

Installation Manual

MARINE RADAR FR-8062/8122/8252

SYSTEM CONFIGURATION	ii
EQUIPMENT LISTS.....	iv
1. MOUNTING.....	1-1
1.1 Antenna Unit.....	1-1
1.2 Display Unit	1-12
1.3 Power Supply Unit.....	1-15
2. WIRING	2-1
2.1 Standard Wiring.....	2-1
2.2 Wiring the Power Supply Unit	2-2
2.3 Port for External Devices	2-4
3. SETTING UP THE EQUIPMENT	3-1
3.1 Setting Language	3-1
3.2 Opening the Installation Menu	3-2
4. OPTIONAL EQUIPMENT	4-1
4.1 ARP Kit ARP-11	4-1
4.2 External Monitor	4-3
4.3 Remote Display	4-5
4.4 External Buzzer	4-7
PACKING LIST, INSTALLATION MATERIALS, SPARE PARTS	A-1
OUTLINE DRAWINGS	D-1
INTERCONNECTION DIAGRAMS.....	S-1





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FURUNO ELECTRIC CO., LTD.

9-52, Ashihara-cho,
Nishinomiya, 662-8580, JAPAN

Telephone: +81-(0)798-65-2111
Fax: +81-(0)798-65-4200

•FURUNO Authorized Distributor Dealer

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Printed in Japan

A :SEP. 2005
H :MAR. 31, 2011



(AKMU)

Pub. No. IME-35390-H
FR-8062/8122/8252





SAFETY INSTRUCTIONS

Read these safety instructions before you operate the equipment.

 WARNING	Indicates a condition that can cause death or serious injury if not avoided.
 CAUTION	Indicates a condition that can cause minor or moderate injury if not avoided.


 Warning, Caution	 Prohibitive Action	 Mandatory Action
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 **WARNING**


ELECTRICAL SHOCK HAZARD

Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.


Wear a safety belt and hard hat when working on the antenna unit.


Serious injury or death can result if someone falls from the radar mast.

Construct a suitable service platform from which to install the antenna unit.

Serious injury or death can result if someone falls from the radar mast.


Turn off the power at the mains switchboard before beginning the installation.

Fire, electrical shock or serious injury can result if the power is left on or is applied while the equipment is being installed.

 **CAUTION**

Observe the following compass safe distances to prevent deviation of a magnetic compass.

	Standard	Steering
Display unit	0.95 m	0.60 m
Antenna unit FR-8062 (24 rpm)	1.95 m	1.25 m
FR-8062 (48 rpm)	1.90 m	1.20 m
FR-8122	1.10 m	0.70 m
FR-8252	1.80 m	1.15 m
Power supply unit	0.80 m	0.50 m

 **WARNING**

Radio Frequency Radiation Hazard

The radar antenna emits electromagnetic radio frequency (RF) energy which can be harmful, particularly to your eyes. Never look directly into the antenna aperture from a close distance while the radar is in operation or expose yourself to the transmitting antenna at a close distance.

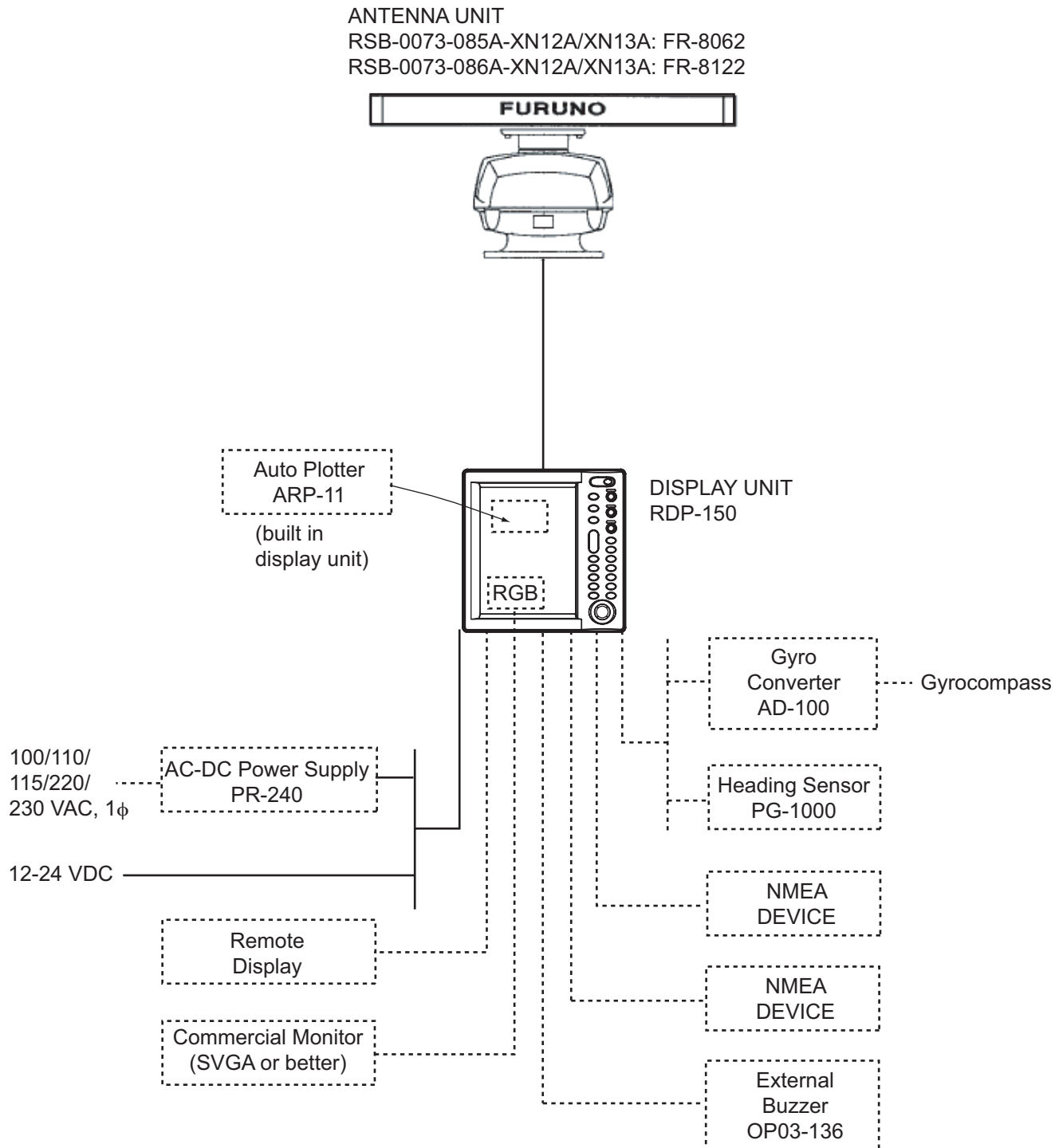
Distances at which RF radiation levels of 100 and 10 W/m² exist are given in the table below.

Note: If the antenna unit is installed at a close distance in front of the wheel house, your administration may require halt of transmission within a certain sector of antenna revolution.

MODEL	Distance to 100 W/m ² point	Distance to 10 W/m ² point
FR-8062 XN-12A (4')	—	0.9 m
FR-8062 XN-13A (6')	—	0.7 m
FR-8122 XN-12A	—	2.1 m
FR-8122 XN-13A	—	1.9 m
FR-8252 XN-12A	0.4 m	4.6 m
FR-8252 XN-13A	0.4 m	3.1 m

SYSTEM CONFIGURATIONS

FR-8062/8122

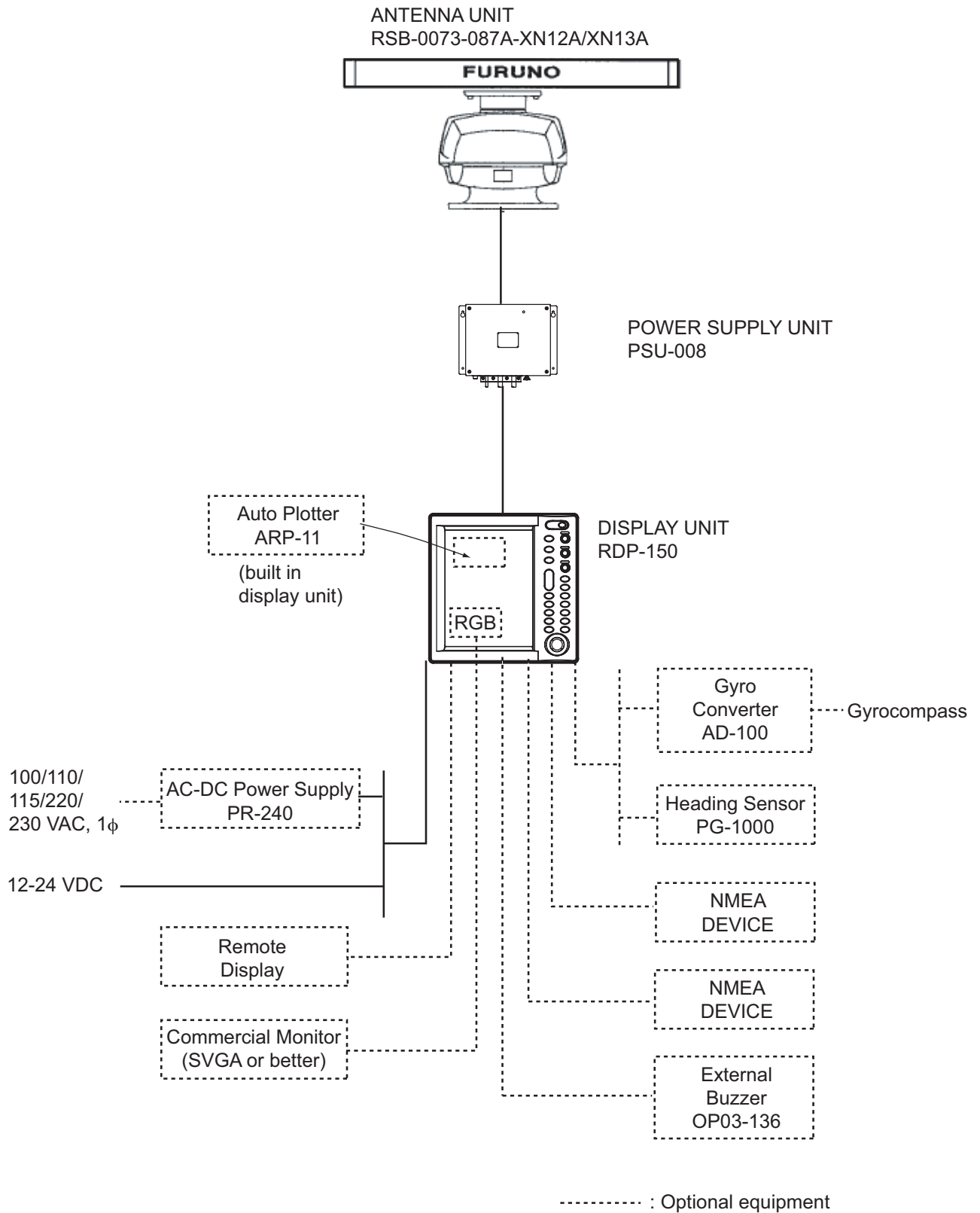


Category of units

Antenna unit: Exposed to weather
 All other units: Protected from weather

----- : Optional equipment

FR-8252



Category of units

Antenna unit: Exposed to weather

All other units: Protected from weather

EQUIPMENT LISTS

Standard Supply

Name	Type	Code No.	Qty	Remarks
Antenna unit	XN12A-RSB-0073-085A	-	1	FR-8062, 1255 mm, 24/36/48 rpm
	XN13A-RSB-0073-085A	-		FR-8062, 1795 mm, 24/36/48 rpm
	XN12A-RSB-0073-086A	-		FR-8122, 1255 mm, 24/36/48 rpm
	XN13A-RSB-0073-086A	-		FR-8122, 1795 mm, 24/36/48 rpm
	XN12A-RSB-0073-087A	-		FR-8252, 1255 mm, 24/36/48 rpm
	XN13A-RSB-0073-087A	-		FR-8252, 1795 mm, 24/36/48 rpm
Display unit	RDP-150	-	1	
Power supply unit	PSU-008	-	1	For FR-8252
Installation materials	CP03-30801	008-552-960	1	For antenna unit
	CP03-30700	000-090-471	1	10 m signal cable for FR-8062/8122
	CP03-30710	000-090-472		15 m signal cable for FR-8062/8122
	CP03-30720	000-090-473		20 m signal cable for FR-8062/8122
	CP03-30730	000-090-474		30 m signal cable for FR-8062/8122
	CP03-30500	000-083-620		1
	CP03-30510	000-083-621	15 m signal cable for FR-8252	
	CP03-30520	000-083-622	20 m signal cable for FR-8252	
	CP03-30530	000-083-623	30 m signal cable for FR-8252	
	CP03-30900	000-090-464	CP03-30901 & power cable for display unit	
Spare parts	SP03-15401	008-553-040	1	15A fuse, 3pcs and 10A fuse, 3pcs

*: See lists on the back of this manual.

