

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Steering Gear Control System**with type designation(s)
NAVIGUIDE 4000

Issued to

**Northrop Grumman Sperry Marine B.V. - German Branch
Hamburg, Germany**

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.****Location classes:**

Temperature	B
Humidity	B
Vibration	A
EMC	B
Enclosure	Required protection according to the Rules to be provided upon installation on board

Issued at **Hamburg** on **2020-12-11**for **DNV GL**This Certificate is valid until **2022-07-23**.DNV GL local station: **Hamburg CMC**Approval Engineer: **Jörg Rebel**

Arne Schaarmann
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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.



Job Id: **262.1-023172-5**
Certificate No: **TAA00000X6**
Revision No: **3**

Product description

The NAVIGUIDE 4000 Manual Steering System based on the NAVINET 4000 Steering Control Network may consist of the following equipment:

<i>Description</i>	<i>Type</i>
Steering Control Unit and Software 020801-0000-000 Rev.: x	4961-AB rev. Hx
Output Boards:	
DC Solenoid Board for On/Off solenoid valves	4961-1083 rev. Ax 4961-1084 rev. Ax
AC Solenoid Board for On/Off solenoid valves	4961-1085 rev. Ax 4961-1086 rev. Ax
Isolated Proportional Output Board ± 10 V or 4..20 mA	4961-1087 rev. Ax
SyncroHelm FU Handwheel	4944-xx; xx = DA, DB, DC; rev. Cx
FU-Miniwheel and Display Unit and Software 020238-0000-000 Rev.: x	4956 rev. Kx
SyncroHelm FU-Miniwheel and Display Unit and Software 020238-0000-000 Rev.: x	4956-AA rev. Kx
Bus Interface Control Unit (6 Keys) with following functions: Steering Mode Selector, Steering Position Selector, Dual Rudder Sync/Indep. Selector, Steering Alarm Indicator, Setup Unit and Software 020238-0000-000 Rev.: x	4955 rev. Kx
Bus Interface Control Unit (3 Keys) with following functions: Wheel Control Unit, FU Device Interface / Display Unit and Software 020238-0000-000 Rev.: x	4955-AA rev. Kx
Override Unit	4987 rev. Bx
FU Handwheel	4944-xx; xx = none, BE; rev. Dx xx = AA, AB, AC, AD, AE, BA, BB, BC, BD, BE, FA, FB, FC, FD; rev. Cx
FU Tiller	4970-xx; xx = none, AB; rev. Cx
NFU Tiller	4930-xx; xx = AB, AC; rev. Bx xx = BA rev. Ax, BB rev. Ox
Selector Switch	4516 rev. 2x, 4518-AB rev. Fx, 4876-AB rev. Ex
FU amplifier	60197 rev. Cx
Feed-back Unit incl. Lever Linkage	4968-xx (Temperature: A; Vibration: B) xx = AA, AD, AE, AF, BA, BB, BD, BE; rev. Dx xx = none, AB, AC, BC; rev. Ex
Emergency Dual NFU Control Box	4870 rev. Bx
Power Supply Unit	60208 rev. 2x, 60281 rev. Bx, 60290 rev. Bx, 60272 rev. Ax, 47891 rev. Ax
Relays	44744 rev. Ax, 47276 rev. 4x, 46154 rev. Ox, 46104 rev. Ox
Relay Box	4971 rev. Bx
Diodes	46673 rev. 2x

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Approval conditions

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

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)
- Test program for product certification

The Type Approval covers hardware and software listed under Product description. No further application software is necessary for delivery of an application system.

The software numbers and versions are listed in document PN300.02 containing the respective latest versions. The document status from 2018-03-12 is the basis for this Type Approval Certificate.

When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated document PN300.02. 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.

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 before the system is shipped to the yard. After the certification the clause for software control will be put into force.

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

[NAVIGUIDE 4000 Renewing Overview - Rev.170106](#)

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339 (2016-11), IEC/EN 60945 (2002) including Corrigendum 1 (2008) and IACS UR E25 (2016).

Note: Equipment intended to be installed on ships contracted for construction on or after 2022-01-01 are to be compliant with class guideline DNVGL-CG-0339 (2019-12 or later).

Marking of product

- Components are marked with product name and product number as listed in the table above.
- Basic software version is displayed in the system graphical user interface.
- Each project application configuration is documented in a dedicated version log file which is specific for each vessel.

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

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- 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 least at renewal of this certificate.

END OF CERTIFICATE