FURUNO

Installation Manual
INMARSAT FLEETBROADBAND
Model FELCOM250/FELCOM500

FURUNO ELECTRIC CO., LTD.

www.furuno.com

(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

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SAFETY INSTRUCTIONS

Read these safety instructions before you operate the equipment.

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

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

Warning, Caution | Prohibitive Action | Mandatory Action

WARNING

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

Only qualified personnel should work inside the equipment.

Do not approach the radome closer than 1.4 m (FELCOM500) or 0.7 m (FELCOM250) when it is transmitting.

The radome emits radio waves which can be harmful to the human body, particularly the eyes.

RF power density on antenna aperture	FELCOM500 distance	FELCOM250 distance
100W/m ^{2}	-	-
25W/m ^{2}	0.5 m	0.4 m
10W/m ^{2}	1.4 m	0.7 m

Turn off the power at the mains switchboard before beginning the installation. Post a sign near the switch to indicate it should not be turned on while the equipment is being installed.

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

WARNING

Ground the equipment to prevent electrical shock and mutual interference.

Confirm that the power supply voltage is compatible with the voltage rating of the equipment.

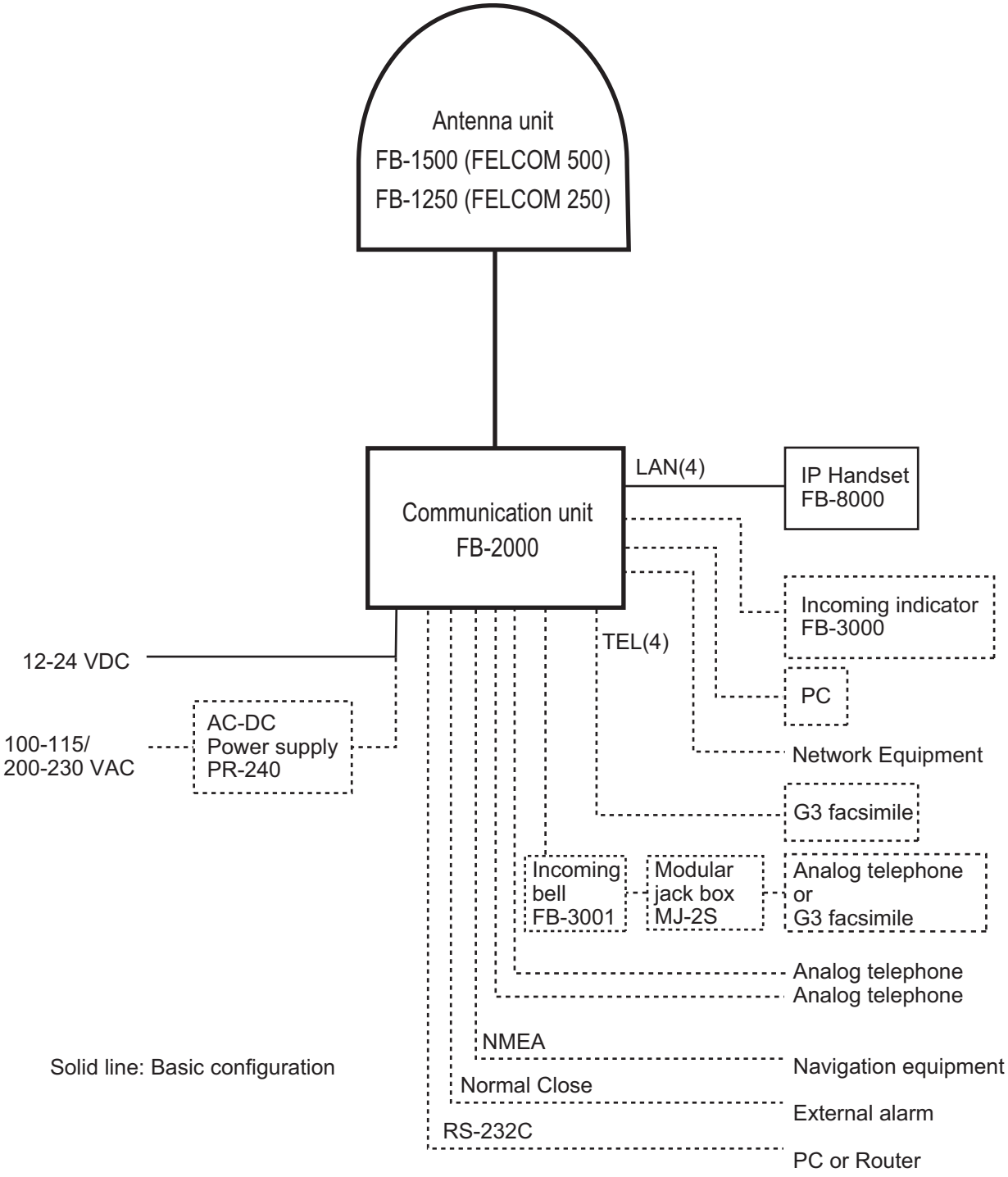
Connection to the wrong power supply can cause fire or damage the equipment.

Keep the following compass safe distances to prevent interference to a magnetic compass.

Unit	Standard Compass	Steering Compass
FELCOM500 Antenna Unit	0.75 m 0.70 m (XL spec.*)	0.40 m 0.35 m (XL spec.*)
FELCOM250 Antenna Unit	0.70 m 0.75 m (XL spec.*)	0.40 m 0.45 m (XL spec.*)
Communication Unit	0.40 m 0.50 m (XL spec.*)	0.30 m 0.30 m (XL spec.*)
IP Handset	0.70 m	0.45 m
Facsimile (FAX-2840)	1.50 m	0.95 m
Telephone (ODA1183-1N)	5 m	5 m
Incoming Indicator	0.45 m	0.30 m
Incoming bell	0.45 m	0.30 m
AC-DC Power Supply	0.90 m	0.60 m

*: “XL” is mentioned in the nameplate.

SYSTEM CONFIGURATION



Environmental Category

Antenna unit	To be installed in an exposed area
Communication unit, IP handset, Incoming indicator, Incoming bell	To be installed in a protecded area

EQUIPMENT LISTS

Standard Supply

Name	Type	Code No.	Qty	Remarks
Antenna unit	FB-1500-A	-	1	For FELCOM 500, w/attachment
	FB-1500-C	-		For FELCOM 500, XL spec., w/attachment
	FB-1250-A	-		For FELCOM 250, w/attachment
	FB-1250-C	-		For FELCOM 250, XL spec., w/attachment
	FB-1250-B	-		For FELCOM 250, no attachment
	FB-1250-D	-		For FELCOM 250, XL spec., no attachment
Communication unit	FB-2000	-	1	
IP handset	FB-8000	-	1	
Installation materials*	CP16-04100	000-015-746	1	30 m antenna cable
	CP16-04110	000-015-747		50 m antenna cable
	CP16-04120	000-015-865		40 m antenna cable
	CP16-04401	001-077-180	1	For FB-1500-A/C
	CP16-04502	001-148-980		For FB-1250-A/C
	CP16-04401/04402	001-067-780		For FB-1500
	CP16-04501/04502	001-086-500		For FB-1250
	CP16-03810	000-015-759	1	For FB-2000
	CP16-03901	001-067-350	1	For FB-8000
Spare parts	SP16-01901	001-067-320	1	Fuses for FB-2000

*: See lists at the back of this manual.

Optional Supply

Name	Type	Code No.	Remarks
Incoming indicator	FB-3000	000-015-763	w/CP16-04001
Telephone unit	ODA1183-1N	000-037-339	Desktop mount type
		000-037-340	Wall mount type
Facsimile	FAX-2840	000-024-872	w/CP16-06010
Transformer	OP16-70	001-196-750	Transformer PAL-1000UE +cable for FAX-2840
Drum unit	DR2200	001-258-440	For FAX-2840
Toner cartridge	TN2210	001-258-460	For FAX-2840
AC-DC power supply	PR-240	000-013-632	
IP handset	FB-8000	000-015-768	
Coaxial cable	12D-SFA-LITE-CV	001-235-960	100 m for antenna cable
Installation materials	CP16-04121	001-067-300	Connector N-SP-12DSFA-CF for cable 12D-SFA-LITE-CV
	CP16-04131	001-067-310	Connector N-P-18U-CF (2 pcs) for RG-18
Connector	CP03-28901	008-542-460	Modular connector MPS588-C2 pcs for LAN cable

Name	Type	Code No.	Remarks
LAN cable	MOD-Z072-020+	001-167-880-10	2 m, modular plug for both ends
	MOD-Z072-050+	001-167-890-10	5 m, modular plug for both ends
	MOD-Z072-100+	001-167-900-10	10 m, modular plug for both ends
	FR-FTPC-CY *10m*	001-240-510	10 m with armor, no plug
	FR-FTPC-CY *20m*	001-240-520	20 m with armor, no plug
	FR-FTPC-CY *30m*	001-240-530	30 m with armor, no plug
	FR-FTPC-CY *50m*	001-240-540	50 m with armor, no plug
	FR-FTPC-CY *100m*	001-240-550	100 m with armor, no plug
Modular jack set	OP16-79	000-037-830	MJ-2S, 3 m cord, lug
Modular jack box	OP16-8	000-043-272	MJ-2S, lug
Joint box	TL-CAT-012	000-167-140-10	Fro LAN cable extension
Cable assy.	81-521-1204-010	001-073-240-10	5 m cable w/ D-sub 9 pin connector at both ends
Incoming bell	FB-3001	-	For analog TEL. w/CP16-06401
Splash proof cap	16-023-5501	001-493-320	For FB-3001
Modular jack box	OP16-10	000-043-278	Box type
	OP16-11	000-043-279	Flush mount type
Pole mount kit	OP16-52	000-017-061	For FELCOM 250 antenna unit
Kit for RF interference	OP16-50	000-016-316	For FELCOM 500
Radiation sticker	OP16-53	001-115-470-10	For FELCOM 500
Lifting tool for antenna	OP16-55	001-121-170	For FELCOM 500 antenna unit
FX mode setup (Instructions)	C52-01602-*	000-192-742-1*	English/Japanese

1. HOW TO INSTALL THE UNIT

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

General

Interfering objects (especially metal objects like masts) near the antenna can, in the worst case, prevent reception or transmission. Further, RF radiation from the antenna will affect the human body. Keep these and the following guidelines in mind when selecting a mounting location for the antenna unit.

Secure unobstructed path in all directions

The best mounting location secures an unobstructed path between the antenna unit and the satellites, from horizontal to zenith. In other words, whatever the direction the antenna unit is pointing there are no interfering objects within the main beam (22° for FELCOM 500, 40° for FELCOM 250). While this might be feasible on some vessels, on others it is impossible due to space considerations. Locate the antenna unit at least three meters away from masts having a diameter more than 15 centimeters.

Select a location low in vibration

The maximum permissible vibration amplitude in three axis direction should be as shown in the table below. Consult with the shipyard to determine the mounting location which meets the requirements shown in the table.

Freq. Range	Max. Amplitude
4 to 10 Hz	2.54 mm (max. 9.8 m/s^2)
10 to 15 Hz	0.76 mm (max. 6.86 m/s^2)
15 to 25 Hz	0.40 mm (max. 9.8 m/s^2)
25 to 33 Hz	0.23 mm (max. 9.8 m/s^2)

Locate away from passengers and crew

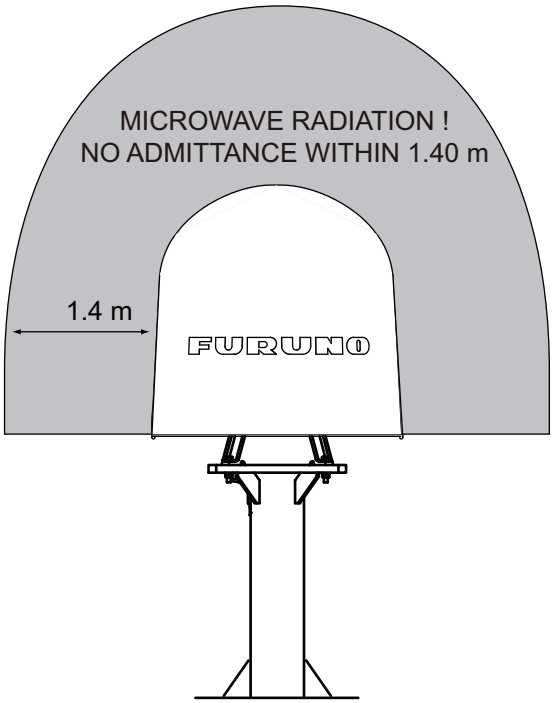
Radio waves can be harmful to the human body. Because safe distances change by country and ship construction, there is no standard formula to calculate safe distance. However, below are general guidelines.

- FELCOM 500: Personnel should not approach an area in which the radiation level is higher than 10 W/m^2, i.e., within 1.40 m from the radome surface.

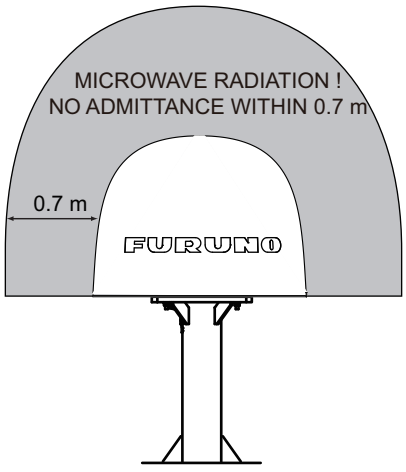
⚠ WARNING

Do not approatch within 1.40 m of the antenna radome when it is transmiting. Microwave radiation can be harmful to the human body, particularly the eyes.

To alert personnel not to approach the antenna unit, attach the caution labels (supplied as installation materials) to any bulkhead which is at the position of 1.40 m from the antenna unit.



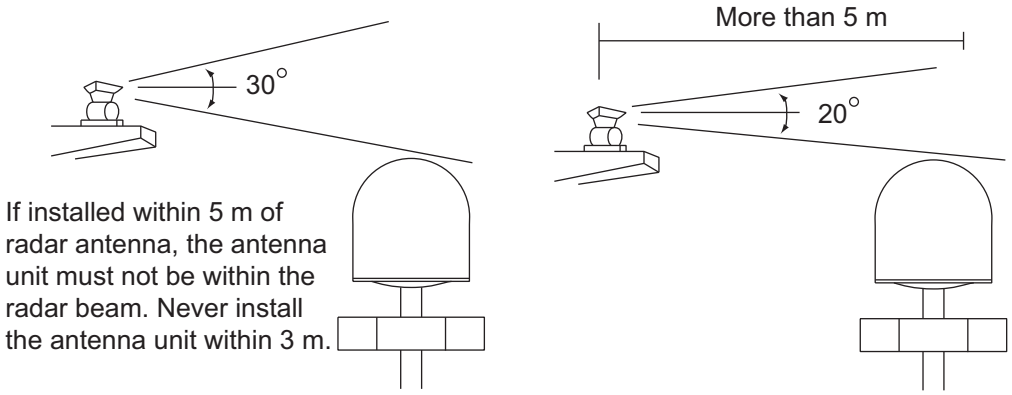
- FELCOM 250: Personnel should not approach an area in which the radiation level is higher than 10 W/m^2, i.e., within 0.70 m from the radome surface.
  To alert personnel not to approach the antenna unit, attach the radiation warning sticker (supplied as installation materials) to any bulkhead which is at the position of 0.70 m from the antenna unit.



Minimum distance from other antennas

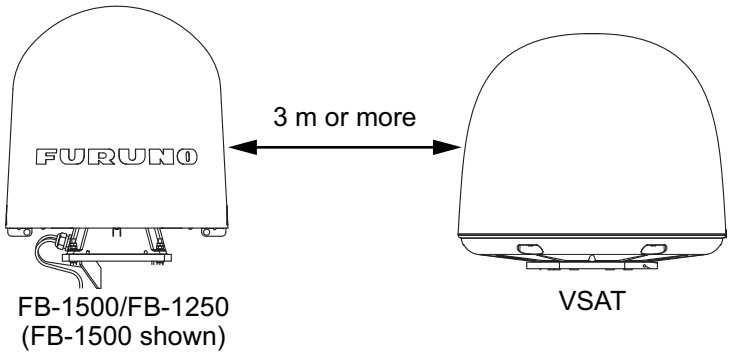
MF/HF antennas, communication/navigation antennas:
The antenna unit should be at least five meters from a MF/HF antenna. The VHF, satellite navigation antenna and other communication antennas should be at least four meters away.

Radar:
The antenna unit should be at least 5 meters away to protect the low-noise amplifier in the FELCOM 500/FELCOM 250 antenna unit. If this distance cannot be secured be sure the antenna unit is not within the radar beam. However, never install the antenna unit within 3 m of a radar antenna.



VSAT systems

For optimum performance we recommend a minimum distance of 3 meters from the antenna to VSAT antennas.



Compass safe distance

Locating the antenna unit too close to a compass can affect the compass performance. Keep the compass safe distance to prevent interference to the magnetic compass. See page i.

Other mounting guidelines

Other important mounting guidelines are

- Locate the antenna unit away from exhaust stacks (foreign material on the radome can interfere with reception and transmission).
- Keep the unit away from heat sources.
- Locate the unit away from places where fuels and chemical solvents are stored.
- Keep in mind the length of the cable from the Communication Unit is maximum 100 meters (when coaxial cable 12D-SFA-LITE-CV is used).

Guardrail, platform

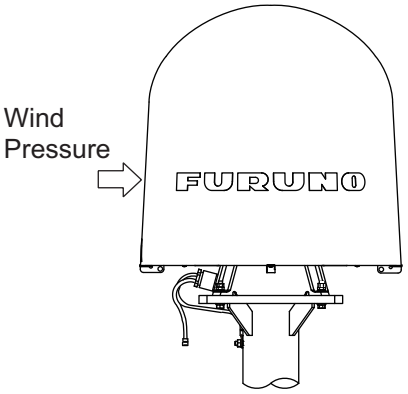
To facilitate servicing, construct a mast of about one meter (40") in height. (See page 1-5.) The paragraphs which follow provide guidelines for selection and construction of the mast.

Fit the mast with a guardrail and platform (or steps), for serviceman's safety. (In most installations the serviceman stands on the platform while checking the radome. Thus this distance should be secured for ease of servicing.) The height of the guardrail should be as tall as possible to ensure safety.

Mast strength

The mast material must be sufficiently strong to meet the demands of the marine environment. It should satisfy the following requirements.

- It must be able to support radome mass plus at least 2.5 cm (1") of ice and snow. Special consideration should be given if the unit is operated in areas of heavy snow or freezing temperature.
- The mast bending moment must be able to withstand expected maximum pitching, rolling and wind pressure.



(Above figure: FELCOM 500)

- To prevent resonance at low frequencies (approximately 5 Hz), four stays can be fixed between the mast and the mounting base.

Item	FELCOM 250			
	FB-1250-A	FB-1250-C	FB-1250-B	FB-1250-D
Antenna unit mass	9.5 kg (20.8 lb) ± 10%	8.6 kg (18.8 lb) ± 10%	6.6 kg (14.6 lb) ± 10%	5.7 kg (12.5 lb) ± 10%
Maximum wind pressure (at wind speed 56 m/s)	36.3 N			

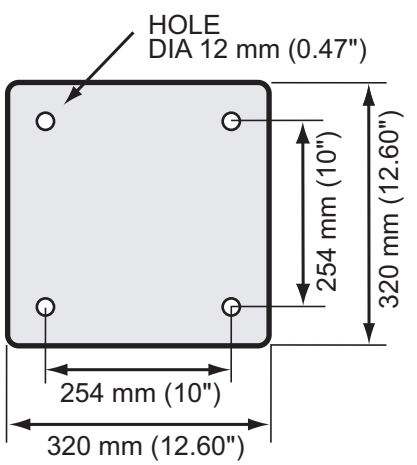
Item	FELCOM 500	
	FB-1500-A	FB-1500-C
Antenna unit mass	21 kg (46 lb) ± 10%	22 kg (48.2 lb) ± 10%
Maximum wind pressure (at wind speed 56 m/s)	280 N	

Antenna mast and mounting base

To get the best performance from the antenna electronics and mechanics, the antenna must be installed properly on a specially designed mast with suitable flange and rubber gasket. Below are guidelines for installation of the mounting mast and mounting base.

- The mounting base should be parallel to the ship's waterline (tolerance: ±3°).
- Weld a ground bolt of stainless steel to the mast (figure below). Connect the ground wire from the antenna unit to the ground bolt.

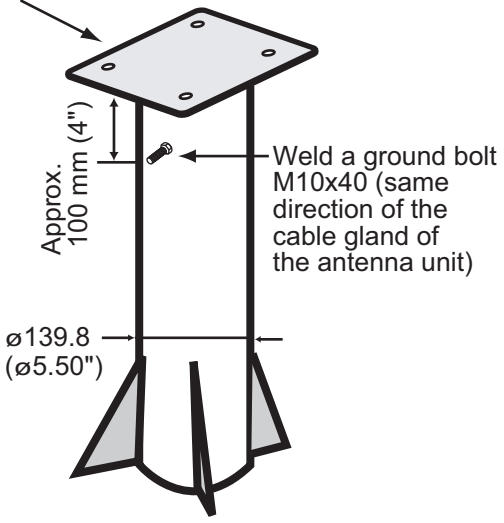
FELCOM 500 (FB-1500-A/C) FELCOM 250 (FB-1250-A/C)



[Mounting base]

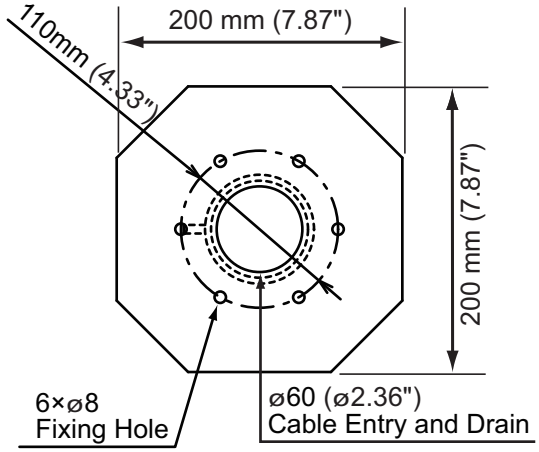
Thickness

FELCOM 500	FELCOM 250
Minimum 20 mm (0.79")	Minimum 10 mm (0.39")

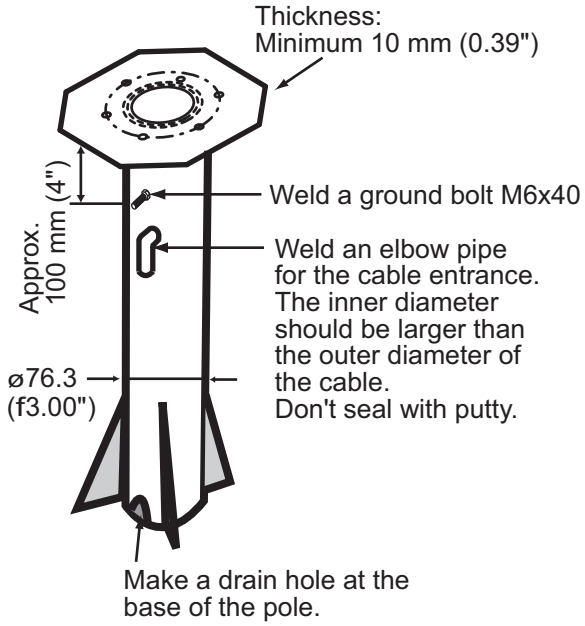


[Antenna mast: Example]

FELCOM 250 (FB-1250-B/D)



[Mounting base]



[Antenna pole: Example]

FB-1500-A/C / FB-1250-A/C: How to install the antenna unit

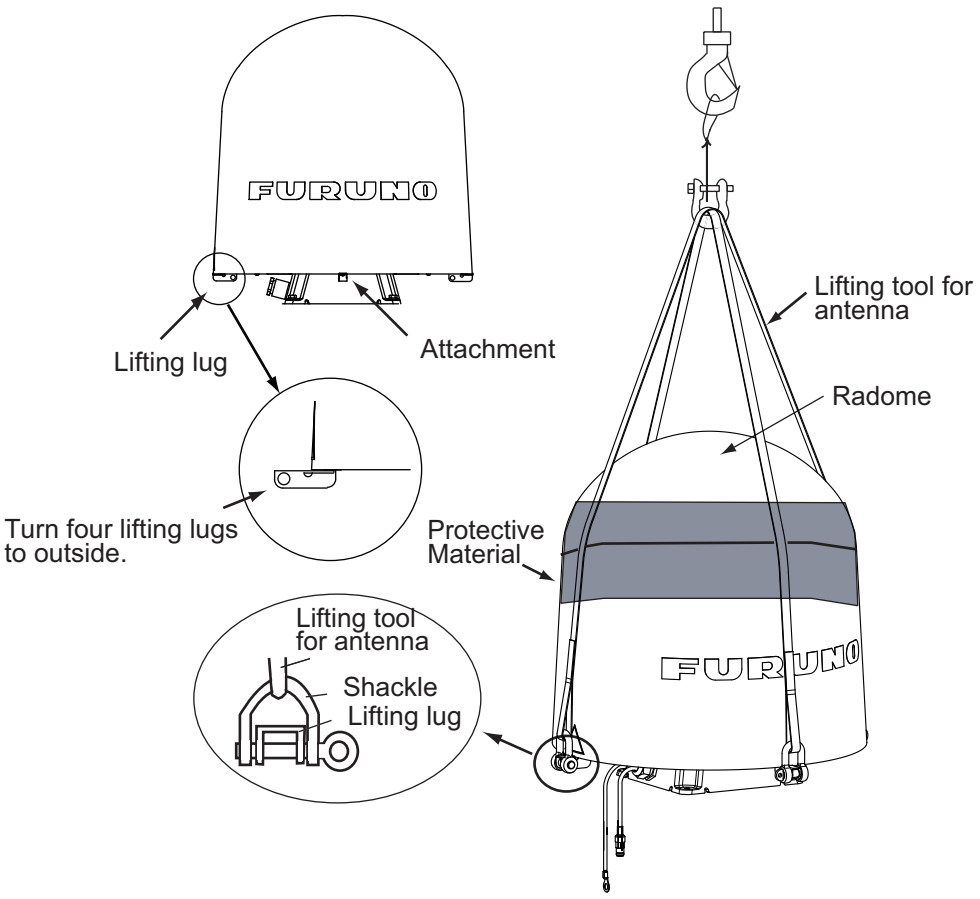
Carefully unpack the radome and check for damage.
For FB-1500-A/C, the optional kit OP16-55 is necessary to lift the antenna unit.

Lifting tool for antenna: Type OP16-55, Code number 001-121-170

Name	Type	Code no.	Qty
Shackle	JISB2801	000-174-468-10	4
Lifting tool for antenna	16-021-5508-1	100-362-721-10	1

Procedure

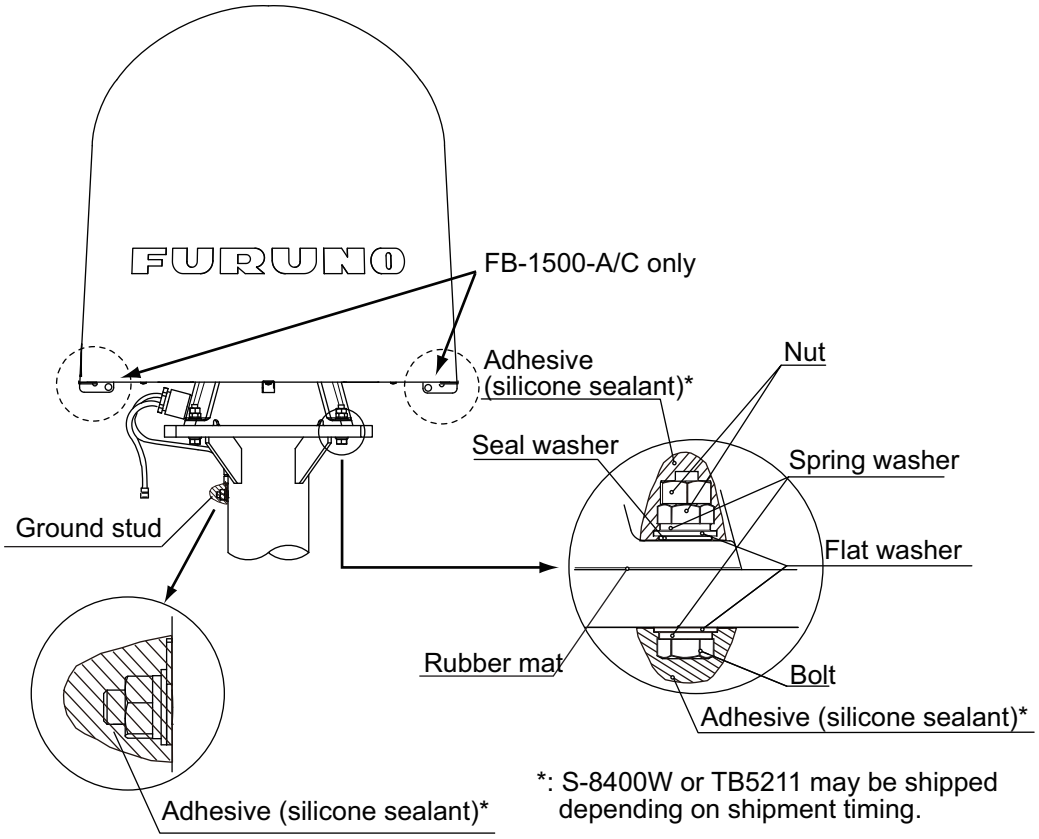
1. For the FB-1500-A/C, do the following:
   1) Loosen four lifting lugs and turn them to outside at the bottom of the radome as shown in the figure below.
   2) Then tighten four bolts for lifting lugs firmly. If not tightened, the bolt may loosen, causing the antenna unit to fall, when hoisting the antenna unit.
   3) Arrange shackle, lifting tool for antenna and lifting lug as shown below.
   4) Cover the part of the radome which contacts the lifting tool for antenna with protective material (rubber mat, etc.), to prevent damage to the radome when hoisting it to the mounting location.
   5) Lift the antenna unit to the mounting location.



