



Certificate No:
TAA0000303

TYPE APPROVAL CERTIFICATE

This is to certify:

That the NOx Selective Catalytic Reduction Control System

with type designation(s)
NOR D control and monitoring system

Issued to

Wärtsilä Finland Oy
Vaasa, Finland

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.
System certificate only.

Issued at **Høvik** on **2021-08-31**

This Certificate is valid until **2023-08-30**.

DNV local station: **Finland CMC**

for **DNV**

Approval Engineer: **Ingrid Hagen Johansen**

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.



Form code: TA 251

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Product description

This type approval certificate is limited to the NOR D control and monitoring system for NOx Selective Catalytic Reduction (SCR) System as listed in Table 1. The NOR D system is built as an independent engine-wise SCR system with dedicated auxiliary units and may be installed for high speed and medium speed engines.

The NOx SCR is based on Reagent injection, governed by the NOR D control and monitoring system. Reagent may be injected based on pre-calculated and tunable parameters (open-loop) or based on pre-calculated and tunable parameters in combination with measurements from an optional NOx sensor (closed-loop).

The NOR D control and monitoring system incorporates:

- Screen based HMI
- Reagent dosing control (-different selectable control strategies)
- Soot blowing logic
- Interface to the ship systems (Ethernet-Modbus TCP or RS-485-Modbus RTU)

Cabinet / module / unit	
No.	Name
11N05_	SCR Pump Unit
11N06_	SCR Dosing Unit
11I05_	SCR Bypass Automation Unit*
*: Optional (applicableness depends on project specific design) Note: complete NOR D control and monitoring system overview is listed in document "NOR D – Control and Monitoring System Components", Drw. No. DMTA00038929, rev. -	

Table 1: Cabinet / module / unit names and numbers used in the Wärtsilä NOx SCR system

Hardware	Software (NOR D release version)
COM-10	1.0.X.X , 1.2.X.X, 1.3.X.X

Table 2: Wärtsilä NOR D, C&M system Software

Application/Limitation

This Type Approval covers the "NOR D control and monitoring system", i.e. the control and monitoring system for the NOx SCR system.

The NOR D control and monitoring system covers hardware as listed in document "NOR D – Control and Monitoring System Components", Drw. No. DMTA00038929, rev. - and software as listed in table 2.

This type approval certificate is based on the validity of the Type Approval certificates referred to in document "NOR D – Control and Monitoring System Components", Drw. No. DMTA00038929, rev. -.

Audible annunciating of alarms (both process alarms and system alarms) shall be through the vessels main alarm system. Alarm interface to the vessels main alarm system shall be hardwired and/or via Modbus and arranged fail safe.

A remote operator station for remote control and alarm handling may optionally be installed within engine room / engine control room. This may either be a dedicated HMI unit or integrated in the vessels Integrated Automation System or integrated in engine control system HMI for high speed engines. If dedicated unit is used, alarm announcing as required by Pt.4 Ch.9 Sec.3 [1.5.8] to be observed.

Reagent tank-level and temperature monitoring (high/low alarm and remote indication) is not covered by this Type Approval certificate.

When reagent is injected based on measurements from an optional NOx sensor, emission analyzer or external emission analyzer, the instrumentation used is not covered by this Type Approval Certificate.

DNV shall be informed in writing whenever the system will be installed on board a DNV classed vessels. The letter to DNV shall include a signed copy of Annex 1 in this Type Approval Certificate together with the following drawings:

High speed engines:

- Project specific block diagram (ref. DAAF461277 rev I) **Note A**
- Project specific I/O and parameter list (ref. DMTA00036942 rev -) **Note A**
- Project specific P&ID / Process layout (ref. DAAF480099 rev A) **Note A**

Medium speed engines:

- Project specific block diagram (ref. DAAF512152 rev D or DAAF519027 rev C) **Note A**
- Project specific I/O and parameter list (ref. DMTA00036943 rev -) **Note A**

- Project specific P&ID / Process layout (ref. DAAF499228 rev A) **Note A**

Note A:

Any change compared to the reference drawing shall be clearly identified (by cloud/bold/colour) on the project specific drawing. Substantial changes shall be described and may be subject to case by case approval and certification.

As long as the system is covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 [1.4] will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation, inclusive the interface to the main alarm system.

Type Approval documentation

Tests carried out

NOR D - Control and Monitoring System Test Summary, drw. No. DMTA00045219, rev. –

Marking of product

Wärtsilä NOR control and monitoring system for NOx Selective Catalytic Reduction system.

Cabinets marked according to table 1.

Supply Voltage: 100- 240 VAC, 110 – 250 VDC or 24 VDC

Frequency: 50/60 Hz

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

Periodical assessment is to be performed at renewal of this certificate.

END OF CERTIFICATE