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Safety Instructions
Memosens pH/ORP sensors

pH and ORP measurement

Supplement to: BA01988C, BA02142C
Safety instructions for electrical apparatus in explosion-hazardous areas
NEPSI Ex ia IIC T3/T4/T6 Ga
NEPSI Ex ia IIC T4/T6 Ga

Endress+Hauser
People for Process Automation

Memosens pH/ORP sensors

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Associated documentation

This document is an integral part of Operating Instructions BA01988C, BA02142C.

Additional documentation

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

Certificates

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

www.endress.com/download

The number of the NEPSI certificate that applies to the product can be found on the nameplate.

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

Type	Version						
CPS11E CPS12E CPS16E CPS41E CPS42E CPS61E CPS62E CPS71E CPS72E CPS76E	NA	*	*	**	*	**b	+*
	NEPSI Ex ia IIC T3/T4/T6 Ga	b denotes the shaft length (< 600 mm (23.6 in) no Ex relevance)					

Type	Version						
CPS31E CPS91E CPS92E CPS96E	NA	*	*	**	*	**b	+*
	NEPSI Ex ia IIC T4/T6 Ga	b denotes the shaft length (< 600 mm (23.6 in) no Ex relevance)					

Certificates and approvals

Ex approvals

The Memosens pH/ORP sensors, type CPSaaE-******b+*, have been certified by the National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (NEPSI). These products meet the following standards:

- GB 3836.1 Explosive atmospheres-Part 1: Equipment-General requirements
- GB 3836.4 Explosive atmospheres-Part 4: Equipment protection by intrinsic safety "i"
- GB 3836.20 Explosive atmospheres-Part 20: Equipment with equipment protection level (EPL) Ga

Please find the current versions of the standards on the certificate.

CPS11E/CPS12E/CPS16E/CPS41E/CPS42E/CPS61E/CPS62E/CPS71E/CPS72E/CPS76E:

NEPSI Ex ia IIC T3/T4/T6 Ga

CPS31E/CPS91E/CPS92E/CPS96E:

NEPSI Ex ia IIC T4/T6 Ga

Safety Instructions

- 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.
- Ex-protected digital sensors with Memosens technology are identified by an orange-red ring on the plug-in head.
- The procedures for electrical connection described in the Operating Instructions must be followed.
- In order to maintain and guarantee the explosion protection of the device, the user may not modify the configuration in any way. Every change can compromise the safety of the device.
- The end user must adhere to the Operating Instructions and the following standards for the installation, operation and maintenance of the product:
  - GB 50257 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
  - GB 3836.13 "Explosive atmospheres - Part 13: Equipment repair, overhaul and reclamation"
  - GB/T 3836.15 "Explosive atmospheres - Part 15: Electrical installations design, selection and erection"
  - GB/T 3836.16 "Explosive atmospheres - Part 16: Electrical installations inspection and maintenance"
  - GB/T 3836.18 "Explosive atmospheres - Part 18: Intrinsically safe electrical systems"

Please find the current versions of standards on the certificate.

The correlations between the device model, the temperature class, the process temperature range and the ambient temperature range are indicated in the temperature tables → 🖹 6.

Temperature tables

Sensor	Temperature class	Process temperature T_p	Ambient temperature T_a
CPS11E CPS12E CPS16E CPS41E CPS42E CPS72E	T3	−15 °C (5 °F)≤ T_p ≤ 135 °C (275 °F)	−15 °C (5 °F) ≤ T_a ≤ 70 °C (158 °F)
	T4	−15 °C (5 °F) ≤ T_p ≤ 120 °C (248 °F)	−15 °C (5 °F) ≤ T_a ≤ 75 °C (167 °F)
		−15 °C (5 °F) ≤ T_p ≤ 110 °C (230 °F)	−15 °C (5 °F) ≤ T_a ≤ 80 °C (176 °F)
		−15 °C (5 °F) ≤ T_p ≤ 100 °C (212 °F)	−15 °C (5 °F) ≤ T_a ≤ 85 °C (185 °F)
		−15 °C (5 °F) ≤ T_p ≤ 90 °C (194 °F)	−15 °C (5 °F) ≤ T_a ≤ 90 °C (194 °F)
	T6	−15 °C (5 °F) ≤ T_p ≤ 70 °C (158 °F)	−15 °C (5 °F) ≤ T_a ≤ 70 °C (158 °F)