For FB-1500-A/C only

2. Lay the rubber mat on the mounting base and put the antenna unit on the rubber mat, keeping in mind cable gland direction (standard direction is stern).

3. Fix the antenna unit with four sets of hexagonal bolts and nuts as shown below.
   Note: Tighten first nut with torque 36.5 Nm, then tighten second nut with the same torque.
4. Connect the ground wire to the ground bolt.
5. For FB-1250-A/C, attach the radiation warning sticker (small) to the bow and stern sides of the antenna radome. If these locations are not suitable, attach the radiation warning sticker (big) to the ship's body near the antenna radome.
6. Coat all bolts and nuts with silicone sealant to prevent electrolytic corrosion.
7. For FB-1500-A/C, restore the lifting lugs to their original positions.



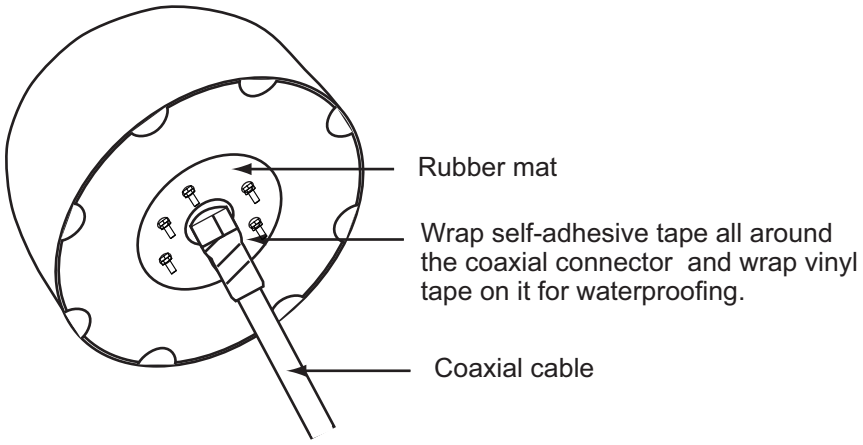
FB-1250-B/D: How to install the antenna unit

Carefully unpack the radome and check for damage. Run the antenna cable before installation of the antenna unit.

Procedure

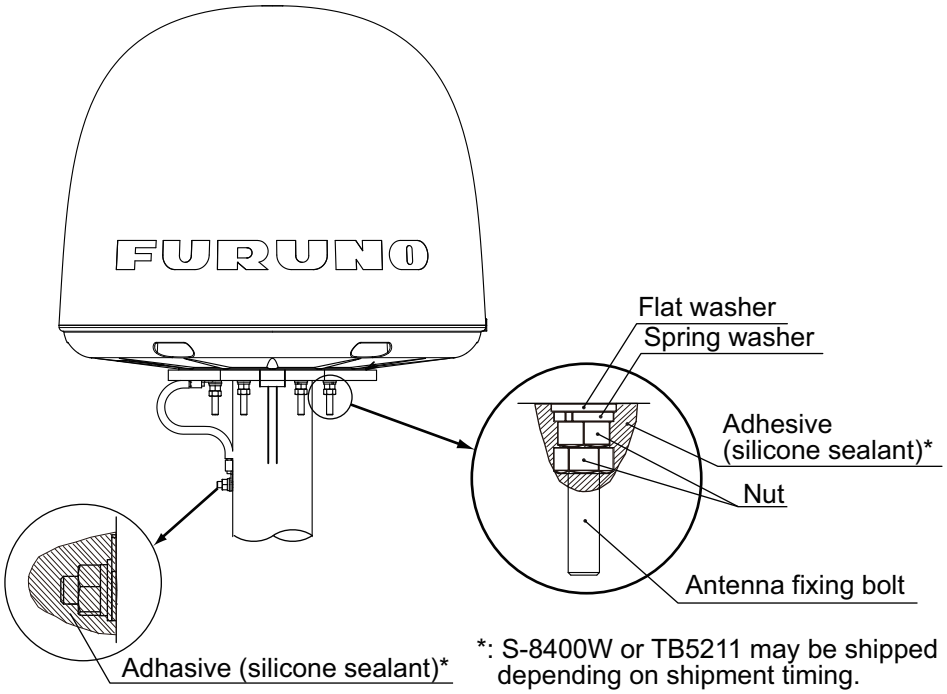
1. If the rubber mat is not attached at the bottom of the dome, peel off the tape from the rubber mat and attach the rubber mat at the bottom of the dome. If another rubber mat is supplied, attach it to the antenna mounting base.
2. Connect the antenna cable to the coaxial plug on the bottom of the antenna unit.

3. Wrap the self-adhesive tape all around the coaxial connector for waterproofing and wrap the vinyl tape on the self-adhesive tape.



Antenna unit bottom

4. Put the antenna unit on the mounting base.
   The antenna unit is free of direction. However, preferably install the antenna unit, so the FURUNO logos face the port/ starboard side.
5. Fasten the ground wire (supplied) to the antenna bolt near the ground stud on the antenna mast and secure with hexagonal nut, spring washer and flat washer.
6. Secure other antenna bolts with a set of hexagonal nuts, spring washers and flat washers as shown below on the next page.
   Note: To fix the antenna bolt, tighten first nut with torque 7.65 Nm and then tighten the second nut with the same torque.
7. Connect the ground wire to the ground stud on the antenna mast.
8. Attach the radiation warning sticker (small) to the bow and stern sides of the antenna radome. If these locations are not suitable, attach the radiation warning sticker (big) to the ship's body near the antenna radome.
9. Coat all bolts and nuts with silicone sealant to prevent electrolytic corrosion as shown below.



*: S-8400W or TB5211 may be shipped depending on shipment timing.

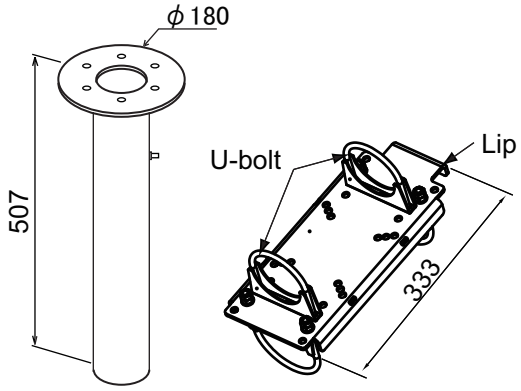
Note: The cable entry hole (ϕ60) at the bottom of the antenna functions as ventilation hole, allowing trapped moisture to escape the dome. For that reason, ensure the hole is not blocked.

How to mount the FELCOM 250 antenna unit with optional pole mount kit

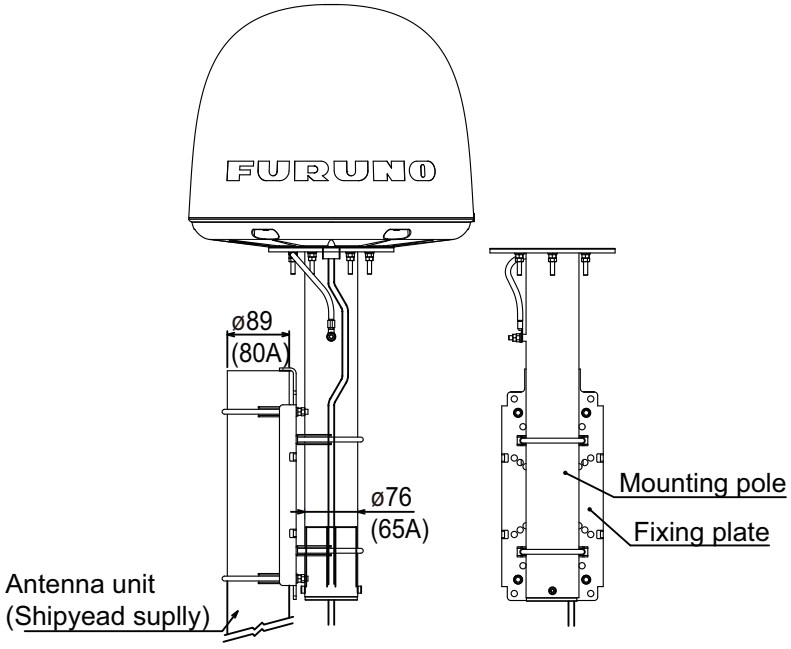
Note: The bottom caps (included in the optional pole mount kit) must be fitted. The caps prevent water leaking into the antenna unit.

Pole Mount Kit (Type: OP16-52, Code: 000-017-061)

Name	Type	Code no.	Qty
Mounting pole	SP-SAC-1031	000-173-963-10	1
Fixing plate	SP-SAC-1032	000-173-964-10	1



1. Ask the shipyard to prepare and mount an antenna mast (diameter ϕ89: 80A).
2. Attach the fixing plate SP-SAC-1032 to the antenna mast by hanging the lip of the fixing plate on the top of the antenna mast.
3. Insert the mounting pole SP-SAC-1031 through the U-bolts of the fixing plate and fasten the U-bolts.
4. Put the FELCOM 250 antenna unit (FB-1250-B/D) on the mounting pole and fix it with nuts (see previous page).



1.2 Communication Unit

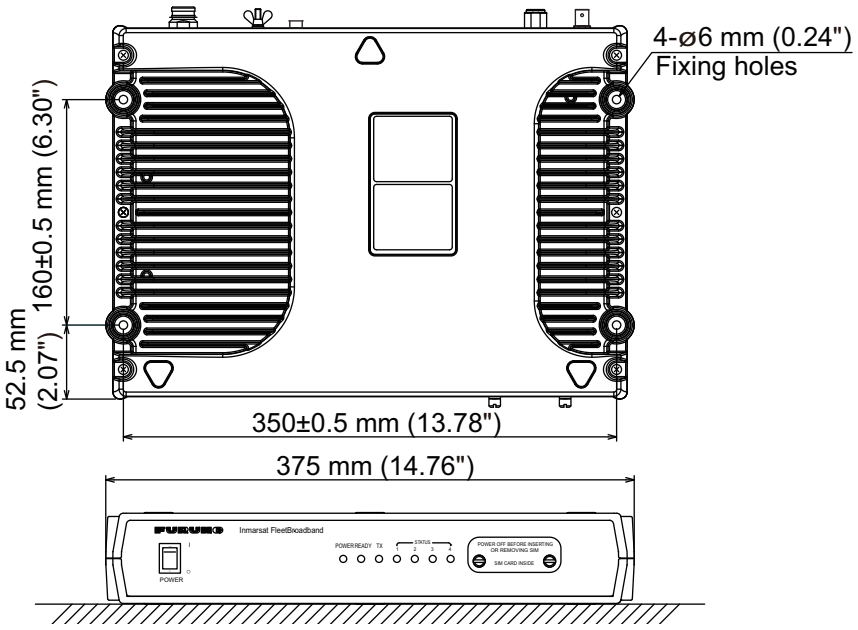
Select a location for the Communication Unit (CU) by following the guidelines shown below.

- The unit is not waterproof. Keep the unit away from water splash.
- Keep the unit away from direct sunlight.
- The temperature and humidity must meet the requirements shown in the equipment specifications.
- Set the unit away from the exhaust pipes and vents.
- The installation location must have enough cool air.
- Install the unit where shock and vibration meet the requirements shown in the equipment specifications.
- Keep the unit away from the equipment that creates an electromagnetic field, for example, motor and generator.
- For maintenance and checking, leave enough space at the sides and rear of the unit. Refer to the outline drawing and provide some additional length in cables.
- Follow the recommended compass safe distances shown on page i to prevent the interference to a magnetic compass.

How to install the CU

Follow the procedure shown below to install the CU on a desktop. See the outline drawing on page D-4 for details.

1. Place the template (supplied) of the CU on the installation site.
2. Mark the points for four pilot holes and makes the pilot holes for 5x50 self-tapping screws.
3. Put the unit on the installation site and fix it with four 5x50 self-tapping screws (supplied).

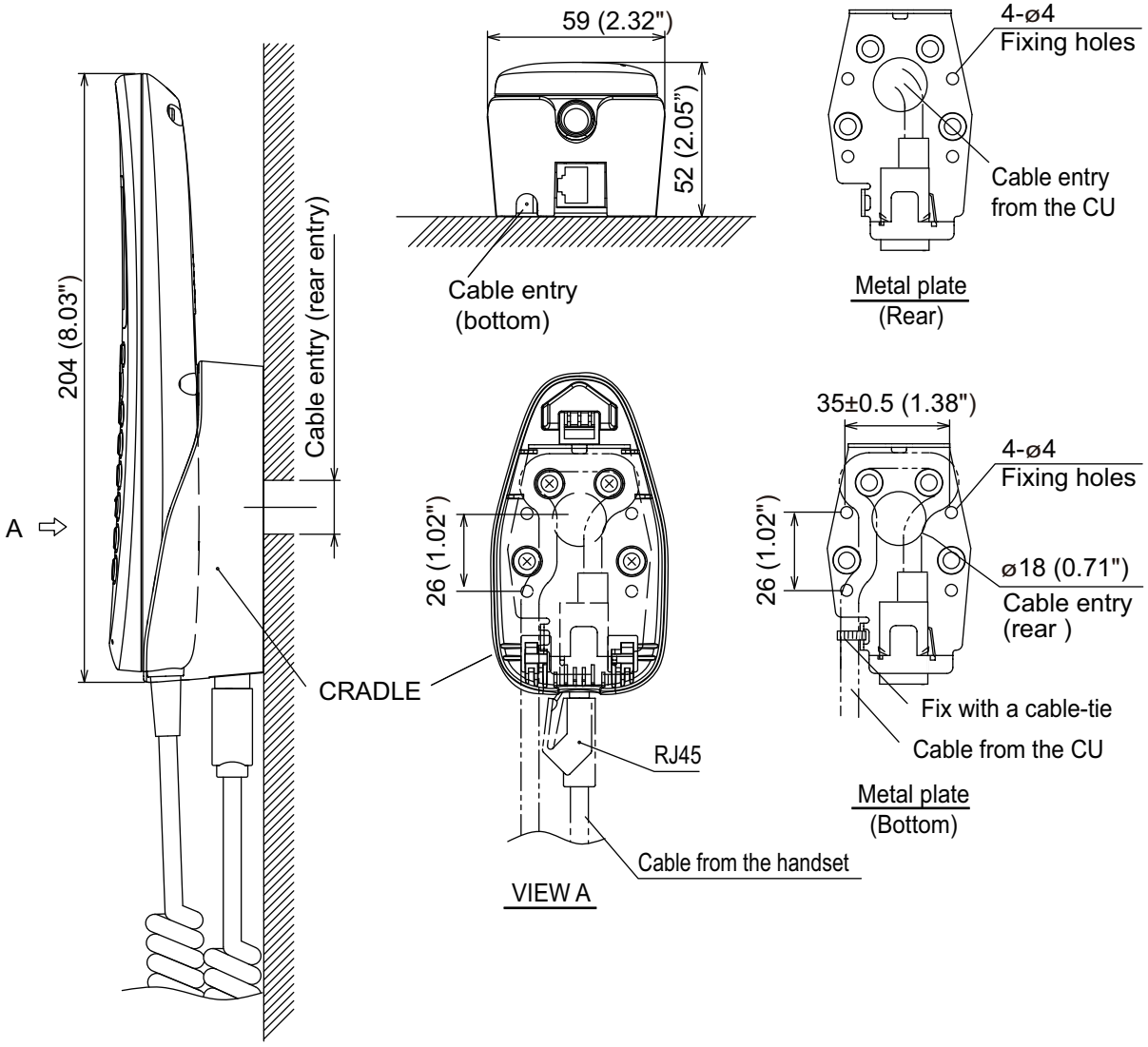


Note: It is necessary to install the Communication Unit on a desktop to comply with IPX2 (dripping) standard. Refer to section 2.5 for directions to how to install on a desktop.

1.3 IP Handset

The IP handset functions as a display and it may also be used for normal voice communication. The units (max 26 units) may be installed anywhere onboard the vessel. The IP handset is provided with a cradle. Fix the cradle to the bulkhead or installation panel. The cradle has two cable entries for convenience; bottom and rear.

1. To use the rear cable entry, make a hole of 18 mm (0.71") diameter in the installation site, Refer to the outline drawing.
2. Remove four screws from the cradle to separate the plastic case from the metal plate.
3. Fix the metal plate to the mounting site with four self-tapping screws.
4. Connect the LAN cable from the CU to the inner RJ45 port in the cradle.
5. If the bottom cable entry is used, run the LAN cable as shown in the figure below and fix it with a cable-tie.
6. Reattach the plastic cover.
7. Connect the cable from the handset to the outer RJ-45 port of the cradle.



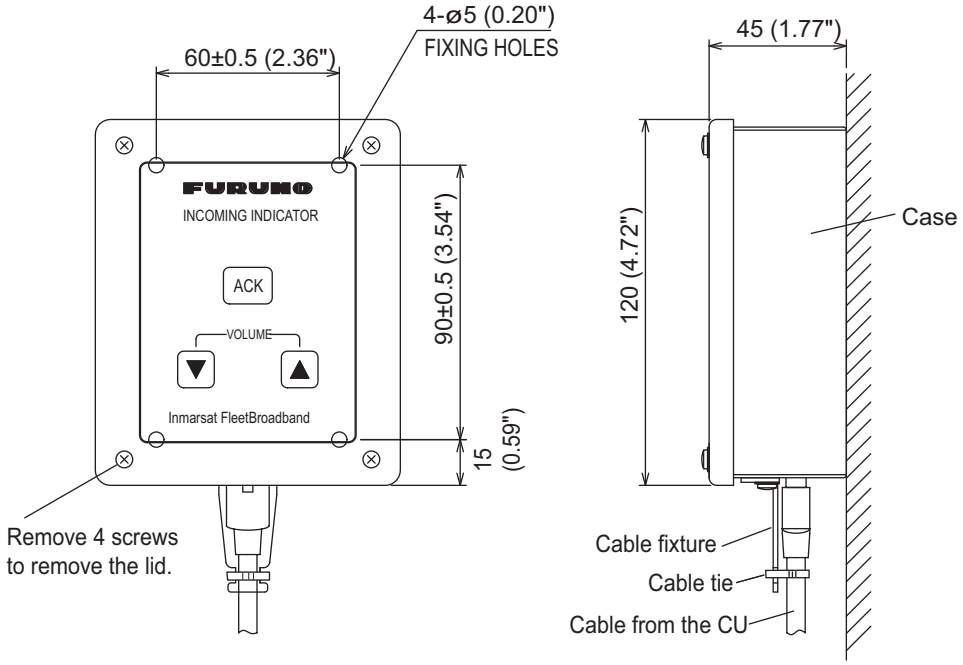
1.4 Incoming Indicator (option)

Select a location for the incoming indicator by following the information shown below.

- Keep the unit away from water splash.
- Keep the unit away from direct sunlight.
- Set the unit away from the exhaust pipes and vents.
- Follow the recommended compass safe distances shown on page i to prevent the interference to a magnetic compass.

How to install on the bulkhead or bridge panel

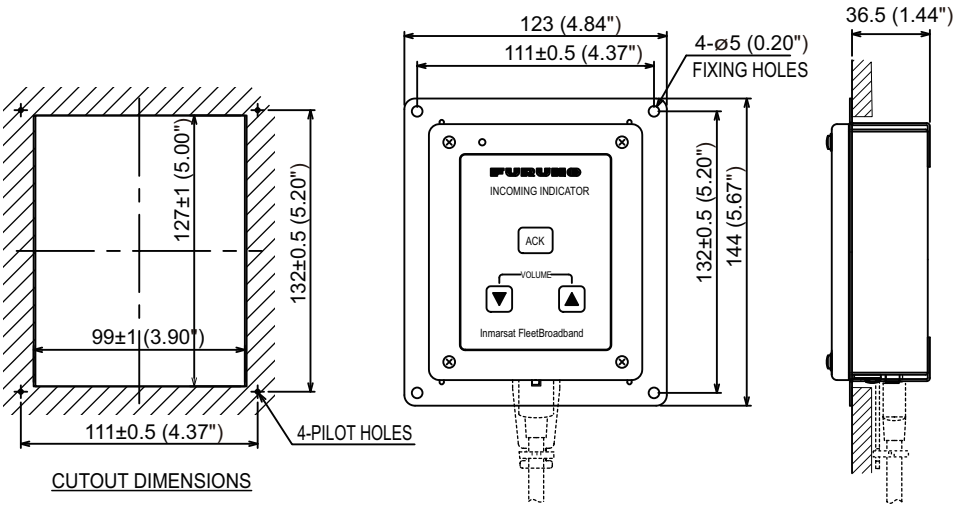
1. Remove four screws from the unit to remove the lid.
2. Fix the case with four 4x16 self-tapping screws (supplied).
3. Reattach the lid with four screws.
4. Connect the cable from the CU.
5. Attach the cable fixture (supplied) with two screws.
6. Fasten the cable to the cable fixture with the cable tie (supplied).



How to install by the flush mount

1. Prepare a cutout in the installation location and make four pilot holes. Refer to the outline drawings.
2. Set the flush mount plate (supplied) to the cutout and fix it with four 4x16 self-tapping screws (supplied).
3. Remove four screws from the unit to remove the lid.
4. Fix the case with four M4x8 screws (supplied) to the flush mount plate.
5. Pass the cable from the CU through the bottom of the case.
6. Connect the cable to the port on the lid.
7. Attach the cable fixture (supplied) with two screws.
8. Fasten the cable to the cable fixture with the cable tie (supplied).

9. Reattach the lid to the case with four screws.

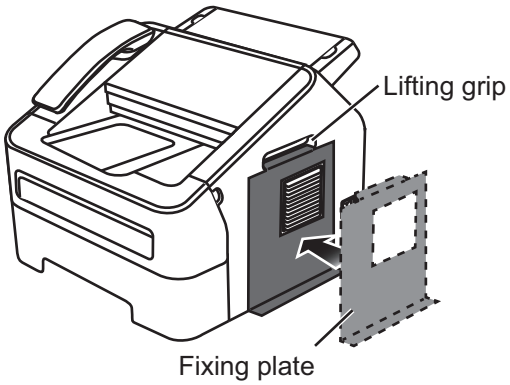


1.5 Telephone (Option)

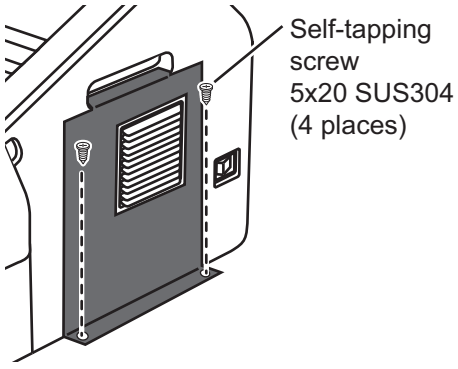
To mount the telephone (ODA1183-1N), see the installation instructions supplied with the telephone.

1.6 Facsimile FAX-2840 (Option)

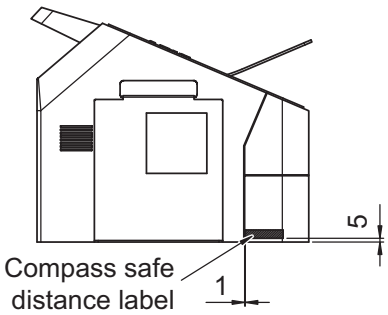
1. Set the facsimile on the mounting location.
2. Set a fixing plate (supplied) to both the right and left sides of the facsimile as shown in the right figure.



3. Fasten the fixing plates to the mounting location with self-tapping screws (supplied).



4. Attach the compass safe distance label at the location shown in the right figure.



5. Attach the supplied label (“INMAR”) to a noticeable location.

How to change modem settings

1. Press [Menu], [*], [2], [8], [6] and [4] keys in this sequence to enter the maintenance mode.
   The fax machine beeps for approximately one second and displays "MAINTENANCE" on the LCD. This means the FAX is in the initial stage of the maintenance mode.
2. Press [1] and [0] keys in this order. "WSW00" is displayed on the LCD.
3. Press [1] and [3] keys in this order. "WSW13=00011011" appears on the LCD.
4. Press [0], [0], [0], [1], [1], [0], [1], [0] and [OK] keys in this order. “WSW00” appears on the LCD.
5. Press [1] and [9] keys in this order. "WSW19=11100000" appears on the LCD.
6. Press [1], [1], [1], [0], [0], [0], [1], [0] and [OK] keys in this order. “WSW00” appears on the LCD.
7. Press [Stop/Exit] key to return the machine to the initial stage of the maintenance mode.
8. Press [9] key twice to exit from the maintenance mode and return to standby. "Please Wait." appears then return the normal display.

1.7 Incoming bell (Option)

Select a location for the incoming bell by following the information shown below. You can connect one analog telephone to the incoming bell.

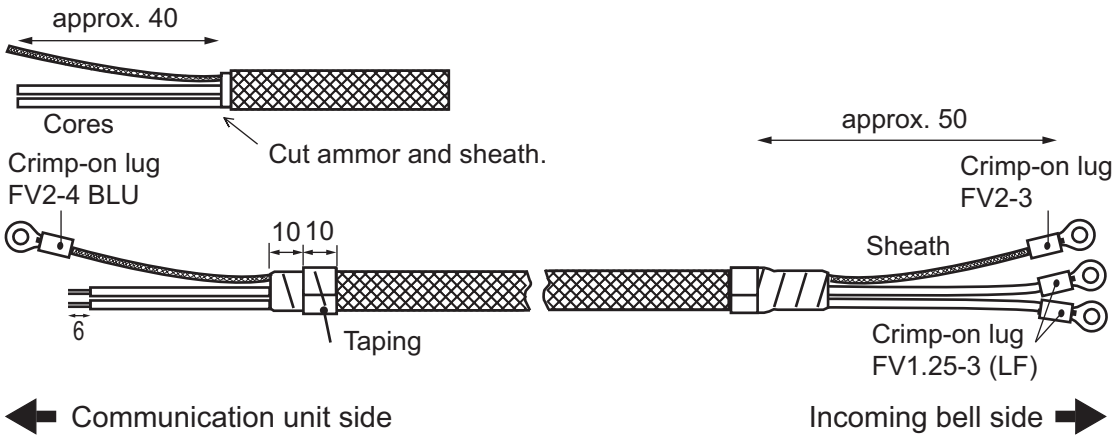
- Keep the unit away from water splash.
- Keep the unit away from direct sunlight.
- Set the unit away from exhaust pipes and vents.
- Follow the recommended compass safe distances shown on page i to prevent interference to a magnetic compass.

How to install on the bulkhead

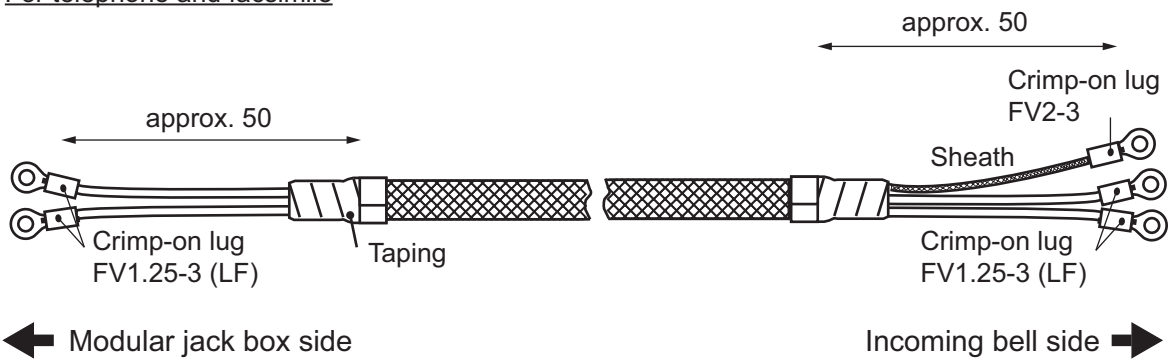
1. Fabricate the TTYCS-1 cable (local supply).
   The crimp-on lugs for the incoming bell and communication unit are included in the installation materials for the incoming bell. The crimp-on lugs for the modular jack box are included in the installation materials for the modular jack box (optional supply).

