

Safety Instructions

Memosens oxygen sensors

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

Ex ia IIC T6... T4 Ga

Class I Zone 0 AEx ia IIC T6... T4 Ga

Safety instructions for electrical apparatus in explosion-hazardous areas




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Table of contents

Associated documentation	4
Supplementary documentation	4
Certificates	4
Identification	4
Ex-approval	4
Notified body	4
Safety instructions	4
Type code	5
Temperature tables	6
Connection	6
Installation conditions	7

Associated documentation	<p>This document is an integral part of the Memosens COS22E Operating Instructions BA02145C.</p> <p>This document is an integral part of the Memosens COS51E Operating Instructions BA02146C.</p>
Supplementary documentation	<p> Competence Brochure CP00021Z</p> <ul style="list-style-type: none"> ▪ Explosion Protection: Guidelines and General Principles ▪ www.endress.com
Certificates	<p>The certificates and declarations of conformity are available in the Downloads area of the Endress +Hauser website:</p> <p>www.endress.com/download</p> <p>CSA C/US certificate, certificate number: CSA20CA80021490X</p>
Identification	<p>The nameplate provides you with the following information on your device:</p> <ul style="list-style-type: none"> ▪ Manufacturer identification ▪ Order code ▪ Extended order code ▪ Serial number ▪ Safety information and warnings ▪ Ex marking on hazardous area versions <p>► Compare the information on the nameplate with the order.</p>
Ex-approval	<p>CSA Ex</p> <p>IS Class I Div 1 Groups A, B, C, D</p> <p>Ex ia IIC T6... T4 Ga</p> <p>IS Class I Zone 0 AEx ia IIC T6... T4 Ga</p> <p>The product meets the requirements of:</p> <ul style="list-style-type: none"> ▪ CLASS - C225804 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations ▪ CLASS - C225884 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - Certified to US Standards <p>This is verified by compliance with the following standards:</p> <ul style="list-style-type: none"> ▪ CAN/CSA-C22.2 No. 60079-0:19 ▪ CAN/CSA-C22.2 No. 60079-11:14 ▪ ANSI/UL 60079-0:19 ▪ ANSI/UL 60079-11:13 ▪ CAN/CSA-C22.2 No. 61010-1-12 (May 2012) ▪ UL Std. No. 61010-1 (3rd Edition)
Notified body	CSA Group
Safety instructions	<p>The Memosens COS22E and Memosens COS51E digital oxygen sensors are suitable for use in hazardous areas in accordance with: CSA type-examination certificate 80021490</p> <ul style="list-style-type: none"> ▪ 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.

Only Memosens COS22E:

- 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.
- Sensors containing parts made of titanium or other light metals must be protected against impact.
- The sensors must not be operated under electrostatically critical process conditions. Avoid strong steam or dust currents that act directly on the connection system.

Only Memosens COS51E:

- The sensors may not be operated under electrostatically critical process conditions in which electrostatic charging of the sensor and the connection system is likely to occur.
- Use of the sensor for its intended purpose in liquids with a conductivity of at least 10 nS/cm can be classified as electrostatically safe.


Type code

Memosens	COS22E-aabbccdde+g	
	aa	Approval CB CSA C/US IS Cl.1 Div1&2 GP A-D T6...T4 CI ▪ CSA C/ US IS CL 1 DIV 1 GP A-D T6...T4 ▪ CSA C/ US CL 1 Zone 0 AEx ia IIC T6... T4
	bb	Measuring range (no ex-relevance)
	cc	Cap characteristics AA = Stainless steel BA = Titanium CA = Alloy C22 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

Memosens	COS51E-aabbcc+g	
	aa	Approval CB CSA C/US IS Cl.1 Div1&2 GP A-D T6 CI ▪ CSA C/ US IS CL 1 DIV 1 GP A-D T6 ▪ CSA C/ US CL 1 Zone 0 AEx ia IIC T6
	bb	Measuring range (no ex-relevance)
	cc	Cap characteristics TF = Response time T90, 0.5 minutes TN = Response time T90, 3 minutes YY = Special version
	g	Optional = one or more characters determining optional features (no ex-relevance), e.g. test or other certificates/declarations

