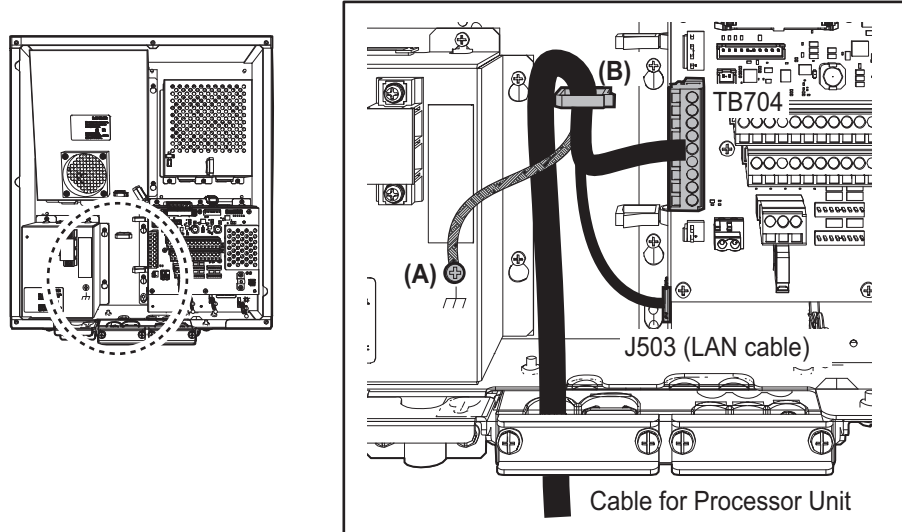3. Connect the lines of the cable for Processor Unit as shown below through the wiring clamp (B).
   - Serial lines: TB704
   - Shield line: Screw (A)
   - LAN cable: J503

Connection of cable for Control Unit

1. Connect the lines of the cable to the appropriate WAGO connectors (TB711 and TB712), referring to the interconnection diagram at the back of this manual.

2. Set the heat shrinkable part of the cable for Control Unit on the appropriate lane on the lower cable entrance as shown below. Fasten the copper part of the cable with the cable clamp.
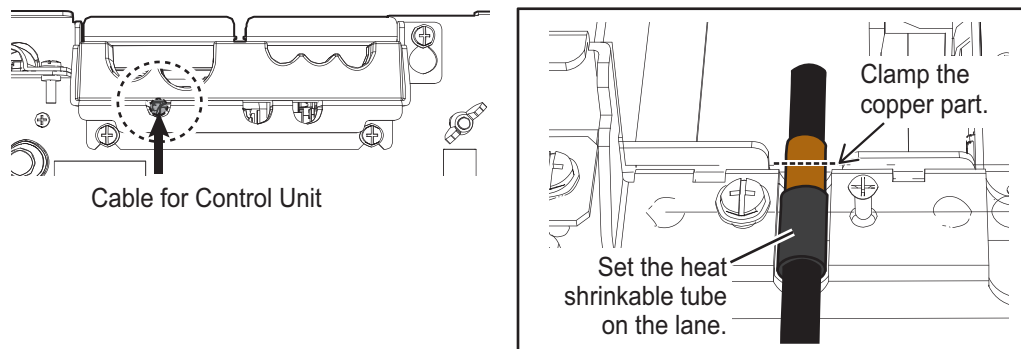
3. Connect the cable for Control Unit to the connectors (TB711 and TB712) through the appropriate wiring clamps (A) and (B).

Cable for Control Unit
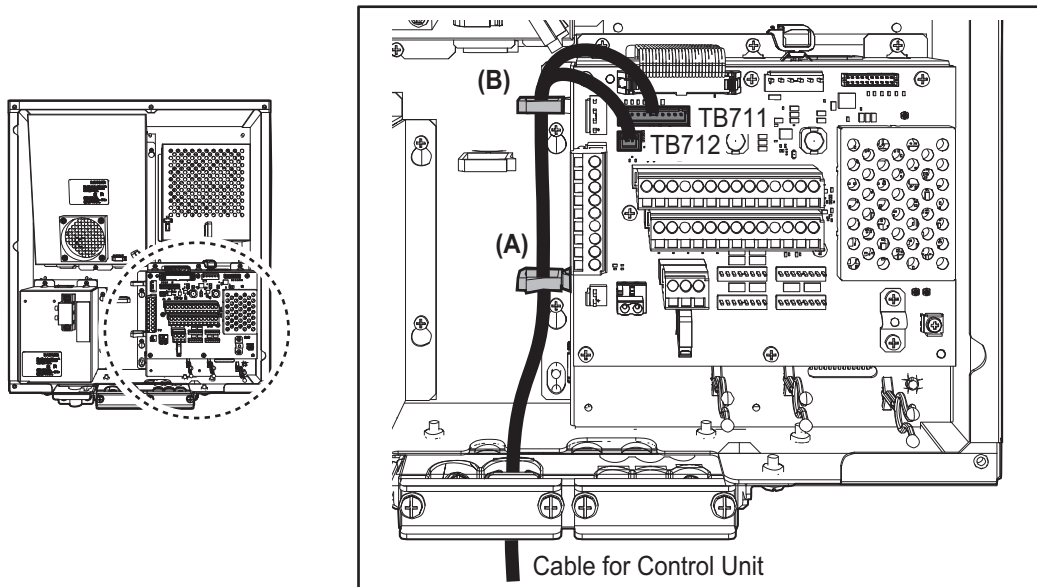
Connection of cable for sub monitor

Up to four cables (RW-00136, RW-4864) can use for sub monitor cables. Set their cables on the specified cable entrance as shown in the figure to the right.

Sub monitor cable (RW-4864/00136)

Sub monitor cable (RW-4864)
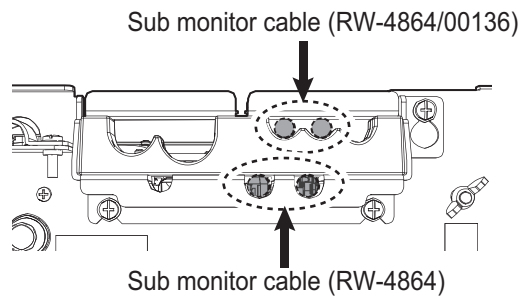
1. Set the shield part of the sub monitor cables on the appropriate lanes on the upper/lower cable entrances as shown below. Fasten the shield part of the cable with the cable clamp.

2. Connect the sub monitor cables to the connectors (J708, J709, J710, J717) through the appropriate wiring clamps (A) to (E).

Upper entrance (RW-4864/00136)
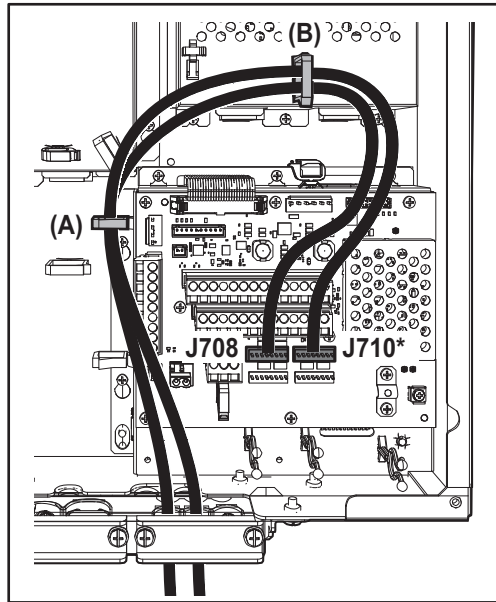
Lower entrance (RW-4864 only)
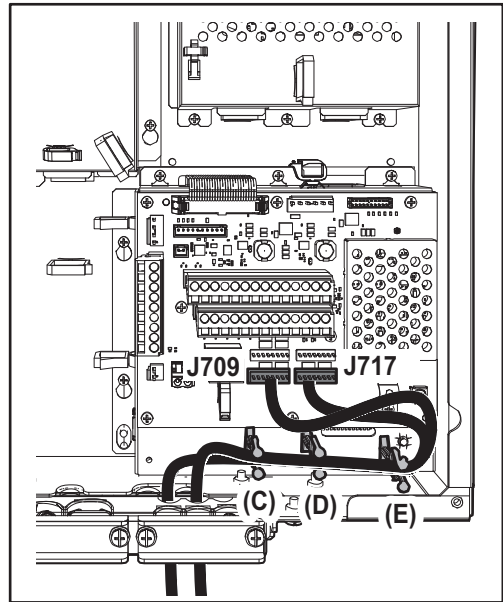
*: For cable for "input" signal of an external radar, connect to J710.