For communication unit

Unit: mm

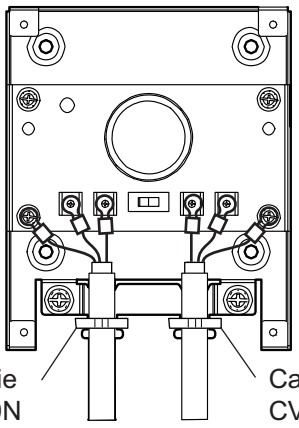


For telephone and facsimile

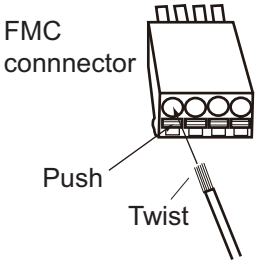


2. Remove the four screws on the front cover, then remove the cover.
3. Secure the case to the installation location with four 3×10 self-tapping screws (supplied). See the outline drawing at the back of this manual for the fixing hole locations.

4. Connect the cables, fabricated at step 1, to the incoming bell's terminals.



5. Fasten the cables to the cable fixture with the cable ties (supplied).
6. Connect the cables with the FMC connector on the communication unit.



Procedure to insert wire
1. Twist core.
2. Push spring-loaded catch with slotted-head screwdriver.
3. Insert core into hole.
4. Release the screwdriver.
5. Pull wire to confirm it is securely inserted.

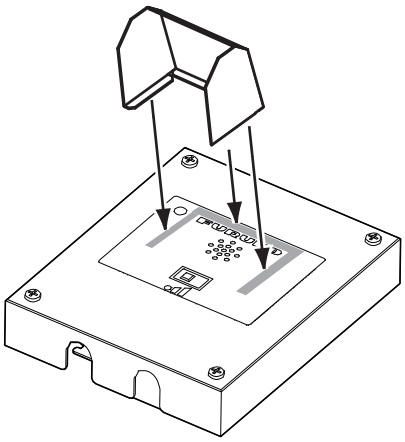
7. The cover of the incoming bell has protective seals on the cable entries. To remove the seals, tear along the perforated lines on the inner side of the cover.
8. Reattach the lid to the case with the four screws removed at step 2.

How to attach Splash proof cap

When installing the incoming bell on a bulkhead, use the optional splash proof cap (Type: 16-023-5501/Code No.:001-493-320) to help keep water our of the unit. With the splash proof cap attached, this unit has an waterproof rating of IP22.

Note: The splash proof cap cannot be used if the incoming bell is mounted face upward.

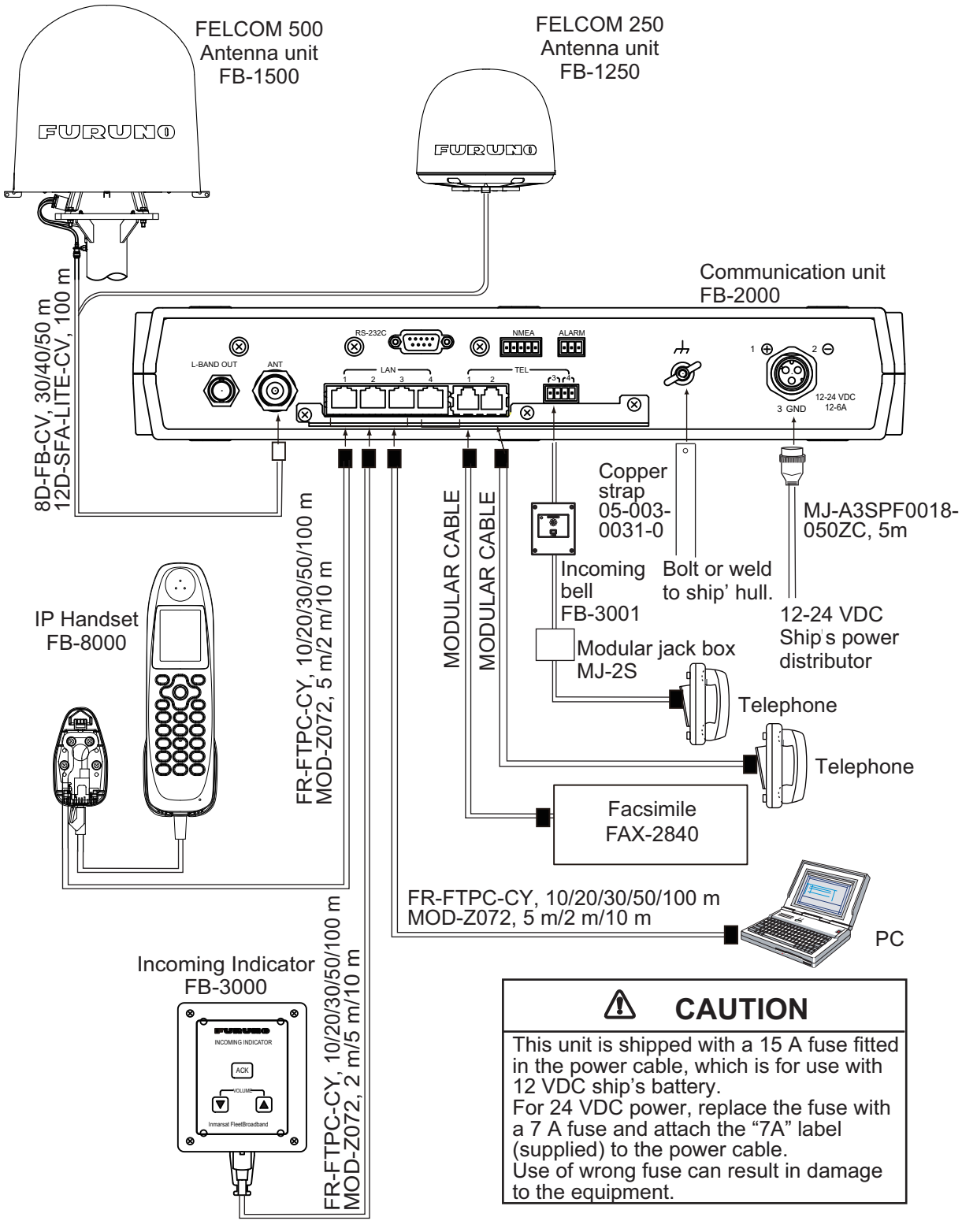
Remove the seal from the splash proof cap and attach the cap as shown in the illustration to the right.



2. CONNECTIONS

2.1 Standard Connection

Run and connect cables, referring to the figure below and the interconnection diagram (page S-1).



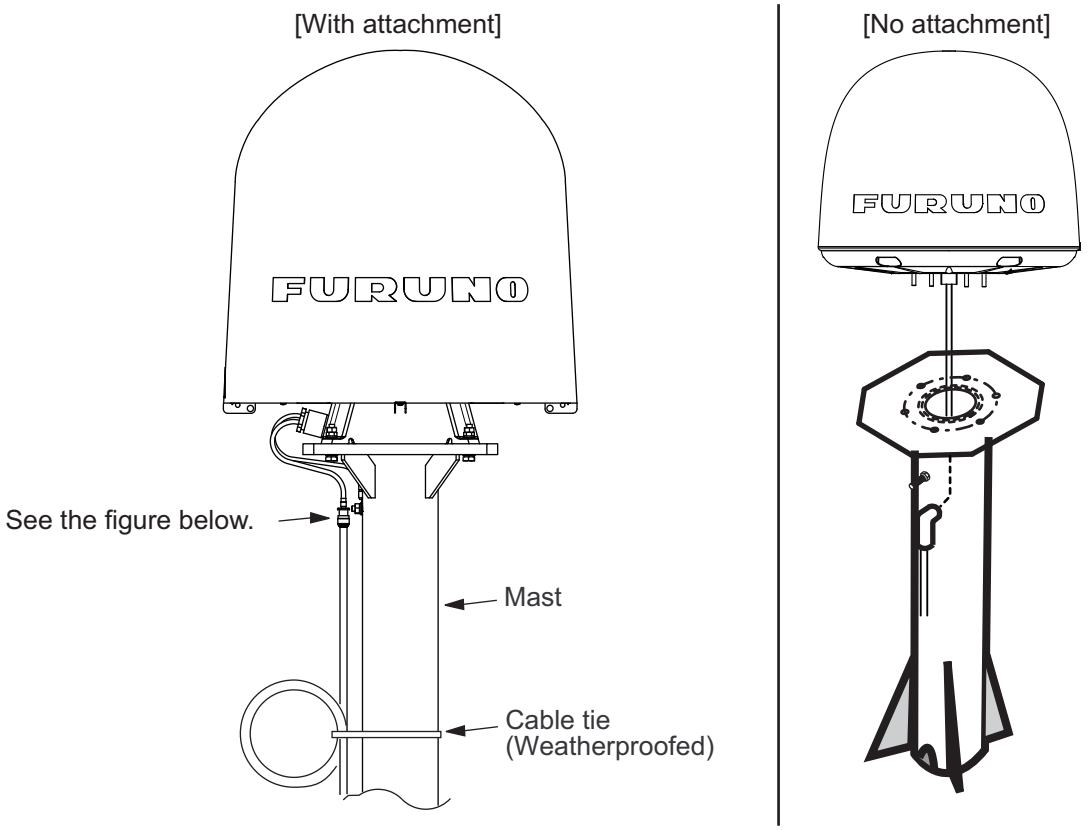
⚠ CAUTION

This unit is shipped with a 15 A fuse fitted in the power cable, which is for use with 12 VDC ship's battery.
For 24 VDC power, replace the fuse with a 7 A fuse and attach the "7A" label (supplied) to the power cable.
Use of wrong fuse can result in damage to the equipment.

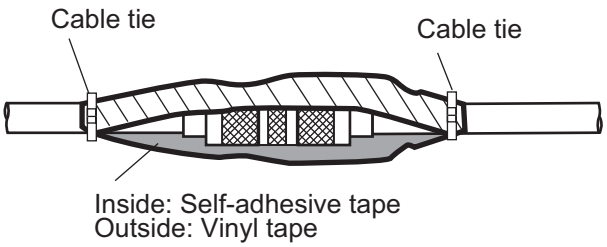
2.2 Antenna Cable

Run the antenna cable (coaxial cable 8D-FB-CV, 30 m, 40 m or 50 m supplied) between the antenna unit and Communication Unit. Attach the connector plug of the antenna cable to the antenna unit. Connect the coaxial connector (8D-FB-CV) to the other end of the antenna cable.
If the attachment is present, attach the coax connector from the antenna unit there. If there is no attachment, connect the coax plug at the bottom of the antenna unit.

Wrap the junction point of connectors with the self-adhesive tape then vinyl tape. Bind the ends of tape with a cable tie (local supply). Fix the cable to the mast with a cable tie (local supply).
If the distance between the antenna unit and Communication Unit is 50 m or more, use cable 12D-SFA-LITE-CV (max. 100 m).



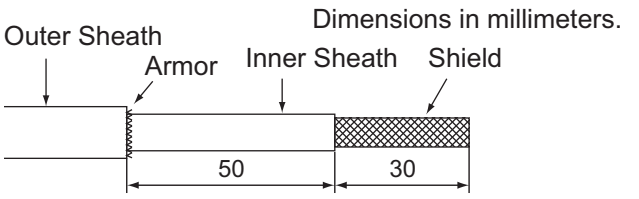
Mouting



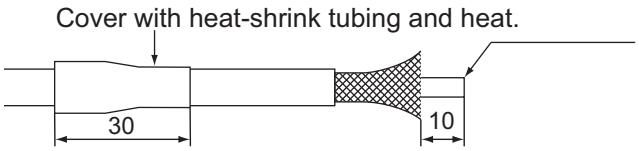
Waterprooting the coaxial connector

How to attach the antenna cable connector N-P-8DFB-1-CF

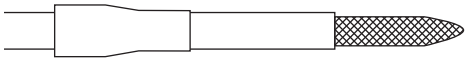
Attach the coaxial plug (supplied) to the other end of the coaxial cable to connect to the CU as follows.



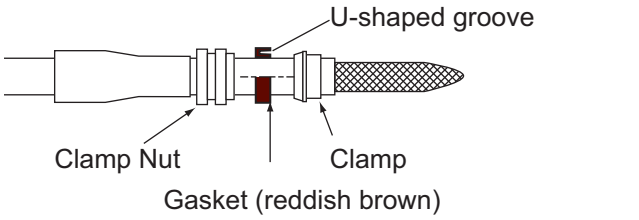
Remove outer sheath and armor by the dimensions shown left.
Expose inner sheath and shield by the dimensions shown left.



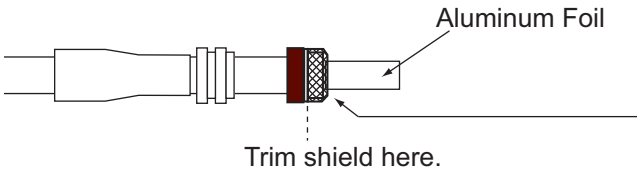
Remove insulator and core by 10 mm.



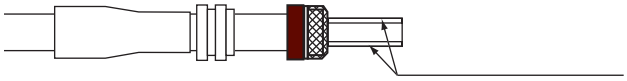
Twist shield end.



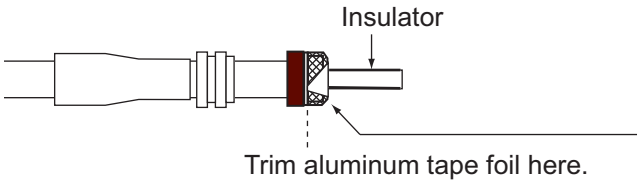
Slip on clamp nut, gasket and clamp as shown left.



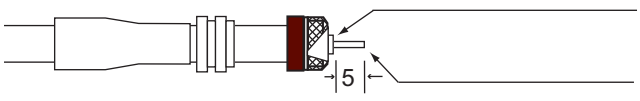
Fold back shield over clamp and trim.



Cut aluminum foil at four places, 90° from one another.

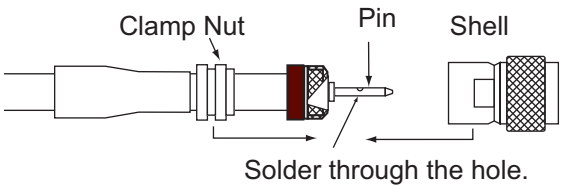


Fold back aluminum tape foil onto shield and trim.



Expose the insulator by 1 mm.

Expose the core by 5 mm.

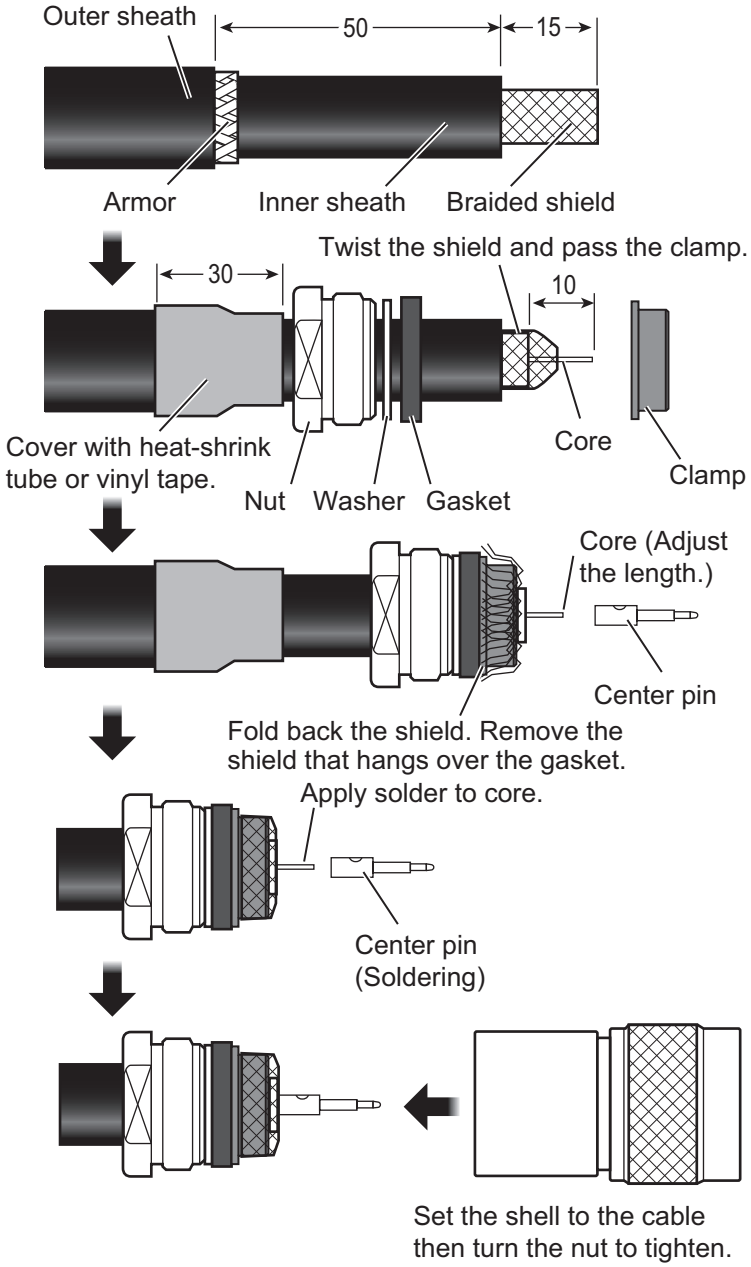


Slip the pin onto the conductor. Solder them together through the hole on the pin.

Insert the pin into the shell. Screw the clamp nut into the shell.
(Tighten by turning the clamp nut. Do not tighten by turning the shell.)

How to attach the antenna cable connector N-P-8DSFA

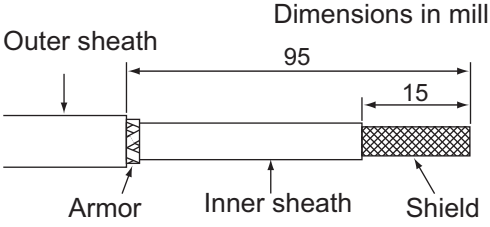
If a coaxial plug N-P-8DSFA supplied. Attach the plug to the end of the coaxial cable to connect CU as follows.



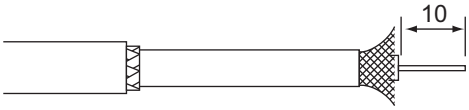
How to attach the antenna cable connector N-SP-12DSFA-CF

If the optional coaxial cable 12D-SFA-LITE-CV (100 m) is used, attach the optional coaxial plug N-SP-12DSFA-CF as follows.

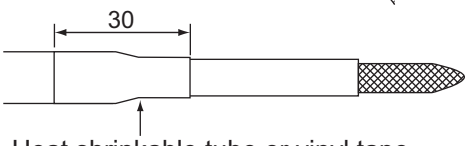
Dimensions in millimeters



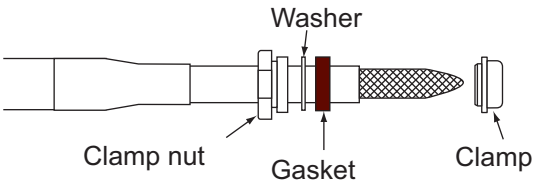
Remove outer sheath and armor by the dimensions shown left.
Remove inner sheath and expose shield by the dimensions shown left.



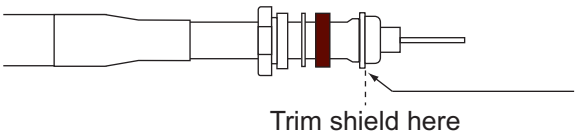
Remove the insulator beneath shield by 10 mm and expose the core.



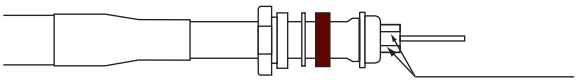
Twist shield end.



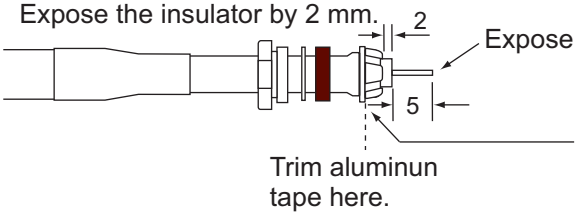
Slip on clamp nut, washer, gasket and clamp as shown left.



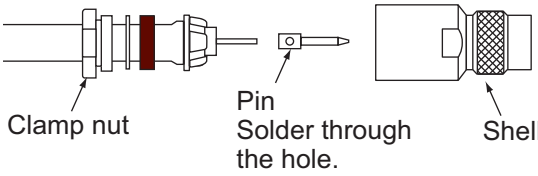
Fold back shield over clamp and trim.



Cut alminum tape at four places, 90° from one another.



Fold back aluminum tape over clamp and trim.



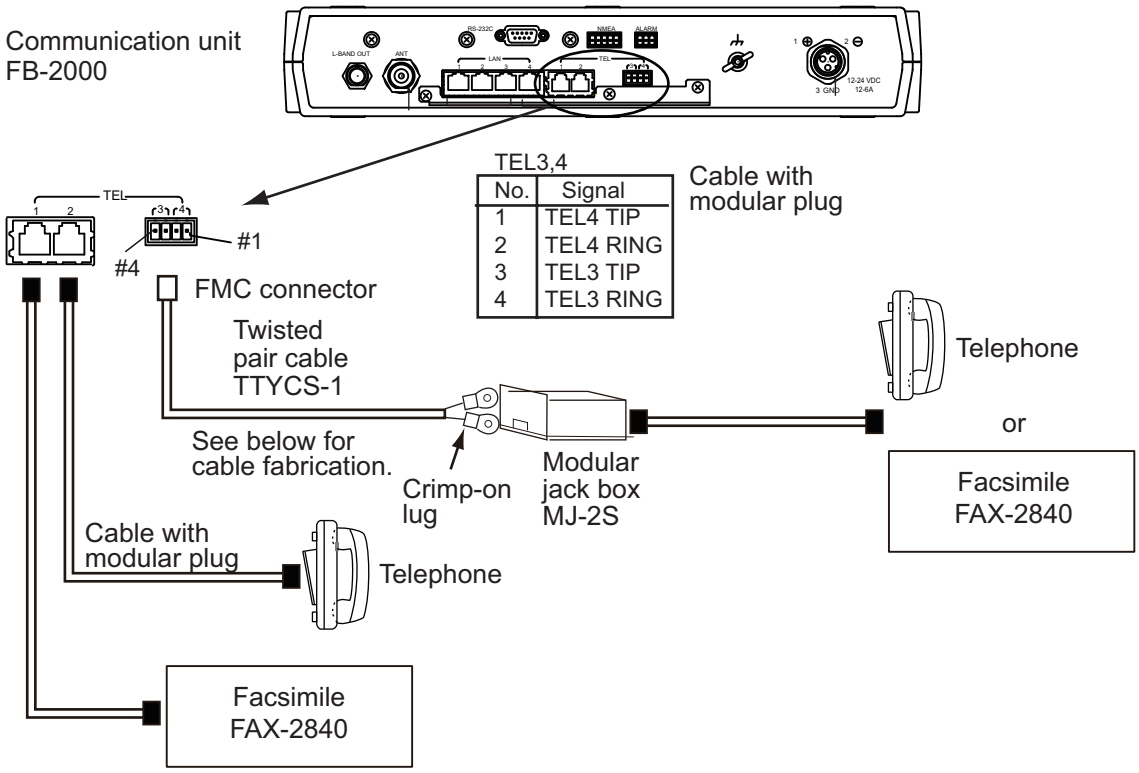
Slip the pin onto the conductor. Solder them together through the hole on the pin. Insert the pin into the shell. Screw the clamp nut into the shell.
Tighten them by turning the clamp nut. (Do not tighten by turning the shell.)

2.3 Communication Unit

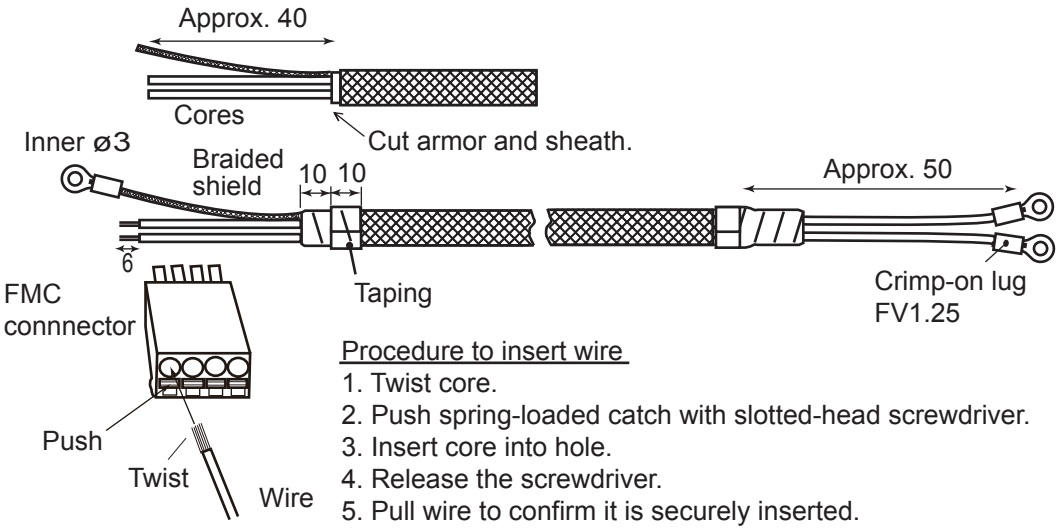
Telephone and Facsimile

Connect the cable from the telephone or facsimile to TEL1, 2, 3 or 4 port of the Communication Unit. The modular connector can be connected directly to the TEL1 or TEL2 as shown in the figure below.

To connect to the TEL3 or TEL4, use the modular jack box (optional supply) or the modular jack set (optional supply). Connect TTYCS-1 (Japan Industry Standard cable, or equivalent, local supply) between the modular jack box and Communication Unit. Attach two crimp-on lugs (FV1.25-3 red, supplied with the modular jack box) to the modular jack box side of the above cable.



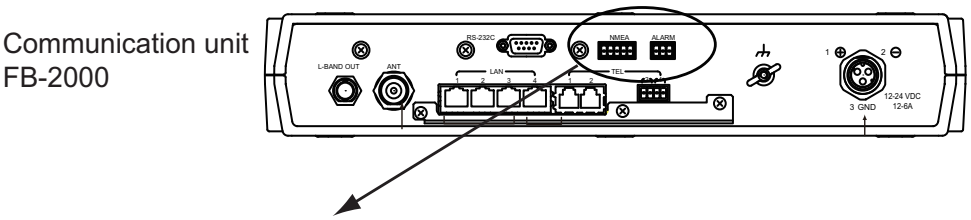
TTYCS-1 Cable fabrication



Procedure to insert wire

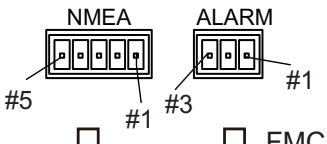
1. Twist core.
2. Push spring-loaded catch with slotted-head screwdriver.
3. Insert core into hole.
4. Release the screwdriver.
5. Pull wire to confirm it is securely inserted.

NMEA signal, External alarm



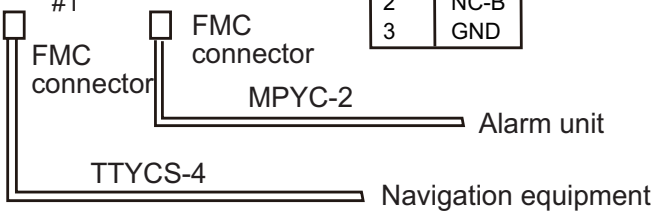
NMEA

No.	Signal
1	TD-A
2	TD-B
3	RD-A
4	RD-B
5	GND



ALARM

No.	Signal
1	NC-A
2	NC-B
3	GND

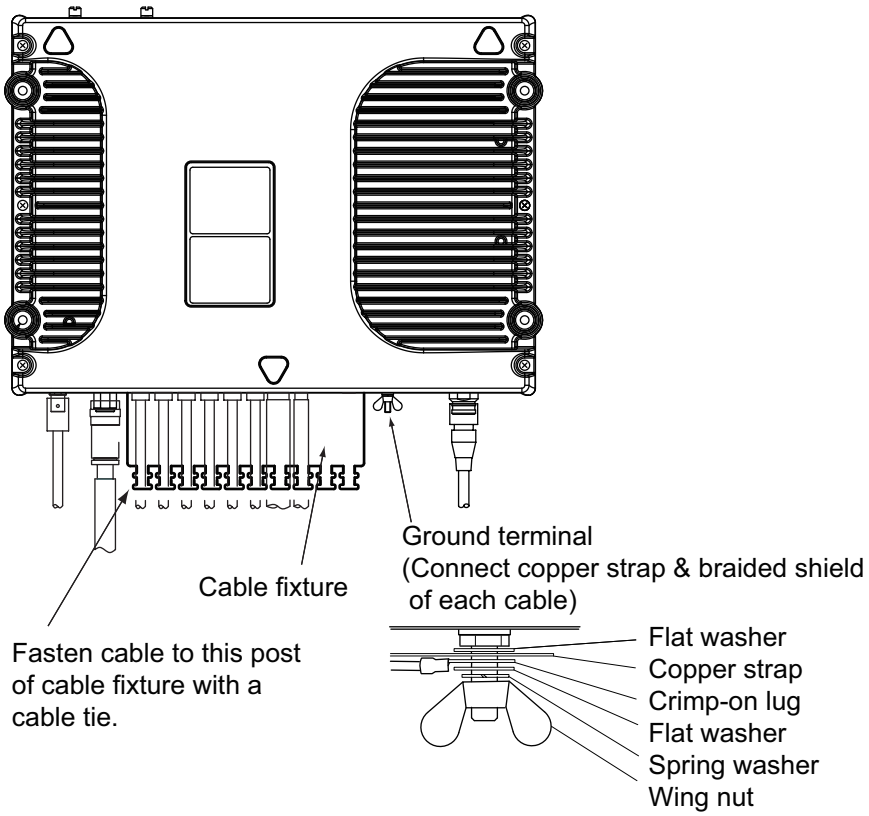


See the figure on previous page for how to fix FMC connector.

