

# TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:  
**MERB000038V**  
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 Speed and distance measuring equipment (SDME)**

with type designation(s)

**NAVIKNOT Types: 350E, 350EE, 450D, 450DD, 550DD, 600S, 600SD, 600SDD, 600SDT and 600SE**

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 7,**

**item No. UK/4.7. SOLAS 74 as amended, Regulations V/18, V/19 & X/3, IMO Res. A.694(17), IMO Res. A.824(19),  
IMO Res. MSC.36(63), IMO Res. MSC.97(73), IMO Res. MSC.191(79), IMO Res. MSC.302(87)**

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

This Certificate is valid until **2025-08-20**.

Issued at **London** on **2023-12-01**

DNV local unit:  
**Hamburg – CMC North/East**



for **DNV UK Ltd.**

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**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

For the speed and distance measuring equipment (SDME) NAVIKNOT following types are existing:

Type: 350E, 350EE,

Single-axis water speed electromagnetic speed log system

Type: 450D, 450DD

Single-axis water speed Doppler speed log system

Type: 550DD

Dual-axis water and ground speed Doppler speed log system

Type: 600S

Dual-axis ground speed satellite speed log system

Type: 600SD, 600SDD, 600SDT

Single-axis water speed Doppler and dual axis ground speed satellite speed log system

Type: 600SE

Single-axis water speed electromagnetic and dual axis ground speed satellite speed log system

The SDME types 350E, 350EE, 450D, 450DD, 550DD, 600S, 600SD, 600SDD, 600SDT and 600SE consist of following main components:

<i>Main component</i>	<i>Part number</i>	<i>Software Rev.</i>	
Control and Display Unit (CDU)	073506-0000-xxx	2.x	OR
CDU in Housing with Brackets	073507-0000-xxx	2.x	
Electronics Unit	073522-0000-xxx	3.x	

With following output interfaces:

6 x NMEA acc. to IEC 61162-1

5 x 10, 100, 200, 400 or 20.000 pulses/nm

Analogue speed output (0...10V and 4...20mA)

Log failure and power failure alarm (n.c.)

Speed limit relay output to limit the rudder angle on steering gear

Watch alarm trigger output for Bridge Navigational Watch Alarm Systems (BNWAS)

Bidirectional alert interface acc. to IEC 62923-1

And of following system components:

<i>System component</i>	<i>Part number</i>	<i>Software Rev.</i>
Preamplifier D	073523-0000-xxx	1.x
Preamplifier E	073458-0000-xxx	n/a
Satellite Antenna Unit	060437-0000-xxx	123
EM Sensor FNF I	073188-0000-xxx	
EM Sensor FNF I (speed ≥ 35 knots)	074218-0000-xxx	
EM Sensor FNF II	073314-0000-xxx	
EM Sensor FNF III	073447-0000-xxx	
EM Sensor NF	073266-0000-xxx	
Doppler Transducer	022827-0000-xxx	
Doppler Transducer	025832-0000-xxx	
Doppler Transducer	025833-0000-xxx	
Doppler Transducer (18 m cable)	074893-0000-xxx	
Doppler Transducer (40 m cable)	074894-0000-xxx	
Doppler Transducer (60 m cable)	074895-0000-xxx	

And of following optional speed indicators:

<i>Speed indicator</i>	<i>Part number</i>	<i>Size</i>	<i>Range</i>
Speed indicator, console mounting	060381-0000-xxx	96x96mm	-5...+25kn
Speed indicator, console mounting	060382-0000-xxx	96x96mm	-5...+40kn
Speed indicator, console mounting	060383-0000-xxx	96x96mm	-5...+60kn
Speed indicator, console mounting	060384-0000-xxx	144x144mm	-5...+25kn
Speed indicator, console mounting	060385-0000-xxx	144x144mm	-5...+40kn
Speed indicator, console mounting	060386-0000-xxx	192x192mm	-5...+25kn
Speed indicator, in housing with bracket	060387-0000-xxx	144x144mm	-5...+25kn

<i>Optional speed indicator</i>	<i>Part number</i>	<i>Software Rev.</i>
Universal Digital Repeater UDR	074833-0000-xxx	≥ 3.x
UDR in housing with bracket	074834-0000-xxx	≥ 3.x
Multifunctional NAV Data Repeater	SM-XDI192N	
Multifunctional NAV Data Repeater	SM-XDI144N	
Serial I/O Module	SM-XDI-NX1	
Serial I/O Module	SM-XDI-NX2	
Analogue Extension Module	SM-XDI-AX1	

### Application/Limitation

Speed and distance through the water only: 350E, 350EE, 450D, 450DD  
 Speed and distance over ground only: 600S

