

Operating Instructions

OUSTF10

Optical sensor with the OUA260 flow assembly for the measurement of undissolved solids

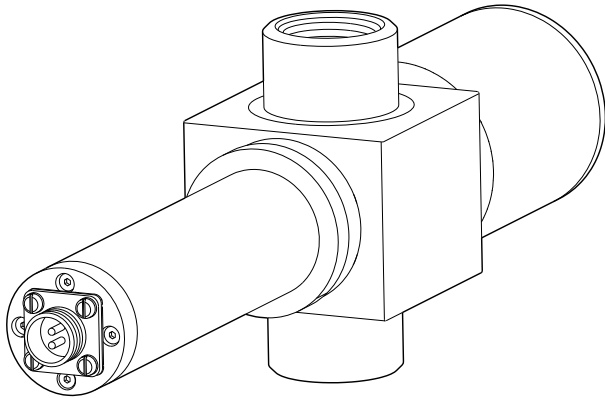






Table of contents








1	Document information	3	9	Repairs	26
1.1	Warnings	3	9.1	Spare parts	26
1.2	Symbols	3	9.2	Return	28
1.3	Symbols on the product	3	9.3	Disposal	28
2	Basic safety instructions	4	10	Accessories	28
2.1	Requirements for the personnel	4	10.1	Flow assembly	28
2.2	Designated use	4	10.2	Cable	28
2.3	Occupational safety	4			
2.4	Operational safety	5	11	Technical data	29
2.5	Product safety	5			
3	Product description	6		Index	31
3.1	Sensor design	6			
3.2	Measuring principle	6			
4	Incoming acceptance and product identification	8			
4.1	Incoming acceptance	8			
4.2	Product identification	8			
4.3	Scope of delivery	9			
4.4	Certificates and approvals	9			
5	Installation	10			
5.1	Installation conditions	10			
5.2	Mounting the sensor	12			
5.3	Post-installation check	13			
6	Electrical connection	13			
6.1	Connecting the sensor	13			
6.2	Lamp voltage	14			
6.3	Versions for use in hazardous areas	14			
6.4	Ensuring the degree of protection	17			
6.5	Post-connection check	17			
7	Commissioning	19			
7.1	Function check	19			
7.2	Calibrating/adjusting the sensor	19			
8	Maintenance	21			
8.1	Maintenance schedule	21			
8.2	Replacing the hazardous area lamp	22			
8.3	Replacing the collimated incandescent lamp	22			
8.4	Replacing the sensor window and seal	24			

1 Document information


1.1 Warnings

Structure of information	Meaning
 DANGER Causes (/consequences) 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) 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) 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 Consequences of non-compliance (if applicable) ► Action/note	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols

Symbol	Meaning
	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 product

Symbol	Meaning
	Reference to device documentation

2 Basic safety instructions

2.1 Requirements for the 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.
- Measuring point faults may be repaired only by authorized and specially trained personnel.



Repairs not described in the Operating Instructions provided may only be carried out directly by the manufacturer or by the service organization.

2.2 Designated use

The scattered light turbidity sensor is used to measure undissolved solids, emulsions and immiscible media in process liquids. The sensor is suitable for use in a wide range of applications in a variety of industrial sectors, such as:

- Outgoing goods inspection/purity monitoring
- Filter control
- Condensate regulation
- Turbidity measurement in
 - Breweries
 - Drinking water
 - Brine
- Leak detection in heat exchanger

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 Occupational safety

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

- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

Electromagnetic compatibility

- The product has been tested for electromagnetic compatibility in accordance with the applicable European standards for industrial applications.
- The electromagnetic compatibility indicated applies only to a product that has been connected in accordance with these Operating Instructions.

2.4 Operational safety

1. Before commissioning the entire measuring point, verify that all connections are correct. Ensure that electrical cables and hose connections are undamaged.
2. Do not operate damaged products, and safeguard them to ensure that they are not operated inadvertently. Label the damaged product as defective.
3. If faults cannot be rectified:
Take the products out of operation and safeguard them to ensure that they are not operated inadvertently.

2.5 Product safety

2.5.1 State of the art

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 European standards have been observed.

2.5.2 Versions with hazardous area lamp

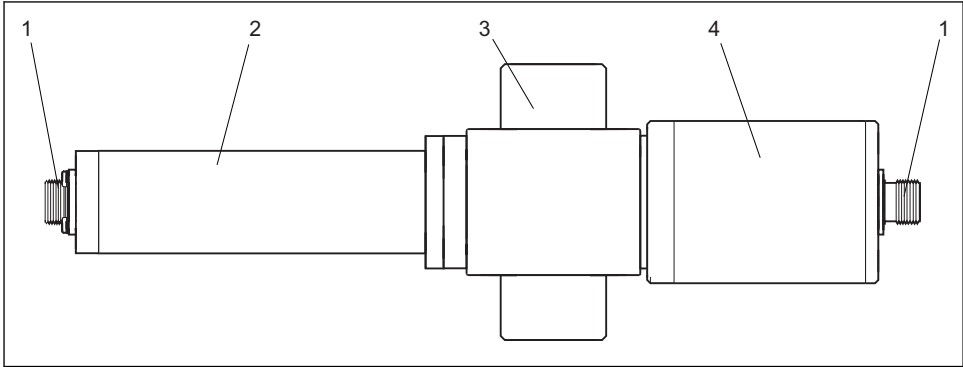
Also observe the safety instructions in the XA for these Operating Instructions.



Safety instructions for electrical apparatus in hazardous areas, photometer sensors, XA01403C/07/A3

3 Product description

3.1 Sensor design



A0030178

1 Sensor with flow assembly OUA260

- 1 Cable connector
- 2 Lamp module
- 3 Flow assembly OUA260 (depending on version)
- 4 Detector module

The detector and lamp can vary on account of the individual options ordered.

3.2 Measuring principle

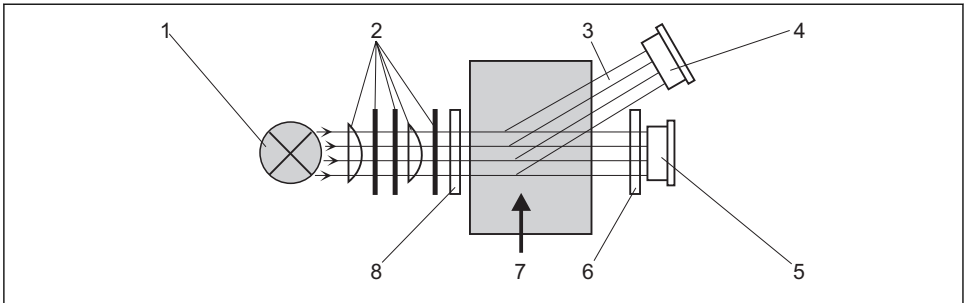
Turbidity

Turbidity refers to the appearance of a liquid that contains suspended particles. The presence of these particles causes the light to be scattered and absorbed, giving the liquid a turbid, or cloudy, appearance. The amount of light scattered or absorbed in a liquid can be used in a measuring system to determine the degree of turbidity.

Scattered light method

A focused parallel beam of light is passed through the medium. This beam is known as the transmitted light and is measured by a transmitted light detector. If the medium does not contain any particles, the transmitted light detector detects all the light transmitted by the light source.

If there are particles in the medium, the light is scattered in all directions, but primarily in a forward direction. The optical system is designed such that the scattered light is measured at an angle of 11°. This angle of measurement ensures that the maximum scattering signal present is detected at the scattered light detector.



A0029413

2 Scattered light measurement

- 1 Light source (lamp)
- 2 Orifice plates and lenses
- 3 Scattered light
- 4 Scattered light detector
- 5 Transmitted light detector
- 6 Neutral broadband density filter with anti-reflex coating
- 7 Medium
- 8 Broadband NIR filter (780 nm +)

4 Incoming acceptance and product identification

4.1 Incoming acceptance

1. Verify that the packaging is undamaged.
 - ↳ Notify your supplier of any damage to the packaging.
Keep the damaged packaging until the matter has been settled.
2. Verify that the contents are undamaged.
 - ↳ Notify your supplier of any damage to the delivery contents.
Keep the damaged products until the matter has been settled.
3. Check the delivery for completeness.
 - ↳ Check it against the delivery papers and 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.
The permitted ambient conditions must be observed (see "Technical data").

If you have any questions, please contact your supplier or your local sales center.

4.2 Product identification

4.2.1 Nameplate

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

- Manufacturer identification
 - Order code
 - Extended order code
 - Serial number
 - Safety information and warnings
 - Ex labeling on hazardous area versions
- Compare the data on the nameplate with your order.

4.2.2 Product identification

Product page

www.endress.com/oustf10

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. Go to the product page for your product on the Internet.

2. At the bottom of the page, select the "Online Tools" link followed by "Check your device features".
 - ↳ An additional window opens.
3. Enter the order code from the nameplate into the search field, and then select "Show details".
 - ↳ You will receive information on each feature (selected option) of the order code.

4.3 Scope of delivery

The scope of delivery consists of the following :

- Detector and lamp module without flow assembly or
- Detector and lamp module mounted on OUA260 flow assembly
- Operating Instructions



Ordering the sensor together with a transmitter:

If you select the calibration option in the **Product Configurator for the transmitter**, the complete measuring system (transmitter, sensor, cable) is factory-calibrated and shipped as one package.

If you have any questions, please contact your supplier or your local sales center.

4.4 Certificates and approvals

4.4.1 CE mark

Declaration of Conformity

The product meets the requirements of the harmonized European standards. As such, it complies with the legal specifications of the EC directives. The manufacturer confirms successful testing of the product by affixing to it the **CE** mark.

4.4.2 Hazardous area approvals

- ATEX II 2G Ex db IIC T5 Gb
- FM Cl.1, Div. 1, Groups B, C, D

4.4.3 FDA conformity

All non-metal parts in contact with medium, such as rubber and plastic parts, meet the requirements of FDA 21 CFR 177.2600. The plastic and elastomer parts of the sensor in contact with medium have passed the biological reactivity tests according to USP <87> and <88> Class VI.

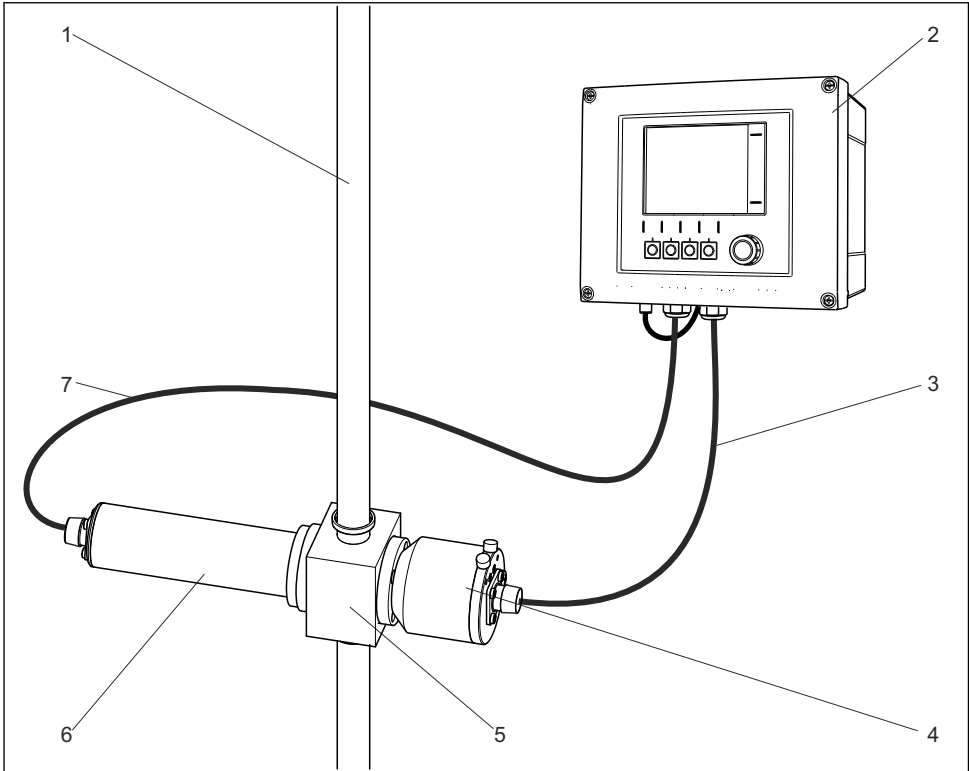
5 Installation

5.1 Installation conditions

5.1.1 Measuring system

An optical measuring system comprises:

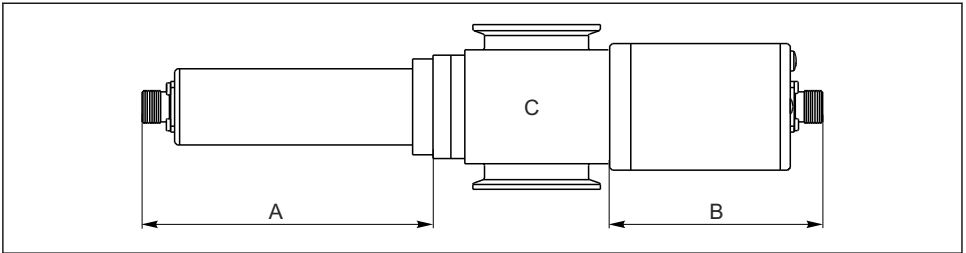
- Sensor (photometer) OUSTF10
- Transmitter, for example Liquiline CM44P
- Cable set, for example CUK80
- Assembly OUA260




3 Example of a measuring system with a photometer sensor

- | | | | |
|---|-------------------|---|-----------------------------|
| 1 | pipe | 5 | Flow assembly OUA260 |
| 2 | CM44P transmitter | 6 | Sensor: light source (lamp) |
| 3 | CUK80 cable set | 7 | CUK80 cable set |
| 4 | Sensor: detector | | |

5.1.2 Dimensions



A0028306

 4 *Sensor module*

A *Dimension of lamp* → Table

B *Dimension of detector* → Table

C *Assembly, see Technical Information for assembly*

Lamp type	Dimension A in mm (inch)
Collimated incandescent lamp	151.3 (5.96)
Detector type	Dimension B in mm (inch)
OUSTF10	101.6 (4.0)

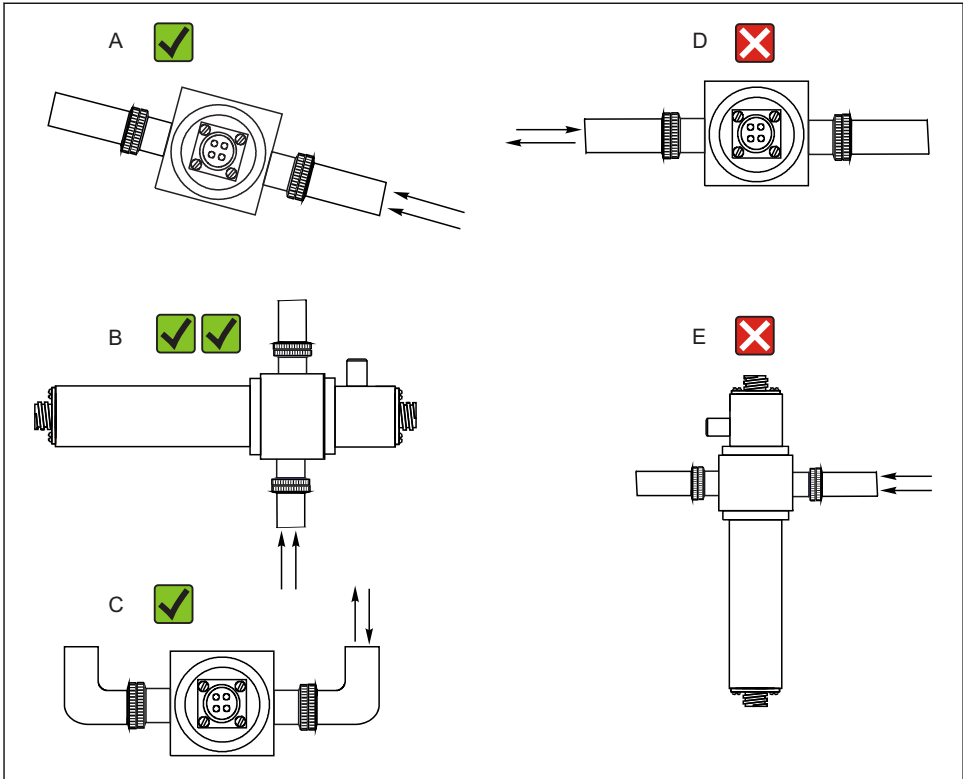


The total length of the sensor module is derived from the lengths of the lamp, the detector and the assembly.

The dimensions of the OUA260 assembly are provided in Technical Information, TI00418C.

- ▶ When connecting the sensor cable, make sure you maintain an additional distance of 5 cm (2") on both the lamp side and the detector side of the sensor.

