

**POTVRDA O TIPNOM ODOBRENJU**
TYPE APPROVAL CERTIFICATEBr / No **03-001524/031218**

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 STROJEM S DVOJNIM GORIVOM
DUAL FUEL ENGINE CONTROL SYSTEM**MAN B&W ME-LGI ECS – sw 1601-x.y.****PROIZVOĐAČ:**
MANUFACTURER:**MAN Diesel & Turbo**
Teglholmmsgade 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 dateM.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.

PODROBNJI OPIS PROIZVODA:**DETAIL PRODUCT DESCRIPTION:**

LGI-ECS je sustav upravljanja za MAN B&W dvotaktne motore ME-C/B s dvojnim gorivom. Pored osnovnog ME-ECS sustava sastoji se i od više upravljačkih modula u funkciji LGI-ECS-a:

LGI-ECS is Control System for MAN B&W 2-stroke ME-C/B dual fuel engines. On top of the main ME-ECS system, it consists also of several additional control modules in LGI-ECS function:

ME – ECS	LGI – ECS
MOP – Main Operating Panel (engine control room)	
LOP – Local Operation Panel (engine side)	Control Units:
ECU – Engine Control Unit	SACU Second Fuel Auxiliary Control Unit (MPC type)
EICU – Engine Interface Control Unit	SPCU Second Plant Control Unit (MPC type)
ACU – Auxiliary Control Unit	
CCU – Cylinder Control Unit	System Major Components:
SCU – Scavenging Air Control Unit	LFLSS Low flashpoint liquid (LFL) Fuel Supply System
MCU – Master Control Unit	FVT Fuel Valve Train
BCU – Backup Control unit	FBIV Fuel Booster Injection Valve
MPC – Multipurpose Controller	ELFI-L Electronic Fuel Injection Valve (liquid second fuel SF)
HCU – Hydraulic Cylinder Unit	ELBI Electrical Block Injection Valve
ELFI – Electronic Fuel Injection	
ELVA – Exhaust Valve Activation	Safety Units:
ALS – Alpha Lubricator System	SPSU Second Fuel Plant Safety unit (MPC type)
CPS – Crankshaft Position Sensors	SCSU Second Fuel Cylinder Safety Unit (DASU type)

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

ME-LGI ECS General System Information, 3099567- 8.1 and 3099567- 8.2 dated 2016.02.26, approved by CRS letter 1733/TSE/VB/TSEv/KF/031218 dated 2016-07-11.

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

Sustav je primjenjiv samo na MAN B&W dvotaktne ME i ME/B motore s dvojnim gorivom. Zajedno s dodatnim mehaničkim komponentama za plin, sustav upravlja brzinom, alarmima i zaštitom motora.

The control system is applicable for the MAN B&W ME and ME/B type of two-stroke dual fuel engines only. Together with additional mechanical components, system contain speed governing, engine alarm and safety functions.

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

Programme for the Type Approval Test of MAN B&W ME-LGI Control system v.1601-2, Document No. 3094514-8 rev.1.1, dated 2016-03-01 and approved by CRS letter 571/TSE/VB/031218 dated 2016-03-11.

Type Approval Test of MAN B&W ME-LGI Control System v.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 LGI-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 LGI-ECS Integration Test with particular engine.