

Safety Instructions

Memosens ISFET pH sensors

pH measurement

Supplement to BA02154C

Safety instructions for electrical apparatus in
explosion-hazardous areas

CSA C/US IS Cl. I Div. 1 GP A-D T3/T4/T6 + CSA
C/US IS Cl. I Zone 0 AEx ia IIC T3/T4/T6

CSA C/US IS Cl. I Div. 1 GP A-D T4/T6 + CSA C/US
IS Cl. I Zone 0 AEx ia IIC T4/T6



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Associated documentation

This document is an integral part of Operating Instructions BA02154C.

Additional documentation



- Competence Brochure CP00021Z
 - Explosion Protection: Guidelines and General Principles
 - www.endress.com

Certificates

CSA C/US certificate, certificate number: CSA20CA80021490X

Identification

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 marking on hazardous area versions
- Compare the information on the nameplate with the order.

Type code

Item type	Version					
xPS47E xPS77E	CI	*	*	**	*	+*
x = C, OC No Ex relevance	CSA C/US IS Cl. I Div. 1 GP A-D T3/T4/T6 + CSA C/US IS Cl. I Zone 0 AEx ia IIC T3/T4/T6	No Ex relevance				

Item type	Version					
xPS97E	CI	*	*	**	*	+*
x = C, OC No Ex relevance	CSA C/US IS Cl. I Div. 1 GP A-D T4/T6 + CSA C/US IS Cl. I Zone 0 AEx ia IIC T4/T6	No Ex relevance				

Certificates and approvals

The product meets the requirements of:

- 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

This is verified by compliance with the following standards:

- 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)

CPS47E / CPS77E:

CSA C/US IS Cl. I Div. 1 GP A-D T3/T4/T6
+
CSA C/US IS Cl. I Zone 0 AEx ia IIC T3/T4/T6

CPS97E:


CSA C/US IS Cl. I Div. 1 GP A-D T4/T6
+
CSA C/US IS Cl. I Zone 0 AEx ia IIC T4/T6

Safety Instructions

The inductive Memosens ISFET pH sensors CPS47E, CPS77E, CPS97E are suitable for use in hazardous areas in accordance with:


CSA C/US certificate CSA20CA80021490X

- It is not permitted to operate the sensor under electrostatically critical process conditions. Significant vapor and dust clouds, which have a direct impact on the Memosens sensor head, must be avoided.
- The sensors must not be operated under process conditions where the sensor and the connection system can become electrostatically charged. Sensor operation in liquid media that are in contact with the process and have a minimum conductivity of 10 nS/cm is not considered problematic with regard to electrostatic charge.
- Ex-protected digital sensors with Memosens technology are identified by an orange-red ring on the terminal head.
- The procedures for electrical connection described in the Operating Instructions must be followed.
- ISFET pH sensors of the series xPSx7E must not be operated under electrostatically critical process conditions. Intensive vapor or dust clouds, which have a direct impact on the connection system, must be avoided.
- Ex-protected digital sensors with Memosens technology are identified by an orange-red ring on the terminal head.
- Install the device according to the National Electrical Code (NFPA70) or the Canadian Electrical Code, Part 1 (C22.1), where applicable.

- The procedures for electrical connection described in the Operating Instructions must be followed.
- The maximum ambient and process temperatures for temperature classes T3, T4 or T6 are limited as specified in the tables of this certificate .
- The device must be installed as specified in Control Drawing 211038777 →  8.

Temperature tables

Sensor	Temperature class	Process temperature T _p		Ambient temperature T _a	
		minimum	maximum	minimum	maximum
CPS47E CPS77E	T3	-15 °C (5 °F)	135 °C (275 °F)	-15 °C (5 °F)	70 °C (158 °F)
	T4	-15 °C (5 °F)	115 °C (239 °F)	-15 °C (5 °F)	75 °C (167 °F)
			110 °C (230 °F)		80 °C (176 °F)
			100 °C (212 °F)		85 °C (185 °F)
			90 °C (194 °F)		90 °C (194 °F)
T6	-15 °C (5 °F)	65 °C (149 °F)	-15 °C (5 °F)	65 °C (149 °F)	
CPS97E	T4	-15 °C (5 °F)	110 °C (230 °F)	-15 °C (5 °F)	80 °C (176 °F)
			100 °C (212 °F)		85 °C (185 °F)
			90 °C (194 °F)		90 °C (194 °F)
	T6	-15 °C (5 °F)	65 °C (149 °F)	-15 °C (5 °F)	65 °C (149 °F)

The temperature table above 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