5.1.3 Mounting angles



A0028250

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

- A Suitable mounting angle, better than C
- B Optimum mounting angle, best installation position
- C Acceptable mounting angle
- D Mounting angle to be avoided
- E Forbidden mounting angle

5.2 Mounting the sensor

The sensors have been specifically designed so that they can be installed in the process together with the flow assembly OUA260. The flow assembly can be installed either directly in a process line or in a bypass line.

The sensor cannot be used without the assembly OUA260.

- ▶ Make sure that the sensor and detector housing are aligned horizontally. This ensures that the optical windows are vertically aligned as this prevents buildup on the window surfaces.
- ▶ Install the sensor upstream from the pressure regulators.

- ▶ Leave enough room for the cable connector at the end of the lamp and at the end of the detector housing. Unimpeded access to these areas is also required for connection/removal tasks.
- ▶ The operation of sensors under pressure prevents the formation of air or gas bubbles.

NOTICE

Mounting errors

Possibility of sensor damage, twisted cables or similar

- ▶ Make sure that the sensor body is protected against damage from external forces - such as trolleys on adjacent paths.
- ▶ Remove the cable before you screw the lamp or detector onto the flow assembly.
- ▶ Make sure to avoid exerting excessive tensile force on the cable (e.g. from jerky pulling movements).
- ▶ Make sure to observe the national grounding regulations when using metal assemblies.

If the sensor is ordered together with the assembly OUA260, the flow assembly is ready-mounted on the sensor upon delivery. The sensor is ready for use immediately.

If the sensor and assembly are ordered separately, you must mount the sensor as follows:

1. Install the flow assembly OUA260 in the process via the process connections.
2. Make sure to fit the O-ring seals on the lamp and detector.
Screw the lamp and detector onto the flow assembly.



The lamp and detector can be installed in and removed from the assembly without this affecting the process line.

5.3 Post-installation check

Put the sensor into operation only if you can answer "yes" to the following questions:

- Are the sensor and cable undamaged?
- Have you chosen a correct mounting angle?

6 Electrical connection

⚠ WARNING

Device is live

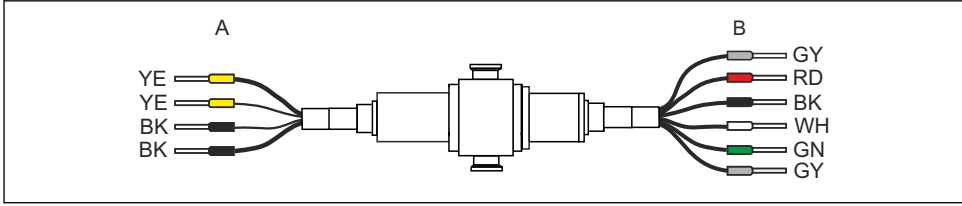
Incorrect connection may result in injury or death

- ▶ The electrical connection may be performed only by an electrical technician.
- ▶ The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- ▶ **Prior** to commencing connection work, ensure that no voltage is present on any cable.

6.1 Connecting the sensor

The sensor is connected to the transmitter using the pre-terminated or labeled cable set CUK80 (for connection to CM44P) or OUK20 (for connection to CVM40). The terminals and

labeling may vary depending on the transmitter in use. The cable set must be ordered separately.



A0028384

6 OUSTF10 connecting cable

A Light source (lamp) power supply

B Signals of scattered light and transmitted light detector

CM44P terminal	CVM40 terminal	Cable color	Assignment
P+	V1.1	YE (thick)	Lamp voltage +
S+	V1.3	YE (thin)	Detection of lamp voltage +
S-	V1.4	BK (thin)	Detection of lamp voltage -
P-	V1.2	BK (thick)	Lamp voltage -
A (1)	S1.1	RD	Scattered light sensor +
C(1)	S1.2	BK	Scattered light sensor -
SH (1)	S1.S	GY	Shield
A (2)	S2.1	WH	Sensor reference +
C(2)	S2.2	GN	Sensor reference -
SH (2)	S2.S	GY	Shield

6.2 Lamp voltage

Sensor version	Lamp type	Lamp voltage [V]
OUSTF10-xxxxx	Collimated incandescent lamp	4.9 ± 0.1

6.3 Versions for use in hazardous areas ¹⁾

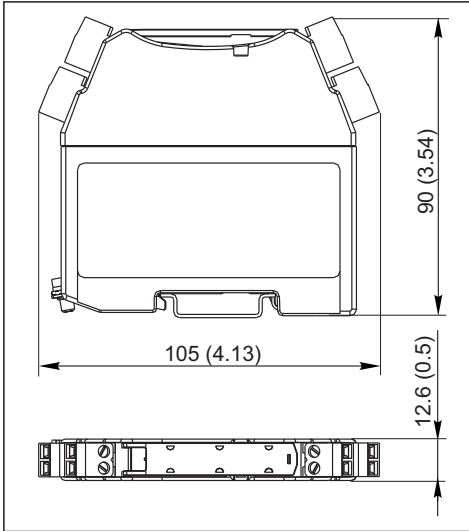
 Safety instructions for electrical apparatus in explosion-hazardous areas, XA01403C

1) Only applies for measuring points consisting of a photometer, CUK80 cable set and Liquline CM44P transmitter.

6.3.1 Connecting the detector using a safety barrier

The photometer sensors use silicon photovoltaic cells as detectors which are operated in the current mode. The detectors are intrinsically safe and can be deployed in Zone 1 and Class I, Division 1 environments.

The safe area is separated from the hazardous area by two safety barriers MTL7760AC.