Optional Supply

Name	Type	Code No.	Remarks
External buzzer	OP03-136	000-086-443	See ch. 4.
AC-DC Power Supply	PR-240	-	For AC ship's mains
Cable assy.	MJ-A7SPF0007-0 50C	000-144-418-10	w/7P plug at one end, 5m
	MJ-A6SPF0003-0 50C	000-154-054-10	w/6P plug at one end, 5 m
	MJ-A6SPF0007-1 00C	000-159-695-10	For compass, 10 m
	MJ-B24LPF0008- 100	000-145-125	10 m for remote display
	MJ-B24LPF0008- 200	000-145-126	20 m for remote display
	MJ-B24LPF0008- 300	000-145-127	30 m for remote display
Auto plotter	ARP-11	008-523-050	See ch. 4.
Installation materials	CP03-31001	008-556-830	Installation materials for remote display, see ch. 4.
RGB kit	OP03-195	008-553-110	See ch. 4.
Remote controller	RCU-019	000-090-945	With 5 m cable

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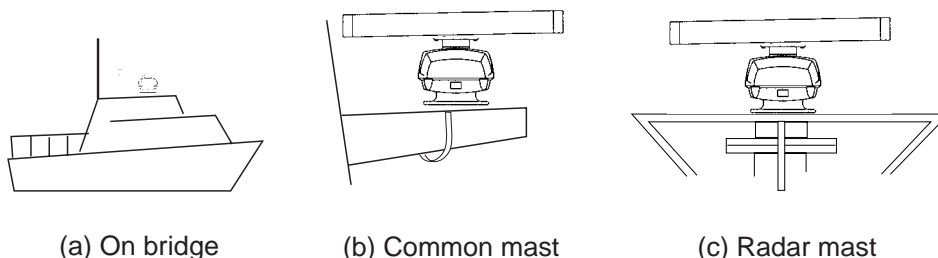
1. MOUNTING

1.1 Antenna Unit

Mounting considerations

- The antenna unit is generally installed either on top of the wheelhouse or on the radar mast on a suitable platform. Locate the antenna unit where there is a good all-round view. Any obstruction will cause shadow and blind sectors. A mast for instance, with a diameter considerably less than the horizontal beamwidth of the radiator, will cause only a small blind sector, but a horizontal spreader or crosstrees in the same horizontal plane as the antenna unit would be a much more serious obstruction; you would need to place the antenna unit well above or below it.
- It is rarely possible to place the antenna unit where a completely clear view in all directions is available. Thus, you should determine the angular width and relative bearing of any shadow sectors for their influence on the radar at the first opportunity after fitting.
- To lessen the chance of picking up electrical interference, avoid where possible routing the signal cable near other onboard electrical equipment. Also avoid running the cable in parallel with power cables.
- A magnetic compass will be affected if the antenna unit is placed too close to it. Observe the compass safe distances mentioned in the SAFETY INSTRUCTIONS to prevent interference to a magnetic compass.
- Do not paint the radiator aperture, to ensure proper emission of the radar waves.
- When this radar is to be installed on larger vessels, consider the following points:
 - The signal cable run between the antenna and the display units comes in lengths of 10 m, 15 m, 20 m and 30 m.
 - Deposits and fumes from a funnel or other exhaust vent can adversely affect the aerial performance and hot gases may distort the radiator portion. The antenna unit must not be mounted where the temperature is more than 70°C.

As shown in the figure below, the antenna unit may be installed on the bridge, on a common mast or on the radar mast.



Mounting methods

1. MOUNTING

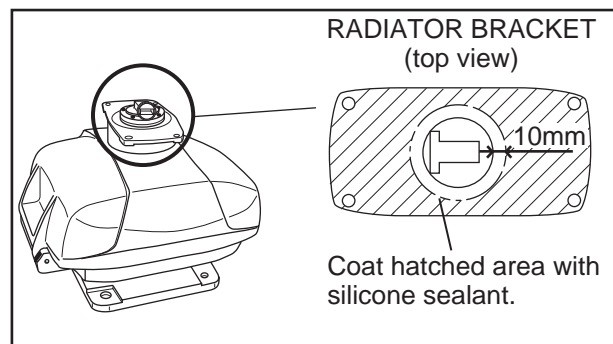
Mounting procedure

Referring to the outline drawing at the back of this manual, drill five holes in the mounting platform: four holes of 15 mm diameter for fixing the antenna unit and one hole of 25-30 mm diameter for the signal cable.

Fastening the radiator to the radiator bracket

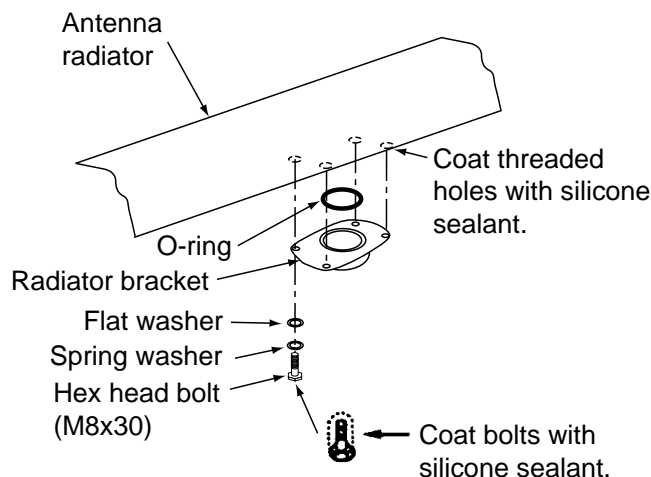
For your reference, the antenna installation materials list appears in the packing list at the back of this manual.

1. Remove the radiator cap from the radiator bracket.
2. Coat contacting surface between the antenna radiator and the radiator bracket with silicone sealant as shown in the figure below.



Coating the antenna with silicone sealant

3. Coat threaded holes on the antenna radiator with silicone sealant.
4. Grease the O-ring and set it to the radiator bracket.
5. Lay the antenna radiator on the radiator bracket.
6. Coat the radiator fixing bolts (4 pcs.) with silicone sealant. Fasten the antenna radiator to the radiator bracket with the radiator fixing bolts, flat washers and spring washers.



Fastening the radiator bracket to the antenna unit chassis

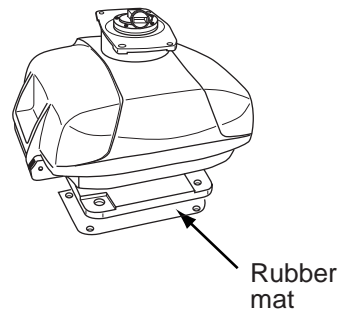
Mounting the antenna unit

The antenna unit can be mounted using the fixing holes on the outside (200x200 mm) or inside (140x150 mm) the antenna unit.

