

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV GL AS under the authority of the Government of Norway.

This is to certify:

That the Integrated navigation system (INS)

with type designation(s)
Furuno Voyager INS

Issued to

Furuno Electric Co., Ltd.
Nishinomiya, Hyogo Pref, Japan

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2018/773**,
item No. MED/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)

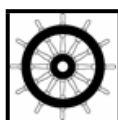
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2023-12-12**.

Issued at **Høvik** on **2018-12-13**

DNV GL local station:
Kobe

Approval Engineer:
Olaf Gundersrud



Notified Body
No.: **0575**

for **DNV GL AS**

Roald Vårheim
Head of Notified 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-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
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.



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 Directive.
- 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(83) 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

Tests carried out

- | | |
|---------------------|--------------------|
| • Performance | IEC 61924-2 (2012) |
| • Environmental | IEC 60945 (2002) |
| • Serial Interface | IEC 61162-1 (2016) |
| • Serial high speed | IEC 61162-2 (1998) |
| • Presentation | IEC 62288 (2014) |
| • Alert management | MSC.302(87) |

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 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 & S-Band) See RADAR type examination certificate for details</i>
Heading reference unit	Yokogawa	MPT590	
Intelligent HUB	HUB-3000		<i>The LAN components shall be duplicated</i> <i>¹⁾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 ¹⁾		
Sensor Adapter- analog	MC-3010A ¹⁾		
Other optional units	Ref. Installation manual IME-44751-xx		
Cabling	Ref. Installation manual IME-44751-xx		
<i>Software version</i>	Operating system: Linux ver.4.xx ECDIS : ver.4.xx RADAR : ver.4.xx Cental Alert Management,CAM :ver.4.xx Conning, CID : ver.4.xx INS : ver.4.xx MPT590 : V800000Axx		

Type Examination documentation

NPS No.	Document no.	Rev.	Title
37	K24-17-766		DNVGL type approval testing report – Furuno Voyager INS
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 (pending items)

APPENDIX

Job Id: **344.1-005849-1**
Certificate No: **MEDB00001G6**

Type Examination documentation cont.

NPS No.	Document no.	Rev.	Title
23	OSE-44571-Z1		Operator's Guide: Furuno Voyager INS
22	K24-17-898-0		DNV type approval testing report (pending items)
21	IME-44751-Z1		Installation manual Furuno Voyager INS
10	OME-44751-Z2		Operator's manual Furuno Voyager INS
2	K24-17-775-6		Specification of Furuno INS Technical information Appendix A
1	K24-17-779-5		FMEA of FURUNO INS for IEC61924-2