Certificate No: LR21310257TA
Issue Date: 26/04/2021
Expiry Date: 27/11/2024

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	**Shanghai Electric Cyeco Environmental Technology Co., Ltd.**
Address	No.2748, Pu Dong Avenue, Shanghai, 200129, China
Place of Production	Shanghai Electric Cyeco Environmental Technology Co., Ltd. No.2748, Pu Dong Avenue, Shanghai, 200129, China
Type	Filtration and UV Ballast Water Management System
Description	Ballast water management system (BWMS) using Filtration and UV ray Cyeco-B series
Trade Name	Cyeco
Application	On-board ballast water treatment
Specified Standard	Lloyd's Register Rules and Regulation for the Classification of Ships Part 5 and Part 6 as applicable, July 2020
Ratings	System Design Pressure:8bar System Design Temperature: 0~50°C Cyeco™-B200 (optional Ex) Rated treatment capacity: 200 m^3/h Main Components: Filter unit: CF200, UV unit: CU200, Body Material: 316L Cyeco™-B250 (optional Ex) Rated treatment capacity: 250 m^3/h

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Xiaodong Zhang

Lead Specialist and Section Leader for Engineering Section to Lloyd's Register Classification Society (China) Co Ltd

19th Floor, 550 Yan An dong Road, Shanghai, Huangpu District, China

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Main Components: Filter unit: CF250, UV unit: CU250, Body Material: 316L
Cyeco™-B300 (optional Ex)
Rated treatment capacity: 300 m^3/h
Main Components: Filter unit: CF300, UV unit: CU300, Body Material: 316L
Cyeco™-B400 (optional Ex)
Rated treatment capacity: 400 m^3/h
Main Components: Filter unit: CF400, UV unit: CU400, Body Material: 316L
Cyeco™-B500 (optional Ex)
Rated treatment capacity: 500 m^3/h
Main Components: Filter unit: CF500, UV unit: CU500, Body Material: 316L
Cyeco™-B600 (optional Ex)
Rated treatment capacity: 600 m^3/h
Main Components: Filter unit: CF600, UV unit: CU600, Body Material: 316L
Cyeco™-B750 (optional Ex)
Rated treatment capacity: 750 m^3/h
Main Components: Filter unit: CF750, UV unit: CU750, Body Material: 316L
Cyeco™-B800 (optional Ex)
Rated treatment capacity: 800 m^3/h
Main Components: Filter unit: CF800, UV unit: CU800, Body Material: 316L
Cyeco™-B1000 (optional Ex)
Rated treatment capacity: 1000 m^3/h
Main Components: Filter unit: CF1000, UV unit: CU1000, Body Material: 316L
Cyeco™-B1200 (optional Ex)
Rated treatment capacity: 1200 m^3/h
Main Components: Filter unit: CF1200, UV unit: CU1200, Body Material: 316L
Cyeco™-B1500 (optional Ex)
Rated treatment capacity: 1500 m^3/h
Main Components: Filter unit: CF750x2sets, UV unit: CU750x2sets, Body Material: 316L
Cyeco™-B2000(optional Ex)
Rated treatment capacity: 2000 m3/h
Main Components: Filter unit: CF1000x2sets, UV unit: CU1000x2sets, Body Material:316L
Cyeco™-B3000(optional Ex)
Rated treatment capacity: 3000 m3/h

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Main Components: Filter unit: CF1000x3sets, UV unit: CU1000x3sets, Body Material:316L
Cyeco™-B4000 (optional Ex)
Rated treatment capacity: 4000 m^3/h
Main Components: Filter unit: CF1000x4sets, UV unit: CU1000x4sets, Body Material:316L
Cyeco™-B5000 (optional Ex)
Rated treatment capacity: 5000 m^3/h
Main Components: Filter unit: CF1000x5sets, UV unit: CU1000x5sets, Body Material:316L
Cyeco™-B6000 (optional Ex)
Rated treatment capacity: 6000 m^3/h
Main Components: Filter unit:CF1200x5sets, UV unit: CU1200x5sets, Body Material: 316L
The following certified safe types of components may be installed in hazardous areas, provided the installation and application is in accordance with IEC60079-14, and the protection types are suitable for the hazardous areas intended to be installed in:
(1).UV unit comprising of:
- UV Disinfection Unit- Type: Cyeco™ BWMS-CU a(Ex), Exd II B T4 Gb;
- Junction Box-Type: JXB 380/220V AC,100A, Exd II B T6, DIP A20TA,T6;
- Temperature Transmitter-Type: TTG-, Ex d II CT1~T6;
- Cable gland-Type: TdJT-: Exd II C, Gb, DIP A21;

(2).High Pressure back flush filter comprising of:
- Cleaning driven motor-type:YB2-80M1-4-H, Exd II C T4 Gb;
- Junction box-type: JXB 380/220V AC,100A, Exd II B T6, DIP A20TA,T6;
- Proximity Switch-type:FA1.5-M8MD-Y, 8.2V, Exia II BT6;
- Differential pressure transmitter/switch-type: PT600, Ex d II CT4~T6 Gb / 530/7DD, Ex ed II C T4~T6;
- Pump motor-type: YB2-112M-4-H,Exd II C T5 Gb;
- Cable Gland-type: TdJT-, Ex d II C,DIP A21;

(3). Valves electrical driven device-Type: QT4Ex,Ex d II B T4 Gb;
(4).Electromagnetic flow meter-type: FEP315_U, Ex d II C T2~T6.

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Other Conditions

For application on a LR classed vessel, the following conditions to be complied with:-

1. Details of the location of the Ballast water management system, and its integration into the ships ballast system and electrical power distribution system are to be shown on the relevant plans and those are to be submitted for consideration in accordance with the applicable LR rules prior to installation.
2. Installation survey and commissioning is to be conducted for each installation on-board ship in accordance with Lloyd's Register specific survey requirements and with reference to IMO Res. MEPC.300 (72) on a case by case basis.
3. Pressure vessel within BWTS is to meet the requirements of Part 5, Chapter 11 if applicable.
4. Valves and other components intended for installation in pressure piping systems having working pressures exceeding 7 bar are to be surveyed at the manufacturer's works, LR Rules Part 5, Chapter 1 and Chapter 12refers.
5. Valves which are provided with remote control are to be arranged for local manual operation, independent of the remote operating mechanism.
6. Materials of Class III piping systems as defined in Part5, Chapter 12, Section 1.5 including mechanical joints, valves, flanges, steel pipes are to be manufactured and tested in accordance with the requirements of recognised National or International standards.
7. Materials used in the construction of machinery and its installation are not to contain asbestos, LR Rules Part 5, Chapter 1, Section2.2.2 refers.
8. The PLC panel is not to be used in Hazardous area.
9. The intended installation location ofCyeco™ BWMS models on board ships are to be suitable and incompliance with the requirements for such location.

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.

The Design Appraisal Document LR21310257TA and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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