Certificate of Compliance

Certificate: 80021490 **Master Contract:** 205557

Project: 80086777 **Date Issued:** 2022-02-10

Issued To: **Endress+Hauser Conducta GmbH & Co. KG**
Dieselstraße 24
Gerlingen, Baden-Württemberg, 70839
Germany

Attention: Marco Rottmann

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: Sorin Tat
Sorin Tat

C US

PRODUCTS

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

Class I Div 1 Groups A, B, C, D
Ex ia IIC Tx* Ga
Class I Zone 0 AEx ia IIC Tx* Ga

-Conductivity Sensors Memosens type xLS15E, xLS16E, xLS21E and xLS82E with suffixes as shown in the Product Nomenclature. Maximum input power: Pi = 180mW, connection via inductive coupling. Installation as per Control Drwg. 961005034.

- pH/ORP sensors Memosens type xPS##E: xPS11E, xPS12E, xPS16E, xPS31E, xPS41E, xPS42E, xPS61E, xPS62E, xPS71E, xPS72E, xPS76E, xPS91E, xPS92E, xPS96E with suffixes. Maximum input power: Pi = 180mW, connection via inductive coupling. Installation as per Control Drwg. 961005034.

- pH/ORP sensors Memosens type xPF81E and xPF82E with suffixes as shown in the Product Nomenclature. Maximum input power: Pi = 180mW, connection via inductive coupling. Installation as per Control Drwg. 961005034.

- ISFET pH sensors Memosens type xPS47D, xPS77D, xPS97D, xPS47E, xPS77E, xPS97E. Maximum input power: Pi = 180mW, connection via inductive coupling. Installation as per Control Drwg. 961005034.

-Oxygen sensors Memosens type xOS22E, xOS51E with suffixes as shown in the Product Nomenclature. Maximum input power: Pi = 180mW, connection via inductive coupling. Installation as per Control Drwg. 961005034.

Class I Div 1 Groups A, B, C, D
Ex ia op is IIC Tx* Ga
Class I Zone 0 AEx ia op is IIC Tx* Ga
Class II Division 1 Groups E, F, G
Ex ia op is IIIC Tx* Da
Zone 20 AEx ia op is IIIC Tx* Da

-Oxygen sensors Memosens type xOS81E with suffixes as shown in the Product Nomenclature. Maximum input power: Pi = 180mW, connection via inductive coupling. Inherently safe optical radiation: Popt < 15 mW. Installation as per Control Drwg. 961005034. Temperature class is T6 for a maximum Tamb and Tprocess of +60°C.

Note:*- The temperature code Tx is defined in the Environmental data 1, 2, 3, 4, 5 and 6 below.

Class I Div 1 Groups A, B, C, D
Ex ia IIC T6 Gb
Class I Zone 0 AEx ia IIC T6 Gb

Sensor-simulator Memocheck type xYP02E- ** * ** *** +*(xYP02E). Maximum input power: Pi = 180mW, connection via inductive coupling. Installation as per Control Drwg. 961005034.

<u>Conditions of Acceptability :</u>

1. xLS15E, xLS16E, xLS21E, xOS81E: Metallic process connection parts have to be mounted electrostatically conductive at the mounting location (< 1 MΩ).
2. xLS15E and xLS21E, xOS51E with non-metallic process connection may only be used in liquid media with a conductivity of at least 10 nS/cm.
3. xLS15E with non-metallic process connection may not be operated on processing conditions, in which an electrostatic loading of the sensor and in particular of the electrically separated outer

electrode, could be expected to occur.

4. xLS82E, xOS22E, xOS81E: The sensor may not be operated in electrostatically critical processing conditions.
   Intense vapour or dust flows directly impacting on the connection system must be avoided. The metallic parts of the sensor have to be mounted at the mounting location electrostatically conductive (< 1 MΩ).
5. The Sensors type xPS## E, xPF81E, xPF82E, xOS51E sensors may not be operated in electrostatically critical processing conditions. Intense vapour or dust flows directly impacting on the connection system must be avoided.
6. For xOS22E, xOS81E: If sensor parts are consisting of light metal e.g. Titan, then these parts have to protected against hits.
7. Do no operate xOS81E it in an atmosphere temperature above +60C unless the atmosphere is not considered explosive .
8. The plastic housing may only be cleaned with a damp cloth.
9. The maximum ambient and process temperatures for the temperature classes T3, T4 or T6 are limited according to the tables of this certificate (see “Environmental data 1 , 2, 3, 4 5 and 6” tables for all the sensors).
   The temperature table is only valid if the installation conditions specified in the manufacturer's operating instructions are observed. The manufacturer's operating instructions include the control drawings.
   If these installation conditions cannot be met, the maximum process temperature range shall not exceed the maximum ambient temperature range.
10. The sensor should be inductive coupling connected with a certified Memosens compatible supply with Po ≤ 180 mW).
11. Additional for ISFET pH Sensors: The sensors may not be operated on processing conditions, in which an electrostatic loading of the sensor and the connecting system is to be counted. Operation in product application intended fluid media providing conductivity of at least 10 nS/cm can be assumed as electrostatic uncritical.

Environmental data 1:

Sensor type	T class	Tp (process)		Ta (ambient)	
		Min.	Max.	Min.	Max.
xLS15E-******A***+*	T3	-20 °C	135 °C	-20 °C	60 °C
	T4	-20 °C	120 °C	-20 °C	60 °C
	T6	-20 °C	70 °C	-20 °C	60 °C

Sensor type	T class	Tp (process)		Ta (ambient)	
		Min.	Max.	Min.	Max.
xLS15E-******B***+*	T3	-20 °C	135 °C	-20 °C	60 °C
	T4	-20 °C	100 °C	-20 °C	60 °C
	T6	-20 °C	50 °C	-20 °C	60 °C

Sensor type	T class	Tp (process)	Ta (ambient)

		Min.	Max.	Min.	Max.
xLS16E-*********+*	T3	-5 °C	135 °C	-20 °C	60 °C
	T4	-5°C	115 °C	-20 °C	60 °C
	T6	-5 °C	65 °C	-20 °C	60 °C

Sensor type	T class	Tp (process)		Ta (ambient)	
		Min.	Max.	Min.	Max.
xLS21E-*********+*	T3	-20 °C	135 °C	-20 °C	60 °C
	T4	-20°C	115 °C	-20 °C	60 °C
	T6	-20 °C	65 °C	-20 °C	60 °C

Sensor type	T class	Tp (process)		Ta (ambient)	
		Min.	Max.	Min.	Max.
xLS82E-*********+*	T3	-20 °C	140 °C	-20 °C	60 °C
	T4	-20°C	120 °C	-20 °C	60 °C
	T6	-20 °C	70 °C	-20 °C	60 °C

Environmental data 2:

Sensor type	T class	T_p (process)		T_a (ambient)	
		min.	max.	min.	max.
xPS11E-**********+*	T3	-15 °C	135 °C	-15 °C	70 °C
xPS41E-**********+*	T4	-15 °C	120 °C	-15 °C	75 °C
xPS12E-**********+*			110 °C	-15 °C	80 °C
xPS42E-**********+*			100 °C	-15 °C	85 °C
xPS72E-**********+*			90 °C	-15 °C	90 °C
xPS16E-**********+*	T6	-15 °C	70 °C	-15 °C	70 °C
xPS61E-**********+*	T3	0 °C	140 °C	0 °C	70 °C
xPS71E-**********+*	T4	0 °C	120 °C	0 °C	75 °C
xPS62E-**********+*			110 °C	0 °C	80 °C
xPS76E-**********+*			100 °C	0 °C	85 °C
			90 °C	0 °C	90 °C
	T6	0 °C	70 °C	0 °C	70 °C
xPS31E-**********+*	T4	0 °C	80 °C	0 °C	90 °C
	T6	0 °C	70 °C	0 °C	70 °C
xPS91E-**********+*	T4	0 °C	110 °C	0 °C	80 °C
xPS92E-**********+*			100 °C	0 °C	85 °C
xPS96E-**********+*			90 °C	0 °C	90 °C
	T6	0 °C	70 °C	0 °C	70 °C

xYP02E-********+*	T6	n/a	n/a	-15°C	70 °C

Environmental data 3:

Sensor type	T class	T_p (process)		T_a (ambient)	
		min.	max.	min.	max.
xPS47D-*******+* xPS47E-*******+* xPS77D-*******+* xPS77E-*******+*	T3	-15 °C	135 °C	-15 °C	70 °C
	T4	-15 °C	115 °C	-15 °C	75 °C
			110 °C	-15 °C	80 °C
			100 °C	-15 °C	85 °C
			90 °C	-15 °C	90 °C
	T6	-15 °C	65 °C	-15 °C	65 °C
xPS97D-*******+* xPS97E-*******+*	T4	-15 °C	110 °C	-15 °C	80 °C
			100 °C	-15 °C	85 °C
			90 °C	-15 °C	90 °C
	T6	-15 °C	65 °C	-15 °C	65 °C

Environmental data 4:

Sensor type	T class	Tp (process)		Ta (ambient)	
		Min.	Max.	Min.	Max.
xPF81E	T4	0 °C	110 °C	0 °C	55 °C
	T6	0 °C	70 °C	0 °C	50 °C
xPF82E	T4	0 °C	80 °C	0 °C	55 °C
	T6	0 °C	70 °C	0 °C	50 °C

Environmental data 5:

Sensor type	T class	Tp (process)		Ta (ambient)	
		Min.	Max.	Min.	Max.
xOS22E	T4	-5 °C	100 °C	-25 °C	70 °C
	T6	-5 °C	70 °C	-25 °C	70 °C
xOS51E	T6	-5 °C	60 °C	-5 °C	60 °C

Environmental data 6:

Sensor type	T class	Tp (process)		Ta (ambient)	
		Min.	Max.	Min.	Max.
xOS81E	T6 rep. T90 °C	-15 °C	60°C	-25 °C	60°C

Product Nomenclature for xLS sensors:

Name	Type								
Memosens	xLS15E xLS16E xLS21E xLS82E	-	**	**	**	a	***	+*	

+* = optional
= + one or more characters determining optional features (no ex-relevance)

*** = only if x = O, OC
= three characters determining OEM/label partner (no ex-relevance)

a = one character determining cell constant k
a=A = type A (cell constant k = 0.01 cm^{-1})
a=B = type B (cell constant k = 0.1 cm^{-1})

** = two characters determining sensor material, (no ex-relevance)

** = two characters determining process connection (no ex-relevance)

** = two characters determining order option approval certification, no Ex relevance

x = C E+H-labeled version (no Ex relevance)
x = O OEM/label partner-labeled version (no Ex relevance)
x = OC OEM/label partner-labeled version (no Ex relevance)

Product Nomenclature for xPS sensors:

Name	Type									
Memosens	xPSx1E xPSx2E xPSx6E	-	**	*	*	**	*	**	+*	

+* = optional
= one or more characters determining optional features, no Ex relevance

*** only if x = O, OC
= three characters determining OEM/label partner (no ex-relevance)

* = one character determining shaft length, max. 600 mm, no Ex relevance

** = two characters determining reference system, no Ex relevance

* = one character determining application range, no Ex relevance

* = one character determining type of electrode, e. g. zero point at pH value 7, no Ex relevance

** = two characters determining order option approval certification, no Ex relevance.

x = C E+H-labeled version (no Ex relevance)
x = O OEM/label partner-labeled version (no Ex relevance)
x = OC OEM/label partner-labeled version (no Ex relevance)

Product Nomenclature for xPS#7 (ISFET) sensors:

ISFET sensors for pH measurement

Type	-	aa	b	cc	dd	e	f
xPS47E	-	**	*	*	**	*	+*
xPS77E	-	**	*	*	**	*	+*
xPS97E	-	**	*	*	**	*	+*

Where:

x:	C, O or OC
aa: Approval	any two characters(not ex-relevant)
b: Electrode type	any one character (non ex-relevant)
cc: Application range	any two characters(non ex-relevant)
dd: Reference system	any two characters(non ex-relevant)
e: shaft length	max. 600 mm (not ex-relevant)
f:	one or more characters (not ex-relevant)

Product Nomenclature for xPF##E:

Memosens	xPF81E-aabcddefff+g xPF82E-aabcddefff+g	
	x	C, O or OC (no ex-relevance)
	aa	Order option ex certification (no ex-relevance)
	b	Electrode Type (no ex-relevance)
	c	Application range (no ex-relevance)
	dd	Reference system (no ex-relevance)
	e	Insertion length (no ex-relevance)

	fff	only if x = O, OC = three characters (no ex-relevance)
	g	Optional = one or more characters determining optional features (no ex-relevance) e.g. test or other certificates/ declarations

Product Nomenclature for xOS22E:

Memosens	xOS22E-aabbccddefff+g	
	x	O, C or OC (no ex-relevance)
	aa	Order option ex-certification (no ex-relevance)
	bb	Measuring range (no ex-relevance)
	cc	Cap characteristics AA = Stainless steel BA = Titan CA = Alloy C22 YY = Special version
	dd	Sensor length (no ex-relevance) max 600 mm
	e	O-ring material (in the cap) (no ex-relevance)
	fff	only if x = O, OC (no ex-relevance)
	g	Optional = one or more characters determining optional features (no ex-relevance) e.g. test or other certificates/ declarations

Product Nomenclature for xOS51E:

Memosens	xOS51E-aabbccfff+g	
	x	O, C or OC (no ex-relevance)
	aa	Order option ex-certification (no ex-relevance)
	bb	Measuring range (no ex-relevance)
	cc	Cap characteristics (no ex-relevance) TF = Response time T90, 0,5 minutes steel TN = Response time T90, 3 minutes YY = Special version
	fff	only if x = O, OC (no ex-relevance)
	g	Optional = one or more characters determining optional features (no ex-relevance) e.g. test or other certificates/ declarations

Product Nomenclature for xOS81E:

Memosens	xOS81E-aabbccddefff+g	
	x	O, C or OC (no ex-relevance)
	aa	Order option ex certification (no ex-relevance)
	bb	Measuring range (no ex-relevance)

	cc	Cap characteristics AC = Stainless steel C-shape AU = Stainless steel U-shape BC = Titan C-shape BU = Titan U-shape CC = Alloy C22 C-shape CU = Alloy C22 U-shape YY = Special version
	dd	Sensor length (no ex-relevance) max 600 mm
	e	O-ring material (in the cap) (no ex-relevance)
	fff	only if x = O, OC = three characters determining OEM/label partner (no ex-relevance)
	g	Optional = one or more characters determining optional features (no ex-relevance) e.g. test or other certificates/ declarations

