

Installation Manual

SURVEILLANCE RADAR

FAR-3220Z

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IMPORTANT NOTICES

General

- This manual has been authored with simplified grammar, to meet the needs of international users.
- The operator of this equipment must read and follow the descriptions in this manual. Wrong operation or maintenance can cancel the warranty or cause injury.
- Do not copy any part of this manual without written permission from FURUNO.
- If this manual is lost or worn, contact your dealer about replacement.
- The contents of this manual and equipment specifications can change without notice.
- The example screens (or illustrations) shown in this manual can be different from the screens you see on your display. The screens you see depend on your system configuration and equipment settings.
- Save this manual for future reference.
- Any modification of the equipment (including software) by persons not authorized by FURUNO will cancel the warranty.
- The following concern acts as our importer in Europe, as defined in DECISION No 768/2008/EC.
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How to discard this product

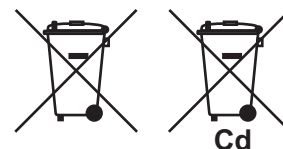
Discard this product according to local regulations for the disposal of industrial waste. For disposal in the USA, see the homepage of the Electronics Industries Alliance (<http://www.eiae.org/>) for the correct method of disposal.

How to discard a used battery

Some FURUNO products have a battery(ies). To see if your product has a battery, see the chapter on Maintenance. Follow the instructions below if a battery is used. Tape the + and - terminals of battery before disposal to prevent fire, heat generation caused by short circuit.

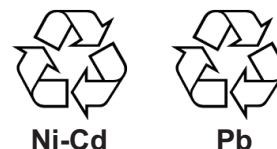
In the European Union

The crossed-out trash can symbol indicates that all types of batteries must not be discarded in standard trash, or at a trash site. Take the used batteries to a battery collection site according to your national legislation and the Batteries Directive 2006/66/EU.



In the USA

The Mobius loop symbol (three chasing arrows) indicates that Ni-Cd and lead-acid rechargeable batteries must be recycled. Take the used batteries to a battery collection site according to local laws.



In the other countries

There are no international standards for the battery recycle symbol. The number of symbols can increase when the other countries make their own recycle symbols in the future.



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



WARNING



**ELECTRICAL
SHOCK
HAZARD**

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

Only qualified personnel are allowed to work inside the equipment.



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.



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.



WARNING



Do not install the transceiver unit in a dusty environment, or one where the unit 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.

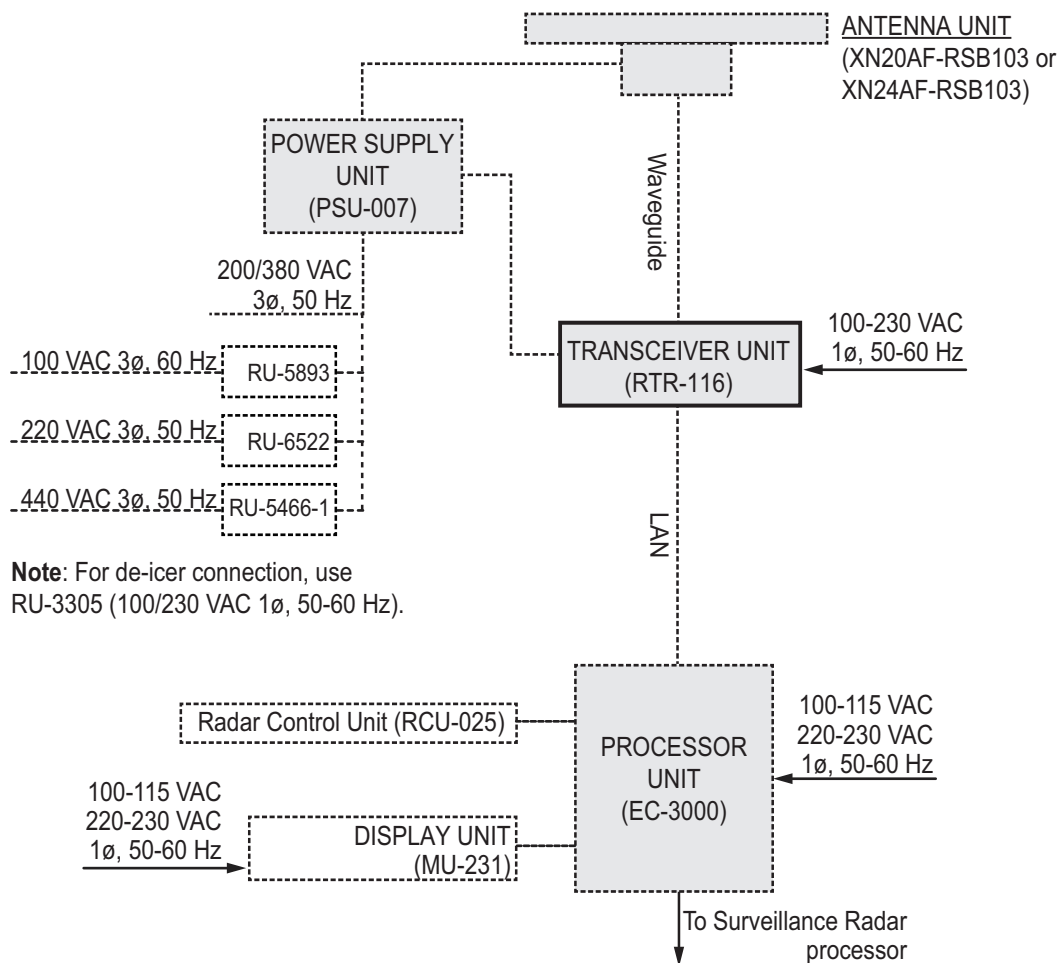


Attach protective earth securely to the ship's body.

The protective earth (grounding) is required for the AC power supply to prevent electrical shock.

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

SYSTEM CONFIGURATION



- Basic configuration is shown with solid line.
- Equipment shown with dotted lines are local supply.

Category of units

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

Program no.

System	Program no.	Version no.	Remarks
Antenna unit			
SPU	0359407	01.xx	
RF-Converter	0359414	01.xx	
Processor unit (EC-3000)			
Main	0359266	02.xx	

xx: Minor change

The latest IHO standard can be found at <http://www.iho.int>

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 Mounting Considerations

Keep in mind the following points when selecting a mounting location for the transceiver unit.

- Locate the unit away from heat sources because of heat that can build up inside the cabinet.
- Locate the unit 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.
- Be sure to connect the ground wire (between the earth terminal on the chassis and the ship's earth).

1.2 How to Mount the Transceiver Unit

Fix the unit to the mounting location with M6 bolts or $\phi 6$ coach screws. See the outline drawing for mounting dimensions.

1. INSTALLATION

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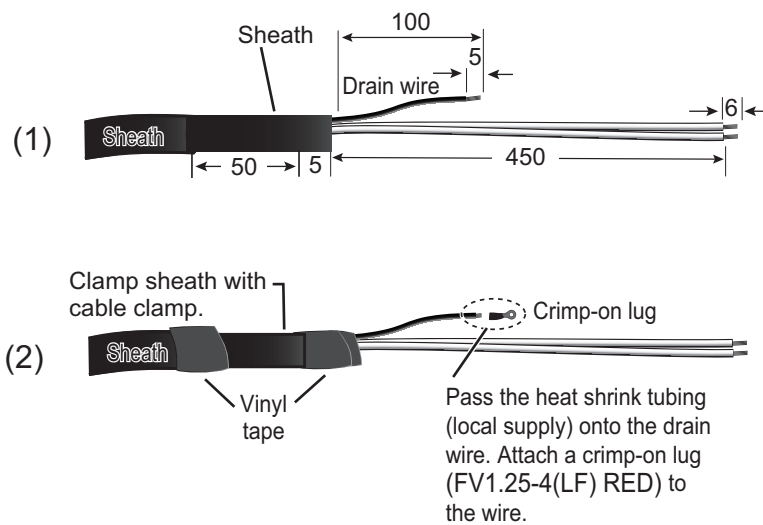
2. WIRING

2.1 Cabling Considerations

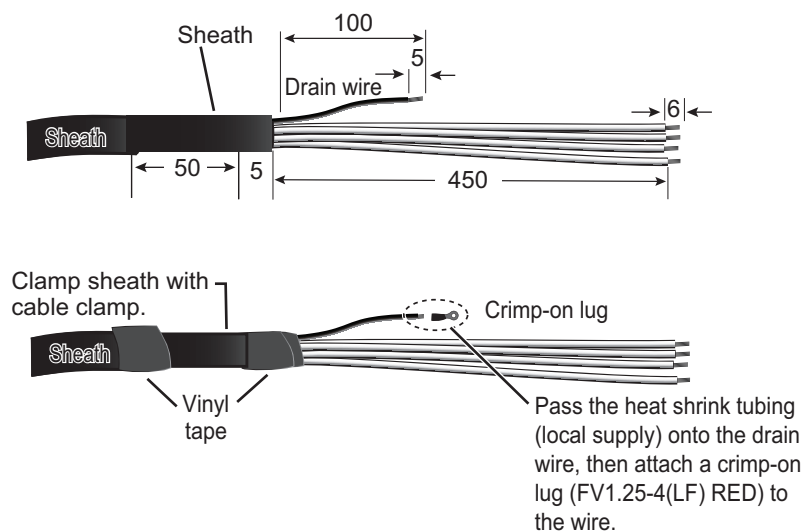
- To lessen the chance of picking up electrical interference, avoid where possible routing the antenna cable (power and LAN) near other onboard electrical equipment (radars, TX radio antennas, etc.). Also avoid running the cable in parallel with power cables. When crossing with other cable, the angle 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 and 30 m. Whatever length is used, it must be unbroken; namely, no splicing allowed. The antenna cable should be 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.
- 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 a Cat5e or Cat6 LAN cable for the network if available locally.
- 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 locking wire saddle.

2.2 How to Fabricate Cables

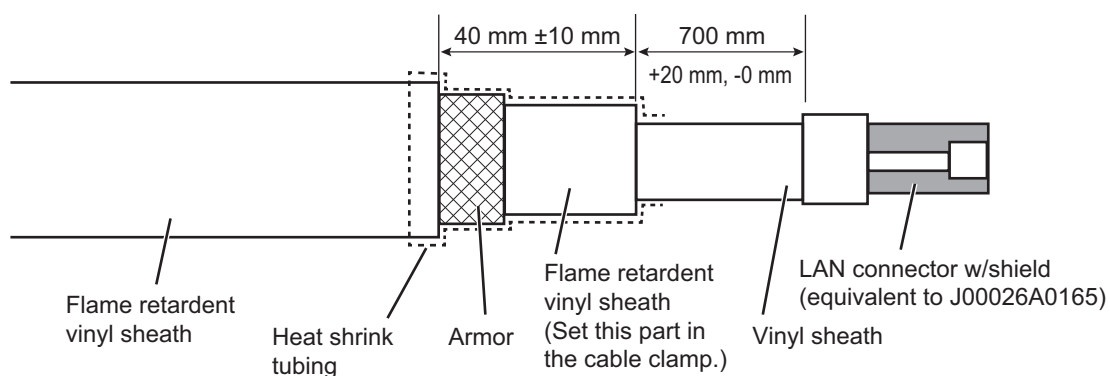
2.2.1 Antenna cable (TTYCYSLA-1)



2.2.2 Serial cable (TTYCYSLA-1Q)



2.2.3 LAN cable (FR-FTPC-CY)



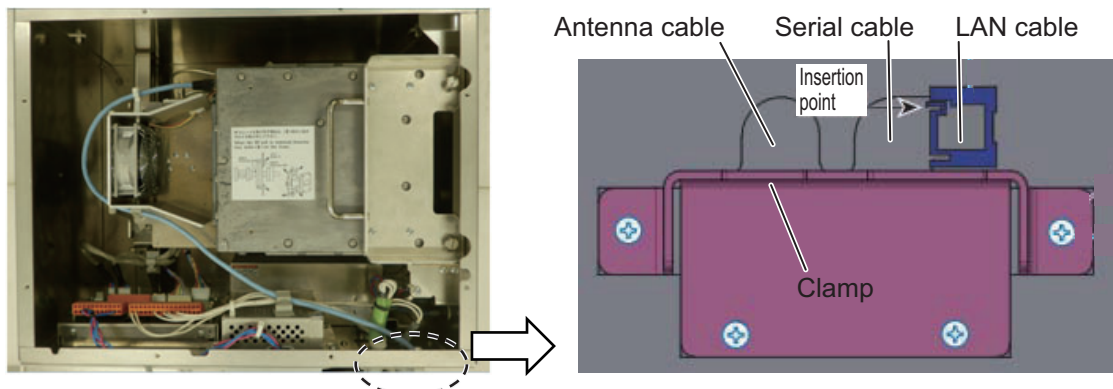
2.2.4 Flexible waveguide

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

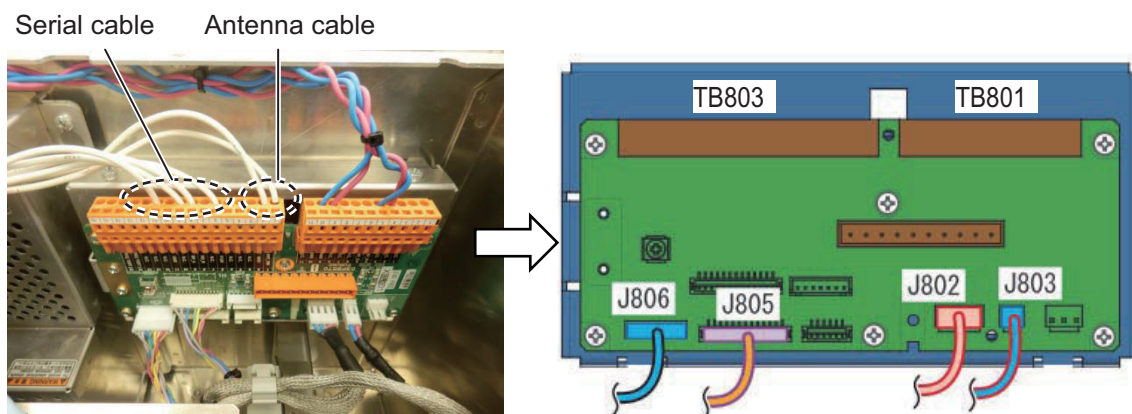
2.3 How to Connect Cables

2.3.1 How to connect the antenna cable, serial cable, and LAN cable

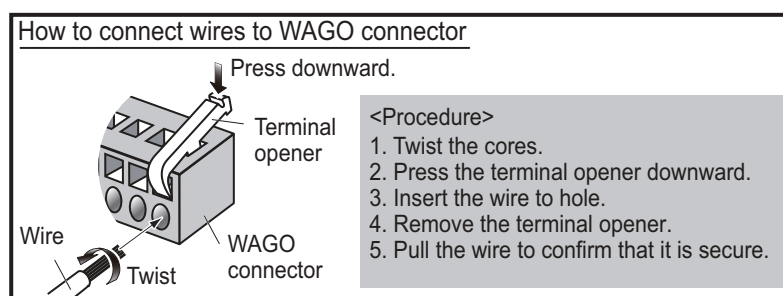
1. Remove the cover of the unit.
2. Lay the cables in respective cable slots so their armors rest in the slots.



3. Connect the power line of the serial cable to the RF-TB Board as shown in the figure below.



- Antenna cable: TB803
- Serial cable: TB803

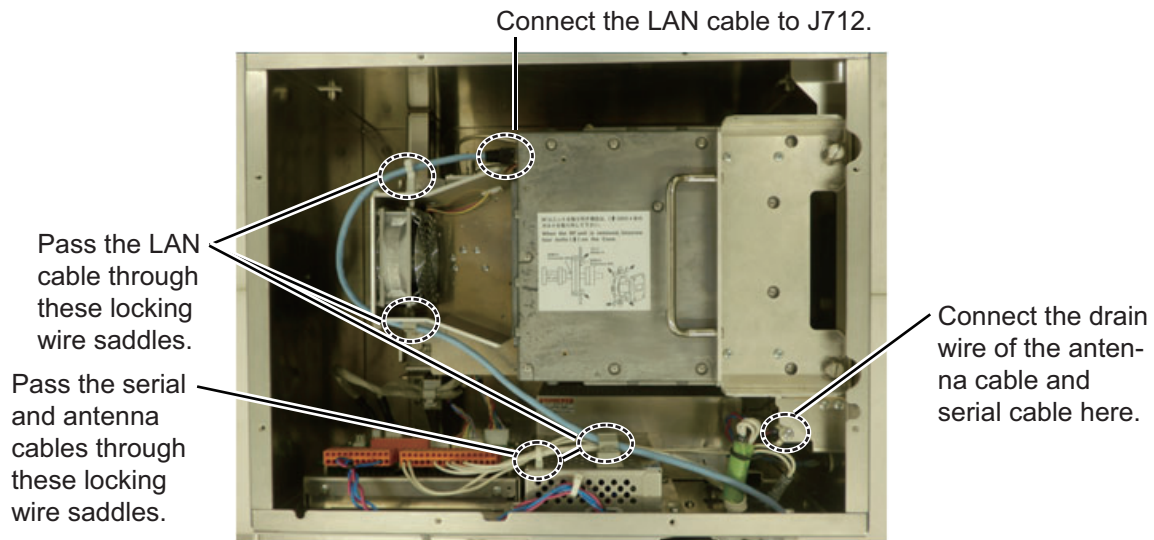


2. WIRING

Pin arrangement of TB803 on RF-TB Board (03P9570)

Pin No.	Signal	In/Out	Remarks
1	ANT_ON	Out	12V, connect to PSU-007.
2	GND		
3	N.C.		
4	N.C.		
5	N.C.		
6	P12V	Out	Power for Heading and Bearing
7	N.C.		
8	HD_B	In	Heading, 5V
9	BP_A	In	Bearing, 12V, 360ppr
10	N.C.		
11	GND		
12	N.C.		
13	N.C.		
14	N.C.		
15	GND		
16	TRIG	Out	N.C., for testing

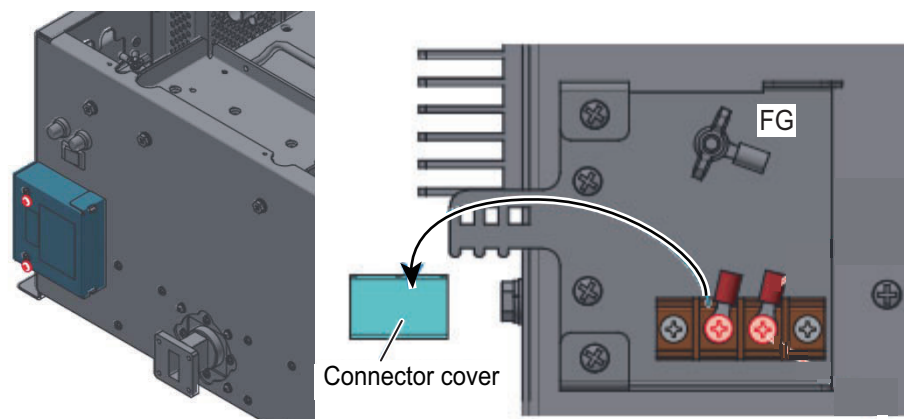
4. Make the following connections inside the transceiver unit.
 - Pass the LAN cable through the locking wire saddles circled in the figure below, then connect the cable to J712.
 - Pass the serial and antenna cables through the locking wire saddles circled in the figure below. Connect the drain wires of the cables to the location specified in the figure below.



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

2.3.2 How to connect the power cable

1. Remove the connector cover for the power cable.



2. Fabricate the power cable (TPY-1.5) as shown below.



3. Pull up the plastic cover and connect the power cable.
4. Remount the cover.
5. Reattach the cover of the power supply unit.

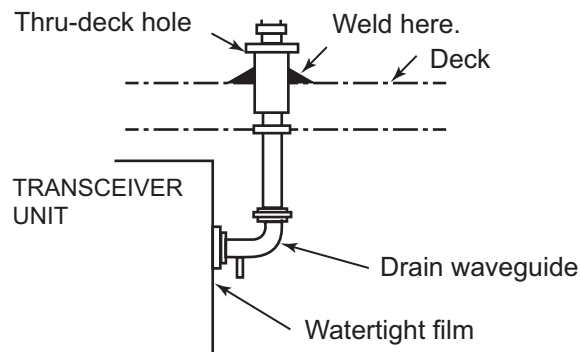
2.3.3 How to connect the flexible waveguide (FR-9)

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.

2. WIRING

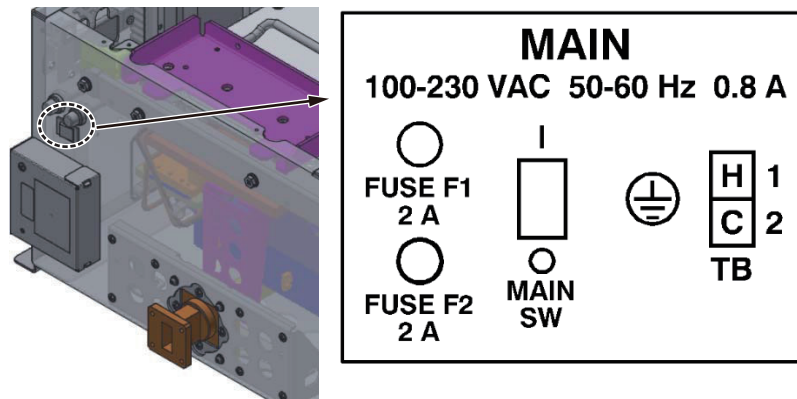
- The transceiver unit output flange is a plain type and the antenna unit output flange is a choke type, and it is important to maintain this relationship throughout the waveguide run.



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

2.4 Power ON/OFF

Use the MAIN SW on the transceiver unit to power the unit on or off. The start-up time is approx. one minute. (The fan starts rotating when the start-up is completed.) This unit is not linked with the power ON/OFF of the EC-3000.



3. SETTINGS AND ADJUSTMENTS

3.1 How to Connect the Surveillance Radar for Settings and Adjustments

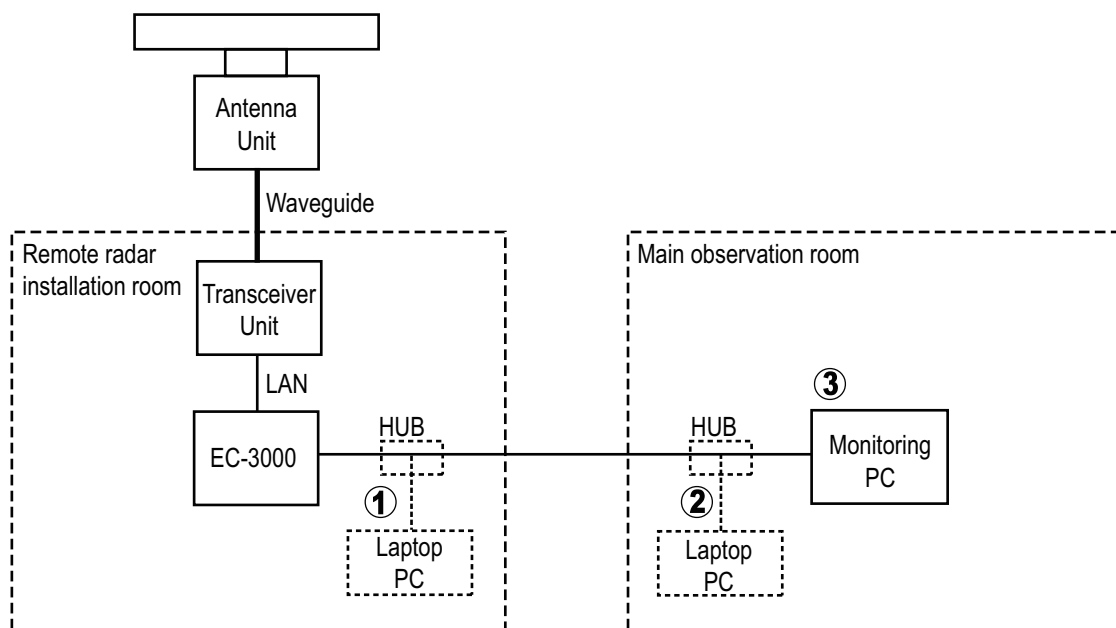
Among the equipment setting menus, those that set values specific to the surveillance radar cannot be displayed in the menu of EC-3000. These items are set by connecting laptop PC(s) to the LAN.

3.1.1 How to connect PC(s) to the surveillance radar

As shown in the figure below, there are two ways to connect PC(s) to the surveillance radar.

Method 1: Connect a pair of laptop PCs to the EC-3000 with two HUBS, as shown by (1) and (2) in the figure below.

Method 2: Connect a monitoring PC directly to the EC-3000, as shown by (3) in the figure below.



3.1.2 Software connection

Use TeraTerm* to connect to the SPU board by using TCP/IP. For the network connection, see the applicable document, issued separately.

Be sure the IP address of the SPU board is not the same as the one for the monitoring PC.

* An open-source software package designed to be used for emulation purposes.

3.2 Settings from the PC(s)

Enter the following commands in a text file and use TeraTerm to send the file to the EC-3000.

3.2.1 Antenna height

Antenna height cannot be set from the EC-3000. Set it with a command as follows.

Antenna height (m)	Command	Antenna height (m)	Command
5	changeanth 0 0	60	changeanth 0 11
7.5	changeanth 0 1	70	changeanth 0 12
10	changeanth 0 2	80	changeanth 0 13
15	changeanth 0 3	90	changeanth 0 14
20	changeanth 0 4	100	changeanth 0 15
25	changeanth 0 5	110	changeanth 0 16
30	changeanth 0 6	120	changeanth 0 17
35	changeanth 0 7	130	changeanth 0 18
40	changeanth 0 8	140	changeanth 0 19
45	changeanth 0 9	150	changeanth 0 20
50	changeanth 0 10		

3.2.2 TX channel (TX_CH)

TX CH	Command
CH1	txchset 1
CH2	txchset 2
CH3	txchset 3

3.3 Settings at Installation of the EC-3000

3.3.1 Initial pulse length settings for each range

Menu operation: MENU→[1 ECHO]→[1 CUSTOMIZE ECHO]→[8 PULSE]

Set the pulse length for the ranges shown in the table below.

Range (nm)	Pulse length setting
0.5	S1
0.75	S1
1.5	S1
3	S2
6	M1
12	M1
24	M2

Menu operation for restoring default pulse lengths: MENU→[1 ECHO]→[1 CUSTOMIZE ECHO]→[0 DEFAULT]

After restoring the pulse lengths, select [SAVE] to save the settings.

3.3.2 Second-trace echo rejection

Menu operation: MENU→[1 ECHO]→[5 2ND ECHO REJ]→[OFF]

3.3.3 Interference rejector

Click the [IR] button on the InstantAccess bar™, then click desired rejection level (or OFF). The higher the number the greater the degree of interference rejection. It is recommended to use [IR1] when using the “long” pulse length.



3.3.4 Beam width

In order to determine the minimum echo detection width of the TT echo, set the antenna nominal beam width.

Menu operation	MENU→[9 RADAR INSTALLATION]→[4 TT PRESET]→[NEXT]→[3 TT DETAIL DATA]→No. 88
Setting	Beam width [deg] × 100 Example: beam width 0.75 deg=0075
Remarks	The beam width setting range is 0.01 to 6.00. If you select the antenna type with [8 INITIAL SETTING]→[5 ANT SELECT], the preset of No. 88 will be changed. Note: TT tracking performance may be affected when the antenna length is long and the horizontal beam width is small, because the number of times the transmitted radio wave strikes the target decreases.

3.3.5 IR setting for TT FrontEnd

Menu operation	MENU→[9 RADAR INSTALLATION]→[4 TT PRESET]→[NEXT]→[3 TT DETAIL DATA]→No. 94
Setting	3 m antenna, 24 rpm=1025 For other antenna length, antenna rotation speed, see below for the setting method. Ones place digit: Set between 0 and 5 according to beam width and antenna rpm. In each pulse setting, compare the echo display with the QV display. If the target displayed in the echo display is not shown in QV, turn off the IR of the TT front end above that pulse setting. Tens place digit: Fixed at “2”. Hundreds, Thousands place digit: Antenna rotation speed × approx. 0.4. (Since the antenna rotation changes slightly by wind etc., it is recommend to use a value close to the nominal value of the rotation speed.) See “Detailed meaning of setting value” below.
Remarks	The default setting is “6006” (IR ON). This setting may not display the QV echo when the pulse length is “LONG”. The QV is turned on or off by MENU→[9 RADAR INSTALLATION]→[4 TT]→[3 QV DISPLAY]→ON / OFF

Detailed meaning of setting value

- Each of the ones place digit, tens place digit, hundreds place digit and thousands place digit have meanings.

(1) The ones place digit indicates the boundary of the pulse length that turns off the IR of the TT front end.

Pulse length	Setting
S1	0
S2	1
M1	2
M2	3
M3	4
L	5

For example, to set “pulse length M2 - L, IR OFF”, set the ones digit to “3”. (The default setting for the ones digit is “6”, which turns off IR no matter the pulse length.)

(2) The tens place has the meaning shown in the table below.

Setting	Content
0	IR always ON.
1	ACE ON: IR is turned OFF according to pulse length and antenna rpm.
2	ACE OFF: IR is turned OFF according to pulse length and antenna rpm.
3	IR always OFF.

(3) The hundreds and thousands places indicate the boundary value of the antenna rotation speed (rpm) that turns off IR.

- The table shows preset values and their content.

Setting	Content
3614	Antenna rotation 36 rpm, ACE ON, IR is turned off when pulse length is M3 - L.
3604	Tens place is “0”, which means IR is always ON. IR is always ON regardless of value of ones place, one hundreds place and or thousands place.
3634	Tens place is “3”, which means IR is always OFF. IR is always OFF regardless of value of ones place, one hundreds place or one thousands place.

3.4 How to Input Navigation Data

Because navigation data is not automatically input to the EC-3000, it is necessary to enter the mode as type=B, and enter heading, speed and position manually.

The operator can select navigation sensors to use for navigation and view their current values on the applicable page in the [System Sensor Setting] and [Local Sensor Setting] menus. To access these menus, right-click the Sensor information datum box, then click [Select Sensor] followed by [Setting].

The descriptions in this section show the sensor menus in the radar mode. The sensor menus in the chart mode mirror those in the radar mode, although the layout is different. Any change made in a sensor menu is reflected to the companion sensor menu, to synchronize the data between the modes.

3.4.1 Sensors menu

[HDG] page (Local Sensor)

Priority	Sensors
1	ECD001/FILTER
2	GYO001

☒ Analog Gyro
 Adjust

☐ Manual
 Adjust

Cancel OK

[Sensors]: Select the heading sensor to use.

[Analog Gyro]: No use.

[Manual]: Set heading manually when there is no heading sensor available.

[Gyro Correction]: Set correction manually for the heading value. (Not available with the [System Sensor Setting] menu.)

[SPD] page (System Sensor)

Priority	Sensors
1	GPS001

☒ Manual

☐ Reference SPD

Drift : ☒ Set Drift

Cancel OK

[Stabilization Mode]: Select the water stabilization

mode: Select [Bottom] for ground stabilization, or select [Water] for sea stabilization.

[Sensor Type]: Select [GPS] in case of a GPS navigator, or [LOG] for speed log.

[Data Source]: Check [Sensors] to use a sensor in the [Sensors] list, or click [Manual] to enter speed manually. Use [Manual] when no speed source is available.

