

Safety Instructions

OUSAF12, OUSAF21, OUSAF22, OUSAF44, OUSAF46, OUSTF10

Process photometer sensors

UK Ex II 2G Ex db IIC T5 Gb



**UK
CA**



OUSAF12, OUSAF21, OUSAF22, OUSAF44, OUSAF46, OUSTF10

Process photometer sensors

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Associated documentation

This document is an integral part of the following Operating Instructions:

- Operating Instructions OUSAF12, BA00497C
- Operating Instructions OUSAF21, BA00471C
- Operating Instructions OUSAF22, BA00472C
- Operating Instructions OUSAF44, BA00416C
- Operating Instructions OUSAF46, BA01349C
- Operating Instructions OUSTF10, BA00500C

Supplementary documentation

Competence Brochure CP00021Z

- Explosion Protection: Guidelines and General Principles
- www.endress.com

Certificates and declarations

The certificates and declarations of conformity are available in the Downloads area of the Endress+Hauser website:

www.endress.com/download

Declaration of Conformity

With this declaration of conformity, the manufacturer guarantees that the product conforms to UK statutory requirements:

- The Electromagnetic Compatibility Regulations SI 2016 No. 1091
- The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations SI 2016 No. 1107
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations SI 2012 No. 3032

UKCA type-examination certificate

EXP-1 Lamp: CSAE 23UKEX1015X

Identification**Nameplate**

The following information on the device can be found on the nameplate:

- Manufacturer identification
- Order code
- Extended order code
- Serial number
- Safety information and warnings
- Ex markings
- Certificate number

- Compare the information on the nameplate with the order.

Type code

Type	Version				
	010 ¹⁾	020 ²⁾	030 ³⁾	040 ⁴⁾	050 ⁵⁾
OUSAF12- OUSAF22- OUSTF10-	* * *	* * *	A/B/C/D C/D B	4 4 4	* * *
	No Ex-relevance		For use in hazardous areas II 2G Ex db IIC T5 Gb		No Ex-relevance

- 1) Wavelength
- 2) Calibration
- 3) Lamp
- 4) Lamp approval
- 5) Assembly

Type	Version											
	010 1)	020 2)	030 3)	040 ⁴⁾	050 5)	060 6)	070 7)	080 8)	090 9)	100 10)	110 11)	120 12)
OUSAF21-	*	*	C/D	4	*							
	No Ex-relevance		For use in hazardous areas II 2G Ex db IIC T5 Gb		No Ex-relevance							

- 1) Wavelength combination
- 2) Calibration/Validation
- 3) Lamp
- 4) Lamp approval
- 5) Process connection
- 6) Nominal diameter
- 7) Optical pathlength
- 8) Window material
- 9) Sealing material
- 10) Air purge
- 11) Certificate
- 12) Options

Type	Version			
	010 ¹⁾	020 ²⁾	030 ³⁾	040 ⁴⁾
OUSAF44-	*	*	E	*
OUSAF46	*	*	E	*
	No Ex-relevance		For use in hazardous areas II 2G Ex db IIC T5 Gb	No Ex-relevance

- 1) Wavelength
- 2) Calibration/Validation
- 3) Lamp approval
- 4) Assembly

Ex approvals

UK II 2G Ex db IIC T5 Gb

Approved Body

EXP-1 Lamp: CSA Group Testing UK Ltd

Safety instructions

The process photometer measuring point, consisting of the certified process photometers OUSAF12, OUSAF21, OUSAF22, OUSAF44, OUSAF46 or OUSTF10 and measuring cable CUK80 may only be connected to a transmitter with the connection values DC 2 to 18 V, 6 VA (e.g. CM44P) via the certified safety barrier MTL7760 ac.

- The electrical connection must be established as illustrated in the relevant control drawings in this document and the installation instructions in the Operating Instructions for the process photometer.
- The process photometers may be used in environments that contain flammable gases and vapors and are assigned to apparatus groups IIA, IIB, IIC, temperature class T5.
- Installation must be performed by trained personnel in compliance with applicable standards and guidelines, e.g. IEC/EN 60079-14 and EN/IEC 60079-17 and as specified in the Operating Instructions for the particular process photometer and the transmitter to be connected.
- Sensor repairs must be performed by trained personnel in compliance with applicable standards and guidelines, e.g. IEC/EN 60079-19 and as specified in the sensor's Operating Instructions and the Operating Instructions for the transmitter to be connected.
- Component parts which are installed as accessories or replacement parts in these process photometers must be mounted by trained personnel in compliance with the manufacturer's documentation.

- If the process photometer can come into contact with aggressive substances, the user must take suitable protective measures to ensure that the confirmed level of protection of the measuring system is not compromised. Examples of aggressive substances include acidic liquids or gases that corrode metal, or solvents that can damage polymeric materials. Suitable protective measures involve regular checks as part of routine inspections, or checks to verify the resistance of the materials to special chemicals using the material data sheet.
- The optical receiver with photodiodes is operated in the current mode. The photodiodes generate energy below the voltage, current and power limits that are specified in IEC/EN 60079-11, Section 5.7. Therefore the equipment is categorized as a simple apparatus.
- The process photometers are assigned to temperature class T5, which permits a maximum surface temperature of 100 °C (212 °F).
- One or two approved safety barriers MTL7760 ac are used to separate the safe area from the area classified as hazardous. The safety barrier must be connected as illustrated in the relevant control drawings in this document and the installation instructions in the Operating Instructions for the process photometer.
- For installation details on the intrinsic safety barrier the operation instruction must be considered.
- If transmitter and safety barrier are placed in hazardous location:
 - CUK80 cable set must be used in conduit or other suitable wiring method for the respective location as per UKEx regulation compatible with explosion proof device.
 - Certified equipment for the respective location must be used.
- The wiring between Sensor and Transmitter must comply with the applicable safety standards. Sealing fittings and conduit supplied by customer.
- Do not remove any cover while circuit in operation.
- The explosions-protected lamp EXP-1 has been developed and manufactured according to SI 2016 No. 1107 and also complies with the following standards:
 - EN 60079-0 Electrical apparatus for explosive gas atmospheres
 - EN 60079-1 Explosive atmospheres. Equipment protection by flameproof enclosures "d"
- The CUK80 measuring cable must be protected against electrostatic charge.
- The OUA260/CUA261 flow assemblies may only be used in the hazardous area with stainless steel adapters.
- Do not remove the sensor (lamp and/or detector) from the flow assembly if the process temperatures is above 95 °C (203 °F).

Specific conditions of use

- The explosion-protected lamp EXP-1 must cool down before the housing is opened. After switching off the power supply, first wait for 5 minutes before you open the photometer housing.
- The explosion-protected lamp EXP-1 must be installed in such a way that the front window is protected against mechanical damage.
- The explosion-protected lamp EXP-1 has a permanently connected cable end which must be connected to an external circuit according to the instructions in these Safety Instructions and the installation instructions in the Operating Instructions for the process photometer.
- In accordance with clause 7.5 of EN IEC 60079-0, the equipment must be connected to ground and the resistance shall not exceed 10⁹ Ω.

Temperature tables

Photometer	Process temperature	Ambient temperature	Temperature class
OUSAF12	0 to 90 °C (32 °F to 194 °F) (continuous operation) max. 130 °C (266 °F), for max. 2 h	-20 to 40 °C (0 to 100 °F)	T5 ≤ 100 °C (≤ 212 °F)
OUSAF21			
OUSAF22			
OUSAF44			
OUSAF46			
OUSTF10			

If the specified process temperatures are complied with, temperatures that are not permitted for the respective temperature class will not occur on the equipment.

