

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



Memosens pH/ORP sensors

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Table of contents

Associated documentation	4
Supplementary documentation	4
Certificates	4
Identification	4
Safety instructions	6
Temperature tables	6
Connection	7
Installation conditions	8

Associated documentation

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

Supplementary documentation



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

Certificates

NEPSI certificate of conformity, certificate number: GYJ19.1375X

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 labeling 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 3836.1-2010 Explosive atmospheres-Part 1: Equipment-General requirements
- GB 3836.4-2010 Explosive atmospheres-Part 4: Equipment protection by intrinsic safety "i"
- GB 3836.20-2010 Explosive atmospheres-Part 20: Equipment with equipment protection level (EPL) Ga

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 terminal 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 50257-2014 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
 - GB 3836.13-2013 "Explosive atmospheres - Part 13: Equipment repair, overhaul and reclamation"
 - GB/T 3836.15-2017 "Explosive atmospheres - Part 15: Electrical installations design, selection and erection"
 - GB/T 3836.16-2017 "Explosive atmospheres - Part 16: Electrical installations inspection and maintenance"
 - GB/T 3836.18-2017 "Explosive atmospheres - Part 18: Intrinsically safe electrical systems"

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	T3	-15 °C (5 °F) ≤ T _p ≤ 135 °C (275 °F)	-15 °C (5 °F) ≤ T _a ≤ 70 °C (158 °F)
CPS41E CPS42E CPS72E	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	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 140\text{ }^{\circ}\text{C (284 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 70\text{ }^{\circ}\text{C (158 }^{\circ}\text{F)}$
	T4	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 120\text{ }^{\circ}\text{C (248 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 75\text{ }^{\circ}\text{C (167 }^{\circ}\text{F)}$
		$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 110\text{ }^{\circ}\text{C (230 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 80\text{ }^{\circ}\text{C (176 }^{\circ}\text{F)}$
		$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 100\text{ }^{\circ}\text{C (212 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 85\text{ }^{\circ}\text{C (185 }^{\circ}\text{F)}$
		$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 90\text{ }^{\circ}\text{C (194 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 90\text{ }^{\circ}\text{C (194 }^{\circ}\text{F)}$
T6	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 70\text{ }^{\circ}\text{C (158 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 70\text{ }^{\circ}\text{C (158 }^{\circ}\text{F)}$	
CPS31E	T4	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 80\text{ }^{\circ}\text{C (176 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 90\text{ }^{\circ}\text{C (194 }^{\circ}\text{F)}$
	T6	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 70\text{ }^{\circ}\text{C (158 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 70\text{ }^{\circ}\text{C (158 }^{\circ}\text{F)}$
CPS91E CPS92E CPS96E	T4	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 110\text{ }^{\circ}\text{C (230 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 80\text{ }^{\circ}\text{C (176 }^{\circ}\text{F)}$
		$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 100\text{ }^{\circ}\text{C (212 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 85\text{ }^{\circ}\text{C (185 }^{\circ}\text{F)}$
		$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 90\text{ }^{\circ}\text{C (194 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 90\text{ }^{\circ}\text{C (194 }^{\circ}\text{F)}$
	T6	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_p \leq 70\text{ }^{\circ}\text{C (158 }^{\circ}\text{F)}$	$0\text{ }^{\circ}\text{C (32 }^{\circ}\text{F)} \leq T_a \leq 70\text{ }^{\circ}\text{C (158 }^{\circ}\text{F)}$

The temperature table above applies only under the following installation conditions, which are described in the following graphic →  8. 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

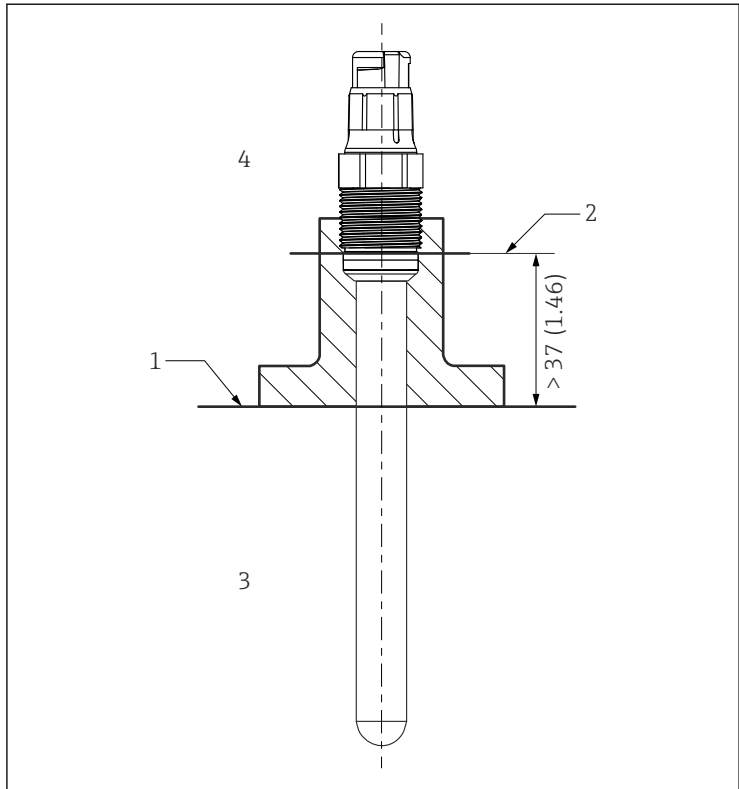
- The pH/ORP sensors of model series CPSaaE*****b+* are approved according to NEPSI certificate GYJ19.1375X and is suitable for use in hazardous environments.
- The approved digital pH/ORP sensors of model series CPSaaE*****b+* have an intrinsically safe input with the following parameter set:

Parameter	Value
P_i	180 mW

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

Parameter	Value
P_o	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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