NMEA input sentence
GGA, GLL, GNS, RMA, RMC, VTG, ZDA
(Talkers for GNS are GN, GP and GL only.
For other sentences any talker will do.)

Cable fixture

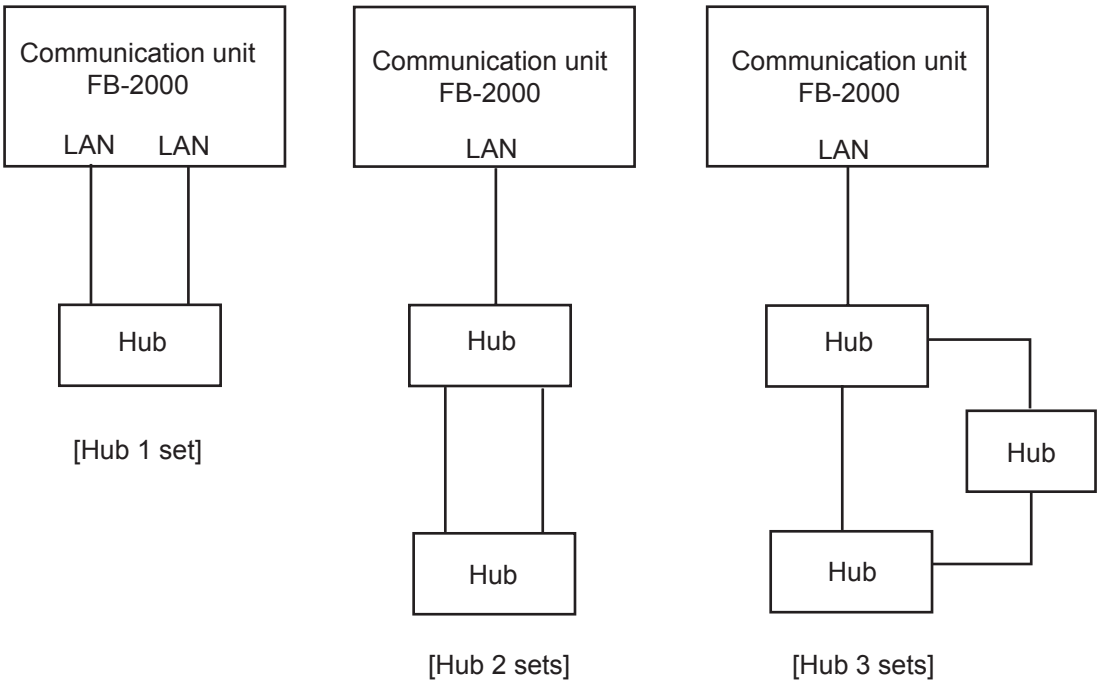
To connect the LAN and TEL lines, attach the cable fixture (supplied) to the rear panel of the Communication Unit. Then insert the connectors to each port. Fasten each cable with a cable tie (supplied) to the cable fixture. Connect the braided shield wire of each cable to the ground terminal.



2.4 Notice for network connection

With a hub(s), FELCOM500/FELCOM250 can establish a network configuration. If the hub(s) is connected in loop form, the FELCOM500/FELCOM250 may not function normally.

Never connect as follows:



Note: If you install a switching hub that does not have an automatic function to distinguish straight/cross (MDI/MDI-X) connections, you will need to select a proper cable:

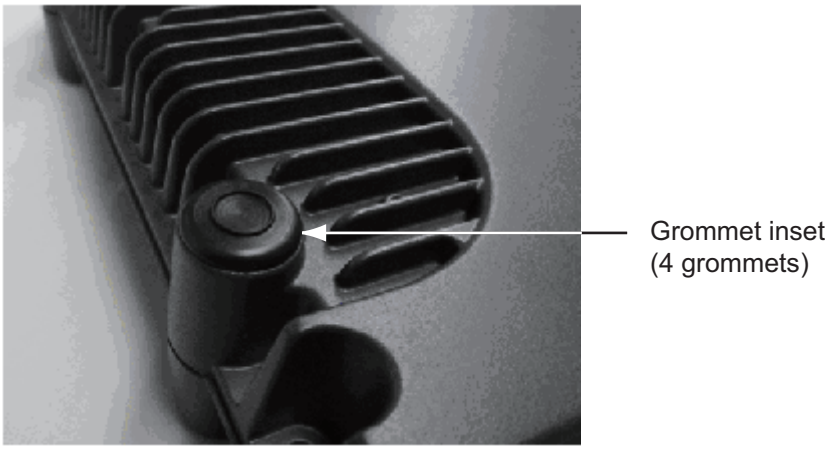
- Use a straight connection cable for an MDI to MDI-X connection.
- Use a cross connection cable for an MDI to MDI or MDI-X to MDI-X connection.

Generally, it is advisable to use an auto MDI/MDI-X switching hub.

2.5 Desktop Installation of Communication Unit to comply with IPX2 (dripping) standard

How to inset the grommet

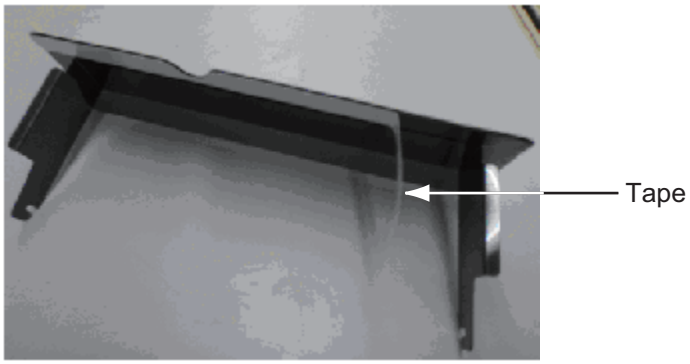
Be sure to install the Communication Unit to a desktop to protect from dripping. After installing, affix the grommets over the mounting screws.



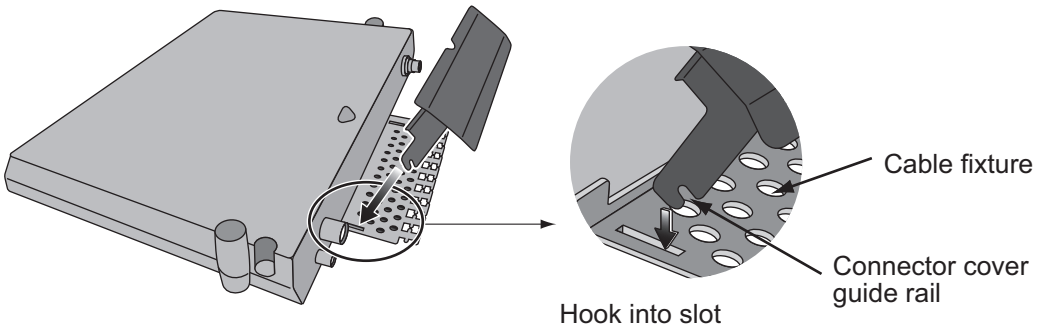
How to install the connector cover

After connecting the cables, perform the following to affix the connector cover.

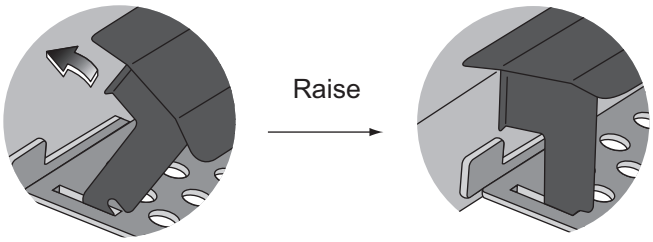
1. Peel off the double sided tape (white) from the connector cover.



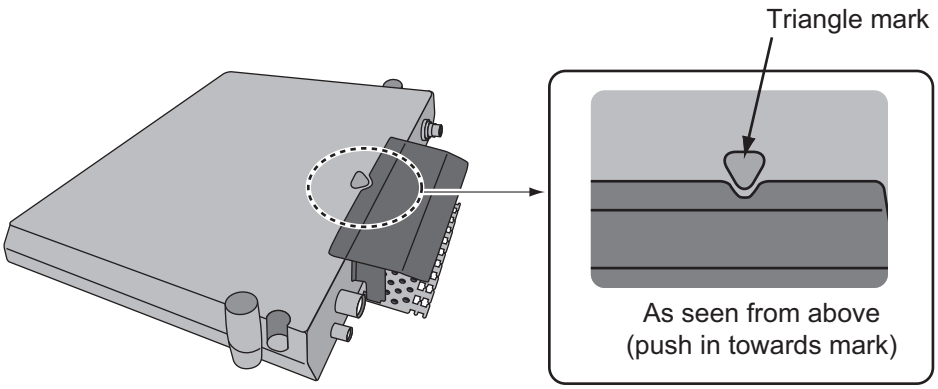
2. Plug the guide rail of the connector cover into the slots as shown, and pull slightly to hook into the slot.

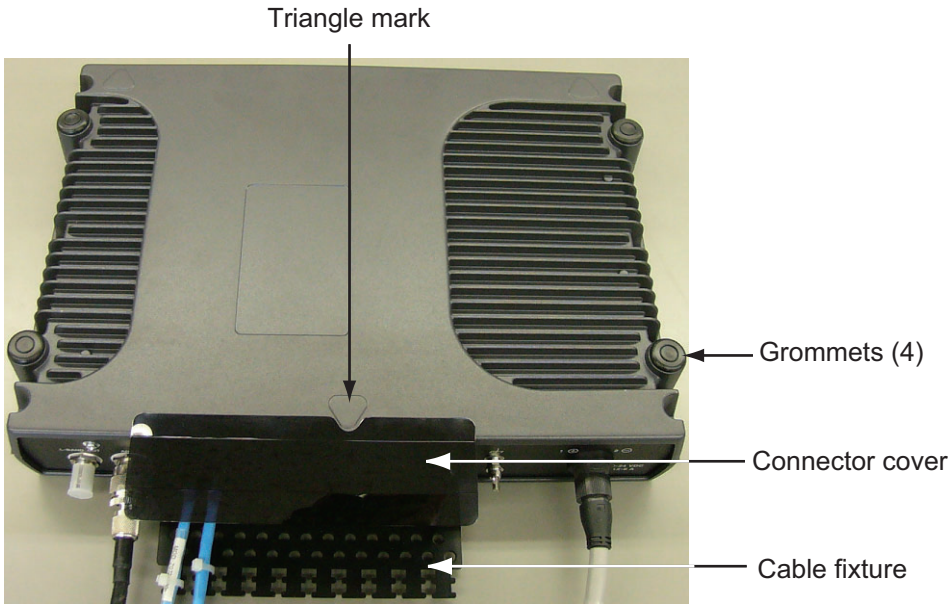


3. With the connector cover rail in the slot, raise the connector cover in the direction of the arrow as shown below.



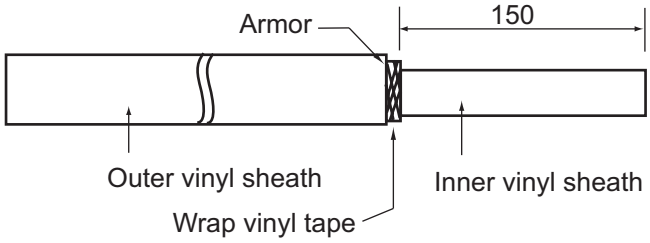
4. Push the connector cover in towards the triangle mark on the center top of the Communication Unit to affix.





2.6 LAN Cable Fabrication

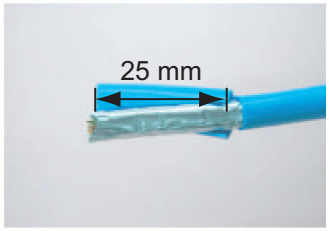
Fabricate an optional LAN cable (FR-FTPC-CY 10, 20, 30, 50 or 100 m) as follows. Cut armor and outer vinyl sheath as shown below and then connect the modular connector MPS588-C (option) to both ends.



1

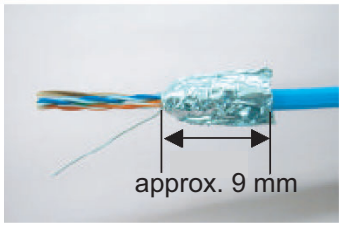
Expose inner vinyl sheath.

2



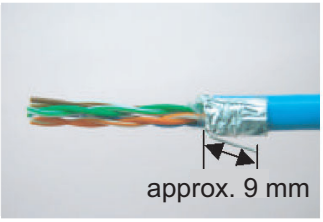
Remove the inner vinyl sheath by approx. 25 mm. Be careful not to damage inner shield and cores.

3



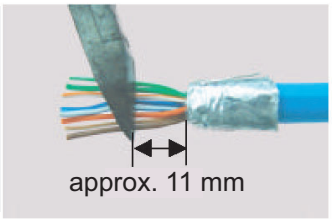
Fold back the shield, wrap it onto the inner vinyl sheath and cut it, leaving approx. 9 mm.

4



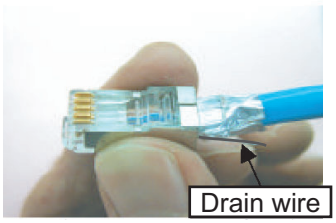
Fold back drain wire and cut it, leaving approx. 9 mm.

5



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

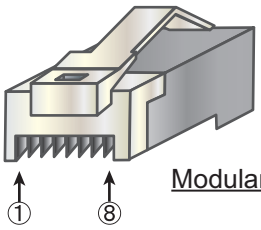
6



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.

7

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



[Crossover cable]

①WHT/GRN	WHT/ORG①
② GRN	ORG ②
③WHT/ORG	WHT/GRN③
④ BLU	BLU ④
⑤WHT/BLU	WHT/BLU⑤
⑥ ORG	GRN ⑥
⑦WHT/BRN	WHT/BRN⑦
⑧ BRN	BRN ⑧

[Straight cable]

①WHT/ORG	WHT/ORG①
② ORG	ORG ②
③WHT/GRN	WHT/GRN③
④ BLU	BLU ④
⑤WHT/BLU	WHT/BLU⑤
⑥ GRN	GRN ⑥
⑦WHT/BRN	WHT/BRN⑦
⑧ BRN	BRN ⑧

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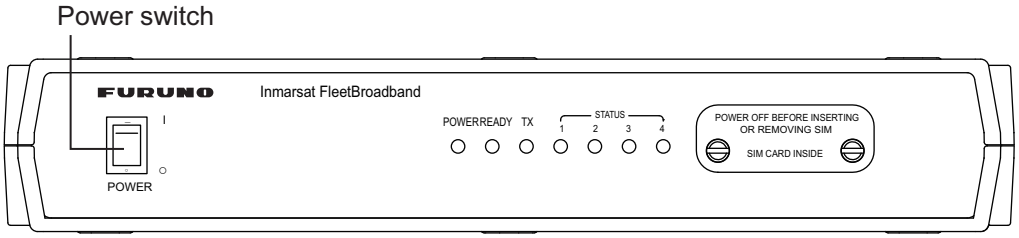
3. SETTING AFTER INSTALLATION

This chapter shows how to enter basic settings, done by the installation technician. For the network setting, request to an administrator of the ship network. (Refer to the Operator's Manual for details.)

The SIM card is required to communicate via a satellite, but not required for the following system settings. “(SIM): No SIM” appears in the Web software screen. Disregard the warning.

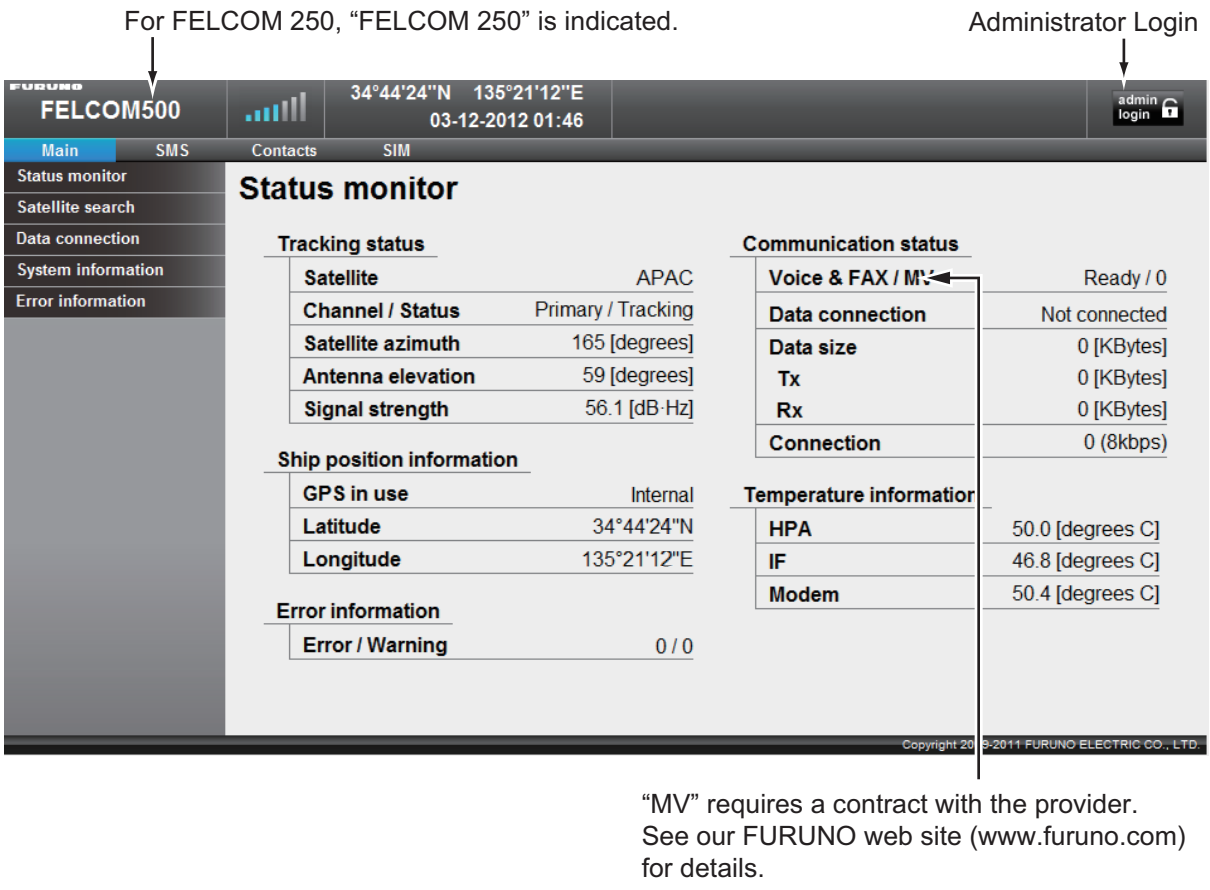
3.1 Preparation for Setting

1. Connect the PC to the Communication Unit with a LAN cable.
2. Turn on the PC.
   Note: Set the Internet Protocol (TCP/IP) Properties of PC to “Obtain an IP address automatically”. If you set the PC IP address manually, set it according to the IP address of the Communication Unit (default 192.168.1.1).
3. Turn on the Communication Unit.
   The initialization begins. During this time, the PC cannot access the Communication Unit.

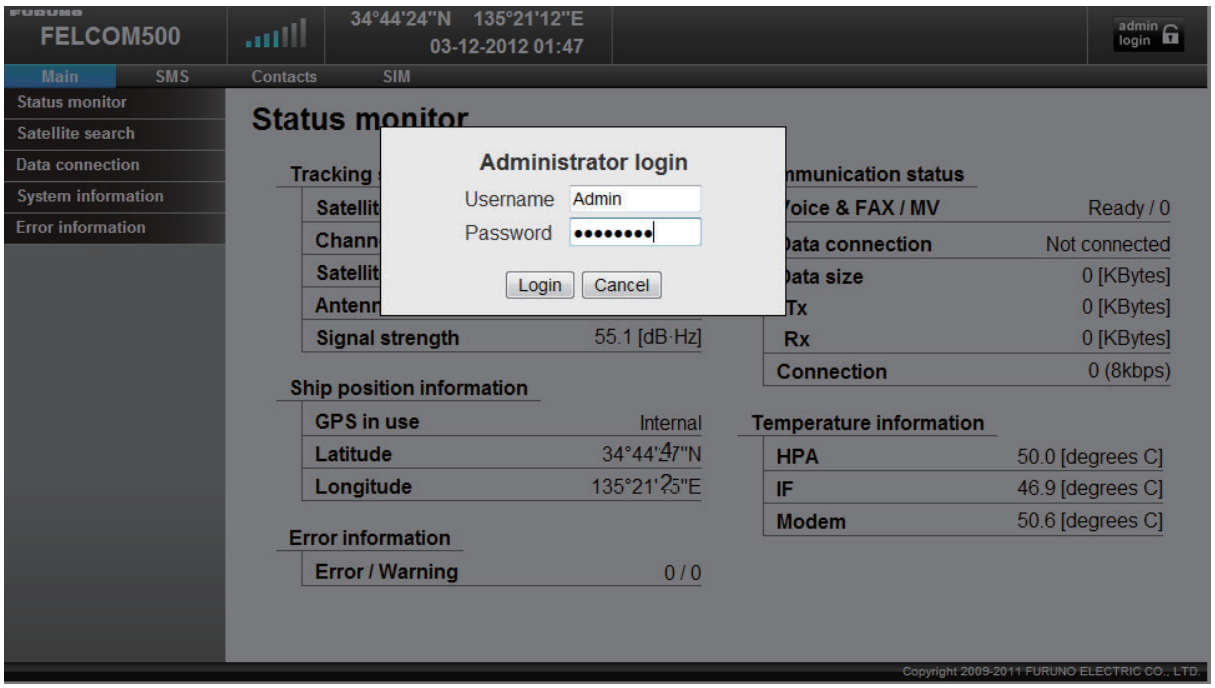


Communication unit

4. When all STATUS LEDs are lit, activate the Web browser.
5. Enter “192.168.1.1” in the address bar and press the **Enter** key.
   The main menu of the Web software opens.
   Note: You can add the main menu of the Web software to “Favorite” or “Bookmark” for easy access.

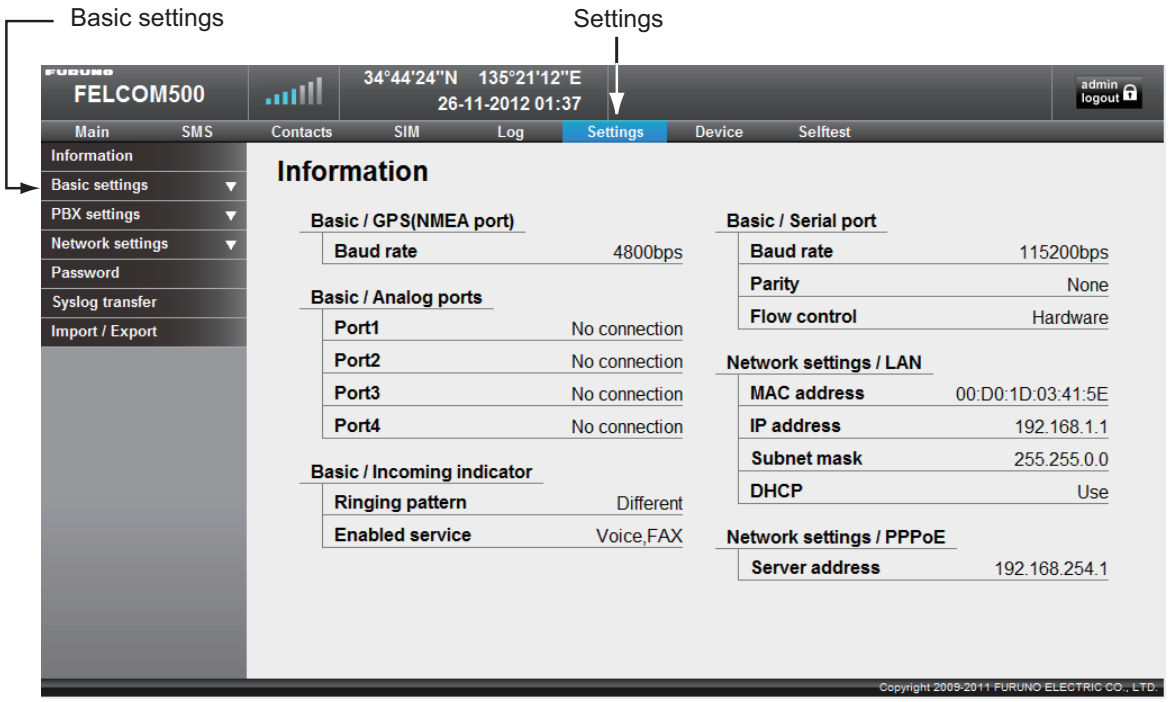


6. Click the [admin login] button at the upper right hand side on the screen to show the Login window.
7. Key in username “Admin” and password “01234567” (default value).
   The administrator can change the password in another menu.

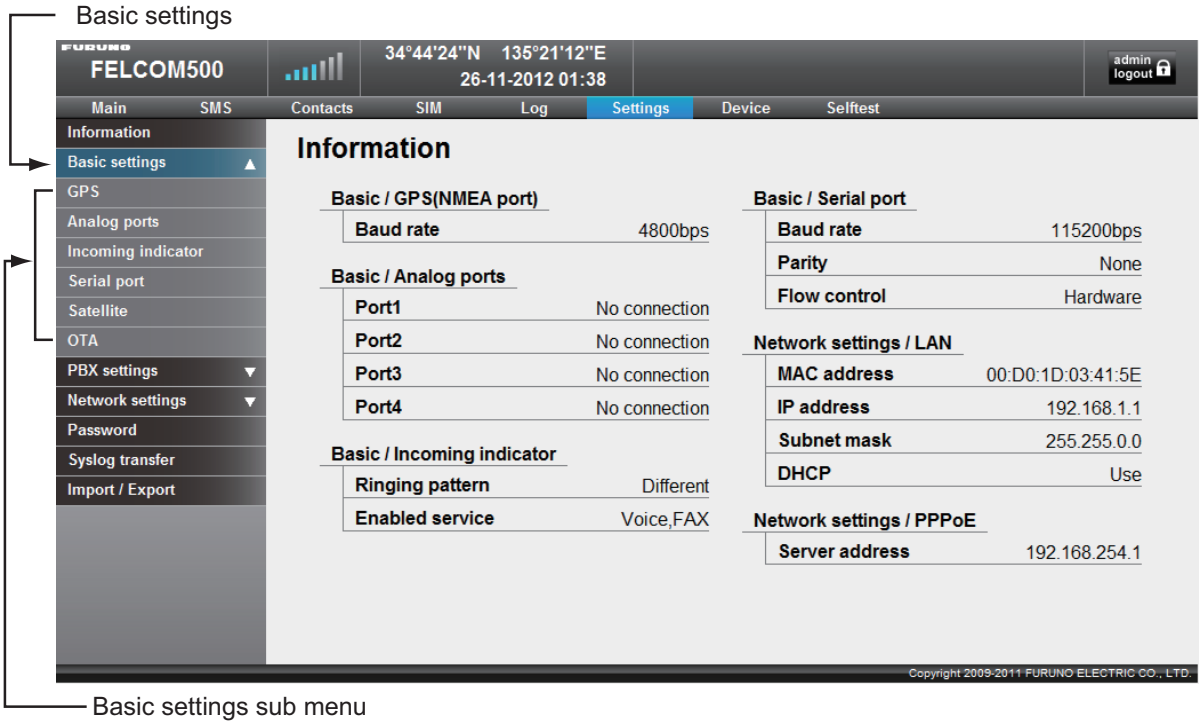


8. Click the [Login] button.
   New menu items appear on the menu bar; Log, Settings, Device, and Selftest.

9. Click [Settings] on the menu bar.
   The sub menu appears at the left side and the current setting appears in the Information window at the right side.



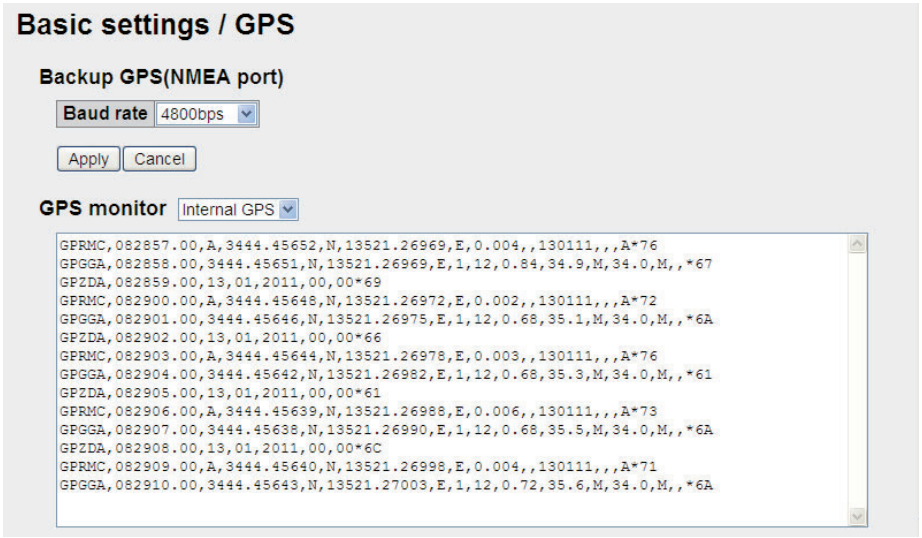
10. Click [Basic settings] on the sub menu to show the list of basic settings sub menus.



Use these sub menus to set the basic settings, following the procedures on the next several pages.

3.2 GPS Setting

1. Click [GPS] on the Basic settings sub menu.

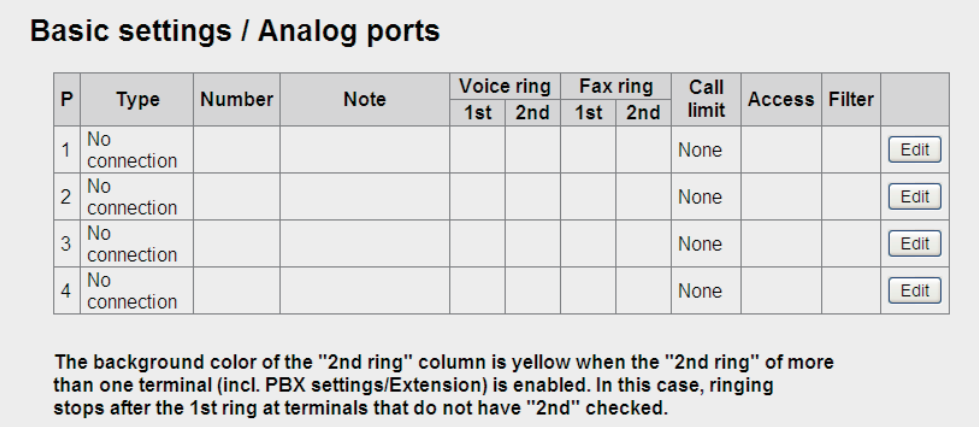


2. If an external GPS is connected to the NMEA port on the Communication Unit, set the baud rate to 4800 bps or 38400 bps according to the GPS connected.
3. Click the [Apply] button.
4. To monitor output sentences from the GPS, select a GPS among Internal GPS, NMEA port, and None. “None” displays no sentences.

3.3 Analog Port Setting

Set for analog telephones/faxes that are connected to the TEL ports as follows.

1. Click [Analog ports] on the Basic settings sub menu.

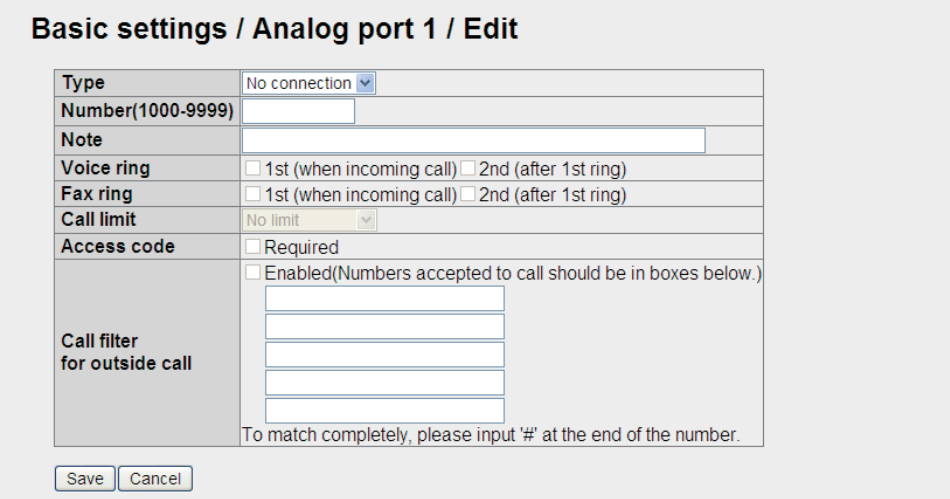


Basic settings / Analog ports

P	Type	Number	Note	Voice ring		Fax ring		Call limit	Access	Filter	
				1st	2nd	1st	2nd				
1	No connection							None			Edit
2	No connection							None			Edit
3	No connection							None			Edit
4	No connection							None			Edit

The background color of the "2nd ring" column is yellow when the "2nd ring" of more than one terminal (incl. PBX settings/Extension) is enabled. In this case, ringing stops after the 1st ring at terminals that do not have "2nd" checked.

2. Click the [Edit] button on the right side of the port to set.
There are four TEL ports (TEL 1 to TEL 4), and TEL 1 is analog port 1 in the table.



Basic settings / Analog port 1 / Edit

Type	No connection
Number(1000-9999)	
Note	
Voice ring	1st (when incoming call) 2nd (after 1st ring)
Fax ring	1st (when incoming call) 2nd (after 1st ring)
Call limit	No limit
Access code	Required
Call filter for outside call	Enabled(Numbers accepted to call should be in boxes below.) To match completely, please input '#' at the end of the number.

Save Cancel

3. In the [Type] box, select the equipment that is connected to the TEL port. The selections are as follows:
   - TEL: Analog telephone
   - FAX: Facsimile
   - TEL & FAX: Facsimile telephone
   - No Connection: Nothing connected
4. Key in extension telephone number in the [Number] box. The setting range is between 1000 and 9999.
5. In the [Note] box, key in a name; user name, setting location, etc. This is the name a called party sees. Up to 50 alphanumeric characters can be used. Do not use symbols, “?”, “/”, etc.
6. Set up outside line calls in the [Voice ring] box.
If you selected TEL at step 3, “1st” is checked. Then, any terminals that have”1st” checked ring first. Remove the check for no ring. Check “2nd” to ring 2nd terminal when there is no answer at the terminal that has “1st” checked. Ring duration time can be set on the [2nd ring timer] of the PBX settings/General settings screen. (See the operator’s manual.)

7. Set up fax call in the [Fax ring] box. (Same as the Voice ring.)
   If you selected FAX or TEL&FAX at step 3, “1st” is checked.
8. Set the transmission limit in the [Call limit] box.
   - No limit: No transmission limit.
   - Extension only: Transmission available for extension call only.
   - Incoming only: Outgoing call not available. Incoming call only.
   - Outside only: Transmission available for external call only.
9. If checked [Access code], requires input of access code to access an outside line. The Caller ID is recorded to the Voice Call log to identify the person accessing the outside line.
   Note: Access code requirement cannot be set in the following cases:
   - When “Extension only” or “Incoming only” is selected in the [Call limit] box (step 8).
   - When “Call filter for outside call” below is enabled.
10. At the [Call filter for outside call] box, set the restrictions for outside calling. Check “Enabled” to activate the restrictions, set in the boxes (a maximum of 20 characters). See the table below for example restrictions. A maximum of five restrictions can be set.

	Usage	Input Example	Remarks
1	Register telephone number of office on the shore.	+81798631131#	Forbid outside calls to other than the phone number registered here.
2	Register only country number (Japan for example).	+81	Permit calls only to Japan.
3	Register the number exclusive use of pre-paid card.	66#	Forbid outside calls other than those made with a pre-paid card.

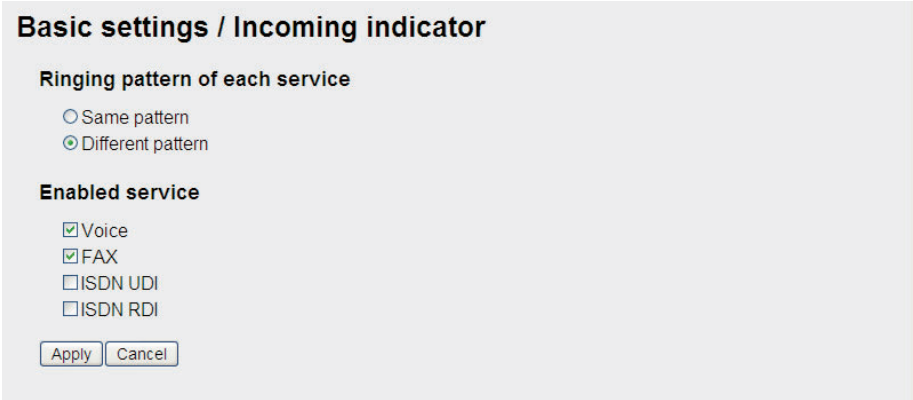
   Note: Call filter for outside call cannot be set in the following cases:
   - When “Extension only” or “Incoming only” is selected in the [Call limit] box (step 8).
   - “Required” is checked at the “Access code box” (step 9).
11. Click the [Save] button. The message "Setting Completed" appears.
12. Click the [OK] button to erase the message.

Note: If “2nd” is checked on the Basic settings/Analog ports screen or PBX settings/Extension screen, the background color of the 2nd column on the Analog ports screen becomes yellow. In this condition, terminals that do not have “2nd” checked stop ringing after the time specified has elapsed.

3.4 Incoming Indicator Setting

If the optional Incoming Indicator is connected, set it as follows.

1. Click [Incoming Indicator] in the Basic settings sub menu.

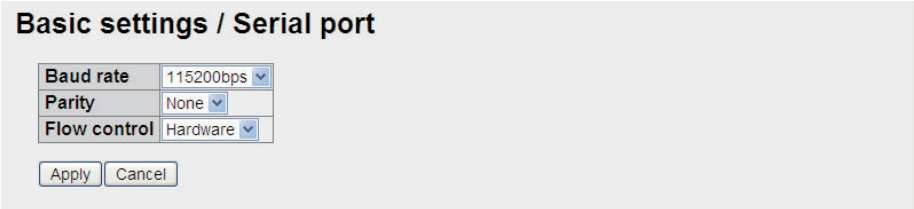


2. Select the ringing pattern of the incoming indicator in the [Ringing pattern of each service], between Same pattern and Different pattern.
   Same pattern: Same ringing pattern for any communication service.
   Different pattern: Different ringing pattern for each communication service.
3. Check a communication services to ring the incoming indicator.
   - Voice: Ring for incoming telephone.
   - FAX: Ring for incoming facsimile.
   - ISDN UDI: Ring for incoming ISDN UDI data communication (FELCOM500 only).
   - ISDN RDI: Ring for incoming ISDN RDI data communication (FELCOM500 only).
4. Click the [Apply] button to conclude the setting.

3.5 Serial Port Setting

Set for the equipment that is connected to the RS-232C port.

1. Click [Serial port] in the Basic settings sub menu.

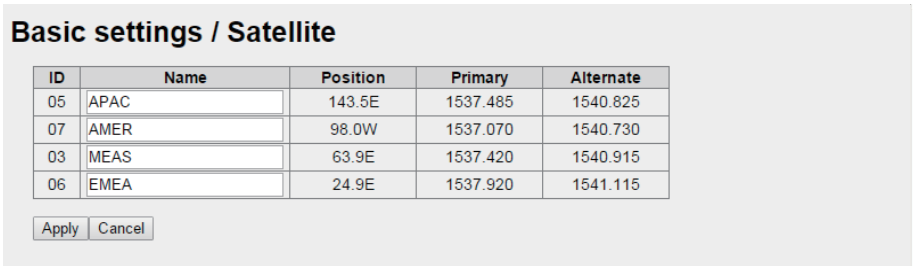


2. Select a baud rate from the [Baud rate] drop-down list. The selections are 9600, 19200, 38400, 57600 and 115200 bps.
3. Set a parity bit in the [Parity] box. The selections are None, Even and Odd.
4. Select the [Flow control] among Hardware, Software and None.
5. Click the [Apply] button to complete the setting.

3.6 Satellite Setting

The four satellites are named APAC (Asia-Pacific), EMEA (Europe-Middle East-Africa) MEAS (Middle East and Asia) and AMER (America). To change satellite name, do as follows.

1. Click [Satellite] in the Basic settings sub menu.

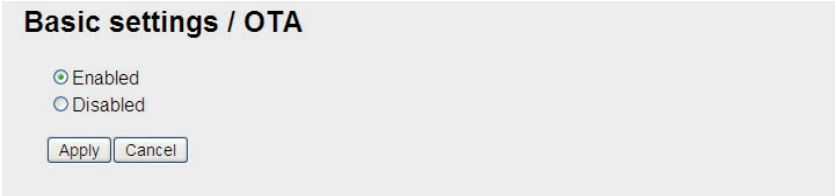


2. Put the cursor in the Name box and enter the name of the satellite (max. 10 characters).
3. Click the [Apply] button to complete the setting.
   The meaning of the table items is as follows.
   - ID: Identification of the satellite
   - Position: Position of the geostationary satellite (longitude)
   - Primary: Frequency of the first global channel of the satellite
   - Alternate: Frequency of the second global channel of the satellite

3.7 OTA Setting

OTA stands for Over The Air. The OTA function permits remote management of files in the SIM card.

1. Click [OTA] in the Basic setting sub menu.



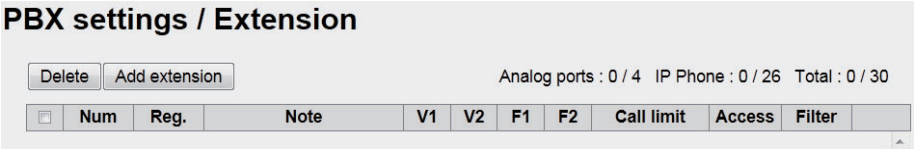
2. To enable the OTA, click the [Enabled] radio button. To disable the OTA, click the [Disabled] radio button.
3. Click the [Apply] button to complete the setting.
   With Enabled, OTA functions as follows.
   a) User requests a change of contract contents to a SIM maker.
   b) The SIM maker transmits an OTA message to the terminal.
   c) The terminal receives the OTA message and modifies the internal parameters according to the contract contents.

3.8 Handset Setting

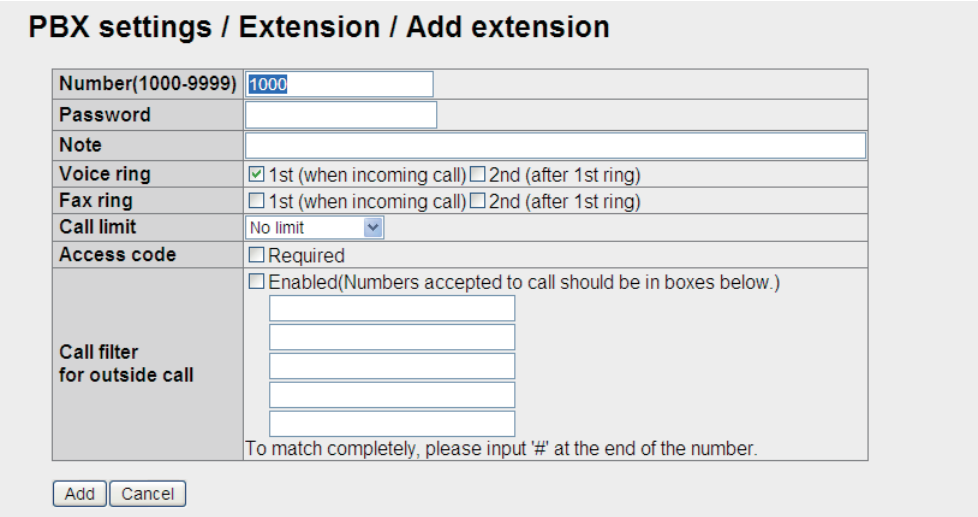
To use the IP handset for calling, set the Web software and the IP handset as follows.

Web software setting

1. Click [Settings] in the menu bar.
2. Click [PBX Settings] in the Settings sub menu at the left side of the screen.
3. Click [Extension] in the PBX Setting sub menu.



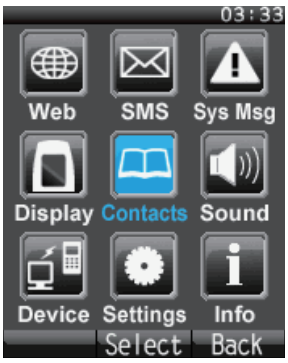
4. Click the [Add extension] button.
   The following window appears. The lowest unregistered number between 1000 and 9999 appears in the [Number] box. To use this number, go to step 6. To register a different number, go to step 5.

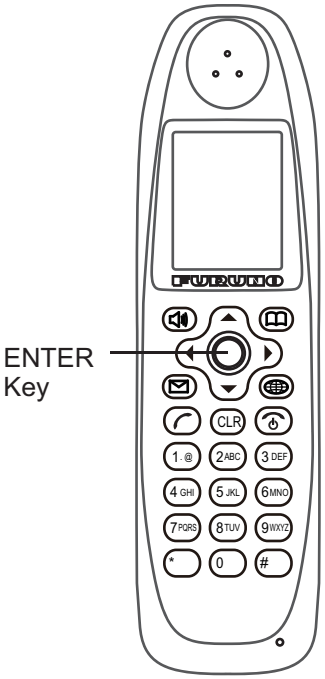


5. Key in a new extension number in the [Number] box (1000-9999).
   You cannot use a number that is already entered. If you enter the same number, an error message will appear at the registration.
6. Key in a password in the [Password] box (a maximum of eight alphanumeric characters).
   Upper case alphabet can be used.
   Note: Do not forget to write down the telephone number and password.
7. If necessary, enter a comment in the [Note] box (a maximum of 50 characters), for example, user name, setting location, etc.
8. Enter the outside line settings in the [Voice ring] box. (Refer to section 3.3.)
9. Enter the fax settings in the [Fax ring] box.
10. Set the transmission limit in the [Call limit] box.
    - No limit: No transmission limit.
    - Extension only: Transmission available for extension call only.
    - Incoming only: Outgoing call not available. Incoming call only.
    - Outside only: Transmission available for external call only.
11. If necessary, check [Required] in the [Access code] box to require input of access code to access an outside line. (Refer to section 3.3.)
12. In the [Call filter for outside call] box, set the restrictions for outside calling. (Refer to section 3.3.)
13. Click the [Add] button.
    The message "Completed" will appear.
14. Click the [OK] button.
    The registered number appears on the Extension screen.
15. To register multiple telephones, repeat steps 4 to 14.

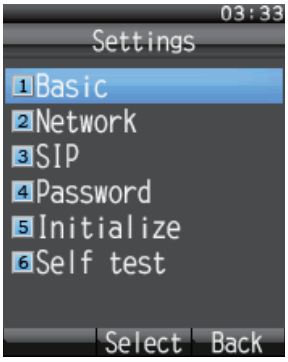
Setting in the IP handset

1. Push the **Enter** key at the idle screen to show the main menu.

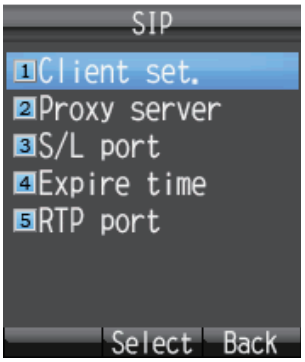




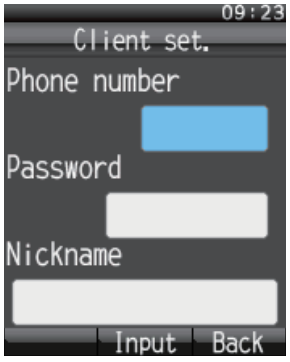
2. Push ▼ to select the Settings icon and then push the **Enter** key to show the Settings menu.



3. Push **3** key to show the SIP menu.



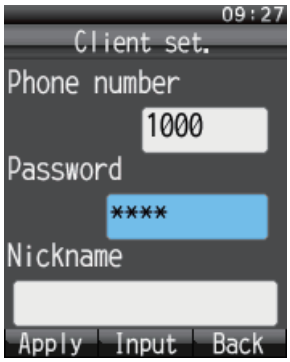
4. Push **1** key to show the Client setting screen.



5. With the Phone number box highlighted in blue, push the **Enter** key to show the phone number input screen.

6. Enter the extension number that is registered in the Web software and push the **Enter** key.
   If something has been registered, push the **CLR** key to erase it.
7. Push ▼ to select Password and then push the **Enter** key.
8. Enter the password which was registered in the Web software and then push the **Enter** key. If the password contains both alphabet and numerals, switch input format with the soft key (📖).

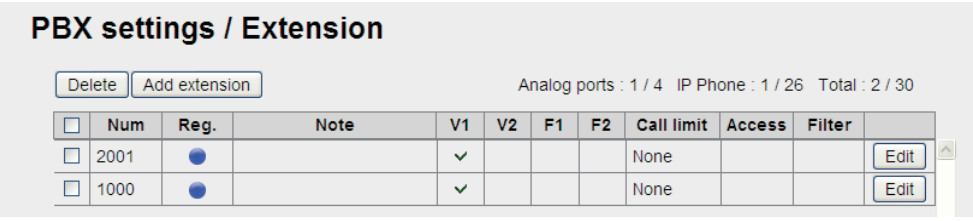
   Note: Alphabet is the default setting of input format.



9. Push the soft key (🔊) (Apply).

   The message "Set" appears and the setting for one IP handset is completed.
10. Push the **CLR** key three times to return to the idle screen.
11. If multiple handsets are connected, repeat the above step 1 to 10 for each handset.

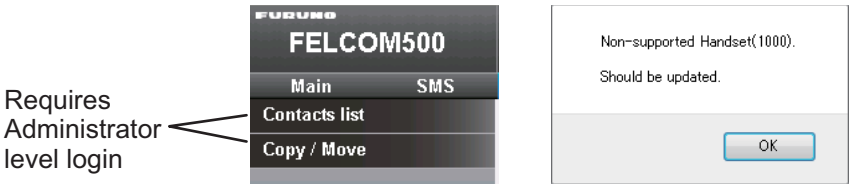
When the Web software-set extension number matches handset-set extension number, the mark with a blue circle appears in the Settings/ PBX settings/ Extension window of the Web software. These handsets can be used for communication. However, the following screen does not update automatically. Press the Reload button of the browser to refresh the screen.



Setting Example

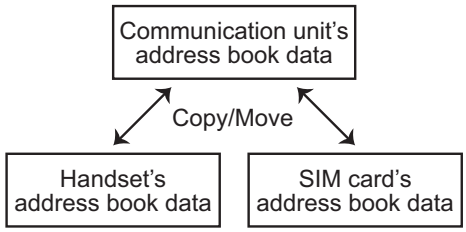
3.9 How to Copy and Move Contacts

You can copy or move contacts between the handsets, communication unit and the SIM card. The communication unit acts as a hub for the data transfer. Administrator level (or higher) login is required to access the Contacts list menu and the Copy/Move function.



Note: The Copy/Move functions are only available on handsets and communication units using version 8.4 software or later. Consult your local dealer to update your software if the above-right error window is displayed when accessing the Copy/Move menu.

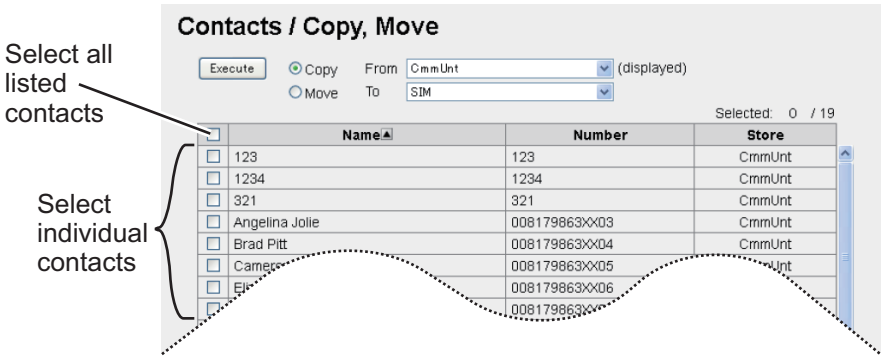
The Copy function creates a copy of all the source device contacts data, except short dial numbers, on the destination device.



The Move function removes all contact data, except short dial numbers, from the source device and moves it to the destination device. Source data is not deleted until the move is completed.

If the copy/move is interrupted for any reason, an entry in the error log is created.

Note: The communication unit cannot store short dial numbers when copying/moving handset contacts to the communication unit. Therefore short dial numbers cannot be transferred between handsets.



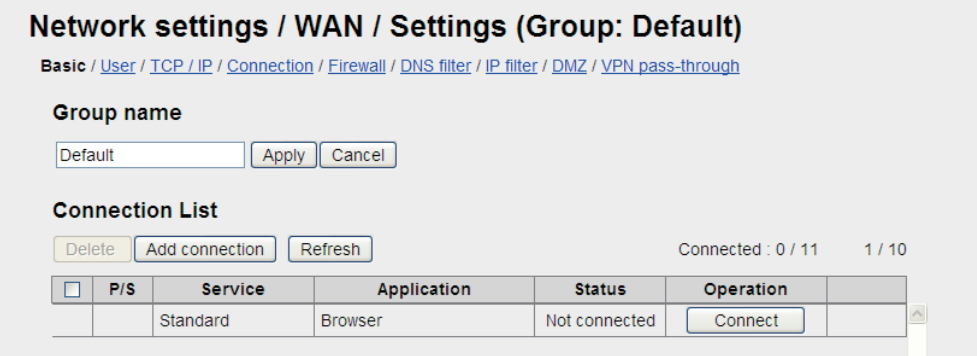
1. Click [Copy/Move] in the [Contacts] sub menu.
2. Select the source using the [From] drop-down box.
3. Select the destination using the [To] drop-down box.
4. Select contacts to be moved or copied, referring to the figure above. You can select one or more individual contacts, or select all contacts.
5. Click [Execute] to begin the copy/move process.

3.10 User Registration (for data connection)

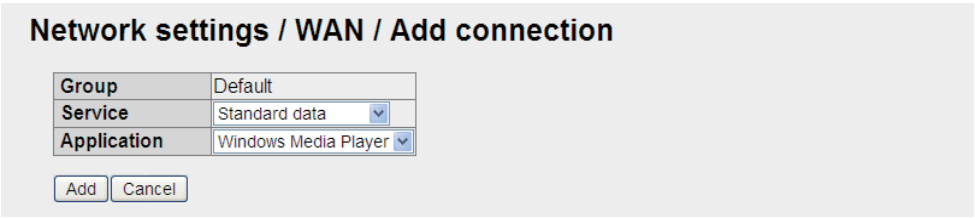
Register the IP address of the handset and the PC to the user list to enable data connection from the registered handset and PC. If no IP address is entered, the standby screen of the handset shows “D: No permission”, the Web software screen shows “Data connection No permission” and data connection from unregistered handset and PC cannot be enabled.

1. Click [Settings] on the menu bar.
2. Click [Network Settings].
3. Click [WAN].
4. Click [Group Settings] to show the Network settings/WAN/Group settings screen.

5. Click the [Settings] button to show the basic setting screen.
The default setting is “standard IP packet communications service”. For SIM card and you have applied for streaming IP packet communication service, go to step 6. If you have not applied, go to step 11.

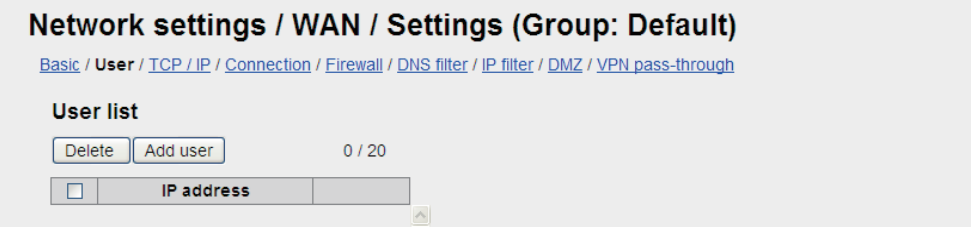


6. Click the [Add connection] button to shown the Add connection screen.



7. Enter the service to use in the [Service] box.
Select one among Standard data, 8kbps Streaming, 16kbps Streaming, 32kbps Streaming, 64kbps Streaming, 128kbps Streaming, and 256kbps Streaming*/ * FELCOM 500 only
8. Enter the application to use in the [Application] box.
Select among Windows Media Player, Quick Time, Real Player, FTP, and Browser.
9. Click the [Add] button. The message “Completed” appears.
10. Click the [OK] button to erase the message.

11. Click [User] to show the User List screen.



12. Click the [Add user] button to shown the Add user screen.

13. Enter the IP address in the [User] box. Do not use 127.0.0.1, 255.255.255.255, or the IP address of the Communication Unit.
    Note: If the IP addresses are the same, only one group can be registered. “192.168.1* and “192.168.1.10” can be registered. * is a wildcard: show network. If you registered two groups this way, the group having the narrowest range (192.168.1.10) has priority.
14. Click the [Add] button. The message "Setting Completed." appears.
15. Click the [OK] button to erase the message.

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APPENDIX 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)

4. Armor Type

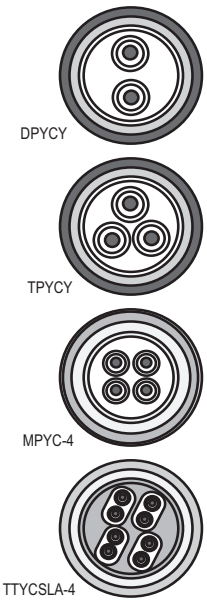
C: Steel

5. Sheath Type

Y: Anticorrosive vinyl sheath

6. Shielding Type

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



EX: TTYCYSLA - 4
(1 2 3 4 5 6)
Designation type — # of twisted pairs

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

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	1.5mm²	1.56mm	11.7mm	TTYCS-1	0.75mm²	1.11mm	10.1mm
DPYC-2.5	2.5mm²	2.01mm	12.8mm	TTYCS-1T	0.75mm²	1.11mm	10.6mm
DPYC-4	4.0mm²	2.55mm	13.9mm	TTYCS-1Q	0.75mm²	1.11mm	11.3mm
DPYC-6	6.0mm²	3.12mm	15.2mm	TTYCS-4	0.75mm²	1.11mm	16.3mm
DPYC-10	10.0mm²	4.05mm	17.1mm	TTYCSLA-1	0.75mm²	1.11mm	9.4mm
DPYCY-1.5	1.5mm²	1.56mm	13.7mm	TTYCSLA-1T	0.75mm²	1.11mm	10.1mm
DPYCY-2.5	2.5mm²	2.01mm	14.8mm	TTYCSLA-1Q	0.75mm²	1.11mm	10.8mm
DPYCY-4	4.0mm²	2.55mm	15.9mm	TTYCSLA-4	0.75mm²	1.11mm	15.7mm
MPYC-2	1.0mm²	1.29mm	10.0mm	TTYCY-1	0.75mm²	1.11mm	11.0mm
MPYC-4	1.0mm²	1.29mm	11.2mm	TTYCY-1T	0.75mm²	1.11mm	11.7mm
MPYCSLA-4	1.0mm²	1.29mm	11.4mm	TTYCY-1Q	0.75mm²	1.11mm	12.6mm
MPYC-7	1.0mm²	1.29mm	13.2mm	TTYCY-4	0.75mm²	1.11mm	17.7mm
MPYC-12	1.0mm²	1.29mm	16.8mm	TTYCY-4S	0.75mm²	1.11mm	21.1mm
TPYC-1.5	1.5mm²	1.56mm	12.5mm	TTYCY-4SLA	0.75mm²	1.11mm	19.5mm
TPYC-2.5	2.5mm²	2.01mm	13.5mm	TTYCYS-1	0.75mm²	1.11mm	12.1mm
TPYC-4	4.0mm²	2.55mm	14.7mm	TTYCYS-4	0.75mm²	1.11mm	18.5mm
TPYCY-1.5	1.5mm²	1.56mm	14.5mm	TTYCYSLA-1	0.75mm²	1.11mm	11.2mm
TPYCY-2.5	2.5mm²	2.01mm	15.5mm	TTYCYSLA-4	0.75mm²	1.11mm	17.9mm
TPYCY-4	4.0mm²	2.55mm	16.9mm				

PACKING LIST FB-2000/8000-A-J/E、-B-J/E

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
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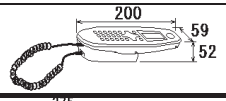
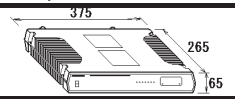
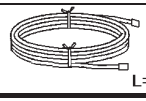
ﾊﾝﾄﾞｾｯﾄ IP HANDSET		FB-8000 000-015-761-00	1
通信制御ﾕﾆｯﾄ COMMUNICATION UNIT		FB-2000-A/-B 000-015-758-00 **	1
通信制御用予備品 COMMUNICATION UNIT SPARE PARTS			
予備品 SPARE PARTS		SP16-01901 001-067-320-00	1
通信制御用工材 COMMUNICATION UNIT INSTALLATION MATERIALS CP16-03810			
ｹｰﾌﾞﾙ(組品)LAN LAN CABLE ASSEMBLY		MOD-Z072-050+ 001-167-890-10	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A3SPF0018-050ZC 000-154-025-10	1
工事材料 INSTALLATION MATERIALS		CP16-03811 001-067-790-00	1
工事材料 INSTALLATION MATERIALS		CP16-03812 001-106-090-00	1
ﾊﾝﾄﾞｾｯﾄ工材 HANDSET INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP16-03901 001-067-350-00	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.）

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
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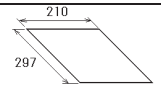
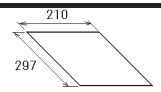
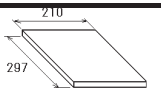
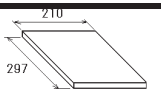
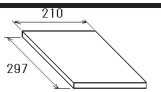
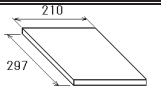
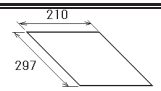
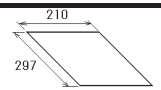
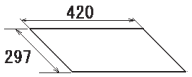
衛星ｶﾊﾞｰｴﾘｱﾏｯﾌﾟ SATELLITE COVERAGE AREA MAP		C52-01101-* 000-175-262-1*	1
衛星位置確認ｽｹｰﾙ SATELLITE POSITION SCALE		C52-01102-* 000-175-457-1*	1
設定事例集 EXAMPLE OF SETTING		*52-01003-* 000-174-622-1* **	1
取扱説明書 OPERATOR'S MANUAL		OM*-56660-* 000-170-976-1* **	1
装備要領書 INSTALLATION MANUAL		IM*-56660-* 000-194-919-1* **	1
操作要領書（多言語） OPERATOR'S GUIDE (MLG)		MLG-56660-* 000-170-980-1*	1
ﾋｭｰｽﾞ変更のお願い NOTIFICATION DOCUMENT		C52-00206-* ﾜｲｴｲ 000-147-004-1*	1
緊急呼出ｼｰﾄ EMERGENCY CALL SHEET		E52-00905-* 000-172-812-1*	1
型紙 PLATE		C52-00901-* 000-171-039-1*	1

P A C K I N G L I S T FB-1500-A/A-H/C/C-H

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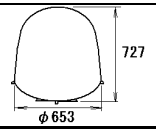
ｱﾝﾃﾅﾕﾆｯﾄ ANTENNA UNIT		FB-1500-A/A-N/C/C-N 000-015-744-00 **	1
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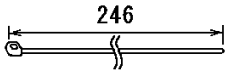
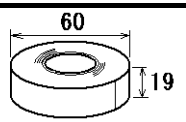
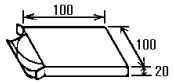
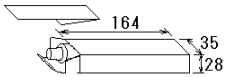
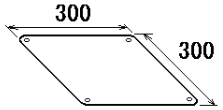
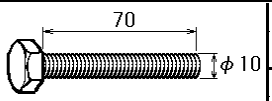
ｺﾝﾍﾞｯｸｽ CONVEX		CV-250B 000-171-854-10	2
ﾋﾞﾆｰﾙﾃｰﾌﾟ VINYL TAPE		0.2X19X10000MM ｸﾛ 000-172-691-10	1
ﾌﾞﾁﾙｺﾞﾑﾃｰﾌﾟ SELF-BONDING TAPE		NO.15 000-174-646-10	1
接着剤袋詰 ADHESIVE		TB5211 50G 001-477-870-00	1
ｺﾞﾑ板 RUBBER MAT		M02219* 999-999-146-00	1 (*)
放射警報ｽﾃｯｶｰ RADIATION WARNING STICKER		L05-10040 999-999-144-00	1 (*)
六角ﾎﾞﾙﾄ HEX BOLT		M10X70 SUS M90-10278 999-999-169-00	4 (*)

1.(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
(*) THIS CODE CANNOT BE ORDERED.

2.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.)

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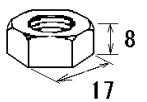
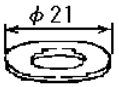
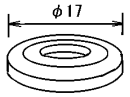
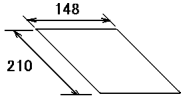
六角ﾅｯﾄ HEX NUT		M10 SUS M90-10082 999-999-151-00	8 (*)
平座金 PLAIN WASHER		M10 SUS M90-10083 999-999-149-00	8 (*)
ﾊﾞﾈ座金 SPRING WASHER		M10 SUS M90-10217 999-999-150-00	8 (*)
ｼｰﾙﾜｯｼｬｰ SEAL WASHER		TWS 10X17 000-159-160-10	4
図書 DOCUMENT			
落下防止手順書 ANTI-DROP PROCEDURE		C52-00903-* 000-164-558-1*	1

A-2

P A C K I N G L I S T FB-1250-A/A-H/C/C-H

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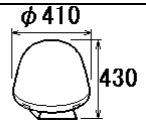
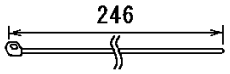
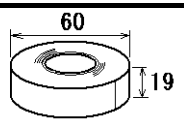
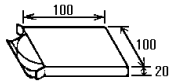
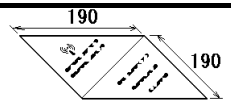
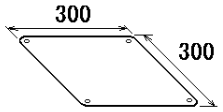
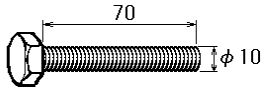
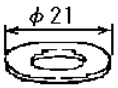
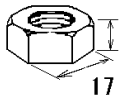
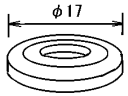
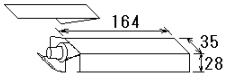
ｱﾝﾃﾅﾕﾆｯﾄ ANTENNA UNIT		FB-1250-A/A-N/C/C-N 000-019-978-00 **	1
工事材料 INSTALLATION MATERIALS		**CP16-04502**	
ｺﾝﾍﾞｯｸｽ CONVEX		CV-250B 000-171-854-10	2
ﾋﾞﾆｰﾙﾃｰﾌﾟ VINYL TAPE		0.2X19X10000MM ｸﾛ 000-172-691-10	1
ﾌﾞﾁﾙｺﾞﾑﾃｰﾌﾟ SELF-BONDING TAPE		NO.15 000-174-646-10	1
放射警報ステッカー(小) REDIATION WARNING STICKER		L5-10048 999-999-156-00	2 (*)
放射警報ステッカー(大) REDIATION WARNING STICKER		L5-10047 999-999-157-00	1 (*)
ｺﾞﾑ板 RUBBER MAT		M02219* 999-999-146-00	1 (*)
六角ﾎﾞﾙﾄ HEX BOLT		M10X70 SUS M90-10278 999-999-169-00	4 (*)

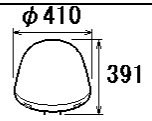
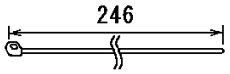
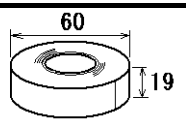
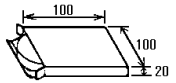
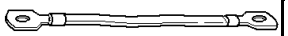
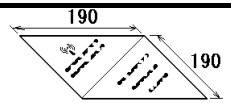
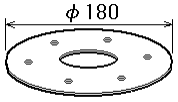
NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
平座金 PLAIN WASHER		M10 SUS M90-10083 999-999-149-00	8 (*)
ﾊﾞﾈ座金 SPRING WASHER		M10 SUS M90-10217 999-999-150-00	8 (*)
六角ﾅｯﾄ HEX NUT		M10 SUS M90-10082 999-999-151-00	8 (*)
ｼｰﾙﾜｯｼｬｰ SEAL WASHER		TWS 10X17 000-159-160-10	4
接着剤袋詰 ADHESIVE		TB5211 50G 001-477-870-00	1

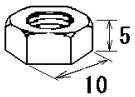
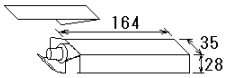
1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

2.(*)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.)

P A C K I N G L I S T FB-1250-B/B-H/D/D-H

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅﾕﾆｯﾄ ANTENNA UNIT		FB-1250-B/B-N/D/D-N 000-016-488-00 **	1
工事材料 INSTALLATION MATERIALS		**CP16-04501**	
ｺﾝﾍﾞｯｸｽ CONVEX		CV-250B 000-171-854-10	2
ﾋﾞﾆｰﾙﾃｰﾌﾟ VINYL TAPE		0.2X19X10000MM ｸﾛ 000-172-691-10	1
ﾌﾞﾁﾙｺﾞﾑﾃｰﾌﾟ SELF-BONDING TAPE		NO.15 000-174-646-10	1
ｱｰｽ線 GROUND CABLE		K02703 999-999-152-00	1 (*)
放射警報ステッカー(大) REDIATION WARNING STICKER		L5-10047 999-999-157-00	1 (*)
放射警報ステッカー(小) REDIATION WARNING STICKER		L5-10048 999-999-156-00	2 (*)
ゴム板 RUBBER MAT		M02716 999-999-158-00	1 (*)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
六角ナット HEX NUT		M6 SUS304 M90-10168 999-999-155-00	12 (*)
平座金 PLAIN WASHER		M6 SUS304 M90-10060 999-999-153-00	6 (*)
バネ座金 SPRING WASHER		M6 SUS304 M90-10080 999-999-154-00	6 (*)
接着剤袋詰 ADHESIVE		TB5211 50G 001-477-870-00	1

1.(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
(*) THIS CODE CANNOT BE ORDERED.

2.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.

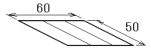
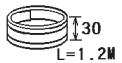
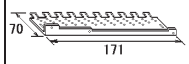
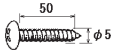
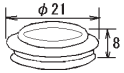
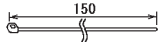
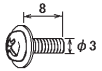
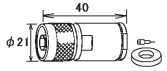
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	001-067-790-00	16AQ-X-9404 -5
TYPE	CP16-03811	1/1

工事材料表
INSTALLATION MATERIALS

COMMUNICATION UNIT
FB-2000-A

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾋｭｰｽﾞﾏｰｸ FUSE LABEL		03-153-1312-0 ROHS CODE NO. 100-292-140-10	1	
2	ｱｰｽ板 COPPER STRAP		05-003-0031-0 ROHS CODE NO. 590-300-310-10	1	
3	ｹｰﾌﾞﾙ金具 CABLE FIXTURE		16-021-2524-3 CODE NO. 100-350-383-10	1	
4	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF TAPPING SCREW		5X50 SUS304 CODE NO. 000-170-987-10	4	
5	ｸﾞﾛﾒｯﾄ GROMMET		C-30-SG-14A-EP-UL CODE NO. 000-173-335-10	4	
6	ｺﾝﾍﾞｯｸｽ CABLE TIE		CV-150N CODE NO. 000-162-186-10	10	
7	+ﾊﾞｲﾝﾄﾞｾﾑｽF BINDER HEAD SCREW-F		M3X8 C2700W MBCR2 CODE NO. 000-163-538-10	3	
8	ｺﾈｸﾀ(N) CONNECTOR		N-P-8DSFA CODE NO. 000-167-921-10	1	

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

FURUNO ELECTRIC CO ., LTD.

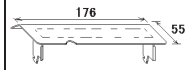
C5666-M04-F

FURUNO

CODE NO.	001-106-090-00	16AQ-X-9412 -0
TYPE	CP16-03812	1/1

工事材料表
INSTALLATION MATERIALS

COMMUNICATION UNIT
FB-2000

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｺﾈｸﾀｶﾊﾞｰ CONNECTOR COVER		16-021-2528-0 CODE NO. 100-359-390-10	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 ELECTRIC CO ., LTD.

C5666-M11-A

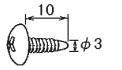
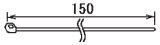
FURUNO

CODE NO.	001-067-350-00	16AQ-X-9405 -0
TYPE	CP16-03901	1/1

工事材料表
INSTALLATION MATERIALS

IP HANDSET

FB-8000

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF-TAPPING SCREW		3X10 SUS304 CODE NO. 000-162-604-10	4	
2	ｺﾝﾍﾞｯｸｽ CABLE TIE		CV-150N CODE NO. 000-162-186-10	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.		16AQ-X-9406 -0
TYPE		1/1

工事材料表
INSTALLATION MATERIALS

ANTENNA UNIT

FB-1500-A/B

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｱﾝﾃﾅｹｰﾌﾞﾙ組品 ANTENNA CABLE ASSY.	 L=30M	8D-FB-CV *30M* CODE NO. 000-167-889-11	1	選択 *TO BE SELECTED
2	ｱﾝﾃﾅｹｰﾌﾞﾙ組品 ANTENNA CABLE ASSY.	 L=40M	8D-FB-CV *40M* CODE NO. 000-167-890-11	1	選択 *TO BE SELECTED
3	ｱﾝﾃﾅｹｰﾌﾞﾙ組品 ANTENNA CABLE ASSY.	 L=50M	8D-FB-CV *50M* CODE NO. 000-168-241-11	1	選択 *TO BE SELECTED

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.

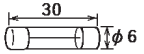
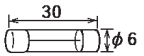
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

☆

FURUNO

CODE NO.	001-067-320-00	16AQ-X-9301-2 1/1
TYPE	SP16-01901	BOX NO. P

SHIP NO.	SPARE PARTS LIST FOR	U S E	SETS PER VESSEL
	FELCOM500		

ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	QUANTITY SPARE	REMARKS/CODE NO.
1	ﾋｭｰｽﾞ GLASS TUBE FUSE		FGBO-A 125V 15A PBF	1	1	1	000-155-827-10
2	ﾋｭｰｽﾞ GLASS TUBE FUSE		FGBO-A 125V 7A PBF	2	2	2	000-164-965-10

MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	C5666-P01-C	1/1

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

FURUNO

D-1

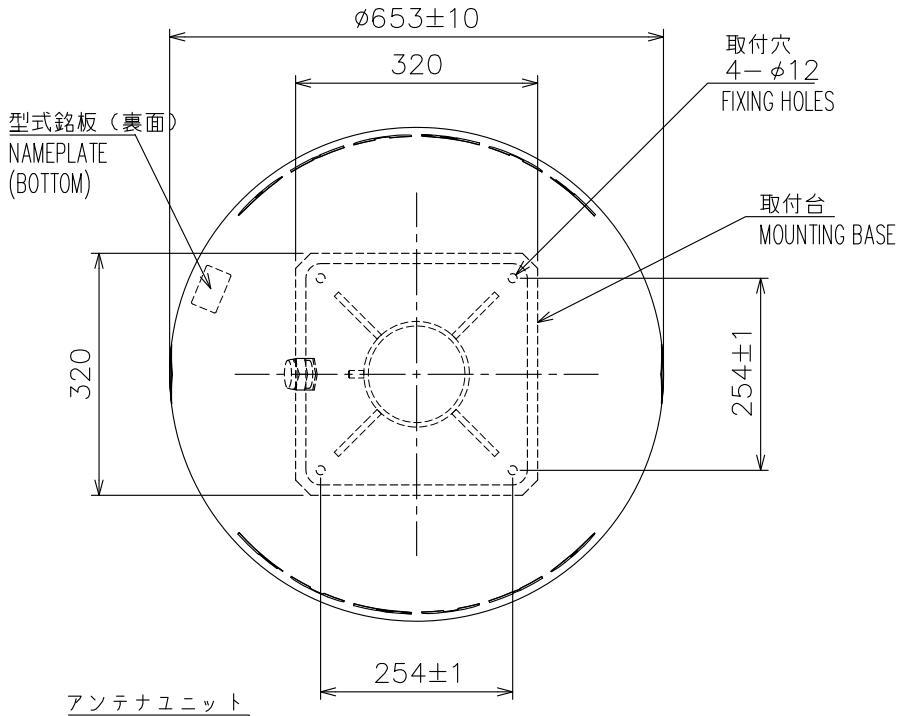
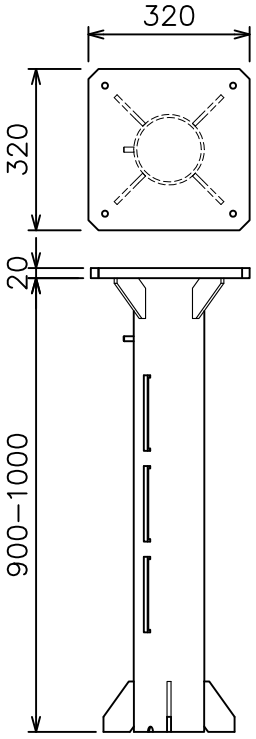
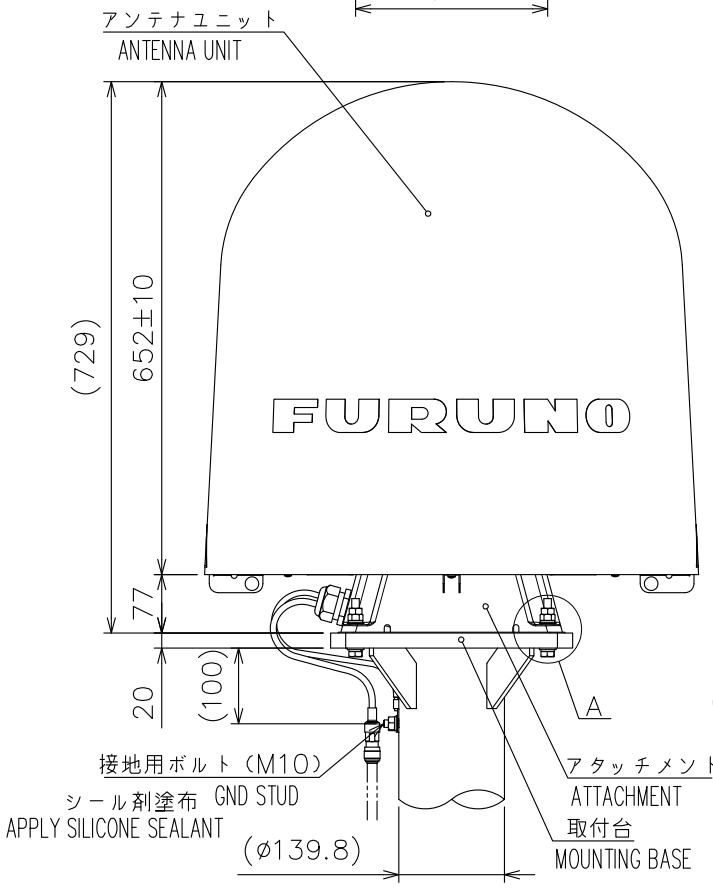


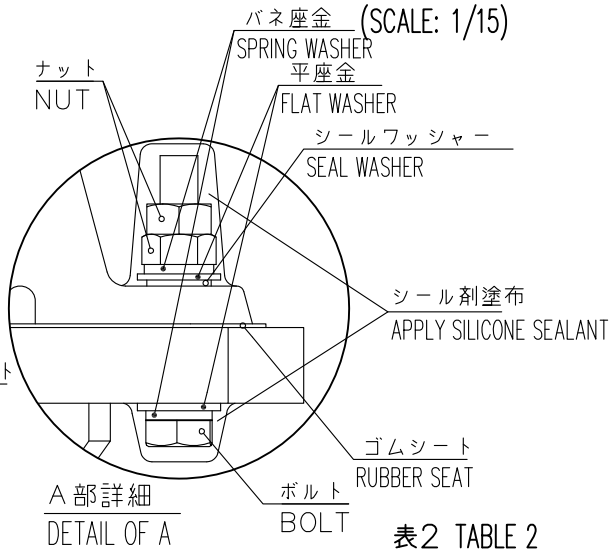
表 1　TABLE 1

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



取付マストの例（縮尺：1／15）
EXAMPLE OF MOUNTING MAST
(SCALE: 1/15)





注　記　1）　指定外の寸法公差は表1による。
　　2）　取付用ネジはM10ボルトを使用のこと。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2.　USE M10 BOLTS FOR FIXING THE UNIT.

表2 TABLE 2

型式 MODEL	質量 (kg±10%) MASS
FB−1500−A	21
FB−1500−C	22

DRAWN 7/Jan/2014 T.YAMASAKI		TITLE	FB−1500−A/C
CHECKED 7/Jan/2014 H.MAKI		名称	アンテナユニット（アタッチメント付）
APPROVED 7/Jan/2014 H. MAKI	FELCOM 500		外寸図
SCALE 1/10	MASS 表2参照 SEE TABLE 2	NAME	ANTENNA UNIT (W/ ATTACHMENT)
DWG. No. C5666−G03− G	REF. No. 16−021−552G−6		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

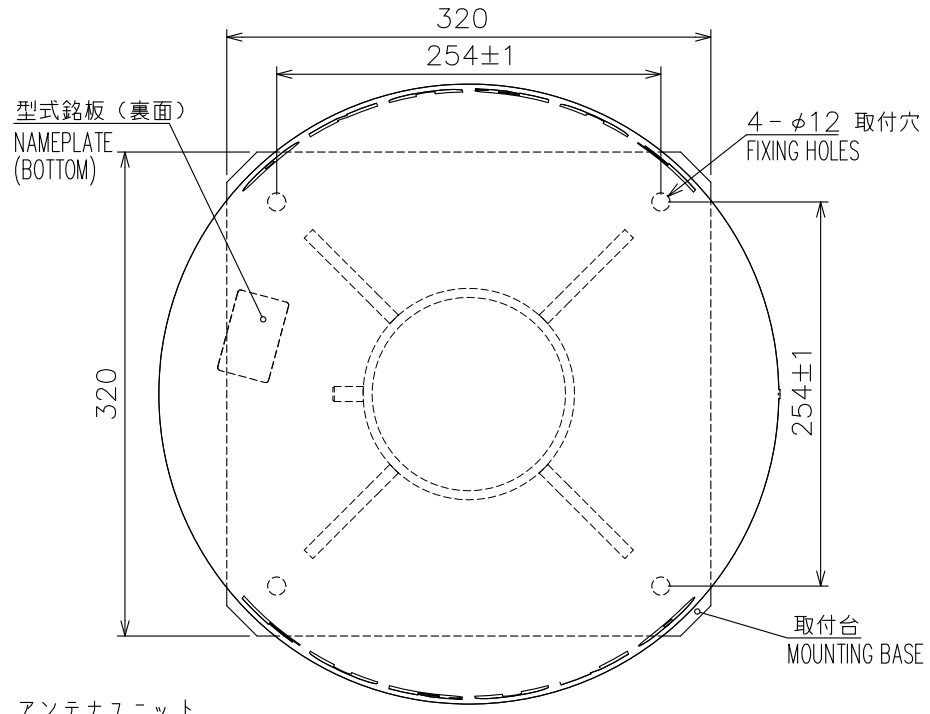
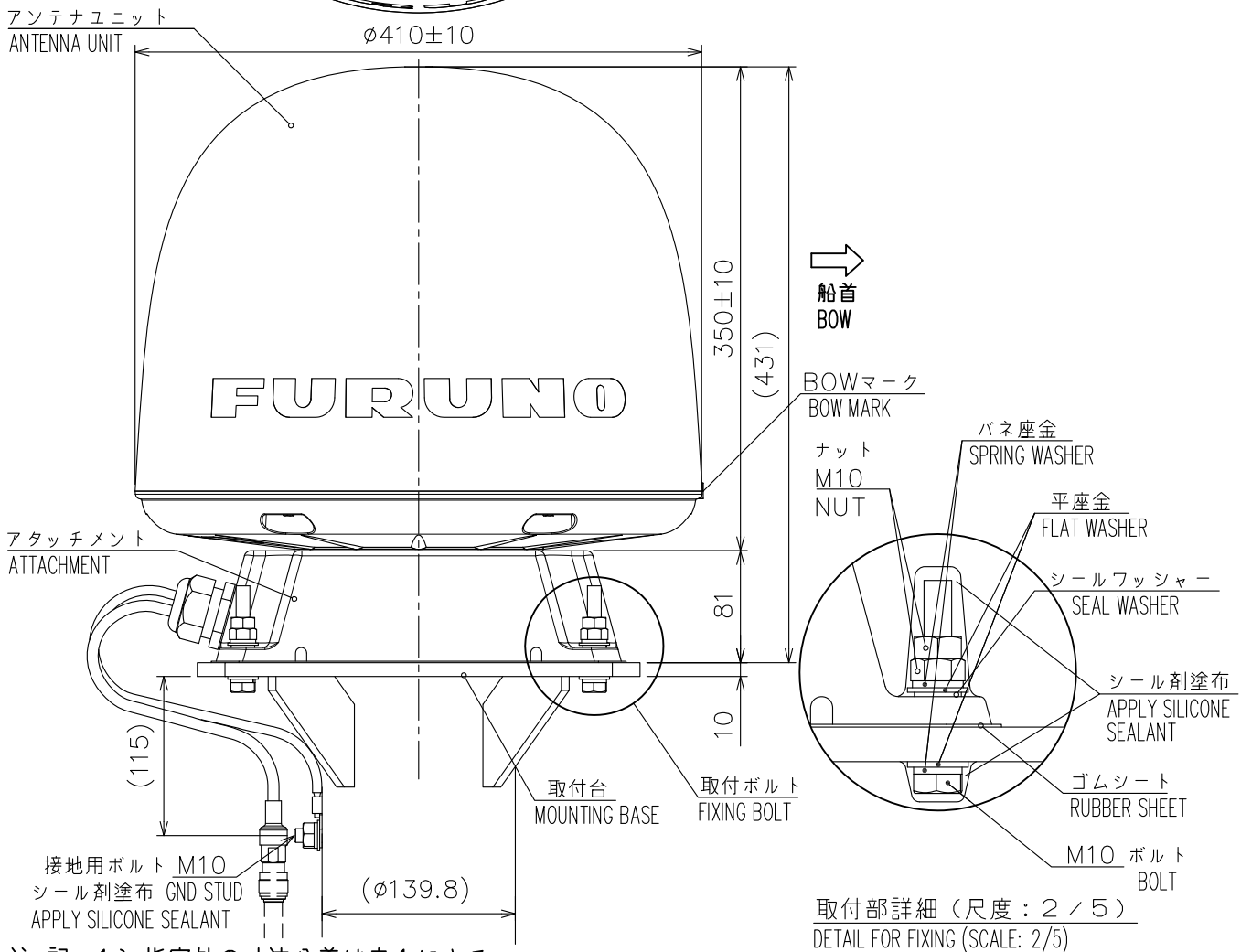


