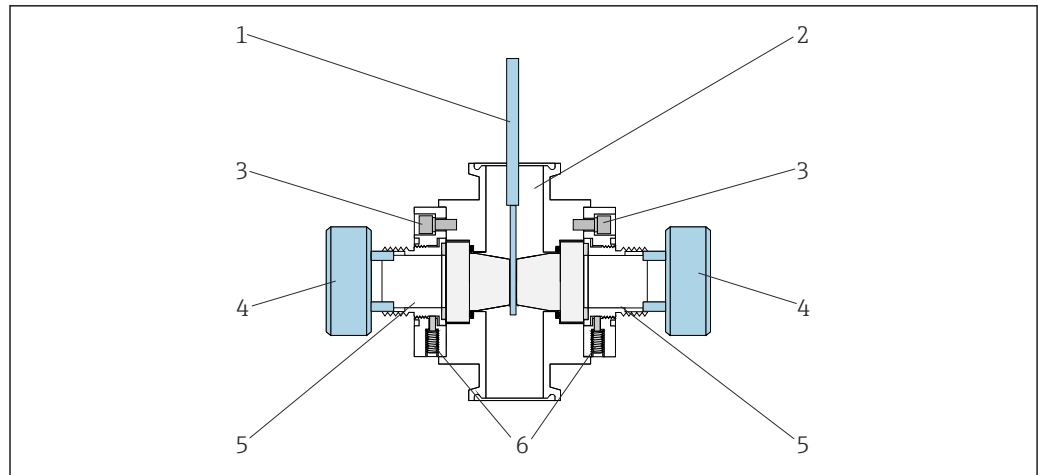
i If you have changed the path length by installing other optical windows, you then have to configure the measuring system appropriately.

In any case, you must always perform an adjustment with liquids after disassembling and assembling the windows.

Assemblies with an adjuster for the precision optical pathlength (POPL)

The precision optical pathlength (POPL) adjuster makes it possible to adjust the optical pathlength to the exact distance necessary for the measurement.

POPL is only required for measuring systems with Easycal and optical pathlengths < 5 mm.



5 Assembly with POPL function, sectional view

- 1 Measuring gage
- 2 Assembly OUA260
- 3 Screws of the window ring
- 4 Path length adjuster
- 5 Actuators with gaskets
- 6 Securing screws

i The following description applies for assemblies with POPL already fitted. If you are retrofitting POPL, please refer to the instructions supplied with the spare parts kit.

1. Replace O-rings and damaged windows in the same way as for assemblies without POPL. Follow the steps until you have re-installed the window rings on either side of the assembly.
2. Release the 2 securing screws (item 6) on each window ring.
3. Clean the measuring gage (item 1) and insert it into the assembly until it is positioned between the windows.
4. Now use the path length adjuster (item 4). Reduce the path length by gradually screwing in the actuator (item 5) on both sides until the measuring gage just touches both windows (→ diagram). Do not tighten too tightly.
5. Carefully remove the measuring gage from the assembly again.
6. Then tighten the securing screws to secure the actuator in place.
 - ↳ Remove the path length adjuster.

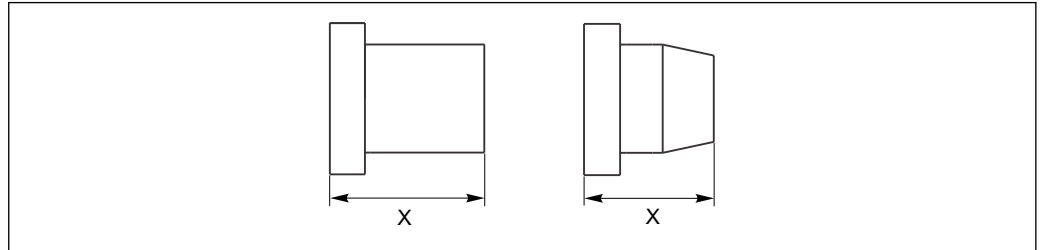
If possible: perform a pressure test with double the process pressure on the mounted flow assembly. Perform another check with the measuring gage and adjust the path length if necessary. Pressure tests guarantee the compression of the O-ring window seals and the adjustment thread during mounting. This compensates for any initial changes to the path length.

i Some window surfaces might not be parallel to one another. This is normal, particularly in the case of windows made of fire-polished quartz. Make absolutely sure that the measuring gage does not scratch the window surfaces.

6 Repair

6.1 Spare parts

For both window types, the length is measured over the entire length.



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6 Length measurement of both window types

Example:

To obtain a path length of 10 mm with the Tri-Clamp 2.5" process connection, take one window with a length of 34 mm and one with a length of 36.8 mm.

