FURUNO

Installation Manual
CHART RADAR

Model FAR-3015/3210(-BB)/3310/3025/3220(-BB)/3320/ FAR-3220W-BB/3320W/3035S/3230S(-BB)/3330S/ FAR-3230SW-BB/3330SW/3035S-NXT/3230S-SSD(-BB)/ FAR-3330S-SSD/3025-NXT/3220-NXT(-BB)/3320-NXT

(Product Name: Marine Radar)

This manual provides the installation procedures for this equipment. For the initial settings, see the following document.

- For the [Common Installation Setting] menu: See the Instruction Manual (TIE-36162/36940).
- For other initial setting menu: See the Adjustment Manual (AME-36162/36940).

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(MOHA) FAR-3000series

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SAFETY INSTRUCTIONS

The installer of the equipment must read the applicable safety instructions before attempting to install the equipment.

DANGER	Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

Warning, Caution Prohibitive Action Mandatory Action

DANGER

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 antenna mast.

WARNING

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

Only qualified personnel are allowed to work inside the equipment.

Construct a suitable service platform from which to install the antenna unit.
Serious injury or death can result if someone falls from the radar antenna 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.

WARNING

Be sure that the power supply is compatible with the voltage rating of the equipment.
Connection of an incorrect power supply can cause fire or damage the equipment.

Use only the specified power cable.
Fire or damage to the equipment can result if a different cable is used.

Do not install the monitor unit, processor unit, power supply unit (PSU), or control unit in a dusty environment, or one where the units may get wet from rain or water splash.
Dust or water in the units can result in fire, electrical shock, or damage to the equipment.

Attach protective earth securely to the ship's body.
The protective earth (grounding) is required for the AC power supply to prevent electrical shock.

⚠ WARNING

Radio Frequency Radiation Hazard

The radar antenna emits electromagnetic radio frequency (RF) energy that 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 level of 100, 50 and 10 W/m² are given in the table below.

Magnetron radar

Radar model	Transceiver	Magnetron	Antenna*	100 W/m²	50 W/m²	10 W/m²
FAR-3015	RTR-131 (12 kW)	FNE1201	XN12AF	0.25 m	0.73 m	4.2 m
			XN20AF	0.17 m	0.42 m	2.6 m
			XN24AF	N/A	0.28 m	1.73 m
FAR-3210/ FAR-3210-BB/ FAR-3310	RTR-105 (12 kW)		XN12CF	0.6 m	1.4 m	4.4 m
			XN20CF	0.4 m	0.9 m	3.0 m
			XN24CF	0.3 m	0.6 m	2.5 m
FAR-3025	RTR-132 (25 kW)	MG5436	XN12AF	0.82 m	1.8 m	8.84 m
			XN20AF	0.51 m	0.93 m	5.76 m
			XN24AF	0.3 m	0.7 m	4.01 m
FAR-3220/ FAR-3220-BB/ FAR-3320	RTR-106 (25 kW)		XN12CF	1.3 m	2.7 m	9.5 m
			XN20CF	1.0 m	1.7 m	6.8 m
			XN24CF	0.7 m	1.3 m	5.5 m
FAR-3220W-BB/ FAR-3320W	RTR-108 (25 kW)	MG5436	XN20CF	0.5 m	1.2 m	5.5 m
			XN24CF	0.3 m	0.9 m	4.0 m
FAR-3035S/ FAR-3230S/ FAR-3230S-BB/ FAR-3330S	RTR-107 (30 kW)	MG5223F	SN24CF	1.7 m	2.4 m	3.8 m
			SN30CF	1.4 m	2.1 m	3.4 m
			SN36CF	N/A	0.5 m	4.6 m
FAR-3230SW-BB/ FAR-3330SW	RTR-109 (30 kW)	MG5223F	SN36CF	N/A	0.26 m	2.3 m

Solid state radar

Radar model	Transceiver	Antenna*	100 W/m²	50 W/m²	10 W/m²
FAR-3035S-NXT/ FAR-3230S-SSD/ FAR-3230S-SSD-BB/ FAR-3330S-SSD	RTR-111 (250 W)	SN24CF	N/A	N/A	N/A
		SN30CF	N/A	N/A	N/A
		SN36CF	N/A	N/A	1.0 m
FAR-3025-NXT/ FAR-3220-NXT/ FAR-3220-NXT-BB/ FAR-3320-NXT	RTR-123 (600 W**)	XN12CF	0.3 m	0.7 m	3.3 m
		XN20CF	0.24 m	0.32 m	1.9 m
		XN24CF	0.19 m	0.29 m	1.6 m

*: The following numerical values, shown in the antenna types, indicate antenna length.
[12]: 4 ft, [20]: 6.5 ft, [24]: 8 ft, [30]: 10 ft, [36]: 12 ft

**: 500 W for a Japanese flag vessel.

⚠ CAUTION

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

Unit		Standard compass	Steering compass
Antenna Unit (X-band, TR-UP, 12 kW, magnetron radar)	CF Antenna	2.15 m	1.40 m
	AF Antenna	1.80 m	1.20 m
Antenna Unit (X-band, TR-UP, 25 kW, magnetron radar)	CF Antenna	2.45 m	1.60 m
	AF Antenna	2.30 m	1.45 m
Antenna Unit (X-band, TR-UP, solid state radar)		1.15 m	0.70 m
Antenna Unit (S-band, TR-UP, magnetron radar)		3.05 m	1.90 m
Antenna Unit (S-band, TR-UP, solid state radar)		1.90 m	1.20 m
Antenna Unit (X-band, TR-DOWN)		1.90 m	1.20 m
Antenna Unit (S-band, TR-DOWN)		1.55 m	0.95 m

Note: For more information, please refer to IMO SN/Circ.271 “Guidelines for the installation of shipborne radar equipment.”

*: If the internal CPU board is ADP-556, the compass safe distances are 2.40 m for standard compass, and 1.55 m for steering compass. The CPU board type can be found in the [System 1] tab in the [About] window.

Unit	Standard compass	Steering compass
Processor Unit (EC-3000*/EC-3005)	2.65 m	1.70 m
Monitor Unit (MU-190)	1.65 m	1.05 m
Monitor Unit (MU-192)	0.70 m	0.45 m
Monitor Unit (MU-231)	0.85 m	0.55 m
Monitor Unit (MU-270W)	0.90 m	0.55 m
Monitor Unit (HD19T22-FUD-MA4-FAGA)	0.90 m	0.45 m
Monitor Unit (JH23T14-FUD-MR4-AOAA)	1.10 m	0.70 m
ECDIS Control Unit (RCU-024)	0.30 m	0.30 m
Radar Control Unit (RCU-025)	0.30 m	0.30 m
Trackball Control Unit (RCU-026)	0.30 m	0.30 m
Power Supply Unit (PSU-014)	2.20 m	1.40 m
Power Supply Unit (PSU-015)	1.45 m	0.90 m
Power Supply Unit (PSU-016)	1.90 m	1.20 m
Power Supply Unit (PSU-018)	1.80 m	1.15 m
Transceiver Unit (RTR-108)	2.00 m	1.25 m
Transceiver Unit (RTR-109)	4.50 m	2.90 m
Intelligent HUB (HUB-3000)	1.20 m	0.75 m
Switching HUB (HUB-100)	1.00 m	0.60 m
Junction Box (RJB-001)	1.10 m	0.70 m

⚠ CAUTION

Follow the instructions in this manual to ensure correct installation and connection with all related equipment.

⚠ CAUTION

Install the antenna in a location accessible only to authorized technicians, such as a radar mast, etc.

SYSTEM CONFIGURATION

NOTICE

The radar(s) must be interconnected to the following type approved sensors:

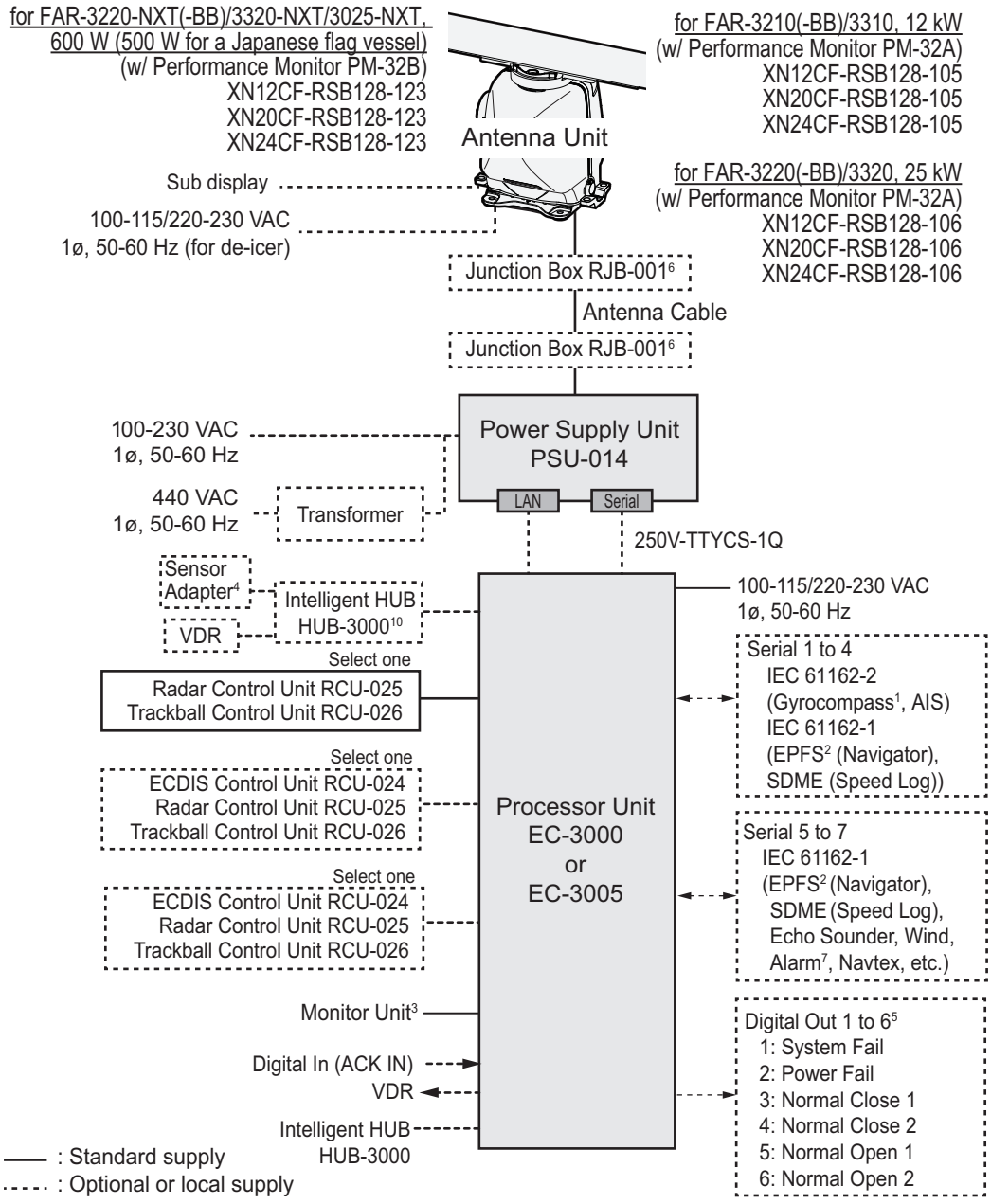
- **EPFS meeting the requirements of the IMO resolution MSC.112(73).**
- **Gyrocompass meeting the requirements of the IMO resolution A.424(XI).**
- **SDME meeting the requirements of IMO resolution MSC.96(72).**

The radar may be interconnected via HUB-3000 to other FURUNO processing units having approved LAN ports.

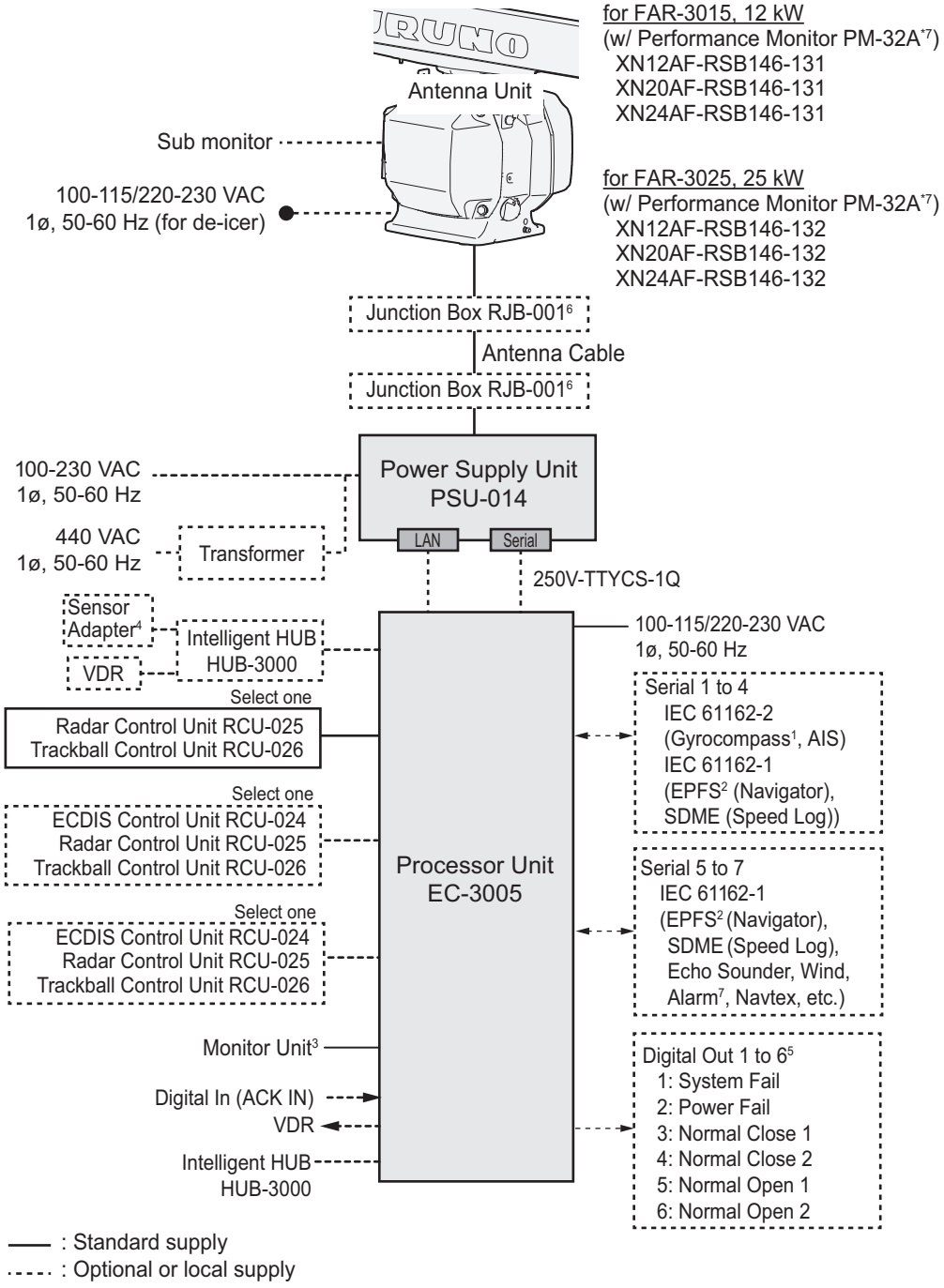
Standard connection

Basic configuration is shown with solid line. For footnotes, see "Notes" on page ix.

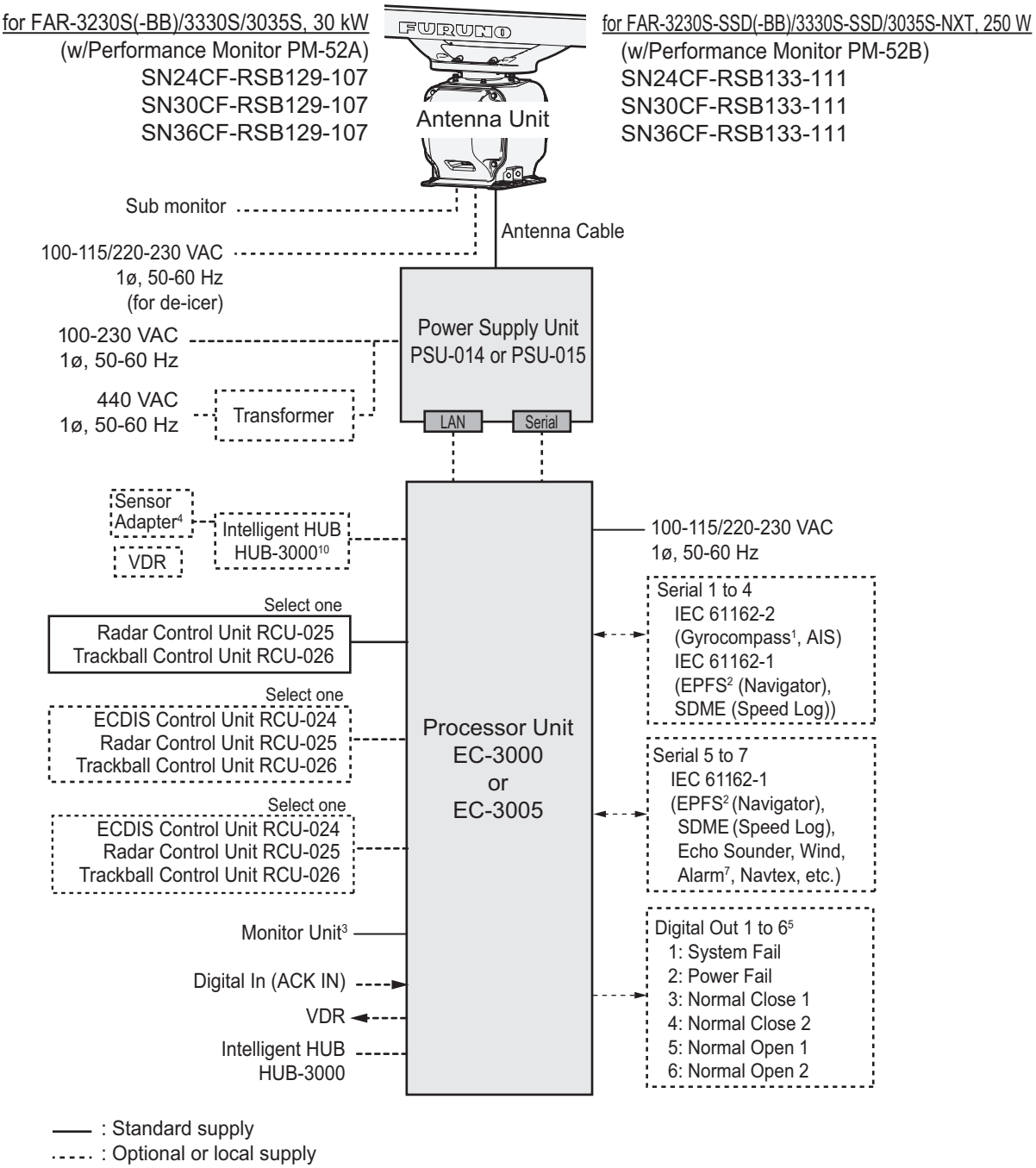
X-band (TR-UP, CF antenna)



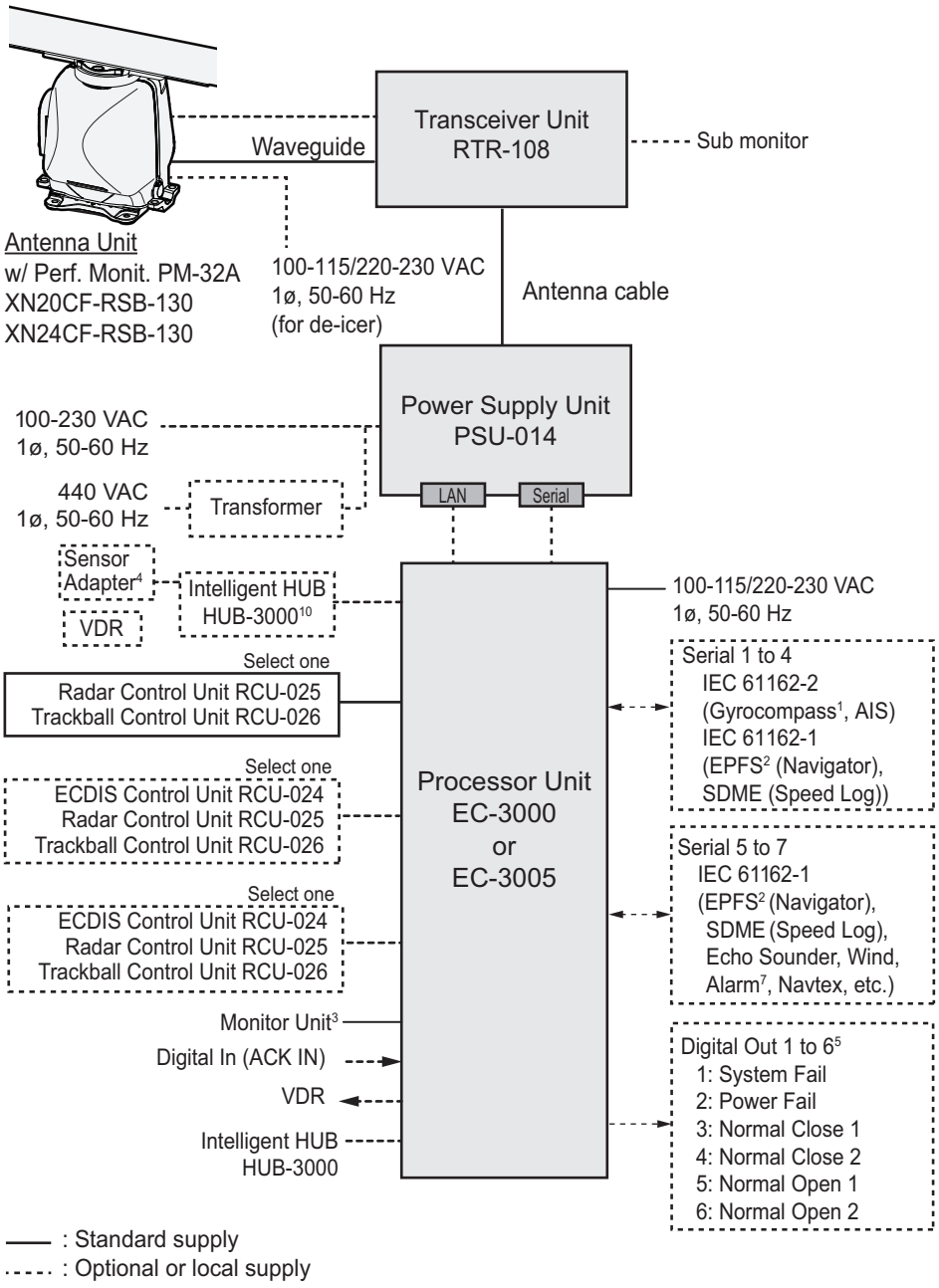
X-band (TR-UP, AF antenna)



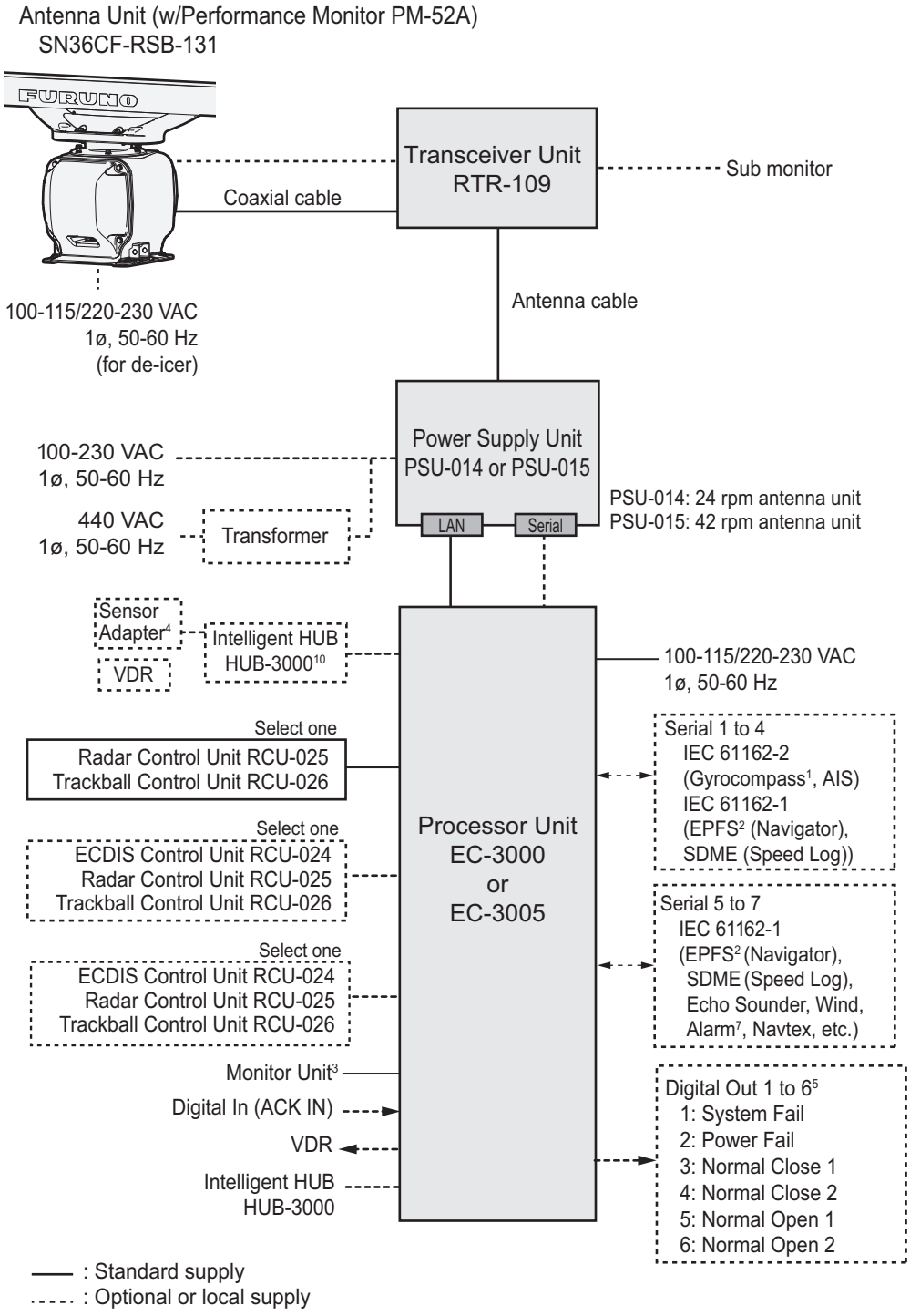
S-band (TR-UP)


for FAR-3230S(-BB)/3330S/3035S, 30 kW
(w/Performance Monitor PM-52A)
SN24CF-RSB129-107
SN30CF-RSB129-107
SN36CF-RSB129-107
for FAR-3230S-SSD(-BB)/3330S-SSD/3035S-NXT, 250 W
(w/Performance Monitor PM-52B)
SN24CF-RSB133-111
SN30CF-RSB133-111
SN36CF-RSB133-111
Antenna Unit
Sub monitor
Antenna Cable
100-115/220-230 VAC
1ø, 50-60 Hz
(for de-icer)
100-230 VAC
1ø, 50-60 Hz
440 VAC
1ø, 50-60 Hz
Transformer
Power Supply Unit
PSU-014 or PSU-015
LAN
Serial
Sensor Adapter4
VDR
Intelligent HUB
HUB-30001O
100-115/220-230 VAC
1ø, 50-60 Hz
Select one
Radar Control Unit RCU-025
Trackball Control Unit RCU-026
Serial 1 to 4
IEC 61162-2
(Gyrocompass1, AIS)
IEC 61162-1
(EPFS2 (Navigator),
SDME (Speed Log))
Select one
ECDIS Control Unit RCU-024
Radar Control Unit RCU-025
Trackball Control Unit RCU-026
Processor Unit
EC-3000
or
EC-3005
Serial 5 to 7
IEC 61162-1
(EPFS2 (Navigator),
SDME (Speed Log),
Echo Sounder, Wind,
Alarm7, Navtex, etc.)
Select one
ECDIS Control Unit RCU-024
Radar Control Unit RCU-025
Trackball Control Unit RCU-026
Monitor Unit3
Digital In (ACK IN)
VDR
Intelligent HUB
HUB-3000
Digital Out 1 to 65
1: System Fail
2: Power Fail
3: Normal Close 1
4: Normal Close 2
5: Normal Open 1
6: Normal Open 2
: Standard supply
: Optional or local supply

X-band (TR-DOWN)



S-band (TR-DOWN)



Notes

1) The gyrocompass must be type approved for compliance with IMO resolution A.424(XI) (and/or resolution A.821(19) for installation on HSC). The gyrocompass must also have an update rate that is adequate for the ship's rate of turn. The update rate must be better than 40 Hz (HSC) or 20 Hz (conventional vessel).
2) The EPFS must be type approved for compliance with IMO resolution MSC.96(72).
3) The monitors listed in the following table have been approved by the IMO.
   If a different monitor is to be used on IMO vessels, its effective diameter must meet the applicable Category requirements.
   - CAT 1C and CAT 1HC: effective diameter of 320 mm or higher
   - CAT 2C and CAT 2HC: effective diameter of 250 mm or higher

Compatible approved monitors

Category	Maker	Model	Viewing distance
CAT 1C and CAT 1HC	FURUNO	MU-231	1.02 m
		MU-231CE	1.02 m
		MU-270W	1.02 m
	Hatteland Technology	JH23T12FUD*	1.02 m
		JH23T14FUD	1.01 m
		HD26T22 FUD	0.99 m
		HD26T21 MMD	0.99 m
		HD27T22 FUD	1.07 m
		HD32T22 FUD	1.15 m
		HD55T22 FUD	1.95 m
	North Invent	WA270-01.MON.01	1.07 m
		WE270FU**	1.07 m
		WA460-01.MON.01	1.64 m
CAT 2C and CAT 2HC	FURUNO	MU-190	1.02 m
		MU-192***	1.02 m
		MU-201CE	1.08 m
	Hatteland Technology	JH19T14FUD	1.02 m
		JH20T17FUD	0.88 m
		HD19T22FUD	1.01 m
		HD24T22FUD	0.86 m

   *: For use with radar only; do not use for Back-up ECDIS.
   **: CCS approved only (Not approved MED). When WE270FU is used with FAR-30x5, the equipment is non-compliant with both CCS and MED.
   ***: Non-compliant with the HK certification (as of February 2025).
   For installation and operation of other monitors, see the respective manuals.
   For BB types, a monitor unit is prepared by the user.
4) The sensor adapters are Control Serial MC-3000S, Analog IN MC-3010A, Digital IN MC-3020D and Digital OUT MC-3030D.
5) Characteristics of contact output for Alarm:
   - (Load current) 250 mA
   - (Polarity) Normally Open: 2 ports, Normally Close: 2 ports
   - Serial I/O for alarm is also possible, which complies with IEC 61162-1.
6) Junction boxes are required for antenna cable length greater than 100 m. Max. cable length is 400 m.

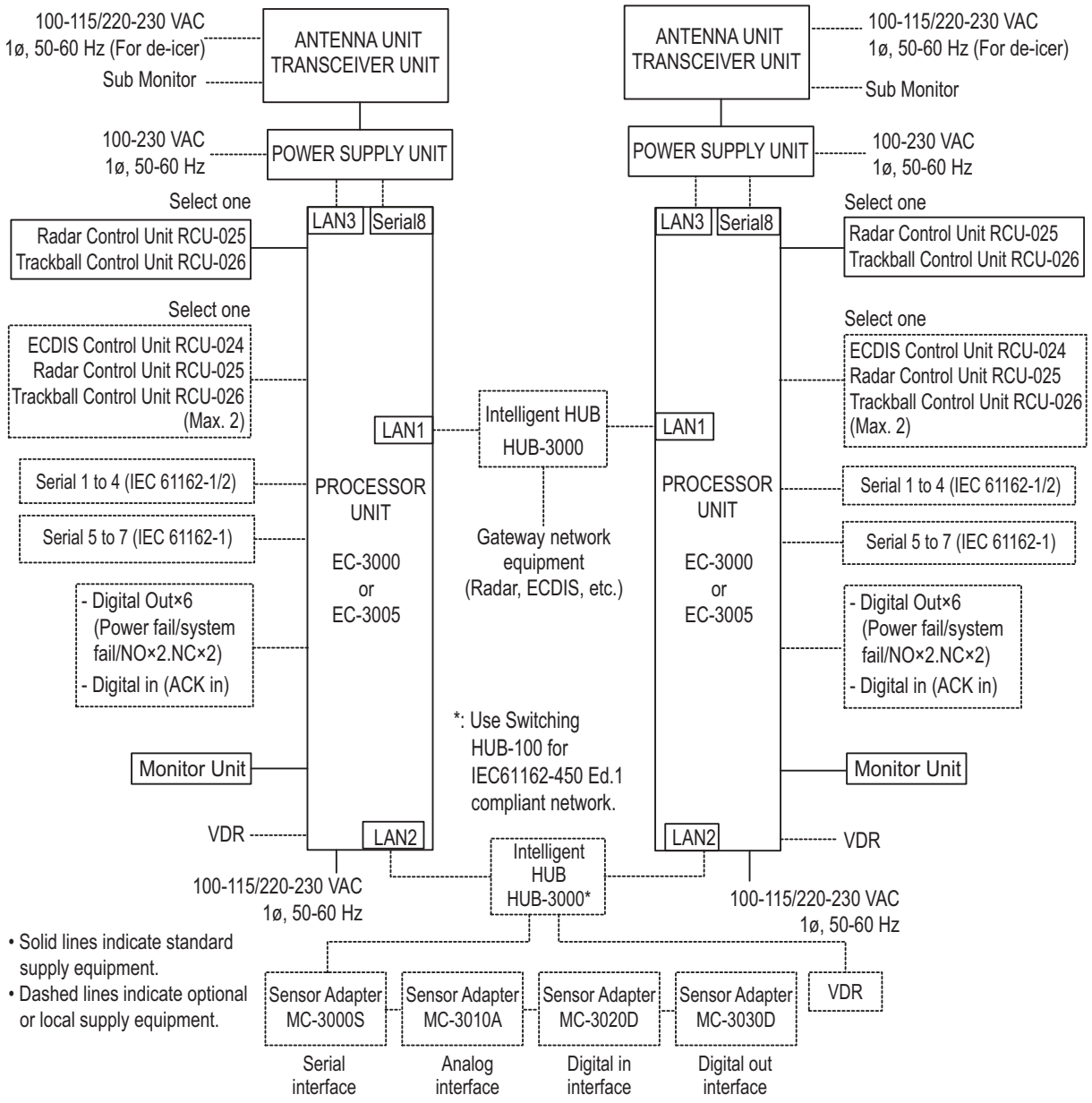
7) The ALR format is not BAM-compliant and shall not be used for new installation. It may be used for retrofitting on ships-in-operation only.
8) When using this unit as a Back-up ECDIS, the setup of the Back-up ECDIS must be completed by a FURUNO approved service engineer.
9) When setting up Operator Fitness and connecting this unit to the BNWAS, ensure the Monitor Unit and Control Unit are installed on the bridge where proper look-out can be carried out.
10) For FAR-3xx0 series radar, you can use switching HUB (HUB-100) for connection to a IEC61162-450 Ed.1 network.

Category of units

Antenna units: Exposed to the weather
Other units: Protected from the weather

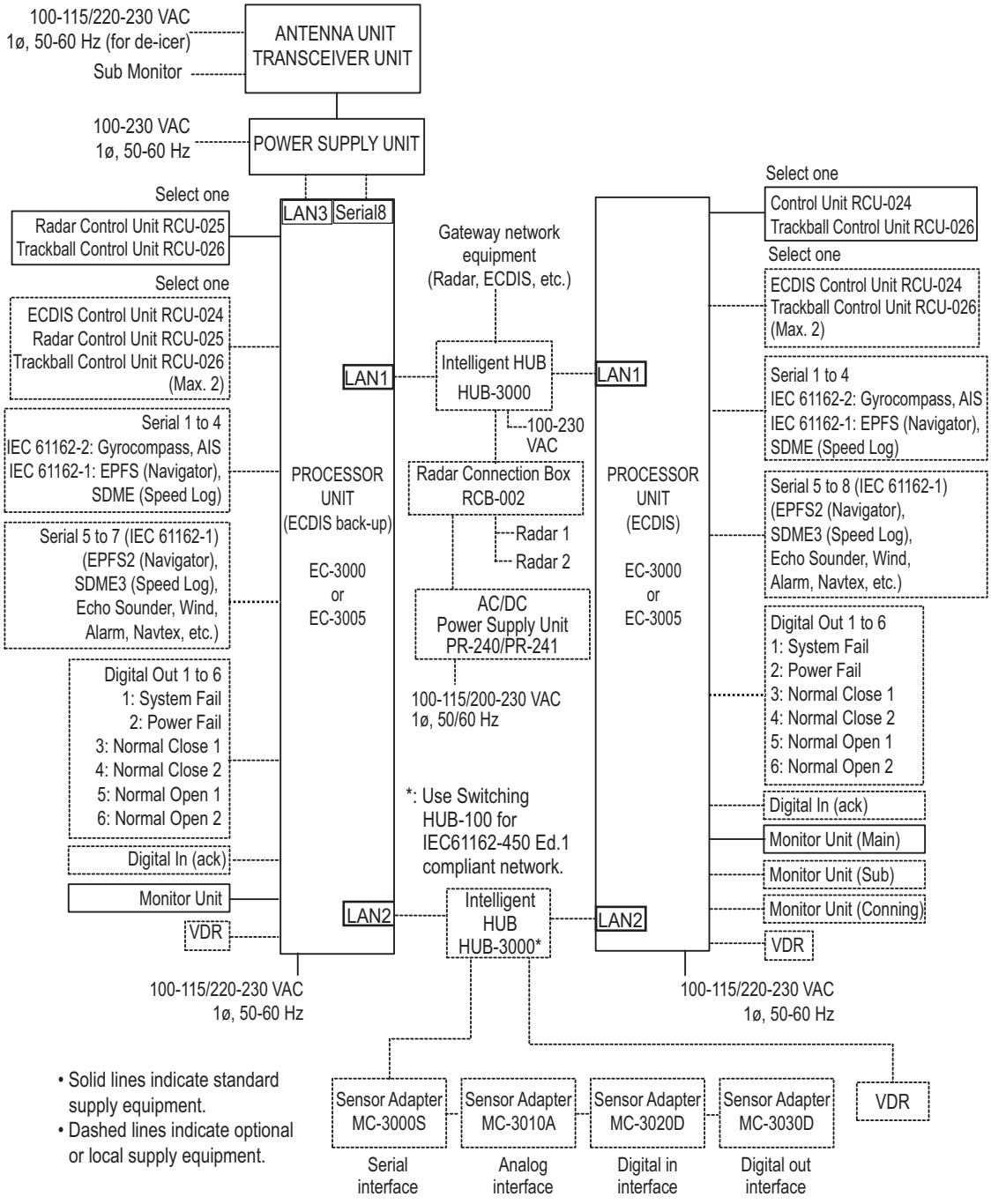
Interswitch connection

When multiple radars are used, connect the units as shown in the figure below. This configuration lets each radar as a standalone radar in case of HUB malfunction.



Back-up ECDIS connection

When setting up the radar as a ECDIS back-up, connect the radar and main ECDIS unit as shown in the figure below.

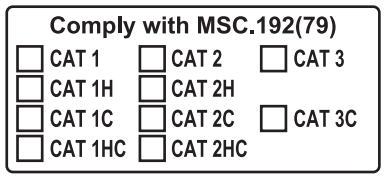


Radar Component Combinations

RADAR MODEL	ANTENNA UNIT	TRANSCEIVER UNIT	POWER SUPPLY UNIT
FAR-3x10 FAR-3x20	XN12CF-RSB-128 XN20CF-RSB-128 XN24CF-RSB-128	RTR-105	PSU-014
		RTR-106	
FAR-3x20-NXT FAR-3025-NXT		RTR-123	
FAR-3015	XN12AF-RSB-146 XN20AF-RSB-146 XN24AF-RSB-146	RTR-131	
FAR-3025		RTR-132	
FAR-3x20W	XN20CF-RSB-130 XN24CF-RSB-130	RTR-108	
FAR-3x30S FAR-3035S	SN24CF-RSB-129 SN30CF-RSB-129 SN36CF-RSB-129	RTR-107	PSU-014 PSU-015
FAR-3x30SW	SN36CF-RSB-131	RTR-109	
FAR-3x30S-SSD FAR-3035S-NXT	SN24CF-RSB-133 SN30CF-RSB-133 SN36CF-RSB-133	RTR-111	PSU-016 PSU-018

About the category sticker

This radar meets the requirements in IEC62388 (Marine navigation and radiocommunication equipment and systems-Shipborne radar-Performance requirements, method of testing and required test results). Check the appropriate box on the sticker which is pre-attached to the processor unit, according to your radar's specification. Refer to the table shown below to confirm your category.



Sticker for category

Category	Radar type	ANT. rotation speed
CAT 1C	FAR-3310, FAR-3320, FAR-3330S, FAR-3330S-SSD, FAR-3320W, FAR-3330SW	24 rpm
CAT 1HC	Same models as above	42 rpm
CAT 2C	FAR-3210(-BB), FAR-3220(-BB), FAR-3230S(-BB), FAR-3230S-SSD(-BB),FAR-3220W-BB, FAR-3230SW-BB	24 rpm
CAT 2HC	Same models as above	42 rpm

Note: For FAR-30x5 radars, select the radar category depends on the installed monitor.

EQUIPMENT LISTS

Standard supply

<X-band TR-UP>

- Magnetron radar (CF antenna): FAR-3210(-BB)/3220(-BB)/3310/3320
- Magnetron radar (AF antenna): FAR-3015/3025
- Solid state radar: FAR-3220-NXT(-BB)/3320-NXT/3025-NXT

Name	Type	Code No.	Qty	Remarks
Antenna Unit (Magnetron radar, CF antenna)	XN12CF-RSB128-105	-	1	4 ft
	XN12CF-RSB128-106	-		
	XN20CF-RSB128-105	-		6.5 ft
	XN20CF-RSB128-106	-		
	XN24CF-RSB128-105	-		8 ft
	XN24CF-RSB128-106	-		
Antenna Unit (Magnetron radar, AF antenna)	XN12AF-RSB146-131	-		4 ft
	XN12AF-RSB146-132	-		
	XN20AF-RSB146-131	-		6.5 ft
	XN20AF-RSB146-132	-		
	XN24AF-RSB146-131	-		8 ft
	XN24AF-RSB146-132	-		
Antenna Unit (Solid state radar)	XN12CF-RSB128-123	-		4 ft
	XN20CF-RSB128-123	-		6.5 ft
	XN24CF-RSB128-123	-		8 ft
Processor Unit	EC-3000	-	1	
	EC-3005	-		
Monitor Unit	MU-190	-	1	19-inch monitor for AC power
	MU-192	-		19-inch monitor for AC power (standard only for FAR-3015/ FAR-3025/FAR-3220-NXT/ FAR-3025-NXT)
	MU-231	-		23.1-inch monitor
	MU-270W	-		27-inch monitor
	HD19T22-FUD-MA4-FAGA	-		19-inch monitor for FAR-3220-NXT (HK configuration only)
	JH23T14-FUD-MR4-AOAA	-		23-inch monitor for FAR-3320/ 3320-NXT (HK configuration only)
Control Unit	RCU-025	-	1	Standard type
	RCU-026	-		Trackball type
Power Supply Unit	PSU-014	-	1	

Name	Type	Code No.	Qty	Remarks
Installation Materials	CP03-35201	001-249-860	1	For radiator
	CP03-35401	001-507-920	1	For RSB, no deicer
	CP03-35403	001-507-930		For RSB, w/deicer
	CP03-35500 [15M]	000-024-096	1	For antenna unit, 15 m
	CP03-35510 [30M]	000-024-097		For antenna unit, 30 m
	CP03-35520 [40M]	000-024-098		For antenna unit, 40 m
	CP03-35530 [50M]	000-024-099		For antenna unit, 50 m
	CP03-35301	001-249-770	1	For PSU-014
	CP24-02120	000-024-925	1	For EC-3000/3005
	CP24-02200	000-027-668	1	For RCU-025
	CP24-02300	000-027-673	1	For RCU-026
Accessories	FP24-00603	001-285-760	1	For EC-3000(FAR-V2)
	FP24-00608	001-624-400	1	For EC-3000(FAR-V5, ADP-219)
	FP24-01502	001-647-220	1	For EC-3000(FAR-V5, ADP-556)
	FP24-01402	001-628-850	1	For EC-3005 (J/HK)
	FP24-01404	001-660-320	1	For EC-3005 (E)
	FP24-00701	001-418-340	1	For RCU-025
	FP24-00801	001-418-410	1	For RCU-026
Spare Parts	SP24-00601	001-170-660	1	For EC-3000/3005 Fuse: FGMB-S 125V 10A PBF (000-157-470-10, 3 pcs.)
	SP24-00602	001-170-670	1	For EC-3000/3005 Fuse: FGMB-A 250V 5A PBF (000-157-570-10, 3 pcs.)
	SP03-17641	001-249-740	1	For PSU-014 Fuse: FGBO-A 250V 7A PBF (000-178-084-10, 2 pcs.)
	SP03-19701	001-531-630	1	For Antenna unit w/de-icer Fuse: FGBO-A 250V 3A PBF (000-155-841-10, 4 pcs.)

<S-band TR-UP>

- Magnetron radar: FAR-3230S(-BB)/3330S/3035S
- Solid state radar: FAR-3230S-SSD(-BB)/3330S-SSD/3035S-NXT

Name	Type	Code No.	Qty	Remarks
Antenna Unit (Magnetron radar)	SN24CF-RSB129-107	-	1	
	SN30CF-RSB129-107	-		
	SN36CF-RSB129-107	-		
Antenna Unit (Solid state radar)	SN24CF-RSB133-111	-		
	SN30CF-RSB133-111	-		
	SN36CF-RSB133-111	-		
Control Unit	RCU-025	-	1	Standard type
	RCU-026	-		Trackball type

Name	Type	Code No.	Qty	Remarks
Power Supply Unit (Magnetron radar)	PSU-014	-	1	For 24rpm
	PSU-015	-		For 42rpm
Power Supply Unit (Solid state radar)	PSU-016	-		For 24rpm
	PSU-018	-		For 42rpm
Processor Unit	EC-3000	-	1	
	EC-3005	-		
Monitor Unit	MU-190	-	1	19-inch monitor
	MU-192	-		19-inch monitor (standard only for FAR-3035S)
	MU-231	-		23.1-inch monitor
	MU-270W	-		27-inch monitor
	HD19T22-FUD-MA4-FAGA	-		19-inch monitor for FAR-3230S (HK configuration only)
	JH23T14-FUD-MR4-AOAA	-		23-inch monitor for FAR-3330S/ 3330S-SSD (HK configuration only)
Installation Materials	CP03-35202	001-249-880	1	For antenna
	CP03-35402	001-255-430	1	For RSB
	CP03-35404	001-270-080		For RSB (w/de-icer)
	CP03-35500	000-024-096	1	15 m cable
	CP03-35510	000-024-097		30 m cable
	CP03-35520	000-024-098		40 m cable
	CP03-35530	000-024-099		50 m cable
	CP03-35301	001-249-770	1	For PSU-014/015
	CP24-02120	000-024-925	1	For EC-3000/3005
	CP24-02200	000-027-668	1	For RCU-025
	CP24-02300	000-027-673	1	For RCU-026
Accessories	FP24-00603	001-285-760	1	For EC-3000(FAR-V2)
	FP24-00608	001-624-400	1	For EC-3000(FAR-V5, ADP-219)
	FP24-01502	001-647-220	1	For EC-3000(FAR-V5, ADP-556)
	FP24-01402	001-628-850	1	For EC-3005 (J/HK)
	FP24-01404	001-660-320	1	For EC-3005 (E)
	FP24-00701	001-418-340	1	For RCU-025
	FP24-00801	001-418-410	1	For RCU-026

Name	Type	Code No.	Qty	Remarks
Spare Parts	SP24-00601	001-170-660	1	For EC-3000/3005, Fuse: FGMB-S 125V 10A PBF (000-157-470-10, 3 pcs.)
	SP24-00602	001-170-670	1	For EC-3000/3005, Fuse: FGMB-A 250V 5A PBF (000-157-570-10, 3 pcs.)
	SP03-17641	001-249-740	1	For PSU-014, Fuse: FGBO-A 250V 7A PBF (000-178-084-10, 2 pcs.)
	SP03-17661	001-249-420	1	For PSU-016, Fuse: FGBO-A 250V 5A PBF (000-178-084-10, 2 pcs.)
	SP03-17651	001-249-750	1	For PSU-015/018, Fuse: FGBO-A 250V 7A PBF (000-178-084-10, 2 pcs.), FGBO-A 250V 3A PBF (000-155-841-10, 2 pcs.)
	SP03-19701	001-531-630	1	For Antenna unit w/de-icer, Fuse: FGBO-A 250V 3A PBF (000-155-841-10, 4 pcs.)

<X-band TR-DOWN>

- Magnetron radar: FAR-3320W/3220W-BB

Name	Type	Code No.	Qty	Remarks
Antenna Unit	XN20CF-RSB-130	-	1	6.5 ft
	XN24CF-RSB-130	-		8 ft
Transceiver Unit	RTR-108	-	1	
Processor Unit	EC-3000	-	1	
Monitor Unit	MU-231	-	1	23.1-inch monitor
	MU-270W	-		27-inch monitor
	JH23T14-FUD-MR4-AOAA	-		23-inch monitor for FAR-3320W (HK configuration only)
Control Unit	RCU-025	-	1	Standard type
	RCU-026	-		Trackball type
Power Supply Unit	PSU-014	-	1	
Installation Materials	CP03-35201	001-249-860	1	For radiator
	CP03-35500[15M]	000-024-096	1	For antenna unit, 15 m
	CP03-35510[30M]	000-024-097		For antenna unit, 30 m
	CP03-35520[40M]	000-024-098		For antenna unit, 40 m
	CP03-35530[50M]	000-024-099		For antenna unit, 50 m
	CP03-35301	001-249-770	1	For PSU-014
	CP24-02120	000-024-925	1	For EC-3000
	CP24-02200	000-027-668	1	For RCU-025
	CP24-02300	000-027-673	1	For RCU-026
	CP03-35901	001-507-940	1	No de-icer
	CP03-35902	001-507-950		With de-icer
	CP03-16410	000-086-744	1	Flexible waveguide, 20 m
	CP03-16420	000-086-745		Flexible waveguide, 30 m
	CP03-16430	000-086-746		Flexible waveguide, 50 m

Name	Type	Code No.	Qty	Remarks
Accessories	FP24-00603	001-285-760	1	For EC-3000(FAR-V2)
	FP24-00608	001-624-400	1	For EC-3000(FAR-V5, ADP-219)
	FP24-01502	001-647-220	1	For EC-3000(FAR-V5, ADP-556)
	FP24-00701	001-418-340	1	For RCU-025
	FP24-00801	001-418-410	1	For RCU-026
Spare Parts	SP24-00601	001-170-660	1	For EC-3000 Fuse: FGMB-S 125V 10A PBF (000-157-470-10, 3 pcs.)
	SP24-00602	001-170-670	1	For EC-3000 Fuse: FGMB-A 250V 5A PBF (000-157-570-10, 3 pcs.)
	SP03-17641	001-249-740	1	For PSU-014 Fuse: FGBO-A 250V 7A PBF (000-178-084-10, 2 pcs.)
	SP03-19701	001-531-630	1	For Antenna unit w/de-icer Fuse: FGBO-A 250V 3A PBF (000-155-841-10, 4 pcs.)

<S-band TR-DOWN>

- Magnetron radar: FAR-3330SW/3230SW-BB

Name	Type	Code No.	Qty	Remarks
Antenna Unit	SN36CF-RSB-131	-	1	
Transceiver Unit	RTR-109	-	1	
Processor Unit	EC-3000	-	1	
Monitor Unit	MU-231	-	1	23.1-inch monitor
	MU-270W	-		27-inch monitor
Control Unit	RCU-025	-	1	
	RCU-026	-		
Power Supply Unit	PSU-014	-	1	24 rpm
	PSU-015	-	1	42 rpm
Installation Materials	CP03-35202	001-249-880	1	For radiator
	CP03-35500[15M]	000-024-096	1	For antenna unit, 15 m
	CP03-35510[30M]	000-024-097		For antenna unit, 30 m
	CP03-35520[40M]	000-024-098		For antenna unit, 40 m
	CP03-35530[50M]	000-024-099		For antenna unit, 50 m
	CP03-35301	001-249-770	1	For PSU-014, PSU-015
	CP03-36300	000-025-573	1	Coax cable, 20 m
	CP03-36310	000-025-574		Coax cable, 30 m
	CP24-02120	000-024-925	1	For EC-3000
	CP24-02200	000-027-668	1	For RCU-025
	CP24-02300	000-027-673	1	For RCU-026
	CP03-36101	001-301-200	1	No de-icer
	CP03-36102	001-301-360		With de-icer
Accessories	FP24-00603	001-285-760	1	For EC-3000(FAR-V2)
	FP24-00608	001-624-400	1	For EC-3000(FAR-V5, ADP-219)
	FP24-01502	001-647-220	1	For EC-3000(FAR-V5, ADP-556)
	FP24-00701	001-418-340	1	For RCU-025
	FP24-00801	001-418-410	1	For RCU-026

Name	Type	Code No.	Qty	Remarks
Spare Parts	SP24-00601	001-170-660	1	For EC-3000 Fuse: FGMB-S 125V 10A PBF (000-157-470-10, 3 pcs.)
	SP24-00602	001-170-670	1	For EC-3000 Fuse: FGMB-A 250V 5A PBF (000-157-570-10, 3 pcs.)
	SP03-17641	001-249-740	1	For PSU-014 Fuse: FGBO-A 250V 7A PBF (000-178-084-10, 2 pcs.)
	SP03-17651	001-249-750	1	For PSU-015 Fuse: FGBO-A 250V 7A PBF (000-178-084-10, 2 pcs.), FGBO-A 250V 3A PBF (000-155-841-10, 2 pcs.)
	SP03-19701	001-531-630	1	For Antenna unit w/de-icer Fuse: FGBO-A 250V 3A PBF (000-155-841-10, 4 pcs.)

Console type

Name	Type	Code No.	Qty.	Remarks
Display Unit	RCN-303	-	1	For 23.1-inch monitor
	RCN-304	-		For 19-inch monitor
	RCN-527	-		For 27-inch monitor
Spare Parts	SP24-01300	000-033-340	1	For 100 VAC
	SP24-01310	000-033-341		For 220 VAC
	SP24-01320	000-033-342		For 100 VAC, including spare parts for HUB-3000
	SP24-01330	000-033-343		For 220 VAC, including spare parts for HUB-3000
	SP24-01340	000-033-344		For 100 VAC, including spare parts for HUB-3000
	SP24-01350	000-033-345		For 220 VAC, including spare parts for HUB-3000
	SP24-01360	000-033-346		For 100 VAC
	SP24-01370	000-033-347		For 220 VAC
Installation Materials	CP24-02800	000-022-443	1	For MC-3000S/3010A
	CP24-02401	001-170-350		For MC-3000S
	CP24-04401	001-462-130		For RCN-527
Accesories	FP03-12400	000-025-589	1	For RCN-303/304, EC-3000(FAR-V2)
	FP03-12410	000-038-690		For RCN-303/304, EC-3000(FAR-V5)
	FP03-12430	000-042-900		For RCN-303/304, EC-3000(Beluga)
	FP03-12420	000-042-897		For RCN-304, EC-3005(J/HK)
	FP03-13200	000-043-127		For RCN-527, EC-3005 (J/HK)

Optional supply

Name	Type	Code No.	Remarks
Sensor Adapter	MC-3000S	-	Serial type
	MC-3010A	-	Analog IN
	MC-3020D	-	Digital IN
	MC-3030D	-	Digital OUT
LAN Signal Converter	OP03-223-1	001-254-360	For RSB-133
	OP03-223-2	001-254-370	For RSB-129
	OP03-223-3	001-254-380	For RSB-128, magnetron radar
	OP03-223-4	001-569-010	For RSB-128, solid state radar
	OP03-223-5	001-631-870	For RSB-146
Cable Extension Kit	OP03-224-1	001-254-390	For RSB-133
	OP03-224-2	001-254-400	For RSB-129
	OP03-224-3	001-254-410	For RSB-128, magnetron radar
	OP03-224-4	001-569-040	For RSB-128, solid state radar
	OP03-224-5	001-631-880	For RSB-146
Retrofit Cable Kit	OP03-255-1	001-505-320	For RSB-129/133
	OP03-255-3	001-505-350	For RSB-128
Antenna Replacement Kit	OP03-272	001-631-900	For RSB-146
Program Install Software	OP03-230	001-285-780	For EC-3000(FAR-V2)
	OP03-267	001-624-440	For EC-3000(FAR-V5, ADP-556)
	OP03-276	001-647-270	For EC-3000(FAR-V5, ADP-219)
	OP03-268	001-628-940	For EC-3005 (J/HK)
	OP03-278	001-660-330	For EC-3005 (E)
Deicer Kit	OP03-226	001-254-320	For RSB-128
	OP03-227	001-254-330	For RSB-129/133
	OP03-231	001-305-060	For RSB-130
	OP03-232	001-305-070	For RSB-131
	OP03-274	001-631-920	For RSB-146
Sub Monitor Kit	OP03-273	001-631-910	For RSB-146
Switching HUB	HUB-100	-	
Intelligent HUB	HUB-3000	-	
Control Unit	RCU-026	-	Trackball type
	RCU-024	-	ECDIS standard type
Monitor Unit	MU-190	-	19-inch monitor
	MU-192	-	19-inch monitor
	MU-231	-	23.1-inch monitor
	MU-270W	-	27-inch monitor
	HD19T22-FUD-MA4-FAGA	-	19-inch monitor
Bracket Assembly	OP26-5	000-016-270	For MU-190
	OP26-48	000-043-860	For MU-192
	OP26-21	001-139-310	For Bracket for MU-190 connection.
	OP26-53	001-662-500	For Bracket for MU-192 connection.
	OP26-15	001-116-730	For MU-231
	OP26-30	001-439-060	For MU-270W

Name	Type	Code No.	Remarks
Hood Assembly	OP26-6	001-080-930	For MU-190/192
	OP26-16	001-116-740-01	For MU-231
Hood Assembly (Rear)	OP26-33	001-439-110	For MU-270W
Hood(19) Assembly	OP26-24	001-139-370	For MU-190
	OP26-51	001-661-360	For MU-192
Flush Mount Kit	OP26-12	001-116-280	For MU-190
	OP26-17	001-116-750	For MU-231
	OP26-13	001-116-290	For 2 units of MU-190/192
	OP26-14	001-116-300	For 3 units of MU-190/192
Flush Mount Assembly (Rear)	OP26-31	001-439-070	For MU-270W
Connection Stand (19)	OP24-25	001-171-800	For FAR-3xx5/RCU-024
	OP26-20	001-139-300	For MU-190/192
Connection Stand (27)	OP26-34	001-462-860	For MU-270W
Monitor Replacement Kit	OP26-22	001-139-320	For MU-190, flush mouning
	OP26-23	001-139-360	For MU-190, desk top mounting
	OP26-26	001-139-390	For MU-190, Hood mounting
	OP26-49	001-661-300	For MU-192, flush mouning
	OP26-50	001-661-340	For MU-192, desk top mounting
	OP26-52	001-661-380	For MU-192, Hood mounting
Handgrip Assembly	FP03-09840	008-535-570	For MU-190/270W
Frame	OP26-43	001-659-800	For HD19T22-FUD-MA4-FAGA
Connection Base	OP26-44	001-659-810	
Table Mount Bracket	OP26-45	001-659-820	
Hood 19	OP26-46	001-659-830	
Hood 19	OP26-47	001-659-840	
Cable Assembly	OP24-32	001-188-300	USB cable between processor unit and control unit
Terminal Opener	OP24-33	001-188-850	
Transformer Unit	RU-1803	-	
	RU-3305	-	
	RU-5693	-	
	RU-6522	-	
	RU-5466-1	-	
Junction Box	RJB-001	000-083-355	
LAN Cable Assy.	MOD-Z072-050+	001-167-890-10	
AC/DC Power Supply Unit	PR-240	-	
	PR-241	-	
Ferrite Core	OP86-11	001-594-450	For PR-241
IPX2 Kit	OP24-23	001-171-780	For processor unit
Case Gasket (Serial)	OP24-28	001-169-970	For MC-3000S
Case Gasket (Analog)	OP24-29	001-169-960	For MC-3010/3020/3030

Name	Type	Code No.	Remarks
Installation Materials	CP03-28900(10M)	000-082-658	LAN cable for sensor adapter
	CP03-28910(20M)	000-082-659	
	CP03-28920(30M)	000-082-660	
Installation Materials	CP24-02900(10M)	001-208-050	LAN cable for HUB-3000
	CP24-02910(20M)	001-208-060	LAN cable for HUB-3000
	CP24-02920(30M)	001-208-040	LAN cable for HUB-3000
Connector	CP03-28901	008-542-460	
Crimping Tool	CRIMPFOX 10S	001-206-920	For sensor adapters
Control Unit Replacing Kit	OP24-31	001-181-700	For RCU-024/025
Cable Assy.	DVI-D/D S-LINK 5M	001-132-960-10	Between processor unit and monitor unit, 5 m
	DVI-D/D S-LINK 10M	001-133-980-10	Between processor unit and monitor unit MU-190/192, 10 m
Cable Assy.	DSUB9P-X2-L5M	001-188-260	For monitor unit, 5 m
	DSUB9P-X2-L10M	001-188-270	For monitor unit, 10 m
Cable Assy.	DSUB9P-X2-L5M-WP	001-207-890	For monitor unit, 5 m, waterproof type
	DSUB9P-X2-L10M-WP	001-207-900	For monitor unit, 10 m, water-proof type
Cable Assy.	DSUB9P-X2-A-L5M	001-252-580	Brightness control cable for monitor unit, 5 m
	DSUB9P-X2-A-L10M	001-252-590	Brightness control cable for monitor unit, 10 m
Cable Assy.	6TPSH-XH12X2-L5.0SP1	001-186-260-10	For RCU-025, 5 m
	6TPSH-XH12X2-L10SP1	001-186-270-10	For RCU-025, 10 m
	6TPSH-XH12X2-L20SP1	001-186-280-10	For RCU-025, 20 m
	6TPSH-XH12X2-L30SP1	001-186-290-10	For RCU-025, 30 m
	6TPSH-XH12X2-L5.0SP2	001-186-310-10	For RCU-026, 5 m
	6TPSH-XH12X2-L10SP2	001-186-320-10	For RCU-026, 10 m
	6TPSH-XH12X2-L20SP2	001-186-330-10	For RCU-026, 20 m
	6TPSH-XH12X2-L30SP2	001-186-340-10	For RCU-026, 30 m
Cable	MC1.5-W-L600	001-187-470-10	Between sensor adapters, 0.6 m
	MC1.5-W-L1000	001-187-480-10	Between sensor adapters, 1 m
	MC1.5-W-L2000	001-187-490-10	Between sensor adapters, 2 m
	MC1.5-W-L3000	001-187-500-10	Between sensor adapters, 3 m

Name	Type	Code No.	Remarks
Signal Cable Assy.	S03-92-15(8P)	001-259-890	For sub monitor, RW-00136, 15 m
	S03-92-30(8P)	001-259-900	For sub monitor, RW-00136, 30 m
	S03-92-40(8P)	001-259-910	For sub monitor, RW-00136, 40 m
	S03-92-50(8P)	001-259-920	For sub monitor, RW-00136, 50 m
Rectangular Guide Clamp	OP03-148	008-477-540	For X-band TR-DOWN radar
FR-9Termination	FR-9-00	001-102-740	
Waveguide Drain	03-009-0360-0	300-903-600	
H-type Wave-guide Clamp	CP03-00600-W	008-198-420	
Waveguide E-Bend	RWA-1030 B107	001-304-640	
Waveguide Twisted	RWA-1050 C-109	001-304-660	
Thru-deck Cable Gland	CP03-00702	008-197-350	For S-band TR-DOWN radar
Cable Clamping Fixture	03-011-3228	001-074-670-10	
Waveguide Tool	BSH-15279	000-192-229-10	For TR-DOWN radar
Dust Cover	03-163-7271	001-121-230-10	
	26-007-1201	001-116-260-10	For MU-190/192
Spare Parts	SP24-00801 (BOX)	001-235-320	For HUB-3000
Antenna Reinforcement Kit	OP03-257	001-507-730	
Wave Analyzer Software	WV-100	001-562-500	
	WV-100ST	001-562-510	With SEA-TRIAL mode.
SSD Replacement Kit	OP03-264	001-576-910	
PM Modification Kit	OP03-265	001-585-810	
Lubrication Kit	OP03-229	001-276-430	For Japan only, RSB-128/129/ 130/131/133,
Glass Fixing Kit	OP26-39	001-567-000	For MU-190/192 For flush mounting (fixed at rear)/ tabletop mounting
	OP26-40	001-567-010	For MU-190/192 For flush mounting (fixed at front)
Operator’s Manual	OME-36160-*	-	Hard copy English manual, for software version 05.**
	OMJ-36160-*	-	Hard copy Japanese manual, for software version 05.**
	OME-36162-*	-	Hard copy English manual, for software version 02.**
	OMJ-36162-*	-	Hard copy Japanese manual, for software version 02.**
	OMC-36181-*	-	Wave Analyzer Software manual, English/Japanese

Name	Type	Code No.	Remarks
Magnetron Replacement Instruction Manual	E32-01306-*	-	Hard copy manual, English
	J32-01306-*	-	Hard copy manual, Japanese

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1. INSTALLATION

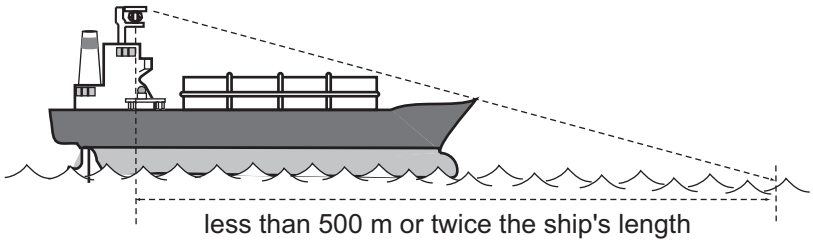
NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.
Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

1.1 Antenna Unit (X-band Radar)

1.1.1 Installation 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 in an elevated position to permit maximum target visibility.
- A line of sight from the antenna unit to the bow of the ship must hit the surface of the sea in not more than 500 m or twice the ship's length, depending whichever value is smaller, for all load and trim conditions.



- BS/CS broadcast equipment may be subject to interference from radar waves. For BS/CS antenna installation, adjust the height and installation position of the BS/CS antenna to avoid interference from radars.
- Install the antenna unit so that any blind sectors caused by objects (mast, etc.) are kept to a minimum. A blind sector must not exist in arc of the horizon from right ahead to 22.5° aft of the beam to either side (see the figure below). Also, individual blind sectors of more than 5°, or the total arc of both blind sectors of more than 20°, must not occur in the remaining arc (Figure 2). Note that any two blind sectors separated by 3° or less are regarded as one sector.

Figure 1

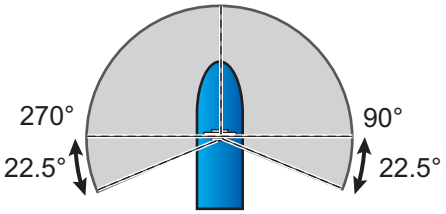
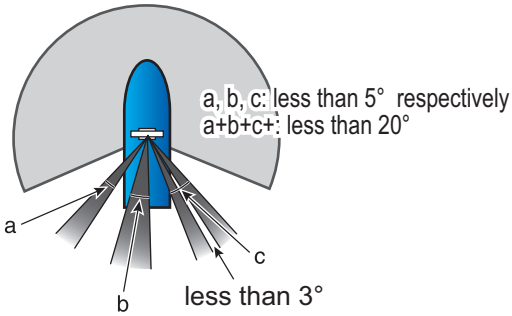
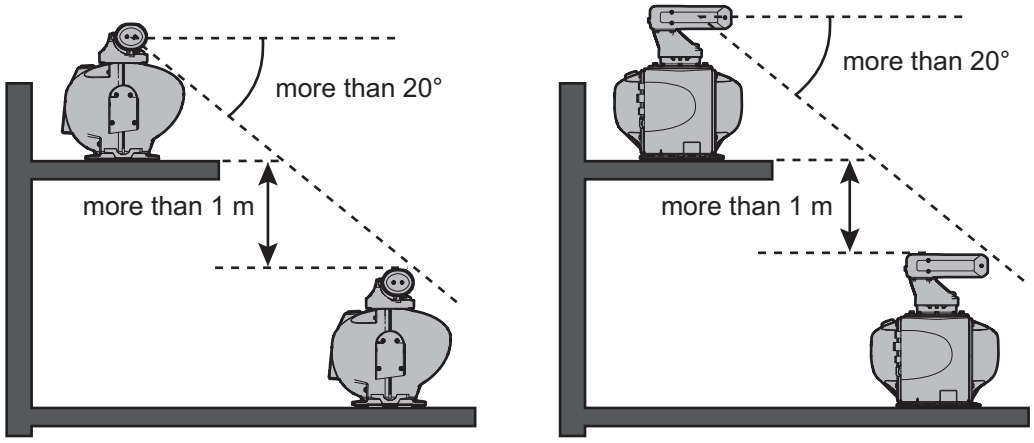


Figure 2



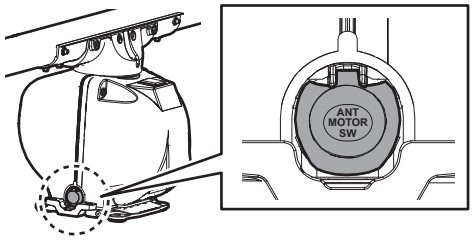
- Do not install the antenna where extreme winds may strike the port and starboard sides of the antenna.

- Install the antenna unit away from interfering high-power energy sources and TX radio antennas.
- Keep the lower edge of the antenna unit above the safety rail by at least 500 mm.
- Install two antenna units as shown in the figure below.

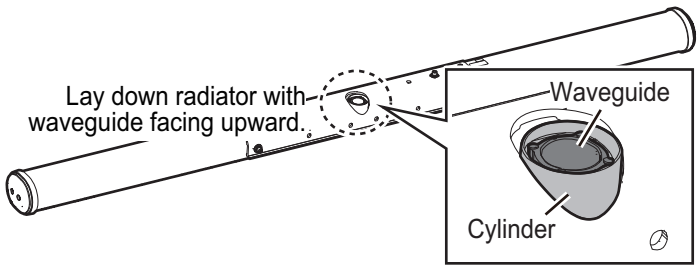


X-band radar S-band radar

- No funnel, mast or derrick shall be within the vertical beamwidth of the antenna unit in the bow direction, especially zero degree ±5°, to prevent blind sectors and false echoes on the radar picture.
- It is rarely possible to place the antenna unit where a completely clear view in all directions is available. Therefore, determine the angular width and relative bearing of any shadow sectors for their influence on the radar at the first opportunity after fitting.
- Locate the antenna of an EPFS clear of the radar antenna to prevent interference to the EPFS. A separation of more than two meters is recommended.
- A magnetic compass will be affected if the antenna unit is placed too close to the compass. Observe the compass safe distances on page ii to prevent interference to a magnetic compass.
- Do not paint the radiator aperture, to ensure proper emission of the radar waves.
- Ground the unit with the ground wire (supplied).
- Deposits and fumes from a funnel or other exhaust vent can affect the aerial performance and hot gases may distort the radiator portion. Do not install the antenna unit where the temperature is more than 55 °C.
- Leave sufficient space around the unit for maintenance and servicing. See the antenna unit outline drawing for recommended maintenance space.
- For X-band radar, an antenna switch is provided on the chassis to stop the antenna. Make sure the mounting location provides easy access to the switch.



- 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.



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

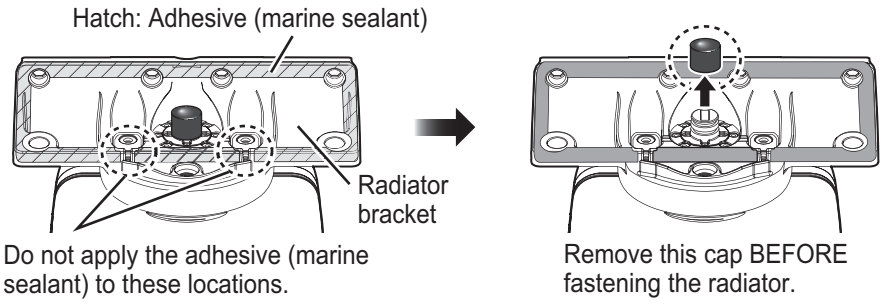
Note: For more information, please refer to IMO SN/Circ.271 "Guidelines for the installation of shipborne radar equipment.

1.1.2 FAR-3x10/3x20/3x20-NXT/3025-NXT/3x20W Radars

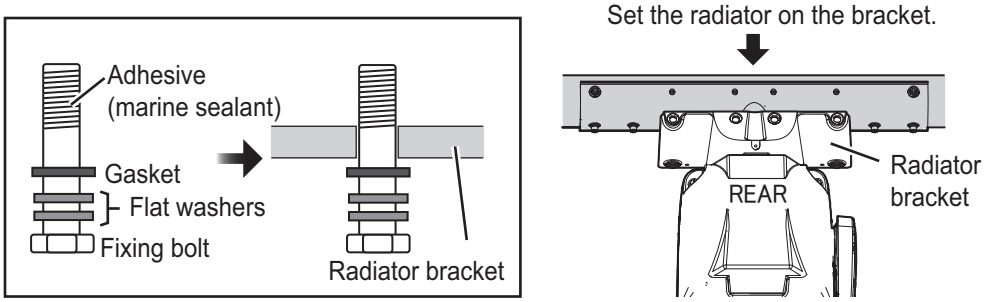
How to assemble the antenna unit

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:

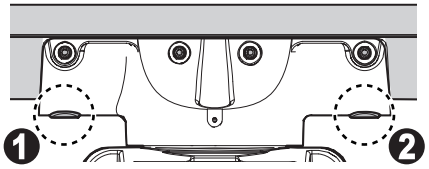
1. Coat the hatched area shown in the figure in step 2 with the supplied adhesive (marine sealant).
   Note: The adhesive (marine sealant) is applied for the purpose of waterproofing. To ensure waterproofing performance, apply the adhesive (marine sealant) without any breaks in the hatched area.
2. Remove the protective waveguide cap from the waveguide on the radiator bracket.



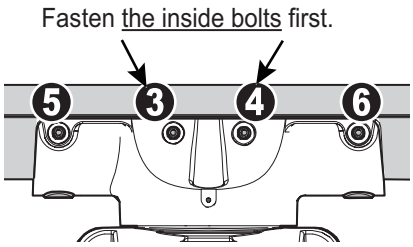
3. Pass the gasket through supplied fixing bolts (8x50, flat washers, six bolts), then coat the threads of the bolts with adhesive (marine sealant). Set the radiator on the radiator bracket.



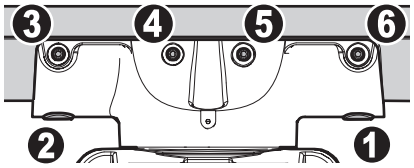
4. Fasten the antenna radiator with the two bolts from the bottom (1 and 2 in the right figure). The torque must be 15.0 N•m.
   Note: If the bolts are not properly tightened, it may be difficult to insert the bolts in the next step.



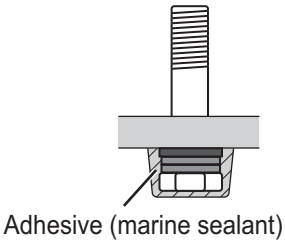
5. Fasten loosely the four bolts from the side (3 to 6 in the right figure). Then fasten first the inside bolts (3 and 4 in the right figure), and fasten the outside bolts (5 and 6 in the right figure). The torque must be 15.0 N•m.



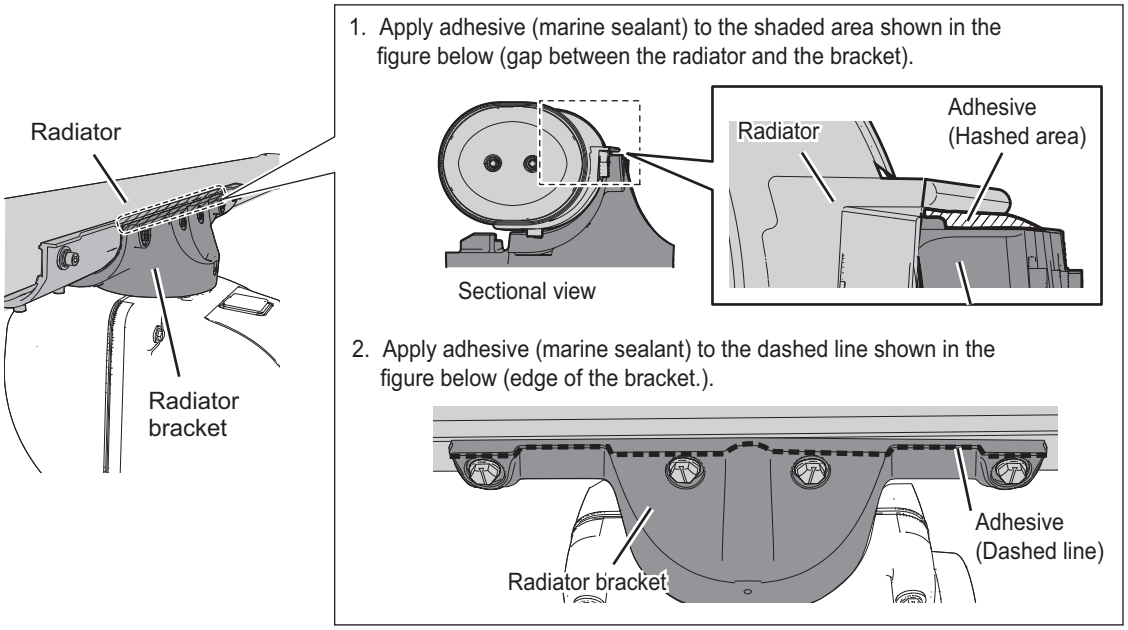
6. **Retighten the six bolts in the order shown in the figure to the right** to fix the antenna radiator. Make sure that the torque for each is 15.0 N•m.



7. Coat the antenna radiator fixing bolts fixed at step 6 with the supplied adhesive (marine sealant) as shown in the right figure.



8. To protect the painting on the antenna unit, apply adhesive (marine sealant) to the two areas shown in the figure below.

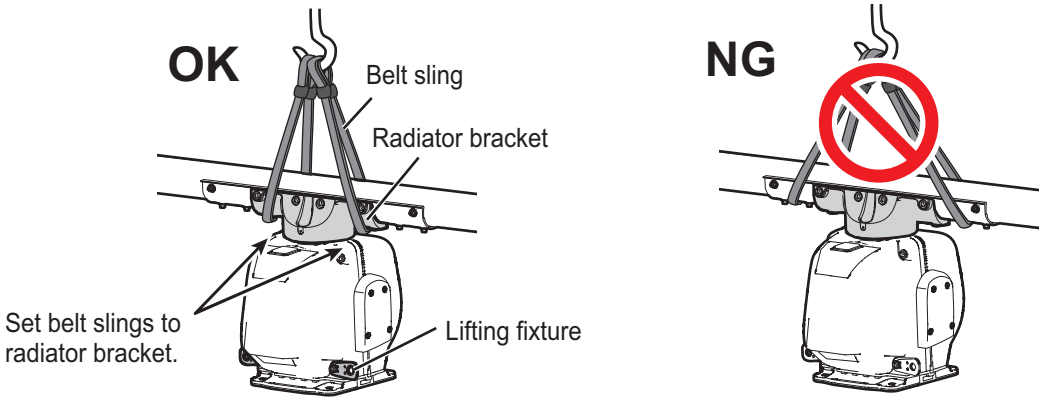


How to hoist the Antenna Unit

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

There are two methods to hoist the antenna unit. Also, hoist the antenna unit slowly. Hoisting swiftly may cause damage to the antenna radiator or damage the radiator chassis. After hoisting the antenna unit, remove the shackles (local supply).

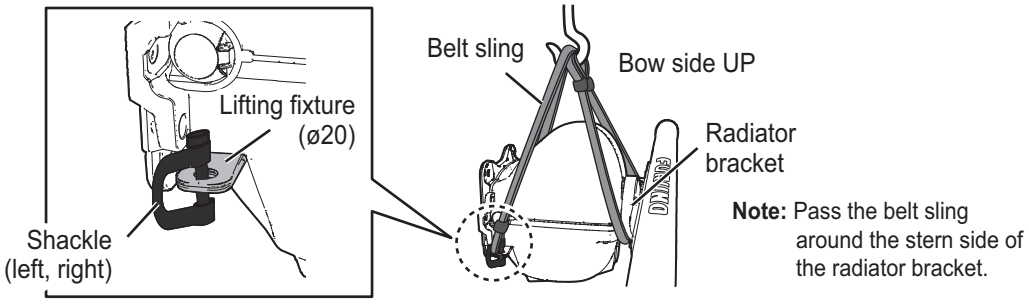
- **Upright hoisting**



- **Sideways hoisting**

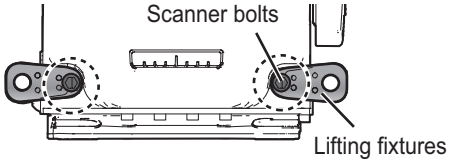
  Lay the antenna unit down and attach it to its mast on the deck. Then, hoist the antenna unit including the mast.

  Attach a shackle (local supply) to each lifting fixture. Using two belt slings (local supply), pass one through the stern side of the radiator bracket with the bow side facing upward, and pass the other through two shackles. Hoist the antenna to the mounting location. After hoisting the antenna unit, remove the shackles.

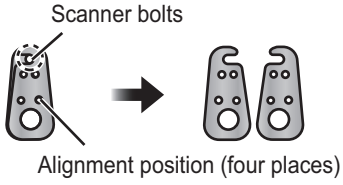


How to remove the lifting fixture

The lifting fixtures are attached to the base of the chassis and must be removed after hoisting the antenna unit. The two lifting fixtures are fixed together with a scanner bolt at the factory, as shown in the figure below.



1) Loosen two scanner bolts.



2) Separate the lifting fixtures to remove them. Tighten the scanner bolts (torque: 10 N•m).

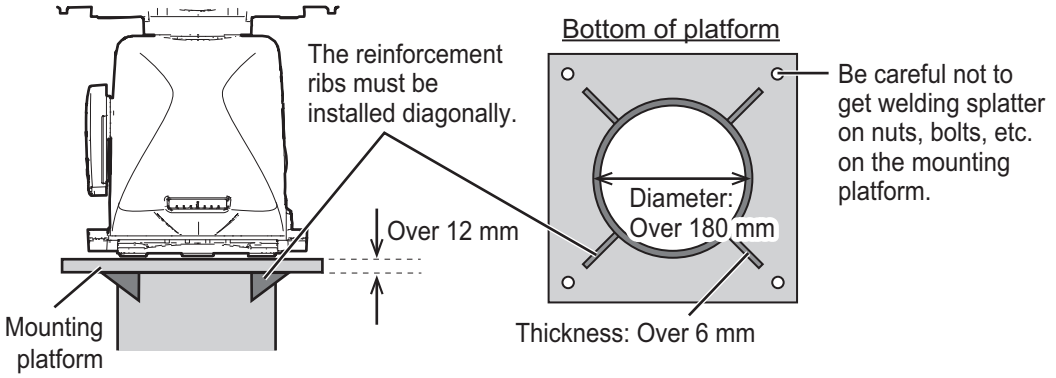
How to fasten the Antenna Unit to the mounting platform

1. Construct a suitable mounting platform referring to the outline drawing at the end of this manual.

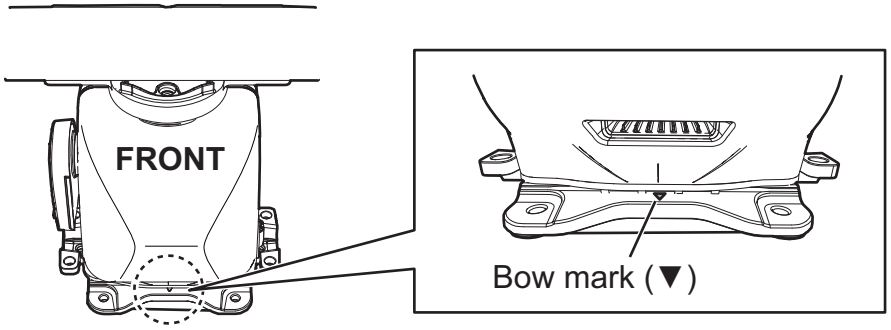
   Note: The mounting platform must be flat, level and firmly secured.

   - The diameter of the mast for fixing the Antenna Unit platform must be over 180 mm.

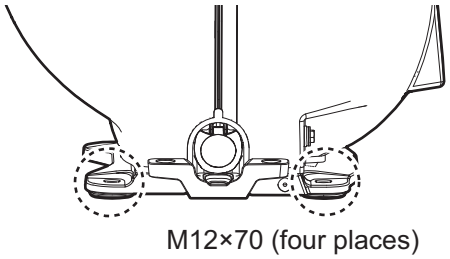
- The thickness of the Antenna Unit platform must be over 12 mm.
- The reinforcement rib must be installed diagonally.



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.



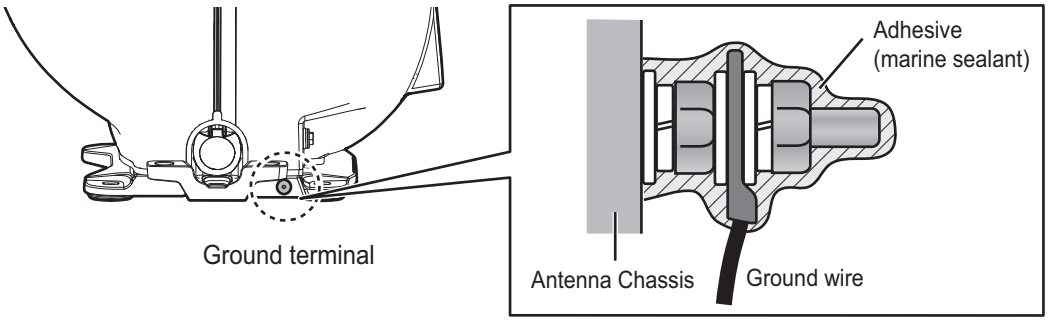
4. Insert four sets of hex bolts (M12×70) attached the seal washers to the mounting holes of the antenna chassis, referring to the installation guide (C3900Y01) at the back of this manual. Lift the antenna chassis slightly then insert the bolts attached the insulation sheets.



   Note: DO NOT insert the bolts from the underside of the platform. The cover cannot be opened.
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.
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, sup-

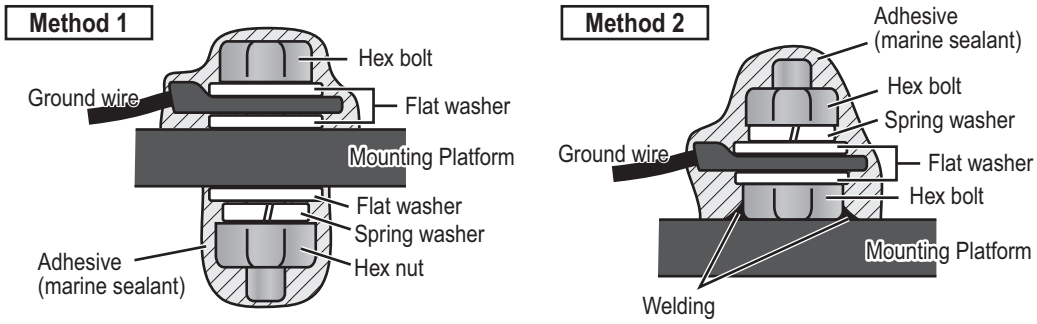
plied) between the grounding point and ground terminal on the Antenna Unit. Coat the hardware of the ground system with the supplied adhesive (marine sealant).

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.

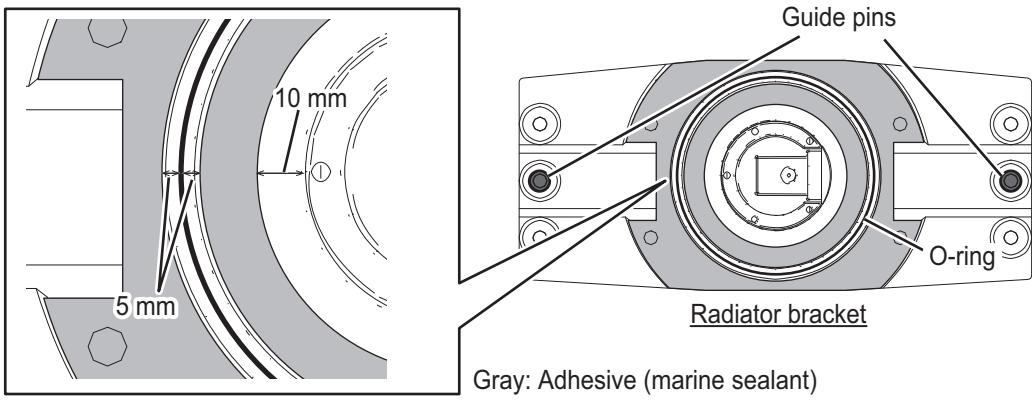


1.1.3 FAR-3015/3025 Radars

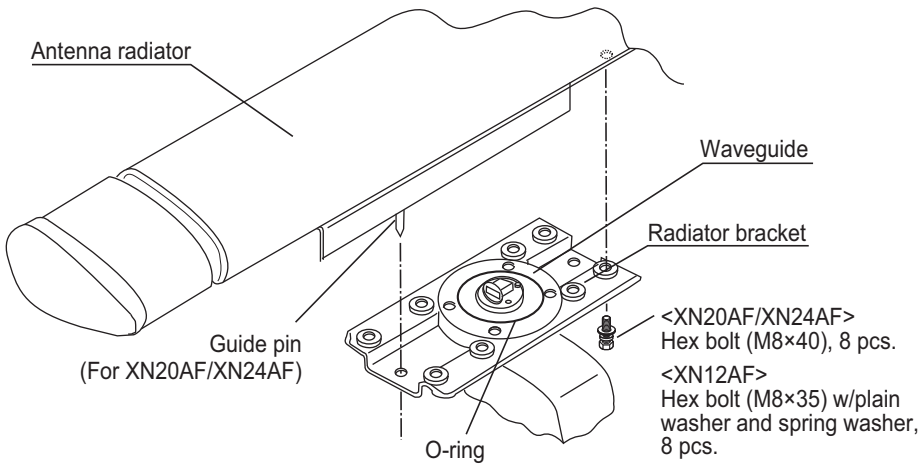
How to assemble the Antenna Unit

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. For XN20AF, XN24AF, attach the supplied two guide pins to the underside of the antenna radiator.
2. Remove the protective waveguide cap from the waveguide on the radiator bracket. The cap may be discarded.
3. Coat the grayed area shown below with the supplied adhesive (marine sealant).



4. Coat the supplied O-ring with a grease (local supply) and set it to the O-ring groove of the radiator flange.
5. Set the antenna radiator to the radiator bracket, taking care the orientation of the radiator.



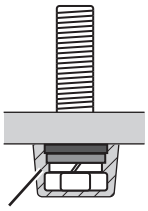
6. Coat hex bolts M8x40 (for XN20AF or XN24AF) or hex bolt M8x35/ flat washer/ spring washer (for XN12AF) with the adhesive (marine sealant) and use them to loosely fasten the antenna radiator to the antenna unit chassis.
7. Remove the two guide pins (inserted at step 1, for XN20AF/XN24AF).

⚠ CAUTION

Be sure to remove the guide pins.

Injury may result if the guide pins loosen and fall.

8. Tighten the hex. bolts to fasten the antenna radiator. The torque must be 15 N•m. Then coat hex bolts with the supplied adhesive (marine sealant).



Adhesive (marine sealant)

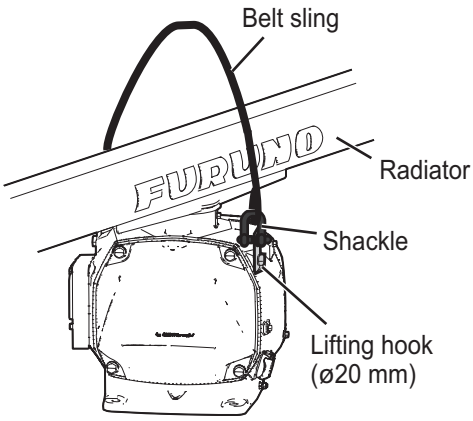
How to hoist the Antenna Unit

After assembling the antenna unit (load: max. 55 kg), hoist it to the mounting platform with belt sling(s) (local supply).

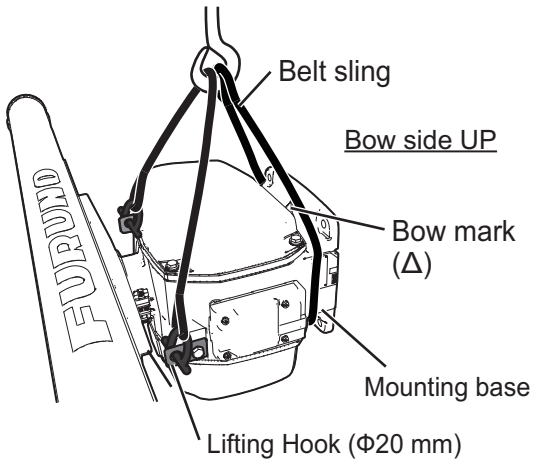
There are two methods to hoist the Antenna Unit. Hoist the Antenna Unit slowly. Hoisting it swiftly may damage the antenna radiator or the radiator chassis. After hoisting the Antenna Unit, remove the shackles (local supply) used to attach the belt sling(s).

Protect the parts where the antenna unit and the belt slings come into contact with cloth to prevent scratches.

- **Upright hoisting**
  The antenna unit is positioned upright. A belt sling is required (recommended length →1 m or more).
  Fasten both ends of a belt sling to two shackles and hoist the antenna unit.
  Rotate the radiator so that it does not contact the belt sling while hoisting.

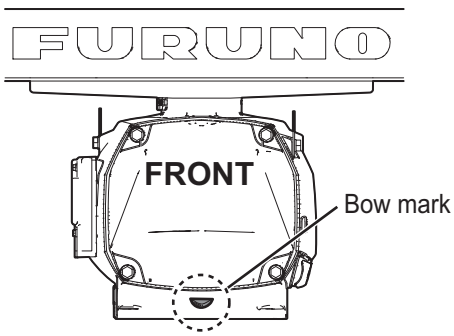


- **Sideways hoisting**
  The antenna unit is positioned sideways with its mast attached. Two belt slings prepared locally are required (recommended length → 1st: 1 m or more, 2nd: 1st + 0.5 m).
  Fasten both ends of a belt sling to two shackles prepared locally and pass another belt sling through the stern side around the antenna base.
  Then hoist the antenna unit as shown in the figure to the right.
  Note: When lifting the antenna unit, adjust the length of the belt slings so that the antenna chassis and the radiator are kept horizontal for safety.

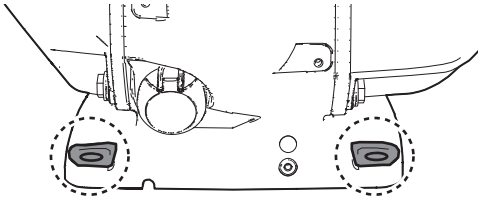


How to fasten the Antenna Unit to the mounting platform

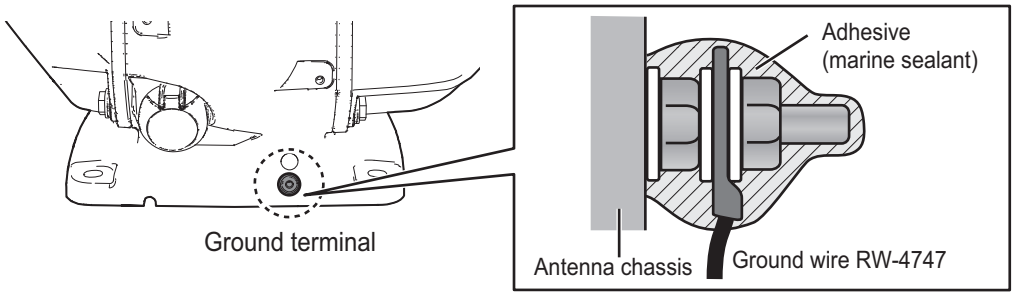
1. Construct a suitable mounting platform and drill four mounting holes (ϕ16 mm), referring to the outline drawing at the end of this manual.
   Note: The mounting platform must be flat, level and firmly secured.
2. Place the antenna unit on the platform, then orient the unit so the bow mark on its base is facing the ship's bow.
   Note: When the Antenna Unit is placed on the platform, make sure that the platform is not inclined.



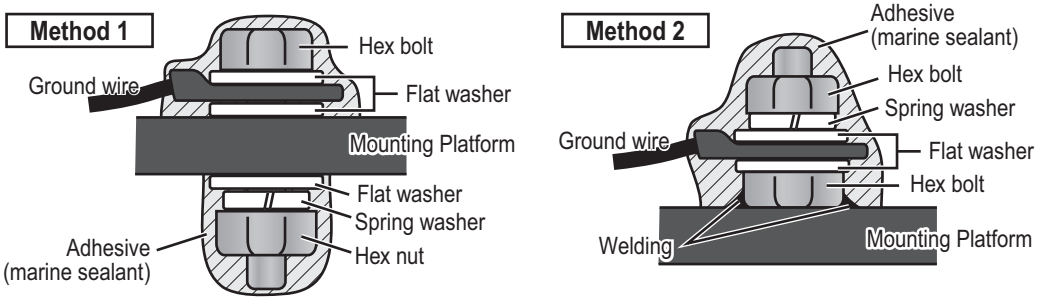
3. Insert four sets of hex bolts (supplied, M12×60) attached the seal washers to the mounting holes of the antenna chassis from the top side, referring to the installation guide (C3900Y01) at the back of this manual. Lift the antenna chassis slightly then insert the supplied insulation sheets to the bolts.
   Fasten the antenna unit loosely with the bolts attached the flat washers and two nuts from the bottom side.



4. Adjust the direction of the Antenna Unit so the bow mark on its base is facing the ship's bow.
5. Fasten the Antenna Unit tightly to the mounting platform with the bolts. The torque must be 49 N•m. For fixing double nuts, refer to the installation guide (C3900Y01) at the back of this manual.
6. Using the supplied hex bolt, nut and flat washer of the ground terminal, connect the supplied ground wire RW-4747 (340 mm) to the ground terminal.



7. Establish the ground point on the mounting platform, then connect the ground wire from the antenna unit between the grounding point and ground terminal on the Antenna Unit. Coat the hardware of the ground system with the supplied adhesive (marine sealant).

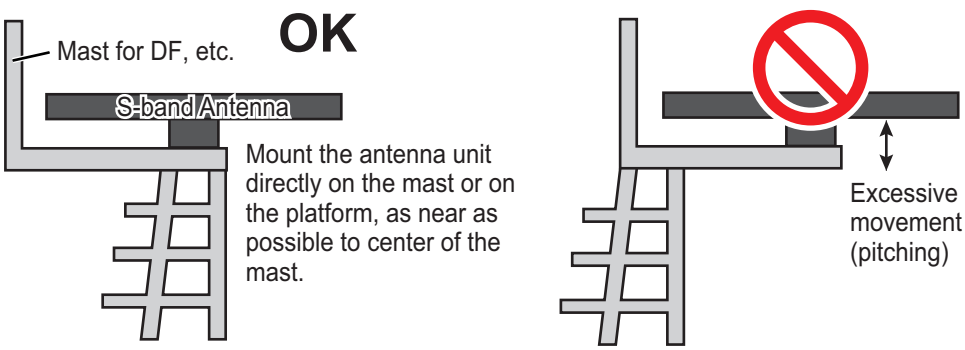


1.2 Antenna Unit (S-band Radar)

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.

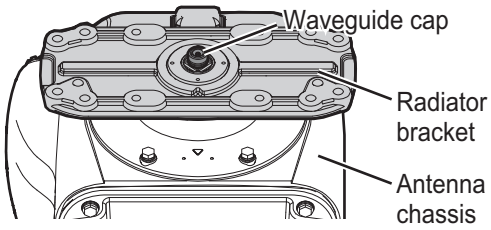


1.2.2 FAR-3x30S/3035S/3x30S-SSD/3035S-NXT/3x30SW Radars

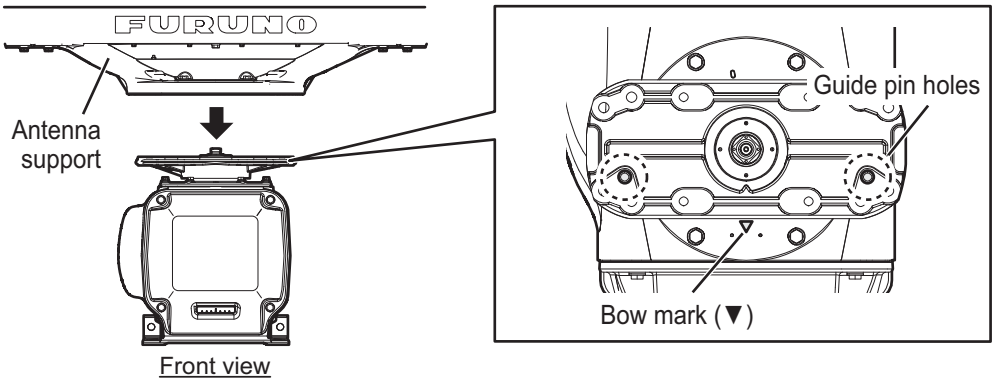
How to assemble the antenna unit

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:

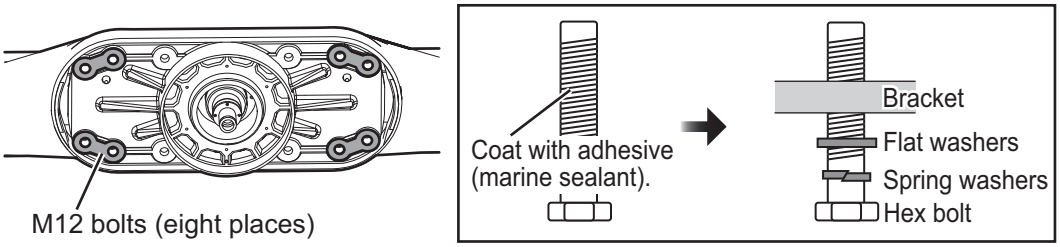
1. Remove the protective waveguide cap from the waveguide on the radiator bracket.



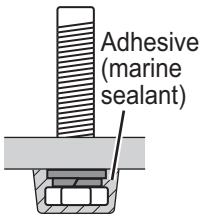
2. Set the radiator on the radiator bracket (w/antenna support) so the guide pins of the antenna support fit into the guide pin holes on the radiator bracket. (Orient the logo of the radiator to the side with bow mark on the bracket. If reversely oriented, the radiator cannot be set to the bracket.)



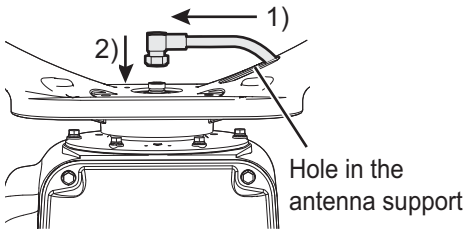
3. Coat the threads of eight hex bolts (M12×50, supplied) with the supplied adhesive (marine sealant).
4. Fasten the antenna radiator to the radiator bracket from the bottom of the bracket with the eight hex bolts, spring washers and flat washers. The torque must be 49 N•m.



5. Coat the bolt heads fastened at step 4 with the supplied adhesive (marine sealant) as shown in the figure to the right.

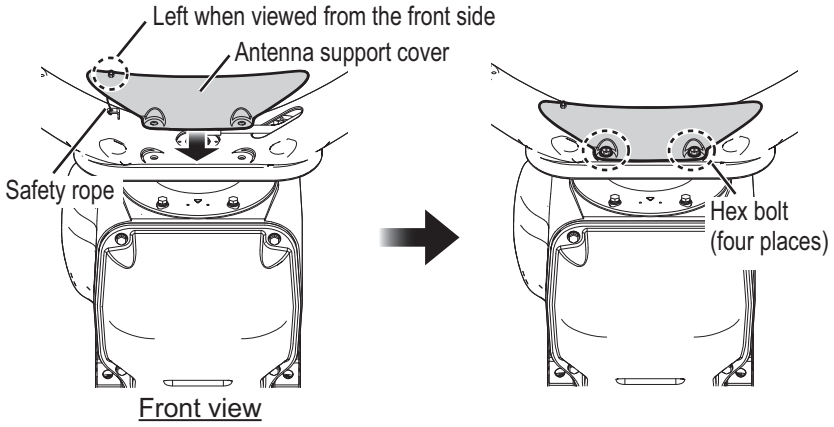


6. Connect the coaxial cable from the Antenna Unit to the rotary joint. The torque must be 25 N•m.
   Note 1: The coaxial cable connector must be connected vertically.
   Note 2: The coaxial cable must be horizontal and must not contact the antenna support hole.
   Note 3: If the coaxial cable is long, 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.



1) Keep the cable straight.
2) Connect the cable connector vertically.

7. Coat the hex bolts (M12×40, 4 pcs.) for the support cover with the supplied adhesive (marine sealnat).
8. Fasten the support cover with the hex bolts, spring washers and flat washers. The torque must be 20 N•m.



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.

How to hoist the Antenna Unit

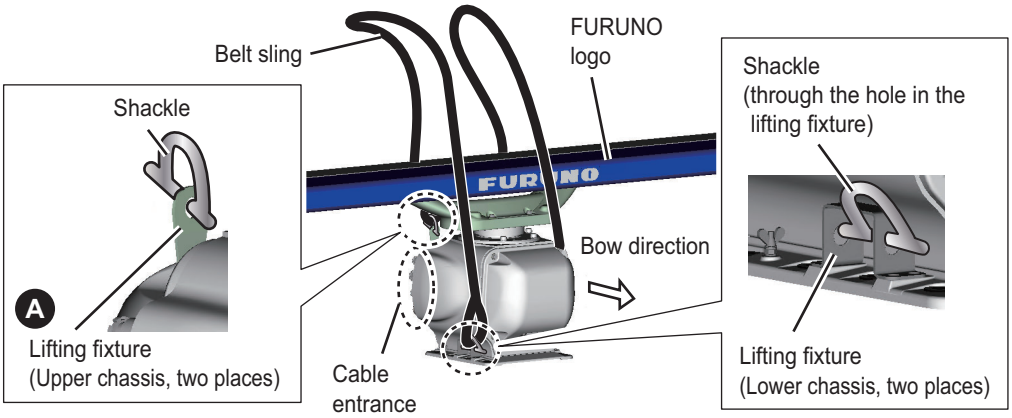
The Antenna Unit may be assembled before hoisting it to the mounting platform. Orient the FURUNO logo of the radiator to the bow side of the antenna unit. Hoist the antenna unit with belt slings and shackles of hole diameter ϕ20 mm (supplied locally with required quantities according to hoisting).

Also, hoist the Antenna Unit slowly. Hoisting swiftly may cause a damage to the antenna radiator or damage the radiator chassis.

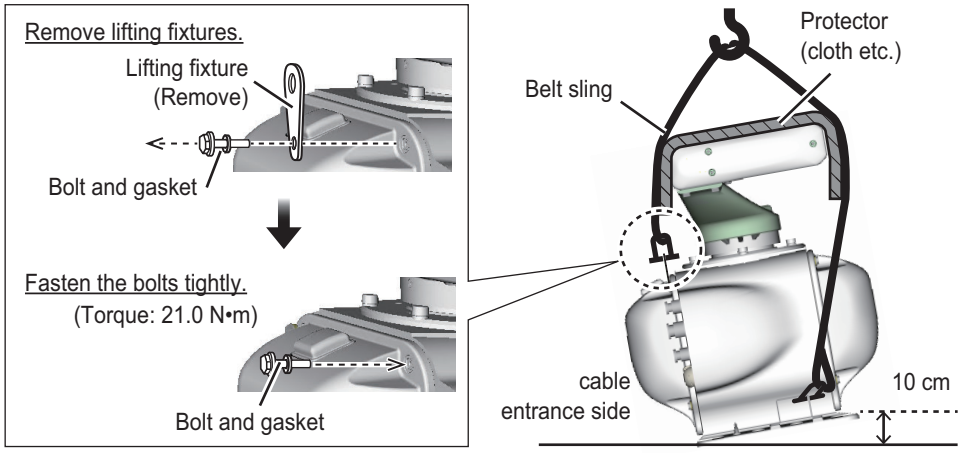
There are two hoisting methods as follows.

- **Upright Hoisting**
  Th antenna unit is positioned upright.

  1. Pass both ends of two belt slings through four shackles. Attach the shackles to the lifting fixtures (A, B, 4 places) of the chassis as shown in the figure below.

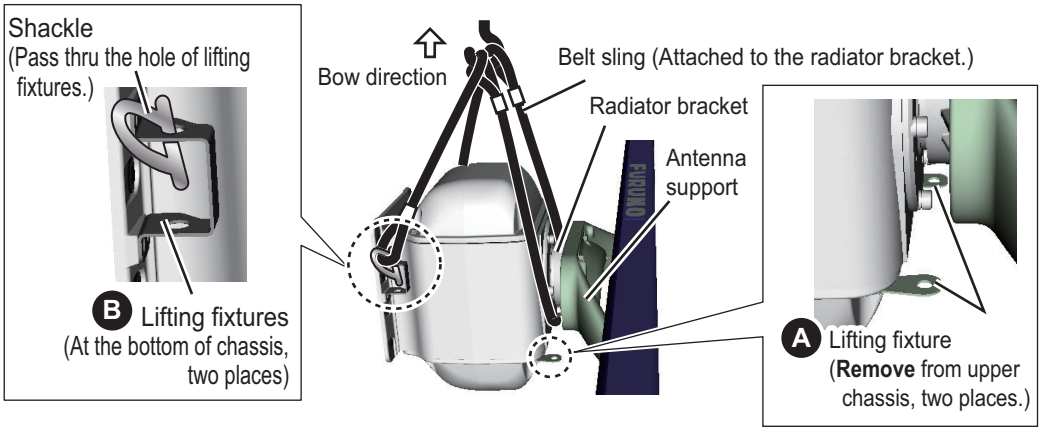


  2. Lift while tilting the antenna unit so that the front and rear loads of the belt slings are even. The tilt angle should be about 10 cm on the opposite side with entrance side as the fulcrum point. Also, protect the parts where the tilted antenna unit and the belt slings come into contact (dashed area) with cloth to prevent scratches. After the antenna unit is hoisted in place, remove the all shackles and the lifting fixtures at the upper chassis (A, two places).



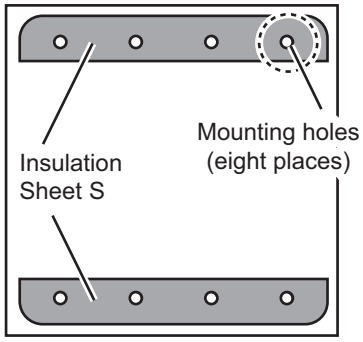
Note: If you forget to remove the lifting bracket, water may enter the antenna.

- **Sideways hoisting**
  The antenna unit is fastened sideways to a mast, etc. and together with the mast installed at a high position on the vessel.
  Place the antenna so that the bow side faces upward. Attach two shackles to both ends of a belt sling and fasten the shackles to the lifting fixtures (B, two places). Pass another belt sling through the stern side of the radiator bracket as shown in the figure below, and hoist the chassis.
  Note: Take care NOT to pass a belt sling around the antenna support.
  For horizontal hoisting, the lifting fixtures (A, two places) at the upper chassis are not used. After the antenna unit is hoisted in place, remove all the shackles and the lifting fixtures at the upper chassis (A, two places), referring to the description in the "Upright Hoisting" on page 1-13.

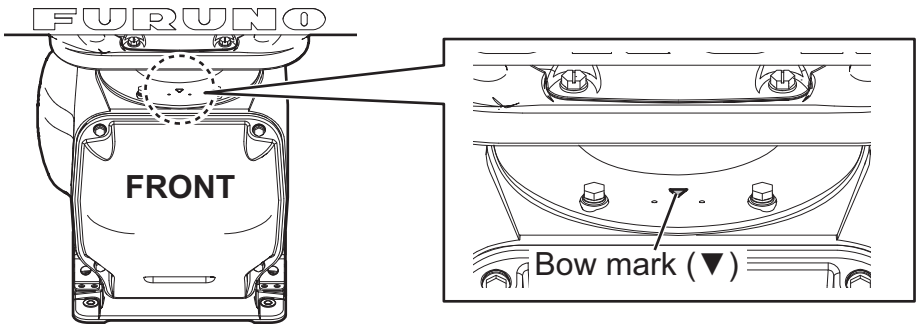


How to fasten the antenna unit to the mounting platform

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 250 mm.
   - The thickness of the antenna unit platform must be over 15 mm.
   - The reinforcement rib must be installed diagonally as shown below.
2. Referring to the outline drawing, drill eight mounting holes (ϕ16 mm) in the mounting platform.
3. If two insulation sheets (type: 03-183-3106) are supplied in the installation materials, place these sheets as aligned with eight mounting holes. If the insulation sheets are not supplied, go to next step because the sheets have been attached on the antenna unit already.



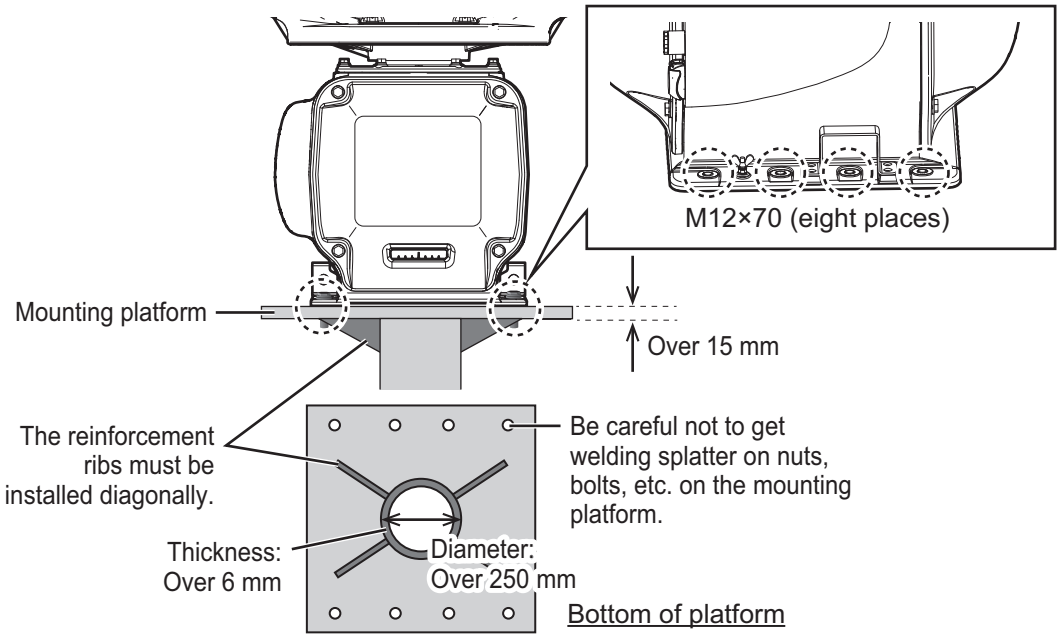
4. Place the Antenna Unit on the mounting platform, then orient the unit so the bow mark on its base is facing the ship's bow.
   Note: When the Antenna Unit is placed on the platform, make sure that the platform is not inclined.



5. Fasten the Antenna Unit to the mounting platform with M12×70 hex bolts, nuts, flat washers and seal washers (supplied). The torque must be 49 N•m. Fasten the

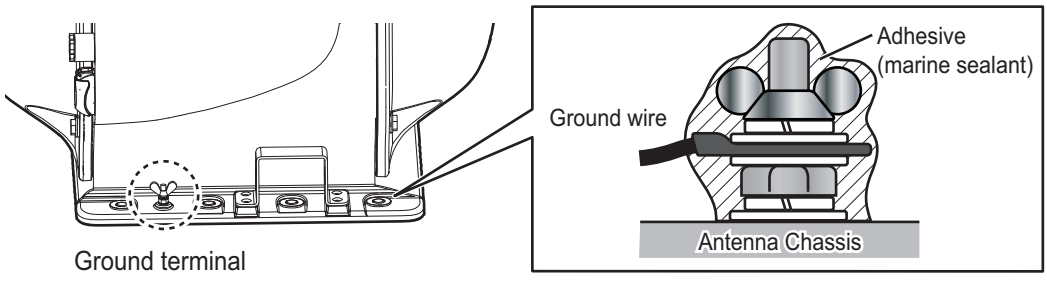
double nuts, referring to the installation guide (C3900Y01) at the back of this manual.

Note: The bolts can also be inserted from the underside of the platform.



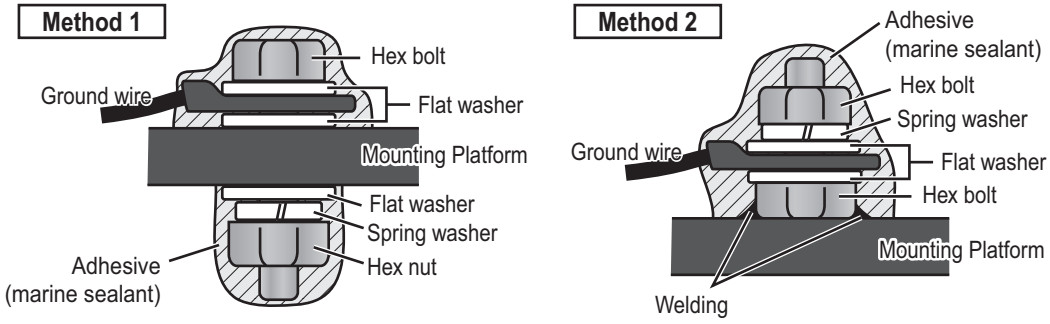
6. Using a hex bolt (M6×25), nut (M6), spring washer (M6) and flat washer (M6), establish the ground system on the mounting platform as shown in the following figure. The location must be within 340 mm of the ground terminal on the Antenna Unit. Connect the ground wire (RW-4747, 340 mm, supplied) between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

Antenna chassis side



Mounting platform side

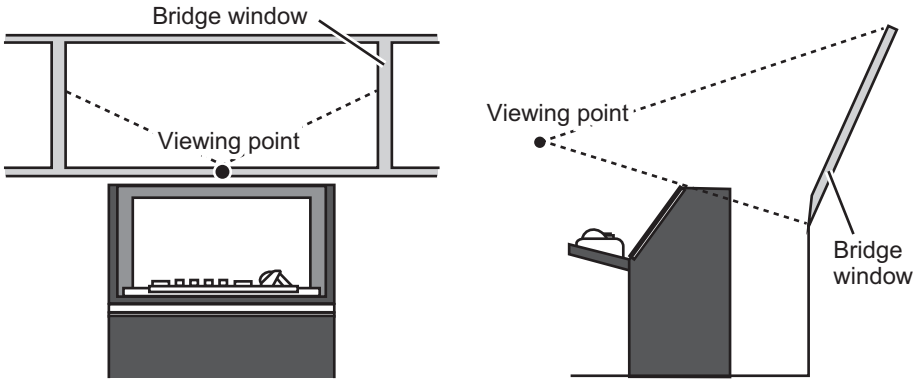
Arrange ground terminal as close as possible to Antenna Unit. There are two methods to connect ground wire for mounting platform side.



1.3 Monitor Unit

See the operator's manual for MU-190/192 (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. For the desktop installation the unit can laid flat or tilted.

Installation considerations

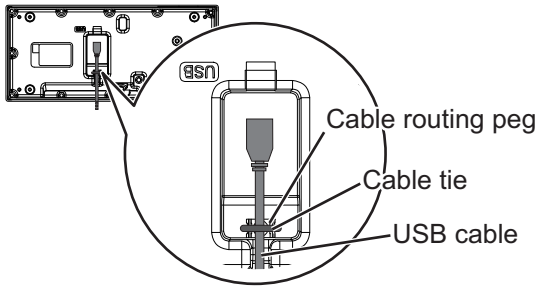
Keep in mind the following points when selecting a location.

- 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 for maintenance and service, referring to the outline drawings at the back of this manual.
  Note: The outline drawing number for RCU-024 and RCU-025 is different depending on the serial number, as shown below:
  For RCU-024:
  - "199999" or earlier: See "C4473-G02" to "C4473-G04".
  - "200001" or later: See "C4473-G18" to "C4473-G20".

  For RCU-025:
  - "199999" or earlier: See "C3607-G01" to "C3607-G03".
  - "200001" or later: See "C3607-G05" to "C3607-G07".
- 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.

- Be sure to connect the ground wire (between the earth terminal on the chassis and the ship's earth).
- Fasten the USB cable with the cable tie.

Ex. RADAR control unit, bottom view

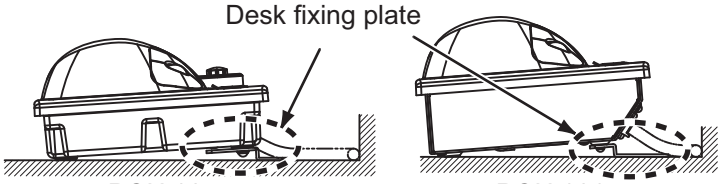


1.4.1 Desktop installation

How to mount the unit tilted

Use the desk fixing plate to mount the unit tilted.

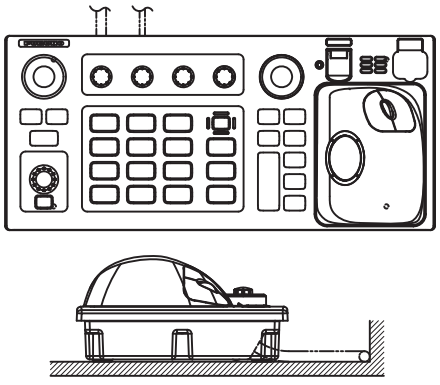
1. Fix the desk fixing plate to the bottom of the control unit.
2. Fix the control unit with self-tapping screws (ϕ5×20, local supply).



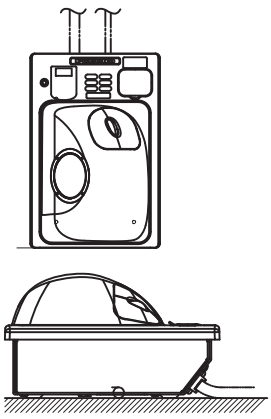
How to mount the unit flush with mounting surface

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, local supply) from the underside of the desktop.

RCU-025



RCU-026



1.4.2 Flush mounting

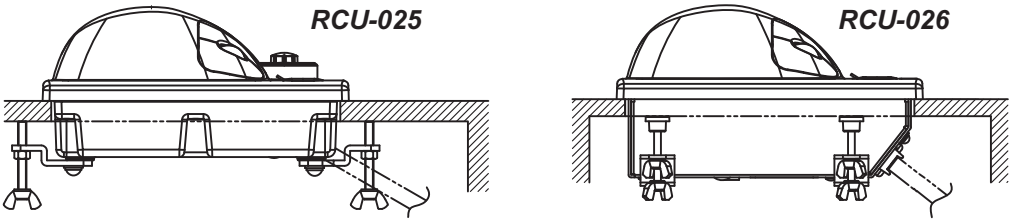
Use the applicable optional flush mount kit to install the control unit in a console.

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

Flush mount kit

Control Unit	Type	Code
RCU-025	OP24-24	001-171-790
RCU-026	OP24-27	001-171-820

1. Prepare a cutout in the location referring to the outline drawing at the back of this manual.
2. Set the control unit to the cutout.
3. Attach the mounting plate 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.

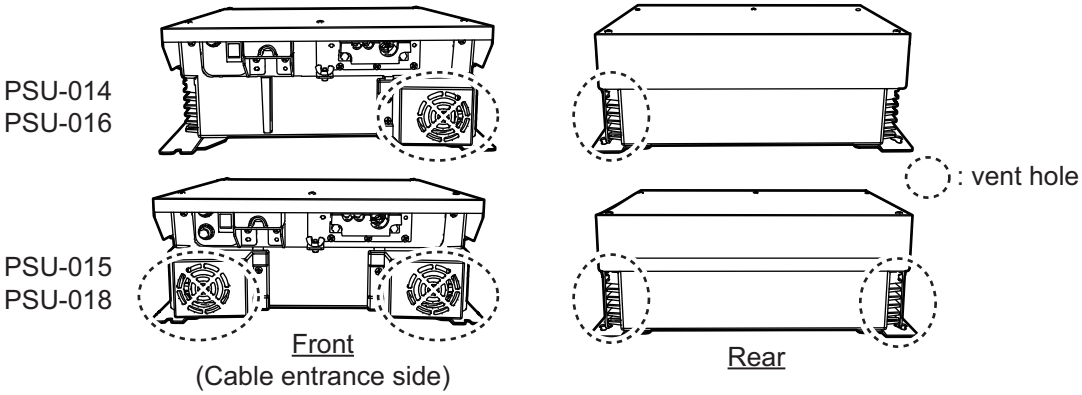


1.5 Power Supply Unit

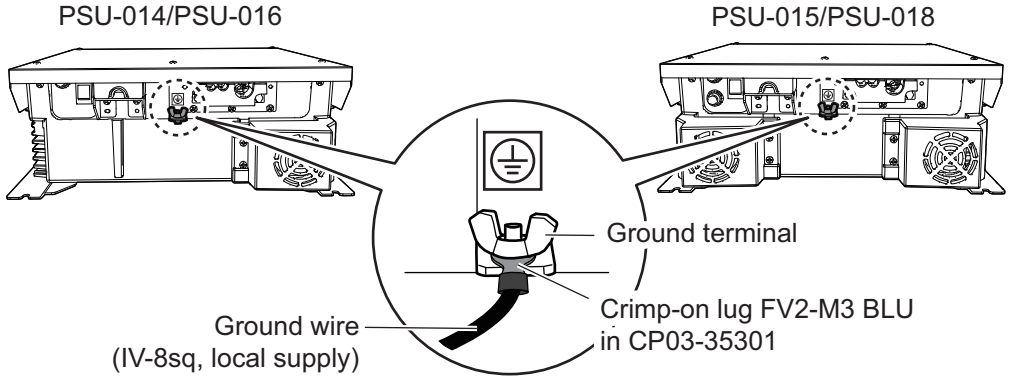
1.5.1 Installation considerations

The Power Supply Unit can be mounted on a bulkhead or deck. 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.
- Select a location where the vibration is minimal.
- Locate the equipment away from places subject to water splash and rain.
- Make the service clearance of 100 mm in front of the vent hole (front and rear sides).



- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- Connect the ground wire between the earth terminal on the chassis and the ship's earth.

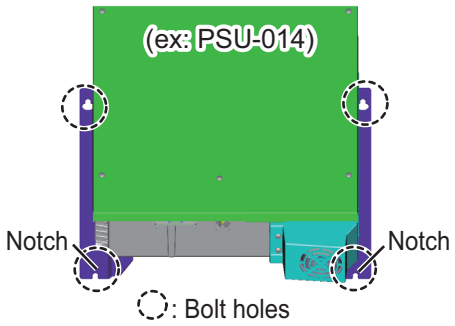


- A magnetic compass will be affected if the unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent disturbance to the compass.

1.5.2 How to install the power supply unit

Use four bolts (M6, local supply) to fix the power supply unit.

Note: For bulkhead mounting, the open notches on the unit must face the deck.



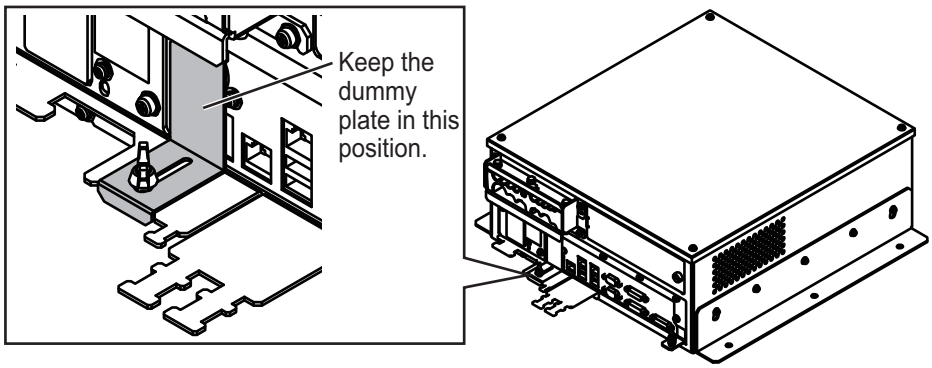
1.6 Processor Unit

1.6.1 Installation considerations

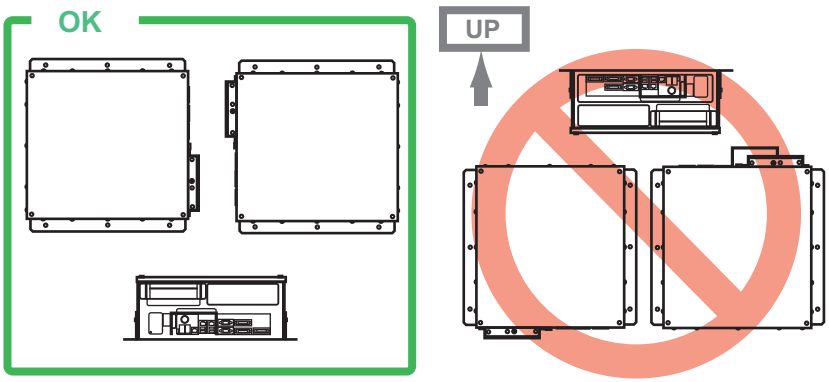
Keep in mind the following points when selecting a location.

- 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.
- Make the service clearance of 100 mm in front of the vent hole (left side).
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- Be sure to connect the ground wire (between the earth terminal on the chassis and the ship's earth).
- 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.

- Leave the dummy plate fastened, to prevent the wrong operation of the power switch. The items behind the plate are for use by the serviceman.

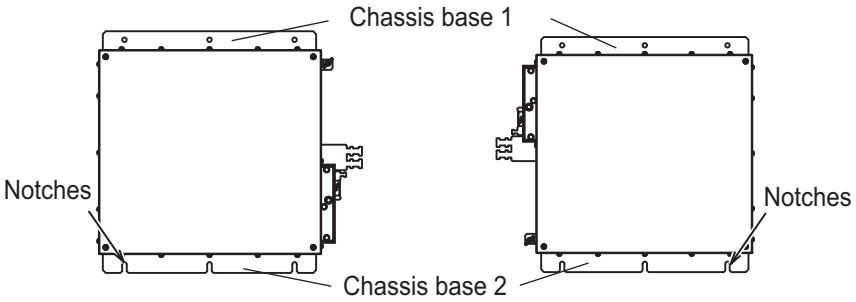


- Install the processor unit on the floor, or on a bulkhead with the following direction (horizontal), because of the DVD drive unit.

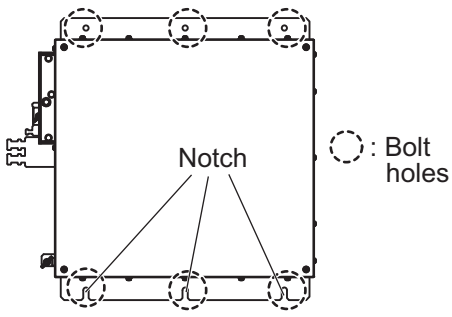


1.6.2 How to install the processor unit

1. Use 10 binding head screws (M4×8, supplied) to attach the chassis bases 1 and 2 to the processor unit.
   Note: For bulkhead mounting, attach the chassis base 2 so that the notches on it are facing the deck.



2. Use six bolts (M6, local supply) to fasten the processor unit.
   For bulkhead mounting, fasten three bolts for the lower bolt holes, leaving 5 mm of thread exposed from the bolt head. Set the notches of the processor unit on the three bolts, then fasten three bolts for the upper bolt holes. Then secure the processor unit in place with all six bolts fastened tightly.



1.7 Transceiver Unit

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 INSTRUCTIONS 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 M8 bolts or ϕ8 coach screws. See the outline drawing for mounting dimensions.

1.8 Sensor Adapters (option)

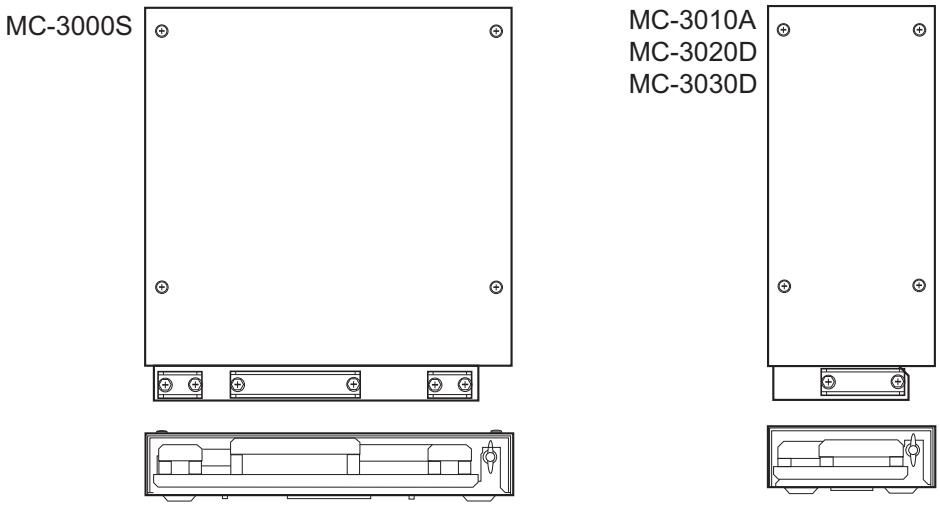
Installation considerations

When you select a mounting location, keep in mind the following points:

- Locate the adapter 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.
- Be sure to connect the ground wire (between the earth terminal on chassis 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 adapter is placed too close to the magnetic compass. Observe the compass safe distances in the SAFETY INSTRUCTIONS to prevent interference to a magnetic compass.
- Select the location considering the number of sensor adapters connected.
  A maximum of eight MC-3000S can be connected to a sensor network.
  A maximum of 10 sensor adapters (MC-3010A/3020D/3030D) can be connected to a MC-3000S. However, note that five MC-3010A can be connected.
- For the MC-3000S, use a Cat5 cable.
- Select the location so that the length of the cables among the sensor adapters (MC-3000S, 3010A, 3020D and 3030D) is less than 6 m. If the length is more than 6 m, the adapters may not work properly.

How to install the sensor adapter

1. Unfasten four pan head screws to remove the cover from the sensor adapter.
2. Fasten four self-tapping screws (ϕ4×20, supplied) to fix the sensor adapter.
3. Reattach the cover.



1.9 Intelligent HUB (option)

Use the optional Intelligent HUB (HUB-3000) to connect gateway network equipment or sensor network. Do not connect this network to the shipborne LAN network. Further, do not connect a PC to this network, other than for maintenance.

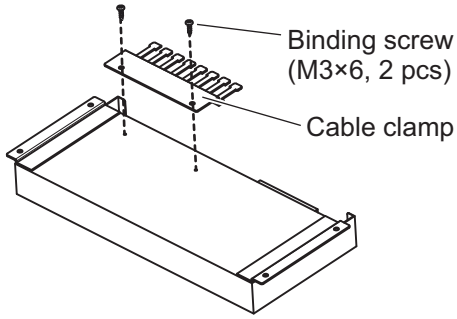
Installation considerations

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.

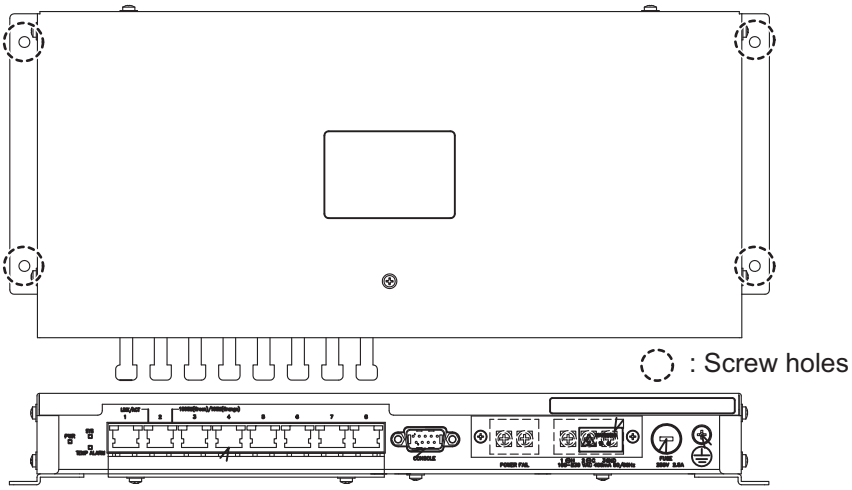
How to install the HUB-3000

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



HUB-3000, bottom view

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



1.10 Switching HUB (option)

For FAR-3xx0 series, you can use switching HUB (HUB-100) for connection to a IEC61162-450 Ed.1 network. 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 procedures, 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.
- A magnetic compass will be affected if the hub is placed too close to the compass. Observe the compass safe distances in the SAFETY INSTRUCTIONS to prevent compass malfunction.

1.11 Junction Box (option)

If the length of the antenna cable is more than 100 m, junction boxes are required. Install the boxes in a location protected from the weather, because their waterproofing standard is IPX3.

Fasten the junction boxes to the mounting location with four sets of M8 bolts and nuts. See the outline drawing for mounting dimensions.

2. WIRING

2.1 Overview

The procedure explanations in this chapter mainly use illustrations of the magnetron radar. Some parts are omitted in the illustrations for clarity.

Cabling considerations

To lessen the chance of picking up electrical interference, avoid where possible routing the antenna cable (power and LAN lines) near other onboard electrical equipment (radars, TX radio antennas, etc.). Also avoid running the cable in parallel with power cables. When crossing with other cable, the angle must be 90° to minimize the magnetic field coupling.

The antenna cable between the antenna and processor units is available in lengths of 15 m, 30 m, 40 m, and 50 m. Whatever length is used, it must be unbroken; namely, no splicing allowed. Use the antenna cable as short as possible to minimize attenuation of the signal.

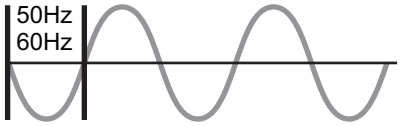
The radar must be connected to an emergency power source, as required by SOLAS II-1.

About network construction

- Use HUB-3000 for IEC 61162-450 Ed.2 compliant network. HUB-100 can also be used to connect IEC 61162-450 Ed.1 compliant network.
- Do not connect the ship's LAN network to the optional HUBs. Also, commercial PCs cannot be connected to the gateway network, other than for maintenance.
- To connect the FAR-2xx7, FAR-2xx8 or FMD-3xxx series via LAN network, use the INS network.
- This unit does not support IGMP snooping or CGMP enabled switch.
- This unit does not have a router or repeater hub function.
- The Switching HUB (HUB-100) does not support IGMP snooping or CGMP enabled switch.
- When you use IEC61162-450 compatible sensors, set [Transmission Group] on the [Common Installation Settings] menu. See the Instruction Manual (TIE-36162/36940) for details.
- When connecting two or more FAR-2xx7 series radars, via the HUB-3000, to a FAR-3xxx series radar, the HUB-3000 IGMP querier function must also be setup. See the Instruction Manual (TIE-36162/36940) for the HUB-3000 IGMP querier.
- To ensure the security of the FURUNO network, be sure to connect with non-FURUNO networks via the service gateway (tBOX810-83A-FL).

About wiring

- To use the USB port on the control unit, connect the control unit to the processor unit, using the USB cable supplied with the control unit or optional USB cable.
- The length of the USB cable must be within 5 m to prevent equipment trouble.
- The length of LAN cables must be within 50 m.
- Use the Cat5e or Cat6 LAN cable for the network if available locally.
- If LAN cables are not available locally, use the optional LAN cables (FR-FTPC-CY for sensor network, DTI-C5E350 VCV for gateway network).
- If extension or division of the DVI or RGB cables is necessary, use the dividers shown below.
  - DVI cable divider: DVI-12A (maker: IMAGENICS)
  - RGB divider: CIF-12H, DD-106 or WBD-14F (maker: IMAGENICS)
- Make sure that the ground wires are connected between the ground terminals on each equipment and the ship's earth.
- Pass the cables through the specified clamp or the locking wire saddle.
- If a UPS (user supply) is connected to this equipment, be sure that the grounding lamp does not light.
- The output from the UPS must be a sine wave, as in the right figure.

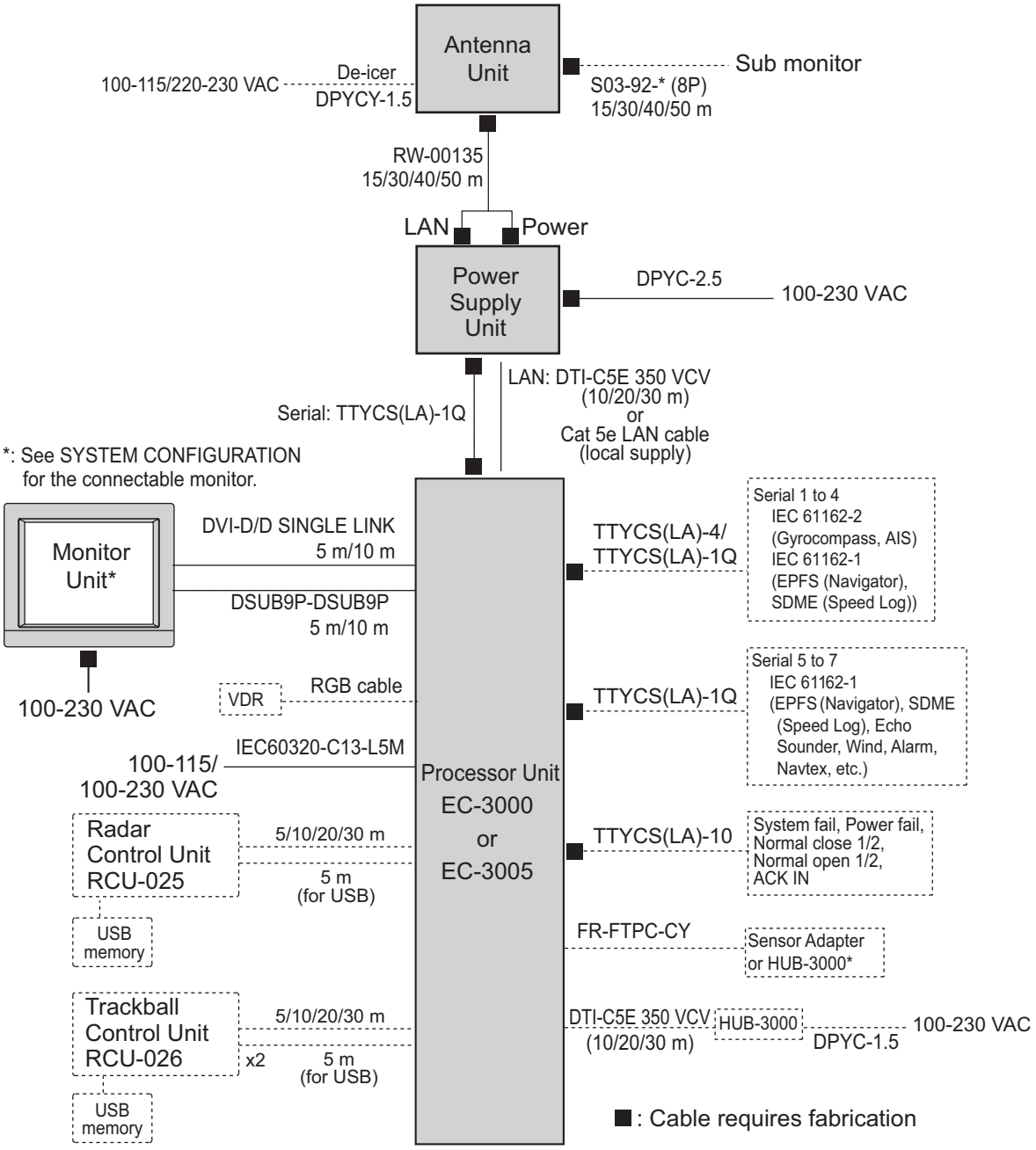


2.1.1 Standard wiring

A Cat 5e LAN cable (RW-00135) connects between the antenna unit and the power supply unit (PSU). The maximum length of the cables between the Processor Unit and the antenna unit is 80 m.

Retrofit (using antenna cable RW-9600/6895/4873) or foremast installation is also possible, with the installation of a pair of LAN Signal Converters, one in the antenna unit, the other in the PSU. See section 2.11.

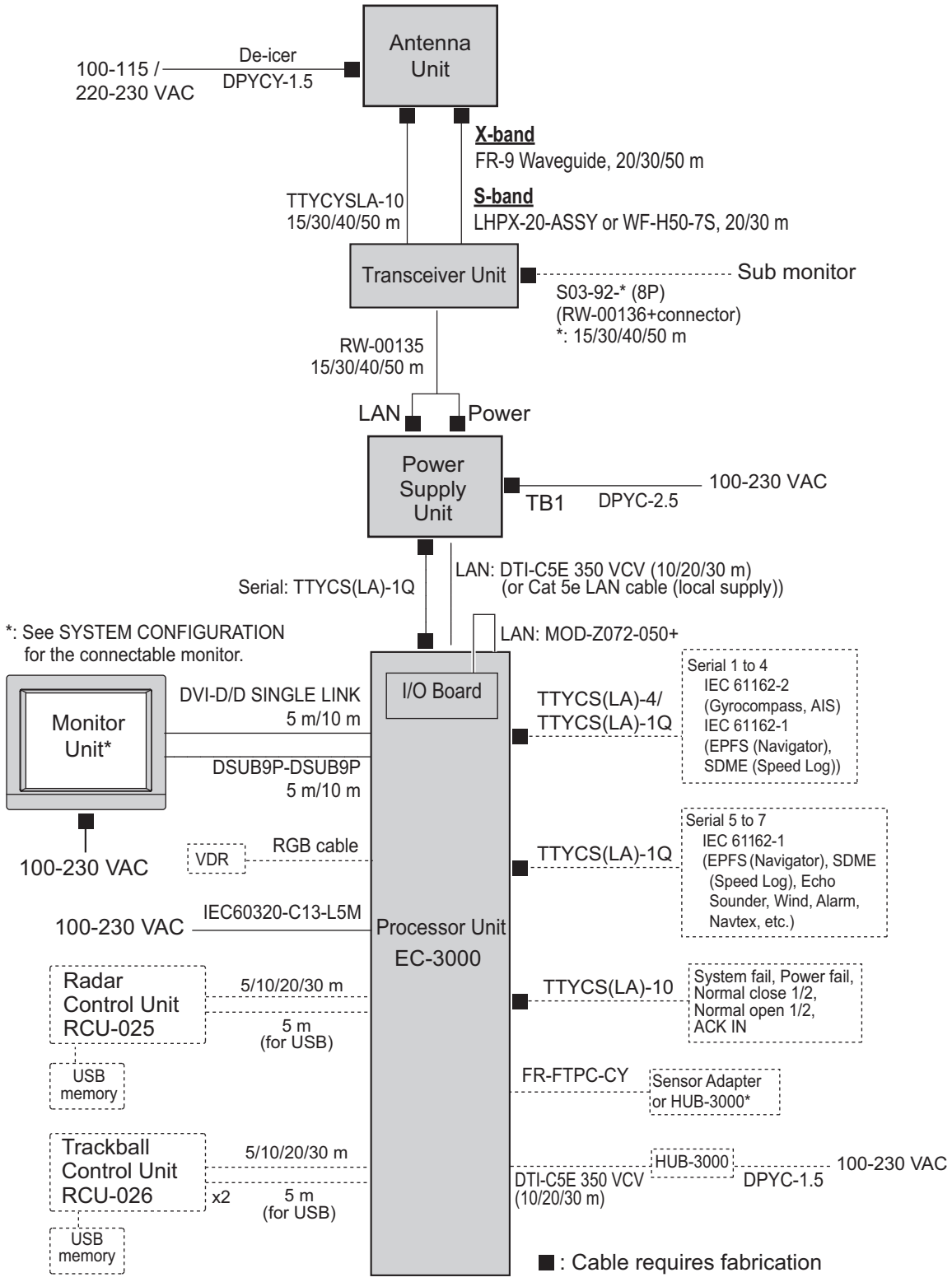
X-band/S-band TR-UP radar



*: Use Switching HUB-100 for IEC61162-450 Ed.1 compliant network.

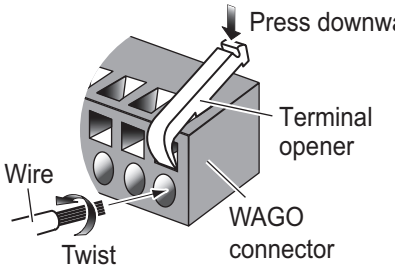
X-band/S-band TR-DOWN radar

Cabling between the transceiver unit and the antenna unit: 80 m
Waveguide: 50 m



*: Use Switching HUB-100 for IEC61162-450 Ed.1 compliant network.

WAGO connector

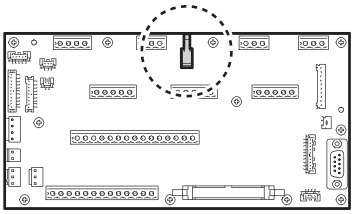


Procedure

1. Twist the cores.
2. Press the terminal opener downward.
3. Insert the wire to hole.
4. Remove the terminal opener.
5. Pull the wire to confirm that it is secure.

A terminal opener is provided on the circuit board as below.

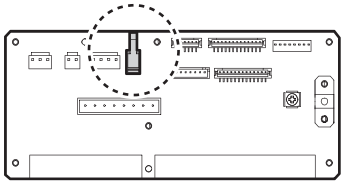
Processor Unit



TB Board 03P9648

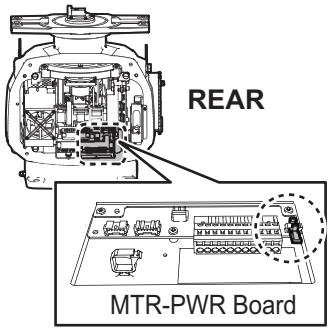
Antenna Unit/Transceiver Unit

<Other than FAR-3015/3025>



RF-TB Board 03P9570

<FAR-3015/3025>



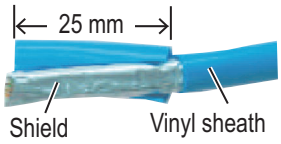
2.2 Antenna Unit (X-band, TR-UP)

2.2.1 How to fabricate the cables

Three cables are connected to the antenna unit: antenna cable, cable for the sub monitor (option) and power cable for the deicer (option). The procedure shows how to connect all cables. Disregard the descriptions for the optional equipment if not applicable.

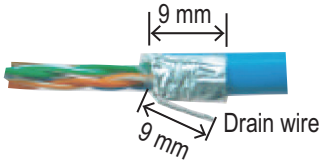
LAN cable

1



Expose inner vinyl sheath and remove it by approx. 25 mm. Be careful not to damage the shield and cores.

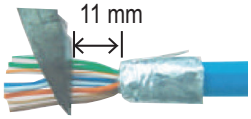
2



Fold back the shield, wrap it onto the vinyl sheath and cut it, leaving approx. 9 mm.

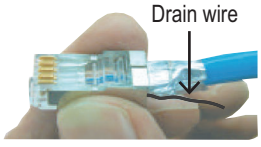
Also, fold back drain wire and cut it, leaving approx. 9 mm.

3



Straighten and flatten the cores in colored order and cut them, leaving approx. 11 mm.

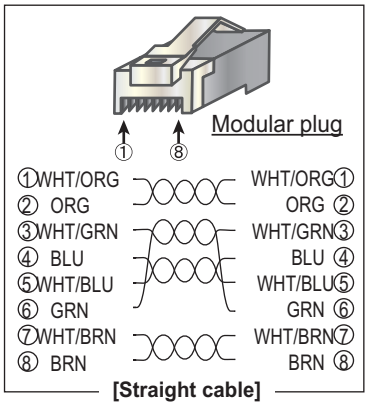
4



Insert the cable into the modular plug so that the folded part of the shield enters into the plug housing. The drain wire should be located on the tab side of the jack.

5

Using special crimping tool MPT5-8AS (PANDUIT CORP.), crimp the modular plug. Finally, check the plug visually.



RW-00135 (antenna cable, RSB-128/130/146)

For X-band radar, the end of the antenna cable RW-00135 which connects to the antenna unit is pre-fabricated.

RW-9600/6895/4873 (for retrofit or foremast installation, RSB-128/146)

The existing cable (RW-9600/6895/4873) can be used for the following cases.

- Cable extension for foremast installation (only for RW-9600 cable)
- Retrofit (For FAR-30x5 radars)

Depending on your installation, one or more of the following kits (available as optional extras) may be required. For the LAN Coaxial Converter, see section 2.11 "LAN Signal Converter Kit (option)" and for details.

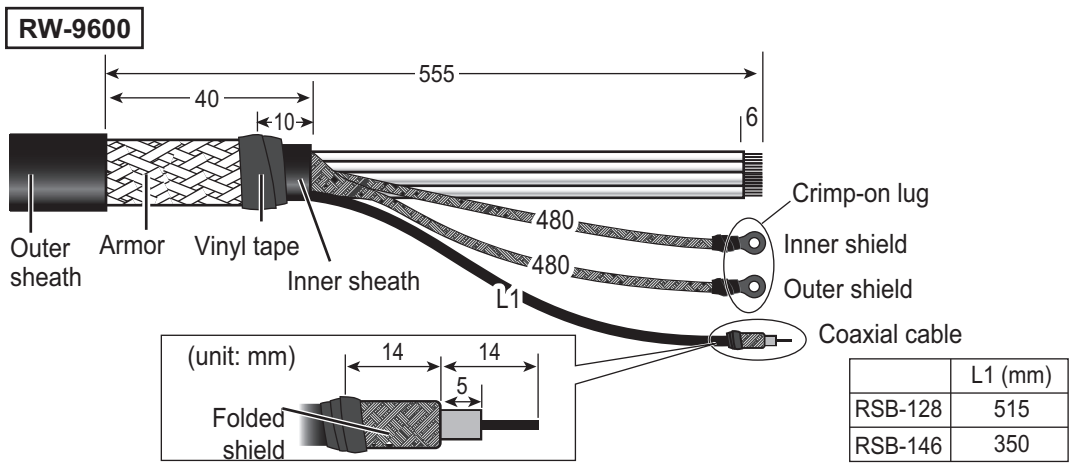
- LAN Signal Converter
  OP03-223-3: For RSB-128, magnetron radar
  OP03-223-4: For RSB-128, solid state radar
  OP03-223-5: For RSB-146
- Retrofit Cable Kit
  OP03-255-3: For RSB-128
  OP03-255-5: For RSB-146

Cable type	Antenna unit		Cable entrance	LAN Signal Converter	Retrofit Cable Kit
	Type	Specifications			
RW-9600	RSB-128	w/LAN signal converter	Cable cover	—	—
	RSB-128 RSB-146		Bottom of chassis	—	✓
	RSB-128	w/o LAN signal converter	Cable cover	✓	—
	RSB-128 RSB-146		Bottom of chassis	✓	✓
RW-6895 RW-4873	RSB-128 RSB-146	w/o LAN signal converter	Bottom of chassis	✓	✓

("✓": Required, "—": Not required)

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.

For wiring the RW-9600 cable via the cable cover, the cable fabrication is shown below. In other cases, see the installation manual in the optional kit.

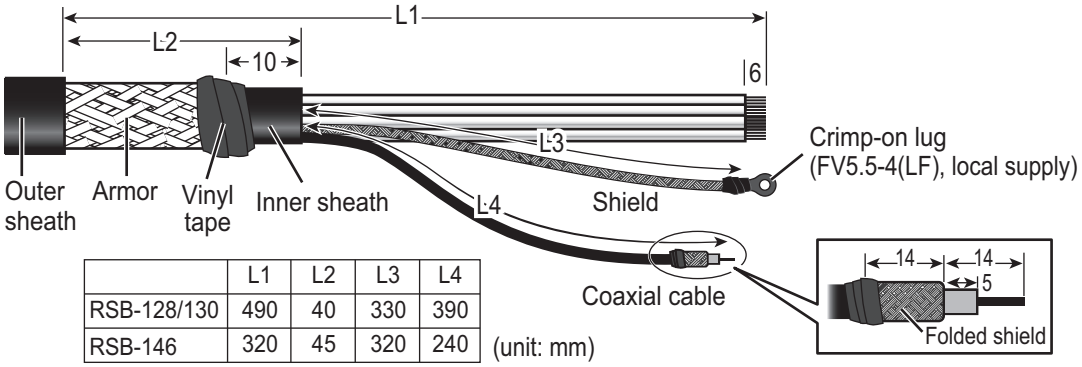


	L1 (mm)
RSB-128	515
RSB-146	350

The unused power lines are tied up and attached to a 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.

RW-00136 (for a sub monitor, RSB-128/130/146)

Note: The maximum cable length is 50 m.

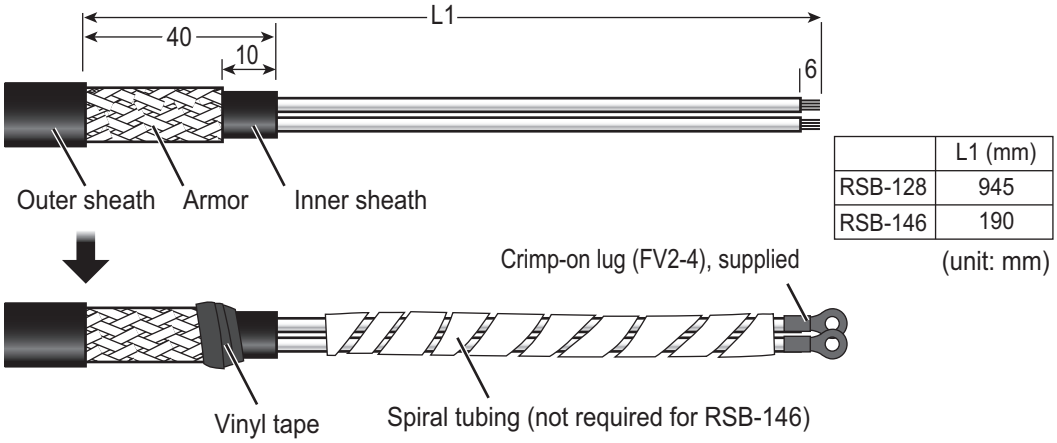


	L1	L2	L3	L4
RSB-128/130	490	40	330	390
RSB-146	320	45	320	240

(unit: mm)

DPYCY-1.5 (for the optional deicer, RSB-128/130/146)

- Before beginning any work on the antenna unit, turn off the breaker for the de-icer at the mains switchboard. (Turning off the display unit has no effect.)
- The de-icer activates when the temperature becomes 0 °C, and shuts down when the temperature reaches 5 °C.



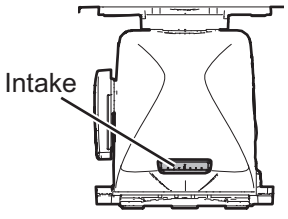
	L1 (mm)
RSB-128	945
RSB-146	190

(unit: mm)

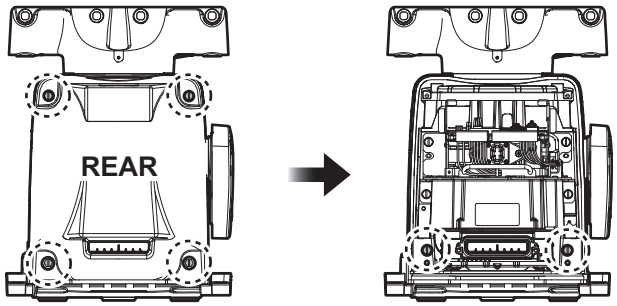
2.2.2 How to connect the cables (RSB-128)

NOTICE

If there is a chance of inclement weather when the RF unit is removed, cover the intakes on both covers with packing tape for waterproofing. Be sure to remove the tape after completing the installation.



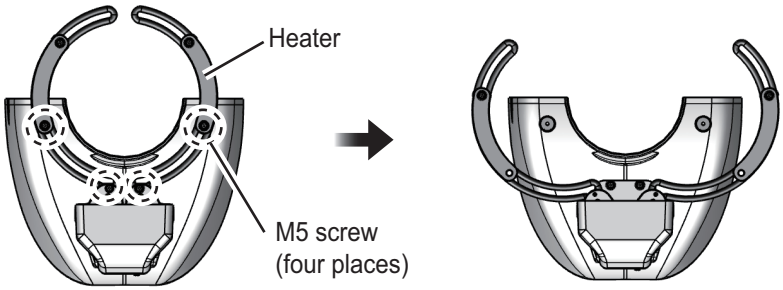
1. Loosen four bolts from the rear cover to remove the rear cover. If the de-icer is already installed, loosen two bolts inside the antenna to remove the front cover.



For de-icer installation

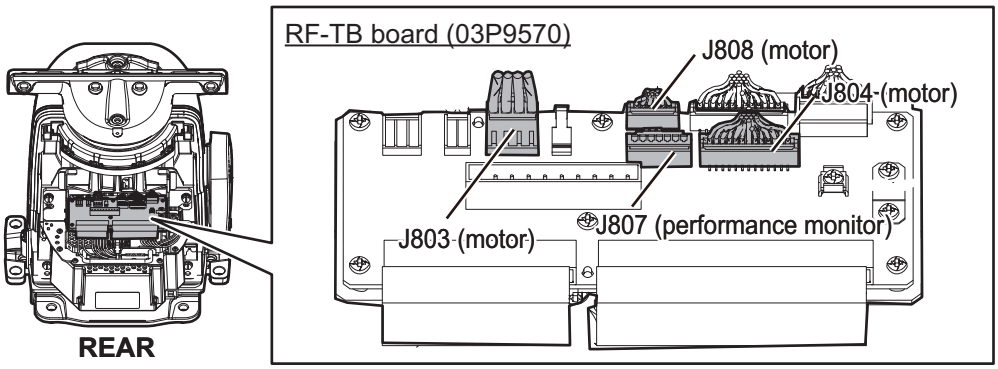
Note 1: The cable for the performance monitor is connected between the rear cover and the RF-TB Board in the Antenna Unit. Open the cover slowly to prevent damage to the cable and connector.

Note 2: If the de-icer is to be installed, remove four M5 screws and spread open the right and left heater elements on the cover, then remove the front cover, being careful not to hit the elements on the radiator or chassis.



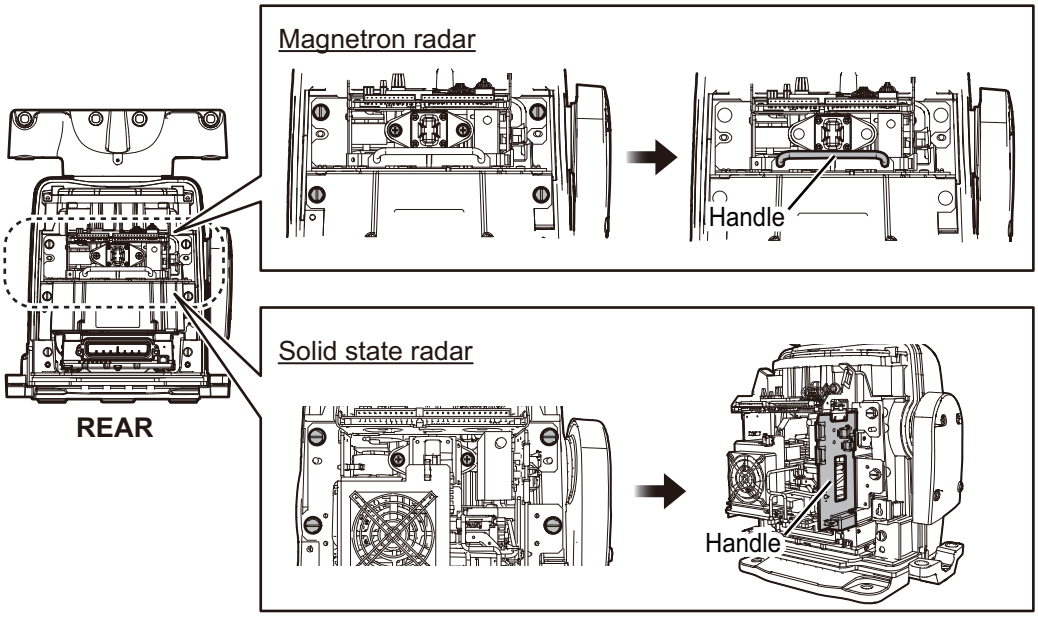
Note 3: If this a retrofit or foremast installation, a LAN Signal Converter is required, in both the Antenna Unit and the Processor Unit. See section 2.11.

2. Disconnect the performance monitor connector (J807) and the motor drive connectors (J803, J804 and J808) from the RF-TB Board.

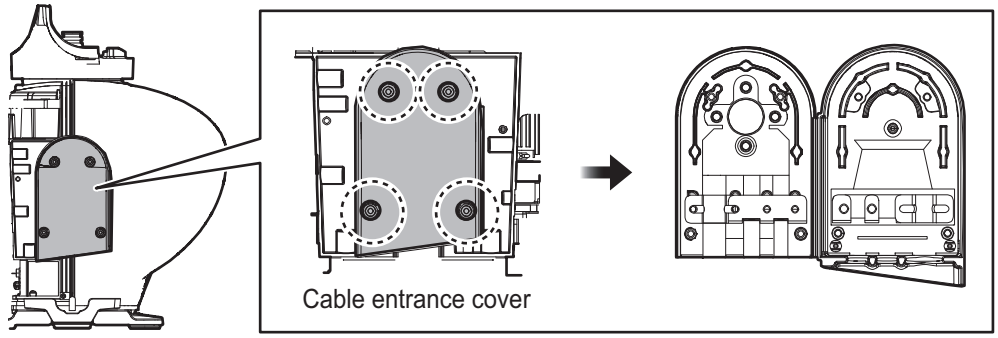


3. Unfasten the six bolts in the figure below to enable removal of the transceiver unit.Then, pull the handle on the transceiver unit to remove the unit. **For magne-**

tron radar, lay the unit on its side or on top of non-ferrous material, to prevent demagnetization of the magnetron.

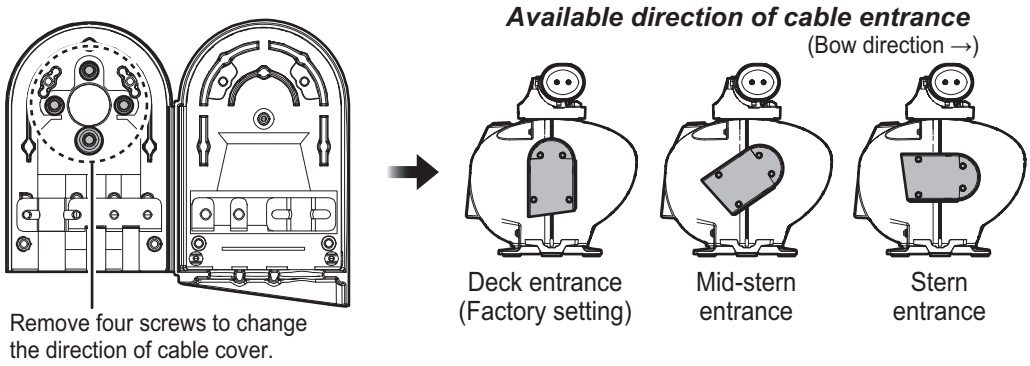


4. Unfasten four screws to open the cable entrance cover.

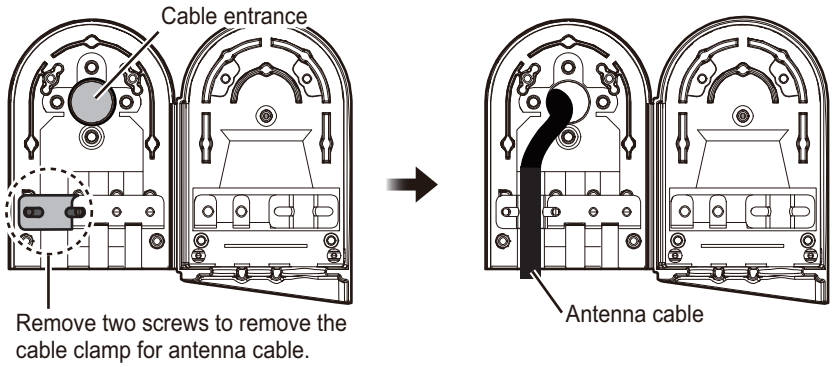


How to change the orientation

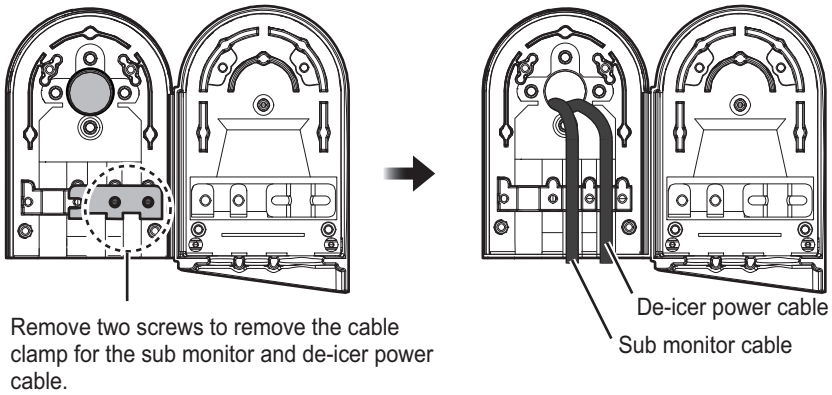
The orientation of the cable entrance can be changed, in one of the three orientations shown in the following figure. **No other orientation is allowed, to maintain watertight integrity.** The default orientation is "deck". To change the entrance, unfasten the four screws circled in the following figure, then orient the cable entrance in the required direction. Refasten the screws.



5. Unfasten the two screws fixing the cable clamp for antenna cable, then pass the antenna cable through the cable entrance.

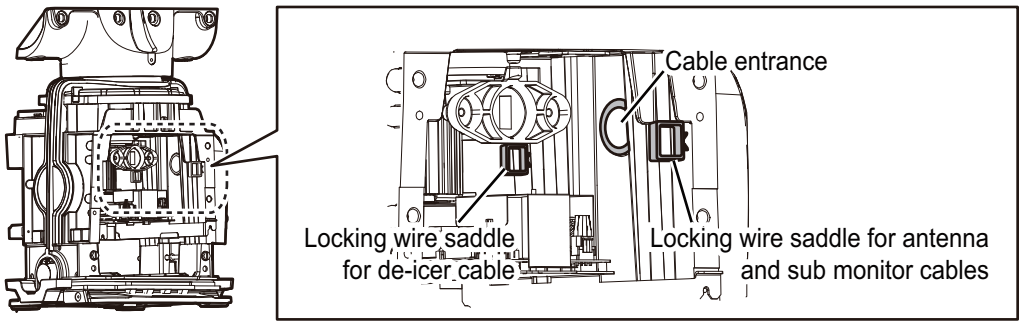


If applicable, unfasten the two screws fixing the cable clamp for the sub monitor and de-icer power cable, then pass the cables through the cable entrance.



Note: Dummy plugs are provided to insert into unused cable slots for waterproofing.

6. Pass the cables through their respective locking wire saddles in the chassis from the cable entrance.
Note: Make sure to pass the cable through the specified locking wire saddle.

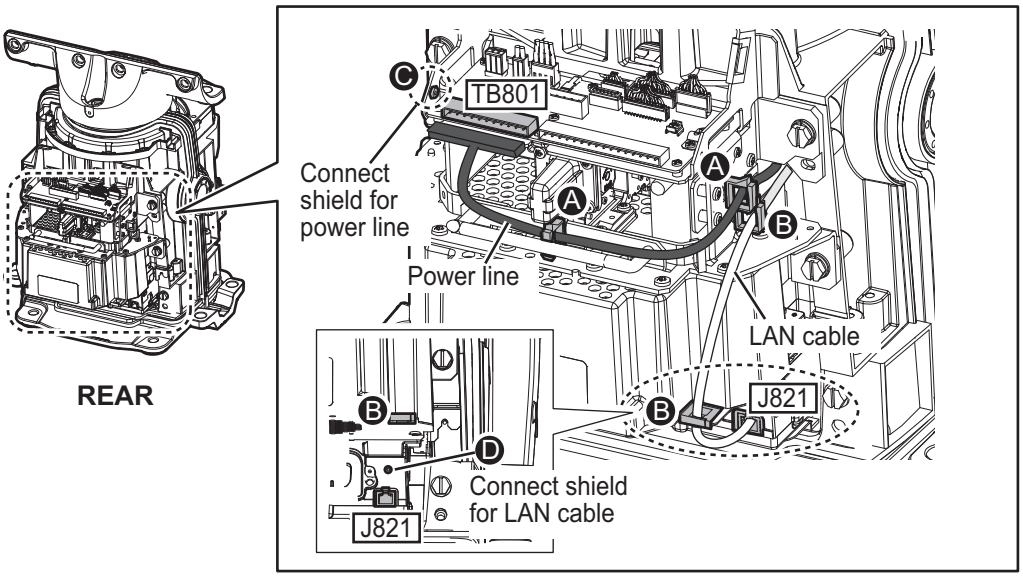


7. Re-mount the transceiver unit then reconnect the connectors for the motor (J803, J804 and J808).

8. Attach the appropriate WAGO connectors (pre-attached) to the appropriate cables, and then connect the antenna and sub monitor cables to the RF-TB Board as shown in the following figure. For how to connect the WAGO connector. 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.

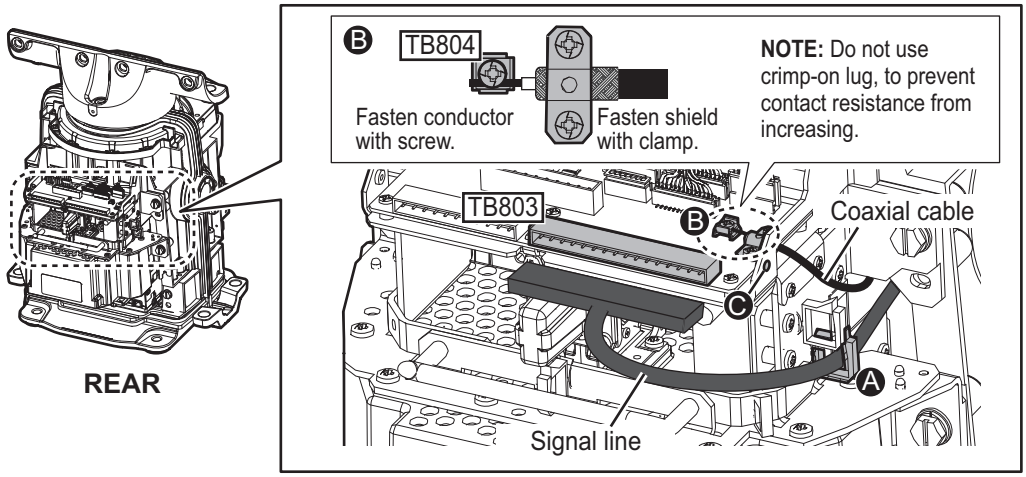
Note 2: A terminal opener is provided on the RF-TB Board.

- Destination of antenna cable
  Power line: TB801 through the locking wire saddles (A, two places).
  LAN cable: J821 through the locking wire saddles (B, two places).
  Shield of power line: Screw on fixing plate (C)
  Shield of LAN cable: Screw (D)

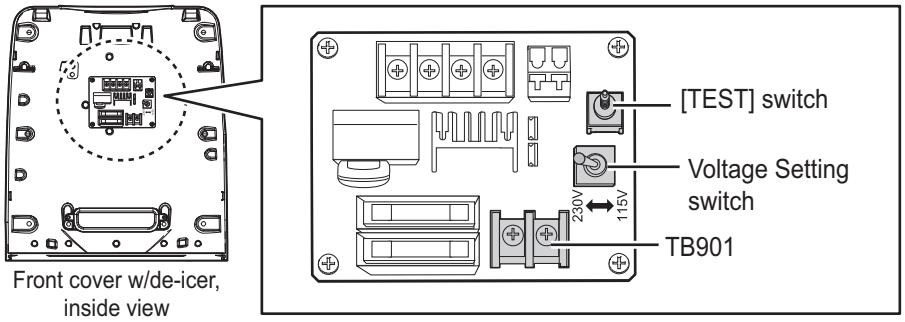


Note: For the antenna cable RW-9600/6895/4873, connect the crimp-on lug (that binds unused wires) together with the shield of the power line.

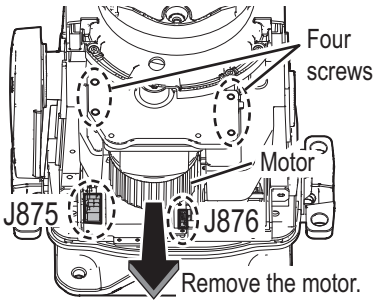
- Destination of sub monitor cable
  Signal line: TB803 through the locking wire saddle (A).
  Coaxial cable: TB804 (B)
  Shield of signal cable: Screw on fixing plate (C)



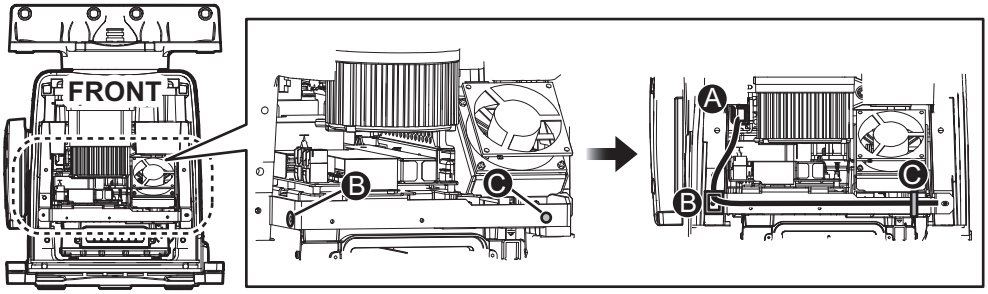
9. **For DE-ICER INSTALLATION**, connect the de-icer power cable to the de-icer board 03P9573 attached on the front cover. If the de-icer is not provided, go to step 10.



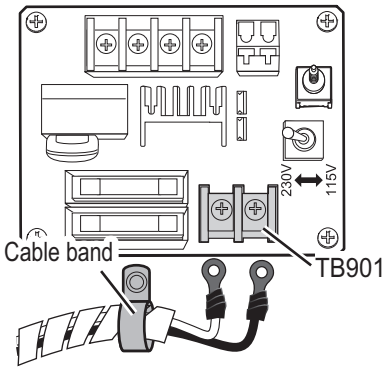
1) Remove four screws from the motor and disconnect connectors J875 and J876 to remove the motor.



2) Set a locking wire saddle (supplied) at locations (B) and (C) shown in the following figure. Pass the de-icer power cable from cable entrance through the locking wire saddles (A), (B) and (C) and pull it to the front side.

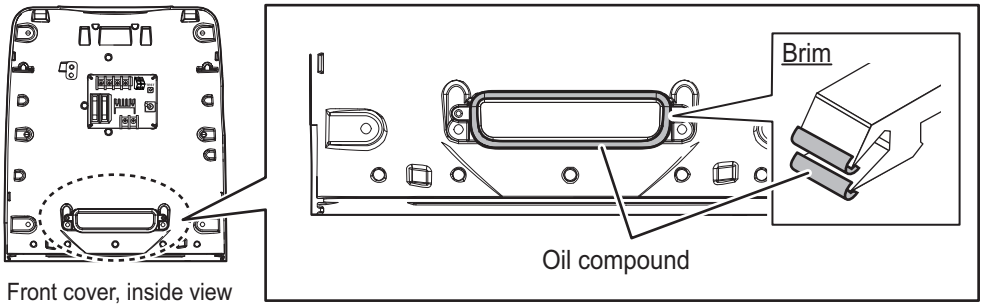


3) Pass the de-icer power cable through the cable band. Connect the cable to TB901 on the DE-ICER board (03P9573), using the supplied crimp-on lugs.
4) Attach the motor and connectors removed at step 1).
5) Set the Voltage Setting switch according to the power source for the de-icer; 115 V or 230 V. The default setting is 230 V.



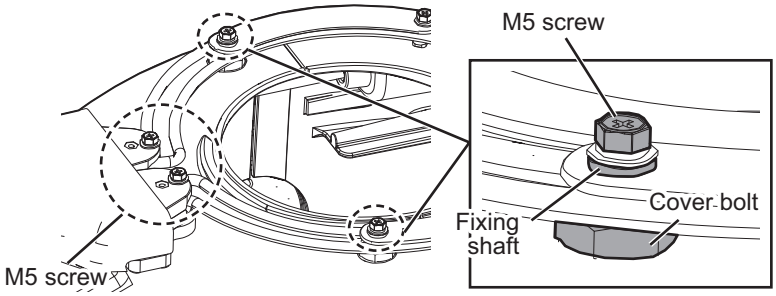
6) Apply power to the de-icer then press and hold the **TEST** switch for about ten seconds. Check that the heater gets hot and then release the **TEST** switch.

7) Coat the gasket (all brims) of the intake with the supplied oil compound. Be sure to coat the gasket completely.

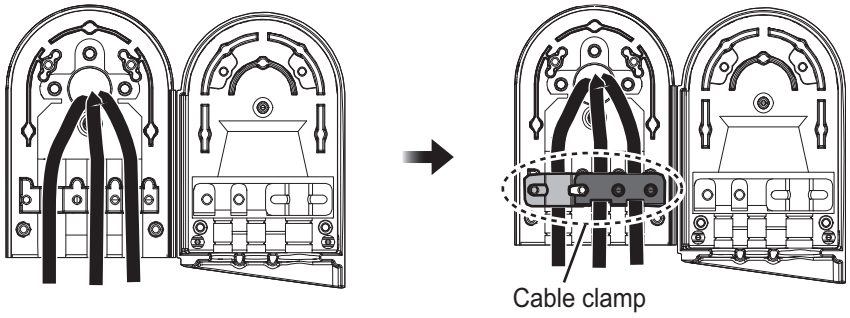


8) Set the front cover to the Antenna Unit. Close the open heater and return it to its original position.Take care not to hit the heater elements on the chassis or radiator.

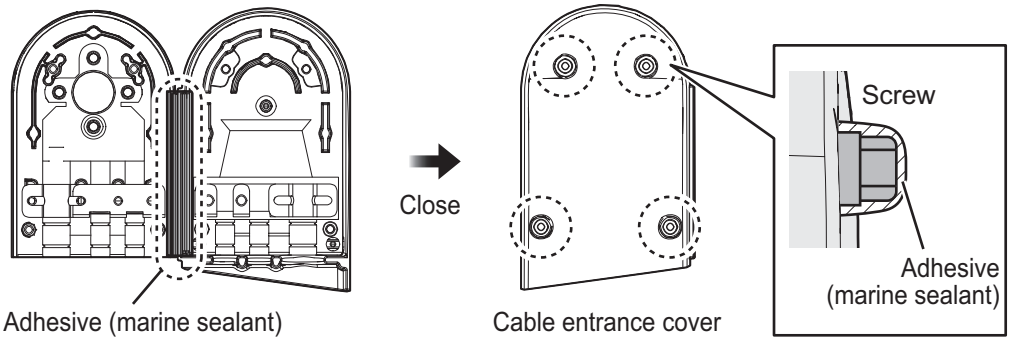
9) Fasten the base of the heater with two M5 screws and apply the supplied adhesive (marine sealant) to the screw heads. Also, fasten the fixing shafts for the cover bolts with two M5 screws.



10. Position the cables so their armors lie beneath their respective cable clamps in the cable entrance. Fasten the cable clamps.

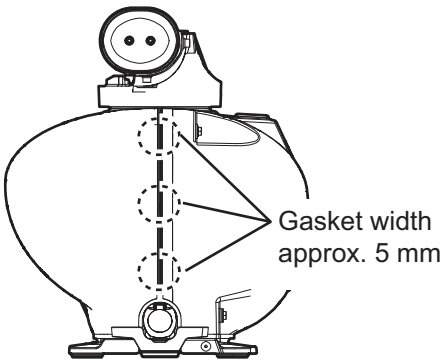


11. Coat the hinge with the supplied adhesive (marine sealant) to waterproof the hinge then close the cable entrance cover. Fix the cable cover with four screws, then coat the screws with the supplied adhesive (marine sealant).



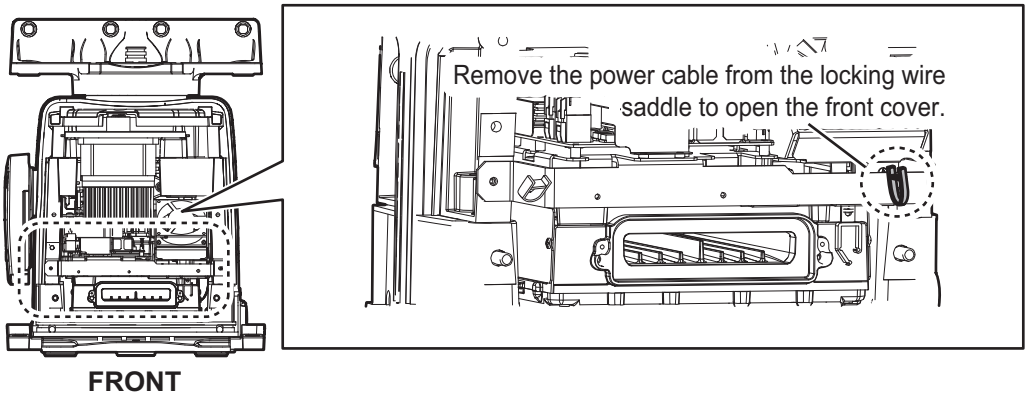
12. Reconnect the performance monitor connector (J807) to the rear cover.

13. Hold the rear cover at the lower part (near the intake), and the push it horizontally towards the chassis until the gasket between the front and rear covers are about 5 mm wide. Then close the rear cover with four bolts. The torque for the fixing bolts must be 10.0 N•m.
    Note 1: After pushing the rear cover by hand, check that the gasket width is approx. 5 mm at three places (the top, middle, and bottom) of the gasket.



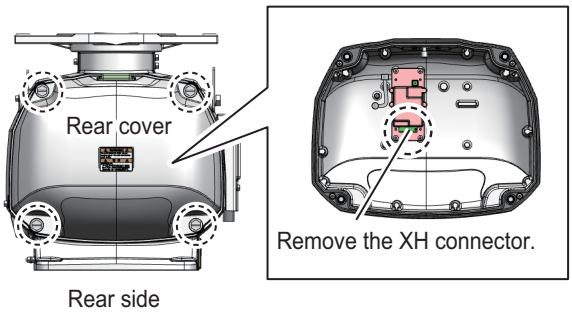
    Note 2: For the de-icer, take care not to hit the heater elements on the chassis or radiator when the front cover is being attached or detached.

    - To fix the heater elements, close the open heater to return it to its original position, then unfasten the fixing screws for the heater to adjust the position of the heater.
    - If it is necessary to open the front cover after installing the de-icer kit, remove the de-icer power cable from the locking wire saddle as shown in the following figure, then detach the cover slowly to prevent damage to the heater element.



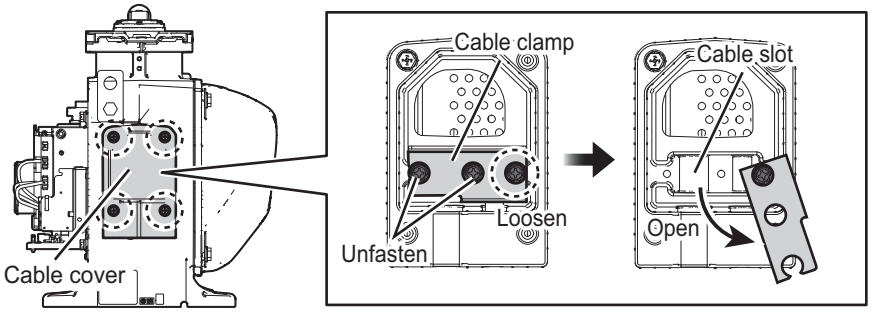
2.2.3 How to connect the cables (RSB-146)

1. Loosen four bolts from the rear cover to remove the rear cover.
   Note: If the performance monitor is installed, disconnect the XH connector on the rear cover.

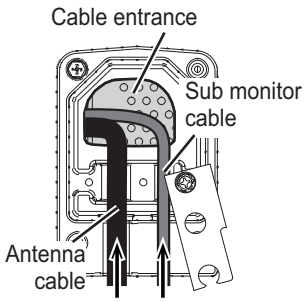


2. Loosen four screws on the cable cover at the starboard side to open the cable cover. Unfasten two screws (from the left) on the cable clamp and loosen the right-

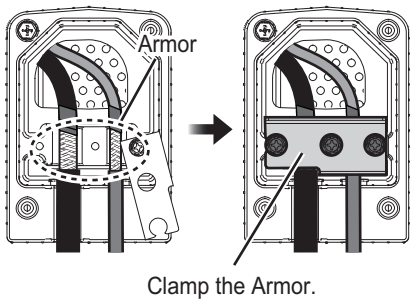
most screw to open the cable clamp, then remove the rubber packing on the left slot. The rubber packing may be discarded.



3. Pass the antenna cable on the left slot through the cable entrance into the chassis. If the sub monitor is connected, remove the dummy plug on the right slot and pass the sub monitor cable on the right slot as well. The dummy plug may be discarded.

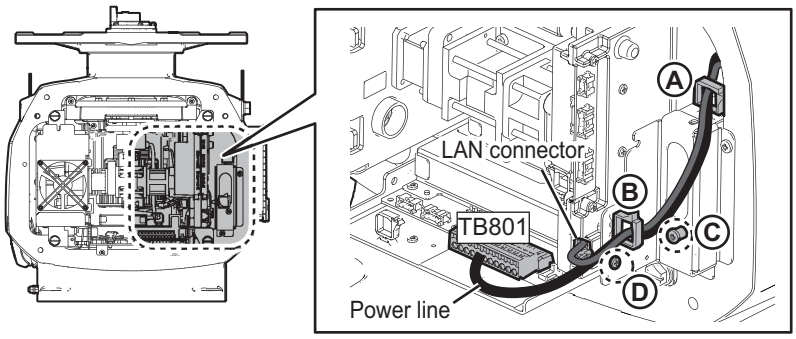


4. Clamp on the armor of the cables with the cable clamp. The torque must be 4.1 N•m.

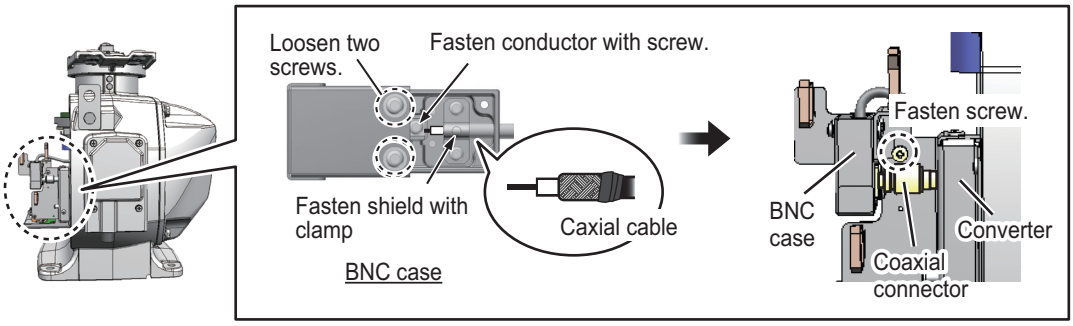


5. Connect the wires to the respective WAGO connectors (pre-attached) and the re-mount the WAGO connectors through the specified wiring clamps.
   For how to connect the WAGO connector, see "WAGO connector" on page 2-5.
   For pin arrangement, see the interconnection diagram at the back of this manual.
   Note: Make sure to pass the cable through the specified wiring clamp.

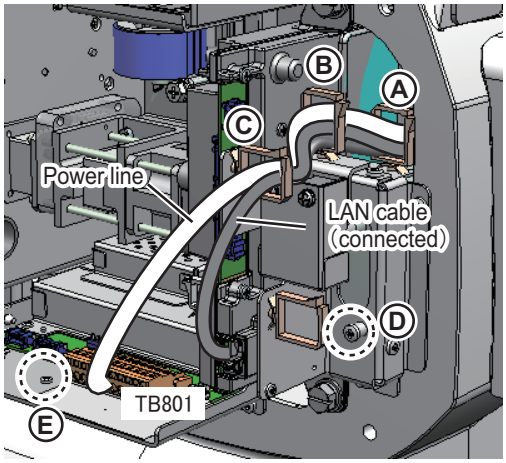
   - Destination of antenna cable
     <For RW-00135>
     Power line: TB801 through the wiring clamps (A, B)
     Shield of power line: Screw (C)
     LAN cable: LAN connector through the wiring clamps (A, B)
     Shield of LAN cable: Screw (D)



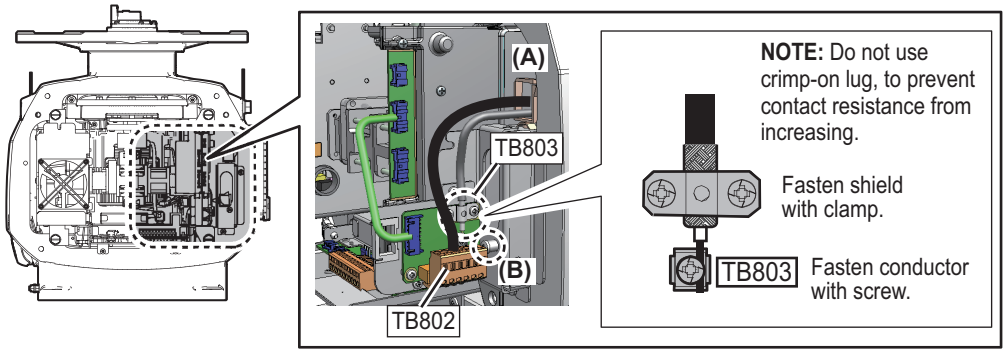
<For RW-9600>
Disconnect the connector between the BNC case and the converter, connect the coaxial cable to the BNC case. After connection, fasten the BNC case to the chassis (Tightening torque: 1.2 N•m).



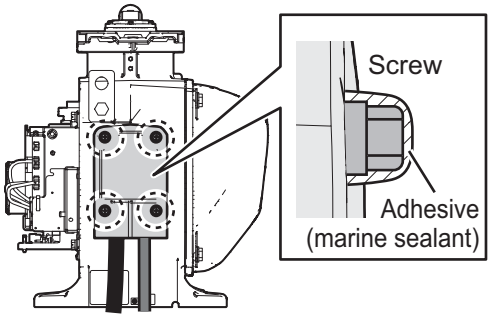
Power line: TB801 through the wiring clamps (A, B, C). The unused lines should be bound together and connected to the screw (E).
Shield of power line: Screw (D)
Coaxial cable: BNC case through the wiring clamps (A, B)



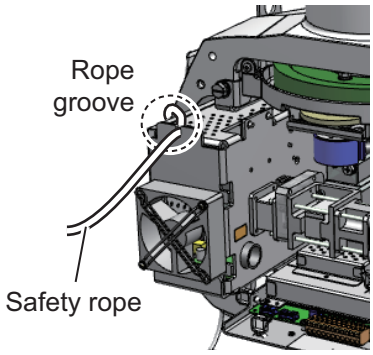
- Destination of sub monitor cable
  Signal line: TB802 through the wiring clamp (A)
  Shield of signal line: Screw (B)
  Coaxial cable: TB803 through the wiring clamp (A)



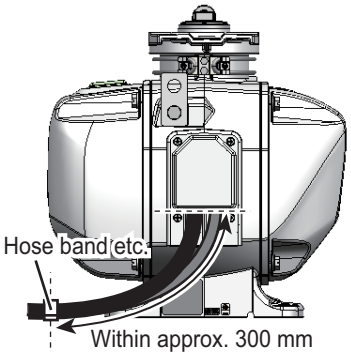
6. Close the cable cover, then coat the screws with the supplied adhesive (marine sealant). The torque must be 4.1 N•m.



7. Hook the safety rope to the rope groove on the chassis, then attach the rear cover (Tightening torque: 21 N•m). Take care not to damage the cables when attaching the cover of the antenna unit.
   Note: If the performance monitor is attached, connect the XH connector, removed at step 1, on the rear cover.

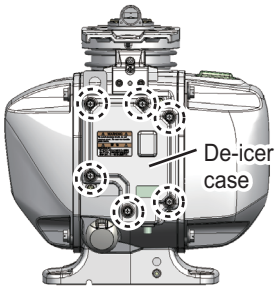


8. Fix the cables within approx. 300 mm from the cable cover with hose bands etc. (local supply) not to contact the cables to the chassis or a mast. If the cables contact the chassis or a mast, protect the cables with a vinyl tape etc.

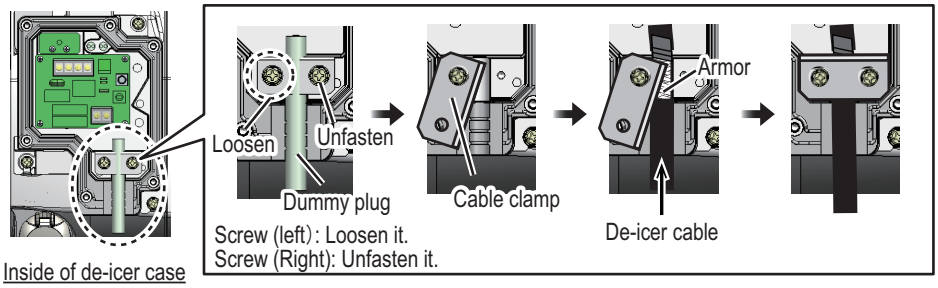


Wiring for de-icer cable

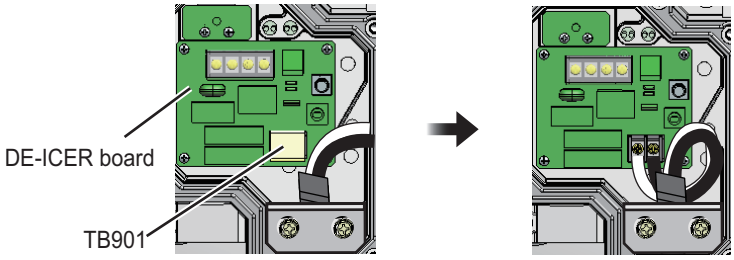
1. Loosen the six screws from the de-icer case to open the de-icer case cover.
   Note: If it is difficult to open the de-icer case cover because of silicone on the screws of the chassis, remove the silicone.



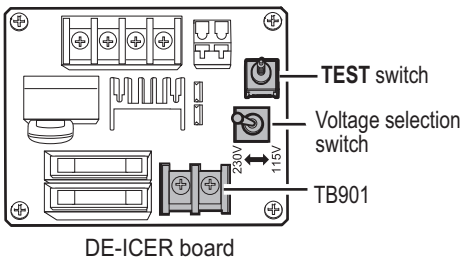
2. Release the cable clamp and remove the dummy plug, which may be discarded, shown in the figure below. Attach the de-icer cable and clamp the armor with the cable clamp with two screws (Tightening torque: 4.1 N•m).



3. Remove the cover from the terminal board TB901 on the DE-ICER board inside the de-icer case. Connect the de-icer cable to TB901.

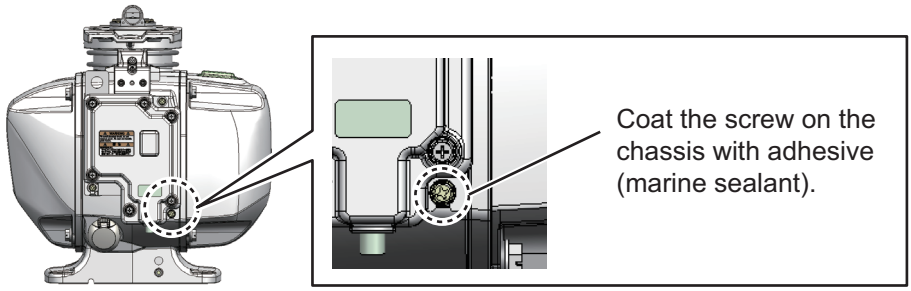


4. For 100-115 V power supply, set the voltage selection switch to 115V (default setting: 230V). Turn on the power to the deicer then press the **TEST** switch about ten seconds. Check if the heater gets hot. Turn off the power to the deicer.
   Note: To check the ship's mains, use a multitester to check the voltage at TB901 on the DE-ICER board (03P9573). Set the position of the voltage selection switch to 115V or 230V according to power source.



DE-ICER board

5. Attach the de-icer case cover (tightening torque: 4.1 N•m). Coat the six screw heads with adhesive (marine sealant).
6. Coat the screw on the chassis with adhesive (marine sealant).



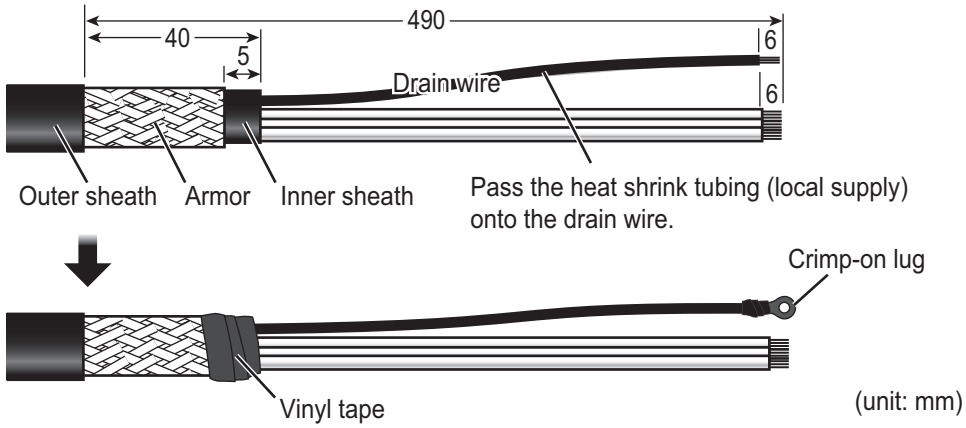
2.3 Antenna Unit (X-band, TR-DOWN)

2.3.1 How to fabricate the cables

Three cables are connected to the antenna unit: the serial cable from the transceiver unit, waveguide (FAR-3220W-BB/3320W) or microwave coaxial cable (FAR-3230SW-BB/3330SW), and power cable for the de-icer (option).

TTYCYSLA-10 (for serial cable)

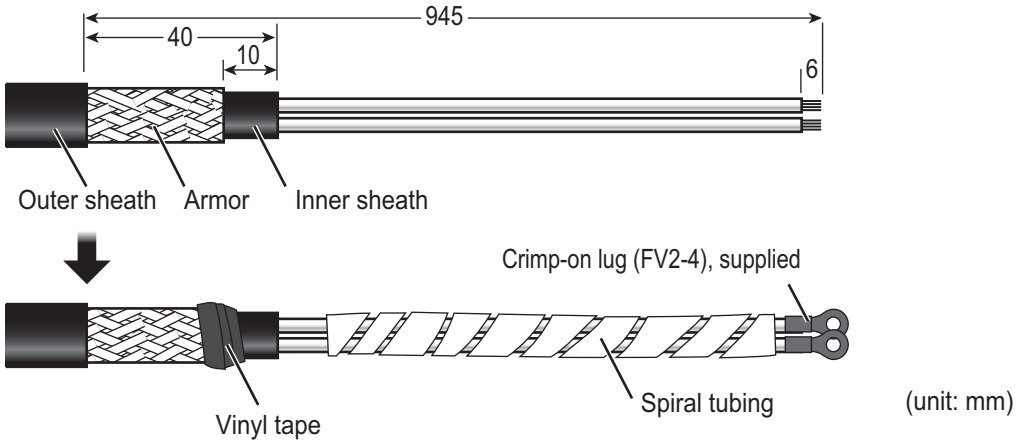
Clamp the armor with the cable clamp.



DPYCY-1.5 (for the optional de-icer)

- Before beginning any work on the Antenna Unit, turn off the breaker for the de-icer at the mains switchboard. (Turning off the display unit has no effect.)
- The de-icer activates when the temperature becomes 0 °C, and shuts down when the temperature reaches 5 °C.

Clamp the armor with the cable clamp.

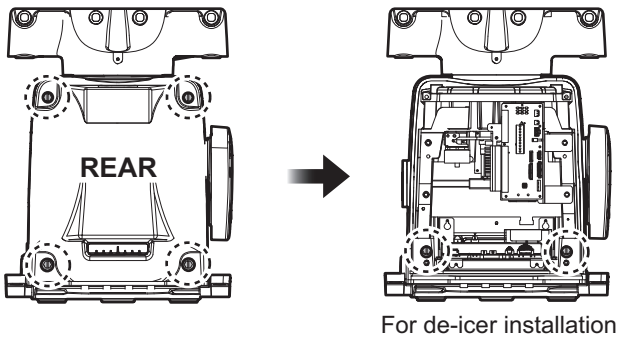


Flexible waveguide

The connector at the antenna side is preattached to the flexible waveguide. The bending radius shown below must be observed to prevent damage to the waveguide.
E-bend: 200 mm, H-bend: 400 mm

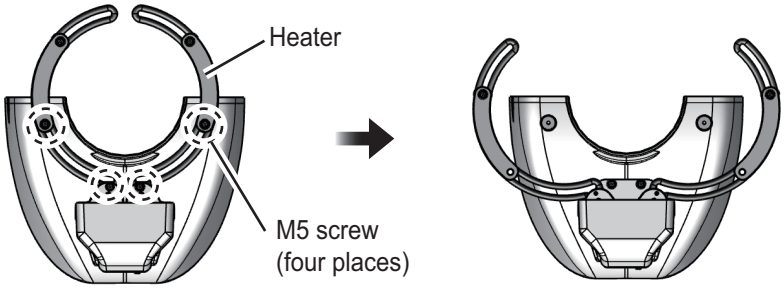
2.3.2 How to connect the cables (RSB-130)

1. Loosen four bolts from the rear cover to remove the rear cover. If the de-icer is already installed, loosen two bolts inside the antenna to remove the front cover.

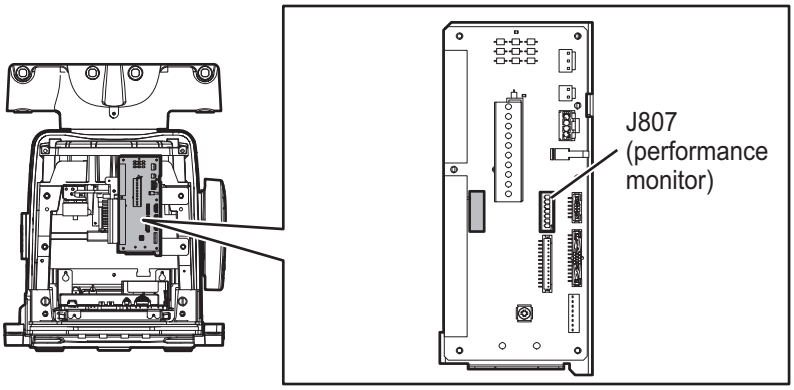


Note 1: The cable for the performance monitor is connected between the rear cover and the RF-TB Board in the Antenna Unit. Open the cover slowly to prevent damage to the cable and connector.

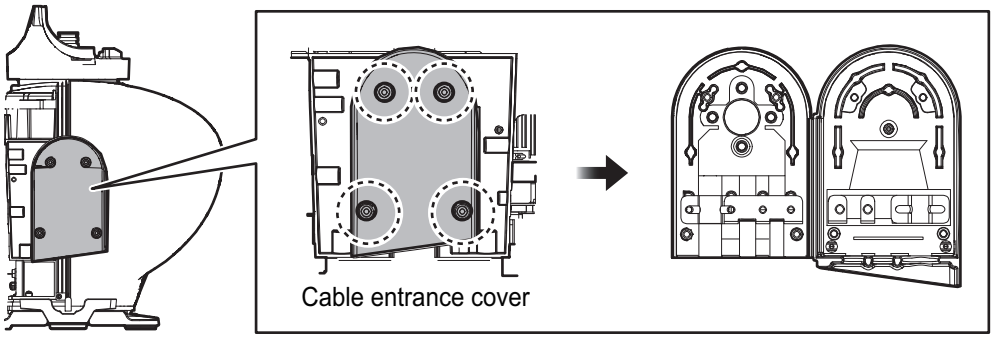
Note 2: If the de-icer is to be installed, remove four M5 screws and spread open the right and left heater elements on the cover, then remove the front cover, being careful not to hit the elements on the radiator or chassis.



2. Disconnect the performance monitor connector (J807) from the RF-TB Board.

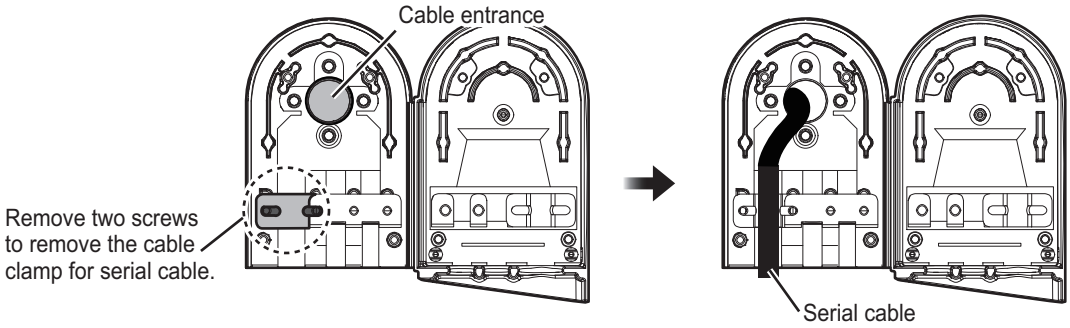


3. Unfasten four screws to open the cable entrance cover.

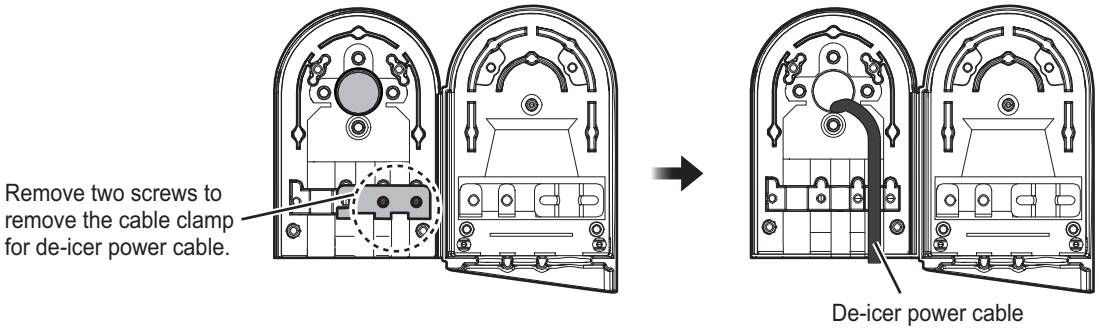


Note: The orientation of the cable entrance can be changed. See "How to change the orientation" on page 2-9.

4. Unfasten the two screws fixing the cable clamp for the serial cable, then pass the serial cable (TTYCYSLA-10) through the cable entrance.



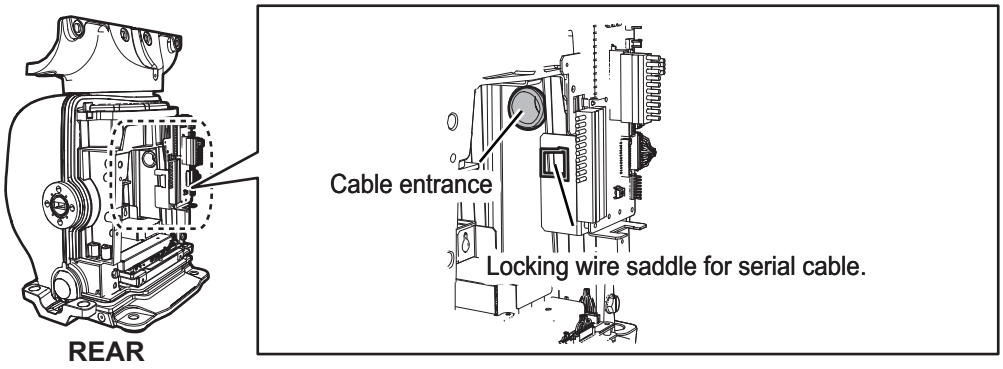
If applicable, unfasten the two screws fixing the cable clamp for the de-icer power cable, then pass the cables through the cable entrance.



Note 1: The dummy plug is provided to insert into the unused cable slot. Insert the plug for waterproofing.

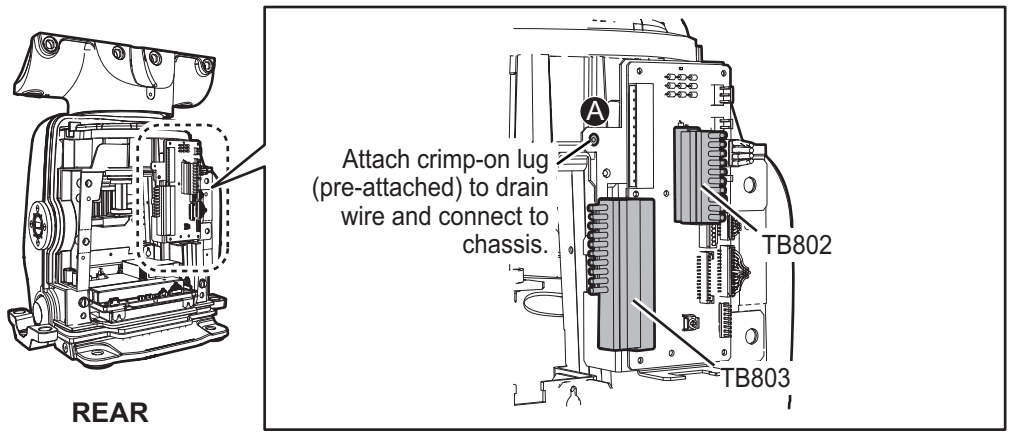
Note 2: The sub monitor cable is connected to the transceiver unit. See section 2.8.2.

5. Pass the serial cable through the cable entrance and locking wire saddle.
   Note: Make sure to pass the cable through the specified locking wire saddle.

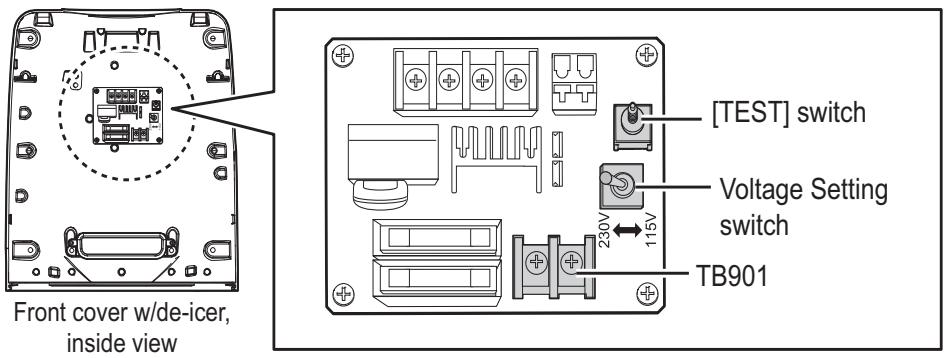


6. Attach the appropriate WAGO connectors (pre-attached) to the serial cable, and then connect the serial cable to the RF-TB Board as shown in the following figure. For how to connect the WAGO connector, see "WAGO connector" on page 2-5. For pin arrangement, see the interconnection diagram at the back of this manual.
   Note: A terminal opener is provided on the RF-TB Board.

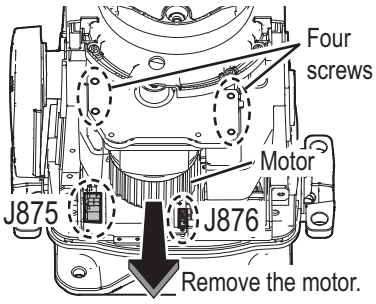
   Destination of serial cable
   Serial line: TB802 (8-pin) and TB803 (16-pin)
   Shield (drain wire): Screw (A)



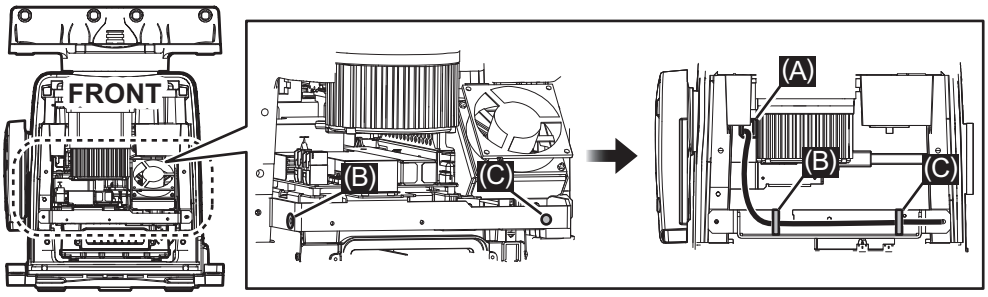
7. **For DE-ICER INSTALLATION**, connect the de-icer power cable to the de-icer board 03P9573 attached on the front cover. If the de-icer is not provided, go to step 8.



1) Remove four screws from the motor and disconnect connectors J875 and J876 to remove the motor.



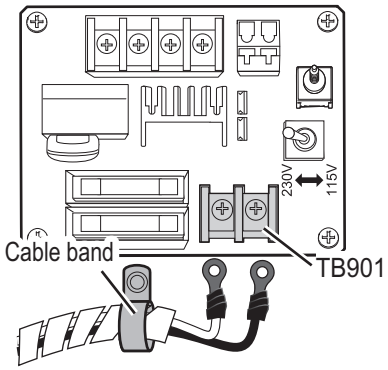
2) Set a locking wire saddle (supplied) at locations (B) and (C) shown in the following figure. Pass the de-icer power cable from cable entrance through the locking wire saddles (A), (B) and (C) and pull it to the front side.



3) Pass the de-icer power cable through the cable band. Connect the cable to TB901 on the DE-ICER board (03P9573), using the supplied crimp-on lugs.

4) Attach the motor and connectors removed at step 1).

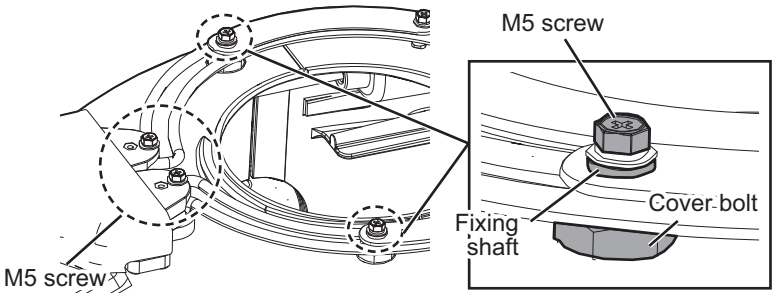
5) Set the Voltage Setting switch according to the power source for the de-icer; 115 V or 230 V. The default setting is 230 V.



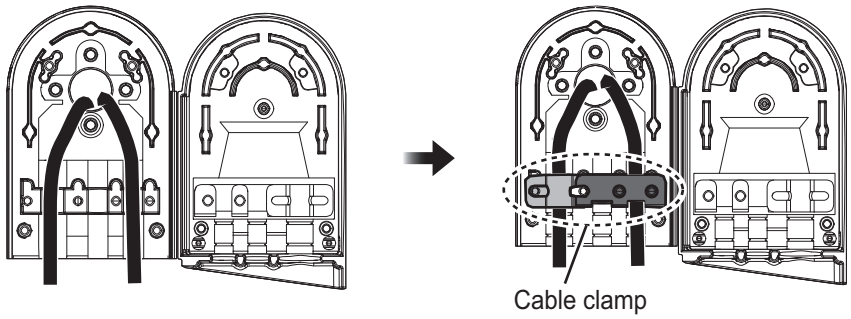
6) Apply power to the de-icer then press and hold the **TEST** switch for about ten seconds. Check that the heater gets hot and then release the **TEST** switch.

7) Set the front cover detached at step 1 to the Antenna Unit. Close the open heater and return it to its original position.Take care not to hit the heater elements on the chassis or radiator.

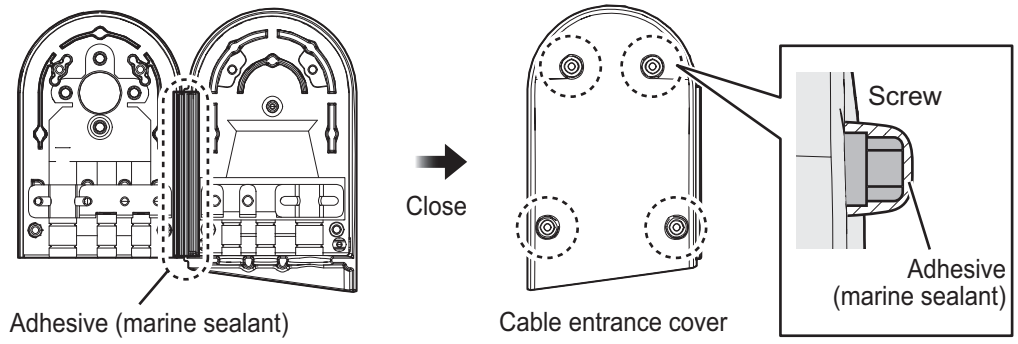
8) Fasten the base of the heater with two M5 screws and apply the adhesive (marine sealant) to the screw heads. Also, fasten the fixing shafts for the cover bolts with two M5 screws.



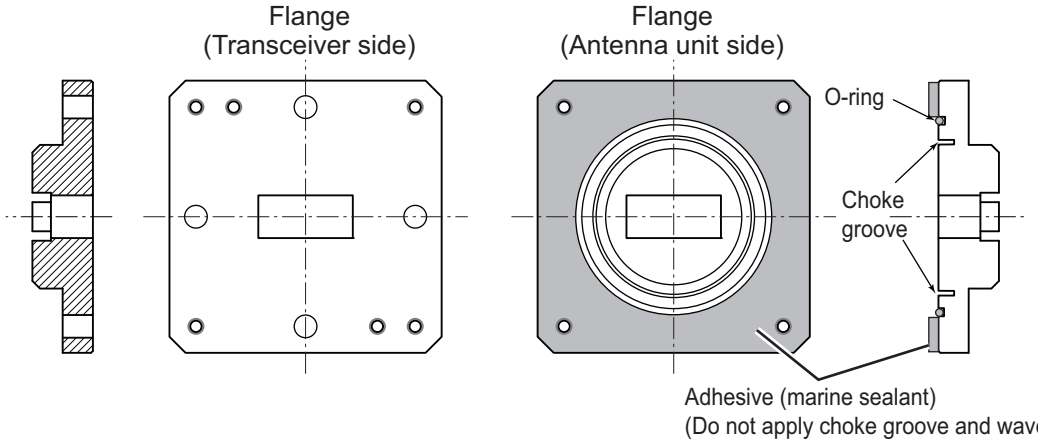
8. Position the cables so their armors lie beneath their respective cable clamps in the cable entrance. Fasten the cable clamps.



9. Coat the hinge with the supplied adhesive (marine sealant) to waterproof the hinge then close the cable entrance cover. Fix the cable cover with four screws, then coat the screws with the supplied adhesive (marine sealant).



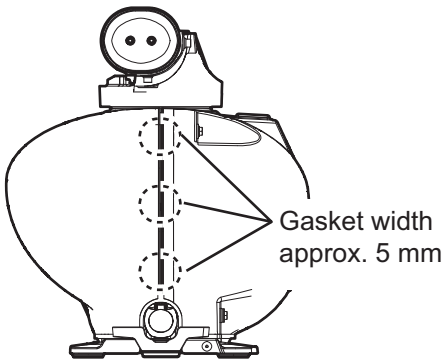
10. Reconnect the performance monitor connector (J807) to the RF-TB Board.
11. Connect the waveguide to the antenna with either an E-bend or H-bend waveguide. See the supplied instruction manual (C32-01903) in Antenna Unit for details.
    1) Wipe the surface of the waveguide flange with a clean, dry cloth to remove any foreign material.
    2) Grease the O-ring and set it in its groove on the Antenna Unit.
    3) Evenly coat the waveguide flange for the Antenna Unit side with supplied adhesive (marine sealant).
       Note: Apply an even coat of the supplied adhesive (marine sealant) to the waveguide flange. It should leak out slightly when the fixing bolts are tightened. Be sure no adhesive (marine sealant) contacts the choke groove and waveguide.



4) Connect the waveguide flange and then fix with the bolt.

5) Wipe off the excess adhesive (marine sealant) from the flange.

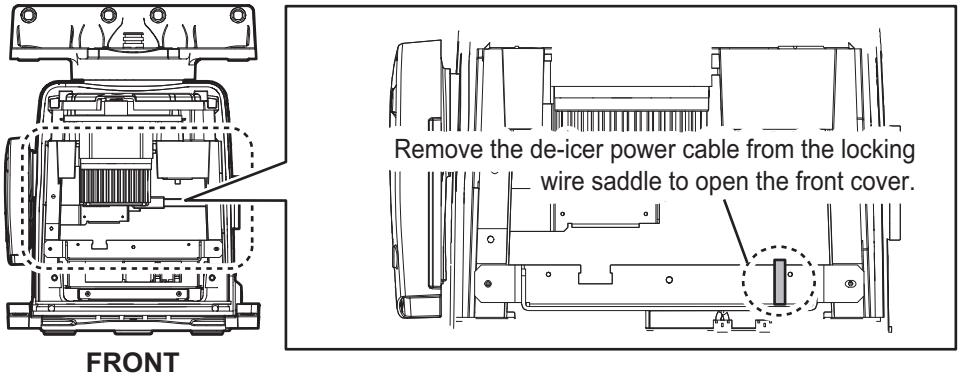
12. Hold the rear cover at the lower part (near the intake), and the push it horizontally towards the chassis until the gasket between the front and rear covers are about 5 mm wide. Then close the rear cover with four bolts. The torque for the fixing bolts must be 10.0 N•m.



Note 1: After pushing the rear cover by hand, check that the gasket width is approx. 5 mm at three places (the top, middle, and bottom) of the gasket.

Note 2: For the de-icer, take care not to hit the heater elements on the chassis or radiator when the front cover is being attached or detached.

- To fix the heater elements, close the open heater to return it to its original position, then unfasten the fixing screws for the heater to adjust the position of the heater.
- If it is necessary to open the front cover after installing the de-icer kit, remove the de-icer power cable from the locking wire saddle as shown in the following figure, then detach the cover slowly to prevent damage to the heater element.

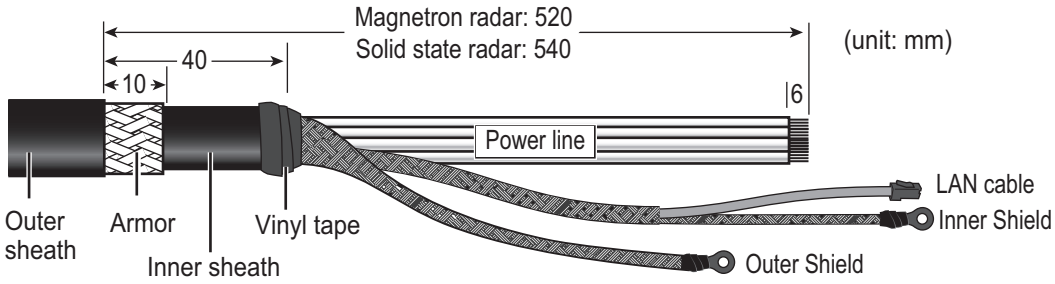


2.4 Antenna Unit (S-band, TR-UP)

2.4.1 How to fabricate the cables

RW-00135 (Antenna cable, RSB-129/133)

See "LAN cable" on page 2-5 for how to attach the LAN cable connector.



RW-9600/6895/4873 (for retrofit)

To use the existing cable (RW-9600/6895/4873) for the retrofit, two optional kits are required. For the LAN Coaxial Converter, see section 2.11 "LAN Signal Converter Kit (option)" for details.

- LAN Signal Converter: Type: OP03-247-2 (for RSB-129)
  Type: OP03-247-1 (for RSB-133)
- Retrofit Cable Kit: Type: OP03-255-1 (for RSB-129/133)

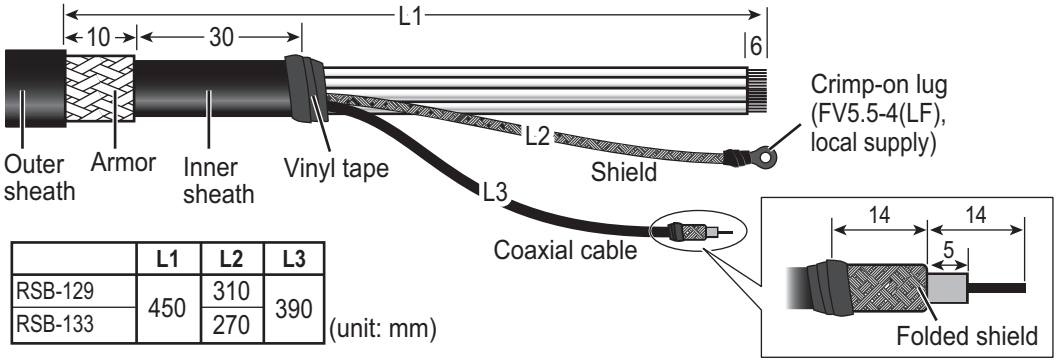
Note: The maximum antenna cable length is 100 m for RW-9600, 50 m for RW-6895/4873. If the existing antenna cable is longer than the above maximum length, replace the antenna cable with RW-00135.

For cable fabrications and wiring, see the installation manuals in the optional kits.

The unused power lines are tied up and attached to a 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.

RW-00136 (for a sub monitor, RSB-129/133)

Note: The maximum cable length is 50 m.

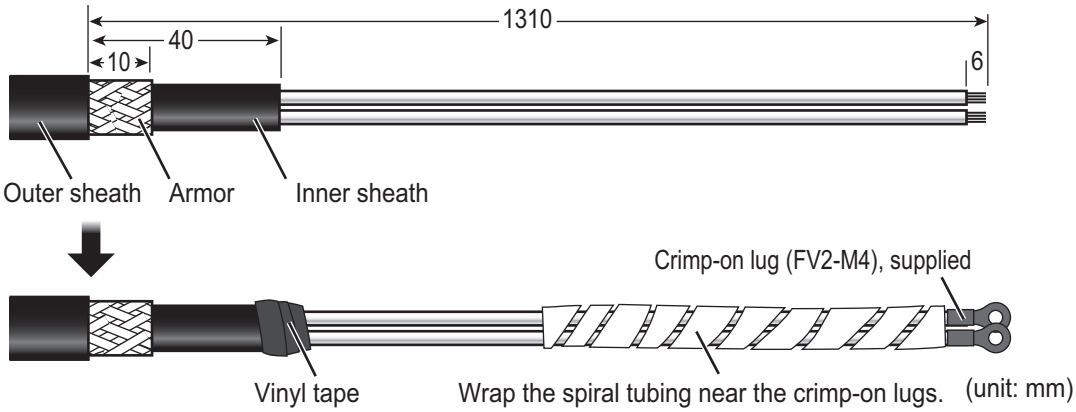


	L1	L2	L3
RSB-129	450	310	390
RSB-133		270	

(unit: mm)

DPYCY-1.5 (for the optional de-icer)

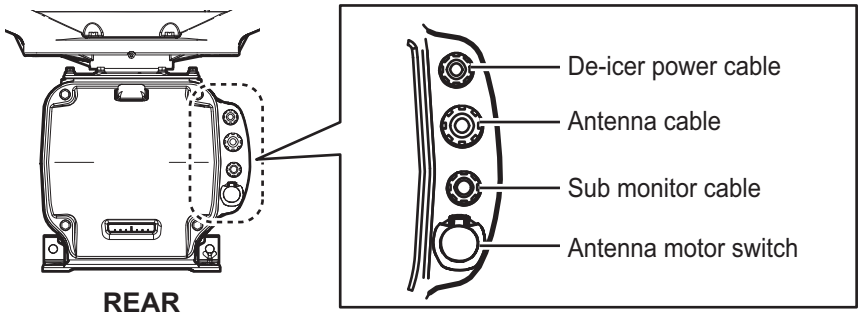
- Before beginning any work on the Antenna Unit, turn off the breaker for the de-icer at the mains switchboard. (Turning off the display unit has no effect.)
- The de-icer activates when the temperature becomes 0 °C, and shuts down when the temperature reaches 5 °C.



2.4.2 How to connect the cables (RSB-129/133)

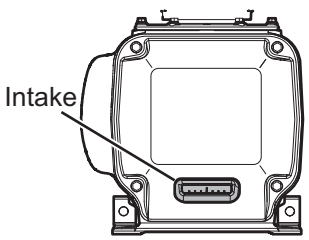
Three cables are connected to the Antenna Unit: antenna, sub monitor* and de-icer* power cables (*: option). The procedure shows how to connect all cables. Disregard the descriptions for the optional equipment if not applicable.

Note: Apply the supplied adhesive (marine sealant) to the unused cable glands.

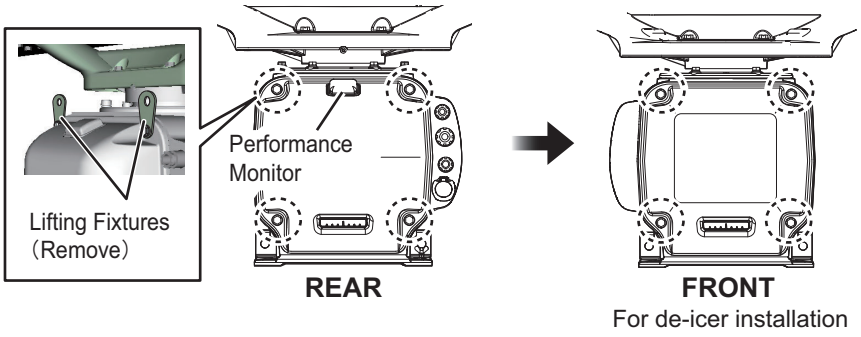


NOTICE

If there is a chance of inclement weather when the RF unit is removed, cover the intakes on both covers with packing tape for waterproofing. Be sure to remove the tape after completing the installation.

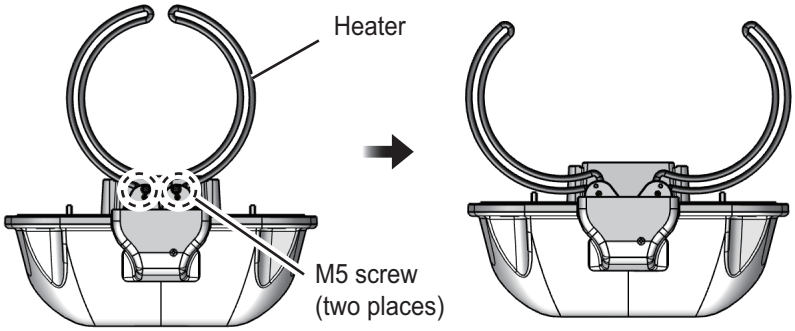


1. Loosen four bolts on the rear cover to remove the rear cover. If the de-icer is already installed, loosen also four bolts on the front cover to remove the front cover. If the lifting fixtures are still attached, they should be removed. For how to remove the lifting fixtures, see section .



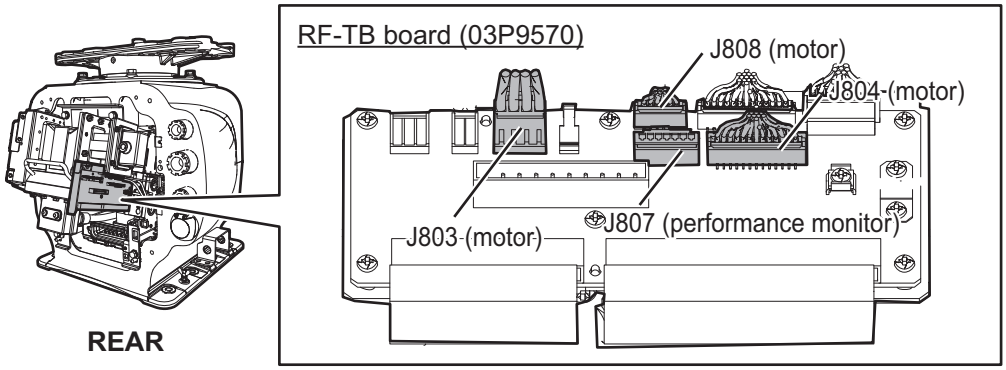
Note 1: The cable for the performance monitor is connected between the rear cover and the RF-TB Board in the Antenna Unit. Open the cover slowly to prevent damage to the cable and connector.

Note 2: If the de-icer is to be installed, remove two M5 screws and spread open the right and left heater elements on the cover, then remove the front cover, being careful not to hit the elements on the radiator or chassis.

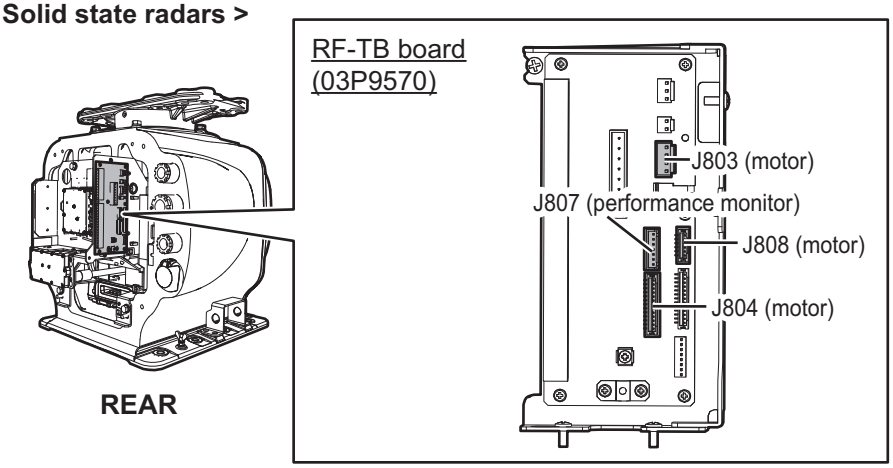


2. Disconnect the performance monitor connector (J807) and the motor drive connectors (J803, J804 and J808) from the RF-TB Board.

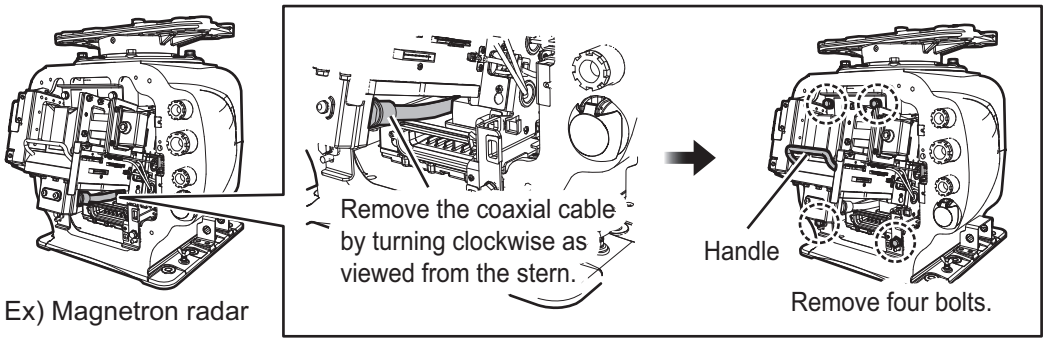
< Magnetron radars >



< Solid state radars >

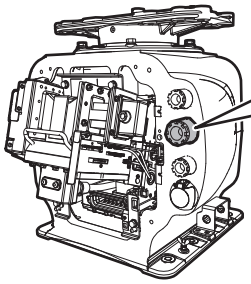


3. Disconnect the coaxial cable and unfasten the four bolts as shown below. Then,remove the RF unit with the handle.

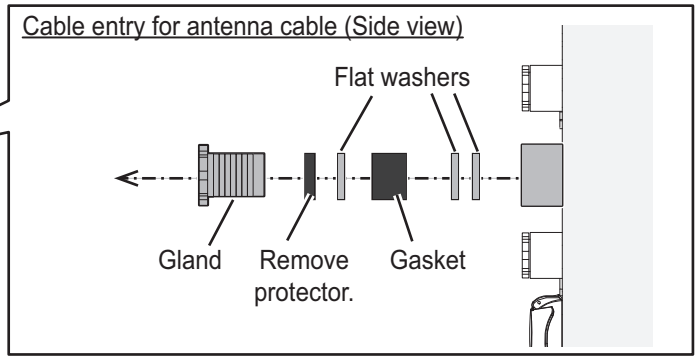


Note: For magnetron radars, lay the unit on its side or on top of non-ferrous material, to prevent demagnetization.

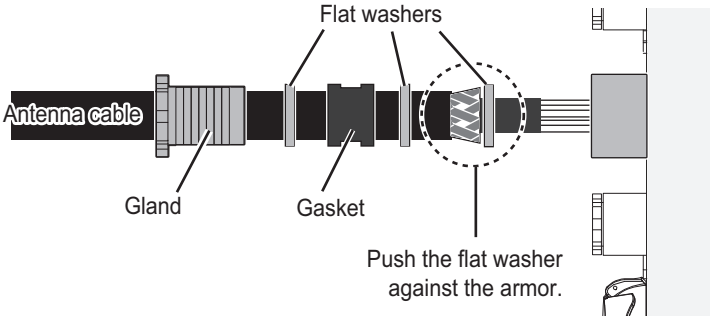
4. Unfasten the cable gland for the antenna cable, then remove the gasket, three flat washers, and protector.



Ex) Magnetron radar



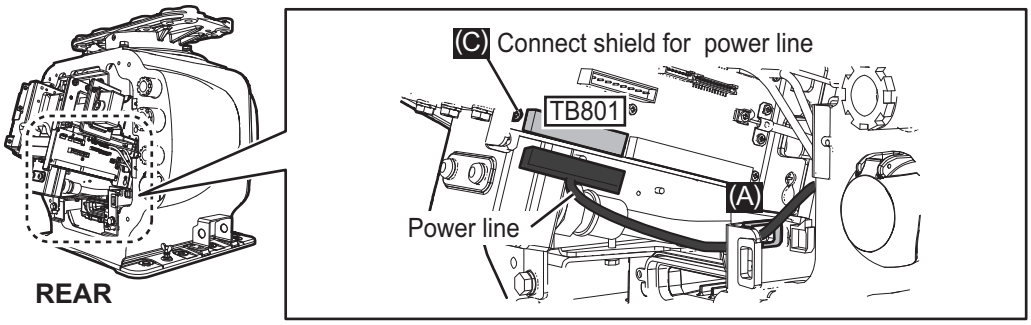
5. Slide the cable gland, the gasket and three flat washers onto the cable.
6. Push the flat washer against the armor.
7. Trim the armor so that it does not extend past the flat washers.

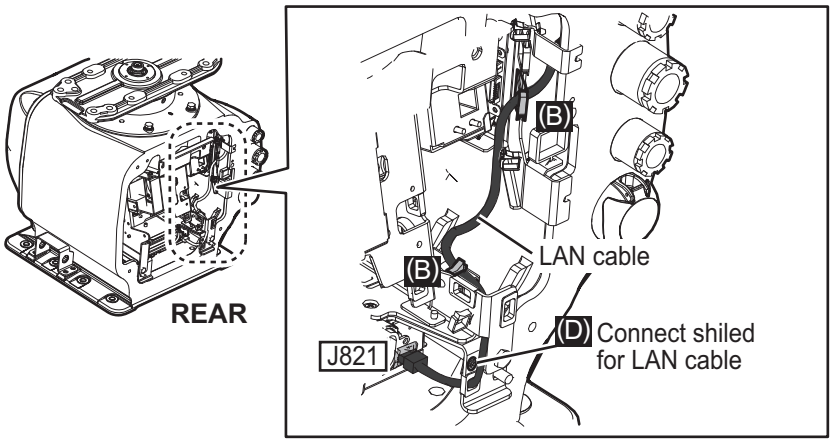


8. Pass the antenna cable through the cable entrance.
   If applicable, unfasten the appropriate cable glands and pass the sub monitor and de-icer power cables through the cable entrance. Pass the cables through their respective locking wire saddle.
9. All other cables are connected to the RF unit and should be pulled out of the chassis after passing them through their respective cable entrances. The de-icer power cable is connected to the de-icer board as shown in step 13.
10. Apply the supplied adhesive (marine sealant) to the threads of the cable glands, and then fasten it tightly with the hook spanner.
    Note: Use the wrench of the correct size referring to cable gland size below. If you do not have the hook spanner, contact your dealer.
    - Gland for the antenna cable: ϕ42
    - Gland for the sub monitor cable or de-icer cable: ϕ34
11. Re-mount the RF unit then reconnect the connectors for the motor (J803, J804 and J808), the four bolts and the coaxial cable (see step 3). The torque for fixing the coaxial cable must be 27.5 N•m.
12. Attach the appropriate WAGO connectors (pre-attached) to the appropriate cables, and then connect the antenna and sub monitor cables to the RF-TB Board shown in the following figure. For how to connect the WAGO connector, see "WAGO connector" on page 2-5. 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.

Magnetron radar

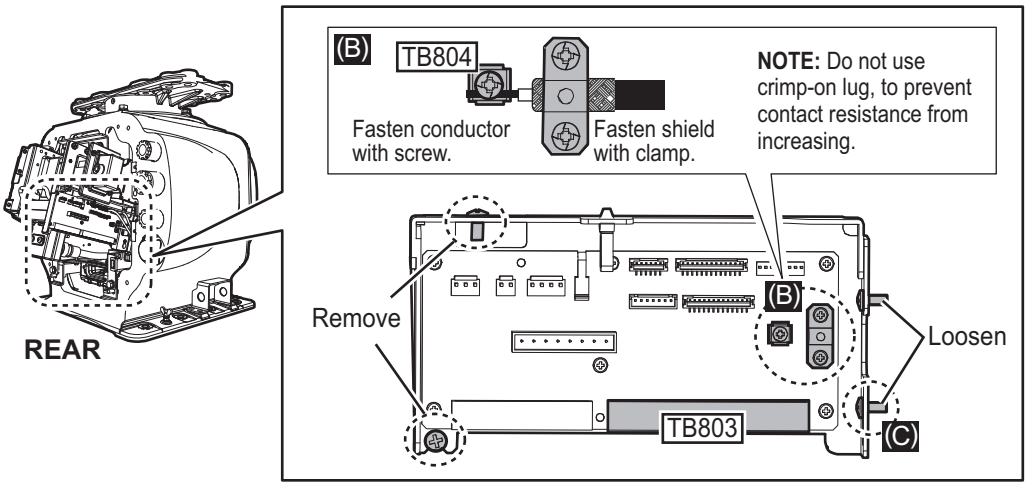
- Destination of Antenna cable:
  Power line: TB801 through the locking wire saddle (A)
  LAN cable: J821 through the locking wire saddles (B, two places)
  Shield of power line: Screw (C)
  Shield of LAN cable: Screw (D)





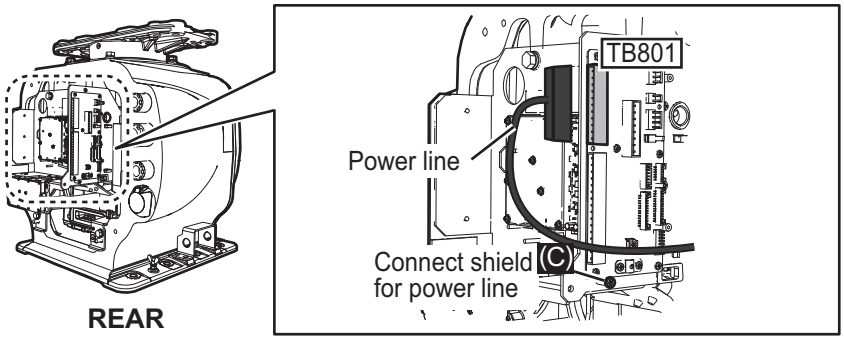
Note: For the antenna cable RW-9600/6895/4873, connect the crimp-on lug (that binds unused wires) together with the shield of the power line.

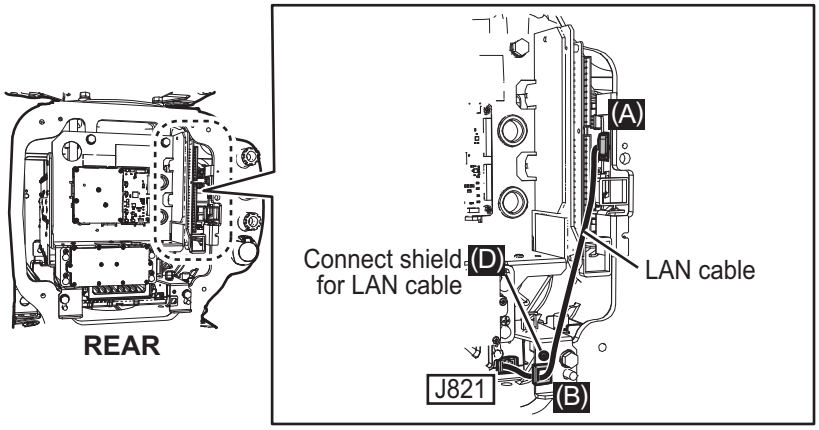
- Destination of sub monitor cable
  Note: Remove (or Loosen) four bolts as shown in the following figure to remove the RF-TB Board from the RF unit.
  Signal line: TB803 through the locking wire saddle (A), see the figure for the "Destination of Antenna cable:"
  Coaxial cable: TB804 (B)
  Shield of signal line: Screw (C)



Solid state radar

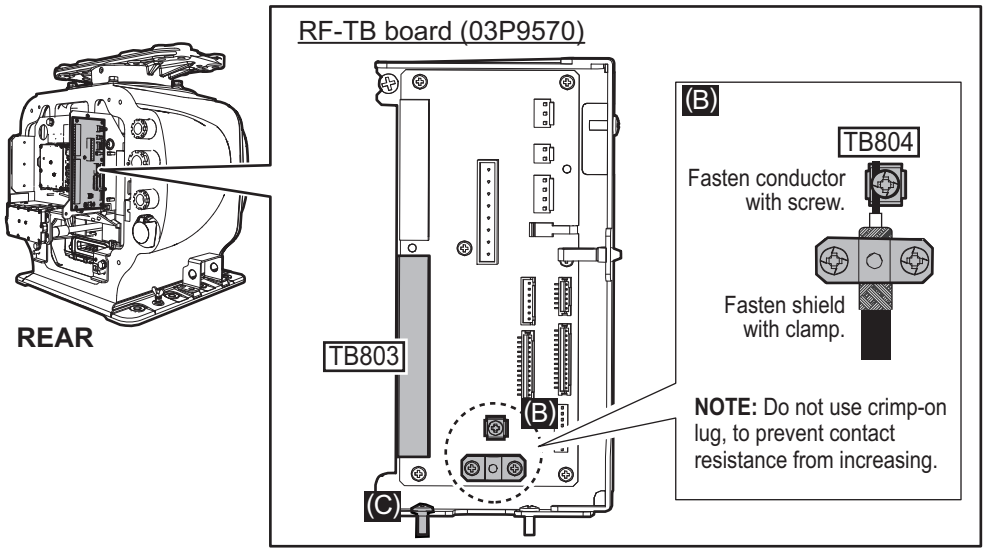
- Destination of Antenna cable:
  Power line: TB801 through the locking wire saddle (A)
  LAN cable: J821 through the locking wire saddles (A and B, two places)
  Shield of power line: Screw (C)
  Shield of LAN cable: Screw (D)



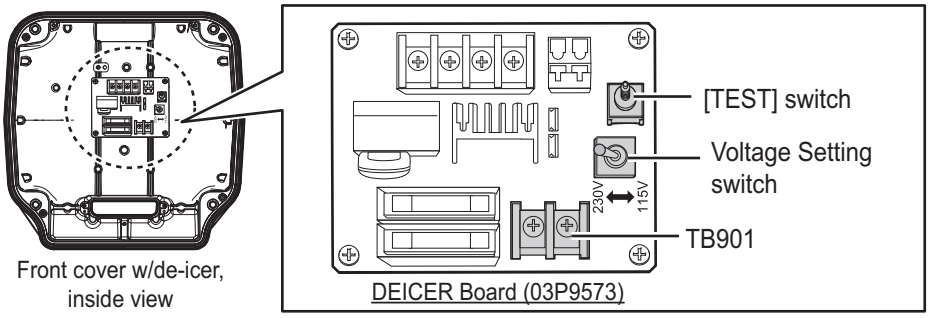


Note: For the antenna cable RW-9600/6895/4873, connect the crimp-on lug (that binds unused wires) together with the shield of the power line.

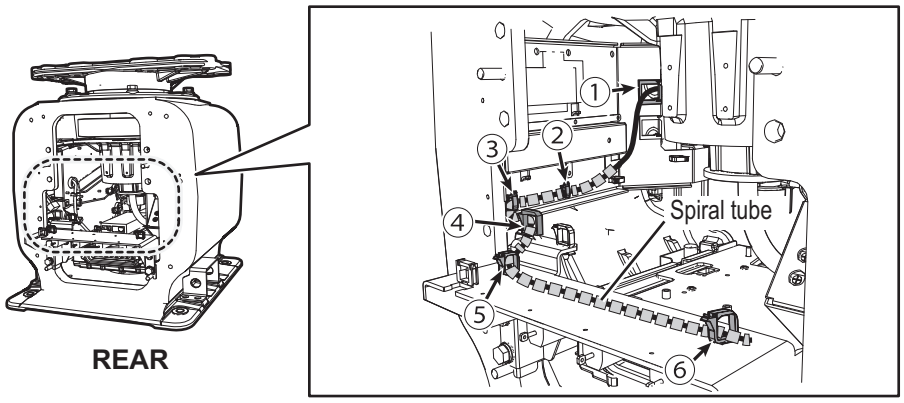
- Destination of sub monitor cable
  Signal line: TB803 through the locking wire saddle (A), see the figure for the "Destination of Antenna cable:"
  Coaxial cable: TB804 (B)
  Shield of signal line: Screw (C)



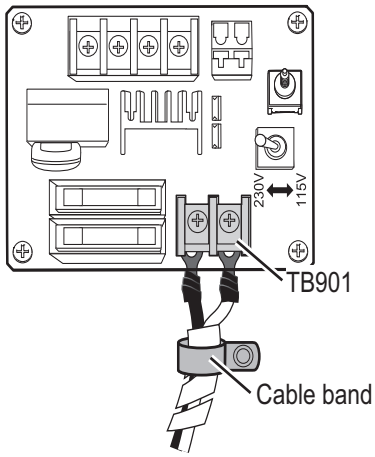
13. **For DE-ICER INSTALLATION**, connect the de-icer power cable the de-icer board 03P9573 attached on the front cover. If the de-icer is not provided, go to step 11.



1) Wrap the supplied spiral tube around the de-icer power cable, starting from the crimp-on lugs. Set a locking wire saddle (supplied) at location (6) shown in the following figure. Pass the de-icer power cable through the locking wire saddles (1) to (6) and it to the front side.



2) Pass the de-icer power cable through the cable band. Connect the cable to TB901 on the DE-ICER board (03P9573), using the supplied crimp-on lugs.



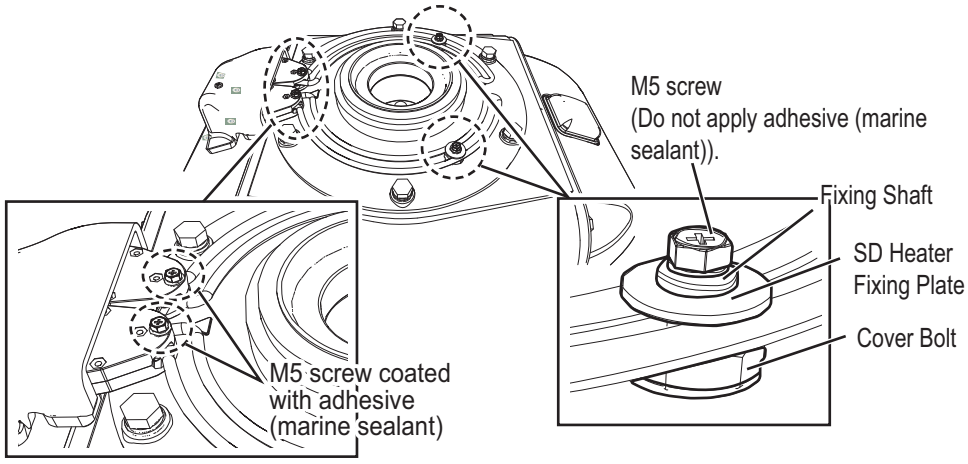
3) Set the Voltage Setting switch according to the power source for the de-icer; 115 V or 230 V. The default setting is 230 V.

4) Apply power to the de-icer then press and hold the **TEST** switch for about ten seconds. Check that the heater gets hot and then release the **TEST** switch.

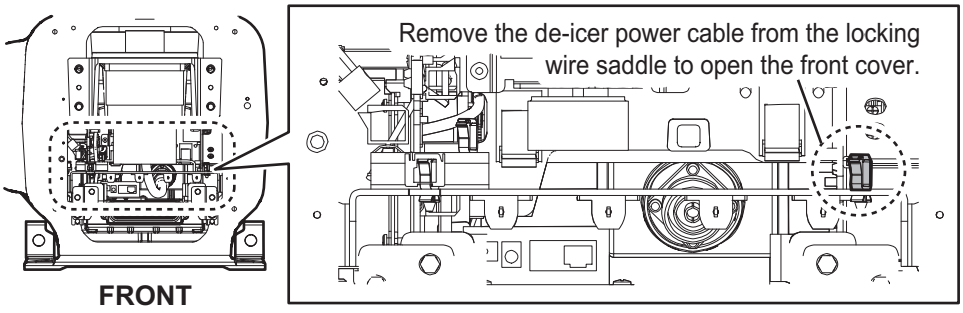
5) Set the front cover detached at step 1 to the Antenna Unit. Close the open heater and return to its original position.Take care not to hit the heater elements on the chassis or radiator.

6) Fasten the two heater elements to the chassis with the four bolts removed at step 1 on page 2-26. Fasten the base of the heater with two bolts coated with

the supplied adhesive (marine sealant). Fasten the installation materials to each of the cover bolts.



Note: If it is necessary to open the front cover after installing the DE-ICER kit, remove the de-icer power cable from the locking wire saddle shown in the following figure then detach the cover slowly to prevent damage to the heater.



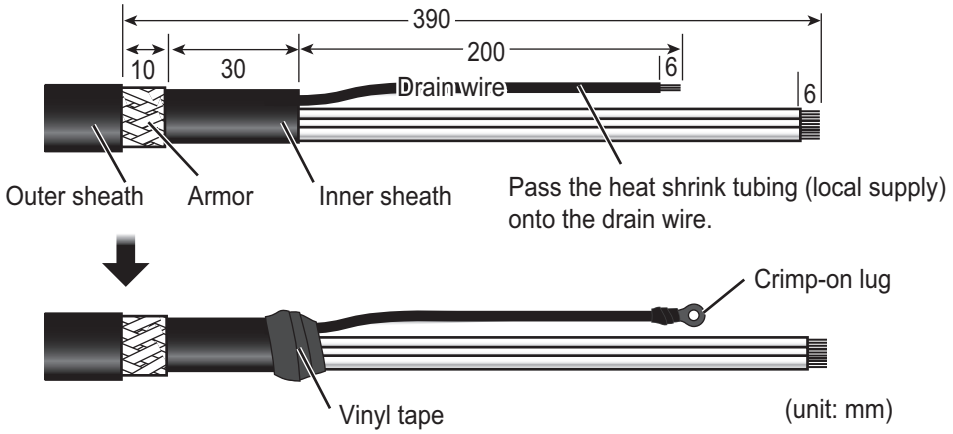
14. Reconnect the performance monitor connector (J807).
15. **Check that the gasket on the front and rear cover is seated properly**, then close the covers. The torque for the fixing bolts must be 28.0 N•m.
    Note: For the de-icer specifications, take care not to hit the heater elements on the chassis or radiator. If the heater hits something, unfasten the fixing screws for the heater to adjust the position of the heater. Then fix the heater again.

2.5 Antenna Unit (S-band, TR-DOWN)

2.5.1 How to fabricate the cables

For how to connect the WAGO connector, see "WAGO connector" on page 2-5.

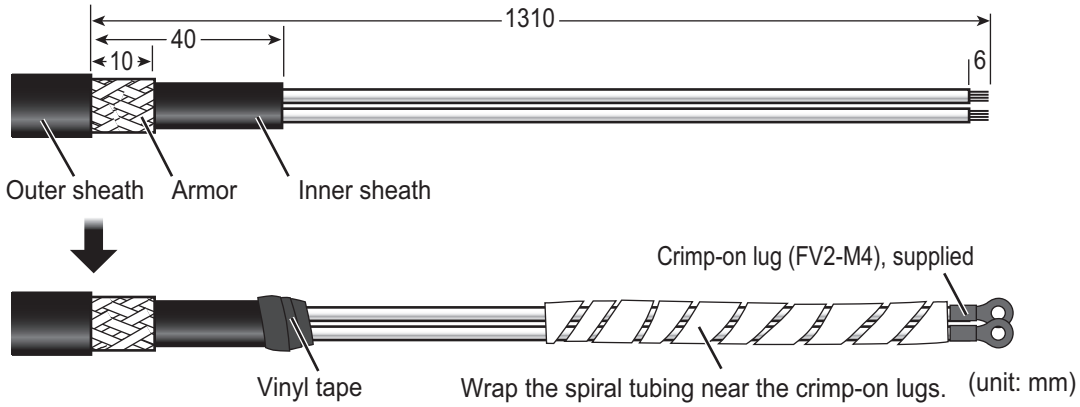
TTYCYSLA-10 (for serial cable)



DPYCY-1.5 (for the optional de-icer)

- Before beginning any work on the Antenna Unit, turn off the breaker for the de-icer at the mains switchboard. (Turning off the display unit has no effect.)
- The de-icer activates when the temperature becomes 0 °C, and shuts down when the temperature reaches 5 °C.

  Wrap the spiral tubing near the crimp-on lugs.



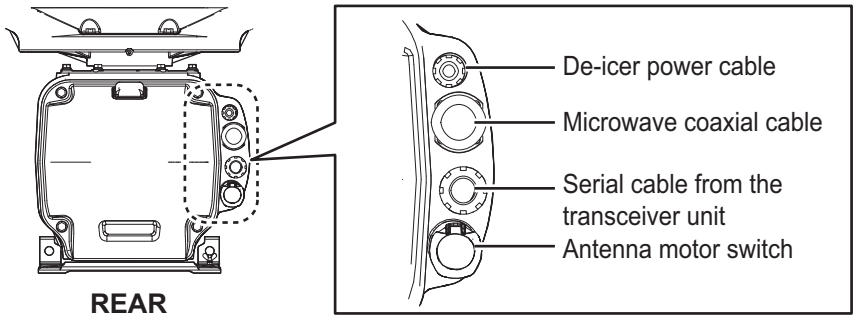
Microwave coaxial cable

See the FURUNO Installation Handbook (publication no. TIE-00160) for how to treat this cable.

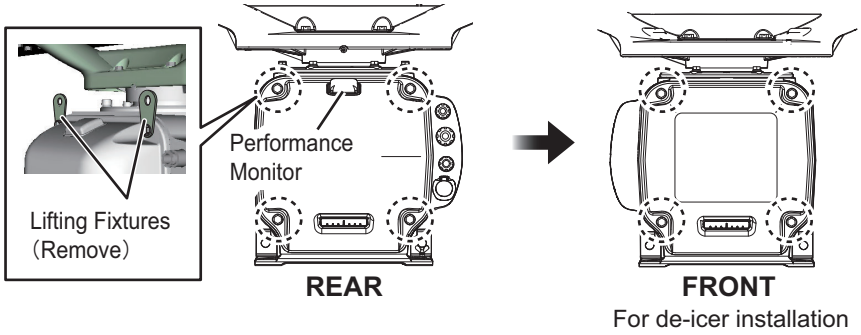
2.5.2 How to connect the cables (RSB-131)

Three cables are connected to the Antenna Unit: serial cable from the transceiver unit, microwave coaxial cable and de-icer power cable (option). The procedure shows how to connect all cables. Disregard the descriptions for the optional equipment if not applicable.

Note: Apply the supplied adhesive (marine sealant) to the unused cable glands.

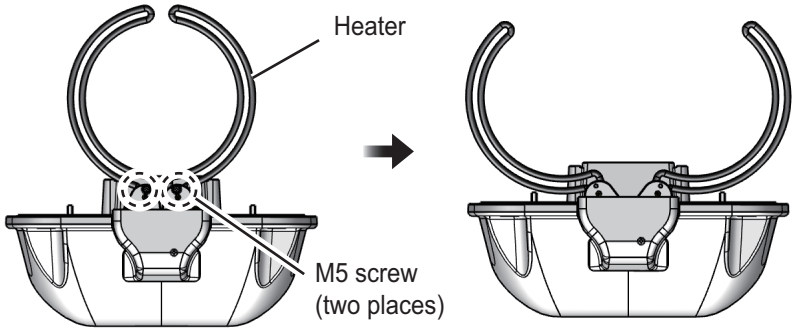


1. Loosen four bolts on the rear cover to remove the rear cover. If the de-icer is already installed, loosen also four bolts on the front cover to remove the front cover. If the lifting fixtures are still attached, they should be removed. For how to remove the lifting fixtures, see "How to hoist the Antenna Unit" on page 1-12.

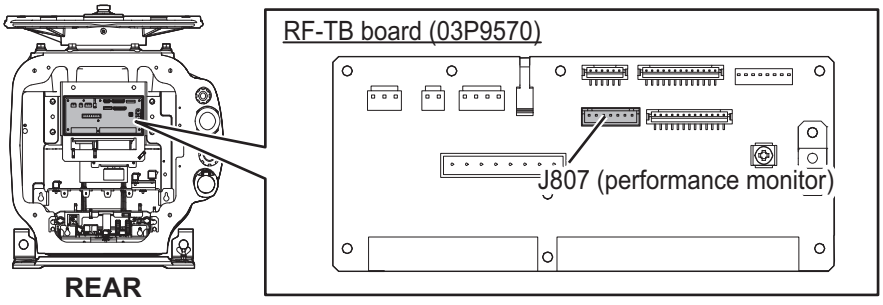


Note 1: The cable for the performance monitor is connected between the rear cover and the RF-TB Board in the Antenna Unit. Open the cover slowly to prevent damage to the cable and connector.

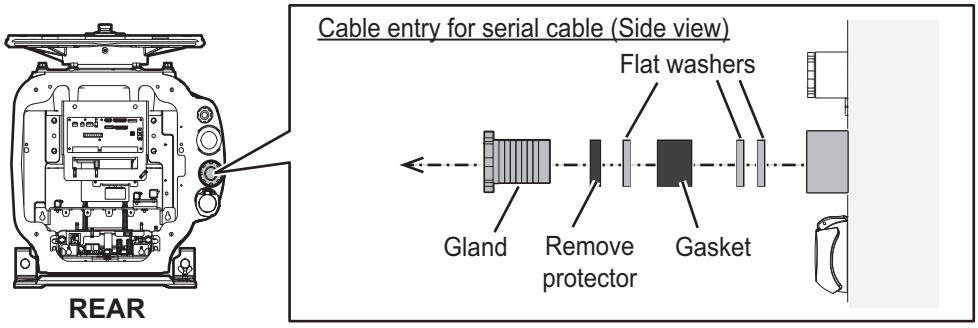
Note 2: If the de-icer is to be installed, remove two M5 screws and spread open the right and left heater elements on the cover, then remove the front cover, being careful not to hit the elements on the radiator or chassis.



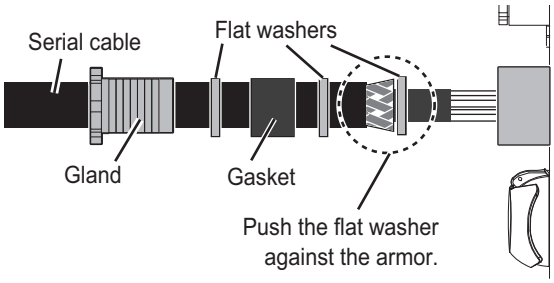
2. Disconnect the performance monitor connector (J807) from the RF-TB Board.



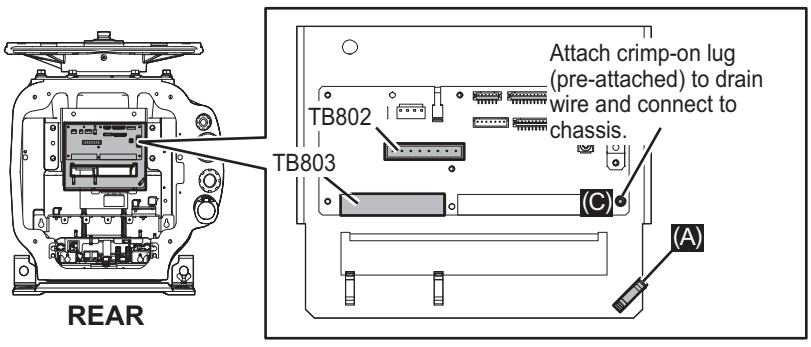
3. Unfasten the cable gland for the serial cable (TTYCSLA-10) and remove the gasket and three flat washers and remove the protector.



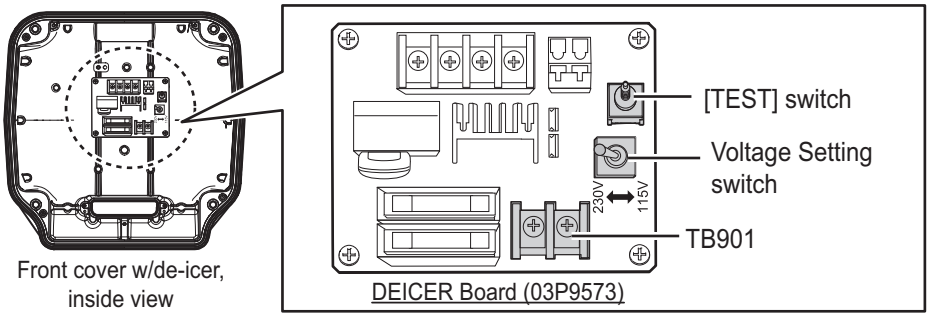
4. Slide the cable gland, the gasket and three flat washers onto the cable.
5. Push the flat washer against the armor.
6. Trim the armor so that it does not extend past the flat washers.



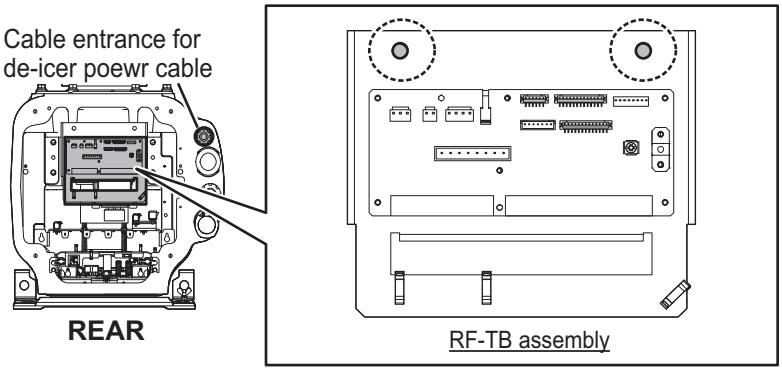
7. Pass the serial cable through the cable entrance.
   If applicable, unfasten the appropriate cable gland and pass the de-icer power cable through the cable entrance. Pass the cable through appropriate locking wire saddle.
8. Apply the supplied adhesive (marine sealant) to the threads of the cable glands, and then fasten it tightly with the hook spanner.
   Note: Use the wrench of the correct size referring to cable gland size below. If you do not have the hook spanner, contact your dealer.
   - Gland for the antenna cable: ϕ42
   - Gland for the sub monitor cable or de-icer cable: ϕ34
9. Attach the appropriate WAGO connectors to the serial cable, and then connect the serial cable to the RF-TB Board as shown in the following figure. For how to connect the WAGO connector, see "WAGO connector" on page 2-5. 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 serial cable:
     Serial line: TB802 (8-pin) and TB803 (16-pin) through the locking wire saddle (A)
     Shield of serial line: Screw (C)



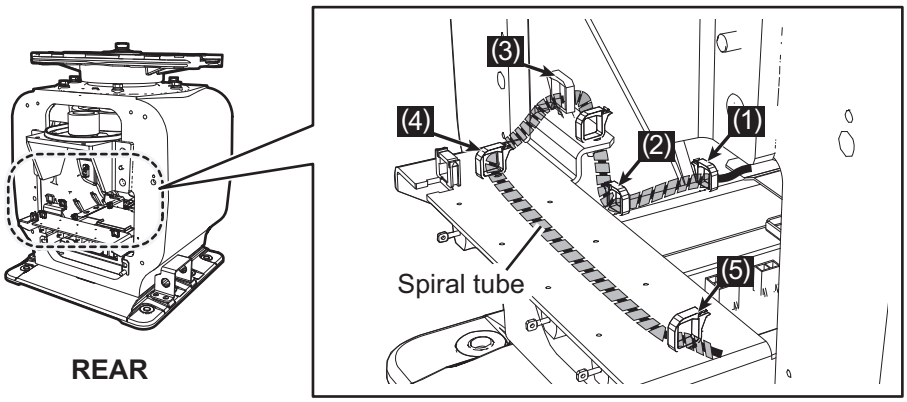
10. **For DE-ICER INSTALLATION**, connect the de-icer power cable the de-icer board 03P9573 attached on the front cover. If the de-icer is not provided, go to step 11.



1) Unfasten two bolts to remove the RF-TB assembly, then pass the de-icer power cable through the cable entrance.



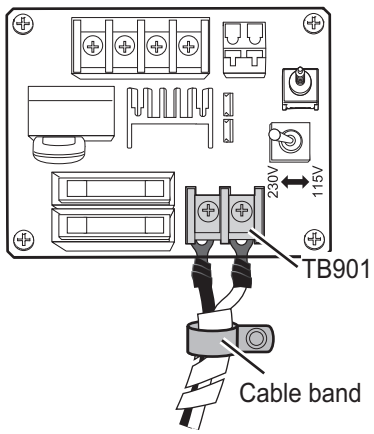
2) Wrap the supplied spiral tube around the de-icer power cable, starting from the crimp-on lugs. Set a locking wire saddle (supplied) at location (5) shown in the following figure. Pass the de-icer power cable through the locking wire saddles (1) to (5) and it to the front side.



3) Pass the de-icer power cable through the cable band. Connect the cable to TB901 on the DE-ICER board (03P9573), using the supplied crimp-on lugs.

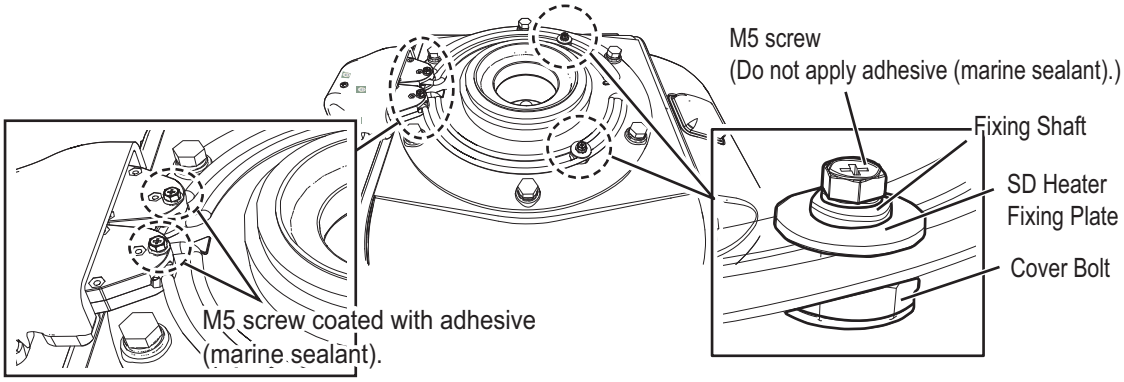
4) Set the Voltage Setting switch according to the power source for the de-icer; 115 V or 230 V. The default setting is 230 V.

5) Apply power to the de-icer then press and hold the **TEST** switch for about ten seconds. Check that the heater gets hot and then release the **TEST** switch.

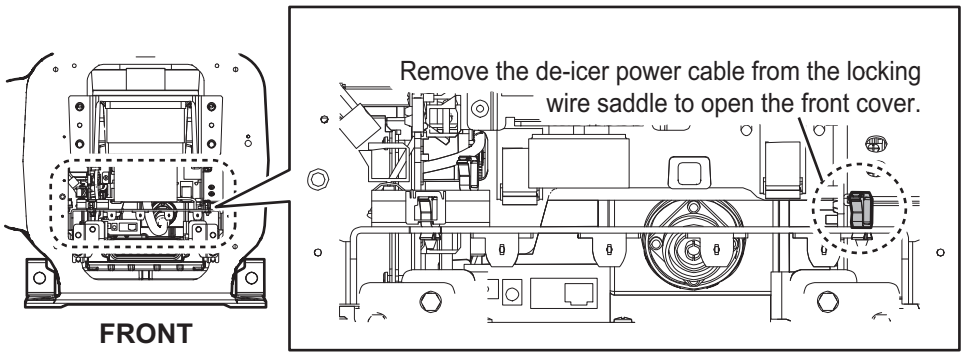


6) Set the front cover detached at step 1 to the Antenna Unit. Close the open heater and return to its original position.Take care not to hit the heater elements on the chassis or radiator.

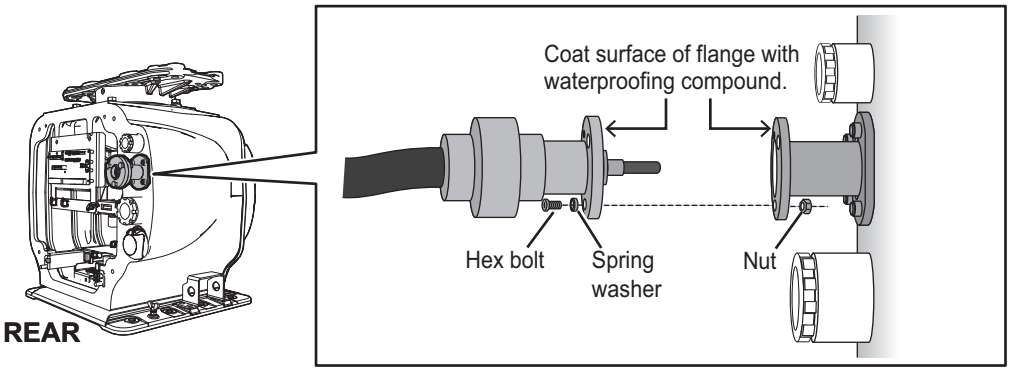
7) Fasten the two heater elements to the chassis with the four bolts removed at step 1 on page 2-34). Fasten the base of the heater with two bolts coated with the supplied adhesive (marine sealant). Fasten the installation materials to each of the cover bolts.



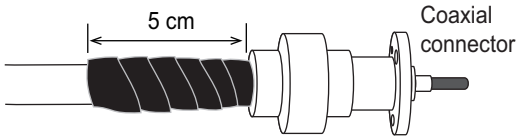
Note: If it is necessary to open the front cover after installing the DE-ICER kit, remove the de-icer power cable from the locking wire saddle shown in the following figure then detach the cover slowly to prevent damage to the heater.



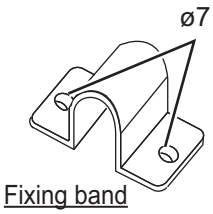
11. Coat the O-ring in the gland for the microwave coaxial cable with silicon grease.
12. Coat the mating surface between the coaxial connector of the cable and the waveguide flange on the Antenna Unit with the supplied waterproofing compound.
    Note: Do not coat the O-ring with the waterproofing compound.
13. Fasten the coaxial connector to the waveguide flange with three sets of M6×20 hex bolts, M6 spring washers and M6 nuts.



14. Tape the cable with two or more turns of self-bonding tape then wrap with PVC tape.



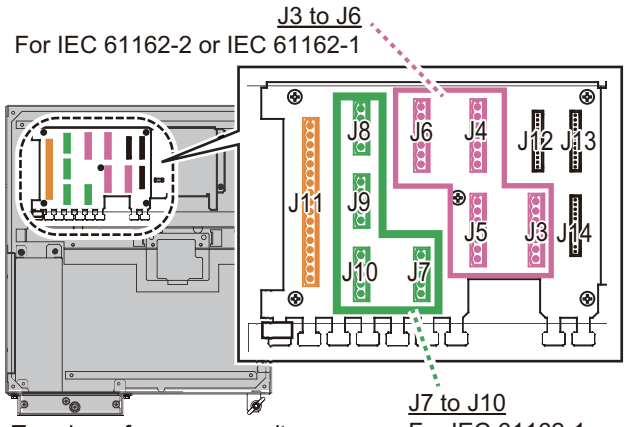
15. Secure the cable with fixing bands (supplied) or the optional cable clamping fixture (Type: 03-011-3228) to the mast and to the wheelhouse structure. For the optional through-deck cable gland, see the outline drawing at the back of this manual.



16. Reconnect the performance monitor connector (J807).
17. Check that the gasket on the front and rear cover is seated properly, then close the covers. The torque for the fixing bolts must be 28.0 N•m.
    Note: For the de-icer specifications, take care not to hit the heater elements on the chassis or radiator. If the heater hits something, unfasten the fixing screws for the heater to adjust the position of the heater. Then fix the heater again.

2.6 Processor Unit

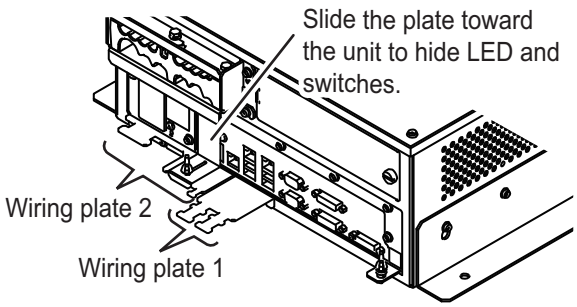
Note: The interface ports approved for interconnecting navigation equipment are shown in the figure below. For details, see section 2.6.3 "How to select the serial input/output format".



Top view of processor unit

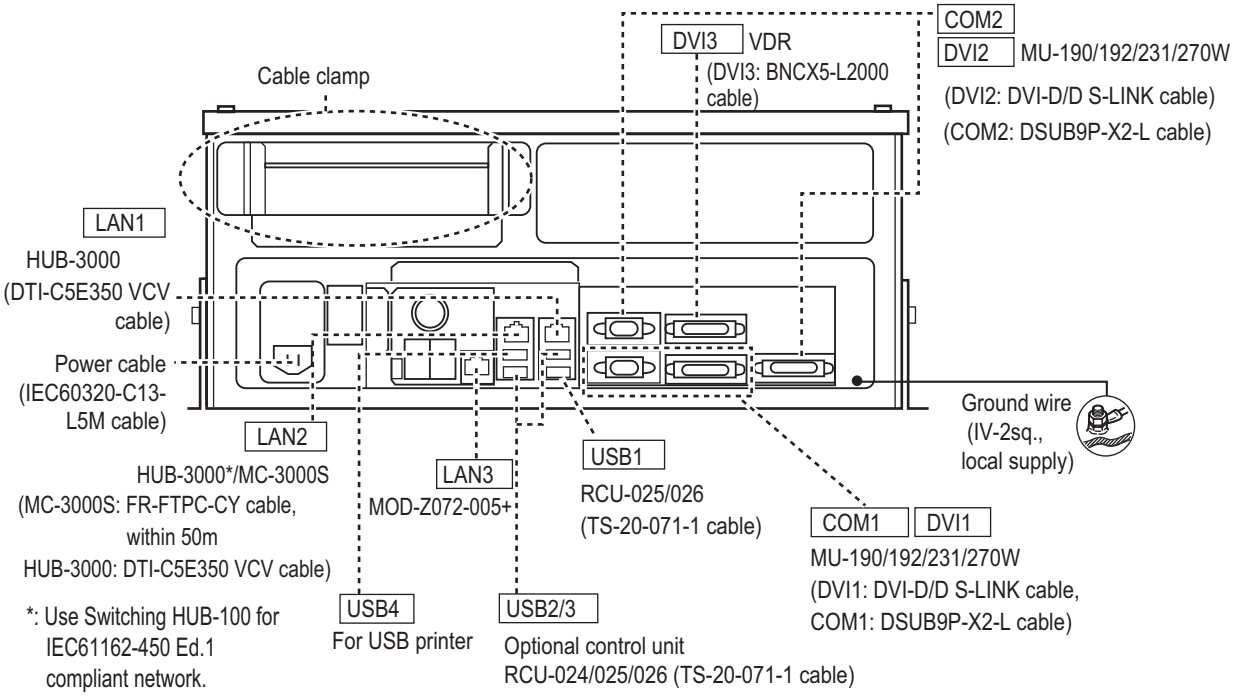
2.6.1 How to connect cables to terminals in the processor unit

Use screws (M3×6, supplied) to attach the wiring plate 1 and wiring plate 2 to the processor unit. Connect the cables shown below to the connectors at the front of the processor unit. Bind cables to the appropriate fixing metal with the cable ties (supplied).



For the cables from the monitor unit (type: DVI-D/D SLINK5M/10M (MU-190/192), DSUB9P-X2-L5/10M) and ground wire, connect them to the processor unit directly (without fixing to a wiring plate). Tighten the fixing screws on these connectors to prevent disconnection from the processor unit.

Note: Connect the cables so that they do not interfere with the opening or closing of the DVD tray.



Cables connected at the wiring plate 1

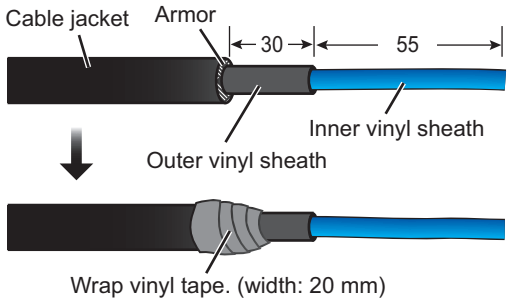
- USB cables from the control units
- Printer cable
- LAN cable (type: DTI-C5E350 VCV) from the HUB-3000
- LAN cable (type: FR-FTPC-CY) from the HUB-100/MC-3000S

Cables connected at the wiring plate 2

- Power cable (Type: IEC60320-C13-L5M)
- LAN cable to the LAN3 port

How to fabricate the LAN cable

Fabricate the LAN cable (FR-FTPC-CY, DTI-C5E350 VCV), as shown below. (Wrap both edges of the armor with vinyl tape.) Make sure the shield of the cable contacts the shell of the modular plug. For how to attach the modular plug, see "LAN cable" on page 2-5.

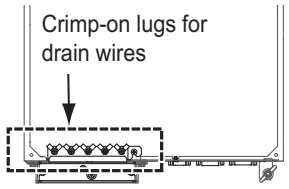


Note: For a locally supplied LAN cable, expose the armor and clamp the armor with the cable clamp.

2.6.2 How to connect cables inside the processor unit

How to fabricate the cables

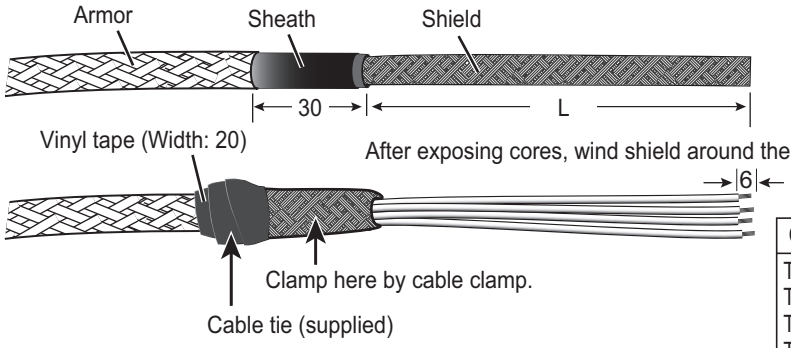
Fabricate the JIS cables (see the Appendix for equivalent cables if not available locally) as shown below. Connect the cables to the WAGO connectors on the I/O Board (24P0124) inside the processor unit.



