

**EC-TYPE EXAMINATION
CERTIFICATE (MODULE B)**

Certificate No:
MEDB00001BE
Revision No:
6

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 Radar equipment CAT1, CAT2; for High Speed Craft CAT 1H/2H ; with a chart option CAT 1C, CAT 2C, CAT 1HC, CAT 2HC

with type designation(s)

FAR-3210, FAR-3210-BB, FAR-3220, FAR-3220-BB, FAR-3310, FAR-3320, FAR-3320W, FAR-3220W-BB, FAR-3330SW, FAR-3230SW-BB, FAR-3230S, FAR-3230S-BB, FAR-3330S, FAR-3230S-SSD, FAR-3230S-SSD-BB, FAR-3330S-SSD, FAR-3220-NXT, FAR-3220-NXT-BB, FAR-3320-NXT

Issued to

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

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

Regulation **(EU) 2019/1397,**

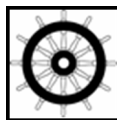
item Nos. MED/4.34, 4.35, 4.37, 4.38. SOLAS 74 as amended, Regulations V/18 & V/19 & X3, IMO Res. A.278(VIII), IMO Res. MSC.36(63), IMO Res. MSC.97(73), IMO Res. A.694(17), IMO Res. MSC.191(79), IMO Res. MSC.192(79), IMO Res. MSC.302(87), IMO MSC.1/Circ.1349, ITU-R M.1177-4 (04/11) and IMO Res. MSC.232(82) Appendix 6

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

This Certificate is valid until **2021-08-29.**

Issued at **Høvik** on **2020-01-29**

DNV GL local station:
Kobe



for **DNV GL AS**

Approval Engineer:
Frederik Tore Elter

Notified Body
No.: **0575**

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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 Radar; FAR-3210, FAR-3210-BB, FAR-3220, FAR-3220-BB, FAR-3310, FAR-3320, FAR-3320W, FAR-3220W-BB, FAR-3330SW, FAR-3230SW-BB, FAR-3230S, FAR-3230S-BB, FAR-3330S FAR-3230S-SSD, FAR-3230S-SSD-BB, FAR-3330S-SSD, FAR-3220-NXT, FAR-3220-NXT-BB and FAR-3320-NXT consist of the following units:

Unit	Location
Processor unit	Protected
Monitor (display) unit	Protected
Control unit (operation panel)	Protected
Data interface	Protected
Transceiver unit (Up-mast)	Exposed
or Transceiver unit (Down-mast)	Protected
Scanner power supply unit	Protected
Antenna unit	Exposed

For details, see Appendix.

Application/Limitation

- The FAR-3xx0 is found to be in compliance with the requirements for RADAR for ships and high speed craft; CAT 1C, CAT 2C, CAT 1HC and CAT 2HC (dependent of monitor and antenna rpm).
- Back-up ECDIS: The FAR-3xx0 is found to be in compliance with the requirements of SOLAS V/19.2.1.5 and the Commission Implementing Regulation (EU)2019/1397 MED/4.30 when configured as Back-up for ECDIS.
- The FAR-3xx0 may be configured for processing(combining) the radar signals from two separate sources (2 transceivers).
- The DVI interface shall be used for video signal transfer between Processor unit and Monitor unit.
- The FAR-3000 may be interconnected to the VDR thru the DVI-I port(USB) or via LAN2 port (IEC61162-450) in compliance with IEC61996-1.
- The FAR-radar shall be installed and tested onboard in accordance with the Installation Manual (ref. appendix)

Type Examination documentation

- See Appendix.

Tests carried out

- IEC62388(2013)
- IEC61162-1(2016)
- IEC61162-2(1998)
- IEC61162-450(2011+AMD1:2016)
- IEC62288(2014)
- IEC60945(2002)+Corr.1 (2008))
- IEC61174(2015) Annex F

Marking of product

The type designation and name and contact address of the manufacturer shall be affixed visibly, legibly and indelibly to the product. In addition the product shall be marked with serial number, safe distance to magnetic compass, power consumption and/or supply voltage.

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USCG Approval for ARPA/ATA (CAT.1C/CAT.2C/CAT.1HC/CAT.2HC) and ECDIS Back-up

The product has been assigned a **U.S. Coast Guard Module B number**, USCG approval 165.115-/EC0575, 165.116/EC0575, 165.216/EC0575 and 165.217/EC0575, as applicable to CAT 1C, CAT 2C, CAT 1HC and CAT 2HC respectively, and 165.124/EC0575 for the ECDIS Back-up configuration, to note type approval to Module B only as it pertains to obtaining US Coast Guard approval as allowed by the "Agreement between the United States of America and the EEA EFTA states on the mutual recognition of certificates of conformity for marine equipment" signed 17 October 2005 and amended 22 February 2019.

The RADAR transceiver for CAT 1C and CAT 2C are not covered by the agreement and must have separate U.S. certification for installation on U.S. flagged vessels.

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APPENDIX

Product description:

The Chart Radars; FAR-3210, FAR-3210-BB, FAR-3220, FAR-3220-BB, FAR-3310, FAR-3320, FAR-3320W, FAR-3220W-BB, FAR-3330SW, FAR-3230SW-BB, FAR-3230S, FAR-3230S-BB, FAR-3330S FAR-3230S-SSD, FAR-3230S-SSD-BB, FAR-3330S-SSD, FAR-3220-NXT, FAR-3220-NXT-BB and FAR-3320-NXT comprise combinations of the following components:

Unit	Model Name	Components	Remark
Processor Unit	EC-3000	Mother board: ADP-556-01 Graphical unit: ATI Radeon E8860	<i>For Chart Radar & ECDIS backup the graphical unit and the monitor shall be of calibrated type</i>
Data Interfaces (embedded)	Connector J3 - J6	TTYCS(LA)-4	<i>IEC61162-2/61162-1</i>
	Connector J7 - J10	TTYCS(LA)-1Q	<i>IEC61162-1</i>
	Ethernet 1000Base-T	2 ports	<i>LAN</i>
Monitor Unit (VDU)	MU-190 ¹⁾ or MU-231 or MU-201CE ¹⁾ or MU-231CE or MU-270W or JH19T14FUD ¹⁾ or JH20T17FUD ¹⁾ or JH23T12FUD ²⁾ or JH 23T14 FUD-MA4-AxxA or HD24T22 FUD-MA4-FxGx ¹⁾ or HD26T21 MMD-MA4-FAGA or HD26T22 FUD-MA4-FxGx or HD27T22 FUD-MA4-FxGx or HD32T22 FUD-MA4-AxGx or HD55T22 FUD-xA4-xOxx or WA460-01-MON-01-XXFU or WA270-01-MON-01-XXFU	<i>¹⁾ CAT 2 monitor</i> <i>²⁾ RADAR only - not for ECDIS backup</i> <i>x=variable letter/number according to manufacturer's type number identification</i>	
Radar Control unit	RCU-025		
Trackball control unit	RCU-026		
Transceiver/antenna Unit	FAR-3x10(-BB) FAR-3x20(-BB)	XN12CF-RSB128-RTR10n or XN20CF-RSB128-RTR10n or XN24CF-RSB128-RTR10n and PSU-014	<i>n=5 or 6</i>
	FAR-3x20W(-BB)	XN20CF-RSB130-RTR108 or XN24CF-RSB130-RTR108 and PSU-014	
	FAR-3x30S(-BB)	SN36CF-RSB129-RTR107 and PSU-014 or PSU-015	