[Manual]: Input speed manually. Check [Water] in [Stabilization Mode] and deactivate the AIS function to enable entry.

[Reference SPD]: Check to use radar as the source for speed and course. (Only available with the Local Sensor Setting and checking [Bottom] in [Stabilization Mode].)

[Set Drift]: Check the [Set Drift] checkbox to manually set speed and course of drift. Note that you can select manual drift only if you check [Water] in [Stabilization Mode].

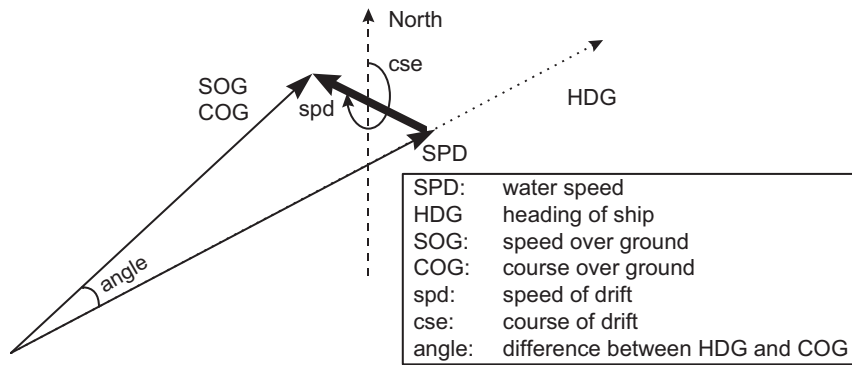
Angle = Difference between heading and COG

Spd = Speed component of the drift vector

Cse = Course component of the drift vector

Vector defined by (SOG and COG) is equal to vector sum of vectors defined by (SPD and HDG) and (set and drift).

3. SETTINGS AND ADJUSTMENTS



[POSN] (Position) page

POSN

Data Source:

☒ Sensors

Priority	Sensors
1	GPS001

☐ DR 35° 18' .120 "N
139° 44' .189 "E

Cancel OK

The sensor label (here, GPS001, GPS002) indicates the name of the sensor.

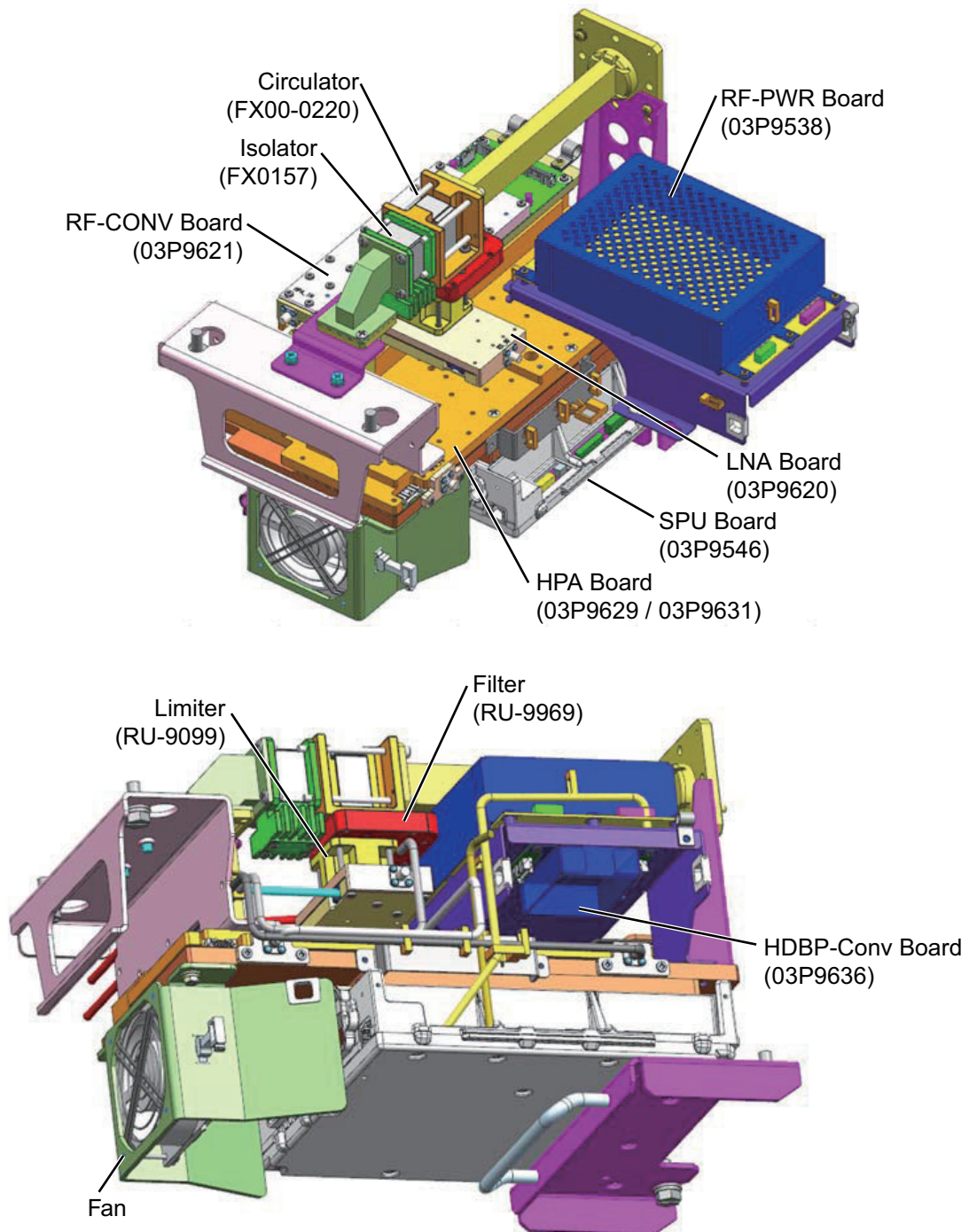
[Data Source]: Check [Sensors] to use a sensor in the [Sensors] list, or click [DR] to enter position manually. When the position source is changed based on priorities and signal validity to another position source, then you get the Alert 472 (ALF format: 10602,1) "Position Source Change".

[DR]: Check [DR] when no position source is available.

4. MAINTENANCE, SERVICE RELATED INFORMATION

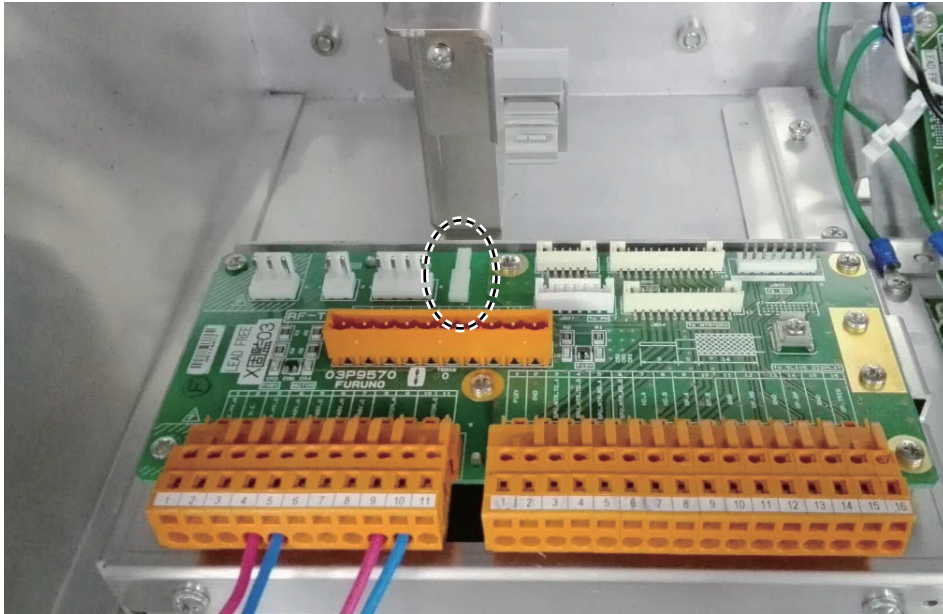
4.1 Parts Location

The figures below show the location of major parts in the transceiver unit.



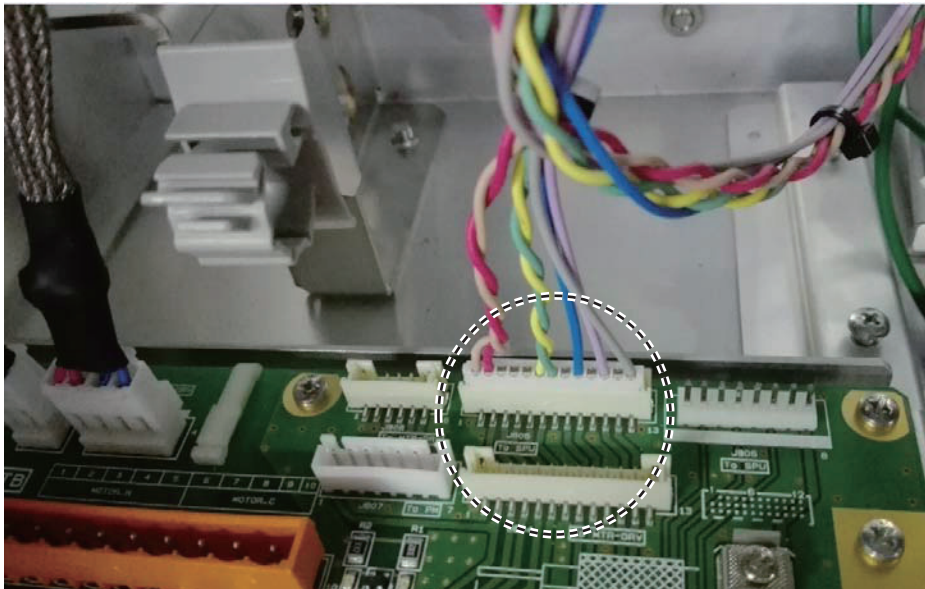
4.2 Jig, Tool

A WAGO connector operating tool is attached to the RF-TB Board, at the location circled in the figure below.



4.3 Wiring Caution

J804 and J805 use the same type of connector; however, connect the harness to J805.



4.4 Cable Types

The table below shows the types of coaxial cables used in the transceiver unit.

Signal name	Connection point 1	Connection point 2	Cable type
TX-IF	SPU Board (J714)	RF-CONV Board (J722)	SP×2 SS L270
RX-IF	SPU Board (J715)	RF-CONV Board (J723)	SP×2 SS L300
Rx_RF	RF-CONV Board (J729)	LNA Board (J742)	SMA-PL/PS L245
HPA_in	RF-CONV Board (J727)	HPA Board (J733)	SMA-PL/PS L475
HPA_FB	RF-CONV Board (J726)	HPA Board (J732)	SMA-PL/PS L245

4.5 Periodic Replacement Parts

The transceiver unit has no periodic replacement parts. The life of the fan is better than 10 years.

4.6 Connection With the Transceiver Unit

Reference information for connecting with the transceiver unit is shown in the table below. Arrange other units, work materials, etc. according to equipment and environment.

Name	Type	Code No.	Remarks
Antenna Unit (Radia- tor)	XN20AF	-	6.5 ft
	XN24AF	-	8 ft
Antenna Unit (Gear Box)	RSB-103	-	
Processor Unit	EC-3000	-	
Monitor Unit	MU-231	-	
Control Unit	RCU-025	000-027-614	Standard type
Power Supply Unit	PSU-007	000-081-238	440 VAC, 60 Hz, 1.2A
FR-9 Termination	FR-9-00	001-102-740	
Installation Materials	CP03-16400	000-086-743	w/CP03-16401
	CP03-16410	000-086-744	Flexible waveguide, 20 m, w/CP03-16411
	CP24-02120	000-024-925	For EC-3000
	CP24-02200	000-027-668	For RCU-025
Accessories	FP24-00603	001-285-760	For EC-3000
	FP24-00701	001-418-340	For RCU-025
Waveguide Twist	RWA-1050 C 109	001-304-660	
Rectangular Guide Clamp	OP03-148	008-477-540	
Waveguide Drain	03-009-0360	001-351-950	
H-type Waveguide Clamp	CP03-00600-W	008-198-420	
E-Bend Waveguide	RWA-1030 B-107	001-304-640	

SPECIFICATIONS OF SURVEILLANCE RADAR FAR-3220Z

1 TRANSCEIVER UNIT

1.1 Tx frequency and modulation

X-band (solid state) CH1: 9403.75 MHz (P0N)/ 9423.75 MHz $\pm$ 15 MHz (Q0N),
 CH2: 9413.75 MHz (P0N)/ 9433.75 MHz $\pm$ 15 MHz (Q0N) or
 CH3: 9423.75 MHz (P0N)/ 9443.75 MHz $\pm$ 15 MHz (Q0N)

1.2 Output power 200 W

1.3 Pulse Repetition Rate and Range scale

PRR (Hz approx.)	Range scale (NM)																	
	0.125	0.25	0.5	0.75	1	1.5	2	3	4	6	8	12	16	24	32	48	72	96
2400 ^{*1}	S1																	
2000 ^{*2}			S2															
1500				M1														
1060						M2												
1000								M3										
600										L								

^{*1}: 1800 Hz (S1) with TT range on 32 NM.

^{*2}: 1500 Hz (S2) with TT range on 32 NM.

