

TYPE APPROVAL CERTIFICATE

This is to certify:

That the SC 1000 Monitoring System and Probes

with type designation(s)

SC1000 Controller/Display, ULTRATURB SC, pHD Sensor/Flow Cell, Conductivity Probe Assembly, PAH500 Sensor

Issued to

**Hach Company
Loveland, CO, USA**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Location classes:

Temperature	A
Humidity	B
Vibration	A
EMC	A
Enclosure	Required protection according to the Rules shall be provided upon installation on board

Issued at **Hamburg** on **2019-11-01**

This Certificate is valid until **2024-04-04**.

DNV GL local station: **Essen**

Approval Engineer: **Dariusz Lesniewski**



Digitally Signed By: Rinkel, Marco

for **DNV GL**

Location: Hamburg, on behalf of

**Joannis Papanuskas
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Job Id: **262.1-027312-2**
 Certificate No: **TAA000021W**
 Revision No: **2**

Product description

SC 1000 Multiparameter Universal Controller	
[LXV400.99.00121, LXV400.99.00122] without Power Cable	
[LXV400.99.20121, LXV400.99.20122] with Power Cable [YYL112]	
SC 1000 Display [LXV402.99.00201, LXV402.99.00202]	
consisting of Ferrite Bead [9625600], Base Cable [6122900-001]	
	Power supply: 100-240 V AC 50/60Hz (by external power line filter)
	Inputs: 4 digital sensors
	Outputs: 4 analogue 0/4-20 mA
	Display: ¼ inch VGA graphical backlit TFT color Glas/Glas Touch screen, 320x240 pixels
	External Power Line Filter: TE Connectivity 6609046-5 / Corcom 6ET3
	Mounting: wall mounting
	Degree of protection: IP65
	Software/Firmware: V3.35
ULTRATURB SC Seawater Turbidity Sensor [LPV415.99.32001, LPV415.99.82001]	
	Power supply: +12 VDC (supplied by SC 1000 Controller)
	Operating: in connection with SC 1000 Controller
	Mounting: inside cabinet, wall mounting
	Degree of protection: IP65
	6122400 Extension Cable
Differential pH Sensor (pHD) [DPD1P1.99, DPD1P1.99M]	
ph Flow Cell [9180100]	
	Power supply: +12 VDC (supplied by SC 1000 Controller)
	Operating: in connection with SC 1000 Controller
	Mounting: inside cabinet, wall mounting
	Degree of protection: IP65
	Base Cable [6122900, 6122900-001]
Conductivity Probe Assembly [D3725E2T.99M], consisting of:	
	Inductive Conductivity Sensor [3725E2T03N] with Base Cable [9625300]
	Electrodeless Conductivity Gateway [6120800.99] with ESD Boot [8665700]
	Conductivity Probe Flow Cell (Knick) [LZU215.99.1E120]
	Operating: in connection with SC 1000 Controller
	Mounting: inside cabinet, wall mounting
	Available Extension Cables [8665600-001, -005, -010]
PAH500 PAH Sensor (Probe with Digital Gateway) [LXV541.99.0001H]:	
	Power supply: +12,6 VDC (supplied by SC 1000 Controller)
	Probe: analog output (0-5 VDC)
	A/D Gateway (with cable): output Modbus, RS-485
	Operating: in connection with SC 1000 Controller
	Mounting: inside cabinet, wall mounting

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Product certificate

If specified in the Rules, ref. Pt.4 Ch.9 Sec.1, the control and monitoring system in which the above listed hardware is used shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The test shall be done according to an approved test program. After certification the clause for software control will be put into force.

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Type Approval documentation

Reports:

DNV GL Report No. MAG CIC-A0560061-CREK-2018-08-15-A, dated 2018-08-27
Hach Company Test Report No. 18-034, issued on 2018-08-23, revised on 2018-11-01
Hach Company Test Report No. 18-033, dated 2018-08-23
Hach Company Test Report No. 18-033-A1, dated 2018-11-07
Woodward EMC Test Report, dated 2018-08-23
Woodward Vibrations Test Report, dated 2018-08-27
Intertek Test Report No.: 103774883MID-001AREV1, dated 2018-12-18
Intertek Test Report No.: 103774883MID-001BREV1, dated 2018-12-18
Woodward Test Report, dated 2019-09-(23)24
Hach Test Report No. 19-54, dated 2019-09-27
Hach Test Report No. 19-052, dated 2019-10-01
Hach Test Report No. 19-059, dated 201910-01

Technical documents:

ULTRATURB sc basic/plus/seawater User Manual, 07/2017, Edition 7
ULTRATURB plus sc Sensor Data Sheet, Lit. No 2620 Rev 1
ULTRATURB sc drawing LPV415.TD.00000, Rev 01
TECHFLEX Data Sheet 01-30
Differential Ph and ORP Sensors Data Sheet, LIT2467 Rev 2
pHD Sensor User Manual, 072016, Edition 3
Product information on Flow-Thru Fitting ARF215, doc-no. TA-ARF215-KNE01 250107
Inductive Conductivity Sensors Data Sheet, LIT2465 Rev 3
Instruction Sheet LZU, DOC273.98.90079
PAH500 PAH Sensor Data Sheet
PAH500 User Manual DOC923.97.80250
Hach Reference Document: IEC 60332-1-2 FR Affected Items.xls
Drawings: No. 9770300 Rev. A, No. 6122400 Rev. B, U0944-58 Rev. E, No. U0913-12 Rev. H
Cable Data Sheets
Type approval assessment report issued at Loveland, CO on 2018-08-15
Type approval assessment report issued at Loveland, CO on 2019-10-09

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines

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- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE