FURUNO

INSTALLATION MANUAL

INMARSAT-C MOBILE EARTH STATION

MODEL FELCOM15

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(HIMA) FELCOM15

00080935101

IME56350B20

⚠ SAFETY INSTRUCTIONS

⚠ WARNING

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

ELECTRICAL SHOCK HAZARD

Only qualified personnel should work inside the equipment.

Do not approach the radome closer than 60 cm when it is transmitting.

Microwave radiation can cause severe injury or illness.
Radiation level:
10 W/m² at 60 cm

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 eqiuipment is being installed.

⚠ CAUTION

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 equipment damage. The voltage rating appears on the label at the rear of the display unit.

Use the correct fuse.

Use 10 A fuse (defalt setting) for 12 VDC ship's mains, or replace the fuse to 5 A (supplied as spare parts) with 24 VDC.

Use of wrong fuse can result in damage to the equipment.

Keep the following compass safe distances.

	Standard	Steering
Antenna Unit IC-115	0.30 m	0.30 m
Terminal Unit IC-215	0.70 m	0.40 m
Printer PP-510	1.00 m	0.80 m
Junction Box IC-315	1.00 m	0.70 m
Distress Alert/ Received Call Unit IC-305	0.50 m	0.30 m
Alarm Unit IC-306	0.50 m	0.30 m
EGC Printer PP-505	2.05 m	1.40 m
AC/DC Power Supply Unit PR-240-CE	0.90 m	0.60 m
Mini keyboard	0.30 m	0.30 m

Attach securely protection earth to the ship's body.

The protection earth is required to the power supply to prevent electrical shock.

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EQUIPMENT LISTS

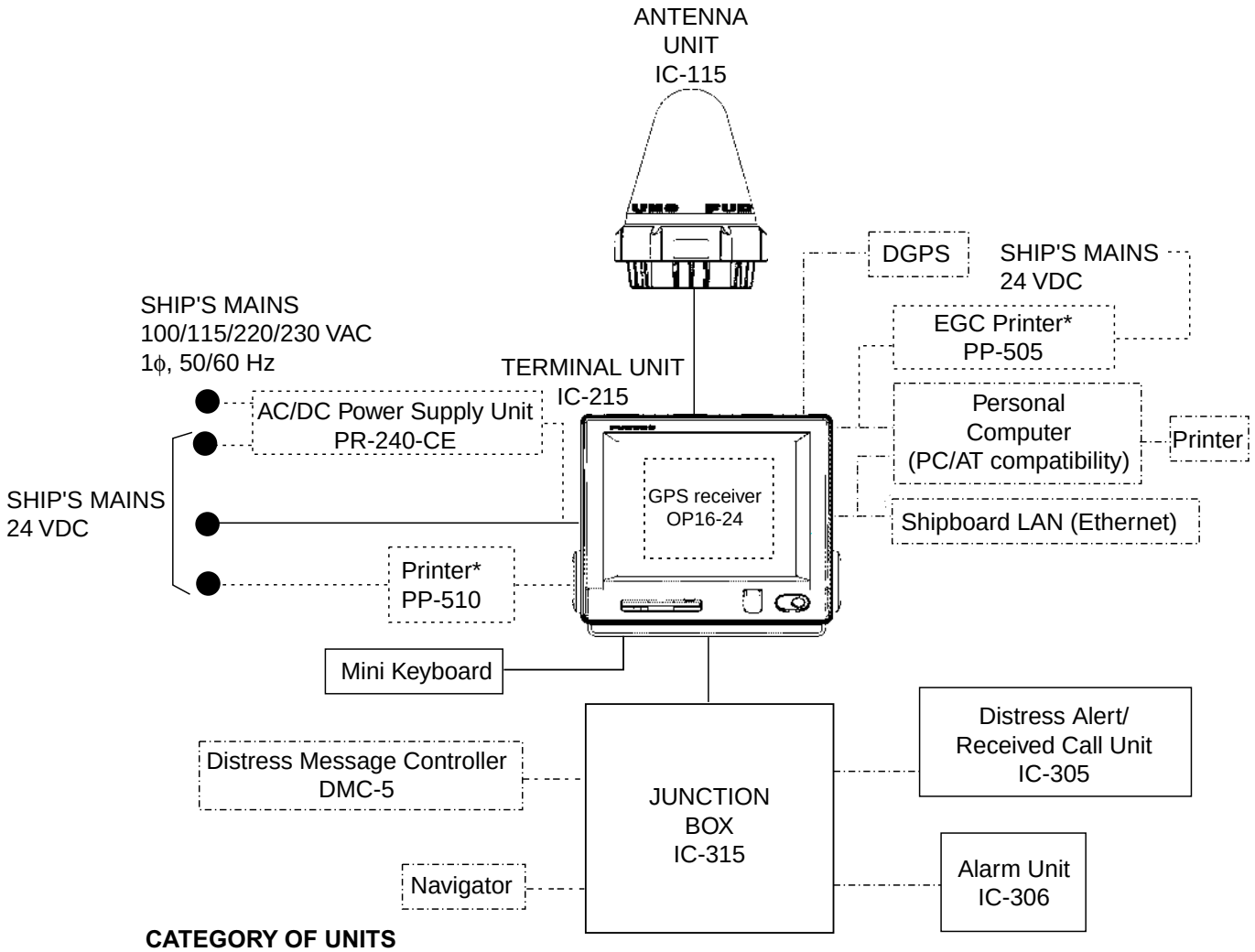
Standard Supply

Name	Type	Code No.	Qty	Remarks
Antenna Unit	IC-115	-	1	
Terminal Unit	IC-215	-	1	
Distress Alert/ Received Call Unit	IC-305	-	1	
Alarm Unit	IC-306	-	1	
Junction Box	IC-315	-	1	w/CP16-2501
Installation Materials	CP16-02101	004-439-060	1 set	For 30 m cable, antenna unit
	CP16-02111	004-439-070		For 50 m cable, antenna unit
	CP16-02121	004-439-080		For 100 m cable, antenna unit
	CP16-02300	000-043-433	1 set	CP16-02301 (for IC-215)*, CP16-02302 (for keyboard)
	CP16-02201	004-438-890	1 set	For IC-305/306
	TP5FBAW-5DFBB	000-146-250	1	30 m antenna cable
	8D-FB-CV	000-117-599		50 m antenna cable
	12D-SFA-CV	000-138-866		100 m antenna cable
Accessories	FP16-00600	000-043-434	1 set	Mini keyboard (BTC-5100C), FD (FP16-00601)
Spare Parts	SP16-01301	004-439-370	1 set	Fuse

Optional Supply

Name	Type	Code No.	Qty	Remarks
FD-ROM	16-5-0164	004-438-920	1 set	
GPS Receiver	OP16-24	004-438-940	1 set	
EGC Printer	PP-505	-	1	
Printer	PP-510	-	1	w/CP16-01200
AC/DC Power Supply Unit	PR-240-CE	-	1	w/CP24-00151
5-pair cable	CO-SPEVV-SB-C 0.2x5P	000-560-452	1	For junction box, 10m
		000-103-868		For junction box, 20m
		000-103-869		For junction box, 30m
		000-132-829		For junction box, 40m
		000-132-828		For junction box, 50m

SYSTEM CONFIGURATION



CATEGORY OF UNITS

Antenna unit	EXPOSED TO WEATHER
Other units	PROTECTED FROM WEATHER

——— : Standard Supply
------- : Option
-.-.-.- : User Supply

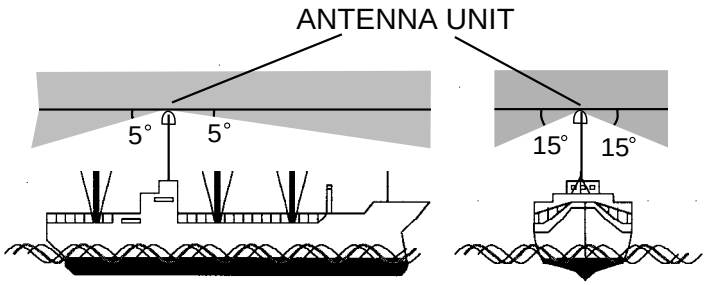
*Mandatory for EGC operation as required by IMO Res. A. 664 (16).

1. MOUNTING THE UNIT

1.1 Antenna Unit

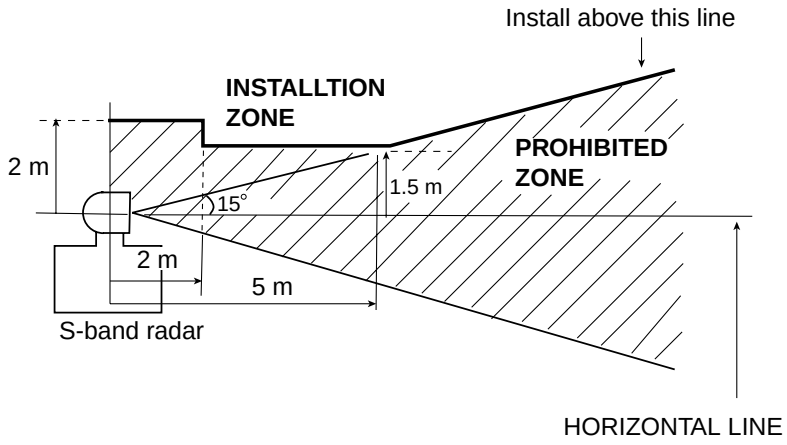
Mounting Location

- Mount the omnidirectional antenna unit high atop a mast clear of stays and the turning diameter of a radar antenna. The ideal mounting location would be where no obstacle appears in the fore and aft directions down to -5º and down to -15º in the port and starboard directions. This concept is illustrated in the figure below. Shadow sector of the antenna mast, whip antenna, etc. should be within 2 degrees at one meter from the antenna unit.



Antenna unit mounting location

- If both Inmarsat-A/B and Inmarsat-C ship earth stations are installed, separate the Inmarsat-A/B antenna at least 8 m from the Inmarsat-C antenna.
- Separate the antenna unit from an S-band radar as follows:



S-band radar and installation area

- The allowable vibration level as specified by Inmarsat is as shown in the table below.

