

**POTVRDA O TIPNOM ODOBRENJU**
*TYPE APPROVAL CERTIFICATE*Br / No **03-001523/031218**

Potvrđuje se da je ovaj proizvod, u skladu s Pravilima za klasifikaciju brodova, Dio 1. - Opći propisi, Odjeljak 3. - Tipno odobrenje proizvoda, odobren za ugradnju na brodove i postrojenja pod nadzorom Hrvatskog registra brodova.

This is to certify that this product, on the basis of the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products, is approved for use on board ships and installations under supervision of the Croatian Register of Shipping.

TIP I OPIS PROIZVODA:*TYPE AND DESCRIPTION OF PRODUCT:***SUSTAV UPRAVLJANJA ME MOTORIMA***ME ENGINE CONTROL SYSTEM***MAN B&W ME-ECS****SW version – 1601-x.y.****PROIZVOĐAČ:**
*MANUFACTURER:***MAN Diesel & Turbo**
Tegholmegade 41
DK-2450 COPENHAGEN SV
*DENMARK***PROIZVOD UDOVOLJAVA SLIJEDEĆIM PRAVILIMA/PROPISIMA:***THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:*

Hrvatski registar brodova: **Pravila za klasifikaciju brodova,**
Dio 9. – Strojevi, Dio 13. – Automatizacija

Croatian Register of Shipping: *Rules for the classification of ships,*
Part 9. – Machinery, Part 13. – Automation

IACS UR E10**DETALJI O PROIZVODU I UVJETIMA CERTIFIKACIJE DANI SU NA POLEĐINI.***FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.***ODOBRENJE VRIJEDI DO:** **2020-09-22**
*APPROVAL IS VALID UNTIL:***Mjesto i datum** Split, 2016-09-22
*Place and date***M.P.**
(Seal)

Marinko Popović, dipl.ing.

Napomena: Ova potvrda nije valjana ako se proizvod ili način njegove proizvodnje promijenio u odnosu na tipno ispitani proizvod. Proizvođač treba obavijestiti Hrvatski registar brodova o bilo kojoj izmjeni na proizvodu kako bi ishodio valjanu potvrdu.

Note: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

PODROBNIJI OPIS PROIZVODA:**DETAIL PRODUCT DESCRIPTION:**

ME-ECS je elektronički sustav upravljanja hidrauličko-mehaničkim ubrizgavanjem goriva i ispušnim ventilima za MAN B&W dvotaktne diesel motore. Sastoji se od više upravljačkih jedinica:

ME-ECS is an electronically controlled system for the hydraulic-mechanical fuel injection and exhaust valves actuation for MAN B&W 2-stroke diesel engines. It is consisted of several control units:

<i>Bridge Panel (through en external RCS system)</i>	<i>SBU - Switchboard Unit</i>
<i>MOP – Main Operating Panel (engine control room)</i>	<i>MPC – Multi purpose Controller</i>
<i>ECMOP – Main Operating Panel (Touchscreen)</i>	<i>MPC-10 – Multi Purpose Controller (CCU)</i>
<i>LOP – Local Operation Panel (engine side)</i>	<i>HPS – Hydraulic Power Supply</i>
<i>ECU – Engine Control Unit</i>	<i>HCU – Hydraulic Cylinder Unit</i>
<i>EICU – Engine Interface Control Unit</i>	<i>ELFI – Electronic Fuel Injection</i>
<i>ACU – Auxiliary Control Unit</i>	<i>ELVA – Exhaust Valve Activation</i>
<i>CCU – Cylinder Control Unit</i>	<i>ALS – Alpha Lubricator System</i>
<i>SCU – Scavenging Air Control Unit</i>	<i>SAV – Starting Air Valve</i>
<i>MCU – Master Control Unit</i>	<i>CPS – Crankshaft Position Sensors</i>
<i>BCU – Backup Control unit</i>	<i>Other components as specified in approval letters</i>

TEHNIČKA DOKUMENTACIJA / NACRTI:**TECHNICAL DOCUMENTATION / DRAWINGS:**

ME-ECS General System Information, 3099296-9.01, dated 2013.06.06.

ME-ECS General System Information, 3099296-9.03, dated 2016.02.22.

PODRUČJE PRIMJENE / POSEBNI I GRANIČNI UVJETI:**APPLICATIONS / LIMITATIONS:**

<i>Engine start, stop and reversing</i>	<i>Monitoring (for alarm and safety systems)</i>
<i>Control of fuel injection, exhaust and start valve activation</i>	<i>Scavenging air pressure control (optional)</i>
<i>Automatic speed control</i>	<i>Autotuning (optional)</i>
<i>Control of cylinder lubrication</i>	

DOKUMENTACIJA ZA TIPNO ODOBRENJE:**TYPE APPROVAL DOCUMENTATION:**

Programme for the Type Approval Test of MAN B&W ME-ECS v. 1601-2, Document No. 3090685-1 rev.3.1, approved by CRS letter 571/TSE/VB/031218 dated 2016-03-11.

Type Approval Test of ME-ECS-SW version 1601 witnessed by CRS at Mitsui Engineering & Shipbuilding Co., Ltd. Tamano, Japan on the 16/17 March 2016.

The entire list of electronic components for ECS 3093398-0 is reviewed by CRS. New components are added and approved up to including Rev.9 dated 2016.08.26 based on submitted relevant Environmental Test reports.

OZNAČAVANJE PROIZVODA:**MARKING OF PRODUCT:**

Ime proizvođača, tip proizvoda, serijski broj-identifikacija, datum proizvodnje, napon napajanja i programska izvedba.

The Manufacturer and Type Designation of the product, serial number, date of manufacture, supply voltage and software version.

UVJETI ZA CERTIFIKACIJU:**CONDITIONS OF CERTIFICATION:**

Za svaku primjenu na brodovima klase HRB-a, potrebno je dostaviti kompletnu tehničku dokumentaciju s nacrtima na pregled i odobrenje prije postavljanja na brod. Značajnije izmjene u software-u moraju biti odobrene prije primjene na brodu.

Pojedinačni prihvata motora obvezno mora uključiti provjeru funkcionalnosti ME-ECS sustava upravljanja.

For each application on board CRS classed vessels complete technical documentation and drawings shall be submitted for examination and approval prior installation on board. Major changes in the software are to be approved before on board application.

Each engine FAT test must include ME-ECS Integration Test with particular engine.