

**FURUNO**

# CHART RADAR



Models:  
FAR-30x5 series

# FURUNO FAR-30x5 Series Chart Radar offers enhanced performance and navigation safety through greatly enhanced reliability

**Newly developed antennas with enhanced high durability and reliability**



- ▶ **Newly designed antenna scanners to suppress the aerodynamic drag and prevent a spike in temperature**
- ▶ **Less maintenance required through use of the DC brushless motor**
- ▶ **Ethernet network link between antenna unit and below deck processor unit**  
The analog signals are converted into the digital signals within the antenna unit and sent to the below deck processor unit via Ethernet network. This network technology eliminates loss of signal gain between antenna unit and processor unit that may be seen in conventional Radar system.
- ▶ **Optional LAN Signal Converter enables users to extend the cable between antenna unit and processor unit or to utilize the existing cables when retrofitting**

## **Solid State Radar model - NXT - specializes in target detection and maintainability**

Compared to the traditional Magnetron Radar, the Solid State Radar NXT Series provide highly reliable target detection while requiring low power.

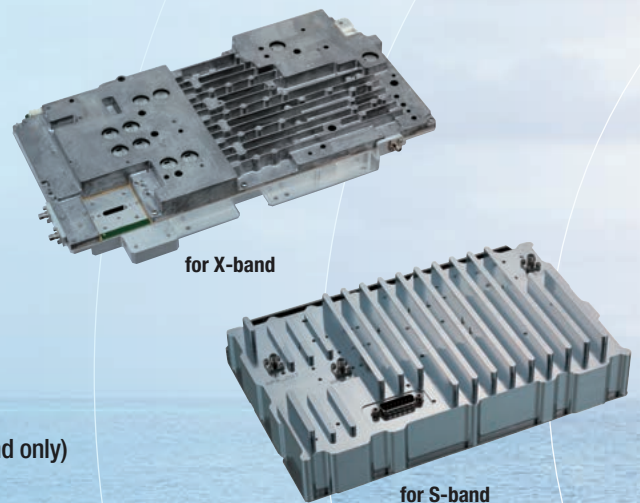
### ▶ **Clear images**

Furuno Solid State Radar technology generates clear echo images, which allows users to obtain a clear picture of the area around their vessel, including weaker echoes from small crafts.

### ▶ **Reducing the time and cost for maintenance**

- No need to replace the magnetron
- Removal of the consumable parts thanks to a fan-less antenna (S-band only)

Power Amplifier Module of the Solid State transceiver

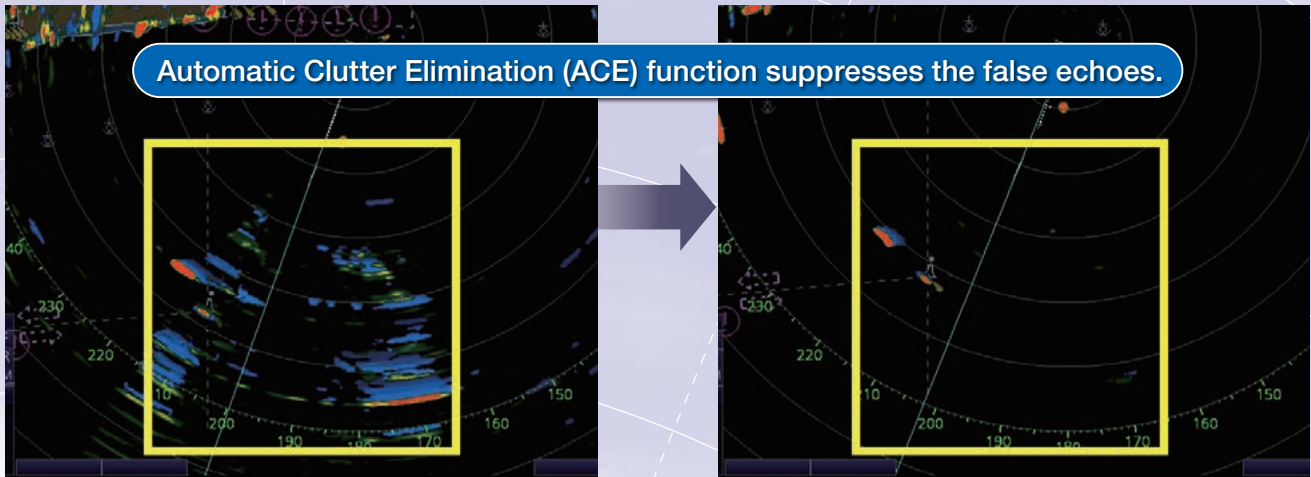


# Provides reliable situational awareness Advanced target detection

## ► Automatic Clutter Elimination (ACE) function provides clear echoes

Users can quickly adjust the radar image with a single action. When Automatic Clutter Elimination (ACE) function is activated, the system automatically adjusts the clutter reduction filter and gain control according to the sea and weather conditions selected (Calm/Rough Sea/Hard Rain).

