

# 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 the Kingdom of Norway.

**This is to certify:**

**That the Radar equipment for high speed craft applications**

with type designation(s)

**FAR-2318, FAR-2328, FAR-2328W, FAR-2338S, FAR-2338SW and FAR-2338S-NXT, FAR-2218, FAR-2218-BB, FAR-2228, FAR-2228-BB, FAR-2238S, FAR-2238S-BB, FAR-2238S-NXT, FAR-2238S-NXT-BB**

Issued to

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

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

Regulation **(EU) 2017/306,**

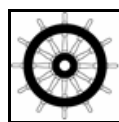
**item No. MED/4.37. SOLAS 74 as amended, Regulation X/3, IMO Res. A.278(VIII), IMO Res. A.694(17), IMO Res. MSC.36(63), IMO Res. MSC.97(73), IMO Res. MSC.191(79), IMO Res. MSC.192(79), IMO Res. MSC.302(87), IMO MSC.1/Circ.1349, ITU-R M.1177-4 (04/11)**

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

This Certificate is valid until **2023-03-13.**

Issued at **Høvik** on **2018-03-14**

DNV GL local station:  
**Kobe**



for **DNV GL AS**

Approval Engineer:  
**Olaf Gundersrud**

Notified Body  
No.: **0575**

**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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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-2318, FAR-2328, FAR-2328W, FAR-2338S, FAR-2338SW and FAR-2338S-NXT, FAR-2218, FAR-2228, FAR-2238S, FAR-2238S-NXT, FAR-2218-BB, FAR-2228-BB, FAR-2238S-BB, FAR-2238S-NXT-BB consist of the following units:

Unit	Location
Processor unit	Protected
Monitor unit (VDU)	Protected
Control unit (operation panel)	Protected
Data interface	Protected
Up-mast transceiver unit -	Exposed
- or down-mast transceiver unit	Protected
Antenna unit	Exposed

For details, see Appendix.

## Application/Limitation

- The FAR-23x8(n) radar is found to be in compliance with the Regulation (EU)2017/306 RADAR for high speed craft; CAT 1H and CAT 2H.
- The FAR-22x8(-BB) radar is found to be in compliance with the Regulation (EU)2017/306 RADAR for high speed craft; CAT 2H
- The antenna rotation shall be setup to 42 rpm.
- The FAR-radar supports a DVI-I port and Ethernet port being in compliance with IEC61996-1 for interconnection with the VDR.
- The FAR-radar shall be installed and tested onboard in accordance with the pertinent Installation Manual (ref. appendix)

## Type Examination documentation

- See Appendix.

## Tests carried out

- IEC62388(2013)
- IEC61162-1(2010 and 2016)
- IEC61162-2(1998)
- IEC61162-450(2011)
- IEC62288(2014)
- IEC60945(2002)

## Marking of product

The manufacturer and Type Designation to be applied to the equipment in a clearly visible location and in addition the equipment shall be marked with serial number, safe distance to magnetic compass, power consumption and/or supply voltage.

## APPENDIX

### Product description

The CAT 1H Radar; FAR-2318, FAR-2328, FAR-2328W, FAR-2338S, FAR-2338SW, FAR-2338-NXT and the CAT 2H Radar; FAR-2218(-BB), FAR-2228(-BB), FAR-2238S(-BB), FAR-2238S-NXT(-BB) comprise combinations of the following components:

Unit	Model Name	Components		Remark
Processor Unit	RPU-025			
Data Interfaces (embedded)	03P9648	I/O board		IEC61162-2/ IEC61162-1
	03P9652			
	Ethernet 100Base-T	2 ports		IEC61162-450
	VDR-connection	DVI-I or Ethernet		LAN2 port
	HMC-200CE-A	LAN signal converter		optional
Monitor Unit for CAT 1H/2H	MU-231 or MU-270W or HD26T21 MMD-MAx-FAGA <sup>1)</sup> or HD26T22 FUD-MAx-FxGx <sup>1)</sup> or HD27T22 FUD-MAx-FxGx <sup>1)</sup> or HD32T22 FUD-MAx-FxGx <sup>2)</sup> or HD55T22 FUD-xAx-xOxx <sup>1)</sup> or JH 23T14 FUD-MA1-AxxA <sup>1)</sup> or WA460-01-MON-01-xxFU <sup>1)</sup> or WA270-01-MON-01-xxFU <sup>1)</sup>			<i>X=variable letter/number according to manufacturer's type number identification</i>
Optional monitor unit for CAT 2H	MU-190 or HD24T22 FUD-MAx-FxGx <sup>1)</sup> or HD24T21 MMD-MAx-Axxx <sup>1)</sup> or HD19T22 FUD-MAx-FxGx <sup>1)</sup> or JH 19T14 FUD-xA1-xxxA <sup>2)</sup> or JH 20T17 FUD-xA1-AOAA <sup>2)</sup>			<sup>1)</sup> DVI/VGA connection <sup>2)</sup> DVI connection
Radar control unit	RCU-014 or RCU-015 and RCU-016 <sup>3)</sup>			<sup>3)</sup> optional
X-band transceiver	<i>model</i>	<i>transceiver</i>	<i>Antenna unit</i>	
	FAR-2318 FAR-2218(-BB)*	RTR-105	XN12CF-RSB-128 XN20CF-RSB-128 XN24CF-RSB-128	4 ft 6.5 ft 8 ft *CAT 2H
	FAR-2328 FAR-2228(-BB)*	RTR-106	XN12CF-RSB-128 XN20CF-RSB-128 XN24CF-RSB-128	*CAT 2H
	FAR-2328W	RTR-108	XN20CF-RSB-130 XN24CF-RSB-130	
S-band transceiver	FAR-2338S FAR-2238S(-BB)*	RTR-107	SN36CF-RSB-129	12.5 ft *CAT 2H
	FAR-2338SW	RTR-109	SN36CF-RSB-131	

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### Product description cont.

Unit	Model Name	Components		Remark
S-band transceiver	FAR-2338S FAR-2238S(-BB)*	RTR-107	SN36CF-RSB-129	12.5 ft *CAT 2H
	FAR-2338SW	RTR-109	SN36CF-RSB-131	
	FAR-2338S-NXT FAR-2238S-NXT(-BB)*	RTR-111	SN36CF-RSB-133	250W - Solid state *CAT 2H
Performance monitors	PM-32A PM-52A PM-52B <sup>6)</sup>	X-band S-band S-band		<sup>6)</sup> solid state
LAN switching HUB	HUB-100			Option
LAN intelligent HUB	HUB-3000			Option
Junction Box	RJB-001			Option
Software	03P9377-xx.xx	RPU-025 (main)		
	03P9380-xx.xx	RPU-025 (sub)		

### Type Examination documentation

NPS No.	Document No.	Rev.	Document Title
104	Applica 2010-3421	1	JH 20T17 MMD-DA1-AAAR Technical report
103	Applica 2010-3253		JH 20T17 MMD-DA1-AAAA Technical report
96	applica 21008	0	HD 24T22 MMD IEC60945 testing
94	VS-TV-060720-04		Vibration test: HD 19T22 MMD-MA1-FHGA-ES-1
88	Applica 21009	0	HD26T22 MMD-MA1-FAGP-ES: EMC & environmental testing
85	Applica 20588	0	HD19T21 MMC-M2D-MBAA: EMC & environmental testing
83	Applica 21122	0	HD19T22 MMD-MA1-FOGA-ES: EMC radiated emission
82	Applica 21089	0	HD19T22 MMD-MA1 -EMC-FAGP-ES: EMC testing
81	170421001T		HD19T22 MMD-MA1 -EMC-FAGP-ES: EMC & environmetal testing
80	170703002T		HD19T22 MMD-MA1 -EMC-FHGA-ES-1: EMC & environmetal testing
79	DNV 2010-3124	2	JH23T14 MMD-MA1 -EMC and environmental testing
81	170421001T		HD19T22 MMD-MA1 -EMC-FAGP-ES: EMC & environmetal testing
80	170703002T		HD19T22 MMD-MA1 -EMC-FHGA-ES-1: EMC & environmetal testing
79	DNV 2010-3124	2	JH23T14 MMD-MA1 -EMC and environmental testing
77	DOC102116-1	1	JH23T14 MMD-MA1-AABA IEC62288 Conformance test report
76	DOC101909-1R3		Keypad P004511-1 minimum brightness test
75	DOC100829-6		JH23T14-MMD-MA1-OBA Flicker test

