

TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MERB00001BE
Revision No:
0

This Certificate is issued by DNV UK Limited based on authorisation of the Maritime & Coast Guard Agency (MCA) as an UK Approved Body to undertake conformity assessments on marine equipment in accordance with the requirements of the Merchant Shipping (Marine Equipment) Regulations 2016 as amended.

This is to certify:

That the Radar equipment

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, Japan

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

Regulation **MSN 1874 Amendment 6,**

item No. UK/4.64 SOLAS 74 as amended, Reg. V/18, 19, X/3, IMO Res. MSC.36(63)-(1994 HSC Code) 13, IMO Res. MSC.97(73)-(2000 HSC Code) 13, IMO Res. A.278 (VIII), A.694(17), MSC.191(79), 192(79), 302(87), IMO MSC.1/Circ.1349, ITU-R M.1177-4 (04/11)
IMO Res. MSC.232(82) Appendix 6

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

This Certificate is valid until **2026-08-29**.

Issued at **London** on **2022-12-28**

DNV local unit:
Kobe



for **DNV UK Ltd.**

Approval Engineer:
Frederik Tore Elter

Approved Body No.: **0097**

Christine Mydlak-Röder
MER Service Responsible



**Maritime &
Coastguard
Agency**

UK Approved Body Authorised
by the MCA

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-control phase module (D, E or F) of Schedule 2 of the Merchant Shipping (Marine Equipment) Regulations 2016, as amended is fully complied with and controlled by a written inspection agreement with an approved body. The product liability rests with the manufacturer or his representative in accordance with the Merchant Shipping (Marine Equipment) Regulations 2016.

This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV UK Ltd. of any changes to the approved equipment. 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. This certificate remains valid unless suspended, withdrawn, re-called, or cancelled.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

The Radar and Back-up ECDIS; 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 MSN 1874 Amendment 6 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 (RGB) or via LAN2 port (IEC61162-450) in compliance with IEC 61996-1.
- 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

- Performance: IEC 62388 (2013)
- Performance: IEC 61174 (2015) Annex F
- Interface: IEC 61162-1 (2016)
- Interface: IEC 61162-2 (1998)
- Interface: IEC 61162-450 (2018)
- Presentation: IEC 62288 (2014)
- Environmental: IEC 60945 (2002) +Corr.1 (2008))
- Bridge Alert Management: IEC 62923-1 (2018) and IEC 62923-2 (2018)

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.

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 JH19T14 FUD-xx4-xxxx ¹⁾ or JH20T17 FUD-xx4-xxxx ¹⁾ or JH23T12 FUD-xxx-xxxx ²⁾ or JH23T14 FUD-xx4-xxxx ¹⁾ or HD19T22-MA4 ¹⁾ 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 | ¹⁾ CAT 2 monitor ²⁾ RADAR only - not for ECDIS backup <i>x=variable letter/number according to manufacturer's type number identification</i> | |
| Radar Control unit Trackball control unit | RCU-025 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 | |

| 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>Option – for proprietary LAN interface.</i> |
| LAN switch/intelligent HUB | HUB-3000 ³⁾ | | <i>Option – for IEC 61162-450 external LAN interface.</i> 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. 05.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. 5.xx Linux 5.x Jeppesen SDK 6.0 | | |

Type Examination documentation

| DNV No | Document ID | Rev | Description |
|--------|----------------------|--------------|---|
| 140 | VS-TV-100708-01 | | Report: VST IEC60945 Vibration, Hatteland HD monitor |
| 139 | 210426002T | | Report: CAL-TECH, IEC60945 Hatteland HD monitor |
| 138 | CEBDLB-WTW-P21041117 | | Report: BW, IEC60945 partial Hatteland HD monitor |
| 137 | INB10036-4 | Rev 00_01 | Manual: User Manual Series 1 G2 - Maritime Multi Display Models |
| 136 | MRA0000016 | Rev. 3 | Certificate: IEC 60945 Monitors HD series |
| 135 | MRA0000006 | Rev. 2 | Certificate: IEC 60945 Monitors HD x-series |
| 134 | MRA0000003 | Rev. 3 | Certificate: IEC 60945 Monitors HD series |
| 133 | K24-17-1057 | 06. OCT 2021 | Report: FMD TA test procedure (JH23T14 FUD) |
| 132 | K24-17-1059 | 06. OCT 2021 | Report: FMD TA test procedure (JH20T17 FUD) |
| 131 | K24-17-1061 | 08. OCT 2021 | Report: FMD TA test procedure (JH19T14 FUD) |
| 130 | K24-17-1048 | 06. OCT 2021 | Report: FMD TA test procedure (HD19T22 FUD) |