Connection

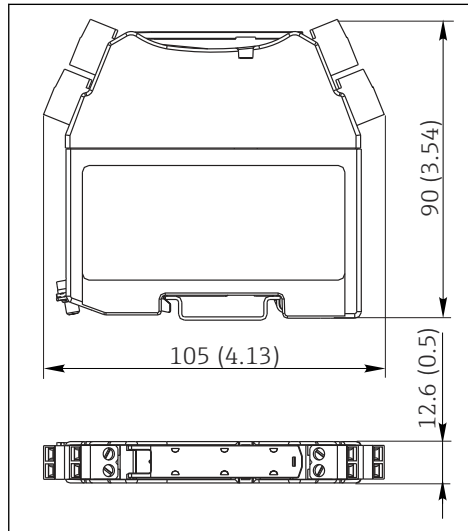


For further information on terminal assignment, see the corresponding Operating Instructions for the photometer sensor.

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.

Separation between the safe area and the hazardous area is achieved by means of one or two MTL7760AC safety barriers.

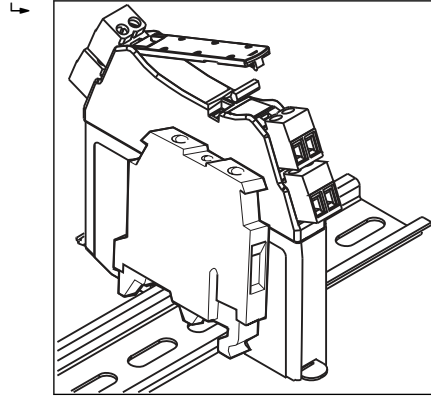


1 Safety barrier, dimensions in mm (inch)

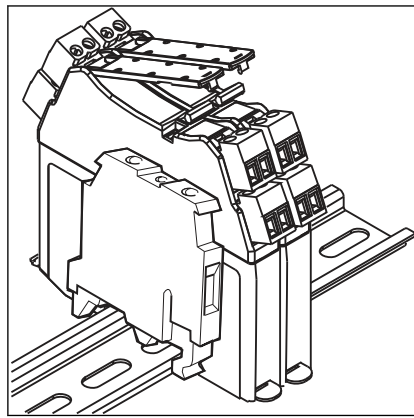
i The safety barrier may only have a very low leak current since the optical signals from the sensor can be in the nanoampere range. Therefore, the sensor cable shield is connected to the ground terminal of the barrier.

The detector cable of the CUK80 is supplied factory-wired to the safety barrier(s).