Using outside fixing holes of the antenna housing

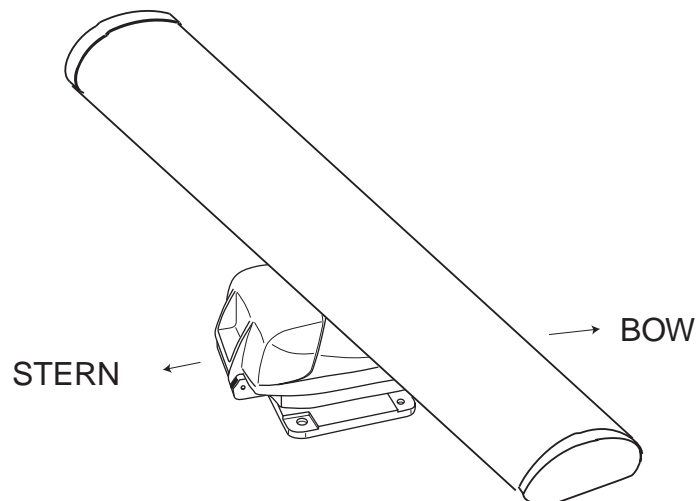
Use the hex head bolts (supplied) to mount the antenna unit as below.

1. Lay the corrosion-proof rubber mat (supplied) on the mounting platform.



Location of rubber mat

2. Lay the antenna unit on the mounting platform, orienting it as shown in below.



Antenna unit

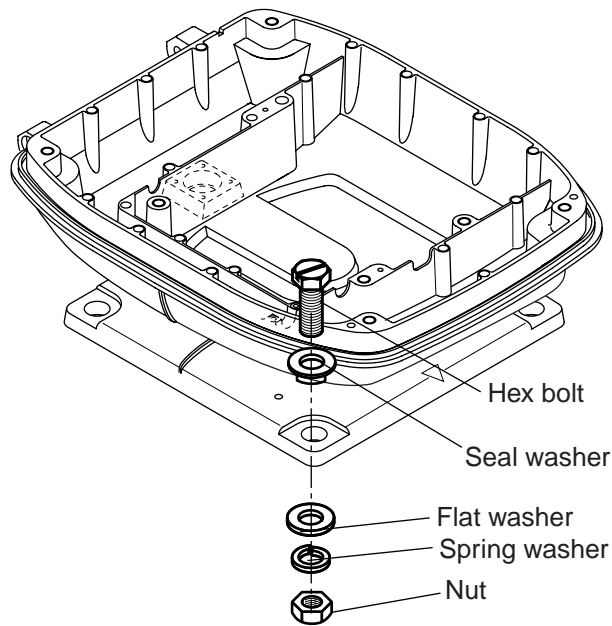
⚠ CAUTION

Do not lift the Antenna unit by the radiator; lift it by the housing.

The radiator may be damaged.

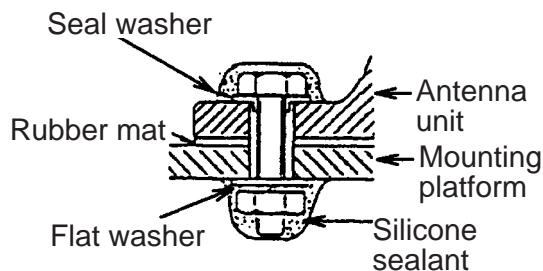
1. MOUNTING

3. Insert four hex bolts (M12x60, supplied) and seal washers (Φ30, supplied) from the top of the antenna housing, as shown below.



Fixing the antenna unit chassis

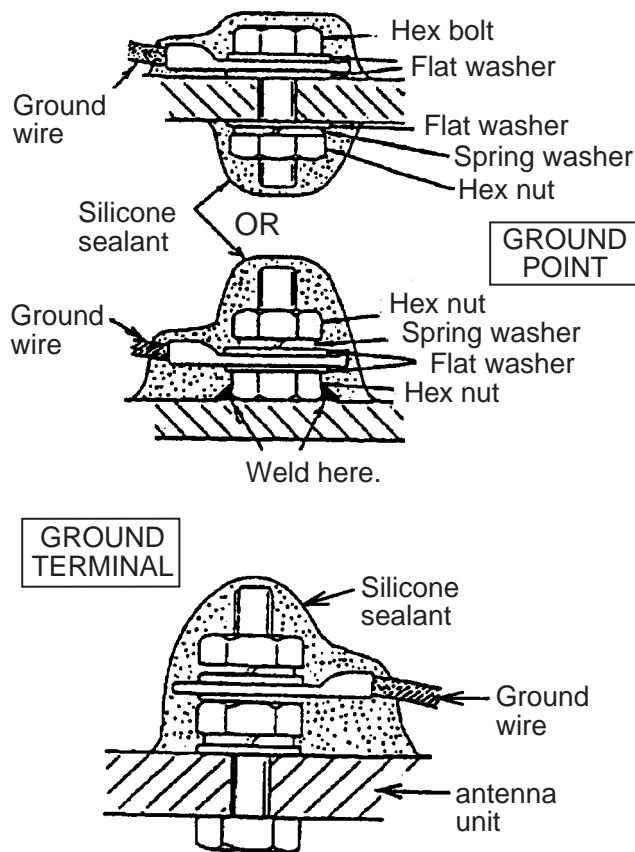
4. Pass flat washers (M12, supplied), spring washers (M12, supplied) and nuts (M12, supplied) onto hex bolts. Fasten by tightening nuts. Do not fasten by tightening the hex bolts; seal washers may be damaged.



How to fasten antenna unit to mounting platform

5. Coat flat washers, spring washers, nuts and exposed parts of bolts with anticorrosive sealant.
6. Prepare ground point on mounting platform (within 300 mm of ground terminal on antenna unit) using M6x25 bolt, nut and flat washer (supplied).
7. Run the ground wire (RW-4747, 340 mm, supplied) between the ground terminal and ground point.

8. Coat ground terminal and ground point with silicone sealant as shown below.



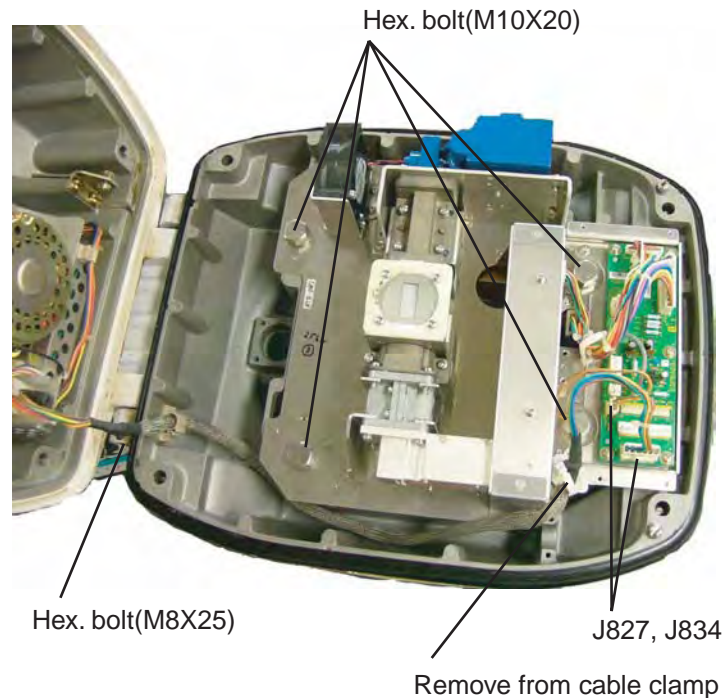
How to coat ground point and ground terminal with silicone sealant

1. MOUNTING

Using inside fixing holes of the antenna housing

This method requires removal of the RF unit in the antenna unit to access inside fixing holes. Use hex head bolts, flat washers, spring washers and nuts (local supply) to mount the antenna unit, confirming length of bolts.