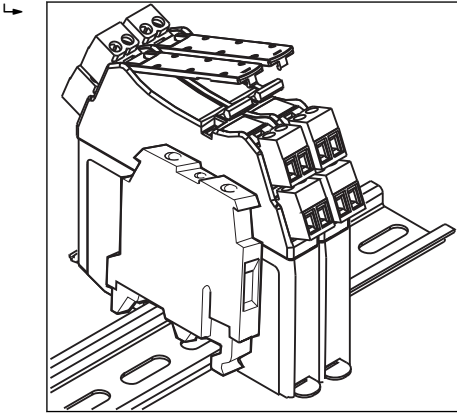


7 Safety barrier, dimensions in mm (inch)

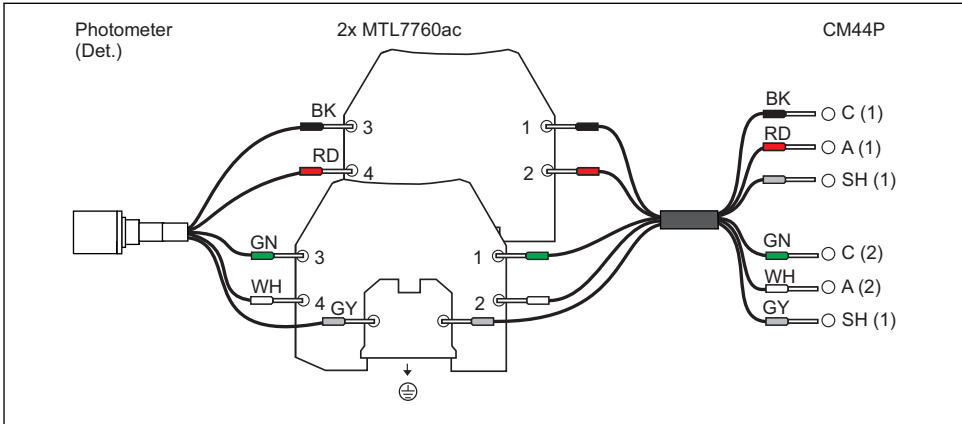
i The safety barrier may only have a very low leak current since the optical signals from the sensor can be in the nanoampere range. Therefore, the sensor cable shield is connected to the ground terminal of the barrier.

On delivery, the CUK80 detector cable is permanently wired to the safety barriers. All you have to do is simply connect the individual cable ends to the detector and transmitter.

1. Mount the safety barriers along with the grounding module on a DIN rail.



2. Connect the detector plug of the cable to the detector.
3. Connect the other end of the cable to the transmitter.

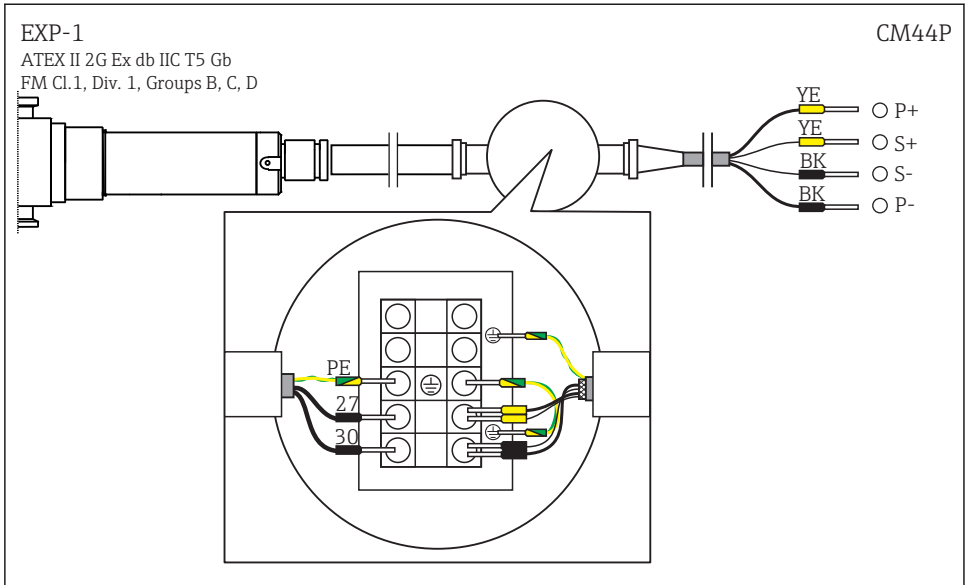


6.3.2 Connecting the hazardous area lamp using a junction box

The hazardous area lamp (EXP-1) must be connected to the transmitter using a certified junction box.

i For versions with FM approval, the junction box is included in the delivery and already pre-terminated on the lamp side. You simply have to connect the cable of the transmitter (CUK80) to the terminals of the junction box.

For versions with ATEX approval, the junction box is not included in the delivery and it and the cable glands required must be provided by the customer at the place of installation. You must connect the cables entirely on your own (CUK80 of transmitter and lamp cable of photometer sensor).



A0029440

8 Connecting the hazardous area lamp to CM44P using a junction box

6.4 Ensuring the degree of protection

Only the mechanical and electrical connections which are described in these instructions and which are necessary for the required, designated use, may be carried out on the device delivered.

- ▶ Exercise care when carrying out the work.

Individual types of protection permitted for this product (impermeability (IP), electrical safety, EMC interference immunity, Ex protection) can no longer be guaranteed if, for example:

- Covers are left off.
- Different power units to the ones supplied are used.
- Cable glands are not sufficiently tightened (must be tightened with 2 Nm for the confirmed level of IP protection).
- Modules are not fully secured.
- The display is not fully secured (risk of moisture entering due to inadequate sealing).
- Loose or insufficiently tightened cables/cable ends.
- Conductive cable strands are left in the device.