Allowable vibration level

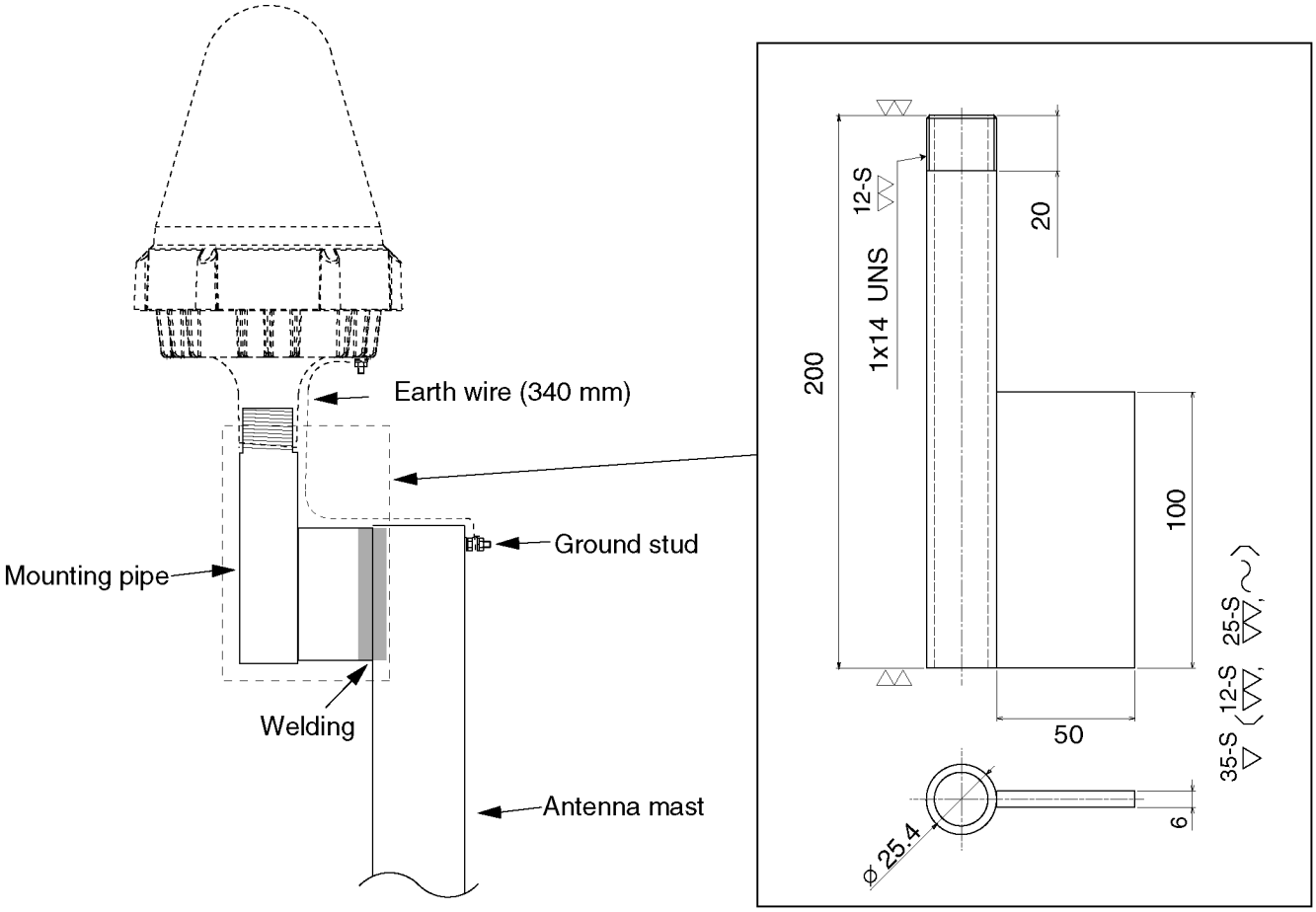
Frequency	Level
2 to 10 Hz	2.54 mm Peak Amplitude
10 to 100 Hz	9.8 m/s² Peak Acceleration

- Avoid the location near funnels and stacks; smoke and soot on the radome can lower signal level.
- Separate the antenna unit 5 m from HF, VHF or 27 MHz antenna.

Mounting

Thirty, 50 or 100 m antenna cable is available. Thirty meters cable has connectors on both sides, and one connector for 50/100 m cable. **Do not shorten these cables to prevent interference.** To mount the antenna unit, an exclusive pipe is necessary.

Locally prepare an antenna mast with a ground stud (M6 stainless steel bolt welded to antenna mast) and mounting pipe with threads and plate (See the outline drawing of the mounting plate shown below.) Weld the mounting pipe to the antenna mast.
The distance between the stud and the earth terminal on the antenna unit should be within 340 mm, which also is the length of the supplied earth wire.

