

FURUNO

CHART RADAR



Models:
FAR-30x5 series

The FURUNO FAR-30x5 Chart Radar Series offers reliable situational awareness and navigation safety through greatly enhanced target detection.

Newly developed antennas with enhanced durability and reliability



S Band Antenna (Magnetron/Solid-State)
SN36CF



X Band Antenna (Magnetron/Solid-State)
XN12AF , XN20AF , XN24AF

► 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 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 the antenna unit and processor unit that may be seen in a conventional Radar system.

► Optional LAN Signal Converter enables users to extend the cable between the antenna unit and processor unit or to utilize the existing cables when retrofitting

Solid State Radar model - NXT - specializes in target detection and reduced maintenance

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

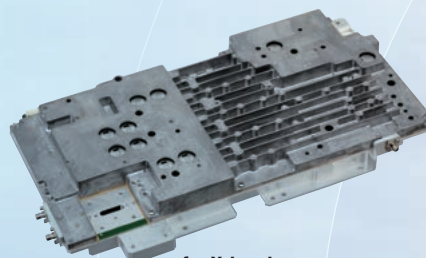
► Clear images

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
- Fan-less antenna reduces cost due to removal of consumable parts (S-band only)

Power Amplifier Module of the Solid State transceiver



for X-band



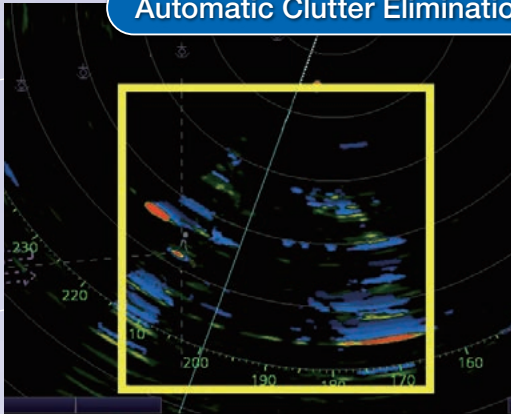
for S-band

► Automatic Clutter Elimination (ACE) function provides clear echoes

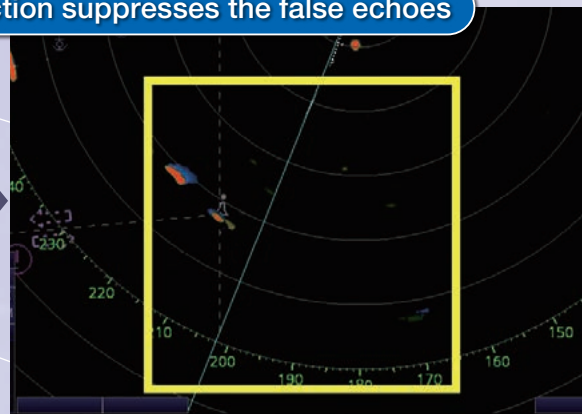
The ACE adjusts the Radar image with a single button press. When the ACE function is activated, the system automatically optimizes clutter reduction filters and gain control according to the sea and weather conditions.

Our advanced echo averaging architecture is also incorporated into the ACE function. Users can avoid complicated adjustment processes, resulting in clear echo images.