Our advanced echo averaging architecture is also incorporated into Automatic Clutter Elimination (ACE) function. Users can avoid complicated adjustment processes, resulting in clear echo images.



Automatic Clutter Elimination (ACE)  
OFF

Automatic Clutter Elimination (ACE)  
ON

## ► Improved Target Tracking (TT) function

- Target acquisition takes only a few seconds



- Acquired target does not jump to adjacent target
- Reliable and stable tracking of high-speed and rapidly maneuvering vessels

## ► High performance Radar with Cat.1 and Cat.2 support

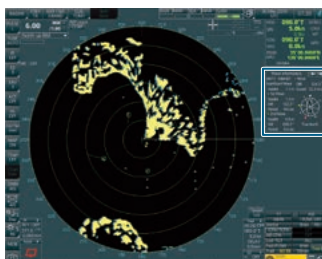
### ► Complies with the following regulations:

- IEC 60945 Ed. 4.0
- IEC 61162-1 Ed. 5.0
- IEC 61162-2 Ed. 1.0
- IEC 61162-450 Ed. 2.0
- IEC 61174 Ed. 4.0
- IEC 62288 Ed. 3.0
- IEC 62388 Ed. 2.0
- IEC 62923-1
- IEC 62923-2

## Advanced technologies for safer and optimal navigation in all kinds of situations (option)

### Wave Analyzer Software \*

- Allows real-time monitoring and analysis of wave echoes
- Ensures safety at sea even at night

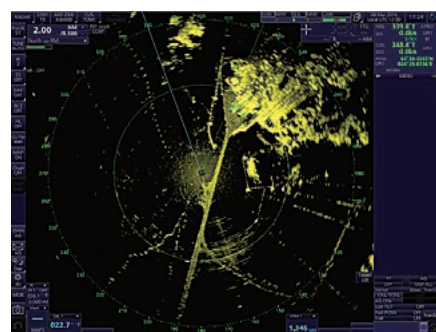


Wave Information	
ANT-1 X-BAND	▲ Wind
Significant Wave	DIR 324.3°
Height 1.7 m	Speed 22.2 m/s
▲ 1st Wave	
Height 1.2 m	DIR 122.2°
Period 9.6 sec	
▲ 2nd Wave	
Height 0.8 m	DIR 039.2°
Period 9.4 sec	

\*More details on the Wave Analyzer brochure

### Ice Mode \*\* (X-band magnetron only)

- Find the best route through ice
- Observe ice conditions by Radar

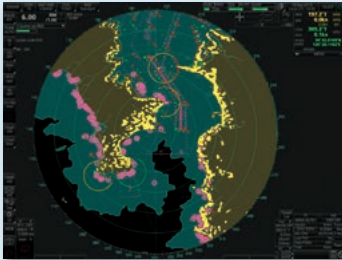


\*\*Please contact your local distributor for more details

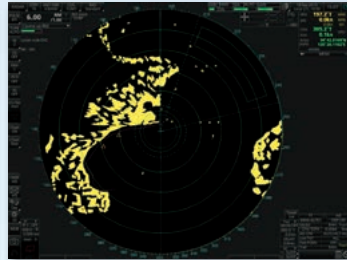
## Multi Function Display (MFD) capability\*

Furuno proposes workstations that combine flexibility and redundancy. Users may easily select ECDIS, Chart Radar, Conning display or Alert Management System at any multi-function display. Navigators will enjoy reduced workload and significant freedom to move about the bridge. All necessary information is available on a variety of displays and at locations that may be altered as required.

\*MFD capability is to be implemented as software upgrade



Radar (Chart ON)



Radar (Chart OFF)



ECDIS



Conning Information Display

## Sensor Adapter

### ► Common sensor adaptor makes installation and maintenance easy

The Sensor Adapter acts as a central medium to gather all of the sensor data and collectively feed it to all FAR-30x5 Chart Radar and FMD-3200/3300 ECDIS in the network. Since the sensor adapter can be extended to interface with all the sensors within the network, individual cable connections in the sensor-to-Chart Radar/ECDIS interface can be greatly reduced.



