



# TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:  
**MERB00001G6**  
Revision No:  
**0**

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 Integrated navigation system (INS)**

with type designation(s)  
**Furuno Voyager INS**

Issued to

**Furuno Electric Co., Ltd.**  
**Nishinomiya, Japan**

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

Regulation **MSN 1874 Amendment 6**,  
**item No. UK/4.59. SOLAS 74 as amended, Regulations V/15, V/18, V/19 & X/3, IMO Res. A.694(17), IMO Res. MSC.36(63), IMO Res. MSC.97(73), IMO Res. MSC.191(79), IMO Res. MSC.252(83), IMO Res. MSC.302(87)**

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

This Certificate is valid until **2024-06-12**.

Issued at **London** on **2022-12-28**

DNV local unit:  
**Kobe**



for **DNV UK Ltd.**

Approval Engineer:  
**Frederik Tore Elter**

Approved Body No.: **0097**

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



**Maritime &  
Coastguard  
Agency**

UK Approved Body Authorised  
by the MCA

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. The product liability rests with the manufacturer or his representative in accordance with the Merchant Shipping (Marine Equipment) Regulations 2016.

This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV UK Ltd. of any changes to the approved equipment. Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply. This certificate remains valid unless suspended, withdrawn, re-called, or cancelled.

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 Voyager Integrated Navigation System (INS) consists of several Multifunction displays (MFDs) incorporating the below INS-functions and integrated via duplicated Ethernet:

<i>Function</i>	<i>type</i>
• Collision Avoidance (RADAR)	FAR-3000 manufactured by Furuno Electric Co., Ltd.
• Route Monitoring (ECDIS)	FMD-3000 manufactured by Furuno Electric Co., Ltd.
• Route Planning (ECDIS)	FMD-3000 manufactured by Furuno Electric Co., Ltd.
• Navigation Control data (CID)	Voyager INS
• Alert Management (CAM)	Voyager INS
• Status and Data Display	Voyager INS

For details, see Appendix

## Application/Limitation

- The ECDIS and RADAR identified under Product description shall hold valid type approval certificates documenting compliance with applicable international standards in accordance with the Regulation.
- The minimum configuration of Voyager INS for SOLAS compliance comprises 4 MFDs. The maximum configuration embraced by the certificate comprises 9 MFDs. An INS-configuration involving additional MFDs may be installed ensuing a case-by-case approval of the actual topology.
- The Voyager INS shall be interconnected with dual installations of position, heading and speed sensors all holding valid type approval certificates.
- The Voyager INS shall be connected to an alarm transfer system for transfer of back-up navigator alarms.
- The MFDs shall be individually connected to the VDR for transfer of ECDIS and RADAR images in compliance with IEC61996-1.
- For vessels where BAM-compliance in accordance with MSC.302(87) is required the INS CAM-HMI should be arranged as the functional HMI for the Bridge Alert Management.
- The Voyager INS ECDIS function may be integrated with and act as HMI for the Furuno TC-3001-“nn” track control system(s).
- The Voyager INS shall be installed and commissioned onboard according to manufacturer’s installation instructions for INS, ECDIS and RADAR.

## Type Examination documentation

- See Appendix

## Tests carried out

• Performance	IEC 61924-2:2012 incl. IEC 61924-2 Corr. 1:2013
• Environmental	IEC 60945 (2002) incl. Corr.1 (2008)
• Serial Interface	IEC 61162-1 (2016)
• Serial high-speed	IEC 61162-2 (1998)
• LAN interface	IEC 61162-450 (2018)
• Presentation	IEC 62288 (2014)
• Alert management	IEC 62923-1 (2018) and IEC 62923-2 (2018)

## Marking of product

The type designation and name and contact address of the manufacturer shall be affixed visibly, legibly and indelibly to at least one part of the product. In addition the various equipment shall be marked with serial number. Safe distance to magnetic compass and power consumption and/or supply voltage may be stated in the individual installation manuals.