6.5 Post-connection check

Device condition and specifications	Notes
Are the sensor, assembly and cable free from damage on the outside?	Visual inspection

Electrical connection	Notes
Does the supply voltage of the connected transmitter match the data on the nameplate?	Visual inspection
Are the installed cables strain-relieved and not twisted?	
Has the cable been routed without loops and cross-overs?	Check that it is firmly seated (by pulling gently)
Are the signal cables connected correctly according to the connection diagram?	
Are all cable entries mounted, tightened and leak-tight?	For lateral cable entries, make sure the cables loop downwards to allow water to drip off.
Are the PE distributor rails grounded (if present)?	Grounding at the point of installation

7 Commissioning

7.1 Function check

Before first commissioning, check if:

- ▶ the sensor is correctly installed
- ▶ the electrical connection is correct.

7.2 Calibrating/adjusting the sensor

Measuring points consisting of a photometer sensor, flow assembly (if provided) and a transmitter are adjusted at the factory. Normally adjustment is not required when commissioning for the first time.

If an adjustment is necessary nevertheless, you have the following adjustment option:
Adjustment with calibration standards

Use a solution of known turbidity for the calibration/adjustment.

- Formazin
Measuring systems that have been configured for FTU are calibrated using a formazin standard solution.
- Diatomaceous earth
Devices that have been configured for ppm are calibrated using a diatomaceous earth (DE) standard solution.

WARNING

Formazin is carcinogenic, has a sensitizing effect and is harmful for water organisms, with a long-term effect.

Can cause cancer and allergic skin reactions.

- ▶ Seek special advice before use.
- ▶ Use the specified personal protective equipment.
- ▶ Read and comprehend all the safety instructions prior to use.
- ▶ Avoid releasing formazin into the environment.

Preparing a formazin standard solution

1. Dilute 1 g of hydrazine sulfate in 100 ml of ultrapure water in a volumetric flask.
2. In a second volumetric flask, dissolve 10 g of hexamethylenetetramine in 100 ml of pure water.
3. Mix 5 ml of each solution together and allow the mixture to stand for 24 to 48 hours at room temperature (25 ± 3 °C).
4. Once the suspension has formed, dilute it with ultrapure water to 100 ml.
 - ↳ This stock suspension is defined as 400 FTU (formazin turbidity unit).
1 FTU = 1 NTU (nephelometric turbidity unit) and 4 FTU = 1 EBC (European Brewery Convention Unit)

The suspension prepared in this way is stable and can be stored for up to 1 month in a lightproof bottle in a cool and dry place.

You can dilute the suspension to produce a series of optical standard solutions. You can check the calibration of the measuring system with the standard solutions.

Stock suspension [ml]	Ultrapure water [ml]	FTU	NTU	EBC
100	0	400	400	100
50	50	200	200	50
25	75	100	100	25
20	80	80	80	20
10	90	40	40	10
5	95	20	20	5
2.5	97.5	10	10	2.5
1.0	99	4	4	1



It is not recommended to dilute the stock suspension below 4 FTU.

Preparing diatomaceous earth standard solution

Diatomaceous earth (DE) is used as the filter medium in a wide variety of filtration processes. Therefore, when monitoring the solids content in the filter inlet and outlet the measurement will correlate directly with the adjustment. If other materials are measured, the values displayed on the device may need to be correlated with the actual process values.

Note that accuracy and reproducibility properties when using diatomaceous earth standard solutions (DE) depend on the level of precision exercised in preparing the standard. DE in a suspension settles out relatively quickly. Therefore, it is very important to mix the sample carefully and determine the measured values as soon as the mixture is stable.

1. Add 1 g of dry diatomaceous earth to 1000 ml of ultrapure water.
 - ↳ You get an aqueous suspension of 1000 ppm DE.
2. Use this suspension to produce a series of diluting solutions.
3. Make sure to agitate the suspension carefully before diluting.

DE suspension [ml]	Ultrapure water [ml]	ppm
1	99	10
2	98	20
5	95	50
10	90	100
50	50	500
100	0	1000

There are two ways to calibrate/adjust with CM44P:

- Calibration
 - Zero point calibration or two-point calibration
- Application calibration
 - You create a maximum of 5 calibration data records which are each adapted to your particular application.

Calibrating the measuring system

- ▶ Follow the instructions in the Operating Instructions of the transmitter used.

8 Maintenance

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, take into account possible repercussions for process control or 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.

8.1 Maintenance schedule


- Maintenance and servicing intervals are based on the individual application.
- Cleaning intervals depend on the medium.

Maintenance checklist

- Replace lamp
 - The lamp is typically replaced after 8000 to 10 000 operating hours (→  30).
- Replace sensor window and seal
 - The window only needs to be replaced if it is damaged.
- Replace O-rings in contact with the medium
 - The replacement of O-rings in contact with the medium depends on the specific requirements of the process.
 - Never re-use a used O-ring.

8.2 Replacing the hazardous area lamp

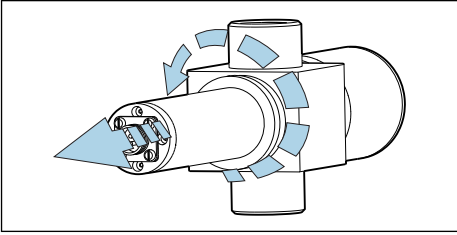
The disassembly and assembly process for the hazardous area lamp is the same as for the non-hazardous area version.

 Make sure you use the right spare parts kit.

8.3 Replacing the collimated incandescent lamp

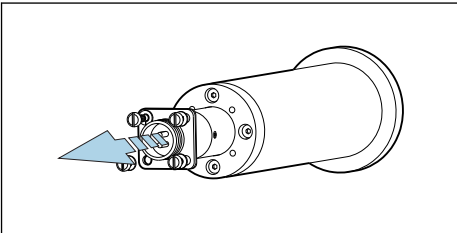
- ▶ Switch off the lamp at the transmitter using the software function.
- ▶ Remove the lamp cable.
- ▶ Allow the lamp to cool down (30 minutes).

