



## 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.

<b>Manufacturer</b>	<b>Endress+Hauser Conducta GmbH+Co.KG</b>
<b>Address</b>	Dieselstrasse 24, Gerlingen, 70839, Germany
<b>Type</b>	Transmitters/Transducers
<b>Description</b>	Sensors for liquid analysis refer to the Appendix for details
<b>Trade Name</b>	xPS11D, xPS11E, xPS12D, xPS12E, xPF81D, xLS21D, xLS21E, xLS50D, xLS82D, xCS50D, xCS51D, xCS55D, xOS81D, xUS50D, xUS52D, xPF81E, xFS51; x = C / O / OC
<b>Application</b>	Marine, offshore and industrial applications for use in environmental categories ENV1, ENV2 and ENV3 as defined in Lloyd's Register's Type Approval System, Test Specification Number 1 - 2021.
<b>Specified Standard</b>	IACS unified requirements E10 (Rev.8 Feb 2021) Manufacturer's specification
<b>Ratings</b>	refer to the Appendix for details
<b>Other Conditions</b>	Ratings for application in hazardous areas are to be obtained from the applicable Ex Certificates.

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## Type Approval Certificate

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:** This certificate supersedes certificate number LR2001804TA-01 issued on 19 July 2021 which is hereby cancelled.

The Design Appraisal Document HPC1962013-22/TW and its supplementary Type Approval Terms and Conditions form part of this Certificate.



## Appendix

### TYPES

xPS11D	pH electrode
xPS11E	pH electrode
xPS12D	ORP electrode
xPS12E	ORP electrode
xPF81D	pH electrode
xLS21D	Digital conductivity sensor
xLS21E	Digital conductivity sensor
xLS50D	Inductive conductivity sensor
xLS82D	Hygienic conductivity sensors
xCS50D	Digital sensor for determining chlorine dioxide
xCS51D	Digital sensor for determining free chlorine
xCS55D	Digital sensor for determining bromine
xOS81D	Hygienic, optical sensor for measuring oxygen
xUS50D	Turbidity and suspended solids sensor
xUS52D	Turbidity sensor
xPF81E	pH sensor
xFS51	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
<b>xPS11D-</b>	*	**	*	*

010	Version:
	7 Basic version
020	Application Range:
	AA 1-12pH, -15...80°C, 6 bar
	AS 1-12pH, -15...80°C, 6 bar, salt stock
030	Shaft Length:
	2 120mm
040	Approval:
	C Non-hazardous area + EAC marking
	1 Non-hazardous area
	* one letter for non-ex or ex-approval (no construction relevance)



	010	020	030	040	050	590
<b>xPS11E-</b>	**	*	*	**	*	+ **

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
<b>xPS12D-</b>	*	**	*	*

010	Version:
	7 Basic version
020	Measuring surface:
	NA Gold
	PA Platinum
030	Shaft Length:
	2 120 mm
040	Approval:
	C Non-hazardous area + EAC marking
	1 Non-hazardous area
	* one letter for non-ex or ex-approval (no construction relevance)

	010	020	030	040	050	590
<b>xPS12E-</b>	**	*	*	**	*	+ **

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	040
<b>xPF81D-</b>	*	**	*	*

010	Version:
	7 Basic version
020	Application range:
	LH 0-14pH; 0-110°C
	NN 0-11pH; 0-80°C
030	Insertion length:
	1 23mm + electrode guard
	3 58mm + electrode guard
040	Approval:
	1 Non-hazardous area
	* one letter for non-ex or ex-approval (no construction relevance)

	010	020	030
<b>xLS21D-</b>	*	**	*

010	Measuring Range:
	C 0.01-20.0mS/cm; k=1
020	Process Connection:
	1E Thread G1; PES
	1N Thread NPT 1"; PES
030	Approval:
	C Non-hazardous + EAC marking
	1 Non-hazardous area
	* one letter for non-ex or ex-approval (no construction relevance)

	010	020	030		590
<b>xLS21E-</b>	**	**	**	+	**

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
<b>xLS50D-</b>	**	*	*	*	*

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
040	Cable Length:
	1 3m
	2 7m
	3 15m
050	Cable connection
	1 Fixed cable; crimp sleeves
	2 Fixed cable; M12 plug

