



Certificate No:
TAA0000380

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Engine Safety, Control and Alarm System

with type designation(s)

Safety, C&M system for diesel engines Bergen Engines B33:45 L/V

Issued to

Bergen Engines AS
Bergen, Norway

is found to comply with

DNV 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.

References to hardware certificates and location classes are found on page 2.

Issued at **Høvik** on **2022-11-28**

This Certificate is valid until **2024-11-27**.

for **DNV**

DNV local unit: **Bergen**

Approval Engineer: **Sergey Gilmiyarov**

Jan Tore Grimsrud
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Place of system manufacture

The System is manufactured, assembled, mounted and tested at:

Bergen Engines AS,

Hordvik,

Norway

Product description

Safety, Control and Monitoring System for diesel Bergen Engines with type designation B33:45 L/V used in Single propulsion engine, multi-engine propulsion and auxiliary applications. System performs speed control, monitoring and safety shutdowns of the diesel engine.

Separately Type Approved hardware		
Module type	Description	Type Approval Certificate ¹⁾
LECM	Digital Speed Control (governor)	TAA0000097
WAGO 750-8212/025-0000	Safety PLC	TAA00001J4
WAGO 750-8216/025-0000	Control PLC	TAA00001J4
Beijer X2 Pro 12"	Local Operator Panel	TAA00000N8
Weidmuller IE-SW-BL05T-5TX	Switch	TAA0000112
Schaller	Oil Mist detector	TAA00002D0
Woodward 8528-32*/UG25+	Fuel actuator	TAA00002C7
1) These are the TA numbers valid at the date of issue of this TA. When the TA are renewed during the period of validity of this TA, the new TA applies.		

Module	Number	Notes
Safety PLC	Vx1_x2_x3	x1 = major release number, x2 = minor release number, x3 = build number
Control PLC	IPC_XXXXX_Vx1_x2_x3	XXXXX = engine number, or first engine no in an engine series, x1 = major release number, x2 = minor release number, x3 = build number
LECM Main	Vx1_x2_x3	x1 = major release number, x2 = minor release number, x3 = build number
LECM Aux	AUXRTCDC_10P_14T_2ST_4S_x1_x2	x1 = version, x2 = build nr

Numbering of software revisions is performed according to the document EL4011/08 Control System Software Change Procedure

Software update notification

When the type approved software is revised (affecting all future deliveries) DNV 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.

Application/Limitation

1. This certificate is valid only for systems applications made and delivered by production facilities listed under Place of system manufacture for engines series listed under Product description, provided they hold a valid DNV Type Approval Certificate.
2. The Type Approval covers hardware and software listed under Product description.
3. The system is suitable for use in single propulsion engine, multi-engine propulsion and auxiliary applications.
4. Operator Panels are not fulfilling DNV Rules requirements for alarm handling and presentation. Connection to separate/additional equipment shall be provided. The supplied alarm list is guidance for implementation of alarms to be activated in the alarm handling system.
5. System shall be built as shown on block diagram: System block diagrams (Doc. no.: EL 4015/97 Rev. A)
6. System power supply shall be provided as shown in document "Power Distribution" (Doc. no.: EL4018/35, Rev. 0)
7. System shall be certified in accordance to project specific procedure based on "Marine Control System Test Procedure" (Doc. no.: EL4018/40 Rev. C)
8. Provided remote access to the control system is meeting DNV requirements in Pt. 4 Ch. 9 Sec. 1 (1.5.6)

Approval conditions

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

- Reference to this Type Approval Certificate²⁾,
- Reference to valid hardware DNV Type Approval Certificate numbers, if they are different than the ones listed on table under Product description²⁾,
- Information about engine technical data (type, output power, number of Turbochargers)²⁾,
- Information about engine intended use (propulsion, auxiliary, etc.)²⁾,
- Reference to valid DNV Type Approval Certificate for Oil Mist Detector when applicable²⁾,
- Software versions and numbers used in specific delivery²⁾,
- List of control and monitored points with defined indications, alarms, load reductions and shutdowns, including identification of which automatic safety actions can be overridden,
- Confirmation that Application/Limitation points 5 and 6 are fulfilled²⁾,
- Confirmation that Application/Limitation point 7 will be fulfilled during certification²⁾,
- Project specific test procedure document number and revision²⁾,

2) Information is to be submitted as document: **"Approval Template for Engine Safety, C&M system for B33:45 L/V according to TAA0000380"**

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.

Application software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV for evaluation and approval before implemented on board.

Type Approval documentation

Tests carried out

- System type test (multi-engine propulsion) performed at Bergen Engines premises, Hordvik, Norway, at 2022-04-20
- System type test (single-engine propulsion) performed at Bergen Engines premises, Hordvik, Norway, at 2022-09-20.

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