## APPENDIX

### Type Examination documentation cont.

NPS No.	Document No.	Rev.	Document Title
73	TAA00000S1		DNVGL TA-certificate
71	doc205984-1		IEC62288: HD55T22 conformance test
70	doc205971-1		IEC62288: HD55T22 flicker test
69	applica 21007	0	HD55T22 EMC and environmental testing (2)
68	applica 20869	1	HD55T22 EMC and environmental testing
67	Nemko E16240.01		HD55T22 Vibration test
65	doc205992-1		IEC62288 conformance test report HD32T22
64	doc205970-1		IEC62288 flicker test HD32T22
63	doc206156-1	1	HD 27T22 MMD - IEC62288 FLICKER TEST
62	doc206155-1	1	HD 27T22 MMD-MA1-FAGA-ES: IEC62288 and colour calibration
60	Applica 20941	0	EMC and environmental testing of HD 27T22 MEC
59	Applica 20885	0	EMC and environmental testing of HD 27T22 MEC
58	doc205967-1		Flicker test report HD24T22
56	doc102352-2	2	IEC62288: Conformance test report 24T22 MMD
54	Applica 21009	0	HD 26T22 MMD: EMC and environmental testing
53	Applica 21008	0	HD 24T21 MMD: EMC and environmental testing
50	doc205969-1	1	IEC62288 Flicker test report HD26T22 MMD
49	doc205958-1	2	Minimum brightness test of GDCX Rev 5
48	doc102352-3		IEC62288: Conform. test report HD 26T22 MMD-MA1-FAGA-ES
46	2008-3511		IEC60945 technical report: JH 20T17 MMD-AA1-AABA
45	2013-3038		IEC60945 technical report: JH 19T14 MMD-MA1-AAAA
44	2008-3528		IEC60945 technical report: JH 19T14 MMD-AA1-AOAA
43	2009-3442		IEC60945 technical report: JH 19T14 MMC-AA1-AABR
38	DOC102116-3		IEC62288: JH 19T14 MMD-MA1-SABA-HW09
37	DOC102116-2		IEC62288: JH 20T17 MMD-AA1-AABA-HW06
35	IME-36520-A20		Installation manual: Marine RADAR, FAR-2xx8 series
34	OME-36520-Z6		Operator's manual: Marine RADAR, FAR-2xx8 series
31	LIC 12-17-023		IEC61162-450 report: FAR-2xx8
30	LIC 12-17-022		IEC61162-1/2 report: FAR-2xx8
29	LIC 12-17-021		CSD IEC60945: FAR-2xx8
28	LIC 12-17-020		IEC60945 others: FAR-2xx8
27	LIC 12-17-019		Temp. & vibration IEC60945: FAR-2xx8
26	LIC 12-17-018		EMC IEC60945: FAR-2xx8
23	Applica 20128	0	Performance testing of Radar FAR-3000 series
21	RET-17-009		The answer of DNVGL comment about FAR-2xx8 type approval
20	K03-17-1538		DNV type approval testing report for pending items: FCR-2xx9 series
19	K03-17-1758		Wind tunnel test report: Radiator & scanner XN12CF/XN20CF/XN24CF and RSB-128
18	K03-17-1759		Wind tunnel test report: Radiator/scanner SN36CF/RSB-129
17	K03-17-1814		Result of TT and Association scenario test marine Radar: FAR-3xx0
16	K03-17-1815		DNV type approval report Marine Radar: FAR-3xx0
15	K03-17-1869		Radar antenna radiation pattern data : FAR-3xxx series
14	K03-17-1888	1	Performance in sea and rain clutter : FAR-3210 with XN-20CF
13	K03-17-1894	1	Performance in sea clutter : FAR-3xx0
12	K03-17-1899	1	Performance in sea and rain clutter : FAR-3xx0

Job Id: **344.1-006649-1**  
Certificate No: **MEDB00002ZW**

## APPENDIX

### Type Examination documentation cont.

<b>NPS No.</b>	<b>Document No.</b>	<b>Rev.</b>	<b>Document Title</b>
11	K03-17-2549		DNVGL type test report marine Radar FAR-2xx8
10	K03-17-2567		Result of TT and Association scenario test: FAR-2xx8
9	QINETIQ/MS/MAR/CR1303 326/V1.2		Unwanted emission measurements of RTR- 105/106/107/111 XN-12CF, XN-24CF, SN36CF
8	OSE-36520-Z1		Operator's Guide FAR-2xx8 series
5	LIC 12-16-012		IEC62288 ed.2.0: Monitor unit MU-270W
3	BSH/4543/4342577/13-1		Marine Radar FAR-2xx7: IEC62388(2013)
2	BSH 6522/1114-8/2004		FAR-2xx7 radar Series
1	FLI 12-10-039		IEC62288 & IEC62388 test report for MU-190 and MU-231
57*	DELTA-L102798-475n (n=1,2,3)		Test of Flicker from 15, 19, 20 inch monitors for use as ECDIS monitor

\*Ref. physical archive 344.1-004741-3