Certificate No: LR2402448TA
Issue Date: 06/10/2023
Expiry Date: 05/10/2028

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	**ABB Engineering (Shanghai) Ltd**
Address	P2, No.4528, Kangxin Highway, Kangqiao Pudong New District, Shanghai, 201319, China
Type	Emissions Monitoring System
Description	Analyser system cabinet Analyser module Uras26 for continuous monitoring of SOx and analyser module Limas21 UV for NOx emission continuous monitoring Options with air conditioning unit: types T-20 and T29
Trade Name	GAA610-M
Application	Marine applications for use in environmental categories ENV1 and ENV2 in the "General Power Distribution Zones" as defined in LR Type Approval System Test Specification No. 1 July 2021.
Specified Standard	IMO Resolution MEPC.340 (77) – 2021 Guidelines for Exhaust Gas cleaning Systems NOx Technical Code 2008 --Technical Code on control of emission of nitrogen oxides from marine diesel engines, where applicable.
Ratings	Power Supply: AC 115/230V, 50/60Hz

Downloaded Copy

Ning Guan

Electrical & Control - Senior Specialist to Lloyd's Register Classification Society (China) Co., Ltd.

12th Floor, Chong Hing Finance Centre, No. 288
Nanjing West Road, Shanghai, 200003, China

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Type Approval Certificate

Component (Calculated)	Sensor type	Measuring range	SO2/CO2 Ratio
SO2	NDIR	0~250ppm/0~500ppm	0~250
CO2	NDIR	0~20 vol.%	
O2	Electrochemical cell	0~25 vol.%	

Additional Tests

Vibration test for gas sample probe JES-301:
2Hz-25Hz, Displacement: ±1.6mm;
2Hz-100Hz, Acceleration: ±4.0g(39ms^2)

Other Conditions

1. The system type approval is limited to continuous monitoring of SOx emissions, as defined in IMO Resolution MEPC.340 (77) and NOx emissions, as defined in NOx Technical Code 2008 --Technical Code on control of emission of nitrogen oxides from marine diesel engines.
2. In order to completely fulfil the requirements of MEPC.340 (77) for "Continuous Emission Monitoring" and NOx- monitoring, additional equipment (e.g. sample probe, sampling tubes, gas dryer, data recording, engine performance measurements) will have to be installed in according to relevant requirements, and requirements of MEPC.340 (77) chapter 6.6 and 6.7 regarding SO_2 losses have to be observed.
3. In case ambient temperature is above 45°C, "Uras26 and Limas21 UV" may only be operated in an air conditioned cabinet.
4. The "ABB AO2000-Uras26 and Limas21 UV" shall be installed, calibrated and operated in compliance with the manufacturer's instructions.
5. Data recording and processing device is not covered by this certificate.
6. In justified cases where the CO2 concentration is reduced by the EGC unit, the CO2concentration can be measured at the EGC unit inlet, provided that the correctness of such a methodology can be clearly demonstrated.
7. If more than one analyser is to be used to determine the SO2/CO2 ratio, these should be tuned to have similar sampling and measurement times and the data outputs aligned so that the SO2/CO2 ratio is fully representative of the exhaust gas composition.
8. Extractive sample systems should be verified to be free of ingress leakage

Downloaded Copy

12th Floor, Chong Hing Finance Centre, No. 288
Nanjing West Road, Shanghai, 200003, China

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Type Approval Certificate

and the system is free of ingress on initial start-up.
9. The span gases for the SO2 and CO2 analyser should be a mixture of SO2 and/or CO2 and nitrogen at a concentration of more than 80% of the full scale of the measuring range used.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register Classification Society (China) Co., Ltd. of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: 18/80070

The Design Appraisal Document LR2402448TA and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Downloaded Copy

12th Floor, Chong Hing Finance Centre, No. 288
Nanjing West Road, Shanghai, 200003, China

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.