DNV·GL

Certificate No:
TAA00000K5

TYPE APPROVAL CERTIFICATE

This is to certify:

That the NOx Selective Catalytic Reduction Control System

with type designation(s)
Engine Exhaust Control "EEC"

Issued to
Scania CV AB (Publ)
Södertälje Stockholms Län, Sweden

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product approved by this certificate is accepted for installation on all vessels classed by DNV GL.
Location classes can be found on page 2.

This Certificate is valid until **2019-04-03**.

Issued at **Høvik** on **2017-04-06**
DNV GL local station: **Stockholm** for **DNV GL**

Approval Engineer: **Krzysztof Aleksander Jankowski**

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.

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Product description

The Engine Exhaust Control "EEC" – is a system responsible for controlling components in the after treatment SCR system for Scania CV AB diesel engines series DI13 091M, DI13 092M and DI16 091M

The functionality includes:

- Control and diagnostics of a Urea Dosing System "UDS".
- Sensor management and signal processing for sensors in the exhaust-system.

EEC3 forwards exhaust sensor data to EMS-S8 (ECU). The ECU calculates dosing-amounts based on engine catalyst operating point. EEC3 receives the requested dosing-amount and is responsible for supplying AdBlue.

Main System components with environmental classes					
Component	Temperature	Humidity	Vibration	EMC	Enclosure
EEC3 (SCR diagnostic and control unit)	D	B	A	A	C
EMS-S8 (Engine and SCR control unit)	D	B	B	A	C
SCR Pump	D	B	A	A	C

EEC3 hardware versions	
Engine type	Hardware version
DI13 091M	1918851
DI13 092M	
DI16 091M	

EMS-S8 (ECU) hardware versions	
Engine type	Hardware version
DI13 091M	1857180
DI13 092M	1857180
DI16 091M	1869762

Software versions		
Engine type	**Controller**	
	EEC3	EMS-S8 (ECU)
DI13 091M	03.74	74.23
DI13 092M		
DI16 091M		

Software development and maintenance is described in documents:

1. Software process for the development of software for production (doc. NE07236.docx)
2. Testing of software (doc.NE11132)
3. Traceability of software - Software Configuration Management (SCM)

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.

Place of manufacture

Scania CV AB
Södertälje
Stockholms Län
Kingdom of Sweden

Marking of product

For EEC3:

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Manufacturer name
Software number:
Hardware number:

For EMS-S8:
Manufacturer name
Engine type:
Engine No:
ECU Clp No:
Hardware version No:

Application/Limitation

1. The Type Approval covers hardware and software listed under Product description.
2. 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.
3. The system intended for multiengine propulsion plants, and engines used for auxiliary and emergency purposes only.
4. List of controlled and monitored points (with defined alarm and shutdowns, including identification of which automatic safety actions can be overridden) shall comply with DNV GL Rules for Ships Pt.4 Ch.6 Sec.8 Table 2 taking into consideration Application/limitation points 5 and 6.
5. System is approved to use post turbine pressure monitoring instead of required by DNV GL Rules for Ships Pt.4 Ch.6 Sec.8 Table 2 pressure drop across unit alarm high.
6. System contains Anti Slip Converter "ASC" for keeping ammonia slip level 15 ppm and for monitoring required by DNV GL Rules for Ships Pt.4 Ch.6 Sec.8 Table 2.
7. System shall be equipped with dual power supply.
8. Power supply inputs are equipped with internal shortcircuit protection.
9. Surge protector for EEC3 power supply shall be installed in every delivery.
10. Alarm handling system (Human – Machine Interface) is not included in the system and need to be evaluated separately.
11. Case-by-case approval and system certification may be requested if the Approval conditions are not met or the system configuration is found not to be in alignment with the requirements from DNV GL Rules.

Approval conditions

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

- Reference to this DNV GL Type Approval Certificate
- Information about engine type and intended use (propulsion, auxiliary, etc.)
- Software version used in specific delivery
- System block diagram showing overall system layout
- Confirmation that list of controlled and monitored points is as stated in Application/Limitation point 4
- Confirmation that power supply arrangement is as stated in Application/Limitation point 7

Product certificate
As long as the units are covered by the Type Approval and all Application/Limitation points including approval documentation submittal are fulfilled, a product certificate according to Pt.4 Ch.9 Sec.1 [1.2.3] will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

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. Certification of modified functionality may be required for the particular vessel.

Tests carried out

Applicable tests according to Class Guideline DNVGL-CG-0339, November 2016.

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Functional Type Testing performed at Scania AS premises, Södertälje, Stockholms Län, Kingdom of Sweden at 2017-01-18

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.