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Operating Instructions OUSTF10

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





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1 About this document

1.1 Warnings

Structure of information	Meaning
A 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

🚹 Additional information, tip	s
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- Permitted
- Recommended
- Not permitted or not recommended
- Reference to device documentation
- Reference to page
- Reference to graphic
- └► Result of an individual step

1.3 Symbols on the product

- $A \square$ Reference to device documentation
- Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

2 Basic safety instructions

2.1 Requirements of 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.
- 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

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 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

Any use other than that intended puts the safety of people and the measuring system at risk. Therefore, any other use is not permitted.

The manufacturer is not liable for harm caused by improper or unintended use.

2.3 Workplace 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 international 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

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, take products out of service and protect them against unintentional operation.

2.5 Product security

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 international standards have been observed.

2.5.2 Versions with hazardous area lamp

• Observe the safety instructions in the XA pertaining to this manual.



Safety instructions for electrical equipment in hazardous areas, photometer sensors, XA01403C

3 Product description

3.1 Sensor design



I Sensor with flow assembly OUA260

- 1 Cable connection
- 2 Lamp module
- 3 Flow assembly OUA260 (depending on version)
- 4 Detector module
- 5 Connection for air purge function (optional)

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.



- Image: 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 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.

4.2 Product identification

4.2.1 Nameplate

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

- Manufacturer identification
- Order code
- Serial number
- Safety information and warnings
- Compare the information on the nameplate with the order.

4.2.2 Identifying the product

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 www.endress.com.
- 2. Page search (magnifying glass symbol): Enter valid serial number.
- 3. Search (magnifying glass).
 - └ The product structure is displayed in a popup window.
- 4. Click the product overview.
 - └ A new window opens. Here you fill information pertaining to your device, including the product documentation.

4.3 Manufacturer address

Endress+Hauser Conducta Inc. 4123 East La Palma Avenue, Suite 200 Anaheim, CA 92807 USA

4.4 Scope of delivery

The scope of delivery comprises the following, :

- Detector and lamp module without flow assembly or
- Detector and lamp module mounted on flow assembly OUA260
- Operating Instructions
- ▶ If you have any queries:

Please contact your supplier or local sales center.

5 Mounting procedure

5.1 Mounting requirements

5.1.1 Measuring system

An optical measuring system comprises:

- Sensor (photometer) OUSTF10
- Transmitter, e. g. Liquiline CM44P
- Cable set, e.g. CUK80
- Assembly OUA260

Example of a measuring system with a photometer sensor

- 1 Pipe
- 2 Transmitter CM44P
- 3 CUK80 cable set
- 4 Sensor: detector

- 5 Flow assembly OUA260
- 6 Sensor: light source (lamp)
- 7 CUK80 cable set

5.1.2 Dimensions

- A Dimension of lamp \rightarrow Table
- *B* Dimension of detector \rightarrow 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) 102.8 (4.05)

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.

► Allow an additional gap of 5 cm (2") on both the lamp side and detector side of the sensor to connect the sensor cable.

5.1.3 Mounting bracket

■ 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

5.1.4 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.

Image of a supply via connections to the detector and lamp of the process photometer

- *1 Compressed air or nitrogen supply*
- 2 Air drier (not required for nitrogen)
- 3 Pressure regulator
- 4 Flow controller
- 5 Process photometer OUSTF10

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

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

5.2 Mounting the sensor

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

The sensor cannot be used without an assembly.

- Make sure that the sensor housing 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 bodies are 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 readymounted 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 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-mounting checks

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 via 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.

▶ Do not shorten or otherwise modify the CUK80 cable!

☑ 7 Connecting cable OUSTF10

A Light source (lamp) power supply

B Signals of scattered light and transmitted light detector

CM44P terminal	Cable color	Assignment
P+	YE (thick)	Lamp voltage +
S+	YE (thin)	Detection of lamp voltage +
S-	BK (thin)	Detection of lamp voltage -
P-	BK (thick)	Lamp voltage -
A (1)	RD	Scattered light sensor +
C(1)	ВК	Scattered light sensor -
SH (1)	GY	Shield
A (2)	WH	Sensor reference +
C(2)	GN	Channel 1 Sensor reference -
SH (2)	GY	Channel 1 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

Section applies only to measuring points consisting of a photometer, cable set CUK80 and a Liquiline CM44P transmitter.

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

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.

1

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

• 8 Safety barrier, dimensions in mm (inch)

The safety barrier may only have a very low leak current since the optical signals from H 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.

L.

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.

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).

Connecting the hazardous area lamp to CM44P via 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 (1.5 lbf ft) for the permitted level of IP protection)
- Unsuitable cable diameters are used for the cable glands
- 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

Prior to initial commissioning, ensure that:

- 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 desired 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.

May cause cancer and allergic skin reactions.