Automatic Clutter Elimination (ACE) function suppresses the false echoes



ACE: OFF



ACE: ON

► Improved Target Tracking (TT) function

- Target acquisition takes only a few seconds



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

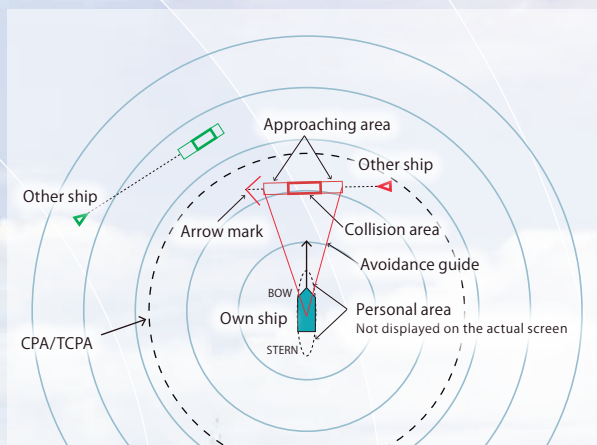
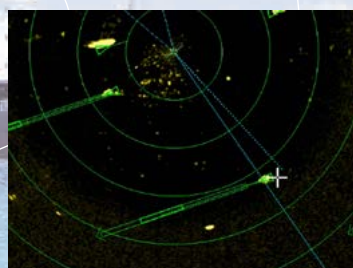
► See potential collisions with Risk Visualizer™

The Risk Visualizer™ assists operators in making avoidance decisions by visualizing the areas where there is a risk of collision if own ship keeps current speed and other ship(s) continue to navigate at their current speed and course.

The Risk Visualizer™ makes it easier to identify the risk of approaching or colliding with other vessels in challenging environments—such as during nighttime navigation, low-visibility conditions, high-traffic areas, or when the operator is managing a high workload.



In the example image, by altering course so that your ship does not enter the approaching area, you can avoid the other ship by maintaining a distance equal to the personal area.



Maneuver your vessel to avoid the approaching/collision areas, you will be able to avoid other ships. If your ship's course is within an approaching area, there is a risk of coming close to other ship, so the operators must steer with caution.

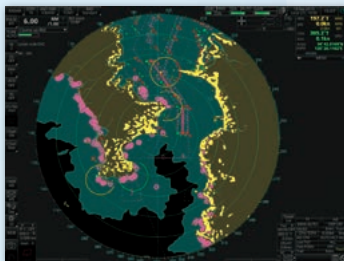
If target's CPA and TCPA are less than the threshold, the approaching/collision area will flash in red and the CPA/TCPA alert occurs. After acknowledging the alert, the flashing stops.

※If a target's speed or course is changed after your vessel changes its course, the risk of collision may increase. Maneuver your vessel accordingly to avoid collision.
 ※When the vector mode is set to the ground stabilization or sea stabilization(true), the approaching/collision area is shown with a thick solid line in the same direction as the vector of the target that is on a collision course with own ship.
 ※The color for the approaching/collision areas change according to the color of the target symbol.

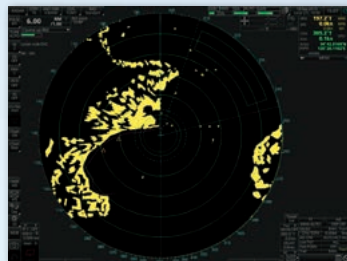
Multi Function Display (MFD) capability*

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

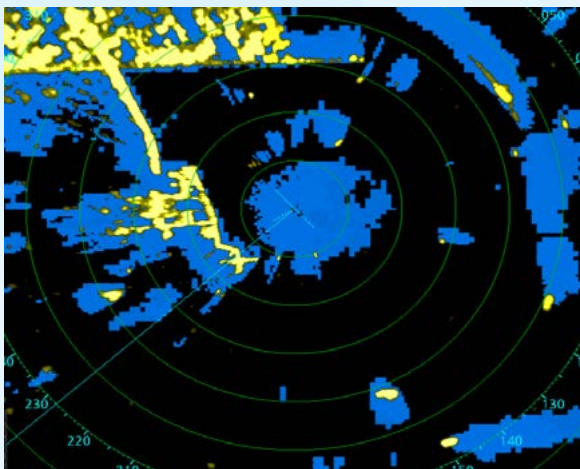


Conning Information Display

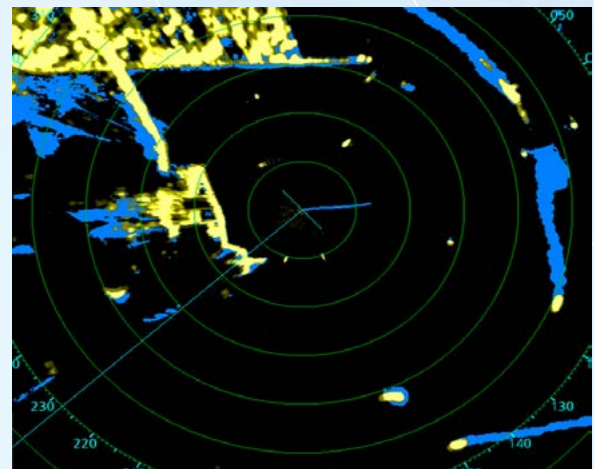
Seamless Trail Display During Range Changes

