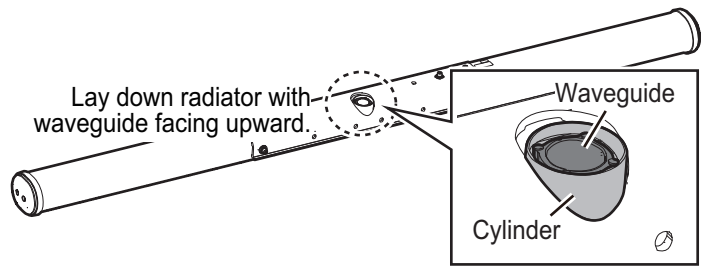• For X-band radar, if it is necessary to lay down the radiator before you fasten it to the antenna unit, lay it down with the waveguide up, to prevent damage to the cylinder that surrounds the waveguide.
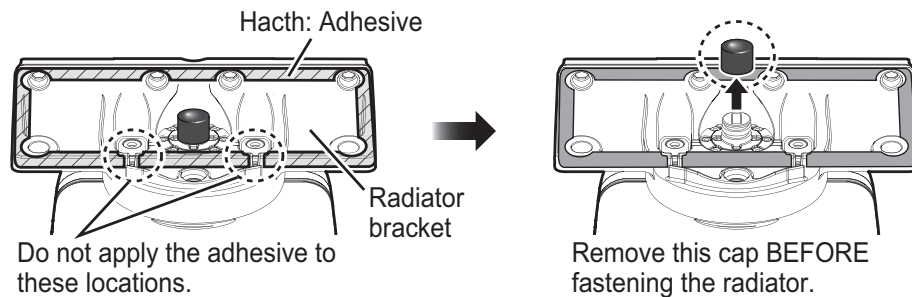

Lay down radiator with waveguide facing upward.

Waveguide

Cylinder

• If the de-icer is installed, a two-pole breaker (supplied locally) must also be installed.

Note: For more information, please refer to IMO SN/Circ.271 "Guidelines for the installation of shipborne radar equipment.
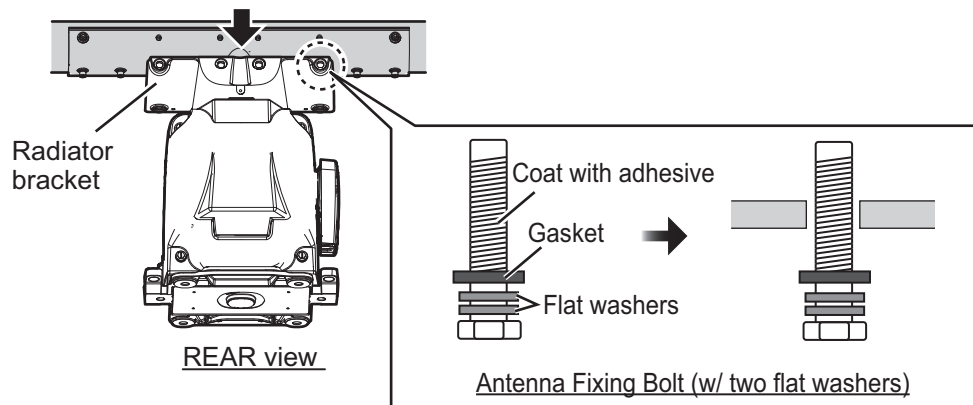
1.1.2   How to assemble the antenna unit (FAR-2x18/2x28/2x38)

The antenna unit consists of the antenna radiator and the antenna unit chassis, and they are packed separately. Fasten the antenna radiator to the antenna unit chassis as follows:
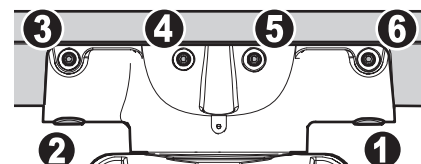
1. Coat the hatched area shown in the figure in step 2 with the supplied adhesive.

2. Remove the protective waveguide cap from the waveguide on the radiator bracket.

Hacth: Adhesive

Radiator bracket

Do not apply the adhesive to these locations.

Remove this cap BEFORE fastening the radiator.

3. Pass the Gasket (03-182-3186, supplied) to six sets of the Antenna fixing bolts (03-182-4188, supplied, w/two flat washers), and then coat the threads of the Antenna fixing bolts with the supplied adhesive. Set the radiator on the radiator bracket.

Radiator bracket

REAR view

Coat with adhesive

Gasket

Flat washers

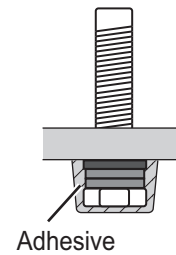Antenna Fixing Bolt (w/ two flat washers)

4. Fasten the antenna radiator to the radiator bracket with the six sets of Antenna fixing bolts. **Fasten the bolts in the order shown in the figure to the right**. The torque must be 15.0 N•m.

5. Coat the Antenna fixing bolts fixed at step 4 with the supplied adhesive as shown in the right figure.

Adhesive

1.1.3 How to assemble the antenna unit (FAR-2x58)

The antenna unit consists of the antenna radiator and the antenna unit chassis, and they are packed separately. Fasten the antenna radiator to the antenna unit chassis as follows:

1. Attach two guide pins which are attached originally to the underside of the antenna radiator.

2. Coat the hatched area shown in the figure in step 3 with the supplied adhesive.

3. Remove the protective waveguide cap from the waveguide on the radiator bracket.

10 mm

5 mm

Waveguide cap

O-ring

Radiator bracket

Gray: Adhesive
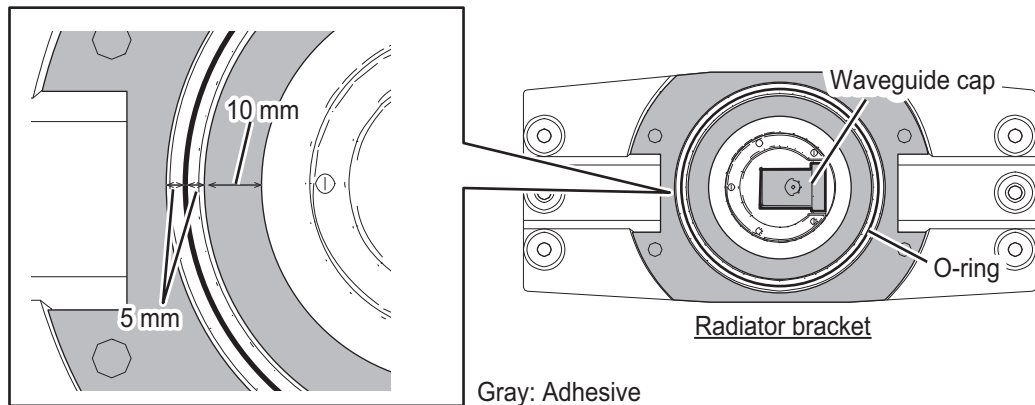
4. Grease the O-ring and set it to the O-ring groove of the radiator flange.

5. Set the antenna radiator to the radiator bracket.

6. Coat hex bolts M8×40 with the supplied adhesive and use them to loosely fasten the antenna radiator to the antenna unit chassis.
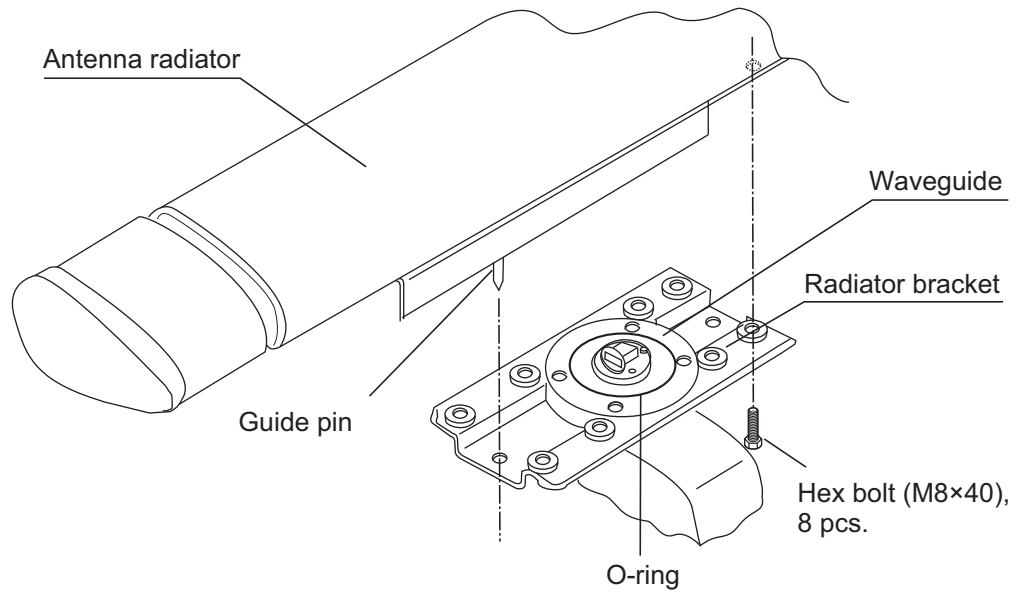
Adhesive
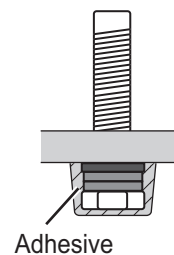
7. Remove two guide pins (inserted at step 1), and then tighten fixing bolts. The torque must be 15 N•m.

⚠ **CAUTION**

Be sure to remove the guide pins.

Injury may result if the guide pins loosen and fall.

Antenna radiator

Waveguide

Radiator bracket

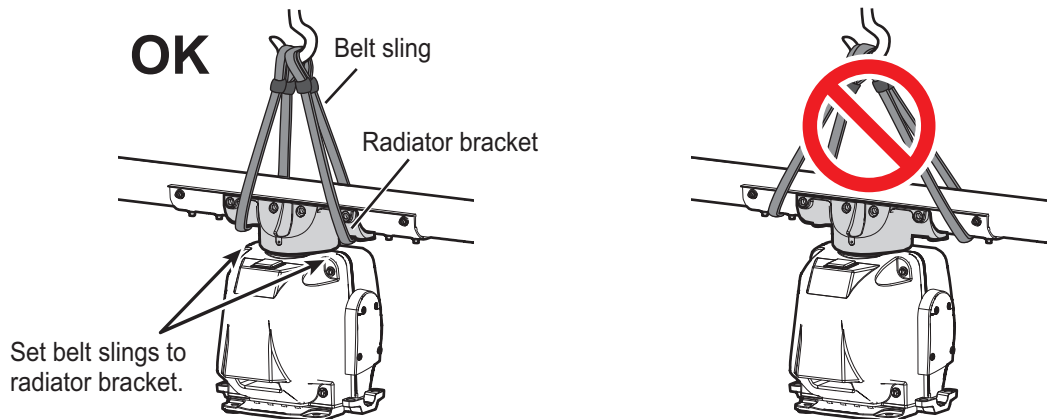Guide pin

Hex bolt (M8×40),
8 pcs.

O-ring

1.1.4 How to hoist the antenna unit (FAR-2x18/2x28/2x38)

The antenna unit may be assembled before hoisting it to the mounting platform. Attach lifting belt slings to the "Radiator Bracket", NOT the antenna radiator, as shown in the figure below.

Also, hoist the antenna unit slowly. Hoisting swiftly may cause a damage to the antenna radiator or damage the radiator chassis.
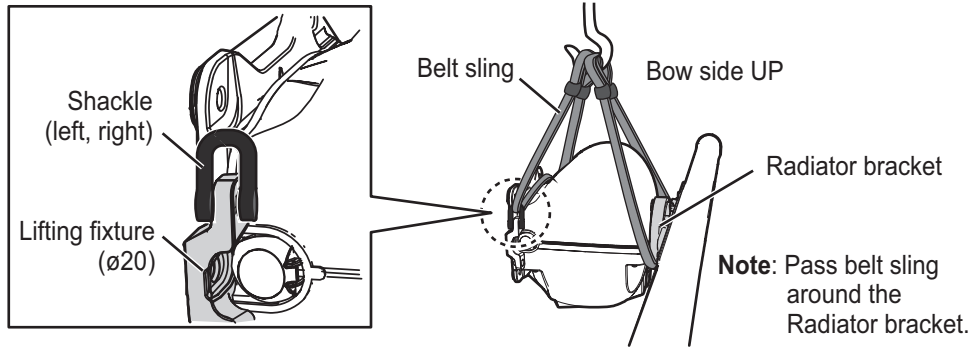
There are two methods to hoist the antenna unit.

Method 1

OK

Belt sling

Radiator bracket

Set belt slings to
radiator bracket.

Method 2

Fasten belt sling to a shackle, pass belt sling around radiator bracket and fasten other end of belt sling to other shackle.


1.1.5 How to hoist the antenna unit (FAR-2x58)

The antenna unit may be assembled before hoisting it to the mounting platform. Do one of the following to hoist the antenna unit. Attach shackles (ϕ20, local supply) to the lifting fixtures to use belt slings. After completing hoisting the antenna unit, remove the shackles.

Also, hoist the antenna unit slowly. Hoisting swiftly may cause a damage to the antenna radiator or damage the radiator chassis.
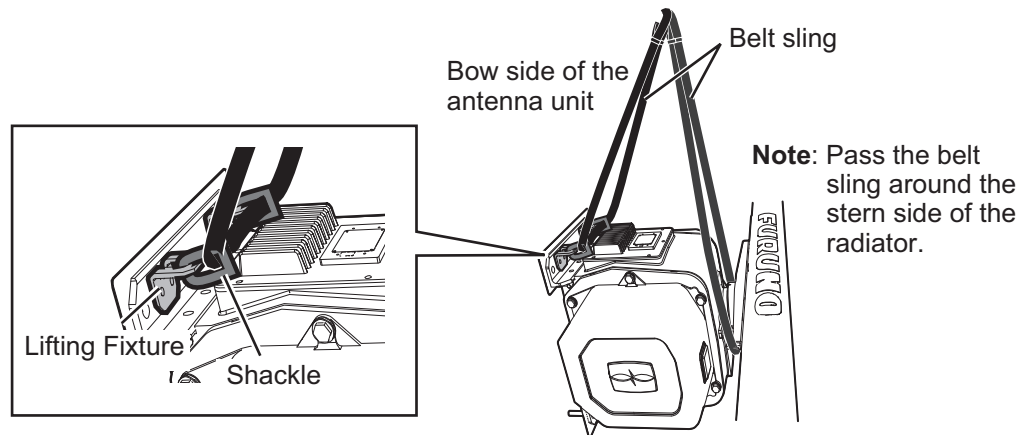
Method 1
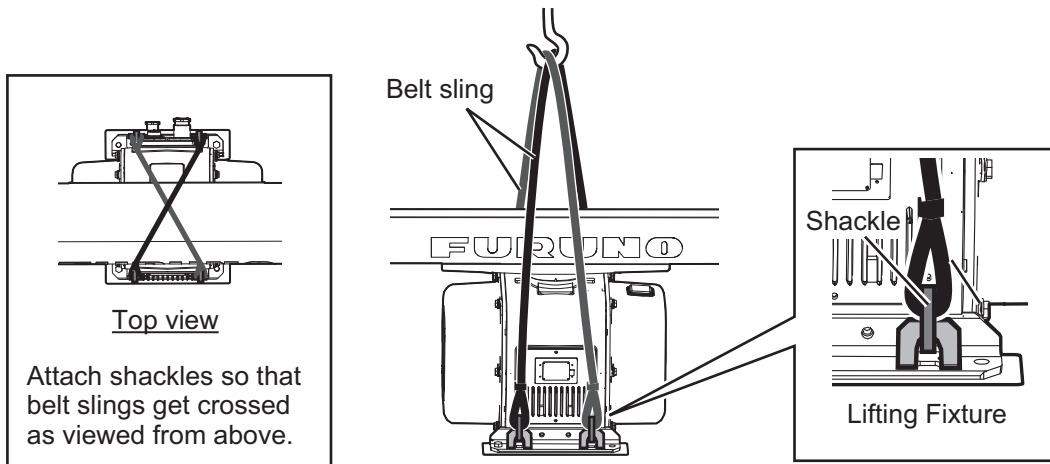
Note: Do not hoist the antenna unit by hanging belt slings around the radiator directly.

Method 2

Fasten one belt sling to both shackles, and pass the other belt sling around the stern side of the radiator.


1.1.6 How to fasten the antenna unit to the mounting platform (FAR-2x18/2x28/2x38)

1. Construct a suitable mounting platform referring to the outline drawing at the end of this manual.
   Note: The mounting platform must be flat, level and firmly secured.

   • The diameter of the mast for fixing the antenna unit platform must be over 180 mm.

   • The thickness of the antenna unit platform must be over 12 mm.

   • The reinforcement rib must be installed diagonally.
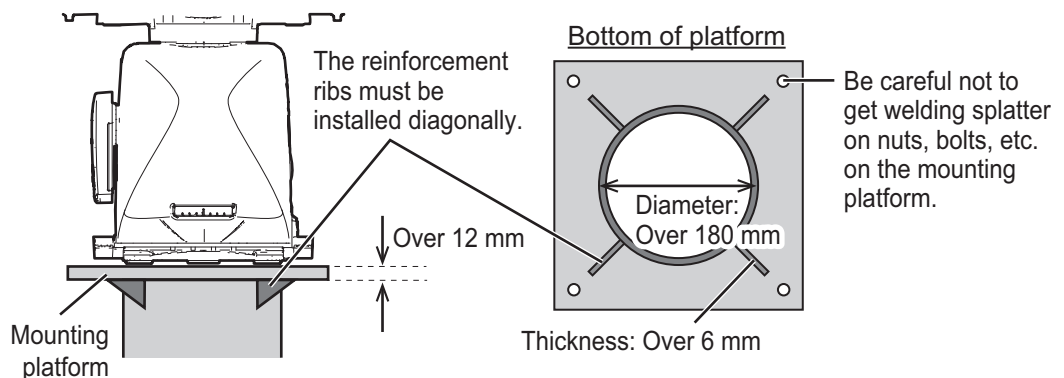
2. Referring to the outline drawing at the back of this manual, drill four mounting holes (φ15 mm) in the mounting platform.

3. Place the antenna unit on the platform, then orient the unit so the bow mark on its base is facing the ship's bow.
    Note: When the antenna unit is placed on the platform, make sure that the platform is not inclined.

Bow mark (▼)
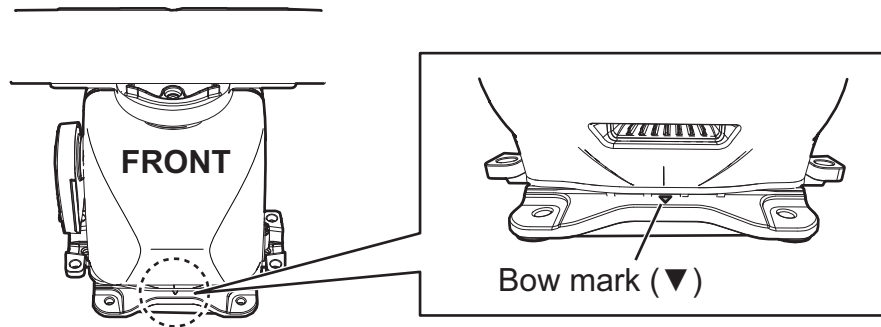
4. Insert four sets of hex bolts (M12×70) attached the seal washers to the mounting holes of the antenna chassis. Lift the antenna chassis slightly then insert the bolts attached the insulation sheets.
   **Note:** DO NOT insert the bolts from the underside of the platform. The cover cannot be opened.
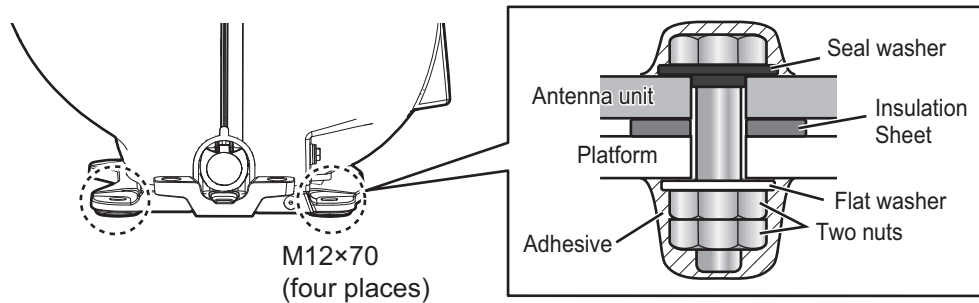
M12×70
(four places)

5. Adjust the direction of the antenna unit so the bow mark on its base is facing the ship's bow.

6. Fasten the antenna unit to the mounting platform with four sets of hex bolts (M12×70), nuts, flat washers and seal washers. Insert the bolts from the topside

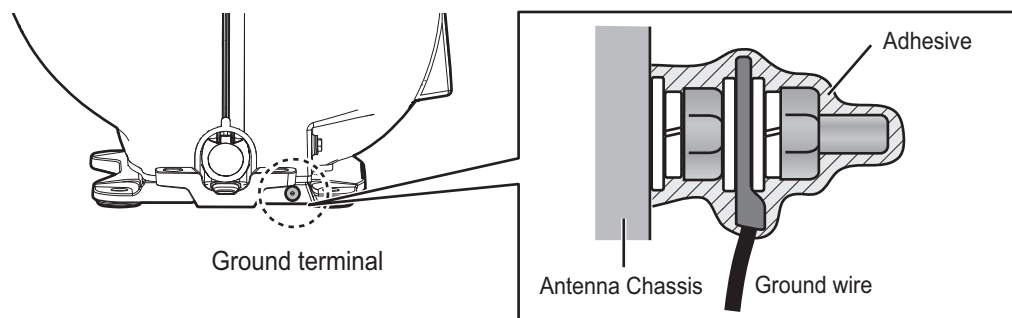of the platform. The torque must be 49 N•m. For how to fasten double nuts, see the following procedure.

How to fasten double nuts

Nut1 (Torque: 57 N•m)

Nut2 (Torque: 49 N•m)

Nut1&2: Simultaneous work as below.
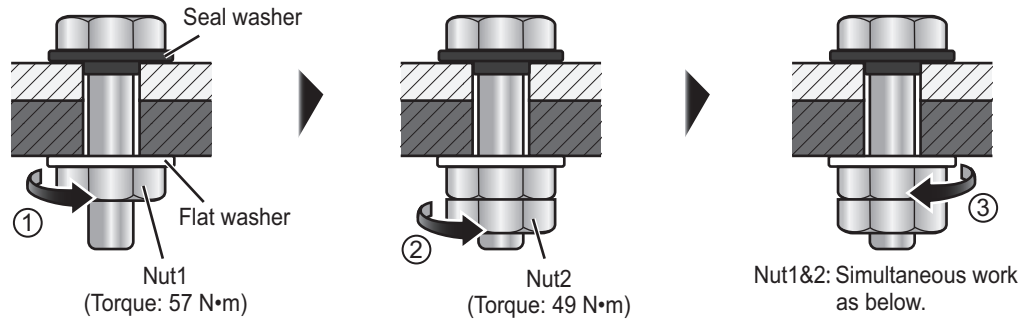
Note: Fasten the double nuts as shown in the figure to the right. Use spanners with a length of approx. 200 mm.

Nut2: Fix in place

Nut1: Fasten

7. Using a hex bolt (M6×25), nut (M6) and flat washer (M6), establish the ground system on the mounting platform. The location must be within 340 mm of the ground terminal on the antenna unit. Connect the ground wire (RW-4747, 340 mm, supplied) between the grounding point and ground terminal on the antenna unit. Coat the hardware of the ground system with the supplied adhesive.
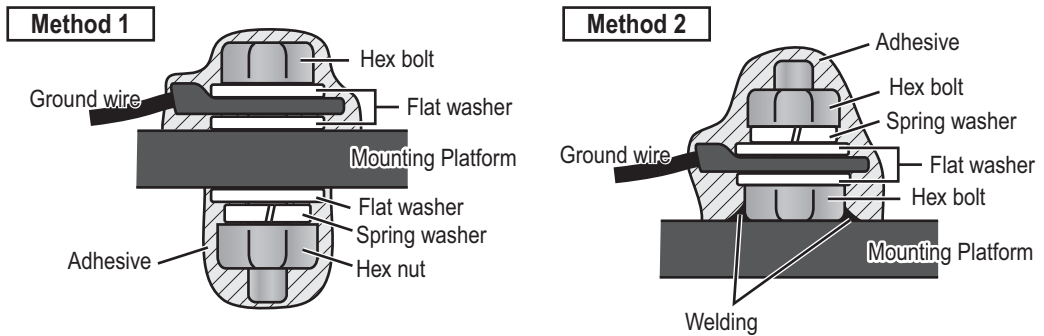
Antenna chassis side

Ground terminal

Adhesive

Antenna Chassis   Ground wire

Mounting platform side

Arrange a ground terminal as close as possible to antenna unit. There are two methods to connect the ground wire for mounting platform side.
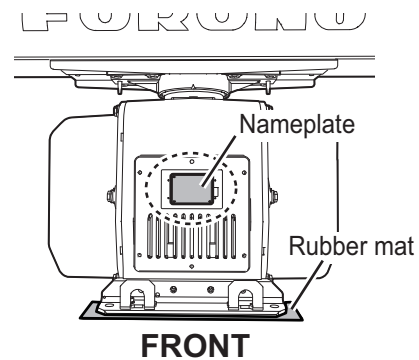

## 1.1.7 How to fasten the antenna unit to the mounting platform (FAR-2x58)

1. Construct a suitable mounting platform referring to the outline drawing at the end of this manual.
   Note: The mounting platform must be flat, level and firmly secured.

2. Lay the rubber mat (supplied) on the mounting platform.

3. Referring to the outline drawing at the back of this manual, drill four mounting holes (φ15 mm) and one cable entry hole (φ50 mm) diameter in the mounting platform.

4. Place the antenna unit on the supplied rubber mats, then orient the unit so the nameplate on the scanner box is facing the ship's bow.
   Note: When the antenna unit is placed on the platform, make sure that the platform is not inclined.


5. Insert four sets of hex bolts (M12×60) attached the seal washers to the mounting holes of the antenna chassis.

6. Adjust the direction of the antenna unit so the nameplate is facing the ship's bow.

7. Fasten the antenna unit to the mounting platform with four sets of hex bolts, nuts, flat washers and seal washers. The torque must be 49 N•m.
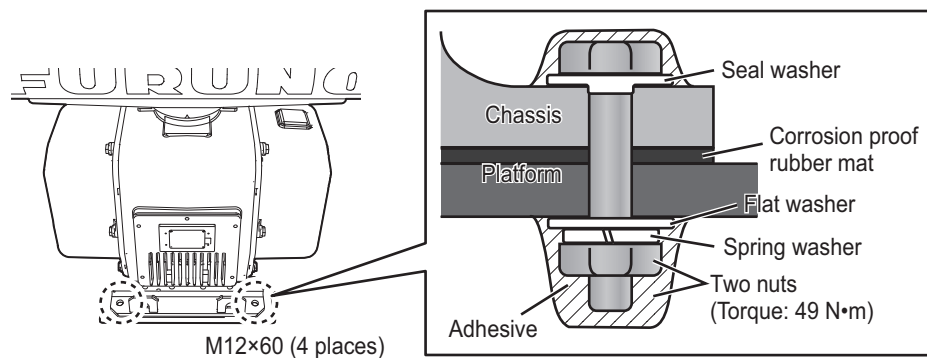
8. Using a hex bolt (M6×25), nut (M6) and flat washer (M6), establish the ground system on the mounting platform. The location must be within 340 mm of the ground terminal on the antenna unit. Connect the ground wire (RW-4747, 340 mm, supplied) between the grounding point and ground terminal on the antenna unit. Coat the hardware of the ground system with the supplied adhesive.

Antenna chassis side
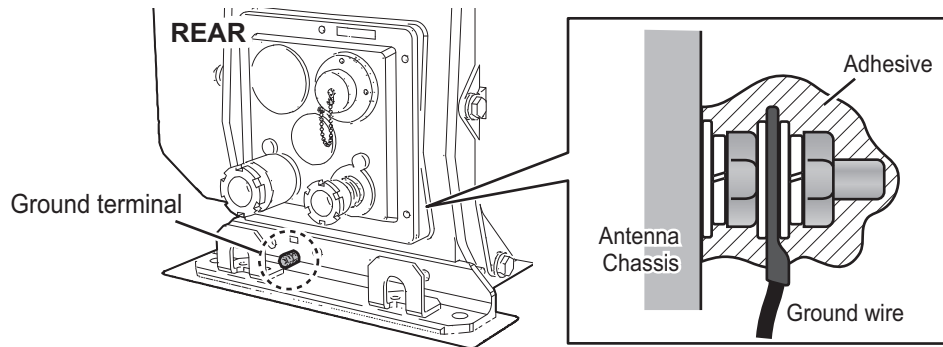
Mounting platform side

Arrange a ground terminal as close as possible to antenna unit. There are two methods to connect the ground wire for mounting platform side.
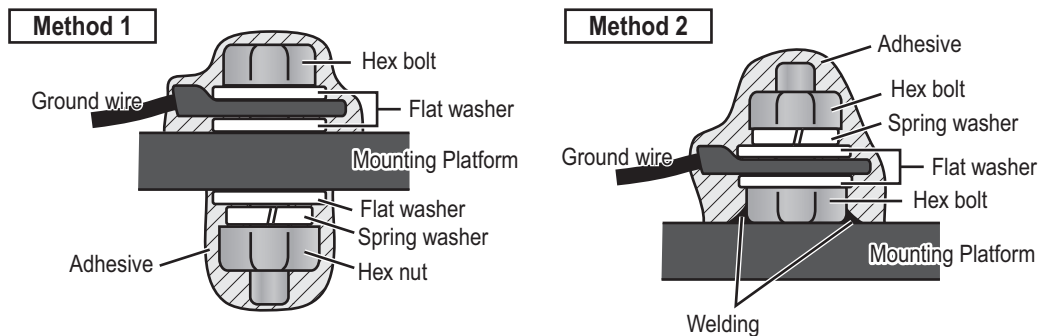

1.2 Antenna Unit (S-band Radar)

For installation considerations regarding the antenna unit, see section 1.1.1.

1.2.1 Installation precaution for S-band antenna unit

Due to the S-band radiator length, there may be excessive stress placed on the radiator caused by vibrations, rolling and general ship movement. To prevent damage to the antenna unit and radiator, do not install the antenna near the end of a platform. If there is no other location available, reinforce the platform before installing the antenna unit.
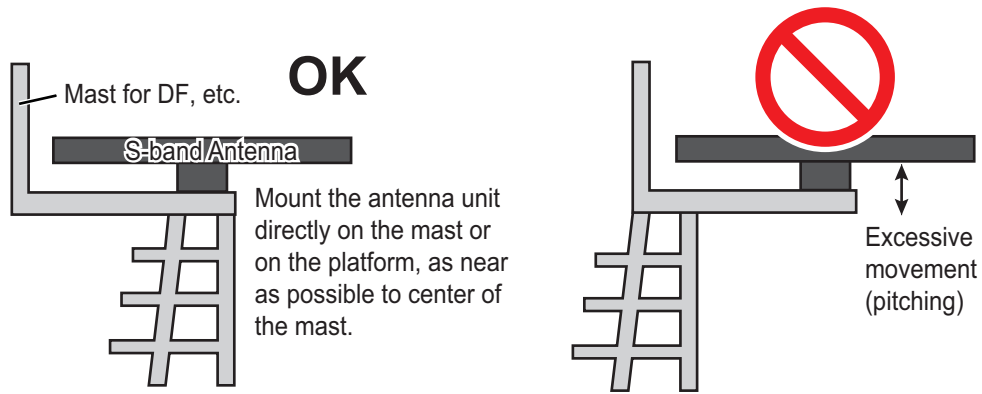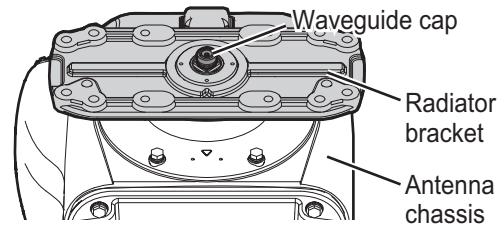
1.2.2 How to assemble the antenna unit

The antenna unit consists of the antenna radiator (w/antenna support) and the antenna unit chassis, and they are packed separately. Fasten the antenna radiator to the antenna unit chassis as follows:

1. Remove the protective waveguide cap from the waveguide on the radiator bracket.


2. Set the radiator on the radiator bracket (w/antenna support) so the guide pins of the antenna support fit into the guide pin holes on the radiator bracket. (Orient the logo of the radiator to the side with bow mark on the bracket. If reversely oriented, the radiator cannot be set to the bracket.)
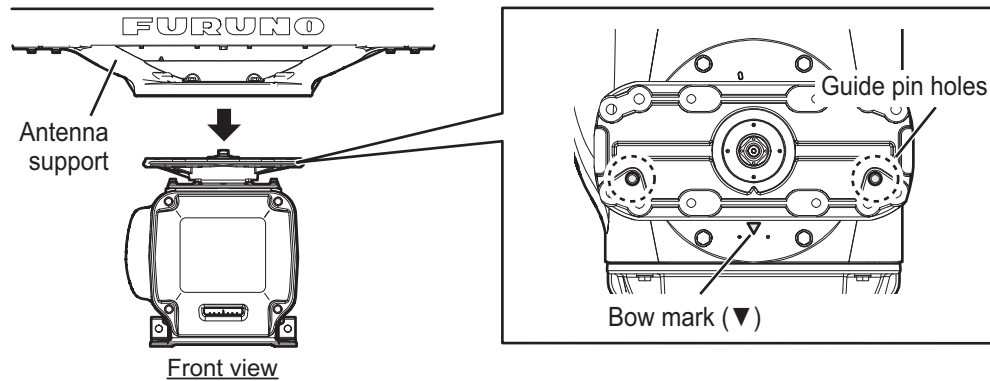

3. Coat the threads of eight hex bolts (M12×50, supplied) with the supplied adhesive.

4. Fasten the antenna radiator to the radiator bracket from the bottom of the bracket with the eight hex bolts, spring washers and flat washers. The torque must be 49 N•m.

M12 bolts (eight places)

Coat with adhesive

Bracket
Flat washers
Spring washers
Hex bolt
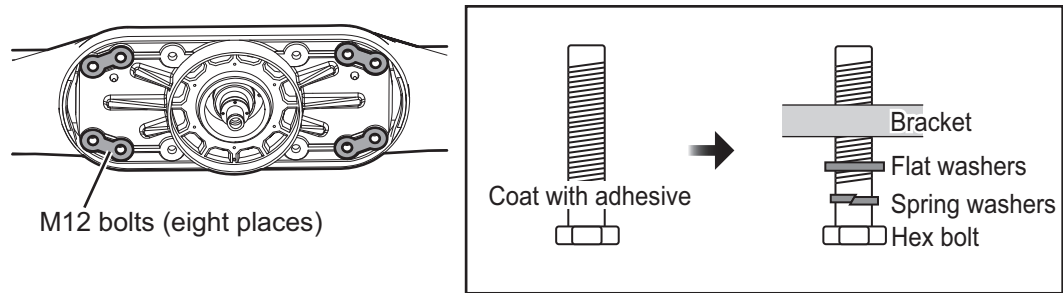
5. Coat the bolt heads fastened at step 4 with the supplied adhesive as shown in the figure to the right.

Adhesive
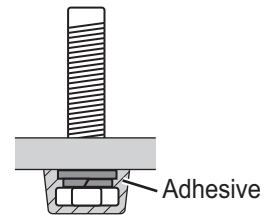
6. Connect the coaxial cable from the antenna unit to the rotary joint. The torque must be 25 N•m.

1)
2)

1) Keep the cable straight.
2) Connect the cable connector vertically.
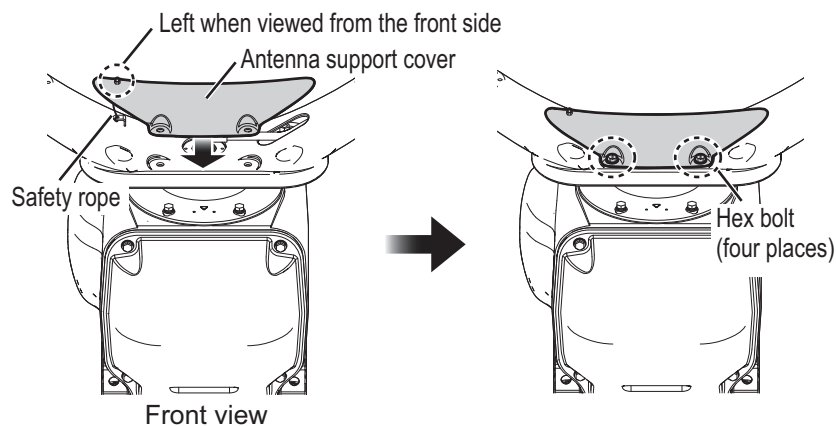
Hole in the antenna support
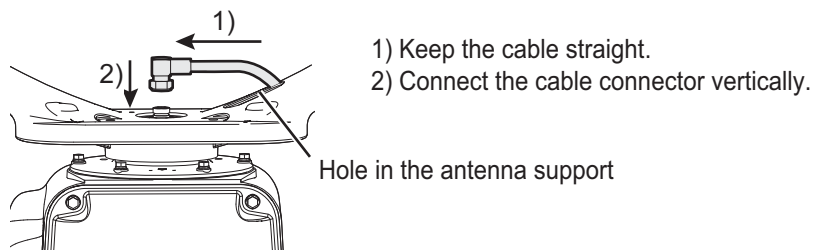
Note 1: The coaxial cable connector must be connected vertically.

Note 2: The coaxial cable must be horizontal and must not contact the antenna support hole.

Note 3: If the coaxial cable is long, bend the cable some distance from the connector. Insert surplus cable into antenna support. Connect the cable to the rotary joint, taking care that the threads of the cable and rotary joint are aligned.

7. Coat the hex bolts (M12×40, 4 pcs.) for the support cover with the supplied adhesive).

8. Fasten the support cover with the hex bolts, spring washers and flat washers. The torque must be 20 N•m.

Left when viewed from the front side
Antenna support cover
Safety rope
Hex bolt (four places)
Front view

Note 1: Make sure the safety rope does not contact the antenna support cover.

Note 2: Set the screw for the safety rope to come to the left when viewed from the front side of the antenna.

1.2.3 How to hoist the antenna unit
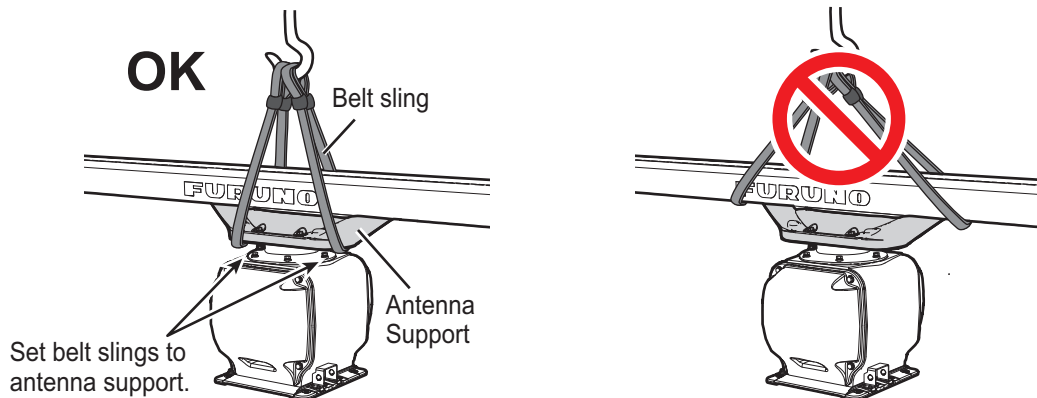
The antenna unit may be assembled before hoisting it to the mounting platform. Attach lifting belt slings to the "Antenna Support", NOT the antenna radiator, as shown in the figure below.

Also, hoist the antenna unit slowly. Hoisting swiftly may cause a damage to the antenna radiator or damage the radiator chassis.
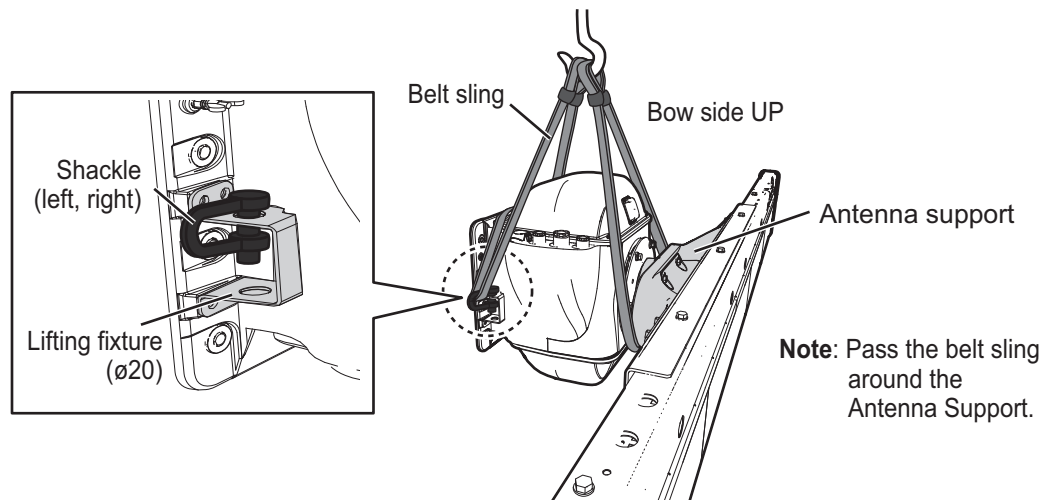
There are two methods to hoist the antenna unit.

Method 1

Method 2

Fasten the belt sling to a shackle, pass the belt sling around the antenna support and fasten the other end of the belt sling to the other shackle.

1.2.4 How to fasten the antenna unit to the mounting platform

1. Construct a suitable mounting platform referring to the outline drawing at the back of this manual.
   Note: The mounting platform must be flat, level and firmly secured.

   • The diameter of the mast for fixing the antenna unit platform must be over 250 mm.

   • The thickness of the antenna unit platform must be over 15 mm.

   • The reinforcement ribs must be installed diagonally shown in the following figure.

