

**SPECIFICATIONS OF MARINE RADAR
FAR-3230S**

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 2.8° (SN24CF), 2.3° (SN30CF), 1.8° (SN36CF)
- 1.4 Vertical beam width 25°
- 1.5 Sidelobe attenuation (value for angle from main-lobe)
 - SN24CF -23 dB (within ±20°), -27 dB (outside ±20°)
 - SN30CF -24 dB (within ±20°), -30 dB (outside ±20°)
 - SN36CF -24 dB (within ±10°), -30 dB (outside ±10°)
- 1.6 Polarization Horizontal
- 1.7 Rotation 24 rpm or 42 rpm (for high speed craft)
- 1.8 Wind load 100 kn relative

2 TRANSCEIVER

- 2.1 TX Frequency and modulation 3050 MHz ±30 MHz, P0N
- 2.2 Output power 30 kW
- 2.3 Pulse Repetition Rate, Range scale 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 32 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 2.0°
- 3.5 Bearing accuracy ±1°
- 3.6 Range scale and Range ring interval

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

- 3.7 Warm-up time 3 min. approx.
- 3.8 Orientation mode Head-up RM, STAB head-up RM, Course-up RM, North-up RM
North-up TM, Stern-up RM
- 3.9 Stabilization mode Ground or sea stabilization
- 3.10 Target tracking (TT) Auto or manual acquisition: 200 targets in 32 NM
Auto tracking on all acquired targets
Past position: 5/10 pts on all activated targets
Vector time: Off, 30 s, 1-60 min

- 3.11 AIS Capacity: 2000 targets,
Past position: 5/10 pts on all activated target
Vector time: Off, 30 s, 1-60 min
- 3.12 Radar map 10 map, 4,000 pts per map
- 3.13 Acquisition zone 2 zones

4 MONITOR UNIT

- 4.1 Screen type 19-inch color LCD, 1280 x 1024 pixel (SXGA)
- 4.2 Brightness 450 cd/m² typical
- 4.3 Visible distance 1.02 m nominal
- 4.4 Video interface DVI-D: DVI-standard, VESA-DDC2B
- 4.5 Brilliance control RS-485, Serial data control (DDC sentence)

5 INTERFACE

5.1 Processor unit (EC-3000)

Number of port

- Serial 7 ports (IEC61162-1/2: 4 ports, IEC61162-1: 3 ports)
- Alarm output 6 ports: contact signal, load current 250mA
(Normal close: 2, Normal open: 2, System fail: 1, Power fail: 1)
- DVI output 3 ports: DVI-D (2), DVI-I or RGB picture data (1 port for VDR)
- USB 4 ports (3 ports for control units)
- LAN 2 ports: Ethernet 1000Base-T for local communication
- Digital input 1 port: contact signal, 100 ohm max. or 24VDC input
- Data sentences (IEC61162-1/2)
 - Input ABK, ACK, ACN (ACM), ALR, CUR, DBT, DPT, DTM, GGA, GLL, GNS, HBT, HDT, MTW, MWV, NRX, RMC, RRT, THS, VBW, VDM, VDO, VDR, VHW, VSD, VTG, ZDA
 - Output ABM, ACK, ALC, ALF, ARC, BBM, EVE, HBT, OSD, RRT, RSD, TLB, TTD, TTM, VSD

5.2 Sensor adapter (option)

- MC-3000S (serial) 8 ports: I/O, IEC61162-1/2: 4 ports, IEC61162-1: 4 ports
- MC-3010A (analog) 3 ports: Input, -10 to +10 V, 0 to 10 V or 4 to 20 mA
- MC-3020D (digital-in) 8 ports: relay contact, logics set from program
- MC-3030D (digital-out) 8 ports: relay contact, normal open and normal close available

5.3 Ethernet interface for IEC61162-450 (EC-3000)

- Port (LAN2) 1000Base-T, IPv4, 8P8C connector
- Data sentences Same as 5.1 sentences
- IEC61162-450 transmission group
 - Input MISC, TGTD, SATD, NAVD, VDRD, RCOM, TIME, PROP, USR1 to USR8
 - 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
 - HTTP: *.*.*.: 80, XML-RPC: *.*.*.: 6403
 - Syslog: 239.192.0.254: 514

- 5.4 Ethernet interface for IEC61162-450 (MC-3000S)
 - Port 100Base-TX, IPv4, 8P8C connector
 - Maximum data rate 800 sps
 - Data sentences Output: XDR
 - IEC61162-450 transmission group
 - Input MISC, TGTD, SATD, NAVD, VDRD, RCOM, TIME, PROP, USR1 to USR8
 - Output Arbitrary (default: MISC)
 - Multicast address 239.192.0.1 to 239.192.0.16
 - Destination port 60001 to 60016
 - Other network function excepted IEC61162-450
 - HTTP: *.*.*: 80, XML-RPC: *.*.*: 6403
 - Syslog: 239.192.0.254: 514

6 POWER SUPPLY

- 6.1 Power supply unit (w/ antenna unit)
 - PSU-014 (24rpm) 100-230 VAC: 3.7-1.6 A, 1 phase, 50-60 Hz
 - PSU-015 (42rpm) 100-230 VAC: 6.4-2.7 A, 1 phase, 50-60 Hz
- 6.2 Processor unit 100-115/220-230 VAC: 1.5/0.7 A, 1 phase, 50-60 Hz
- 6.3 Monitor unit 100-230 VAC: 0.7-0.4 A, 1 phase, 50-60 Hz
- 6.4 Sensor adapter (option) 24 VDC: 1.4 A (for 11 units), input to MC-3000S, the sources of other sensor adapters are fed from MC-3000S
- 6.5 Switching HUB (option)
 - HUB-3000 100-230 VAC: 0.1 A max, 1 phase, 50/60 Hz
 - HUB-100 100-230 VAC: 0.1 A max, 1 phase, 50/60 Hz
- 6.6 Transformer (RU-1803, option) 440 VAC, 1 phase, 50/60 Hz
- 6.7 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
- 7.2 Relative humidity 95% or less at +40°C
- 7.3 Degree of protection
 - Antenna unit IP56
 - Processor unit IP20 (IP22: option)
 - Sensor adapter IP20 (IP22: option)
 - HUB HUB-100: IP20, HUB-3000: IP22
 - Control/ monitor/ power supply unit IP22
- 7.4 Vibration IEC 60945 Ed.4

8 UNIT COLOR

- 8.1 Antenna unit N9.5
- 8.2 Power supply unit N2.5
- 8.3 Processor unit N2.5
- 8.4 Control/ monitor unit N2.5
- 8.5 HUB HUB-100: N3.0, HUB-3000: N2.5
- 8.6 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 (1st pulse max. output), -58 dBm (1st pulse min. output)
- 9.4 Step level 8 to 12 dB (1st pulse to last pulse)