In addition, trail rendering across all ranges provides a seamless display that minimizes trail degradation and interruption during range changes, supporting immediate situational awareness.

Trail Display Comparison After Range Change



Trails are degraded (Conventional technology)



Trails are maintained (New technology)

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.



FURUNO's new user interface delivers straightforward operation

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

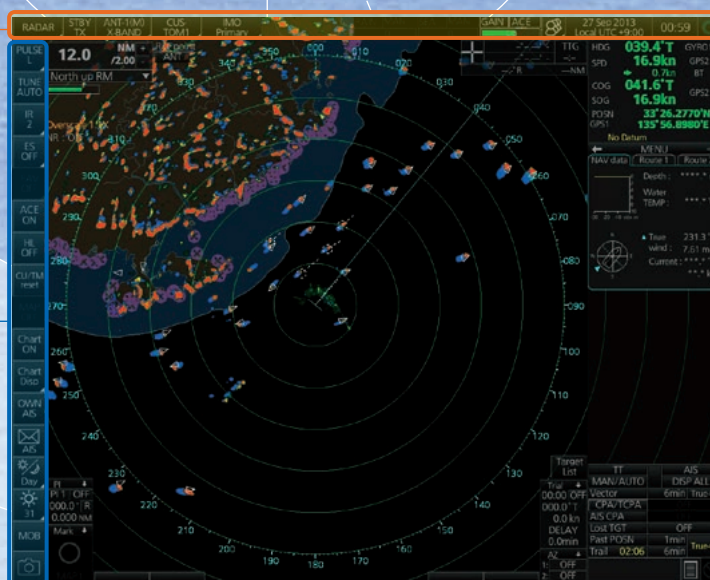
The user interface of the Radar utilizes carefully organized operational tools: the Status bar and the InstantAccess bar™. These operational tools deliver straightforward, task-based operation by which the operator can quickly perform tasks without having to navigate an intricate menu tree.

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

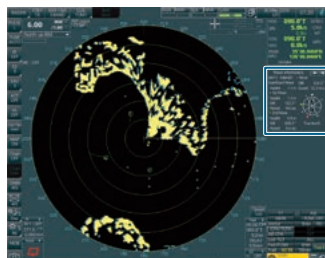
The context menu contains all the available actions related to the selected icon or area, it provides quick access to tasks.



Advanced optional technologies for safer and optimal navigation in all kinds of situations

Wave Analyzer Software *

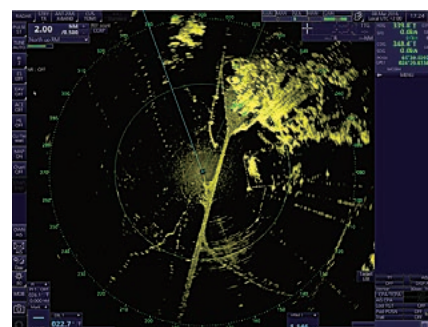
- Allows real-time monitoring and analysis of wave echoes
- Ensures safety at sea even at night



*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

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	
	XN124F	XN204F	XN244F	SN36CF		
Antenna Length (cm/ft)	126 / 4.1	211 / 6.9	261 / 8.6	383 / 12.6		
Horizontal beam	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		
Side lobe(±10° or above)	-30 dB	-32 dB	-32 dB	-30 dB		

