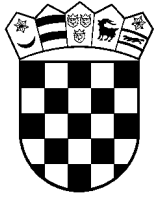


**POTVRDA O TIPNOM ODOBRENJU SUSTAVA ZA OBRADU  
BALASTNIH VODA**  
*TYPE APPROVAL CERTIFICATE OF BALLAST WATER MANAGEMENT SYSTEM*



**REPUBLIKA HRVATSKA**

**REPUBLIC OF CROATIA**

Izdana u ime Vlade REPUBLIKE HRVATSKE od HRVATSKOG REGISTRA BRODOVA

*Issued under the authority of the Government of the REPUBLIC OF CROATIA by the CROATIAN REGISTER OF SHIPPING*

Br. / No. 02-003288/025294

Potvrđuje se da je ovaj sustav za obradu balastnih voda pregledan i ispitan u skladu sa zahtjevima specifikacija sadržanih u Kodeksu za odobrenje sustava za obradu balastnih voda (Rezolucija MEPC.300(72)). Ova Potvrda vrijedi samo za ovaj sustav za obradu balastnih voda.

*This is to certify that the ballast water management system listed below has been examined and tested in accordance with the requirements of the specifications contained in the Code for Approval of Ballast Water Management Systems (Resolution MEPC.300(72)). This certificate is valid only for the ballast water management system referred to below.*

**Naziv sustava za obradu balastnih voda:**

*Name of ballast water management system:*

**BIO-SEA BWMS**

**Sustav za obradu balastnih voda proizveden od:**

*Ballast water management system manufactured by:*

**BIO-UV GROUP**

850 avenue Louis Medard

LUNEL 34400; FRANCE

**Oznaka tipa i modela, uključujući:**

*Under type and model designation and incorporating:*

B01-0055 do B14-2100 & L01-0030 do L04-0120 – sustav za obradu balastnih voda koji koristi filtraciju, te UV dezinfekciju.

*B01-0055 to B14-2100 & L01-0030 to L04-0120 – ballast water treatment system using filtration and UV disinfection.*

Vidi Tablicu 1 - Popis odobrenih BWMS

*See Table 1 - List of certified BWMS*

**Prema nacrtu opreme/sklopnom nacrtu br.:** Prema/ As per FIC-BET-27, rev.A

*To equipment / assembly drawing No.:*

**datum** -  
*date*

**Ostala oprema proizvedena od-:**

*Other equipment manufactured by-:*

**Filter/ Filter**

Proizvođač/Manufacturer: FILTREX S.r.l.

Tip/Type: ACB

Kapacitet/Capacity: 35 do/ to 2100 m<sup>3</sup>/h

Veličina mrežice/ Mesh size: 20 µm

Proračunski tlak/ Design pressure: 10 bar

Najveća radna temperatura/ Maximum working temperature: 55°C

**UV sklop/ UV assembly Bio-Sea B**

Proizvođač/Manufacturer: BIO-UV Group

Reaktor tip/Reactor type: Bio-Sea right/ left

Struja/Current: 400-440 VAC/ 50-60 Hz/ 3-fazna/ 3-phase

Min./ Max. snaga po lampi/Min./ Max. electric power per lamp: 11 kW (IMO)/14 kW (USCG)/ 22 kW

Najveći protok po reaktoru/ Maximum flow rate per reactor: 150 m<sup>3</sup>/h (IMO/MPN) ili/ or 100 m<sup>3</sup>/h (USCG/CMFDA)

Najveći radni tlak/Maximum working pressure: 10 bar

Najveća radna temperatura/Maximum working temperature: 120°C

**UV sklop/ UV assembly Bio-Sea L**

Proizvođač/Manufacturer: BIO-UV Group

Reaktor tip/Reactor type: Bio-Sea 30 m<sup>3</sup>/h

Struja/Current: 400-440 VAC/ 50-60 Hz/ 3-fazna/ 3-phase

Min./ Max. snaga po lampi/Min./ Max. electric power per lamp: 3 kW (IMO)/4 kW (USCG)/ 6 kW

Najveći protok po reaktoru/ Maximum flow rate per reactor: 30 m<sup>3</sup>/h (IMO/MPN) ili/ or 20 m<sup>3</sup>/h (USCG/CMFDA)

Najveći radni tlak/Maximum working pressure: 10 bar

Najveća radna temperatura/Maximum working temperature: 120°C

**Jedinica za kontrolu/ Control cabinet**

Proizvođač/Manufacturer: BIO-UV Group

Dio br./Part No.: CCB1P1.5kW do/to CCB2P9.2kW

Struja/Current: 400-440 VAC/ 50-60 Hz/ 3-fazna/ 3-phase

Temperaturno područje/ Temperature rating: 0-55°C; IP 55

Prema nacrtu opreme/sklopnom nacrtu br.: Prema/ As per FIC-BET-27, rev.A  
To equipment / assembly drawing No.:datum \_\_\_\_\_  
dateNazivni kapacitet obrade: Bio-Sea B 55-2100 m<sup>3</sup>/h  
Treatment rated capacity: Bio-Sea L 30 - 120

Ova Potvrda o tipnom odobrenju izdana je na osnovu odobrenja od Republike Francuske, izdanog od BV Marine &amp; Offshore,

Potvrda br.: 65393/A0 MMF

This Type Approval Certificate is issued based on approval by Republic of France, issued by BV Marine &amp; Offshore, Certificate No.: 65393/A0 MMF

Kopija ove Potvrde o tipnom odobrenju mora se nalaziti na brodu opremljenom ovim sustavom za obradu balastnih voda, za pregled na brodu. Ako je Potvrda o tipnom odobrenju izdana na osnovu odobrenja od druge Uprave, potrebno je navesti tu Potvrdu o tipnom odobrenju.

