

TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MERB00006Y5
Revision No:
2

This Certificate is issued by DNV UK Limited based on authorisation of the Maritime & Coast Guard Agency (MCA) as an UK Approved Body to undertake conformity assessments on marine equipment in accordance with the requirements of the Merchant Shipping (Marine Equipment) Regulations 2016 as amended.

This is to certify:

That the Heading control system (HCS)

with type designation(s)
NAVIPILOT 4500N

Issued to

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

is found to comply with the requirements in the following Regulations/Standards:

Regulation **MSN 1874 Amendment 8,**

**item No. UK/4.16. SOLAS 74 as amended, Regulations V/18 & V/19, IMO Res. A.342(IX), IMO Res. A.694(17),
IMO Res. MSC.191(79), IMO Res. MSC.64(67) Annex 3, IMO Res. MSC.302(87)**

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2027-09-06**.

Issued at **London** on **2024-05-06**

DNV local unit:
Hamburg – CMC North/East



for **DNV UK Ltd.**

Approval Engineer:
Jörg Rebel

Approved Body No.: **0097**

**Mydlak-Röder, Christine
MER Service Responsible**



**Maritime &
Coastguard
Agency**

UK Approved Body Authorised
by the MCA

This certificate will not be valid if the manufacturer makes any changes or modifications to the approved type of equipment, which have not been notified to, and agreed with the approved body named on this certificate.

During the period of validity of this certificate the applicable regulations (international conventions and the relevant resolutions and circulars of the IMO) and testing standards may change, therefore the product conformity may need to be re-assessed by the Approved Body.

"The Mark of Conformity" may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-control phase module (D, E or F) of Schedule 2 of the Merchant Shipping (Marine Equipment) Regulations 2016, as amended is fully complied with and controlled by a written inspection agreement with an approved body. In case limitations of use apply, these should be indicated in the Annex.

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.



Product description

The Heading Control System NAVIPILOT 4500N consists of following equipment:

- | | |
|---|---|
| <p>1. Control and Display Unit (CDU)
 (front (console mount): IP 24, back: IP 20)</p> <p>And</p> <p>2. Autopilot Processing Unit (APU)
 (IP 20)</p> | <p>P/N: 074929-0000-xxx
 Application Software Version: 2.xxx or 3.xxx
 OS Software Version: 1.xxx (xxx ≥ 001)
 Boot Software Version: 1.xxx</p> <p>P/N: 074928-0000-xxx
 Application Software Version: 2.xxx or 3.xxx
 OS Software Version: 1.xxx (xxx ≥ 001)
 Boot Software Version: 1.xxx</p> |
|---|---|

With following interfaces:

- Central Alarm Interface bidirectional acc. to IEC 61162-1
- Inputs acc. to IEC 61162-1: 2 x Heading, 1 x Speed, 1 x GNSS
- Outputs acc. to IEC 61162-1: 1 x Rudder Order, 1 x Voyage Data Recorder, 1 x Heading Monitor
- Analogue Outputs 4-20mA or +/-10V: 2 x Rudder Order
- Isolated status Inputs: 6 x configurable for different functions e.g. Auto Mode, Override, Silence.
- Potential free contacts: 1 x System Failure, 9 x configurable for different functions e.g. Main Power Failure, Backup Power Failure, Override Status, Auto Mode, OFF Heading Alert, BNWAS Timer Reset, Backup Navigator Call.

3. Additional components:

The following units may be used as additional components for controlling bang-bang steering control valves:

- | | |
|---|--|
| <p>Steering Control Interface Unit (SCU):</p> | <p>P/N: 074851-0000-xxx
 Application Software Version:
 020801-0000-000 Rev. x</p> |
|---|--|

With integral output board

- | | |
|--|---|
| <ul style="list-style-type: none"> - DC Solenoid board for On/Off solenoid valves | <p>P/N: 020042-0000-xxx or
 020043-0000-xxx</p> |
|--|---|

Or

- | | |
|--|---|
| <ul style="list-style-type: none"> - AC Solenoid board for On/Off solenoid valves | <p>P/N: 020040-0000-xxx or
 020041-0000-xxx</p> |
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Or

- | | |
|--|-----------------------------|
| <ul style="list-style-type: none"> - Isolated Proportional Output board +/- 10 V or 4-20 mA | <p>P/N: 020044-0000-xxx</p> |
|--|-----------------------------|