- Seek special advice before use.
- ► Use the specified personal protective equipment.
- Read and make sure you understand all the safety instructions in the Safety Datasheets prior to use.
- Avoid releasing the substance 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 another volumetric flask, dilute 10 g of hexamethylenetetramine in 100 ml of ultrapure water.
- 3. Mix 5 ml of each solution together and allow the mixture to stand for 24 to 48 hours at room temperature (25 \pm 3 °C).
- 4. Once the suspension has formed, dilute 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.

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

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.

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 dry diatomaceous earth to 1,000 ml ultrapure water.
 - ← You get an aqueous suspension of 1000 ppm DE.
- 2. Shake the suspension carefully before diluting.
- 3. Use the suspension to prepare a range of dilution solutions.

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 adjustment You create a maximum of five calibration datasets 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, 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.

8.1 Maintenance schedule

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

Maintenance checklist

- 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

Preparation

- 1. Switch off the lamp using the software function on the transmitter.
- 2. Release the lamp cable.
- 3. Allow the lamp to cool down (30 minutes).

Replacing the lamp unit

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

2.

1.

Remove the four 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.

Loosen the two securing screws on the optical project unit (a) and then 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 too tightly.

5.

Insert the assembled optical projection and lamp unit fully into the lamp housing and retighten the four screws and washers of the cable connector.

1

Screw the lamp module clockwise onto the flow assembly.

A zero point adjustment is required after replacing the lamp.

8.4 Replacing the sensor window and seal

Operating Instructions for Flowcell OUA260, BA01600C

Operating Instructions for CUA261, BA01652C

If you have mounted the sensor in a VARIVENT flow assembly using the CUA261 adapter, refer to the Operating Instructions of the adapter for information on removal and on replacing the optical windows.

Removing optical windows and seals

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

The following applies for OUA260:

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

1. In the case of OUA260 only:

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 change O-rings or optical windows $^{1)}$ on both sides.

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.

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

5.

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

Gently push the optical window out of the assembly. 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 of the assembly 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, on the assembly. 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.
- If the optical windows and the window 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. Then mount the lamp and 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 Repair

Repair

9.1 General notes

The repair and conversion concept provides for the following:

- The product has a modular design
- Spare parts are grouped into kits which include the associated kit instructions
- Only use original spare parts from the manufacturer
- Repairs are carried out by the manufacturer's Service Department or by trained users
- Certified devices can only be converted to other certified device versions by the manufacturer's Service Department or at the factory
- Observe applicable standards, national regulations, Ex documentation (XA) and certificates
- 1. Carry out the repair according to the kit instructions.
- 2. Document the repair and conversion and enter, or have entered, in the Life Cycle Management tool (W@M).

9.2 Spare parts

Device spare parts that are currently available for delivery can be found on the website:

https://portal.endress.com/webapp/SparePartFinder

► Quote the serial number of the device when ordering spare parts.

9.3 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:

 Check the website www.endress.com/support/return-material for information on the procedure and general conditions.

9.4 Disposal

If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

10 Accessories

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

Listed accessories are technically compatible with the product in the instructions.

- Application-specific restrictions of the product combination are possible.
 Ensure conformity of the measuring point to the application. This is the responsibility of the operator of the measuring point.
- 2. Pay attention to the information in the instructions for all products, particularly the technical data.
- 3. For accessories not listed here, please contact your Service or Sales Center.

10.1 Flow assembly

OUA260

- Flow assembly for hygienic sensors
- For sensor installation in pipes
- Numerous materials, process connections and path length versions available
- Product Configurator on the product page: www.endress.com/oua260

Technical Information TI00418C

CUA261

- VARIVENT adapter for installation in VARINLINE housing
- Hygienic process connection, suitable for cleaning in the process (CIP) and sterilization in the process (SIP)
- Numerous window materials and path length versions available
- Product Configurator on the product page: www.endress.com/cua261

Operating Instructions BA01652C

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

11.1.3 Wavelength

Broadband (VIS and NIR) Broadband filter (780 nm and above)

11.2 Environment

11.2.1 Ambient temperature

Non-hazardous area versions

0 to 55 °C (32 to 131 °F)

Hazardous area versions

2 to 40 °C (36 to 104 °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

IP65 and NEMA 4

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 Pressure

Max. 100 bar (1450 psi) absolute, depending on the material, pipe size and process connection of the flow assembly $% \left(\frac{1}{2}\right) =0$

11.4 Mechanical construction

11.4.1 Dimensions

→ 🗎 10

11.4.2 Weight

1.225 kg (2.7 lbs.), without flow assembly

11.4.3 Materials

Sensor housing	Stainle	ess steel 316L
Assembly OUA260		Technical Information OUA260, TI00418C

Assembly CUA261

Operating Instructions CUA261, BA01652C

Cable connector ends

Nickel-plated brass

11.4.4 Light source

Collimated incandescent lamp

Lamp operating life: typically 10 000 h

The lamp will not operate at full capacity until a warm-up period of 30 minutes has elapsed.

11.4.5 Detector

silicon detector, hermetically sealed

11.4.6 Filter

Multilayer narrow-band interference filter

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