表1　TABLE 1

寸法区分（mm）DIMENSION	公差（mm）TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表2 TABLE 2

型式 MODEL	質量 (kg±10%) MASS
FB-1250-A	9.5
FB-1250-C	8.6



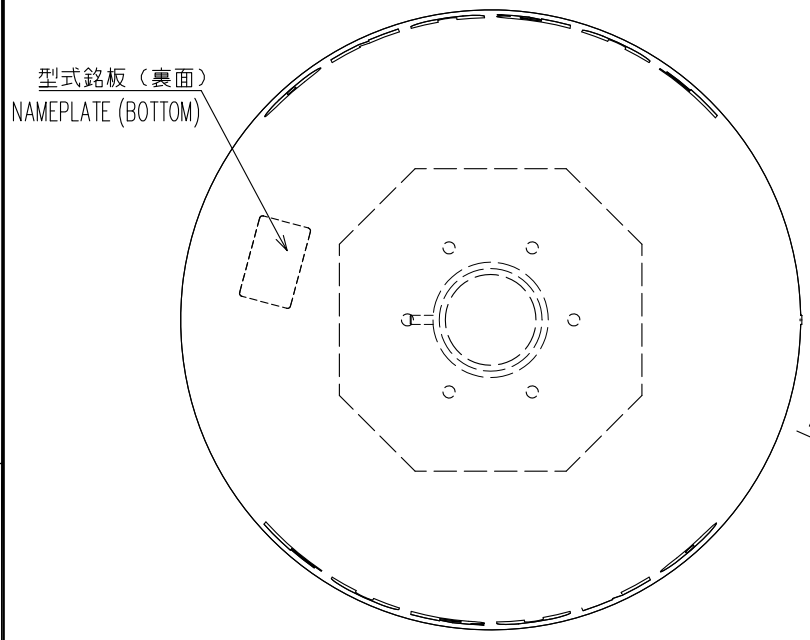
取付部詳細（尺度：２／５）
DETAIL FOR FIXING (SCALE: 2/5)

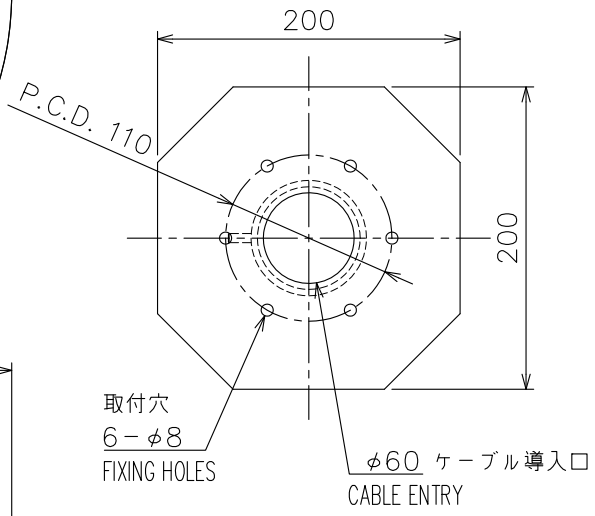
注 記　１）指定外の寸法公差は表１による。
NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN 7/Jan/2014 T.YAMASAKI		TITLE	FB-1250-A/C
CHECKED 7/Jan/2014 H.MAKI		名称	アンテナユニット（アタッチメント付）
APPROVED 7/Jan/2014 H. MAKI	FELCOM 250		外寸図
SCALE 1/5	MASS 表２参照 SEE TABLE 2	NAME	ANTENNA UNIT (W/ ATTACHMENT)
DWG. No. C5667-G03- C	REF. No. 16-021-651G-3		OUTLINE DRAWING

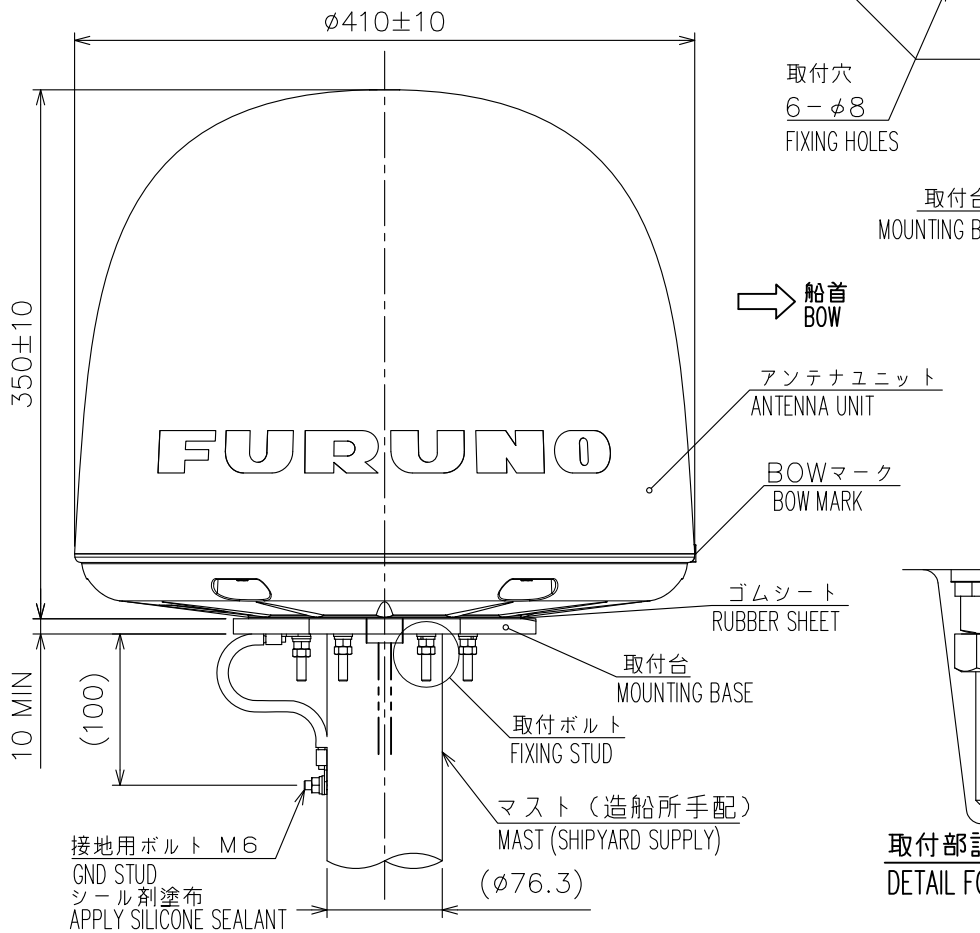
表1　TABLE 1

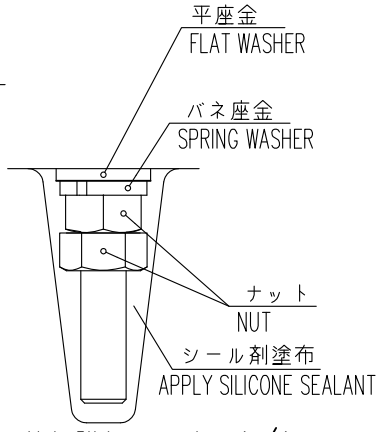
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3





取付台寸法例
MOUNTING BASE DIMENSIONS





取付部詳細（尺度：1/1）
DETAIL FOR FIXING (SCALE:1/1)

表2　TABLE 2

型式 MODEL	質量（kg±10%） MASS
FB-1250-B	6.6
FB-1250-D	5.7

注 記　1）指定外の寸法公差は表1による。
　　2）ケーブルはマスト内を通る。
NOTE　1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2. ANTENNA CABLE RUNS INNER MAST.

DRAWN 7/Jan/2014 T.YAMASAKI		TITLE	FB-1250-B/D
CHECKED 7/Jan/2014 H.MAKI		名称	アンテナユニット
APPROVED 7/Jan/2014 H. MAKI	FELCOM 250		外寸図
SCALE 1/5 MASS 表2参照 SEE TABLE 2		NAME	ANTENNA UNIT
DWG. No. C5667-G01- D	REF. No. 16-021-650G-4		OUTLINE DRAWING

FURUNO

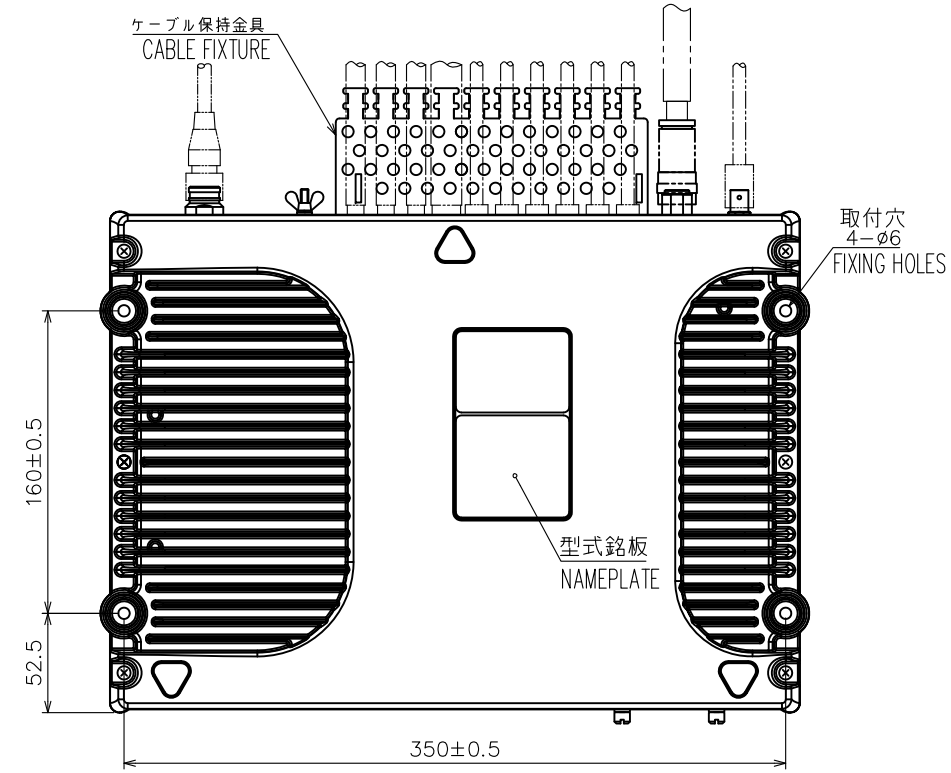
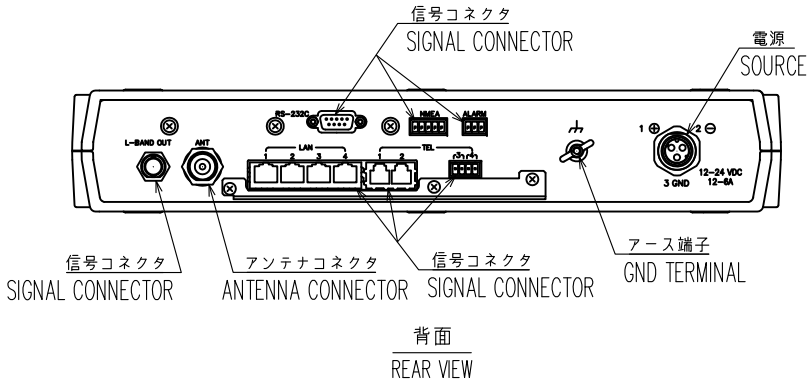
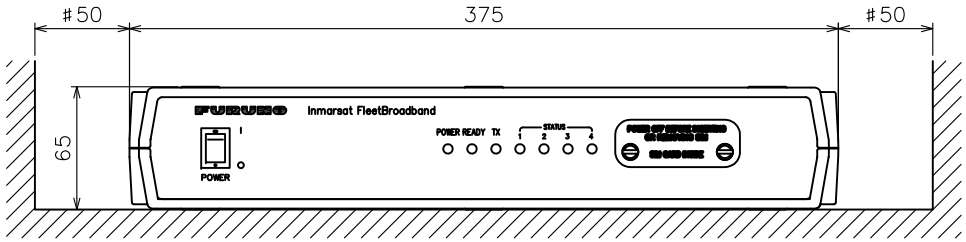
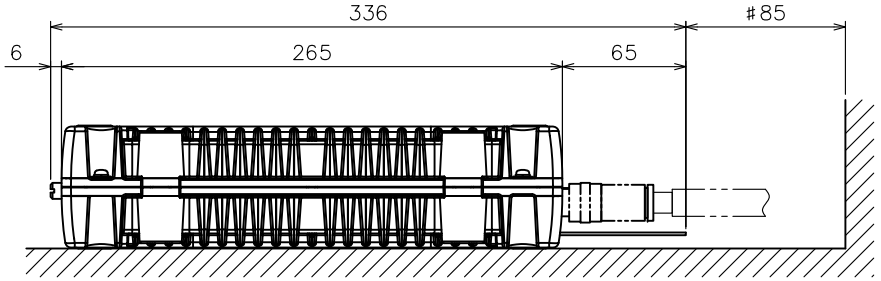


表1　TABLE 1

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）＃印寸法は最小サービス空間寸法とする。
　　2）指定外の寸法公差は表１による。
　　3）取付には＋トラスタッピンネジ呼び径５×５０を使用のこと。

NOTE　1. #: MINIMUM SERVICE CLEARANCE.
　　2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　3. USE M5 BOLTS OR TAPPING SCREWS ø5x50 FOR FIXING THE UNIT.

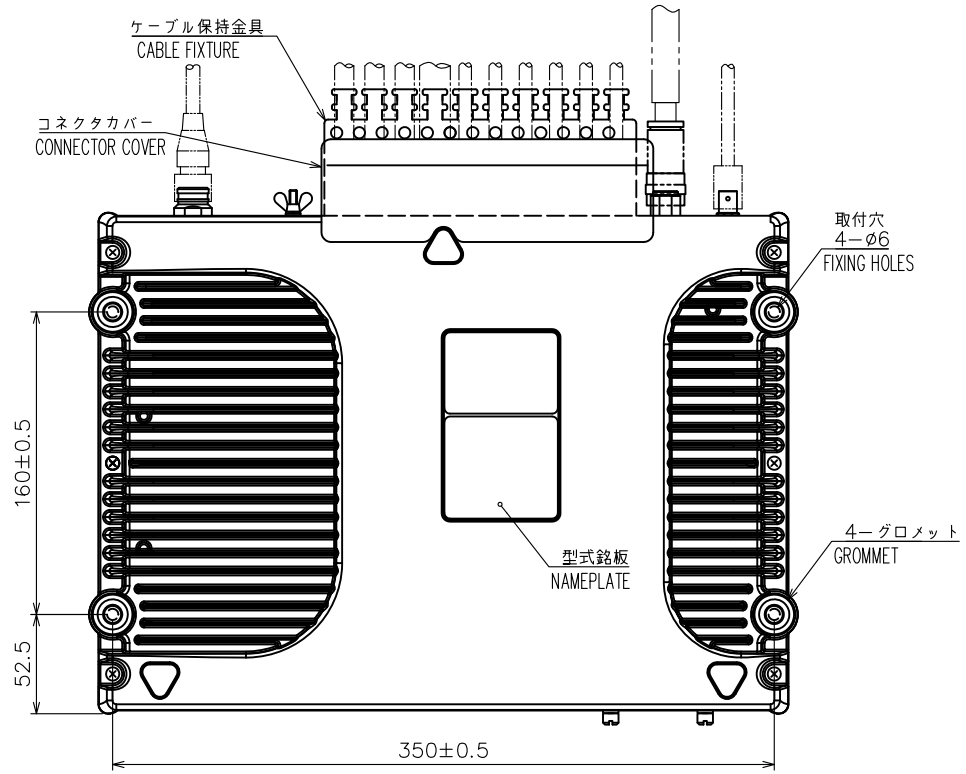
DRAWN 11/May/2010 T.YAMASAKI		TITLE	FB-2000 (IP20)
CHECKED 11/May/2010 T.TAKAHASHI		名称	通信制御ユニット（壁掛・卓上装備）
APPROVED 17/May/2010 TAKAHASHI	FELCOM 500/250		外寸図
SCALE 1/4	MASS 4.1 ±10% kg	NAME	COMMUNICATION UNIT (BULKHEAD/TABLETOP MOUNT)
DWG.No. C5666-G01- C	REF.No. 16-021-250G-3		OUTLINE DRAWING

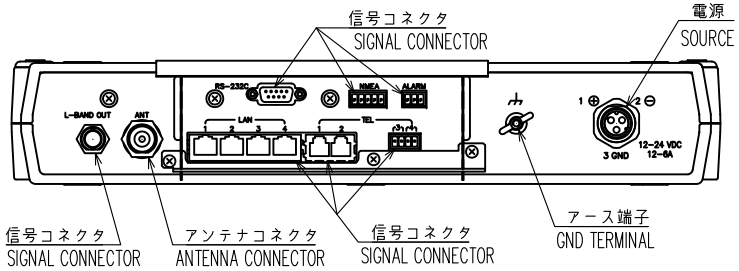
FURUNO ELECTRIC CO., LTD.

FURUNO

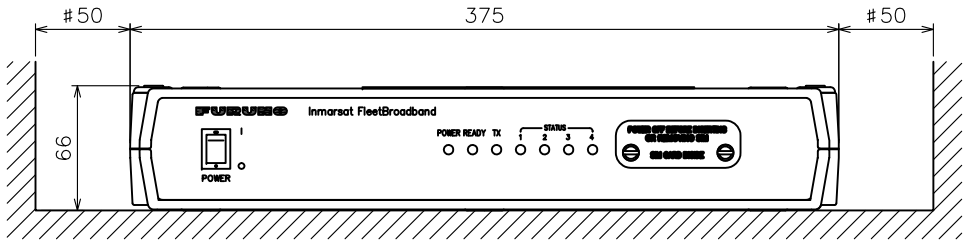
表 1 TABLE 1

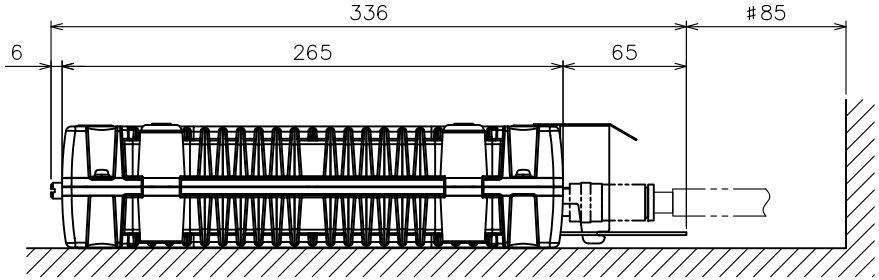
寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3





背面
REAR VIEW





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）取付には＋トラスタッピンネジ呼び径５×５０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 ø5x50 FOR FIXING THE UNIT.

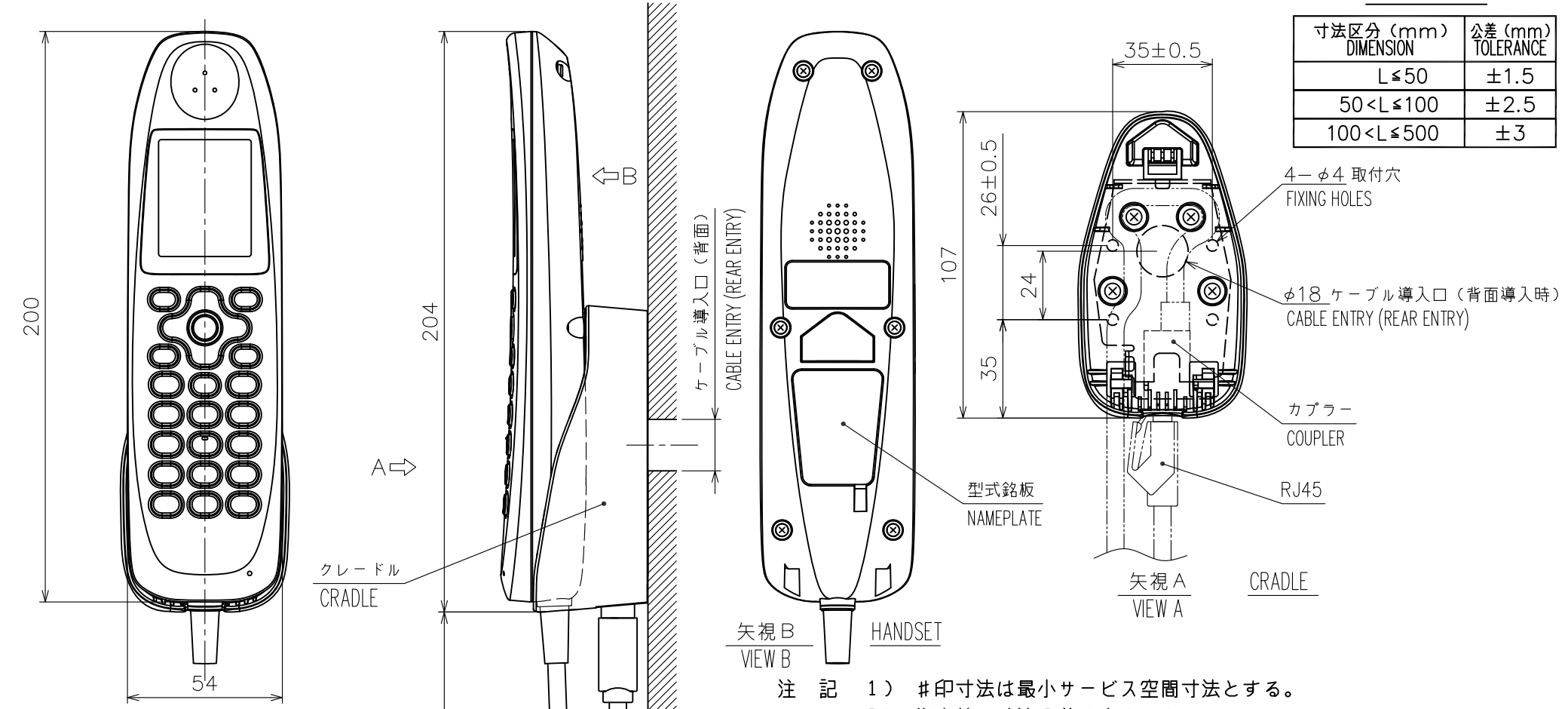
DRAWN 11/May/2010 T.YAMASAKI			TITLE FB-2000 (IP22)
CHECKED 11/May/2010 T.TAKAHASHI			名称 通信制御ユニット（卓上装備）
APPROVED 17/May/2010 TAKAHASHI		FELCOM 500/250	外寸図
SCALE 1/4	MASS 4.2 ±10% kg		NAME COMMUNICATION UNIT (TABLETOP MOUNT)
DWG.No. C5666-G08- A		REF.No. 16-021-251G-0	OUTLINE DRAWING

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）　#印寸法は最小サービス空間寸法とする。
　　2）　指定外の寸法公差は表1による。
　　3）　取付用ネジはトラスタッピンネジ呼び径3×10を使用のこと。

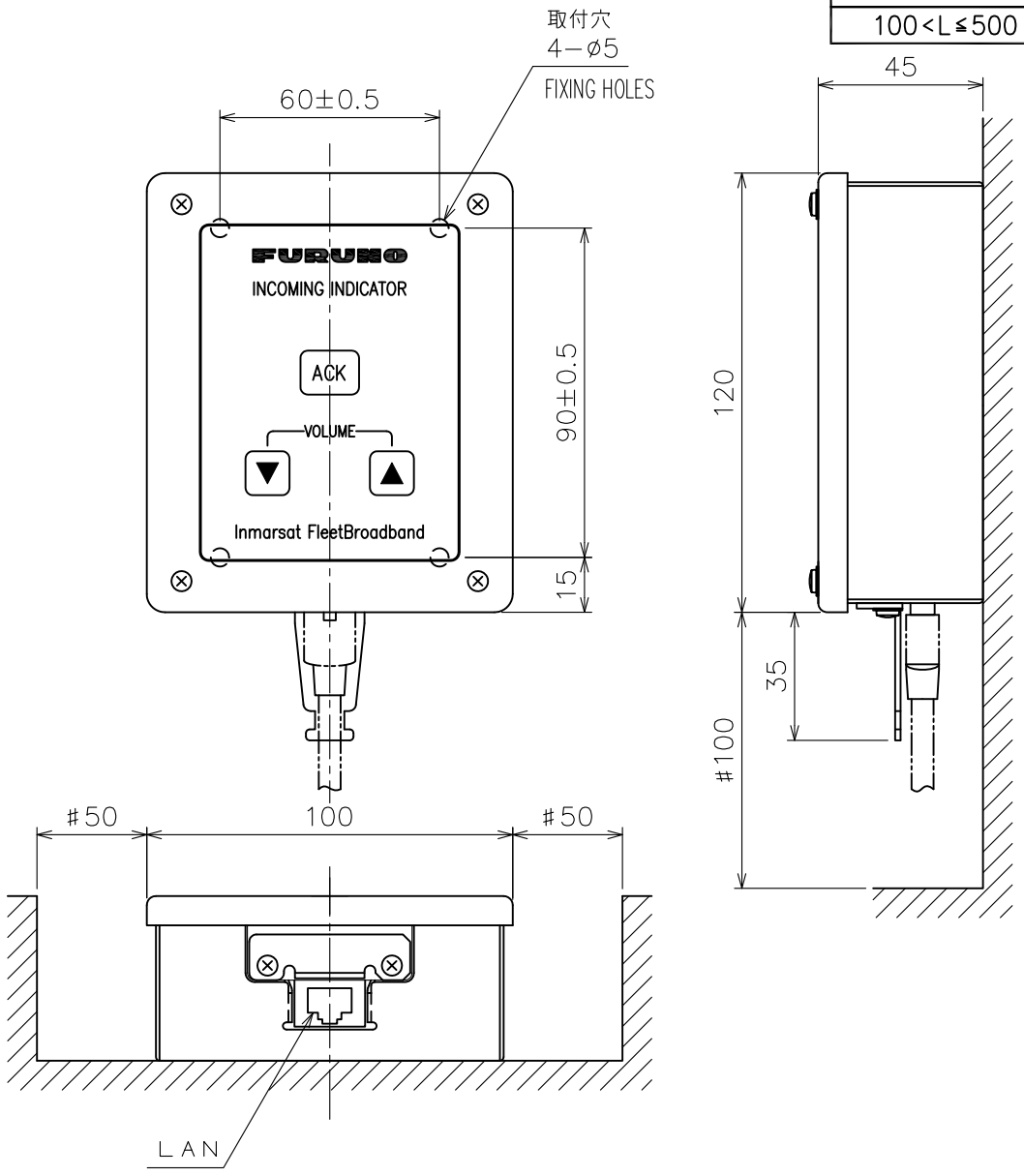
NOTE　1. #: MINIMUM SERVICE CLEARANCE.
　　2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　3. USE TAPPING SCREWS ø3x10 FOR FIXING THE UNIT.