1.



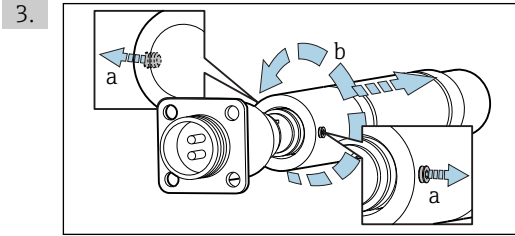
Turn the lamp module counterclockwise to remove it from the flow assembly.

2.

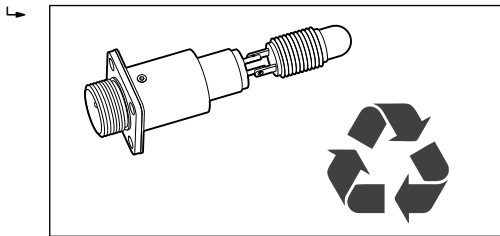


Remove the 4 screws and washers from the cable connector and carefully remove the lamp unit and the optical projection unit from the housing.

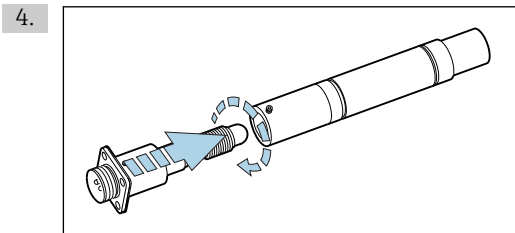
- ↳ The lamp unit and the cable connector are connected to one another. Both are screwed into the optical projection unit together.



Release the 2 securing screws on the optical projection unit (a). Carefully unscrew the optical projection unit (b).



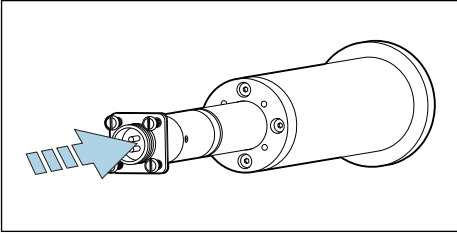
Dispose of the lamp unit, along with the cable connector, in accordance with local regulations.



Insert the new lamp unit into the optical projection unit and retighten the securing screws.

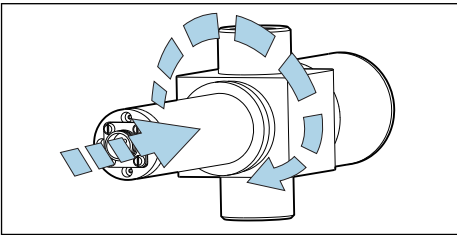
↳ Do not tighten the screws too tightly.

5.



Insert the re-assembled optical projection unit and lamp unit back into the lamp housing. Install the module fully and fit the 4 screws and washers back on the cable connector.

6.



Screw the lamp module back onto the flow assembly by tightening it in the clockwise direction.

A zero point adjustment is required after replacing the lamp.

8.4 Replacing the sensor window and seal



Operating Instructions for Flowcell OUA260, BA01600C

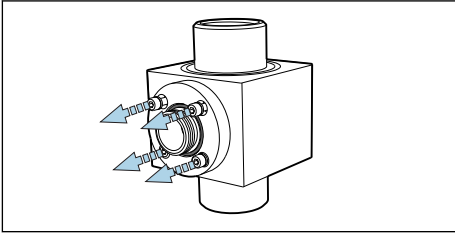
Always replace windows with windows of the same type in order to maintain the path length.

The flow assembly must be removed from the process line in order to replace the windows and seals.

1. Stop the flow in the process pipe and remove the assembly from the **dry** process line.
2. Remove the lamp and detector housing from the assembly.

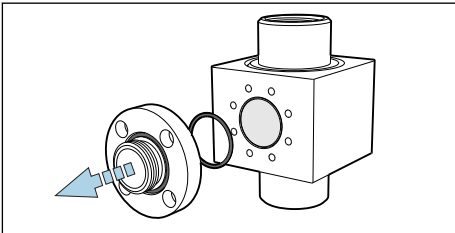
The following description applies for both sides, i.e. the detector side and the lamp side.
Always replace the O-rings or optical windows on both sides.

3.



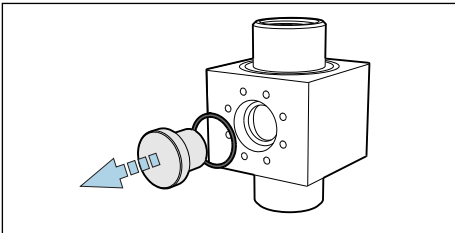
Remove the 4 Allen screws (1/8" or 3 mm) from the window retaining ring. Make sure to loosen the screws evenly and alternately around the retaining ring of the window.

4.



Remove the window retaining ring along with the O-ring on the inside towards the assembly.

5.




Gently force the optical window out of the assembly. If the window jams, apply some acetone around the window seal and wait a few minutes for it to take effect. This should help you remove the windows from the seals. **The seal cannot be reused afterwards!**

6. Check the area around the window for residue or fouling. Clean it if necessary.

7. Check the windows for signs of chipping or wear from abrasion.

↳ Replace the windows if such signs are visible.

8. Dispose of all the O-rings and replace them with new O-rings from the relevant maintenance kit.

9. Mount the optical window and then fit the window retaining ring, along with the new O-rings, back on the assembly. Make sure to tighten the screws of the window retaining ring uniformly in a diagonally opposite sequence. In this way, you ensure that the ring is seated correctly.
10. If the optical windows and the window retaining rings are not identical, make sure the lamp is on the right side. The lamp should be on the side with the "shorter" window length. (→  27)
Then mount the lamp and the detector on the assembly.

 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.