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 60079-0:19	Explosive Atmospheres - Part 0: Equipment - General requirements
CAN/CSA-C22.2 No. 60079-11:14	Explosive Atmospheres – Part 11: Equipment protection by intrinsic safety "i"
CAN/CSA-C22.2 No. 60079-28:2016	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation
ANSI/UL 60079-0:19	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements
ANSI/UL 60079-11:13	Electrical apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety “i”
ANSI/UL 60079-28:2017	Explosive Atmospheres - Part 28: Equipment – Protection of Equipment and transmission systems using optical radiation
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
ANSI/UL 61010-1-2018 (3rd Edition)	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Method of markings: laser printing. The markings shall contain:

- Manufacturer's name: "Endress+Hauser", or CSA Master Contract Number "205557", adjacent to the CSA Mark in lieu of manufacturer's name.
- Model designation: As specified in the PRODUCTS section, above.
- Ambient temperature rating: As specified in the PRODUCTS section, Tables 1 through 6, above.
- Manufacturing date in MMYY format, or serial number, traceable to year and month of manufacture (The serial number is lased next to the above label. The date of manufacturing is coded in the serial number).
- Hazardous locations designation: Class I, Division 1, Groups A, B, C, D. The word "Class" may be abbreviated "CL", the word "Division" may be abbreviated "DIV", and the word "Groups" may be abbreviated "GRP" or "GP".
- Temperature code rating "T6" is optional for the above markings.
- Method of Protection markings (Ex -- markings): "Ex ia IIC Tx Ga"; and "Class I Zone 0 AEx ia IIC Tx Ga", where the marked temperature code is per tables 1 through 3 in the PRODUCTS section, above.
- The CSA Mark, with or without the "C" and "US" indicators, as shown on the Certificate of Conformity.
- The certificate number "CSA20CA80021490X".
- The words "INTRINSICALLY SAFE" in English and "SECURITE INTRINSEQUE" in French or "I.S." or "Ex ia".
- Reference to the I.S. Control drawing 961005034.
- The words "Read and understand the manual before operating", or ISO 3864 Symbol B.3.1 ⚠ or ISO 7000 symbol 0434 ⚠ (triangle with exclamation point).

Supplement to Certificate of Compliance

Certificate: 80021490 **Master Contract:** 205557

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

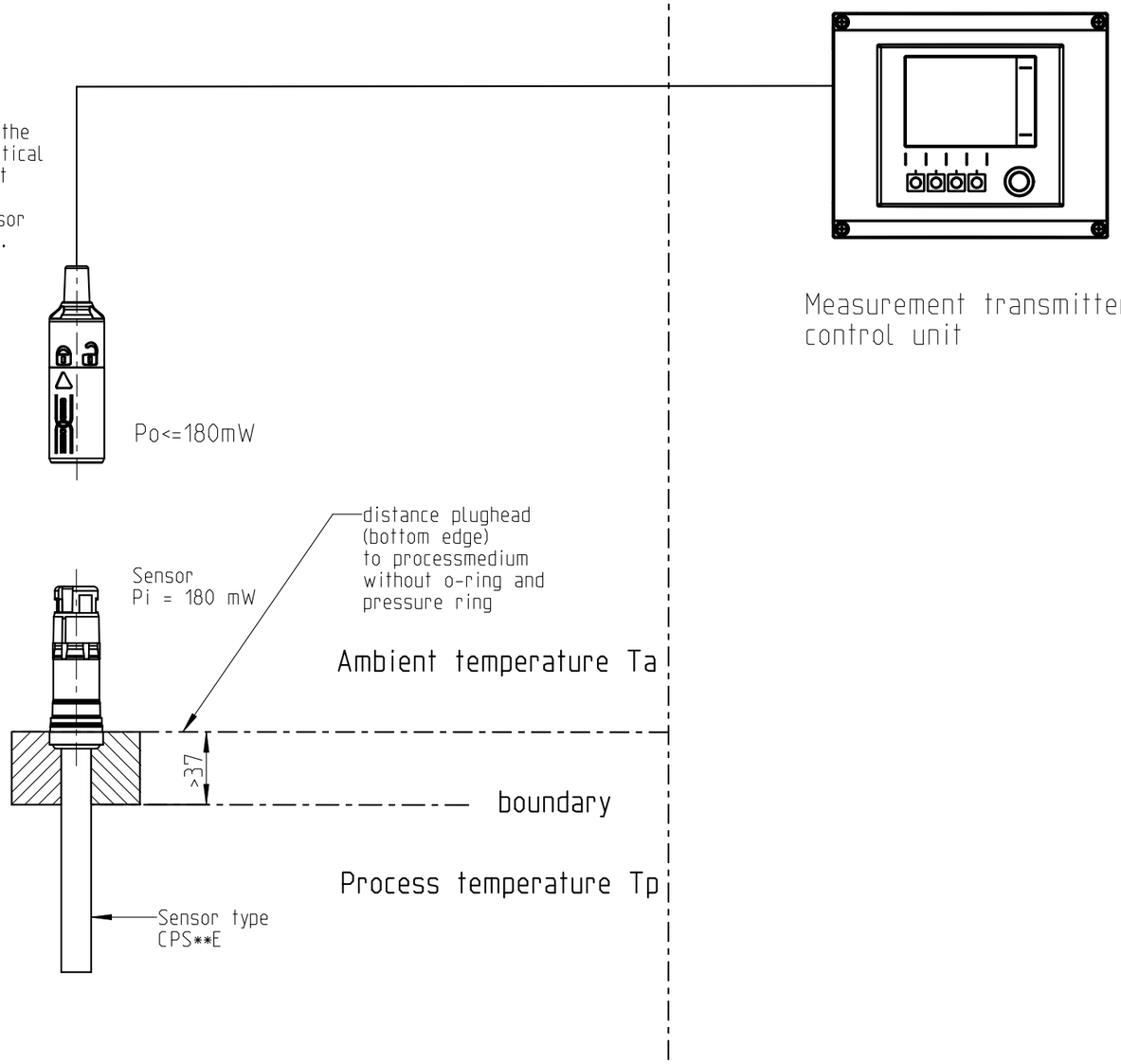
Project	Date	Description
80086777	2022-02-10	Update of certificate 80021490 (Last project 80064813) based of alternate construction.
80064813	2021-04-05	Update cCSAus report # 80021490 for intrinsically safe Conductivity Sensors Memosens series for addition of new models, changes to resistor values and update of 13 descriptive documents. Based on the latest edition of IECEx BVS 19.0056X (Issue 1) and IECEx TUR 19.0030X (Issue 1).
80021490	2020-04-16	Prime certification to issue cCSAus report for the following sensor models: Conductivity Sensors Memosens type: CLS15E, CLS16E, CLS21E, CLS82E and pH/ORP Memosens Sensors type: CPS11E, CPS12E, CPS31E, CPS41E, CPS42E, CPS61E, CPS71E, CPS72E, CPS91E, CPS92E and Memocheck sensor simulator type: CYP02E.