1. Unfasten four antenna bolts on the cover to open the antenna unit.
2. Unfasten four screws on the RTB cover to remove it.
3. Unplug connector J827 and J834 on the RTB board.
4. Separate upper chassis from lower chassis by removing two hex head bolts (M8x25).
5. Remove RF unit by unfastening four hex head bolts.



Antenna unit, opened

7. Lay the corrosion-proof rubber mat (supplied) on the mounting platform.
8. Fasten the lower chassis to the mounting platform with hex head bolts, spring washers, flat washers and nuts (local supply), and then coat flat washers, nuts and exposed parts of bolts with silicone sealant. Cut a slit in the rubber bushing and insert bolt into the bushing. Do not use seal washers.
9. Reassemble RF unit, cover and chassis.
10. Set four knob caps (supplied) into outside fixing holes.
11. Do steps 6-8 in "Outside fixing holes".

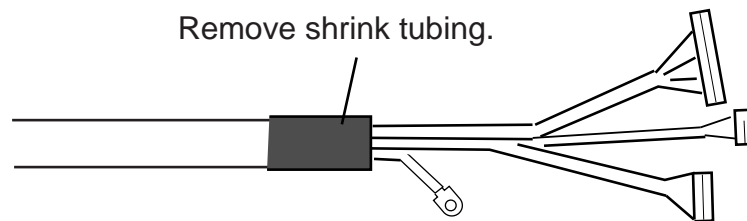
Connecting the signal cable

Only the signal cable runs from the display unit (power supply unit in case of FR-8252) to the antenna unit. In order to minimize the chance of picking up electrical interference, avoid where possible routing the signal cable near other onboard electrical equipment. Also, avoid running the cable in parallel with power cables. Pass the cable through the hole and apply sealing compound around the hole for waterproofing.

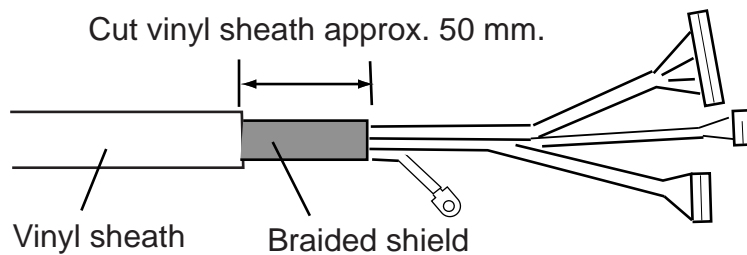
- Fabricating the signal cable

This type of signal cable is used with other models of radar. For this model, the following fabrication is required.

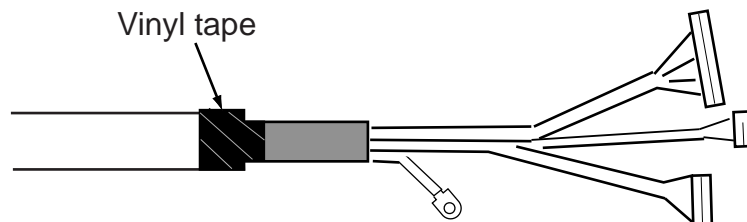
1. Remove shrink tubing from the signal cable.



2. Remove vinyl sheath approx. 50 mm.



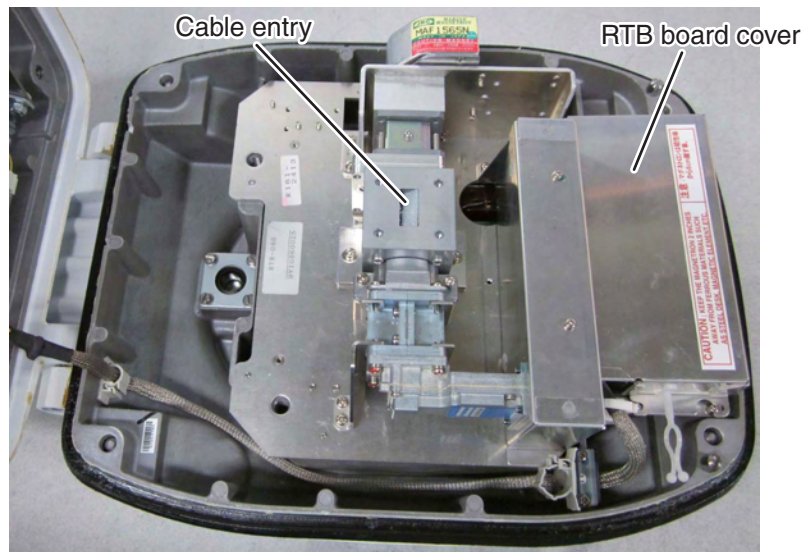
3. Wrap vinyl tape at the end of the vinyl sheath.