Processor unit, cover removed

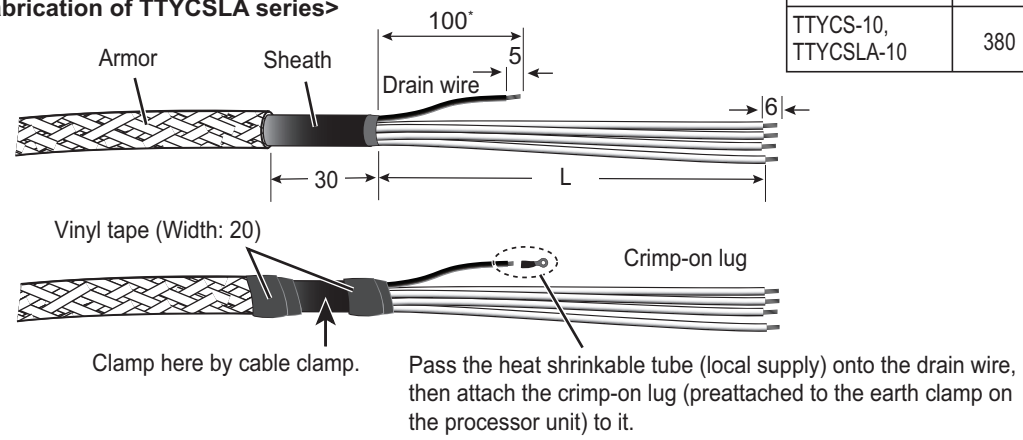
For locations of cables and cores, see the sticker on the reverse side of the top cover. (All dimensions in millimeters)

<Fabrication of TTYCS series>



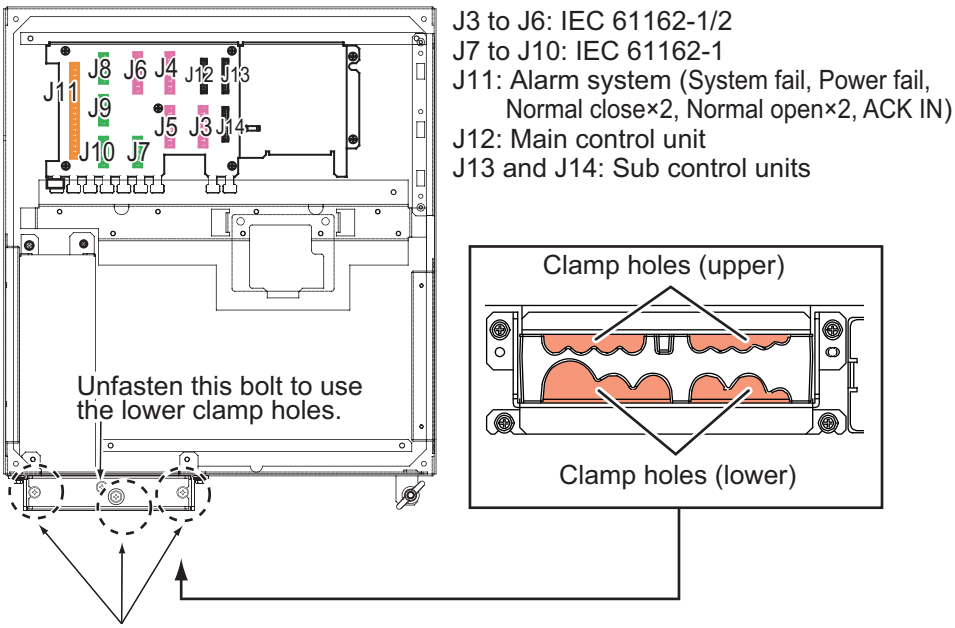
Cable type (JIS)	"L"
TTYCS-4, TTYCSLA-4, TTYCS-1Q, TTYCSLA-1Q	400
TTYCS-10, TTYCSLA-10	380

<Fabrication of TTYCSLA series>



How to connect the cables

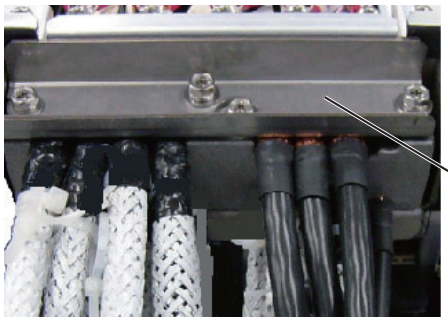
1. Unfasten four screws (M4×8) to remove the top cover from the processor unit.
2. Unfasten the three bolts circled below to remove the upper plate of the cable clamp.



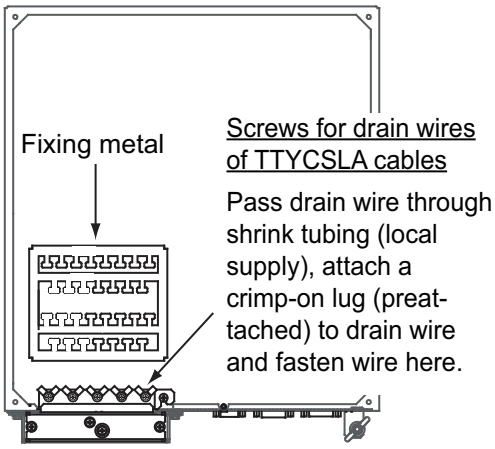
J3 to J6: IEC 61162-1/2
J7 to J10: IEC 61162-1
J11: Alarm system (System fail, Power fail, Normal close×2, Normal open×2, ACK IN)
J12: Main control unit
J13 and J14: Sub control units

Processor unit, top view

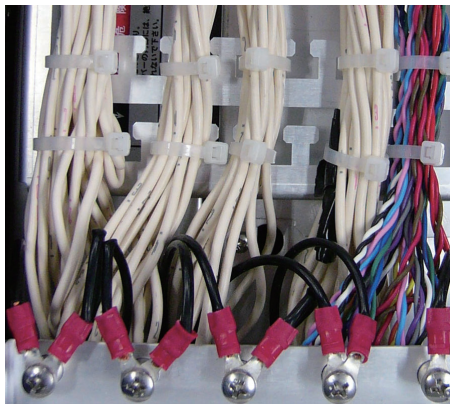
3. Pass the cables through the clamp holes, then fasten the bolts removed at step 2 to fix the cables.



4. Connect the WAGO connectors to the I/O Board, referring to the interconnection diagram.
5. Bind the cables to the fixing metal in the processor unit with the cable ties (supplied).



6. For the drain wire of the TTYCSLA series cable, attach shrink tubing (local supply) to drain wire, fasten a crimp-on lug (pre-attached at location shown in the figure to the right.) to drain wire then fasten the wire with a screw.

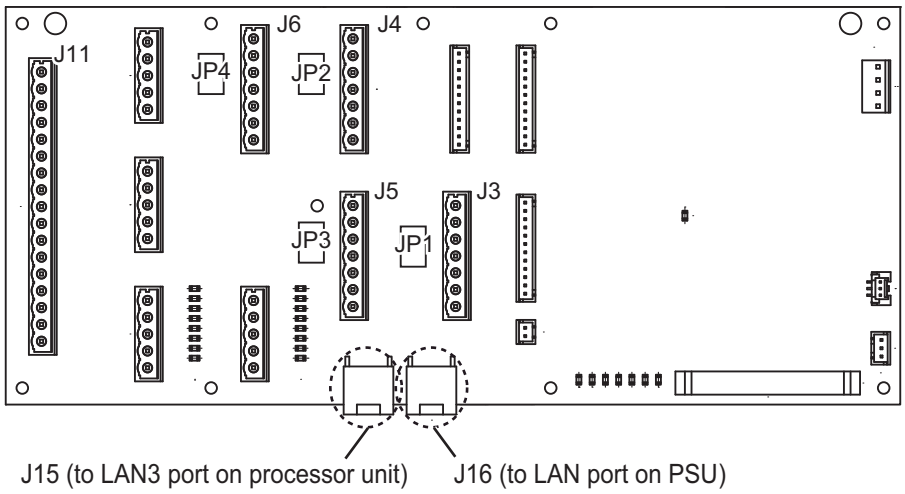


2.6.3 How to select the serial input/output format

How to set the termination resistors

Use the jumper blocks JP1 to JP4 on the I/O Board (24P0124) to set the termination resistors for J3 to J6 ON or OFF. The default setting is ON.

- When setting the starting/ending terminal for the multipoint connection, or multipoint is not connected (CH1 to CH4): termination resistor ON
- When not setting the starting/ending terminal for the multipoint connection (CH1 to CH4): termination resistor OFF



Processor unit, I/O Board (24P0124)

Jumper block JP1		Connector J3
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination connector: OFF
2-3	SHORT	

Jumper block JP2		Connector J4
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination connector: OFF
2-3	SHORT	

Jumper block JP3		Connector J5
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination connector: OFF
2-3	SHORT	

Jumper block JP4		Connector J6
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination connector: OFF
2-3	SHORT	

How to select the serial input/output format

Use the connectors J3 to J6 to set the input/output format for serial CH1 to CH4, from IEC 61162-1 or IEC 61162-2. For connectors J7 to J10, use TTYCS-1Q or TTYCSLA-1Q cable for a connector.

Connector J3

Pin #	Signal	In/Out	Description	IEC 61162-2	IEC 61162-1
1	TD1-A	Out	Serial CH1, output IEC 61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD1-B	Out	Serial CH1, output IEC 61162-1/2		
3	RD1-A	In	Serial CH1, input IEC 61162-2		No connection
4	RD1-B	In	Serial CH1, input IEC 61162-2		
5	ISOGND1	-	Isolation GND (CH1)		
6	RD1-H	In	Serial CH1, input IEC 61162-1	No connection	TTYCS(LA)-4
7	RD1-C	In	Serial CH1, input IEC 61162-1		

Connector J4

Pin #	Signal	In/Out	Description	IEC 61162-2	IEC 61162-1
1	TD2-A	Out	Serial CH2, output IEC 61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD2-B	Out	Serial CH2, output IEC 61162-1/2		
3	RD2-A	In	Serial CH2, input IEC 61162-2		No connection
4	RD2-B	In	Serial CH2, input IEC 61162-2		
5	ISOGND2	-	Isolation GND (CH2)		
6	RD2-H	In	Serial CH2, input IEC 61162-1	No connection	TTYCS(LA)-4
7	RD2-C	In	Serial CH2, input IEC 61162-1		

Connector J5

Pin #	Signal	In/Out	Description	IEC 61162-2	IEC 61162-1
1	TD3-A	Out	Serial CH3, output IEC 61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD3-B	Out	Serial CH3, output IEC 61162-1/2		
3	RD3-A	In	Serial CH3, input IEC 61162-2		No connection
4	RD3-B	In	Serial CH3, input IEC 61162-2		
5	ISOGND3	-	Isolation GND (CH3)		
6	RD3-H	In	Serial CH3, input IEC 61162-1	No connection	TTYCS(LA)-4
7	RD3-C	In	Serial CH3, input IEC 61162-1		

Connector J6

Pin #	Signal	In/Out	Description	IEC 61162-2	IEC 61162-1
1	TD4-A	Out	Serial CH4, output IEC 61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD4-B	Out	Serial CH4, output IEC 61162-1/2		
3	RD4-A	In	Serial CH4, input IEC 61162-2		No connection
4	RD4-B	In	Serial CH4, input IEC 61162-2		
5	ISOGND4	-	Isolation GND (CH4)		
6	RD4-H	In	Serial CH4, input IEC 61162-1	No connection	TTYCS(LA)-4
7	RD4-C	In	Serial CH4, input IEC 61162-1		

Connector J7

Pin#	Signal	In/Out	Description	Remarks
1	TD5-A	Out	Serial CH5, output IEC 61162-1	Use TTYCS(LA)-1Q, IEC 61162-1 only
2	TD5-B	Out	Serial CH5, output IEC 61162-1	
3	RD5-H	In	Serial CH5, input IEC 61162-1	
4	RD5-C	In	Serial CH5, input IEC 61162-1	
5	GND	-	GND	

Connector J8

Pin#	Signal	In/Out	Description	Remarks
1	TD6-A	Out	Serial CH6, output IEC 61162-1	Use TTYCS(LA)-1Q, IEC 61162-1 only
2	TD6-B	Out	Serial CH6, output IEC 61162-1	
3	RD6-H	In	Serial CH6, input IEC 61162-1	
4	RD6-C	In	Serial CH6, input IEC 61162-1	
5	GND	-	GND	

Connector J9

Pin#	Signal	In/Out	Description	Remarks
1	TD7-A	Out	Serial CH7, output IEC 61162-1	Use TTYCS(LA)-1Q, IEC 61162-1 only
2	TD7-B	Out	Serial CH7, output IEC 61162-1	
3	RD7-H	In	Serial CH7, input IEC 61162-1	
4	RD7-C	In	Serial CH7, input IEC 61162-1	
5	GND	-	GND	

Connector J10

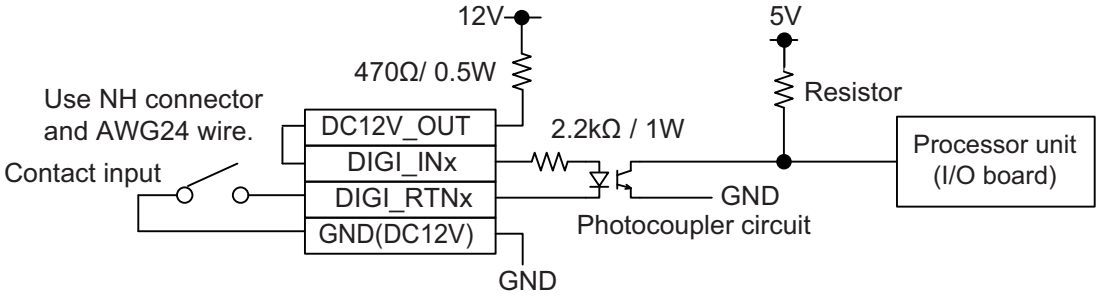
Pin#	Signal	In/Out	Description	Remarks
1	TD8-A	Out	Serial CH8, output IEC 61162-1	Use TTYCS(LA)-1Q, IEC 61162-1 only For PSU
2	TD8-B	Out	Serial CH8, output IEC 61162-1	
3	RD8-H	In	Serial CH8, input IEC 61162-1	
4	RD8-C	In	Serial CH8, input IEC 61162-1	
5	GND	-	GND	

How to set contact input/output

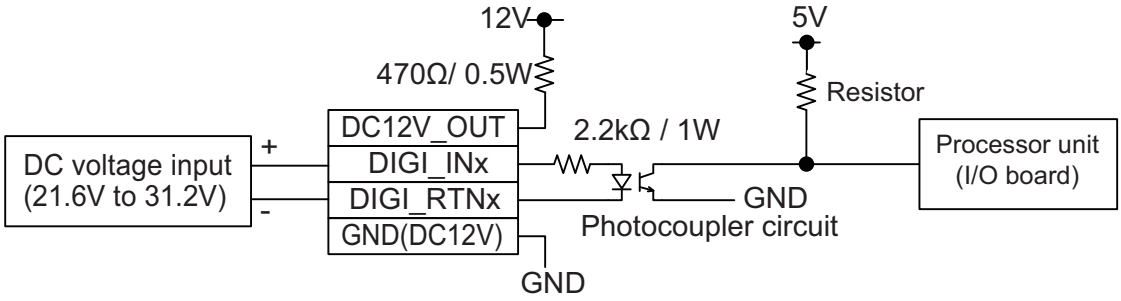
The connector J11 can be used for the connection of contact input or voltage input. Refer to the figures shown below to make the wiring which complies with the input specification.

Note: The input must not exceed the range of the input voltage, to prevent malfunction.
-Setting for voltage input: 21.6V to 31.2V
-Setting for contact input: Voltage cannot be input (contact signal only).

• (Setting for contact input)



• (Setting for voltage input)



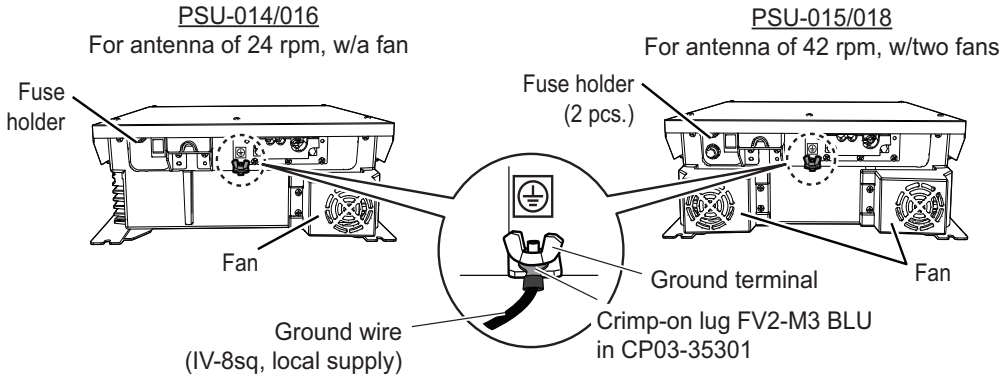
Connector J11

Pin #	Signal name	In/Out	Description	Contact input	Voltage input
1	SYS_FAIL-A	Out	System fail output (NC)	TTYCS(LA)-10	TTYCS(LA)-10
2	SYS_FAIL-B	Out	System fail output (NC)		
3	PWR_FAIL-A	Out	Power fail output (NC)		
4	PWR_FAIL-B	Out	Power fail output (NC)		
5	NC1-A	Out	Alarm output (NC1)		
6	NC1-B	Out	Alarm output (NC1)		
7	NC2-A	Out	Alarm output (NC2)		
8	NC2-B	Out	Alarm output (NC2)		
9	NO1-A	Out	Alarm output (NO1)		
10	NO1-B	Out	Alarm output (NO1)		
11	NO2-A	Out	Alarm output (NO2)		
12	NO2-B	Out	Alarm output (NO2)		
13	DC12V_OUT	Out	ACK input	#13-#14: short	No connection
14	DIGI_IN1	In	ACK input		TTYCS(LA)-10
15	DIGI_RTN1	Out	ACK input	TTYCS(LA)-10	
16	GND (DC12V)	In	ACK input		No connection
17	GND	-	GND	NO connection	

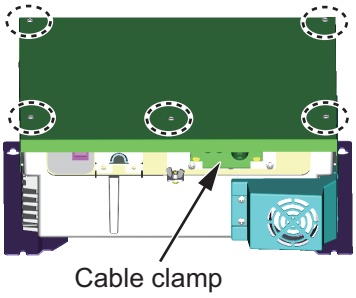
Note: NC1/2 and NO1/2 are output with a fixed value.

2.7 Power Supply Unit

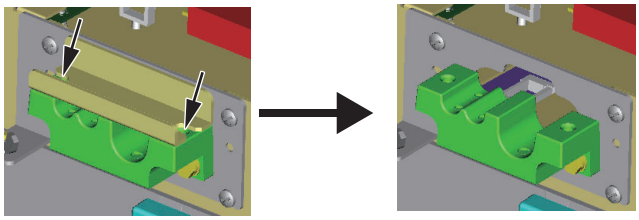
1. Connect the ground wire between the ground terminal on the chassis and the ship's earth.
   Note: Electrical shock can result if the ground wire is not connected properly.



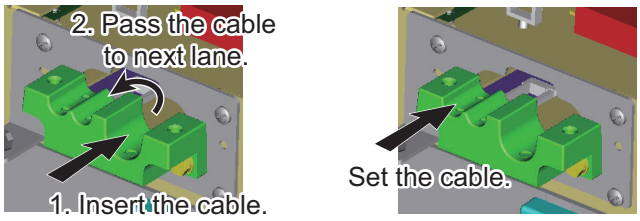
2. Unfasten five screws to open the cover of the power supply unit.



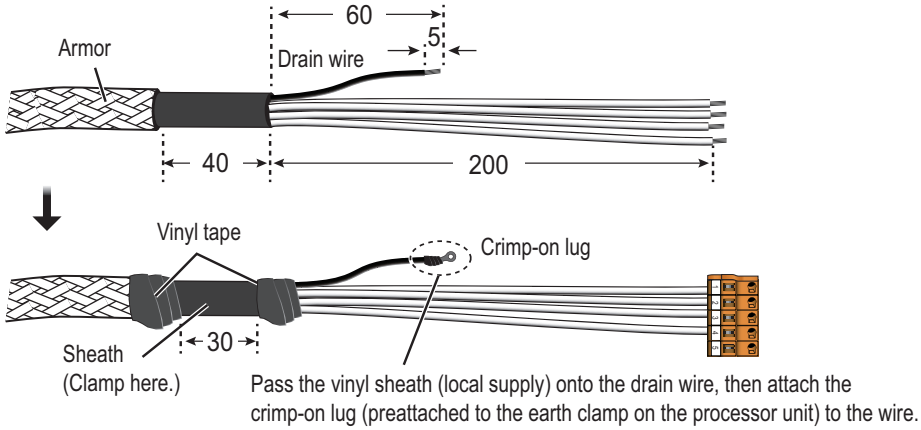
3. Unfasten two screws from the cable clamp to separate the cable clamp assembly.



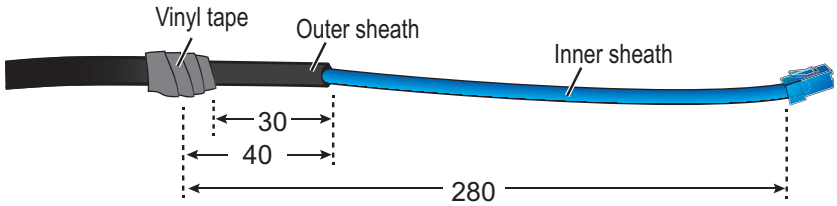
4. Pass the LAN and serial cables through the cable clamp.



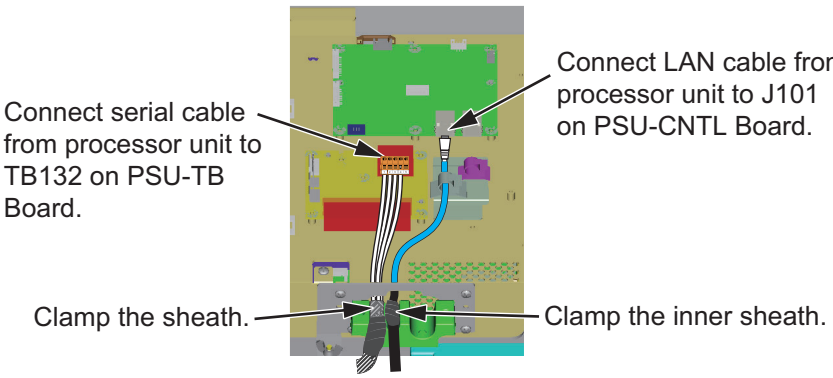
5. As shown below, fabricate the cables. For retrofit, the optional LAN Signal Converter kit. See section 2.11 for wiring.
   TTYCS(LA)-1Q



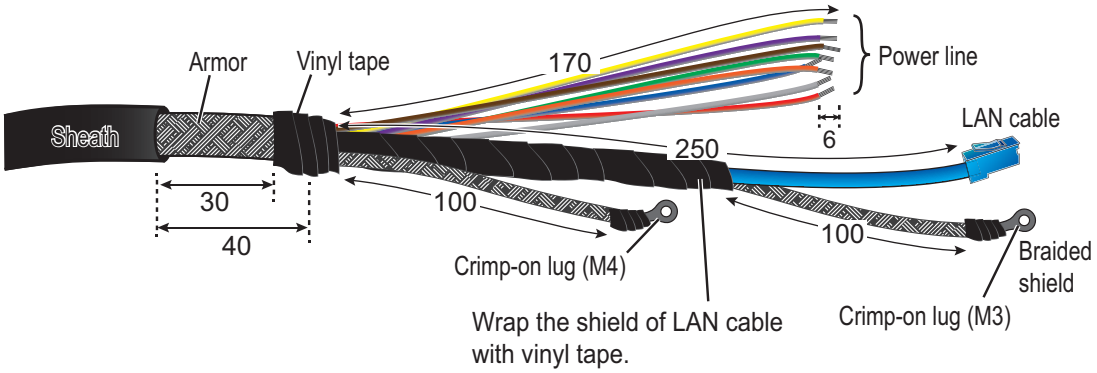
   LAN cable
   See "How to fabricate the LAN cable" on page 2-39 for how to attach the LAN cable connector.



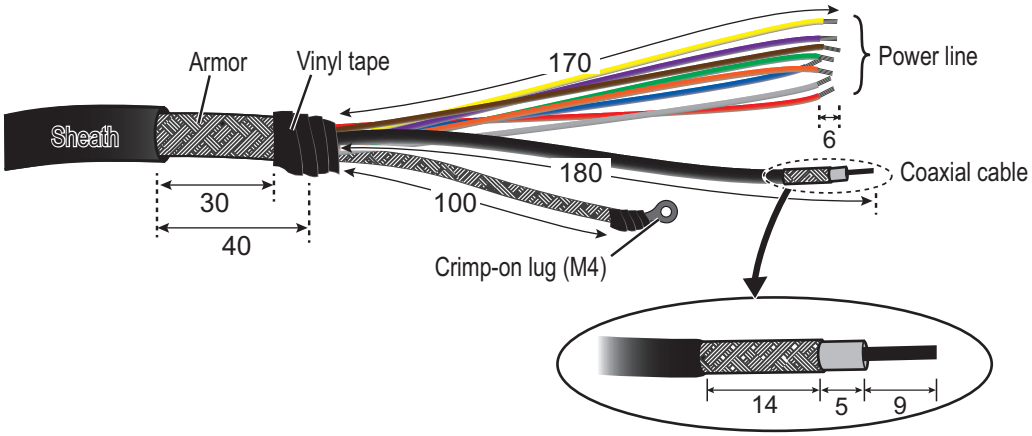
6. Connect the cables fabricated at step 4 as shown below.



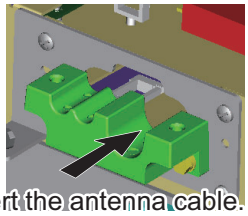
7. Fabricate the antenna cable as shown below.
   RW-00135
   See "How to fabricate the LAN cable" on page 2-39 for how to attach the LAN cable connector.



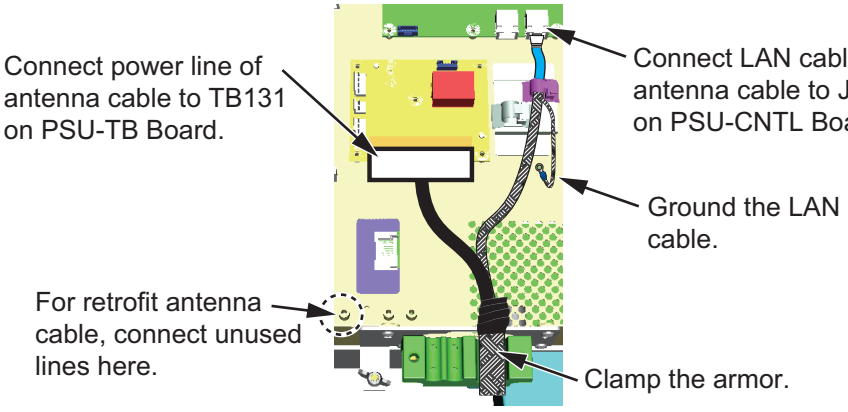
RW-9600/6895/4873



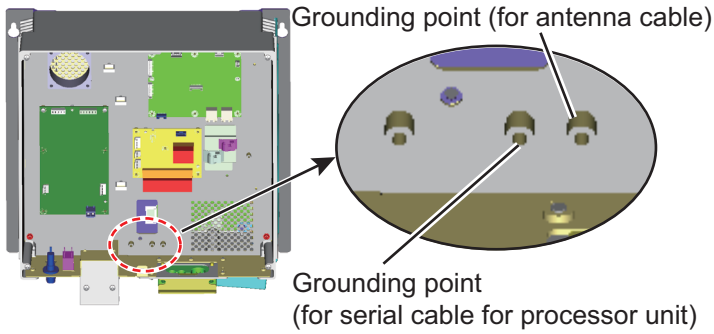
8. Pass the antenna cable through the cable clamp.


Insert the antenna cable.

9. Connect the power line of the antenna cable to the 13-pin WAGO connector, referring to the interconnection diagram at the back of this manual.
10. Connect the power line and the LAN cable of the antenna cable as shown below.

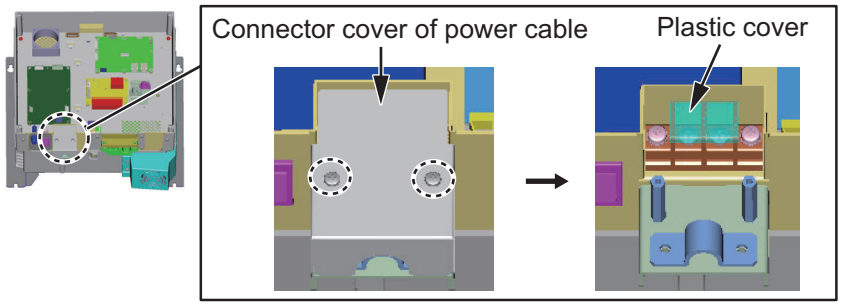


11. Connect the shield wires of the antenna cable and serial cable for processor unit to each grounding point.

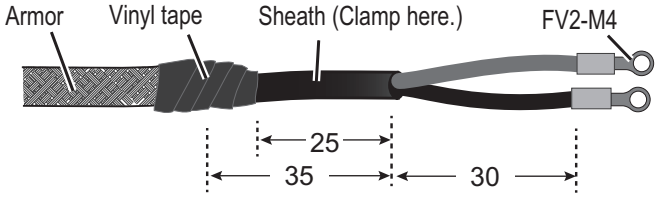


12. Reattach the cable clamp assembly.

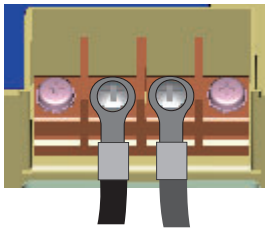
13. Remove the connector cover for the power cable (2 places).



14. Fabricate the power cable (DPYC-2.5) as shown below.



15. Pull up the plastic cover and connect the power cable.
16. Remount the connector cover for the power cable.
17. Reattach the cover of the power supply unit.



2.8 Transceiver Unit

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

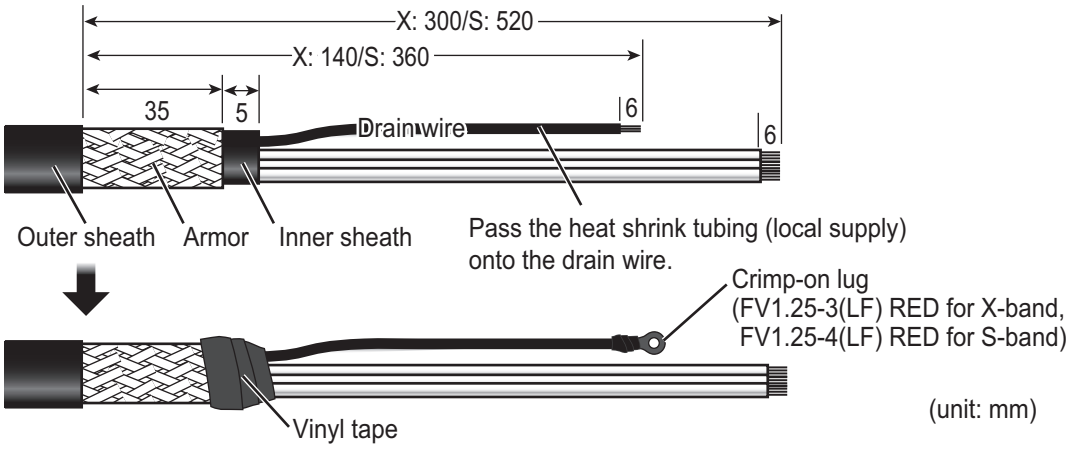
- Transceiver Unit RTR-108 for X-band radar
- Transceiver Unit RTR-109 for S-band radar

2.8.1 How to fabricate the cables

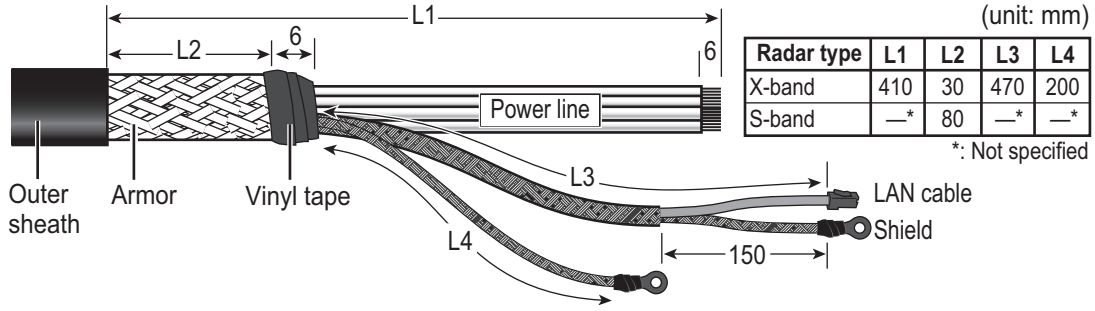
For how to connect the LAN modular plug, see "LAN cable" on page 2-5. For how to connect the WAGO connector, see "WAGO connector" on page 2-5.

TTYCYSLA-10 (for serial cable)

Clamp the armor with the cable clamp.



RW-00135



(unit: mm)

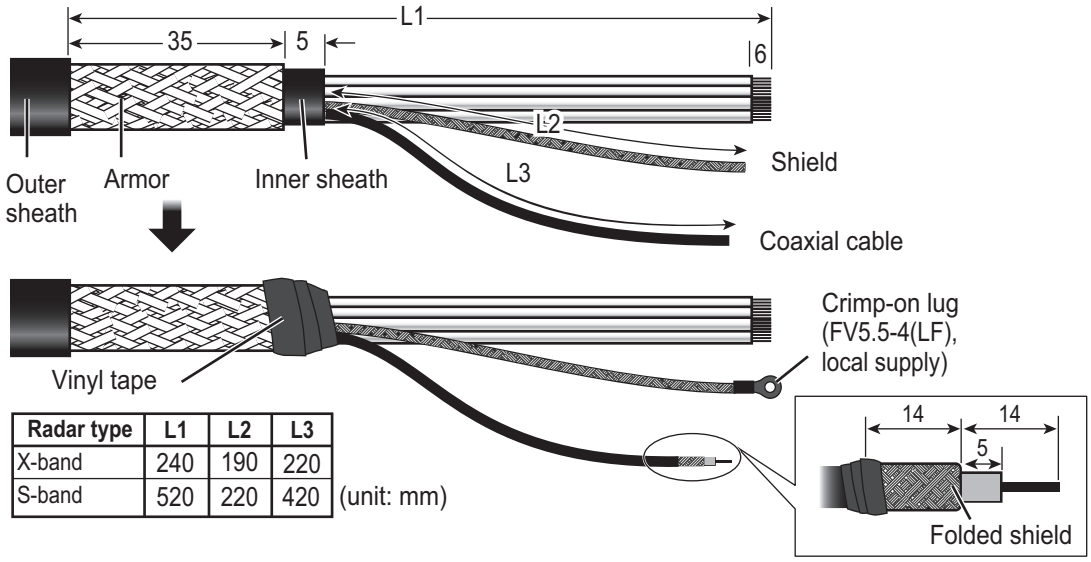
Radar type	L1	L2	L3	L4
X-band	410	30	470	200
S-band	—*	80	—*	—*

*: 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.



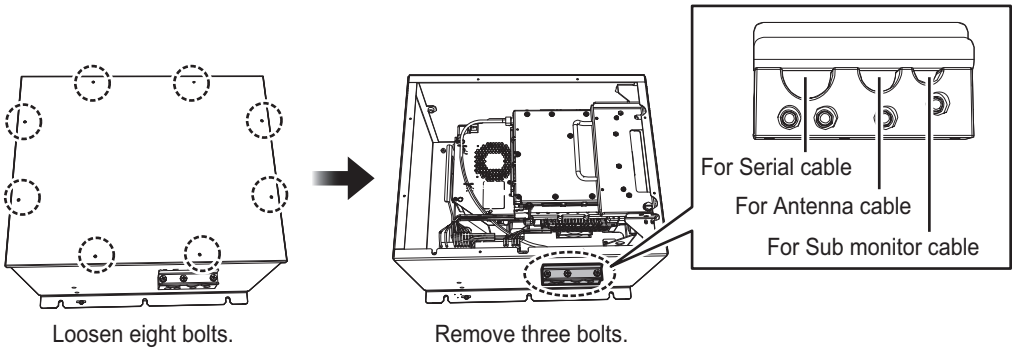
Radar type	L1	L2	L3
X-band	240	190	220
S-band	520	220	420

(unit: mm)

2.8.2 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.



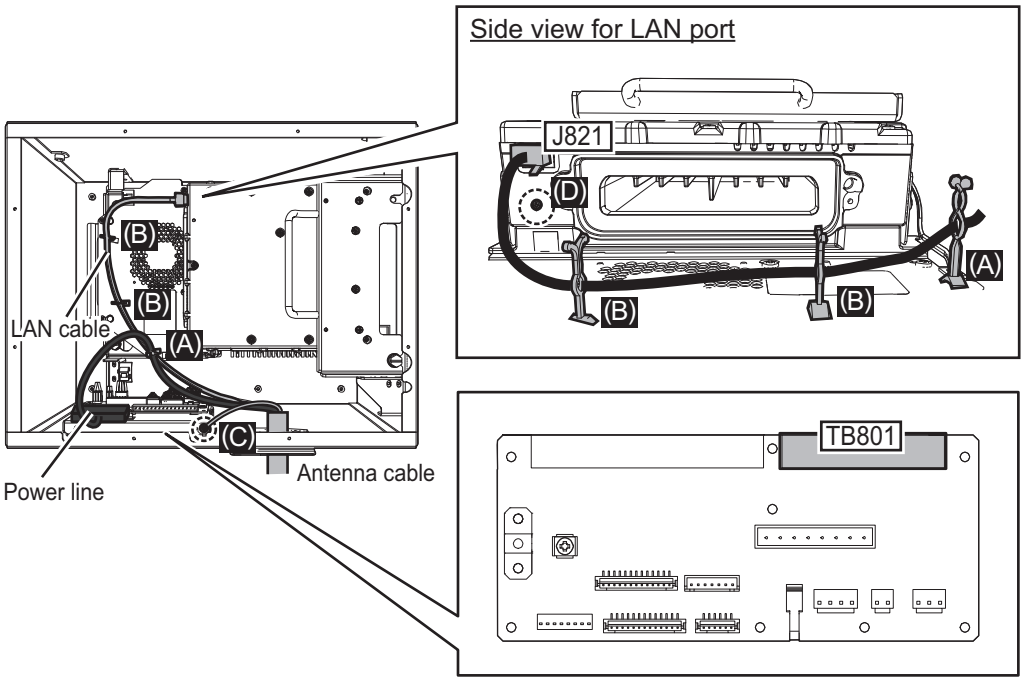
Loosen eight bolts. Remove three bolts.

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 2-5. For pin arrangement, see the interconnection diagram at the back of this manual.

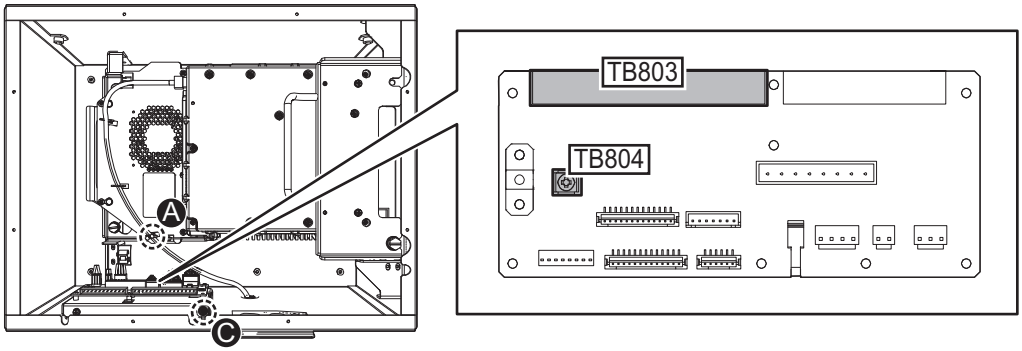
   Note 1: Make sure to pass the cable through the specified locking wire saddle.

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

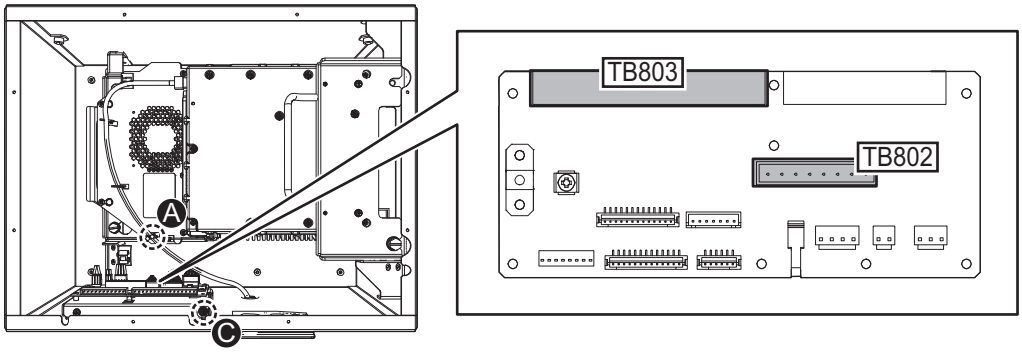
   • Destination of Antenna cable
   Power line: TB801 through the locking wire saddle (A).
   LAN cable: J821 through the locking wire saddles (A and B, three places.)
   Shield of power line: Screw (C)
   Shield of LAN cable: Screw (D)



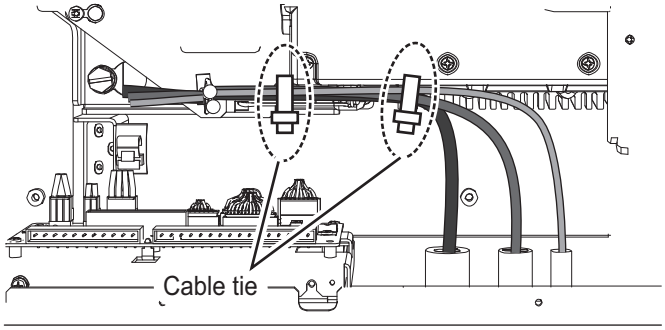
   • Destination of cable for the sub monitor
   Signal line: TB803 through the locking wire saddle (A).
   Coaxial cable: TB804
   Shield of signal cable: Screw on fixing plate (C)



   • 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).



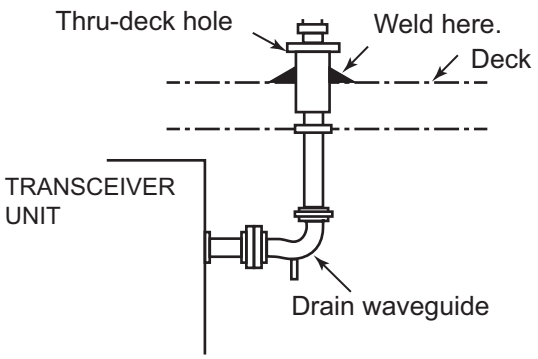
5. Check that armor of cables are lying in their respective cable slots then fasten the cable clamp.

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.

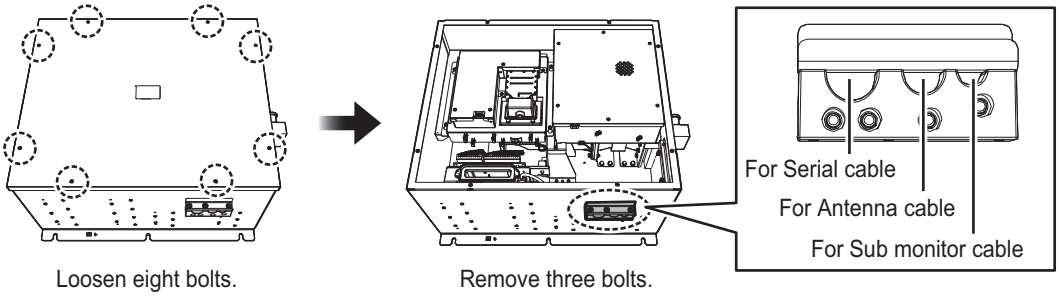


- After installation of the waveguide is completed, the coupling portions must be sealed by using the supplied adhesive (marine sealant).
- In a very short time the surface of the waveguide becomes green with verdigris. Therefore, paint both the surface of the waveguide and flanges to avoid corrosion and water penetration. Paint must not be allowed to reach the inner surface of the waveguide or the mating surface of any flange.

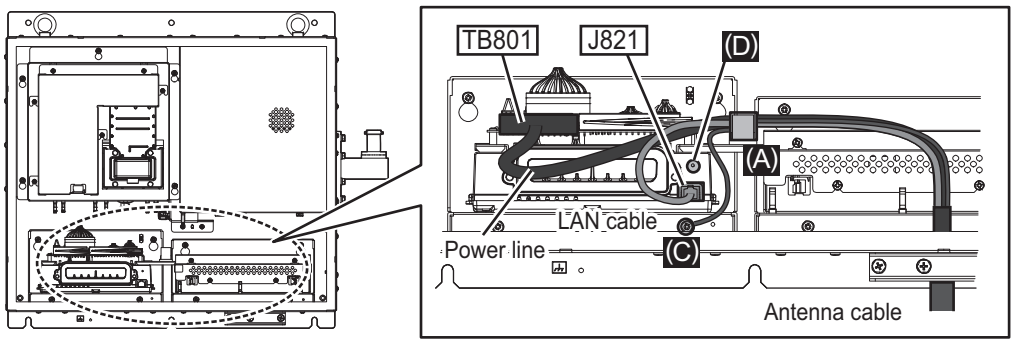
2.8.3 How to connect the cables from S-band radar antenna

Antenna cable, serial cable, sub monitor

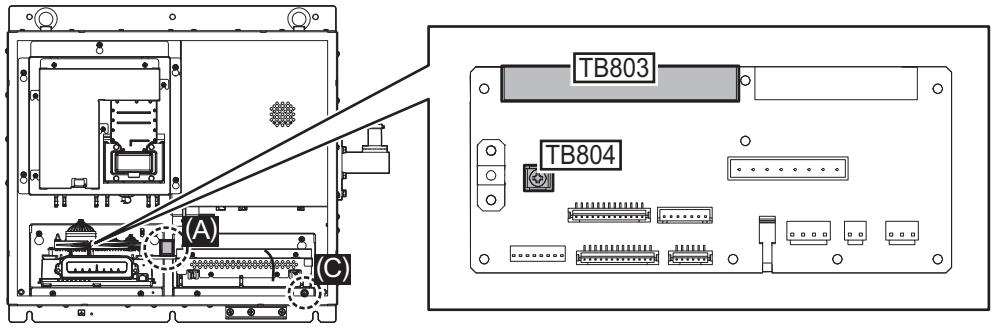
1. Loosen eight bolts then remove the cover of the unit.
2. Unfasten three bolts from the cable clamp. Lay the cables in their cable slots so their armors rest in the slots.



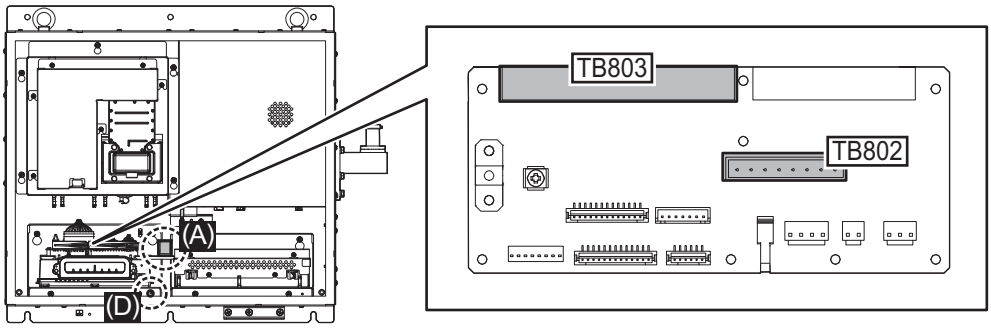
3. Attach the appropriate WAGO connectors (pre-attached) to the appropriate cables, and then connect the antenna, sub monitor and serial cables to the RF-TB Board shown in the following figure. For how to connect the WAGO connector, see "WAGO connector" on page 2-5. For pin arrangement, see the interconnection 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)



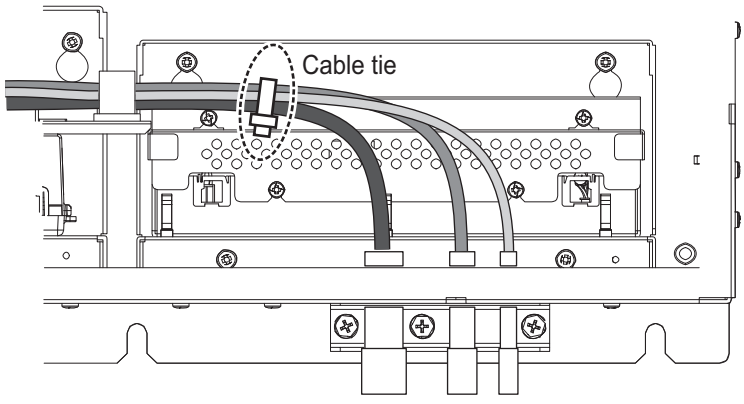
- Destination of sub monitor cable
  Signal line: TB803 through the locking wire saddle (A), see the figure for the "Destination of Antenna cable:"
  Coaxial cable: TB804 (B)
  Shield of signal line: Screw (C)



- 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).

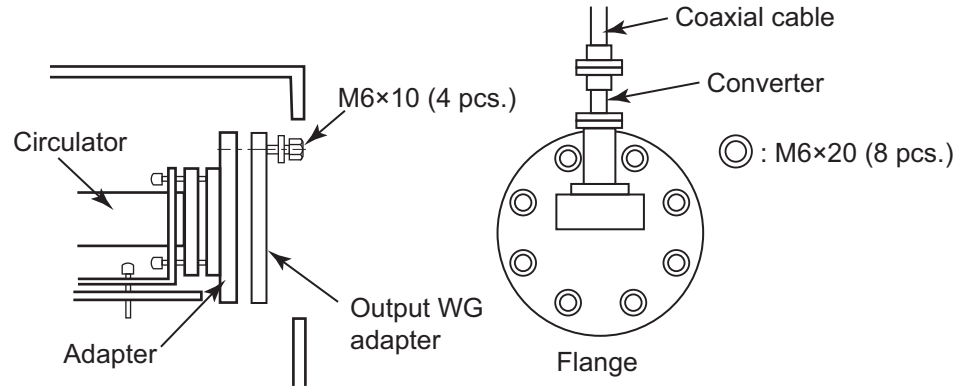


5. Check that armor of cables are lying in their respective cable slots then fasten the cable clamp.

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

2.9 Monitor Unit

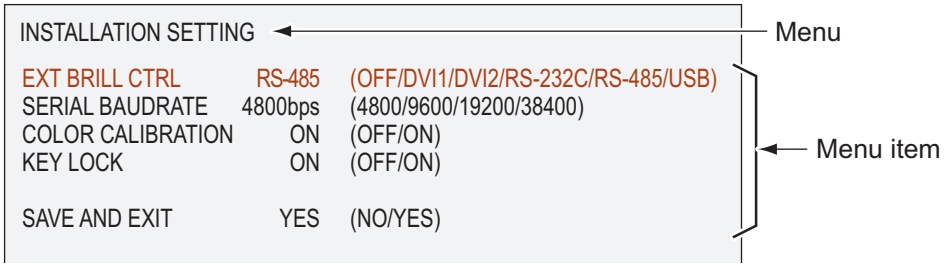
For the wiring of the monitor unit, see the operator's manual supplied with the monitor unit. Also, for resolution and image data output settings, see the Instruction Manual (TIE-36162/36940).

Mounting considerations

- Connect the radar main monitor to the DVI1 and COM1 ports.
- Connect the sub radar monitor to the DVI2 and COM2 ports.

Menu Settings (For MU series monitors)

The [INSTALLATION SETTING] menu appears only when the power is turned on for the first time after installation of the monitor unit.



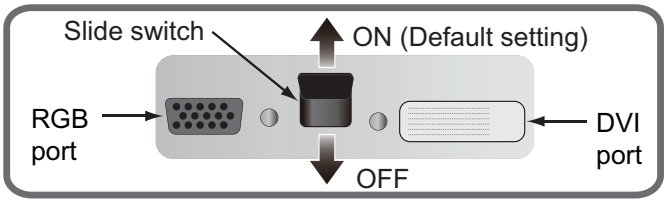
Adjust the settings referring to the following table.

EXT BRILL CTRL	SERIAL BAUD RATE	COLOR CALIBRATION	KEY LOCK	DVI PWR SYNC*
RS-485	4800bps	ON	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 (For MU series monitors)

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 (For MU series monitors)

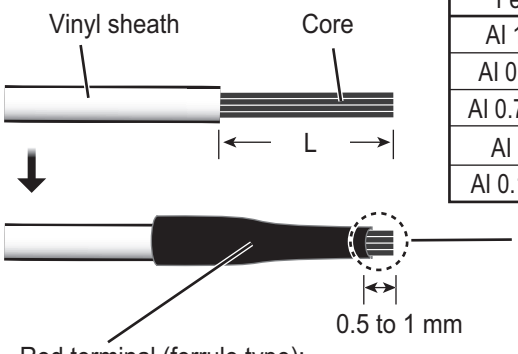
Turn off the monitor unit. While you hold the **DISP** key, press the **BRILL** key to turn on the monitor unit. Keep the **DISP** key pressed until the [INSTALLATION SETTING] menu appears.

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.

2.10 Sensor Adapters (option)

A maximum of eight MC-3000S can be connected to a sensor network (for the redundant connection: 16). The MC-3000S (serial input/output, IEC61162-2/1, 4ch) can connect a maximum of 10 sensor adapters, using the MC1.5-W cables. The maximum number of MC-3010A units is five.

When fabricating the MC1.5-W cables, use the lot terminal (ferrule type, supplied) to maintain performance. Use the ferrule-type terminals (supplied) to connect the cables to the terminals in the sensor adapters. This connection requires a crimping tool (CRIMPFOX10S, option). For the relations between the connectors and rod terminals, see page AP-2. Also, the stickers attached on the reverse side of the covers show the detailed connections.



Ferrule-type lug	Length of "L"
AI 1.5-6 BK (BLK)	6 mm
AI 0.34-6 TQ (BLU)	
AI 0.75-6 GY (GREY)	
AI 1-6 RD (RED)	
AI 0.14-8 GY(GREY)	8 mm

Attach the cables to the applicable pins.

Pin no.	Cable color	Signal
1	Red	24V_OUT or 24V_IN
2	Black	24V_GND
3	White	MODBUS-A
4	Blue	MODBUS-B
5	Gray	GND

Note 1: Use the MC1.5-W cable between the sensor adapters.

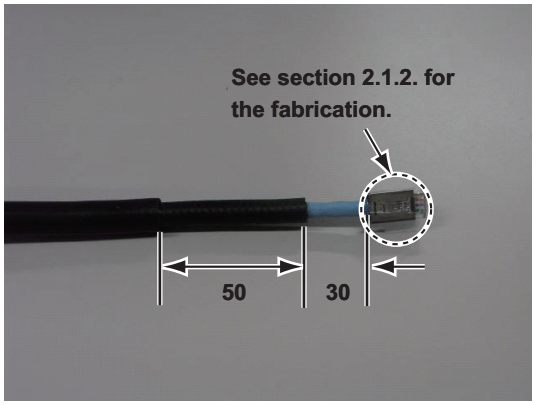
Note 2: The total length of the MC1.5-W cables must be less than 6 m to prevent malfunction.

2.10.1 MC-3000S

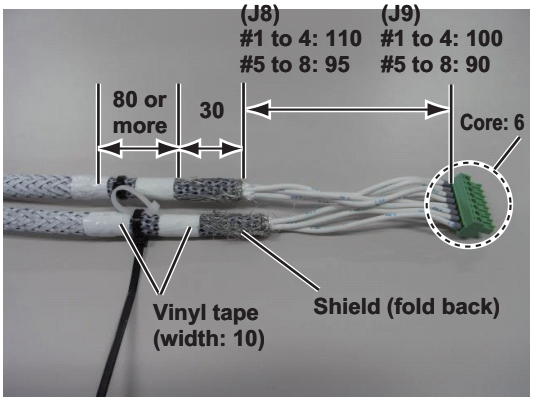
Use the LAN cable FR-FTPC-CY cable to connect the MC-3000S and the processor unit. With HUB-3000 or HUB-100, a maximum of eight MC-3000S can be connected.

Fabrications

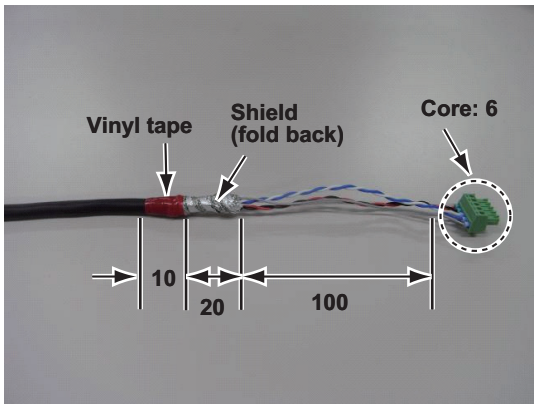
LAN cable (FR-FTPC-CY)



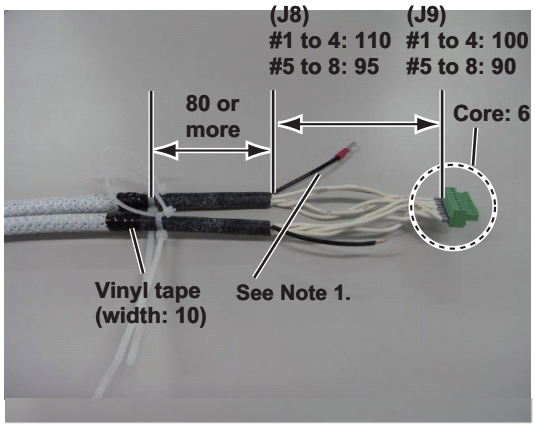
TTYCS-1Q cable



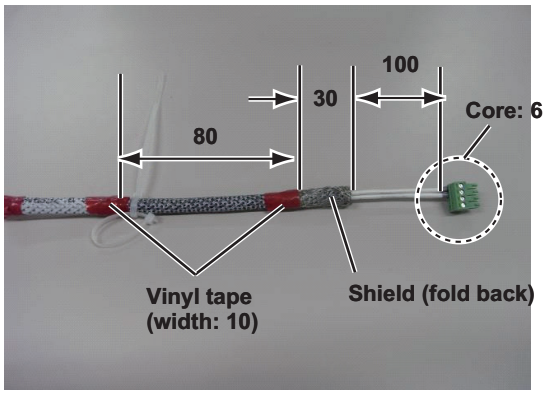
MC1.5-W-L600/1000/2000/3000 cable



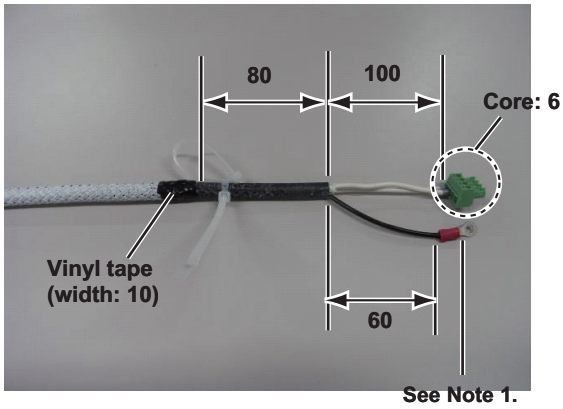
TTYCSLA-1Q cable



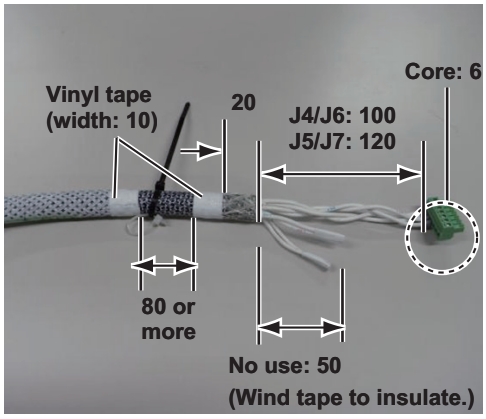
TTYCS-1 cable



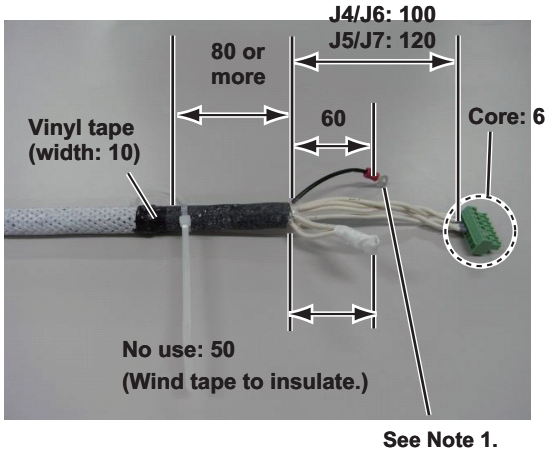
TTYCSLA-1 cable



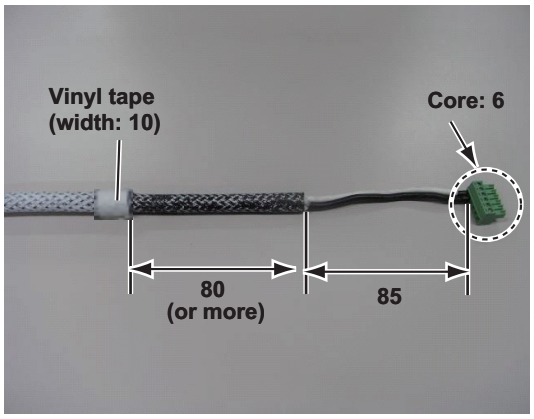
TTYCS-4 cable



TTYCSLA-4 cable



DPYC-1.5 cable

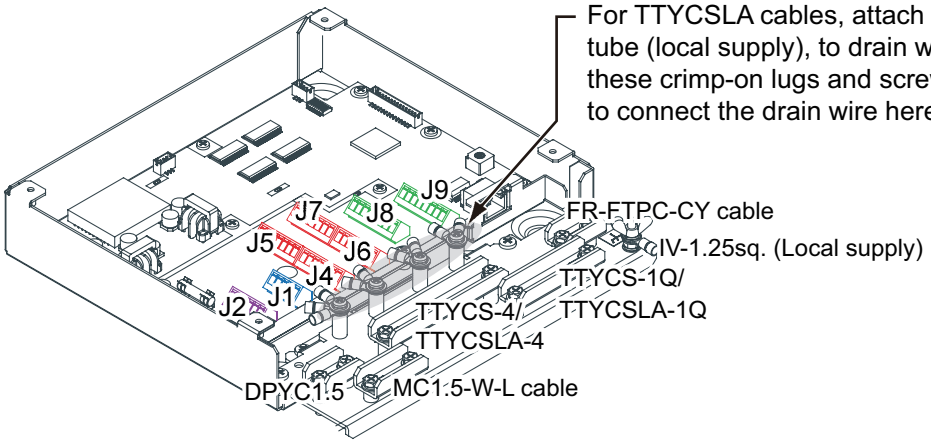


Note 1: Pass drain wire through shrink tubing (local supply), then attach crimp-on lug (pre-attached in unit).

Note 2: See "How to fabricate the LAN cable" on page 2-39 for how to fabricate the LAN cable.

Connections

Unfasten four screws to remove the cover. Pass the cables through the clamps and attach the cables to respective connectors. The shield (or drain wire) must lie in (connected to) the clamp.



Note: Be sure each cable shield lies in the cable clamp.

How to set NC/NO output (J2)

The POWER FAIL signal on the connector J2 can be set to NC (normal close) output or NO (normal open) output as shown in the table below.

Connector J2

Pin #	Signal name	In/Out	Remarks	NO	NC
1	24V_IN	-	24 VDC	DPYC-1.5	
2	24V_GND	-	GND (24 VDC)		
3	PWR_FAIL_A	Out	Power fail output	TTYCS(LA)-1	No connection
4	PWR_FAIL_COM	Out	Power fail output		TTYCS(LA)-1
5	PWR_FAIL_B	Out	Power fail output	No connection	

How to set input specification (J4 to J9)

For connectors J4 to J7, the connections are different depending on the input specifications as shown below.

Connector J4

Pin #	Signal name	In/ Out	Remarks	IEC 61162-2	IEC 61162-1
1	TD1-A	Out	Serial CH1, output IEC 61162-1/2/modbus	TTYCS(LA)-4	TTYCS(LA)-4
2	TD1-B	Out	Serial CH1, output IEC 61162-1/2/modbus		
3	RD1-A	In	Serial CH1, output IEC 61162-2/modbus		No connection
4	RD1-B	In	Serial CH1, output IEC 61162-2/modbus		
5	ISOGND1	-	Isolation, GND (CH1)		
6	RD1-H	In	Serial CH1, output IEC 61162-1	No connection	TTYCS(LA)-4
7	RD1-C	In	Serial CH1, output IEC 61162-1		

Connector J5

Pin #	Signal name	In/ Out	Remarks	IEC 61162-2	IEC 61162-1
1	TD2-A	Out	Serial CH2, output IEC 61162-1/2/modbus	TTYCS(LA)-4	TTYCS(LA)-4
2	TD2-B	Out	Serial CH2, output IEC 61162-1/2/modbus		
3	RD2-A	In	Serial CH2, output IEC 61162-2/modbus		No connection
4	RD2-B	In	Serial CH2, output IEC 61162-2/modbus		
5	ISOGND2	-	Isolation, GND (CH2)		
6	RD2-H	In	Serial CH2, output IEC 61162-1	No connection	TTYCS(LA)-4
7	RD2-C	In	Serial CH2, output IEC 61162-1		

Connector J6

Pin #	Signal name	In/ Out	Remarks	IEC 61162-2	IEC 61162-1
1	TD3-A	Out	Serial CH3, output IEC 61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD3-B	Out	Serial CH3, output IEC 61162-1/2		
3	RD3-A	In	Serial CH3, output IEC 61162-2		No connection
4	RD3-B	In	Serial CH3, output IEC 61162-2		
5	ISOGND3	-	Isolation, GND (CH3)		
6	RD3-H	In	Serial CH3, output IEC 61162-1	No connection	TTYCS(LA)-4
7	RD3-C	In	Serial CH3, output IEC 61162-1		

Connector J7

Pin #	Signal name	In/ Out	Remarks	IEC 61162-2	IEC 61162-1
1	TD4-A	Out	Serial CH4, output IEC 61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD4-B	Out	Serial CH4, output IEC 61162-1/2		
3	RD4-A	In	Serial CH4, output IEC 61162-2		No connection
4	RD4-B	In	Serial CH4, output IEC 61162-2		
5	ISOGND4	-	Isolation, GND (CH4)		
6	RD4-H	In	Serial CH4, output IEC 61162-1	No connection	TTYCS(LA)-4
7	RD4-C	In	Serial CH4, output IEC 61162-1		

Connector J8

Pin #	Signal name	In/ Out	Description	Used cable
1	TD5-A	Out	Serial CH5, output IEC 61162-1	TTYCS-1Q or TTYCSLA-1Q
2	TD5-B	Out	Serial CH5, output IEC 61162-1	
3	RD5-H	In	Serial CH5, input IEC 61162-1	
4	RD5-C	In	Serial CH5, input IEC 61162-1	
5	TD6-A	Out	Serial CH6, output IEC 61162-1	
6	TD6-B	Out	Serial CH6, output IEC 61162-1	
7	RD6-H	In	Serial CH6, input IEC 61162-1	
8	RD6-C	In	Serial CH6, input IEC 61162-1	

Connector J9

Pin#	Signal name	In/Out	Description	Used cable
1	TD7-A	Out	Serial CH7, output IEC 61162-1	TTYCS-1Q or TTYCSLA-1Q
2	TD7-B	Out	Serial CH7, output IEC 61162-1	
3	RD7-H	In	Serial CH7, input IEC 61162-1	
4	RD7-C	In	Serial CH7, input IEC 61162-1	
5	TD8-A	Out	Serial CH8, output IEC 61162-1	
6	TD8-B	Out	Serial CH8, output IEC 61162-1	
7	RD8-H	In	Serial CH8, input IEC 61162-1	
8	RD8-C	In	Serial CH8, input IEC 61162-1	

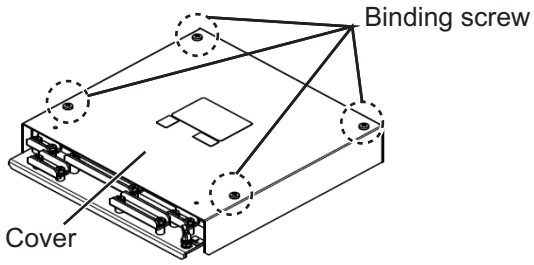
Case gasket OP24-28

The optional kit OP24-28 protects the connectors on the MC-3000S to waterproofing standard IPX2.

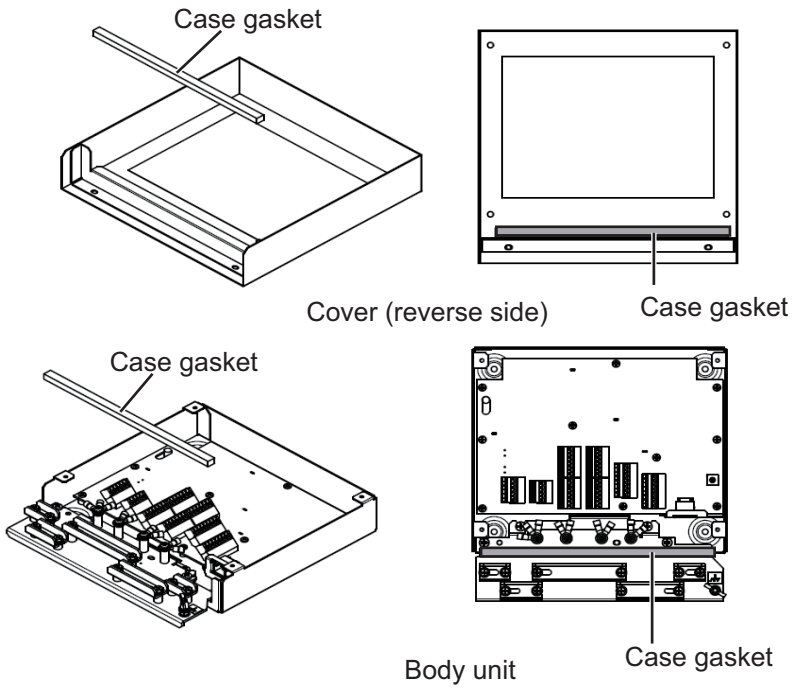
Case gasket (type: OP24-28, code no.: 001-169-970)

Name	Type	Code No.	Qty	Remarks
Case gasket (serial)	24-014-2051	100-367-880-10	2	For MC-3000S

1. Unfasten four binding screws to remove the cover from the adapter.



2. Peel the paper from the case gasket, then attach the case gasket to the reverse side of the cover and the body unit as shown below.



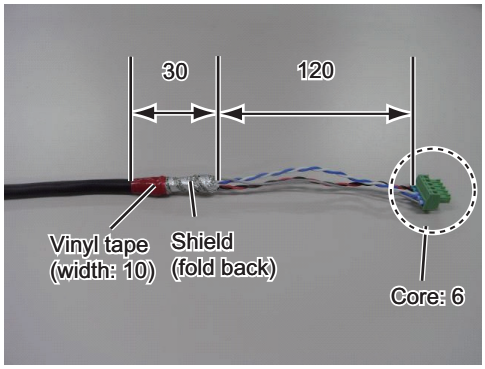
3. Attach the cover to the MC-3000S body unit.

2.10.2 MC-3010A/3020D/3030D

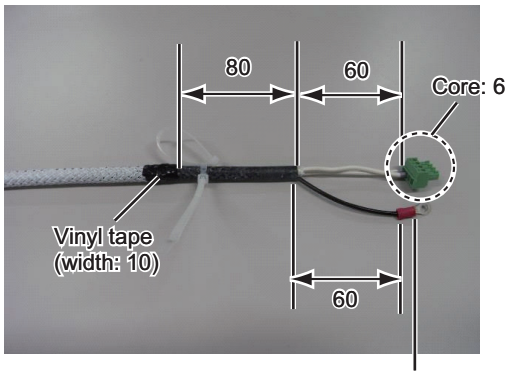
- MC-3010A: Inputs analog signal. To use MC-3010A as current input, connect short pins to each terminals.
- MC-3020D: Inputs digital signal (8ch contact input). Contact or voltage input is selectable (contact input requires short pins).
- MC-3030D: Outputs digital signal (8ch, normal open/close).

Fabrications

MC1.5-W-L600/1000/2000/3000 cable (Input)

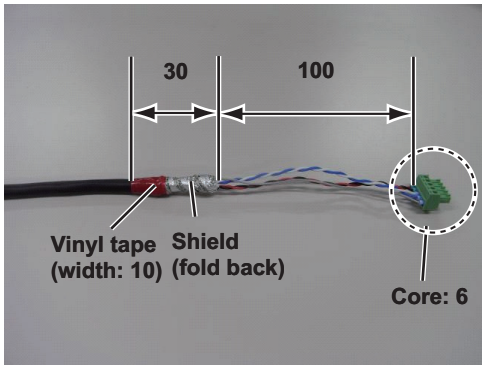


TTYCSLA-1 (MC-3010A)

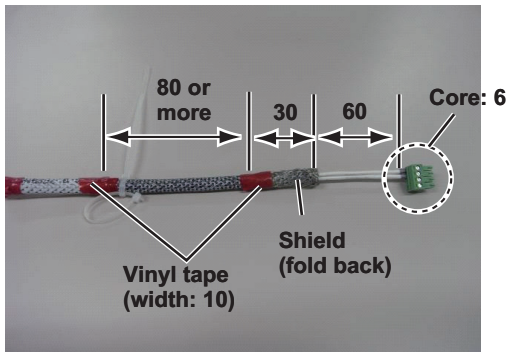


Pass drain wire through shrink tubing (local supply), then attach crimp-on lug (pre-attached in unit).

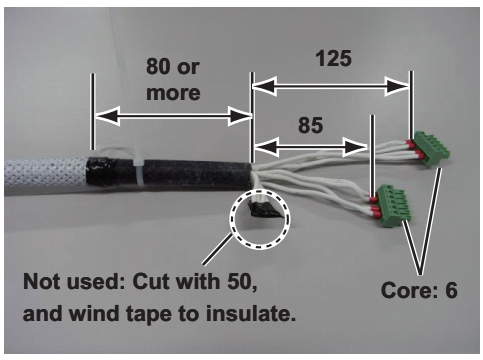
MC1.5-W-L600/1000/2000/3000 cable (Output)



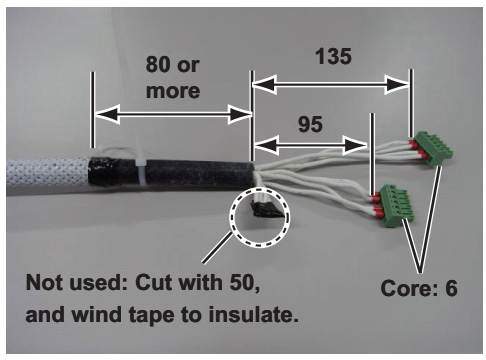
TTYCS-1 (MC-3010A)



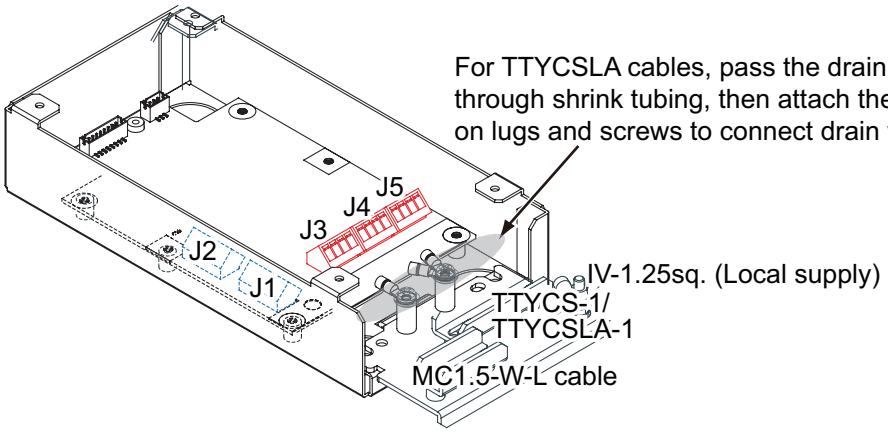
MPYC-12 cable (MC-3030D)



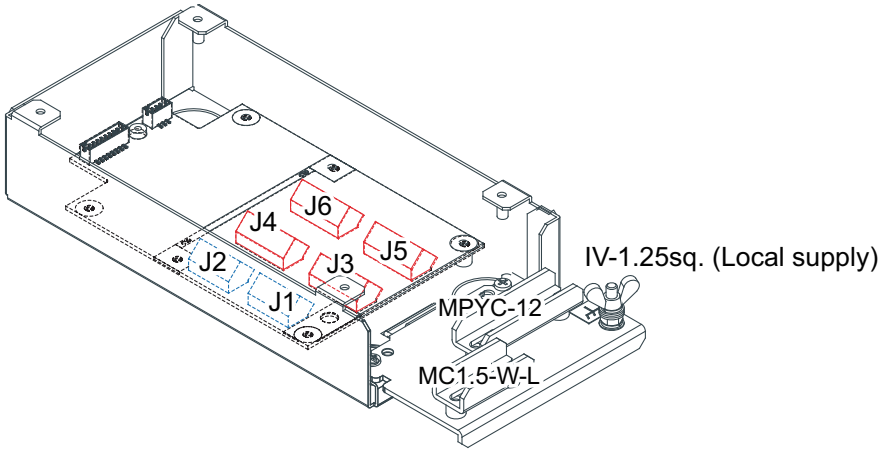
MPYC-12 cable (MC-3020D)



Connection



MC-3010A



MC-3020D/3030D

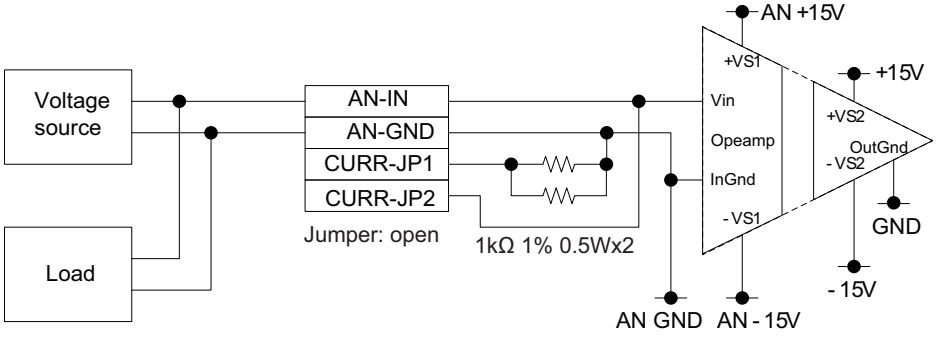
Input method (MC-3010A only)

Select the method of the analog data input, power voltage or power current.

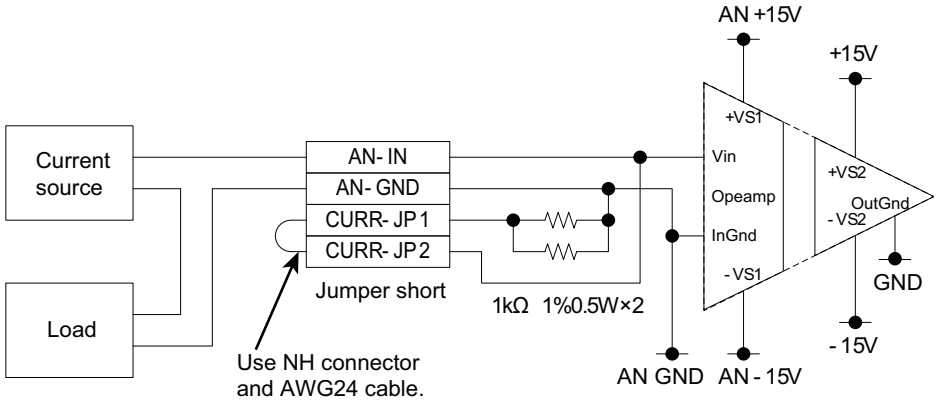
Note 1: The input must not exceed the range of the input voltage, to prevent malfunction.
-Setting for voltage input: -10V to +10V or 0 to 10V (depending on the setting)
-Setting for contact input: Voltage 4mA to 20mA

Note 2: When changing the input method, turn off the MC-3010A and on again to put change in effect.

- Power voltage: Input the amount of power voltage change to the operational amplifier.



- Power current: Pass the power current to the shunt resistor, 1kΩ/parallel (combined resistance: 500Ω) to input the amount of voltage change at the both ends of the resistor to the operational amplifier.



Connector J3

Pin #	Signal name	In/Out	Description	Power voltage	Power current
1	AN1_IN	In	Analog 1 input	TTYCS(LA)-1	
2	AN1_GND	-	Analog 1 GND		
3	CURR1_JP1	-	Analog 1 input, power current/ voltage setting jumper 1	Pin #3-#4: open	Pin #3-#4: short
4	CURR1_JP2	-	Analog 2 input, power current/ voltage setting jumper 1		

Connector J4

Pin #	Signal name	In/Out	Description	Power voltage	Power current
1	AN2_IN	In	Analog 2 input	TTYCS(LA)-1	
2	AN2_GND	-	Analog 2 GND		
3	CURR2_JP1	-	Analog 2 input, power current/ voltage setting jumper 1	Pin #3-#4: open	Pin #3-#4: short
4	CURR2_JP2	-	Analog 2 input, power current/ voltage setting jumper 1		

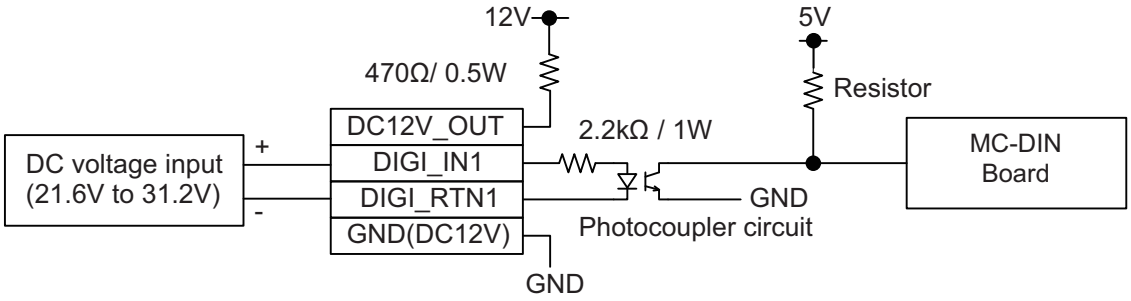
Connector J5

Pin #	Signal name	In/Out	Description	Power voltage	Power current
1	AN3_IN	In	Analog 3 input	TTYCS(LA)-1	
2	AN3_GND	-	Analog 3 GND		
3	CURR3_JP1	-	Analog 3 input, power current/ voltage setting jumper 1	Pin #3-#4: open	Pin #3-#4: short
4	CURR3_JP2	-	Analog 3 input, power current/ voltage setting jumper 1		

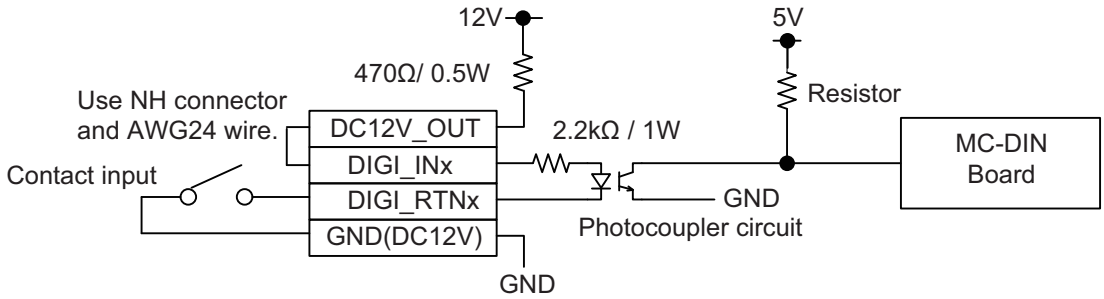
How to set ACK input (MC-3020D)

Use the connectors J3 to J6 to set the ACK input for ACK1 to ACK8 as shown below.

- Input circuit for voltage input



- Input circuit for contact input



Note 1: The input must not exceed the range of the input voltage, to prevent malfunction.

- Setting for voltage input: 21.6V to 31.2V
- Setting for contact input: Voltage cannot be input (contact signal only).

Note 2: For analog input, see page 2-63.

Connector J3

Pin #	Signal name	In/ Out	Remarks	ACK1 contact	ACK1 voltage	ACK2 contact	ACK2 voltage
1	DC12V_OUT	Out	ACK1 In	Pin #1-#2: short	No connection	According to ACK1 input	
2	DIGI_IN1	In			MPYC-12		
3	DIGI_RTN1	Out		MPYC-12			
4	GND (DC12V)	In			No connection		
5	DC12V_OUT	Out	ACK2 In	According to ACK2 input		Pin #5-#6: short	No connection
6	DIGI_IN2	In					MPYC-12
7	DIGI_RTN2	Out				MPYC-12	
8	GND (DC12V)	In					No connection

Connector J4

Pin #	Signal name	In/ Out	Remarks	ACK3 contact	ACK3 voltage	ACK4 contact	ACK4 voltage
1	DC12V_OUT	Out	ACK3 In	Pin #1-#2: short	No connection	According to ACK3 input	
2	DIGI_IN3	In			MPYC-12		
3	DIGI_RTN3	Out		MPYC-12			
4	GND (DC12V)	In			No connection		

Pin #	Signal name	In/ Out	Remarks	ACK3 contact	ACK3 voltage	ACK4 contact	ACK4 voltage
5	DC12V_OUT	Out	ACK4 In	According to ACK4 input		Pin #5-#6: short	No connection
6	DIGI_IN4	In					MPYC-12
7	DIGI_RTN4	Out				MPYC-12	
8	GND (DC12V)	In					No connection

Connector J5

Pin #	Signal name	In/ Out	Remarks	ACK5 contact	ACK5 voltage	ACK6 contact	ACK6 voltage
1	DC12V_OUT	Out	ACK5 In	Pin #1-#2: short	No connection	According to ACK5 input	
2	DIGI_IN5	In			MPYC-12		
3	DIGI_RTN5	Out		MPYC-12			
4	GND (DC12V)	In			No connection		
5	DC12V_OUT	Out	ACK6 In	According to ACK6 input		Pin #5-#6: short	No connection
6	DIGI_IN6	In					MPYC-12
7	DIGI_RTN6	Out				MPYC-12	
8	GND (DC12V)	In					No connection

Connector J6

Pin #	Signal name	In/ Out	Remarks	ACK7 contact	ACK7 voltage	ACK8 contact	ACK8 voltage
1	DC12V_OUT	Out	ACK1 In	Pin #1-#2: short	No connection	According to ACK7 input	
2	DIGI_IN7	In			MPYC-12		
3	DIGI_RTN7	Out		MPYC-12			
4	GND (DC12V)	In			No connection		
5	DC12V_OUT	Out	ACK2 In	According to ACK8 input		Pin #5-#6: short	No connection
6	DIGI_IN8	In					MPYC-12
7	DIGI_RTN8	Out				MPYC-12	
8	GND (DC12V)	In					No connection

How to set alarm output (MC-3030D)

Use the connector J3 to J6 on the MC_OUT Board (24P0117) to select NC (normal close) or NO (normal open) for alarm output 1 to 8.

Connector J3

Pin #	Signal name	In/ Out	Remarks	Alarm1 NO Out	Alarm1 NC Out	Alarm2 NO Out	Alarm2 NC Out
1	A1	Out	Alarm1 Out	MPYC-12	No connection	-	
2	COM1				MPYC-12		
3	B1			No connection			
4	A2		Alarm2 Out	-		MPYC-12	No connection
5	COM2						MPYC-12
6	B2					No connection	

Connector J4

Pin #	Signal name	In/ Out	Remarks	Alarm3 NO Out	Alarm3 NC Out	Alarm4 NO Out	Alarm4 NC Out
1	A3	Out	Alarm3 Out	MPYC-12	No connection	-	
2	COM3				MPYC-12		
3	B3			No connection			
4	A4		Alarm4 Out	-		MPYC-12	No connection
5	COM4						MPYC-12
6	B4					No connection	

Connector J5

Pin #	Signal name	In/ Out	Remarks	Alarm5 NO Out	Alarm5 NC Out	Alarm6 NO Out	Alarm6 NC Out
1	A5	Out	Alarm5 Out	MPYC-12	No connection	-	
2	COM5				MPYC-12		
3	B5			No connection			
4	A6		Alarm5 Out	-		MPYC-12	No connection
5	COM6						MPYC-12
6	B6					No connection	

Connector J6

Pin #	Signal name	In/ Out	Remarks	Alarm7 NO Out	Alarm7 NC Out	Alarm8 NO Out	Alarm8 NC Out
1	A7	Out	Alarm7 Out	MPYC-12	No connection	-	
2	COM7				MPYC-12		
3	B7			No connection			
4	A8		Alarm8 Out	-		MPYC-12	No connection
5	COM8						MPYC-12
6	B8					No connection	

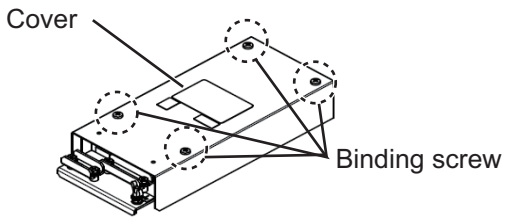
Case gasket OP24-29

The optional kit OP24-29 protects the connectors on the MC-3010A/3020D/3030D to waterproofing standard IPX2.

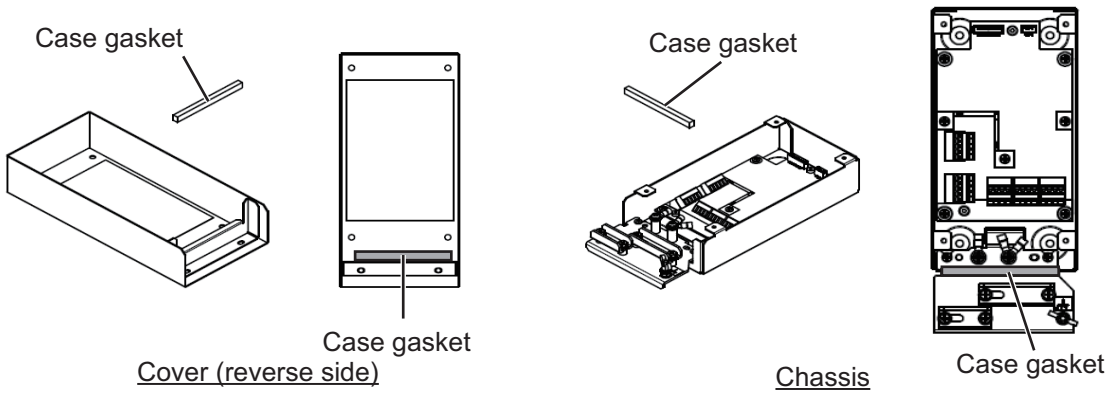
Case gasket (type: OP24-29, code no.: 001-169-960)

Name	Type	Code No.	Qty	Remarks
Case gasket (analog)	24-014-2052-1	100-367-961-10	2	MC-3010A/3020D/3030D

1. Unfasten four binding screws to remove the cover from the adapter.



2. Peel the paper from the case gasket, then attach the case gasket to the reverse side of the cover and the body unit as shown below.

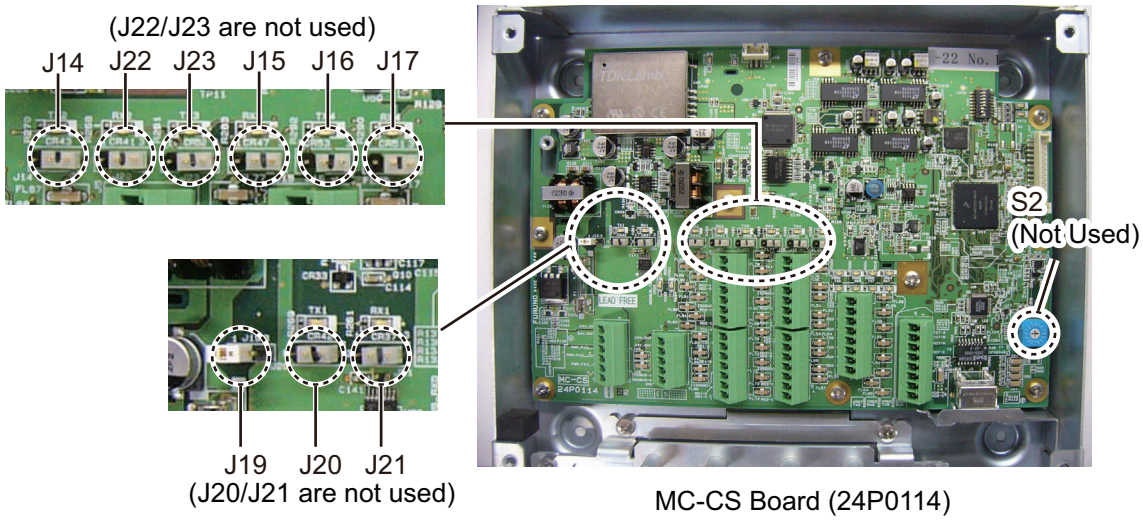


3. Attach the cover to the MC-3010A/3020D/3030D chassis.

2.10.3 How to set jumper blocks in the sensor adapters

MC-3000S

Set the jumper blocks on the MC-CS Board (24P0114) referring to the tables that follow.



MC-CS Board (24P0114)

Jumper block: Use the jumper block J19 to set the termination resistor on/off for the MODBUS communication on the connector J1. For the first and last sensor adapter in a series, their termination resistors must be set to ON. Use the MC-CS Board with the default setting because it becomes the "first" adapter in a series.

Jumper block J19		Connector J1
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Set the jumper blocks J14 through J17 to turn the termination resistors on connectors J4 through J7, respectively.

(Termination resistor ON)

- When setting the starting/ending terminal for the multipoint, or the multipoint is not connected (CH1 to 4).

(Terminal resistor OFF)

- When setting the terminal other than starting/ending for the multipoint (CH1 to 4).

Jumper block J14		Connector J4 (CH1)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

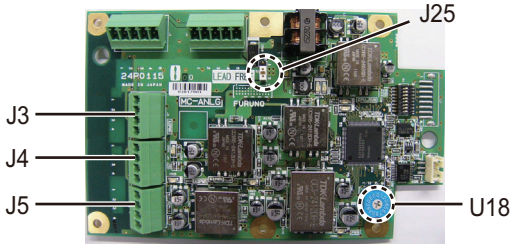
Jumper block J15		Connector J5 (CH2)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Jumper block J16		Connector J6 (CH3)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

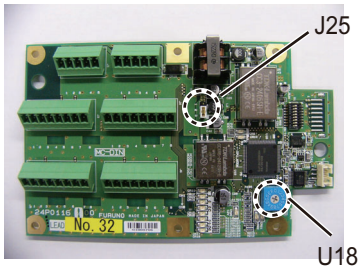
Jumper block J17		Connector J7 (CH4)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

MC-3010A/3020D/3030D

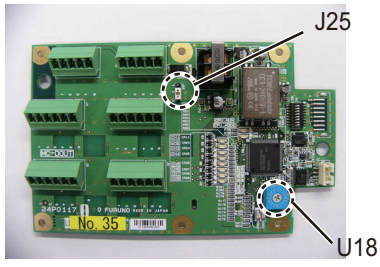
This paragraph shows how to set the MC-ANLG Board (24P0115, for MC-3010A), MC-DIN Board (24P0116, for MC-3020D) and MC-DOUT Board (24P0117, for MC-3030D).



MC-ANLG Board (24P0115)



MC-DIN Board (24P0116)



MC-DOUT Board (24P0117)

Rotary switch: Use the rotary switch (U18) to set the MODBUS address with a digit of number from "0". When multiple sensor adapters are connected to the MC-3000S, the same number cannot be used among them. (It is allowed to use the same number between the MC-3000S and a sensor adapter.)

Jumper block: Use the jumper block J25 to set the termination resistor on/off for the MODBUS communication on the connector J1. For the first and last sensor adapter in a series, their termination resistors must e set to ON. If not, communication between sensor adapters is not possible.

Jumper block J25		Connector J1
1-2	OPEN	Termination resistor: OFF (default setting)
2-3	SHORT	
1-2	SHORT	Termination resistor: ON
2-3	OPEN	

2.11 LAN Signal Converter Kit (option)

The LAN Signal Converter allows the use of existing antenna cable RW-9600/6895/4873 for TR-UP radar.

If the LAN Signal Converter is not attached in the antenna and power supply units, the LAN Signal Converter Kit (optional supply) is required.

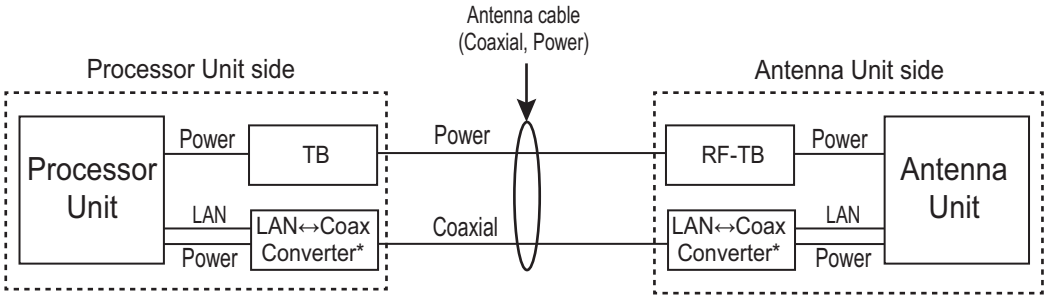
LAN Signal Converter Kit

Radar	Type	Code No.
X-band Magnetron radar	OP03-223-3	001-254-380
X-band Solid state radar	OP03-223-4	001-569-010

2.11.1 Application overview

The LAN Signal Converter has two applications.

Application 1: Use with existing antenna cable (retrofit)

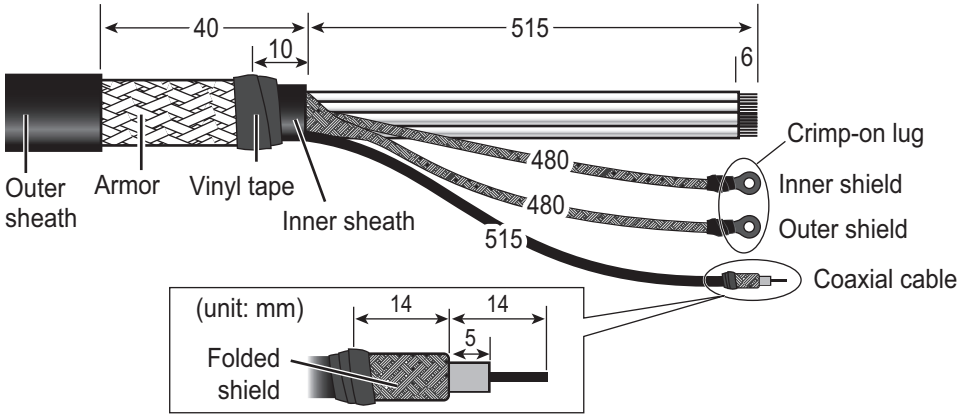


** Installed inside respective unit.*

Method 1: Using existing antenna cable

Use with existing antenna cable (RW-9600) in case of retrofit. The maximum length of the antenna cable is 100 m for RW-9600, 50 m for RW-6895/4873.

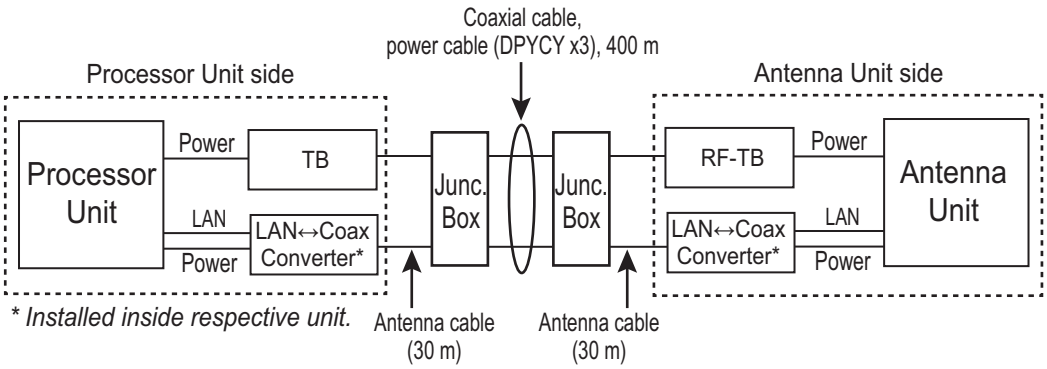
The white, red, and green wires are not used. Attach a single crimp-on lug (FV5.5-S4(LF), yellow) locally to the wires. (These wires will be connected together with the shield of the power line, in the next section.)



Application 2: Foremast installation

Foremast installation, where the distance between the antenna unit and the power supply unit is more than 100 m (max. 460 m). See section 2.12 and the interconnection diagram for connections in the junction box.

The Cable Extension Kit (Type: OP03-224-3, Code No.: 001-254-410), comprised of two junctions boxes, two LAN Signal Converters and necessary hardware, is optionally available.



Method 2: Using antenna cable RW-9600

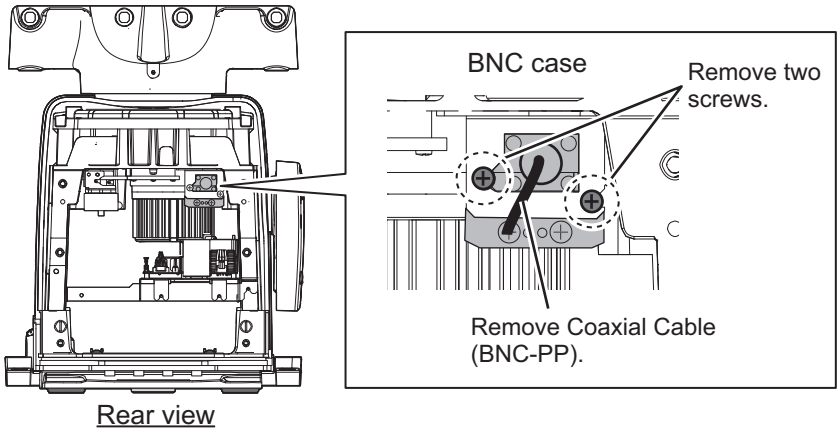
2.11.2 Installation in the antenna unit

X-band Radar

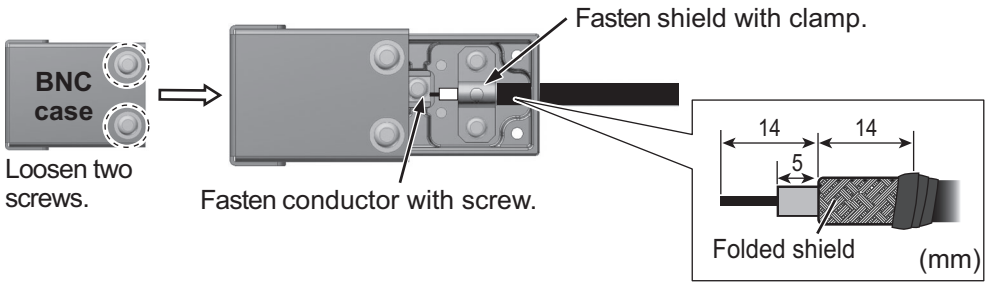
Note: If the Antenna Unit does not included the LAN Signal Converter, the converter kit (available as an optional extra) is required. See "LAN Signal Converter Kit" on page 2-70.

Dismount the transceiver unit in the Antenna Unit. See section 2.2.2, for details. Also, in the procedure, mainly figures of magnetron radar are shown.

1. Unfasten the coaxial cable from the converter in the Antenna Unit, then unfasten two screws to detach the BNC case from the antenna unit.



2. Loosen two screws on the BNC case. Attach the coaxial cable from the Antenna Unit then close the case.

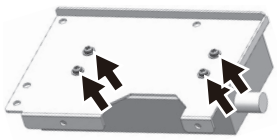


3. Fasten the BNC case to the original position in the Antenna Unit with original two screws, referring to step 1.
4. Mount the transceiver unit to the Antenna Unit.
5. Re-connect the coaxial cable (disconnected at step 1).

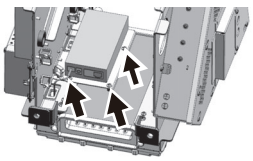
S-band Radar

Dismount the transceiver unit. See paragraph 2.4.2 for the procedure.

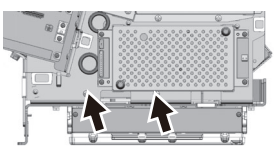
1. Set the M_S switch on the converter to the S (Slave) position.
2. Fasten the converter with four screws from inside of the transceiver unit so that the connector of the coaxial cable faces upward.
   <Magnetron radar>

❶ 

Fasten the converter to its mounting bracket with four screws.

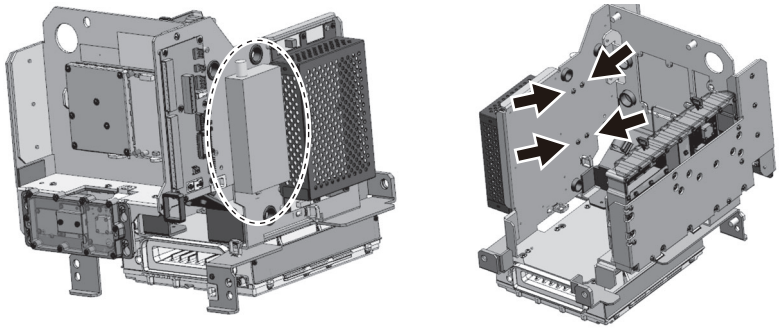
❷ 

Loosely fasten the converter inside the transceiver unit with three screws.

❸ 

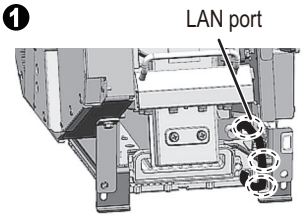
Fasten the converter outside the transceiver unit with two screws. Tighten three screws loosely fastened at step ❷.

<Solid state radar>

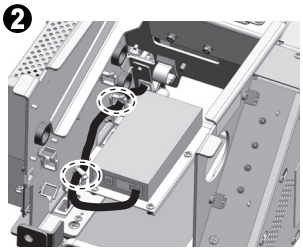


3. Unfasten two screws to remove the cover plate from the SPU board.
4. Connect the power cable to the converter, pass it through the locking wire saddle then connect it to J824 on the SPU board. Note polarity before connecting. Close the cover plate.
5. Connect the LAN cable to the LAN port on the transceiver unit. Pass the cable through the locking wire saddle then connect it to the LAN port on the converter.

<Magnetron radar>

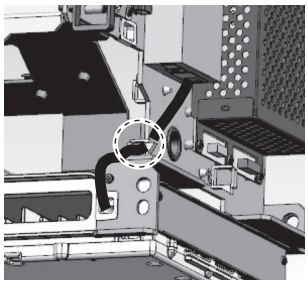


Connect the LAN cable to the LAN port then pass it through the locking wire saddle.

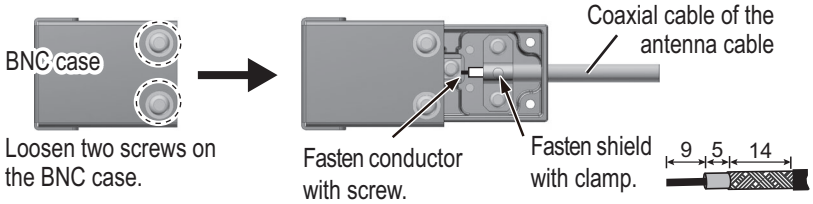


Pass the cable through two locking wire saddles then connect it to the LAN port on the converter.

<Solid state radar>

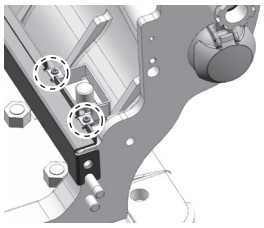


6. Open the BNC case to connect the coaxial cable to the BNC case, then close the case.



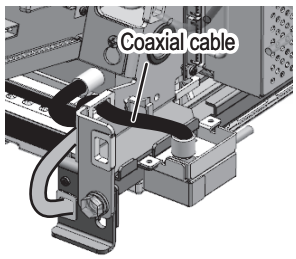
Loosen two screws on the BNC case.

7. Fasten the BNC case to the antenna unit, then mount the transceiver unit.
8. Connect the coaxial cable from the converter to the BNC case, passing through the locking wire saddle.



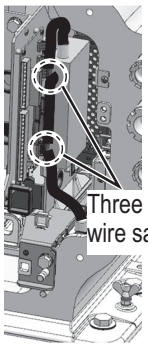
Fasten the BNC case to the rail inside the antenna unit with two screws.

<Magnetron radar>



Connect the coaxial cable to the BNC case, passing through the locking wire saddle.

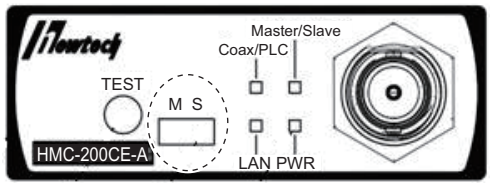
<Solid state radar>



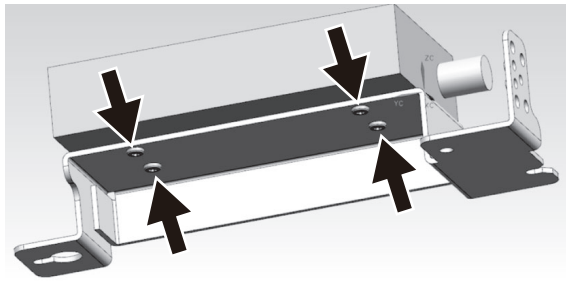
2.11.3 Installation in the power supply unit

Some parts or wiring may have been omitted from the illustrations of the power supply unit for clarity.

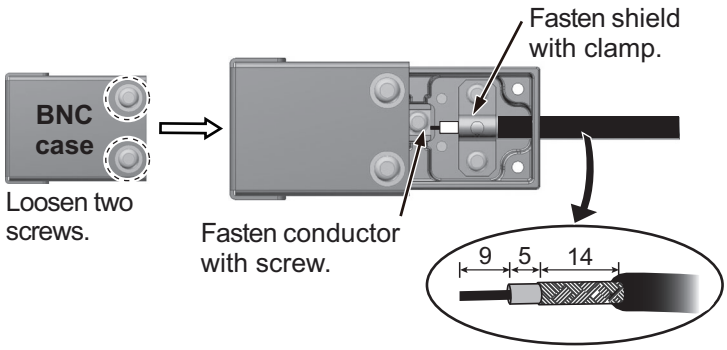
1. Set the M_S switch on the converter to the M (Master) position.



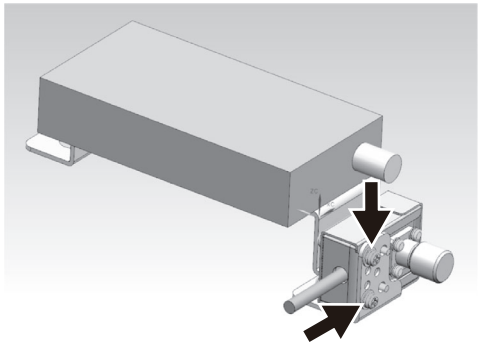
2. Fasten the converter to its mounting bracket with four screws.



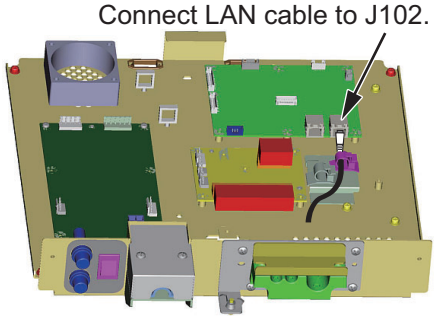
3. Loosen two screws on the BNC case. Attach the coaxial cable from the antenna cable then close the case.



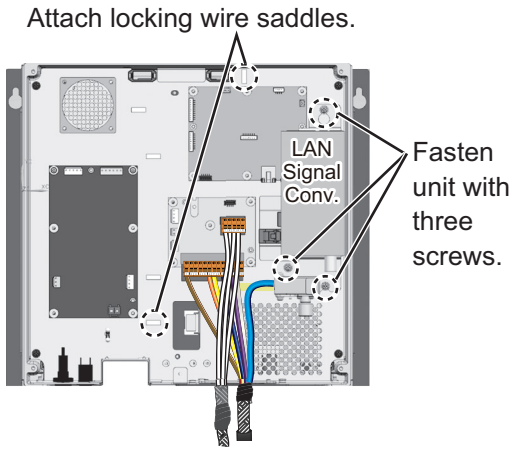
4. Fasten the BNC case to the mounting bracket with two screws.



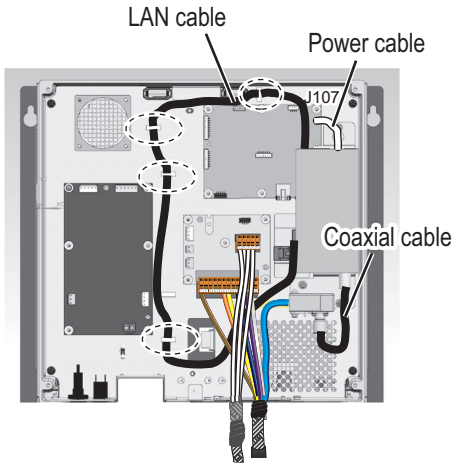
5. Pass the LAN cable through the clamp then connect it to J102 on the PSU-CNTL board. (The cable will be connected to the converter after the converter is installed.)



6. Fasten the converter with three screws. Attach the two supplied locking wire saddles to the locations circled in the right figure.

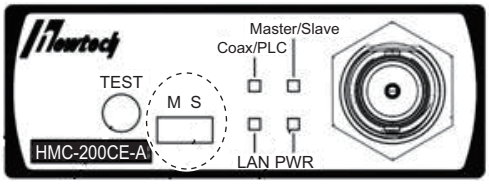


7. Connect the LAN, power and coaxial cables as shown below.
   - Pass the LAN cable through the four locking wire saddles then connect it to the LAN port on the converter.
   - Connect the power cable between the converter and J107 on the PSU-CNTL Board.
   - Connect the coaxial cable between the converter and the BNC case.



2.11.4 How to check the installation

Observe the LEDs on the converter to check for proper operation, troubleshoot.



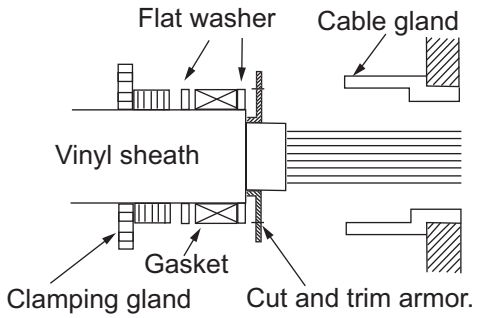
LED	State	Meaning
PWR	OFF	Power OFF
	Lighting green	Power ON
	Flashing orange	Test mode
LAN	OFF	Link down
	Lighting green	100 M link up
	Flashing green	100 M active
	Lighting orange	10 M link up
	Flashing orange	10 M active
Coax/PLC	OFF	Link down
	Lighting green	Link up
Master/Slave	Lighting green	Master mode
	Lighting orange	Slave mode

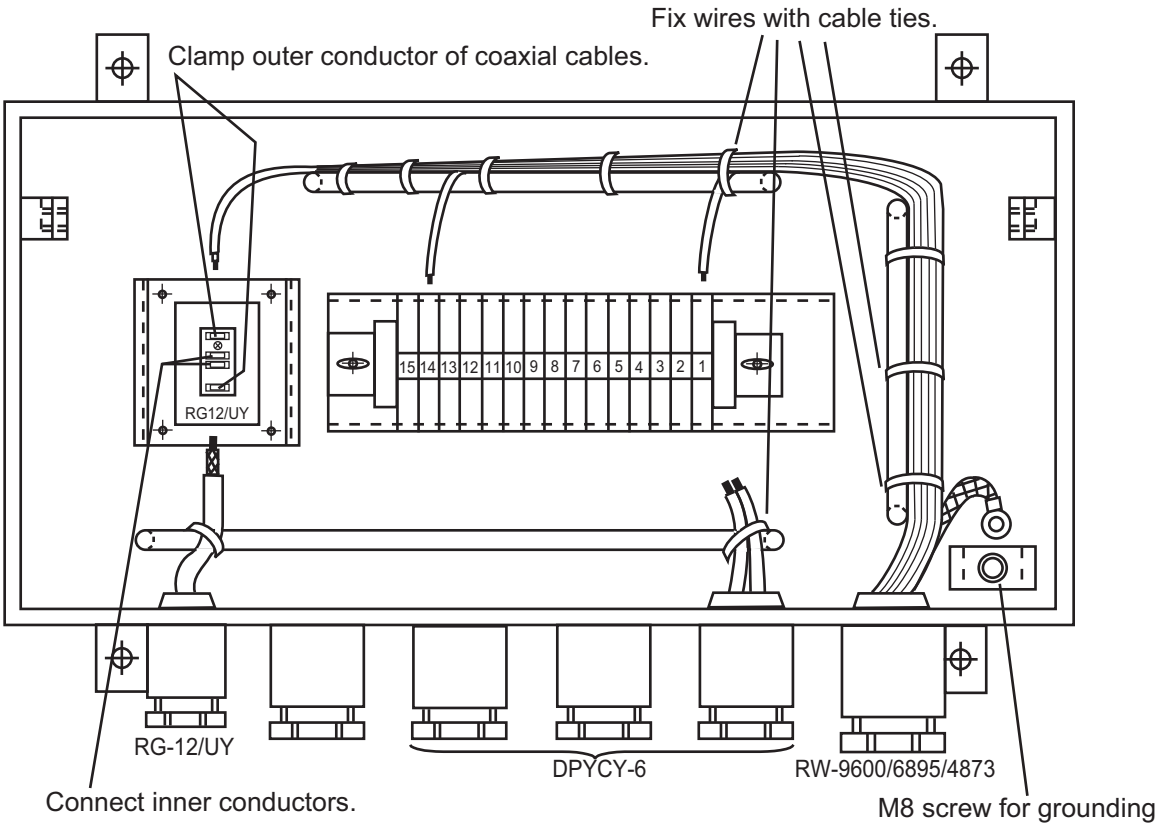
Note: The [TEST] button has no use.

2.12 Junction Box (option)

Junction boxes are required when the distance between the antenna unit and power supply unit is greater than 100 meters (max. 460 meters); for example, the antenna unit is installed on the foremast. Use signal cable RW-9600(x2), power cable DPYCY-6(x3), and coaxial cable RG-12/UY(x3).

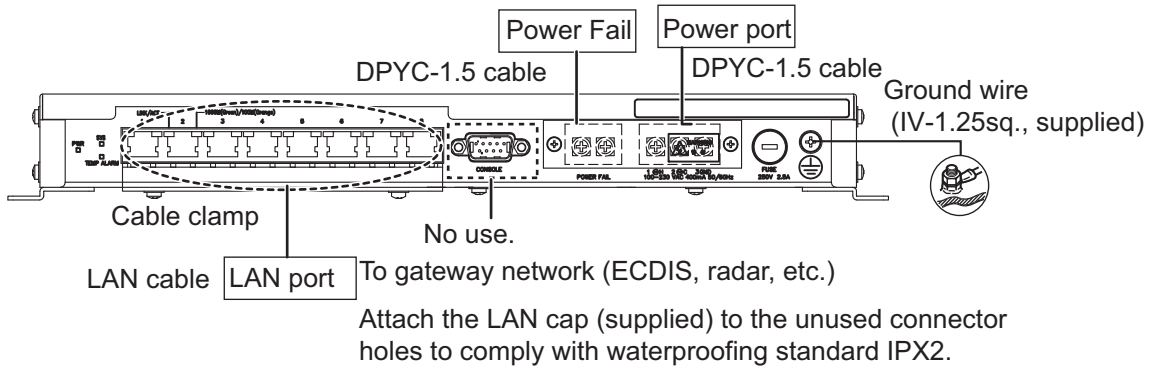
Pass each cable through its cable gland as shown below.





2.13 Intelligent HUB (option)

Fix the LAN cables to the cable clamp with the cable ties (supplied).



2.14 How to Extend the Control Unit Cable (option)

To extend the length of the cable between the control unit and the processor unit, use the appropriate cable assembly for the control unit, as listed below.

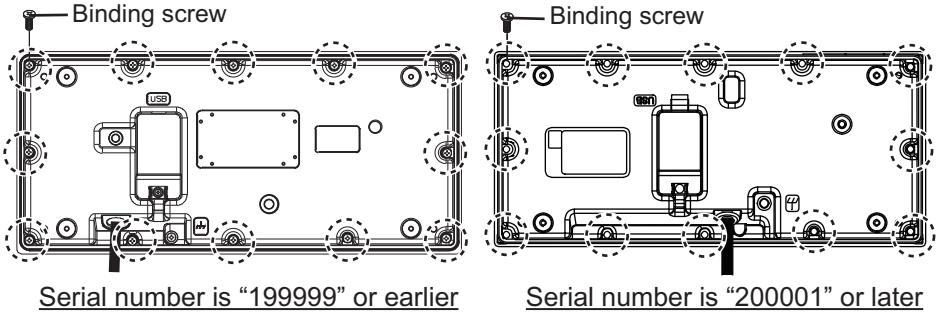
- RCU-025: TET-16-045A (5/10/20/30 m)
- RCU-026: 6TPSH-XH12X2-LxxSP2 (5/10/20/30 m)

Note: When the control unit cable is 10 m or longer, the USB cable (TS-20-071-1, 5 m) that is supplied with the control unit cannot be used. Even if the USB cable is not used, you can operate the control unit properly, but the USB port on the control unit is deactivated.

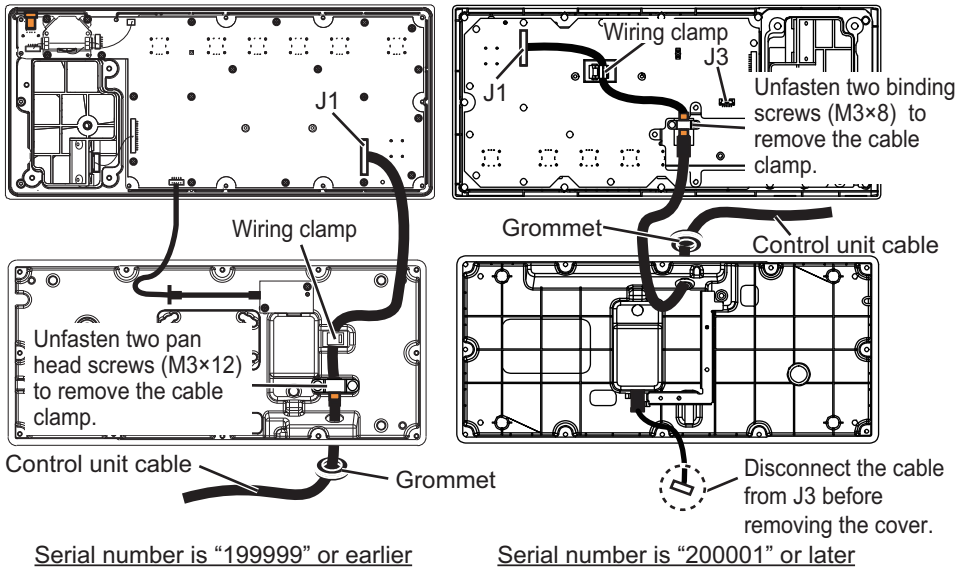
2.14.1 Radar control unit (RCU-025)

Wiring for the control unit

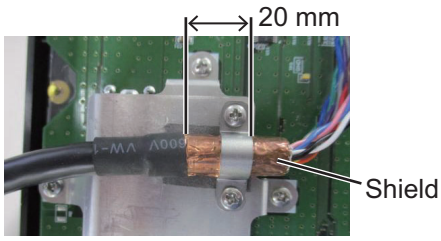
1. Unfasten 12 binding screws (M3×8) from the bottom of the control unit to remove the cover.
   Note: Do not add stress to the cables connected to the control unit board when removing the cover. When the serial number of the control unit is "200001" or later, disconnect the cable from the J3 (see the figure on step 3) before removing the cover.



2. Unfasten two screws to remove the cable clamp.
3. Release the control unit cable from the wiring clamp, then disconnect the cable from the J1.



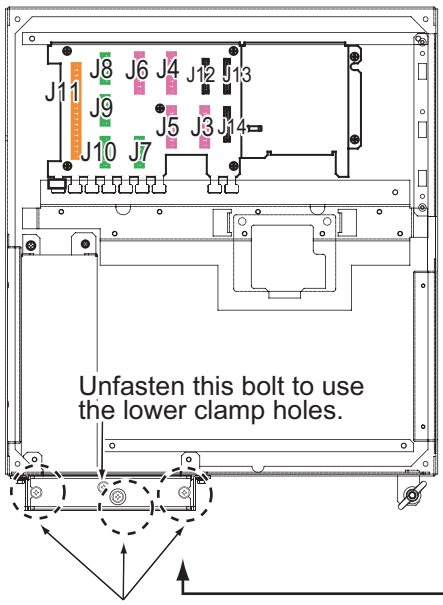
4. Pull out the control unit cable from the cover.
5. Pass the optional cable assy (TET-16-045A) through the grommet and cable entrance on the control unit.
6. Fasten the shield of the cable with the cable clamp (removed at step 2).
   Note: When the serial number is "200001" or later, fasten the shield as shown in the figure to the right.



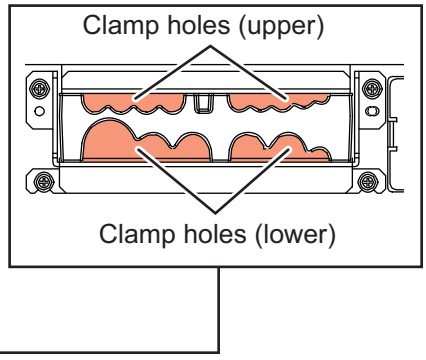
7. Connect the cable to the J1, then secure the cable with the wiring clamp.
8. Reattach the control unit cover.

Wiring for the processor unit

1. Unfasten four screws (M4×8) to remove the processor unit cover.
2. Unfasten the three bolts circled in the figure below to remove the cable clamp (upper).



J3 to J6: IEC 61162-1/2
J7 to J10: IEC 61162-1
J11: Alarm system (System fail, Power fail, Normal close×2, Normal open×2, ACK IN)
J12: Main control unit
J13 and J14: Sub control units



Unfasten these three bolts to remove the upper plate.

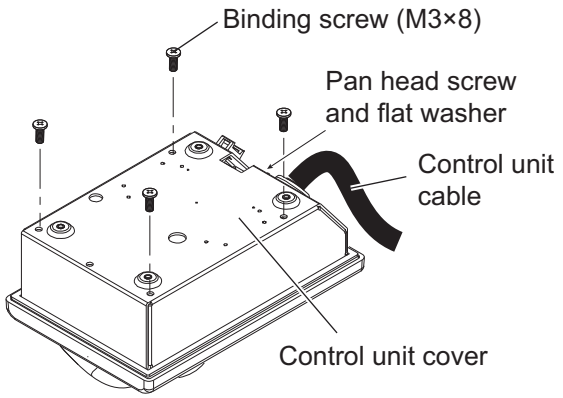
3. Disconnect the control unit cable from the processor unit, then connect the cable assy (TET-16-045A).
4. Set the shield part of cables under the cable clamp then tighten the cable clamp.

5. Attach the processor unit cover.

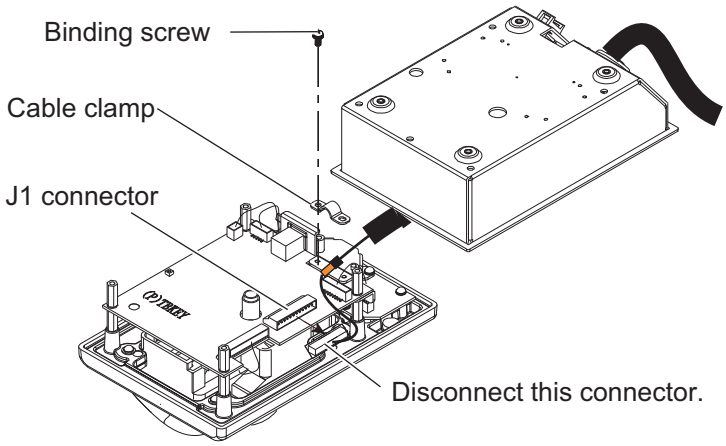
2.14.2 Trackball control unit (RCU-026)

Wiring for the trackball control unit

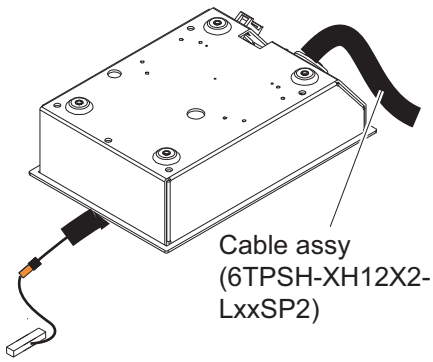
1. Unfasten four binding screws (M3×8) from the bottom of the control unit, and a pan head screw (M3×8) and flat washer from the back of the control unit to remove the cover.
   Note: Remove the cover slowly to prevent damage to the cables connected to the circuit board in the control unit.



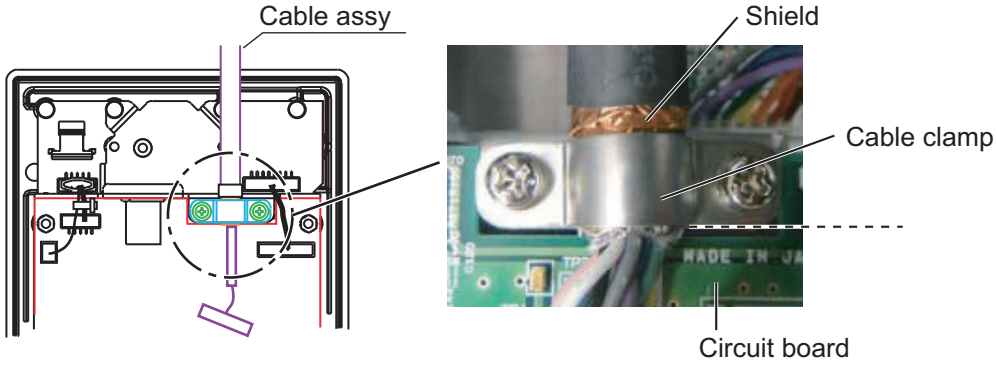
2. Remove the cable clamp from the control unit, then disconnect the control unit cable from the J1 connector.
3. Pull out the control unit cable from the cover.



4. Pass the optional cable assy (6TPSH-XH12X2-LxxSP2) through the cable hole on the cover.



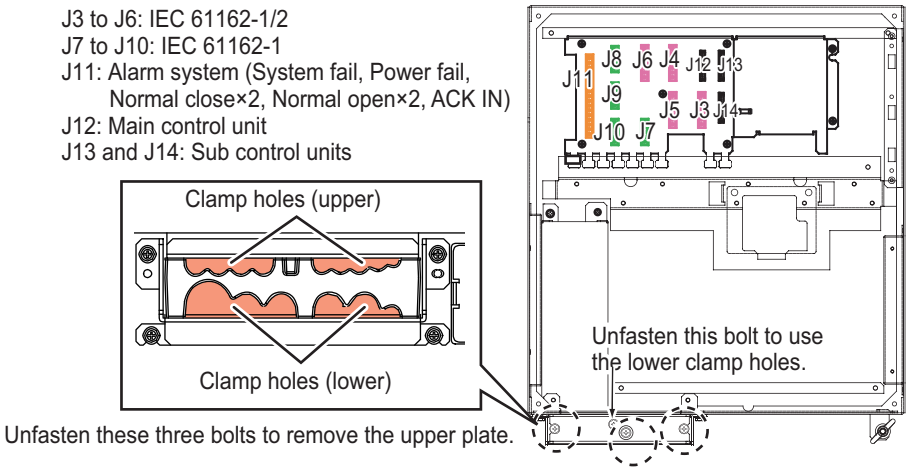
5. Fasten the shield of the cable assy with the cable clamp (removed at step 2), then connect the connector at the end of the cable assy to the J1 on the circuit board.
   Note: The shield of the cable must not touch the circuit board.



6. Reattach the control unit cover.

Wiring for the processor unit

1. Unfasten four screws (M4×8) to remove the processor unit cover.
2. Unfasten the three bolts circled below to remove the cable clamp (upper) as shown below.



3. Disconnect the control unit cable from the processor unit, then connect the cable assy (6TPSH-XH12X2-LxxSP2).
4. Set the shields of cables under the cable clamp then tighten the cable clamp.
5. Remount the processor unit cover.

2.15 VDR Connection

You can connect a VDR to this radar in one of two manners: DVI-I (Analog RGB) or LAN.

2.15.1 DVI-I (Analog RGB) connection

- Use the RGB cable (DVI-BNCX5-L2000) to connect the VDR.
- The DVI-D port and DVI-I port each have their own circuits. This prevents the interruption of the radar picture shown on the main monitor (connected to the DVI-D port), if a fault occurs at the DVI-I port.
- The processor unit continuously outputs video signals from its DVI-D and DVI-I ports. These signals cannot be stopped by the operator.

2.15.2 LAN connection

- Connect the VDR to the LAN2 port of the processor unit.
  The VDR must comply with IEC 61160-450 standards.
- To set up the VDR, refer to the Instruction Manual supplied with the VDR, as well as the Instruction Manual (TIE-36162/36940).
- The image output from the LAN2 port is the same resolution as the image output from the DVI-D port.

3. INPUT/OUTPUT DATA

NOTICE

The radar(s) must be interconnected to the following type approved sensors:
- **EPFS meeting the requirements of the IMO resolution MSC.112(73).**
- **Gyrocompass meeting the requirements of the IMO resolution A.424(XI).**
- **SDME meeting the requirements of IMO resolution MSC.96(72).**

The radar may be interconnected via HUB-3000 to other FURUNO processing units having approved LAN ports.

3.1 Processor Unit

Input and output data are shown in the table below.

Input

Data	Port	Specification	Contents	Remarks
Heading signal	J4, J5	IEC 61162-2*		
Speed signal	J7	IEC 61162-1 Ed.5		
Navaid data	J6, J8	IEC 61162-1 Ed.5	Position, time and date, datum, course, speed, wind, current, depth, temperature, Navtex, etc.	
AIS signal	J3	IEC 61162-2		
Alarm handling signal	J11	Contact closure		Input from alarm system
		IEC 61162-1 Ed.5		Input from alarm system

*: Data input cycle must be more than 40 Hz (high speed craft) or 20 Hz (conventional ships).

Output

Data	Specification	Contents	Remarks
Radar system data	IEC 61162-1 Ed.5	RSD, OSD	
TT data**	IEC 61162-1 Ed.5	TTD, TTM, TLB	
Alarm signal	IEC 61162-1 Ed.5		4 systems, output contents are selected by menu.
	Contact closure		

**: The output sentence and baud rate can be set on the [Common Installation Settings] menu (see the Instruction Manual (TIE-36162/36940)). The mode can be set at the [TT PRESET] menu (see the Adjustment Manual (AME-36162/36940)).

Alert Interface

The alert interface for this equipment are shown as follows:

- IEC 61162-1/2 (combination): 4 ports
- IEC 61162-1: 3 ports
- IEC 61162-450: 1 port

3.2 IEC 61162 Sentences

Input Data	Sentence priority
AIS addressed and binary broadcast acknowledgment	ABK
Alert command	ACN (ACM)
Cyclic alert list	ALC
Alert sentence	ALF
Set alarm state	ALR
Alert command refused	ARC
Set and drift	CUR>VDR
Display dimming control	DDC
Depths	DPT>DBT
Datum	DTM
Position	GNS>GGA>RMC>GLL
Heartbeat supervision report	HBT
Heading correction report	HCR
Water temperature	MTW
Wind direction and speed	MWD
Wind speed and angle (relative)	MWV (R)
Wind speed and angle (true)	MWV (T)
NAVTEX receiver mask	NRM
NAVTEX received message	NRX
Navigation status report	NSR
Route transfer report	RRT
System function ID	SRP
Heading (true)	THS>HDT
Speed (SOG)	VBW
Speed (STW)	VBW>VHW
UAIS VHF data-link message	VDM
UAIS VHF data-link own-vessel report	VDO
Dual ground/water distance	VLW
AIS voyage static data	VSD
Speed (position)	VTG>RMC
Time and date	ZDA

Output Data	Sentence
Addressed binary and safety related message	ABM
Cyclic alert list	ALC
Alert sentence	ALF
Set alarm state	ALR
Alert command refused	ARC

Output Data	Sentence
AIS broadcast binary message	BBM
Monitor setting	DDC
General event message	EVE
Heartbeat supervision report	HBT
Own ship data	OSD
Route transfer report	RRT
Radar system data	RSD
Routes	RTE
System function ID	SRP
TT target data	TLB, TTD, TTM
Voyage static data	VSD
Waypoint location	WPL

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APPX. 1 JIS CABLE GUIDE

Cables listed in the manual are usually shown as Japanese Industrial Standard (JIS). Use the following guide to locate an equivalent cable locally.

JIS cable names may have up to 6 alphabetical characters, followed by a dash and a numerical value (example: DPYC-2.5).
For core types D and T, the numerical designation indicates the *cross-sectional Area (mm^2)* of the core wire(s) in the cable.
For core types M and TT, the numerical designation indicates the *number of core wires* in the cable.

1. Core Type

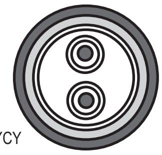
D: Double core power line
T: Triple core power line
M: Multi core
TT: Twisted pair communications (1Q=quad cable)

2. Insulation Type

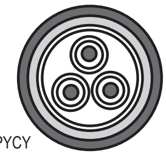
P: Ethylene Propylene Rubber

3. Sheath Type

Y: PVC (Vinyl)



DPYCY



TPYCY

4. Armor Type

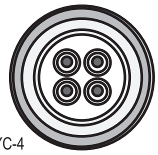
C: Steel

5. Sheath Type

Y: Anticorrosive vinyl sheath

6. Shielding Type

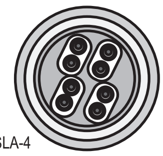
SLA: All cores in one shield, plastic tape w/aluminum tape
-SLA: Individually shielded cores, plastic tape w/aluminum tape



MPYC-4

1 3 4 5 6
EX: TTYCYSLA - 4
Designation type — # of twisted pairs

1 2 3 4
MPYC - 4
Designation type — # of cores



TTYCSLA-4

The following reference table lists gives the measurements of JIS cables commonly used with Furuno products:

Type	Core Area	Core Diameter	Cable Diameter	Type	Core Area	Core Diameter	Cable Diameter
DPYC-1.5	1.5mm^2	1.56mm	11.7mm	TTYCSLA-1	0.75mm^2	1.11mm	9.4mm
DPYC-2.5	2.5mm^2	2.01mm	12.8mm	TTYCSLA-1T	0.75mm^2	1.11mm	10.1mm
DPYC-4	4.0mm^2	2.55mm	13.9mm	TTYCSLA-1Q	0.75mm^2	1.11mm	10.8mm
DPYC-6	6.0mm^2	3.12mm	15.2mm	TTYCSLA-4	0.75mm^2	1.11mm	15.7mm
DPYC-10	10.0mm^2	4.05mm	17.1mm	TTYCY-1	0.75mm^2	1.11mm	11.0mm
DPYCY-1.5	1.5mm^2	1.56mm	13.7mm	TTYCY-1T	0.75mm^2	1.11mm	11.7mm
DPYCY-2.5	2.5mm^2	2.01mm	14.8mm	TTYCY-1Q	0.75mm^2	1.11mm	12.6mm
DPYCY-4	4.0mm^2	2.55mm	15.9mm	TTYCY-4	0.75mm^2	1.11mm	17.7mm
MPYC-2	1.0mm^2	1.29mm	10.0mm	TTYCY-4SLA	0.75mm^2	1.11mm	19.5mm
MPYC-4	1.0mm^2	1.29mm	11.2mm	TTYCYSLA-1	0.75mm^2	1.11mm	11.2mm
MPYC-7	1.0mm^2	1.29mm	13.2mm	TTYCYSLA-4	0.75mm^2	1.11mm	17.9mm
MPYC-12	1.0mm^2	1.29mm	16.8mm	TTPYCSLA-1	0.75mm^2	1.11mm	9.2mm
TPYC-1.5	1.5mm^2	1.56mm	12.5mm	TTPYCSLA-1T	0.75mm^2	1.11mm	9.8mm
TPYC-2.5	2.5mm^2	2.01mm	13.5mm	TTPYCSLA-1Q	0.75mm^2	1.11mm	10.5mm
TPYC-4	4.0mm^2	2.55mm	14.7mm	TTPYCSLA-4	0.75mm^2	1.11mm	15.3mm
TPYCY-1.5	1.5mm^2	1.56mm	14.5mm				
TPYCY-2.5	2.5mm^2	2.01mm	15.5mm				
TPYCY-4	4.0mm^2	2.55mm	16.9mm				

APPX. 2 ROD TERMINALS

MC-3000S, MC-CS Board (24P0114)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_VOUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		
J2	1	24V_IN	AI 1.5-6 BK (black)	DPYC-1.5
	2	24V_GND		
	3	PWR_FAIL-A	AI 0.75-6 GY (Gray)	TTYCS-4 TTYCSLA-4
	4	PWR_FAIL-COM		
	5	PWR_FAIL-B		
	6	NC	-	-
J4	1	TD1-A	AI 0.75-6 GY (Gray)	TTYCS-4 TTYCSLA-4
	2	TD1-B		
	3	RD1-A		
	4	RD1-B		
	5	ISOGND1		
	6	RD1-H		
	7	RD1-C		
J5	1	TD2-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD2-B		
	3	RD2-A		
	4	RD2-B		
	5	ISOGND2		
	6	RD2-H		
	7	RD2-C		
J6	1	TD3-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD3-B		
	3	RD3-A		
	4	RD3-B		
	5	ISOGND3		
	6	RD3-H		
	7	RD3-C		
J7	1	TD4-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD4-B		
	3	RD4-A		
	4	RD4-B		
	5	ISOGND4		
	6	RD4-H		
	7	RD4-C		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J8	1	TD5-A	AI 0.75-6 GY (gray)	TTYCS-1Q TTYCSLA-1Q
	2	TD5-B		
	3	RD5-H		
	4	RD5-C		
	5	TD6-A		TTYCS-1Q TTYCSLA-1Q
	6	TD6-B		
	7	RD6-H		
	8	RD6-C		
J9	1	TD7-A	AI 0.75-6 GY (gray)	TTYCS-1Q TTYCSLA-1Q
	2	TD7-B		
	3	RD7-H		
	4	RD7-C		
	5	TD8-A		TTYCS-1Q TTYCSLA-1Q
	6	TD8-B		
	7	RD8-H		
	8	RD8-C		

MC-3010A MC-ANLG Board (24P0115)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_IN	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		
J2	1	24V_OUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		
J3*	1	AN1_IN	AI 0.75-6 GY (gray)	TTYCS-1 TTYCSLA-1
	2	AN1_GND		
	3	CURR1_JP1		
	4	CURR1_JP2		
J4*	1	AN2_IN	AI 0.75-6 GY (gray)	TTYCS-1 TTYCSLA-1
	2	AN2_GND		
	3	CURR2_JP1		
	4	CURR2_JP2		
J5*	1	AN3_IN	AI 0.75-6 GY (gray)	TTYCS-1 TTYCSLA-1
	2	AN3_GND		
	3	CURR3_JP1		
	4	CURR3_JP2		

*: For pin #3 and 4, no cable is connected. However the jumper connection is necessary depending on the input specification.

MC-3020D, MC-DIN Board (24P0116)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_IN	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		
J2	1	24V_OUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		
J3*	1	DV12V_OUT1	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN1		
	3	DIGI_RTN1		
	4	GND		
	5	DC12V_OUT2		
	6	DIGI_IN2		
	7	DIGI_RTN2		
	8	GND		
J4*	1	DV12V_OUT3	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN3		
	3	DIGI_RTN3		
	4	GND		
	5	DC12V_OUT4		
	6	DIGI_IN4		
	7	DIGI_RTN4		
	8	GND		
J5*	1	DV12V_OUT5	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN5		
	3	DIGI_RTN5		
	4	GND		
	5	DC12V_OUT6		
	6	DIGI_IN6		
	7	DIGI_RTN6		
	8	GND		
J6*	1	DV12V_OUT7	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN7		
	3	DIGI_RTN7		
	4	GND		
	5	DC12V_OUT8		
	6	DIGI_IN8		
	7	DIGI_RTN8		
	8	GND		

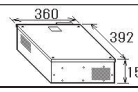
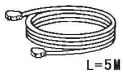
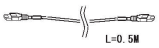
*: Pin #1 and 5: no cable connection. However the jumper connection is necessary between #1 and 2 and #5 and 6 depending on the input specification.

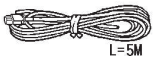
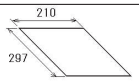
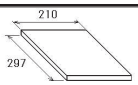
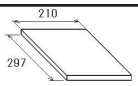
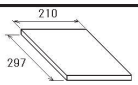
MC-3030D, MC-DOUT Board (24P0117)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_IN	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		
J2	1	24V_OUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		
J3	1	A1	AI 1-6 RD (red)	MPYC-12
	2	COM1		
	3	B1		
	4	A2		
	5	COM2		
	6	B2		
J4	1	A3	AI 1-6 RD (red)	MPYC-12
	2	COM3		
	3	B3		
	4	A4		
	5	COM4		
	6	B4		
J5	1	A5	AI 1-6 RD (red)	MPYC-12
	2	COM5		
	3	B5		
	4	A6		
	5	COM6		
	6	B6		
J6	1	A7	AI 1-6 RD (red)	MPYC-12
	2	COM7		
	3	B7		
	4	A8		
	5	COM8		
	6	B8		

PACKING LIST

EC-3000R3210X*/R3220X*/R3310X*/R3320X/R32XBB/R2710*/2720*/R*NXT*/R*NXT*-K/R*NXT*HK

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
制御部 PROCESSOR UNIT		EC-3000-* 000-020-737-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP24-00601 001-170-660-00	1 (*1)
予備品 SPARE PARTS		SP24-00602 001-170-670-00	1 (*1)
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-00603 001-285-760-00	1 (*2)
付属品 ACCESSORIES		FP24-00608 001-624-400-00	1 (*4)
付属品 ACCESSORIES		FP24-01502 *BELUGA* 001-647-210-00	1 (*3)
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ) CABLE ASSEMBLY		DSUB9P-X2-L5M 000-176-663-11	1
ｹｰﾌﾞﾙ組品LAN LAN CABLE ASSEMBLY		MOD-Z072-005+ 001-588-900-00	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
工事材料 INSTALLATION MATERIALS		CP24-02101 001-170-630-00	1
電源ｹｰﾌﾞﾙ AC CABLE		IEC60320-C13-L5M 000-176-423-11	1
図書 DOCUMENT			
ﾄﾞﾝｸﾞﾙｲﾝﾌｫﾒｰｼｮﾝｼｰﾄ DONGLE INFORMATION SHEET		999-999-085-0*	1 (*)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-201-854-1*	1
操作要領書 OPERATOR'S GUIDE		OS*-36162-* 000-199-360-1* **	1 (*5)
装備要領書 INSTALLATION MANUAL		IM*-36160-* 000-201-238-1*	1 *3/4
装備要領書 INSTALLATION MANUAL		IM*-36162-* 000-199-359-1* **	1 (*2)

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
1.CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

2.(*1)は、それぞれ仕様選択品を表します。3.(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
2.(*1)INDICATE SPECIFICATION SELECTIVE ITEM. 3.(*) THIS CODE CANNOT BE ORDERED.

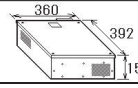
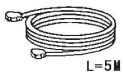
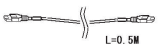
4.(*2),(*3),(*4):仕様により選択。-HKまたは和文(-J)は(*2)、E-Belugaは(*3)、それ以外は(*4)になります。
4.(*2),(*3),(*4):SELECT ONE ACCORDING TO SPECIFICATIONS: (*2):-HK OR -J, (*3):E-Beluga,(*4):OTHERS.
5.(*5)は-HK又は和文用。
5.(*5):FOR -HK or -J SPEC. ONLY.

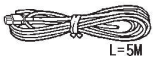
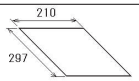
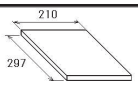
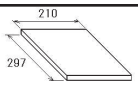
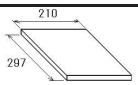
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C3616-Z06-S

PACKING LIST

EC-3000-R32S*/HK , EC-3000-R32SBB* , EC-3000-R33S*/HK , EC-3000-R27S*/HK

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
制御部 PROCESSOR UNIT		EC-3000-* 000-020-737-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP24-00601 001-170-660-00	1 (*1)
予備品 SPARE PARTS		SP24-00602 001-170-670-00	1 (*1)
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-00603 001-285-760-00	1 (*2)
付属品 ACCESSORIES		FP24-00608 001-624-400-00	1 (*4)
付属品 ACCESSORIES		FP24-01502 *BELUGA* 001-647-210-00	1 (*3)
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ) CABLE ASSEMBLY		DSUB9P-X2-L5M 000-176-663-11	1
ｹｰﾌﾞﾙ組品LAN LAN CABLE ASSEMBLY		MOD-Z072-005+ 001-588-900-00	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
工事材料 INSTALLATION MATERIALS		CP24-02101 001-170-630-00	1
電源ｹｰﾌﾞﾙ AC CABLE		IEC60320-C13-L5M 000-176-423-11	1
図書 DOCUMENT			
ﾄﾞﾝｸﾞﾙｲﾝﾌｫﾒｰｼｮﾝｼｰﾄ DONGLE INFORMATION SHEET		999-999-085-0*	1 (*)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-201-854-1*	1
操作要領書 OPERATOR'S GUIDE		OS*-36162-* 000-199-360-1* **	1 (*5)
装備要領書 INSTALLATION MANUAL		IM*-36160-* 000-201-238-1*	1 *3/4
装備要領書 INSTALLATION MANUAL		IM*-36162-* 000-199-359-1* **	1 (*2)

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
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2.(*1)は、それぞれ仕様選択品を表します。3.(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
2.(*1)INDICATE SPECIFICATION SELECTIVE ITEM. 3.(*) THIS CODE CANNOT BE ORDERED.

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4.(*2),(*3),(*4):SELECT ONE ACCORDING TO SPECIFICATIONS: (*2):-HK OR -J, (*3):E-Beluga,(*4):OTHERS.
5.(*5)は-HK又は和文用。
5.(*5):FOR -HK or -J SPEC. ONLY.

(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

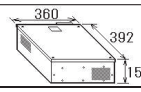
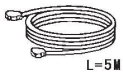
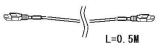
C3618-Z04-R

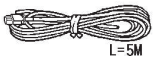
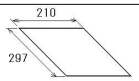
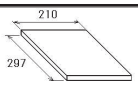
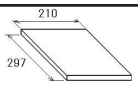
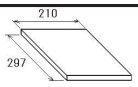
PACKING LIST

EC-3000-R32SSD* , EC-3000-R32SSDBB* , EC-3000-R33SSD*/HK , EC-3000-R27SSD*/HK

03HL-X-9863-15 1/1

A-3

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
制御部 PROCESSOR UNIT		EC-3000-* 000-020-737-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP24-00601 001-170-660-00	1 (*1)
予備品 SPARE PARTS		SP24-00602 001-170-670-00	1 (*1)
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-00603 001-285-760-00	1 (*2)
付属品 ACCESSORIES		FP24-00608 001-624-400-00	1 (*4)
付属品 ACCESSORIES		FP24-01502 *BELUGA* 001-647-210-00	1 (*3)
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ) CABLE ASSEMBLY		DSUB9P-X2-L5M 000-176-663-11	1
ｹｰﾌﾞﾙ組品LAN LAN CABLE ASSEMBLY		MOD-Z072-005+ 001-588-900-00	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
工事材料 INSTALLATION MATERIALS		CP24-02101 001-170-630-00	1
電源ｹｰﾌﾞﾙ AC CABLE		IEC60320-C13-L5M 000-176-423-11	1
図書 DOCUMENT			
ﾄﾞﾝｸﾞﾙｲﾝﾌｫﾒｰｼｮﾝｼｰﾄ DONGLE INFORMATION SHEET		999-999-085-0*	1 (*)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-201-854-1*	1
操作要領書 OPERATOR'S GUIDE		OS*-36162-* 000-199-360-1* **	1 (*5)
装備要領書 INSTALLATION MANUAL		IM*-36160-* 000-201-238-1*	1 *3/4
装備要領書 INSTALLATION MANUAL		IM*-36162-* 000-199-359-1* **	1 (*2)

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
1.CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

2.(*1)は、それぞれ仕様選択品を表します。3.(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
2.(*1)INDICATE SPECIFICATION SELECTIVE ITEM. 3.(*) THIS CODE CANNOT BE ORDERED.

(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

4.(*2),(*3),(*4):仕様により選択。-HKまたは和文(-J)は(*2)、E-Belugaは(*3)、それ以外は(*4)になります。
4.(*2),(*3),(*4) : SELECT ONE ACCORDING TO SPECIFICATIONS: (*2):-HK OR -J, (*3):E-Beluga,(*4):OTHERS.
5.(*5)は-HK又は和文用。
5.(*5):FOR -HK or -J SPEC. ONLY.

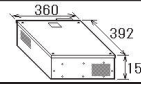
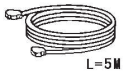
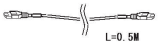
C3619-Z02-R

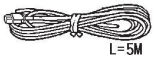
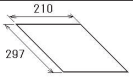
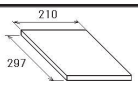
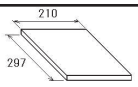
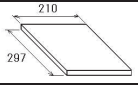
PACKING LIST

EC-3000-R32SWBB* , EC-3000-R32XWBB*, EC-3000-R33SW* , EC-3000-R33XW* , EC-3000-R27XW* , EC-3000-R27SW*

03H0-X-9857-14 1/1

A-4

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
制御部 PROCESSOR UNIT		EC-3000-* 000-020-737-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP24-00601 001-170-660-00	1 (*1)
予備品 SPARE PARTS		SP24-00602 001-170-670-00	1 (*1)
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-00603 001-285-760-00	1 (*2)
付属品 ACCESSORIES		FP24-00608 001-624-400-00	1 (*4)
付属品 ACCESSORIES		FP24-01502 *BELUGA* 001-647-210-00	1 (*3)
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ) CABLE ASSEMBLY		DSUB9P-X2-L5M 000-176-663-11	1
ｹｰﾌﾞﾙ組品LAN LAN CABLE ASSEMBLY		MOD-Z072-005+ 001-588-900-00	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
工事材料 INSTALLATION MATERIALS		CP24-02101 001-170-630-00	1
電源ｹｰﾌﾞﾙ AC CABLE		IEC60320-C13-L5M 000-176-423-11	1
図書 DOCUMENT			
ﾄﾞﾝｸﾞﾙｲﾝﾌｫﾒｰｼｮﾝｼｰﾄ DONGLE INFORMATION SHEET		999-999-085-0*	1 (*)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-201-854-1*	1
操作要領書 OPERATOR'S GUIDE		OS*-36162-* 000-199-360-1* **	1 (*5)
装備要領書 INSTALLATION MANUAL		IM*-36160-* 000-201-238-1*	1 *3/4
装備要領書 INSTALLATION MANUAL		IM*-36162-* 000-199-359-1* **	1 (*2)

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
1.CODE NUMBER ADDED "**" : REPRESENTATIVE CODE NUMBER.

2.(*1)は仕様選択品を表します。(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
2.(*1)INDICATE SPECIFICATION SELECTIVE ITEM. (*) THIS CODE CANNOT BE ORDERED.

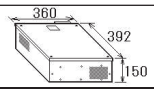
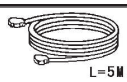
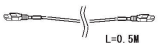
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

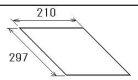
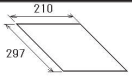
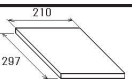
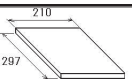
3.(*2),(*3),(*4):仕様により選択。-HKまたは和文(-J)は(*2)、E-Belugaは(*3)、それ以外は(*4)になります。
3.(*2),(*3),(*4) : SELECT ONE ACCORDING TO SPECIFICATIONS: (*2):-HK OR -J, (*3):E-Beluga,(*4):OTHERS.
4.(*5)は-HKまたは和文(-J)仕様のみに適用。
4.(*5): FOR -HK OR -J.

C3624-Z03-P

PACKING LIST EC-3005-6RB*, -6R1*, -6R2*, -6R3*, -6C1*, -6C2*

A-5

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
制御部 PROCESSOR		EC-3005-* 000-039-268-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP24-00601 001-170-660-00	1
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-01402 001-628-850-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP24-02101 001-170-630-00	1
電源ｹｰﾌﾞﾙ AC CABLE		IEC60320-C13-L5M 000-176-423-11	1
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ) CABLE ASSEMBLY		DSUB9P-X2-L5M 000-176-663-11	1
ｹｰﾌﾞﾙ組品LAN LAN CABLE ASSEMBLY		MOD-Z072-005+ 001-588-900-00	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
図書 DOCUMENT			
ﾄﾞﾝｸﾞﾙｲﾝﾌｫﾒｰｼｮﾝｼｰﾄ DONGLE INFORMATION SHEET		 999-999-085-0*	1 (*)
技適認証要領 APPLICATION GUIDE		J32-02005-* 000-197-937-1*	1 (*1)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-197-278-1*	1 (*1)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-201-854-1*	1 (*2)
操作要領書 OPERATOR'S GUIDE		OS*-36160-* 000-178-028-1*	1 (*1)
装備要領書 INSTALLATION MANUAL		IM*-36160-* 000-201-238-1* **	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

(*1)の書類は、和文仕様専用です。
(*1) MARKED DOCUMENTS ARE FOR JAPANESE SET ONLY.

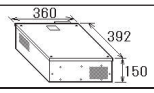
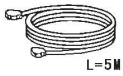
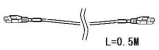
(*2)の書類は、英文仕様専用です。
(*2) MARKED DOCUMENTS ARE FOR ENGLISH SET ONLY.
(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
(*) THIS CODE CANNOT BE ORDERED.

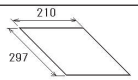
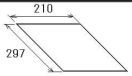
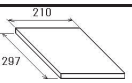
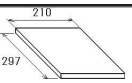
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C3694-Z01-D

PACKING LIST EC-3005-7RB*, -7R1*, -7R2*, -7R3*, -7C1*, -7C2*

A-6

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
制御部 PROCESSOR		EC-3005-* 000-039-268-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP24-00602 001-170-670-00	1
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-01402 001-628-850-00	1
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ) CABLE ASSEMBLY		DSUB9P-X2-L5M 000-176-663-11	1
工事材料 INSTALLATION MATERIALS		CP24-02101 001-170-630-00	1
電源ｹｰﾌﾞﾙ AC CABLE		IEC60320-C13-L5M 000-176-423-11	1
ｹｰﾌﾞﾙ組品LAN LAN CABLE ASSEMBLY		MOD-Z072-005+ 001-588-900-00	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
図書 DOCUMENT			
ﾄﾞﾝｸﾞﾙｲﾝﾌｫﾒｰｼｮﾝｼｰﾄ DONGLE INFORMATION SHEET		 999-999-085-0*	1 (*)
技適認証要領 APPLICATION GUIDE		J32-02005-* 000-197-937-1*	1 (*1)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-197-278-1*	1 (*1)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-201-854-1*	1 (*2)
操作要領書 OPERATOR'S GUIDE		OS*-36160-* 000-178-028-1*	1 (*1)
装備要領書 INSTALLATION MANUAL		IM*-36160-* 000-201-238-1* **	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

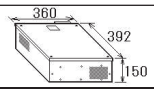
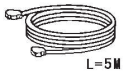
(*1)の書類は、和文仕様専用です。
(*1) MARKED DOCUMENTS ARE FOR JAPANESE SET ONLY.

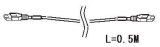
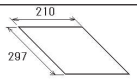
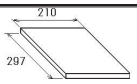
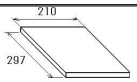
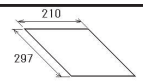
(*2)の書類は、英文仕様専用です。
(*2) MARKED DOCUMENTS ARE FOR ENGLISH SET ONLY.
(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
(*) THIS CODE CANNOT BE ORDERED.

(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C3694-Z03-D

PACKING LIST EC3005-6C/6R/7C/7R*NN-*

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
制御部 PROCESSOR UNIT		EC3005-* 000-039-204-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP24-00601 001-170-660-00	1 (*1)
予備品 SPARE PARTS		SP24-00602 001-170-670-00	1 (*1)
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-01402 001-628-850-00	1 (*2)
付属品 ACCESSORIES		FP24-01404 001-660-320-00	1 (*3)
工事材料 INSTALLATION MATERIALS			
電源ｹｰﾌﾞﾙ AC CABLE		IEC60320-C13-L5M 000-176-423-11	1
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ) CABLE ASSEMBLY		DSUB9P-X2-L5M 000-176-663-11	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ｹｰﾌﾞﾙ組品LAN LAN CABLE ASSEMBLY		MOD-Z072-005+ 001-588-900-00	1
工事材料 INSTALLATION MATERIALS		CP24-02101 001-170-630-00	1
図書 DOCUMENT			
ﾄﾞﾝｸﾞﾙｲﾝﾌｫﾒｰｼｮﾝｼｰﾄ DONGLE INFORMATION SHEET		999-999-085-0*	1 (*)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-197-278-1*	1 (*4)
取扱説明CD OPERATOR'S MANUAL CD		FAR3XXX O/M *CD-ROM* 000-201-854-1*	1 (*5)
装備要領書 INSTALLATION MANUAL		IM*-36160-* 000-201-238-1* **	1
操作要領書 OPERATOR'S GUIDE		OS*-36160-* 000-178-028-1*	1 (*4)
技適認証要領 APPLICATION GUIDE		J32-02005-* 000-197-937-1*	1 (*4)

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
1.CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

2.(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。(*1)印は、仕様により選択。
2.(*) THIS CODE CANNOT BE ORDERED. (*1): CHOOSE ONE DEPENDING ON THE SPECIFICATION.

(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

3.(*2)(*3):EC3005-6C*NN-*は(*2)、それ以外は(*3)になります。
3.(*2)(*3):(*2) FOR EC3005-6C*NN-*, (*3) FOR OTHERS.
4.(*4)の書類は、和文仕様専用です。5.(*5)の書類は、英文仕様専用です。
4.(*4) MARKED DOCUMENTS ARE FOR JAPANESE SET ONLY.(*5) : FOR ENGLISH SET ONLY.

C3694-Z08-C

PACKING LIST

03HL-X-9851 -1 1/1

XN12CF/-HK

A-8

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA RADIATOR ASSEMBLY		XN12CF* 001-252-640-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35201 001-249-860-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C3616-Z01-B

PACKING LIST

03HL-X-9852 -0 1/1

XN20CF/-HK

A-9

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA RADIATOR ASSEMBLY		XN20CF 001-252-650-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35201 001-249-860-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

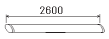
C3616-Z02-A

PACKING LIST

03HL-X-9853 -0 1/1

XN24CF/-HK

A-10

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA RADIATOR ASSEMBLY		XN24CF 001-252-660-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35201 001-249-860-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

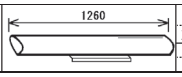
C3616-Z03-A

PACKING LIST

03IT-X-9867 -0 1/1

XN12AF-R/-R-HK

A-11

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA		XN12AF-R 001-633-660-00	1

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

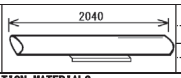
C3692-Z03-A

PACKING LIST

03IT-X-9868 -0 1/1

XN20AF-R/-R-HK

A-12

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA		XN20AF-R 001-633-670-00	1
工事材料 INSTALLATION MATERIALS			
ｱﾝﾃﾅ工事材料 INSTALLATION MATERIALS		CP03-19101 001-510-420-00	1

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

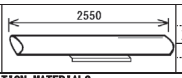
C3692-Z04-A

PACKING LIST

03IT-X-9869 -0 1/1

XN24AF-R/-R-HK

A-13

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA		XN24AF-R 001-633-680-00	1
工事材料 INSTALLATION MATERIALS			
ｱﾝﾃﾅ工事材料 INSTALLATION MATERIALS		CP03-19101 001-510-420-00	1

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3692-Z05-A

PACKING LIST

03IC-X-9864 -0 1/1

SN24CF A-14

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA RADIATOR ASSEMBLY	2547 	SN24CF 001-505-800-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35202 001-249-880-00	1

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3656-Z03-A

PACKING LIST

03IC-X-9865 -0 1/1

SN30CF A-15

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA RADIATOR ASSEMBLY	3072 	SN30CF 001-505-810-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35202 001-249-880-00	1

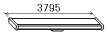
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3656-Z04-A

PACKING LIST

03HL-X-9854 -0 1/1

SN36CF/-HK A-16

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA RADIATOR ASSEMBLY	3795 	SN36CF 001-252-670-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35202 001-249-880-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

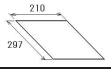
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3618-Z01-A

PACKING LIST

03HL-X-9867 -6 1/1

RSB-128-105N*/-105N*HK/105N*MSA ,RSB-128-106N*/-106N*HK/-106N*MSA, RSB-128-123N*/-123N*HK A-17

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT	533 409 	RSB-128*N* 000-024-105-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35401 001-507-920-00	1
図書 DOCUMENT			
吊下締付要領 HOIST X-BAND, TIGHTEN BOLSTS	210 297 	C32-01302-* 000-178-042-1*	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

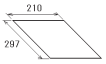
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3616-Z08-G

PACKING LIST

03HL-X-9855 -6 1/1

RSB-128-105I*, RSB-128-105I*HK, SB-128-106I* ,RSB-128-106I*HK, RSB-128-123I*, RSB-128-123I*HK A-18

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT		RSB-128*I* 000-024-106-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-19701 001-531-630-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35403 001-507-930-00	1
図書 DOCUMENT			
吊下締付要領 HOIST X-BAND,TIGHTEN BOLSTS		C32-01302-* 000-178-042-1*	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

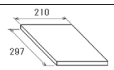
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3616-Z04-G

PACKING LIST

03HL-X-9856 -3 1/1

RSB-129-107N* ,RSB-129-107NHK,RSB-129-107NMSA,RSB-133-111N* ,RSB-133-111NHK,,RSB-133-111NMSA A-19

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT		RSB-129/133*N* 000-024-113-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35402 001-255-430-00	1
図書 DOCUMENT			
吊下要領 HOIST S-BAND ANTENNA		C32-01303-* 000-178-043-1*	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

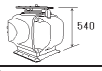
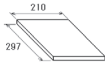
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3618-Z02-D

PACKING LIST

03HL-X-9866 -2 1/1

RSB-129-107I* ,RSB-129-107IHK ,RSB-133-111I* ,RSB-133-111IHK A-20

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体 SCANNER UNIT		RSB-129/133*I* 000-024-114-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-19701 001-531-630-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35404 001-270-080-00	1
図書 DOCUMENT			
吊下要領 HOIST S-BAND ANTENNA		C32-01303-* 000-178-043-1*	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

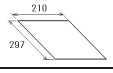
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3619-Z03-C

PACKING LIST

03IT-X-9870 -1 1/1

RSB-146-131N*/132N* A-21

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT		RSB-146-* 000-039-347-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-40601 001-631-650-00	1
図書 DOCUMENT			
ｱﾝﾃﾅ吊下要領 ANTENNA HOIST INSTRUCTIONS		C32-02205-* 000-199-638-1*	1

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
1.CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

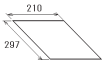
C3692-Z01-B

PACKING LIST

03IT-X-9871 -2 1/1

RSB-146-*I/*IHK/*IL/*ILHK/*ILN/*IN/*INS

A-22

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT		RSB-146-* 000-039-348-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-19701 001-531-630-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-40602 001-631-660-00	1
図書 DOCUMENT			
ｱﾝﾃﾅ吊下要領 ANTENNA HOIST INSTRUCTIONS		C32-02205-* 000-199-638-1*	1

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
1.CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

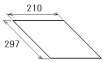
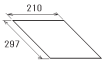
C3692-Z02-C

PACKING LIST

03HO-X-9851 -2 1/1

RSB-130N

A-23

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT		RSB-130N 000-025-517-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35901 001-507-940-00	1
図書 DOCUMENT			
吊下締付要領 HOIST X-BAND,TIGHTEN BOLSTS		C32-01302-* 000-178-042-1*	1
ﾚｸﾄｶﾞｲﾄﾞ取付(X) RECTGUIDE INSTALLATION(X)		C32-01903-* 000-196-922-1*	1

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

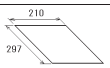
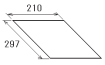
C3624-Z01-C

PACKING LIST

03HO-X-9852 -3 1/1

RSB-130I

A-24

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT		RSB-1301* 000-025-518-00	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-19701 001-531-630-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35902 001-507-950-00	1
図書 DOCUMENT			
吊下締付要領 HOIST X-BAND,TIGHTEN BOLSTS		C32-01302-* 000-178-042-1*	1
ﾚｸﾄｶﾞｲﾄﾞ取付(X) RECTGUIDE INSTALLATION(X)		C32-01903-* 000-196-922-1*	1

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

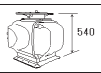
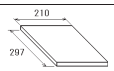
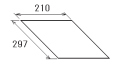
C3624-Z02-D

PACKING LIST

03HO-X-9853 -2 1/1

RSB-131N

A-25

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT		RSB-131N 000-025-523-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-36101 001-301-200-00	1
図書 DOCUMENT			
吊下要領 HOIST S-BAND ANTENNA		C32-01303-* 000-178-043-1*	1
ﾚｸﾄｶﾞｲﾄﾞ取付(S) RECTGUIDE INSTALLATION(S)		C32-01904-* 000-196-923-1*	1

略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

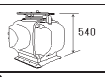
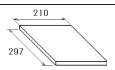
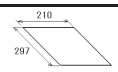
C3625-Z01-C

PACKING LIST

03HO-X-9854 -3 1/1

RSB-1311

A-26

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線本体部 SCANNER UNIT		RSB-1311* 000-025-524-00	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-19701 001-531-630-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-36102 001-301-360-00	1
図書 DOCUMENT			
吊下要領 HOIST S-BAND ANTENNA		C32-01303-* 000-178-043-1*	1
ﾚｸﾄｶﾞｲﾄﾞ取付(S) RECTGUIDE INSTALLATION(S)		C32-01904-* 000-196-923-1*	1

略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C3625-Z02-D

PACKING LIST

03HL-X-9857 -3 1/1

PSU-014/014L/014HK/014LHK/014A/014AL/014AHK/014ALHK

A-27

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線電源部 POWER SUPPLY UNIT		PSU-014* 000-023-893-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-17641 001-249-740-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35301 001-249-770-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

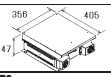
C3616-Z05-D

PACKING LIST

03HL-X-9858 -1 1/1

PSU-015/HK

A-28

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線電源部 POWER SUPPLY UNIT		PSU-015/HK 000-023-895-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-17651 001-249-750-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35301 001-249-770-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C3618-Z03-B

PACKING LIST

03HL-X-9859 -1 1/1

PSU-016/HK

A-29

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線電源部 POWER SUPPLY UNIT		PSU-016/HK 000-023-897-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-17661 001-249-760-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35301 001-249-770-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

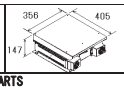
C3617-Z01-B

PACKING LIST

03HL-X-9860 -1 1/1

PSU-018/HK

A-30

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線電源部 POWER SUPPLY UNIT		PSU-018/HK 000-023-899-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-17651 001-249-750-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP03-35301 001-249-770-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

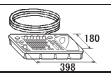
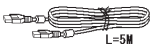
C3619-Z01-B

PACKING LIST

24AL-X-9879 -2 1/1

RCU-024B ,RCU-024B-HK

A-31

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ECDIS操作部 ECDIS CONTROL UNIT		RCU-024B* 000-037-640-00 **	1
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-00701 001-418-340-00	1
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ)USB CABLE ASSEMBLY		TS-20-071-1 L=5000 000-176-700-11	1
工事材料 INSTALLATION MATERIALS		CP24-02201 001-418-330-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

CN

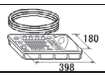
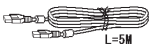
C4473-Z31-C

PACKING LIST

24AL-X-9880 -3 1/1

RCU-025A/-HK

A-32

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾚｰﾀﾞｰ操作部 RADAR CONTROL UNIT		RCU-025A/-HK 000-037-642-00 **	1
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-00701 001-418-340-00	1
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ)USB CABLE ASSEMBLY		TS-20-071-1 L=5000 000-176-700-11	1
工事材料 INSTALLATION MATERIALS		CP24-02201 001-418-330-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
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（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

CN

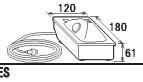
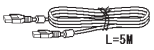
C4473-Z32-D

PACKING LIST

24AL-X-9881 -0 1/1

RCU-026/-HK

A-33

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾄﾗｯｸﾎﾞｰﾙ操作部 TRACKBALL CONTROL UNIT		RCU-026/-HK 000-027-666-00 **	1
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP24-00801 001-418-410-00	1
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(ｸﾐﾋﾝ)USB CABLE ASSEMBLY		TS-20-071-1 L=5000 000-176-700-11	1
工事材料 INSTALLATION MATERIALS		CP24-02301 001-418-400-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

CN

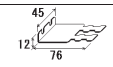
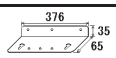
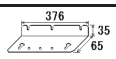
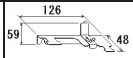
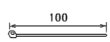
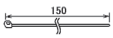
C4473-Z33-A

FURUNO

CODE NO.	001-170-630-00	24AL-X-9401 -3
TYPE	CP24-02101	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	配線板1 WIRING PLATE 1		24-014-0104-2 CODE NO. 100-366-812-10	1	
2	筐体足1 CHASSIS BASE 1		24-014-0121-1 CODE NO. 100-367-721-10	1	
3	筐体足2 CHASSIS BASE 2		24-014-0122-1 CODE NO. 100-372-171-10	1	
4	配線板2組立品 WIRING PLATE 2 ASSY		CP24-02102 CODE NO. 001-186-200-00	1	
5	ｺﾝﾍﾞｯｸｽ CABLE TIE		CV-100N CODE NO. 000-162-167-10	10	
6	ｺﾝﾍﾞｯｸｽ CABLE TIE		CV-150N CODE NO. 000-162-186-10	30	
7	圧着端子 CRIMP-ON LUG		FV1.25-4(LF) RED K CODE NO. 000-166-666-11	9	
8	ﾅﾍﾞｲﾝﾄﾞｺﾈｼﾞ BINDING HEAD SCREW		M3X6 SUS304 CODE NO. 000-162-664-10	5	
9	ﾅﾍﾞｲﾝﾄﾞﾐﾘﾈｼﾞ BINDING HEAD SCREW		M4X8 SUS304 CODE NO. 000-162-669-10	10	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

C4473-M01-D

FURUNO

CODE NO.	001-249-860-00	03HL-X-9401 -3
TYPE	CP03-35201	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾎﾞﾙﾄ用ﾊﾟｯｷﾝ GASKET FOR BOLT		03-182-3186-0 CODE NO. 100-386-270-10	6	
2	ｱﾝﾃﾅ取付ﾎﾞﾙﾄ ANTENNA FIXING BOLT		03-182-4188-3 CODE NO. 100-383-603-10	6	
3	接着剤袋詰 ADHESIVE		TB5211 50G CODE NO. 001-477-870-00	1	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

C3616-M04-B

FURUNO

CODE NO.	001-249-880-00	03HL-X-9402 -2
TYPE	CP03-35202	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾐｶﾞｷﾏﾙ平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	12	
2	ﾊﾞﾈ座金 SPRING WASHER		M12 SUS304 CODE NO. 000-167-397-10	12	
3	六角ﾎﾞﾙﾄ HEXAGONAL HEAD BOLT		M12X40 SUS304 CODE NO. 000-162-810-10	4	
4	六角ﾎﾞﾙﾄ HEXAGONAL HEAD BOLT		M12X50 SUS304 CODE NO. 000-164-116-10	8	
5	接着剤袋詰 ADHESIVE		TB5211 50G CODE NO. 001-477-870-00	1	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

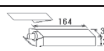
C3618-M02-C

FURUNO

CODE NO.	008-526-380-00	03FS-X-9409 -7
TYPE	CP03-24201	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	Oﾘﾝｸﾞ O-RING		JBP-135 CODE NO. 000-171-805-10	1	
2	バネ座金 SPRING WASHER		M8 SUS304 CODE NO. 000-167-410-10	8	
3	ﾐｶﾞｷ丸平座金 FLAT WASHER		M8 SUS304 CODE NO. 000-167-464-10	8	
4	六角ｽﾘﾜﾘ ﾎﾞﾙﾄ HEXAGONAL HEAD SLOT BOLT		M8X35 SUS304 CODE NO. 000-162-923-10	8	
5	接着剤袋詰 ADHESIVE		TB5211 50G CODE NO. 001-477-870-00	1	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

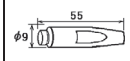
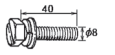
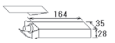
C3453-M04-G

FURUNO

CODE NO.	008-487-130-00	03FS-X-9403 -8
TYPE	CP03-19101	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾋﾟﾝ PIN		03-141-0301-2 ROHS CODE NO. 100-266-882-10	2	
2	ｵﾘﾝｸﾞ O-RING		JBP-135 CODE NO. 000-171-805-10	1	
3	六角ｽﾘﾜﾘ ｾﾑｽB HEX HEAD SLOT BOLT-B WASHER		M8X40 SUS304 CODE NO. 000-162-953-10	8	
4	接着剤袋詰 ADHESIVE		TB5211 50G CODE NO. 001-477-870-00	1	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

C3464-M04-J

FURUNO

CODE NO.	001-507-920-00	03HL-X-9403 -2
TYPE	CP03-35401	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｼｰﾙﾜｯｼｬｰ SEAL WASHER		03-001-3002-0 ROHS CODE NO. 300-130-020-10	4	
2	絶縁ｼｰﾄ1 INSULATION SHEET 1		03-182-3117-2 CODE NO. 100-387-752-10	4	
3	六角ﾅｯﾄ 1ｼｭ HEXAGONAL NUT		M12 SUS304 CODE NO. 000-167-491-10	8	
4	ﾐｶﾞｷﾏﾙ平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	4	
5	六角ﾎﾞﾙﾄ 全ﾈｼﾞ HEXAGON HEAD SCREW		M12X70 SUS304 CODE NO. 000-162-814-10	4	
6	六角ﾅｯﾄ 1ｼｭ HEXAGONAL NUT		M6 SUS304 CODE NO. 000-158-856-10	1	
7	ﾊﾞﾈ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	1	
8	ﾐｶﾞｷ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-158-854-10	3	
9	六角ﾎﾞﾙﾄ HEXAGONAL HEAD BOLT		M6X25 SUS304 CODE NO. 000-162-871-10	1	
10	ｹｰﾌﾞﾙ組品 CABLE ASSY.		RW-4747 CODE NO. 000-566-000-12	1	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

C3616-M02-C

FURUNO

CODE NO.	001-507-930-00	03HL-X-9408 -7
TYPE	CP03-35403	1/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｼｰﾙﾜｯｼｬｰ SEAL WASHER		03-001-3002-0 ROHS CODE NO. 300-130-020-10	4	
2	絶縁ｼｰﾄ1 INSULATION SHEET 1		03-182-3117-2 CODE NO. 100-387-752-10	4	
3	圧着端子 CRIMP-ON LUG		FV2-M4 K CODE NO. 000-157-229-11	2	
4	ﾛｯｷﾝｸﾞﾜｲﾔｰｻﾄﾞﾙ LOCKING WIRE SADDLE		LWS-1211Z CODE NO. 000-167-788-11	2	
5	六角ﾅｯﾄ 1ｼｭ HEXAGONAL NUT		M12 SUS304 CODE NO. 000-167-491-10	8	
6	ﾐｶﾞｷﾏﾙ平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	4	
7	六角ﾎﾞﾙﾄ 全ﾈｼﾞ HEXAGON HEAD SCREW		M12X70 SUS304 CODE NO. 000-162-814-10	4	
8	六角ﾅｯﾄ 1ｼｭ HEXAGONAL NUT		M6 SUS304 CODE NO. 000-158-856-10	1	
9	ﾊﾞﾈ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	1	
10	ﾐｶﾞｷ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-158-854-10	3	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

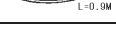
C3616-M01-H(1)

FURUNO

CODE NO.	001-507-930-00	03HL-X-9408 -7
TYPE	CP03-35403	2/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	六角ﾎﾞﾙﾄ HEXAGONAL HEAD BOLT		M6X25 SUS304 CODE NO. 000-162-871-10	1	
12	ｹｰﾌﾞﾙ組品 CABLE ASSY.		RW-4747 CODE NO. 000-566-000-12	1	
13	ｽﾊﾟｲﾗﾙﾁｭｰﾌﾞ VO SPIRAL TUBE VO		SPN-08L-VO *900MM* CODE NO. 000-198-786-10	1	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

C3616-M01-H(2)

FURUNO

CODE NO.	001-270-080-00	03HL-X-9407 -6
TYPE	CP03-35404	1/2

工事材料表
INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	シールワッシャー SEAL WASHER		03-001-3002-0 ROHS CODE NO. 300-130-020-10	8	
2	圧着端子 CRIMP-ON LUG		FV2-M4 K CODE NO. 000-157-229-11	2	
3	ロッキングワイヤーサドル LOCKING WIRE SADDLE		LWS-1316Z CODE NO. 000-169-148-10	1	
4	六角ナット 1シュ HEXAGONAL NUT		M12 SUS304 CODE NO. 000-167-491-10	16	
5	ミガキマル平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	8	
6	バネ座金 SPRING WASHER		M12 SUS304 CODE NO. 000-167-397-10	8	
7	六角ボルト 全ネジ HEXAGON HEAD SCREW		M12X70 SUS304 CODE NO. 000-162-814-10	8	
8	六角ナット 1シュ HEXAGONAL NUT		M6 SUS304 CODE NO. 000-158-856-10	1	
9	バネ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	1	
10	ミガキ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-158-854-10	3	

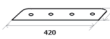
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

FURUNO

CODE NO.	001-270-080-00	03HL-X-9407 -6
TYPE	CP03-35404	2/2

工事材料表
INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	六角ボルト HEXAGONAL HEAD BOLT		M6X25 SUS304 CODE NO. 000-162-871-10	1	
12	ケーブル組品 CABLE ASSY.		RW-4747 CODE NO. 000-566-000-12	1	
13	スパイラルチューブ VO SPIRAL TUBE VO		SPN-08L-VO *900MM* CODE NO. 000-198-786-10	1	
14	絶縁シートS INSTALLATION SHEET S		03-183-3106-0 CODE NO. 100-436-120-10	2	

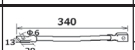
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

FURUNO

CODE NO.	001-255-430-00	03HL-X-9404 -2
TYPE	CP03-35402	1/2

工事材料表
INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	シールワッシャー SEAL WASHER		03-001-3002-0 ROHS CODE NO. 300-130-020-10	8	
2	六角ナット 1シュ HEXAGONAL NUT		M12 SUS304 CODE NO. 000-167-491-10	16	
3	ミガキマル平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	8	
4	バネ座金 SPRING WASHER		M12 SUS304 CODE NO. 000-167-397-10	8	
5	六角ボルト 全ネジ HEXAGON HEAD SCREW		M12X70 SUS304 CODE NO. 000-162-814-10	8	
6	六角ナット 1シュ HEXAGONAL NUT		M6 SUS304 CODE NO. 000-158-856-10	1	
7	バネ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	1	
8	ミガキ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-158-854-10	3	
9	六角ボルト HEXAGONAL HEAD BOLT		M6X25 SUS304 CODE NO. 000-162-871-10	1	
10	ケーブル組品 CABLE ASSY.		RW-4747 CODE NO. 000-566-000-12	1	

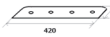
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

FURUNO

CODE NO.	001-255-430-00	03HL-X-9404 -2
TYPE	CP03-35402	2/2

工事材料表
INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	絶縁シートS INSTALLATION SHEET S		03-183-3106-0 CODE NO. 100-436-120-10	2	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

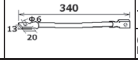
FURUNO ELECTRIC CO ., LTD.

FURUNO

CODE NO.	001-507-940-00	03H0-X-9401 -3
TYPE	CP03-35901	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	シールワッシャー SEAL WASHER		03-001-3002-0 ROHS CODE NO. 300-130-020-10	4	
2	絶縁シート1 INSULATION SHEET 1		03-182-3117-2 CODE NO. 100-387-752-10	4	
3	六角ナット 1シュ HEXAGONAL NUT		M12 SUS304 CODE NO. 000-167-491-10	8	
4	ﾐｶﾞｷﾏﾙ平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	4	
5	六角ﾎﾞﾙﾄ 全ﾈｼﾞ HEXAGON HEAD SCREW		M12X70 SUS304 CODE NO. 000-162-814-10	4	
6	六角ナット 1シュ HEXAGONAL NUT		M6 SUS304 CODE NO. 000-158-856-10	1	
7	ﾊﾞﾈ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	1	
8	ﾐｶﾞｷ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-158-854-10	3	
9	六角ﾎﾞﾙﾄ HEXAGONAL HEAD BOLT		M6X25 SUS304 CODE NO. 000-162-871-10	1	
10	ｹｰﾌﾞﾙ組品 CABLE ASSY.		RW-4747 CODE NO. 000-566-000-12	1	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-507-950-00	03H0-X-9402 -4
TYPE	CP03-35902	1/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	シールワッシャー SEAL WASHER		03-001-3002-0 ROHS CODE NO. 300-130-020-10	4	
2	絶縁シート1 INSULATION SHEET 1		03-182-3117-2 CODE NO. 100-387-752-10	4	
3	圧着端子 CRIMP-ON LUG		FV2-M4 K CODE NO. 000-157-229-11	2	
4	ﾛｯｷﾝｸﾞﾜｲﾔｰｻﾄﾞﾙ LOCKING WIRE SADDLE		LWS-1211Z CODE NO. 000-167-788-11	2	
5	六角ナット 1シュ HEXAGONAL NUT		M12 SUS304 CODE NO. 000-167-491-10	8	
6	ﾐｶﾞｷﾏﾙ平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	4	
7	六角ﾎﾞﾙﾄ 全ﾈｼﾞ HEXAGON HEAD SCREW		M12X70 SUS304 CODE NO. 000-162-814-10	4	
8	六角ナット 1シュ HEXAGONAL NUT		M6 SUS304 CODE NO. 000-158-856-10	1	
9	ﾊﾞﾈ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	1	
10	ﾐｶﾞｷ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-158-854-10	3	

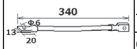
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-507-950-00	03H0-X-9402 -4
TYPE	CP03-35902	2/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	六角ﾎﾞﾙﾄ HEXAGONAL HEAD BOLT		M6X25 SUS304 CODE NO. 000-162-871-10	1	
12	ｹｰﾌﾞﾙ組品 CABLE ASSY.		RW-4747 CODE NO. 000-566-000-12	1	
13	ｽﾊﾟｲﾗﾙﾁｭｰﾌﾞVO SPIRAL TUBE VO		SPN-08L-VO +900MM+ CODE NO. 000-198-786-10	1	

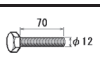
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-301-360-00	03H0-X-9404 -3
TYPE	CP03-36102	1/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	シールワッシャー SEAL WASHER		03-001-3002-0 ROHS CODE NO. 300-130-020-10	8	
2	ﾛｯｷﾝｸﾞﾜｲﾔｰｻﾄﾞﾙ LOCKING WIRE SADDLE		LWS-1316Z CODE NO. 000-169-148-10	1	
3	六角ナット 1シュ HEXAGONAL NUT		M12 SUS304 CODE NO. 000-167-491-10	16	
4	ﾐｶﾞｷﾏﾙ平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	8	
5	ﾊﾞﾈ座金 SPRING WASHER		M12 SUS304 CODE NO. 000-167-397-10	8	
6	六角ﾎﾞﾙﾄ 全ﾈｼﾞ HEXAGON HEAD SCREW		M12X70 SUS304 CODE NO. 000-162-814-10	8	
7	六角ナット 1シュ HEXAGONAL NUT		M6 SUS304 CODE NO. 000-158-856-10	1	
8	ﾊﾞﾈ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	1	
9	ﾐｶﾞｷ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-158-854-10	3	
10	六角ﾎﾞﾙﾄ HEXAGONAL HEAD BOLT		M6X25 SUS304 CODE NO. 000-162-871-10	1	

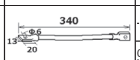
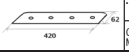
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-301-360-00	03H0-X-9404 -3
TYPE	CP03-36102	2/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	ｹｰﾌﾞﾙ組品 CABLE ASSY.		RW-4747 CODE NO. 000-566-000-12	1	
12	ｽﾊﾟｲﾗﾙﾁｭｰﾌﾞVO SPIRAL TUBE VO		SPN-08L-VO *900MM* CODE NO. 000-198-786-10	1	
13	絶縁ｼｰﾄS INSULATION SHEET S		03-183-3106-0 CODE NO. 100-436-120-10	2	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD.

C3625-M02-D(2)

FURUNO

CODE NO.	001-301-200-00	03H0-X-9403 -2
TYPE	CP03-36101	1/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｼｰﾙﾜｯｼｬｰ SEAL WASHER		03-001-3002-0 ROHS CODE NO. 300-130-020-10	8	
2	六角ﾅｯﾄ 1ｼｭ HEXAGONAL NUT		M12 SUS304 CODE NO. 000-167-491-10	16	
3	ﾐｶﾞｷﾏﾙ平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-167-446-10	8	
4	ﾊﾞﾈ座金 SPRING WASHER		M12 SUS304 CODE NO. 000-167-397-10	8	
5	六角ﾎﾞﾙﾄ 全ﾈｼﾞ HEXAGON HEAD SCREW		M12X70 SUS304 CODE NO. 000-162-814-10	8	
6	六角ﾅｯﾄ 1ｼｭ HEXAGONAL NUT		M6 SUS304 CODE NO. 000-158-856-10	1	
7	ﾊﾞﾈ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	1	
8	ﾐｶﾞｷ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-158-854-10	3	
9	六角ﾎﾞﾙﾄ HEXAGONAL HEAD BOLT		M6X25 SUS304 CODE NO. 000-162-871-10	1	
10	ｹｰﾌﾞﾙ組品 CABLE ASSY.		RW-4747 CODE NO. 000-566-000-12	1	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD.

C3625-M01-C(1)

FURUNO

CODE NO.	001-301-200-00	03H0-X-9403 -2
TYPE	CP03-36101	2/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	絶縁ｼｰﾄS INSULATION SHEET S		03-183-3106-0 CODE NO. 100-436-120-10	2	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD.

C3625-M01-C(2)

FURUNO

CODE NO.	001-249-770-00	03HL-X-9405 -2
TYPE	CP03-35301	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	圧着端子 CRIMP-ON LUG		FV1.25-4(LF) RED K CODE NO. 000-166-666-11	1	
2	圧着端子 CRIMP-ON LUG		FV2-4 BLU K CODE NO. 000-157-247-11	3	
3	圧着端子 CRIMP-ON LUG		FV2-M3 BLU K CODE NO. 000-157-250-11	1	
4	ｺﾈｸﾀ(ﾓｼﾞｭﾗｰ) MODULAR CONNCTOR		MPS588-C CODE NO. 000-166-044-10	3	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD.

C3618-M04-C

FURUNO

CODE NO.		03HL-X-9406 -0
TYPE		1/1

工事材料表
INSTALLATION MATERIALS

FAR-3210/3210-BB/3310/3220/3220-BB/3320/3230S/
3230S-BB/3230S-SSD/3230S-SSD-BB/3330S/3330S-SSD

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY	 L=15M	RW-00135-L15M CODE NO. 001-259-830-00	1	選択 TO BE SELECT
2	ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY	 L=30M	RW-00135-L30M CODE NO. 001-259-860-00	1	選択 TO BE SELECT
3	ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY	 L=40M	RW-00135-L40M CODE NO. 001-259-870-00	1	選択 TO BE SELECT
4	ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY	 L=50M	RW-00135-L50M CODE NO. 001-259-880-00	1	選択 TO BE SELECT

型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-418-330-00	24AL-X-9408 -0
TYPE	CP24-02201	1/1

工事材料表
INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+ﾄﾗｽｽﾀｯﾋﾟﾝﾎﾝｼﾞ ﾘｼｭ SELF-TAPPING SCREW	 20 φ5	5X20 SUS304 CODE NO. 000-162-608-10	2	
2	ｺﾝﾍﾞｯｸｽ CABLE TIE	 125	CV-125N CODE NO. 000-172-164-10	2	

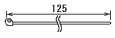
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-418-400-00	24AL-X-9409 -0
TYPE	CP24-02301	1/1

工事材料表
INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+ﾄﾗｽｽﾀｯﾋﾟﾝﾎﾝｼﾞ ﾘｼｭ SELF-TAPPING SCREW	 20 φ5	5X20 SUS304 CODE NO. 000-162-608-10	2	
2	ｺﾝﾍﾞｯｸｽ CABLE TIE	 125	CV-125N CODE NO. 000-172-164-10	2	
3	+ﾅﾍﾞｾﾑｽB WASHER HEAD SCREW *B*	 12 φ3	MSX12 SUS304 CODE NO. 000-162-648-10	4	

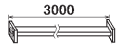
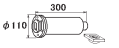
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.		03BF-X-9403 -7
TYPE	22XCW	1/1

工事材料表
INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	導波管 WAVEGUIDE STRAIGHT	 3000	RWA-1020 A-107A ROHS CODE NO. 310-100-420-10	4	
2	導波管貫通金物 WAVEGUIDE *THRU-DECK*	 300 φ110	RWG-1000 CODE NO. 001-352-000-00	1	

型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

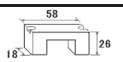
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）
☆

FURUNO

CODE NO.	008-470-010-00	03EP-X-9423 -11
TYPE	CP03-16401	1/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	防水ﾌｨﾙﾑ WATERTIGHT FILM		03-009-0368-0 ROHS CODE NO. 300-903-680-10	1	
2	Oﾘﾝｸﾞ(AS568) O-RING(AS568)		CO 1380 A CODE NO. 000-196-410-10	20	
3	ﾊﾞﾈ座金 SPRING WASHER		M4 SUS304 CODE NO. 000-167-405-10	35	
4	六角ﾅｯﾄ 1ｼｭ HEX.NUT		M4 SUS304 CODE NO. 000-167-488-10	35	
5	ﾐｶﾞｷ丸平座金 FLAT WASHER		M4 SUS304 CODE NO. 000-167-455-10	65	
6	六角ｽﾘﾜﾘ ｾﾑｽA HEX.BOLT(SLOTTED WASHER HEAD)		M4X16 SUS304 CODE NO. 000-162-933-10	80	
7	六角ｽﾘﾜﾘ ﾎﾞﾙﾄ HEXAGONAL HEAD SLOT BOLT		M4X35 SUS304 CODE NO. 000-162-894-10	35	
8	導波管押え3E型 WAVEGUIDE CLAMP		RSB-2007-2 CODE NO. 360-220-072-10	15	
9	導波管保護ｺﾞﾑ RUBBEW CUSHION		RWA-1011-0 ROHS CODE NO. 310-110-110-10	15	
10	工事用WG.Hﾍﾞﾝﾄﾞ WABEGUIDE H-BEND		RWA-1040 B-108 CODE NO. 310-100-160-00	2	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	008-470-010-00	03EP-X-9423 -11
TYPE	CP03-16401	2/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	ｶﾊﾞｰﾌﾗﾝｼﾞ FLANGE		WRJ-9 CODE NO. 000-164-500-10	7	
12	ﾁｮｰｸﾌﾗﾝｼﾞ CHOKE FLANGE		WRJ-9 ｵｳﾄﾞｳ CODE NO. 000-179-919-10	7	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

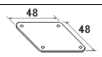
FURUNO

CODE NO.	008-470-020-00	03CO-X-9420 -7
TYPE	CP03-16411	1/1

工事材料表

INSTALLATION MATERIALS

MARINE RADER　　FOR FR-9 RECTGUIDE (FLEXIBLE WAVEGUIDE)

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	防水ﾌｨﾙﾑ WATERTIGHT FILM		03-009-0368-0 ROHS CODE NO. 300-903-680-10	1	
2	ｸﾞﾗﾝﾄﾞ本体 TRUK-DECK CABLE GLAND		03-009-0521-1 ROHS CODE NO. 100-207-551-10	1	
3	座金 WASHER		03-009-0522-0 ROHS CODE NO. 100-207-560-10	2	
4	ﾊﾟｯｷﾝ (1) RUBBER PACKING		03-009-0523-0 ROHS CODE NO. 100-207-570-10	2	
5	ﾊﾟｯｷﾝ(2) RUBBER PACKING(2)		03-009-0524-0 ROHS CODE NO. 100-207-580-10	2	
6	Oﾘﾝｸﾞ(AS568) O-RING(AS568)		CO 1380 A CODE NO. 000-196-410-10	3	
7	ｹﾞﾗﾝﾄﾞ用締付 CABLE GLAND NIPPLE		JIS F8801 45ｶﾗ CODE NO. 000-171-869-10	1	
8	六角ｽﾘﾜﾘ ｾﾑｽB HEX.HEAD SLOT BOLT-B WASHER		M4X16 SUS304 CODE NO. 000-162-940-10	4	

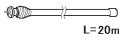
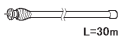
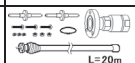
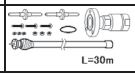
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.		03GP-X-9403 -2
TYPE		1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｹｰﾌﾞﾙ(組品) COAXIAL CABLE ASSEMBLY		LHPX-20D-ASSY(L=20M) CODE NO. 001-087-110-00	1	選択 TO BE SELECTED
2	ｹｰﾌﾞﾙ(組品) COAXIAL CABLE ASSEMBLY		LHPX-20D-ASSY(L=30M) CODE NO. 001-087-120-00	1	選択 TO BE SELECTED
3	ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY		WF-H50-7S(L=20M) CODE NO. 001-461-470-00	1	選択 TO BE SELECTED
4	ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY		WF-H50-7S(L=30M) CODE NO. 001-461-490-00	1	選択 TO BE SELECTED

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	001-418-340-00	24AL-X-9511 -0
TYPE	FP24-00701	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	卓上取付板 DESK FIXING PLATE		24-014-1401-0 CODE NO. 100-367-460-10	1	
2	USBｼｰﾄ USB SHEET		24-014-1411-0 CODE NO. 100-372-000-10	1	
3	+ﾅﾍﾞｾﾙｽB WASHER HEAD SCREW *B*		M4X12 C2700W MBNI2 CODE NO. 000-163-192-10	4	

型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-418-410-00	24AL-X-9512 -0
TYPE	FP24-00801	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	卓上取付板 DESKTOP FIXING PLATE		14-078-2311-0 CODE NO. 100-364-730-10	1	
2	USBｼｰﾄ USB SHEET		24-014-1411-0 CODE NO. 100-372-000-10	1	
3	+ﾅﾍﾞｾﾙｽB WASHER HEAD SCREW *B*		M3X8 SUS304 CODE NO. 000-162-649-10	2	

型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

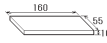
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-285-760-00	03HL-X-9501 -1
TYPE	FP24-00603	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	DVD-R書込み品 PROGRAM INSTALL SOFTWARE		0359324- CODE NO. 001-285-750-00	1	
2	防塵ｽﾎﾟﾝｼﾞ DUST-PROOF SPONGE		24-014-0105-1 CODE NO. 100-366-821-10	1	

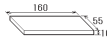
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-624-400-00	24AL-X-9517 -1
TYPE	FP24-00608	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	DVD-R書込み品 PROGRAM INSTALL SOFTWARE		0359324- CODE NO. 001-624-410-00	1	
2	防塵ｽﾎﾟﾝｼﾞ DUST-PROOF SPONGE		24-014-0105-1 CODE NO. 100-366-821-10	1	

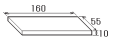
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-647-210-00	24AL-X-9519 -0
TYPE	FP24-01502 *BELUGA*	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	防塵ｽﾎﾟﾝｼﾞ DUST-PROOF SPONGE		24-014-0105-1 CODE NO. 100-366-821-10	1	
2	DVD-R書込み品 PROGRAM INSTALL SOFTWARE		0359324- *BELUGA* CODE NO. 001-647-220-00	1	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD.

C3616-F03-A

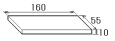
FURUNO

CODE NO.	001-628-850-00	24AU-X-9502 -0
TYPE	FP24-01402	1/1

付属品表

ACCESSORIES

EC-3005(FAR)

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	DVD-R書込品 PROGRAM INSTALL SOFTWARE		0359567- CODE NO. 001-628-870-00	1	
2	防塵ｽﾎﾟﾝｼﾞ DUST-PROOF SPONGE		24-014-0105-1 CODE NO. 100-366-821-10	1	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD.

C3694-F01-A

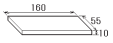
FURUNO

CODE NO.	001-660-320-00	24AU-X-9503 -0
TYPE	FP24-01404	1/1

付属品表

ACCESSORIES

EC3005(FAR)E

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	DVD-R書込品 PROGRAM INSTALL SOFTWARE		0359567- CODE NO. 001-660-340-00	1	
2	防塵ｽﾎﾟﾝｼﾞ DUST-PROOF SPONGE		24-014-0105-1 CODE NO. 100-366-821-10	1	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD.

C3694-F02-A

FURUNO

表１ TABLE 1

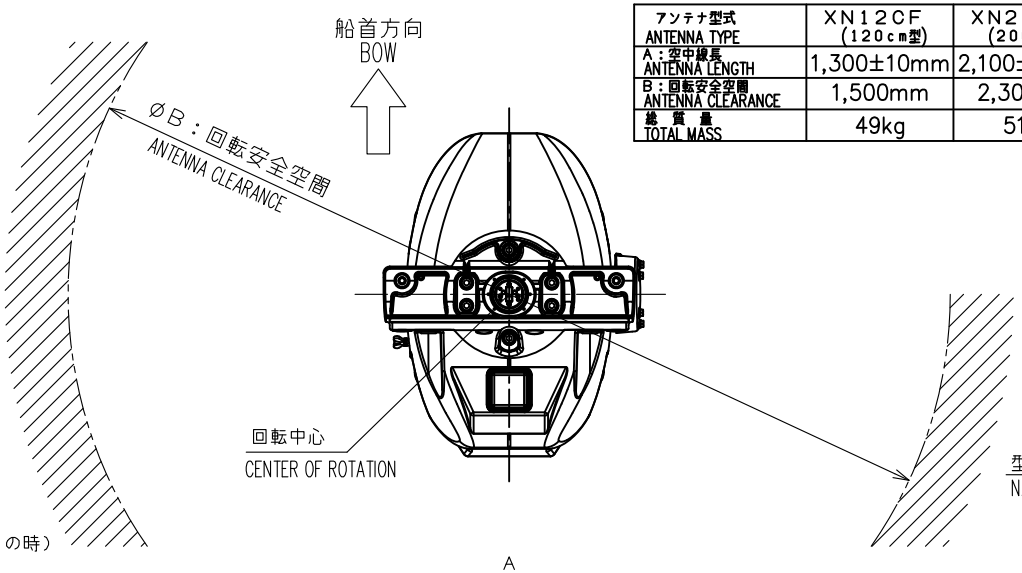
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

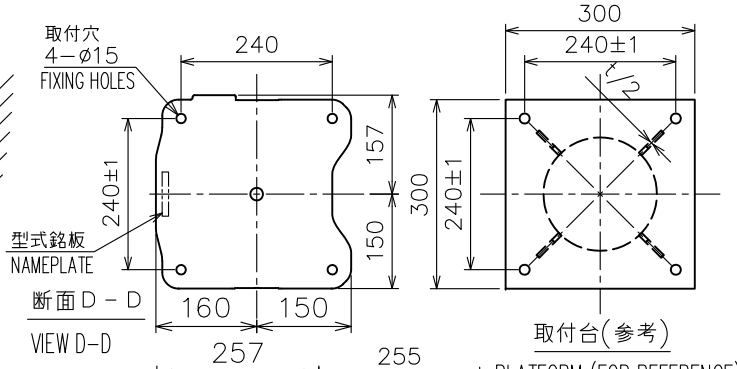
表２ TABLE 2

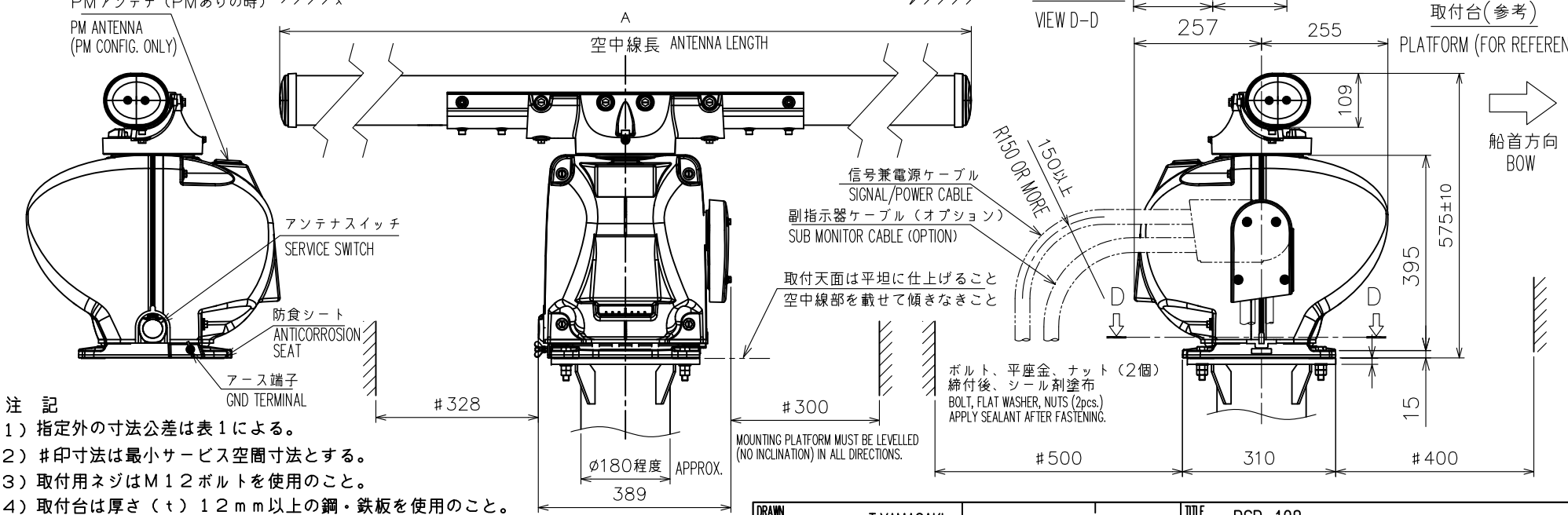
アンテナ型式 ANTENNA TYPE	XN12CF (120cm型)	XN20CF (200cm型)	XN24CF (240cm型)
A：空中線長 ANTENNA LENGTH	1,300±10mm	2,100±10mm	2,600±10mm
B：回転安全空間 ANTENNA CLEARANCE	1,500mm	2,300mm	2,800mm
総質量 TOTAL MASS	49kg	51kg	52kg

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付穴の中心を結ぶ方向に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED IN THE LINE WITH THE STANCHION CENTER AND FIXING HOLES CENTER.







注　記
1）指定外の寸法公差は表１による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ１２ボルトを使用のこと。
4）取付台は厚さ（ｔ）１２ｍｍ以上の鋼・鉄板を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 12 mm OR MORE STEEL PLATE.

DRAWN 16/Aug/2022 T.YAMASAKI		TITLE	RSB-128
CHECKED 16/Aug/2022 H.MAKI		名称	空中線部（PMあり／なし、氷結防止なし）
APPROVED 31/Aug/2022 H.MAKI	FAR-2xx8ser. FAR-3210ser.		外寸図
SCALE 1/12 MASS 表2参照 SEE TABLE 2		NAME	ANTENNA UNIT (PM Y/N, NO DE-ICER)
DWG.No. C3616-G02- H	REF.No. 03-182-310G-9		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

表１ TABLE 1

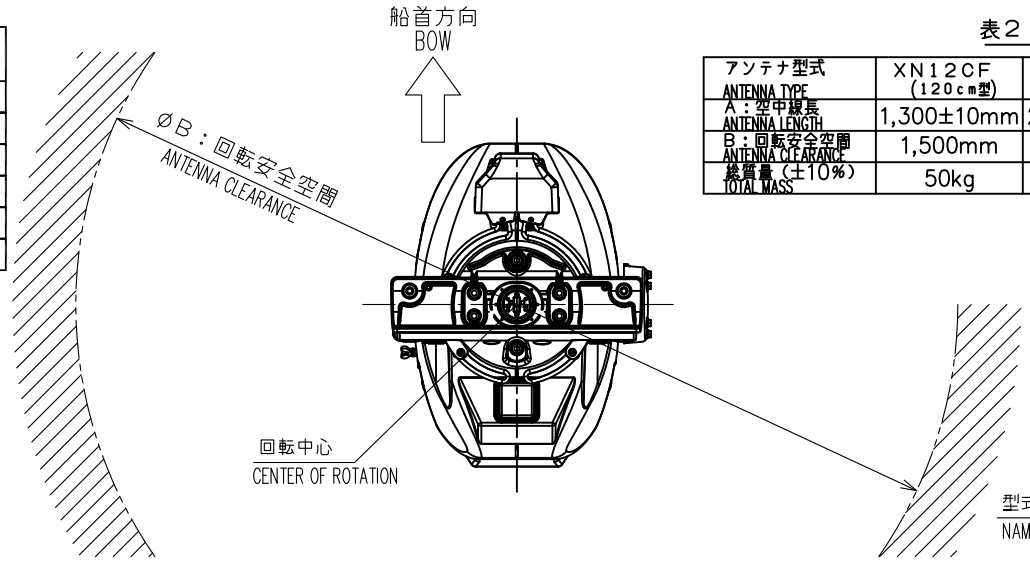
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

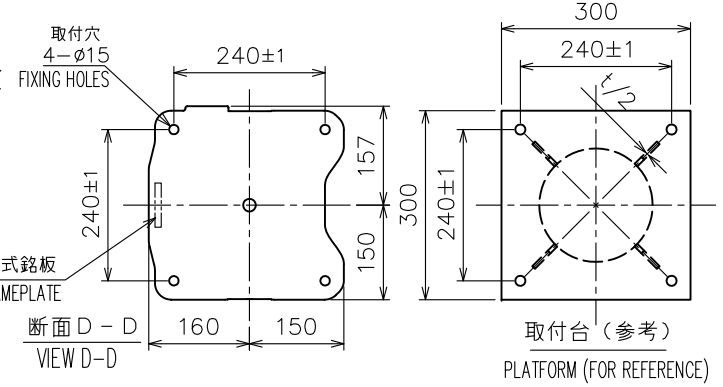
表２ TABLE 2

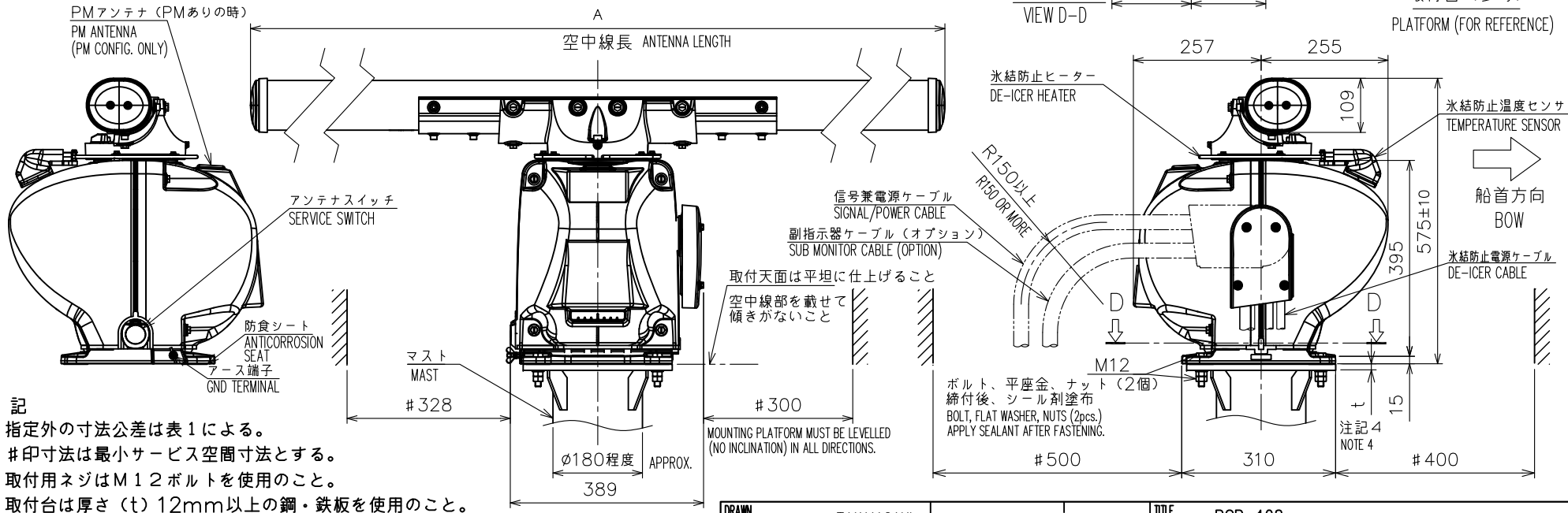
アンテナ型式 ANTENNA TYPE	XN12CF (120cm型)	XN20CF (200cm型)	XN24CF (240cm型)
A：空中線長 ANTENNA LENGTH	1,300±10mm	2,100±10mm	2,600±10mm
B：回転安全空間 ANTENNA CLEARANCE	1,500mm	2,300mm	2,800mm
総質量（±10%） TOTAL MASS	50kg	52kg	53kg

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付穴の中心を結ぶ方向に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED IN THE LINE WITH THE STANCHION CENTER AND FIXING HOLES CENTER.







注　記
１）指定外の寸法公差は表１による。
２）＃印寸法は最小サービス空間寸法とする。
３）取付用ネジはＭ１２ボルトを使用のこと。
４）取付台は厚さ（t）12mm以上の鋼・鉄板を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 12 mm OR MORE STEEL PLATE.

DRAWN 16/Aug/2022 T.YAMASAKI		TITLE	RSB-128
CHECKED 16/Aug/2022 H.MAKI		名称	空中線部（PMあり／なし、氷結防止付）
APPROVED 31/Aug/2022 H.MAKI	FAR-2xx8ser. FAR-3210ser.		外寸図
SCALE 1/12 MASS 表2参照 SEE TABLE 2		NAME	ANTENNA UNIT (PM Y/N, W/ DE-ICER)
DWG.No. C3616-G03- G	REF.No. 03-182-311G-8		OUTLINE DRAWING

D-2

FURUNO ELECTRIC CO., LTD.

FURUNO

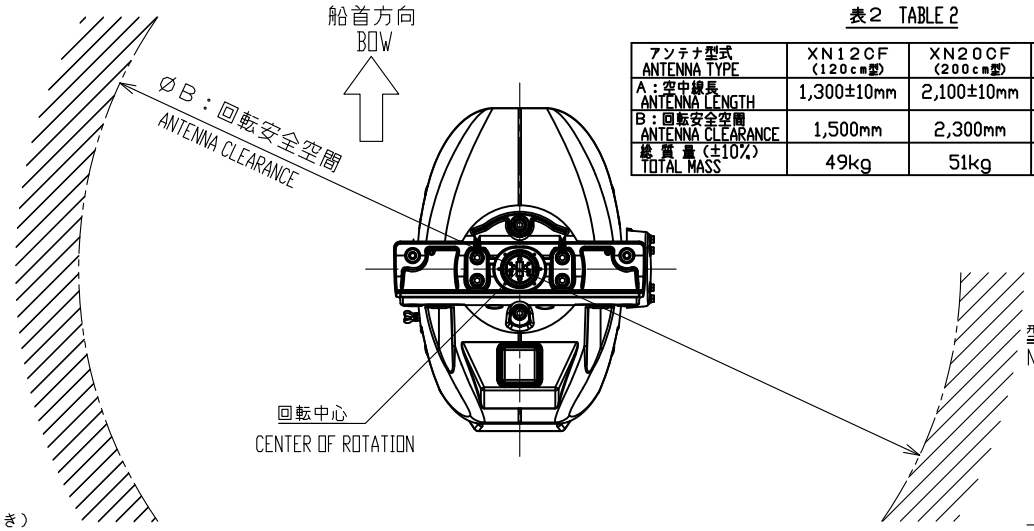
表１ TABLE 1

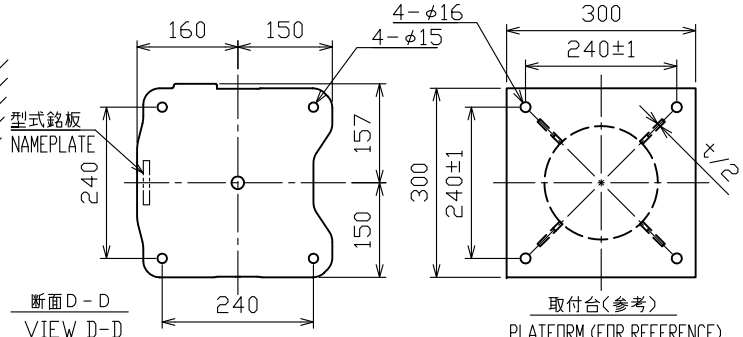
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

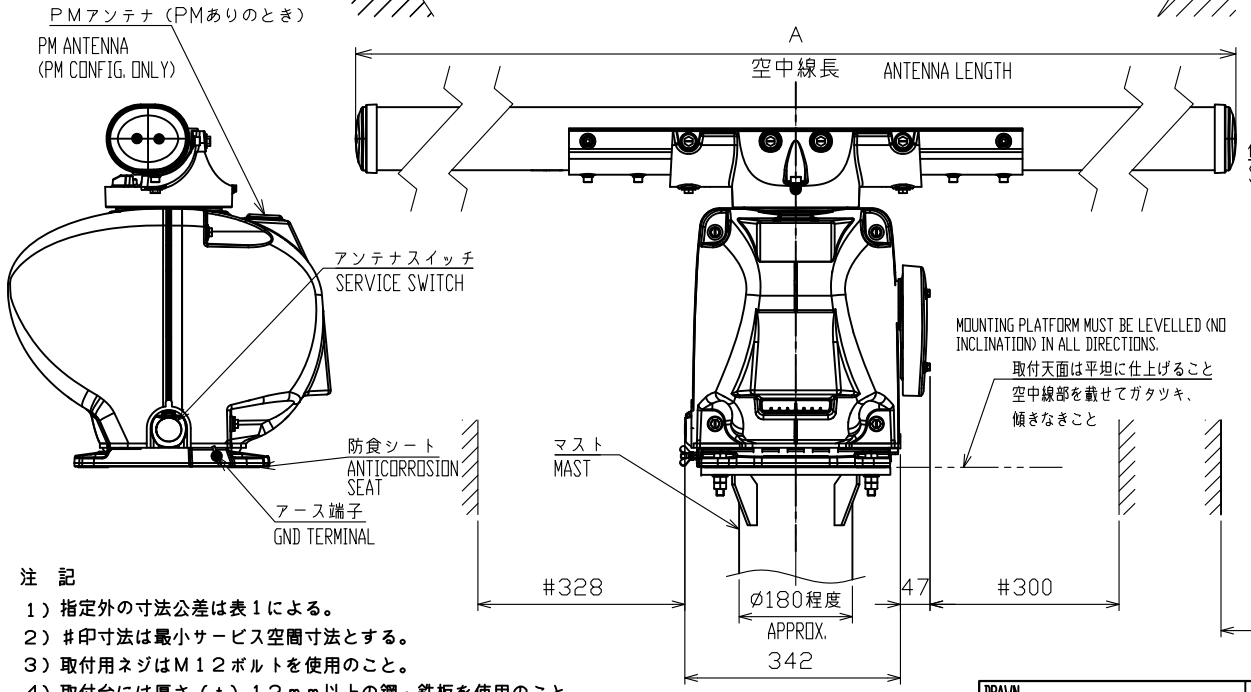
表２ TABLE 2

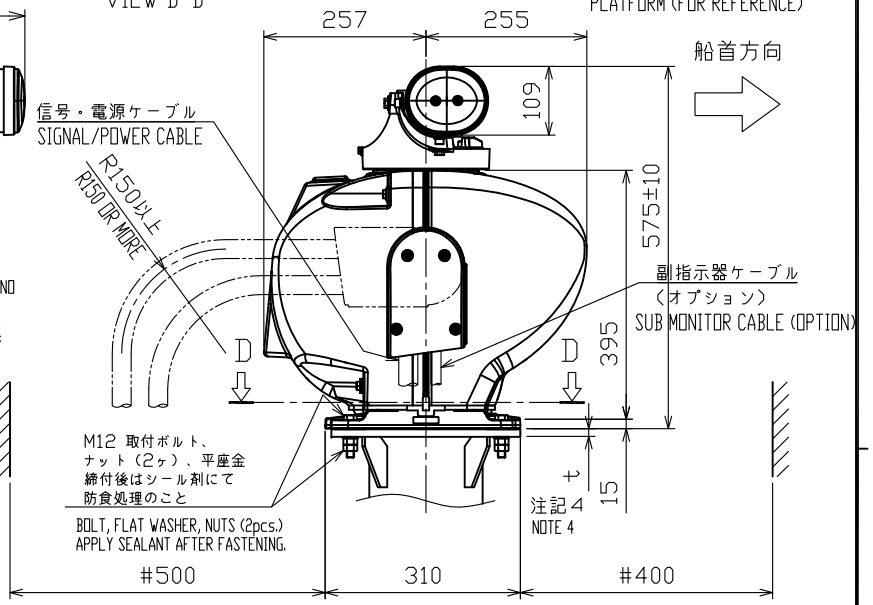
アンテナ型式 ANTENNA TYPE	XN12CF (120cm型)	XN20CF (200cm型)	XN24CF (240cm型)
A：空中線長 ANTENNA LENGTH	1,300±10mm	2,100±10mm	2,600±10mm
B：回転安全空間 ANTENNA CLEARANCE	1,500mm	2,300mm	2,800mm
総 質 量（±10%） TOTAL MASS	49kg	51kg	52kg

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付穴の中心を結ぶ方向に取り付けること。
THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED IN THE LINE WITH THE STANCHION CENTER AND FIXING HOLES CENTER.









注 記
１）指定外の寸法公差は表１による。
２）＃印寸法は最小サービス空間寸法とする。
３）取付用ネジはＭ１２ボルトを使用のこと。
４）取付台には厚さ（ｔ）１２ｍｍ以上の鋼・鉄板を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 12 mm OR MORE STEEL PLATE.

DRAWN 25/Aug/2022 T.YAMASAKI		TITLE	RSB-128
CHECKED 25/Aug/2022 H.MAKI		名称	空中線部（PMあり／なし、氷結防止なし）
APPROVED 31/Aug/2022 H.MAKI	FAR-2xx8-NXT		外寸図
SCALE 1/12	MASS 表2参照 SEE TABLE 2	NAME	ANTENNA UNIT (PM Y/N, NO DE-ICER)
DWG.No. C3679-G01- B	REF.No. 03-199-310G-3		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

表１ TABLE 1

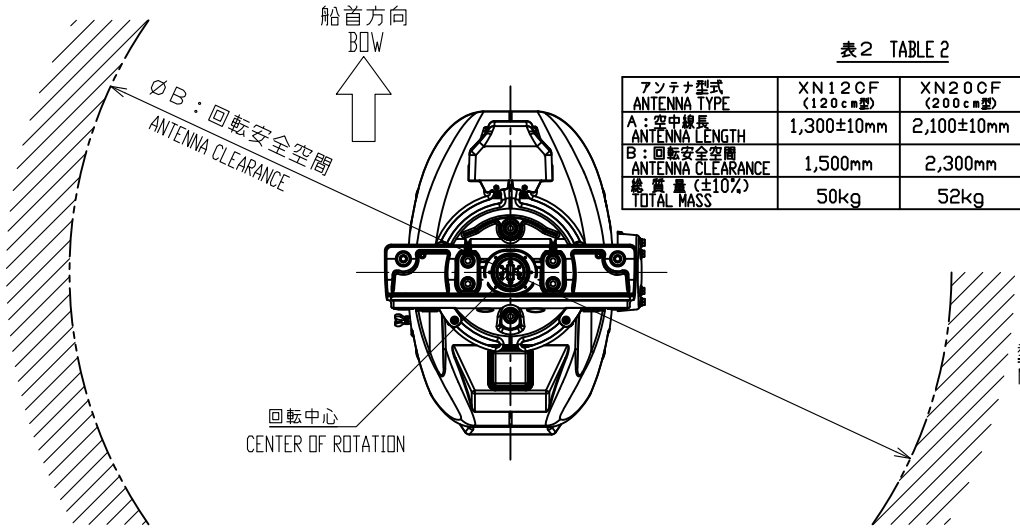
寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

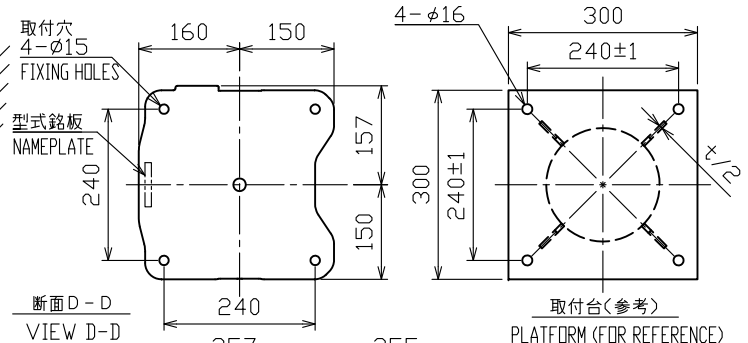
表２ TABLE 2

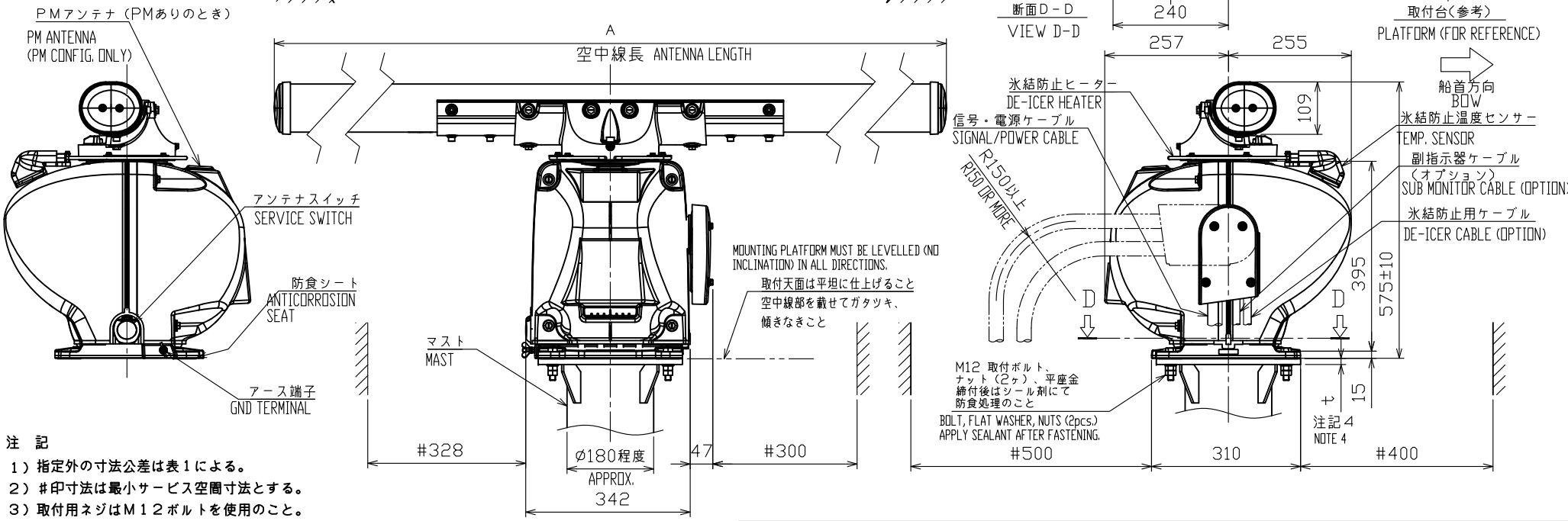
アンテナ型式 ANTENNA TYPE	XN12CF (120cm型)	XN20CF (200cm型)	XN24CF (240cm型)
A：空中線長 ANTENNA LENGTH	1,300±10mm	2,100±10mm	2,600±10mm
B：回転安全空間 ANTENNA CLEARANCE	1,500mm	2,300mm	2,800mm
総質量 (±10%) TOTAL MASS	50kg	52kg	53kg

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付穴の中心を結ぶ方向に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED IN THE LINE WITH THE STANCHION CENTER AND FIXING HOLES CENTER.







注　記

１）指定外の寸法公差は表１による。
２）＃印寸法は最小サービス空間寸法とする。
３）取付用ネジはＭ１２ボルトを使用のこと。
４）取付台には厚さ（ｔ）１２ｍｍ以上の鋼・鉄板を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 12 mm OR MORE STEEL PLATE.

DRAWN 26/Aug/2022 T.YAMASAKI		TITLE	RSB-128
CHECKED 26/Aug/2022 H.MAKI		名称	空中線部（PMあり／なし、氷結防止あり）
APPROVED 31/Aug/2022 H.MAKI	FAR-2xx8-NXT		外寸図
SCALE 1/12	MASS 表2参照 SEE TABLE 2	NAME	ANTENNA UNIT (PM Y/N, W/ DE-ICER)
DWG.No. C3679-G02- B	REF.No. 03-199-311G-3		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

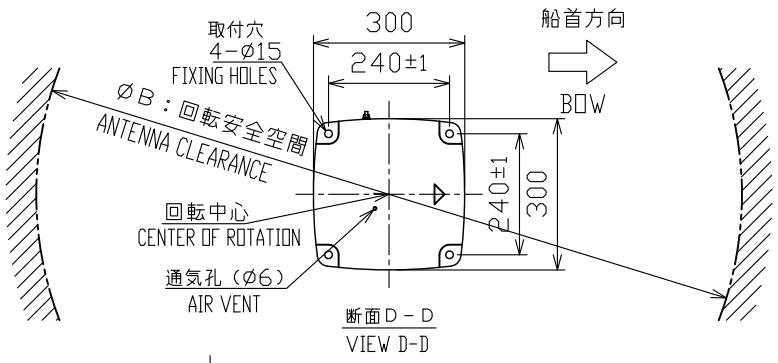
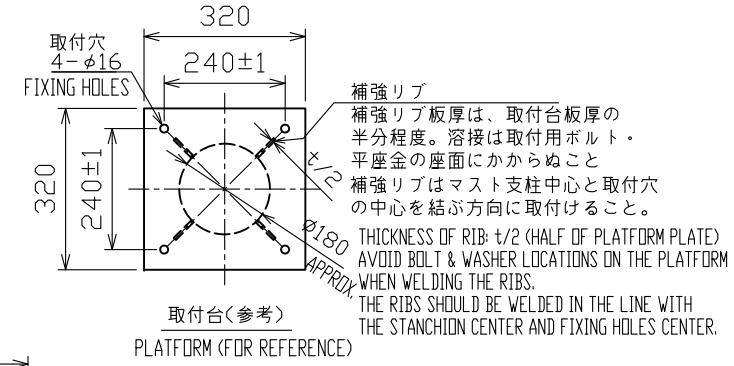
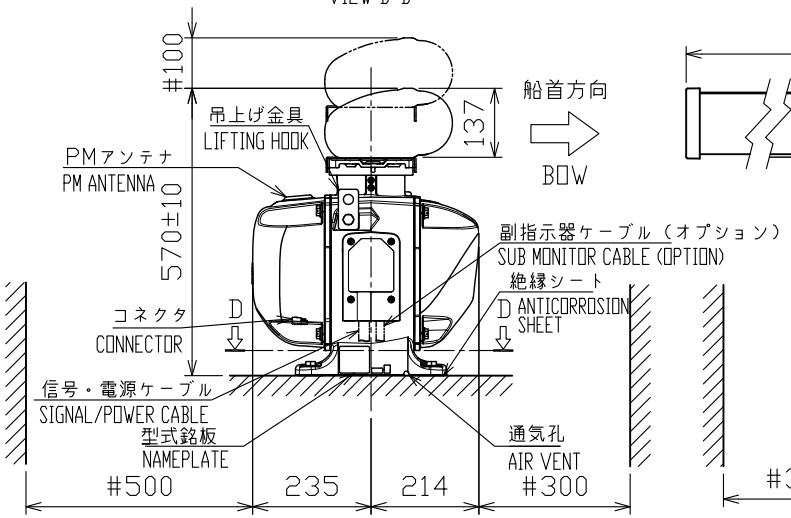
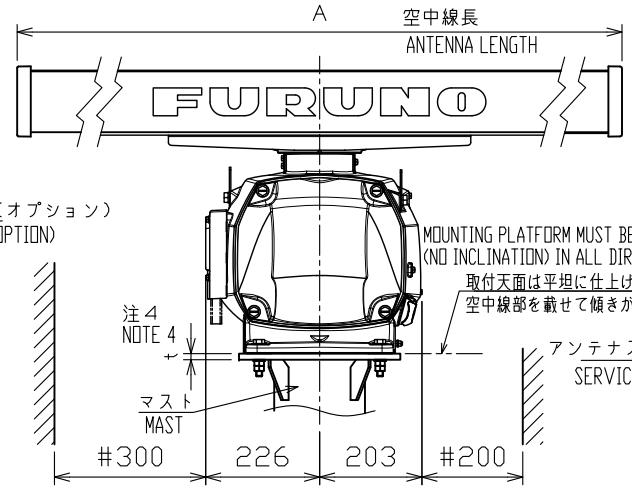


表2 TABLE 2

アンテナ型式 ANTENNA TYPE	XN20AF (200cm型)	XN24AF (240cm型)
A：空中線長 (mm) ANTENNA LENGTH	2,040±10	2,550±10
B：回転安全空間 (mm) ANTENNA CLEARANCE	2,200	2,700
質量 (kg±10%) MASS	44	46







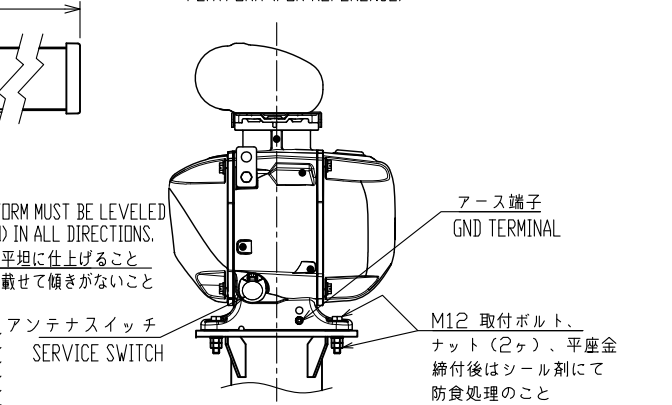


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

注　記

1）指定外の寸法公差は表１による。

2）＃印寸法は最小サービス空間寸法とする。

3）取付用ネジはＭ１２ボルトを使用のこと。

4）取付台には厚さ（ｔ）１２～１５ｍｍの鋼・鉄板を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 12 TO 15, STEEL PLATE.

DRAWN 28/Oct/2022 T.YAMASAKI			TITLE RSB-146(XN20/24AF)
CHECKED 28/Oct/2022 H.MAKI			名称 空中線部
APPROVED 10/Jan/2023 H.MAKI		FAR-30x5 FAR-20x8-MARK-2	外寸図
SCALE 1/15	MASS 表2参照 TABLE 2		NAME ANTENNA UNIT
DWG.No. C3692-G01-A		REF.No. 03-207-300G-2	OUTLINE DRAWING

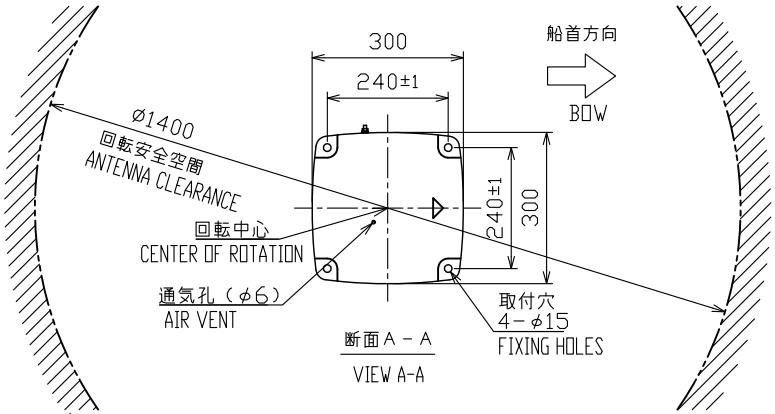
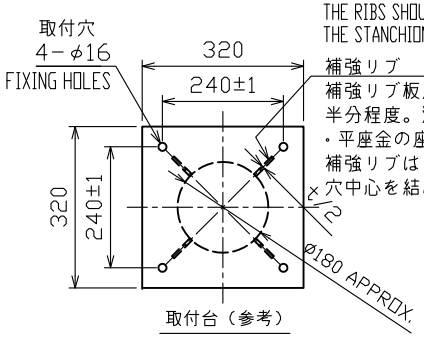


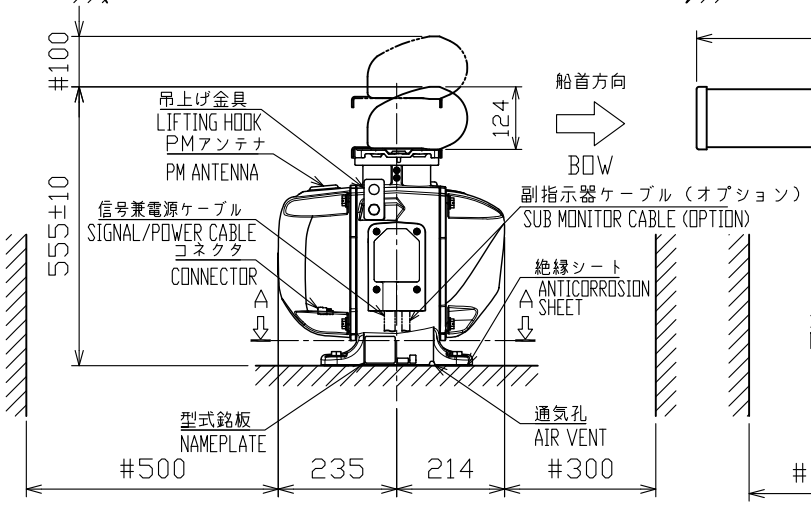
表1 TABLE 1

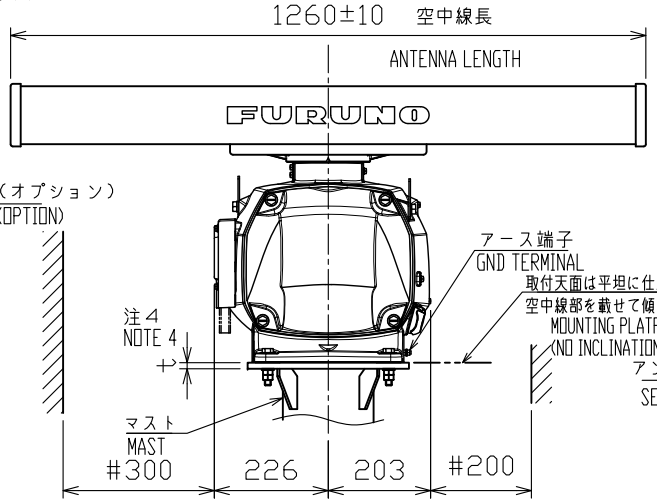
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5

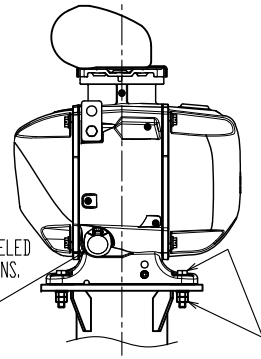


THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED IN THE LINE WITH THE STANCHION CENTER AND FIXING HOLES CENTER.

補強リブ
補強リブ板厚は、取付台板厚の半分程度。溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付穴中心を結ぶ方向に取付けること。







M12 取付ボルト、ナット（2ヶ）、平座金締付後はシール剤にて防食処理のこと
BOLT, FLAT WASHER, NUTS (2pcs). APPLY SEALANT AFTER FASTENING

注 記
1） 指定外の寸法公差は表1による。
2） #印寸法は最小サービス空間寸法とする。
3） 取付用ネジはM12ボルトを使用のこと。
4） 取付台には厚さ（t）12～15mmの鋼・鉄板を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. PLATFORM THICKNESS (t): 12 TO 15, STEEL PLATE.

DRAWN 28/Oct/2022 T.YAMASAKI		TITLE	RSB-146(XN12AF)
CHECKED 28/Oct/2022 H.MAKI		名称	空中線部
APPROVED 10/Jan/2023 H.MAKI	FAR-30x5 FAR-20x8-MARK-2		外寸図
SCALE 1/15 MASS 38 kg ±10%		NAME	ANTENNA UNIT
DWG.No. C3692-G02-A	REF.No. 03-207-3016-1		OUTLINE DRAWING

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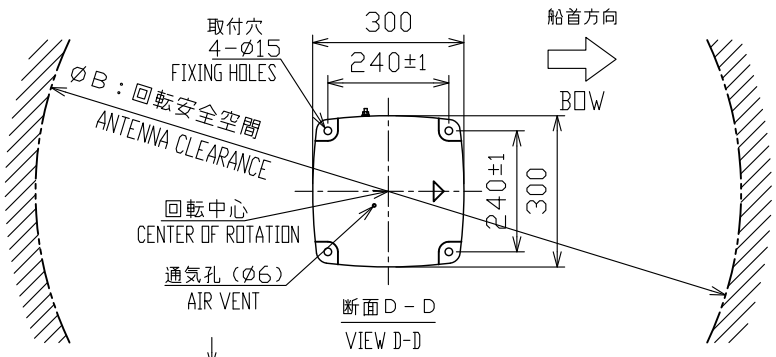


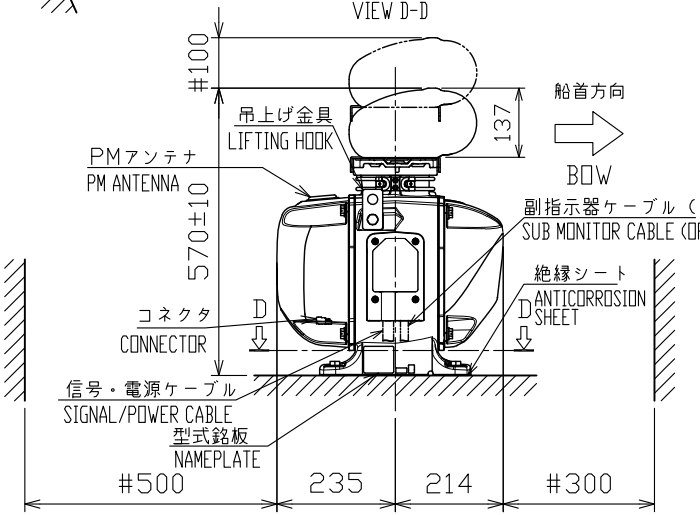
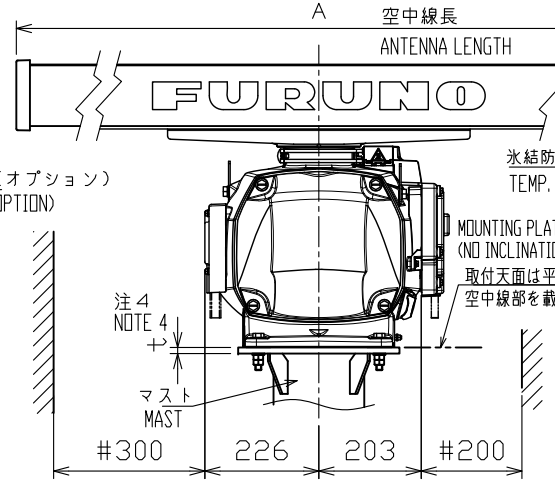
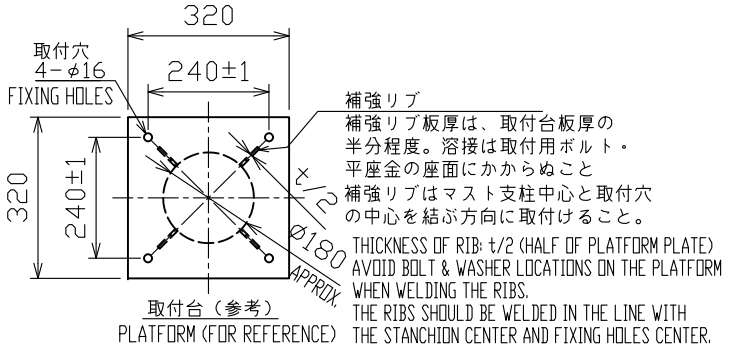


表2　TABLE 2

アンテナ型式 ANTENNA TYPE	XN20AF (200cm型)	XN24AF (240cm型)
A：空中線長（mm） ANTENNA LENGTH	2,040±10	2,550±10
B：回転安全空間（mm） ANT. CLEARANCE	2,200	2,700
質量 MASS (kg±10%)	47	49





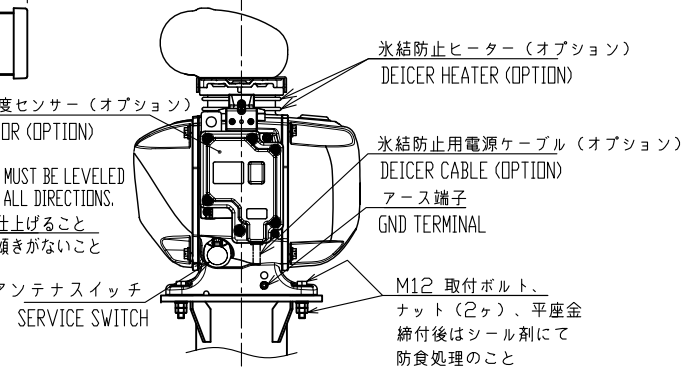


表1　TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

注 記

1）　指定外の寸法公差は表１による。
2）　＃印寸法は最小サービス空間寸法とする。
3）　取付用ネジはＭ１２ボルトを使用のこと。
4）　取付台には厚さ（ｔ）１２～１５ｍｍの鋼・鉄板を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 12 TO 15, STEEL PLATE.

DRAWN 28/Oct/2022 T.YAMASAKI		TITLE	RSB-146 (XN20/24AF)
CHECKED 28/Oct/2022 H.MAKI		名称	空中線部（氷結防止付）
APPROVED 10/Jan/2023 H.MAKI	FAR-30x5 FAR-20x8-MARK-2		外寸図
SCALE 1/15 MASS 表2参照 TABLE 2		NAME	ANTENNA UNIT (W/ DEICER)
DWG.No. C3692-G03- A	REF.No. 03-207-311G-2		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

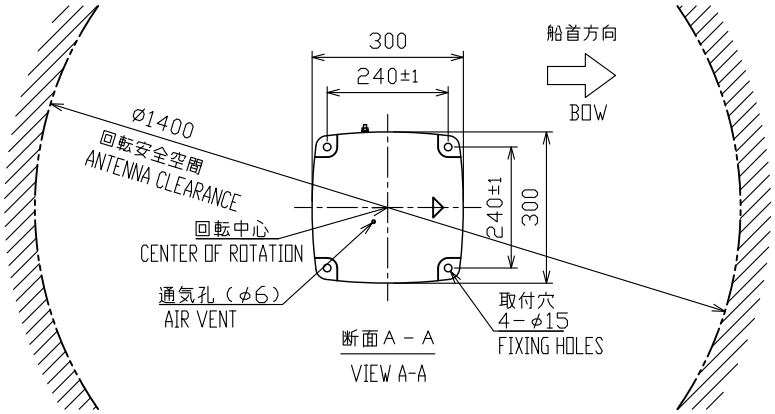
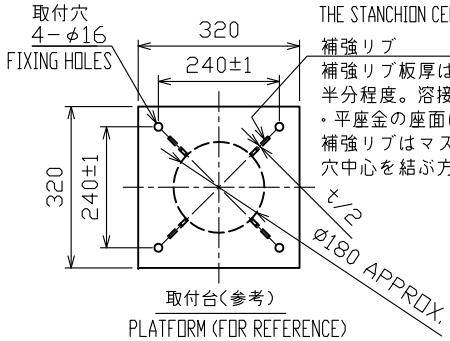


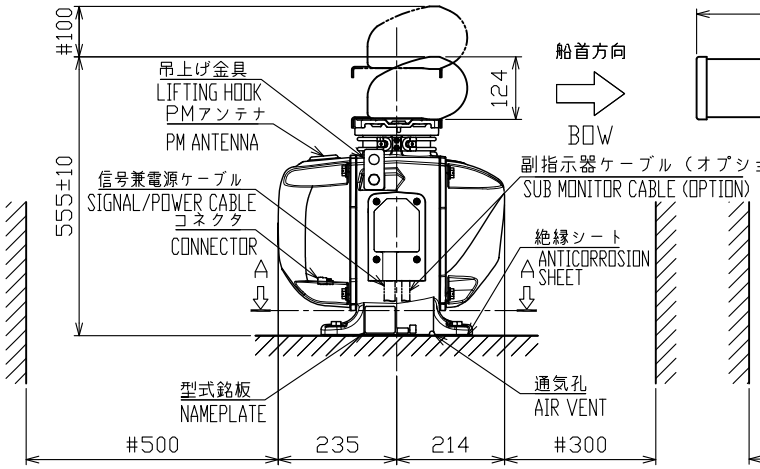
表1 TABLE 1

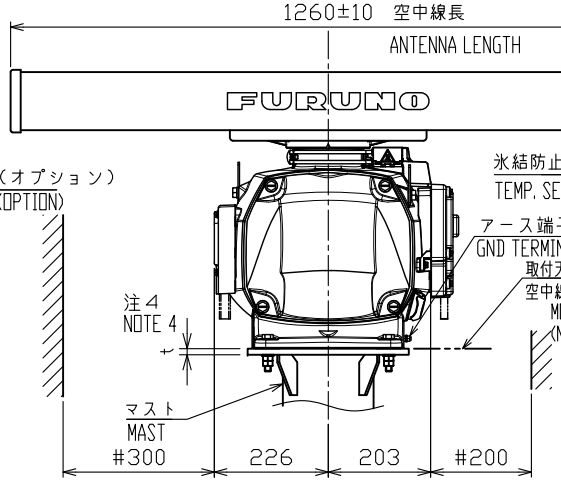
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5

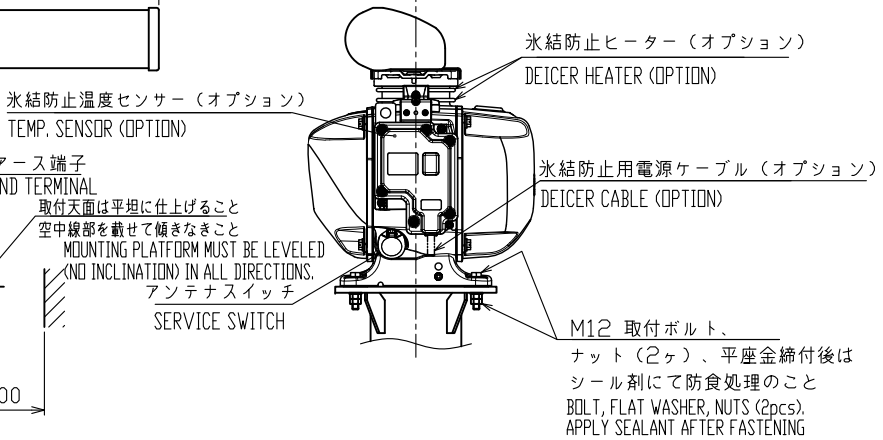


THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED IN THE LINE WITH THE STANCHION CENTER AND FIXING HOLES CENTER.

補強リブ
補強リブ板厚は、取付台板厚の半分程度。溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付穴中心を結ぶ方向に取付けること。







注 記
1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付用ネジはＭ１２ボルトを使用のこと。
4） 取付台には厚さ（ｔ）１２～１５ｍｍの鋼・鉄板を使用のこと。

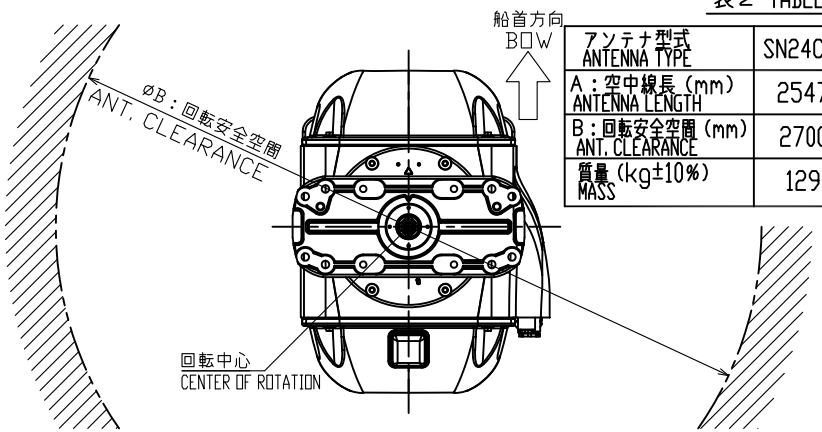
NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. PLATFORM THICKNESS (t): 12 TO 15, STEEL PLATE.

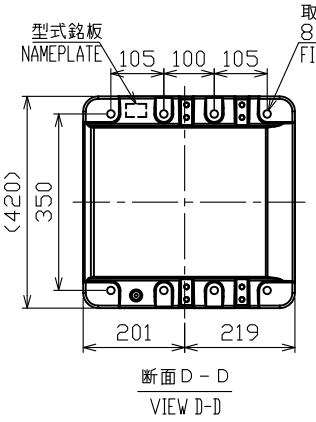
DRAWN 28/Oct/2022 T.YAMASAKI		TITLE	RSB-146(XN12AF)
CHECKED 28/Oct/2022 H.MAKI		名称	空中線部（氷結防止付）
APPROVED 10/Jan/2023 H.MAKI	FAR-30x5 FAR-20x8-MARK-2		外寸図
SCALE 1/15 MASS 41 ±10% kg		NAME	ANTENNA UNIT (W/ DEICER)
DWG.No. C3692-G04- A	REF.No. 03-207-312G-2		OUTLINE DRAWING

FURUNO

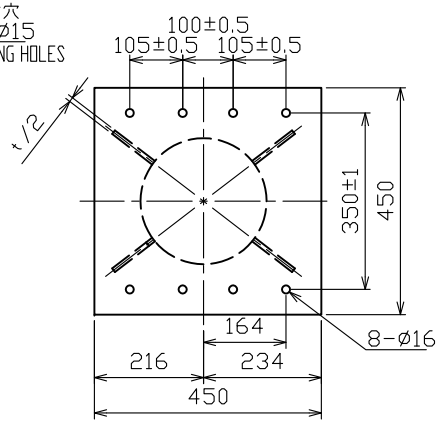
表2 TABLE 2

アンテナ型式 ANTENNA TYPE	SN24CF	SN30CF	SN36CF
A：空中線長（mm） ANTENNA LENGTH	2547	3072	3822
B：回転安全空間（mm） ANT. CLEARANCE	2700	3200	3900
質量（kg±10%） MASS	129	135	140

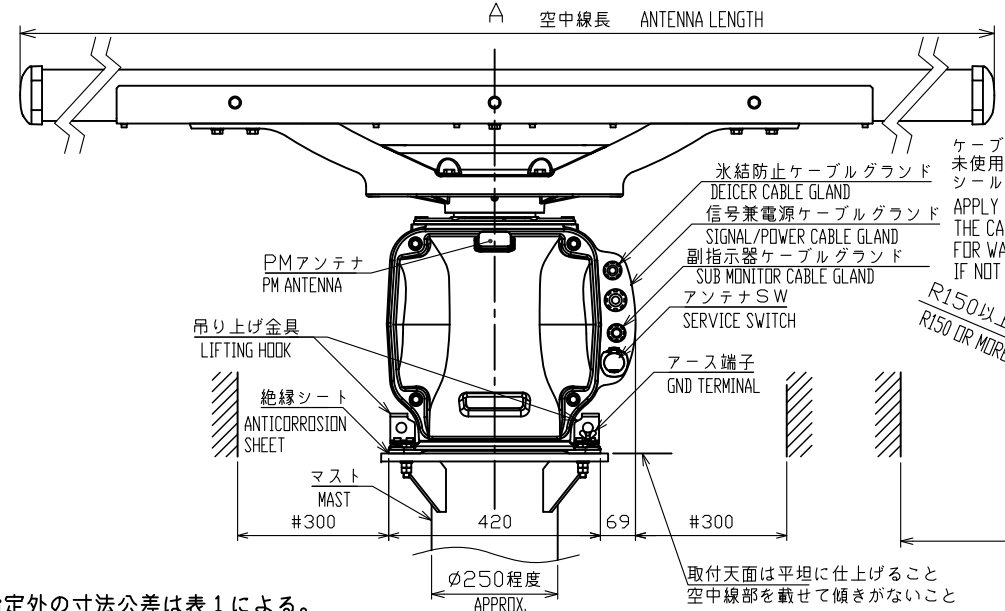




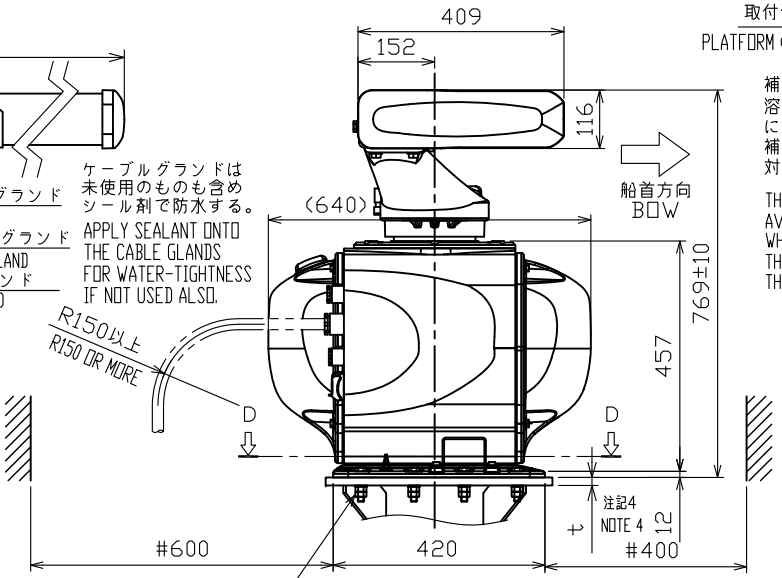
断面D－D
VIEW D-D



取付台（参考）
PLATFORM (FOR REFERENCE)



ケーブルグランドは未使用のものも含めシール剤で防水する。
APPLY SEALANT ONTO THE CABLE GLANDS FOR WATER-TIGHTNESS IF NOT USED ALSO.



ボルト、平座金、ナット（2個）
締付後、シール剤塗布
BOLT, FLAT WASHER, NUTS (2pcs.)
APPLY SEALANT AFTER FASTENING.

取付天面は平坦に仕上げること
空中線部を載せて傾きがないこと
MOUNTING PLATFORM MUST BE LEVELED (NO INCLINATION) IN ALL DIRECTIONS.

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付台の対角線方向近傍に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED NEAR THE LINE WITH THE STANCION CENTER AND PLATFORM CORNER.

表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≤50	±1.5
50<L≤100	±2.5
100<L≤500	±3
500<L≤1000	±4
1000<L≤2000	±5
2000<L≤4000	±7

注　記

1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ１２ボルトを使用のこと。
4）取付台厚さ（ｔ）：１５ｍｍ以上の鋼・鉄板を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 15 mm OR MORE STEEL PLATE.

DRAWN 9/May/2020 T.YAMASAKI		TITLE	RSB-129
CHECKED 11/May/2020 H.MAKI		名称	空中線部(PMあり、氷結防止なし)
APPROVED 13/May/2020 H.MAKI	FAR-3230S/3330S		外寸図
SCALE 1/15 MASS 表2参照 SEE TABLE 2		NAME	ANTENNA UNIT (W/ PM, W/O DE-ICER)
DWG.No. C3618-G02- J	REF.No. 03-183-310G-7		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

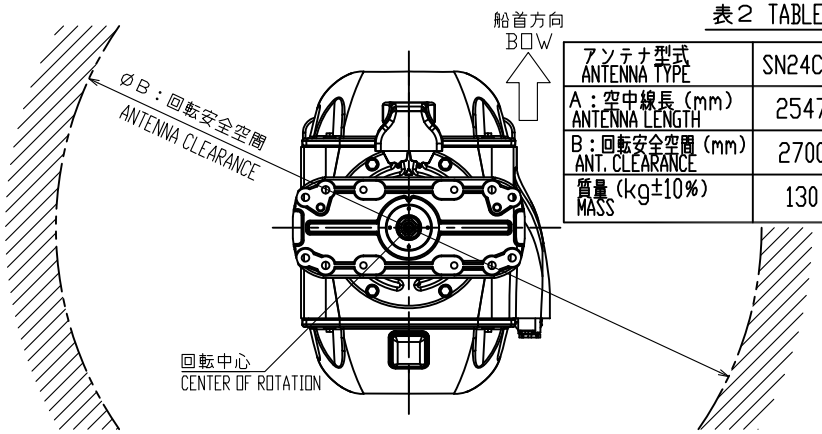
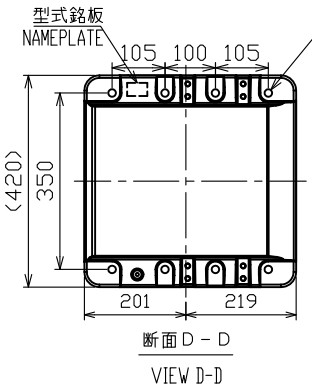
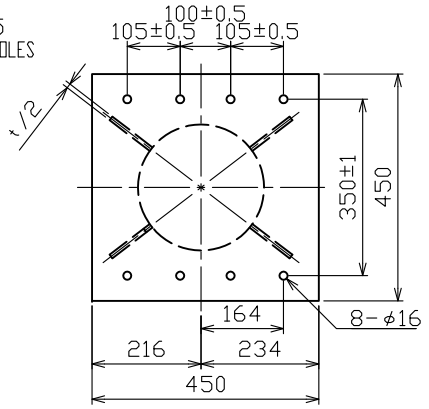


表2 TABLE 2

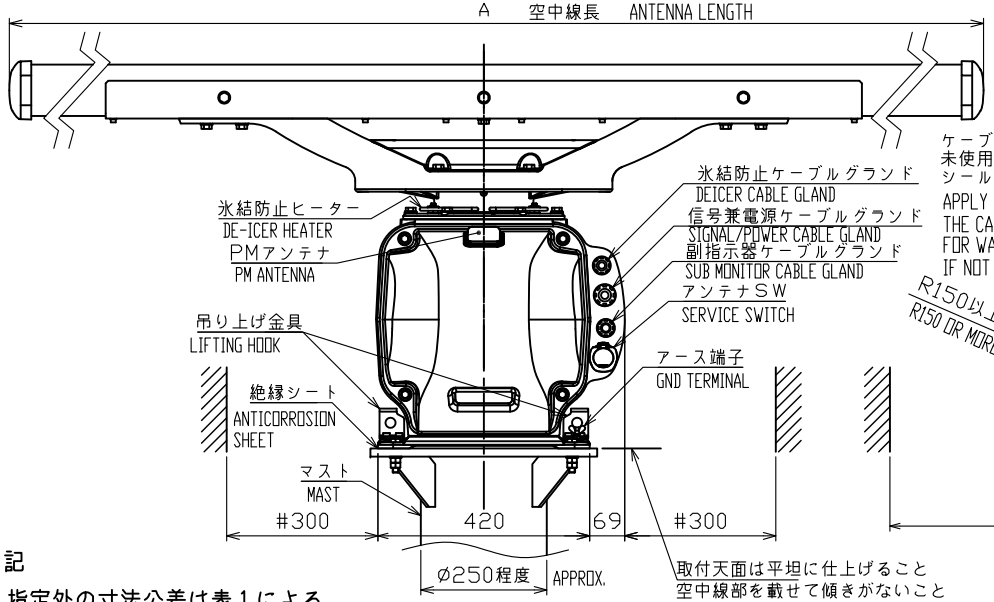
アンテナ型式 ANTENNA TYPE	SN24CF	SN30CF	SN36CF
A：空中線長（mm） ANTENNA LENGTH	2547	3072	3822
B：回転安全空間（mm） ANT. CLEARANCE	2700	3200	3900
質量（kg±10%） MASS	130	136	141





補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付台の対角線方向近傍に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED NEAR THE LINE WITH THE STANCION CENTER AND PLATFORM CORNER.



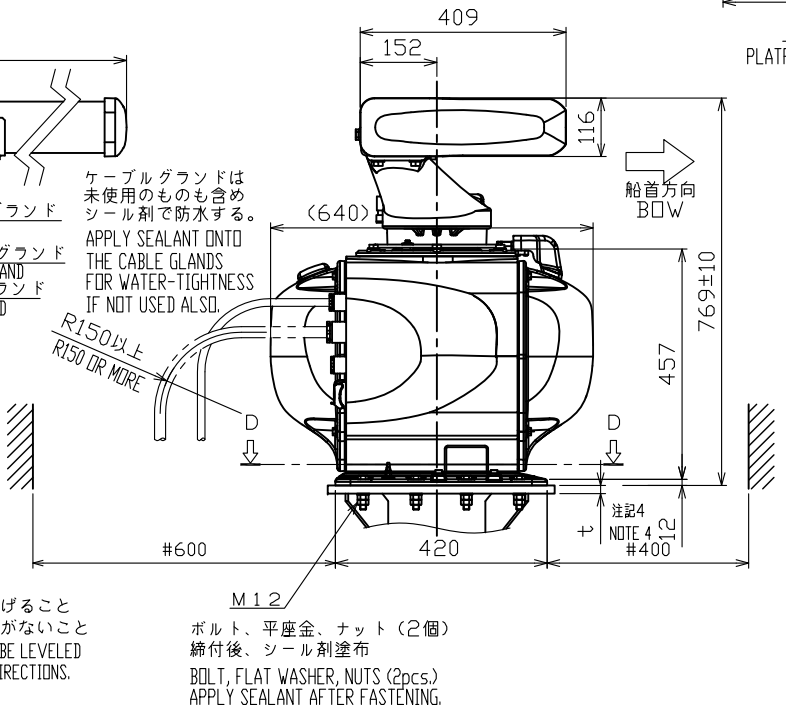


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≤50	±1.5
50<L≤100	±2.5
100<L≤500	±3
500<L≤1000	±4
1000<L≤2000	±5
2000<L≤4000	±7

注 記

1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはM12ボルトを使用のこと。
4）取付台厚さ（t）：15mm以上の鋼・鉄板を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 15 mm OR MORE STEEL PLATE.

DRAWN 9/Mar/2020 T.YAMASAKI		TITLE	RSB-129
CHECKED 11/Mar/2020 H.MAKI		名称	空中線部（PMあり、氷結防止あり）
APPROVED 13/May/2020 H.MAKI	FAR-3230S/3330S		外寸図
SCALE 1/15 MASS 表2参照 SEE TABLE 2		NAME	ANTENNA UNIT (W/ PM, W/ DE-ICER)
DWG.No. C3618-G03-F	REF.No. 03-183-320G-6		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

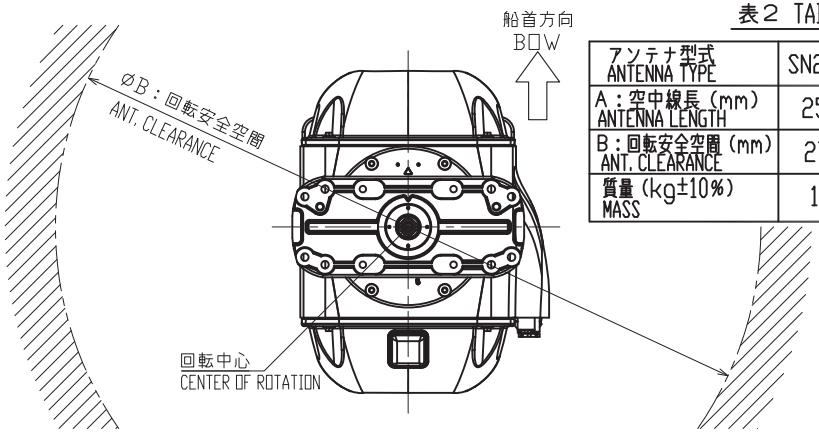
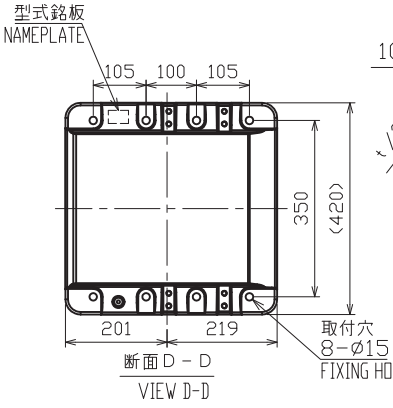
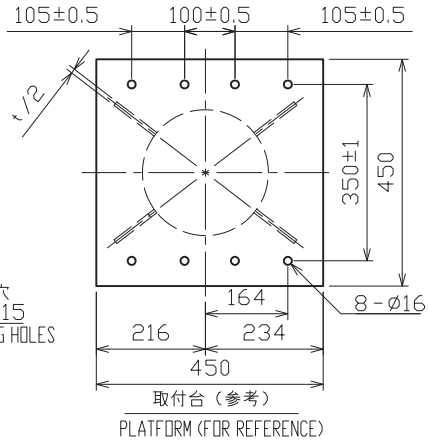
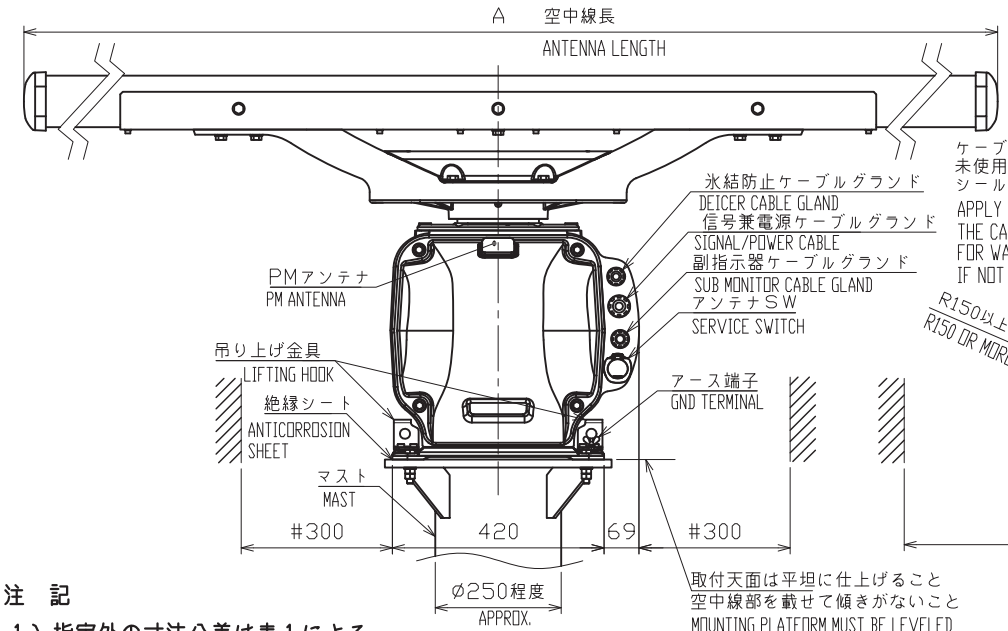


表2 TABLE 2

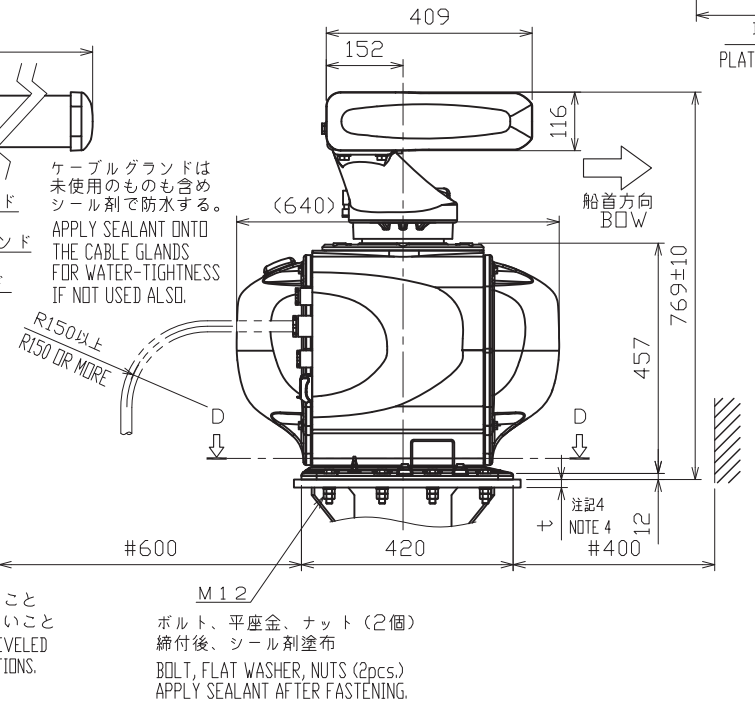
アンテナ型式 ANTENNA TYPE	SN24CF	SN30CF	SN36CF
A：空中線長（mm） ANTENNA LENGTH	2547	3072	3822
B：回転安全空間（mm） ANT. CLEARANCE	2700	3200	3900
質量（kg±10%） MASS	123	129	134







ケーブルグランドは未使用のものも含めシール剤で防水する。
APPLY SEALANT ONTO THE CABLE GLANDS FOR WATER-TIGHTNESS IF NOT USED ALSO.



ボルト、平座金、ナット（2個）
締付後、シール剤塗布
BOLT, FLAT WASHER, NUTS (2pcs.)
APPLY SEALANT AFTER FASTENING.

取付天面は平坦に仕上げること
空中線部を載せて傾きがないこと
MOUNTING PLATFORM MUST BE LEVELED (NO INCLINATION) IN ALL DIRECTIONS.

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付台の対角線方向近傍に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED NEAR THE LINE WITH THE STANCION CENTER AND PLATFORM CORNER.

表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

注　記
1）指定外の寸法公差は表１による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ１２ボルトを使用のこと。
4）取付台厚さ（ｔ）：１５ｍｍ以上の鋼・鉄板を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 15 mm OR MORE STEEL PLATE.

DRAWN 16/Nov/2023 T.YAMASAKI		TITLE	RSB-133
CHECKED 16/Nov/2023 H.MAKI		名称	空中線部（PMあり、氷結防止なし）
APPROVED 16/Nov/2023 H.MAKI	FAR-3230S/3330S-SSD		外寸図
SCALE 1/15	MASS 表2参照 SEE TABLE 2	NAME	ANTENNA UNIT (W/PM, W/O DE-ICER)
DWG.No. C3623-G01-L	REF.No. 03-183-352G-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

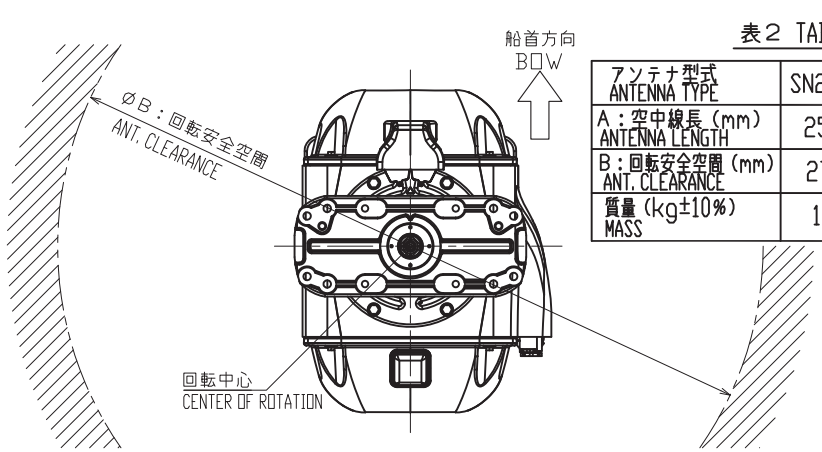
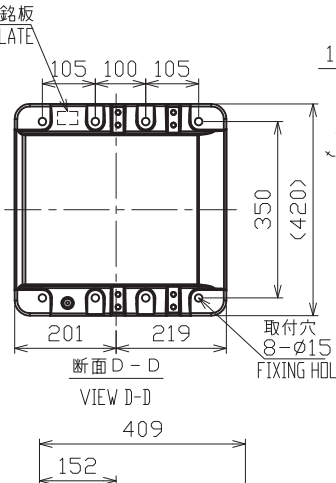
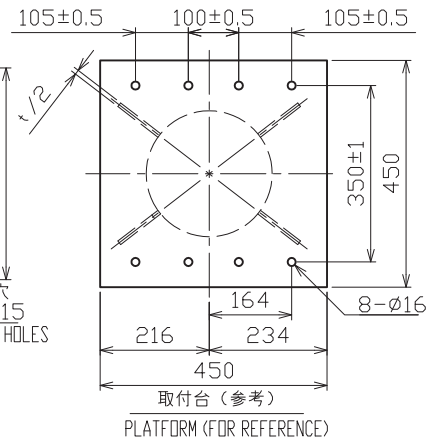
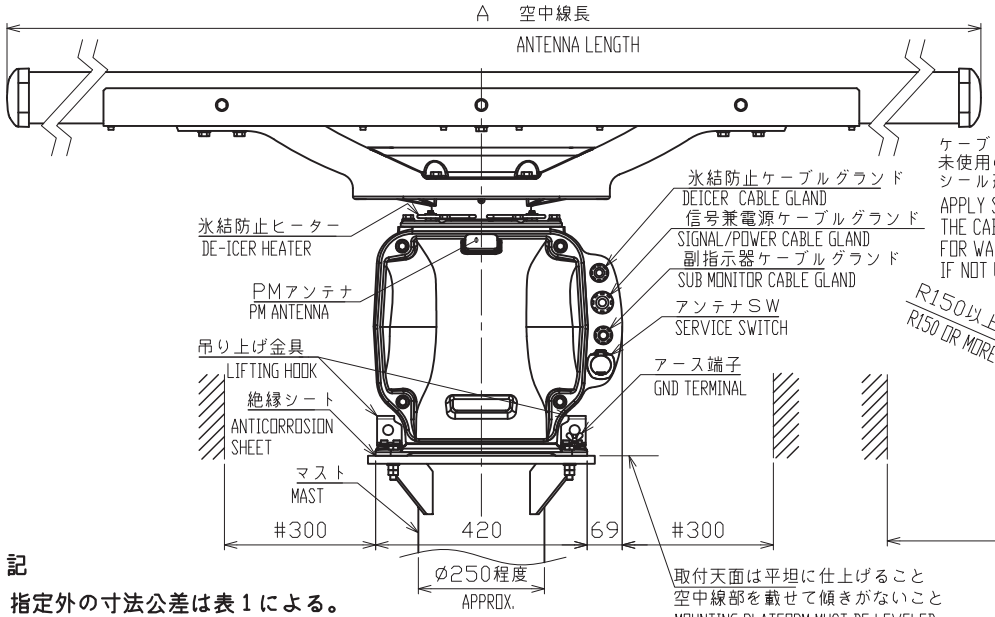


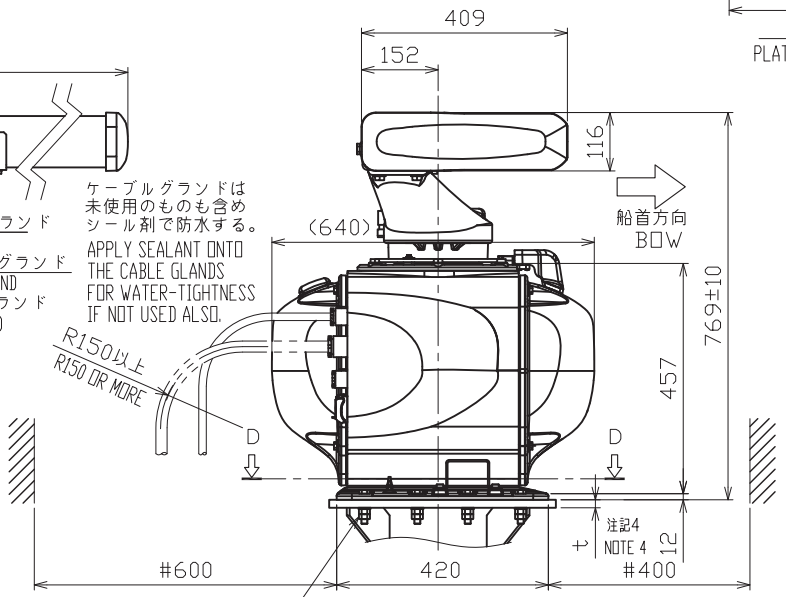
表2 TABLE 2

アンテナ型式 ANTENNA TYPE	SN24CF	SN30CF	SN36CF
A：空中線長（mm） ANTENNA LENGTH	2547	3072	3822
B：回転安全空間（mm） ANT. CLEARANCE	2700	3200	3900
質量（kg±10%） MASS	124	130	135









ケーブルグランドは未使用のものも含めシール剤で防水する。
APPLY SEALANT ONTO THE CABLE GLANDS FOR WATER-TIGHTNESS IF NOT USED ALSO.

取付天面は平坦に仕上げること
空中線部を載せて傾きがないこと
MOUNTING PLATFORM MUST BE LEVELED (NO INCLINATION) IN ALL DIRECTIONS.

ボルト、平座金、ナット（2個）
締付後、シール剤塗布
BOLT, FLAT WASHER, NUTS (2pcs.)
APPLY SEALANT AFTER FASTENING.

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付台の対角線方向近傍に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED NEAR THE LINE WITH THE STANCION CENTER AND PLATFORM CORNER.

表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≤50	±1.5
50<L≤100	±2.5
100<L≤500	±3
500<L≤1000	±4
1000<L≤2000	±5
2000<L≤4000	±7

注 記
1）指定外の寸法公差は表1による。
2）#印寸法は最小サービス空間寸法とする。
3）取付用ネジはM12ボルトを使用のこと。
4）取付台厚さ（t）：15mm以上の鋼・鉄板を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 15 mm OR MORE STEEL PLATE.

DRAWN 16/Nov/2023 T.YAMASAKI		TITLE	RSB-133
CHECKED 16/Nov/2023 H.MAKI		名称	空中線部（PMあり、氷結防止あり）
APPROVED 16/Nov/2023 H.MAKI	FAR-3230S/3330S-SSD		外寸図
SCALE 1/15	MASS 表2参照 SEE TABLE 2	NAME	ANTENNA UNIT (W/PM, W/ DE-ICER)
DWG.No. C3623-G02- F	REF.No. 03-183-360G-7		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

表１ TABLE 1

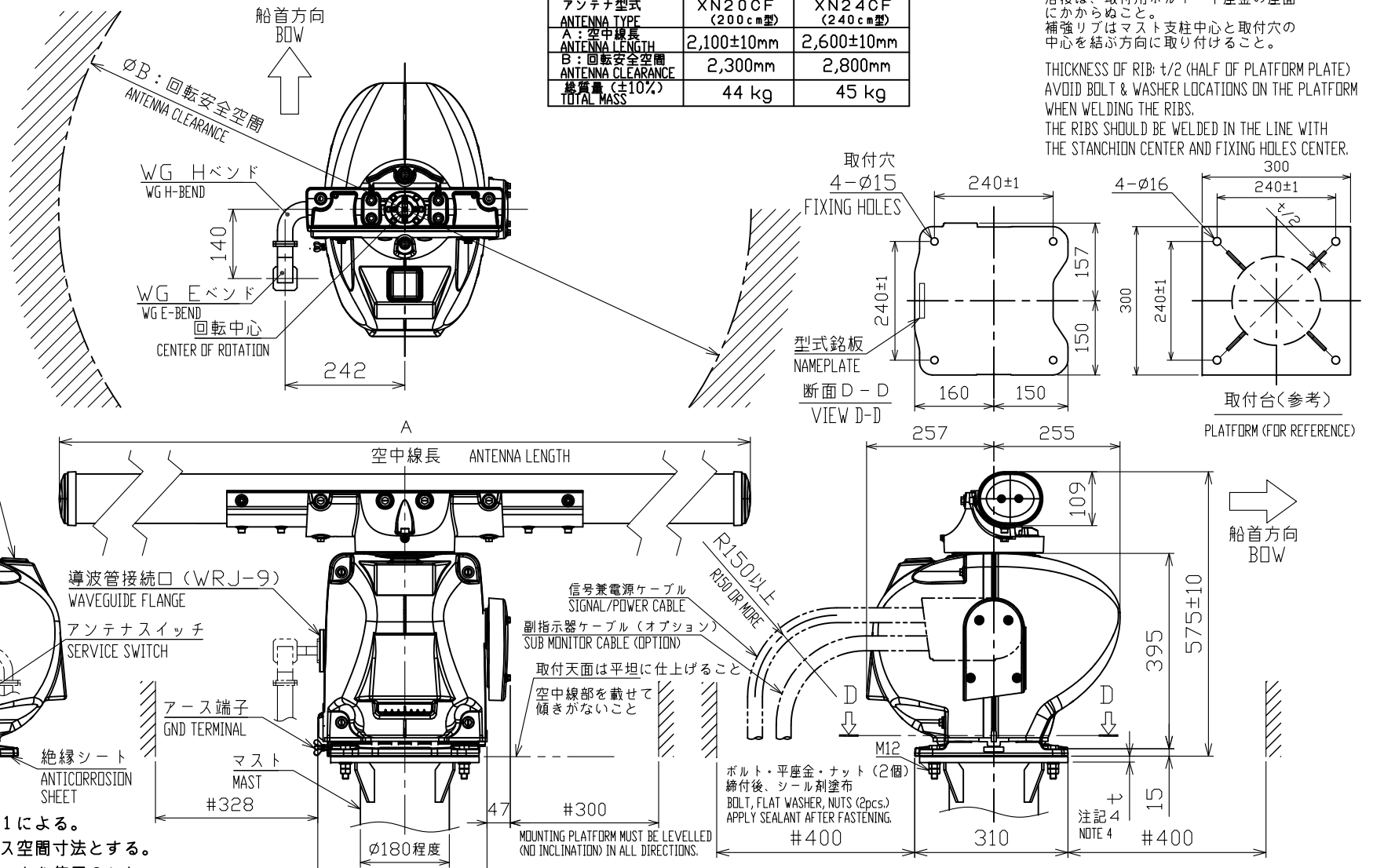
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

表２ TABLE 2

アンテナ型式 ANTENNA TYPE	XN20CF (200cm型)	XN24CF (240cm型)
A：空中線長 ANTENNA LENGTH	2,100±10mm	2,600±10mm
B：回転安全空間 ANTENNA CLEARANCE	2,300mm	2,800mm
総質量（±10%） TOTAL MASS	44 kg	45 kg

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付穴の中心を結ぶ方向に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED IN THE LINE WITH THE STANCHION CENTER AND FIXING HOLES CENTER.



注　記
１）指定外の寸法公差は表１による。
２）＃印寸法は最小サービス空間寸法とする。
３）取付用ネジはＭ１２ボルトを使用のこと。
４）取付台は厚さ（t）12mm以上の鋼・鉄板を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 12 mm OR MORE STEEL PLATE.

DRAWN 22/Aug/2022 T.YAMASAKI		TITLE RSB-130
CHECKED 22/Aug/2022 H.MAKI		名称 空中線部（氷結防止なし）
APPROVED 31/Aug/2022 H.MAKI	FAR-3220W/3220W-BB	外寸図
SCALE 1/12 MASS 表2参照 SEE TABLE 2		NAME ANTENNA UNIT (W/O DEICER)
DWG.No. C3624-G03- J	REF.No. 03-182-330G-7	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

表1 TABLE 1

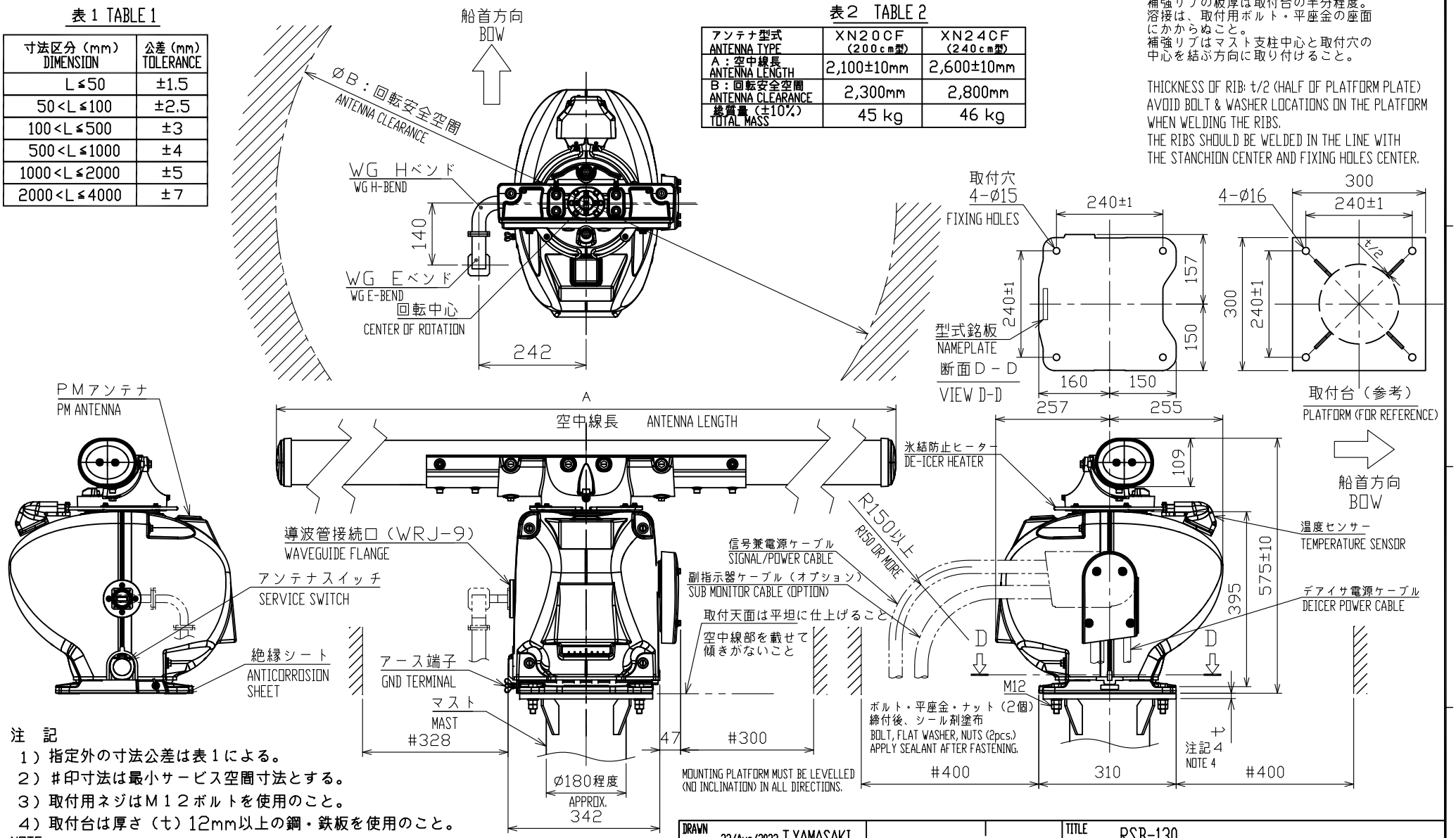
寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

表2 TABLE 2

	XN20CF (200cm型)	XN24CF (240cm型)
アンテナ型式 ANTENNA TYPE		
A：空中線長 ANTENNA LENGTH	2,100±10mm	2,600±10mm
B：回転安全空間 ANTENNA CLEARANCE	2,300mm	2,800mm
総質量 (±10%) TOTAL MASS	45 kg	46 kg

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面にかからぬこと。
補強リブはマスト支柱中心と取付穴の中心を結ぶ方向に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED IN THE LINE WITH THE STANCHION CENTER AND FIXING HOLES CENTER.



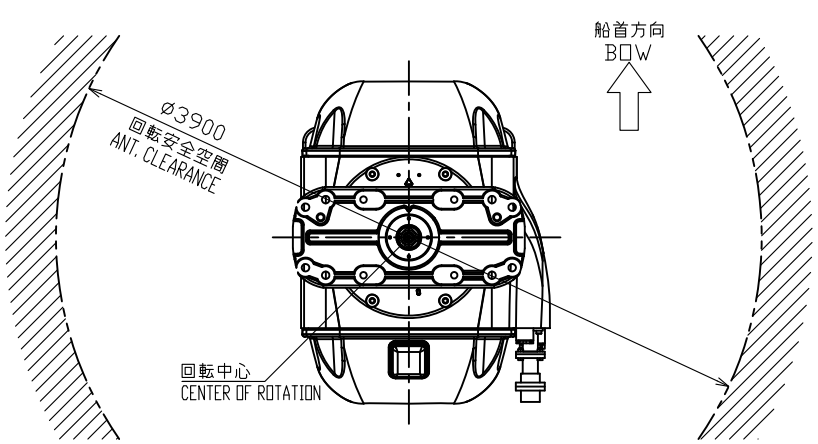
注 記
1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ１２ボルトを使用のこと。
4）取付台は厚さ（t）12mm以上の鋼・鉄板を使用のこと。

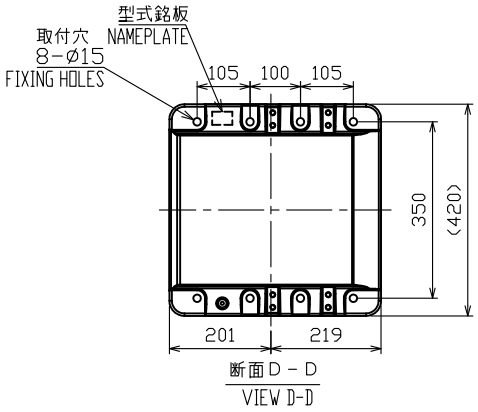
NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 12 mm OR MORE STEEL PLATE.

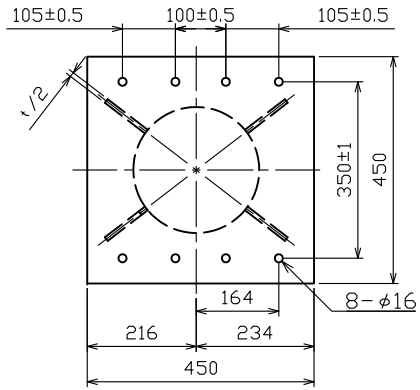
DRAWN 23/Aug/2022 T.YAMASAKI		TITLE RSB-130
CHECKED 23/Aug/2022 H.MAKI		名称 空中線部（氷結防止付）
APPROVED 31/Aug/2022 H.MAKI	FAR-3320W/3220W-BB	外寸図
SCALE 1/12 MASS 表2参照 SEE TABLE 2		NAME ANTENNA UNIT (W/ DEICER)
DWG.No. C3624-G04- G	REF.No. 03-182-331G-7	OUTLINE DRAWING

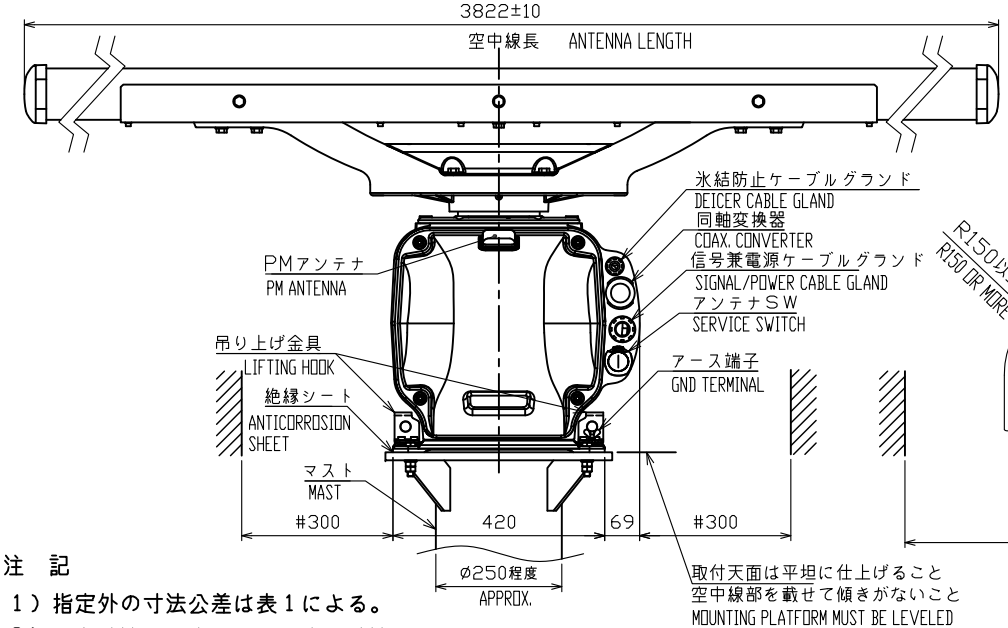
FURUNO ELECTRIC CO., LTD.

FURUNO

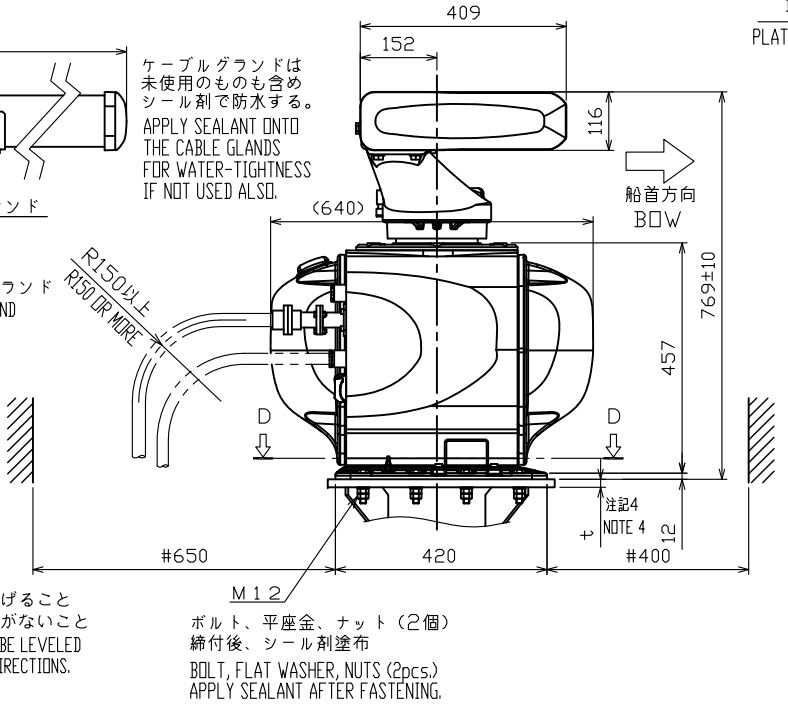








ケーブルグランドは
未使用のものも含め
シール剤で防水する。
APPLY SEALANT ONTO
THE CABLE GLANDS
FOR WATER-TIGHTNESS
IF NOT USED ALSO.



ボルト、平座金、ナット（2個）
締付後、シール剤塗布
BOLT, FLAT WASHER, NUTS (2pcs.)
APPLY SEALANT AFTER FASTENING.

取付天面は平坦に仕上げること
空中線部を載せて傾きがないこと
MOUNTING PLATFORM MUST BE LEVELED
(NO INCLINATION) IN ALL DIRECTIONS.

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面
にかからぬこと。
補強リブはマスト支柱中心と取付台の
対角線方向近傍に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM
WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED NEAR THE LINE WITH
THE STANCION CENTER AND PLATFORM CORNER.

表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5
2000<L≦4000	±7

注　記

1）指定外の寸法公差は表１による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ１２ボルトを使用のこと。
4）取付台厚さ（ｔ）：１５ｍｍ以上の鋼・鉄板を使用のこと。

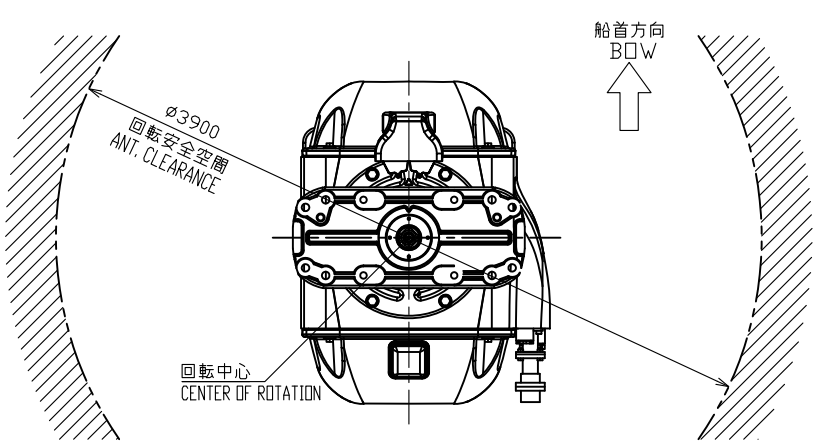
NOTE

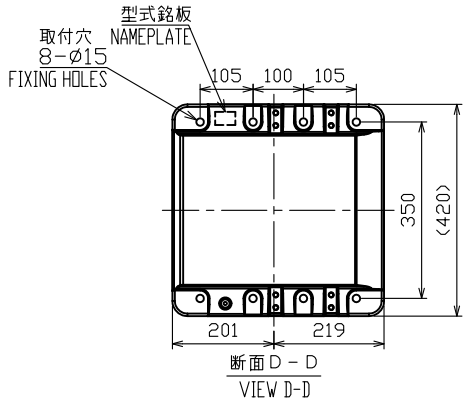
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 15 mm OR MORE STEEL PLATE.

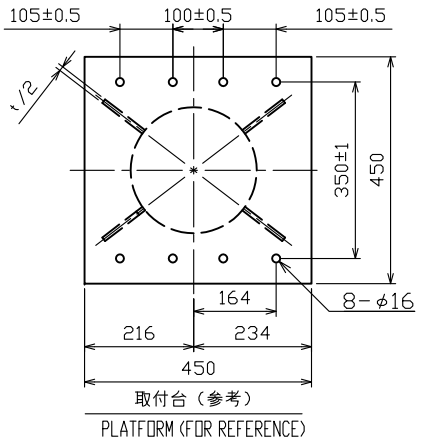
DRAWN 9/May/2020 T.YAMASAKI		TITLE	RSB-131
CHECKED 11/May/2020 H.MAKI		名称	空中線部（PMあり、氷結防止なし）
APPROVED 13/May/2020 H.MAKI	FAR-3330SW		外寸図
SCALE 1/15 MASS 128 ±10% kg		NAME	ANTENNA UNIT (W/ PM, W/O DE-ICER)
DWG.No. C3625-G01-F	REF.No. 03-183-330G-6		OUTLINE DRAWING

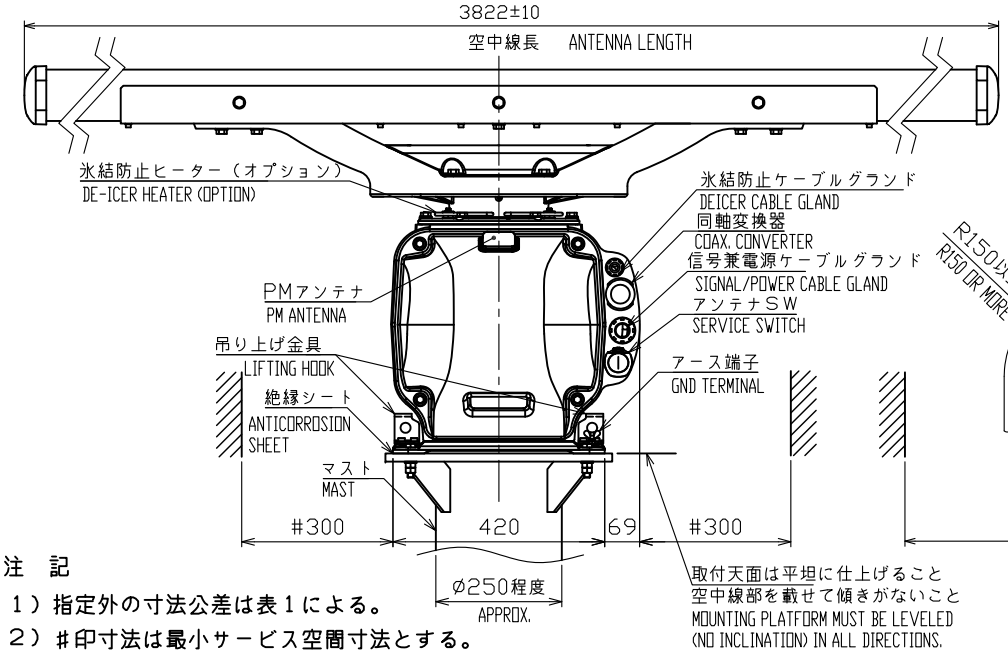
FURUNO ELECTRIC CO., LTD.

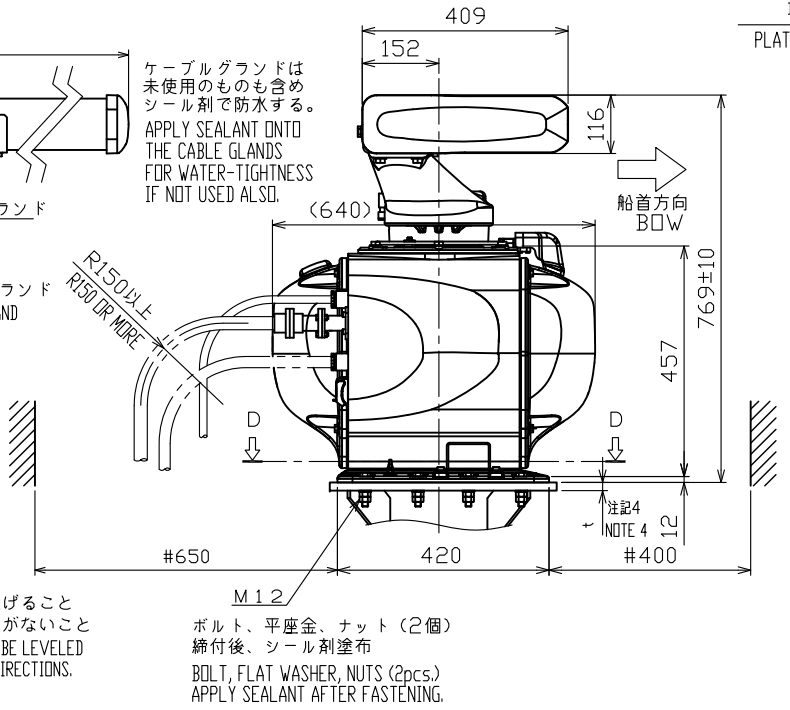
FURUNO











ケーブルグランドは
未使用のものも含め
シール剤で防水する。
APPLY SEALANT ONTO
THE CABLE GLANDS
FOR WATER-TIGHTNESS
IF NOT USED ALSO.

補強リブの板厚は取付台の半分程度。
溶接は、取付用ボルト・平座金の座面
にかからぬこと。
補強リブはマスト支柱中心と取付台の
対角線方向近傍に取り付けること。

THICKNESS OF RIB: t/2 (HALF OF PLATFORM PLATE)
AVOID BOLT & WASHER LOCATIONS ON THE PLATFORM
WHEN WELDING THE RIBS.
THE RIBS SHOULD BE WELDED NEAR THE LINE WITH
THE STANCION CENTER AND PLATFORM CORNER.

表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≤50	±1.5
50<L≤100	±2.5
100<L≤500	±3
500<L≤1000	±4
1000<L≤2000	±5
2000<L≤4000	±7

注　記

1）指定外の寸法公差は表１による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ１２ボルトを使用のこと。
4）取付台厚さ（ｔ）：１５ｍｍ以上の鋼・鉄板を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M12 BOLTS FOR FIXING THE UNIT.
4. THICKNESS OF PLATFORM (t): 15 mm OR MORE STEEL PLATE.

DRAWN 9/May/2020 T.YAMASAKI		TITLE	RSB-131
CHECKED 11/May/2020 H.MAKI		名称	空中線部（PMあり、氷結防止あり）
APPROVED 13/May/2020 H.MAKI	FAR-3330SW		外寸図
SCALE 1/15 MASS 129 ±10% kg		NAME	ANTENNA UNIT (W/PM, W/ DE-ICER)
DWG.No. C3625-G03-F	REF.No. 03-183-340G-5		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

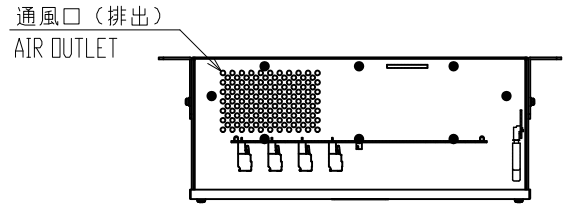
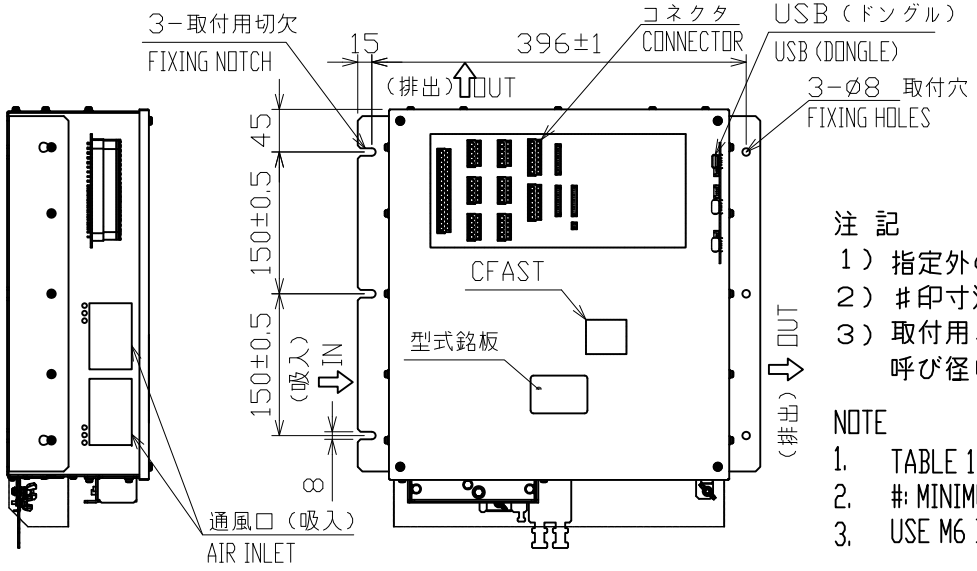


表 1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

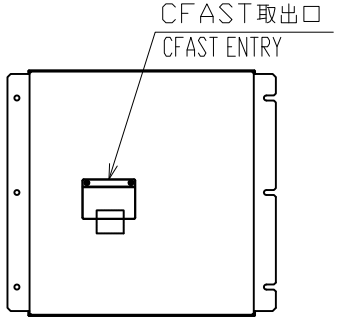


注 記

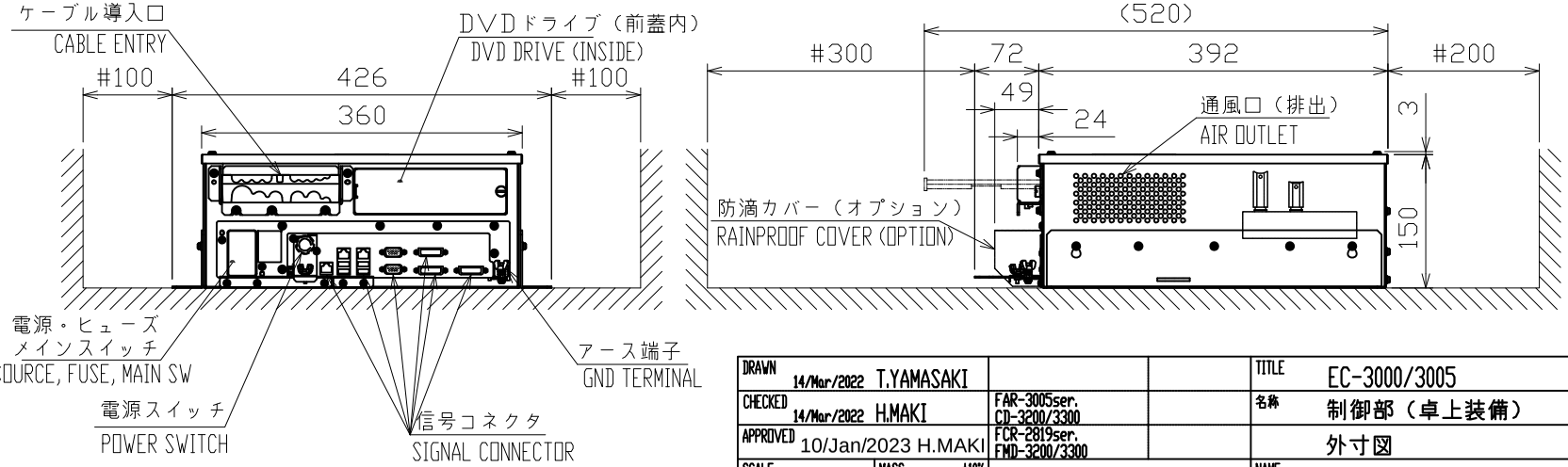
1）指定外の寸法公差は表 1 による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ６ボルトまたはコーチボルト
　呼び径６を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M6 BOLTS OR COACH SCREWS Ø6 FOR FIXING THE UNIT.



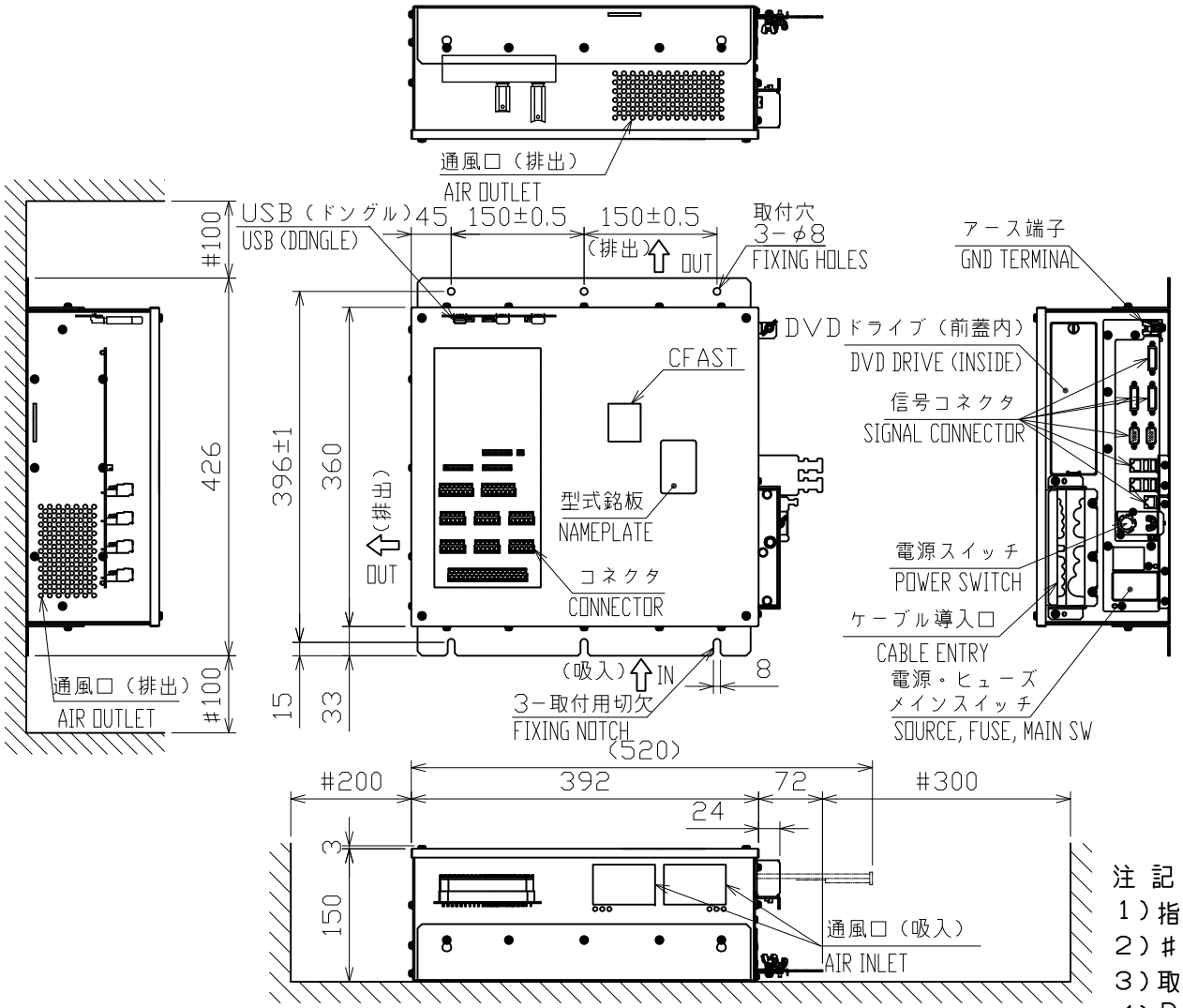
背面（尺度:1/12）
REAR VIEW (SCALE: 1/12)

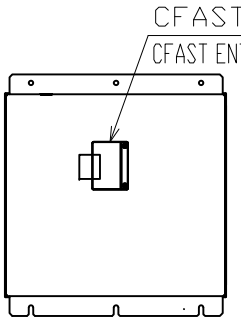


DRAWN 14/Mar/2022 T.YAMASAKI			TITLE EC-3000/3005
CHECKED 14/Mar/2022 H.MAKI	FAR-3005ser. CD-3200/3300		名称 制御部（卓上装備）
APPROVED 10/Jan/2023 H.MAKI	FCR-2819ser. FMD-3200/3300		外寸図
SCALE 1/8 MASS 14 ±10% kg			NAME PROCESSOR UNIT (TABLETOP MOUNT)
DWG.No. C4473-G14- C	REF.No. 24-014-010G-4		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO



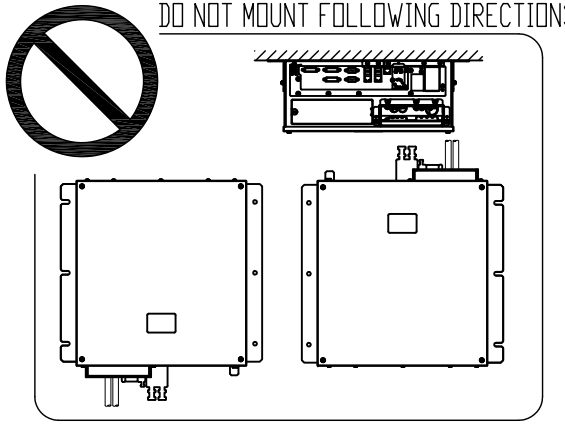


背面（尺度： 1／12）
REAR VIEW (SCALE: 1/12)

表 1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

下図の向きでは取付けできません
DO NOT MOUNT FOLLOWING DIRECTIONS



注 記
1）指定外の寸法公差は表１による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはM6ボルトまたはコーチネジ呼び径6を使用のこと。
4）ＤＶＤドライブの向きは左右いずれかとする。切欠きが下向きとなるよう取付金具（工材）を本体に取り付ける。

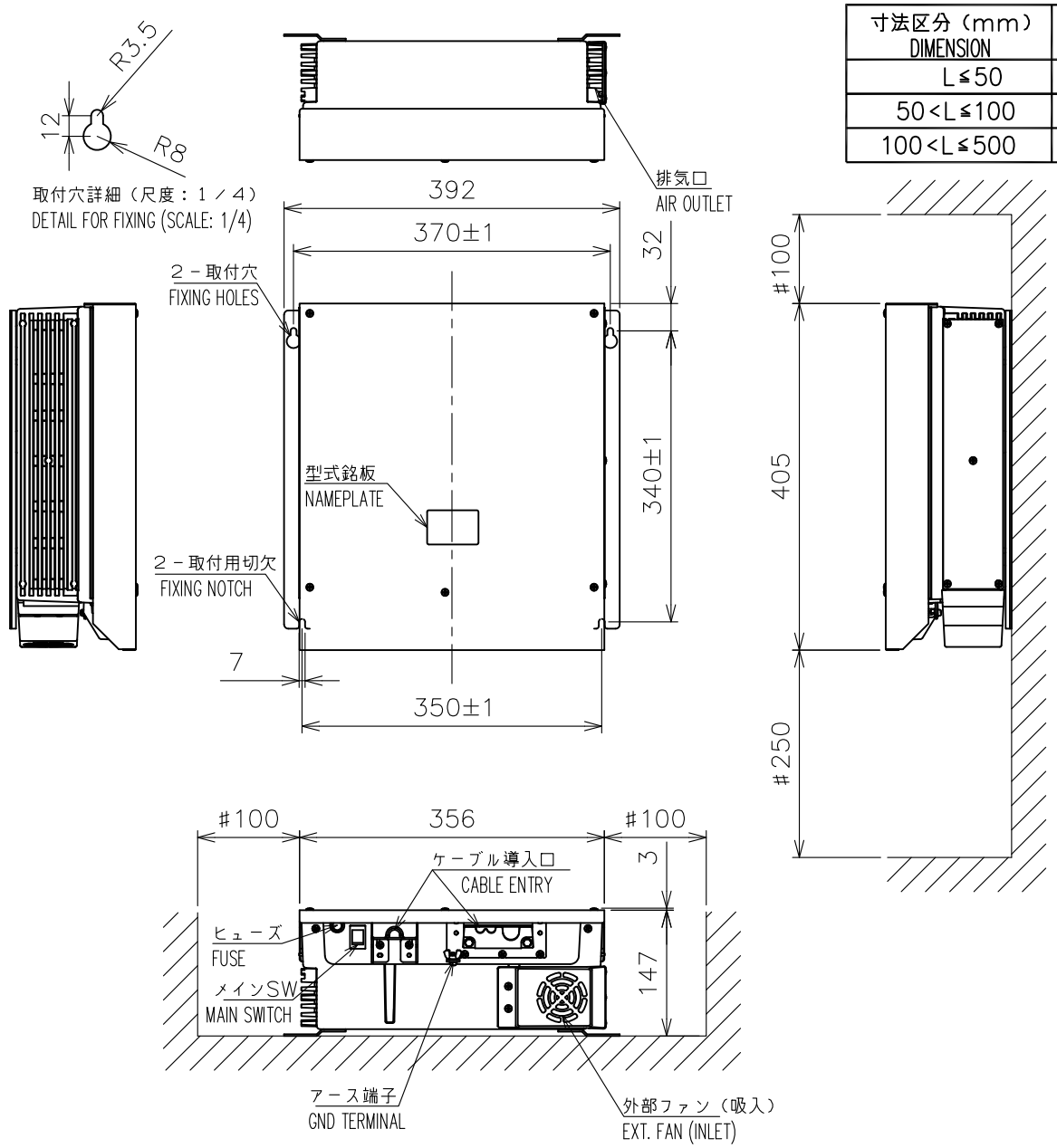
NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M6 BOLTS OR COACH SCREWS φ6 FOR FIXING THE UNIT.
4. FACE THE DVD DRIVE TO RIGHT OR LEFT SIDE EITHER. MOUNT THE FIXING PLATES (SUPPLIED) TO THE CHASSIS AS THE FIXING NOTCH FACES TO BOTTOM.

DRAWN 14/Mar/2022 T.YAMASAKI			TITLE EC-3000/3005
CHECKED 14/Mar/2022 H.MAKI	FAR-3005ser. CD-3200/3300		名称 制御部（壁掛装備）
APPROVED 10/Jan/2023 H.MAKI	FCR-2819ser. FMD-3200/3300		外寸図
SCALE 1/8 MASS 14 ±10% kg			NAME PROCESSOR UNIT (BULKHEAD MOUNT)
DWG.No. C4473-G01-E	REF.No. 24-014-011G-3		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3



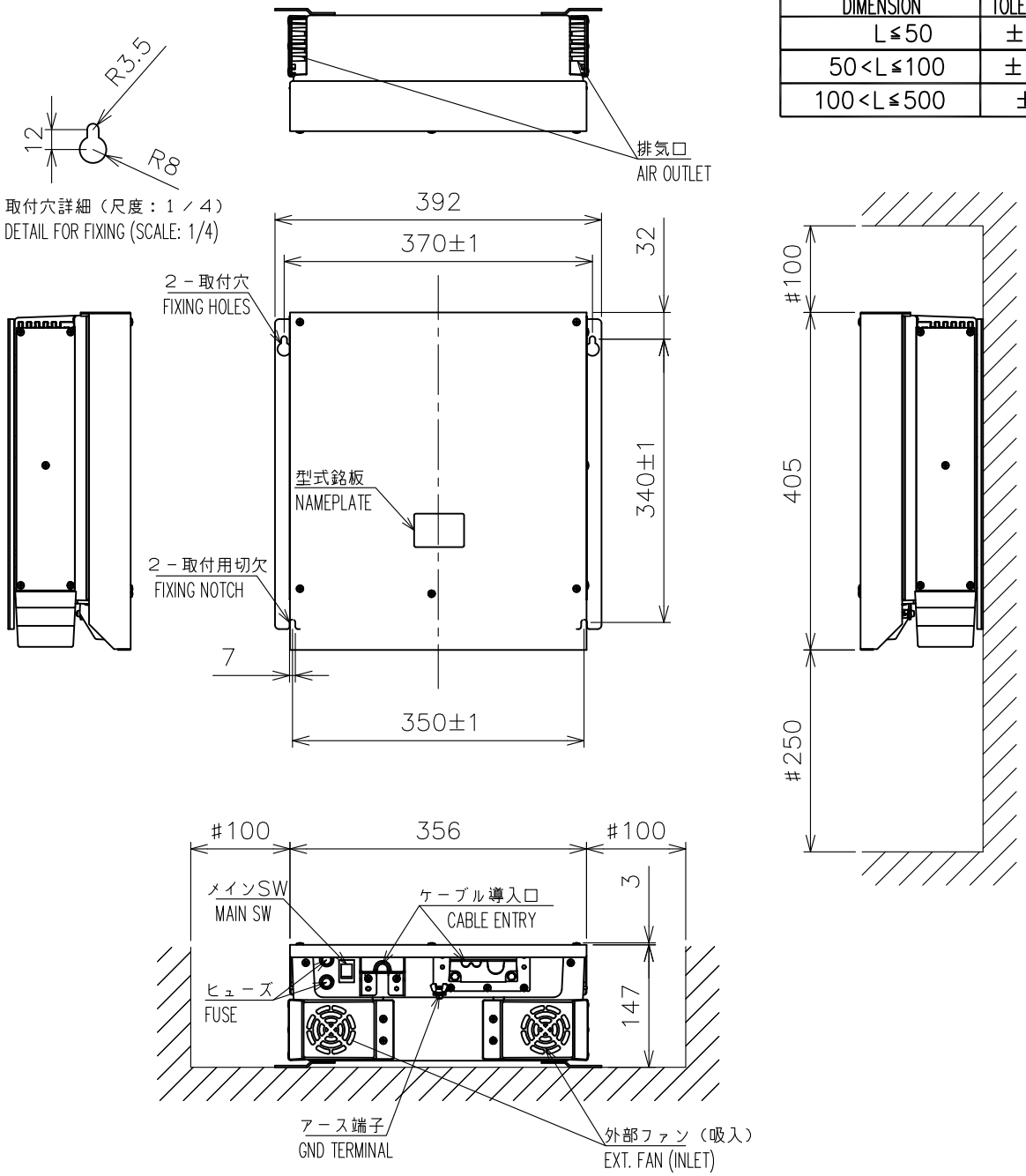
注記
1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ６ボルトまたはコーチボルト呼び径６を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M6 BOLTS OR COACH SCREWS ø6 FOR FIXING THE UNIT.

DRAWN 20/Mar/2014 T.YAMASAKI		TITLE	PSU-014/016
CHECKED 20/Mar/2014 H.MAKI		名称	空中線電源部
APPROVED 24/Mar/2014 H.MAKI	FAR-3210/3220 ser.		外寸図
SCALE 1/8 MASS 8.5 ±10% kg		NAME	POWER SUPPLY UNIT
DWG. No. C3616-G01- B	REF. No. 03-182-910G-3		OUTLINE DRAWING

表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3



注記

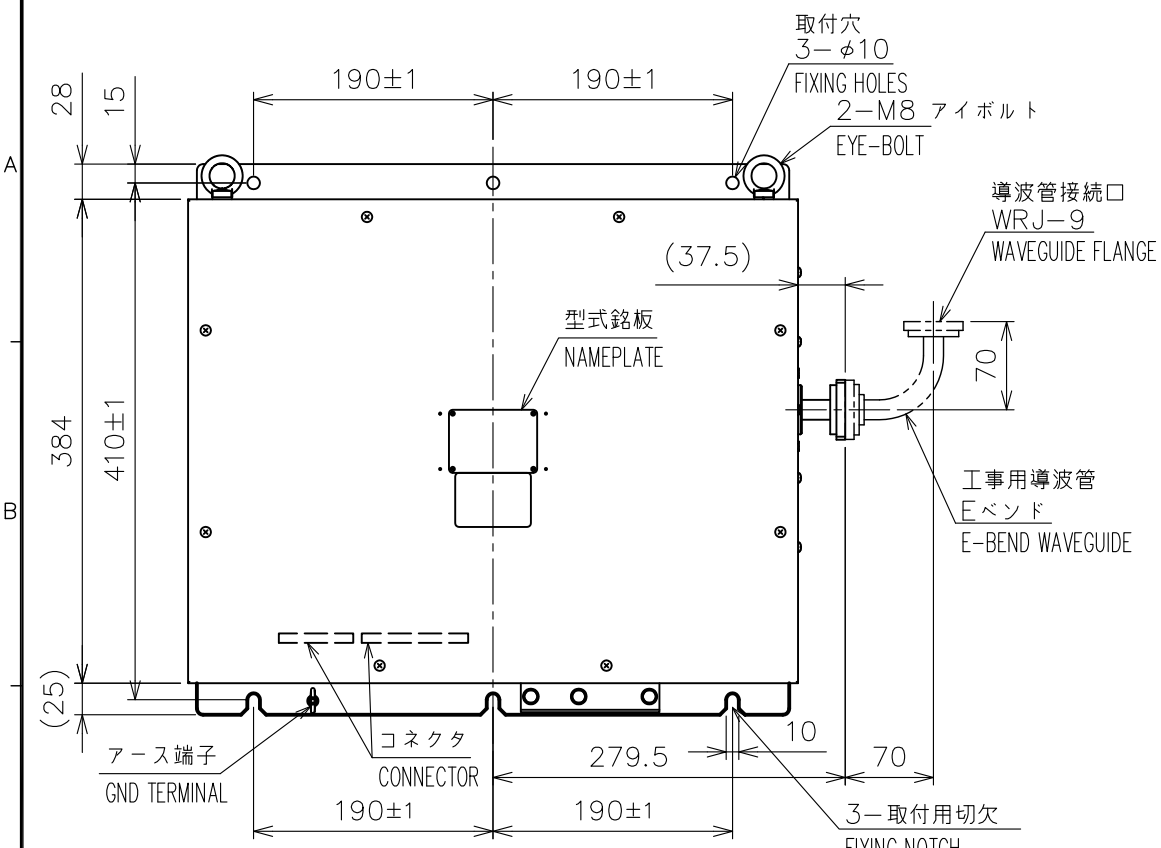
1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはＭ６ボルトまたはコーチボルト呼び径６を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M6 BOLTS OR COACH SCREWS ø6 FOR FIXING THE UNIT.

DRAWN 20/Mar/2014 T.YAMASAKI		TITLE	PSU-015/018
CHECKED 20/Mar/2014 H.MAKI		名称	空中線電源部
APPROVED 24/Mar/2014 H.MAKI	FAR-3230S ser.		外寸図
SCALE 1/8 MASS 10 ±10% kg		NAME	POWER SUPPLY UNIT
DWG. No. C3618-G01- B	REF. No. 03-183-910G-3		OUTLINE DRAWING

FURUNO



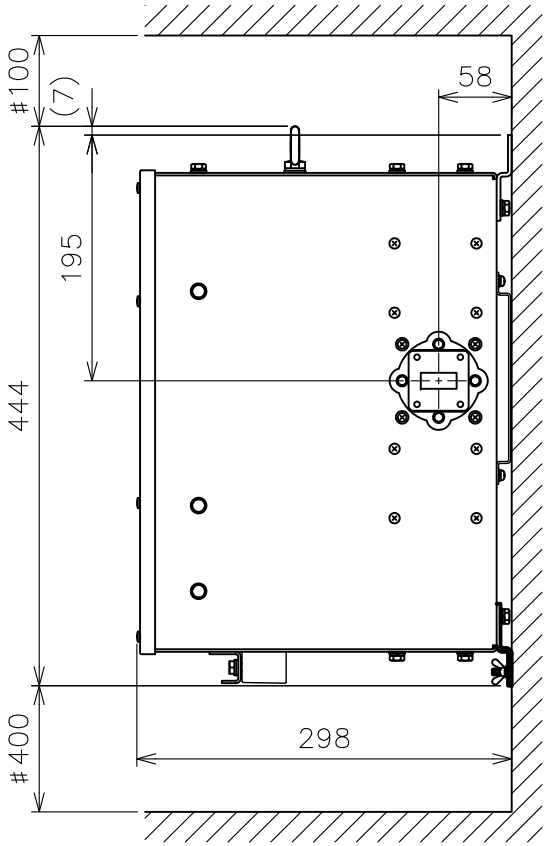
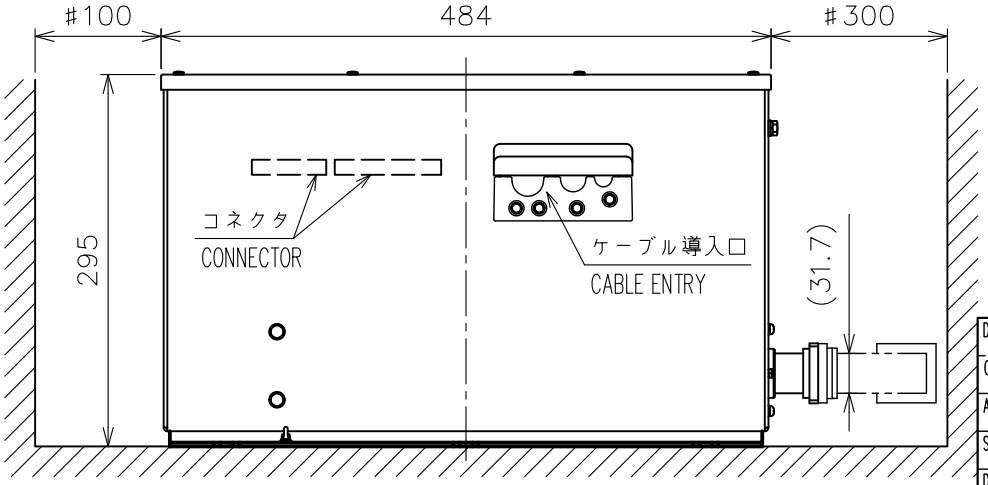


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3



注　記　1）　指定外の寸法公差は表１による。
　　2）　＃印寸法は最小サービス空間寸法とする。
　　3）　取付用ネジはＭ８ボルトまたはコーチボルト呼び径８を使用のこと。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2.　#: MINIMUM SERVICE CLEARANCE.
　　3.　USE M8 BOLTS OR COACH SCREWS ø8 FOR FIXING THE UNIT.

DRAWN 8/Jun/2018 T.YAMASAKI			TITLE RTR-108
CHECKED 8/Jun/2018 H.MAKI			名称 送受信部（壁掛装備）
APPROVED 8/Jun/2018 H.MAKI		FAR-3320W	外寸図
SCALE 1/6	MASS 17 ±10% kg		NAME TRANSCEIVER UNIT (BULKHEAD MOUNT)
DWG. No. C3624-G01- B		REF. No. 03-182-530G-C	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

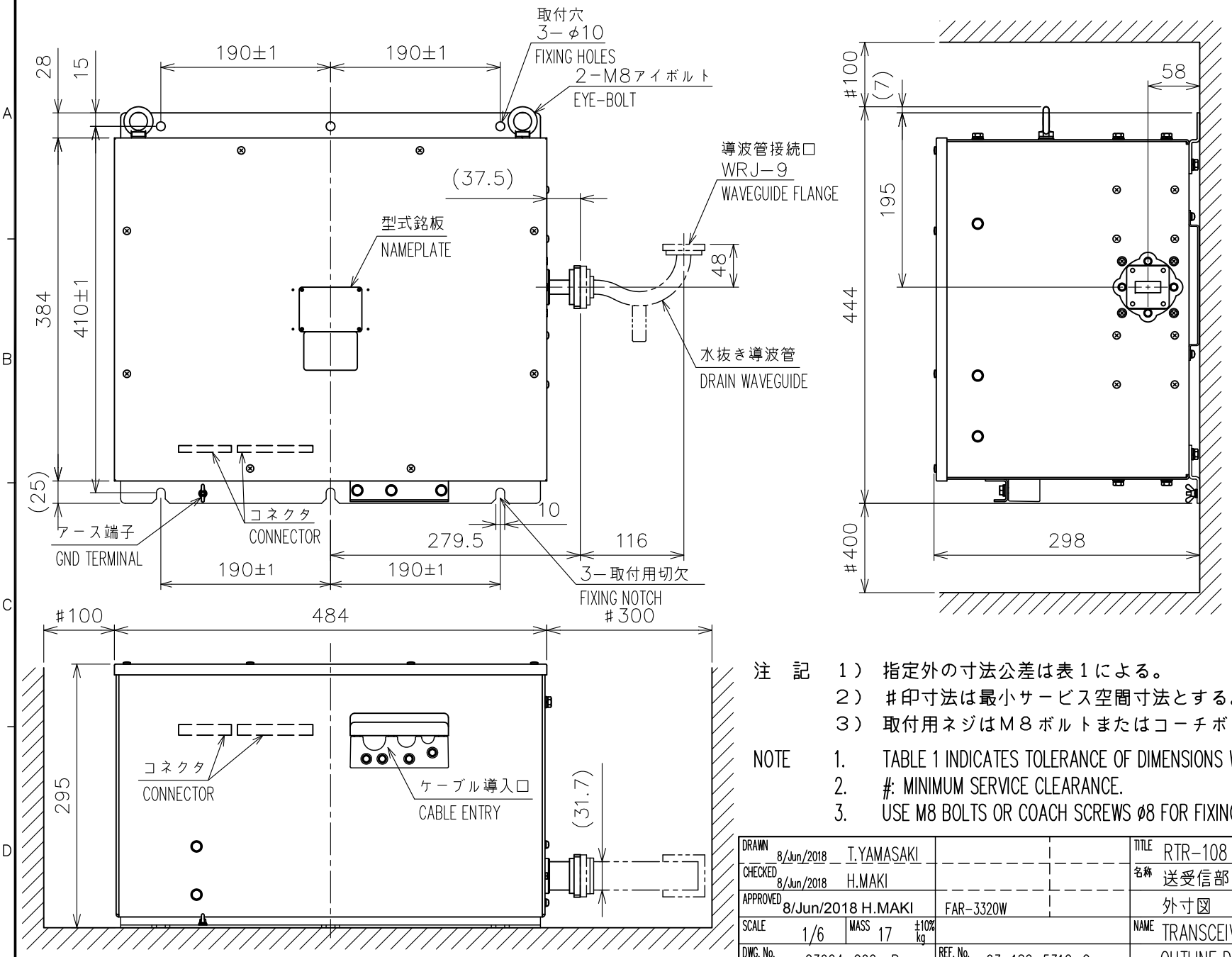


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注　記　1）　指定外の寸法公差は表1による。
　　2）　＃印寸法は最小サービス空間寸法とする。
　　3）　取付用ネジはＭ８ボルトまたはコーチボルト呼び径８を使用のこと。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2.　#: MINIMUM SERVICE CLEARANCE.
　　3.　USE M8 BOLTS OR COACH SCREWS ø8 FOR FIXING THE UNIT.

DRAWN 8/Jun/2018 T.YAMASAKI		TITLE	RTR-108
CHECKED 8/Jun/2018 H.MAKI		名称	送受信部（壁掛装備）
APPROVED 8/Jun/2018 H.MAKI	FAR-3320W		外寸図
SCALE 1/6	MASS 17 ±10% kg	NAME	TRANSCEIVER UNIT (BULKHEAD MOUNT)
DWG. No. C3624-G02- B	REF. No. 03-182-531G-C		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

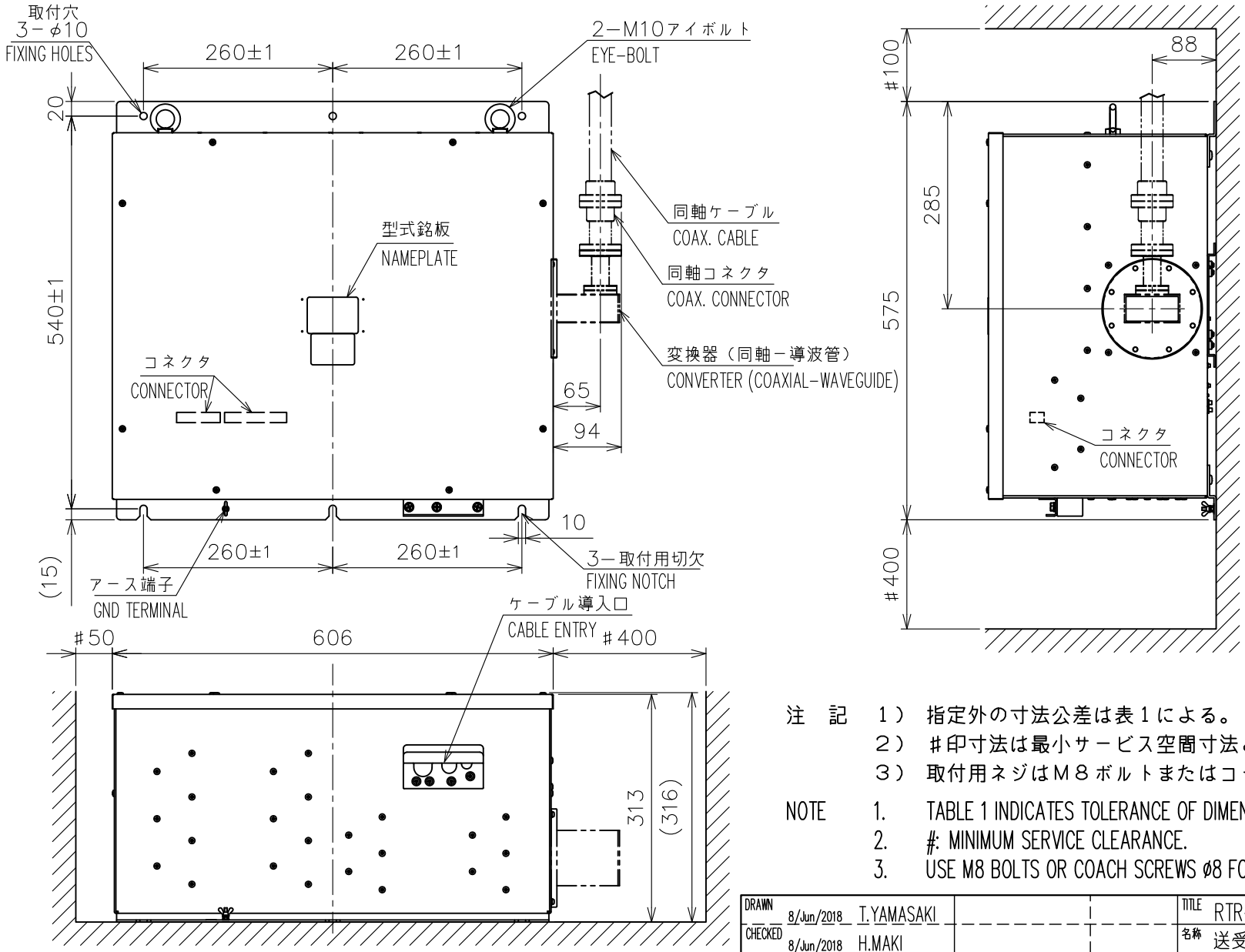


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

注　記　1）　指定外の寸法公差は表１による。
　　2）　＃印寸法は最小サービス空間寸法とする。
　　3）　取付用ネジはＭ８ボルトまたはコーチボルト呼び径８を使用のこと。

NOTE　1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2. #: MINIMUM SERVICE CLEARANCE.
　　3. USE M8 BOLTS OR COACH SCREWS ø8 FOR FIXING THE UNIT.

DRAWN 8/Jun/2018 T.YAMASAKI			TITLE RTR-109
CHECKED 8/Jun/2018 H.MAKI			名称 送受信部（壁掛装備）
APPROVED 8/Jun/2018 H.MAKI		FAR-3330SW	外寸図
SCALE 1/8	MASS 24 ±10% kg		NAME TRANSCEIVER UNIT (BULKHEAD MOUNT)
DWG.No. C3625-G02- B		REF.No. 03-183-530G-C	OUTLINE DRAWING

FURUNO

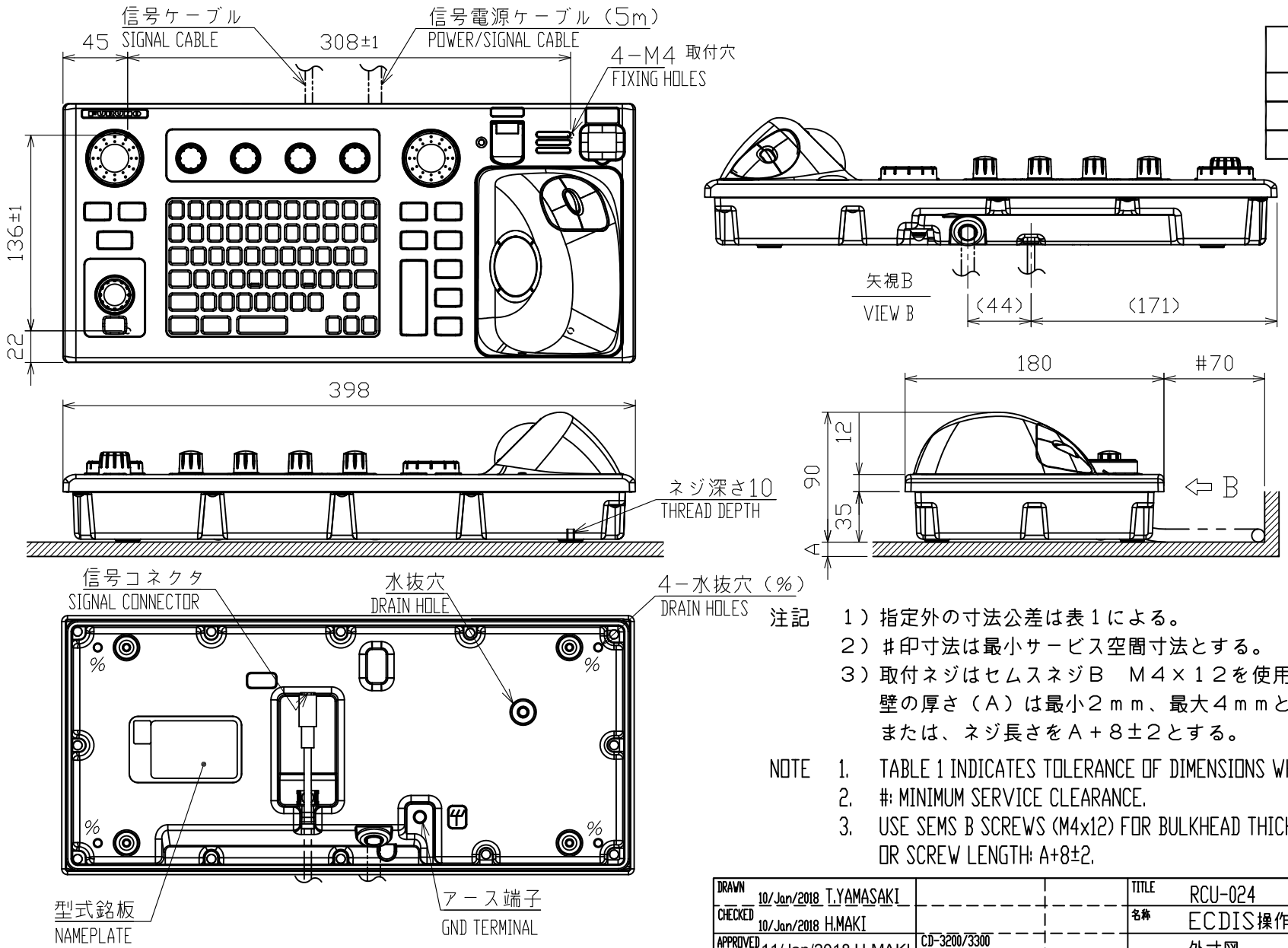


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注記
1）指定外の寸法公差は表１による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付ネジはセムスネジＢ　Ｍ４×１２を使用のこと。
壁の厚さ（Ａ）は最小２ｍｍ、最大４ｍｍとする。
または、ネジ長さをＡ＋８±２とする。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE SEMS B SCREWS (M4x12) FOR BULKHEAD THICKNESS(A):2≦A≦4 OR SCREW LENGTH: A+8±2.

DRAWN 10/Jan/2018 T.YAMASAKI		TITLE	RCU-024
CHECKED 10/Jan/2018 H.MAKI		名称	ECDIS操作部（卓上装備）
APPROVED 11/Jan/2018 H.MAKI	CD-3200/3300 FMD-3200/3300		外寸図
SCALE 1/4 MASS 2.1 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	ECDIS CONTROL UNIT (TABLETOP MOUNT)
DWG.No. C4473-G19- A	REF.No. 24-014-510G-1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

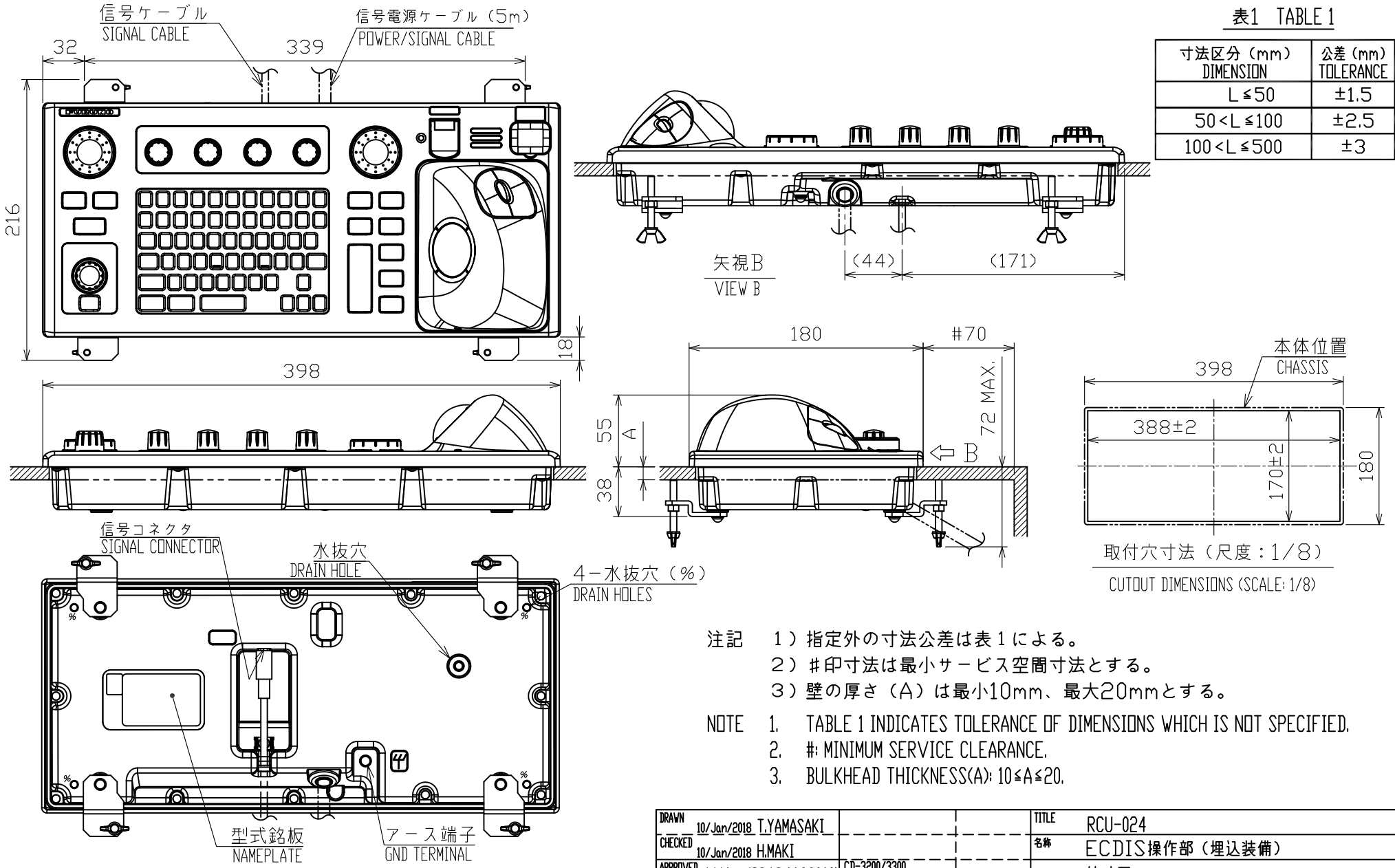


表1　TABLE 1

寸法区分（mm）DIMENSION	公差（mm）TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注記　1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）壁の厚さ（A）は最小10mm、最大20mmとする。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS(A): 10≦A≦20.

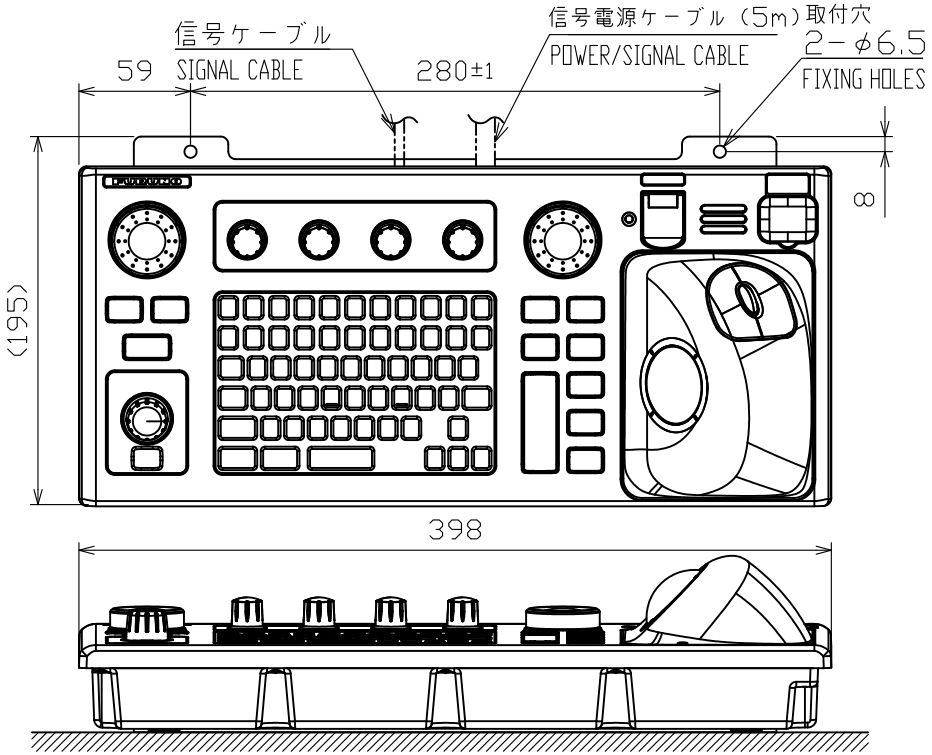
DRAWN 10/Jan/2018 T.YAMASAKI		TITLE	RCU-024
CHECKED 10/Jan/2018 H.MAKI		名称	ECDIS操作部（埋込装備）
APPROVED 11/Jan/2018 H.MAKI	CD-3200/3300 FMD-3200/3300		外寸図
SCALE 1/4 MASS 2.3 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	ECDIS CONTROL UNIT (FLUSH MOUNT)
DWG.No. C4473-G18- A	REF.No. 24-014-500G-1		OUTLINE DRAWING

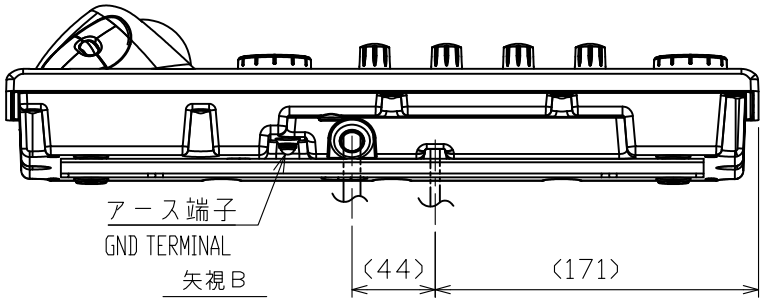
FURUNO ELECTRIC CO., LTD.

FURUNO

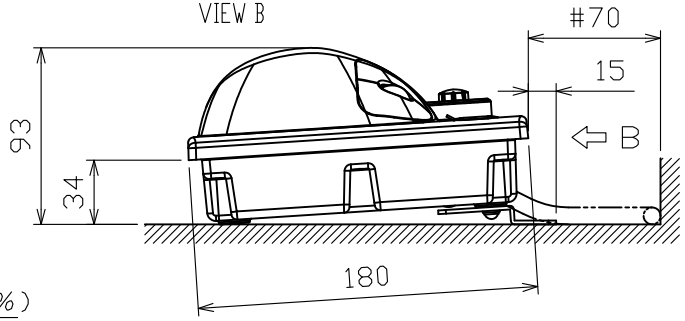
表1 TABLE 1

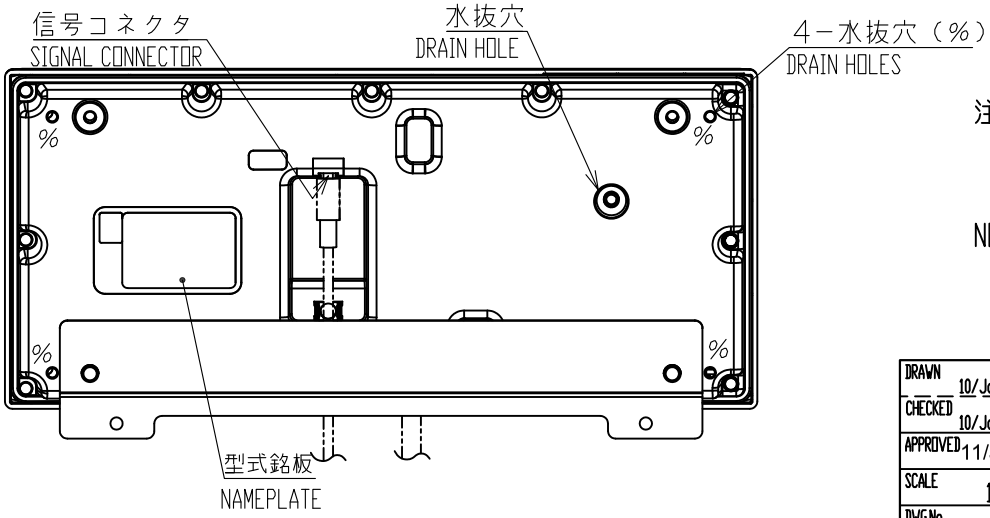
寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3





矢視B
VIEW B





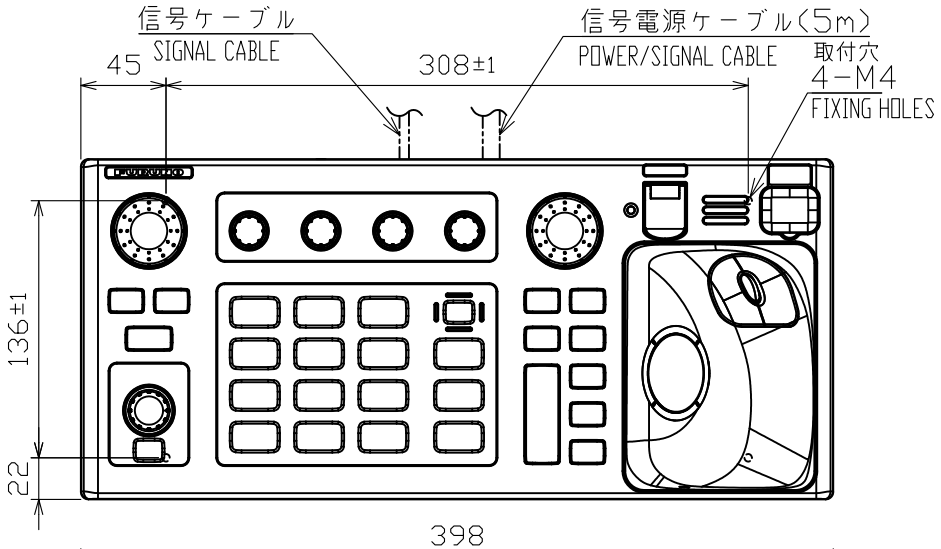
注記　1）指定外の寸法公差は表1による。
　　2）#印寸法は最小サービス空間寸法とする。
　　3）壁の厚さ（A）は最小10mm、最大20mmとする。

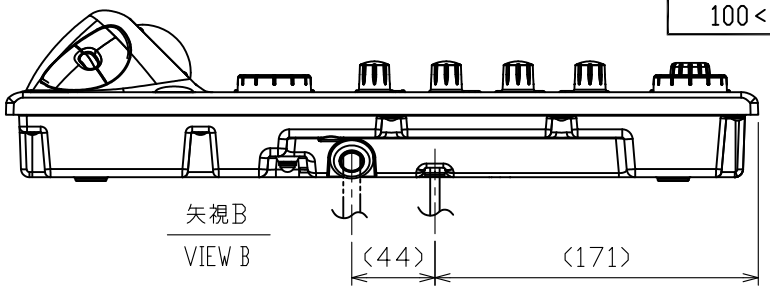
NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS(A): 10≦A≦20.

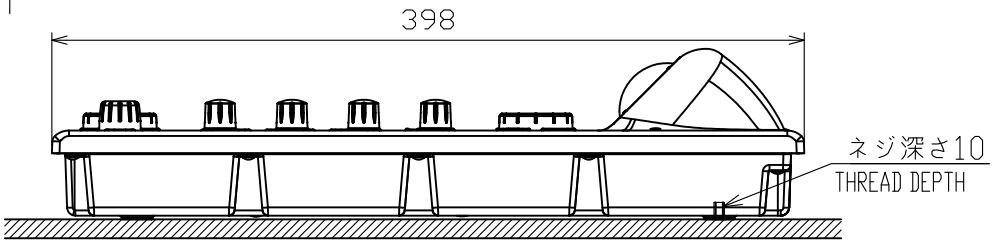
DRAWN 10/Jan/2018 T.YAMASAKI		TITLE	RCU-024
CHECKED 10/Jan/2018 H.MAKI		名称	ECDIS操作部（取付金具）
APPROVED 11/Jan/2018 H.MAKI	CD-3200/3300 FMD-3200/3300		外寸図
SCALE 1/4 MASS 2.4 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	ECDIS CONTROL UNIT (FIXTURE MOUNT)
DWG.No. C4473-G20- A	REF.No. 24-014-520G-1		OUTLINE DRAWING

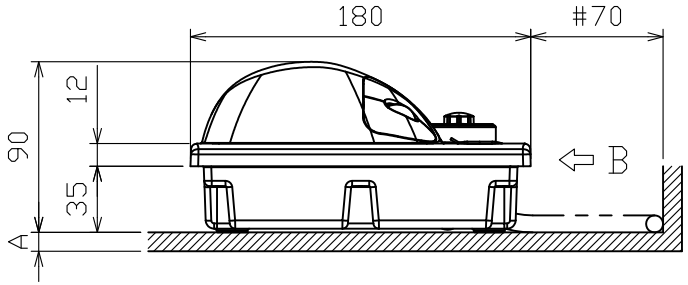
FURUNO ELECTRIC CO., LTD.

FURUNO









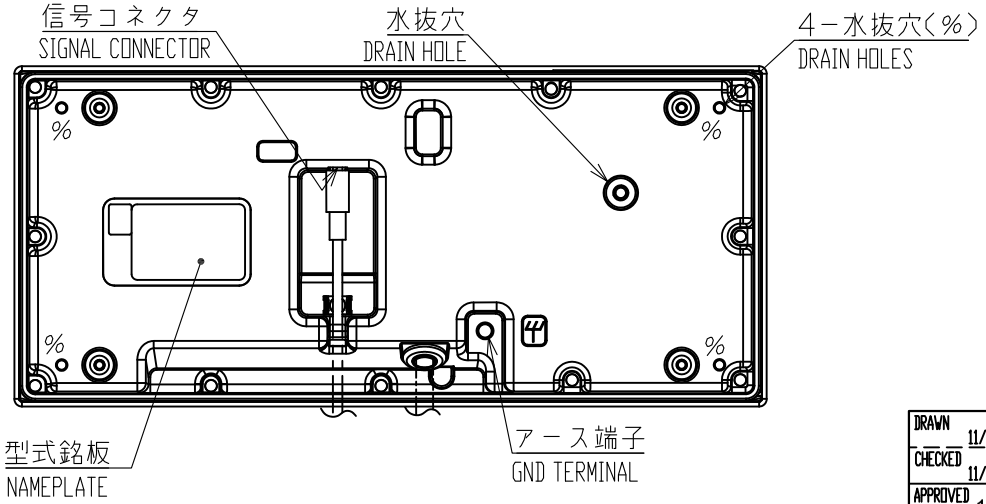


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

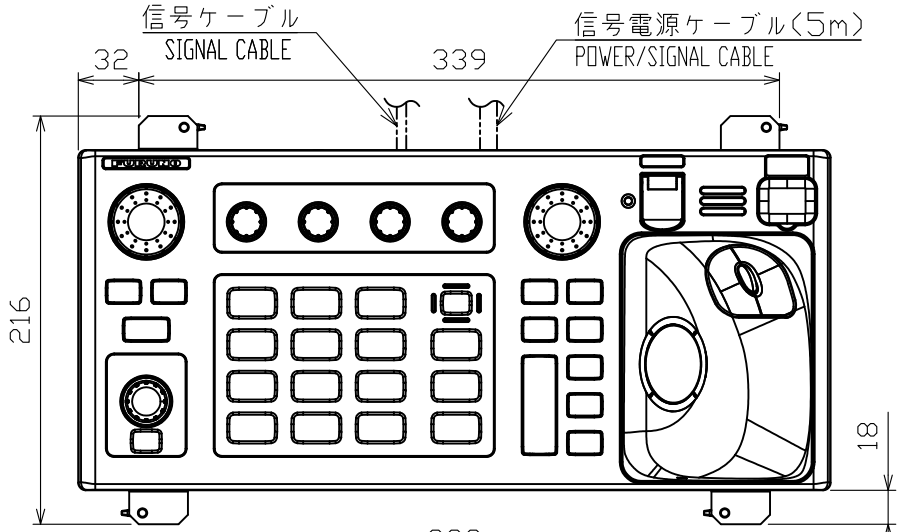
注 記 1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付ネジはセムスネジＢ Ｍ４×１２を使用のこと。
壁の厚さ（Ａ）は最小２、最大４とする。
または、ねじ長さを（Ａ＋８±２）とする。

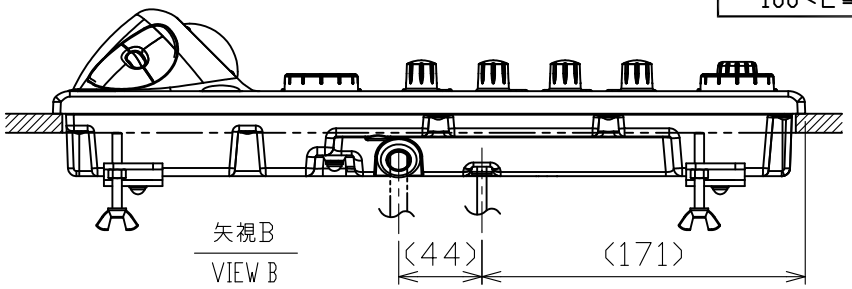
NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE SEMS B SCREWS M4×12 FOR FIXING THE UNIT.
BULKHEAD THICKNESS (A): 2≦A≦4 OR SCREW LENGTH: A+8±2.

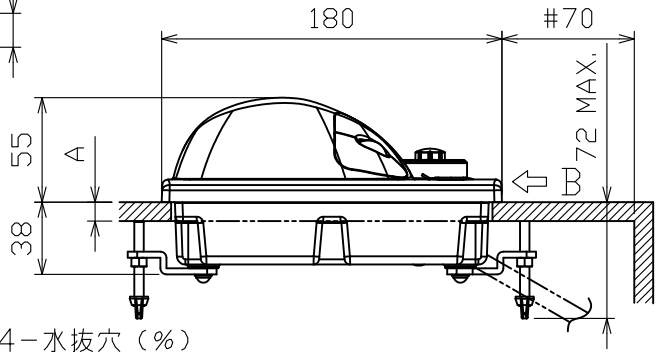
DRAWN 11/Jan/2018 T.YAMASAKI		TITLE	RCU-025
CHECKED 11/Jan/2018 H.MAKI		名称	レーダー操作部（卓上装備）
APPROVED 11/Jan/2018 H.MAKI	FAR-32x0/33x0 FCR-21x9/28x9		外寸図
SCALE 1/4 MASS 2.1 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	RADAR CONTROL UNIT (TABLETOP MOUNT)
DWG.No. C3607-G05- A	REF.No. 03-179-200G-0		OUTLINE DRAWING

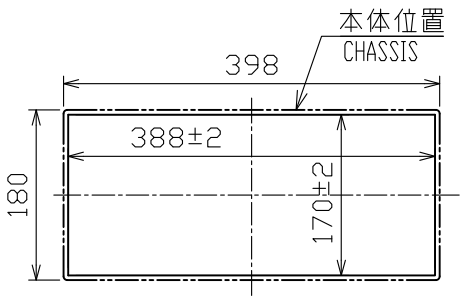
FURUNO ELECTRIC CO., LTD.

FURUNO









取付穴寸法（尺度：1／8）
CUTOUT DIMENSIONS (SCALE: 1/8)

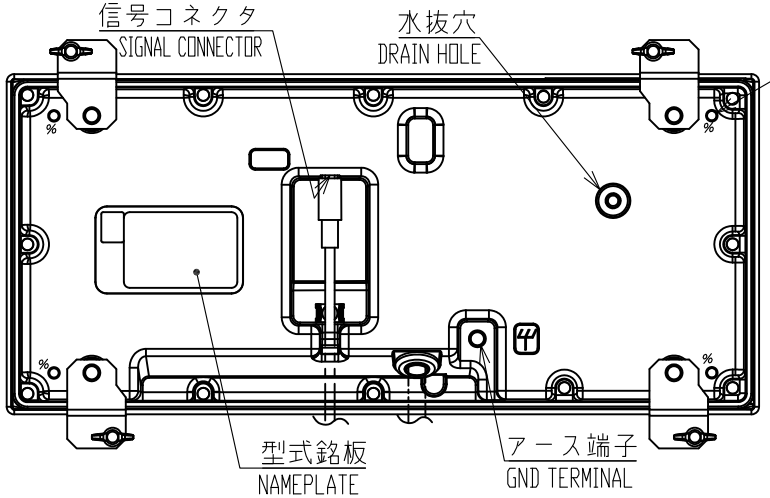


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注記　1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）壁の厚さ（A）は最小10mm、最大20mmとする。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS(A): 10≦A≦20.

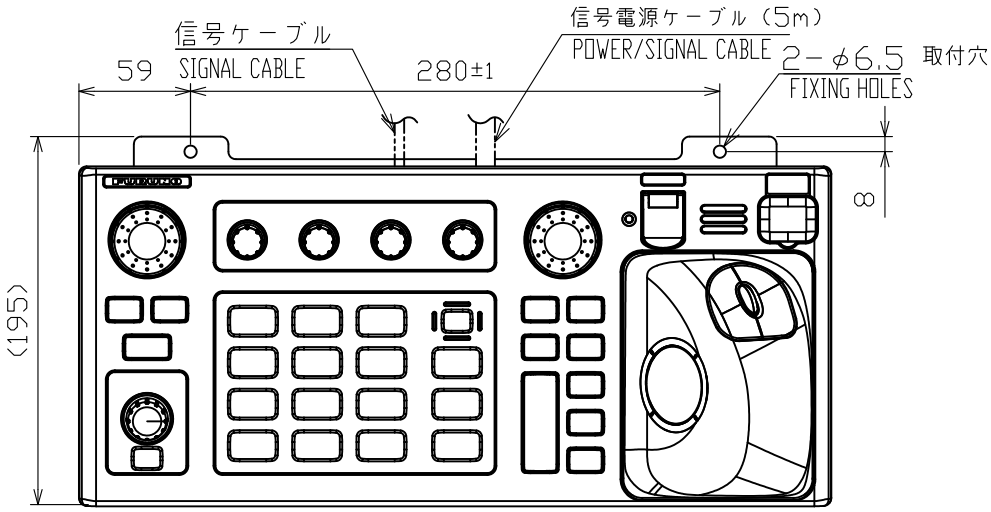
DRAWN 11/Jan/2018 T.YAMASAKI		TITLE	RCU-025
CHECKED 11/Jan/2018 H.MAKI		名称	レーダー操作部（埋込装備）
APPROVED 11/Jan/2018 H.MAKI	FAR-32x0/33x0 FCR-21x9/28x9		外寸図
SCALE 1/4 MASS 2.3 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	RADAR CONTROL UNIT (FLUSH MOUNT)
DWG.No. C3607-G06-A	REF.No. 03-179-210G-0		OUTLINE DRAWING

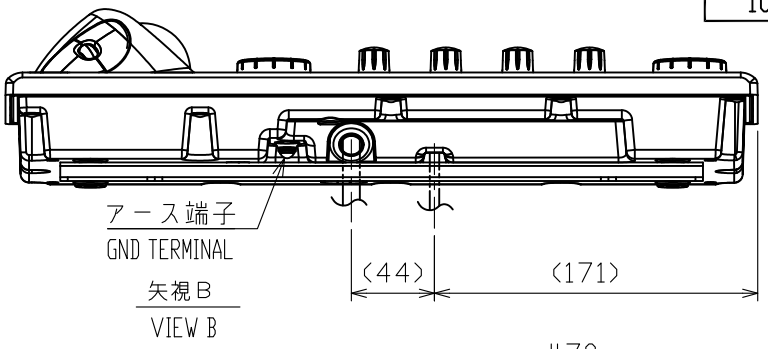
FURUNO ELECTRIC CO., LTD.

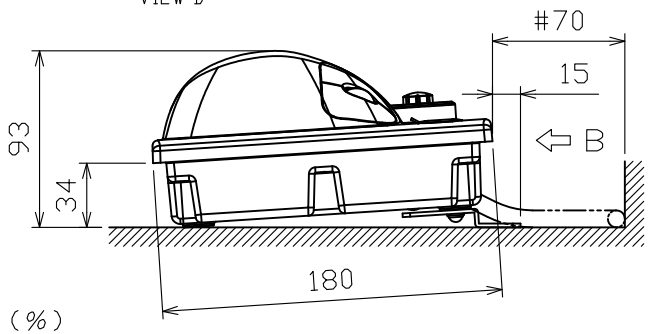
FURUNO

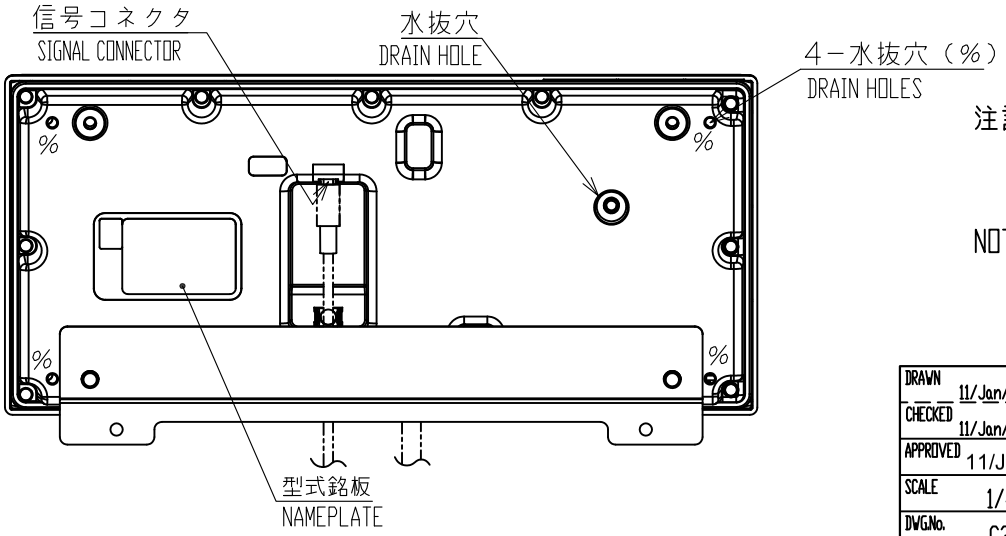
表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3









注記 1）指定外の寸法公差は表1による。
2）#印寸法は最小サービス空間寸法とする。
3）壁の厚さ（A）は最小10mm、最大20mmとする。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS(A): 10≦A≦20.

DRAWN 11/Jan/2018 T.YAMASAKI		TITLE	RCU-025
CHECKED 11/Jan/2018 H.MAKI		名称	レーダー操作部（取付金具）
APPROVED 11/Jan/2018 H.MAKI	FAR-32x0/33x0 FCR-21x9/28x9		外寸図
SCALE 1/4 MASS 2.4 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	RADAR CONTROL UNIT (FIXTURE MOUNT)
DWG.No. C3607-G07-A	REF.No. 03-179-220G-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

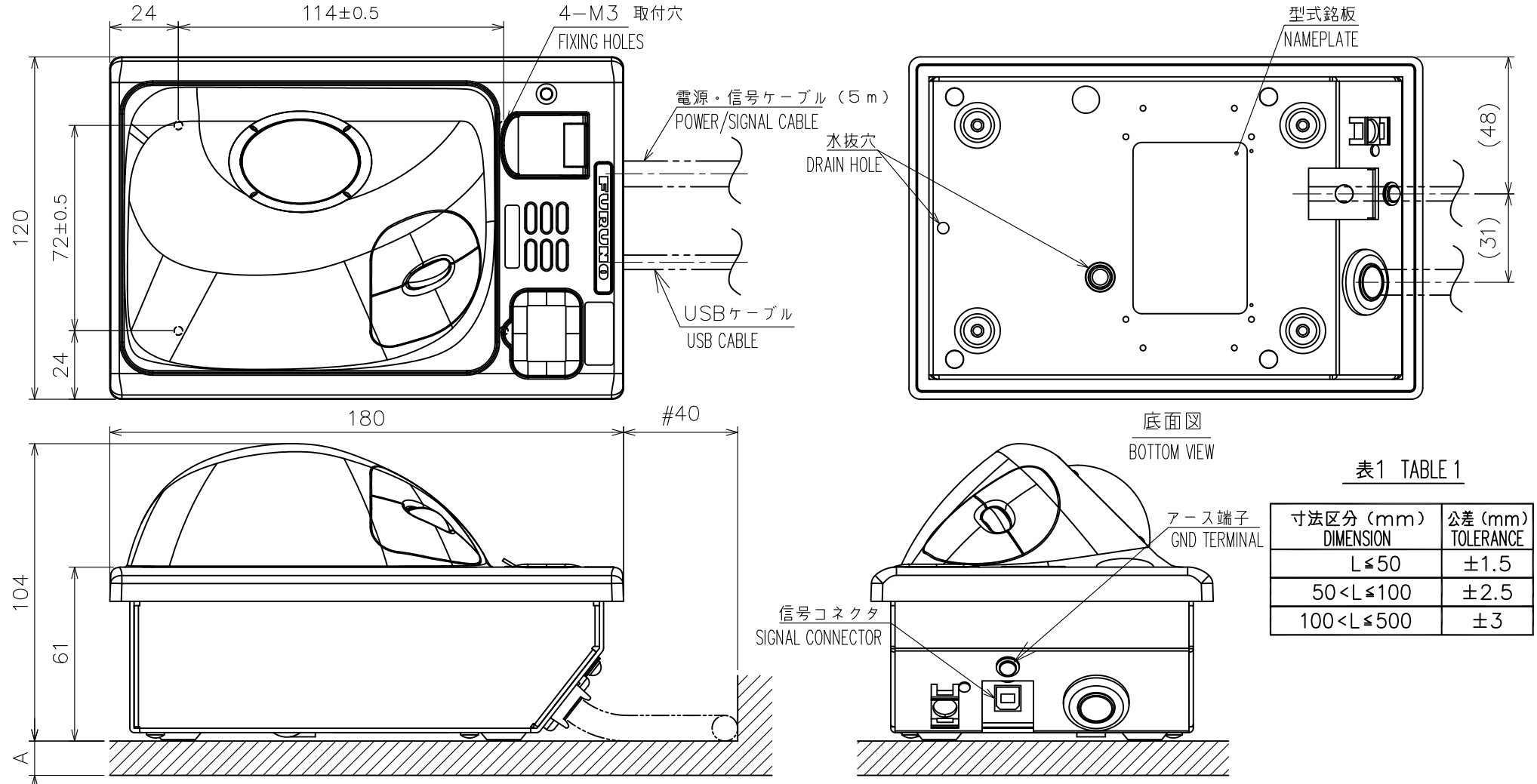


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

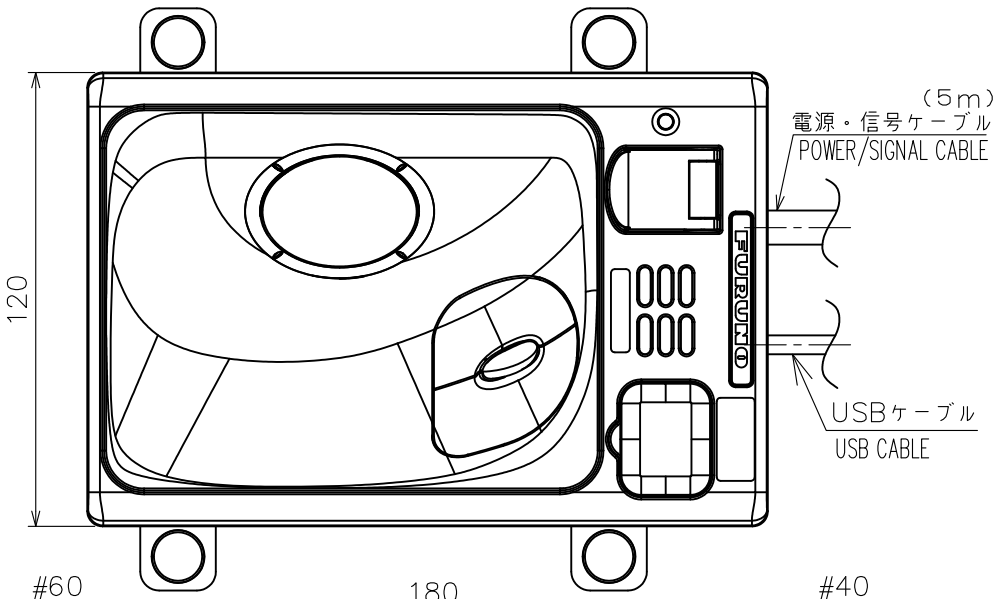
注 記 １）指定外の寸法公差は表１による。
２）＃印寸法は最小サービス空間寸法とする。
３）取付ネジはセムスネジＢ Ｍ３×１２を使用のこと。壁の厚さ（Ａ）は最小２、最大４とする。それ以外はねじ長さをＡ＋８±２とする。

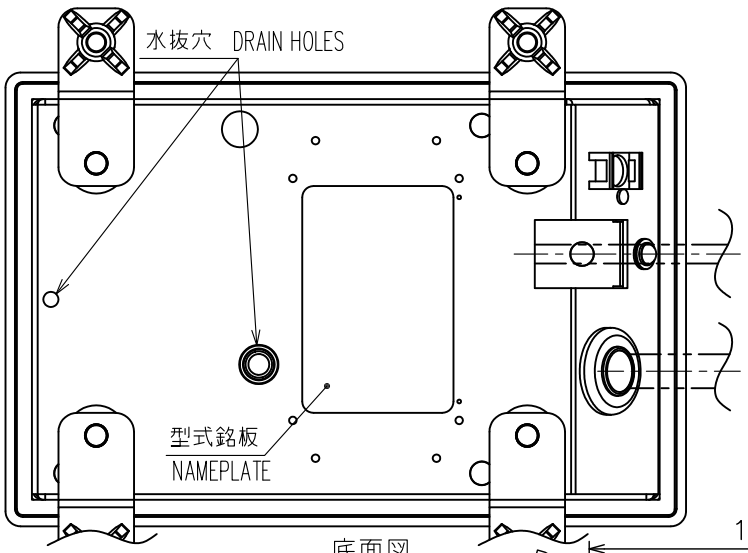
NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE SEMS B SCREWS M3x12 FOR BULKHEAD THICKNESS (A): 2≦A≦4.
OR SCREW LENGTH: A+8±2.

DRAWN 14/Jun/2018 T.YAMASAKI		TITLE	RCU-026
CHECKED 14/Jun/2018 H.MAKI		名称	トラックボール操作部（卓上装備）
APPROVED 14/Jun/2018 H.MAKI	FMD-3200		外寸図
SCALE 1/2 MASS 1.4 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	TRACKBALL CONTROL UNIT (TABLETOP MOUNT)
DWG.No. C4473-G05- C	REF.No. 24-014-150G-2		OUTLINE DRAWING

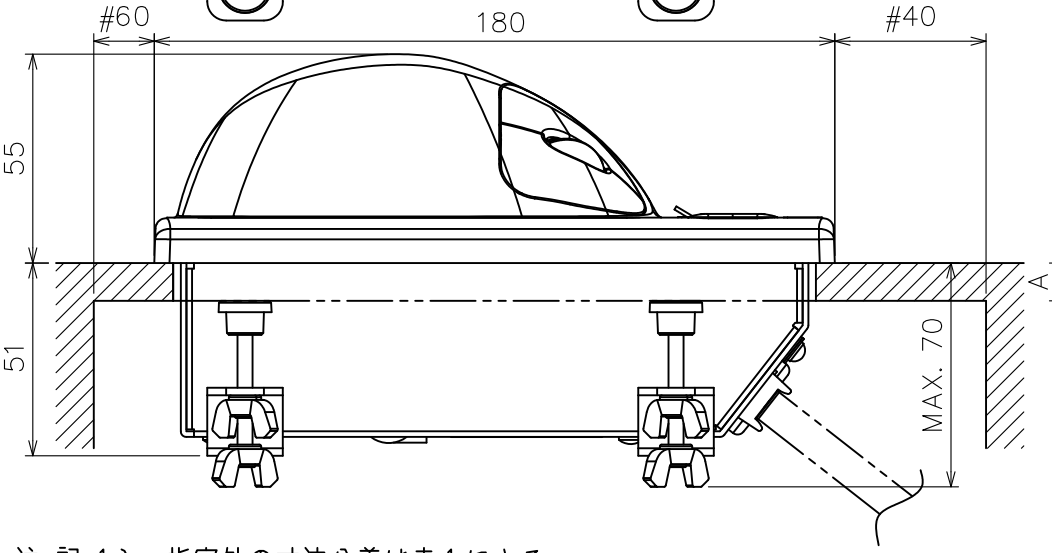
FURUNO ELECTRIC CO., LTD.

