



Certificate No:
TAA000039A

TYPE APPROVAL CERTIFICATE

This is to certify:

That the NOx Selective Catalytic Reduction Control System

with type designation(s)
SCR Control System

Issued to

H+H Engineering & Service GmbH
Sonnefeld, Germany

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.

Issued at **Hamburg** on **2023-05-03**

This Certificate is valid until **2025-03-27**.

DNV local unit: **Augsburg**

for **DNV**

Approval Engineer: **Jens Dietrich**

Joannis Papanuskas
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: 2022-12

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Product description

System Components (modular). LoCaMP=List of Controlled and Monitored Points.

PLC Cabinet +0CBC10 with HMI panel

+0CBC10	Drawing no.	Revision
Variant 1	<u>PA20yy xxxxWDI120Rxy REV01</u>	REV01 or higher
Variant 2	<u>PA20yy xxxxWDI121Rxy REV01</u>	REV01 or higher
LoCaMP	<u>PA20yy xxxx LoCaMP Auxiliaries REV00</u>	REV00 or higher

Pump Unit +0CBC40 (PU single pump and PU2 double pump config.)

+0CBC40	Drawing no.	Revision
Single Pump PU	<u>PA20yy xxxxWDI124Rxy REV01</u>	REV01 or higher
LoCaMP PU	<u>PA20yy xxxx LoCaMP PU REV00</u>	REV00 or higher
Double Pump PU2	<u>PA20yy xxxxWDI128Rxy REV01</u>	REV01 or higher
LoCaMP PU2	<u>PA20yy xxxx LoCaMP PU2 REV00</u>	REV00 or higher

Dosing Unit +xCBC10 (DU ADV and DU STD config.)

+xCBC10	Drawing no.	Revision
Standard – DU STD	<u>PA20yy xxxxWDI122Rxy REV01</u>	REV01 or higher
LoCaMP DU STD	<u>PA20yy xxxx LoCaMP DU STD REV00</u>	REV00 or higher
Advanced – DU ADV	<u>PA20yy xxxxWDI123Rxy REV01</u>	REV01 or higher
LoCaMP DU ADV	<u>PA20yy xxxx LoCaMP DU ADV REV00</u>	REV00 or higher

Reactor Unit +xCBC60 (Soot blower Ctrl.)

+xCBC60	Drawing no.	Revision
Reactor Unit	<u>PA20yy xxxxWDI126Rxy REV00</u>	REV00 or higher
LoCaMP	<u>PA20yy xxxx LoCaMP Auxiliaries REV00</u>	REV00 or higher

Interface Box +0CBC90 (IB2 for 2 line applications, IB4 for 4 line applications)

+0CBC90	Drawing no.	Revision
IB2	<u>PA20yy xxxxWDI125Rxy REV01</u>	REV01 or higher
IB4	<u>PA20yy xxxxWDI127Rxy REV00</u>	REV00 or higher

Type Approved Components for the Control and Monitoring System

The system is to be composed from main components as listed here:

Type	Maker	DNV Certificate
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Fuse Module	Murr	TAA00001YE
Fuse Module	Siemens	TAE00001E3
HMI	Siemens	TAA000016S
Industrial Communication	Weidmüller	TAA0000112
Industrial Communication	Siemens	TAA0000136
PLC + Utilities	Siemens	TAA0000227
PLC + Utilities	Siemens	TAA00001AR
PLC + Utilities	Siemens	TAA00002GW
Loop-powered isolators	PR Electronics	TAA00001RW
VFD	Siemens	TAE00003SK

Above listed certificates were valid at the time this TA has been issued. The respectively mentioned applications/limitations are to be observed.

General Information

The systems can cover 1 - 8 engine SCR lines. Soot blowing function may optionally be included. For single line applications a bypass flap control may be optionally included as part of +0CBC10.

Interfaces to vessels IAS:

- analog/ digital IO's in combination with IB2 or IB4
- Modbus TCP/IP

Software-Version:

V202201.x4y0.08.xx-x

The hardware/software version has the following structure:

Item	
Version ID	202201
Hardware ID	x4y0
Software ID	8
Release ID	xx
Project Rev	x

x and y in hardware ID can either be 0 or 1.

Place of Production

HERMOS
95490 Mistelgau
Germany

Approval Conditions

This type approval is valid for system manufactured at place of production mentioned above.

For the Control- and Monitoring System the following documentation for the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- Block diagram PA_20yy_xxxxCBD100R00
- Circuit diagrams
- H+H SCR Software Version used for the specific application
- LoCaMP (List of Controlled and Monitored Points)
- Proof of internal test

The Type Approval covers the electronic control system hardware and software listed under Product description.

The following is not covered by this type approval: Piping, sensors, valve actuators, Router eWon Flexy 205.

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

Manual emergency stop to be configured as to force the VFD shut-down.

The system components are to be mounted taking into account the required ingress detection IP for the intended mounting location.

Evaluation of exhaust gas cleaning efficiency capabilities is not in the scope of this certificate.
Compliance with MARPOL Annex VI Reg.13 / NOx Technical Code and MEPC.291(71) is to be certified separately as applicable.

Product certificate

If the system is covered by the above Product Description a product certification will not be required.
After internal test the H&H test proof needs to be submitted to DNV. After the test 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.

Tests carried out

Functional performance test, witnessed 2022-09-28 at HERMOS.

Marking of product

The cabinets/mounting plates are labelled with H&H company logo as well as:

PLC Cabinet: item designation: **+0CBC10**, project n°, project name, customer, order n°, year of manufacture
Pump E-box: item designation: **+0CBC40**, project n°, project name, customer, order n°, year of manufacture
Pump Skid: item designation: **+0CBC40**, project n°, project name, customer, order n°, year of manufacture
Dosing Unit: item designation: **+xCBC10** (x = engine ref.), project n°, project name, customer, order n°, year of manufacture
Reactor Unit: item designation: **+xCBC60** (x = engine ref.), project n°, project name, customer, order n°, year of manufacture
Interface Box: item designation: **+0CBC90**, project n°, project name, customer, order n°, year of manufacture

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 the certificate.

END OF CERTIFICATE