

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Engine Safety, Control and Alarm System**

with type designation(s)

**Engine Safety, C&M System for Bergen Engines B32:40L, B32:40V, B33:45L and C25:33 used in Single Main Engine applications**

Issued to

**Bergen Engines AS  
Hordvik, Norway**

is 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.****References to hardware certificates and location classes are found on page 2.**Issued at **Høvik** on **2019-10-30**This Certificate is valid until **2021-10-29**.for **DNV GL**DNV GL local station: **Bergen**Approval Engineer: **Krzysztof Aleksander Jankowski****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.



Job Id: **262.1-028941-1**  
Certificate No: **TAA000026U**

## Place of system manufacture

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

**Bergen Engines AS,**  
Hordvik,  
Kingdom of Norway

## Product description

Safety, Control and Monitoring System for 4-stroke diesel engines with type designation B32:40L, B32:40V, B33:45L and C25:33 used in Single Main Engine applications.

### Separately Type Approved hardware

| Module type                                                                                                                                              | Description                      | Type Approval Certificate <sup>1)</sup> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------|
| Woodward 723+                                                                                                                                            | Digital Speed Control (governor) | TAA000000E                              |
| Simatic S7-300                                                                                                                                           | Safety PLC                       | TAA0000225                              |
| Simatic S7-300                                                                                                                                           | Control PLC                      | TAA0000225                              |
| Beijer T70                                                                                                                                               | Local Operator Panel             | TAA00000TZ                              |
| 700-600-CAN81                                                                                                                                            | CAN 300 module                   | TAA000028G                              |
| Beijer X2 Series                                                                                                                                         | Operator Panel                   | TAA00000N8                              |
| RRADI16 <sup>2)</sup>                                                                                                                                    | Can I/O cards                    | TAA00001FA                              |
| RRPWR16 <sup>2)</sup>                                                                                                                                    | Can I/O cards                    | TAA00001FA                              |
| PSM-ME RS232/485-P <sup>2)</sup>                                                                                                                         | Interface converter              | TAA00001KR                              |
| 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. |                                  |                                         |
| 2) Modules installed in junction box having 2 vertical and 2 horizontal vibration isolators.                                                             |                                  |                                         |

### System software versions

| Module                                                                               | Number       | Version                         | Applications     |
|--------------------------------------------------------------------------------------|--------------|---------------------------------|------------------|
| Safety PLC                                                                           | STD_SAF_CON_ | SAFETY PLC_V29.x <sup>4)</sup>  | All              |
| Control PLC                                                                          | STD_SAF_CON_ | CONTROL PLC_V32.x <sup>4)</sup> | All              |
| Woodward 723+                                                                        | 5418-2271    | N                               | Power generation |
|                                                                                      | 9927-795     | E                               | Propulsion       |
| 4) "x" indicates minor software changes without effect on DNV GL Rules requirements. |              |                                 |                  |

### The software version history documents reference

| Title                                             | Number    | Revision | Date       |
|---------------------------------------------------|-----------|----------|------------|
| Revision history PLC Program_Std_Saf_Con          | ---       | V38      | 2019-01-16 |
| Speed Ctrl Release Notes Marine Diesel Generator  | EL1065/46 | D        | 2016-12-16 |
| Speed Ctrl Release Notes Marine Diesel Propulsion | EL4000/86 | B        | 2018-08-16 |

### 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.

## 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 GL Type Approval Certificate.
2. The Type Approval covers hardware and software listed under Product description.

3. The system is suitable for use in Single Main Engine, multi-engine, auxiliary and emergency applications.
4. Operator Panels are not fulfilling DNV GL 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. The test procedure 'EL1179\_61' (rev. B) shall be performed during the engine Factory Acceptance Test.
6. Short circuit of auto-stop circuits to be monitored when in use as single engine propulsion plant, reference to Pt.4 Ch.9 Sec.2 [2.1.2].
7. System shall be built as shown on block diagram: "MEDIUM with ECC off engine" in document "System description Instrumentation level Medium Safety, Control, and Monitoring System for Diesel Engine" (Doc. no.: EL1019/24-1, Rev. F, dated: 2018-10-09)
8. System power supply shall be provided as shown in document "Power supply principle Single engine" (Doc. no.: EL4007/45, Rev. ---, dated: 2018-09-21)
9. Optional splash oil temperature monitoring system is not part of this type approval certificate and is not considered as approved for crankcase explosive condition monitoring. The DNV GL Type Approved Oil Mist Detector system shall be used.

### Approval conditions

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

- Reference to this Type Approval Certificate<sup>5)</sup>,
- Reference to valid hardware DNV GL Type Approval Certificate numbers, if they are different than the ones listed on table under Product description<sup>5)</sup>,
- Information about engine technical data (type, output power, number of Turbochargers)<sup>5)</sup>,
- Information about engine intended use (propulsion, auxiliary, etc.)<sup>5)</sup>,
- Reference to valid DNV GL Type Approval Certificate for Oil Mist Detector when applicable<sup>5)</sup>,
- Software versions and numbers used in specific delivery<sup>5)</sup>,
- 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, 6, 7, 8 are fulfilled<sup>5)</sup>,
- Test program for certification.

- 5) Information is to be submitted as document: "**Approval Template for Engine Safety, C&M System for Bergen Engines B32:40L, B32:40V, B33:45L and C25:33 used in Single Main Engines applications according to TAA000026U**" (Document no.: TD0006\_04, Rev.OR, dated: 2019-10-25)

#### 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 GL for evaluation and approval before implemented on board.

### Type Approval documentation

#### Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2001.

System test performed at Bergen Engines, Hordvik, Kingdom of Norway,

Dated: 2013-06-18, 2015-11-25 and 2016-12-20.

System type test performed at Bergen Engines premises, Hordvik, Kingdom of Norway,

Dated: 2018-09-19

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### **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