



TYPE APPROVAL CERTIFICATE
No. ELE061721XP

This is to certify that the product below is found to be in compliance with the applicable requirement of the RINA type approval system.

<i>Description</i>	APPARATUS FOR MONITORING SYSTEMS
<i>Type</i>	OPSIS M800 Gas Analyser
<i>Applicant</i>	Opsis AB BOX 244 244 02 FURULUND SWEDEN
<i>Manufacturer</i>	Opsis AB
<i>Place of manufacture</i>	BOX 244 244 02 FURULUND SWEDEN
<i>Reference standards</i>	Rules for the classification of ships.- Part C - Machinery, systems and fire protection. - Ch.3, Sect. 6, Table 1.

Issued in **GDANSK** on **May 20, 2021**. This Certificate is valid until **May 19, 2026**

RINA Services S.p.A.



This certificate consists of this page and 1 enclosure



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OPSIS M800 Gas Analyser

Product description:

OPSIS M800 is a complete monitoring system for emission monitoring in marine applications.

System M800 is based on transferring a beam of light from a light source over a chosen measurement path and then using advanced computer calculations to evaluate and analyze the light losses from molecular absorption along the path. The light from the light source includes both visible, ultraviolet and infrared wavelengths. The light is captured by a receiver and guided through an optical fiber to the analyzer. The optical fiber allows the analyzer to be installed away from potentially aggressive environments. The analyzer includes a spectrometer, a computer and associated control circuits.

Components:

- Analyser (AR600M/AR620M/AR650M),
- Emitter/Receiver (ER060M/ER062M),
- Power Supply (PS150-01M),
- Optical Fibre Cable (OF60R/OF100B),
- Signal Handling System and
- Cabinet AC180M or AC181M

Models:

- Analyser model AR600M - NDUV analyser for monitoring gases such as NO, NO₂ (NO_x) , SO₂ and NH₃ . For marine applications.
- Analyser model AR620M - NDIR and NDUV analyser for monitoring gases such as NO, NO₂ (NO_x) , SO₂, H₂O and CO₂ .For Marine applications. AR620M is sold for landbased applications under the name AR602Z/N.
- Analyser model AR650M - NDIR analyser for monitoring gases such as CO, HCL, HF, CH₄,TOC, NH₃, H₂O and CO₂ .For Marine applications. AR650M is sold for landbased applications under the name AR650/N.

Remark: DOAS is a name used by OPSIS to explain the optical filter used for NDUV and NDIR.

Technical Data/Specification:

Dimensions:	600 x 440 x 266mm
Weight incl. case:	50 kg
Supply voltage:	230 V (+6%/-10%), 115 V (+/- 10%) @ 50/60 Hz
Power consumption:	110 W
Degree of protection:	IP20
Ambient temperature:	+15°C - +25°C (+60°F - +80°F)



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OPSIS M800 Gas Analyser

Technical Data/Specification: (continued)

Analyser	Opsis M800 SO ₂ , AR620M	Opsis M800 CO ₂ , AR620M
Analyser type	NDUV	NDIR
Analyser range, max	0-10000 ppm	0-30 % vol
Analyser range, typ	0-50 ppm	0-12 % vol
Analyser output	4-20mA or MODBUS	4-20 mA or MODBUS
Data recording rate	25 seconds per point	25 seconds per point
Sampling	Same point and rate as for CO ₂	Same point and rate as for SO ₂
Installation on ships	Approved	Approved
Precision	Better than 0.5 ppm	Better than 0.3% vo
Noise	Better than 0.5 ppm	Better than 0.3% vol
Drift span	Less than 2% in 1 year	Less than 2% in 1 year
Drift zero	Less than 0.5 ppm in 1 year	Less than 0.3% vol in 1 year
Linearity	Better than 0.5 ppm deviation	Better than 0.3% vol deviation
Calibration curve	7 point incl zero	7 point incl zero
Calibration interval	1 year	1 year
Alternative calibration	Automatic System check	Automatic System check
Sampling	In Situ, Cross stack. wet	In Situ, Cross stack. wet
Gas drying, heated tube	NA	NA
Wavelength	UV 0.3 um	IR 2.0 um.

Test reports:

- Bertrandt vibrationtest.pdf
- OPSIS GL REPORT.pdf
- RAP-092_ISO17025.pdf
- SERCO_004811.pdf
- TUV_21216959.pdf
- TUV_21216959Y.pdf

Data sheets:

- P02_AR600M_Eng.pdf
- P03_ER060M_Eng.pdf
- P08_PS150M.pdf
- P09_OF060_Eng.pdf
- P20_AC180_Eng.pdf



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Specifications:

- 12742555.pdf Certificate
- 14-10-10 OPSIS M800 Confirmation of Compliance.pdf
- A41_Ships_SO2_Scrubber_Eng_150417.pdf Description
- Bertrandt_Akkreditierungsurkunde_EN_ISO_IEC_17025_KN.pdf
- c15-20111 - Opsis 32521 (1562145) JB signed .pdf
- d15-20111 - Opsis 32521 (1562145) (3) JB signed.pdf
- I15-20111 - Opsis 32521 (1562145) .pdf
- M800 CEMS Type Approval DNVGL.PDF
- OPSIS_Analyser_Manual.pdf
- OPSIS_UsersGuide.pdf
- RAP-169_ISO9001.pdf

Remarks:

This approval is granted only on the basis of positive outcome of verifications on board to be carried out and to all other applicable RINA Rules.

This certificate has replaced the previous certificate no. ELE190215XG.

GDANSK May 20, 2021