TRANSCEIVER 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 CH1 P0N: 3043.75 MHz/Q0N: 3063.75 MHz±5 MHz CH2 P0N: 3053.75 MHz/Q0N: 3073.75 MHz±5 MHz
S band (Solid-state)	

Peak Output

FAR-3015	12 kW
FAR-3025	25 kW
FAR-3025-NXT-MARK-2	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-MARK-2

PRR (Hz approx.)	Range scale (NM)																
	0.125	0.25	0.5	0.75	1	1.5	2	3	4	6	8	12	16	24	32	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

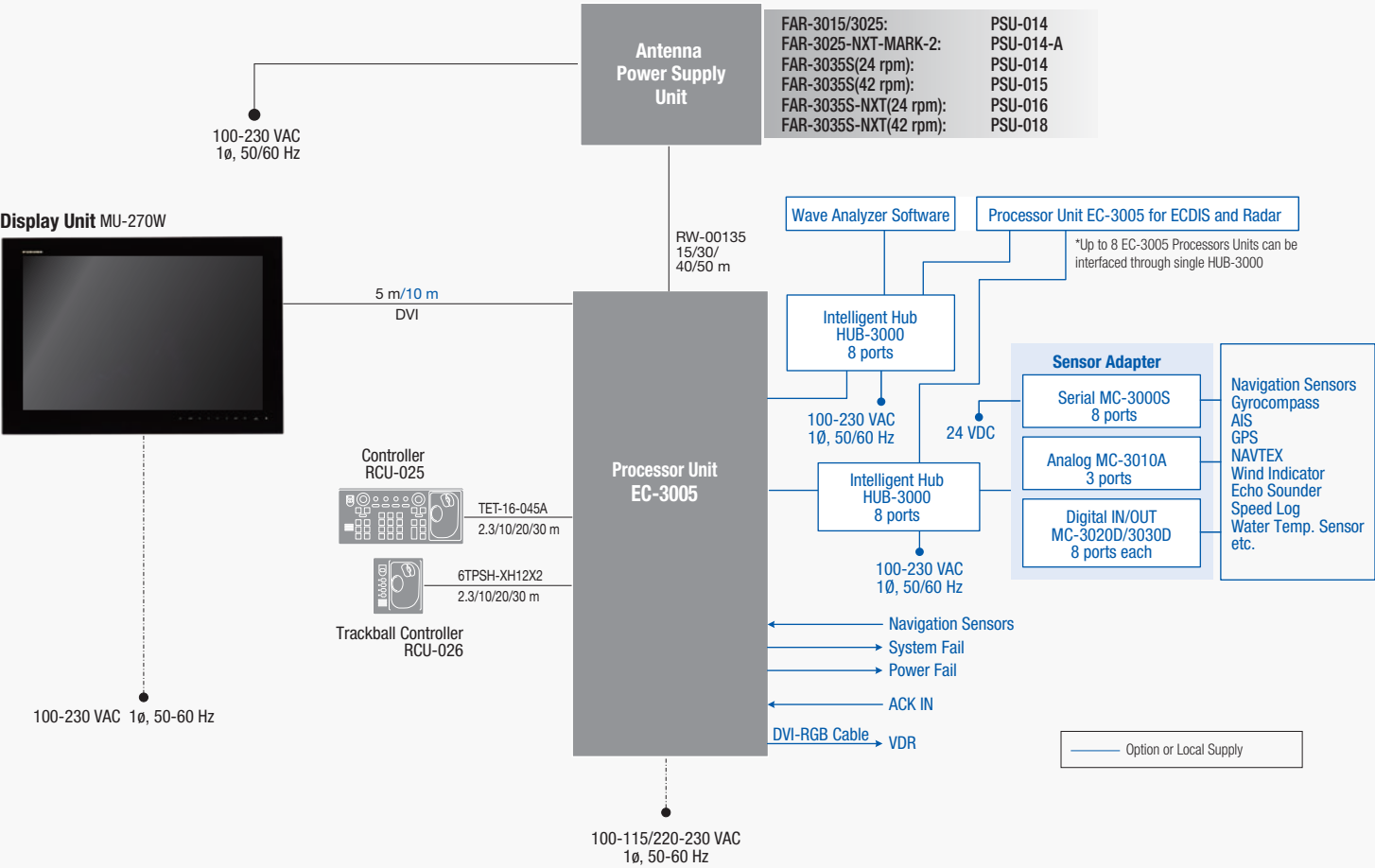
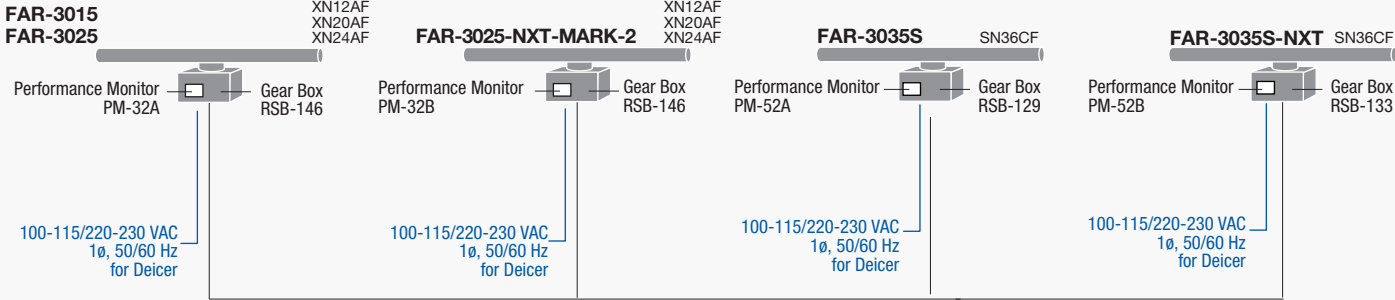
Navigation by result from external position sensor
Dead reckoning with gyro and log data from gyro, log,
and position sensors to be fed to mathematical filter to
generate highly accurate position and speed