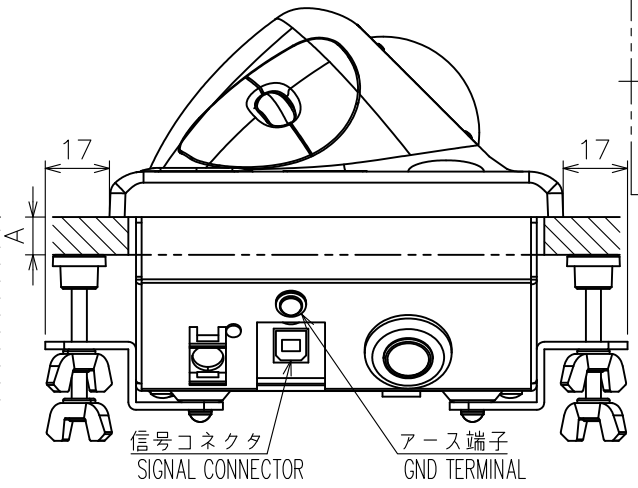
FURUNO

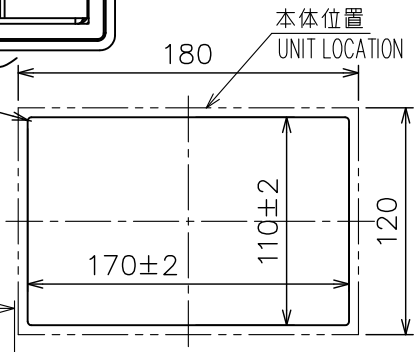




底面図
BOTTOM VIEW







取付穴寸法（尺度：1／4）
CUTOUT DIMENSIONS (SCALE: 1/4)

表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

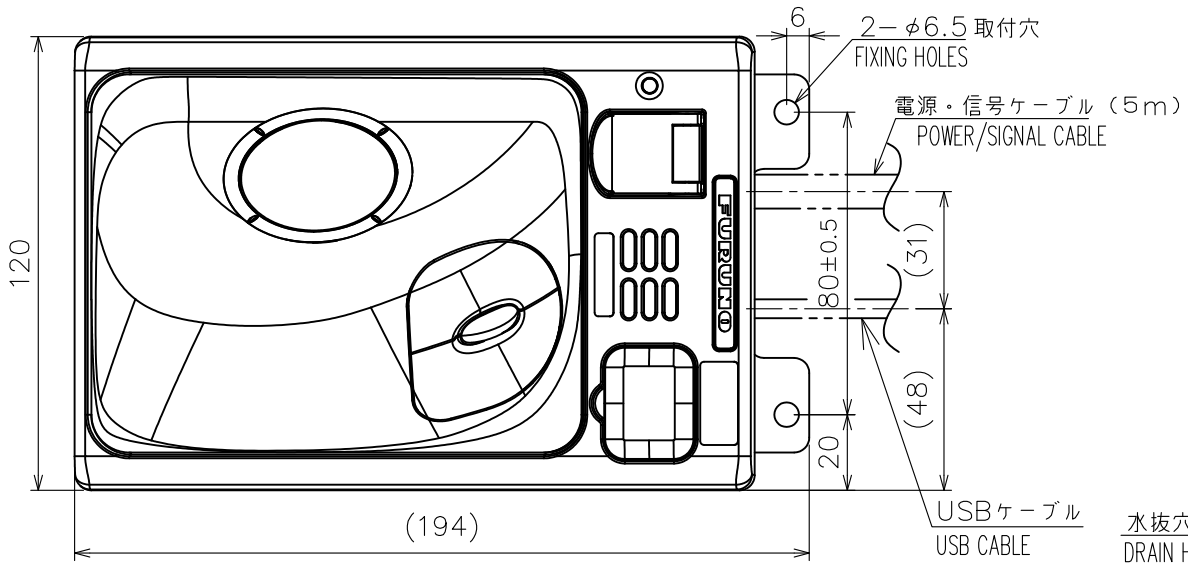
注 記 1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 壁の厚さ（Ａ）は最小１０ｍｍ、最大２０ｍｍとする。

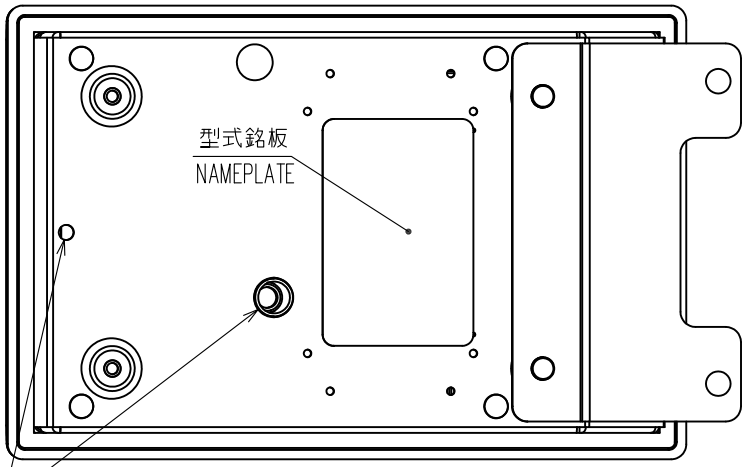
NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS (A): 10≦A≦20.

DRAWN 14/Jun/2018 T.YAMASAKI		TITLE	RCU-026
CHECKED 14/Jun/2018 H.MAKI		名称	トラックボール操作部（埋込装備）
APPROVED 14/Jun/2018 H.MAKI	FMD-3200		外寸図
SCALE 1/2 MASS 1.5 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	TRACKBALL CONTROL UNIT (FLUSH MOUNT)
DWG.No. C4473-G06- C	REF.No. 24-014-160G-2		OUTLINE DRAWING

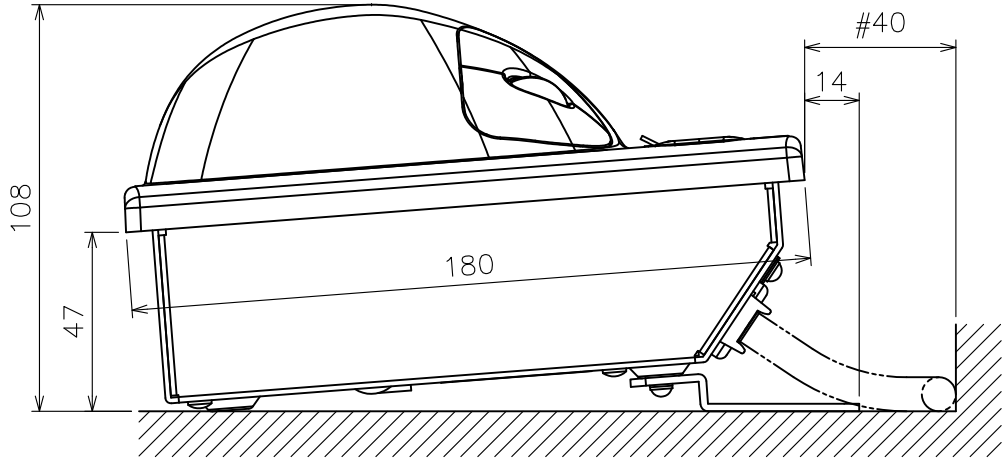
FURUNO ELECTRIC CO., LTD.

FURUNO





底面図
BOTTOM VIEW



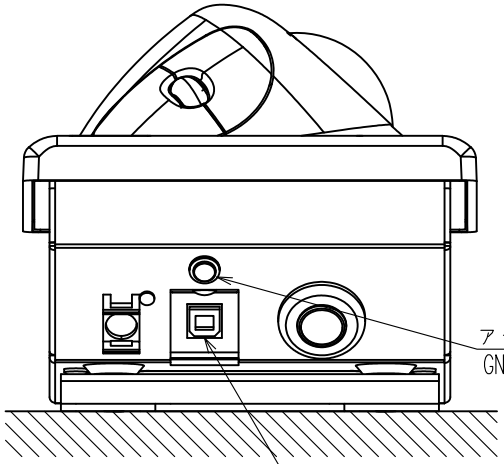


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

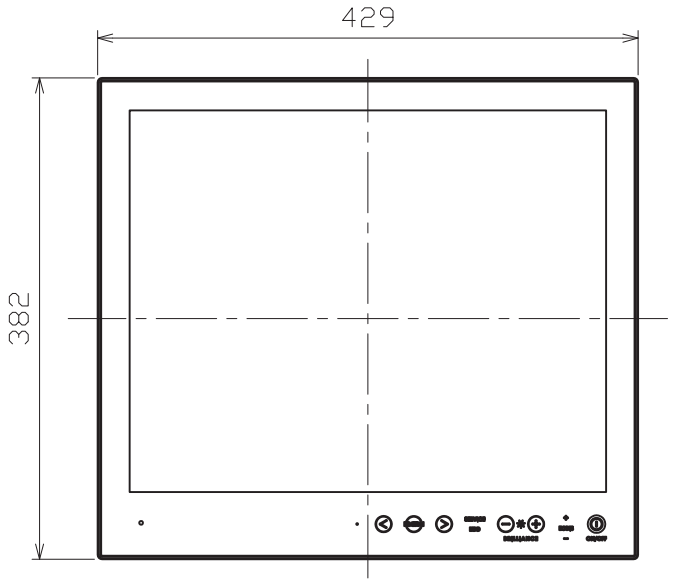
注　記　1）　指定外の寸法公差は表１による。
　　2）　＃印寸法は最小サービス空間寸法とする。
　　3）　取付ネジはトラスタッピンネジ呼び径５Ｘ２０を使用のこと。

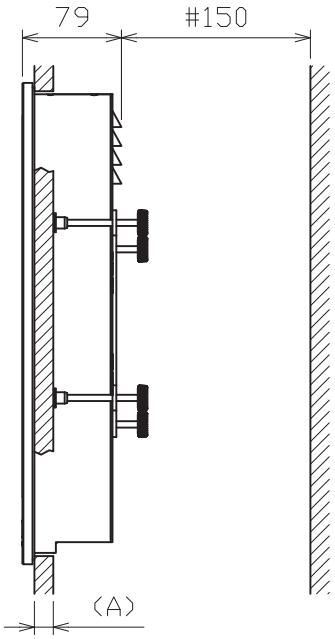
NOTE　1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2. #: MINIMUM SERVICE CLEARANCE.
　　3. USE TAPPING SCREWS ø5x20 FOR FIXING THE UNIT.

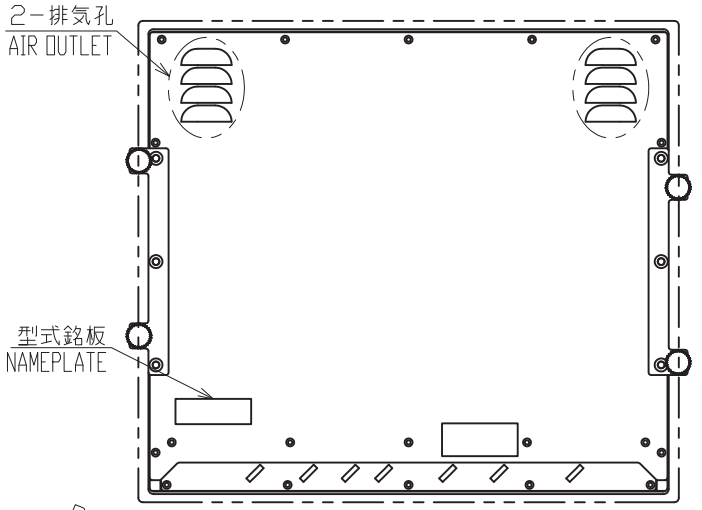
DRAWN 14/Jun/2018 T.YAMASAKI		TITLE	RCU-026
CHECKED 14/Jun/2018 H.MAKI		名称	トラックボール操作部（取付金具）
APPROVED 14/Jun/2018 H.MAKI	FMD-3200		外寸図
SCALE 1/2 MASS 1.5 ±10% kg	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	NAME	TRACKBALL CONTROL UNIT (FIXTURE MOUNT)
DWG.No. C4473-G07- C	REF.No. 24-014-170G-2		OUTLINE DRAWING

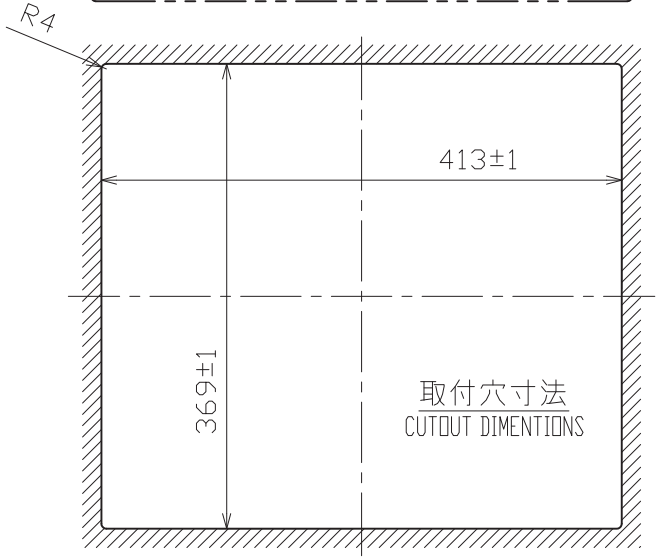
FURUNO ELECTRIC CO., LTD.

FURUNO









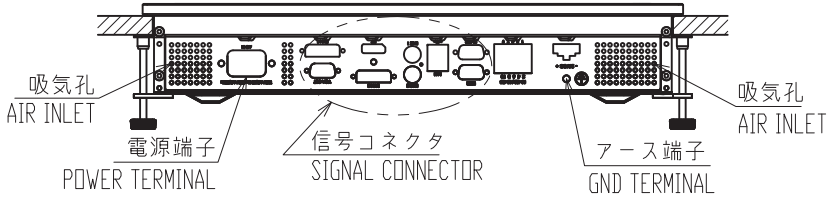


表１ TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注　記

１）指定外の寸法公差は表１による。

２）＃印寸法は最小サービス空間寸法とする。

３）壁の厚さ（Ａ）は最小１０ｍｍ、最大２０ｍｍとする。

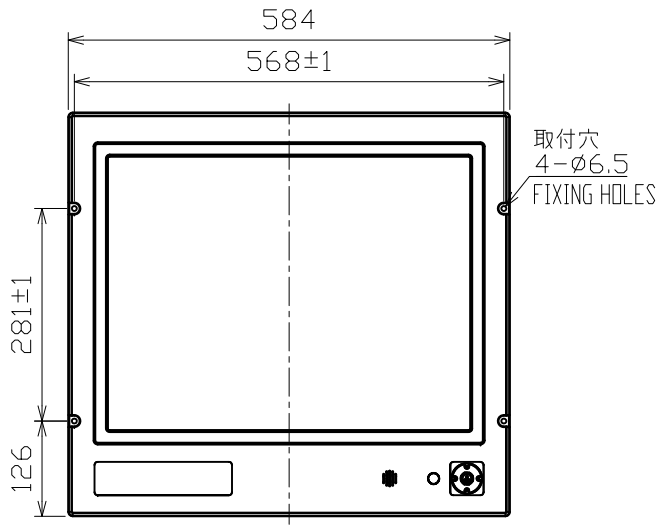
NOTE

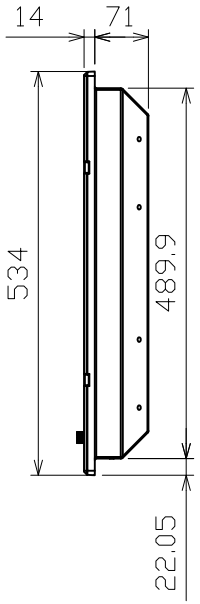
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS(A): 10≦A≦20.

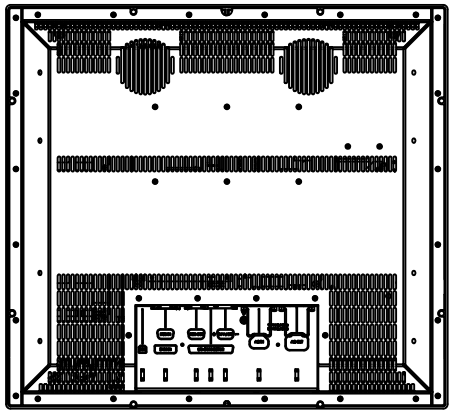
DRAWN 12/Dec/2023 S.HAN		TITLE HD19T22
CHECKED 12/Dec/2023 T.YAMASAKI		名称 表示部（埋込装備R）
APPROVED 27/Dec/2023 H.MAKI	FMD-3200	外寸図
SCALE 1/6 MASS 8.5 ±10% kg		NAME MONITOR UNIT (FLUSH MOUNT R)
DWG.No. C4473-G25- A	REF.No. 26-013-130G-1	OUTLINE DRAWING

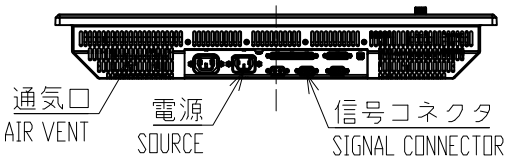
FURUNO ELECTRIC CO., LTD.

FURUNO









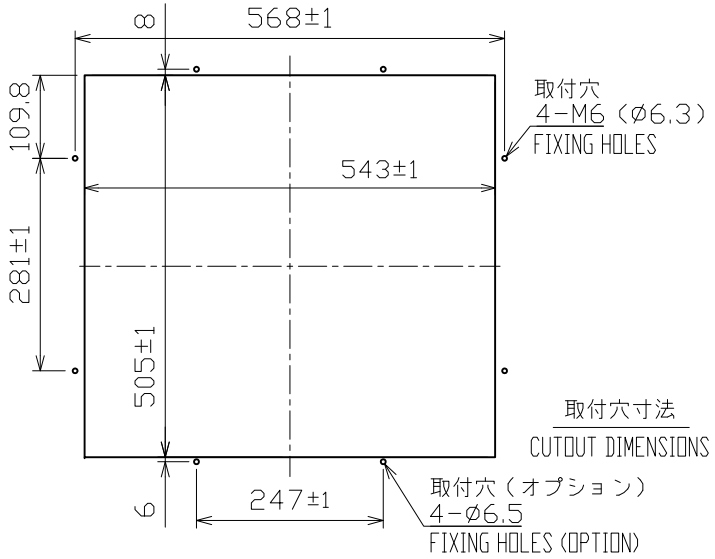


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

注記

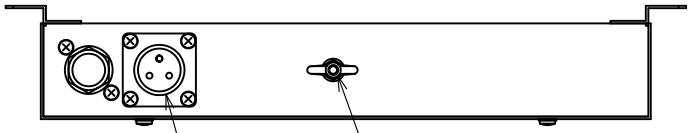
1）指定なき寸法公差は表1による。

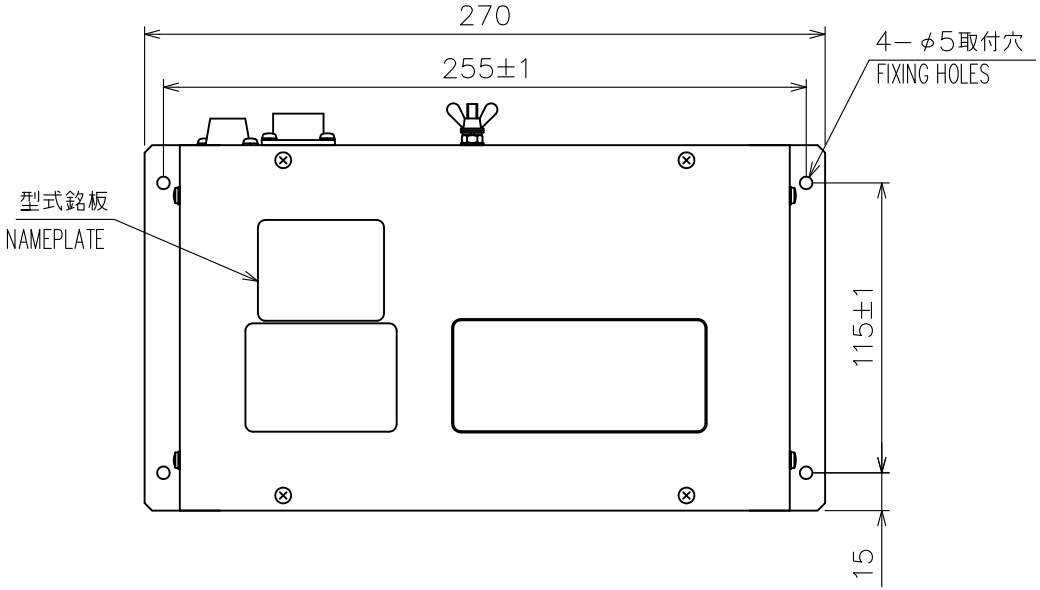
NOTE

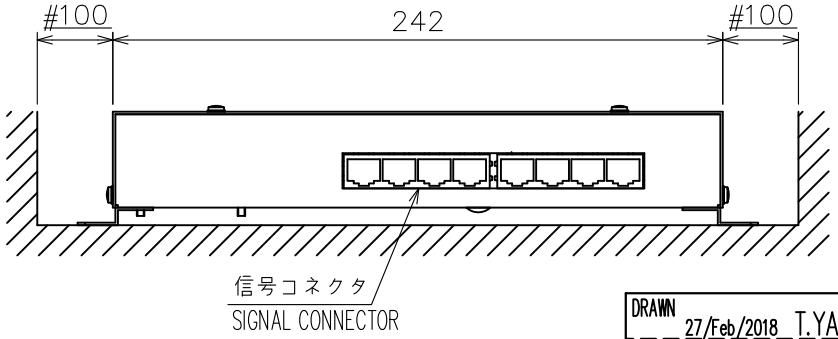
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN 27/Mar/2024 T.YAMASAKI			TITLE JH23T14
CHECKED 22/Apr/2024 A. Murao			名称 表示部（埋込装備）
APPROVED 22/Apr/2024 A. Murao	FMD-3300		外寸図
SCALE 1/10	MASS 18 ±10% kg		NAME MONITOR UNIT (FLUSH MOUNT)
DWG.No. C4475-G07-A	REF.No. A001524-1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.







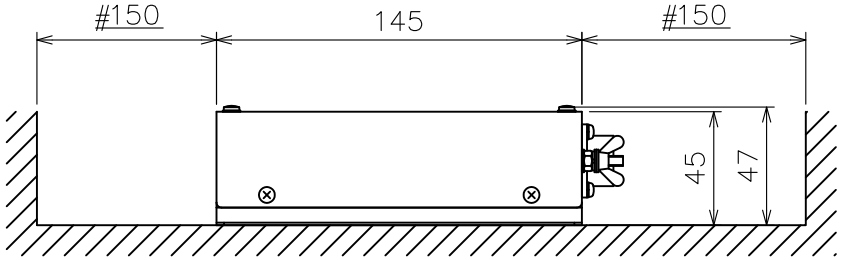


表１　TABLE 1

寸法区分（ｍｍ） DIMENSIONS	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０<Ｌ≦１００	±２．５
１００<Ｌ≦５００	±３

注　記

１）　指定外寸法公差は表１による
２）　＃印寸法は最小サービス空間寸法とする
３）　取付用ネジはトラスタッピンネジ呼び径４×１６を使用のこと

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x16 FOR FIXING THE UNIT.

DRAWN 27/Feb/2018 T.YAMASAKI		TITLE	HUB-100
CHECKED 27/Feb/2018 H.MAKI		名称	イーサネットスイッチングハブ
APPROVED 28/Feb/2018 H.MAKI			外寸図
SCALE 1/3	MASS 1.5 ±10% kg	NAME	SWITCHING HUB
DWG. No. C3519-G18- C	REF. No. 03-163-960G-4		OUTLINE DRAWING

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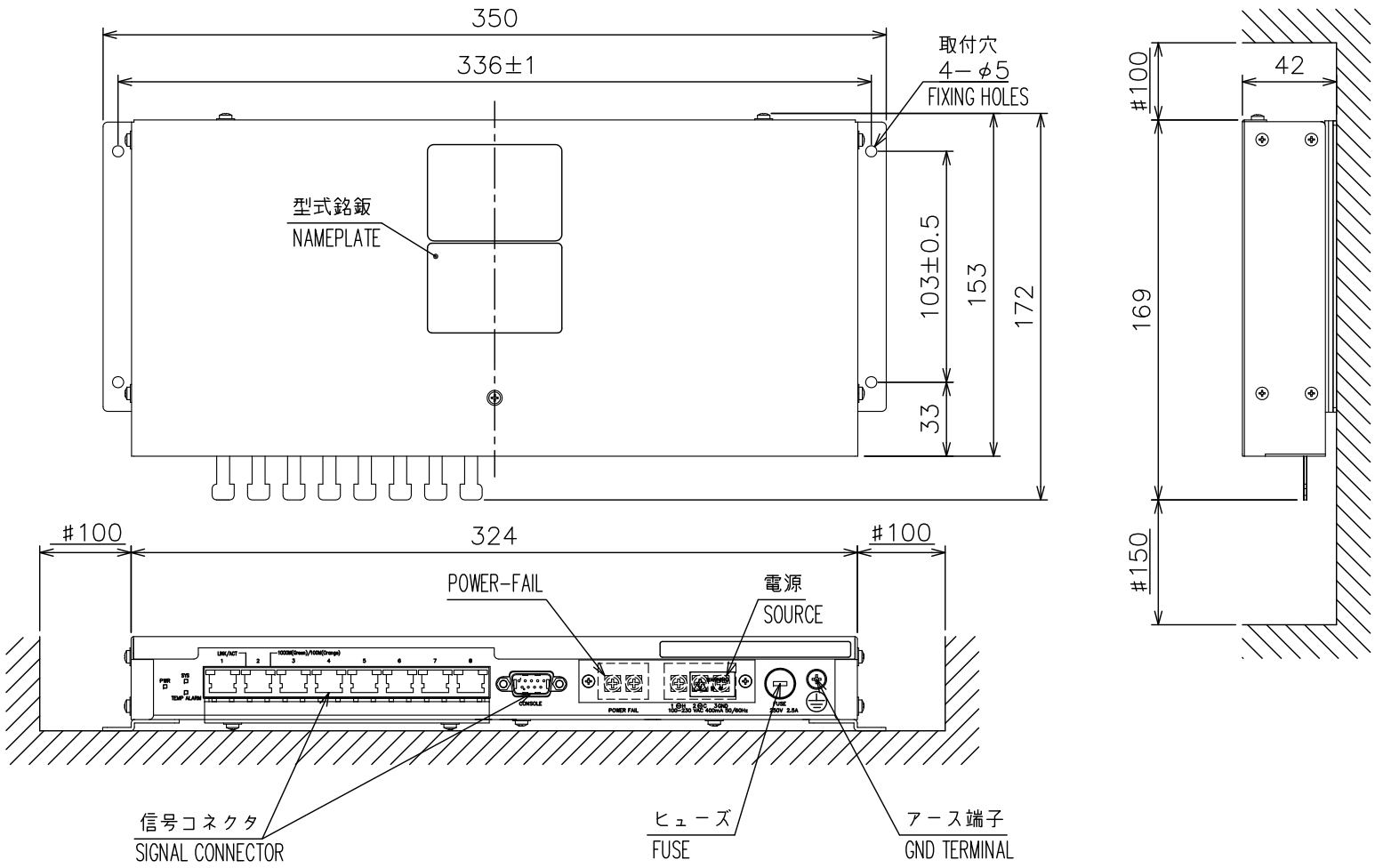
表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3



注 記 1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付用ネジはトラスタッピンネジ呼び径４×２０を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x20 FOR FIXING THE UNIT.

DRAWN 8/Jun/2018 T.YAMASAKI		TITLE	HUB-3000
CHECKED 8/Jun/2018 H.MAKI		名称	インテリジェントハブ
APPROVED 8/Jun/2018 H.MAKI	FMD-3200		外寸図
SCALE 1/3 MASS 1.5 ±10% kg	質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME	INTELLIGENT HUB
DWG. No. C4473-G12- C	REF. No. 24-014-350G-2		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

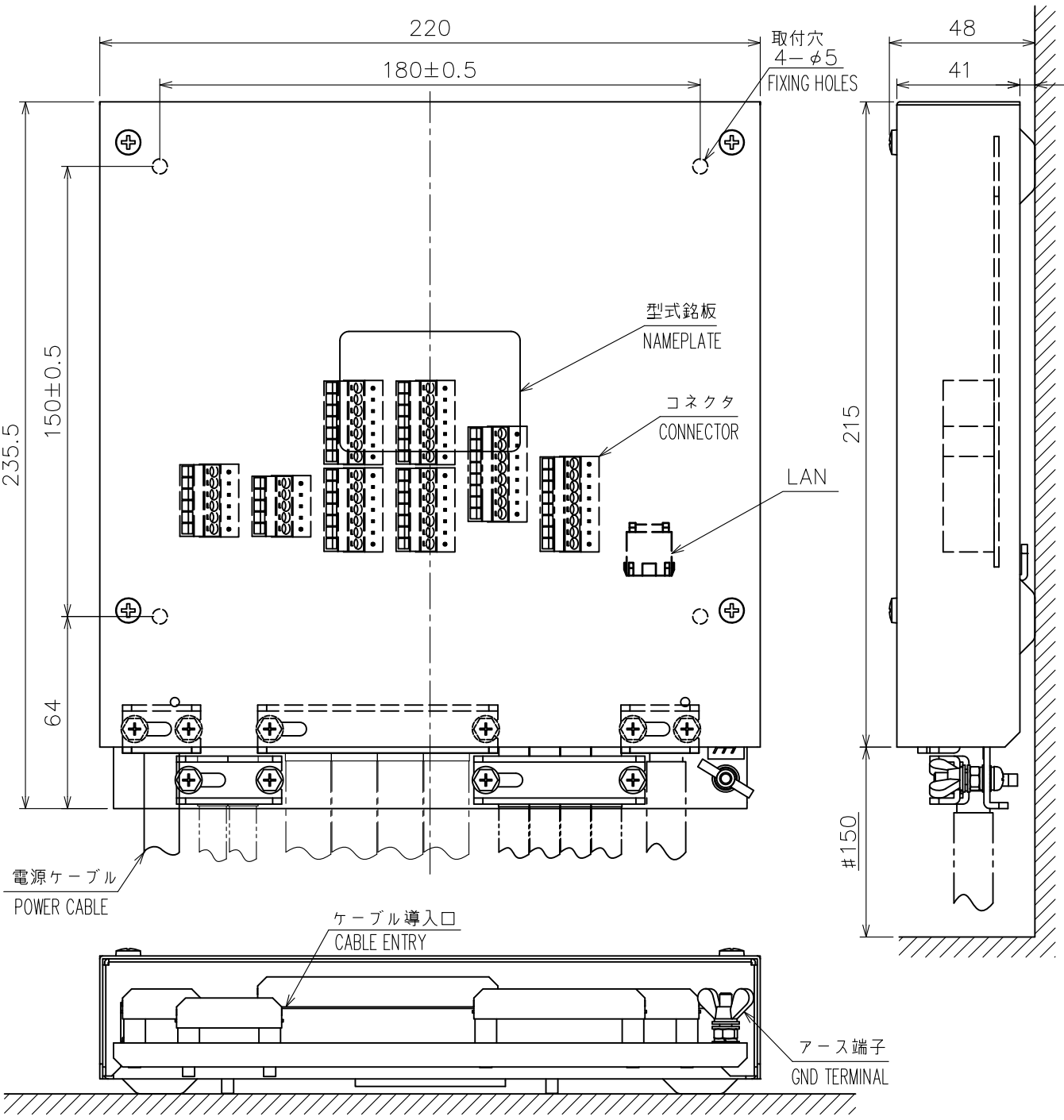


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注 記 1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付用ネジはトラスタッピンネジ呼び径４×２０を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x20 FOR FIXING THE UNIT.

DRAWN 11/Jan/2012 T.YAMASAKI		TITLE	MC-3000S
CHECKED 11/Jan/2012 H.MAKI		名称	センサーアダプター（シリアル）
APPROVED 13/Jan/2012 Y.NISHIYAMA	FMD-3200		外寸図
SCALE 1/2 MASS 1.5 ±10% kg	質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME	SENSOR ADAPTER (SERIAL)
DWG. No. C4473-G08- A	REF. No. 24-014-200G-1		OUTLINE DRAWING

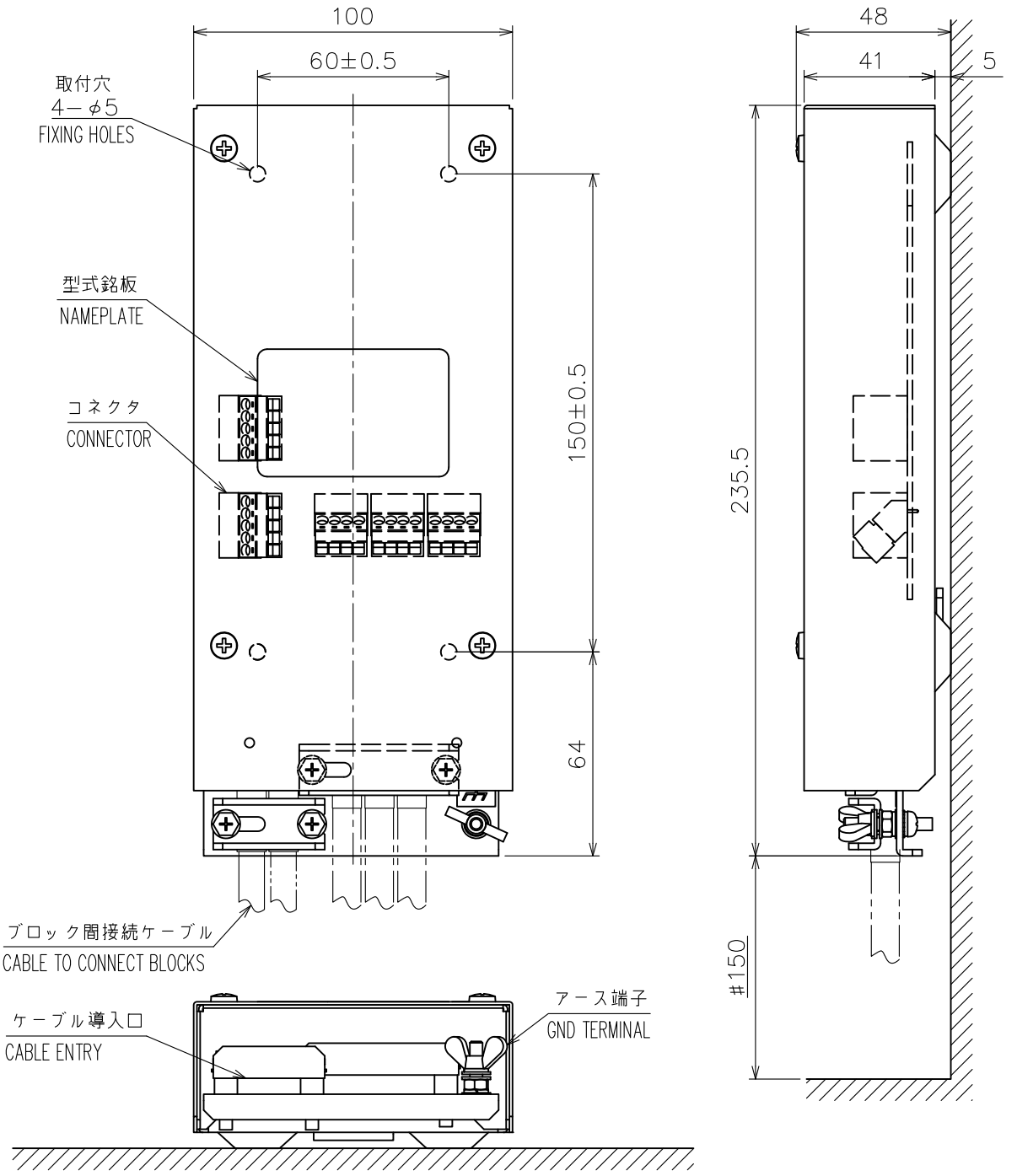


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注 記 1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付用ネジはトラスタッピンネジ呼び径４×２０を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x20 FOR FIXING THE UNIT.

DRAWN 11/Jan/2012 T.YAMASAKI		TITLE	MC-3010A
CHECKED 11/Jan/2012 H.MAKI		名称	センサーアダプター（アナログ）
APPROVED 13/Jan/2012 Y.NISHIYAMA	FMD-3200		外寸図
SCALE 1/2 MASS 0.8 ±10% kg	質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME	SENSOR ADAPTER (ANALOG)
DWG. No. C4473-G09- A	REF. No. 24-014-210G-1		OUTLINE DRAWING

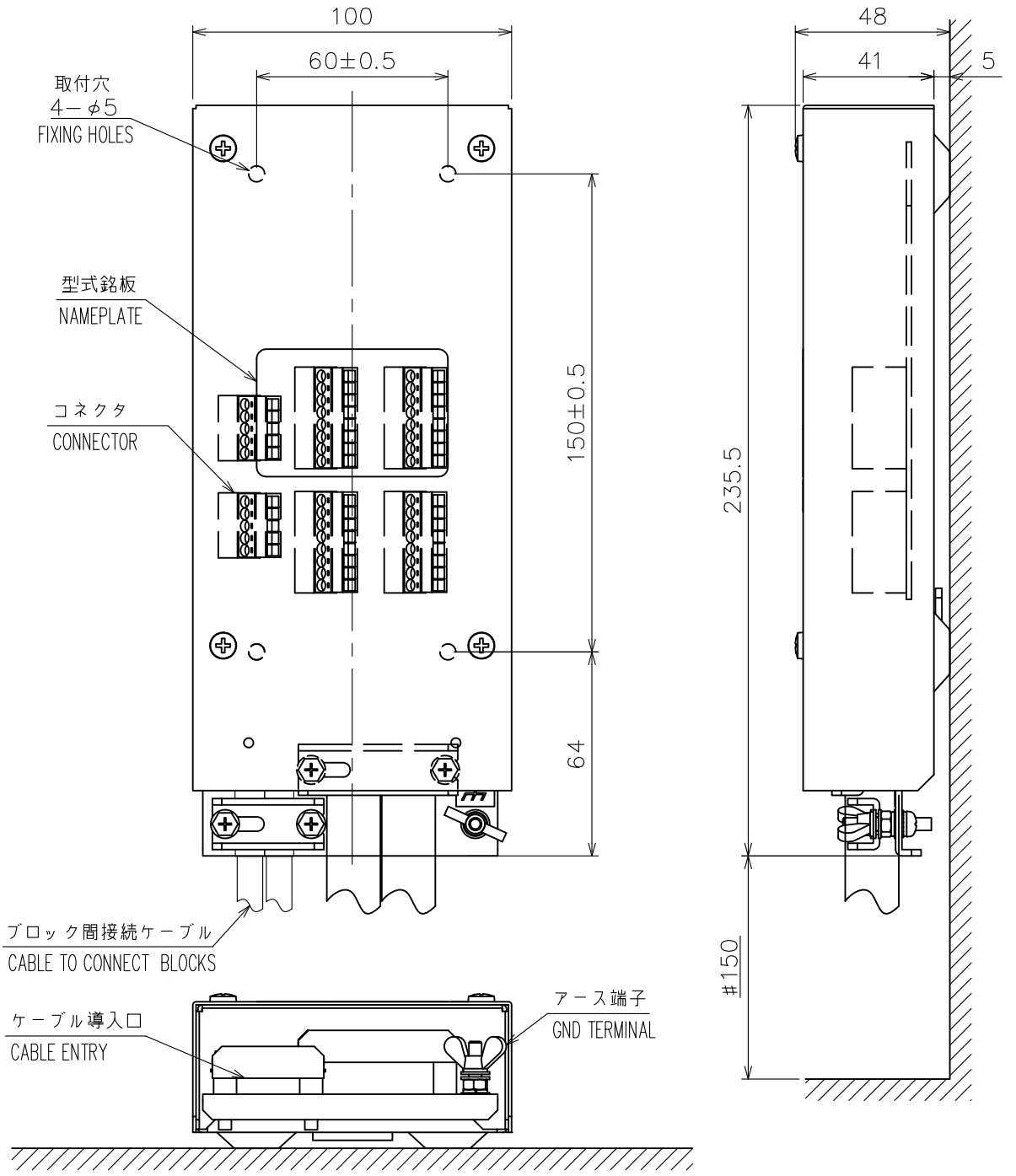


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注 記 1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付用ネジはトラスタッピンネジ呼び径４×２０を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x20 FOR FIXING THE UNIT.

DRAWN 11/Jan/2012 T.YAMASAKI		TITLE	MC-3020D
CHECKED 11/Jan/2012 H.MAKI		名称	センサーアダプター（デジタルイン）
APPROVED 13/Jan/2012 Y.NISHIYAMA	FMD-3200		外寸図
SCALE 1/2 MASS 0.8 ±10% kg	質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME	SENSOR ADAPTER (DIGITAL IN)
DWG. No. C4473-G10- A	REF. No. 24-014-220G-1		OUTLINE DRAWING

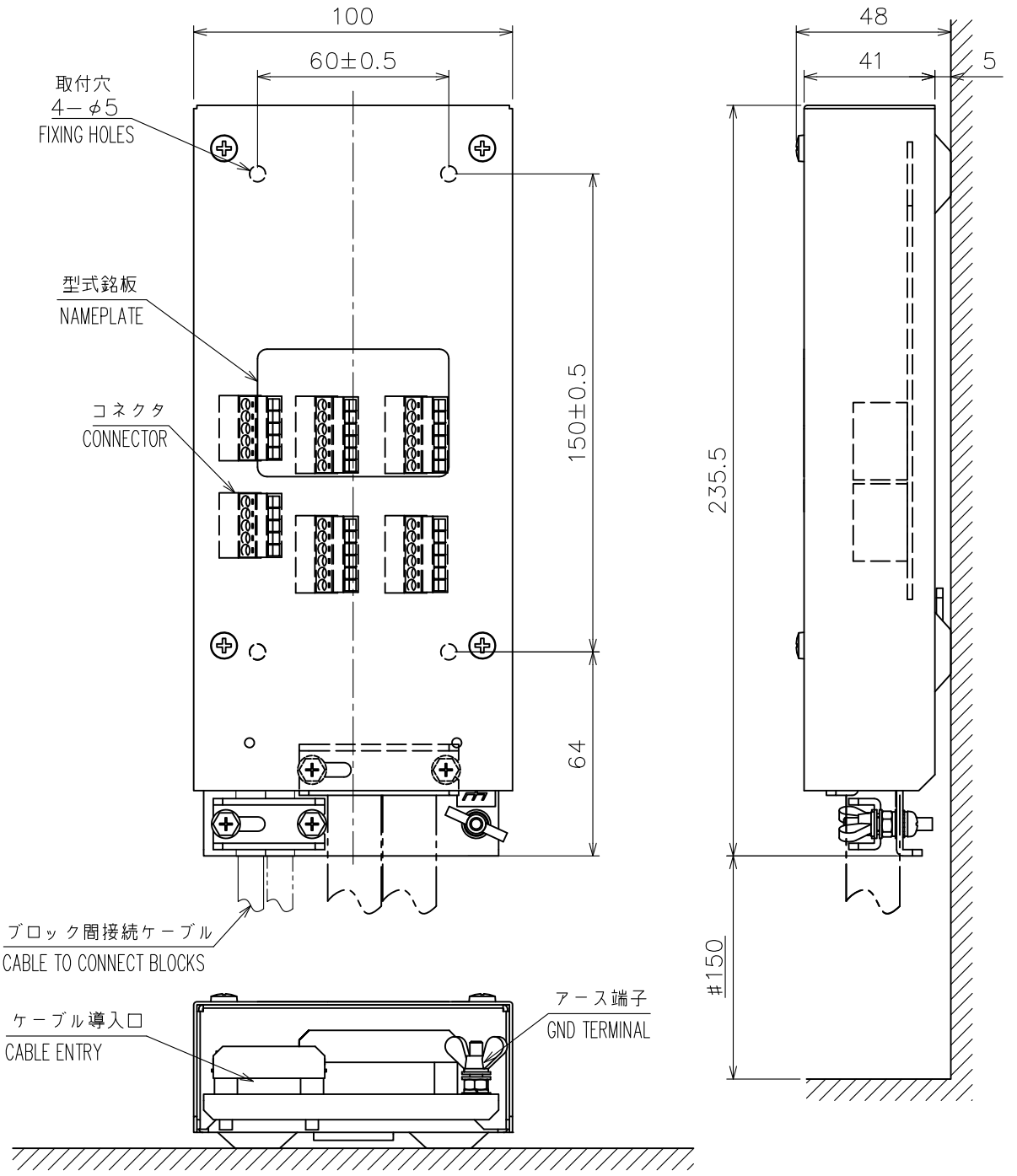


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

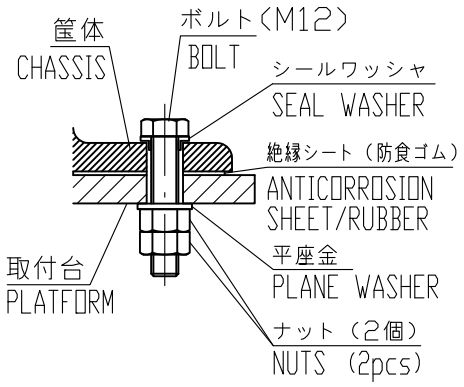
注 記 1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付用ネジはトラスタッピンネジ呼び径４×２０を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x20 FOR FIXING THE UNIT.

DRAWN 11/Jan/2012 T.YAMASAKI		TITLE	MC-3030D
CHECKED 11/Jan/2012 H.MAKI		名称	センサーアダプター（デジタルアウト）
APPROVED 13/Jan/2012 Y.NISHIYAMA	FMD-3200		外寸図
SCALE 1/2 MASS 0.8 ±10% kg	質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME	SENSOR ADAPTER (DIGITAL OUT)
DWG. No. C4473-G11- A	REF. No. 24-014-230G-1		OUTLINE DRAWING

FURUNO

（1） 取付ボルトのダブルナット締付手順
PROCEDURE OF DOUBLE NUTS FASTENING TO A BOLT



締付方法 FASTENING METHOD

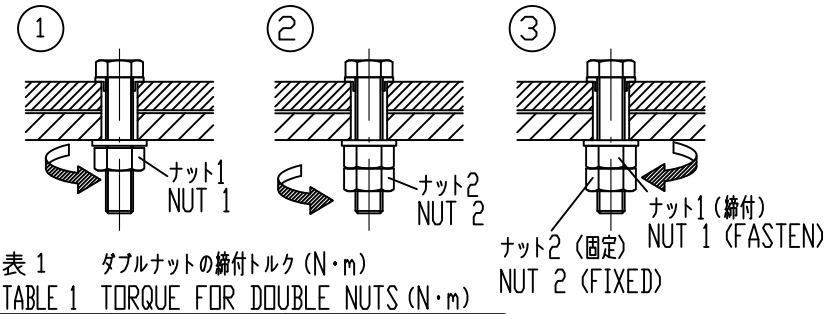
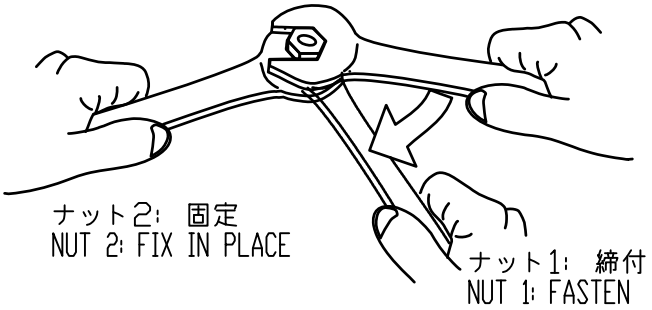


表 1 ダブルナットの締付トルク（N・m）
TABLE 1 TORQUE FOR DOUBLE NUTS (N・m)

空中線部 ANT. UNIT		標準 STANDARD	RSB-098/099/100/101/102/132/144
ナット NUT	1	57	74
	2	49	63.5

ナット1とナット2は、右図の通り同時に締め付けます。このとき、どちらのナットにも200mm程度のスパナを使用してください。

FASTEN THE DOUBLE NUTS AS SHOWN IN THE FIGURE TO THE RIGHT. USE SPANNERS WITH A LENGTH OF APPROX. 200 mm.

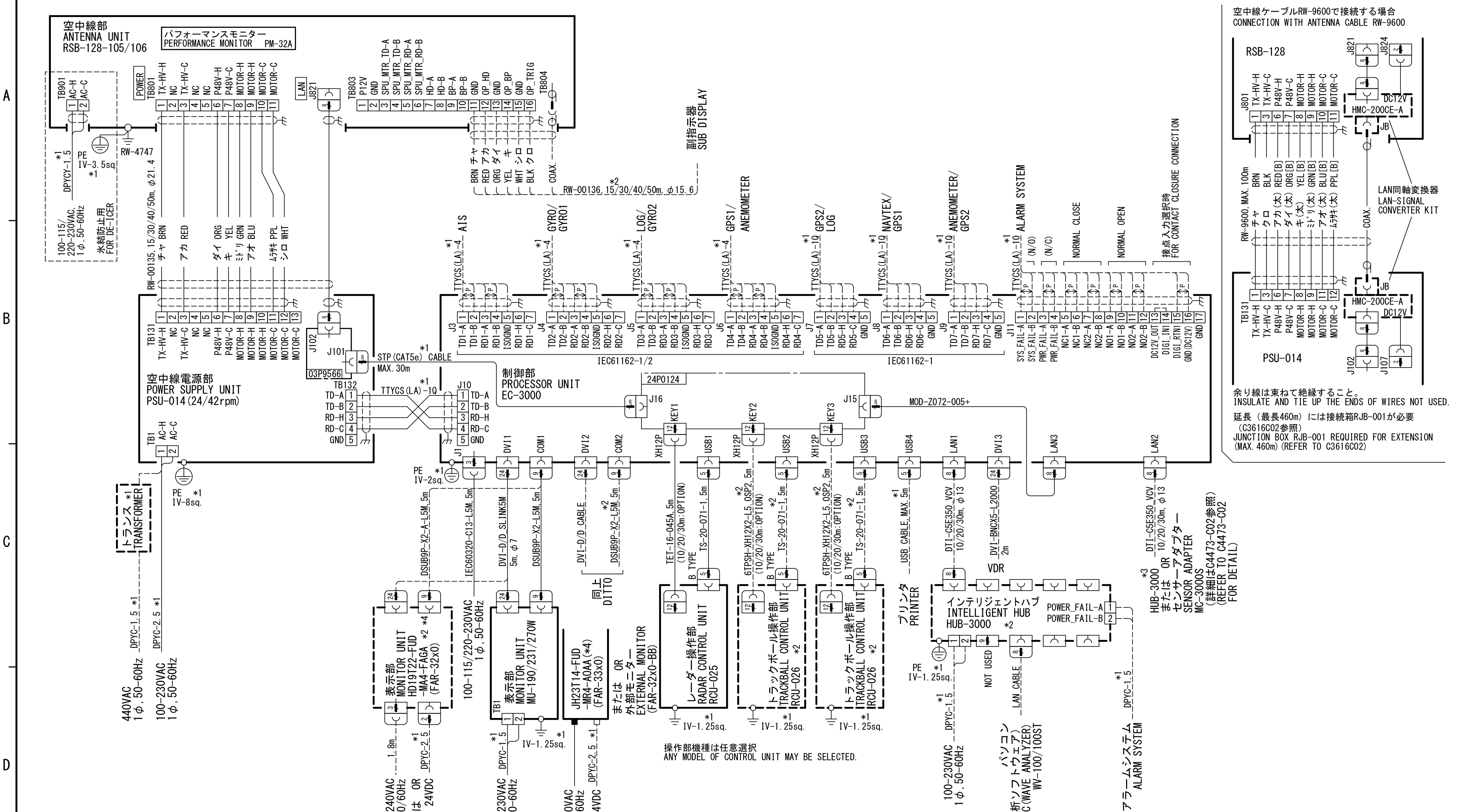


（2） 防水シールの例
EXAMPLE FOR SEALING BOLTS/NUTS

注記
1） 取付ボルト、ナットには、図示（2）のようにシール剤を塗布すること。
2） 空中線部本体は、底面に外部との圧力調整機能がありますので、装備面の周囲にはシリコンを塗布しないでください。

NOTE
1. APPLY SILICONE SEALANT ONTO FIXING BOLT/NUT AS FIGURE (2).
2. DO NOT APPLY SILICONE SEALANT AROUND THE ANTENNA BASE BECAUSE IT HAS A FUNCTION FOR PRESSURE BALANCE WITH OUTER ENVIRONMENT.

DRAWN 25/Mar/2021 T.YAMASAKI		TITLE	RADAR OPEN ANTENNA
CHECKED 25/Mar/2021 H.MAKI		名称	レーダーオープンアンテナ（締付トルク）
APPROVED 25/Mar/2021 H.MAKI			装備要領図
SCALE – MASS – ±10% kg		NAME	TORQUE FOR FASTENING
DWG. No. C3900-Y01- A	REF. No.		INSTALLATION PROCEDURE

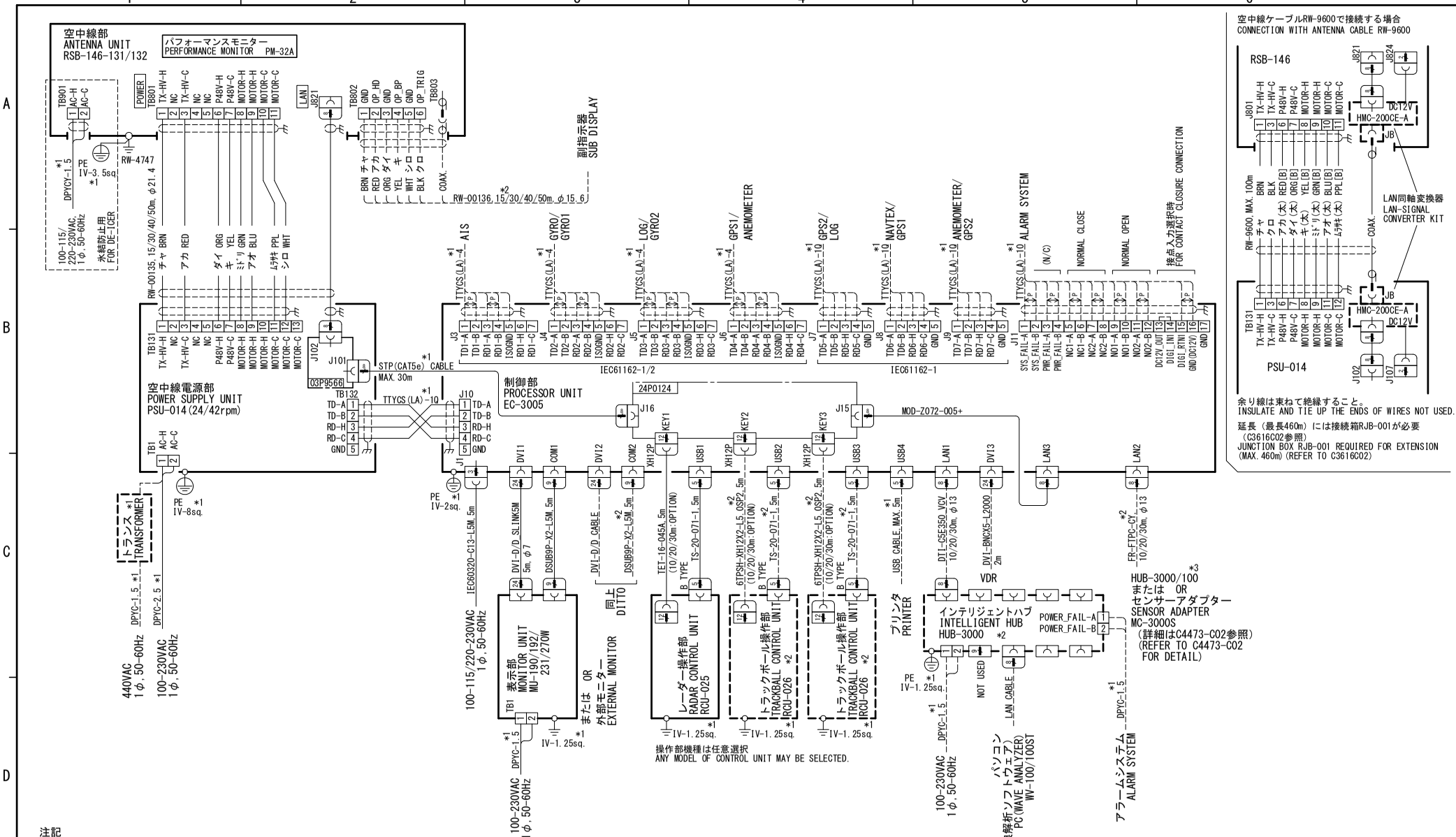


注記
＊１）造船所手配。
＊２）オプション。
＊３）IEC61162-450 Ed.1でネットワークを構成するときは、HUB-100も使用可。
＊４）HK仕様では標準選択。

NOTE
*1: SHIPYARD SUPPLY
*2: OPTION
*3: HUB-100 ALSO AVAIRABLE WHEN THE NETWORK FOR IEC61162-450 Ed.1.IS USED.
*4: STANDARD SUPPLY AVAIRABLE FOR HK CONFIGURATION.

DRAWN	9/Jul/2024 S.HAN	TYPE	FAR-3210/3220(-BB), FAR-3310/3320
CHECKED	9/Jul/2024 T.YAMASAKI	名称	航海用レーダー
APPROVED	21/Jul/2024 A. Murao		相互結線図
SCALE	MASS kg	NAME	MARINE RADAR
DWG. No.	C3616-C01- S REF. No. 03-183-6002-2		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

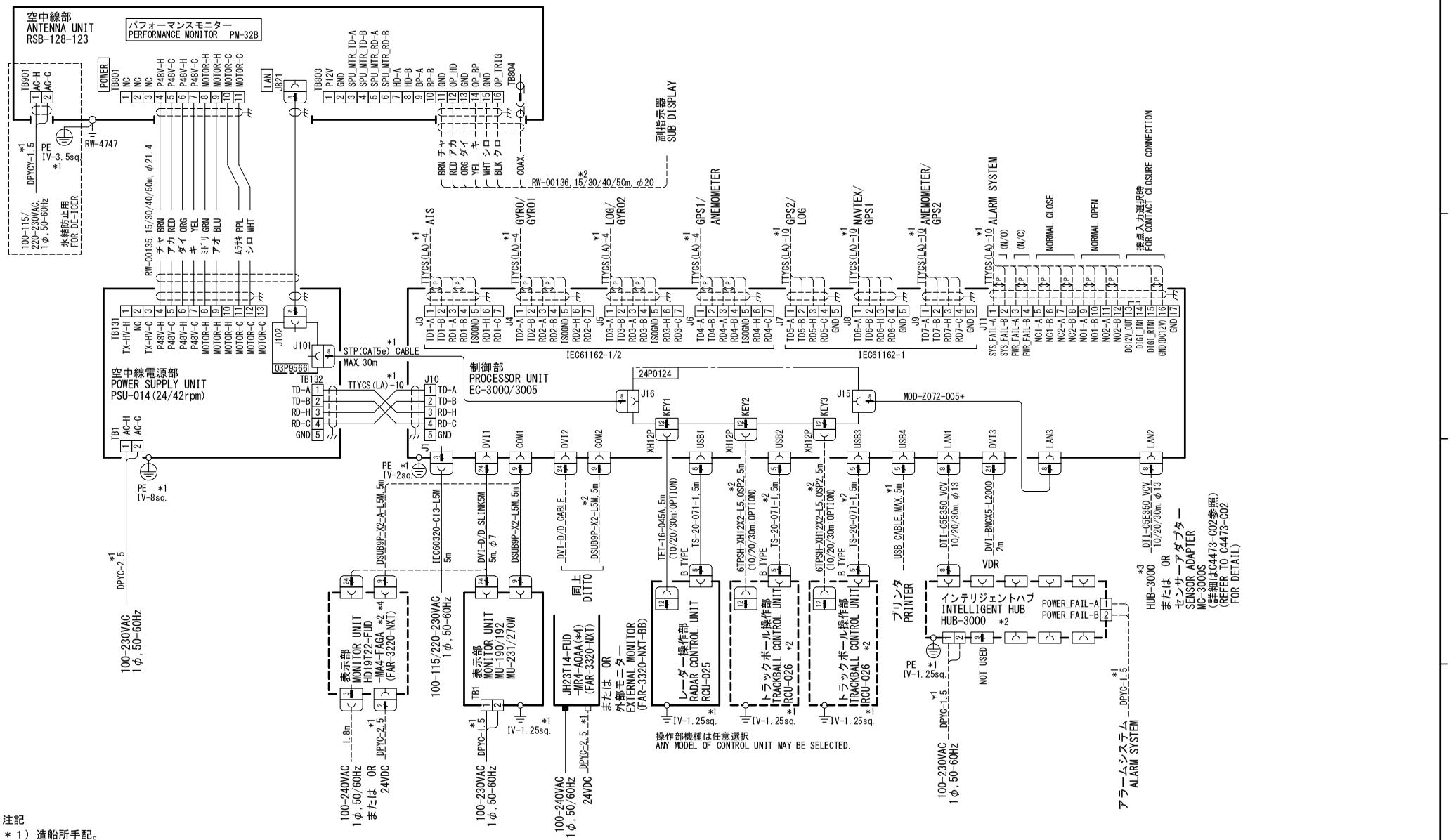


注記
＊1）造船所手配。
＊2）オプション。
＊3）IEC61162-450 Ed.2を構成する際はHUB-3000を使用のこと。
IEC61162-450 Ed.1の場合はHUB-100でもよい。

NOTE
*1: SHIPYARD SUPPLY
*2: OPTION
*3: USE HUB-3000 FOR IEC61162-450 Ed.2.
HUB-100 IS AVAILABLE FOR IEC61162-450 Ed.1.

DRAWN 11/Dec/2024 T.YAMASAKI		TYPE	FAR-3015/3025
CHECKED 14/Mar/2025 A. Murao		名称	航海用レーダー
APPROVED 14/Mar/2025 A. Murao			相互結線図
SCALE / MASS kg		NAME	MARINE RADAR
DWG. No. C3694-C01- C	REF. No. 03-183-6002-1		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.



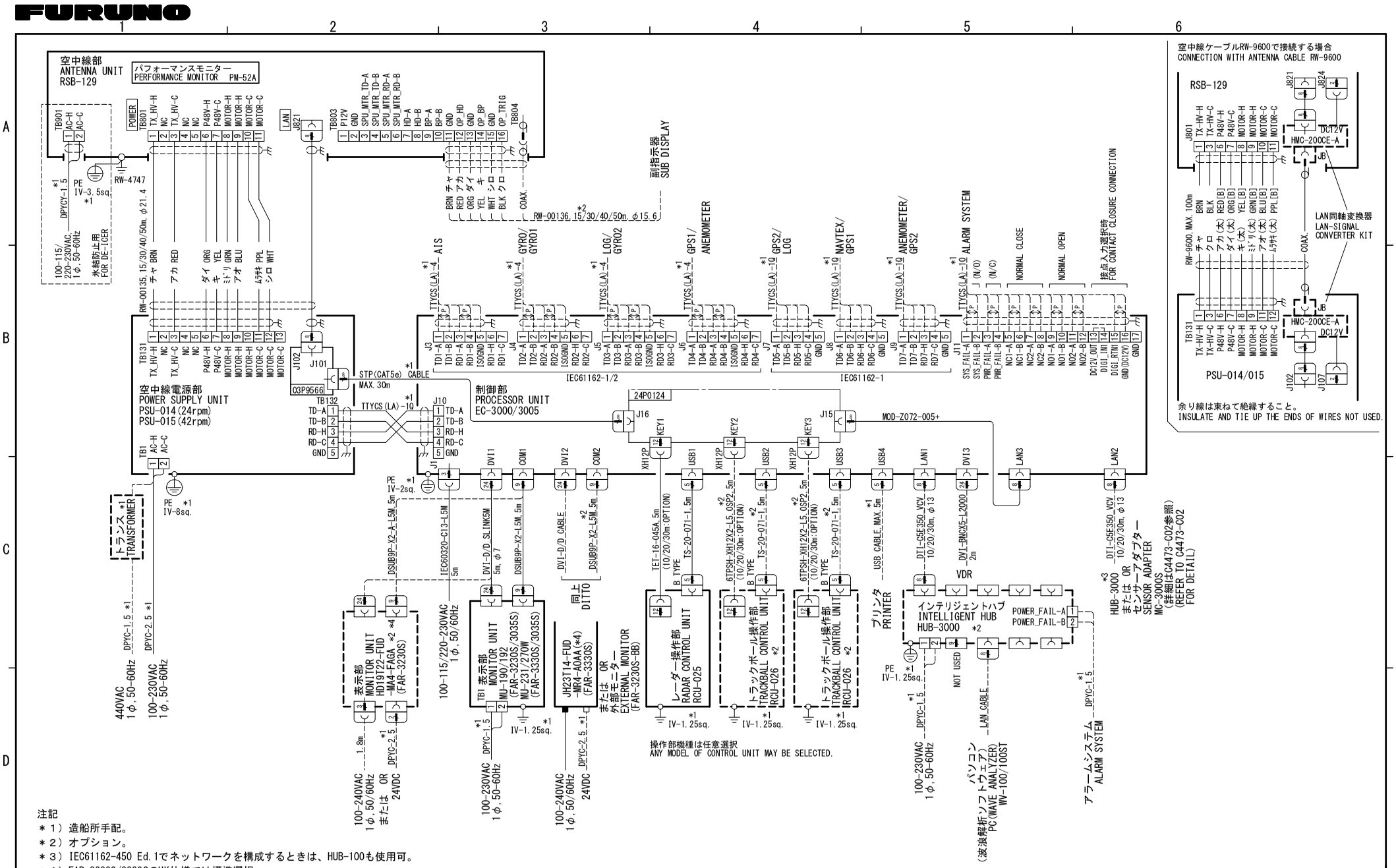
注記
＊1）造船所手配。
＊2）オプション。
＊3）IEC61162-450 Ed.1でネットワークを構成するときは、HUB-100も使用可。
＊4）FAR-3220/3320-NXTのHK仕様では標準選択。

NOTE
*1: SHIPYARD SUPPLY
*2: OPTION
*3: HUB-100 ALSO AVAILABLE WHEN THE NETWORK FOR IEC61162-450 Ed.1.IS USED.
*4: STANDARD SUPPLY AVAILABLE FOR FAR-3220/3320-NXT HK CONFIGURATION.

ユニット構成 CONFIGURATION

型式 MODEL	FAR-3x20-NXT	FAR-3025-NXT
空中線部 ANTENNA	RSB-128-123	
制御部 PROCESSOR	EC-3000	EC-3005

DRAWN	13/Mar/2025 T.YAMASAKI	TYPE	FAR-3220-NXT(-BB)/3320-NXT/3025-NXT
CHECKED	14/Mar/2025 A. Murao	名称	航海用レーダー
APPROVED	14/Mar/2025 A. Murao		相互結線図
SCALE	MASS kg	NAME	MARINE RADAR
DWG.No.	C3681-C01- J	REF.No.	INTERCONNECTION DIAGRAM



注記
＊1）造船所手配。
＊2）オプション。
＊3）IEC61162-450 Ed.1でネットワークを構成するときは、HUB-100も使用可。
＊4）FAR-3230S/3330SのHK仕様では標準選択。

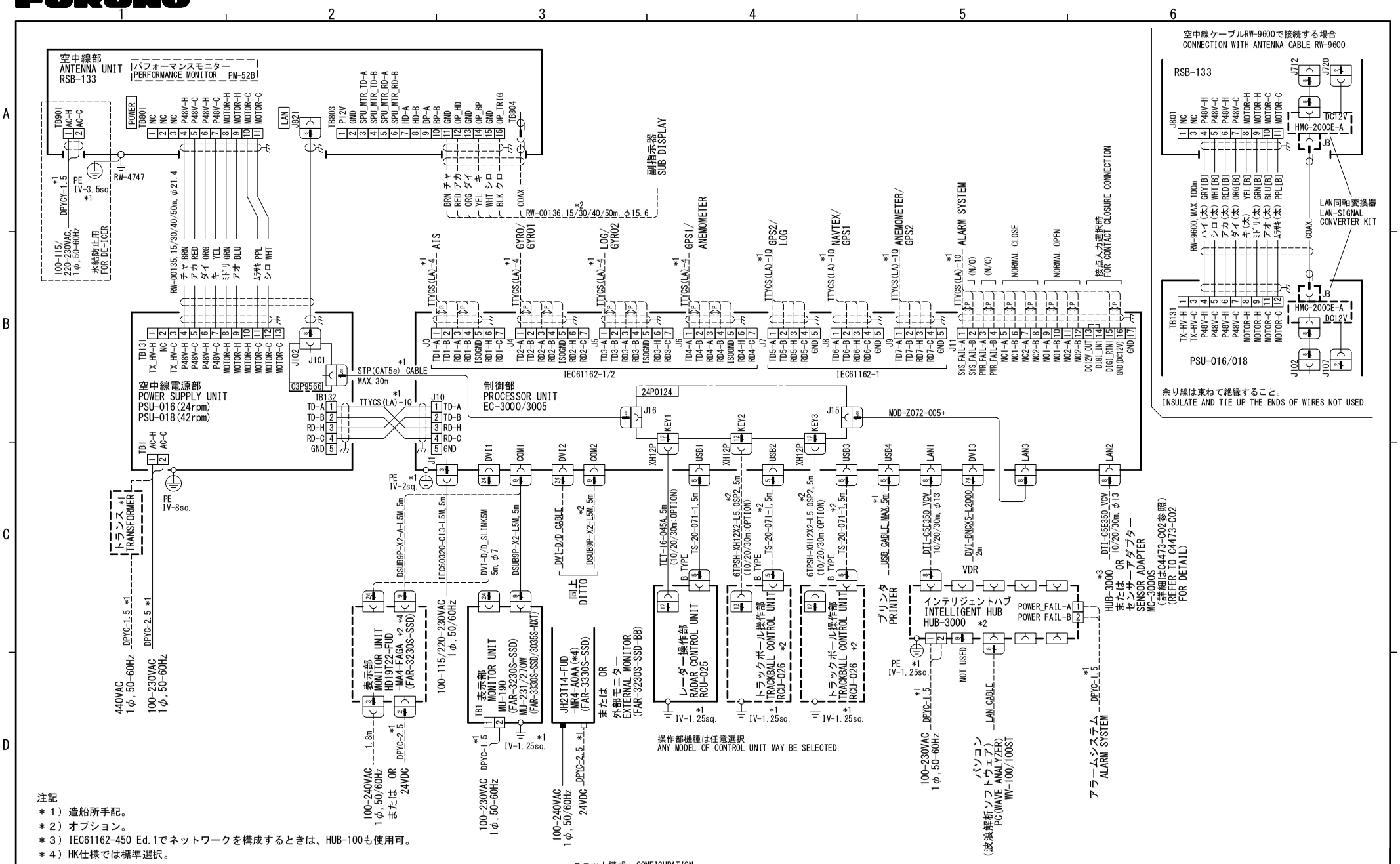
NOTE
*1: SHIPYARD SUPPLY
*2: OPTION
*3: HUB-100 ALSO AVAIRABLE WHEN THE NETWORK FOR IEC61162-450 Ed.1. IS USED.
*4: STANDARD SUPPLY AVAIRABLE FOR FAR-3230S/3330S HK CONFIGURATION.

ユニット構成　CONFIGURATION

型式 MODEL	FAR-3230S/3330S	FAR-3025S
空中線部 ANTENNA	RSB-129	
制御部 PROCESSOR	EC-3000	EC-3005

DRAWN	3/Mar/2025 T.YAMASAKI	TYPE	FAR-3230S(-BB)/3330S/3035S
CHECKED	14/Mar/2025 A.Murao	名称	航海用レーダー
APPROVED	14/Mar/2025 A.Murao		相互結線図
SCALE	MASS kg	NAME	MARINE RADAR
DWG.No.	C3618-C01- U	REF.No.	03-183-6002-2
			INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.



注記
＊1）造船所手配。
＊2）オプション。
＊3）IEC61162-450 Ed.1でネットワークを構成するときは、HUB-100も使用可。
＊4）HK仕様では標準選択。

NOTE
*1: SHIPYARD SUPPLY
*2: OPTION
*3: HUB-100 ALSO AVAIRABLE WHEN THE NETWORK FOR IEC61162-450 Ed.1.IS USED.
*4: STANDARD SUPPLY AVAIRABLE FOR HK CONFIGURATION.

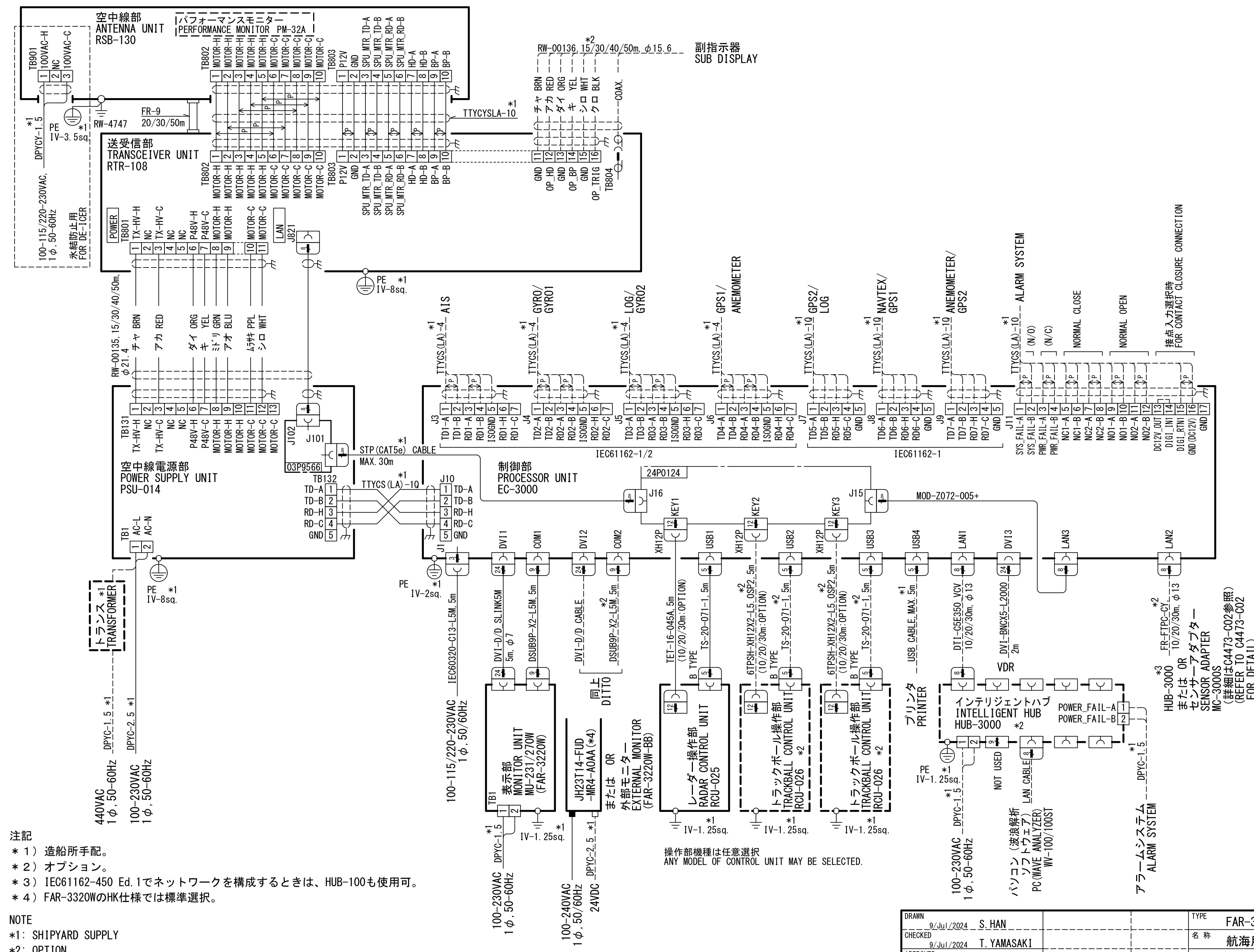
ユニット構成 CONFIGURATION

型式 MODEL	FAR-3x330S-SSD	FAR-3035S-NXT
空中線部 ANTENNA	RSB-133	
制御部 PROCESSOR	EC-3000	EC-3005

DRAWN	9/Jul/2024 S.HAN	TYPE	FAR-3230S-SSD(-BB)/3330S-SSD/3035S-NXT
CHECKED	9/Jul/2024 T.YAMASAKI	名称	航海用レーダー
APPROVED	21/Jul/2024 A.Murao		相互結線図
SCALE	MASS kg	NAME	MARINE RADAR
DWG.No.	C3619-C01- S	REF.No.	03-183-6002-2
			INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO

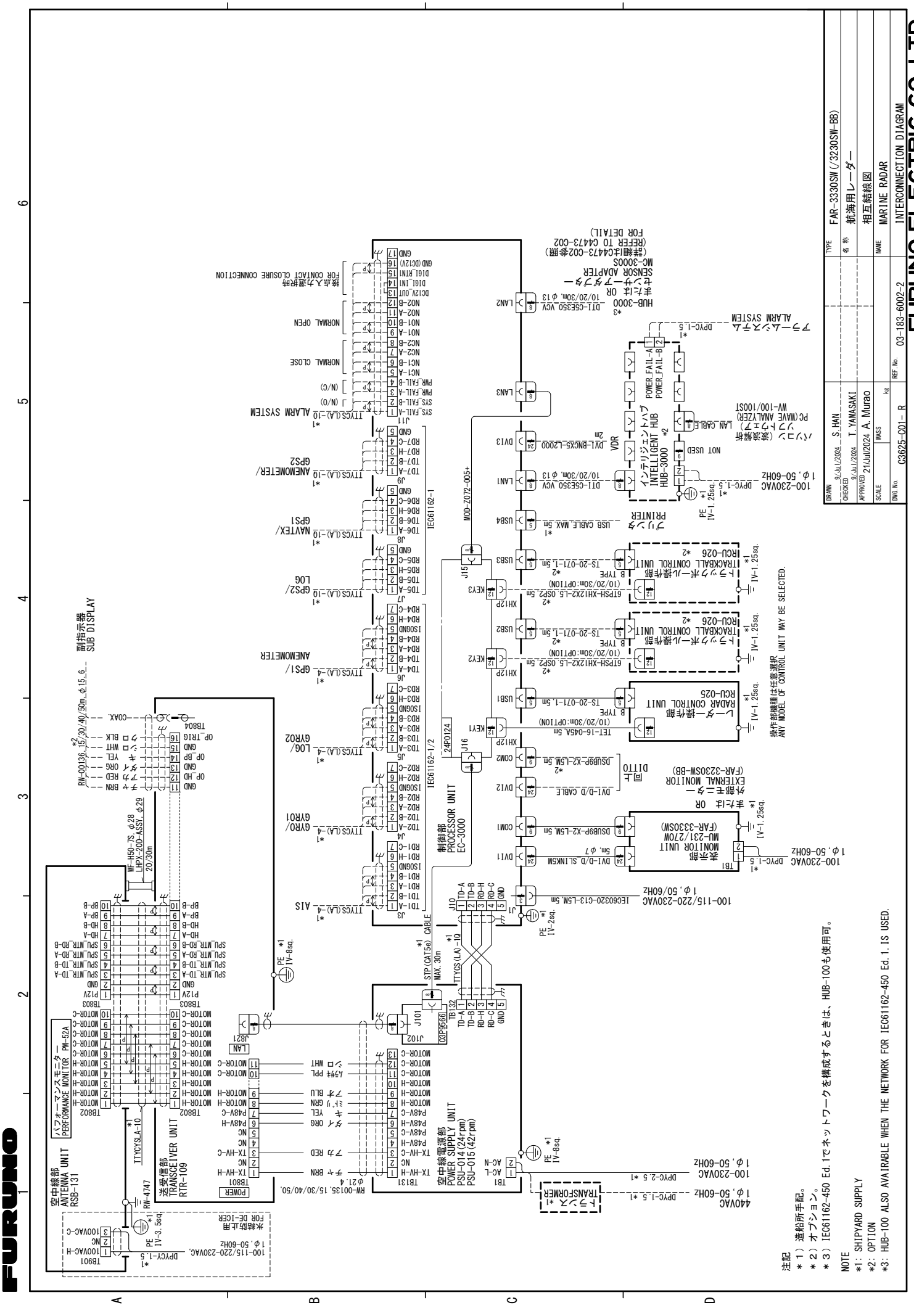


注記
＊１）造船所手配。
＊２）オプション。
＊３）IEC61162-450 Ed.1でネットワークを構成するときは、HUB-100も使用可。
＊４）FAR-3320WのHK仕様では標準選択。

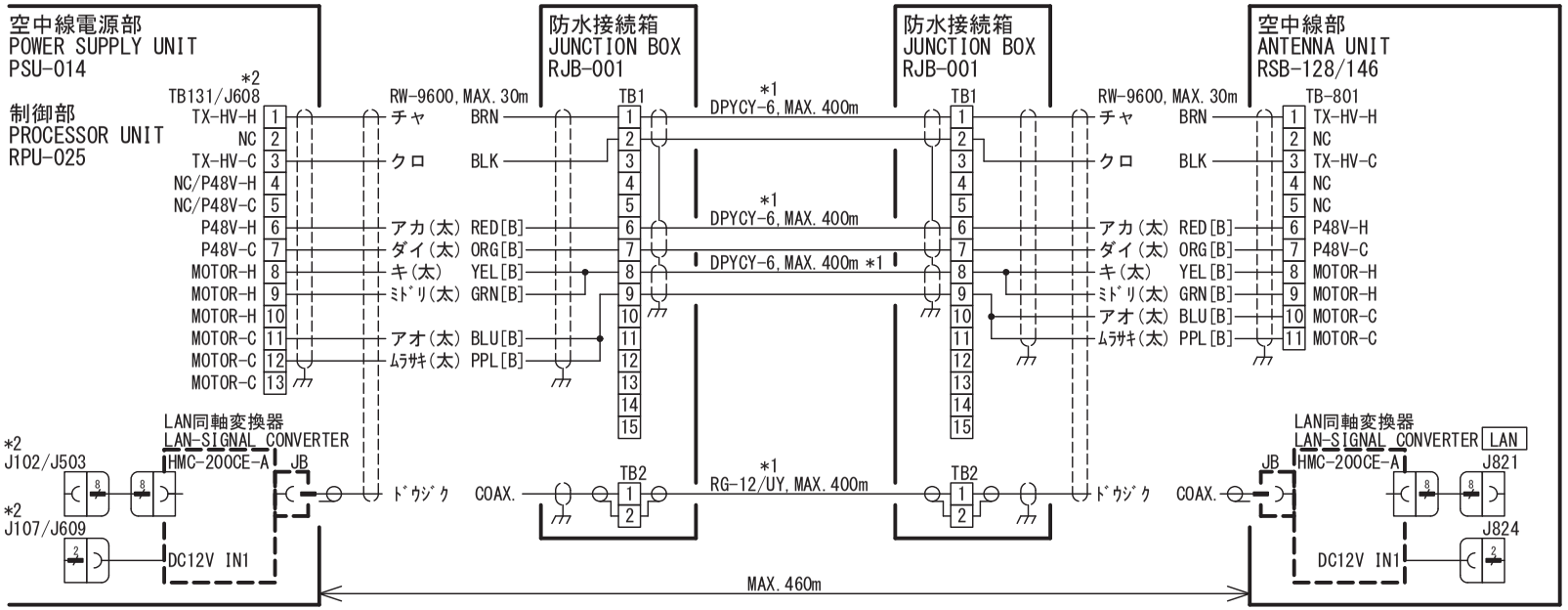
NOTE
*1: SHIPYARD SUPPLY
*2: OPTION
*3: HUB-100 ALSO AVAIRABLE WHEN THE NETWORK FOR IEC61162-450 Ed.1.IS USED.
*4: STANDARD SUPPLY AVAIRABLE FOR FAR-3320W HK CONFIGURATION.

DRAWN 9/Jul/2024 S.HAN		TYPE	FAR-3320W(/3220W-BB)
CHECKED 9/Jul/2024 T.YAMASAKI		名 称	航海用レーダー
APPROVED 21/Jul/2024 A. Murao			相互結線図
SCALE	MASS kg	NAME	MARINE RADAR
DWG. No. C3624-C01- R	REF. No. 03-183-6002-2		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.


FURUNO ELECTRIC CO., LTD.
INTERCONNECTION DIAGRAM
FAR-3330SW(/3230SW-BB)
航海用レーダー
相互結線図
MARINE RADAR
03-183-6002-2
C3625-001- R
空中線部 ANTENNA UNIT RSB-131
送受信部 TRANSCEIVER UNIT RTR-109
空中線電源部 POWER SUPPLY UNIT PSU-014 (24rpm) PSU-015 (42rpm)
制御部 PROCESSOR UNIT EC-3000
表示部 MONITOR UNIT MU-231/27OW (FAR-3330SW)
RADAR CONTROL UNIT RCU-025
TRACKBALL CONTROL UNIT RCU-026
INTELLIGENT HUB HUB-3000
HUB-3000 OR SENSOR ADAPTER MC-3000S
PRINTER
ALARM SYSTEM
VDR
PERFORMANCE MONITOR PM-52A
副指示器 SUB DISPLAY
水蛙防止用 FOR DE-ICER
FOR CONTACT CLOSURE CONNECTION
NORMAL CLOSE
NORMAL OPEN
ANEMOMETER
NAVTEX/ GPS1
GPS2/ LOG
GYRO2
GYRO/ GYRO1
AIS
ALARM SYSTEM
ANEMOMETER/ GPS2
100-115/220-230VAC 1φ, 50/60Hz
100-230VAC 1φ, 50-60Hz
440VAC 1φ, 50-60Hz
TRANSFORMER
STP(CAT5e) CABLE MAX. 30m
IEC61162-1/2
IEC61162-1
24P0124
MOD-Z072-005+
LAN CABLE
USB CABLE MAX. 5m
NOT USED
REF. No.
DWG. No.
APPROVED
CHECKED
DRAWN
SCALE
MASS
NAME
TYPE
名 称
9/Jul/2024 S.HAN
9/Jul/2024 T.YAMASAKI
21/Jul/2024 A.Murao
注記
＊1）造船所手配。
＊2）オプション。
＊3）IEC61162-450 Ed.1でネットワークを構成するときは、HUB-100も使用可。
NOTE
*1: SHIPYARD SUPPLY
*2: OPTION
*3: HUB-100 ALSO AVAIRABLE WHEN THE NETWORK FOR IEC61162-450 Ed.1.1S USED.

FURUNO



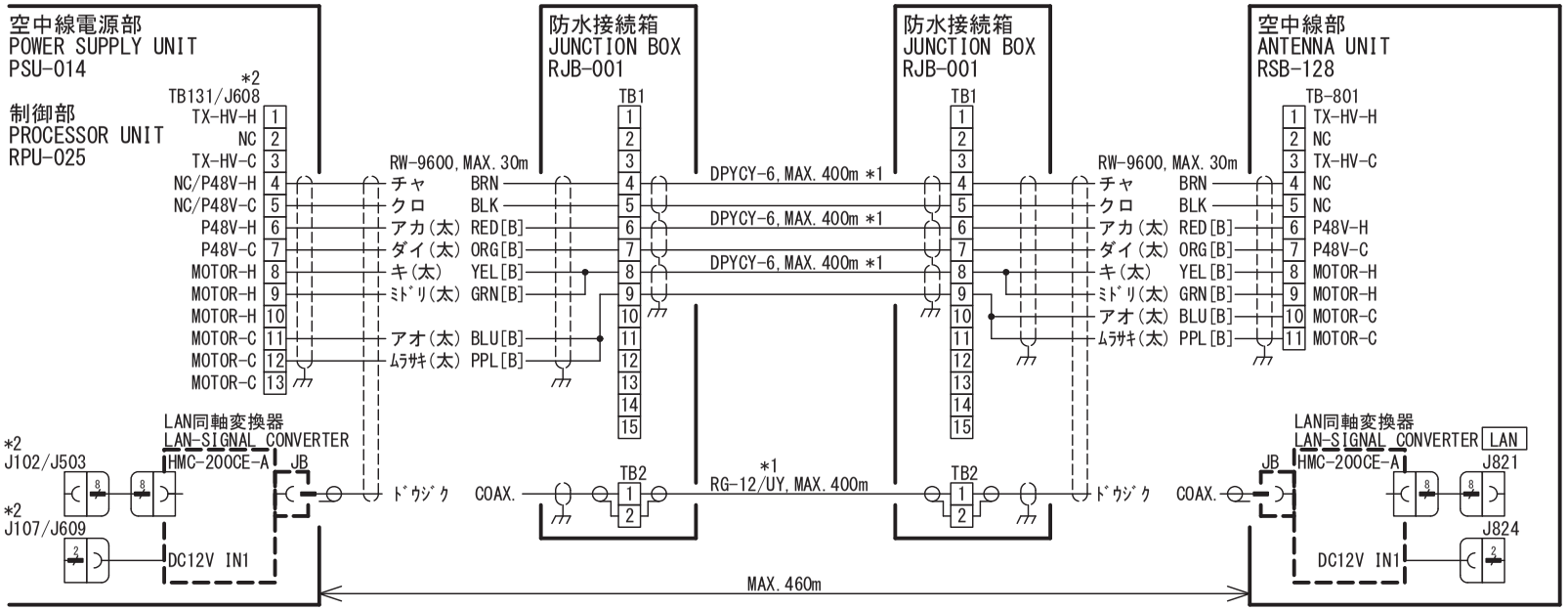
注記
＊１）造船所手配。
＊２）併記された番号は、PSU-014/RPU-025の順。

NOTE
*1: SHIPYARD SUPPLY.
*2: THE CONNECTOR NUMBERS ARE SHOWN AS PSU-014/RPU-025 ORDER.

DRAWN 29/Mar/2022 T. YAMASAKI			TITLE RJB-001
CHECKED 29/Mar/2022 H. MAKI			名 称 防水接続箱（空中線ケーブル延長）
APPROVED 10/Jan/2023 H.MAKI	FAR-2xx8(M2) ser. FAR-3xxx ser.		相互結線図
			NAME JUNCTION BOX (ANTENNA CABLE EXTENSION)
DWG. No. C3616-C02- H	REF. No.		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO



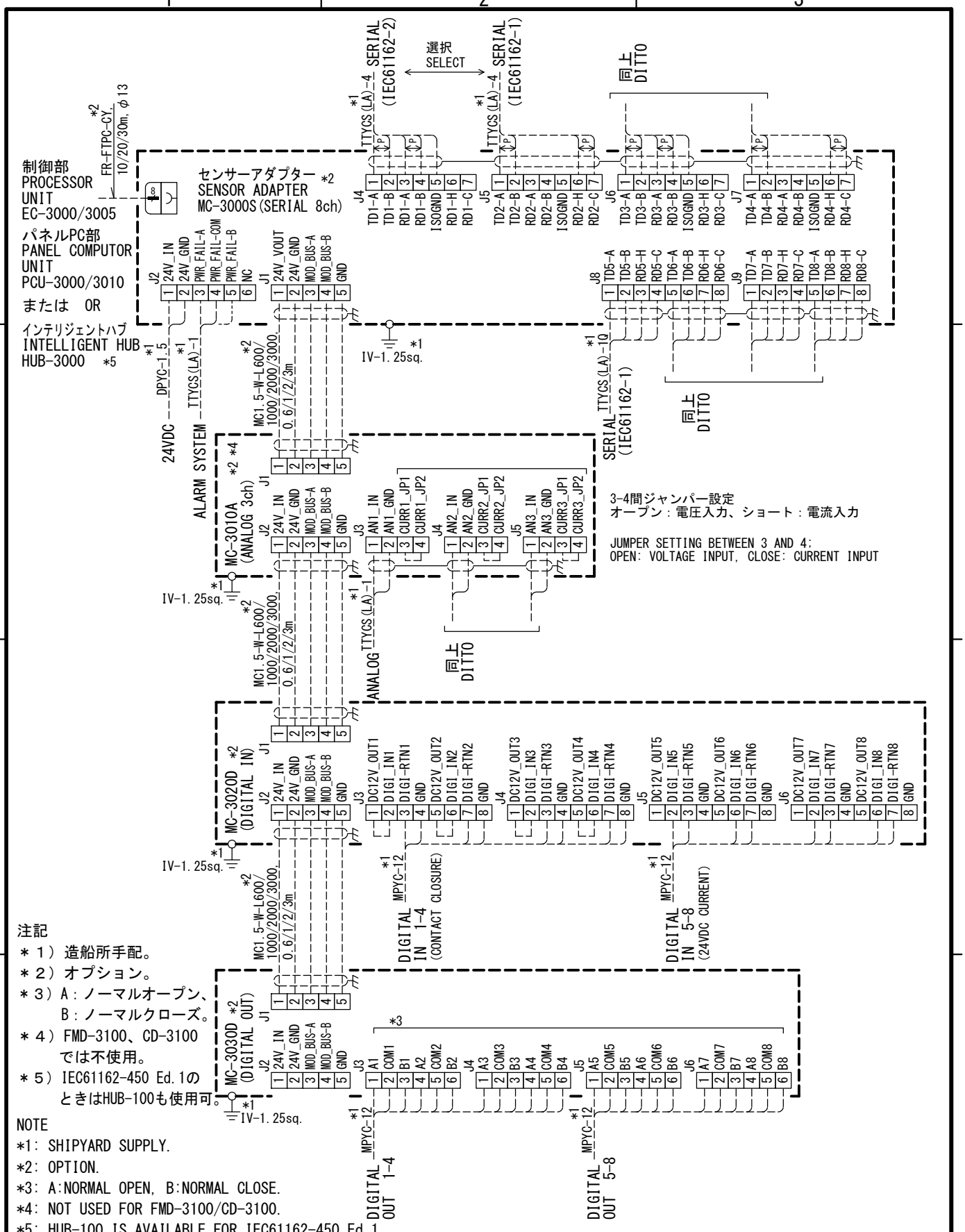
注記
＊１）造船所手配。
＊２）併記された番号は、PSU-014/RPU-025の順。

NOTE
*1: SHIPYARD SUPPLY.
*2: THE CONNECTOR NUMBERS ARE SHOWN AS PSU-014/RPU-025 ORDER.

DRAWN 29/Mar/2022 T. YAMASAKI			TITLE RJB-001
CHECKED 29/Mar/2022 H. MAKI			名 称 防水接続箱（空中線ケーブル延長/固体化）
APPROVED 10/Jan/2023 H.MAKI	FAR-3xxx-NXT ser. FAR-2xx8-NXT ser.		相互結線図
			NAME JUNCTION BOX (CABLE EXTENSION/SOLID)
DWG. No. C3679-C03- B	REF. No.		INTERCONNECTION DIAGRAM

Hiromasa Maki

FURUNO ELECTRIC CO., LTD.



注記
＊１）造船所手配。
＊２）オプション。
＊３）A：ノーマルオープン、
　　B：ノーマルクローズ。
＊４）FMD-3100、CD-3100
　　では不使用。
＊５）IEC61162-450 Ed.1の
　　ときはHUB-100も使用可。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: A:NORMAL OPEN, B:NORMAL CLOSE.
*4: NOT USED FOR FMD-3100/CD-3100.
*5: HUB-100 IS AVAILABLE FOR IEC61162-450 Ed.1.

DRAWN 19/Jun/2023 T.YAMASAKI			TITLE MC-3000S/3010A/3020D/3030D
CHECKED 19/Jun/2023 H.MAKI		CD-3x00	名称 センサーアダプター
APPROVED 21/Jun/2023 H.MAKI		FAR-3xxx SER. FMD-3x00/3005	相互結線図
SCALE	MASS kg		NAME SENSOR ADAPTER
DWG.No. C4473-C02- L		REF.No. 24-014-6003-2	INTERCONNECTION DIAGRAM