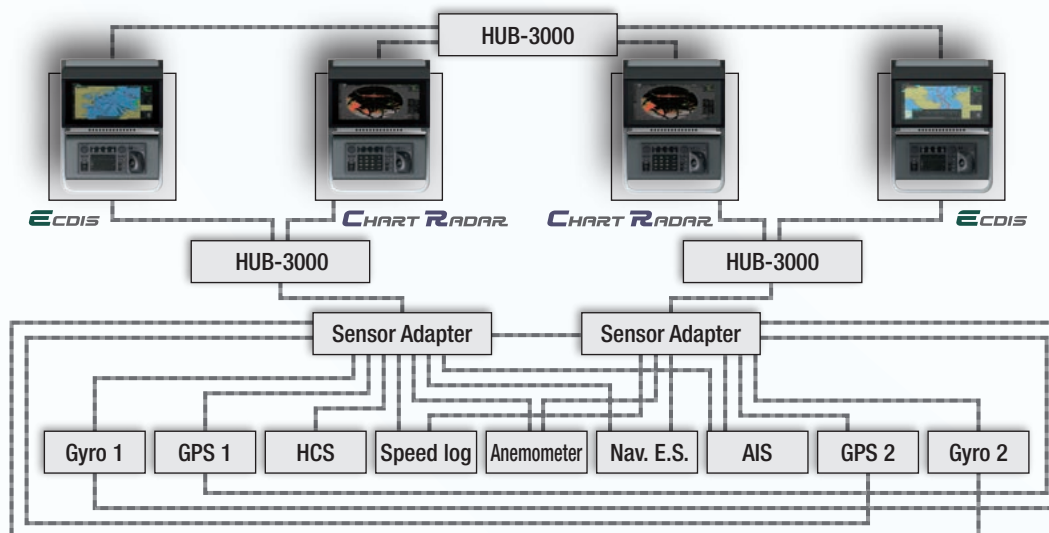
Navigation sensors can be directly interfaced with the processor's 8 serial I/O ports. Sensor adapters are required under the following conditions:

- The sensor data is to be shared amongst multiple networked Chart Radar and ECDIS systems,
- The number of sensors interfaced is more than the number of the ports the processor has (8 serial I/O ports, 1 digital IN and 6 digital OUT), and/or
- The networked sensors include analog sensors.

In order to integrate onboard sensors into the navigation network, the sensor adapter may be interfaced with the Intelligent Hub HUB-3000 from which distribution of the sensor data throughout the network is possible. Alternatively, multiple sensor adapters may be interfaced via Ethernet to integrate onboard sensors for use in the shipboard network.

### System diagram for the new Chart Radar

#### Model: FAR-30x5



# FURUNO's new user interface delivers straightforward operation

## Unique & smart operation tool – “Status bar” and “InstantAccess bar™”

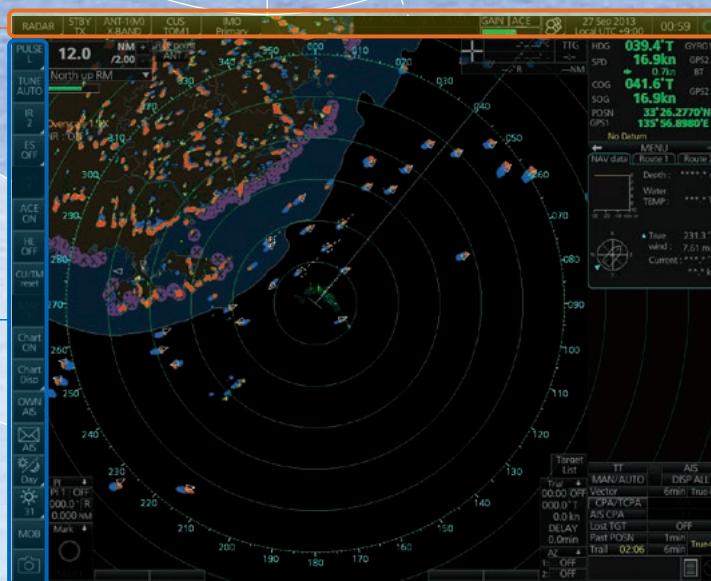
The user interface of the Radar utilizes carefully organized operational tools: the Status bar and the InstantAccess bar™. These operational tools deliver straightforward, task-based operation by which the operator can quickly perform tasks without having to navigate an intricate menu tree.