1. Mount the safety barrier(s), including the grounding module, on a DIN rail.

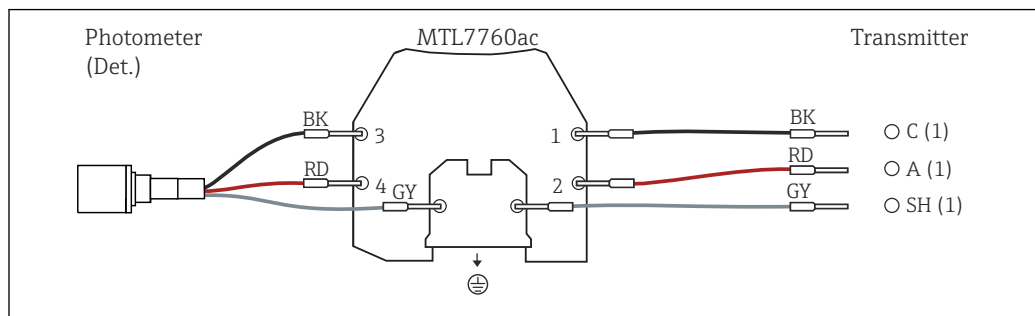


2 OUSAF12, OUSAF44

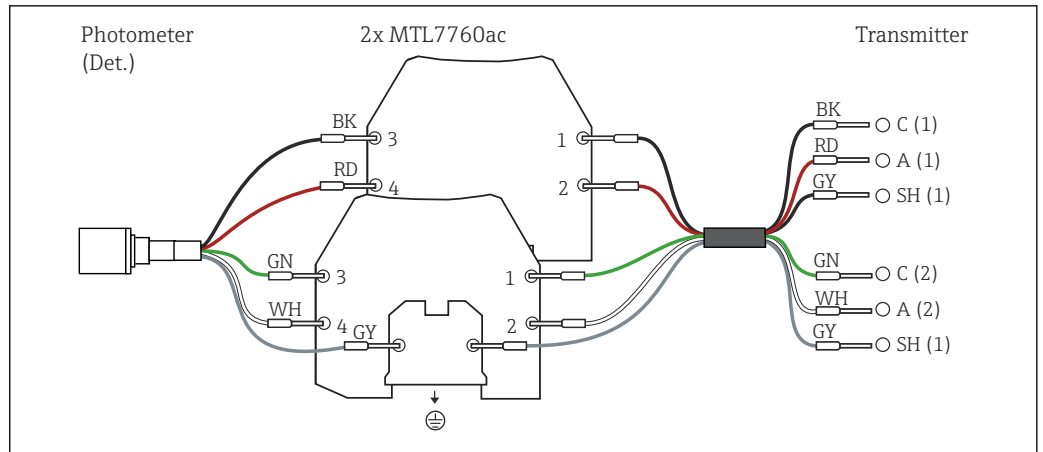


3 OUSAF21, OUSAF22, OUSAF46, OUSTF10

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



4 OUSAF12, OUSAF44

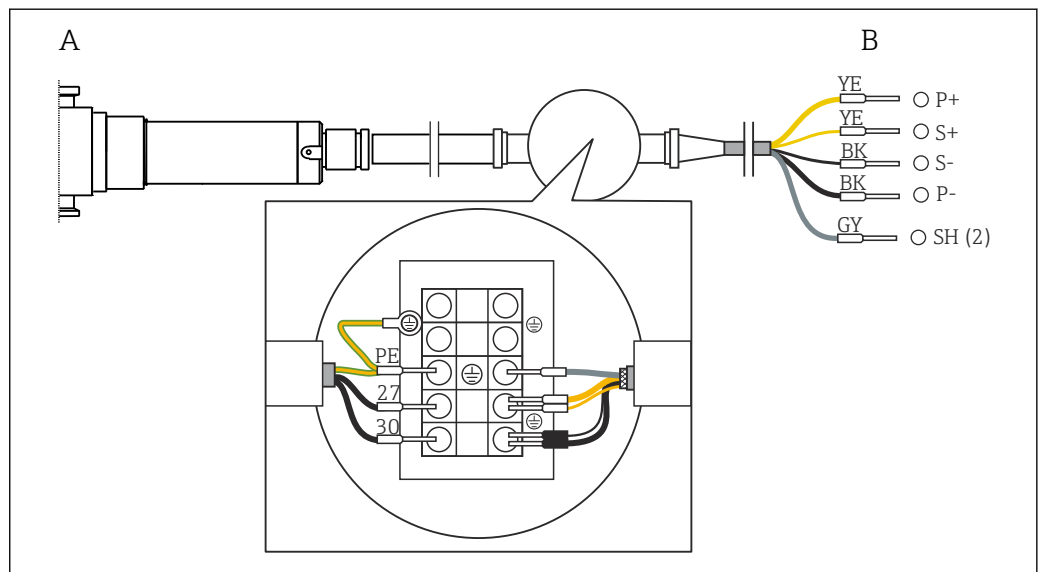


5 OUSA21, OUSA22, OUSA46, OUSTF10

Connecting the hazardous area lamp to the transmitter via a junction box

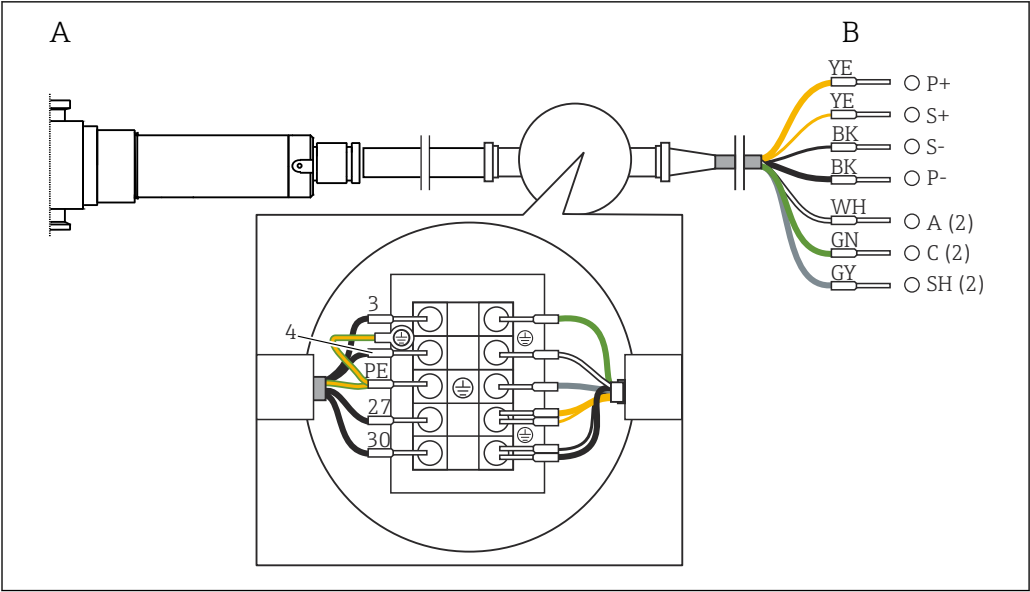
The hazardous area lamp (EXP-1) must be connected to the transmitter using a certified junction box.

i 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).



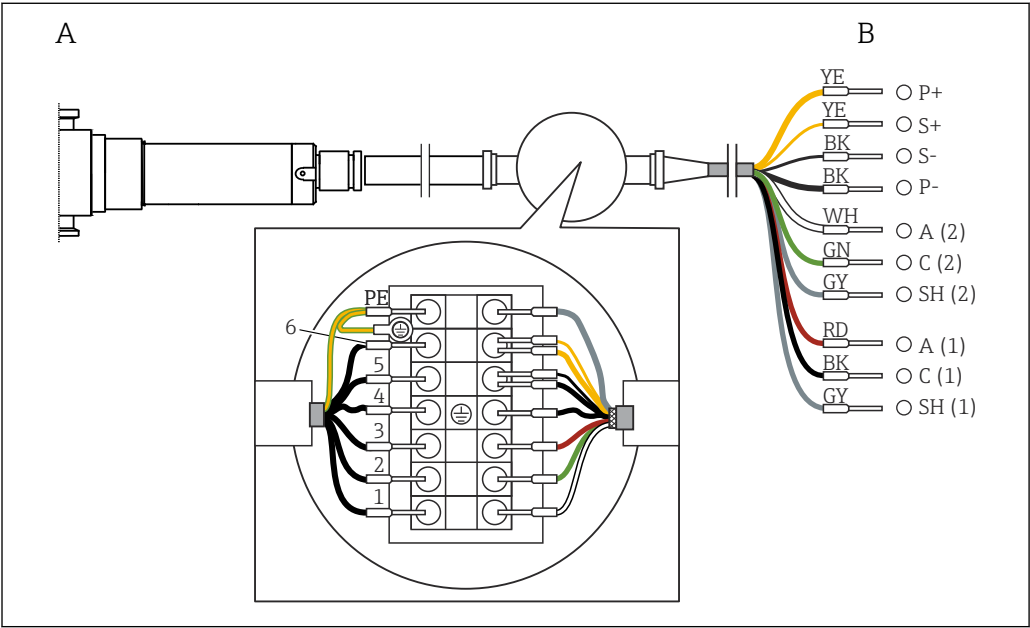
6 OUSA12, OUSA21, OUSA22, OUSTF10: Connecting the hazardous area lamp to the transmitter via the junction box

