



Marine & Offshore  
Division

Certificate number: 42658/A0 BV

File number: AP 4630

Product code: 3926H

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*

**Vimex A/S**

Barkåker - NORWAY

*for the type of product*

**NOx MONITORING AND RECORDING DEVICE**

ShipCEMS

Emission Monitoring System measuring SO<sub>2</sub>/CO<sub>2</sub>

**Requirements:**

Bureau Veritas Rules for the Classification of Steel Ships  
IMO revised MARPOL Annex VI and NOx Technical Code 2008  
IMO Resolution MEPC.184(59).

EC Code: 31

*This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 18 Nov 2020**

**For BUREAU VERITAS,**

At BV GOTHENBURG, on 18 Nov 2015,

Magne MOLLER



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 October 2014

This certificate consists of 4 page(s)

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION :

- Product model or type designation :  
**ShipCEMS**

-Product description:

The ShipCEMS Continuous Exhaust Emission Monitoring System is to analyse sulphur dioxide and carbon dioxide in wet marine exhaust flue., according to MEPC.184(59) MARPOL.

#### 1.1 - Technical Specifications:

Analyser System cabinet	<ul style="list-style-type: none"> <li>• Online Analyser Module for analysis of SO<sub>2</sub> and CO<sub>2</sub></li> <li>• LOGO! PLC with LOGO! TD unit for alarm display and auto calibration</li> <li>• Peltier cabinet cooler system</li> <li>• Solenoid valves for stream switching and validation and for analyser calibration</li> <li>• 24 VDC power supply</li> <li>• 48 VDC power supply (for Peltier cooler only)</li> <li>• Terminals for power and signal interfaces</li> </ul>
Sample Conditioning System cabinet	<ul style="list-style-type: none"> <li>• Heated oven cabinet</li> <li>• Sample gas pump</li> <li>• Sample gas filter</li> <li>• Sample gas dryers</li> <li>• Sensors for flow, temperature and moisture</li> <li>• Junction box</li> </ul>
Sample Probes	<ul style="list-style-type: none"> <li>• SC-SP</li> </ul>

#### 1.2 - External Interfaces:

Parameter	Signal type (ShipCEMS side)	Comment
Select engine #1	DI	<ul style="list-style-type: none"> <li>• CC = Engine X is selected.</li> <li>• Only one engine to be selected at a time.</li> </ul>
Select engine #2	DI	
Select engine #3	DI	
Select engine #4	DI	
SO <sub>2</sub> (ppm)	AO	<ul style="list-style-type: none"> <li>• SO<sub>2</sub>, 4-20 mA (ppm)</li> </ul>
CO <sub>2</sub> (mol %)	AO	<ul style="list-style-type: none"> <li>• CO<sub>2</sub>, 4-20 mA (mol %)</li> </ul>
SCS common alarm	DO	<ul style="list-style-type: none"> <li>• OC=Alarm or power off (SCS cabinet)</li> <li>• CC=No fault</li> </ul>
AC common alarm	DO	<ul style="list-style-type: none"> <li>• OC=Alarm or power off (AC cabinet)</li> <li>• CC=No fault</li> </ul>
Measurement valid	DO	<ul style="list-style-type: none"> <li>• OC=Not valid measurement or power off</li> <li>• CC=Valid measurement</li> </ul>
Maintenance in progress	DO	<ul style="list-style-type: none"> <li>• OC=Maintenance not in progress</li> <li>• CC=Maintenance in progress</li> </ul>

#### 1.3 - Rating:

Power Supply : 230VAC Nominal 50/60 Hz  
 Enclosure Rating : IP 44 (Analyser Cabinet)  
 Primary gases : SO<sub>2</sub>, CO<sub>2</sub>