DRAWN 20/Apr/09 T.YAMASAKI		TITLE	FB-8000
CHECKED 20/Apr/09 T.TAKENO		名称	ハンドセット（クレードル）
APPROVED 11/May/09 R.Esumi	FELCOM 500/250		外寸図
SCALE 1/2 MASS 0.42 ±10% kg		NAME	HANDSET (CRADLE)
DWG.No. C5666-G04- B	REF.No. 16-021-3506-2		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

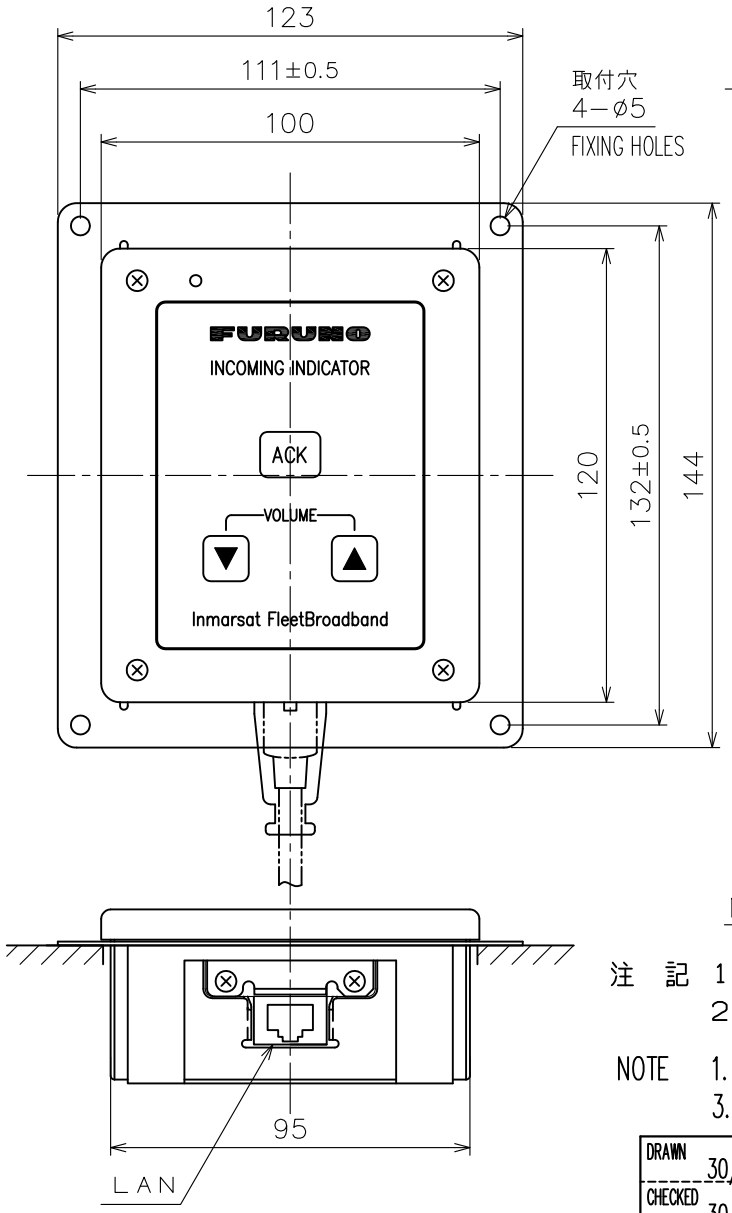
1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付用ネジは、＋トラスタッピンネジ呼び径４×１６を使用のこと。

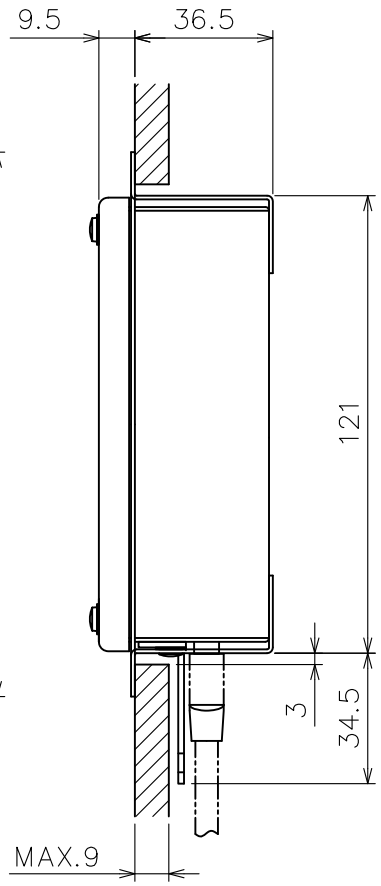
NOTE

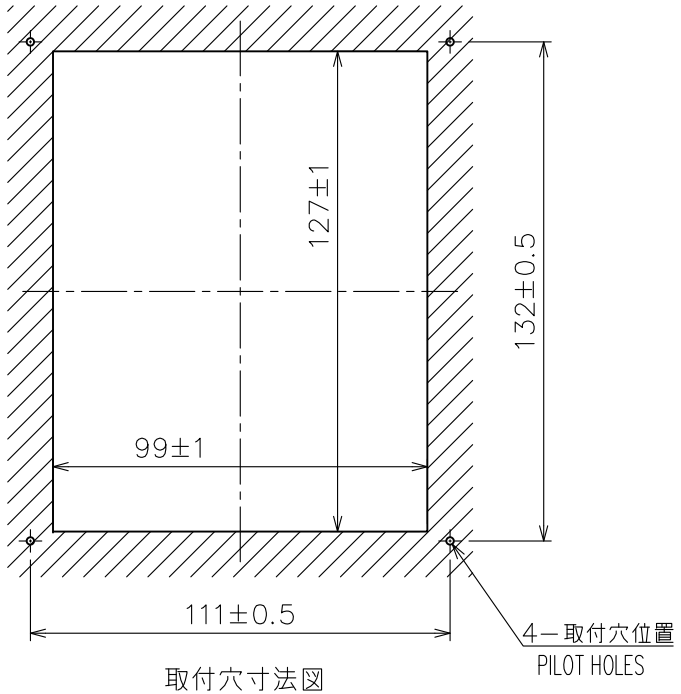
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x16 FOR FIXING THE UNIT.

DRAWN 30/Jan/09 T.YAMASAKI		TITLE	FB-3000
CHECKED 30/Jan/09 T.TAKENO		名称	着信指示器（壁掛装備）
APPROVED 18/Feb/09 R. Esumi	FELCOM 500/250		外寸図
SCALE 1/2	MASS 0.37 ±10% kg	NAME	INCOMING INDICATOR (BULKHEAD MOUNT)
DWG. No. C5666-G05- A	REF. No. 16-021-450G-1		OUTLINE DRAWING

FURUNO







取付穴寸法図
CUTOUT DIMENSIONS

注　記　1）指定外の寸法公差は表１による。
　　2）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.
　　3. USE TAPPING SCREWS ø4x16 FOR FIXING THE UNIT.

表1　TABLE 1

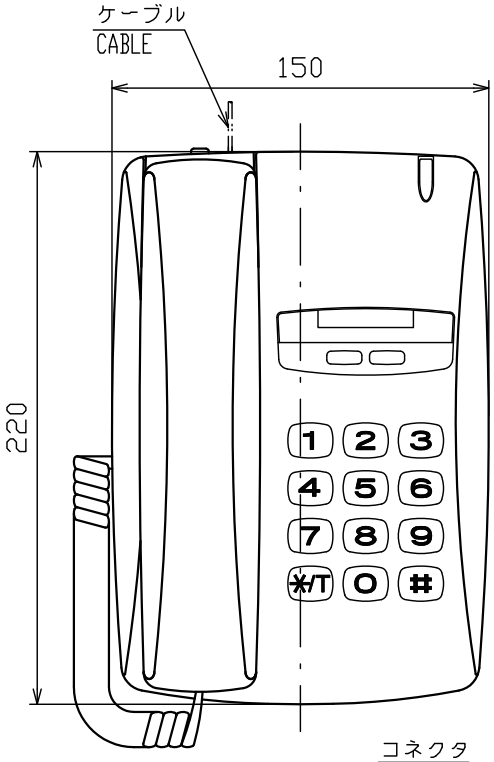
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

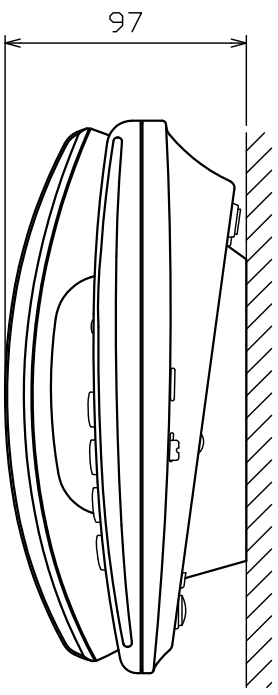
DRAWN 30/Jan/09 T.YAMASAKI		TITLE	FB−3000
CHECKED 30/Jan/09 T.TAKENO		名称	着信指示器（埋込装備）
APPROVED 18/Feb/09 R. Esumi	FELCOM 500/250		外寸図
SCALE 1/2	MASS 0.46 ±10% kg	NAME	INCOMING INDICATOR (FLUSH MOUNT)
DWG. No. C5666−G06− A	REF. No. 16−021−451G−2		OUTLINE DRAWING

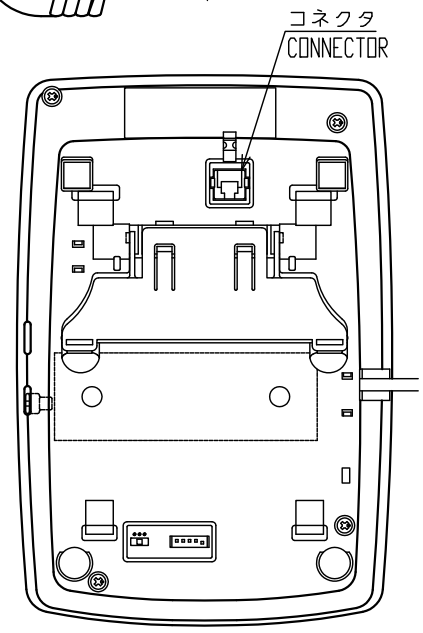
FURUNO ELECTRIC CO., LTD.

表1 TABLE 1

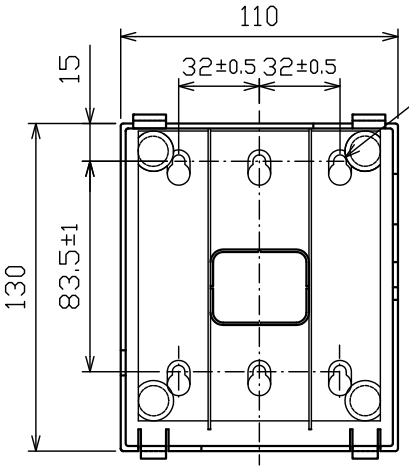
寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 < L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3



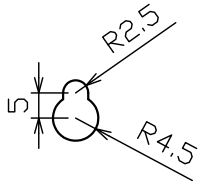




背面
REAR VIEW



壁掛金具
WALL MOUNT BRACKET



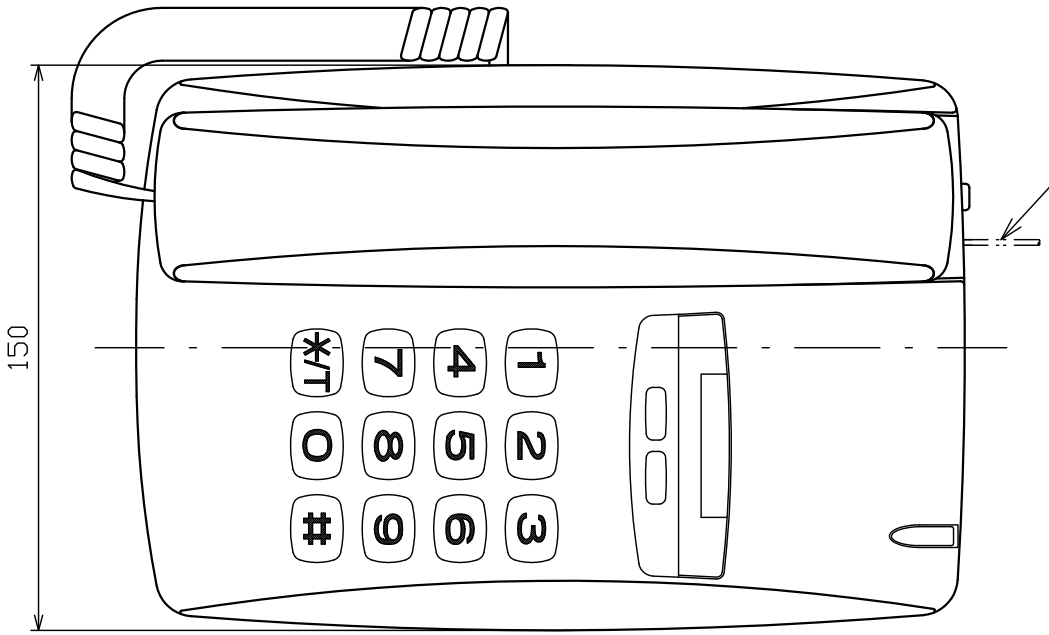
取付穴詳細（尺度：1/2）
DETAIL FOR FIXING (SCALE: 1/2)

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.

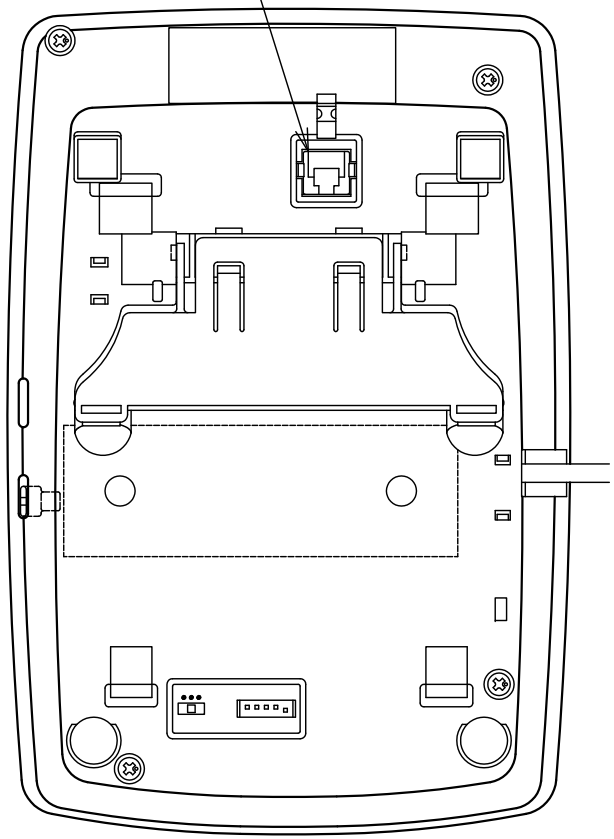
DRAWN 10/Sep/2019 T.YAMASAKI			TITLE ODA1183-1N
CHECKED 10/Sep/2019 H.MAKI			名称 電話機(壁掛装備)
APPROVED 10/Sep/2019 H.MAKI		FELCOM251/501, ETC.	外寸図
SCALE 1/3	MASS 0.7 ±10% kg		NAME TELEPHONE (BULKHEAD MOUNT)
DWG. No. C5705-G12- B	REF. No. RA1116-6132-1NA		OUTLINE DRAWING

FURUNO



ケーブル
CABLE

コネクタ
CONNECTOR



背面
REAR VIEW

表1 TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 < L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3

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.

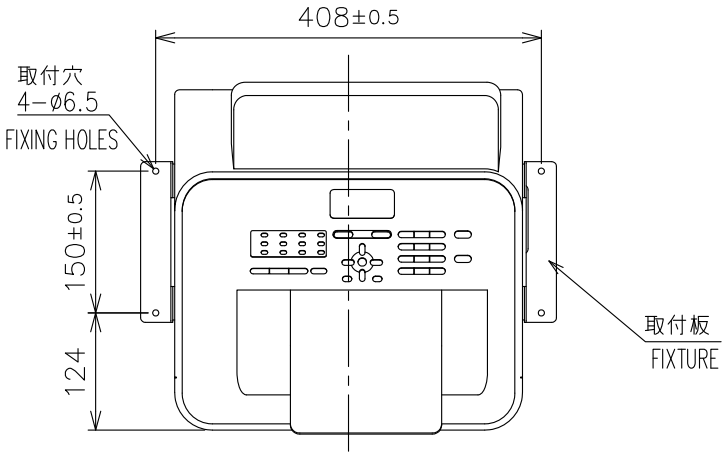
DRAWN 10/Sep/2019 T.YAMASAKI		TITLE	DA1183-1N
CHECKED 10/Sep/2019 H.MAKI		名称	電話機（卓上装備）
APPROVED 10/Sep/2019 H.MAKI	FELCOM251/501, ETC.		外寸図
SCALE 1/2 MASS 0.6 ±10% kg	質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME	TELEPHONE (TABLETOP MOUNT)
DWG.No. C5705-G13- A	REF.No. RA1116-6132-1NA		OUTLINE DRAWING

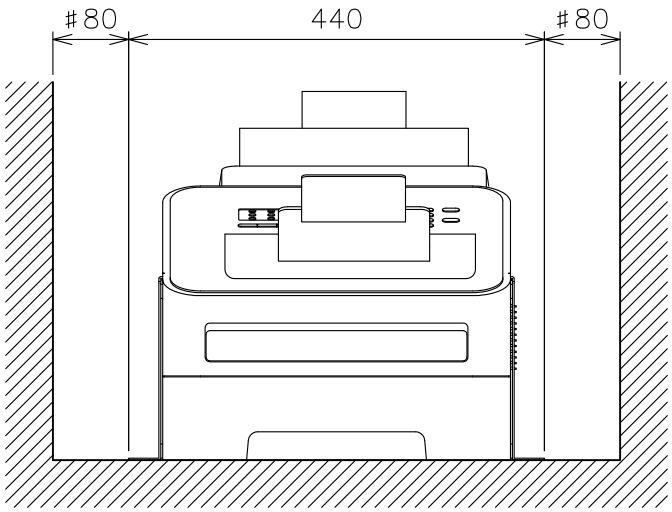
FURUNO ELECTRIC CO., LTD.

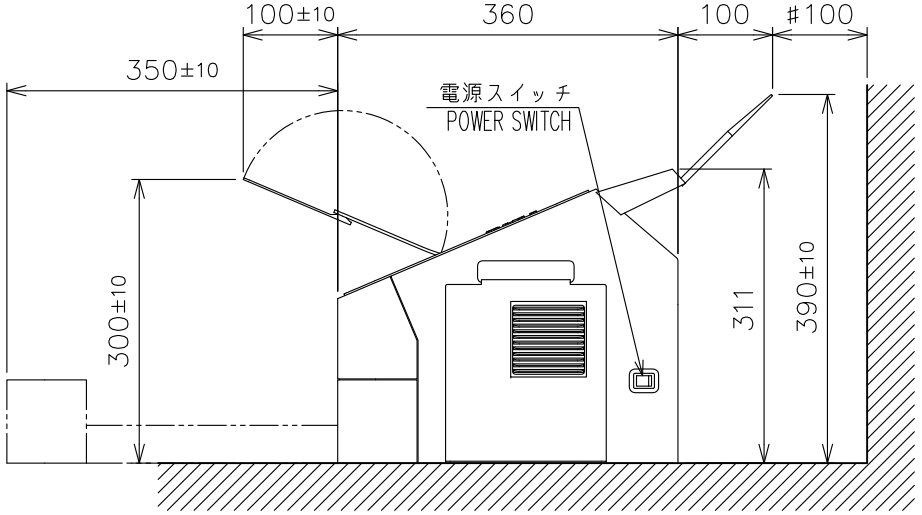
FURUNO

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）取付用ネジはトラスタッピンネジ呼び径５×２０を使用のこと。

NOTE　1. TABLE 1 INDICATE TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2. #: MINIMUM SERVICE CLEARANCE.
　　3. USE TAPPING SCREWS ø5x20 FOR FIXING THE UNIT.

DRAWN 5/Aug/2013 T.YAMASAKI		TITLE	FAX-2840
CHECKED 5/Aug/2013 H.MAKI		名称	ファクシミリ装置
APPROVED 5/Aug/2013 H.MAKI	FELCOM250/500		外寸図
SCALE 1/8 MASS 11 ±10% kg	質量は取付板を含む。 MASS INCLUDEDS FIXTURES.	NAME	FACSIMILE MACHINE
DWG.No. C5666-G10- A	REF.No. 16-021-455G-0		OUTLINE DRAWING

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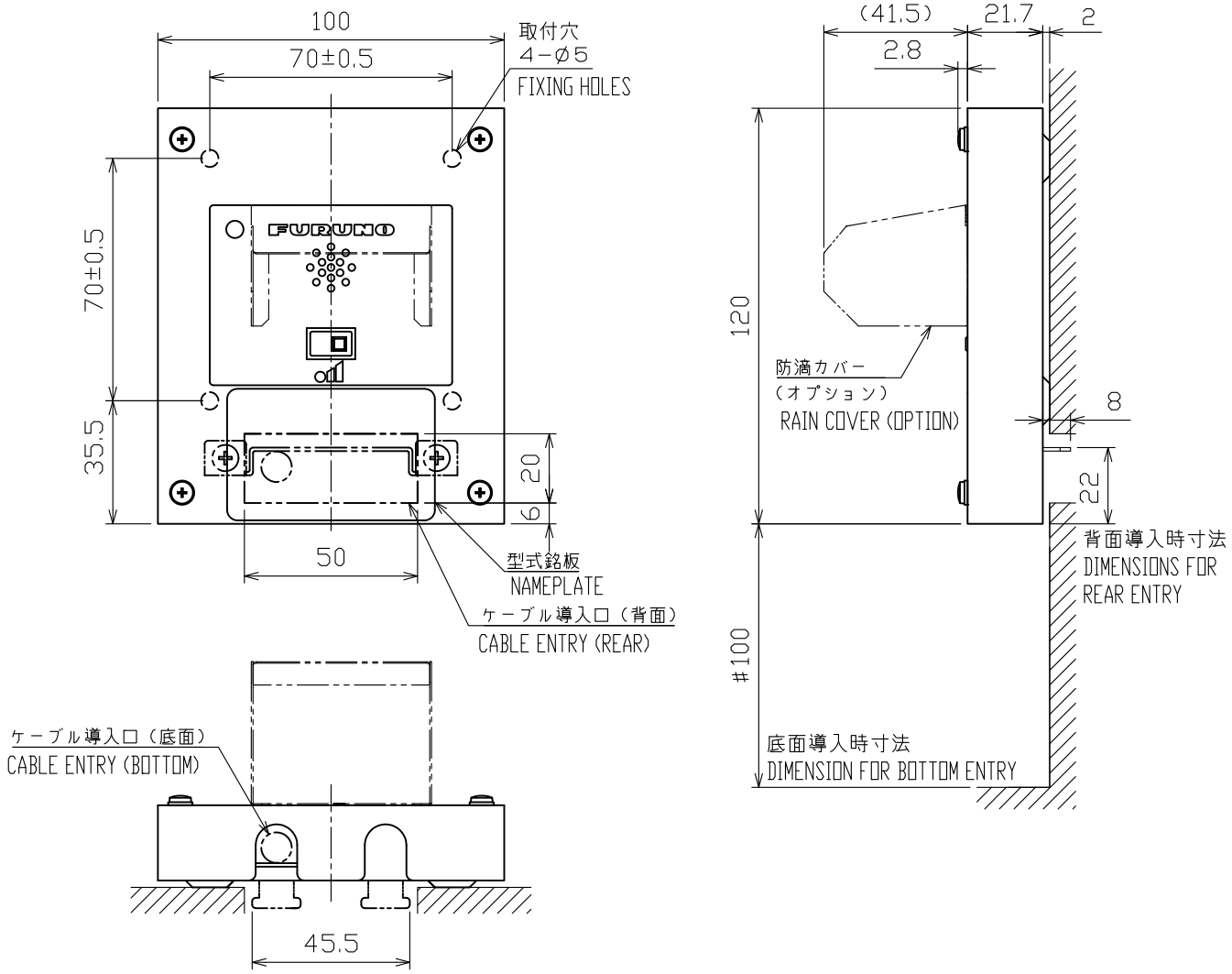
表1 TABLE 1

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。

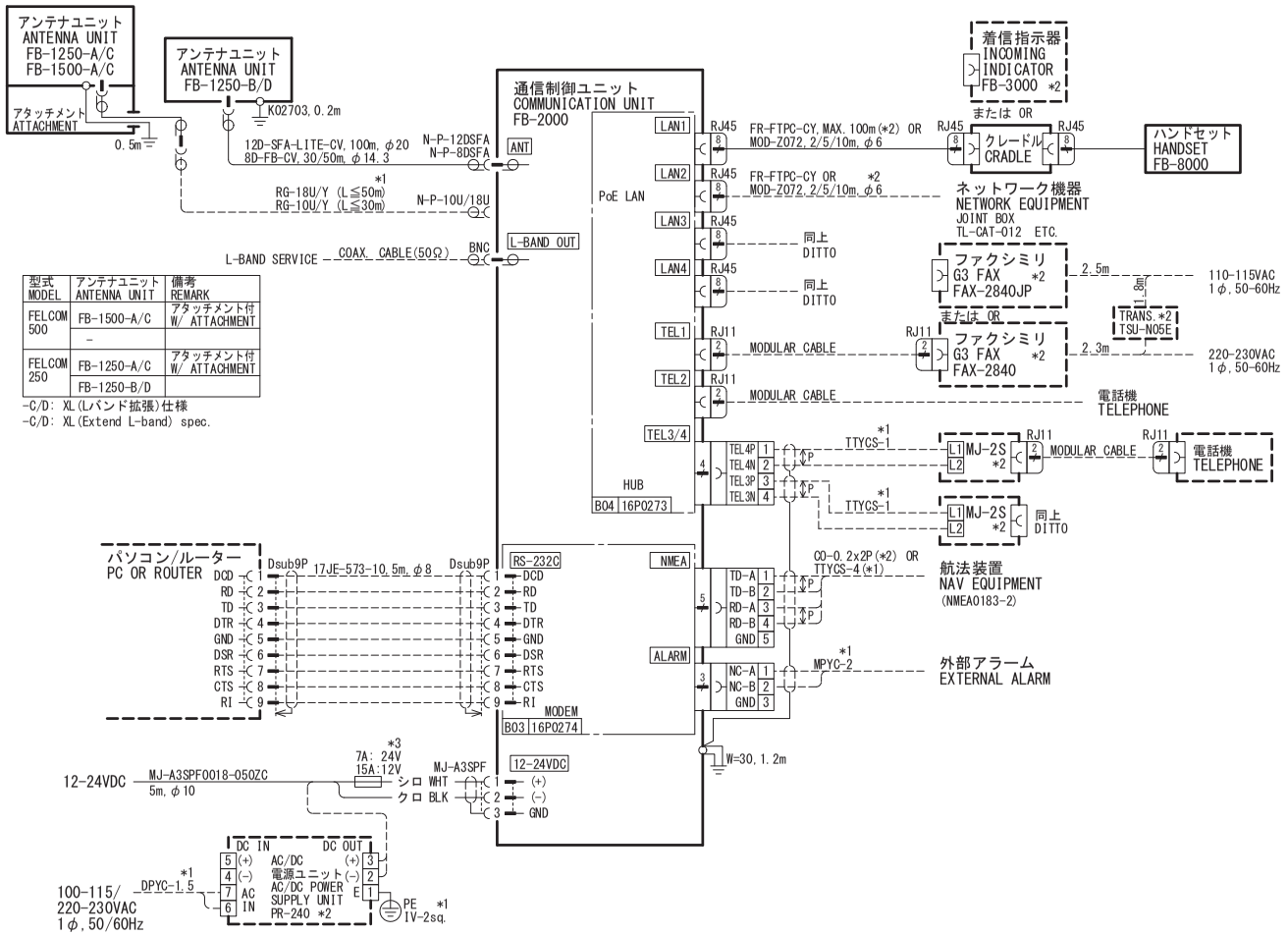
2）＃印寸法は最小サービス空間寸法とする。

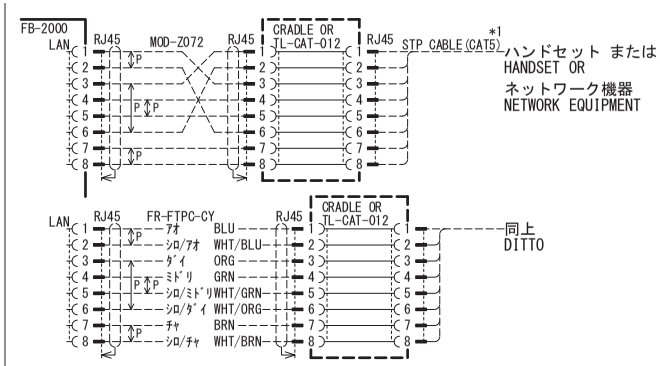
3）取付用ネジは＋タッピンネジ呼び径３×１０を使用のこと。

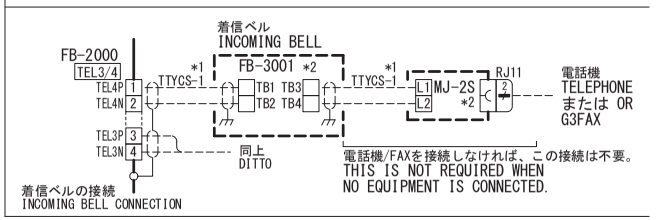
NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS Ø3x10 FOR FIXING THE UNIT.

DRAWN 21/Apr/2017 T.YAMASAKI		TITLE	FB-3001
CHECKED 21/Apr/2017 H.MAKI		名称	着信ベル
APPROVED 21/Apr/2017 H.MAKI	FELCOM 250/500		外寸図
SCALE 1/2 MASS 0.31 ±10% kg	質量はオプションを含まず。 MASS DOES NOT INCLUDE OPTION.	NAME	INCOMING BELL
DWG. No. C5666-G13- B	REF. No. 16-025-450G-1		OUTLINE DRAWING







注記
＊1）造船所手配。
＊2）オプション。
＊3）工場出荷時：15A

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: DEFAULT: 15A

DRAWN 1/Feb/2019 T.YAMASAKI			TITLE FELCOM 500/250
CHECKED 1/Feb/2019 H.MAKI			名称 インマルサットフリートブロードバンド
APPROVED 4/Feb/2019 H.MAKI			相互結線図
SCALE	MASS kg		NAME INMARSAT FLEET BROADBAND
DWG No. C5666-C01- R	REF.No. 16-021-1001-1		INTERCONNECTION DIAGRAM

S-1

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