9 Repairs

9.1 Spare parts

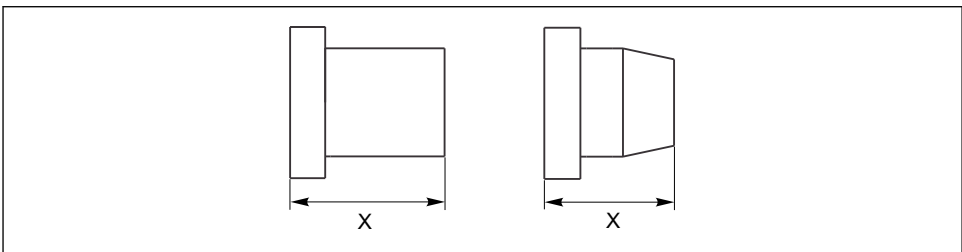
9.1.1 Sensor

Sensor spare parts

Description	Order number
Kit OUSxF1x, collimated incandescent lamp	71142626
Kit OUSxFxx, connector dust cover	71210161

9.1.2 Assembly

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



A0024807

 9 *Length measurement of both window types*

Window types and path lengths for the various pipe sizes with NPT SS and RFF 150/300 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"
40 mm	14 + 14	14 + 14	24 + 24	36.8 + 36.8

Dimensions of the window types given in mm (e.g. 14 mm + 14 mm)

Window types and path length 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"
40 mm			14 + 14	19 + 21.5	24 + 24	36.8 + 36.8

Dimensions of the window types given in mm (e.g. 19 mm + 21.5 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 19 mm	71136391
KIT OUA260, quartz window 21.5 mm	71136392
KIT OUA260, quartz window 24 mm	71136395
KIT OUA260, lamp and detector O-rings	71142537
KIT OUA260, borosilicate window 24 mm	71321644
KIT OUA260, sapphire window 24 mm	71142623
KIT OUA260, borosilicate window 14 mm	71321645
KIT OUA260, sapphire window 14 mm	71210134
KIT OUA260, borosilicate window 19 mm	71321647
KIT OUA260, sapphire window 19 mm	71210137
KIT OUA260, POPL adjuster	71210140
KIT OUA260, Buna "N" window O-rings	71210142

9.2 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 swift, safe and professional device returns, please read the return procedures and conditions at www.endress.com/support/return-material.

9.3 Disposal

The device contains electronic components and must therefore be disposed of in accordance with regulations on the disposal of electronic waste.

Observe the local regulations.

10 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 office.

10.1 Flow assembly

OUA260

- Flow assembly for hygienic sensors
- For sensor installation in pipes
- Materials: stainless steel 316, 316L or Kynar (other materials available on request)
- Wide variety of process connections and path lengths available
- Product Configurator on the product page: www.endress.com/oua260



Technical Information TI00418C

10.2 Cable

CUK80 cable set

- Pre-terminated and labeled cables for connecting analog photometer sensors
- Product Configurator on the product page: www.endress.com/cuk80

OUK20 cable set

- Pre-terminated and labeled cables for connecting OUSTF10- and OUSAF2x-type sensors to Memograph CVM40
- Order as per product structure

11 Technical data

11.1 Input

11.1.1 Measured variable

process absorption

11.1.2 Measuring range

- 0 to 200 FTU
- 0 to 200 ppm DE

11.1.3 Wavelength

Broadband (VIS and NIR)

Broadband filter (780 nm and above)

11.2 Environment

11.2.1 Ambient temperature range

Non-hazardous area versions

0 to 55 °C (32 to 130 °F)

Hazardous area versions

2 to 40 °C (36 to 100 °F)

11.2.2 Storage temperature

-10 to +70 °C (+10 to +160 °F)

11.2.3 Humidity

5 to 95 %

11.2.4 Degree of protection

IP66 and NEMA 4X

11.3 Process

11.3.1 Process temperature

0 to 90 °C (32 to 194 °F) continuous

Max. 130 °C (266 °F) for 2 hours

11.3.2 Process pressure

Max. 100 bar (1450 psi) absolute, depending on the material, pipe size and process connection of the flow assembly

11.4 Mechanical construction

11.4.1 Dimensions

→  11

11.4.2 Weight

1.225 kg (2.7 lbs.), without flow assembly

11.4.3 Materials

Sensor housing	Stainless steel 316L
Assembly OUA260	Stainless steel 316, 316L or Kynar
Cable connector ends	Nickel-plated brass

11.4.4 Light source

Collimated incandescent lamp
Lamp operating life: typically 10 000 h

11.4.5 Detector

silicon detector, hermetically sealed

11.4.6 Filter

Multilayer narrow-band interference filter

Index

A

Accessories 28

C

Check

 Connection 17

 Installation 13

Connection

 Check 17

 Measuring device 13

D

Declaration of Conformity 9

Design 6

Designated use 4

Device description 6

Dimensions 11

Disposal 28

E

Ensuring the degree of protection 17

F

Function check 19

H

Hazardous area lamp 14

I

Incoming acceptance 8

Installation

 Check 13

Installation conditions 10

L

Lamp voltage 14

M

Maintenance schedule 21

Measured variable 29

Measuring principle 6

Measuring range 29

Measuring system 10

Mounting angles 12

Mounting the sensor 12

N

Nameplate 8

O

Occupational safety 4

Operational safety 5

P

Power supply

 Connecting the measuring device 13

Product identification 8

Product safety 5

R

Replacing

 Collimated incandescent lamp 22

 Sensor window and seal 24

Requirements for the personnel 4

Return 28

S

Safety

 Occupational safety 4

 Operation 5

 Product 5

Safety instructions 4

Scope of delivery 9

Symbols 3

T

Technical personnel 4

U

Use

 Designated 4

W

Warnings 3

Wavelength 29



71316946

www.addresses.endress.com
