

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Engine Control System**with type designation(s)
ECS-800 Eco-Engine Control System

Issued to

Nabtesco Corporation
Kobe 28, Japanis found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Location classes / references to Type Approval Certificates are listed in product description.**Issued at **Høvik** on **2018-01-24**This Certificate is valid until **2020-01-23**.for **DNV GL**DNV GL local station: **Kobe**Approval Engineer: **Bartosz Kabak**

Odd Magne Nesvåg
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Job Id: **262.1-023601-1**
Certificate No: **TAA00001G9**

Place of Manufacture

Nabtesco Corporation Marine Control System Company Seishin Plant
1617-1, Fukuyoshidai, 1-chrome, Nishi-ku, Kobe-shi, Hyogo 651-2313
Japan

Product description

ECS-800 Eco-Engine Control System is designed to control the fuel injection system, exhaust valve system, starting (braking) air system and cylinder oil lubricator system electronically for the large marine diesel engine type UEC Eco-Engine.

ECS-800 Eco-Engine Control System consists of hardware covered by this certificate and separate DNV GL Type Approved as follows:

C&C UNIT (CPU and Cylinder control)	PCB cards	Software Version	Location classes
	SCC-111 / 112 SCC-511 / 512 CCB-303	DVEVA_01V1000.mot (CPU) S511_01E.mot (CCU)	Temperature B Humidity B Vibration B EMC A
AS UNIT (Analog Sampling)	PCB cards	Software Version	Location classes
	SCC-421 SCC-422	S421_01E.mot	Temperature B Humidity B Vibration B EMC A
MIO UNIT (Multi Input Output)	PCB cards	Software Version	Location classes
	SCC-261 SCC-262 SCC-263	S261_01.mot	Temperature B Humidity B Vibration B EMC A
HUB UNIT (communication HUB)	PCB cards	Software Version	Location classes
	SCC-301 SCC-302	S302_09A.mot	Temperature B Humidity B Vibration B EMC A
DRV CARD (solenoid valve DRiVer)	PCB cards	Software Version	Location classes
	CCB-301 CCB-104	C301_01D.mot	Temperature B Humidity B Vibration B EMC A
MCP (local control box)	Software Version		TAC ¹
	W101EC01.mot		TAA000007M_rev.1
CDP (LCD unit)	Software Version		TAC ¹
	901EC01A.mot (control system) and CL01E.V9 (display data)		TAA000007M_rev.1
AC/DC convertor ADA600F-24 and ADA-1000F			TAC ¹
			TAA00000ME
Noise filter RG-208F2			TAC ¹
			TAA000007M_rev.1

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Absolute encoder TS5972N	Location classes
	Temperature B Humidity B Vibration B EMC A

¹⁾ TAC – Type Approval Certificate number. These are the TAC numbers valid at the date of issue of this TAC. When the TAC numbers are renewed during the period of validity of this TAC, the new TAC number applies.

Software revisions valid for this approval are placed in Software Management List rev. ax7 dated 2017/6/7. Any software modifications shall be logged in a maintenance document.

Software is identified on each component on separate labels.

Application/Limitation

1. This certificate is valid only for systems applications made and delivered by production facilities listed under Place of Manufacture for engines series listed under Product Description provided they hold a valid DNV GL Type Approval Certificate
2. The Type Approval covers software and partially hardware (listed under product description)
3. The Type Approval does not cover safety, monitoring and alarm system. Those systems shall be approved separately
4. Emergency stop circuits between engine and external location are not part of this Type Approval certificate

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- Information about engine type
- Circuit diagram²
- Software versions used in specific delivery
- System block diagram³
- Power supply arrangement (can be part of system block diagram)
- Instrument and equipment list⁴
- Test program for certification

²⁾: for engines type different than those listed in product description

³⁾: The main components on the drawing / diagram are to be identifiable towards the hardware list under product description

⁴⁾: Any component included in Nabtesco project delivery, but not listed in this Type Approval certificate is to be highlighted in the equipment list and on the required block diagram

Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system, preferably at the engine/system application maker integrating control, monitoring and safety system, before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

Software update notification

When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

Type Approval documentation

Tests carried out

Applicable tests according to DNVGL-CG-0339 Edition November 2016.
Functional Type Testing performed at Nabtesco Corporation Marine Control System Company Seishin Plant.

Marking of product

Each module shall be externally marked to enable identification in accordance with the documentation and be marked with the manufacturer's name.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE