Bundesrepublik Deutschland

Federal Republic of Germany

BSH-Cert

Benannte Stelle – Navigations- und Funkausrüstung
beim Bundesamt für Seeschifffahrt und Hydrographie

Notified Body – Navigation and Radiocommunication Equipment at the Federal Maritime and Hydrographic Agency

NOTIFIED BODY 0735

EC TYPE EXAMINATION (MODULE B) CERTIFICATE

This is to certify that:

BSH-Cert, specified as a "notified body" under the terms of „Schiffssicherheitsgesetz" of 09 September 1998 (BGBl. I, p. 2860) modified last 08 March 2012 (BGBl. I, p. 483), did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the Navigation requirements of Marine Equipment Directive (MED) 96/98/EC and the last modification by Directive 2012/32/EU.

Manufacturer	**Furuno Electric Co., Ltd.**
Address	**9-52 Ashihara-Cho, Nishinomiya City, 662-8580, JAPAN**
Applicant	**Furuno Deutschland GmbH**
Address	**Siemensstraße 33, 25462 Rellingen, GERMANY**
Annex A.1 Item (No & item designation)	**4.34 Radar equipment CAT 1** **4.35 Radar equipment CAT 2** **4.36 Radar equipment CAT 3** **4.37 Radar equipment for high-speed craft applications CAT 1H, CAT 2H)**
Product Name	**FAR-2xx7**
Trade Name(s)	**FAR-21x7, FAR-21x7W, FAR-21x7S, FAR-21x7SW** **FAR-28x7, FAR-28x7W, FAR-28-7S, FAR-28x7SW**

Specified Standard(s)

IMO Resolution A.278(VIII)	IMO Resolution MSC.302(87) only Module C[2]	IEC 62388 Ed.2.0, 2013	IEC 61993-2 Ed.1.0, 2001[6]
IMO Resolution A.694(17)		IEC 62288 Ed.1.0, 2008[5]	IEC 61162-1 Ed.4.0, 2010
IMO Resolution A.823(19)[1]	ITU-R M.628-5[3]	IEC 60945 Ed.4.0, 2002 incl. Corr. 1, 2008	IEC 61162-2 Ed.1.0, 1998
IMO Resolution MSC.191(79)	ITU-R M.824-4[4]		
IMO Resolution MSC.192(79)	ITU-R M.1177-4		

[1] Superseded by MSC.192(79), [2] Relevant parts covered by Module C "Interfacing" of IMO Resolution MSC.302(87)
[3] Limited to the detection of SART, [4] Limited to the detection of Racon, [5] Relevant parts covered by section 6 of IEC 62388
[6] Limited to required data contend to display and process other UAIS information in IEC 61162-1 Ed 4.0.

Based on the Directive 2011/75/EU, additional applied version : Directive 2012/32/EU
This certificate remains valid unless cancelled, expired or revoked.

Date of issue: **14 October 2013**

Expiry date: **13 October 2018**

Issued by: **BSH-Cert**
Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany
Notified body 0735

Certificate No.: **4581/001/4342464/13**

USCG-Module-B No.: **165.115/EC0735** Unique Identifier: **4342464**
165.116/EC0735 Unique Identifier: **4342464**
165.117/EC0735 Unique Identifier: **4342464**

This certificate consists of 8 pages.

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE
Siegel

Kai-Jens Schulz-Reifer

NOTIFIED BODY 0735

This certificate is issued under the authority of the „Bundesministerium für Verkehr, Bau und Stadtentwicklung".
V 2013-06-21

Components necessary for operation:

See Annex 1 to EC type examination Module B certificate 4581/001/4342464/13

Approval Documentation:

See Annex 2 to EC type examination Module B certificate 4581/001/4342464/13

Tested Software:

PC Board	SPU	Key	RFC	CARD
Software Version	035-9204-03.XX 035-9223-03.XX	035-9203-01.XX	035-9202-01.XX	035-9209-01.XX

Note: Both Software versions noted for SPU are equivalent when the system is set-up in IMO-mode.

Places of production:

Limitations on the acceptance or use of the product:

FURUNO FAR-2xx7 Series has been approved with a cable length up to 300m between Electronic unit and Transceiver.

Administrations may accept this radar when configured as CAT 2 on ships, not required to carry water tracking log according to chapter V SOLAS 1974 as amended, when a GPS-Sensor in accordance with the MSC. 112(73) tested against IEC 61108-1 Ed.4.0, 2010 is used for speed stabilisation.

Note: When configured as CAT 2 the Trial Manoeuvre is disabled.

Notes:

The manufacturer shall inform BSH-Cert, as the notified body, of any modifications to the type-tested product(s) that may affect compliance with the requirements or conditions laid down for use of the product(s).

In case the specified regulations or standards are amended during the validity of this certificate, the product(s) must be re-certified before being placed on board vessels to which such amended regulations or standards apply.

The Mark of Conformity (wheelmark) may only be affixed to the type approved equipment, and a Manufacturer´s Declaration of Conformity may only be issued, if the product quality system fully complies with the Marine Equipment Directive and is certified by a notified body against ANNEX B module D, E, or F of the Directive.

The Transceiver RTR-078A, RTR-079A and RTR-081A would not exceed the limits of an applied Roll Off Mask off -40 dB.

U.S. Coast Guard Approval

This product has been assigned a U.S. Coast Guard Module B number (165.xxx/EC0735/Unique Identifier [if other than EC 0735: /Number of the notified body which certifies the quality assurance system]) to note type approval to Module B only as it pertains to obtaining U.S. Coast Guard approval as allowed by the "Agreement between the European Community and the United States of America on Mutual Recognition of Certificates of Conformity for Maritime Equipment" signed February 27th, 2004, and additional information given by U.S. Coast Guard by E-Mail 2010.

Note: Further FCC authorization for the Radar system is required before placed on the market.

Notice on legal remedies available:

Objection to this document may be filed within one month after notification. The objection must be filed in writing to, or put on record at, Federal Maritime and Hydrographic Agency, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

ANNEX 1 TO
EC TYPE EXAMINATION (MODULE B) CERTIFICATE
No.: 4581/001/4342464/13

I. List of components:

No.	Designation	Type designation
1.1	X-Band Scanner	a) 4 ft, type XN-12AF
1.2	X-Band Scanner	a) 6,5 ft, type XN-20AF b) 6,5 ft, type XN-20CF c) 8 ft, type XN-24AF d) 8 ft, type XN-24BF e) 8 ft, type XN-24CF
2.1	X-Band Transceiver Up Mast	a) 12 kW, type RTR-078A b) 25 kW, type RTR-079A
2.2	X-Band Transceiver Down Mast	a) 25 kW, type RTR-081A
3.1	X-Band Turning Unit Up Mast	a) type RSB-096
3.2	X-Band Turning Unit Down Mast	a) type RSB-103
3.3	X-Band Turning Unit HSC	a) type RSB-097
4.	S-Band Scanner	a) 12 ft, type SN-36AF b) 12 ft, type SN-36BF
5.1	S-Band Transceiver Up Mast	a) 30 kW, type RTR-080
5.2	S-Band Transceiver Down Mast	a) 30 kW, type RTR-082
6.1	S-Band Turning Unit Up Mast	a) type RSB-098 b) type RSB-099
6.2	S-Band Turning Unit Down Mast	a) type RSB-104 b) type RSB-105
6.3	S-Band Turning Unit HSC	a) type RSB-100 b) type RSB-101 c) type RSB-102
7.1	Display with 320mm PPI	a) type MU-231CR b) type MU-231 c) type JH23T12FUD-AA1-AOAA d) type JH23T14FUD-MA1-AOAA[1]
7.2	Display with 250mm PPI	a) type MU-201CR b) type MU-190 c) type MU-170C d) type JH19T14FUD-AA1-AOAA e) type JH19T14FUD-DA1-AOAA f) type JH20T17FUD-AA1-AOAA g) type JH19T14FUD-MA1-AOAA
7.3	Display with 180mm PPI	a) type JH15T17FUD-AA1-AOAA b) type JH15T17FUD-DA1-AOAA
8.	Processor	a) type RPU-013
9.	Control keyboard with integrated trackball	a) type RCU-014 b) type RCU-015
10.1	Gyro stabilisation (external)	a) type AD-100
10.2	Gyro stabilisation (integrated)	a) type GC-10
11.1	Performance Monitor X-Band	a) type PM-31
11.2	Performance Monitor S-Band	a) type PM-51
12.	Power supply	a) type PSU-007
Continuation see overleaf		