Navigation Planning

Route Monitoring

INTERCONNECTION DIAGRAM

Antenna Units

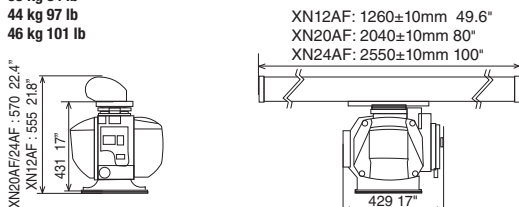


Model	Output Power	Transceiver	Antenna	Rotation	Power Supply	Display
FAR-3015	X band 12 kW	RTR-131	126 cm (XN12AF)	24/42* rpm	PSU-014	27"WUXGA (MU-270W)
FAR-3025	X band 25 kW	RTR-132	204 cm (XN20AF) 255 cm (XN24AF)			
FAR-3025-NXT-MARK-2	X band 600 W	RTR-137	126 cm (XN12AF) 211 cm (XN20AF) 261 cm (XN24AF)	24/42* rpm	PSU-014-A	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 XN24AF

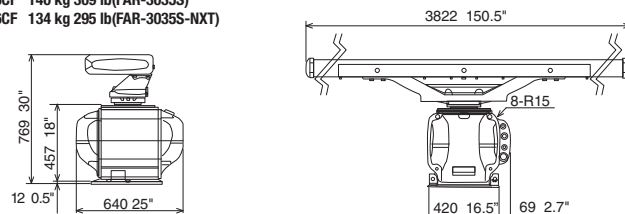
Antenna Unit (FAR-3015/3025/FAR-3025-NXT-MARK-2)