2.7 Transceiver Unit

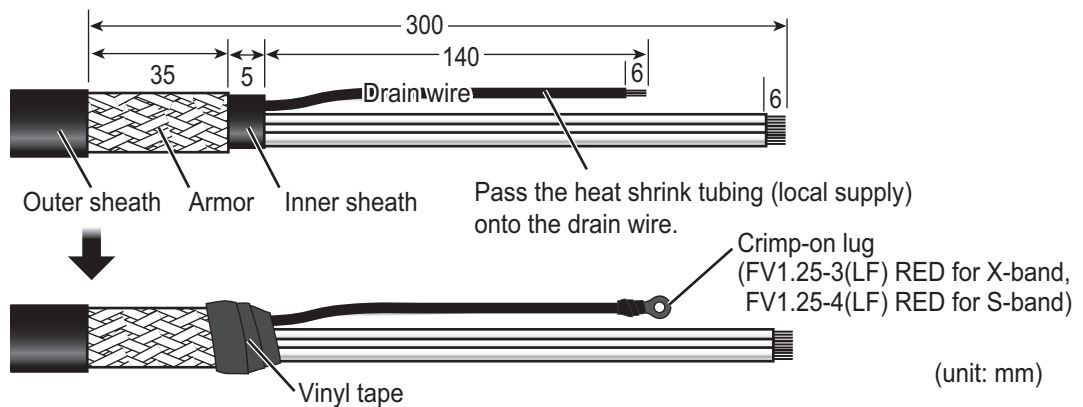The TR-DOWN radar requires the transceiver unit as follows:

• Transceiver Unit RTR-108 for X-band radar (FAR-2328W)

• Transceiver Unit RTR-109 for S-band radar (FAR-2338SW)
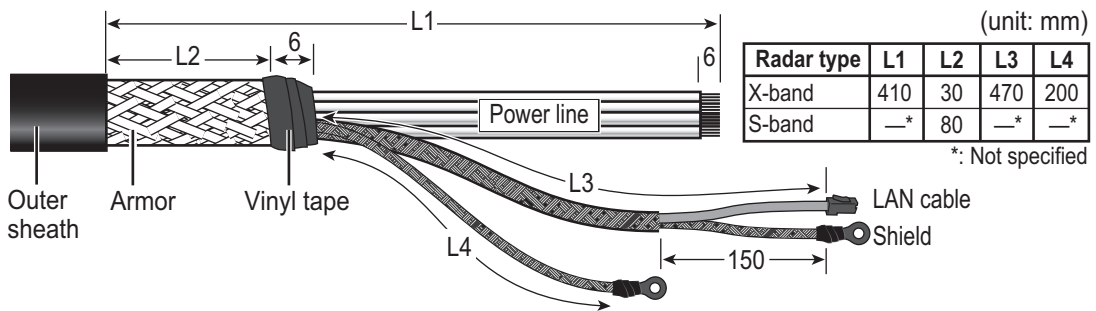
2.7.1 How to fabricate the cables

For how to connect the LAN modular plug, see "LAN cable" on page 2-5. For how to connect the WAGO connector, see "WAGO connector" on page 2-6.

TTYCYSLA-10 (for serial cable)

Clamp the armor with the cable clamp.

Outer sheath   Armor   Inner sheath

Pass the heat shrink tubing (local supply) onto the drain wire.

Crimp-on lug
(FV1.25-3(LF) RED for X-band,
FV1.25-4(LF) RED for S-band)

(unit: mm)

Vinyl tape

RW-00135

Radar type	L1	L2	L3	L4
X-band	410	30	470	200
S-band	—*	80	—*	—*

(unit: mm)

*: Not specified

S03-92-15/30/40/50 (RW-00136 + connector, for a sub monitor)

Note: The maximum cable length is 50 m.

Clamp the armor with the cable clamp.

Radar type	L1	L2	L3
X-band	240	190	220
S-band	520	220	420

(unit: mm)
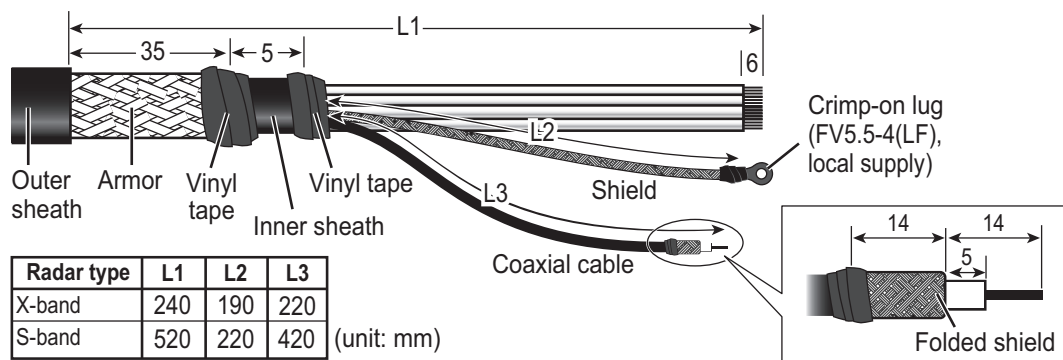
2.7.2   How to connect the cables from X-band radar antenna
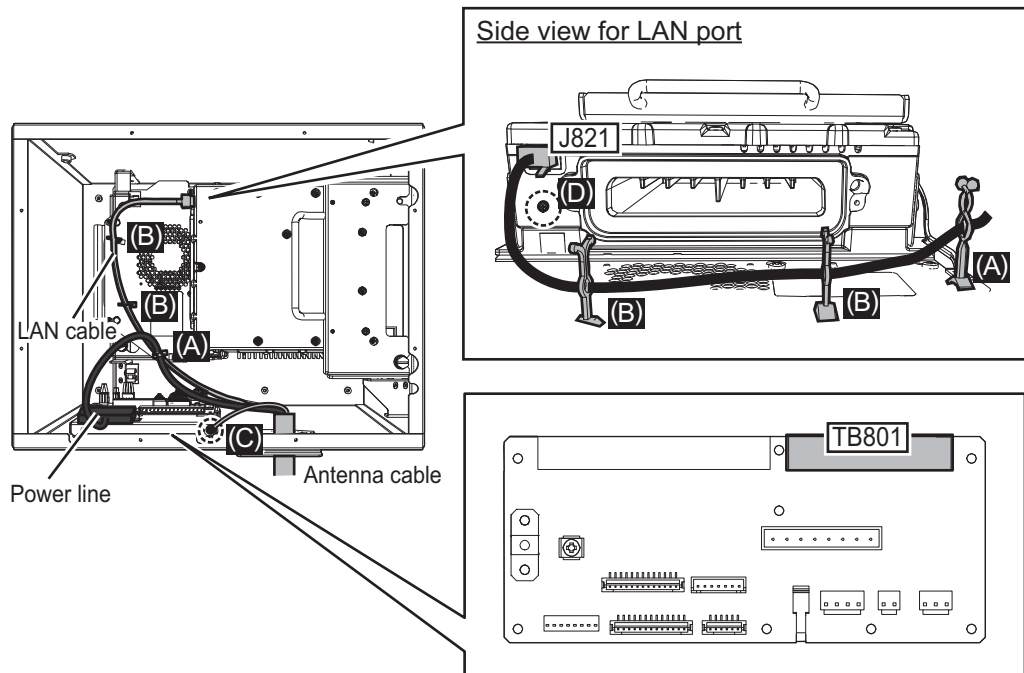
Antenna cable, serial cable, sub monitor cable

1. Loosen eight bolts then remove the cover of the unit.

2. Unfasten three bolts from the cable clamp. Lay the cables in respective cable slots so their armors rest in the slots.
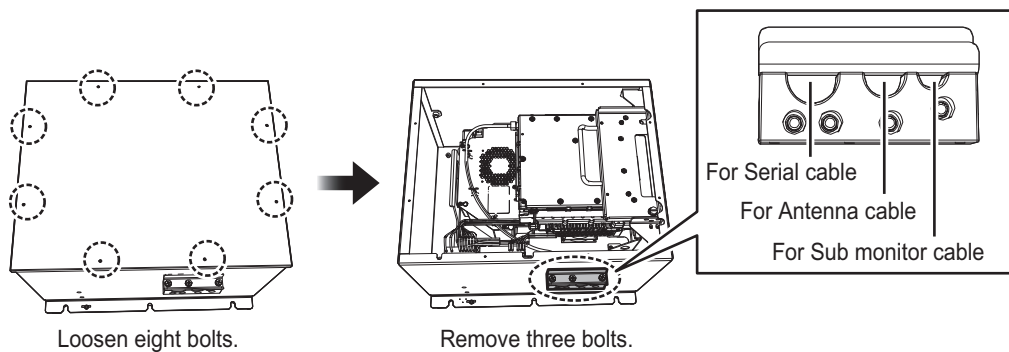
Loosen eight bolts.   Remove three bolts.

3. Attach the appropriate WAGO connectors (pre-attached) to the appropriate cables, and then connect the antenna, sub monitor and serial cables to the RF-TB Board shown in the following figure. For how to connect the WAGO connector, see "WAGO connector" on page 2-6. For pin arrangement, see the interconnection diagram at the back of this manual.

   Note 1: Make sure to pass the cable through the specified locking wire saddle.

   **Note 2:** A terminal opener is provided on the RF-TB Board.

- Destination of Antenna cable
  Power line: TB801 through the locking wire saddle (A).
  LAN cable: J821 through the locking wire saddles (A and B, three places.)
  Shield of power line: Screw (C)
 **Shield of LAN cable**: Screw (D)

- Destination of cable for the sub monitor
  Signal line: TB803 through the locking wire saddle (A).
  Coaxial cable: TB804
  Shield of signal cable: Screw on fixing plate (C)
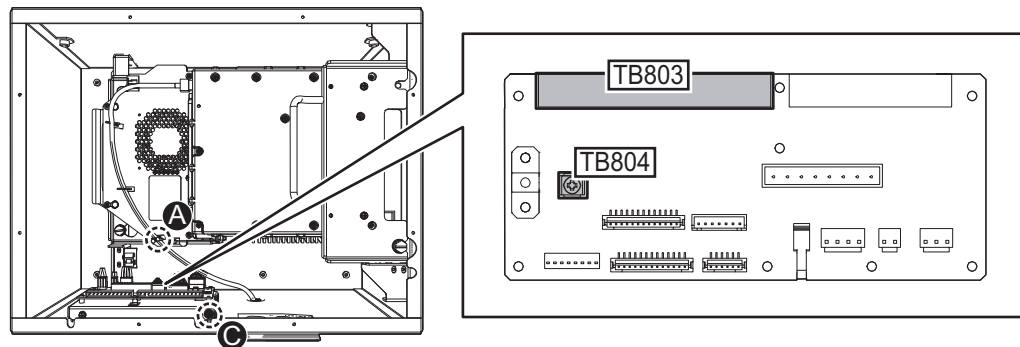
- Destination of Serial cable from the Antenna unit
  Serial cable: TB802 and TB803 through the locking wire saddle (A).
  Shield of serial cable: Screw on fixing plate (C)
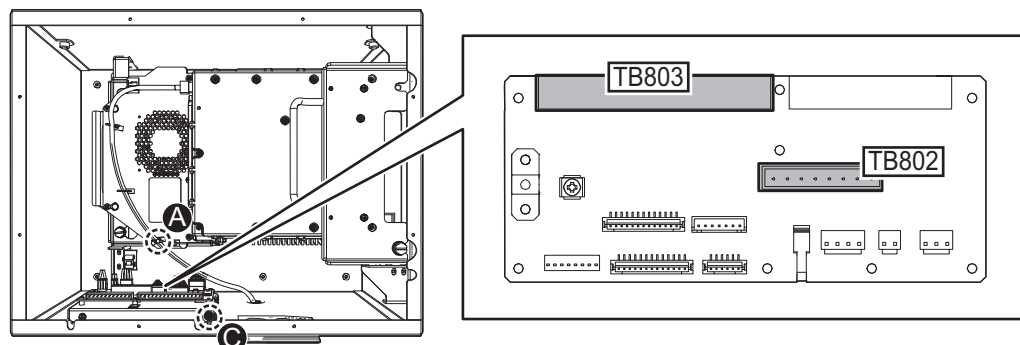
4. Bind all cables with cable ties supplied locally (two places).
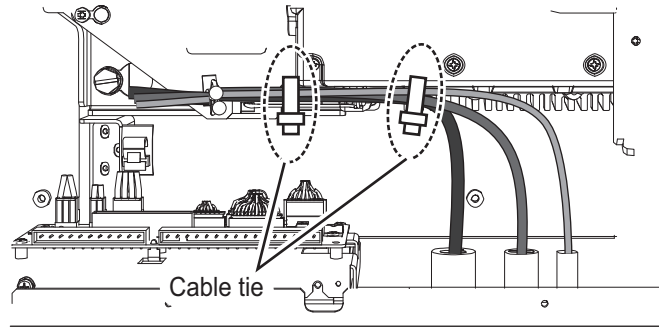
Cable tie

5. Check that armor of cables are lying in their respective cable slots then fasten the cable clamp.

Flexible waveguide (FR-9)

The RF interconnection between the antenna unit and the transceiver can be made with a flexible waveguide (FR-9). If the rectangular waveguide is used, observe the following installation guidelines.

• Correctly installed waveguide runs ensure the most efficient transmission of electrical energy at high frequencies. Electrical losses, however, occur in the waveguide runs. To minimize them the following factors are of great importance: minimum length, airtightness and electrical continuity.

• Another consideration required is that of frequency disturbance. The transmitting valve, a magnetron, is the primary oscillator in the radar. This is different from the oscillation system at lower frequencies in which conventional radio valves are used. In the latter case, the primary oscillator is always protected from the effects of load impedance by a buffer stage so that frequency and waveform are left unobstructed. With a waveguide and magnetron, however, mismatch of impedance causes "frequency pulling." For this reason, the number of possible mismatches in a waveguide run, i.e., joins and bends, must be kept minimum.

• Each pair of flanges should be coupled with one O-ring, four bolts and spring washers and the choke flange must be in the upper position. The bolts and O-ring must be greased before insertion to facilitate removal if required at a later date.

• The transceiver unit output flange is a plain type and the antenna unit output flange is a choke type, and it is important to maintain this relationship throughout the waveguide run.
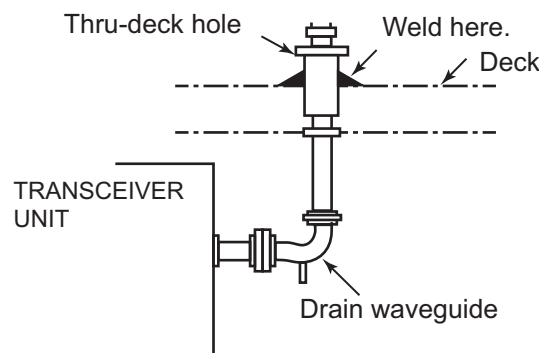

• After installation of the waveguide is completed, the coupling portions must be sealed by using the adhesive supplied.

• In a very short time the surface of the waveguide becomes green with verdigris. Therefore, paint both the surface of the waveguide and flanges to avoid corrosion

and water penetration. Paint must not be allowed to reach the inner surface of the waveguide or the mating surface of any flange.

2.7.3 How to connect the cables from S-band radar antenna

Antenna cable, serial cable, sub monitor

1. Loosen eight bolts then remove the cover of the unit.

2. Unfasten three bolts from the cable clamp. Lay the cables in their cable slots so their armors rest in the slots.
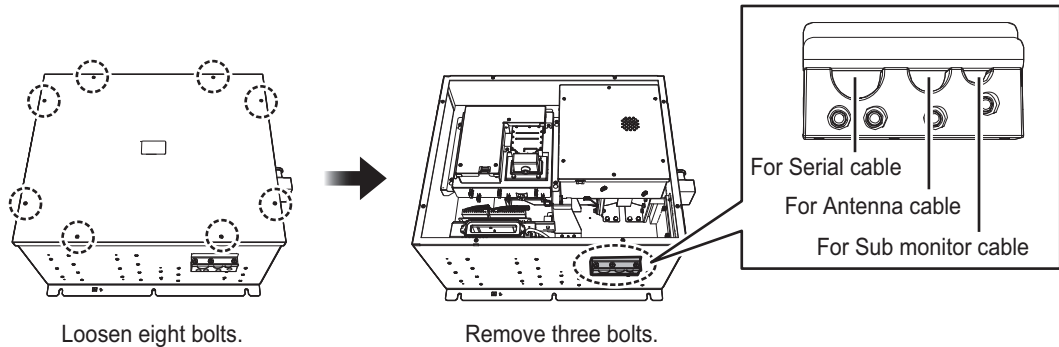
For Serial cable
For Antenna cable
For Sub monitor cable

Loosen eight bolts.   Remove three bolts.

3. Attach the appropriate WAGO connectors (pre-attached) to the appropriate cables, and then connect the antenna, sub monitor and serial cables to the RF-TB Board shown in the following figure. For how to connect the WAGO connector, see "WAGO connector" on page 2-6. For pin arrangement, see the interconnection diagram at the back of this manual.

Note 1: Make sure to pass the cable through the specified locking wire saddle.

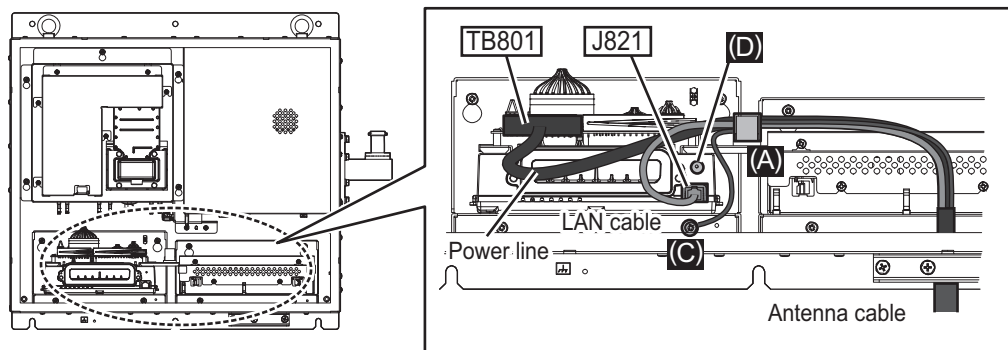**Note 2:** A terminal opener is provided on the RF-TB Board.

- Destination of Antenna cable
  Power line: TB801 through the locking wire saddle (A).
  LAN cable: J821 through the locking wire saddle (A)
  Shield of power line: Screw (C)
  Shield of LAN cable: Screw (D)

TB801   J821   (D)

LAN cable

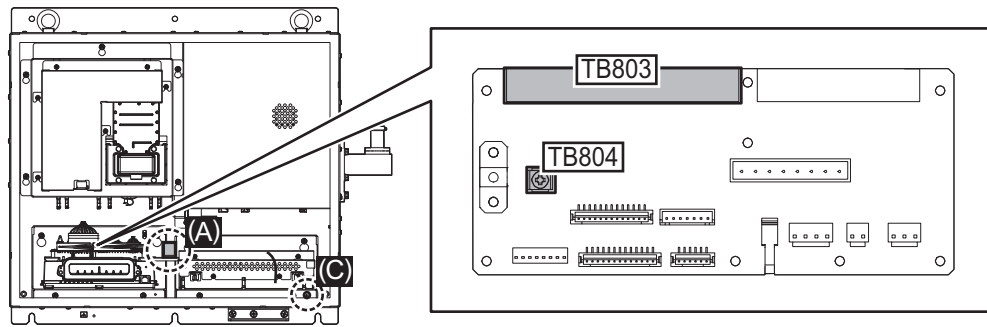Power line

(A)

(C)

Antenna cable

- Destination of sub monitor cable
  Signal line: TB803 through the locking wire saddle (A), see the figure for the "Destination of Antenna cable:"
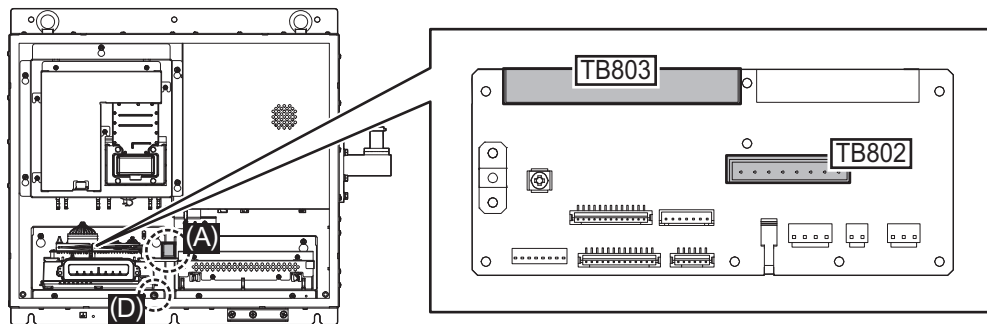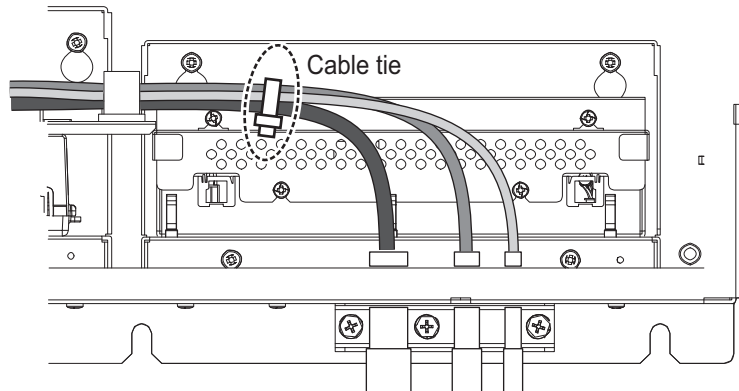 **Coaxial cable**: TB804 (B)
  Shield of signal line: Screw (C)

- Destination of Serial cable from the Antenna unit
  Serial cable: TB802 and TB803 through the locking wire saddle (A).
  Shield of serial cable: Screw on fixing plate (D)

4. Bind all cables with cable ties supplied locally (two places).

5. Check that armor of cables are lying in their respective cable slots then fasten the cable clamp.

Microwave coaxial plug

Attach the microwave coaxial plug to the coaxial cable. See the applicable FURUNO technical information for the procedure. Attach the coaxial cable assembly to the transceiver unit as follows:

1. Unfasten four bolts (M6×10) to remove the dust cover from the output WG adapter.

2. Fasten eight bolts (removed at step 1) to attach the flange to the transceiver unit.

3. Attach the coaxial cable to the converter of the flange.

Transceiver unit, inside view
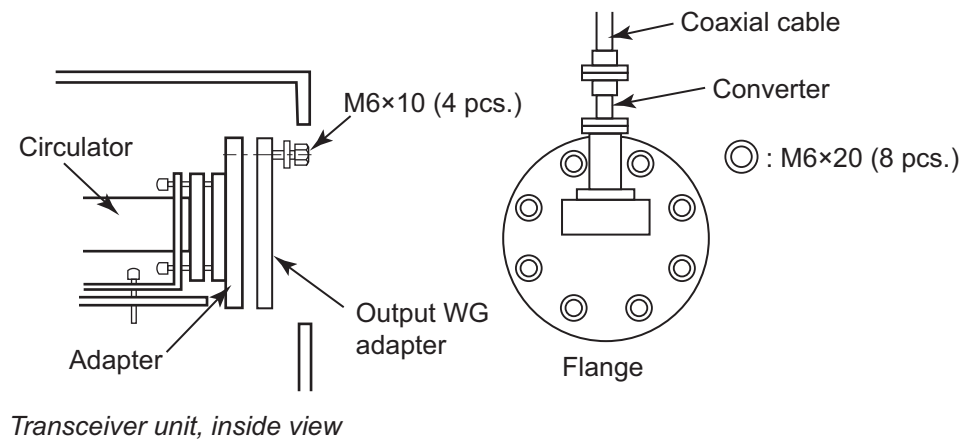
2.8 Processor Unit

2.8.1 How to fabricate cables

For locations of cables and cores, see the sticker on the reverse side of the top cover. (All dimensions in millimeters)

For how to connect the LAN modular plug, see "LAN cable" on page 2-5. For how to connect the WAGO connector, see "WAGO connector" on page 2-6.

RW-00135/RW-00339 (for Antenna cable)

Note: For the 1.5 m cable of RW-00339 cable (for FAR-2x58 radars), a fabrication is not required.
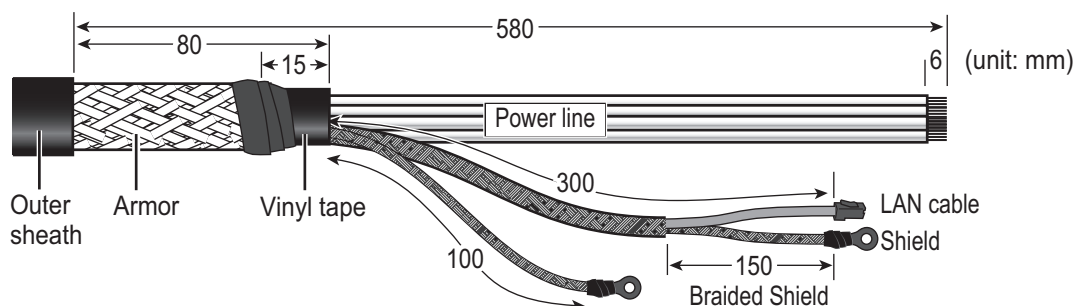
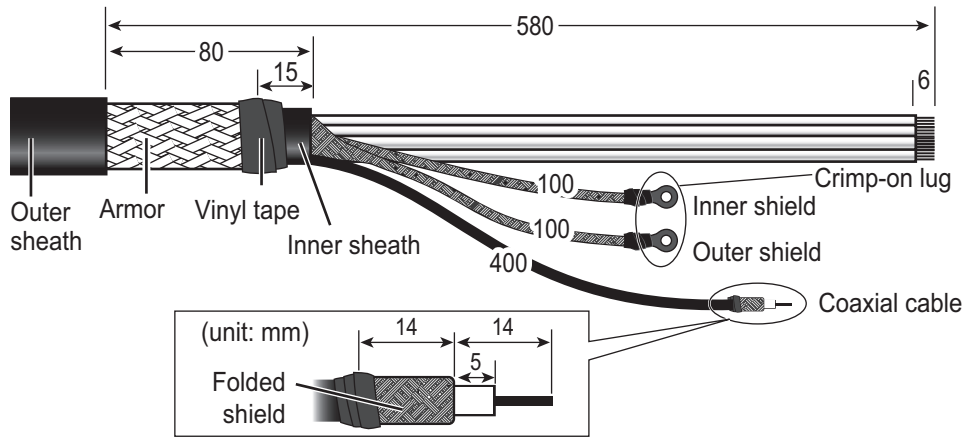### RW-9600/6895/4873 (for retrofit or foremast installation)

The existing cable can be used for the following cases. In these cases, the optional LAN Signal Converter is required. See section 2.10 "LAN Signal Converter" for details.

• Cable extension for foremast installation (For X-band of FAR-2x18/2x28/2x38 radars, TR-UP radar only)

• Retrofit (For X-band/S-band of FAR-2x18/2x28/2x38 radars, TR-UP radar only)

Note: The maximum antenna cable length is 100 m for RW-9600, 50 m for RW-6895/4873. If the existing antenna cable is longer than the above maximum length, replace the antenna cable with RW-00135.
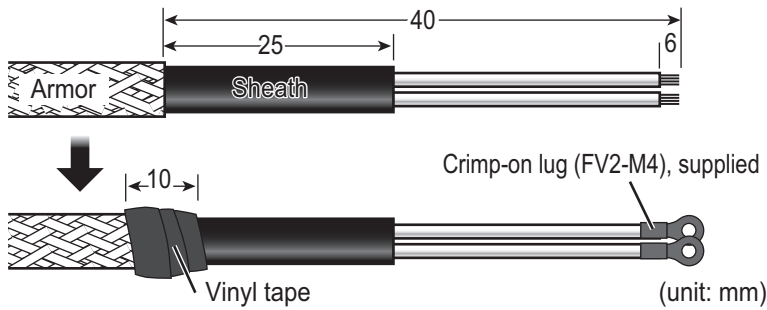
The unused power lines are tied up and attached to the crimp-on lug FV5.5-S4 (LF), supplied locally. Connect these unused lines to the ground terminal with the shield line. See the interconnection diagram at the back of this manual for details.
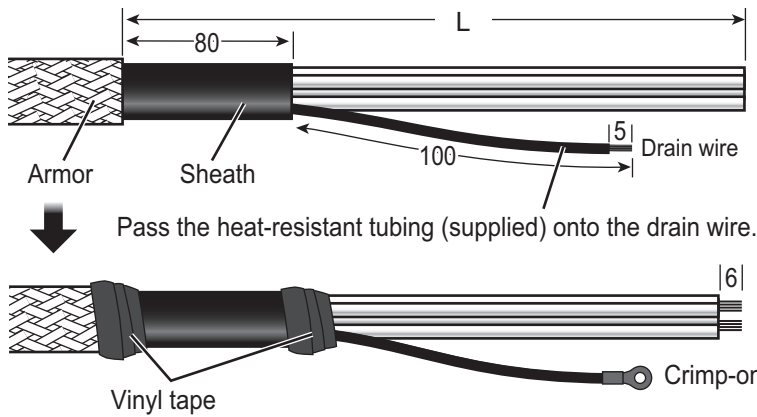
Outer sheath | Armor | Vinyl tape | Inner sheath | Crimp-on lug | Inner shield | Outer shield | Coaxial cable

(unit: mm) | Folded shield

DPYC-2.5 cable (for Power)

Clamp the sheath with the cable clamp.

Armor | Sheath | Crimp-on lug (FV2-M4), supplied | Vinyl tape | (unit: mm)

TTYCSLA series cable (for serial)

Armor | Sheath | Drain wire | Pass the heat-resistant tubing (supplied) onto the drain wire. | Vinyl tape | Crimp-on lug

(unit: mm)

Cable type (JIS)	L
TTYCSLA-1Q	590
TTYCSLA-4	720
TTYCSLA-7	570

2.8.2 How to connect cables inside the processor unit

Connect the ground wire between the ground terminal on the chassis and the ship's earth.

Note: If the power supply unit is turns on, turn off it before wiring of the processor unit.

Ground terminal

2-60
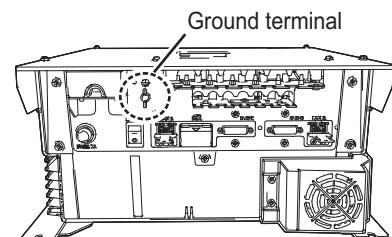
How to open/close the top cover

Unfasten six screws (M4×8) to open the top cover from the processor unit.
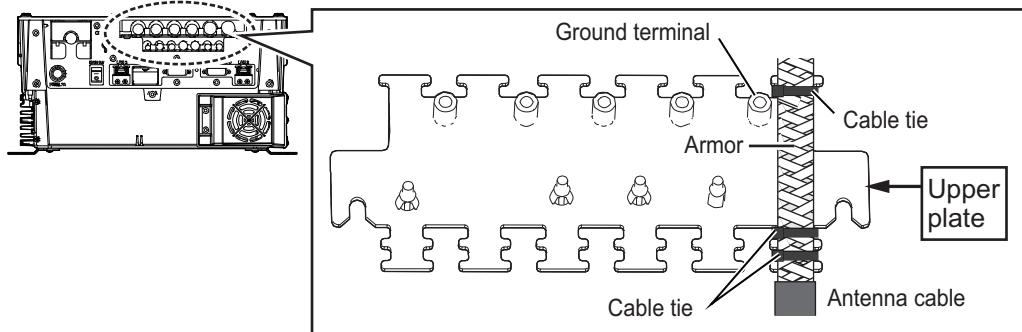
After the appropriate cable connections are completed, fasten six screws to close the top cover.
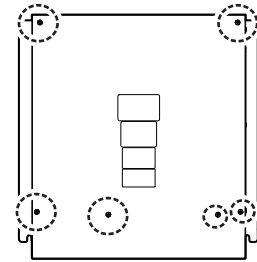
Connection of Antenna cable

For existing antenna cable, see section 2.10 "LAN Signal Converter".

1. Remove the spacers to pass the antenna cable on the upper plate.

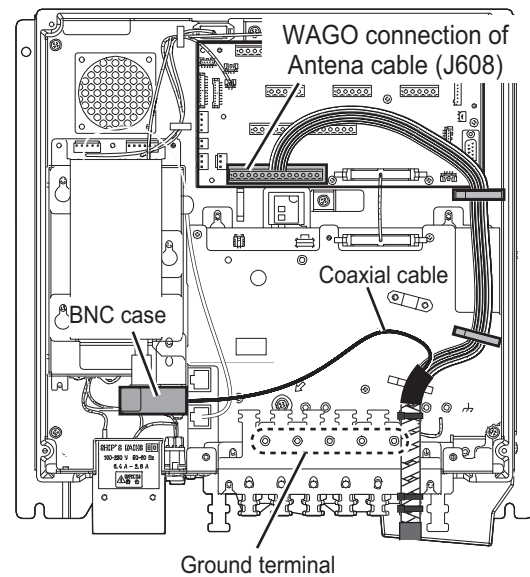2. Fasten the cable to the post part of the plate with a cable tie (local supply).
   Note: Be sure the vinyl sheath of the cables is on the post.

3. Pass the cable to connect the WAGO connector on the TB Board 03P9648 through the locking wire saddles as below.
   For retrofit, the extra cables should be grounded on the ground terminal shown as below. For the connection between the BNC case and the coaxial cable, see section 2.10.3.
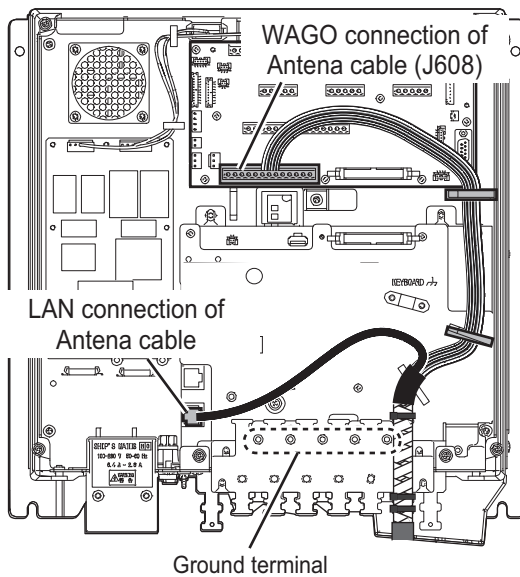

For RW-00135/00339 cable   For retrofit cable

4. Connect the shield line of the antenna cable to the near ground terminal on the plate.

Connection of Power cable

1. Unfasten two screws to open the power cable cover.

2. Remove the plastic cover and cable clamp to pass the power cable.

3. Connect the cable to the terminal with the pre-attached crimp-on lugs. Clamp the power cable on the sheath.
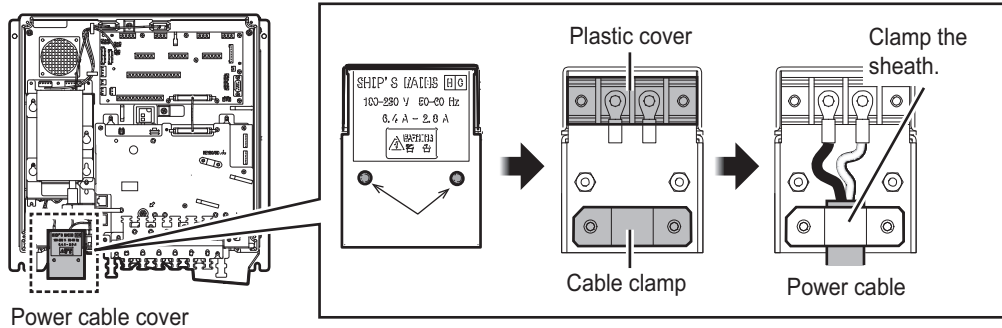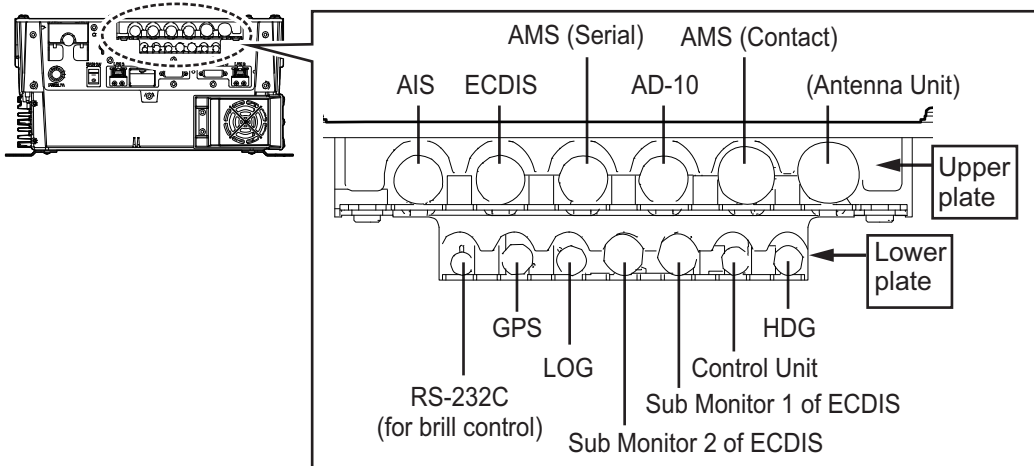

4. Remount the plastic cover and the power cable cover.

Connection of cables for serial, contact signal lines and sub monitors of EC-DIS

1. Unfasten the four bolts dashed circled below to remove the upper plate of the cable clamp.
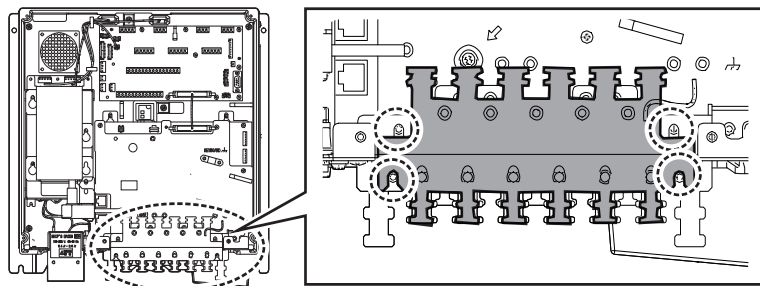
2. Remove the spacers to pass the appropriate cables on the upper and lower plates. The recommended cable entrances are shown as below.

3. Fasten the cables to the post part of the plates with cable ties (local supply).
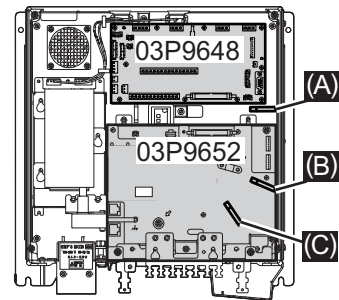   **Note:** Be sure the vinyl sheath on the post.

Upper plate   Lower plate
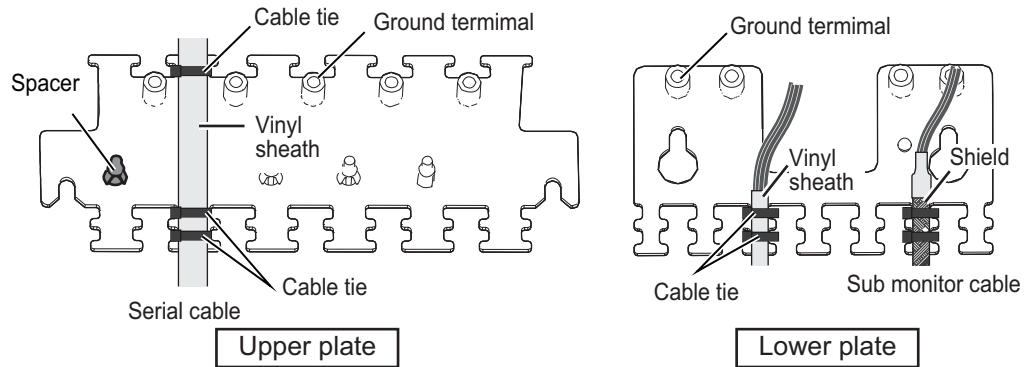
4. Pass the cables to the TB board 03P9648 and
    03P9562 through the locking wire saddles (A, B and
    C) in the figure shown right.
    For the cables on the upper plate, use locking wire
    saddles (A and B).
    For the cables on the lower plate, use locking wire
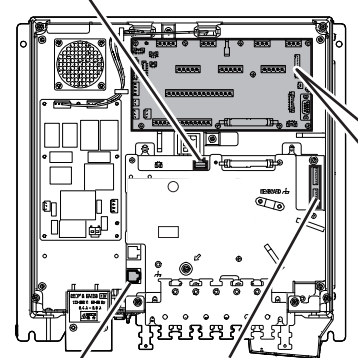   saddles (A, B and C).

5. Connect the connectors to the TB Board. referring to
    the interconnection diagram.

J508
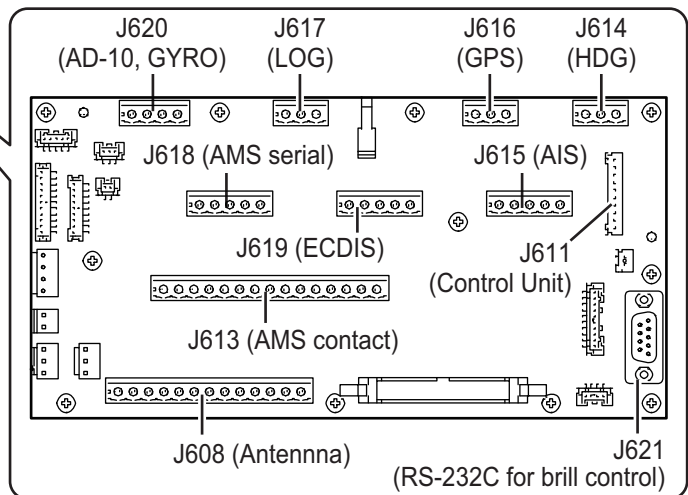Connect cable for USB mouse or USB keypad (local supply, max. 5 m).
Note: Do not connect a USB device other than mouse.


J510/J511
Connect cable for sub
monitors of ECDIS.

J503
Connect LAN cable
for antenna cable.

J620 (AD-10, GYRO)   J617 (LOG)   J616 (GPS)   J614 (HDG)
J618 (AMS serial)   J615 (AIS)
J619 (ECDIS)   J611 (Control Unit)
J613 (AMS contact)
J608 (Antennna)   J621 (RS-232C for brill control)

6. Connect the ground wires of cables to the near ground terminals on the plates.
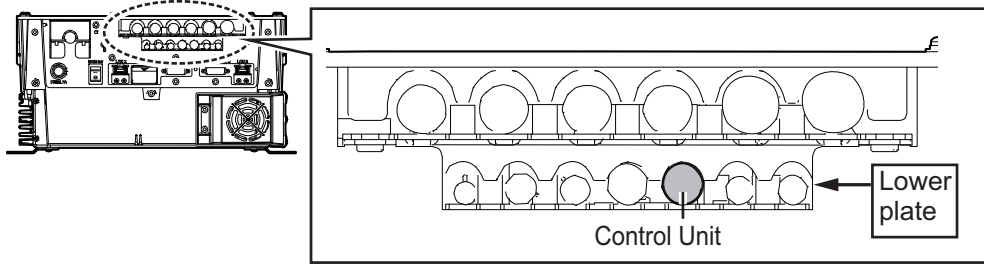
Connection of cables for Control Unit

1. Unfasten the four bolts, indicated with dashed circles below, to remove the upper
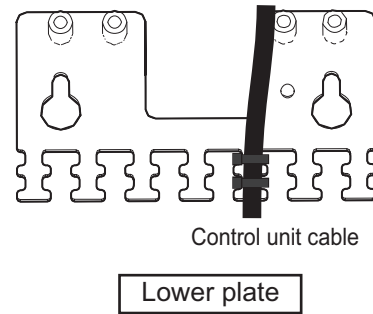   plate of the cable clamp.
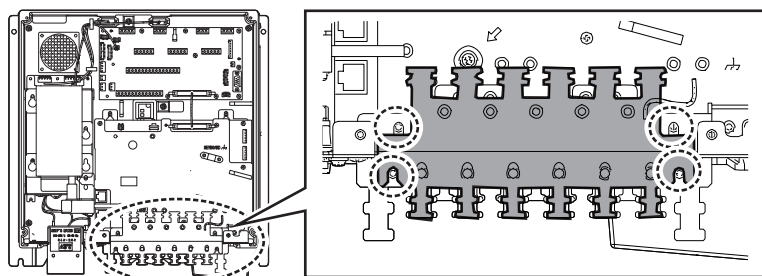
2. Remove the appropriate spacer to pass the cable for control unit on the lower plate. The recommended cable entrance is shown as below.


3. Fasten the cable to the post part of the plate with a cable tie (local supply).
Note: Be sure the vinyl sheath on the post.
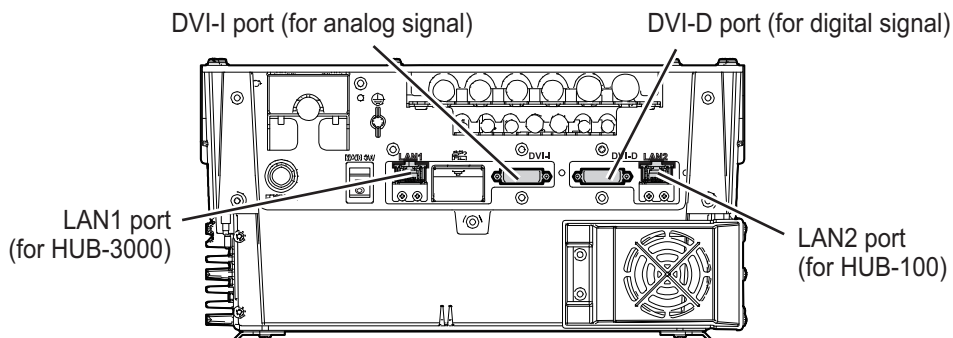
Control unit cable

Lower plate

4. Pass the cables to the TB board 03P9648 and clamp the shield of the cable with the cable clamp (A) shown in the following figure. Then, connect to J611 and J612.

03P9648

J611 (10 lines)

J612 (2 lines)

(A)
Clamp the shield.

Control unit cable
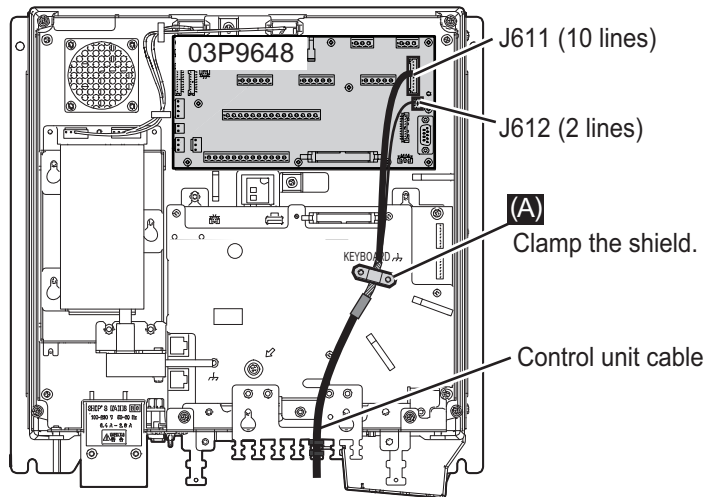
Connection of cable of LAN, Monitor Unit, VDR

Connect the cables of Intelligent HUB (HUB-3000) and Switching HUB (HUB-100) to the LAN ports in front of the processor unit.

Connect the cables of Monitor unit or VDR to the DVI ports at the front of the processor unit.

DVI-I port (for analog signal)   DVI-D port (for digital signal)

LAN1 port
(for HUB-3000)

LAN2 port
(for HUB-100)

For VDR connection, the RGB signal can be output with using the optional DVI-BNC cable kit OP03-252 (Code No.: 001-496-900).

1. Attach the five connectors of the Cable Assembly (supplied) to the fixing plate (supplied) with cable ties as below.
2. Establish the ground system on the fixing plate.
3. Fix the cable assembly to the appropriate location with two screw (M5). The location must be within 200 cm of the processor unit.
4. Connect the VDR cables to the connectors of the cable assembly.

1.   2.   3.   4.

Fixing plate

Cable   Grounding   Fix with two   Cable of VDR
Assembly   M5 screws.
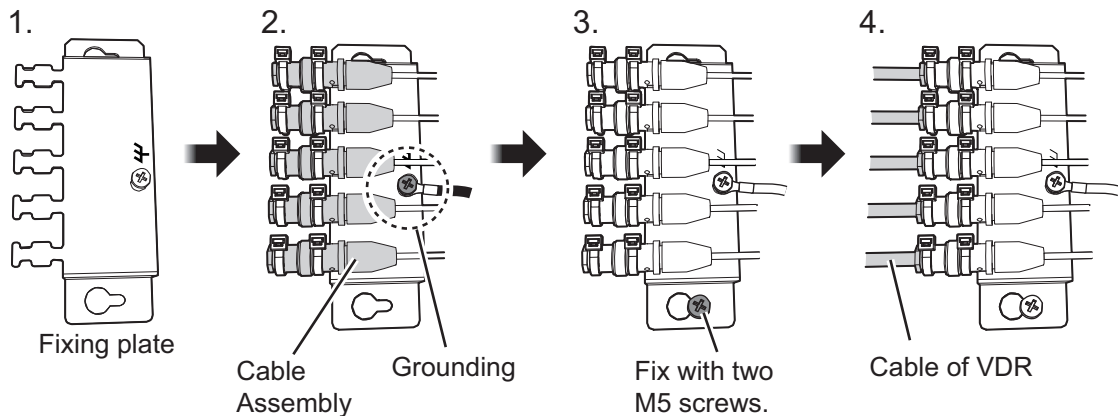
Fastening of USB connector (for C-type radars)

The USB connector of the RP board should be fastened as shown in the figure to the right. Use three cable ties (local supply) to secure the connector of the USB cable to the upper cable entrance of the processor unit.

Upper plate

Cable tie

Connector of USB cable

If there is no extra space on the cable entrance of the processor unit and you can not secure the cable connector, pass the USB cable next to the thinnest cable (cable entrance with the most room to spare), then pull the USB connector towards the front of the processor unit. Place the USB cable beneath the other cables to prevent water intrusion into the USB cable. Secure the USB cable to the neighboring cable with the supplied cable ties.

USB entry
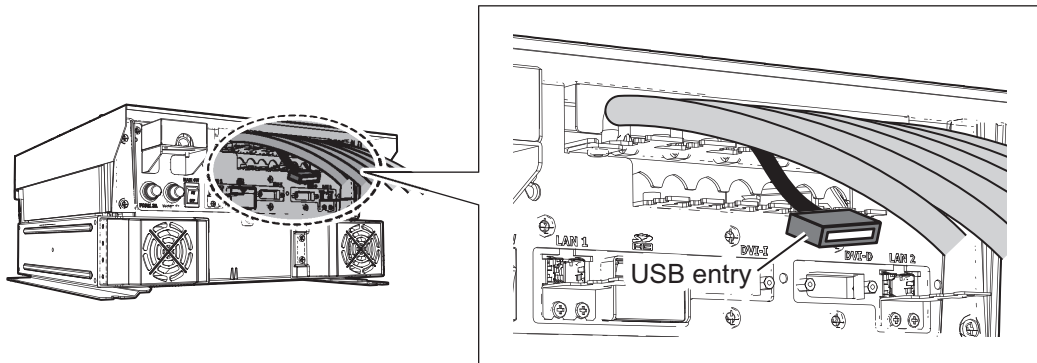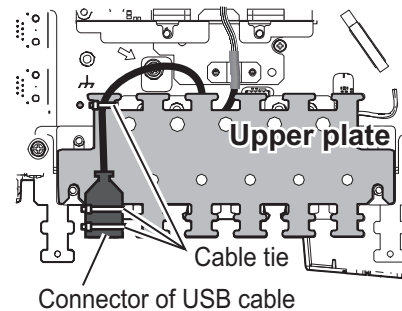
2.9 Monitor Unit

For the wiring of the monitor unit, see the operator's manual supplied with the monitor unit.

Mounting considerations

- Standard type
  - Connect the radar main monitor to the DVI1.
  - Connect the sub radar monitor to the DVI2.
- VDR connection
  To connect a VDR, it is necessary to output data in analog format. To connect a VDR to the DVI-I port, use the optional DVI-BNCX5+GND-L2.0 cable to output the RGB signal from the DVI-I. See the operator's manual supplied with the VDR. Adjustment of the output is necessary.

Menu Setting

The [INSTALLATION SETTING] menu appears only when the power is turned on for the first time after installation of the monitor unit.
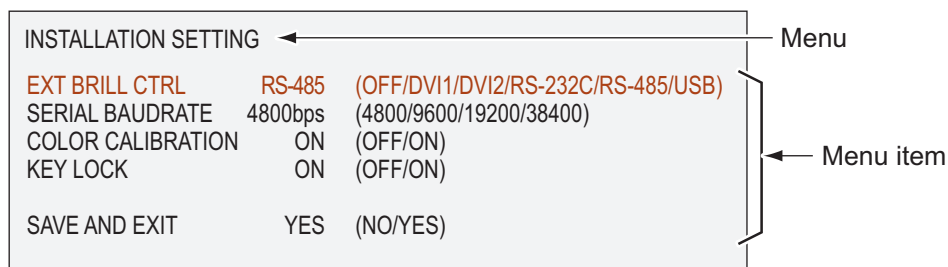
Adjust the settings referring to the following table.

EXT BRILL CTRL	COLOR CALIBRATION	KEY LOCK	DVI PWR SYNC*
DVI	OFF	ON	ON

*: [DVI PWR SYNC] is the slide switch at the bottom rear of the monitor unit. Confirm that this switch is set to [ON] (default setting). See Slide switch below for details.

Slide switch

Set the slide switch to "ON" (default setting). This setting automatically powers the monitor unit on or off according to the DVI signal input. The power switch of the monitor unit is inoperative.

Note: The OFF position provides control of the monitor unit power with the power switch of the monitor unit.
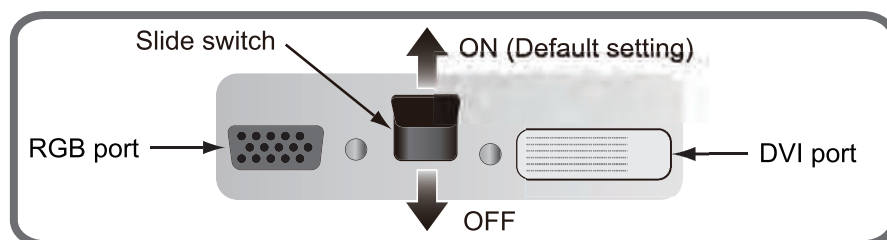
How to open the [INSTALLATION SETTING] menu

Turn off the monitor unit. While you hold the **DISP** key, press the **BRILL** key to turn on the monitor unit. Keep the **DISP** key pressed until the [INSTALLATION SETTING] menu appears.

Note: When the [DVI PWR SYNC] slide switch is ON, turn on the connected external equipment while you press the **DISP** key to turn on the monitor unit.