	010	020	030
<b>xLS82D-</b>	**	**	*

010	Approval:
	AA Non-hazardous
	GR Non-hazardous + EAC marking
	** two letters for non-ex or ex-approval (no construction relevance)
020	Process Connection:
	GA Thread G1
	HA Thread NPT1
	PG PG 13.5 120mm
	PM PG 13.5 215mm
030	Sensor Material
	A Ceramic, Platinum, Stainless Steel

	010	020	030	040	050	060	070
<b>xUS50D-</b>	**	*	*	*	*	*	*

010	Approval:
	AA Non-hazardous area
	GR Non-hazardous area + EAC
	** 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

	010	020	030	040	050
<b>xUS52D-</b>	**	*	*	*	*

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
	7 ....m
	8 .... Ft



	010	020	030
<b>xCS50D-</b>	**	**	**

010	Approval:
	AA Non-hazardous area
	GR Non-hazardous area + EAC
	** two letters for non-ex or ex-approval (no construction relevance)
020	Application
	11 Process water, drinking water
	21 Process water, waste water
030	Measuring Range:
	AD 5 mg/l
	BF 20 mg/l
	CJ 200 mg/l

	010	020	030
<b>xCS51D-</b>	**	**	**

010	Approval:
	AA Non-hazardous area
	GR Non-hazardous area + EAC
	** two letters for non-ex or ex-approval (no construction relevance)
020	Application
	11 Process water, drinking water
	21 Process water, waste water
030	Measuring Range:
	AD 5 mg/l
	BF 20 mg/l
	CJ 200 mg/l

	010	020	030
<b>xCS55D-</b>	**	**	**

010	Approval:
	AA Non-hazardous area



	GR Non-hazardous area + EAC
	** two letters for non-ex or ex-approval (no construction relevance)
020	Application
	11 Process water, drinking water
	21 Process water, waste water
	31 Process water, sea water
030	Measuring Range:
	AD 5 mg/l
	BF 20 mg/l
	CJ 200 mg/l

	010	020	035	040	050	060
xOS81D-	**	**	*	*	*	*

010	Approval:
	AA Non-hazardous area
	GR Non-hazardous area + EAC marking
	** two letters for non-ex or ex-approval (no construction relevance)
020	Diameter; Process Connection; Length:
	A2 12mm; PG13.5; 120mm
	A4 12mm; PG13.5;220mm
035	Type Optical Cap:
	C C-shape
	U U-shape
040	Material, Sensorshaft; Sensorcap:
	B Stainless steel 1.4435, 316L
050	Material O-Ring:
	1 EPDM USP Cl. VI+FDA
	3 FFKM
060	Material Process Sealing:
	1 FKM USP Cl. VI+FDA
	3 FKM Ex



	010	020	030	040	045
<b>xPF81E-</b>	**	*	*	**	*

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 KNO <sub>3</sub> , 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

	010	020	030	040	050	060	070		590
<b>xFS51-</b>	**	*	*	*	*	*	*	+	**

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
xPS11D	pH	1 to 12 pH (up to 7 bar)	V1.00.xx V1.01.xx
xPS11E	pH	0 to 14 pH (0.8 to 17 bar)	V1.00.xx
xPS12D	ORP	-1500... 1500 mV (up to 16 bar)	V2.01.xx
xPS12E	ORP	-1500 to 1500 mV (0.8 to 17 bar)	V1.00.xx
xPF81D	pH	0 to 14 pH (up to 10 bar)	V1.01.xx
xLS21D	Conductivity	10 µS/cm to 20 mS/cm (up to 17 bar)	V1.45.xx
xLS21E	Conductivity	10 µS/cm to 20 mS/cm (up to 17 bar)	V1.01.xx
xLS82D	Conductivity	1 µS/cm to 500 mS/cm (up to 17 bar)	V1.00.xx
xLS50D	Conductivity	2 µS/cm to 2000 mS/cm (up to 21 bar)	V1.00.xx
xCS50D	Chlorine dioxide	0-200 mg/l, 1 bar (2 bar abs.)	V1.01.xx
xCS51D	Free chlorine	0-200 mg/l, 1 bar (2 bar abs.)	V1.01.xx
xCS55D	Free bromine	0-200 mg/l, 1 bar (2 bar abs.)	V1.01.xx
xOS81D (optical cap c-shaped)	Dissolved oxygen	0.004 to 26 mg/l (up to 13 bar)	V1.01.xx
xOS81D (optical cap u-shaped)	Dissolved oxygen	0.004 to 30 mg/l (up to 13 bar)	V1.01.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 <sub>phe</sub>	V01.00.xx



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