

**SPECIFICATIONS OF MARINE RADAR  
FAR-2238S**

**1 ANTENNA RADIATOR**

- 1.1 Type Slotted waveguide array
- 1.2 Radiator length 8 ft (SN24CF), 10 ft (SN30CF), 12 ft (SN36CF)
- 1.3 Horizontal beam width 2.6° (SN24CF), 2.3° (SN30CF), 1.8° (SN36CF)
- 1.4 Vertical beam width 25°
- 1.5 Sidelobe attenuation
  - SN24CF -23 dB (within ±20° of main-lobe), -27 dB (outside ±20° of main-lobe)
  - SN30CF -24 dB (within ±20° of main-lobe), -30 dB (outside ±20° of main-lobe)
  - SN36CF -24 dB (within ±10° of main-lobe), -30 dB (outside ±10° of main-lobe)
- 1.6 Polarization Horizontal
- 1.7 Rotation 24 rpm or 42 rpm (for high speed craft)
- 1.8 Wind load 100 kn relative
- 1.9 De-icer (option)
  - On: when temperature goes down to 0°C
  - Off: when temperature goes up to +5°C

**2 TRANSCEIVER**

- 2.1 TX Frequency and modulation 3050 MHz±30 MHz, P0N
- 2.2 Output power 30 kW
- 2.3 Range scale, Pulse Repetition Rate and Pulselength

PRR (Hz approx.)	Range scale (NM)										
	0.125	0.25	0.5	0.75	1.5	3	6	12	24	48	96
3000*	S1										
3000*			S2								
1500				M1							
1200					M2						
1000						M3					
600**								L			

\*: 2200 Hz with TT range on 48 NM. \*\*: 500 Hz on 96 NM range

**3 PROCESSOR UNIT**

- 3.1 Minimum range 22 m
- 3.2 Range discrimination 26 m
- 3.3 Range accuracy 1% of the maximum range of the scale in use or 10 m, whichever is the greater
- 3.4 Bearing discrimination 2.8° (SN24CF), 2.5° (SN30CF), 2.0° (SN36CF)
- 3.5 Bearing accuracy ±1°
- 3.6 Range scale and Range ring interval (RI)

Range (NM)	0.125	0.25	0.5	0.75	1.5	3	6	12	16	24	48	96
RI (NM)	0.025	0.05	0.1	0.25	0.25	0.5	1	2	4	4	8	16
Number of rings	5	5	5	3	6	6	6	6	4	6	6	6

- 3.7 Warm-up time 3 min. approx.
- 3.8 Presentation mode Head-up, STAB head-up, Course-up, North-up (RM/TM), Stern-up
- 3.9 Marks Cursor, Range ring, Heading mark, North mark, Bearing mark, Target trail, VRM, EBL, Acquisition zone

- 3.10 Target tracking (TT) Auto or manual acquisition: 100 targets in 24 NM  
Auto tracking on all acquired targets,  
Tracking: 5/10 pts on all activated targets  
Vector time: Off, 30 s, 1-60 min
- 3.11 AIS Display capacity: 350 targets,  
Tracking: 5/10 pts on all activated targets  
Vector time: Off, 30 s, 1-60 min
- 3.12 Radar map 20,000 pts
- 3.13 Acquisition zone 2 zones
- 3.14 Interswitch function Selectable from menu

**4 MONITOR UNIT**

- 4.1 Screen type 19-inch color LCD, 1280 x 1024 (SXGA)
- 4.2 Brightness 450 cd/m<sup>2</sup> typical
- 4.3 Visible distance 1.02 m nominal
- 4.4 Radar effective diameter 282 mm