Temperature tables

Sensor	Process temperature T_p	Ambient temperature T_a
COS22E	$-5\text{ °C (23 °F)} \leq T_p \leq 70\text{ °C (158 °F)}(T6)$	$-25\text{ °C (-13 °F)} \leq T_a \leq 70\text{ °C (158 °F)}(T6)$
	$-5\text{ °C (23 °F)} \leq T_p \leq 100\text{ °C (212 °F)}(T4)$	$-25\text{ °C (-13 °F)} \leq T_a \leq 70\text{ °C (158 °F)}(T4)$
COS51E	$-5\text{ °C (23 °F)} \leq T_p \leq 60\text{ °C (140 °F)}(T6)$	$-5\text{ °C (23 °F)} \leq T_a \leq 60\text{ °C (140 °F)}(T6)$

The above temperature table applies only under the following installation conditions, which are described in the following graphic →  7. 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 COS22E and Memosens COS51E digital oxygen sensors have an intrinsically safe input with the following parameter set:

Parameter	Value
P_i	180 mW

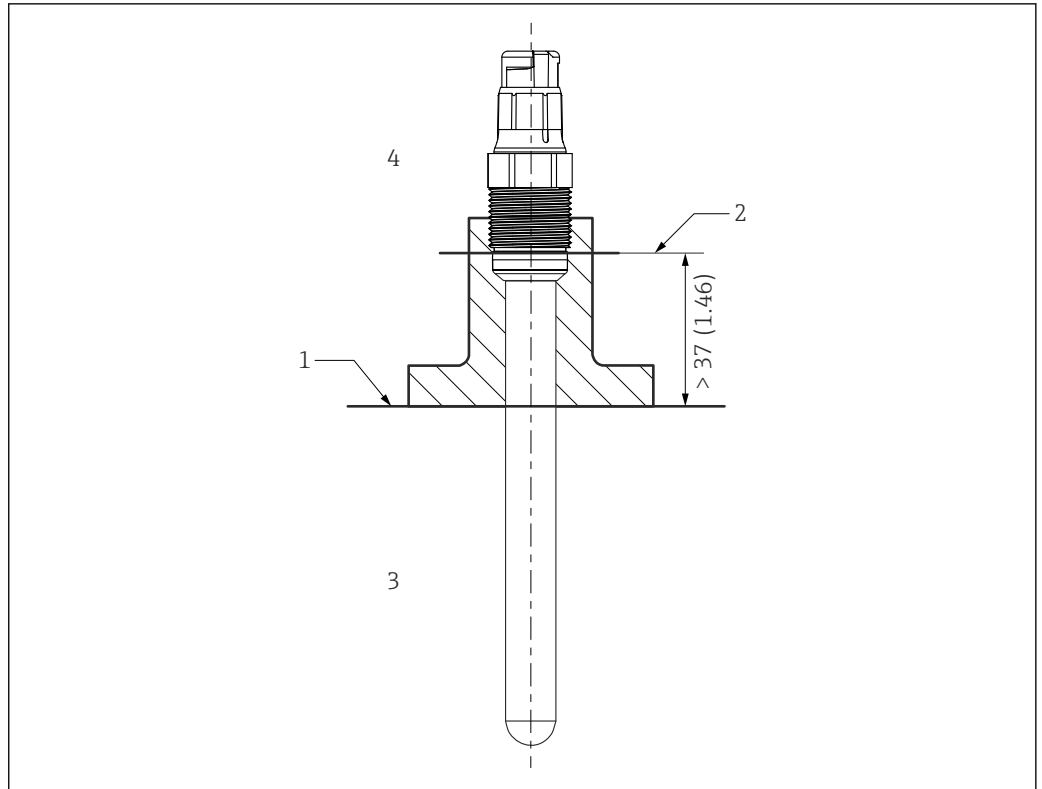
The approved Memosens COS22E and Memosens COS51E digital oxygen sensors must be connected to a Memosens cable or cable transmitter with intrinsically safe output with the following parameter:

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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