Sensor	Temperature class	Process temperature T_p	Ambient temperature T_a
CPS61E CPS62E CPS71E CPS76E	T3	0 °C (32 °F) ≤ T_p ≤ 140 °C (284 °F)	0 °C (32 °F) ≤ T_a ≤ 70 °C (158 °F)
	T4	0 °C (32 °F) ≤ T_p ≤ 120 °C (248 °F)	0 °C (32 °F) ≤ T_a ≤ 75 °C (167 °F)
		0 °C (32 °F) ≤ T_p ≤ 110 °C (230 °F)	0 °C (32 °F) ≤ T_a ≤ 80 °C (176 °F)
		0 °C (32 °F) ≤ T_p ≤ 100 °C (212 °F)	0 °C (32 °F) ≤ T_a ≤ 85 °C (185 °F)
		0 °C (32 °F) ≤ T_p ≤ 90 °C (194 °F)	0 °C (32 °F) ≤ T_a ≤ 90 °C (194 °F)
	T6	0 °C (32 °F) ≤ T_p ≤ 70 °C (158 °F)	0 °C (32 °F) ≤ T_a ≤ 70 °C (158 °F)
CPS31E	T4	0 °C (32 °F) ≤ T_p ≤ 80 °C (176 °F)	0 °C (32 °F) ≤ T_a ≤ 90 °C (194 °F)
	T6	0 °C (32 °F) ≤ T_p ≤ 70 °C (158 °F)	0 °C (32 °F) ≤ T_a ≤ 70 °C (158 °F)
CPS91E CPS92E CPS96E	T4	0 °C (32 °F) ≤ T_p ≤ 110 °C (230 °F)	0 °C (32 °F) ≤ T_a ≤ 80 °C (176 °F)
		0 °C (32 °F) ≤ T_p ≤ 100 °C (212 °F)	0 °C (32 °F) ≤ T_a ≤ 85 °C (185 °F)
		0 °C (32 °F) ≤ T_p ≤ 90 °C (194 °F)	0 °C (32 °F) ≤ T_a ≤ 90 °C (194 °F)
	T6	0 °C (32 °F) ≤ T_p ≤ 70 °C (158 °F)	0 °C (32 °F) ≤ T_a ≤ 70 °C (158 °F)

The temperature table above applies only under the following installation conditions, which are described in the following graphic → 📄 9. 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

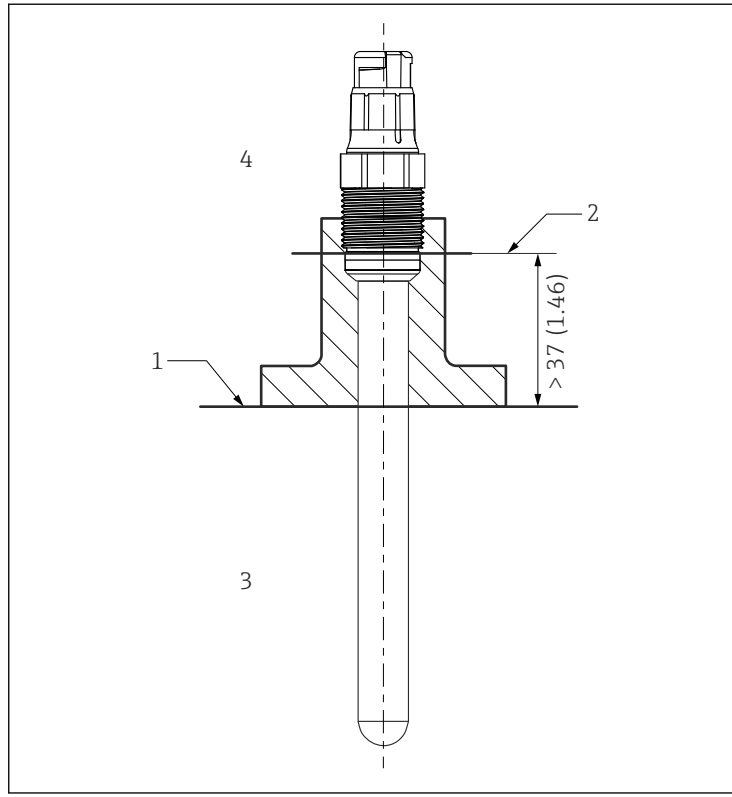
- The pH/ORP sensors of model series CPSaaE******b+* are suitable for use in hazardous environments.
- The approved digital pH/ORP sensors of model series CPSaaE******b +* have an intrinsically safe input with the following parameter set:

Parameters	Value
P_i	180 mW

The approved digital pH/ORP sensors of model series CPSaaE******b +* must be connected to a Memosens measuring cable or cable transmitter with an intrinsically safe output with the following parameter:

Parameters	Value
P_o	Maximum 180 mW

Installation conditions



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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