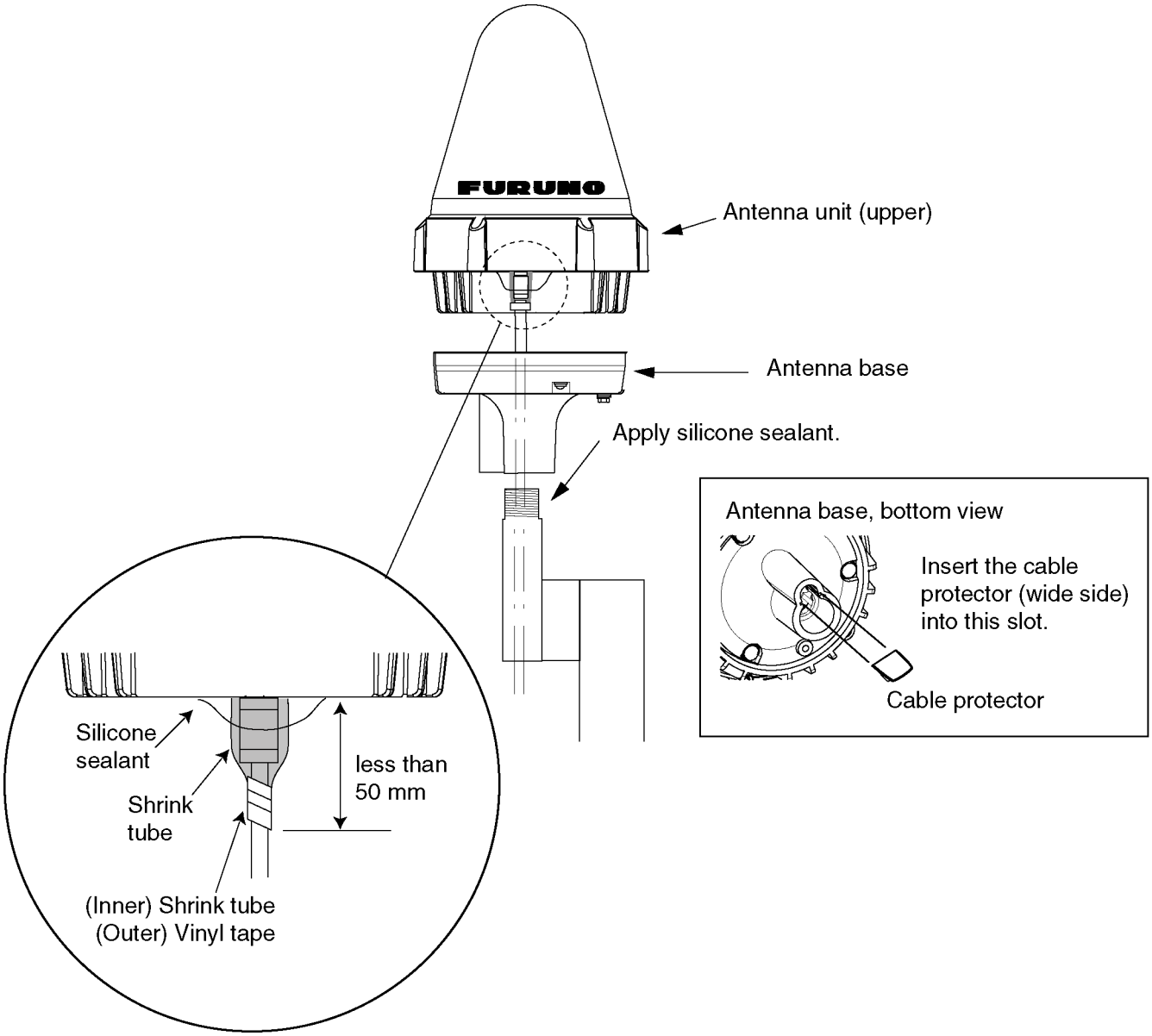


Mounting pipe and antenna mast

For 15 or 30 m cable

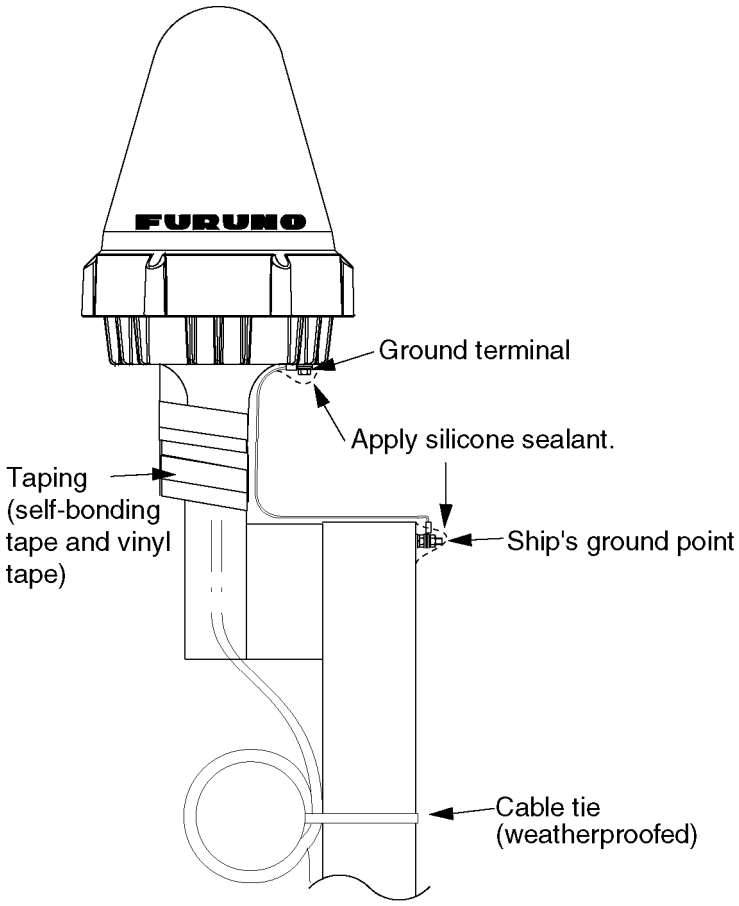
1. Apply silicone sealant (local supply) to the threads of the pipe.
2. Unscrew three screws to remove the antenna base from the antenna unit.
3. Pass the antenna cable through the pipe, antenna base in order.
4. Insert the cable protector (supplied) into the slot at the bottom of antenna base.
5. Screw the antenna base onto the antenna pipe by rotating the antenna base.
6. Pass the antenna cable into the shrink tube (SCM2, supplied).
7. Attach the antenna cable to the connector at the bottom of the antenna unit (upper).
8. Shift the shrink tube until it touches the bottom of the antenna unit (upper).
9. Heat the above shrink tube, and then apply silicone sealant around the upper edge of the tube. Also wind self-bonding tape around the lower edge of the shrink tube and then wrap vinyl tape over self-bonding tape.

Note: Between the bottom of the antenna unit (upper) and the end of the taping should be less than 50 mm.



Antenna unit, passing the cable through the pipe

10. Remount the antenna unit (upper) on the antenna base. (Torque: 2.6 N·m ± 10%)
11. Wrap self-bonding tape around the connection of antenna base and pipe, and then wind vinyl tape over self-bonding tape. These tapes should be winded closely.
12. Fix the earth wire RW-4747 (supplied) between the ground terminal on the antenna unit and the ship's ground point.



Mounting

13. Apply silicone sealant (supplied) to the earth terminal and three screws at the bottom of antenna base.
14. Fix the antenna cable to the mast with a cable tie (local supply).

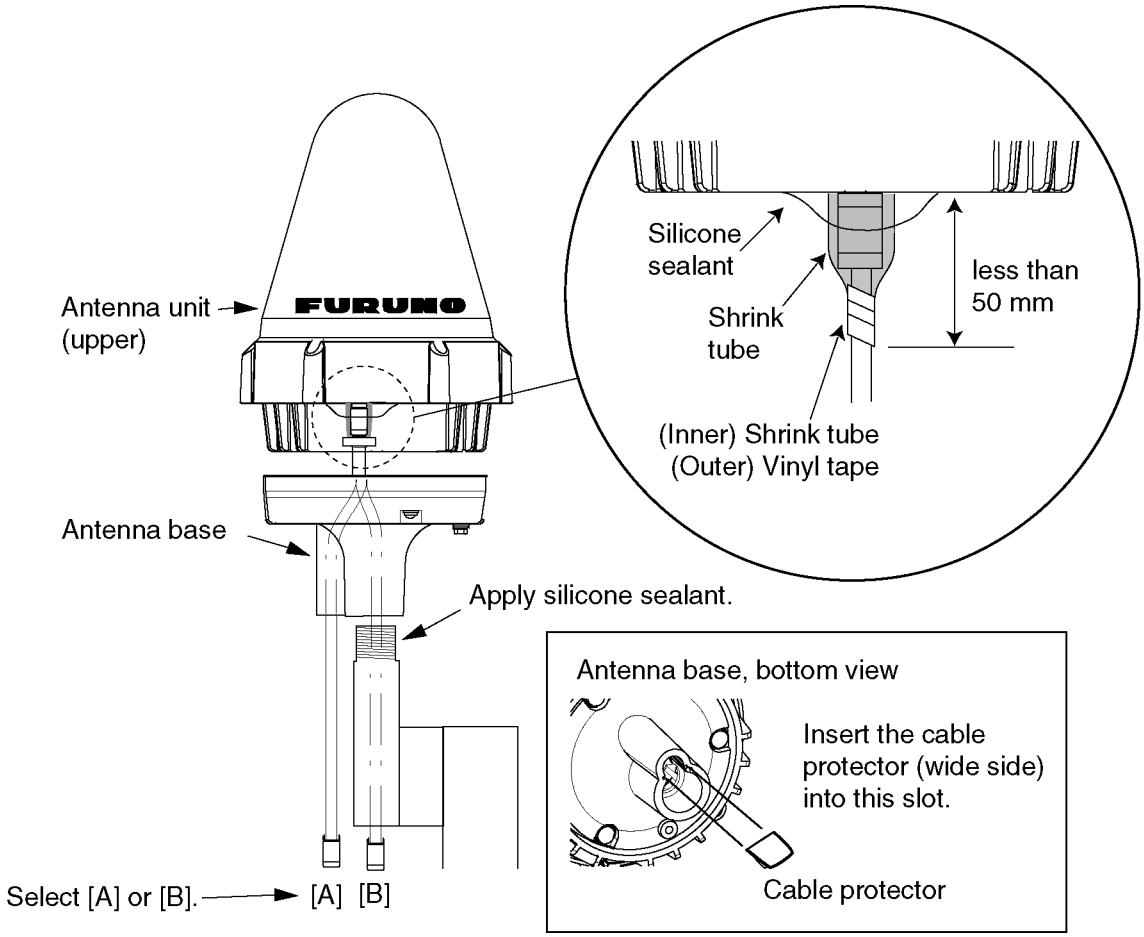
For 50 or 100 m cable

1. Apply silicone sealant (local supply) to the threads of the pipe.
2. Unscrew three screws to remove the antenna base from the antenna unit.
3. Pass the cable assy TPA5FB0.3NJ5FBA-5DFB (supplied, 300 mm) into the shrink tube (SCM2, supplied).
4. Attach the above cable assy to the connector at the bottom of the antenna unit (upper).
5. Shift up the shrink tube until it touches the bottom of the antenna unit (upper).
6. Heat the shrink tube, and then apply silicone sealant to the upper edge of the tube, also wind self-bonding tape around the lower edge of the shrink tube and then wrap vinyl tape over self-bonding tape.

Note: Between the bottom of the antenna unit (upper) and the end of the taping should be less than 50 mm.

7. Insert the cable protector (supplied) in to the slot at the bottom of the antenna base.
8. Pass the antenna cable through the pipe and antenna base in order.