And with

- | | |
|--|--|
| <ul style="list-style-type: none"> - Feedback Unit for rudder angles up to ± 45° <ul style="list-style-type: none"> - with 1 potentiometer, one set of limit switches - with 1 potentiometer, one set of limit switches, one rudder midship switch - with 1 potentiometer, two sets of limit switches, one rudder midship switch - with 2 potentiometers, one set of limit switches - with 2 potentiometers, two set of limit switches, one rudder midship switch - with 3 potentiometers, two set of limit switches, one rudder midship switch - with 4 potentiometers, two set of limit switches, one rudder midship switch | <p>P/N: 074720-0000-xxx or
 P/N: 074721-0000-xxx or
 P/N: 074795-0000-xxx or
 P/N: 074722-0000-xxx or
 P/N: 074796-0000-xxx or
 P/N: 074788-0000-xxx or
 P/N: 074784-0000-xxx or</p> |
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Or

- | | |
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| <ul style="list-style-type: none"> - Feedback Unit for rudder angles up to ± 70° <ul style="list-style-type: none"> - with 1 potentiometer, one set of limit switches - with 2 potentiometers, one set of limit switches - with 3 potentiometers, two set of limit switches, one rudder midship switch - with 4 potentiometers, two set of limit switches, one rudder midship switch | <p>P/N: 074724-0000-xxx or
 P/N: 074725-0000-xxx or
 P/N: 074791-0000-xxx or
 P/N: 074785-0000-xxx or</p> |
|--|---|

And with

- | | |
|--|---|
| <ul style="list-style-type: none"> Lever Linkage with a maximum length of 350/1200 mm Lever Linkage with a maximum length of 600/1500 mm | <p>P/N: 020508-0000-xxx or
 P/N: 022051-0000-xxx.</p> |
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4. Documentation:

- | | |
|---|---|
| <ul style="list-style-type: none"> NAVIPILOT 4500N System Operation Manual NAVIPILOT 4500N System Installation and Service Manual | <p>Doc. no. 056403
 Doc. no. 056404</p> |
|---|---|

Application/Limitation

The Heading Control System NAVIPILOT 4500N is to be setup and operated in Standard Mode to fulfill the requirements as stated in this Certificate.

In Standard Mode the Heading Control System NAVIPILOT 4500N fulfills the requirements to work as part of the Track Control System type "VisionMaster Net ECDIS with Track Control" according to IMO Res. MSC.64(67) and MSC.74(69), Annex 2.

If installed as part of this Track Control System on board ships sailing under EU flag, the Track Control System needs a valid EU Type Examination certificate for item MED/4.33.

In Standard Mode the Heading Control System NAVIPILOT 4500N can be configured as PID-controlled or self-tuning (adaptive) type.

Type Examination documentation

DNV No.	Document ID	Rev.	Description
18	5032-0141-15	A	Report: NGSM, HCS-related tests according to ISO 16329 (2003)
15	5032-0141-12	A	Report: NGSM, TCS-related tests according to ISO 11674 (2019)
12	056404	D	Manual: System installation and service of NAVIPILOT 4500N
11	056403	D	Manual: Operation of NAVIPILOT 4500N
10	243-21	2021-10-04	Report: Treo, Tests acc. to IEC 60945, 8.2 to 8.4, 8.7, 11.2 and 12.1
9	F210932E1	2021-07-07	Report: Phoenix Testlab, Presentation tests acc. to IEC 62288 (2014)
8	21-E009028-BM	A01	Report: Siemens, EMC tests according to IEC 60945, 9 and 10 and DNV-CG-0339 (2021-08)
7	5032-0141-08	A1	Report: Summary of test reports
6	5032-0141-07	A	Report: NGSM, Interface tests according to IEC 61162-1, Annex B.4
5	5032-0141-06	A	Report: NGSM, Bridge alert management tests acc. to IEC 62923-1/-2
4	5032-0141-05	A	Report: NGSM, Performance tests according to ISO 11674 (2019)
3	5032-0141-04	A	Report: NGSM, Tests according to IEC 60945
2	5032-0141-03	B1	Report: NGSM, Presentation tests according to IEC 62288 (2021)
1	5032-0141-01	A	Report: NGSM, Acoustic noise test according to IEC 60945, 11.1

Tests carried out

- Environmental and EMC testing: IEC 60945 (2002) incl. Corrigendum 1 (2008)
- Interface testing: IEC 61162-1 (2016) and IEC 61162-2 (1998)
- Presentation testing: IEC 62288 (2021)
- Bridge alert management testing: IEC 62923-1 (2018) and IEC 62923-2 (2018)
- Performance testing: ISO 11674 (2019)

Marking of product

According to IEC 60945, Sect.4.9:

The product to be marked with following information, where practicable:

- Identification of the manufacturer,
- Equipment type number or model identification under which it was type tested,
- Serial number of the unit,
- Compass safe distance.

Alternatively, the marking may be presented on a display at equipment start-up, and in case of fixed equipment compass safe distance may be given in the equipment manual.

END OF CERTIFICATE