[1]Console-version only

No.	Designation	Type designation
13	Components of navigational equipment, which may be carried additionally	a) Hub, type HUB-100 b) Card Reader, type CU-100 c) Card Reader, type CU-200 d) Remote Control, type RCU-016 e) Junction Box, type RJB-001 f) Break Unit, type BRU-001 g) Break Unit, type BRU-002

II. Table of combinations:

	Type of RADAR	1.1 X-Band FURUNO FAR-21X7 (PPI 250)	1.2 X-Band FURUNO FAR-21X7W (PPI 250)	1.3 X-Band FURUNO FAR-21X7-HSC (PPI 250)	2.1 S-Band FURUNO FAR-21X7S (PPI 250)	2.2 S-Band FURUNO FAR-21X7SW (PPI 250)	2.3 S-Band FURUNO FAR-21X7S-HSC (PPI 250)	3.1 X-Band FURUNO FAR-28X7 (PPI 320)	3.2 X-Band FURUNO FAR-28X7W (PPI 320)	3.3 X-Band FURUNO FAR-28X7-HSC (PPI 320)	4.1 S-Band FURUNO FAR-28X7S (PPI 320)	4.2 S-Band FURUNO FAR-28X7SW (PPI 320)	4.3 S-Band FURUNO FAR-28X7S-HSC (PPI 320)	5.1 X-Band FURUNO FAR-21X7 (PPI 180)	5.2 X-Band FURUNO FAR-21X7W (PPI 180)	6.1 S-Band FURUNO FAR-21X7S (PPI 180)	6.2 S-Band FURUNO FAR-21X7SW (PPI 180)
	Designation	CAT 2	CAT 2	CAT 2H	CAT 2	CAT 2	CAT 2H	CAT 1	CAT 1	CAT 1H	CAT 1	CAT 1	CAT 1H	CAT 3	CAT 3	CAT 3	CAT 3
1.1	X-Band Scanner 4ft	D		D				D		D				D			
1.2	X-Band Scanner 6,5ft/8ft	D	X	D				D	X	D				D	X		
2.1	X-Band Transceivers Up Mast	X		X				X		X				X			
2.2	X-Band Transceivers Down Mast		X						X						X		
3.1	X-Band Turning Units Up Mast	X						X						X			
3.2	X-Band Turning Units Down Mast		X						X						X		
3.3	X-Band Turning Units HSC			X						X							
4.	S-Band Scanners				X	X	X				X	X	X			X	X
5.1	S-Band Transceivers Up Mast				X		X				X		X			X	
5.2	S-Band Transceivers Down Mast					X						X					X
6.1	S-Band Turning Units Up Mast				X						X					X	
6.2	S-Band Turning Units Down Mast					X						X					X
6.3	S-Band Turning Units HSC						X						X				
7.1	Display Units PPI 320 mm	A	A	A	A	A	A	X	X	X	X	X	X				
7.2	Display Units PPI 250 mm*	X	X	X	X	X	X	A	A	A	A	A	A	A	A	A	A
7.3	Display Units PPI 180 mm*	A	A	A	A	A	A							X	X	X	X
8.	Processor Unit**	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9.	Control Keyboard with Trackball	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.1	Gyro stabilistaion (internal)***	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
10.2	Gyro stabilistaion (external)***	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
11.1	Performance Monitor X-Band	X	X	X				X	X	X				X	X		
11.2	Performance Monitor S-Band				X	X	X				X	X	X			X	X
12.	Power Supply				X		X				X		X			X	
13.	Additional Components	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

Note: X = Mandatory equipment.
A = Optional for additional display systems, e.g. radar display in the wings.
O = Optional equipment
D = One out of noted possibilities in relevant section is mandatory.
* = Mandatory display units can be replaced by larger PPI diameter noted in the list of components
** = Processor Unit can be configured as CAT 1, CAT 2 or CAT 3 during installation
*** = Substitution of components is possible when type approved Gyro with adequate serial
Interface is available on the vessel.