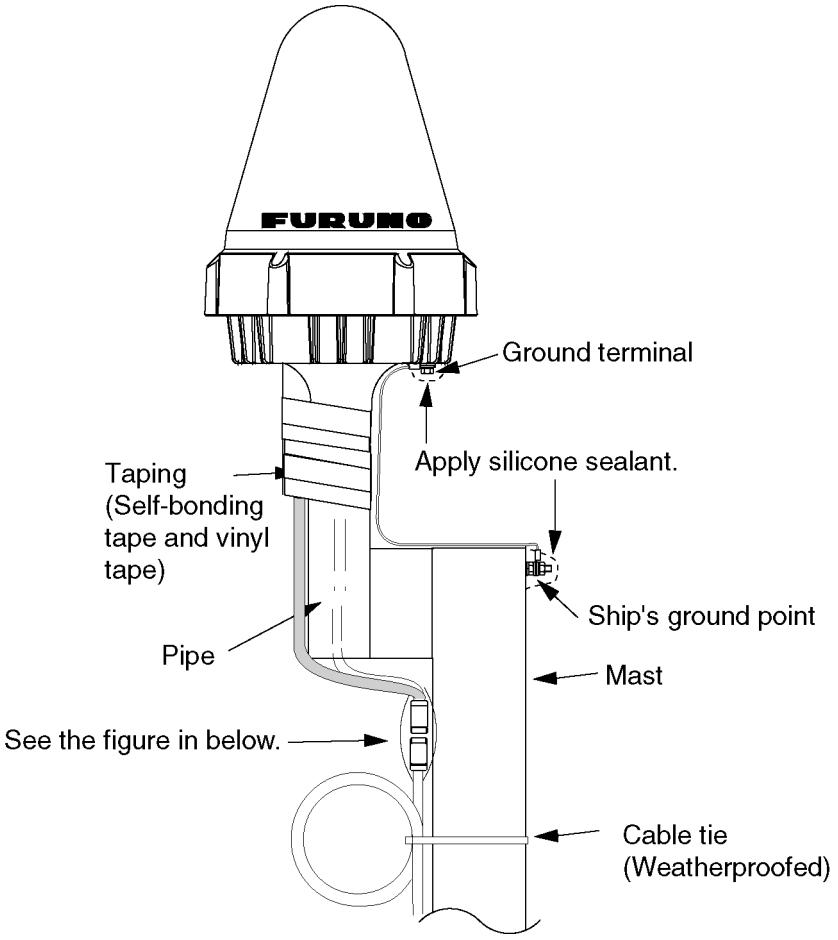
When laying the cable along side the pipe, put the cable aside to pass through the projection in the antenna base. See [A] in the figure shown below.



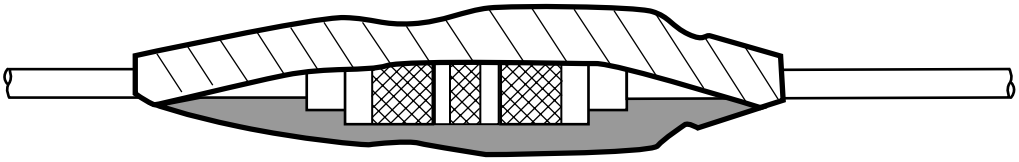
Waterproofing

9. Remount the antenna unit (upper) on the antenna base. (Torque: 2.6 N·m ± 10%)
10. Screw the antenna unit onto the antenna pipe by rotating the antenna unit.
11. Wind self-bonding tape (supplied) at the connection of antenna base and pipe, and then wrap vinyl tape over self-bonding tape.
12. Fix the ground wire RW-4747 (supplied) between the ground terminal on the antenna unit and the ground stud on the mast.

13. Connect the antenna cable (50 or 100 m) and cable assy (attached at step 5).
14. Wrap the connector with self-bonding tape and then vinyl tape. Bind the cable end with a cable tie (local supply).
15. Fix the cable to the mast with cable tie (local supply).



Mounting



Waterproofing

1.2 Terminal Unit

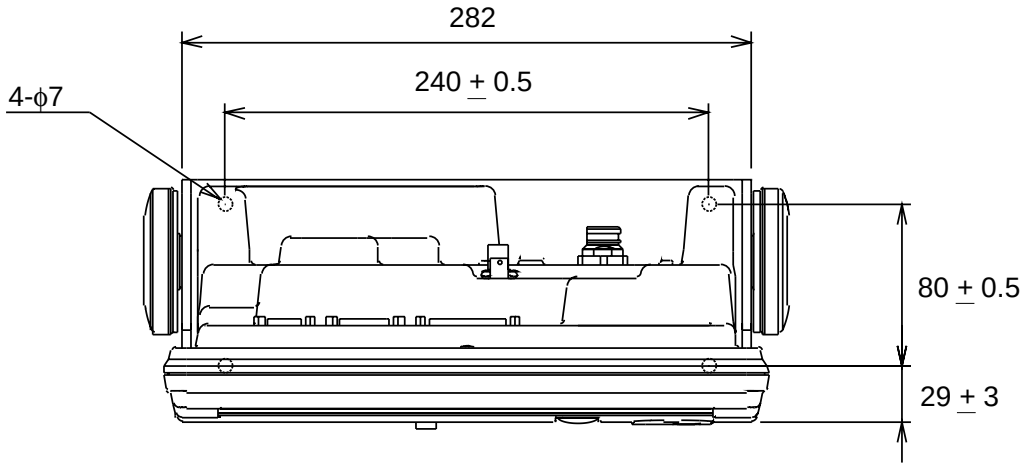
Select the following place to install the terminal unit.