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Unit	Model Name	Components	Remark
Transceiver/antenna Unit	FAR-3x30SW(-BB)	SN36CF-RSB131-RTR109 and PSU-014 or PSU-015	
	FAR-3x30S-SSD	SN36CF-RSB133-RTR111 and PSU-016 or PSU-018	
	FAR-3220-NXT(-BB) FAR-3320-NXT	XN12CF-RSB128-RTR123 or XN20CF-RSB128-RTR123 or XN24CF-RSB128-RTR123 and PSU-014	<i>Solid State</i>
Performance monitors	PM-32A, PM-52A PM-32B, PM-52B (solid states)		
ECDIS control unit	RCU-024		<i>Optional</i>
Sensor Adapter (interface unit)	MC-3000S	Serial to network (IEC61162-450)	<i>Optional</i>
Sensor Adapter (interface unit)	MC-3010A	analog	<i>Optional</i>
Sensor Adapter (interface unit)	MC-3020D	digital IN	<i>Optional</i>
Sensor Adapter (interface unit)	MC-3030D	digital OUT	<i>Optional</i>
LAN switch/switching HUB	HUB-100		<i>Radar: optional</i>
LAN switch/intelligent HUB	HUB-3000 ³⁾		³⁾ <i>ECDIS backup: Mandatory</i>
Junction Box	RJB-001		<i>Optional</i>
LAN signal converter	HMC-200CE-A		<i>Optional</i>
Software	Main: 0359266 Ver. 02.xx SPU: 0359281 ver.01.xx (Magnetron radar) 0359286 ver.01.xx (S-band solid state radar) 0359477 ver.01.xx (X-band solid state radar)		
RADAR			
ECDIS backup	Ver. 2.xx Linux 3.2 Jeppesen SDK 6.0		

Type Examination documentation:

NPS No.	Document No.	Rev.	Document Title
4	K03-17-1759		Wind Tunnel test report - RSB-129 & SN36CF
5	K03-17-1758		Wind Tunnel test report - RSB-128 & XN12CF/XN20CF/XN24CF
8	IME-36180-J22		Installation Manual Chart RADAR- FAR-3230S(-BB)/-3330S
9	IME-36190-J22		Installation Manual Chart RADAR- FAR-3230S-SSD(-BB)/FAR-3330S-SSD
10	IME-36240-J22		Installation Manual Chart RADAR- FAR-3320W/-3220-BB/-3330SW/3230SW-BB
11	K03-17-1814		TT and Association scenario test Marine Radar
13	K03-17-1815		DNV type approval testing report: IEC62388
14	OMC-44670-Z		Monitor MU-190: Operator's manual
15	OSE-36160-D10		Operator's guide: CHART RADAR

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NPS No.	Document No.	Rev.	Document Title
18	OMC-44690-Z		Monitor MU-231 Operator's manual
19	FLI 12-03-058		IEC60945 test report
20	FLI 12-10-068	1	IEC60945 test report - monitor units
21	FLI 12-11-111		IEC60945 test report - ECDIS FMD-3000 series
22	FLI 12-11-112		IEC61162-1 test report - FMD-3000 series ECDIS
23	FLI 12-12-025		IEC60945 test report - FMD-3000 series ECDIS
24	FLI 12-13-057		IEC60945 & 62388 test report - FAR-3230S/-3330S
25	FLI 12-13-058		IEC60945 & 62388 test report - FAR-3210/-3310/-3220/-3320
26	FLI 12-13-059		IEC60945 & 62388 test report - FAR-3230S-SSD/-3330S-SSD
27	FLI 12-13-062		IEC60945 EMC test report - FAR-3210/-3310/-3220/-3320
28	FLI 12-13-063		IEC60945 EMC test report - FAR-3230S/-3330S
29	FLI 12-13-064		IEC60945 EMC test report - FAR-3230S-SSD/-3330S-SSD
32	K03-17-1869		Antenna radiation pattern for FAR-3xxx series
33	QINETIQ/MS/MAR/CR13 03326/V1.2	1.2	Unwanted emission measurements - FAR-3xxx-series
34	FLI 12-13-072		IEC60945 EMC test report - FAR-3230S/-3330S
35	FLI 12-13-073		IEC60945 test report -FAR-3230S/-3330S
36	FLI 12-13-074		IEC60945 EMC test report -FAR-3210/-3310/-3220/-3320
37	FLI 12-13-075		IEC60945 test report -FAR-3210/-3310/-3220/-3320
38	FLI 12-13-076		IEC60945 EMC test report -FAR-3230S-SSD/-3330S-SSD
39	FLI 12-13-077		IEC60945 test report -FAR-3230S-SSD/-3330S-SSD
40	FLI 12-13-078		IEC60945 EMC test report -FAR-3320W
41	FLI 12-13-079		IEC60945 test report -FAR-3320W
42	FLI 12-13-080		IEC60945 EMC test report -FAR-3330SW
43	FLI 12-13-081		IEC60945 test report -FAR-3330SW
50	K03-17-1899	1	Performance in sea and rain clutter
51	K03-17-1894	1	Performance in sea clutter
52	K03-17-1888	1	FAR-3210 Performance in sea and rain clutter
53	Applica 20128	0	performance testing of RADAR FAR-3000 series
54	K03-17-1424		FCR-2xxx Chart Radar: DNV type approval testing report
55	K03-17-1538		FCR-2xxx Chart Radar: DNV type approval testing report - Pending items
56	K03-17-1554		FCR-2xxx Chart Radar: DNV type approval testing report - Pending items
57	K03-17-1877		DNV Type approval testing report
58	K03-17-2231		DNVGL type approval testing report: Marine Radar FAR-3000 series
59	OME-36160-H30		Operator's manual; Chart RADAR FAR-3xx0 series
60	IME-36160-K30		Installation manual; Chart RADAR FAR-3xx0 series
61	K03-17-2051		DNV type approval testing report: IEC61162-450
62	LIC 12-15-058		Test report: IEC61162-450 for processor unit type EC-3000
64	LIC 12-16-009/-010/-011/-012		IEC60945 and 62288 test reports: Monitor unit: MU-270W