Window types and path lengths for the various pipe sizes with the Tri-Clamp process connection

Path length	0.25" 0.50" 0.75"	1.0 " LV 1.5" LV	2.0"	2.5"	3.0"	4.0"
0.5 mm POPL	19 + 18.5	24 + 23.5	33.5 + 34			
1 mm	18 + 19	23 + 24	33.5 + 33.5			
1 mm POPL	18 + 19	23 + 24	33.5 + 33.5			
2 mm	18 + 18	23 + 23				
2 mm POPL	18 + 18	23 + 23				
5 mm	16.5 + 16.5	21.5 + 21.5	31.5 + 31.5			
5 mm POPL	16.5 + 16.5	21.5 + 21.5	31.5 + 31.5			
10 mm	14 + 14	19 + 19	29 + 29	34 + 36.8		
20 mm	9 + 9	14 + 14	24 + 24	29 + 31.5	34 + 34	
30 mm		9 + 9	19 + 19	21.5 + 29	29 + 29	
40 mm			14 + 14	19 + 21.5	24 + 24	36.8 + 36.8
50 mm			9 + 9	14 + 16.5	19 + 19	31.5 + 31.5
60 mm				9 + 9	14 + 14	24 + 29
70 mm					9 + 9	21.5 + 21.5
80 mm						16.5 + 16.5
90 mm						9 + 14

Dimensions of the window types given in mm (e.g. 19 mm + 18.5 mm)

Window types and path lengths for the various pipe sizes with NPT SS and RFF 150/300/EN 1092-1 process connections

Path length	NPT SS 0.5" / 1.0" / 2.0"	RFF 150/300 1.0" / 2.0"	RFF 150/300 3.0"	RFF 150/300 4.0"
0.5 mm POPL	33.5 + 34	33.5 + 34		
1 mm POPL	33.5 + 33.5	33.5 + 33.5		
2 mm				
2 mm POPL				
5 mm	31.5 + 31.5	31.5 + 31.5		
5 mm POPL	31.5 + 31.5	31.5 + 31.5		
10 mm	29 + 29	29 + 29		
20 mm	24 + 24	24 + 24	34 + 34	
30 mm	19 + 19	19 + 19	29 + 29	
40 mm	14 + 14	14 + 14	24 + 24	36.8 + 36.8
50 mm	9 + 9	9 + 9	14 + 24	31.5 + 31.5
60 mm			14 + 14	24 + 29
70 mm			9 + 9	21.5 + 21.5
80 mm				16.5 + 16.5
90 mm				9 + 14

Dimensions of the window types given in mm (e.g. 19 mm + 18.5 mm)

OUA260 spare parts

Description	Order number
KIT OUA260, EPDM window O-rings (USP)	71136357
KIT OUA260, KALREZ window O-rings	71136358
KIT OUA260, silicon window O-rings	71136359
KIT OUA260, VITON window O-rings (USP)	71136360
KIT OUA260, quartz window 14 mm	71136387
KIT OUA260, quartz window 16.5 mm	71136388
KIT OUA260, quartz window 18.5 mm	71136389
KIT OUA260, quartz window 18 mm	71136390
KIT OUA260, quartz window 19 mm	71136391
KIT OUA260, quartz window 21.5 mm	71136392
KIT OUA260, quartz window 23.5 mm	71136393
KIT OUA260, quartz window 23 mm	71136394
KIT OUA260, quartz window 24 mm	71136395
KIT OUA260, quartz window 31.5 mm	71136397
KIT OUA260, quartz window 33.5 mm	71136398
KIT OUA260, quartz window 34 mm	71136400
KIT OUA260, quartz window 9 mm	71136406
KIT OUA260, lamp and detector O-rings	71142537
KIT OUA260, borosilicate window 24 mm	71321644
KIT OUA260, sapphire window 24 mm	71142623

Description	Order number
KIT OUA260, borosilicate window 9 mm	71321643
KIT OUA260, borosilicate window 14 mm	71321645
KIT OUA260, sapphire window 14 mm	71210134
KIT OUA260, borosilicate window 16.5 mm	71321646
KIT OUA260, borosilicate window 19 mm	71321647
KIT OUA260, sapphire window 19 mm	71210137
KIT OUA260, borosilicate window 23 mm	71321648
KIT OUA260, sapphire window 23 mm	71210139
KIT OUA260, POPL adjuster	71210140
KIT OUA260, Buna "N" window O-rings	71210142
KIT OUA260, retrofit kit 0.5 mm POPL certified	71210155
KIT OUA260, retrofit kit 1 mm POPL certified	71210154
KIT OUA260, retrofit kit 2 mm POPL certified	71210143
KIT OUA260, retrofit kit 5 mm POPL certified	71210144
KIT OUA260, certified POPL measuring device 0.5 mm	71210145
KIT OUA260, certified POPL measuring device 1.0 mm	71210146
KIT OUA260, certified POPL measuring device 2.0 mm	71210147
KIT OUA260, certified POPL measuring device 5.0 mm	71210148
KIT OUA260, retrofit kit 0.5 mm POPL with air purge	71210157
KIT OUA260, retrofit kit 1 mm POPL with air purge	71210158
KIT OUA260, retrofit kit 2 mm POPL with air purge	71210159
KIT OUA260, retrofit kit 5 mm POPL with air purge	71210160

6.2 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

To ensure the swift, safe and professional return of the device:

- ▶ Refer to the website www.endress.com/support/return-material for information on the procedure and conditions for returning devices.