A copy of this Type Approval Certificate shall be carried onboard a ship fitted with this ballast water management system, for inspection onboard the ship. If the Type Approval Certificate is issued based on approval by another Administration, reference to that Type Approval Certificate shall be made.

Mjesto pečata  
Official stamp

Potpis

Signed

Marinko Popović, dipl.ing.

Uprava

Administration of

Republika Hrvatska

Republic of Croatia

Izdana

Issued this

18.

18<sup>th</sup>

dana

day of

lipnja 2021.

June 2021

Valjana do

Valid until this

18.

18<sup>th</sup>

dana

day of

lipnja 2025.

June 2025

**Tablica 1/ Table 1**

<b>Model</b>	<b>Max TRC IMO/MPN (m3/ h)</b>	<b>Max TRC USCG/CMFDA (m3/ h)</b>	<b>Min TRC (m3/ h)</b>	<b>Filter Filtrex</b>	<b>Broj/ Number of UV reactors</b>
B01-0055	55	55	50	ACB-904-080	1
B01-0087	87	87	50	ACB-906-100	1
B01-0135	135	100	50	ACB-910-150	1
B01-0150	150	100	50	ACB-915-150	1
B02-0190	190	190	100	ACB-915-150	2
B02-0255	255	200	100	ACB-935-200	2
B02-0300	300	200	100	ACB-945-200	2
B03-0340	340	300	150	ACB-945-200	3
B03-0450	450	300	150	ACB-955-250	3
B04-0515	515	400	200	ACB-955-250	4
B04-0600	600	400	200	ACB-985-300	4
B05-0515	515	500	250	ACB-955-250	5
B05-0750	750	500	250	ACB-985-300	5
B06-0770	770	600	300	ACB-985-300	6
B06-0900	900	600	300	ACB-999-350	6
B07-0770	770	700	350	ACB-985-300	7
B07-1040	1040	700	350	ACB-999-350	7
B08-1040	1040	800	400	ACB-999-350	8
B08-1200	1200	800	400	ACB-9100-400	8
B09-1350	1350	900	450	ACB-9100-400	9
B10-1040	1040	1000	500	ACB-999-350	10
B10-1500	1500	1000	500	ACB-9100-400	10
B12-1500	1500	1200	600	ACB-9100-400	12
B12-1800	1800	1200	600	ACB-9120-500	12
B14-1500	1500	1400	700	ACB-9100-400	14
B14-2100	2100	1400	700	ACB-9120-500	14

<b>Model</b>	<b>Max TRC IMO/MPN (m3/ h)</b>	<b>Max TRC USCG/CMFDA (m3/ h)</b>	<b>Min TRC (m3/ h)</b>	<b>Filter Filtrex</b>	<b>Broj/ Number of UV reactors</b>
L01-0030	30	20	13	ACB-903-065	1
L01-0055	30	20	15	ACB-904-080	1
L02-0035	35	35	20	ACB-903-065	2
L02-0055	55	40	20	ACB-904-080	2
L02-0060	60	40	25	ACB-906-100	2
L03-0055	55	55	30	ACB-904-080	3
L03-0087	87	60	30	ACB-906-100	3
L04-0087	87	80	40	ACB-906-100	4
L04-0120	120	80	45	ACB-910-150	4

UV reaktore se može ugraditi za paralelni rad radi većeg kapaciteta obrade (TRC).  
*UV reactors can be combined in parallel for higher TRC.*

**Granični radni uvjeti su opisani u ovom dokumentu (temperatura/salinitet):**

*Limiting operating conditions imposed are described in this document (temperature/salinity):*

Salinitet/ *Salinity*: bez ograničenja/ *no limitation*

Temperatura balastne vode/ *Temperature of ballast water*: bez ograničenja/ *no limitation*

Najmanje vrijeme zadržavanja između usisa i pražnjenja/ *Minimum holding time between uptake and discharge*: bez ograničenja/ *no limitation*

**Ostala ograničenja uključuju sljedeće:**

*Other restrictions imposed include the following:*

Najmanji intenzitet UV zračenja/ *Minimum UV intensity (IMO Mode)*:

Bio-Sea B  
150 W/m<sup>2</sup> pri smanjenom protoku/ *at reduced flow*  
750 W/m<sup>2</sup> pri punom protoku/ *at full flow*

Bio-Sea L  
900 W/m<sup>2</sup> pri smanjenom protoku/ *at reduced flow*  
2100 W/m<sup>2</sup> pri punom protoku/ *at full flow*

Najmanji intenzitet UV zračenja/ *Minimum UV intensity (USCG Mode)*:

Bio-Sea B  
725 W/m<sup>2</sup> pri smanjenom protoku/ *at reduced flow*  
1440 W/m<sup>2</sup> pri punom protoku/ *at full flow*

Bio-Sea L  
1700 W/m<sup>2</sup> pri smanjenom protoku/ *at reduced flow*  
2900 W/m<sup>2</sup> pri punom protoku/ *at full flow*

**Ova oprema je projektirana za rad u sljedećim uvjetima:\***

*This equipment has been designed for operation in the following conditions:\**

Najveći radni tlak/ *Maximum working pressure*: 10 bar

Temperatura okoline/ *Ambient temperature*: 0°C do/ *to* 55°C

\* Unesi projektna ograničenja sustava  
Insert system design limitations