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NPS No.	Document No.	Rev.	Document Title
65	LIC 12-15-059		Test report (IEC61162-450) for Sensor adapters type MC-3000
66	OMC-44930-Z4		MU-270W marine display: Operator's manual
69	DNVGL: TAA00000S1		Wave series of monitors
72	K03-17-2468		DNVGL type approval testing report - FAR-3000 series
73	E32-01305-G20		Instruction Manual. setting and adjustments
74	K03-17-2679		DNVGL type approval testing report; IEC61174 AnnexF & MSC.302(87)
75	K03-17-2792-0		DNVGL type approval testing report for pending items
78	LIC 12-17-062		EC-300 Processor unit: IEC60945 EMC
79	LIC 12-17-063		EC-300 Processor unit: IEC60945 Environmental
80	LIC 12-17-064		EC-300 Processor unit: IEC60945 CSD
81	LIC 12-19-027	5	EC-3000 IEC61162-1 Ed.5
82	LIC 12-19-028	5	MC-3000S IEC61162-1 Ed.5
83	RET-19-029		The modification of FHD layout for CAT1 requirement
85	K03-17-2929	0	Performance in sea and clutter FAR-2328-NXT
87	TR-30215	0	Performance testing of X-band SSD antenna & transceiver
88	LIC 12-20-002		Test report (ITU-R M.1177) for transceiver type RTR-123
90	K03-17-2885	1.03	DNVGL type approval testing report FAR-3x20 NXT
92	K03-17-2892		IEC 62388, Result of TT Marine Radar F A R 2x 2 8 NXT
93	LIC 12-19-151		IEC 60945, ETSI EN 301 843-1, Furuno Marine Radar Type: FAR-2228-NXT/2228-NXT-BB/2328-NXT, FAR-3220-NXT/3220-NXT-BB/3320-NXT
94	LIC 12-19-152		IEC 60945, Furuno Marine Radar Type: FAR-2228-NXT/2228-NXT-BB/2328-NXT, FAR-3220-NXT/3220-NXT-BB/3320-NXT - dangerous voltage
95	LIC 12-19-153		IEC 60945, Furuno Marine Radar Type: FAR-2228-NXT/2228-NXT-BB/2328-NXT, FAR-3220-NXT/3220-NXT-BB/3320-NXT - temperature
96	LIC 12-19-154		IEC 60945, IEC62388 Furuno Marine Radar Type: FAR-2228-NXT/2228-NXT-BB/2328-NXT, FAR-3220-NXT/3220-NXT-BB/3320-NXT - vibration and shock
97	LIC 12-19-155		IEC 60945, Furuno Marine Radar Type: FAR-2228-NXT/2228-NXT-BB/2328-NXT, FAR-3220-NXT/3220-NXT-BB/3320-NXT - CSD
98	LIC 12-19-156		IEC 60945, Furuno Marine Radar Type: FAR-2228-NXT/2228-NXT-BB/2328-NXT, FAR-3220-NXT/3220-NXT-BB/3320-NXT - Electromagnetic RF radiation