**2. DOCUMENTS AND DRAWINGS :**

- ShipCEMS Continuous Emission Measurement System User Manual, Rev. 05, dated 12.05.2014
- Drawing Package\_ShipCEMS:
  - P300-1001, Rev. 04, General Arrangement Drawing Analyzer Cabinet External View;
  - P300-1002, Rev. 06, General Arrangement Drawing Analyzer Cabinet Interior Hook-Up Locations;
  - P300-1005, Rev. 06, General Arrangement Drawing Analyzer Cabinet Hook-Up/Wall Mounting External View;
  - P300-1202, Rev. 03, General Arrangement Drawing Heated Sample Probe Flange DN65-PN6 230Vac Electric Heated;
  - P300-1401, Rev. 01, General Arrangement Drawing Calibration Gas Cylinder Support Frame External View;
  - P300-1801, Rev. 06, General Arrangement Drawing Sample Conditioning System External View Hook-Up Details;
  - P300-1804, Rev. 05, General Arrangement Drawing Sample Conditioning Cabinet Hook-Up/Wall Mounting External View;
  - P300-1805, Rev. 03, General Arrangement Drawing Sample Conditioning System Junction Box Layout;
  - P300-1901, Rev. 03, General Arrangement Drawing Emergency Stop External/Interior View;
  - P300-3001, Rev. 05, System Diagram Analyzer Cabinet Stream Switching System;
  - P300-3002, Rev. 04, System Diagram Analyzer Cabinet PLC & Signal Conditioning;
  - P300-3801, Rev. 05, System Diagram Sample Conditioning System;
  - P300-5001, Rev. 03, Termination Diagram - Power Analyzer Cabinet - Interface ShipCEMS SO<sub>2</sub>/CO<sub>2</sub> Analysis;
  - P300-5002, Rev. 03, Termination Diagram PLC Logo Analyzer Cabinet;
  - P300-5101, Rev. 06, Termination Diagram Sample Conditioning System Heater & Flow Control Logic Junction Box;
  - P300-5102, Rev. 06, Termination Diagram Sample Conditioning System Back-Flush Option Junction Box;
  - P300-5201, Rev. 04, Termination Diagram - Signal Analyzer Cabinet - Interface Emission Monitoring System;
  - P300-5301, Rev. 03, Termination Diagram Heated Sample Probe Model 222.15/222.17 Plug Connections;
  - P300-5401, Rev. 03, Termination Diagram Cabinet Cooler System 194 Watt Peltier Element Analyzer Cabinet;
  - P300-S501, Rev. 03, Termination Diagram Signal SO<sub>2</sub>/CO<sub>2</sub> Analyzer D-Sub Pinout;
  - P300-5502, Rev. 03, Termination Diagram Signal SO<sub>2</sub>/CO<sub>2</sub> Analyzer D-Sub Pinout;
  - P300-5601, Rev. 03, Termination Diagram Emergency Power Switch SCS-Analyzer Cabinet;
  - P300-5701, Rev. 03, Termination Diagram Emergency Power Switch System Layout - Loop.

**3. TEST REPORTS :****Delta:**

- Test report No.: DANAK-19/13168, dated 21 June 2013.

**4. APPLICATION / LIMITATION :**

- 4.1 - BUREAU VERITAS Rules and Regulations for the Classification of Steel Ships.
- 4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**
- 4.3 - BUREAU VERITAS Environmental Category, **EC Code: 31**
- 4.4 - Use of the Exhaust Emissions Monitoring System must be included in the engine's technical file and detailed in the ship's on-board monitoring manual, which must be approved by the Administration.
- 4.5 - The Exhaust Emissions Monitoring System is in accordance with Notation **CLEANSHIP SUPER.**
- 4.6 - The Gas analysers must be operated and calibrated in accordance with the manufacturer's recommendations.
- 4.7 - The Exhaust Emissions Monitoring System must satisfy the accuracy and calibration requirement specified in the NO<sub>x</sub> Technical Code and MEPC Resolutions.(MEPC.130(49) - Guideline for on-board NO<sub>x</sub> verification procedure-direct measurement and monitoring method & MEPC.130(53) - Guidelines for on-board exhaust gas SO<sub>x</sub> cleaning systems).
- 4.8 - Installation of ShipCEMS on-board seagoing vessels.

**5. PRODUCTION SURVEY REQUIREMENTS:**

- 5.1 - The above products are to be supplied by **Vimex A/S** in compliance with the type described in this certificate.
- 5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note NR320.
- 5.3 - **Vimex A/S** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products :

**Svensk Analys AB**  
**Nyängsgatan 5,**  
**S-66434 Grums,**  
**Sweden**

**6. MARKING OF PRODUCT:**

- Maker's name or trade mark.
- Serial number of the units.
- Equipment type number or model identification under which it was type-tested.

**7. OTHERS:**

This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the units at any time and that **Vimex A/S - NORWAY** - will accept full responsibility for informing shipbuilders, shipowners or their sub-contractors of the proper methods of use and general maintenance of the units and the conditions of this approval.

\*\*\* END OF CERTIFICATE \*\*\*