1. MOUNTING

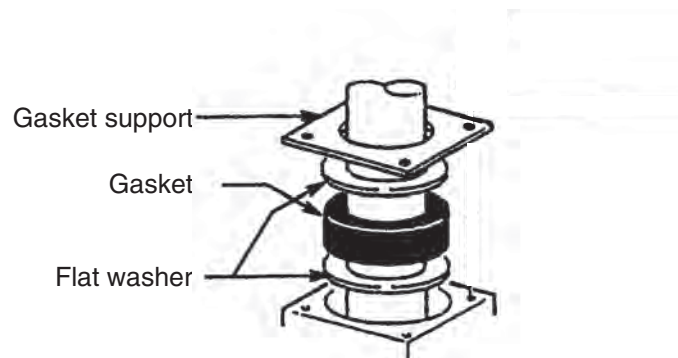
- Connecting the signal cable

1. Open the antenna cover by loosening four bolts, and then fix the stay.



Antenna unit chassis, cover opened

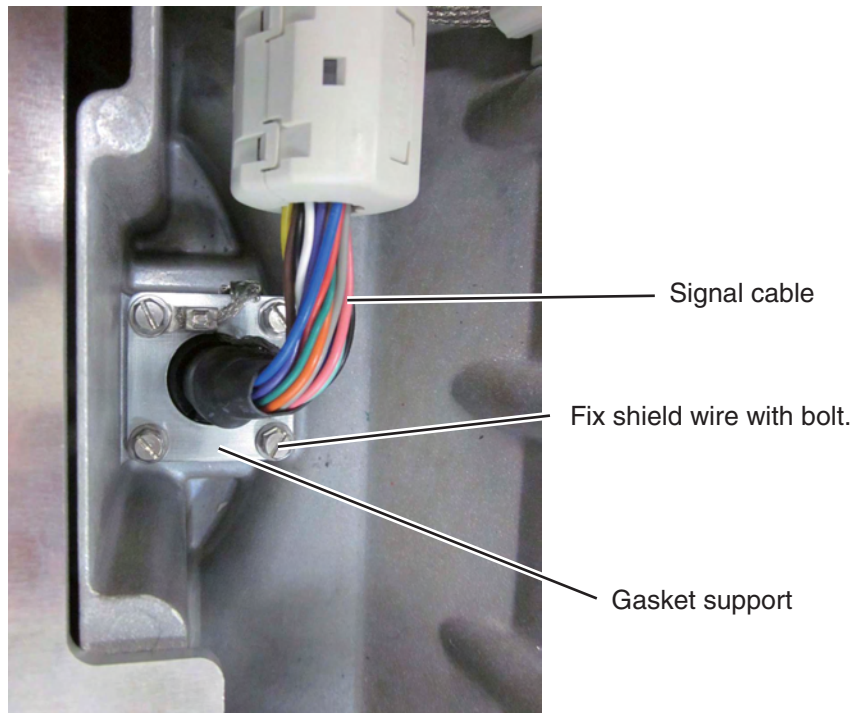
2. Unfasten the cable gland assembly (plate, gasket, flat washer). The plate may be discarded.
3. Pass the signal cable with connector through the bottom of the antenna unit chassis. Pass the cable through the gland assembly as shown below.



Passing the signal cable through the cable gland assembly

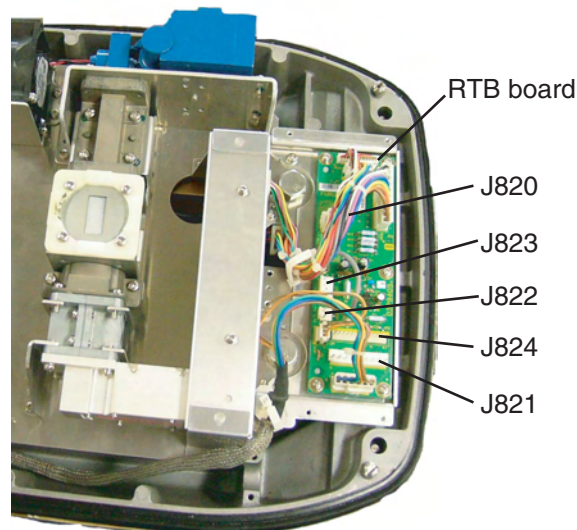
4. Fasten the gasket support with four bolts. Using one of the four bolts, fasten the crimp-on lug to the shield wire.

5. Fasten the shielded part of the signal cable with shield clamp (installation material) as shown below.



How to fix signal cable in cable gland

6. Unfasten four screws to remove the RTB board cover.
7. Connect the plugs of the signal cable to the RTB board.
FR-8062, FR-8122: J821, J823, J824, J822
FR-8252: J821, J823, J824, J820

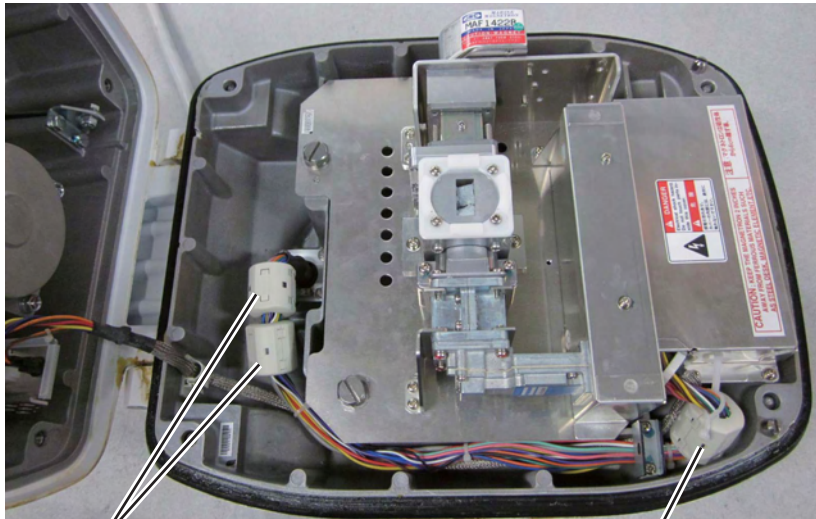


Connecting to the RTB board

8. Reattach the RTB board cover.

1. MOUNTING

9. Attach three EMI cores to the signal cable as shown below.



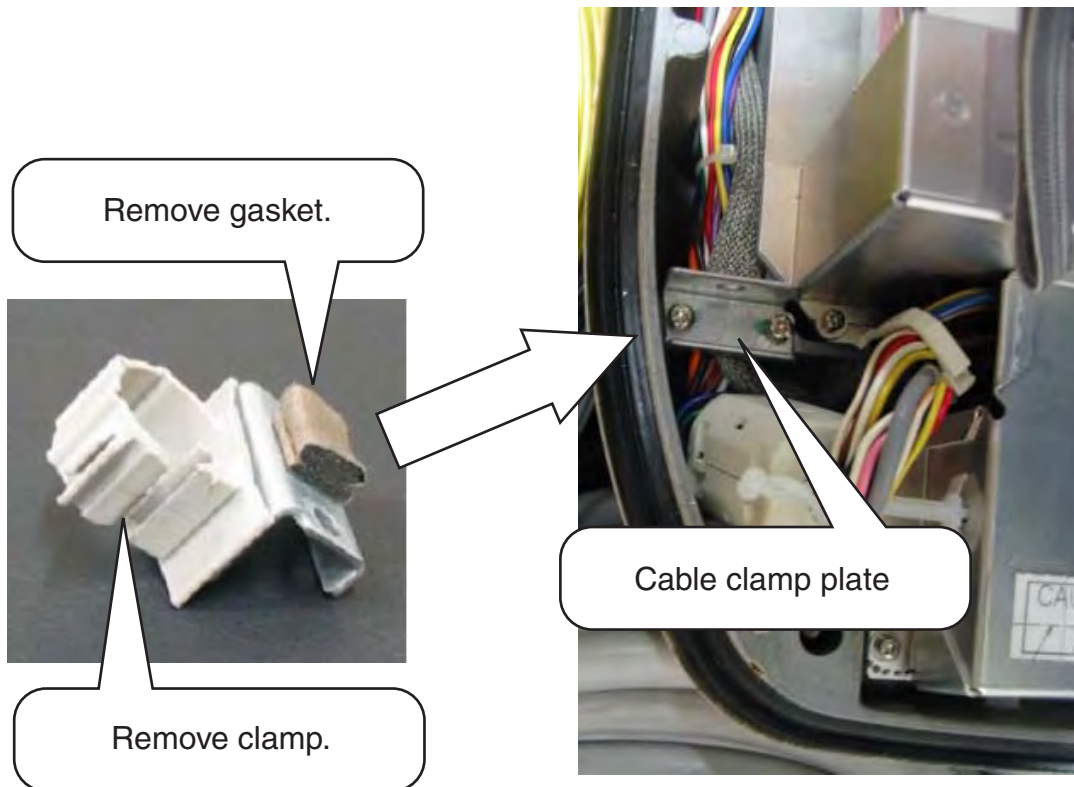
EMI Core RFC-13 (2 pcs)

