DNV·GL

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB00002AU
Revision No:
5

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 CAT 1, CAT 2, CAT 3, CAT 1H and CAT 2H

with type designation(s)
FAR-2218, FAR-2218-BB, FAR-2228, FAR-2228-BB, FAR-2228-NXT, FAR-2228-NXT-BB, FAR-2238S, FAR-2238S-BB, FAR-2238S-NXT, FAR-2238S-NXT-BB, FAR-2318, FAR-2328, FAR-2328W, FAR-2328-NXT, FAR-2338-SW, FAR-2338S, FAR-2338S-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 No. MED/4.34, MED/4.35, MED/4.36. SOLAS 74 as amended, Regulations V/18 & V/19, IMO Res. A.278(VIII), IMO Res. A.694(17), IMO Res. MSC.191(79), IMO Res. MSC.192(79), IMO Res. MSC.302(87), ITU-R M.1177-4 (04/11)

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 **2021-08-29**.
Issued at **Høvik** on **2020-01-29**

DNV GL local station:
Kobe

Approval Engineer:
Frederik Tore Elter

Notified Body
No.: **0575**

for **DNV GL AS**
Digitally Signed By: Trond Sjåvåg
Location: DNV GL Høvik, Norway
on behalf of

Roald Vårheim
Head of Notified Body

A U.S. Coast Guard approval number will be assigned to the equipment when the production module has been completed and will appear on the production module certificate (module D, E or F), 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 by Decision No 1/2019 dated February 22nd, 2019.

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 Radars FAR-2218, FAR-2218-BB, FAR-2228, FAR-2228-BB, FAR-2228-NXT, FAR-2228-NXT-BB, FAR-2238S, FAR-2238S-BB, FAR-2238S-NXT, FAR-2238S-NXT-BB and FAR-2318, FAR-2328, FAR-2328W, FAR-2328-NXT, FAR-2338-SW, FAR-2338S, FAR-2338S-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
Antenna unit	Exposed

For details, see Appendix.

Application/Limitation

- The radar types FAR-23x8(-nn) is found to be in compliance with RADAR for ships and high speed crafts; CAT 1, CAT 2, CAT 3, CAT 1H and CAT 2H (dependent of monitor installed, and antenna rpm).
- The radar types FAR-22x8(-nn) is found to be in compliance with RADAR for ships and high speed crafts; CAT 2, CAT 3 and CAT 2H(dependent of monitor installed and antenna rpm).
- The radar types FAR-2xx8(-nn) CAT 1H/2H: -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

- IEC 62388(2013)
- IEC 61162-1(2016)
- IEC 61162-2(1998)
- IEC 61162-450(2011 with Am1(2016))
- IEC 62288(2014)
- IEC 60945(2002) incl. Corr.1(2008)

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.

USCG Approval for ARPA/ATA/EPA (CAT 1/CAT 2/CAT 3/CAT 1H/CAT 2H)

The product has been assigned a **U.S. Coast Guard Module B number**, USCG approvals 165.115/EC0575, 165.116/EC0575, 165.117/EC0575, 165.216/EC0575 and 165.217/EC0575 as applicable, 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 is not covered by the agreement and must have separate U.S. certification for installation on U.S. flagged vessels.

APPENDIX

Product description

The CAT 1/1H radars FAR-2318, FAR-2328, FAR-2328W, FAR-2328-NXT, FAR-2338-SW, FAR-2338S, FAR-2338S-NXT and the CAT 2/3/2H radars FAR-2218, FAR-2218-BB, FAR-2228, FAR-2228-BB, FAR-2228-NXT, FAR-2228-NXT-BB, FAR-2238S, FAR-2238S-BB, FAR-2238S-NXT, FAR-2238S-NXT-BB comprise combinations of the following components:

