



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	Endress+Hauser Conducta GmbH+Co.KG
Address	Dieselstrasse 24, Gerlingen, 70839, Germany
Place of Production	Endress+Hauser Conducta GmbH+Co.KG Dieselstrasse 24, Gerlingen, 70839, Germany
Place of Production	Endress+Hauser Conducta Inc. 4123 East La Palma Avenue, Suite 200, Anaheim, California, 92807, United States
Place of Production	Endress+Hauser Conducta GmbH+Co.KG Landsberger Straße 28, Waldheim, 04736, Germany
Type	Transmitters/Transducers
Description	Sensors for liquid analysis refer to the Appendix for details
Trade Name	xPS11E, xPS12E, xLS21E, xLS50D, xUS50D, xUS52D, xPF81E, xFS51; x = C / O / OC
Application	Marine, offshore and industrial applications for use in environmental categories ENV1, ENV2 and ENV3 as defined in Lloyd's Register's Type Approval

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Type Approval Certificate

System, Test Specification Number 1 - 2021.

Specified Standard	Manufacturer's specification IACS unified requirements E10 (Rev.9 Aug 2023)
Ratings	refer to the Appendix for details
Other Conditions	Ratings for application in hazardous areas are to be obtained from the applicable Ex Certificates. Memosensensors are to be connected to an appropriate Memosens connection system.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: LR2001804TA-02

The Design Appraisal Document TSO-25-037040/TW and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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Appendix

TYPES

xPS11E	pH electrode
xPS12E	ORP electrode
xLS21E	Digital conductivity sensor
xLS50D	Inductive conductivity sensor
xUS50D	Turbidity and suspended solids sensor
xUS52D	Turbidity sensor
xPF81E	pH sensor
xF551	Sensor for fluorescence measurement

x can be named as C or O or OC, it is only a naming convention difference. No difference in HW or SW. This is valid for all devices in this list.

Product order codes for Marine type approval

	010	020	030	040	050	590
xPS11E-	**	*	*	**	*	+ **

010	Approval
	AA Non-hazardous area
	** two letters for non-ex or ex-approval (no construction relevance)
020	Electrode Type
	7 Basic version, zero point pH 7.0, temperature sensor NTC 30k
030	Application Range
	A 1-12 pH, -15...80°C, 0.8...17 bar (abs)
	B 0-14 pH, 0...135°C, 0.8...17 bar (abs)
	F 0-10 pH, 0...70°C, 0.8...7 bar (abs)
040	Reference system
	AA Teflon ring junction, 3 M KCl, Ag/AgCl
	AS Teflon ring junction, salt store, saturated KCl, Ag/AgCl
	TA Teflon ring junction, ion trap, 3 M KCl, Ag/AgCl
050	Shaft Length
	2 120 mm
590	Additional approval
	LG LR
	and other additional marks (no construction relevance, can be more than two letters)

	010	020	030	040	050		590
xPS12E-	**	*	*	**	*	+	**

010	Approval
	AA Non-hazardous area
	** two letters for non-ex or ex-approval (no construction relevance)
020	Electrode Type
	7 Basic version, temperature sensor NTC 30k
030	Application Range
	G Gold, -1500 mV... 1500 mV, -15...135°C, 0.8...17 bar (abs)
	P Platinum, -1500 mV... 1500 mV, -15...135°C, 0.8...17 bar (abs)
040	Reference System
	AA Teflon ring junction, 3 M KCl, Ag/AgCl
050	Shaft length
	2 120 mm
590	Additional approval
	LG LR
	and other additional marks (no construction relevance, can be more than two letters)

	010	020	030		590
xLS21E-	**	**	**	+	**

010	Approval
	AA Non-hazardous area
	** two letters for non-ex or ex-approval (no construction relevance)
020	Process Connection
	GA Thread G1"
	HA Thread NPT 1"
030	Material
	11 Sensor PES, electrodes Graphite
590	Additional approval
	LG LR
	and other additional marks (no construction relevance, can be more than two letters)

	010	020	030	040	050
xLS50D-	**	*	*	*	*
010	Approval:				
	AA	Standard			
	GR	Non-hazardous area + EAC marking			
	**	two letters for non-ex or ex-approval (no construction relevance)			
020	Process Connection:				
	1	Thread G 3/4"			
	2	Thread NPT 1"; PEEK			
030	Sensor-, Seal-, Adapter Material:				
	B	PEEK; Viton; PEEK			
	C	PEEK; Chemraz; PEEK			
	D	PFA; Chemraz; 1.4571			
	E	PEEK; Viton; 1.4571			
	G	PEEK; Chemraz; 1.4571			
040	Cable Length:				
	1	3m			
	2	7m			
	3	15m			
050	Cable connection				
	1	Fixed cable; crimp sleeves			
	2	Fixed cable; M12 plug			
590	Additional approval				
	LG	LR			
	and other additional marks (no construction relevance, can be more than two letters				

