

# Safety Instructions

## Memosens COS81E

IS Class I Div 1 Groups A, B, C, D

Ex ia op is IIC T6 Ga

Class I Zone 0 AEx ia op is IIC T6 Ga

IS Class II Division 1 Groups E, F, G

Ex ia op is IIIC T90 °C Da

Zone 20 AEx ia op is IIIC T90 °C Da

Safety instructions for electrical apparatus in explosion-hazardous areas






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<b>Associated documentation</b>	This document is an integral part of Operating Instructions BA02066C.
<b>Supplementary documentation</b>	 Competence Brochure CP00021Z <ul style="list-style-type: none"> <li>■ Explosion Protection: Guidelines and General Principles</li> <li>■ <a href="http://www.endress.com">www.endress.com</a></li> </ul>
<b>Certificates</b>	<p>The certificates and declarations of conformity are available in the Downloads area of the Endress+Hauser website:</p> <p><a href="http://www.endress.com/download">www.endress.com/download</a></p> <p>CSA C/US certificate, certificate number: CSA20CA80021490X</p>
<b>Identification</b>	<p>The nameplate provides you with the following information on your device:</p> <ul style="list-style-type: none"> <li>■ Manufacturer identification</li> <li>■ Order code</li> <li>■ Extended order code</li> <li>■ Serial number</li> <li>■ Safety information and warnings</li> <li>■ Ex marking on hazardous area versions</li> </ul> <p>► Compare the information on the nameplate with the order.</p>
<b>Ex-approval</b>	<p><b>CSA Ex</b></p> <p>IS Class I Div 1 Groups A, B, C, D</p> <p>Ex ia op is IIC T6 Ga</p> <p>Class I Zone 0 AEx ia op is IIC T6 Ga</p> <p>IS Class II Division 1 Groups E, F, G</p> <p>Ex ia op is IIIC T90 °C Da</p> <p>Zone 20 AEx ia op is IIIC T90 °C Da</p> <p>The product meets the requirements of:</p> <ul style="list-style-type: none"> <li>■ CLASS - C225804 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations</li> <li>■ CLASS - C225884 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - Certified to US Standards</li> </ul> <p>This is verified by compliance with the following standards:</p> <ul style="list-style-type: none"> <li>■ CAN/CSA-C22.2 No. 60079-0:19 Explosive Atmospheres - Part 0: Equipment - General requirements</li> <li>■ CAN/CSA-C22.2 No. 60079-11:14 Explosive Atmospheres – Part 11: Equipment protection by Intrinsic Safety "i"</li> <li>■ CAN/CSA-C22.2 No. 60079-28:2016 Explosive Atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation</li> <li>■ ANSI/UL 60079-0:19 Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements</li> <li>■ ANSI/UL 60079-11:13 Electrical Apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety "i"</li> <li>■ ANSI/UL 60079-28:2017 Explosive Atmospheres - Part 28: Equipment – Protection of Equipment and transmission systems using optical radiation</li> <li>■ CAN/CSA-C22.2 No. 61010-1-12 (May 2012) Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements</li> <li>■ ANSI/UL 61010-1-2018 (3rd Edition) Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements</li> </ul>
<b>Notified body</b>	CSA Group

**Safety instructions**

The Memosens COS81E oxygen sensor is suitable for use in hazardous areas in accordance with: CSA type-examination certificate 80021490


- A maximum ambient temperature of 90 °C (194 °F) must not be exceeded at the sensor head.
- Oxygen sensors for use in hazardous areas have a special conductive O-ring. The electrical connection of the metallic sensor shaft to the conductive mounting location (such as a metallic assembly) is via the O-ring.
- Appropriate measures must be taken to connect the assembly or the mounting location to ground in accordance with the Ex guidelines.
- The plastic housing may only be cleaned with a damp cloth.
- Hazardous area versions of digital sensors with Memosens technology are marked by an orange/red ring on the plug-in head.
- The maximum permitted cable length between the sensor and transmitter is 100 m (330 ft).
- When using devices and sensors, observe the regulations for electrical systems in hazardous areas (EN/IEC 60079-14).
- The procedures for electrical connection described in the Operating Instructions must be followed.
- Install the device according to the National Electrical Code (NFPA70) or the Canadian Electrical Code, Part 1 (C22.1), where applicable.