Unit	Model Name	Components	Remark
Processor Unit	RPU-025		
Data Interfaces (embedded)	03P9648 03P9652	I/O board	*IEC61162-2/ IEC61162-1*
	Ethernet 100 Base-T	2 ports	*IEC61162-450*
	VDR-connection	DVI-I or Ethernet	*LAN2 port*
	HMC-200CE-A	LAN signal converter	*option*
Monitor Unit for CAT 1/2/3/1H/2H	MU-231 or MU-270W or HD26T21 MMD-MAx-FAGA[2] or HD26T22 FUD-MAx-FxGx[2] or HD27T22 FUD-MAx-FxGx[2] or HD32T22 FUD-MAx-AxGx[3] or HD55T22 FUD-xAx-xOxx[2] or JH 23T14 FUD-MA1-AxxA[2] or WA460-01-MON-01-xxFU[2] or WA270-01-MON-01-xxFU[2]		*x=variable letter/number according to manufacturer's type number identification* *[2]DVI/VGA connection* *[3]DVI connection*
Optional monitor unit for CAT 2/3/2H	MU-190 or HD24T22 FUD-MAx-FxGx[2] or HD24T21 MMD-MAx-Axxx[2] or HD19T22 FUD-MAx-FxGx[2] or JH 19T14 FUD-xA1-xxxA[3] or JH 20T17 FUD-xA1-AOAA[3]		
Optional monitor unit for CAT 3	MU-152[2] or HD15T22 FUD-MAx-FxGx[2] or JH 15T17 FUD-xA1-xxxx[2]		
Radar control units	RCU-014 or RCU-015 and RCU-016[4]		*[4]optional*

Unit	Model Name	Components		Remark
X-band transceiver		*Transceiver*	*Antenna unit*	
	FAR-2318 FAR-2218(-BB)*	RTR-105	XN12CF-RSB-128 XN20CF-RSB-128 XN24CF-RSB-128	*4 ft* *6.5 ft* *CAT 2/3/2H* *8 ft*
	FAR-2328 FAR-2228(-BB)*	RTR-106	XN12CF-RSB-128 XN20CF-RSB-128 XN24CF-RSB-128	
	FAR-2328W	RTR-108	XN20CF-RSB-130 XN24CF-RSB-130	
	FAR-2328-NXT FAR-2228-NXT(-BB)*	RTR-123	XN12CF-RSB128 XN20CF-RSB128 XN24CF-RSB128	*Solid State* *CAT 2/3/2H*
S-band transceiver	FAR-2338S FAR-2238S(-BB)*	RTR-107	SN36CF-RSB-129	*12.5 ft* *CAT 2/3/2H*
	FAR-2338SW	RTR-109	SN36CF-RSB-131	
	FAR-2338S-NXT FAR-2238S-NXT(-BB)*	RTR-111	SN36CF-RSB-133	*Solid State* *CAT 2/3/2H*
Performance monitors	PM-32A PM-32B[5)] PM-52A PM-52B[5)]	X-band X-band S-band S-band		[5)]*Solid State*
LAN switching HUB	HUB-100			*Option*
LAN intelligent HUB	HUB-3000			*Option*
Junction Box	RJB-001			*Option*
Software	*0359377-xx.xx*	*RPU-025 (main)*		
	0359380-xx.xx	*RPU-025 (sub)*		