6.3 Disposal

- ▶ Please observe local regulations!

7 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.

OUSAF44

- Optical sensor for measuring UV absorption
- Variety of materials and process connections available
- Hygienic design
- Product Configurator on the product page: www.endress.com/ousaf44



Technical Information TI00416C

OUSAF12

- Optical sensor for the measurement of absorbance
- Variety of materials and process connections available
- Product Configurator on the product page: www.endress.com/ousaf12



Technical Information TI00497C

OUSAF22

- Optical sensor for measuring color concentrations
- Variety of materials and process connections available
- Product Configurator on the product page: www.endress.com/ousaf22



Technical Information TI00472C

OUSTF10

- Optical sensor for measuring turbidity and undissolved solids
- Variety of materials and process connections available
- Product Configurator on the product page: www.endress.com/oustf10



Technical Information TI00500C

OUSAF46

- Optical sensor for measuring UV absorption
- Two individually configurable measuring channels
- Product Configurator on the product page: www.endress.com/ousaf46



Technical Information TI01190C

8 Technical data

8.1 Process

Process temperature and pressure range

The process temperature range and pressure range depend on the process connection, material and pipe size.

Process connection	Pipe size	Nominal pressure	Temperature
Tri-Clamp 1.4435/316L	0.25 to 2"	16 bar (230 psi)	0 to 130 °C (32 to 266 °F)
Tri-Clamp 1.4435/316L	2.5 to 4"	10 bar (150 psi)	0 to 130 °C (32 to 266 °F)
Tri-Clamp PVDF	0.25", 0.5", 0.75"	4 bar (58 psi)	0 to 130 °C (32 to 266 °F)
Flange ASME RF Class 150, 316SS	All	10 bar (150 psi)	0 to 130 °C (32 to 266 °F)
Flange ASME RF Class 300, 316SS	All	20 bar (300 psi)	0 to 130 °C (32 to 266 °F)
Flange RF EN 1092-1 PN16	DN 25	10 bar (150 psi)	0 to 130 °C (32 to 266 °F)
Flange RF EN 1092-1 PN16	DN 50	20 bar (300 psi)	0 to 130 °C (32 to 266 °F)
NPT 316SS	All	20 bar (300 psi)	0 to 130 °C (32 to 266 °F)
NPT PVDF, plastic fittings	All	4 bar (58 psi)	0 to 130 °C (32 to 266 °F)
NPT PVDF, metal fittings	All	2 bar (29 psi)	0 to 35 °C (32 to 95 °F)

- Comply with the maximum permitted process temperature of the sensor!

8.2 Mechanical construction

Dimensions

→ Section "Installation"

Weight	¼" Tri-Clamp	stainless steel 316L/1.4435:	1.14 kg (2.51 lbs)
	1" Tri-Clamp	stainless steel 316L/1.4435:	1.39 kg (3.07 lbs)
	2" Tri-Clamp	stainless steel 316L/1.4435:	1.88 kg (4.15 lbs)
	4" Tri-Clamp	stainless steel 316L/1.4435:	3.38 kg (7.45 lbs)

Materials

Flow assembly: Stainless steel AISI 316L, 1.4435, PVDF, other materials available on request
 Window: Borosilicate, quartz, sapphire
 O-rings: VITON-FDA, silicone FDA, EPDM-FDA, KALREZ-FDA



PVDF is not suitable for all hazardous areas.

Index

A

Accessories	18
Air purge	9
Assembly	
Dimensions	9
Installing	11
Replacing the sensor windows	12

D

Dimensions	9
Disposal	17

I

Incoming acceptance	6
Installation	8
Installation conditions	8
Intended use	5

M

Maintenance	12
Manufacturer address	7
Materials	19
Measuring system	10
Mechanical construction	19

N

Nameplate	6
-----------------	---

O

Operational safety	5
--------------------------	---

P

Post-installation check	11
Product identification	6
Product safety	5

R

Replacing O-rings	12
Replacing seals	12
Replacing sensor windows	12
Requirements for personnel	5
Return	17

S

Safety instructions	5
Scope of delivery	7
Spare parts	15
Symbols	4

T

Technical data	19
----------------------	----

U

Use	5
-----------	---

W

Warnings	4
----------------	---

Weight	19
Workplace safety	5



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