**5 INTERFACE**

- 5.1 Number of port (processor unit)
  - Serial 7 ports (IEC61162-1/2: 2 ports, IEC61162-1: 4 ports, AD-10: 1 port)
  - Alarm output 6 ports: contact signal, load current 250mA  
(Normal close/ open: 4, System fail: 1, Power fail: 1)
  - DVI output 2 ports: DVI-D, DVI-I or RGB picture data (for VDR)  
(RGB resolution 1280x1024 (SXGA), 60.0Hz or  
1440x900 (WXGA+), 59.9Hz)
  - LAN 2 ports: Ethernet 100Base-TX
  - RS-232C 1 port: brilliance control
  - Sub display (for ECDIS) 2 ports: HD, BP, Trigger and Video signal
- 5.2 Data sentences (IEC61162-1/2)
  - Input ABK, ACK, ACN, ALR, BWC, BWR, CUR, DBK<sup>\*1</sup>, DBS<sup>\*1</sup>, DBT, DDC, DPT, DTM, GGA, GLL, GNS, HBT, HDT<sup>\*1</sup>, MTW, MWV, OSD, RAQ, RMB, RMC, ROT, RTE, THS, VBW, VDM, VDO, VDR, VHW, VSD, VTG, VWR<sup>\*1</sup>, VWT<sup>\*1</sup>, WPL, ZDA
  - Output ABM, ACK, AIQ, ALC, ALF, ALR, ARC, BBM, DDC, EVE, HBT, OSD, RSD, TLB, TTD, TTM, VSD

<sup>\*1</sup>: for retrofit
- 5.3 Ethernet interface for IEC61162-450
  - Port (LAN2) 100Base-TX, IPv4, 8P8C connector
  - Data sentences Same as 5.2 sentences
  - IEC61162-450 transmission group
    - Input MISC, TGTD, SATD, NAVD, TIME, PROP
    - Output Arbitrary (default: TGTD)
    - Multicast address 239.192.0.1 to 239.192.0.16
    - Destination port 60001 to 60016
  - Re-transmittable binary image transfer
    - Multicast address 239.192.0.26 to 239.192.0.30
    - Destination port 60026 to 60030

Other network function excepted IEC61162-450

SNMP, HTTP, Syslog, Furuno Management Protocol (FMP)

5.4 Output port on antenna unit

Sub display (for radar) 1 port: HD, BP, Trigger and Video signal

**6 POWER SUPPLY**

6.1 Processor unit (w/ antenna unit)

100-230 VAC: 3.9-1.7 (6.6-2.8) A, 1 phase, 50-60 Hz  
( ): 42 rpm

6.2 Monitor unit 100-230 VAC: 0.7-0.4 A, 1 phase, 50-60 Hz

6.3 HUB (option) 100-230 VAC: 0.1 A max. 1 phase, 50/60 Hz

6.4 Transformer (RU-1803, option) 440 VAC, 1 phase, 50/60 Hz

6.5 De-icer (option) 100-115/220-230 VAC: 2.6/1.3 A, 1 phase, 50-60 Hz

**7 ENVIRONMENTAL CONDITIONS**

7.1 Ambient temperature

Antenna unit -25°C to +55°C (storage: -25°C to +70°C)

Indoor units -15°C to +55°C (storage: -20°C to +70°C)

7.2 Relative humidity 95% or less at +40°C

7.3 Degree of protection

Antenna unit IP56

Processor/ monitor unit IP22

Control unit IP20

HUB IP20 (HUB-100), IP22 (HUB-3000)

7.4 Vibration IEC 60945 Ed.4

**8 UNIT COLOR**

8.1 Antenna unit N9.5

8.2 Processor unit N2.5

8.3 Control/ monitor unit N2.5

8.4 HUB N3.0 (HUB-100), N2.5 (HUB-3000)

8.5 Radar console 2.5GY5/1.5 (standard), 7.5BG7/2, 2.5G7/2, N7.5

**9 PERFORMANCE MONITOR (PM-52A)**

9.1 Frequency range 3040 to 3080 MHz

9.2 Input power +25 dBm to +40 dBm

9.3 Output power -38 dBm (1<sup>st</sup> pulse max. output), -58 dBm (1<sup>st</sup> pulse min. output)

9.4 Step level 8 to 12 dB (1<sup>st</sup> pulse to last pulse)