Type Examination documentation

DNV GL No.	Document No.	Rev.	Document Title
1	FLI 12-10-039		IEC62288 & IEC62388 test report for MU-190 and MU-231
2	BSH 6522/1114-8/2004		FAR-2xx7 radar Series : IEC61162 conformance test
3	BSH/4543/4342577/13-1		Marine Radar FAR-2xx7: IEC62388(2013)
5	LIC 12-16-012		IEC62288 ed.2.0: Monitor unit MU-270W
8	OSE-36520-C10		Operator's Guide FAR-2xx8 series
9	QINETIQ/MS/MAR/CR1303326/V1.2		Unwanted emission measurements of RTR-105/106/107/111 XN-12CF, XN-24CF, SN36CF
10	K03-17-2567		Result of TT and Association scenario test: FAR-2xx8
11	K03-17-2549		DNVGL type test report marine Radar FAR-2xx8
12	K03-17-1899	1	Performance in sea and rain clutter : FAR-3xx0
13	K03-17-1894	1	Performance in sea clutter : FAR-3xx0
14	K03-17-1888	1	Performance in sea and rain clutter : FAR-3210 with XN-20CF
15	K03-17-1869		Radar antenna radiation pattern data : FAR-3xxx series
16	K03-17-1815		DNV type approval report Marine Radar: FAR-3xx0
17	K03-17-1814		Result of TT and Association scenario test marine Radar: FAR-3xx0
18	K03-17-1759		Wind tunnel test report: Radiator/scanner SN36CF/RSB-129
19	K03-17-1758		Wind tunnel test report: Radiator & scanner XN12CF/XN20CF/XN24CF and RSB-128
20	K03-17-1538		DNV type approval testing report for pending items: FCR-2xx9 series
21	RET-17-009		The answer of DNVGL comment about FAR-2xx8 type approval
23	Applica 20128	0	Performance testing of Radar FAR-3000 series
26	LIC 12-17-018		EMC IEC60945: FAR-2xx8
27	LIC 12-17-019		Temp. & vibration IEC60945: FAR-2xx8
28	LIC 12-17-020		IEC60945 others: FAR-2xx8
29	LIC 12-17-021		CSD IEC60945: FAR-2xx8
30	LIC 12-17-022		IEC61162-1/2 report: FAR-2xx8
31	LIC 12-17-023		IEC61162-450 report: FAR-2xx8
34	OME-36520-D10		Operator's manual: FAR-2xx8 series
35	IME-36520-E12		Installation manual: FAR-2xx8 series
36	K03-17-2549	1.04	DNVGL type approval testing report
37	DOC102116-2		IEC62288: JH 20T17 MMD-AA1-AABA-HW06
38	DOC102116-3		IEC62288: JH 19T14 MMD-MA1-SABA-HW09
39	DOC102116-4		IEC62288: JH 15T17 MMD-AA1-AABR-HW09
41	2011-3494	1	IEC60945 test report: JH 15T17 MMD-AA1-AABA
42	2008-3324		IEC60945 technical report: JH 15T17 MMD-DA1-AOAA
43	2009-3442		IEC60945 technical report: JH 19T14 MMC-AA1-AABR
44	2008-3528		IEC60945 technical report: JH 19T14 MMD-AA1-AOAA
45	2013-3038		IEC60945 technical report: JH 19T14 MMD-MA1-AAAA
46	2008-3511		IEC60945 technical report: JH 20T17 MMD-AA1-AABA
48	doc102352-3		IEC62288: Conformance test report HD 26T22 MMD-MA1-FAGA-ES
49	doc205958-1	2	Minimum brightness test of GDCX Rev 5
50	doc205969-1	1	IEC62288 Flicker test report HD26T22 MMD
53	Applica 21008	0	HD 24T21 MMD: EMC and environmental testing
54	Applica 21009	0	HD 26T22 MMD: EMC and environmental testing
56	doc102352-2	2	IEC62288: Conformance test report 24T22 MMD
57	doc205958-1		minimum brightness test of GDCX rev 5