A Hazardous area lamp (EXP-1)
B Transmitter



7 OUSAF44: Connecting the hazardous area lamp to the transmitter via the junction box

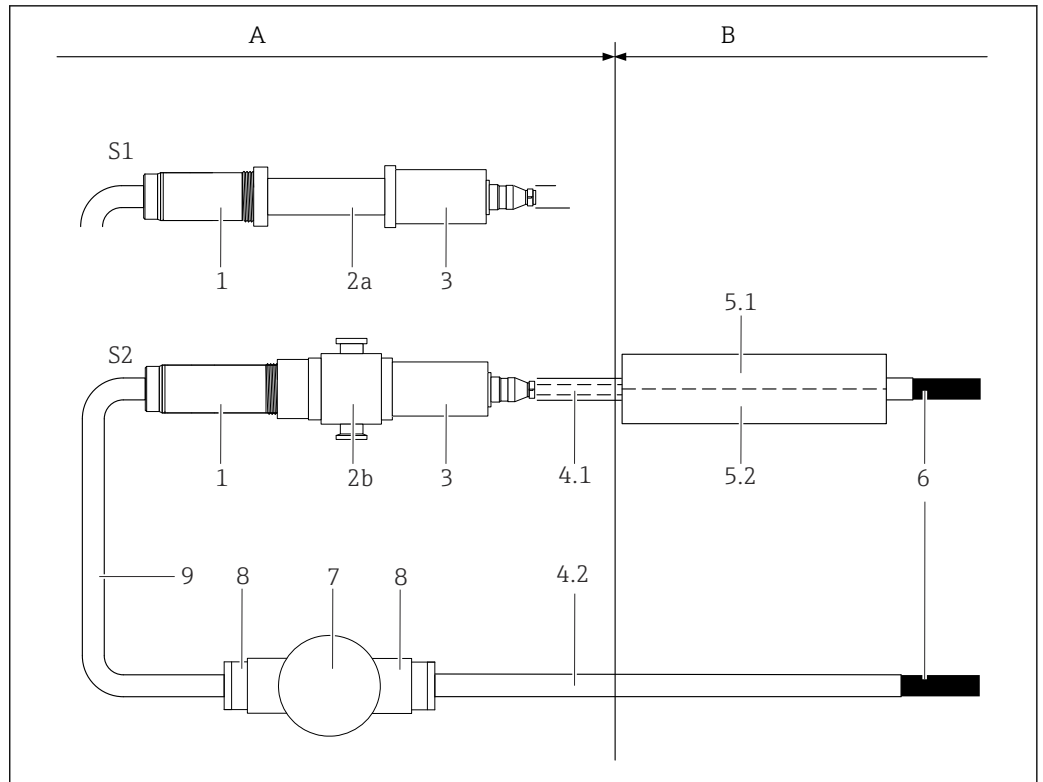
A Hazardous area lamp (EXP-1)
B Transmitter



8 OUSAF46: Connecting the hazardous area lamp to the transmitter via the junction box

A Hazardous area lamp (EXP-1)
B Transmitter

Installation conditions



A0059499

9 Control drawing UKEx

A Hazardous area, zone 1, gas groups IIC, IIB, IIA, temperature class T5

B Non-hazardous area or hazardous area

1 EXP-1 lamp (UKCA approved)

2a Assembly for OUSAF21

2b Assembly OUA260 or CUA261 for OUSAF12, OUSAF22, OUSAF44, OUSAF46 or OUSTF10

3 Intrinsically safe optical detector

4.1 Cable set CUK80 or other suitable wiring method for intrinsically safe wiring

4.2 Cable set CUK80 must be routed in a conduit. Alternatively, another suitable wiring method suitable for the intended environment and permitted for use with flameproof equipment in accordance with SI 2016 No. 1107 must be used.

5.1 MTL7760AC safety barrier (included in CUK80 delivery, connect to ground). Follow the manufacturer's instructions, particularly for installation in hazardous areas.

5.2 Second MTL7760AC safety barrier for OUSAF21, OUSAF22, OUSAF46 or OUSTF10 (see 5.1)

6 Connection to the transmitter e.g. CM44P. If the transmitter and safety barrier are located in a hazardous area, carry out installation using a suitable wiring method in accordance with the SI 2016 No. 1107 that is approved for use with hazardous equipment.

7 Hazardous area junction box, UKCA approved, not included in the scope of delivery (connect to ground)

8 Hazardous area cable gland, UKCA approved (to be provided by the customer)

9 Flexible conduit (integrated into the EXP-1 lamp)

