

RAP-277

Type Approval Certificate – OPSIS M800 for SO₂, CO₂ and NO_x

DNV-GL, Hamburg, Germany, 2016-03-08



TYPE APPROVAL CERTIFICATE

DNV·GL

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the DNV GL Type Approval System.

Certificate No. **59 947 - 13 HH**

Company **OPSIS AB**
Skytteskogsvägen 16
24402 Furulund, SWEDEN

Product Description **Emission Monitoring System**

Type **M800**

Environmental Category **B, EMC2**

Technical Data /
Range of Application **Opsis M800 - a monitoring system for monitoring Emission in marine applications including Analyser, Emitter/Receiver, Power Supply, Optical Fibre Cable, Cabinet and Signal Handling System.**

M800 Marine System with the main components
- Analyser model AR620M - NDIR and NDUV analyser for monitoring gases such as NO, NO₂ (Nox), SO₂, H₂O and CO₂.
- Optical Emitter (type ER060M) and Optical Receiver (ER062M), the ER062 system can transmit and receive light over a light path up to 5m
- Optical Fibre Cable (OF060R/OF100B)
- Cabinet AC180M is the shelter for the analyzing moduls and consists all supply units such as control monitor, keyboard, main power supply, PS150 power supply for the xenon lamp, data logger, AC unit and pressure sensor, including air-condition (AC181)

Analyser type AR620M: Software version 7.21

Test Standard **GL Guidelines for the Performance of Type Approvals, Chapter 2- Test Requirements for Electrical / Electronic Equipment and Systems (VI-7-2), Edition 2003**

Documents **Test report for Opsis M800 marine emissions monitoring system (07.10.14), OPSIS M800 Marine Emissions Monitoring System - Report on NOx Monitoring Equivalence Tests (01.09.15); TÜV report no. 936/21213004/A (30.11.10), TÜV report no. 936/21213004/C (30.11.10)**

Remarks **This certificate is issued on the basis of GL Guidelines for the Performance of Type Approvals, Chapter 1 - Procedure (VI-7-1), Edition 2007.**

Valid until **2021-01-20**

Page **1 of 3**

File No. **I.A.03**

Hamburg, 2016-03-08

Type Approval Symbol



DNV GL

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This is to confirm that the OPSIS M800 has been tested in accordance with the relevant requirements of: NOx Technical Code 2008, "Technical Code on control of emission of nitrogen oxides from marine diesel engines" and Resolution MEPC.259(68) adopted on 15. May 2015, "2015 Guidelines for exhaust gas cleaning systems".

The exhaust gas analyser "OPSIS M800" is found to be suitable as a component of a continuous monitoring system of NOx- and SOx emissions to comply with the requirements of MEPC.259(68) as well as with relevant requirements of Revised MARPOL Annex VI and NTC 2008.

The "OPSIS M800", in combination with other equipment, may be used in the context of:

- Simplified measurement method (Chapter 6.3; NTC 2008),
- Direct Measurement and monitoring method (Chapter 6.4; NTC 2008),
- Continues monitoring of SOx emissions (Chapter 6; MEPC.259(68))

The "OPSIS M800" meets the following requirements:

- Principle of detection for SO₂ (MEPC.259(68), 6.2)
- Principle of detection for CO₂ (MEPC.259(68), 6.2 and NTC 2008, Appendix III, 3)
- Analyser Performance
 - Accuracy (NTC 2008, Appendix III, 1.6)
 - Precision (NTC 2008, Appendix III, 1.7)
 - Noise (NTC 2008, Appendix III, 1.8)
 - Zero and span drift (NTC 2008, Appendix III, 1.9 and 1.10)
 - Calibration curve (NTC 2008, Appendix IV, 5.5.1)
 - Interference effect (NTC 2008, Appendix IV, 9)
- The equivalence of the alternative sensors for NOx (NO + NO₂) have been demonstrated under surveillance and to the satisfaction of DNV GL in accordance with ISO 8178:2006 Part 1, Annex D.

Technical Data:

Component	Sensor type	Typical Range	Max. Range
SO ₂	NDUV	0 – 50 ppm	0 – 10000 ppm
CO ₂	NDIR	0 – 12 vol.-%	0 – 30 vol.-%
NO ₂	NDUV	0 – 50 ppm	0 – 100 ppm
NO	NDUV	0 – 1000 ppm	0 – 2000 ppm

The "OPSIS M800" shall be installed, calibrated and operated in compliance with the manufacturer's instructions and in accordance with the requirements and intervals as specified in Revised MARPOL Annex VI and NTC 2008.

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Page **2 of 3**

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For simplified measurement method (Chapter 6.3; NTC 2008), direct Measurement and monitoring method (Chapter 6.4; NTC 2008) the "OPSIS M800" must be operated and calibrated in accordance with the requirements and intervals specified in NOx Technical Code 2008.

Further Documents

Test plan TÜV no. 936/21214485/TP2 (17.02.11),
Test report OPSIS for OPSIS M800 marine emissions monitoring system (07.10.14),
Test reports: TÜV no. 936/21216959/A (07.02.12), TÜV no. 936/21213004/C (30.11.10),
TÜV no. 21198834 Fibre Optical Cable OF060/OF100 (23.04.13);
TÜV Declaration no. 21216959 (28.12.12),
Test report SERCO no. 0048/11 (29.06.11),
Test report Bertrandt no. 10146028 (11.11.11);

Data sheet AR600 Series Multi-Component Analysers (P2 2012 09),
Data sheet ER060 Series Emitter and Receiver Sets (P3 2012 09),
Data sheet OF060/OF100 Fibre Optic Cable (P9 2012 09),
Installation & User`s Guide OPSIS DOAS CEM System (Release 1),
Analyser Reference Manual AR500, AR600, AR550, AR650 SW-Version 7.21 (Release 2),

OPSIS Standard System Test GL (X19 010 110131),
Test report OPSIS IR Analyser AR650 (Q10 096 0806), TÜV Report no. 936/21220445/A (07.09.12)

Software Questionnaire Requirement Class 3 (12/2012)

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Page **3 of 3**

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