	010	020	030	040	050	060	070
xUS50D-	**	*	*	*	*	*	*

010	Approval:	
	AA	Non-hazardous area
	**	two letters for non-ex or ex-approval (no construction relevance)
020	Measuring Range:	
	2	Absorption (ISO 7027)

030	Process Connection
	A Immersion sensor, thread G1, NPT 3/4
040	Adaption Cable:
	A Fixed cable; crimp sleeves
	B Fixed cable; M12 plug
050	Cable Length:
	2 3m
	3 7m
	4 15m
	7 ...m
	8 ...ft
060	Sensor Material:
	A Head: PCTFE, shaft: 1.4571
	B Head: PCTFE, shaft: PPS
070	Seal Material:
	1 EPDM
590	Additional approval
	LG LR
	and other additional marks (no construction relevance, can be more than two letters)

	010	020	030	040	050
xUS52D-	**	*	*	*	*

010	Approval:
	AA Non-hazardous area
	GR Non-hazardous area + EAC marking
	** two letters for non-ex or ex-approval (no construction relevance)
020	Measuring Method:
	1 ISO 7027, IR
030	Process Connection:
	A Immersion sensor, thread G1, NPT 3/4
	B Clamp 2"
	C Varivent N DN 65-125 (standard immersion depth 22,5 mm)
	D Varivent N DN 65-125 (immersion depth 42,5 mm)
	H Immersion sensor, thread G1, NPT3/4, head: PEEK, shaft: PPS
040	Adaption Cable:
	A Fixed cable; crimp sleeves
	B Fixed cable; M12 plug
050	Cable Length:

	2	3m
	3	7m
	4	15m
	7m
	8 Ft
590	Additional approval	
	LG	LR
	and other additional marks (no construction relevance, can be more than two letters)	

010 020 030 040 045

xPF81E-	**	*	*	**	*
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010	Approval:	
	AA	Non-hazardous area
	**	two letters for non-ex or ex-approval (no construction relevance)
020	Electrode type	
	5	Basic version, process connection NPT 3/4", zero point pH 7,0, temperature sensor NTC 30k
030	Application range	
	L	0-14 pH, 0...110°C, 0,8... 11 bar (abs)
	N	0-14 pH, 0...80°C, 0,8... 11 bar (abs)
040	Reference System	
	AD	Teflon ring junction, double chamber, 3 M KNO3, 3 M KCL, Ag/ AgCl
045	Insertion Length	
	1	23 mm, bulb membrane, electrode guard
	2	13, flat membran
	3	58 mm, bulb membrane, electrode guard
590	Additional approval	
	LG	LR
	and other additional marks (no construction relevance, can be more than two letters)	

010 020 030 040 050 060 070 590

xFS51-	**	*	*	*	*	*	*	+	**
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010	Approval:	
	AA	Non-hazardous area

	**	two letters for non-ex or ex-approval (no construction relevance)
020		Application/ measuring Range
	1	PAH measurement for marine applications
030		Process connection
	A	Immersion sensor, thread G1, NPT3/4
040		Adaption Cable
	A	Fixed cable, crimp sleeves
	B	Fixed cable, M12 plug
050		Cable Type:
	2	3 m
	3	7 m
	4	15 m
	7	... m
	8	... f
060		Sensor Material
	A	Titanium
070		Seal Material
	1	FKM
590		Additional approval
	LG	LR
		and other additional marks (no construction relevance, can be more than two letters)

RATINGS

Sensor	Measurement parameter	Ratings Measurement Range	Software
xPS11E	pH	0 to 14 pH (0.8 to 17 bar)	V1.00.xx
xPS12E	ORP	-1500 to 1500 mV (0.8 to 17 bar)	V1.00.xx
xLS21E	Conductivity	10 µS/cm to 20 mS/cm (up to 17 bar)	V1.01.xx
xLS50D	Conductivity	2 µS/cm to 2000 mS/cm (up to 21 bar)	V1.00.xx
xUS50D	Turbidity	0.000 to 5.000 AU absorption (up to 4.5 bar)	V1.00.xx
xUS52D	Turbidity	0.000 to 4000 FNU (up to 10 bar)	V1.00.xx
xPF81E	pH	0 to 14 (11) bar	V1.00.xx
xFS51	PAH	0 to 5 000 µg/l PAH _{phe}	V01.00.xx