| DNV No | Document ID | Rev | Description |
|--------|---------------|---------------------|--|
| 129 | K03-17-3209 | 17. SEPT 2021 | Report: Furuno DNV type approval Hatteland FAR - RADAR |
| 126 | DOC206405-1 | Rev. 1 | Report: Hatteland, Conformance test report HD 19T22 MMD-MA1-FOGP_HTB30-DVI-D |
| 125 | DOC206081-1 | Rev. 1 | Report: Hatteland, IEC62288 flicker test report HD 19T22 MMD_SIGNED |
| 124 | DOC205958-1 | Rev. 5 | Report: Hatteland, IEC62288 Minimum brightness test of GDCX |
| 120 | DOC208098-1 | Rev. 1 | Report: Hatteland - Conformance test report_JH 19T14 MMD-AR4-AOBC_SIGNED |
| 119 | DOC208089-1 | Rev. 1 | Report: Hatteland - Conformance test report_JH 20T17 MMD-MR4-AABA_SIGNED |
| 118 | DOC208088-1 | Rev.1 | Report: Hatteland - IEC62288 flicker test report_ H 20T17 MMD-MR4-AABA |
| 117 | DOC208070-1 | Rev.1 | Report: Hatteland - Conformance test report JH 23T14 MMD-MR4-AABA |
| 116 | DOC208060-1 | Rev. 1 | Report: Hatteland - IEC62288 flicker test report JH 23T14 MMD-MR4-AABA |
| 115 | LIC 12-21-055 | 26 April 2021 | Report: LABOTECH: IEC 61162-450 (2018) Model: Sensor Adapter Type: MC-3000S |
| 114 | LIC 01-21-017 | 26 April 2021 | Report: LABOTECH: Reference document for IEC 61162-450 test performed by LIC (LIC test report no. LIC 12-21-055 for MC-3000S) |
| 113 | LIC 01-21-014 | 7 April 2021 | Report: LABOTECH IEC61162-450 (2018), Reference document for LCI 12-21-037 for FAR-3xx0 series |
| 112 | LIC 12-21-037 | 7 April 2021 | Report: LABOTECH IEC61162-450 (2018), for FAR-3xx0 series |
| 107 | IME-36160-P12 | P12: APR . 23, 2021 | Manual: Furuno - Installation Manual - CHART RADAR - Model: FAR-3210(-BB)/3220(-BB)/3310/3320/FAR-3220-NXT(-BB)/3320-NXT |
| 105 | K03-17-3122 | Ver. 1.03 | Report: DNV type approval report - Model : MARINE RADAR - Type: FAR 3 xx 0 series |
| 104 | IME-36240-P12 | P12: APR . 23, 2021 | Manual: Furuno - Installation Manual - CHART RADAR - Model FAR-3320W/3220W-BB/3330SW/3230SW-BB |
| 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 |
| 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 |
| 96 | LIC 12-19-154 | 27 September 2019 | 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 |
| 95 | LIC 12-19-153 | 27 September 2019 | IEC 60945, Furuno Marine Radar Type: FAR-2228-NXT/2228-NXT-BB/2328-NXT, FAR-3220-NXT/3220-NXT-BB/3320-NXT - temperature |
| 94 | LIC 12-19-152 | 27 September 2019 | IEC 60945, Furuno Marine Radar Type: FAR-2228-NXT/2228-NXT-BB/2328-NXT, FAR-3220-NXT/3220-NXT-BB/3320-NXT - dangerous voltage |
| 93 | LIC 12-19-151 | 27 September 2019 | 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 |
| 92 | K03-17-2892 | 27 September 2019 | IEC 62388, Result of TT Marine Radar F A R 2 x 2 8 NXT |
| 91 | OMC-44690-Z | | Operator's manual: MU-231 monitor |
| 90 | K03-17-2885 | 1.03 | DNVGL type approval testing report FAR-3xx0-NXT |
| 88 | LIC 12-20-002 | | Test report (ITU-R M.1177) for transceiver type RTR-123 |
| 87 | TR-30215 | 0 | Performance testing of X-band SSD antenna & transceiver |
| 85 | K03-17-2929 | 0 | Performance in sea and clutter FAR-2328 NXT |
| 83 | RFT-19029 | | The modification of FHD layout for CAT1 requirement |
| 82 | LIC 12-19-028 | 5 | MC-3000S IEC61162-1 Ed.5 |
| 81 | LIC 12-19-027 | 5 | EC-3000 IEC61162-1 Ed.5 |
| 80 | LIC 12-17-064 | | EC-300 Processor unit: IEC60945 CSD |
| 79 | LIC 12-17-063 | | EC-300 Processor unit: IEC60945 Environmental |