### Status bar

Status bar contains information about the operating status, i.e., MFD operating mode, main tasks assigned to each MFD operating mode.

### InstantAccess bar™

InstantAccess bar™ contains all the tasks (functions or actions) corresponding to the operation mode currently selected so that quick access to necessary functions/actions can be made.



## Stress-free operation with the well-designed control unit

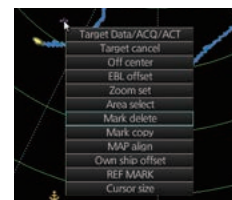


### Intuitive operation

All operations can be controlled with the trackball.

### Contextual menu

The context menu contains all the available actions related to the selected icon or area, it provides quick access to tasks.



# SPECIFICATIONS

## PRODUCT NAME

MARINE RADAR

## GENERAL

### Range Scales and Ring Intervals

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

## ANTENNA UNIT

Radiator Type Slotted waveguide array  
Beamwidth and Sidelobe

Antenna Type	X band							S band
	XN12CF	XN20CF	XN24CF	XN12AF	XN20AF	XN24AF	SN36CF	
Antenna Length (cm/ft)	130 / 4.2	210 / 7	260 / 8.5	126 / 4	204 / 6.7	255 / 8.3	383 / 12.6	
Horizontal beam	1.9°	1.23°	0.95°	1.9°	1.23°	0.95°	1.8°	
Vertical beam	20°						25°	
Side lobe (±10° or below)	-24 dB	-28 dB	-28 dB	-24 dB	-28 dB	-28 dB	-24 dB	
Side lobe (±10° or above)	-30 dB	-32 dB	-32 dB	-30 dB	-32 dB	-32 dB	-30 dB	

## TRANSCIVER UNIT

### ● Frequency and radio wave type

X band (Magnetron)	9410 MHz ± 30 MHz, P0N
S band (Magnetron)	3050 MHz ± 30 MHz, P0N
X band (Solid-state)	CH1 P0N: 9403.75 MHz/Q0N: 9423.75 MHz ± 5 MHz CH2 P0N: 9413.75 MHz/Q0N: 9433.75 MHz ± 5 MHz
S band (Solid-state)	CH1 P0N: 3043.75 MHz/Q0N: 3063.75 MHz ± 5 MHz CH2 P0N: 3053.75 MHz/Q0N: 3073.75 MHz ± 5 MHz

### ● Peak Output

FAR-3015	12 kW
FAR-3025	25 kW
FAR-3025-NXT	600 W
FAR-3035S	30 kW
FAR-3035S-NXT	250 W

### Range scale, Pulse Repetition Rate and Pulselength

Magnetron radar: FAR-3015/3025/3035S

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					

\*: 500 Hz on 96 NM range.

Solid state radar: FAR-3025-NXT

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

Solid state radar: FAR-3035S-NXT

PRR (Hz approx.)	Range scale (NM)										
	0.125	0.25	0.5	0.75	1.5	3	6	12	24	48	96
2400	S1										
2000						S2					
1500					M1						
1060						M2					
1000						M3					
600						L					

## PROCESSOR UNIT

### Chart Materials

IMO/IHO S57 edition-3 ENC vectorized material (IHO S-63 ENC data protection scheme), C-MAP and CM-93/3 vectorized materials

### Data Presentation

#### Own Ship

Own ship's mark and numeral position in lat/lon, speed and course

#### Target Data (TT: ARPA, AIS)

Range, bearing, speed, course, CPA/TCPA, BCR/BCT  
Target information from AIS (waypoint, ship's hull and status)

### Position Calculation

Navigation by result from external position sensor

Dead reckoning with gyro and log data from gyro, log, and position sensors to be fed to mathematical filter to generate highly accurate position and speed

### Navigation Planning

#### Route Monitoring

Off-track display, waypoint arrival alarm, shallow depth alarm

#### User Chart

User chart creation and display

#### Notes Data

Create and display notes data

#### MOB (Man Overboard)

Position, and other data at time of man overboard are recorded MOB mark is displayed on the screen

## DISPLAY UNIT

### Screen type

MU-270W

### Resolution

27-inch color LCD, 1920 x 1200 (WUXGA)

### Brightness

400 cd/m<sup>2</sup> typical

### Visible distance

1.02 m nominal

### Effective diameter

349 mm

## INTERFACE

### Processor Unit

#### DVI

2 ports, DVI-D (Video signal from DVI-1 and DVI-2 is identical)

1 port, DVI-I Ver. 1.1 (RGB for VDR)