### Tests carried out

- Environmental and EMC testing: IEC 60945 (2002) incl. Corrigendum 1 (2008)
- Interface testing: IEC 61162-1 (2016), IEC 61162-2 (1998) and IEC PAS 61162-103 (2021)
- Presentation testing: IEC 62288 (2021)
- Bridge alert management testing: IEC 62923-1 (2018) and IEC 62923-2 (2018)
- Performance testing: IEC 61023 (2007)

### 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.

### Type Examination documentation

<b>DNV No.</b>	<b>Document ID</b>	<b>Rev.</b>	<b>Description</b>
31	5003-0141-10	A1, 2023-01-20	Report: NG Sperry Marine, Tests acc. to IEC 61162-1, B.4.9.2 for DDC sentence acc. to IEC PAS 61162-103 (2021)
30	5003-0141-09	A1, 2023-01-16	Report: NG Sperry Marine, Test summary according to IEC 60945 and IEC 62288 (2021)
29	5003-0141-08	A3, 2023-01-16	Report: NG Sperry Marine, Tests acc. to IEC 62288 (2021), 4.4.1 and 7.2.1
26	197-21	1, 2021-08-05	Report: Treo, Tests according to IEC 60945, Sects. 9, 10 and 11.2
25	5003-0141-07	A, 2020-07-23	Report: Gap analysis for bridge alert management compliance acc. to IEC 62923-1/-2 (2018)
24	056395	A, 2018-05-29	Manual: Operation, installation and service manual for NAVIKNOT 600SD with GNSS 5004
23	056396	A, 2018-05-29	Manual: Operation, installation and service manual for NAVIKNOT 600SD with GNSS 5003 and Preamplifier 5029
22	056394	A, 2018-05-29	Manual: Operation, installation and service manual for NAVIKNOT 450D with Preamplifier 5029
21	5029-0141-04	A, 2018-05-23	Report: Test Change Log
20	5003-0141-04	A, 2018-06-19	Report: BAM compliance tests acc. to IEC 61924-2 (Module A and C) and to CDV IEC 62923-2 (2017-09)2
19	5029-0141-03	A, 2018-04-16	Report: Environmental tests acc. to IEC60945, 8.2 to 8.4
18	5029-0141-02	C, 2018-05-16	Report: Speed accuracy tests acc. to IEC 61023, 5.12
17	066-18	1, 2018-05-08	Report: Vibration tests acc. to IEC 60945, 8.7 and DNVGL-CG-0339, 3[6.2]
16	139-18	1, 2018-05-18	Report: EMC tests acc. to IEC 60945, 9 and 10

<b>DNV No.</b>	<b>Document ID</b>	<b>Rev.</b>	<b>Description</b>
15	056381	A, 2015-09-09	Manual: Service manual GNSS retrofit procedures for NAVIKNOT 600SDT and 600SDD
14	056380	A, 2015-09-09	Manual: Service manual GNSS retrofit procedures for NAVIKNOT 600S, 600SE and 600SD
13	056379	D, 2018-08-15	Manual: Operation, installation and service manual for NAVIKNOT 600SD with GNSS 5003 and Preamplifier 5005
12	056378	D, 2018-08-15	Manual: Operation, installation and service manual for NAVIKNOT 600SE with GNSS 5003
11	056377	D, 2018-08-15	Manual: Operation, installation and service manual for NAVIKNOT 600S with GNSS 5003
10	056354	F, 2018-08-15	Manual: Operation, installation and service manual for NAVIKNOT 550DD
9	056347	G, 2018-08-15	Manual: Operation, installation and service manual for NAVIKNOT 450DD with SRD331
8	056346	F, 2018-08-15	Manual: Operation, installation and service manual for NAVIKNOT 450D with SRD331
7	056366	E, 2018-08-15	Manual: Operation, installation and service manual for NAVIKNOT 350EE
6	056345	H, 2018-08-15	Manual: Operation, installation and service manual for NAVIKNOT 350E
5	-	A, 2015-08-14	Report: Integration and speed and distance measurement tests acc. to IEC 61023 for NAVIKNOT 600 S
4	-	B, 2015-08-13	Report: Display test acc. to IEC 62288
3	GL 07 05 01	2007-04-12	Report: Performance tests acc. to IEC 61023
2	6052b/07	2007-04-03	Report: Environmental tests acc. to IEC 60945, Sects. 8.2 to 8.4 and 8.7
1	07/7003-1-1	2007-02-08	Report: EMC tests acc. to IEC60945, Sects. 9 and 10

END OF CERTIFICATE