2. Referring to the outline drawing, drill four mounting holes (ϕ16 mm) in the mounting platform.

3. Place the antenna unit on the mounting platform, then orient the unit so the bow mark on its base is facing the ship's bow.
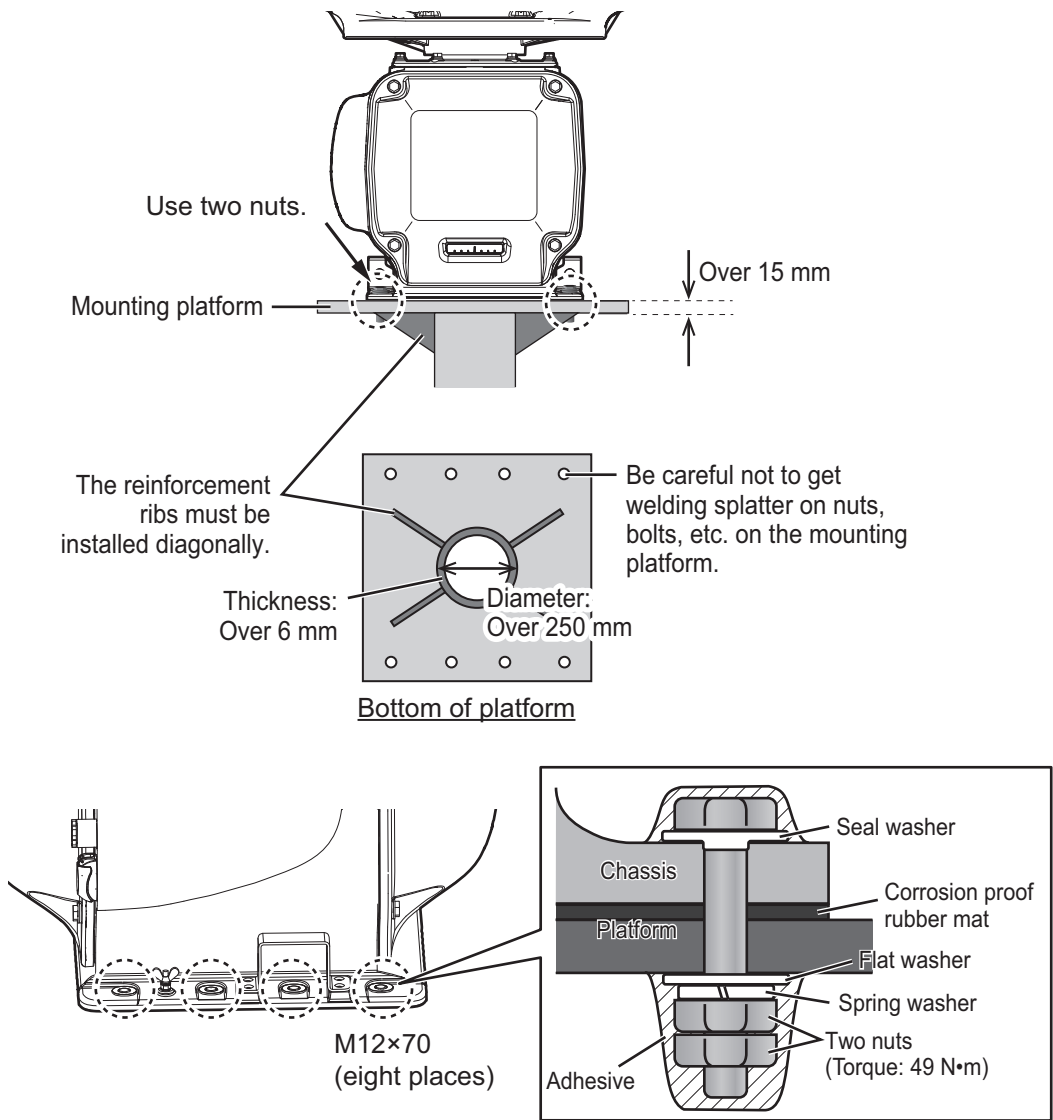   **Note:** When the antenna unit is placed on the platform, make sure that the platform is not inclined.
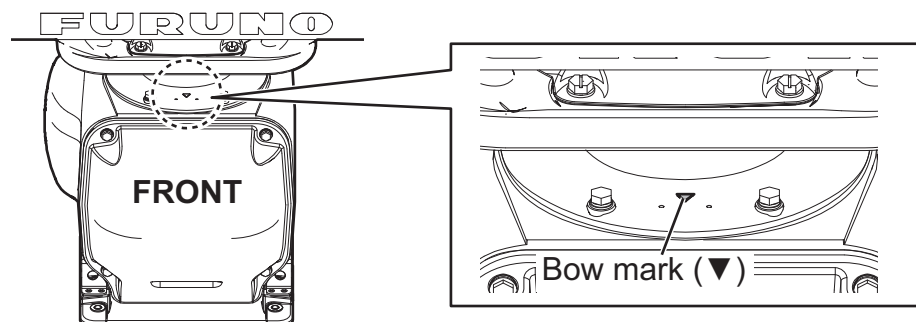
4. Fasten the antenna unit to the mounting platform with M12×70 hex bolts, nuts, flat washers, spring washers and seal washers (supplied). The torque must be 49 N•m. Fasten the double nuts, referring to "How to fasten double nuts" on page 1-9.
   **Note:** The bolts can also be inserted from the underside of the platform.

Use two nuts.

Mounting platform

Over 15 mm

The reinforcement ribs must be installed diagonally.

Be careful not to get welding splatter on nuts, bolts, etc. on the mounting platform.

Thickness: Over 6 mm

Diameter: Over 250 mm

Bottom of platform

Seal washer

Chassis

Corrosion proof rubber mat

Platform

Flat washer

Spring washer

M12×70 (eight places)

Two nuts (Torque: 49 N•m)

Adhesive

5. Using a hex bolt (M6×25), nut (M6), spring washer (M6) and flat washer (M6), establish the ground system on the mounting platform as shown in the following figure. The location must be within 340 mm of the ground terminal on the antenna unit. Connect the ground wire (RW-4747, 340 mm, supplied) between the grounding point and ground terminal on the antenna unit. Coat the hardware of the ground system with the supplied adhesive.

Antenna chassis side

Adhesive

Ground wire

Ground terminal

Antenna Chassis
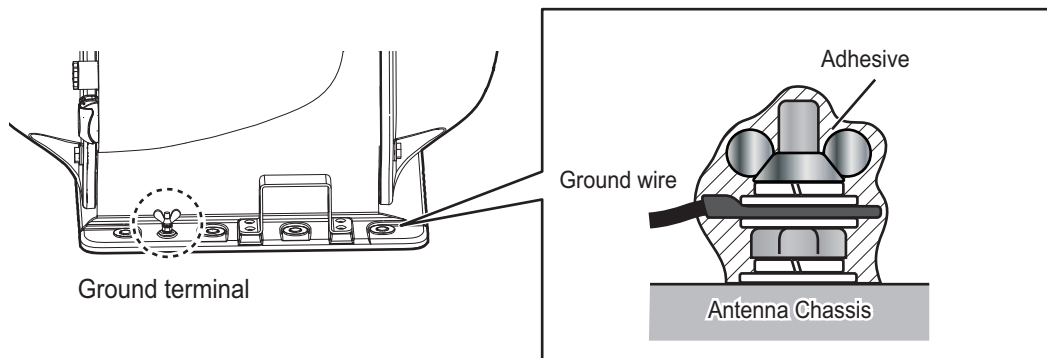
Mounting platform side

Arrange ground terminal as close as possible to antenna unit. There are two methods to connect ground wire for mounting platform side.
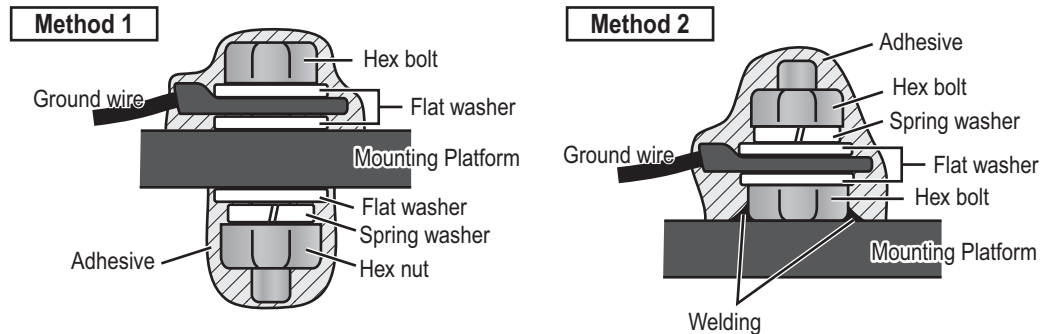
1.3 Monitor Unit

See the operator's manual for MU-190 (OMC-44670), MU-231 (OMC-44690) or MU-270W (OMC-44930) for the installation procedure. Keep in mind the following points when selecting a location.

• Locate the monitor unit where no framing is installed immediately in front of the monitor.
• Locate the monitor where the display is easily visible in all ambient lighting conditions.
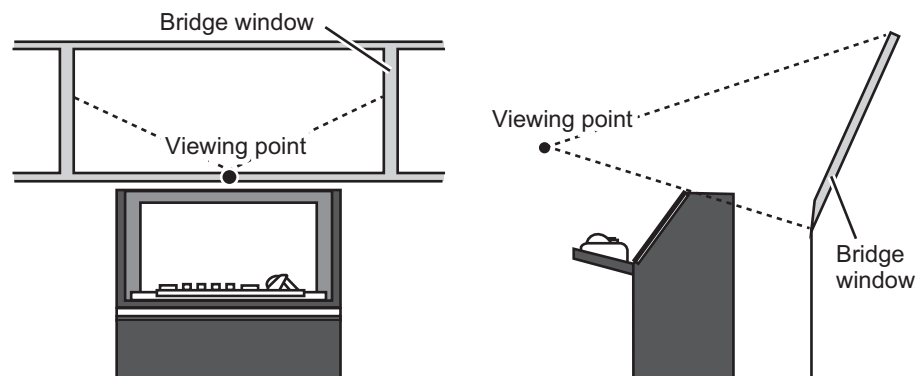
1.4 Control Unit

The control units can be installed on a desktop or flush mounted in a console.

Installation considerations

Keep in mind the following points when selecting a location.

• Select a location where the control unit can be operated easily.
• Locate the unit away from heat sources because of heat that can build up inside the cabinet.
• Locate the equipment away from places subject to water splash and rain.
• Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
• Determine the location considering the length of the signal cable between the control unit and the processor unit.

- A magnetic compass will be affected if the control unit is placed too close to the magnetic compass. Observe the compass safe distances in the SAFETY INSTRUCTIONS to prevent interference to the compass.

Usage Notice

The control units can turn the power on/off. However, to prevent accidental power on, always turn the system off at the ship's main for the processor unit and the power supply unit BEFORE conducting maintenance, service or wiring cables.

1.4.1 Desktop installation

For desktop installation, the unit can be laid flat or tilted.

How to mount the unit tilted

<RCU-014/015/016>

1. Fit the KB fixing plate (in FP03-09850 for RCU-014, in FP03-09860 for RCU-015/016) to the bottom of the control unit.

2. Attach the rubber foots (three for RCU-014, two for RCU-015/016) to the bottom of the control unit as shown in the following figure.

3. Install the control unit at the desired location with self-tapping screws (local supply).
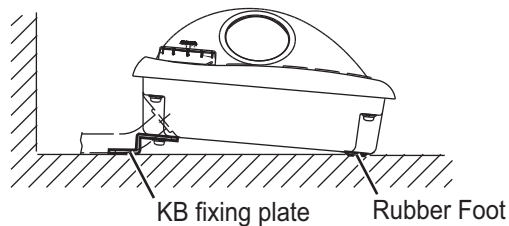
*Side view of control units*

<RCU-031>

The control unit can be mounted with the KB fixture, which mounts the unit at an angle.

1. Drill four pilot holes in the mounting location for mounting screws, referring to the outline drawing at the back of this manual.

2. Secure the KB fixture (supplied) to the mounting location, using four self tapping screws ($\phi5{\times}20$, supplied).
   **Note:** Secure the KB fixture so that the cutout is located on the top side.
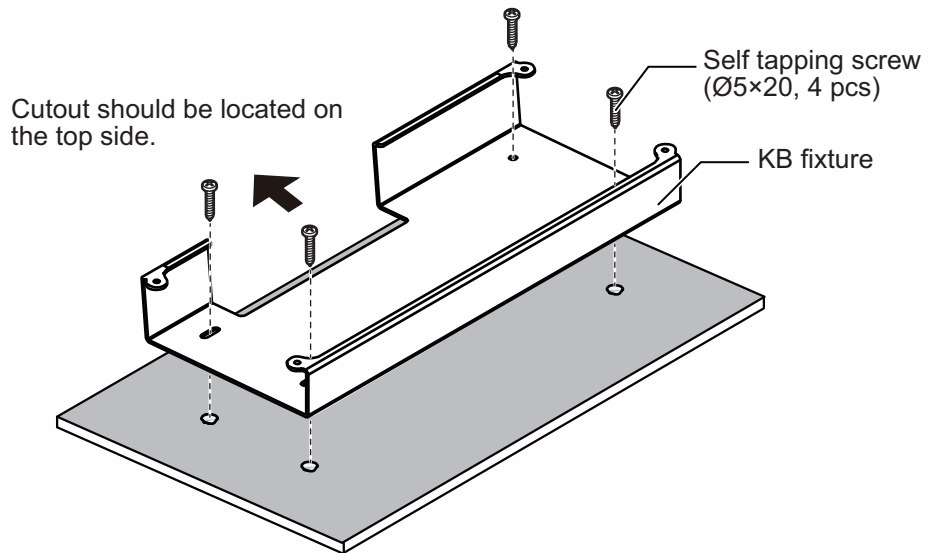
Cutout should be located on the top side.

Self tapping screw (Ø5×20, 4 pcs)

KB fixture

3. Attach a ground wire (IV-1.25sq, supplied locally) to the ground terminal at the bottom of the unit.

Ground screw*

*: Use the screw that is preattached to the ground terminal.

Ground wire
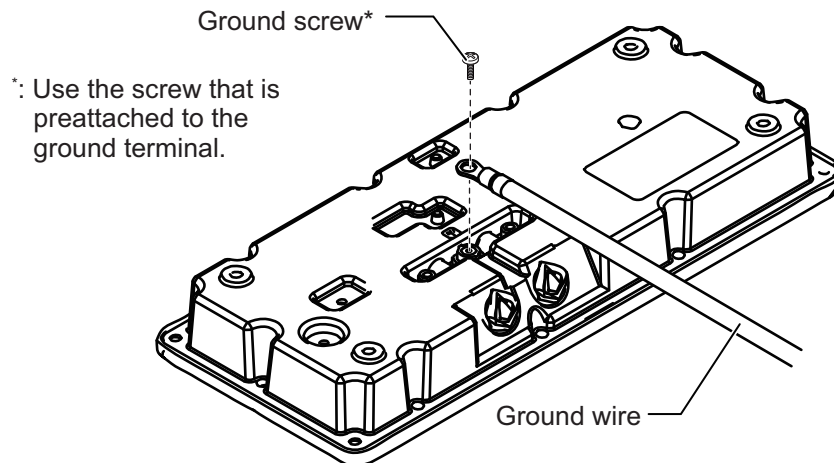
4. Secure the control unit the KB fixture, using four binding screws (M5×20, supplied).

5. Attach four bolt hole caps (supplied).

Bolt hole cap (4 pcs)

Binding screw (M5×20, 4 pcs)
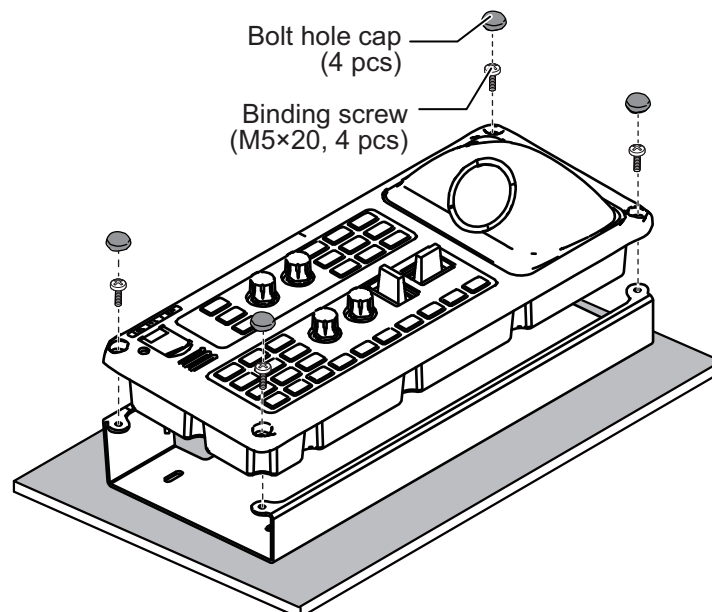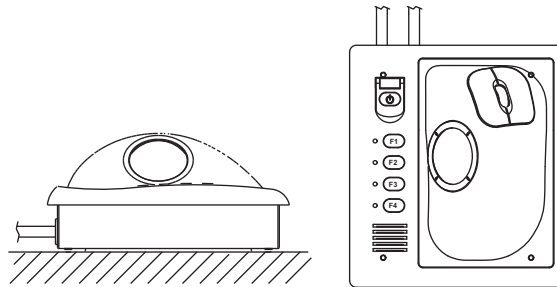
How to mount the unit flush with mounting surface

<RCU-014/015/016>

1. Drill four mounting holes of 5 mm diameter referring to the outline drawing at the back of this manual.

2. Fix the control unit with four screws (M4) from the underside of the desktop. (The M4 screws with a sufficient length for the thickness of the desktop should be provided locally.)
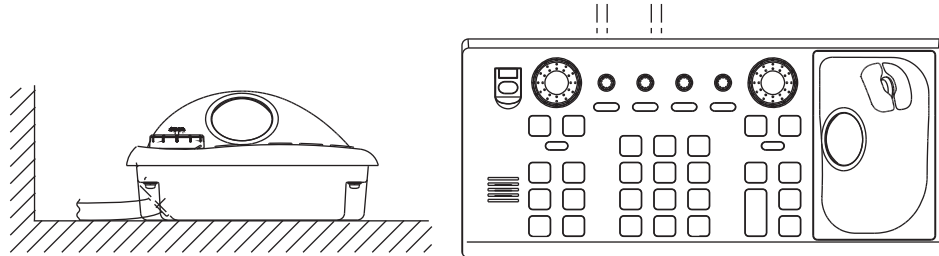

Control Unit RCU-014

Control Unit RCU-015/RCU-016

<RCU-031>

1. Drill four pilot holes in the mounting location for stud bolts (M4×50), referring to the outline drawing at the back of this manual.

2. Attach a ground wire (IV-1.25sq, supplied locally) to the ground terminal at the bottom of the unit.

3. Insert four stud bolts (M4×20, supplied) to the bolt holes at the bottom of the unit.
    Note: Insert the stud bolts manually. If you insert the stud bolts using a tool, the unit may be damaged.

Stud bolt (4 pcs)

Ground screw*

*: Use the screw that is preattached to the ground terminal.

Ground wire
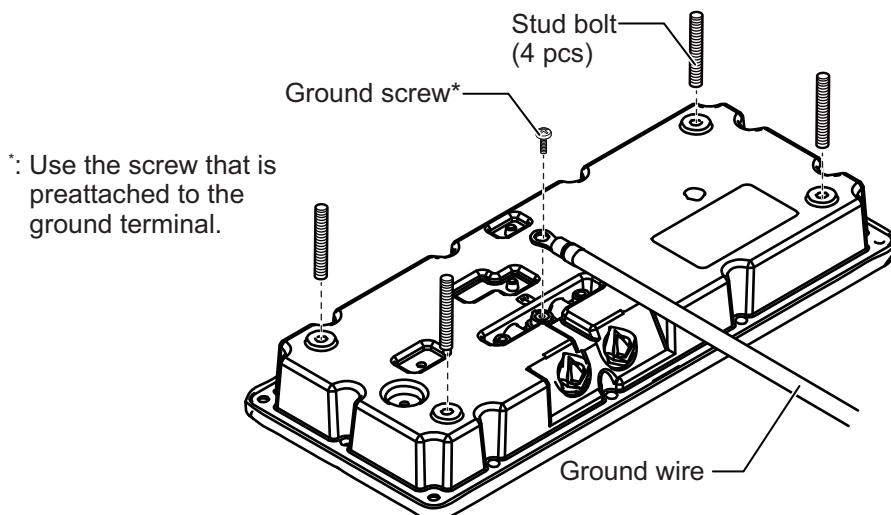
4. Set the unit to the mounting location so that the stud bolts on the bottom of the unit are inserted to the pilot holes.

5. Fasten the four wind nuts (supplied) to the stud bolts from the rear side of the mounting surface.

Wing nut (4 pcs)
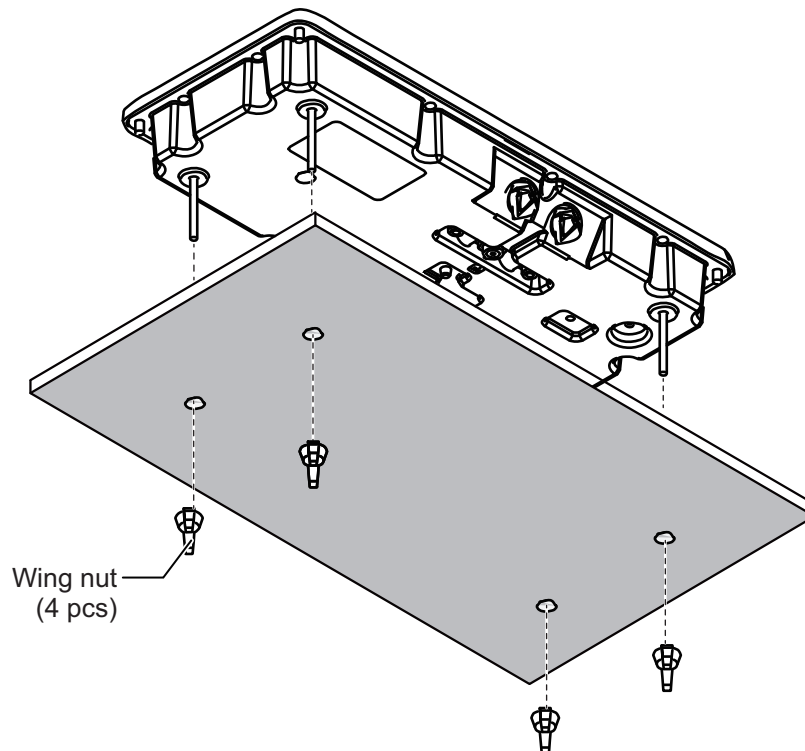
1.4.2 Flush mount Installation

Note: For flush mounting in a panel, the mounting surface must be flat. Do not install the unit on an uneven surface.

Flush mount, fixed at rear (for RCU-014/015/016)

Use the optional flush mount kit FP03-09870 to mount the control unit to a console panel. See the outline drawing at the back of this manual.

1. Prepare a cutout in the location as shown in the figure as below.

170 ±2 mm (67')

176 ±2 mm (69')

388 ±2 mm (153')

150 ±2 mm (59')
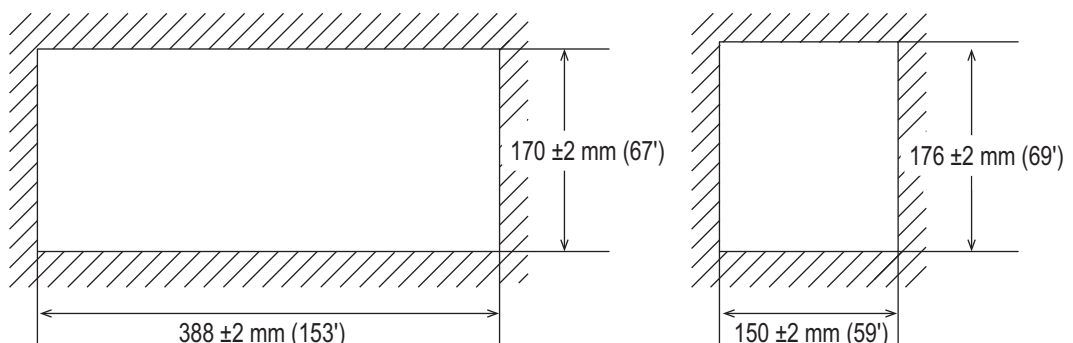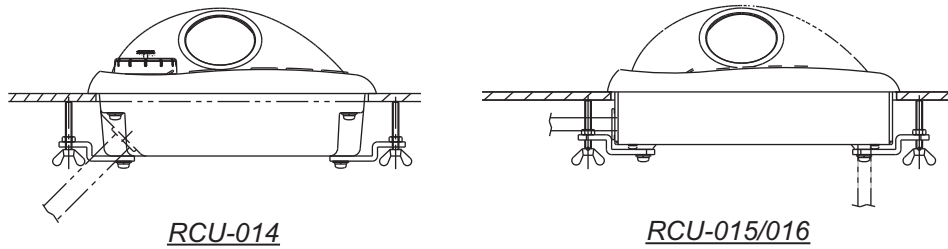
RCU-014   *RCU-015/016*

2. Set the control unit to the cutout.

3. Attach the flush mount fixtures to the control unit with four screws from the rear side.

4. Screw the wing screw to each mounting plate and then insert hex. bolt to each wing screw.

5. Fasten each wing screw and then fasten the hex. nuts as shown in figure below.
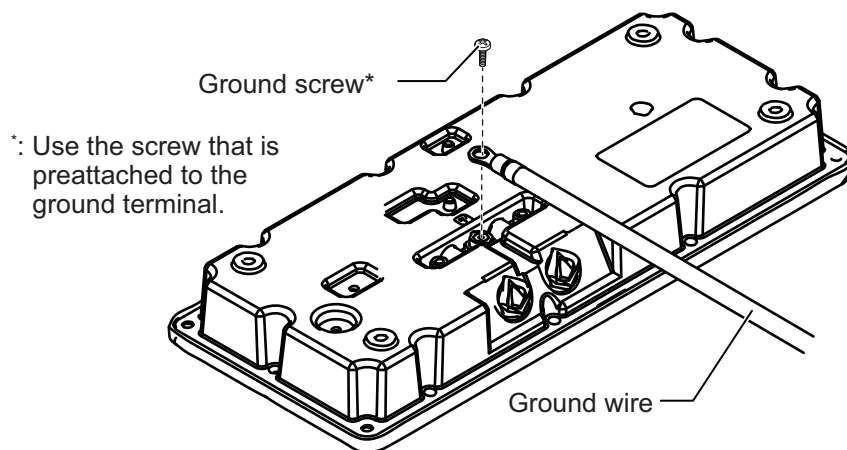

RCU-014   RCU-015/016

Side view of control units

Flush mount, fixed at font (for RCU-031)

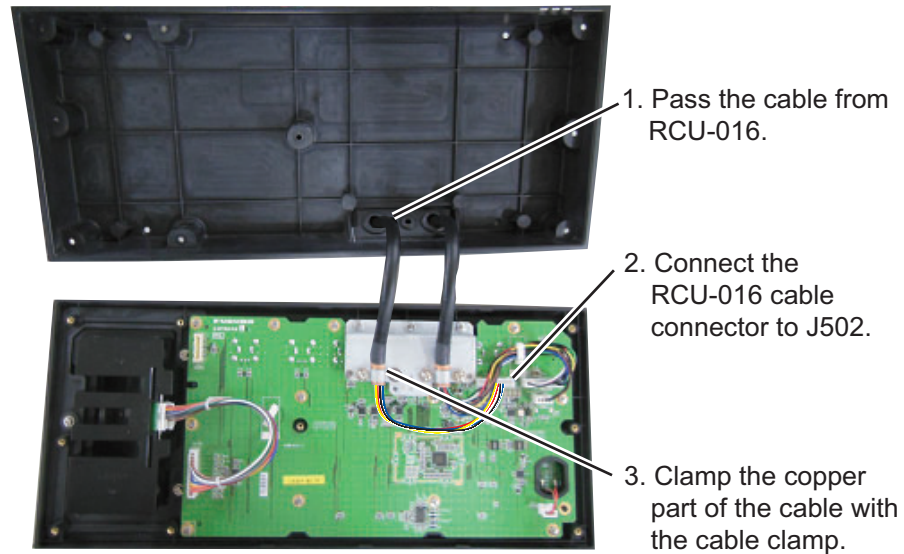**Note:** For flush mounting, select a location where the surface is flat.

1. Make a mounting hole and drill four pilot holes in the mounting location, referring to the outline drawing at the back of this manual.

2. Attach a ground wire (IV-1.25sq, supplied locally) to the ground terminal at the bottom of the unit.

Ground screw*

*: Use the screw that is preattached to the ground terminal.

Ground wire

3. Set the unit to the mounting hole, then secure the unit with four self-tapping screws (ϕ5×20, supplied).

4. Attach four bolt hole caps (supplied).

Bolt hole cap (4 pcs)

Self tapping screw (Ø5×20, 4 pcs)
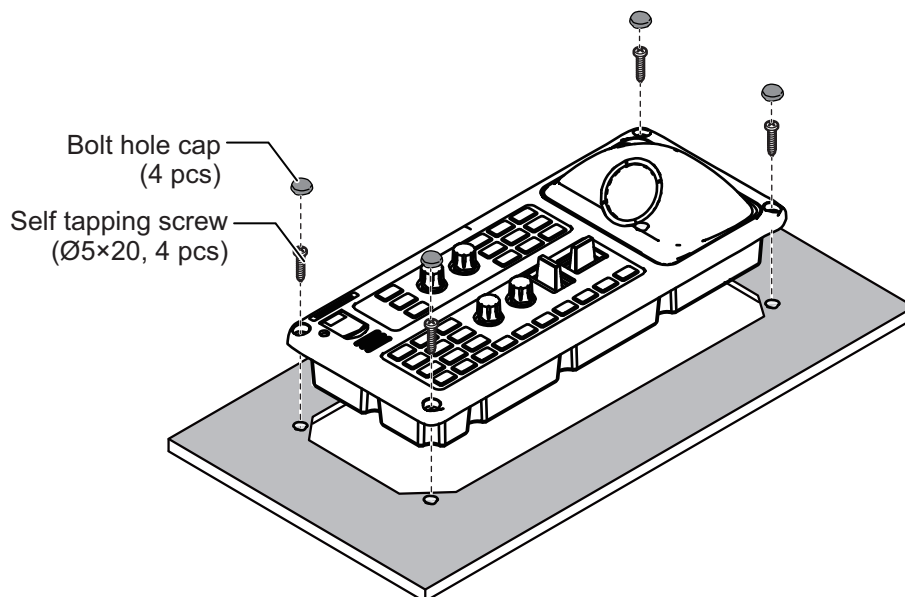
1.4.3 Installation of RCU-016 connected with RCU-014

1. Pass the cable from RCU-016.

2. Connect the RCU-016 cable connector to J502.

3. Clamp the copper part of the cable with the cable clamp.

1.4.4 How to change the cable entry of RCU-015/016

To change the cable entry from the side (default) to the bottom, modify the unit as shown in the following procedure.

1. Turn the chassis upside-down and remove four screws (M3×8) to open the back cover.

2. Remove the cable clamp, then remove the cable.

Screw (M3×8)

Bottom of the unit

Remove the cable clamp .

Screw (M4×8)
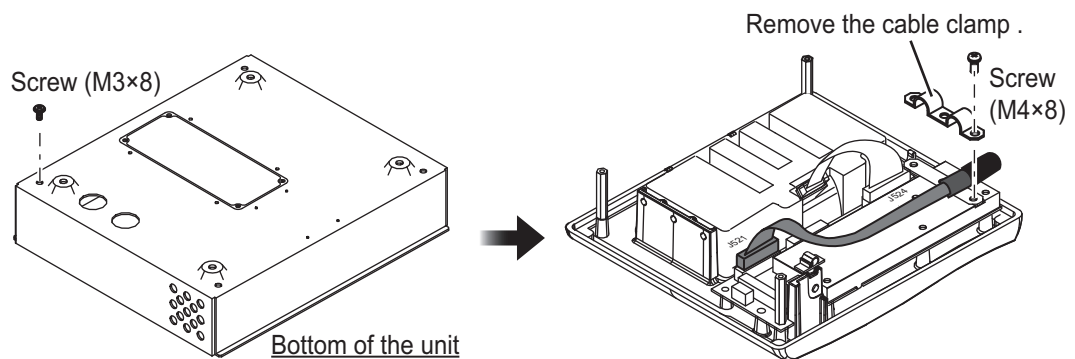
3. Pass the cable through the hole in the figure shown in the figure to the right, then clamp the copper part of the cable with the cable clamp removed at step 1.
Note: If the RCU-016 is connected in series with RCU-015, connect J522 instead of J521.

4. Close the back cover of RCU-016.

Hole to pass the cable.

J522
(for connection with RCU-015)
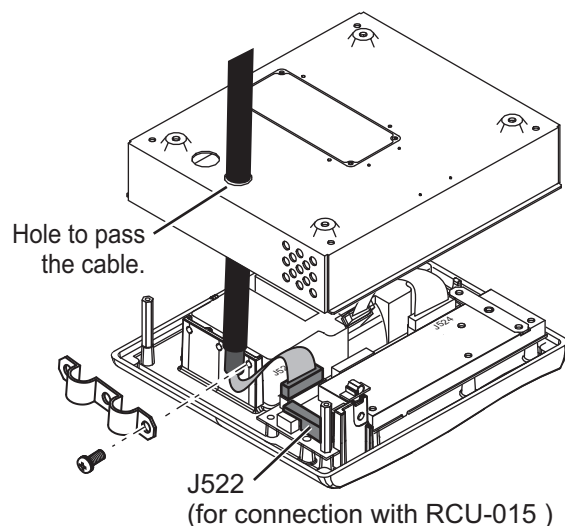
1.5   Power Supply Unit

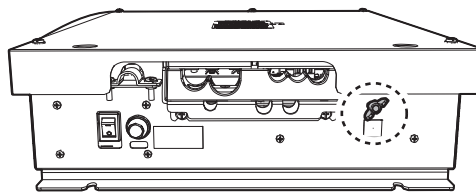This unit can be installed on a bulkhead, wall or on the floor.

1.5.1   Installation considerations

Keep in mind the following points when selecting a location.

- Locate the processor unit away from heat sources because of heat that can build up inside the cabinet.
- Select a location where the vibration is minimal.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the processor unit is placed too close to the magnetic compass. Observe the compass safe distances in the SAFETY IN-STRUCTIONS to prevent interference to a magnetic compass.
- Install the processor unit on the floor, or on a bulkhead with the following direction. For bulkhead, the cable entry must face the deck.