#### LAN

2 ports, Ethernet 1000 Base-T (for Interswitch and Sensor Adapter)

1 port, 100 Base-TX (for Radar sensor)

#### USB

4 ports, USB 2.0 type-A

#### COM

2 ports, RS232C/RS-485 (for brilliance control)

#### Serial I/O

8 ports

IEC61162-1/2 (2 ports), IEC61162-1 (6 ports)

#### Sentences

##### Input

ABK, ACN (ACM), ALC, ALF, ALR, ARC, CUR, DBT, DDC, DPT, DTM, GGA, GLL, GNS, HBT, HCR, HDT, MTW, MWD, MWV, NRM, NRX, NSR, RMC, RRT, SRP, THS, VBW, VDM, VDO, VDR, VHW, VLW, VSD, VTG, ZDA

##### Output

ABM, ALC, ALF, ALR, ARC, BBM, DDC, EVE, HBT, OSD, RRT, RSD, RTE, SRP, TLB, TTD, TTM, VSD, WPL

#### Digital Input

1 port (for ACK signal input)

#### Contact Closure

6 ports

1 port for system fail, 1 port for power fail, 2 ports for normal close, and 2 ports for normal open

#### Sensor Adapter

#### Control and Serial Input

##### LAN

1 port, Ethernet 100 Base-TX

##### Serial

8 ports

IEC 61162-1/2 (4 ports), IEC 61162-1 (4 ports)

#### Analog Input

3 ports/per unit, -10 to +10 V/0 to 10 V, 4 to 20 mA selectable

#### Digital Input

8 ports/per unit, normal close or open, selectable

#### Digital Output

8 ports/per unit, normal close or open, selectable

## POWER SUPPLY

### Power Supply Unit

100-230 VAC: 1 phase, 50-60 Hz

#### FAR-3015

PSU-014: 1.7-0.8 A / PSU-014: 2.5-1.1 A

#### FAR-3025

PSU-014: 1.8-0.8 A / PSU-014: 2.5-1.2 A

#### FAR-3025-NXT

PSU-014: 1.8-0.9 A / PSU-014: 2.5-1.2 A

#### FAR-3035S

PSU-014: 2.8-1.3 A / PSU-015: 5.1-2.3 A

#### FAR-3035S-NXT

PSU-016: 2.8-1.3 A / PSU-018: 4.7-2.1 A

### Processor Unit (EC-3005)

100-115/220-230 VAC: 2.3/1.1 A, 1 phase, 50-60 HZ

### Display Unit

MU-270W : 100-230 VAC : 0.6-0.4A, 1 phase, 50-60 Hz

### Hub

100-230 VAC: 0.1 A, 1 phase, 50-60 Hz

### De-icer (option)

100-115/220-230 VAC: 2.6-1.3 A, 1 phase, 50-60 Hz

## ENVIRONMENTAL CONDITIONS

Unit	Ambient Temperature	Relative Humidity	Degree of protection	Vibration
Antenna Unit	-25°C to +55°C (storage +70°C)	95% or more at 40°C	IP56	IEC 60945 Ed. 4
Power Supply Unit	-15°C to +55°C		IP22	
Processor Unit			IP20	
Control Unit			IP22	
HUB-3000			IP22	