- The temperature and humidity should be moderate and stable.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables.

Mounting

Tabletop mounting

1. Fix the hanger on a table with four tapping screws (5x20, supplied).

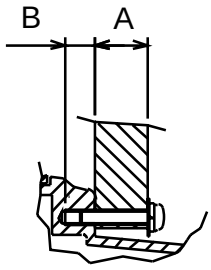


Terminal unit, tabletop mounting

2. Screw knobs and washers to terminal unit loosely.
3. Set the terminal unit to the hanger and tighten knobs.

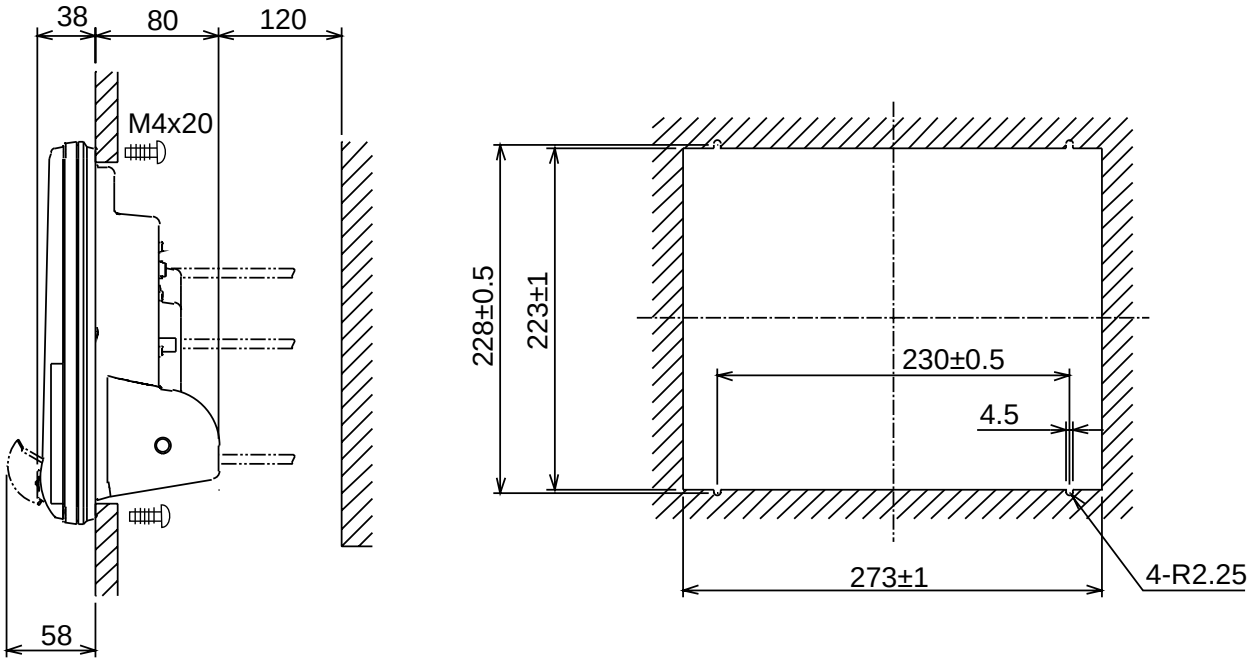
Flush mounting

Use local supplied pan head screws (M4x20) when the thickness of the bulkhead is from 11 to 14 mm. For bulkhead which exceeds 14 mm in thickness the length of the pan head screws should be bulkhead thickness A +7.8±2 mm. Also the length of B should be max. 8 mm (B≤8 mm).



Bulkhead, sectional view

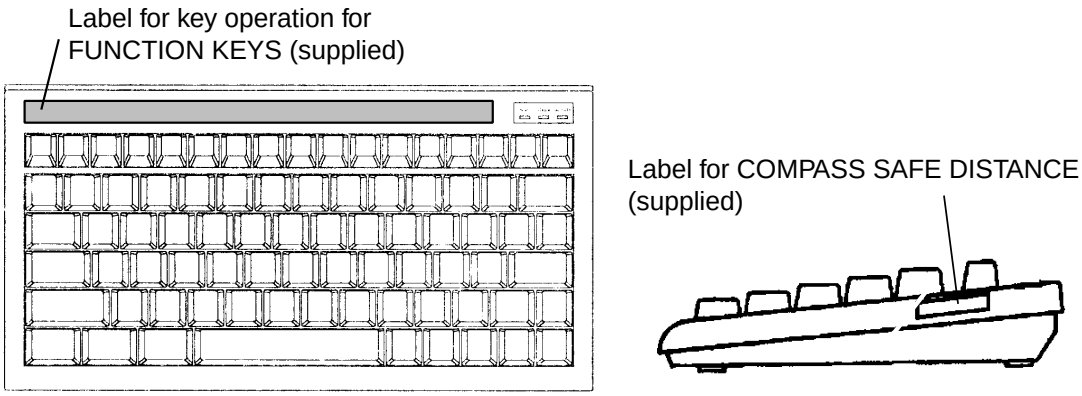
1. Prepare a cutout in the mounting location whose dimensions are as shown on next page.
2. Fix the display unit by six pan head screws M4x20, inserting from the inside of the bulkhead. Refer to the outline drawing at the end of this manual.



