



Type Approval Certificate

[Gas Monitoring System]

Initial Approval 30 August 2019

Manufacturer ABB Engineering (Shanghai) Ltd.
No.4528, Kangxin Highway, Pudong New District Shanghai, 201319 P.R. China

Product Description Emission monitoring system for marine applications

Type : GAA610-M

Intended for the measurement of SO₂ and CO₂ concentrations in exhaust gas

" See Appendix 1 "

Approval Condition " See Appendix 1 "

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows.

Pt. 6, Ch. 2, Art. 301 of the Rules for Classification, Steel Ships
MEPC.340.(77) and MARPOL Annex VI and NOx Technical Code 2008

This Certificate is valid until 29 August 2024

Reissued at Shanghai, China on 19 April 2022



This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "<http://e-cert.krs.co.kr>" by using the tracking No(ME22011381003) and certificate No.(SHI27710-AC001).



KOREAN REGISTER

*General Manager of
Technical Support Team
CHINA KR Co., Ltd.*

Note : 1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.
2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Product Description and/or Approval Condition

Date of Issue : 19 April 2022

A. Product Description

1. Product Specification

- 1) System Description (Type : GAA610-M)
GAA610-M is a system that monitors SO₂ and CO₂ concentrations in exhaust gas by sampling the gas into the gas analyzer through the probes with heated line and the sample conditioning system.
- 2) General Specification
 - Power Supply : 115/230VAC, 50/60Hz
 - External Communication : Ethernet Modbus TCP/IP, 4 x AO, 2 x DO, 2 x DI
 - System Comprising : Analyzer (Type : Uras26), Sampling Probe (Type : JES-301L), Sample Conditioning System (Type : SCC-C, SCC-F)
 - Measuring Principle : NDIR for SO₂, CO₂, O₂ for electrochemical cell
 - Measuring Range : SO₂ : 0 ~ 250ppm / 0 ~ 500ppm
CO₂ : 0 ~ 20% vol.
O₂ : 0 ~ 25% vol.
 - Accuracy/Linearity : $\leq \pm 1\%$ of full scale
 - Precision/Repeatability : $\leq \pm 0.5\%$ of full scale
 - Noise : $\leq \pm 0.2\%$ of full scale
 - Zero Drift : $\leq \pm 1\%$ of full scale

2. Approved Drawings and Documents

- 1) Drawing no. AUS-4498-00125-02-000, -100, -102, -103, -201, -301
- 2) Operating instruction no. OI/GAA610-M-EN Rev.B
- 3) Installation and commissioning instruction
- 4) Component data sheet 10/20-1.20 EN Rev.6, DS/GAA610-M-EN

3. Test Reports, etc.

- 1) Environmental Test
 - Test Report No. ULM04720180327001, UL112220190619002 issued by Unilab (Shanghai)
 - Test Report No. S714-ZD(1)-2018 issued by No.704 Research Institute of CSIC
 - Test Report No. A16-022-WT issued by SITIIAS
- 2) Performance Test
 - Test Report No. TP/Uras26/MEPC-EN Rev.A signed by DNVGL (2015-11)
 - Function Test Report No. 3KXG610FATG0115 (2019.08)

B. Approval Condition

1. Application & Limitation

- 1) Unless specially directed by the Administration, this approval is not to be construed as a substitute for a flag Administration's approval.
- 2) This approval is granted on the basis of the approved documentation and test reports.
- 3) The manufacturer should inform this Society of all kinds of the equipment including software. If the changes are recognized to affect functionality of the approved equipment, type test to confirm the reliability of the revised equipment may be performed in the presence of our surveyor.
- 4) Installation is to be in accordance with manufacture's instruction.
- 5) This approval only covers hardware listed under Product description.

2. Individual Product Cert. and Drawing Approval Requirement

- 1) Individual product Certification is not required.

3. Marking

- 1) The product or packing is to be marked with the manufacturer's name and type designation on a suitable position

< To be continued >

4. Others

- 1) Test condition

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Product Description and/or Approval Condition

Date of Issue : 19 April 2022

Approved Testing	Approved location	Remark
EMC	For other than bridge and deck zone	-
Temperature	+5 ~ +55°C	-
Vibration	Acceleration $\pm 0.7g$ Acceleration $\pm 4.0g$	Cabinet Probe
Degree of protection	IP54	-
Salt mist	Not to be installed in weather exposed areas	-

< The End >