EMI Core RFC-H13 (1 pc)

Antenna unit chassis, cover opened

10. Fix the signal cable with the cable clamp as follows.

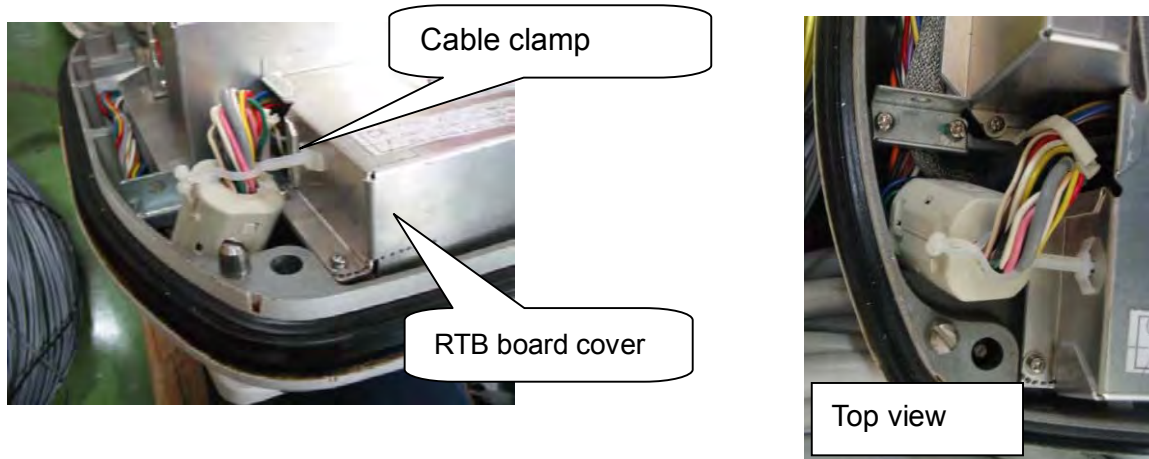
a) Dismount the cable clamp plate and remove clamp and gasket.



b) Run the signal cable as shown below.

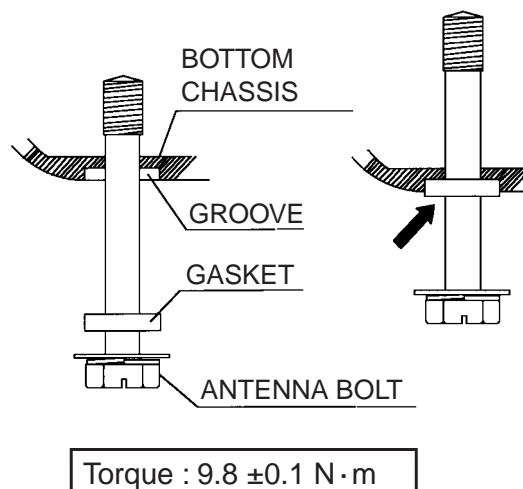


c) Fix the signal cable with cable clamp as shown below.



11. Release the stay and close the cover. Loosely fasten the antenna bolts; you will have to make some adjustments inside after completion of wiring.

Note: When closing the cover, set the gaskets to grooves in the bottom chassis, then tighten bolts.



1.2 Display Unit

The display unit can be mounted on a tabletop, on the overhead or flush mounted in a console or panel.

Mounting considerations

When selecting a mounting location for the display unit, keep the following in mind:

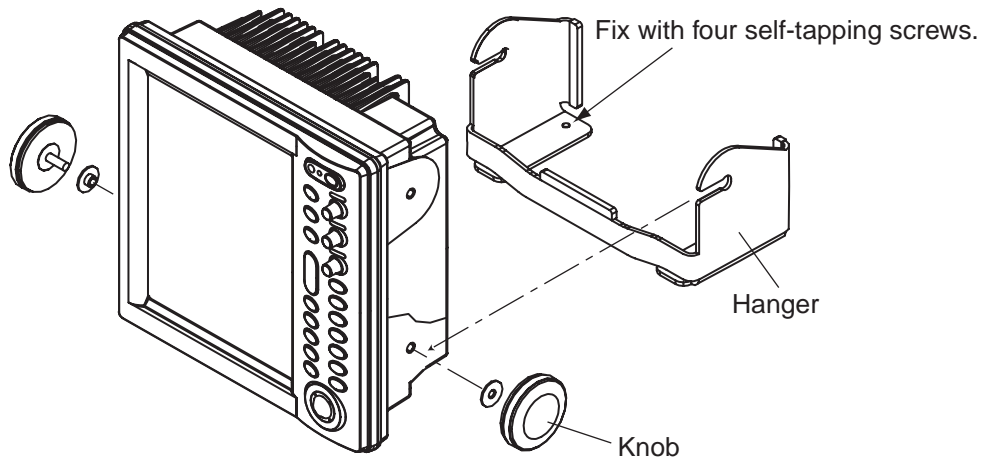
- Keep the display unit out of direct sunlight.
- The temperature and humidity at the mounting location should be moderate and stable.
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field generating equipment such as motors and generators.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables. Minimum recommended space is shown in the outline drawing for the display unit.
- A magnetic compass will be affected if the display unit is placed too close to it. Observe the compass safe distances shown in the SAFETY INSTRUCTIONS to prevent disturbance to the magnetic compass.

Mounting procedure

Tabletop mounting

Follow the procedure below to mount the display unit on a tabletop.

1. Fix the hanger by using four self-tapping screws (5x20).
2. Screw knob bolts in display unit, set it to the hanger, and tighten the knob bolts.