Hazardous location
Class I, Division 1, Groups A, B, C, D

Ordinary or hazardous location
(see sensor certification)

Sensor type	T class	Tp (process)		Ta (ambient)	
		min.	max.	min.	max.
CPS11E CPS12E CPS16E CPS41E CPS42E CPS72E	T3	-15°C	135°C	-15°C	70°C
	T4	-15°C	120°C	-15°C	75°C
			110°C	-15°C	80°C
			100°C	-15°C	85°C
			90°C	-15°C	90°C
	T6	-15°C	70°C	-15°C	70°C
CPS61E CPS62E CPS71E CPS76E	T3	0°C	140°C	0°C	70°C
	T4	0°C	120°C	0°C	75°C
			110°C	0°C	80°C
			100°C	0°C	85°C
			90°C	0°C	90°C
	T6	0°C	70°C	0°C	70°C
CPS31E	T4	0°C	80°C	0°C	90°C
	T6	0°C	70°C	0°C	70°C
CPS91E CPS92E CPS96E	T4	0°C	110°C	0°C	80°C
			100°C	0°C	85°C
			90°C	0°C	90°C
	T6	0°C	70°C	0°C	70°C
CYP02E	T6	--	--	-15°C	70°C

It is not allowed to operate the sensor under electrostatic critical process conditions. Significant steam and dust clouds acting directly on the Memosens sensor head must be strictly avoided.



Specific Conditions of Use:

1. The maximum ambient and process temperatures for the temperature classes T3, T4 or T6 are limited according to the tables. The temperature table is only valid if the installation conditions specified in the manufacturer's operating instructions are observed. If these installation conditions cannot be met, the maximum process temperature range shall not exceed the maximum ambient temperature range.
2. The sensor should be inductive coupling connected with a certified Memosens compatible supply with Po ≤ 180 mW).
3. The sensors pH/ORP-Sensors type *PS ** E* sensors may not be operated in electrostatically critical processing conditions. Intense vapor or dust flows directly impacting on the connection system must be avoided.

CSA20CA80021490X

I.S. Class 1 Division 1, Groups A, B, C, D, Tx
I.S. Class 1, Zone 0 AEx/Ex ia IIC Tx
(Tx: see table for temperature requirements)

Endress+Hauser
Endress+Hauser Conducta GmbH+Co. KG
70839 Gerlingen, Germany

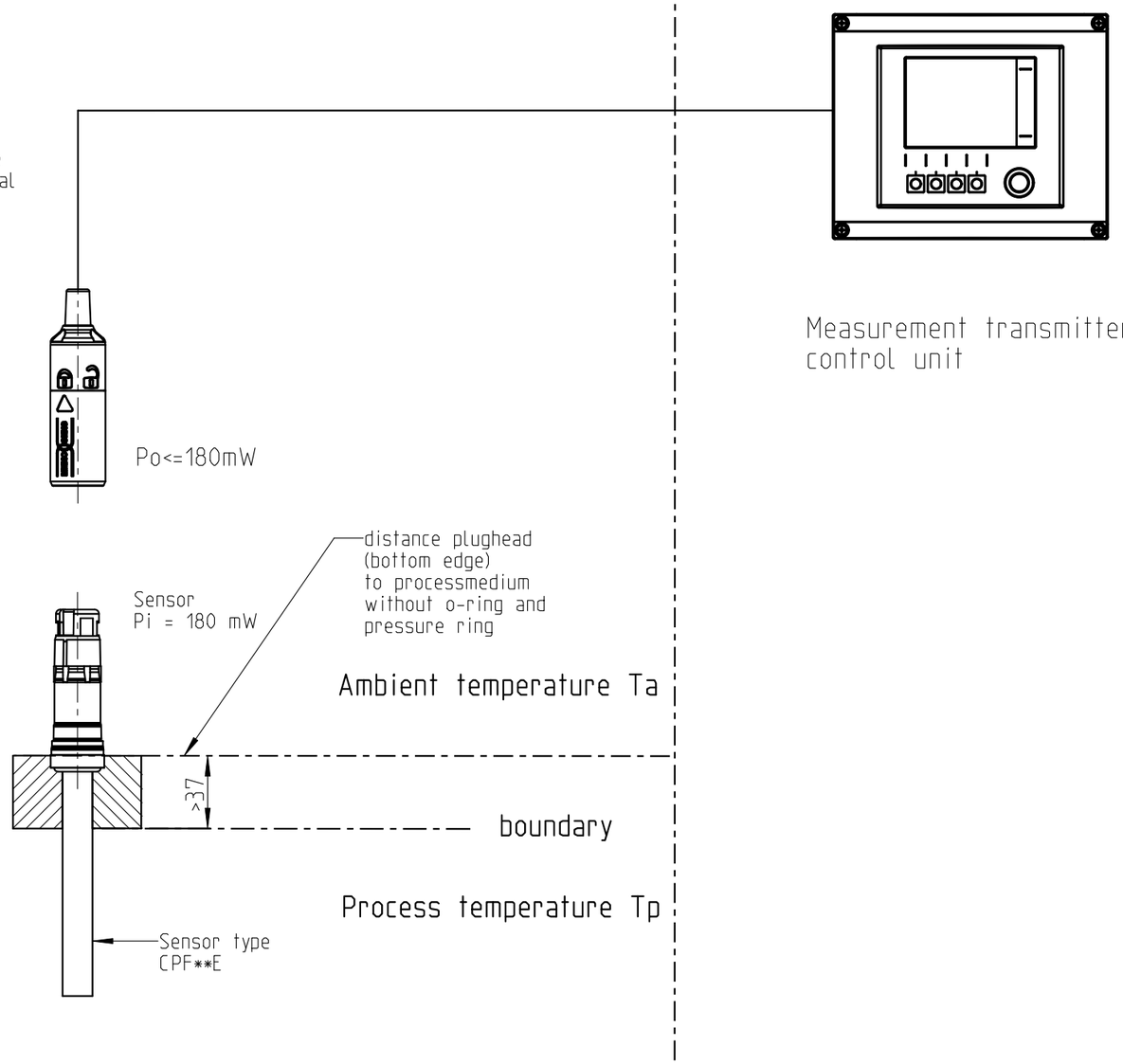
Refer to protection notice ISO 16016 Classification internal	Scale 1:5	Tolerance –	
pH/ORP	Notif. no. 116563	Designed 02.03.2021 BlochwitzS	
Control drawing CSA Sensors	Number of changes 4 E	Drawing chng. 04.02.2022 BreitfeldT	
		Welding contr.	
	Status Approved	Approval contr. 04.02.2022 RottmannM	
		Pressure contr.	
		Released 04.02.2022 BreitfeldT	
Control drawing CSA Sensors	No. of document 961005034	Version E	Doc. part 000
211038777	Weight	Volume	
Material –	SAP material no. multiple	Format DIN A3	Sheet 1/6

Hazardous location
Class I, Division 1, Groups A, B, C, D

Ordinary or hazardous location
(see sensor certification)

Sensor type	T class	Tp (process)		Ta (ambient)	
		min.	max.	min.	max.
CPF81E	T4	0°C	110°C	0°C	55°C
	T6	0°C	70°C	0°C	50°C
CPF82E	T4	0°C	80°C	0°C	55°C
	T6	0°C	70°C	0°C	50°C

It is not allowed to operate the sensor under electrostatic critical process conditions. Significant steam and dust clouds acting directly on the Memosens sensor head must be strictly avoided.