| DNV No | Document ID | Rev | Description |
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| 78 | LIC 12-17-062 | | EC-300 Processor unit: IEC60945 EMC |
| 75 | K03-17-2792-0 | | DNVGL type approval testing report for pending items |
| 74 | K03-17-2679 | | DNVGL type approval testing report; IEC61174 Annex F & MSC.302(87) |
| 73 | E32-01305-G20 | | Instruction Manual. setting and adjustments |
| 72 | K03-17-2468 | | DNVGL type approval testing report - FAR-3000 series |
| 69 | DNVGL TAA00000S1 | | Wave series of monitors |
| 66 | OMC-44930-Z4 | | MU-270W marine display: Operator's manual |
| 65 | LIC 12-15-059 | | Test report (IEC61162-450) for Sensor adapters type MC-3000,... |
| 64 | LIC 12-16-0nn | nn = 09, 10, 11, 12 | IEC60945 and 62288 test reports: Monitor unit: MU-270W |
| 62 | LIC 12-15-058 | | Test report: IEC61162-450 for processor unit for Marine Radar type EC-3000 |
| 61 | K03-17-2051 | | DNV type approval testing report: IEC61162-450 |
| 58 | K03-17-2231 | | DNVGL type approval testing report: Marine Radar FAR-3000 series |
| 57 | K03-17-1877 | | DNV Type approval testing report |
| 56 | K03-17-1554 | | FCR-2xxx Chart Radar: DNV type approval testing report -Pending items |
| 55 | K03-17-1538 | | FCR-2xxx Chart Radar: DNV type approval testing report -Pending items |
| 54 | K03-17-1424 | | FCR-2xxx Chart Radar: DNV type approval testing report |
| 53 | Applica 20128 | 0 | performance testing of RADAR FAR-3000 series |
| 52 | K03-17-1888 | 1 | FAR-3210 Performance in sea and rain clutter |
| 51 | K03-17-1894 | 1 | Performance in sea clutter |
| 50 | K03-17-1899 | 1 | Performance in sea and rain clutter |
| 43 | FLI 12-13-081 | | IEC60945 test report -FAR-3330SW |
| 42 | FLI 12-13-080 | | IEC60945 EMC test report -FAR-3330SW |
| 41 | FLI 12-13-079 | | IEC60945 test report -FAR-3320W |
| 40 | FLI 12-13-078 | | IEC60945 EMC test report -FAR-3320W |
| 39 | FLI 12-13-077 | | IEC60945 test report -FAR-3230S-SSD/-3330S-SSD |
| 38 | FLI 12-13-076 | | IEC60945 EMC test report -FAR-3230S-SSD/-3330S-SSD |
| 37 | FLI 12-13-075 | | IEC60945 test report -FAR-3210/-3310/-3220/-3320 |
| 36 | FLI 12-13-074 | | IEC60945 EMC test report -FAR-3210/-3310/-3220/-3320 |
| 35 | FLI 12-13-073 | | IEC60945 test report -FAR-3230S/-3330S |
| 34 | FLI 12-13-072 | | IEC60945 EMC test report - FAR-3230S/-3330S |
| 33 | QINETIQ/MS/M AR/CR1303326/ V1.2 | 1.2 | Unwanted emission measurements - FAR-3xxx-series |
| 32 | K03-17-1869 | | Antenna radiation pattern for FAR-3xxx series |
| 29 | FLI 12-13-064 | | IEC60945 EMC test report - FAR-3230S-SSD/-3330S-SSD |
| 28 | FLI 12-13-063 | | IEC60945 EMC test report - FAR-3230S/-3330S |
| 27 | FLI 12-13-062 | | IEC60945 EMC test report - FAR-3210/-3310/-3220/-3320 |
| 26 | FLI 12-13-059 | | IEC60945 & 62388 test report - FAR-3230S-SSD/-3330S-SSD |
| 25 | FLI 12-13-058 | | IEC60945 & 62388 test report - FAR-3210/-3310/-3220/-3320 |
| 24 | FLI 12-13-057 | | IEC60945 & 62388 test report - FAR-3230S/-3330S |
| 23 | FLI 12-12-025 | | IEC60945 test report - FMD-3000 series ECDIS |
| 22 | FLI 12-11-112 | | IEC61162-1 test report - FMD-3000 series ECDIS |
| 21 | FLI 12-11-111 | | IEC60945 test report - ECDIS FMD-3000 series |
| 20 | FLI 12-10-068 | 1 | IEC60945 test report - monitor units |
| 19 | FLI 12-03-058 | | IEC60945 test report |
| 15 | OSE-36160-D10 | | Operator's guide: CHART RADAR |
| 14 | OMC-44670-Z | | Monitor MU-190: Operator's manual |
| 13 | K03-17-1815 | | DNV type approval testing report: IEC62388 |
| 11 | K03-17-1814 | | TT and Association scenario test Marine Radar |
| 9 | IME-36190-N12 | N12 : APR . 23, 2021 | Installation Manual Chart RADAR- FAR-3230S-SSD(-BB)/FAR-3330S-SSD |
| 8 | IME-36180-N12 | N12 : APR . 23, 2021 | Installation Manual Chart RADAR- FAR-3230S(-BB)/-3330S |



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| DNV No | Document ID | Rev | Description |
|---------------|--------------------|------------|--|
| 5 | K03-17-1758 | | Wind Tunnel test report - RSB-128 & XN12CF/XN20CF/XN24CF |
| 4 | K03-17-1759 | | Wind Tunnel test report - RSB-129 & SN36CF |