( ) : Cable entry
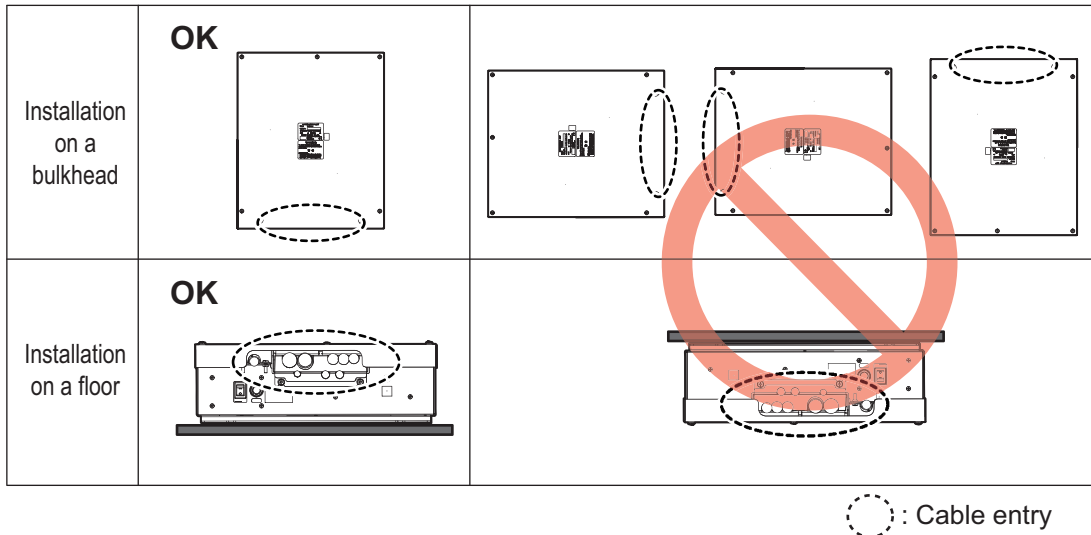
- Connect the ground wire (IV-8sq, local supply) between the earth terminal on the chassis and the ship's earth, using the supplied crimp-on-lug FV2-4 BLU.
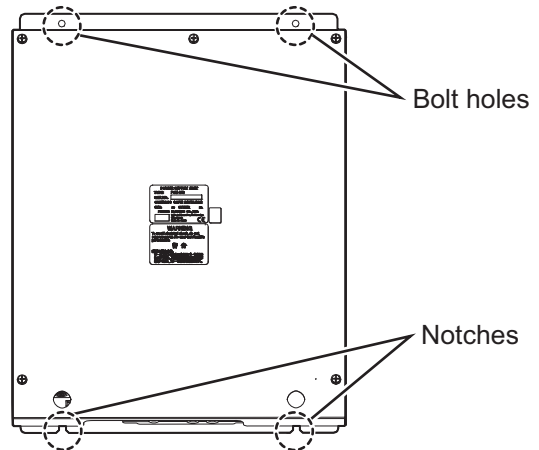
1.5.2 How to install the processor unit

Use four bolts (M6, local supply) to fasten the processor unit.

For bulkhead mounting, fasten two bolts for the lower notches, leaving 5 mm of thread exposed from the bolt head. Set the notches of the processor unit on the two bolts, then fasten two bolts for the upper bolt holes. Then secure the processor unit in place with all four bolts fastened tightly.

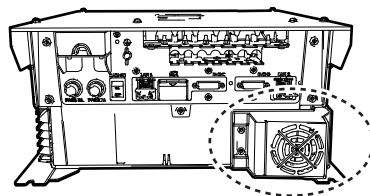**Note:** For bulkhead installations, the cable entry must face the deck.

1.6 Processor Unit

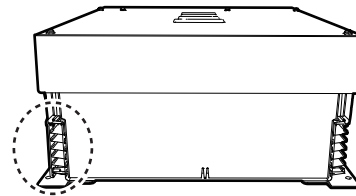This unit can be installed on a bulkhead, wall or on the floor.

1.6.1 Installation considerations

Keep in mind the following points when selecting a location.

- Locate the processor unit away from heat sources because of heat that can build up inside the cabinet.
- Select a location where the vibration is minimal.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the processor unit is placed too close to the magnetic compass. Observe the compass safe distances in the SAFETY INSTRUCTIONS to prevent interference to a magnetic compass.
- Allow for a service clearance of 100 mm in front of the vent hole (front and rear sides).
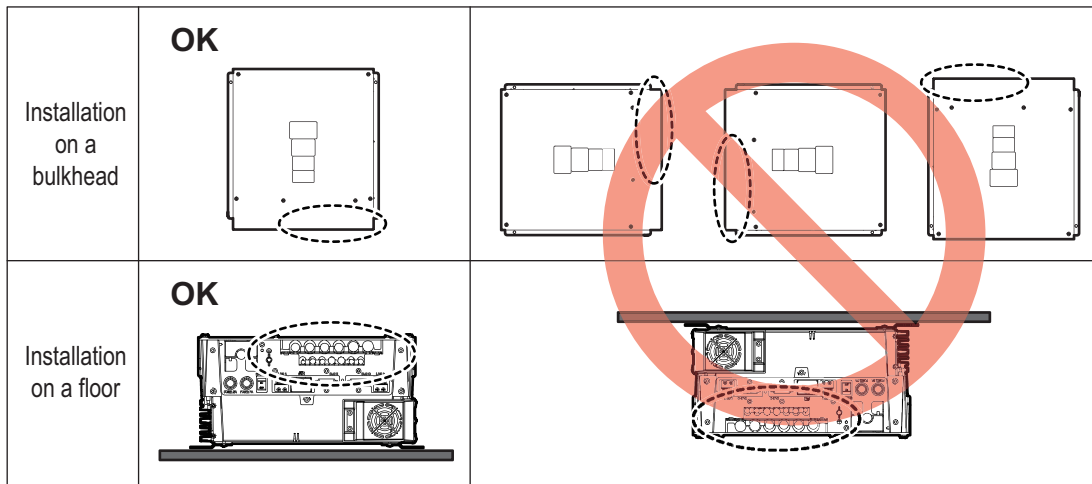

Front view
（Cable entrance side）
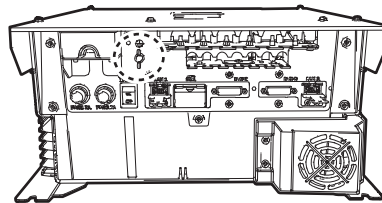
Rear view

⌐ ⌐ : Vent hole

• Install the processor unit on the floor, or on a bulkhead with the following direction. For bulkhead, the cable entry must face the deck.

|	OK	
Installation on a bulkhead		
Installation on a floor		

 : Cable entry

• Connect the ground wire (IV-8sq, local supply) between the earth terminal on the chassis and the ship's earth, using the supplied crimp-on-lug FV2-M3 BLU.

1.6.2 How to install the processor unit

Use four bolts (M6, local supply) to fasten the processor unit.

For bulkhead mounting, fasten two bolts for the lower notches, leaving 5 mm of thread exposed from the bolt head. Set the notches of the processor unit on the two bolts, then fasten two bolts for the upper bolt holes. Then secure the processor unit in place with all four bolts fastened tightly.

Bolt holes

Notches
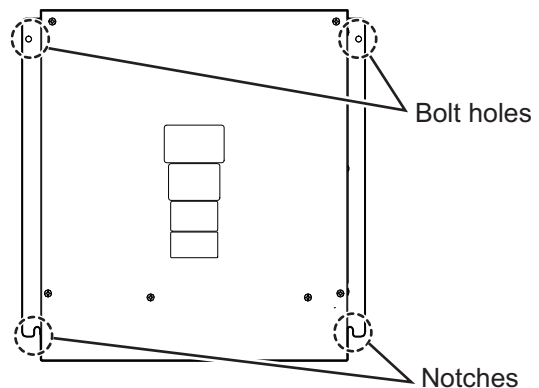
Note: For bulkhead installations, the cable entry must face the deck.

1.7   Transceiver Unit

The transceiver unit is required for TR-DOWN Radar.

Installation considerations

Keep in mind the following points when selecting a location.

- Locate the unit away from heat sources because of heat that can build up inside the cabinet.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- Determine the location considering the length of the cable between the transceiver unit and the antenna unit and the cable between the transceiver unit and the power supply unit.
- A magnetic compass will be affected if the transceiver unit is placed too close to the magnetic compass. Observe the compass safe distances in the SAFETY IN-STRUCTIONS to prevent interference to the compass.
- Be sure to connect the ground wire (between the earth terminal on the chassis and the ship's earth).

How to mount the transceiver unit

Fix the unit to the mounting location with M6 bolts or φ6 coach screws. See the outline drawing for mounting dimensions.

1.8   Intelligent Hub (option)

Use the optional Intelligent Hub HUB-3000 to connect gateway network equipment. Do not connect this network to the shipborne LAN network. Further, do not connect a PC to this network, other than for maintenance.
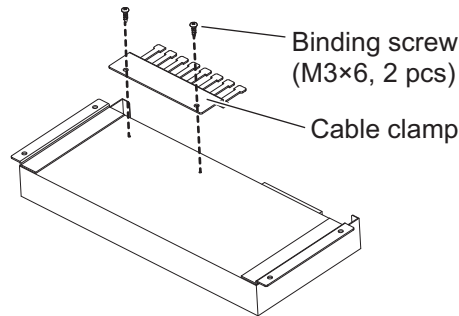
Installation considerations

Keep in mind the following considerations when selecting a location.

- Locate the hub away from heat sources because of heat that can build up inside the cabinet.
- Select a location where the vibration is minimal.
- Locate the hub away from places subject to water splash and rain.
- Be sure to connect a ground (between the earth terminal on the hub and the ship's earth).
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the hub is placed too close to the magnetic compass. Observe the compass safe distances in the SAFETY INSTRUCTIONS to prevent interference to a magnetic compass.
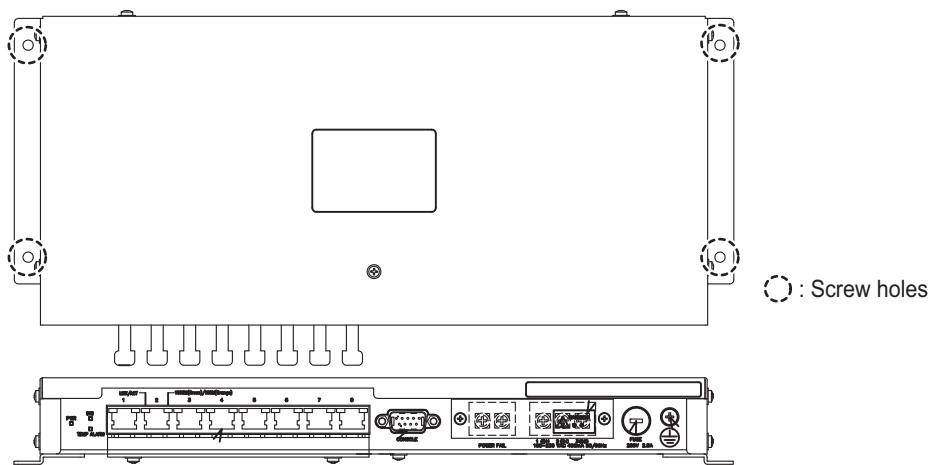
How to install the Intelligent Hub

1. Use two binding screws (M3×6, supplied) to attach the cable clamp (supplied) to the bottom of the HUB-3000.

Bottom view

2. Fasten four self-tapping screws (φ4×20, supplied) to secure the unit.

◯ : Screw holes

1.9 Switching Hub (option)

Use the HUB-100 to connect sensor networks. This network cannot be connected to the shipborne LAN network. Further do not connect a commercial PC to this network, other than for the maintenance.

For the installation procedure, see the operator's manual for HUB-100 (Pub. No. OMC-35191).

Installation considerations

Keep in mind the following points when selecting a location.

*   Locate the hub away from heat sources because of heat that can build up inside the cabinet.
*   Select a location where the vibration is minimal.
*   Locate the equipment away from places subject to water splash and rain.
*   Make sure that the ground wire is connected between the earth terminal on the hub and the ship's earth.
*   Leave sufficient space at the sides and rear of the unit to facilitate maintenance.