Specific Conditions of Use:

1. The maximum ambient and process temperatures for the temperature classes T3, T4 or T6 are limited according to the tables. The temperature table is only valid if the installation conditions specified in the manufacturer's operating instructions are observed. If these installation conditions cannot be met, the maximum process temperature range shall not exceed the maximum ambient temperature range.
2. The sensor should be inductive coupling connected with a certified Memosens compatible supply with Po ≤ 180 mW).
3. The sensors pH/ORP-Sensors type *PS ** E* sensors may not be operated in electrostatically critical processing conditions. Intense vapor or dust flows directly impacting on the connection system must be avoided.

C US
CSA20CA80021490X

I.S. Class 1 Division 1, Groups A, B, C, D, Tx
I.S. Class 1, Zone 0 AEx/Ex ia IIC Tx
(Tx: see table for temperature requirements)

Endress+Hauser
Endress+Hauser Conducta GmbH+Co. KG
70839 Gerlingen, Germany

Refer to protection notice ISO 16016
Classification internal

Scale 1:5
Tolerance –

pH/ORP

Control drawing
CSA Sensors

Control drawing
CSA Sensors

211038777

Material –

Notif. no. 116563
Number of changes 4 E
Status Approved

Designed 02.03.2021 BlochwitzS
Drawing chng. 04.02.2022 BreitfeldT
Welding contr.
Approval contr. 04.02.2022 RottmannM
Pressure contr.
Released 04.02.2022 BreitfeldT

No. of document 961005034
Version E
Doc. part 000

Weight
Volume

SAP material no. multiple
Format DIN A3
Sheet 2/6

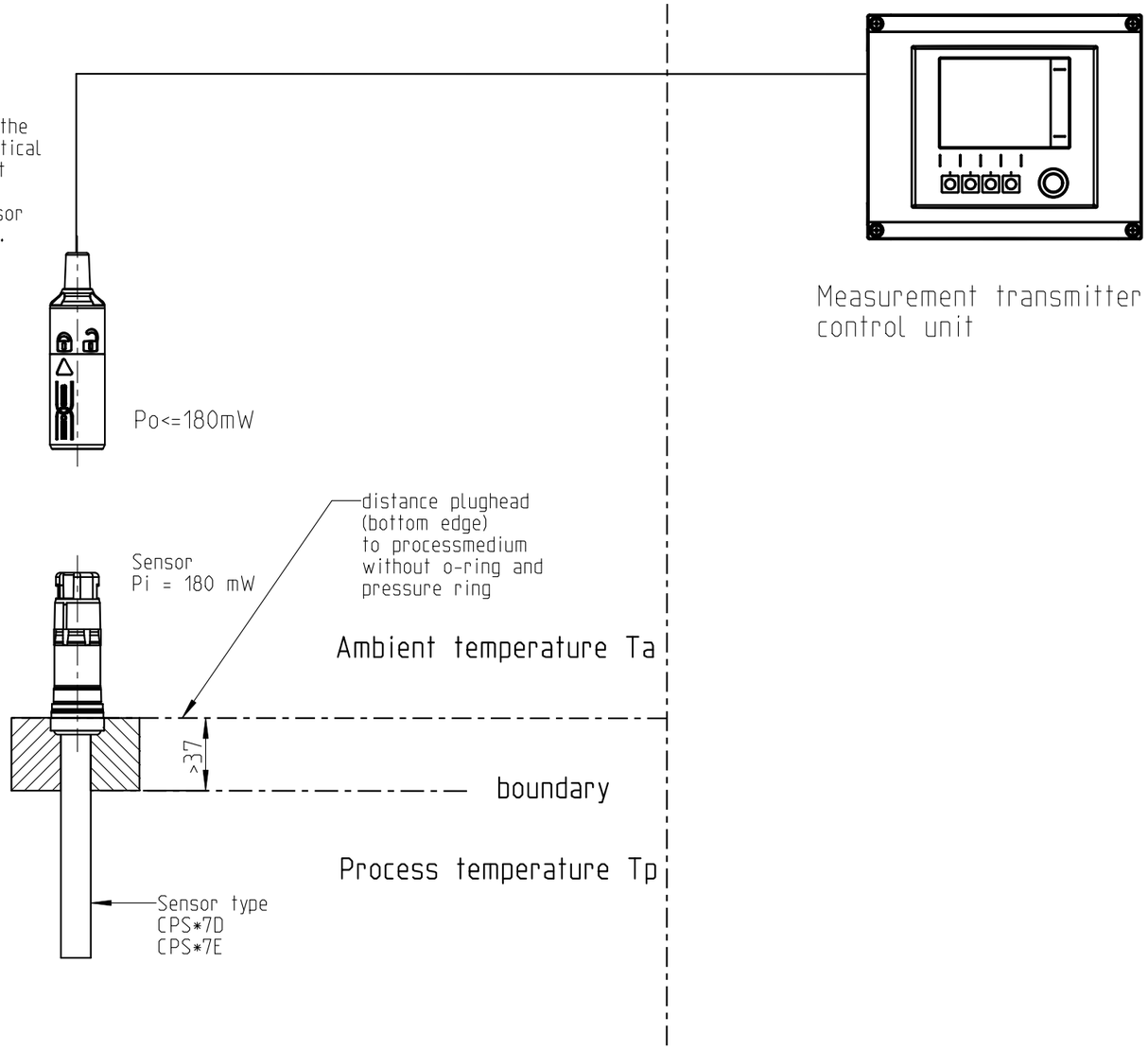
EDGES OF UNDEFINED SHAPE ISO 13715
GPS-GEOMETRICAL TOLERANCING ISO 1101
GPS-INDICATION OF SURFACE TEXTURE ISO 1302
GPS-FUNDAMENTALS ISO 8015
GPS-DIMENSIONAL TOLERANCING ISO 14405
GPS-DRAWING INDICATIONS ISO 10135

Hazardous location
Class I, Division 1, Groups A, B, C, D

Ordinary or hazardous location
(see sensor certification)

Sensor type	T class	Tp (process)		Ta (ambient)	
		min.	max.	min.	max.
CPS47D CPS47E CPS77D CPS77E	T3	-15°C	135°C	-15°C	70°C
	T4	-15°C	115°C	-15°C	75°C
			110°C	-15°C	80°C
			100°C	-15°C	85°C
			90°C	-15°C	90°C
	T6	-15°C	65°C	-15°C	65°C
CPS97D CPS97E	T4	-15°C	110°C	-15°C	80°C
			100°C	-15°C	85°C
			90°C	-15°C	90°C
	T6	-15°C	65°C	-15°C	65°C

It is not allowed to operate the sensor under electrostatic critical process conditions. Significant steam and dust clouds acting directly on the Memosens sensor head must be strictly avoided.



Specific Conditions of Use:

1. It is not allowed to operate the sensor under electrostatic critical process conditions.
2. The sensors may not be operated on processing conditions, in which an electrostatic loading of the sensor and the connecting system is to be counted. Operation in product application intended fluid media providing conductivity of at last 10 nS/cm can be assumed as electrostatic uncritical.
3. Ex protected digital sensors providing Memosens Technology are indicated by an orange-red ring at the connection head.
4. The electrical connection instruction of the Installation Manual must be followed.