# EQUIPMENT LIST

## Standard

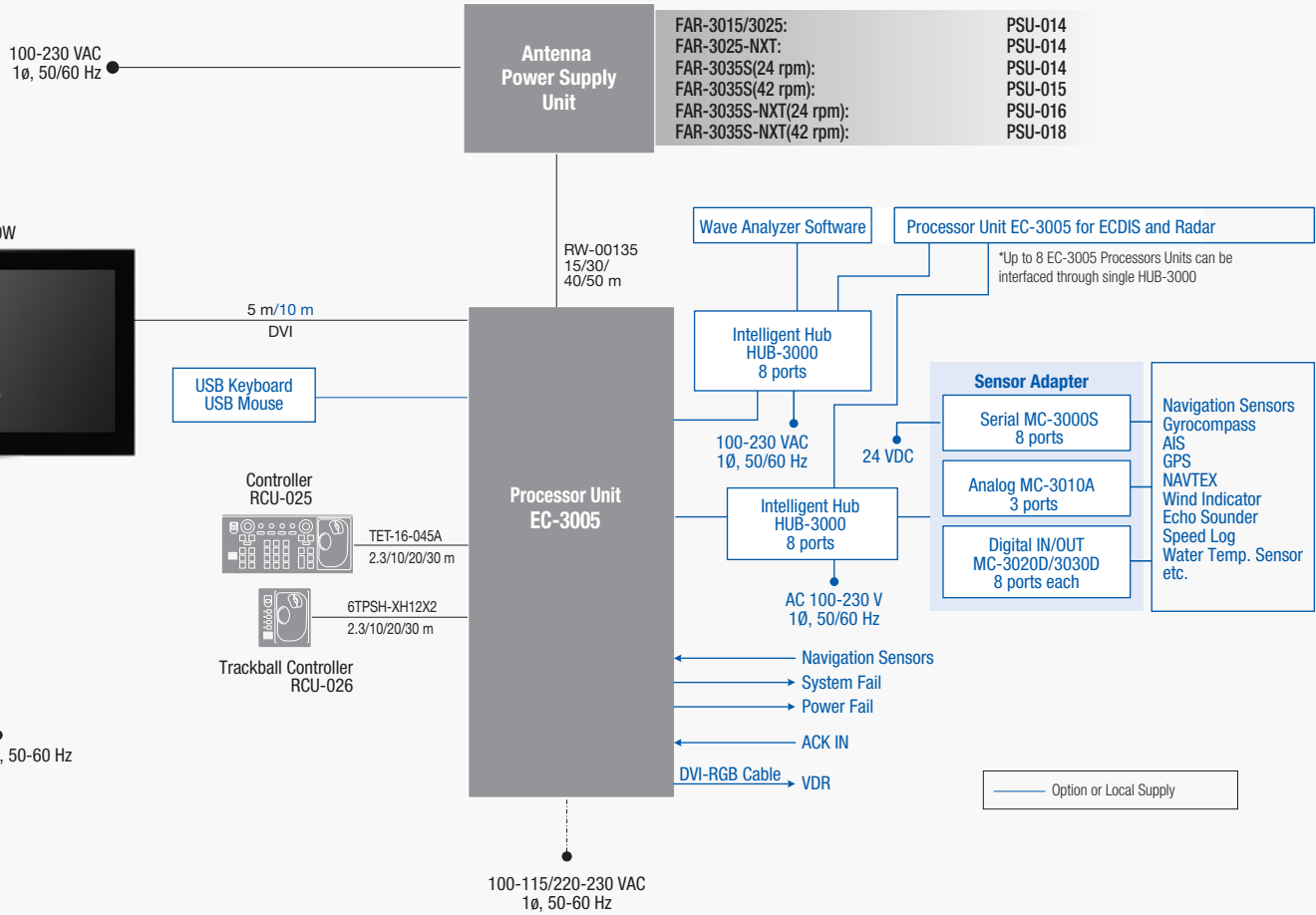
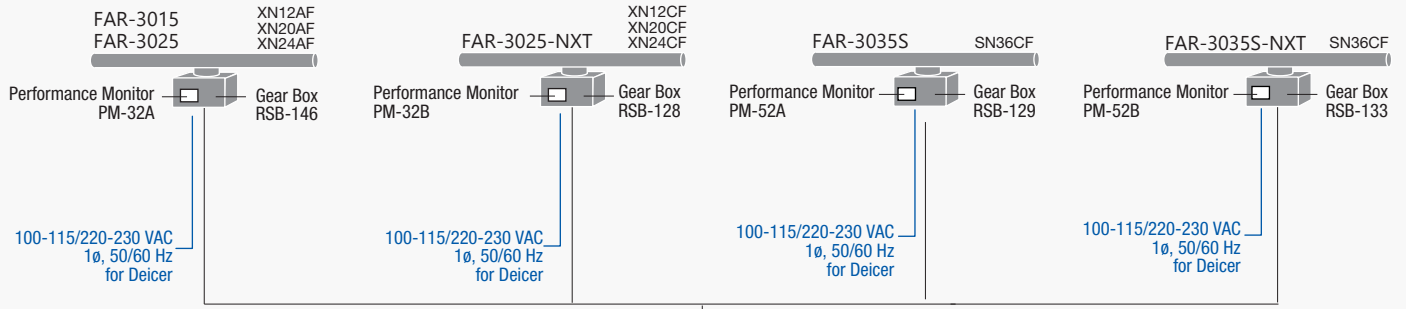
Display Unit	MU-270W	1 unit
Processor Unit	EC-3005	1 unit
Control Unit		1 unit
Radar Control Unit	RCU-025	1 unit (specify when ordering)
Trackball Control Unit	RCU-026	
Antenna Radiator	XN12CF/XN20CF/XN24CF XN12CA/XN20AF/XN24AF SN36CF	1 unit
Transceiver	RTR-107/111/123/131/132	1 unit
Gear Box	RSB-128/129/133/146	1 unit
Performance Monitor	PM-32A/32B/52A/52B	1 unit
Power Supply Unit	PSU-014/015/016/018	1 unit
Cable between Power Supply Unit and Antenna Unit		1 pc
LAN Cable between Processor Unit and Power Supply Unit		1 pc
Standard Spare Parts and Installation Materials		1 set