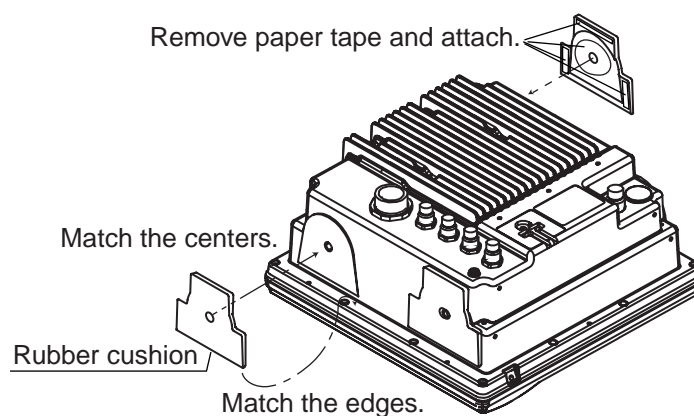


Mounting dimensions of display unit

Overhead mounting

Note: For the overhead mounting, reinforce the mounting location and secure the hanger, with bolts, nuts and washers (local supply).

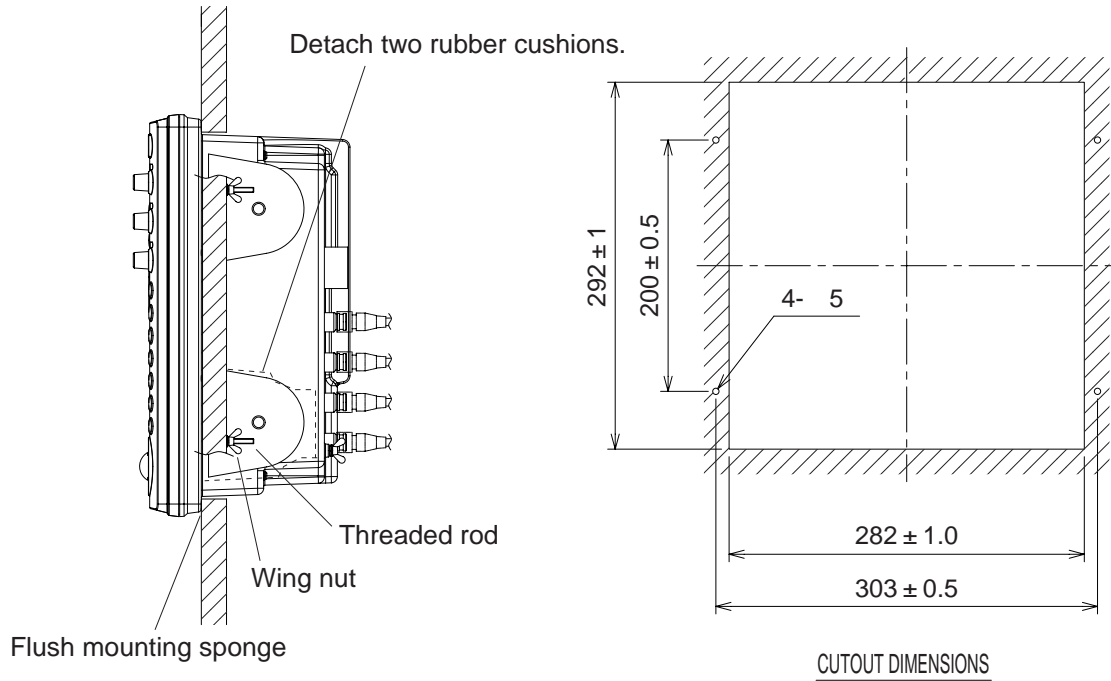
Attach two rubber cushions to the display unit as shown in the figure below. Then fix the unit with hanger.



1. MOUNTING

Flush mounting

1. Prepare a cutout in the mounting location whose dimensions are as shown below.
2. Detach two rubber cushions from the display unit.
3. Insert the flush mounting sponge and four threaded rods from the rear side of the display unit, and then set the display unit to the mounting location.
4. Fix the display unit by using four wing nuts from the rear side of the display unit.



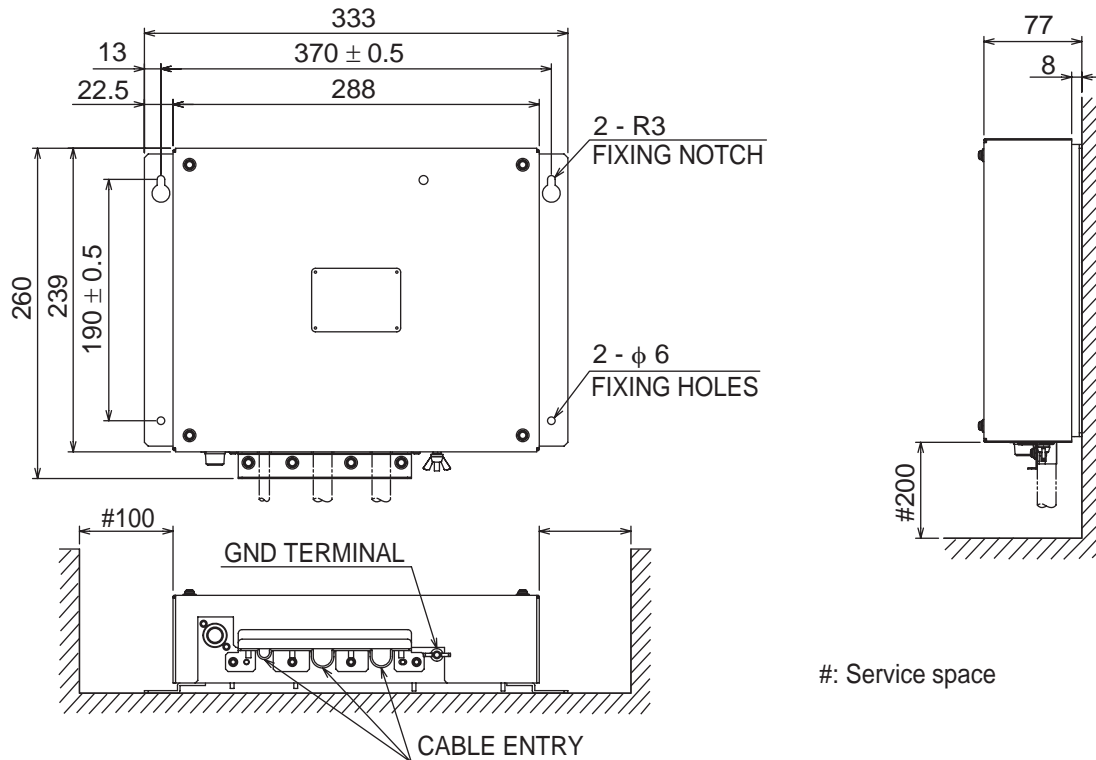
Flush mounting of display unit

1.3 Power Supply Unit

A power supply unit is shipped with the FR-8252, because of its high power consumption.

The power supply unit can be installed almost anywhere provided the location is dry, well-ventilated, sufficient maintenance space is provided and is installed within 5 m (cable length) from the display unit. To fix the unit, use four self-tapping screws (5x20).

Note: Do not install the power supply unit on the overhead; install it on the deck or bulkhead.



Power supply unit

1. MOUNTING

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2. WIRING

2.1 Standard Wiring