**Type code**

Memosens	COS81E-aabbccdde+g	
	aa	Approval <b>CB</b> CSA C/US IS Cl.1 Div1&2 GP A-D T6 <b>C5</b> CSA C/US IS Cl. I Div 1&2 GP A-D T6 + CSA C/US IS Cl. I Zone 0 AEx ia op is IIC T6 Ga + CSA C/US IS Cl. II Div 1&2 Groups E-G T90 °C+ CSA C/US IS Cl. II Zone 20 AEx ia op is IIIC T90 °C
	bb	Measuring range (no ex-relevance)
	cc	Cap characteristics AC = Stainless steel C-shape AU = Stainless steel U-shape BC = Titanium C-shape BU = Titanium U-shape CC = Alloy C22 C-shape CU = Alloy C22 U-shape YY = Special version
	dd	Sensor length (no ex-relevance) max. 600 mm (23,6 in)
	e	Material of O-ring (in the cap) (no ex-relevance)
	g	Optional = one or more characters determining optional features (no ex-relevance), e.g. test or other certificates/declarations

**Temperature table**

Sensor	Process temperature $T_p$	Ambient temperature $T_a$
COS81E	$-15\text{ °C (5 °F)} \leq T_p \leq 60\text{ °C (140 °F)}$ (T6 rep. T90°C (194°F))	$-25\text{ °C (-13 °F)} \leq T_a \leq 60\text{ °C (140 °F)}$ (T6 rep. T90°C (194°F))

The above temperature table applies only under the following installation conditions, which are described in the following graphic →  6. If the installation conditions cannot be met, the maximum process temperature  $T_p$  must not exceed the maximum ambient temperature  $T_a$ .

**Connection**

**Ex specification**

The approved Memosens COS81E digital oxygen sensor has an intrinsically safe input with the following parameter set:

Parameter	Value
$P_i$	180 mW

The approved Memosens COS81E digital oxygen sensor uses inherently safe optical radiation:

Parameter	Value
$P_{opt}$ (sensor signal)	$\leq 15$ mW

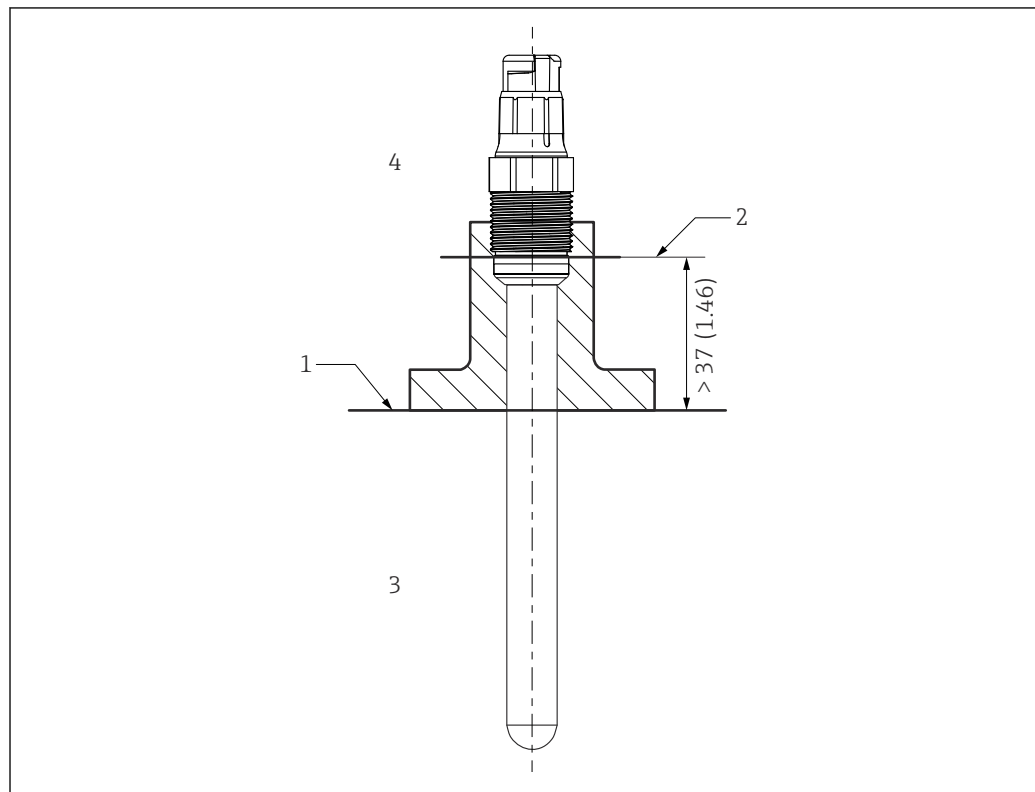
The approved Memosens COS81E digital oxygen sensor must be connected to a Memosens cable or cable transmitter with intrinsically safe output with the following parameter:

Parameter	Value
$P_o$	max. 180 mW

For installation connection see control drawing 961005034.

The sensors can be connected both Class I Division 1 and Class I Division 2: Division 1 equipment can be used in Division 2 as long as they are installed in the same manner as they were intended for Division 1 (NEC 500.8 (B)(2)). This is the case for Memosens sensor with inductive coupling between sensor and cable. There are no different installation methods between sensor and cable. For the cable-transmitter connection the XA of the transmitter must be considered.

## Installation conditions



A0041281

### 1 Installation conditions

- 1 Limit
- 2 Distance between plug-in head (lower edge) and process medium, without ring and thrust collar
- 3 Process temperature range  $T_p$
- 4 Ambient temperature range  $T_a$

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