SUPPLEMENT TO ANNEX 1
EC TYPE EXAMINATION (MODULE B) CERTIFICATE
No.: 4581/001/4342464/13

Statement concerning Spurious Emissions, Out of Band Emissions and the Boundary between both

The following Radar Transceivers, which form part of the systems noted in this certificate, have been subject to a measurement procedure as detailed in IEC 62388 (2007), Annex B, as contained in the guidelines contained in ITU-R Recommendation RM.1177. This standard defines the test method and requirements that ship-borne radar have to meet in order to comply with Appendix 3 of the Radio Regulations and ITU-R Recommendations SM.1539 and SM.1541.

The results of the measurement procedure were satisfactory and provide sufficient evidence that these Radar Transceivers are compliant with the criteria contained in the standards mentioned above and fulfil the requirements of Maritime Equipment Directive 96/98/EC as amended by 2011/75/EU.

Table of measured Transceivers:

Type	Model No.
S-Band Up Mast	RTR-066 / 30KW

The test reports detailing the tests and test results provided by the applicant are:

QINETIQ/FST/TR031505

The Transceiver Modules contained in the above Transceiver/Turning units are also found in the following Down Mast units. Since the applicable electronic circuitry and component parts are comparable and the addition of the wave-guide is known to have band limiting properties, a presumption of conformity can be applied by analogy.

Type	Model No.
S-Band Up Mast	RTR-080 / 30KW
S-Band Down Mast	RTR-082 / 30KW

are including the same relevant microwave components within the transmitting part as the measured units noted above.

The following noted transceivers have shown compliance to the relevant standards detailing the tests and test results as noted in Report No. **QINETIQ/TS/SDS/CR1000440**, January 2010 as provided by the applicant.

Type	Model No.
X-Band Up Mast	RTR-078A / 12KW
X-Band Up Mast	RTR-079A / 25KW

The Transceiver Modules contained in the above Transceiver/Turning units are also found in the following Down Mast units. Since the applicable electronic circuitry and component parts are comparable and by the addition of the wave-guide which is known to have band limiting properties, a presumption of conformity can be applied by analogy.

Down Mast Unit	
Type	Model No.
X-Band, Down Mast Transceiver	Type RTR-081A / 25 kW

ANNEX 2 TO
EC TYPE EXAMINATION (MODULE B) CERTIFICATE
No.: 4581/001/4342464/13

Approval documentation:

I. System Documentation

Operator's Manual	OME-35190	Edition Q7	October 3, 2013
Operators Guide	OSE-35190	Edition C	October 3, 2013
Installation Manual	IME-35190	Edition M5	August 1, 2013
Installation Manual	IME-35210	Edition L5	August 1, 2013
Installation Manual	IME-35270	Edition K5	August 1, 2013
Installation Manual	IME-20341	Edition A	November 2008

Operator's Manual, Monitor Unit Model MU-190 Pub.No. OMC-44670-Z2 2011-02-04
Operator's Manual, Monitor Unit Model MU-231 Pub.No. OMC-44690-Z2 2011-02-04
Hatteland User Manual for JHxxTxxFUD Series Monitors Doc ID.: INB100036-3 Rev.0 (07/09)

II. Test reports

Assessment Report No.:	BSH/4612/432098/12	TFT Monitor JH23T14 FUD
Assessment Report No.:	BSH/4612/4341824/11	TFT Monitors MU-190/MU-231
Test Report No.:	BSH/46162/0071828/11	TFT Panel Display MU-190
Test Report No.:	BSH/46162/0071829/11	TFT Panel Display MU-231
Assessment Report No.:	BSH/4612/4341603/10	Transceiver RTR-078A/RTR-079A
Assessment Report No.:	BSH/4612/4341625/10	Antenna XN-20CF/XN-24CF
Assessment Report No.:	BSH/4612/4341740/10	Transceiver RTR-081A
Test Report No.:	BSH/4543/4342577/13-2	IEC 62388 Ed. 2.0, 2013 Chapter 11
Test Rep. No.:	BSH/4543/4342577/13-1	IEC 62388 Ed. 2.0, 2013 Chapter 4-10,13-16,18