DNV GL No.	Document No.	Rev.	Document Title
58	doc205967-1		Flicker test report HD24T22
59	Applica 20885	0	EMC and environmental testing of HD 27T22 MEC
60	Applica 20941	0	EMC and environmental testing of HD 27T22 MEC
62	doc206155-1	1	HD 27T22 MMD-MA1-FAGA-ES: IEC62288 and colour calibration
63	doc206156-1	1	HD 27T22 MMD - IEC62288 FLICKER TEST
64	doc205970-1		IEC62288 flicker test HD32T22
65	doc205992-1		IEC62288 conformance test report HD32T22
67	Nemko E16240.01		HD55T22 Vibration test
68	applica 20869	1	HD55T22 EMC and environmental testing
69	applica 21007	0	HD55T22 EMC and environmental testing (2)
70	doc205971-1		IEC62288: HD55T22 flicker test
71	doc205984-1		IEC62288: HD55T22 conformance test
73	TAA00000S1		DNVGL TA-certificate Wave series monitors
75	DOC100829-6		JH23T14-MMD-MA1-OBA Flicker test
76	DOC101909-1R3		Keypad P004511-1 minimum brightness test
77	DOC102116-1	1	JH23T14 MMD-MA1-AABA IEC62288 Conformance test report
79	DNV 2010-3124	2	JH23T14 MMD-MA1 -EMC and environmental testing
80	170703002T		HD19T22 MMD-MA1 -EMC-FHGA-ES-1: EMC & environmetal testing
81	170421001T		HD19T22 MMD-MA1 -EMC-FAGP-ES: EMC & environmetal testing
82	Applica 21089	0	HD19T22 MMD-MA1 -EMC-FAGP-ES: EMC testing
83	Applica 21122	0	HD19T22 MMD-MA1-FOGA-ES: EMC radiated emission
85	Applica 20588	0	HD19T21 MMC-M2D-MBAA: EMC & environmental testing
86	Applica 21121	0	HD15T22 MMD-MA1-FHGA-ES: EMC & environmental testing
87	Applica 21120	0	HD15T22 MMD-MA1-FOGA-ES: Radiated emission & compass safe distance
88	Applica 21009	0	HD26T22 MMD-MA1-FAGP-ES: EMC & environmental testing
89	DNV 2012-3177	0	HD15T21 MMD-FA1-FHGA: EMC & environmental testing
90	Applica 20589	0	HD15T21 MMC-M2N-PCAA: EMC & environmental testing
94	VS-TV-060720-04		Vibration test: HD 19T22 MMD-MA1-FHGA-ES-1
96	applica 21008	0	HD 24T22 MMD IEC60945 testing
98	LIC 12-17-070		MU-152 EMC test report
99	LIC 12-17-071		MU-152 IEC60945 test report
100	LIC 12-17-072		MU-152 IEC60945 others -test report
101	LIC 12-17-073		MU-152 IEC62288 -test report
102	LIC 12-17-074		MU-152 IEC62288 -CSD report
104	applica 3253		JH 20T17 MMD-DA1-AAAA Technical report 2010
105	applica 3421	1	JH 20T17 MMD-DA1-AAAR Technical report 2010
107	LIC 12-19-014	1	RPU-025. EMC test report
108	LIC 12-19-015	1	RPU-025: IEC60945 env. test report
109	LIC 12-19-016	1	RPU-025: IEC60945 CSD test report
110	LIC 12-19-019	1	RPU-025: IEC60945 other test report
57[1)]	DELTA-L102798-475n (n=1,2,3)		Test of Flicker from 15, 19, 20 inch monitors for use as ECDIS monitor
1/5*	K03-17-2929	0	Performance in Sea and Clutter
2/5*	APPLICA TR-30215		Performance testing of X-band NXT antenna and transceiver
3/5*	LIC 12-20-002		Test report (ITU-R M.1177) for transceiver type RTR-123
4/5*	K03-17-2885	1.03	DNVGL type approval testing report FAR-2xx8-NXT
8/5*	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

DNV GL No.	Document No.	Rev.	Document Title
9/5*	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
10/5*	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
11/5*	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
12/5*	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
13/5*	K03-17-2892		IEC 62388, Result of TT Marine Radar F A R 2x 2 8 NXT
14/5*	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

[1)]Ref. archive 344.1-004741-3
*)Ref. NPS JOB archive 344.1-006649-5