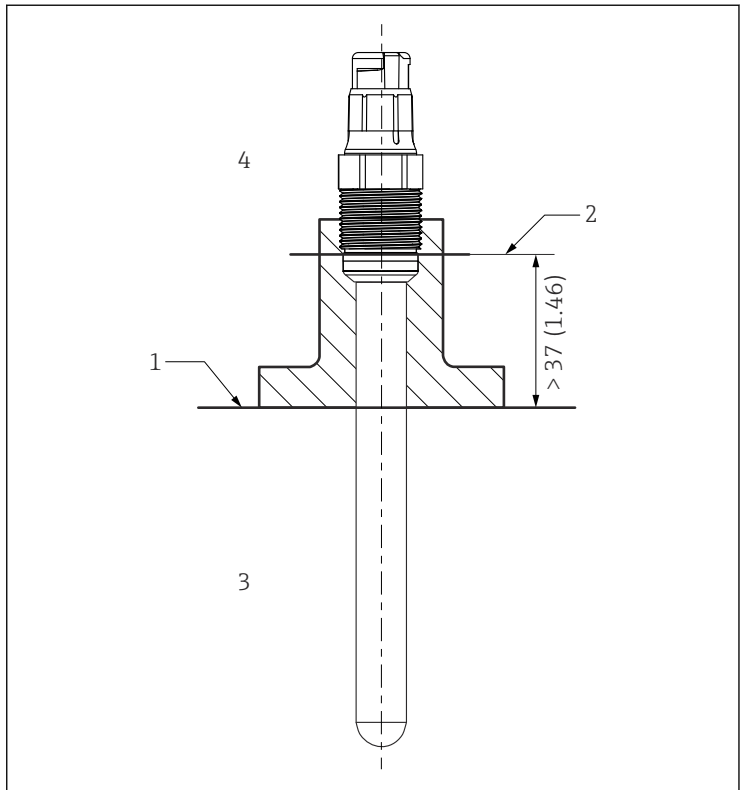
- The ISFET pH sensors of the series CPSx7E are approved according to CSA20CA80021490X and suitable for use in explosion-hazardous environments.
- The approved digital ISFET pH sensors feature an intrinsically safe input with the following parameter set:

Parameters	Value
P_1	180 mW

The approved CPSx7E-type digital ISFET pH sensors must be connected to a Memosens measuring cable with an intrinsically safe output with the following parameter:

Parameters	Value
P_0	Maximum 180 mW

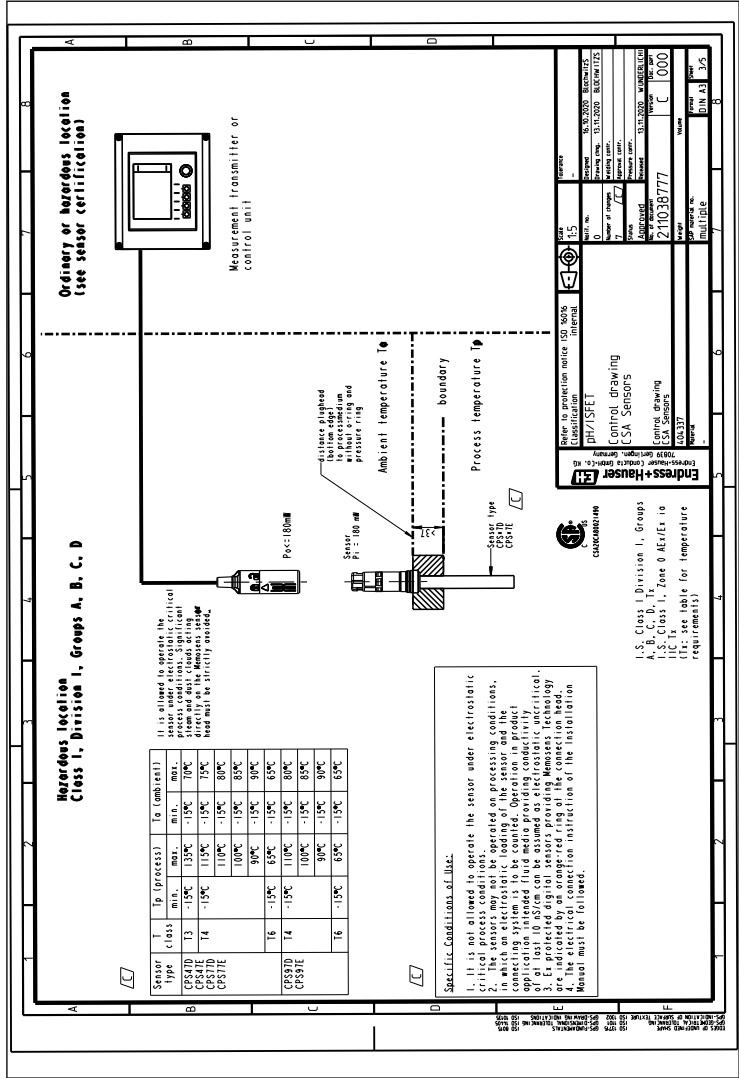
Installation conditions



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1 Installation conditions

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



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