2 PROCESSOR UNIT

2.1 Minimum range 35 m

2.2 Range discrimination 25 m (Less than 5 NM), 75 m (5 NM to 20 NM)

2.3 Range accuracy 1% of the maximum range of the scales in use or 10 m, which is the greater

3 POWER SUPPLY

Transceiver unit 100-230 VAC: 1.5-0.7 A, 1 phase, 50-60 Hz

4 ENVIRONMENTAL CONDITIONS

4.1 Ambient temperature -15°C to +55°C

4.2 Relative humidity 95% or less at +40°C

4.3 Degree of protection

Transceiver unit IP20

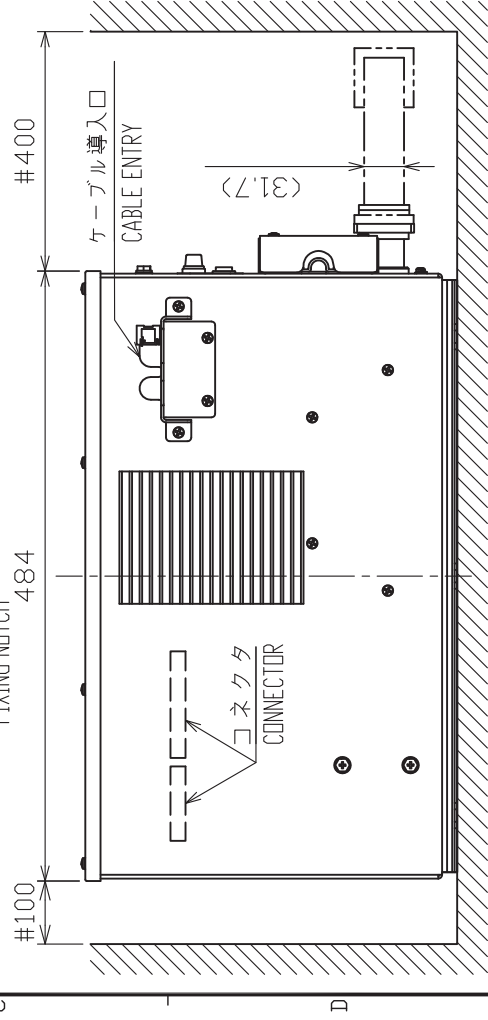
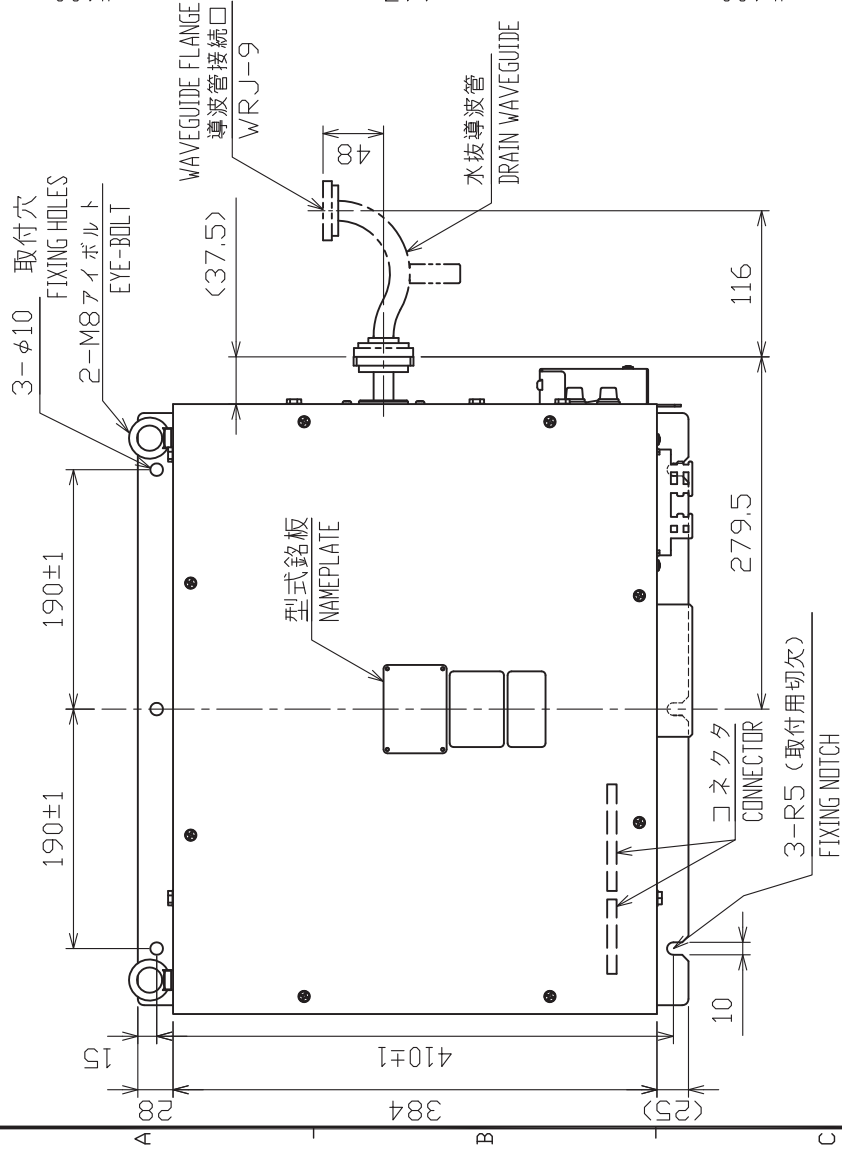
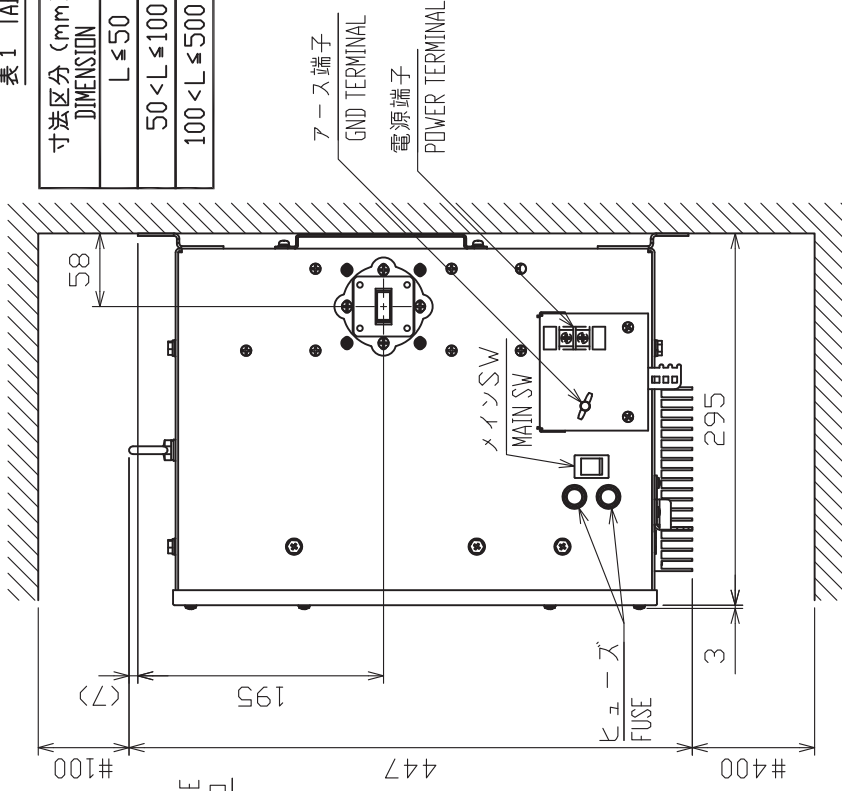
4.4 Vibration IEC 60945 Ed.4

5 UNIT COLOR

Transceiver unit N2.5

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.

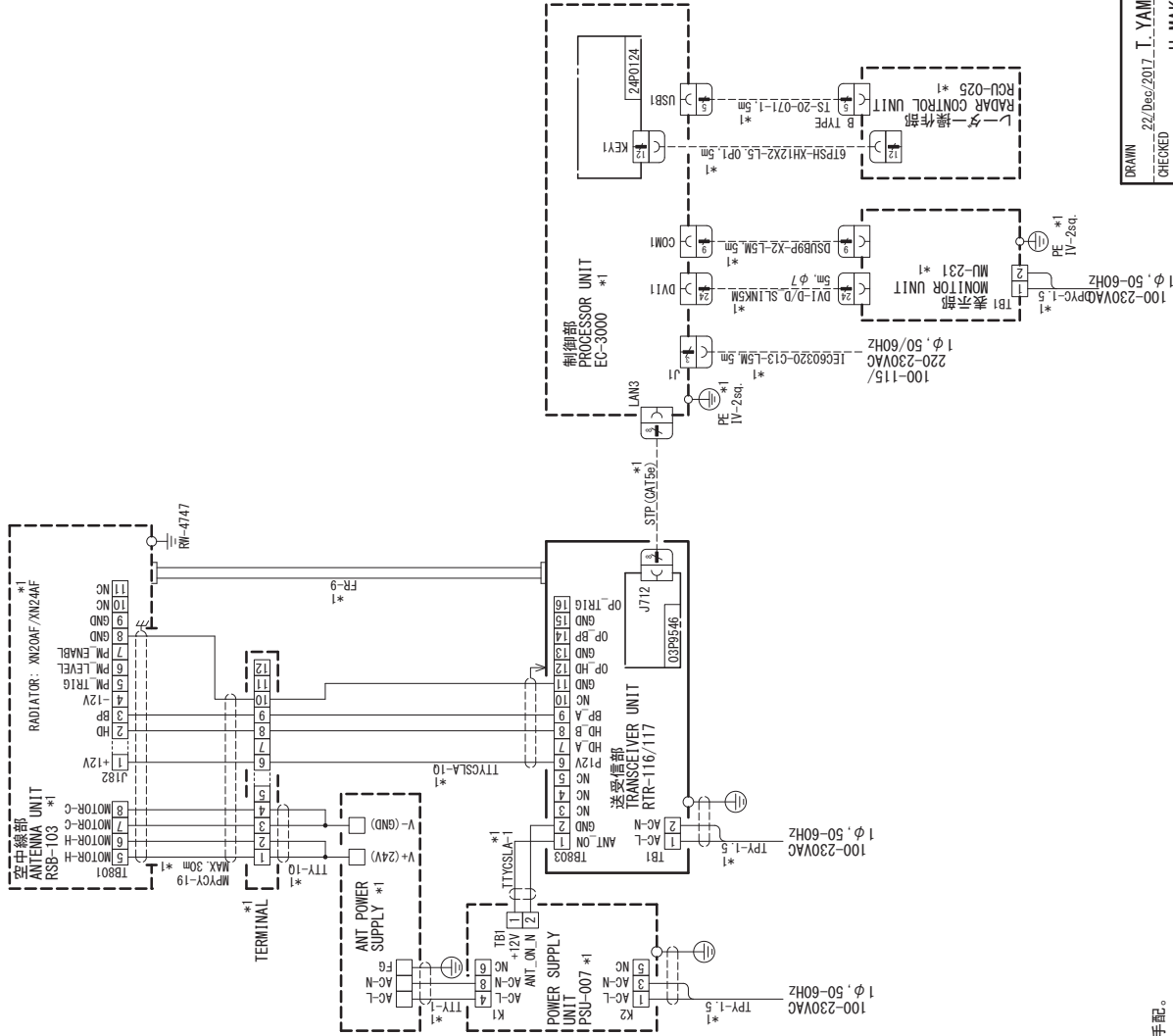
2. # MINIMUM SERVICE CLEARANCE.

3. USE M8 BOLTS OR COARCH SCREWS Ø8 FOR FIXING THE UNIT.

DRAWN	6/Dec/2017	I. YAMASAKI	TITLE	RTR-116/117
CHECKED	6/Dec/2017	H. MAKI	名称	送受信部 (壁掛装置)
APPROVED	7/Dec/2017	H. MAKI	外寸図	
SCALE	1/6	19	NAME	TRANSCIVER UNIT (BULKHEAD MOUNT)
FIG. No.	C3667-G01-A	REF. No.	OUTLINE DRAWING	

接続例

EXAMPLE for CONNECTION



注記
* 1) 現地手配。
NOTE
* 1: LOCAL SUPPLY.

DRAWN	22/Dec/2017	T. YAMASAKI	TYPE	FAR-3220Z
CHECKED	22/Dec/2017	H. MAKI	名称	監視レーダー
APPROVED	26/Dec/2017	H. MAKI		相互結線図
SCALE	1/MS	kg	NAME	SURVEILLANCE RADAR
DWG. No.	C3667-C01-A	REF. No.	03-190-6001-0	INTERCONNECTION DIAGRAM

Declaration of Conformity

[FAR-3220Z]

Bulgarian (BG)	С настоящото Furuno Electric Co., Ltd. декларира, че гореспоменат тип радиосъоръжение е в съответствие с Директива 2014/53/ЕС. Цялостният текст на ЕС декларацията за съответствие може да се намери на следния интернет адрес:
Spanish (ES)	Por la presente, Furuno Electric Co., Ltd. declara que el tipo de equipo radioeléctrico arriba mencionado es conforme con la Directiva 2014/53/UE. El texto completo de la declaración UE de conformidad está disponible en la dirección Internet siguiente:
Czech (CS)	Tímto Furuno Electric Co., Ltd. prohlašuje, že výše zmíněné typ rádiového zařízení je v souladu se směrnicí 2014/53/EU. Úplné znění EU prohlášení o shodě je k dispozici na této internetové adrese:
Danish (DA)	Hermed erklærer Furuno Electric Co., Ltd., at ovennævnte radioudstyr er i overensstemmelse med direktiv 2014/53/EU. EU-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse:
German (DE)	Hiermit erklärt die Furuno Electric Co., Ltd., dass der oben genannte Funkanlagentyp der Richtlinie 2014/53/EU entspricht. Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar:
Estonian (ET)	Käesolevaga deklareerib Furuno Electric Co., Ltd., et ülalmainitud raadioseadme tüüp vastab direktiivi 2014/53/EL nõuetele. ELi vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil:
Greek (EL)	Με την παρούσα η Furuno Electric Co., Ltd., δηλώνει ότι ο προαναφερθέντας ραδιοεξοπλισμός πληροί την οδηγία 2014/53/ΕΕ. Το πλήρες κείμενο της δήλωσης συμμόρφωσης ΕΕ διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο:
English (EN)	Hereby, Furuno Electric Co., Ltd. declares that the above-mentioned radio equipment type is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
French (FR)	Le soussigné, Furuno Electric Co., Ltd., déclare que l'équipement radioélectrique du type mentionné ci-dessus est conforme à la directive 2014/53/UE. Le texte complet de la déclaration UE de conformité est disponible à l'adresse internet suivante:
Croatian (HR)	Furuno Electric Co., Ltd. ovime izjavljuje da je gore rečeno radijska oprema tipa u skladu s Direktivom 2014/53/EU. Cjeloviti tekst EU izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi:
Italian (IT)	Il fabbricante, Furuno Electric Co., Ltd., dichiara che il tipo di apparecchiatura radio menzionato sopra è conforme alla direttiva 2014/53/UE. Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo Internet:
Latvian (LV)	Ar šo Furuno Electric Co., Ltd. deklarē, ka augstāk minēts radioiekārta atbilst Direktīvai 2014/53/ES. Pilns ES atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē:

Lithuanian (LT)	Aš, Furuno Electric Co., Ltd., patvirtinu, kad pirmiau minėta radijo įrenginių tipas atitinka Direktyvą 2014/53/ES. Visas ES atitikties deklaracijos tekstas prieinamas šiuo interneto adresu:
Hungarian (HU)	Furuno Electric Co., Ltd. igazolja, hogy fent említett típusú rádióberendezés megfelel a 2014/53/EU irányelvnek. Az EU-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen:
Maltese (MT)	B'dan, Furuno Electric Co., Ltd., niddikjara li msemmija hawn fuq-tip ta' tagħmir tar-radju huwa konformi mad-Direttiva 2014/53/UE. It-test kollu tad-dikjarazzjoni ta' konformità tal-UE huwa disponibbli f'dan l-indirizz tal-Internet li ġej:
Dutch (NL)	Hierbij verklaar ik, Furuno Electric Co., Ltd., dat het hierboven genoemde type radioapparaat conform is met Richtlijn 2014/53/EU. De volledige tekst van de EU-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres:
Polish (PL)	Furuno Electric Co., Ltd. niniejszym oświadczam, że wyżej wymieniony typ urządzenia radiowego jest zgodny z dyrektywą 2014/53/UE. Pełny tekst deklaracji zgodności UE jest dostępny pod następującym adresem internetowym:
Portuguese (PT)	O(a) abaixo assinado(a) Furuno Electric Co., Ltd. declara que o mencionado acima tipo de equipamento de rádio está em conformidade com a Diretiva 2014/53/UE. O texto integral da declaração de conformidade está disponível no seguinte endereço de Internet:
Romanian (RO)	Prin prezenta, Furuno Electric Co., Ltd. declară că menționat mai sus tipul de echipamente radio este în conformitate cu Directiva 2014/53/UE. Textul integral al declarației UE de conformitate este disponibil la următoarea adresă internet:
Slovak (SK)	Furuno Electric Co., Ltd. týmto vyhlasuje, že vyššie spomínané rádiové zariadenie typu je v súlade so smernicou 2014/53/EÚ. Úplné EÚ vyhlásenie o zhode je k dispozícii na tejto internetovej adrese:
Slovenian (SL)	Furuno Electric Co., Ltd. potrjuje, da je zgoraj omenjeno tip radijske opreme skladen z Direktivo 2014/53/EU. Celotno besedilo izjave EU o skladnosti je na voljo na naslednjem spletnem naslovu:
Finnish (FI)	Furuno Electric Co., Ltd. vakuuttaa, että yllä mainittu radiolaitetyyppi on direktiivin 2014/53/EU mukainen. EU-vaatimusten mukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa:
Swedish (SV)	Härmed försäkrar Furuno Electric Co., Ltd. att ovan nämnda typ av radioutrustning överensstämmer med direktiv 2014/53/EU. Den fullständiga texten till EU-försäkran om överensstämmelse finns på följande webbadress:

Online Resource

http://www.furuno.com/en/support/red_doc