## Option

Sensor Adapter	MC-3000S/3010A/3020D/3030D
Sub Display Radar Cable	RW-00136
De-icer	OP03-226/227/231/232/274
Junction Box (for foremast mounting)	RJB-001
Composite Cable between Junction Box and Antenna/Power Supply Unit (for foremast mounting)	RW-9600
LAN Signal Converter (for foremast mounting)	OP03-223
Intelligent Hub	HUB-3000
Wave Analyzer Software	WV-100/WV-100ST

# INTERCONNECTION DIAGRAM

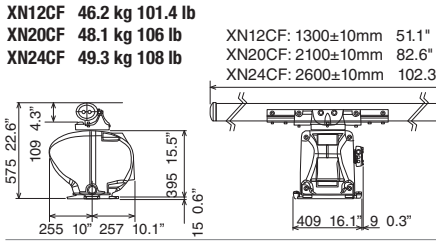
## Antenna Units



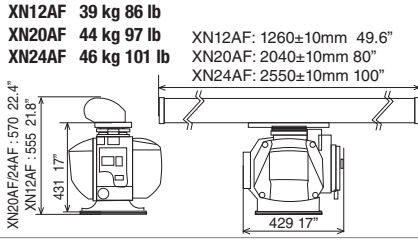
Model	Output Power	Transceiver	Antenna	Rotation	Power Supply	Display
FAR-3015	X band 12 kW	RTR-131	126 cm (XN12AF)		PSU-014	27" WUXGA (MU-270W)
FAR-3025	X band 25 kW	RTR-132	204 cm (XN20AF) 255 cm (XN24AF)	24/42* rpm	PSU-014	27" WUXGA (MU-270W)
FAR-3025-NXT	X band 600 W	RTR-123	130 cm (XN12CF) 210 cm (XN20CF) 260 cm (XN24CF)	24/42* rpm	PSU-014	27" WUXGA (MU-270W)
FAR-3035S	S band 30 kW	RTR-107	383 cm (SN36CF)	24/42* rpm	PSU-014 (24 rpm) PSU-015 (42 rpm)	27" WUXGA (MU-270W)
FAR-3035S-NXT	S band 250 W	RTR-111	383 cm (SN36CF)	24/42* rpm	PSU-016 (24 rpm) PSU-018 (42 rpm)	27" WUXGA (MU-270W)