CSA20CA80021490X

I.S. Class 1 Division 1, Groups A, B, C, D, Tx
I.S. Class 1, Zone 0 AEx/Ex ia IIC Tx
(Tx: see table for temperature requirements)

Endress+Hauser
Endress+Hauser Conducta GmbH+Co. KG
70839 Gerlingen, Germany

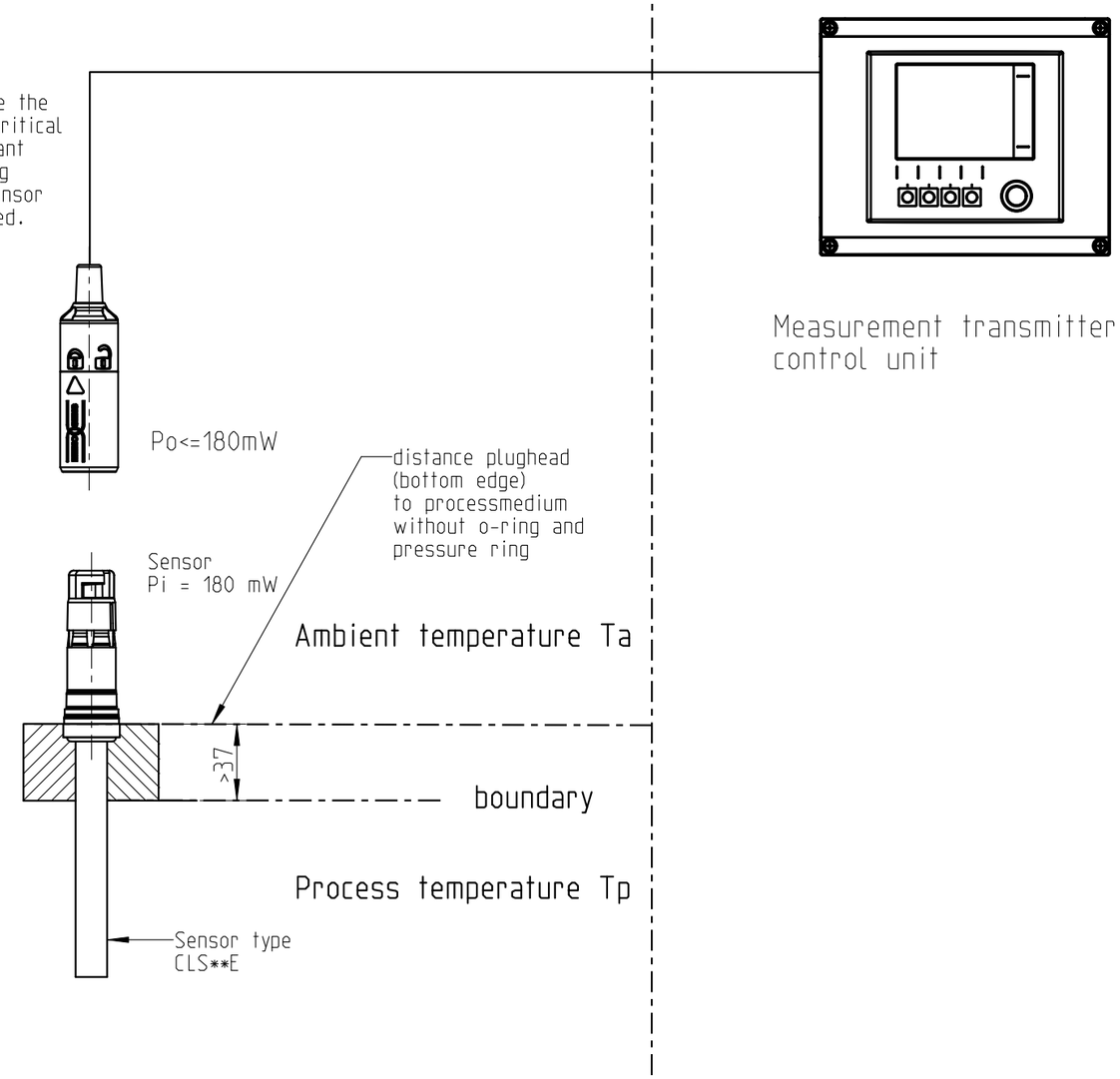
Refer to protection notice ISO 16016 Classification internal		Scale 1:5	Tolerance –
pH/ISFET Control drawing CSA Sensors		Notif. no. 116563	Designed 02.03.2021 BlochwitzS Drawing chng. 04.02.2022 BreitfeldT
		Number of changes 4 E	Welding contr. Approval contr. 04.02.2022 RottmannM
		Status Approved	Pressure contr. Released 04.02.2022 BreitfeldT
Control drawing CSA Sensors		No. of document 961005034	Version E / Doc. part 000
211038777		Weight	Volume
Material –		SAP material no. multiple	Format DIN A3 / Sheet 3/6

EDGES OF UNDEFINED SHAPE ISO 13715
GPS-GEOMETRICAL TOLERANCING ISO 1101
GPS-INDICATION OF SURFACE TEXTURE ISO 1302
GPS-FUNDAMENTALS ISO 8015
GPS-DIMENSIONAL TOLERANCING ISO 14405
GPS-DRAWING INDICATIONS ISO 10135

Hazardous location
Class I, Division 1, Groups A, B, C, D

Sensor type	T class	Tp (process)		Ta (ambient)
		min.	max.	max.
CLS15E-******A***+*	T3	-20°C	135°C	60°C
	T4	-20°C	120°C	60°C
	T6	-20°C	70°C	60°C
CLS15E-******B***+*	T3	-20°C	135°C	60°C
	T4	-20°C	100°C	60°C
	T6	-20°C	50°C	60°C
CLS16E-*********+*	T3	-5°C	135°C	60°C
	T4	-5°C	115°C	60°C
	T6	-5°C	65°C	60°C
CLS21E-*********+*	T3	-20°C	135°C	60°C
	T4	-20°C	115°C	60°C
	T6	-20°C	65°C	60°C
CLS82E-*********+*	T3	-20°C	140°C	60°C
	T4	-20°C	120°C	60°C
	T6	-20°C	70°C	60°C

It is not allowed to operate the sensor under electrostatic critical process conditions. Significant steam and dust clouds acting directly on the Memosens sensor head must be strictly avoided.



Specific Conditions of Use:

1. The maximum ambient and process temperatures for the temperature classes T3, T4 or T6 are limited according to the tables. The temperature table is only valid if the installation conditions specified in the manufacturer's operating instructions are observed. If these installation conditions cannot be met, the maximum process temperature range shall not exceed the maximum ambient temperature range.
2. The sensor should be inductive coupling connected with a certified Memosens compatible supply with Po ≤ 180 mW).
3. CLS15E, CLS16E, CLS21E: Metallic process connection parts have to be mounted electrostatically conductive at the mounting location (< 1 MΩ).
4. CLS15E and CLS21E with non-metallic process connection may only be used in liquid media with a conductivity of at least 10 nS/cm.
5. CLS15E with non-metallic process connection may not be operated on processing conditions, in which an electrostatic loading of the sensor and in particular of the electrically separated outer electrode, could be expected to occur.
6. CLS82E: The sensor may not be operated in electrostatically critical processing conditions. Intense vapor or dust flows directly impacting on the connection system must be avoided. The metallic parts of the sensor have to be mounted at the mounting location electrostatically conductive (< 1 MΩ).