XN12AF 38 kg 84 lb
XN20AF 44 kg 97 lb
XN24AF 46 kg 101 lb



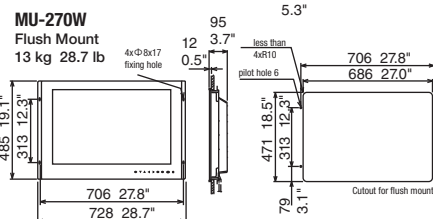
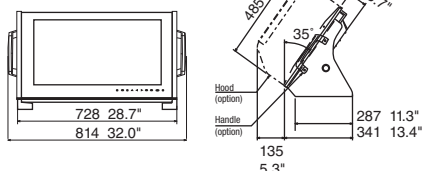
Antenna Unit (FAR-3035S/3035S-NXT)

SN36CF 140 kg 309 lb (FAR-3035S)
SN36CF 134 kg 295 lb (FAR-3035S-NXT)



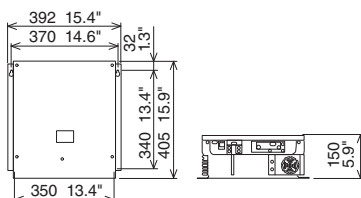
Monitor Unit

MU-270W
Tabletop Mount
21 kg 46.3 lb

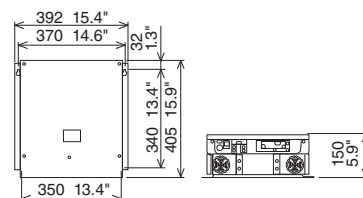


Power Supply Unit

PSU-014 8.5 kg 18.7 lb
PSU-016 8.5 kg 18.7 lb

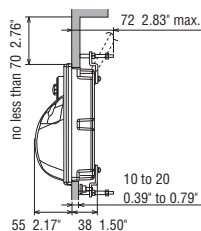
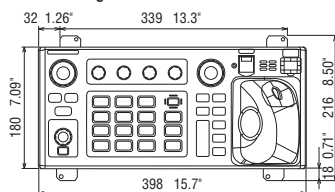


PSU-015 10 kg 22.0 lb
PSU-018 10 kg 22.0 lb



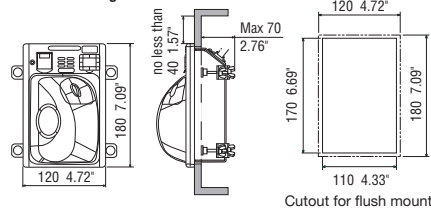
Control Unit

RCU-025 2.3 kg 4.4 lb



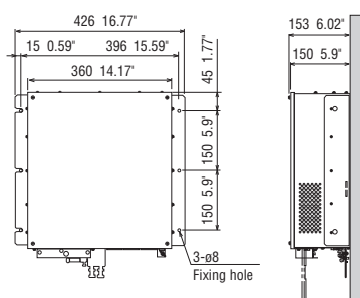
Trackball Control Unit

RCU-026 1.5 kg 3.31 lb



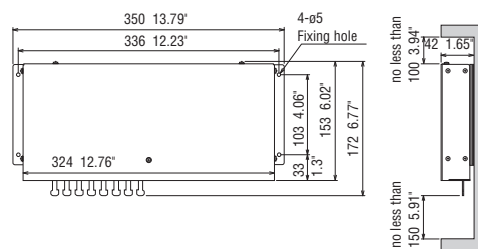
Processor Unit

EC-3005
14 kg 30.9 lb



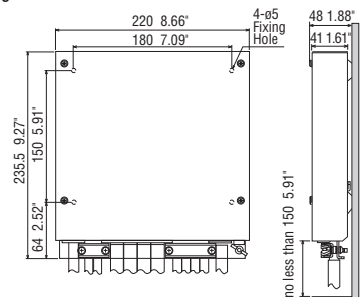
Intelligent Hub

HUB-3000
1.5 kg 3.31 lb

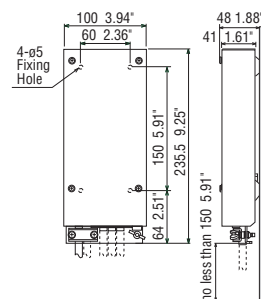


Sensor Adapter

Serial : MC-3000S 1.5 kg 3.3 lb



Analog : MC-3010A 0.8 kg 1.76 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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