\* Except for XN24CF

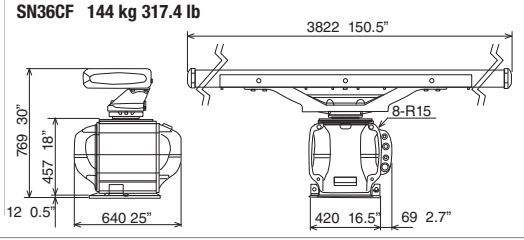
**Antenna Unit (FAR-3025-NXT)**



**Antenna Unit (FAR-3015/3025)**



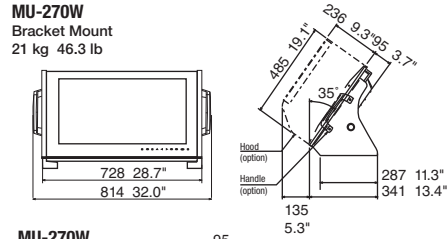
**Antenna Unit (FAR-3035S/3035S-NXT)**



**Monitor Unit**

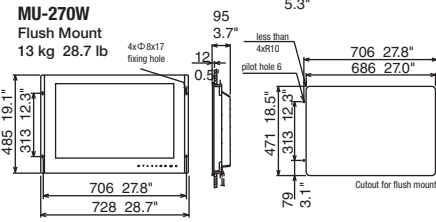
**MU-270W**

Bracket Mount  
21 kg 46.3 lb



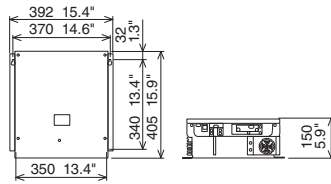
**MU-270W**

Flush Mount  
13 kg 28.7 lb

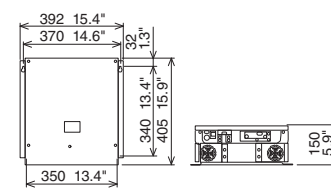


**Power Supply Unit**

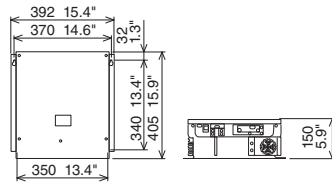
**PSU-014 8.5 kg 18.7 lb**



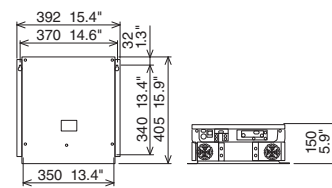
**PSU-015 10 kg 22.0 lb**



**PSU-016 8.5 kg 18.7 lb**

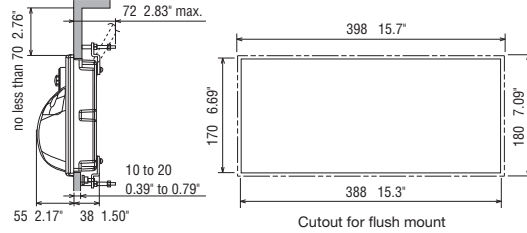
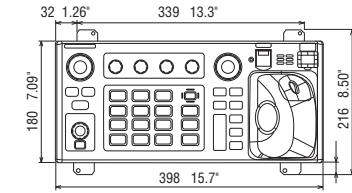


**PSU-018 10 kg 22.0 lb**



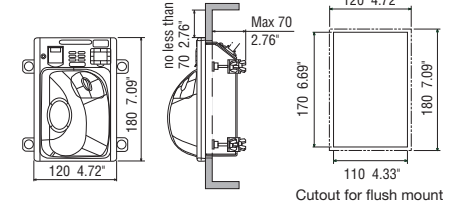
**Control Unit**

**RCU-025 2.3 kg 4.4 lb**



**Trackball Control Unit**

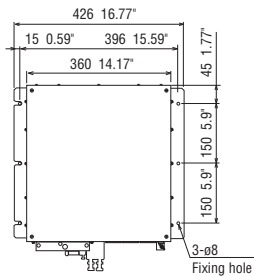
**RCU-026 1.5 kg 3.31 lb**



**Processor Unit**

**EC-3005**

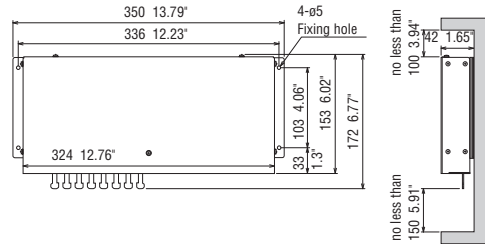
14 kg 30.9 lb



**Intelligent Hub**

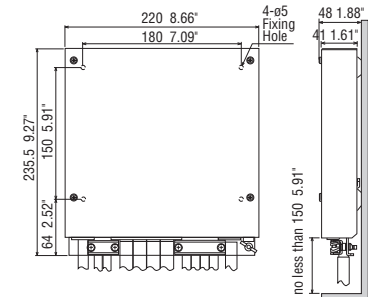
**HUB-3000**

1.5 kg 3.31 lb

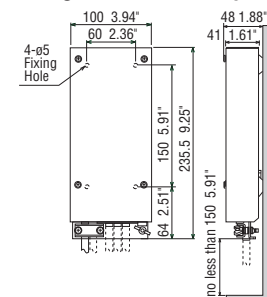


**Sensor Adapter**

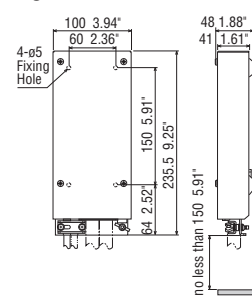
**Serial : MC-3000S 1.5 kg 3.3 lb**



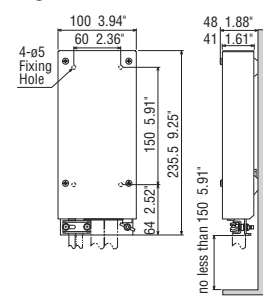
**Analogue : MC-3010A 0.8 kg 1.8 lb**



**Digital In : MC-3020D 0.8 kg 1.76 lb**



**Digital Out : MC-3030D 0.8 kg 1.76 lb**



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