CSA20CA80021490X

I.S. Class 1 Division 1, Groups A, B, C, D, Tx
I.S. Class 1, Zone 0 AEx/Ex ia IIC Tx
(Tx: see table for temperature requirements)

Endress+Hauser
Endress+Hauser Conducta GmbH+Co. KG
70839 Gerlingen, Germany

Refer to protection notice ISO 16016 Classification internal		Scale 1:5	Tolerance –
CONDUCTIVITY Control drawing CSA Sensors		Notif. no. 116563	Designed 02.03.2021 BlochwitzS Drawing chng. 04.02.2022 BreitfeldT
		Number of changes 4 E	Welding contr. Approval contr. 04.02.2022 RottmannM
		Status Approved	Pressure contr. Released 04.02.2022 BreitfeldT
Control drawing CSA Sensors		No. of document 961005034	Version E / Doc. part 000
211038777		Weight	Volume
Material –		SAP material no. multiple	Format DIN A3 / Sheet 4/6

EDGES OF UNDEFINED SHAPE ISO 13715 GPS-FUNDAMENTALS ISO 8015
GPS-GEOMETRICAL TOLERANCING ISO 1101 GPS-DIMENSIONAL TOLERANCING ISO 14405
GPS-INDICATION OF SURFACE TEXTURE ISO 1302 GPS-DRAWING INDICATIONS ISO 10135

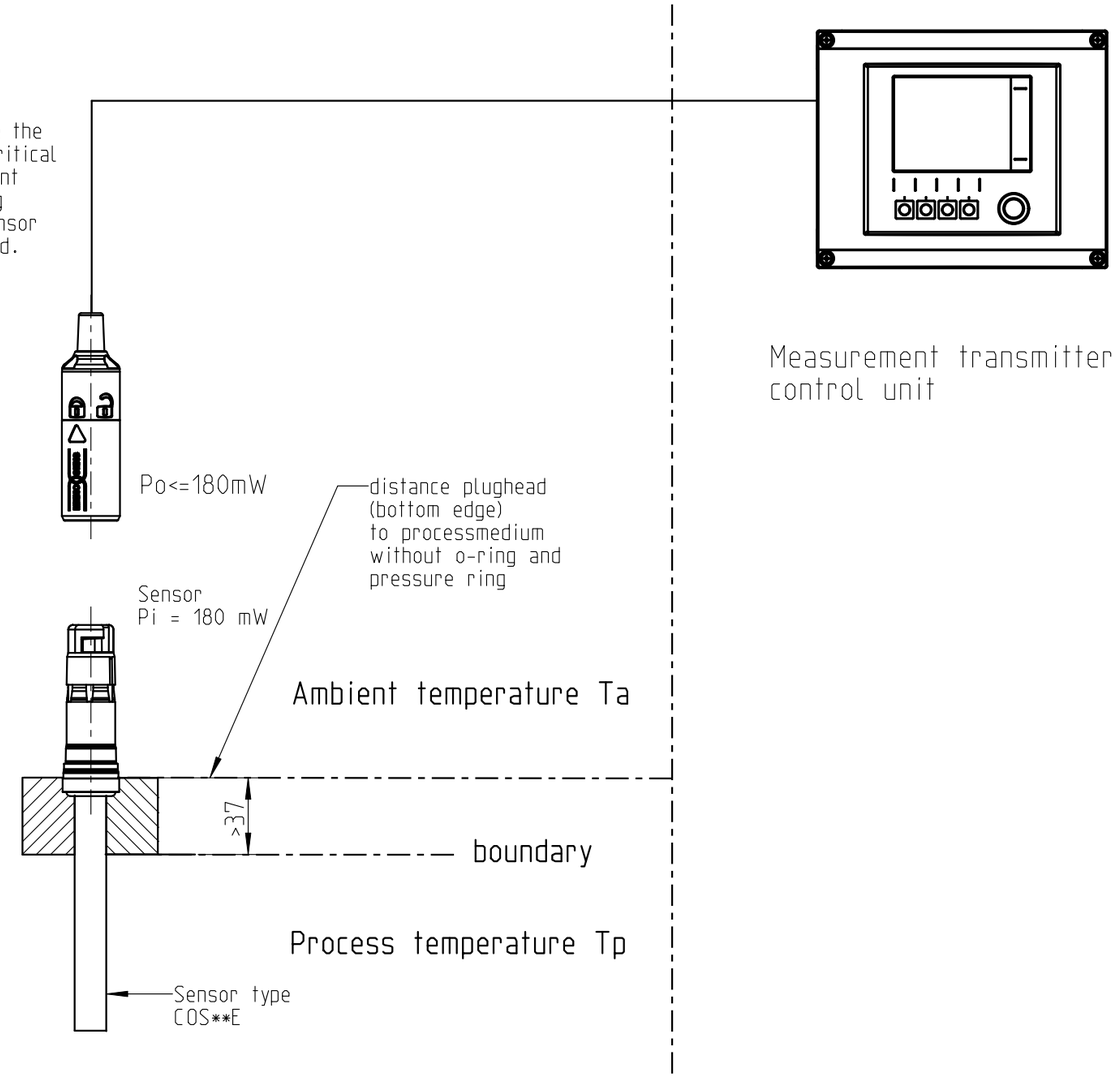
Hazardous location
Class I, Division 1, Groups A, B, C, D

Ordinary or hazardous location
(see sensor certification)

Sensor type	T class	Tp (process)		Ta (ambient)	
		min.	max.	min.	max.
COS81E	(T6 rep. T90°)	-15°C	60°C	-25°C	60°C

/E

It is not allowed to operate the sensor under electrostatic critical process conditions. Significant steam and dust clouds acting directly on the Memosens sensor head must be strictly avoided.



Specific Conditions of Use:

1. Metallic process connection parts have to be mounted electrostatically at the mounting location (< 1 MΩ).
2. The plastic housing may only be cleaned with a damp cloth.
3. It is not allowed to operate the sensor under electrostatic critical process conditions. Significant steam and dust clouds acting directly on the Memosens sensor head must be strictly avoided.
4. If sensor parts are consisting of light metal e.g. Titan, then these parts have to protected against hits.
5. Do no operate COS81E it in an atmosphere temperature above +60°C unless the atmosphere is not considered explosive.

/E

CSA20CA80021490X

I.S. Class 1 Division 1, Groups A, B, C, D, Tx
I.S. Class 1, Zone 0 AEx/Ex ia IIC Tx
(Tx: see table for temperature requirements)

Endress+Hauser
Endress+Hauser Conducta GmbH+Co. KG
70839 Gerlingen, Germany

Refer to protection notice ISO 16016 Classification internal	Scale 1:5	Tolerance –	
DO opt	Notif. no. 116563	Designed 02.03.2021 BlochwitzS	
Control drawing CSA Sensors	Number of changes 4 /E	Drawing chng. 04.02.2022 BreitfeldT	
		Welding contr.	
	Status Approved	Approval contr. 04.02.2022 RottmannM	
		Pressure contr.	
		Released 04.02.2022 BreitfeldT	
Control drawing CSA Sensors	No. of document 961005034	Version E	Doc. part 000
211038777	Weight	Volume	
Material –	SAP material no. multiple	Format DIN A3	Sheet 5/6

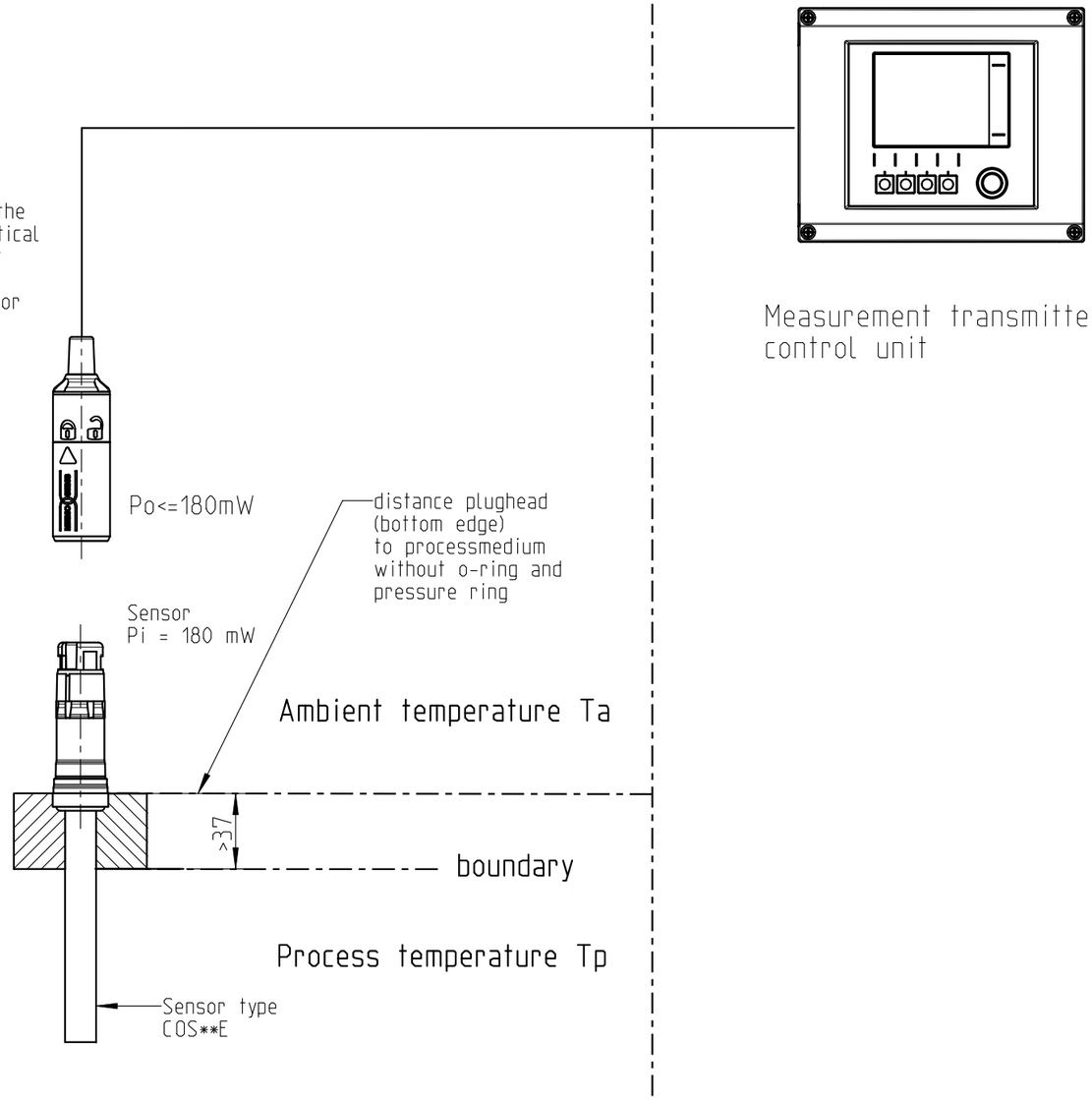
EDGES OF UNDEFINED SHAPE ISO 13715
GPS-GEOMETRICAL TOLERANCING ISO 1101
GPS-INDICATION OF SURFACE TEXTURE ISO 1302
GPS-FUNDAMENTALS ISO 8015
GPS-DIMENSIONAL TOLERANCING ISO 14405
GPS-DRAWING INDICATIONS ISO 10135

Hazardous location
Class I, Division 1, Groups A, B, C, D

Ordinary or hazardous location
(see sensor certification)

Sensor type	T class	Tp (process)		Ta (ambient)	
		min.	max.	min.	max.
COS22E	T4	-5°C	100°C	-25°C	70°C
	T6	-5°C	70°C	-25°C	70°C
COS51E	T6	-5°C	60°C	-5°C	60°C

It is not allowed to operate the sensor under electrostatic critical process conditions. Significant steam and dust clouds acting directly on the Memosens sensor head must be strictly avoided.



Specific Conditions of Use:

1. The maximum ambient and process temperatures for the temperature classes T3, T4 or T6 are limited according to the table (see also in manual).
2. The plastic housing may only be cleaned with a damp cloth.
3. The sensor may not be operated in electrostatically critical processing conditions, in which an electrostatic loading of the sensor and the connecting system is to be counted. Significant steam and dust clouds acting directly on the Memosens sensor head must be strictly avoided.
4. Metallic process connection parts have to be mounted electrostatically conductive at the mounting location (<1MΩ).
5. If sensor parts are consisting of light metal e.g. Titan, then these parts have to protected against hits.

Only for type COS51E:

6. Operation in product application intended fluid media providing conductivity of at least 10 nS/cm can be assumed as electrostatic uncritical.

CSA20CA80021490X

I.S. Class 1 Division 1, Groups A, B, C, D, Tx
I.S. Class 1, Zone 0 AEx/Ex ia IIC Tx
(Tx: see table for temperature requirements)

Endress+Hauser
Endress+Hauser Conducta GmbH+Co. KG
70839 Gerlingen, Germany

Refer to protection notice ISO 16016
Classification internal

DO amp

Control drawing
CSA Sensors

Control drawing
CSA Sensors

211038777

Material

Scale 1:5	Tolerance –		
Notif. no. 116563	Designed 02.03.2021 BlochwitzS		
	Drawing chng. 04.02.2022 BreitfeldT		
Number of changes 4 E	Welding contr.		
	Approval contr. 04.02.2022 RottmannM		
Status Approved	Pressure contr.		
	Released 04.02.2022 BreitfeldT		
No. of document 961005034		Version E	Doc. part 000
Weight	Volume		
SAP material no. multiple		Format DIN A3	Sheet 6/6

EDGES OF UNDEFINED SHAPE ISO 13715
GPS-GEOMETRICAL TOLERANCING ISO 1101
GPS-INDICATION OF SURFACE TEXTURE ISO 1302
GPS-FUNDAMENTALS ISO 8015
GPS-DIMENSIONAL TOLERANCING ISO 14405
GPS-DRAWING INDICATIONS ISO 10135