## APPENDIX

### Product Description

The Voyager INS topology consists of combinations of the following units and components:

Unit	Components	Model	Remark
MFD (general)	Processing unit Control unit(s) Monitor(s)	EC-3000 RCU-024 (ECDIS) RCU-025(RADAR) All monitors $\geq 26"$ and identified on the ECDIS type examination certificate are acceptable.	<i>Ref. individual equipment type examination certificates for further details</i>
MFD (RADAR)	Transceiver units Antenna units Power supply unit	RTR-105/-106/-107/-108/-109/-111/-123 XN12CF-RSB-128 XN20CF-RSB-128/130 XN24CF-RSB-128/130 SN36CF-RSB-129/131/133 PSU-014/-015/-016/-018	<i>Dual radar transceiver installation (X-band &amp; S-Band)  See RADAR type examination certificate for details</i>
Yokogawa Heading Reference Unit <sup>1)</sup>	HR I/F Box HR Relay Box	MST504 MST505	<sup>1)</sup> <i>optional (part of CCRS)</i>
Intelligent HUB	HUB-3000		<i>The LAN components shall be duplicated</i>  <sup>1)</sup> <i>optional</i>  <i>maintenance number: (x=0,1,2...9)</i>
Sensor Adapter- serial	MC-3000S		
Sensor Adapter- digital	MC-3030D		
Sensor Adapter- digital	MC-3020D <sup>1)</sup>		
Sensor Adapter- analog	MC-3010A <sup>1)</sup>		
Other optional units	Ref. Installation manual IME-44751-xx		
Cabling	Ref. Installation manual IME-44751-xx		
<i>Software version</i>	Operating system: Linux ver.6.xx ECDIS : ver.6.xx RADAR : ver.6.xx Cental Alert Management,CAM :ver.6.xx Conning, CID : ver.6.xx INS : ver.6.xx MPT590 : V800000B01		

### Type Examination documentation

DNV No.	Document ID	Rev.	Description
54	K24-17-1040	Rev 1.1 11/Oct/2022	Report: Furuno IEC62923-1/-2, DNVGL type approval testing report, Model: Integrated Navigation System, Type: Furuno Voyager INS
53	K24-17-1093	Rev 1.1	Report: Furuno IEC62923-1/-2, DNVGL type approval testing report, Model: Integrated Navigation System, Appendix, Type: Furuno Voyager INS
52	LIC 12-21-103	5 August 2021	Report: LABOTECH IEC61162-450 clause 8.2.2, Test Report, Furuno INS
51	LIC 01-21-050	5 August 2021	Report: LABOTECH IEC61162-450 clause 8.2.2, Reference document for IEC 61162-450 test performed by LIC
50	LIC 01-21-045	30 June 2021	Report: LABOTECH IEC 61162-450: Reference document for IEC 61162-450

## APPENDIX

**Type Examination documentation cont.**

<b>NPS No.</b>	<b>Document no.</b>	<b>Rev.</b>	<b>Title</b>
49	LIC 12-21-080	30 June 2021	Report: LABOTECH IEC 61162-450: INS
47	K03-17-3122	23 APR 2021	Report: DNVGL type approval testing report, Model: MARINE RADAR, Type: FAR-3xx0 series
46	K24-17-1034	14 May 2021	Report: DNVGL type approval testing report, Model: Alert management System, Type: FMD-3000 series
45	K24-17-1033	2021-Mar-10	Report: DNVGL type approval testing report, Model: ECDIS, Type: FMD-3000 series
37	K24-17-766		Voyager INS: DNVGL type approval test report
35	ENV17024		Heading Reference Unit: CSD Test Report
34	EMC17079		Heading Reference Unit: EMC Test Report
33	K24-17-812		Result of CCRP calculation tests
32	K24-17-917		Result of input/output circuits - protocol conformity test
31	K03-17-2453		Result of TT Association - Scenario test
29	K24-17-916		DNV type approval testing report for pending items
23	OSE-44571-Z1		Operator's Guide: Furuno Voyager INS
22	K24-17-898-0		testing program for pending items
21	IME-44751-A21		Installation manual Furuno Voyager INS
10	OME-44751-A21		Operator's manual: Furuno Voyager INS
2	K24-17-775-6		Appendix A: Specification of Furuno INS Technical information
1	K24-17-779-5	5	FMEA of FURUNO INS for IEC61924-2