



Certificate No:
TAA000033Z

TYPE APPROVAL CERTIFICATE

This is to certify:

That the **NOx Selective Catalytic Reduction Control System**

with type designation(s)

SCRC-ME, SSBX-01, SSBX-02, HSOB-SF1, HSOB-SF2

Issued to

Hanshin Electric Mfg. Co. Ltd.
Osaka, Japan

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.

Location classes:

Type	Temperature	Humidity	Vibration	EMC	Enclosure
SCRC-ME	B	B	A	A	IP44
SSBX-01	B	B	A	A	IP44
SSBX-02	B	B	A	A	IP44
HSOB-SF1	B	B	A	A	IP44
HSOB-SF2	B	B	A	A	IP44

Issued at **Høvik** on **2022-07-04**

This Certificate is valid until **2024-07-03**.

DNV local station: **Kobe**

for **DNV**

Approval Engineer: **Thorbjørn Hansen**

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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

Revision: 2021-03

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Page 1 of 5

Product description

This type approval certificate covers SCRC-ME, an SCR control and monitoring system produced by Hanshin Electric Mfg. Co. Ltd. for diesel engine for mechanical propulsion. The system may be arranged with or without exhaust gas dampers and bypass arrangement.

The SCRC-ME comprises one common control panel and an independent safety system.

The SCR Control Panel can be operated in different modes and may be configured to cover the following functions for a maximum of 2 propulsion engines:

- Urea injection (with or without air-assist)
- Operation of exhaust gas damper and catalyst bypass line
- Soot blow
- Intake air bleed
- NOx calibration (if NOx sensor is used)
- Urea tank monitoring (up to two tanks)
- NH3 sensor (NH3 concentration inside the exhaust pipe: optional)
- NH3 alarm (NH3 leakage from the exhaust pipe: optional)

High differential pressure detected by an independent safety system will cut control power to the exhaust dampers, causing all exhaust dampers to revert to their fail-to-safe position (open exhaust gas bypass damper).

Table 1 below show the SCR Control / safety system cabinets, terminal box and corresponding software covered by the subject TA certificate. Table 2 show the different configurations / options covered by this TA certificate.

Table 1: SCR Control / safety system cabinets.

Cabinet	Description	PLC-		HMI-	
		SW	HW	SW	HW
SCRC-ME	SCR Control panel for one main engine	109810-2302XXX* OR 109810-2303XXX*	TAA0000122	109810-2316XXX	TAA00001YC
SCRC-ME	Common SCR Control panel for two main engines				
SSBX-01	Safety box, SCR safety system for one main engine	1098-2309XXX	N/A	1098-2143XXX	N/A
SSBX-02	Safety box, SCR safety system for two main engines**				
HSOB-SF1	SCR Reactor terminal box for process signals and with Calculation unit covering damper safety for one main engine***	N/A	TAA0000145 (RMA42)	N/A	N/A
HSOB-SF2	SCR Reactor terminal box for process signals and with Calculation unit*** covering damper safety for one main engine**	N/A	TAA0000145 (RMA42)	N/A	N/A

* Depending on no of UREA tanks, single or double.
** SSBX-02 is a common safety unit for two main engines.
*** HSOB-SF1: single soot blower, HSOB-SF2: multiple soot blowers

Table 2: Available configurations /options.

Option no.	Bypass	Safety System	Configuration: One Main Engine	Configuration: Two main engines
1	With bypass	Safety box	1 * SCRC-ME 1 * SSBX-01	N/A
2		Calculation unit	1 * SCRC-ME 1 * HSOB-SF1	N/A
3		Calculation unit	1 * SCRC-ME 1 * HSOB-SF2	N/A
4		Safety box	N/A	1 * SCRC-ME 1 * SSBX-02
5		Calculation unit	N/A	1 * SCRC-ME 2 * HSOB-SF1
6		Calculation unit	N/A	1 * SCRC-ME 2 * HSOB-SF2
7	Without bypass ^{note 1}	N/A	1 * SCRC-ME	1 * SCRC-ME

^{note 1}: For installations without bypass the requirements in Pt.6 Ch.7 Sec.7 [4.1.2] applies. Reference is made to Annex 1.

Place of Manufacture

Designer of SCRC-ME:
Yanmar

Manufacturer of SCRC-ME:
Hanshin Electric Mfg. Co. Ltd.
Osaka, Japan

Application/Limitation

The formal supplier of the SCRC-ME system shall inform DNV in writing whenever the system is scheduled for installation on a DNV classed vessel. The letter to DNV shall include a signed copy of Annex 1 in this Type Approval Certificate together with the following project specific drawings:

- Instrument and Alarm / Shut Down List (reference doc. no. G2-09810-0770) Note A
- Test program for certification (reference doc. no. 2103-052-TM) Note A
- P&ID (reference doc. no. P5-09610-0020/30, P9630-0040/50) Note A
- Outline of SCR system (reference doc. no. J2-09810-1380) Note A, Note B

Note A

Any principal change compared to the reference document shall be clearly identified (by cloud/bold/colour) in the project specific drawings and may be subject to case by case approval and certification.

Note B

The SCR System Configuration does not need to be project specific. The actual arrangement is reflected by combining this drawing with project specific information in Annex 1.

Upon document submission, the manufacturer shall ensure that Application/Limitation in the DNV TA certificates referred to in table 1 are complied with and further that these are valid.

As long as the system is covered by the Type Approval, is arranged without exhaust gas dampers and the vessel subject to installation does not hold any additional class notation RP or DP, 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, hereunder verification of alarms in the project specific parameter list as well as system alarms relayed to the vessels main alarm system.

The sensors used in the SCR system are not covered by this type approval certificate. Datasheet or similar proving suitability for shipborne installation / compliance with the applicable environmental requirements (IACS UR E10 / Pt.4 Ch.9 Sec.5) shall be available and may be requested during installation and commissioning.

Correct configuration, hereunder external interfaces (ref Annex 1 Item no. 7) to i.a. the vessels main alarm system to be verified after installation onboard.

Type Approval documentation

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.

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



Job Id: **262.1-036755-1**
Certificate No: **TAA000033Z**