Dimensions for Flush mounting

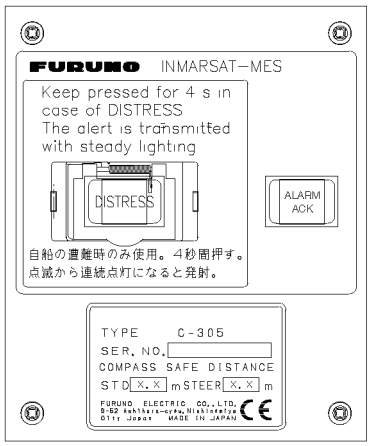
Keyboard

1. Attach the labels for INMAR-C and the compass safe distance to the appropriate locations shown below.

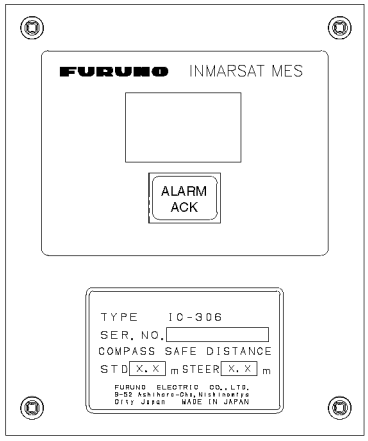


2. Attach four fasteners (small, supplied) to the bottom of the keyboard.
3. Attach four fasteners (large, supplied) to the small fasteners attached in step 3.
4. Peel the paper from four fasteners.
5. Mount the keyboard on the location selected, and then fix it.

1.3 Distress Alert/Received Call Unit IC-305/ Alarm Unit IC-306



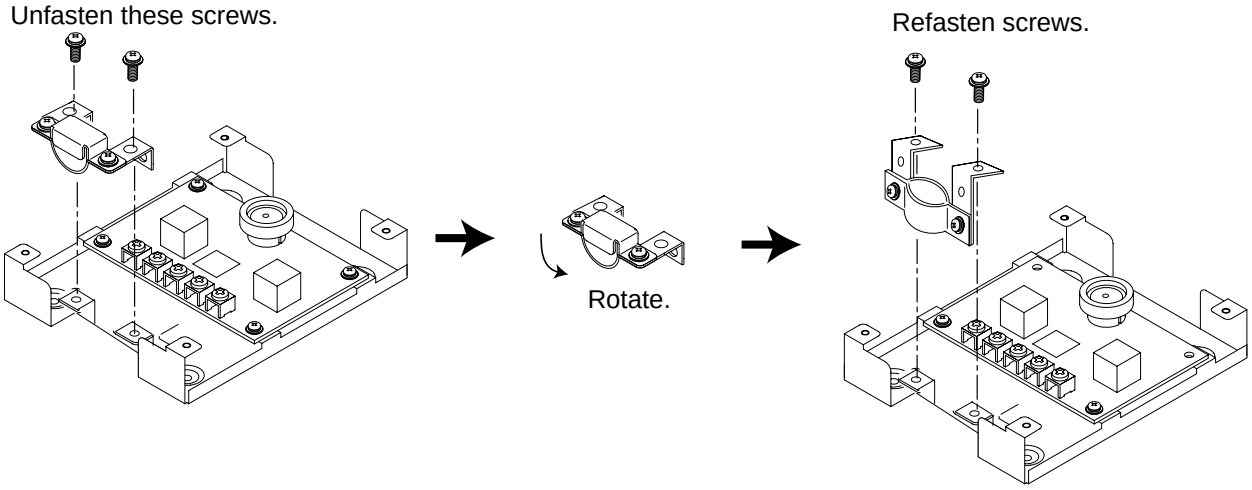
Distress alert/received call unit
IC-305



Alarm unit
IC-306

Mounting

1. Remove four screws from the unit to separate the bottom chassis from the top cover.
2. Fix the bottom chassis to the mounting location with four tapping screws (supplied).
3. Cable can be entered from bottom or rear panel. Select suitable entrance. For rear panel entrance, change the clamp orientation as follows.
   a) Unfasten two screws to remove the cable clamp.
   b) Turn the clamp 90 degrees.
   c) Refasten two screws removed at step a) to fix the clamp.



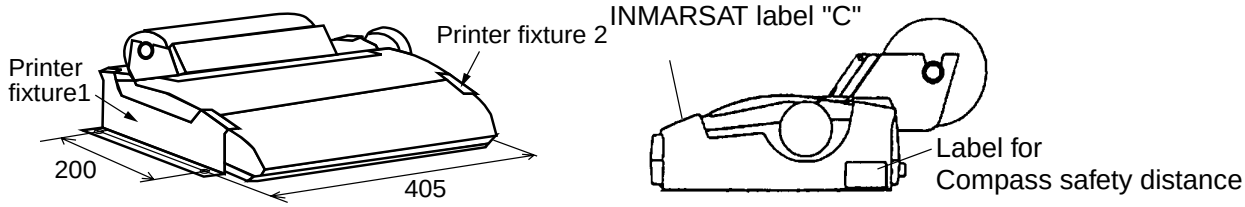
Cable clamp, rotating

4. Run the interconnection cable thru a cable entrance and connect it to terminal board.

1.4 Printer PP-510 (option)/ EGC Printer PP-505 (option)

PP-510 (option)

Lay the printer on a table and fix it with printer fixtures 1 and 2.
Attach labels appropriately; right side of printer for the compass safety distance label and front of printer for INMAR C label.



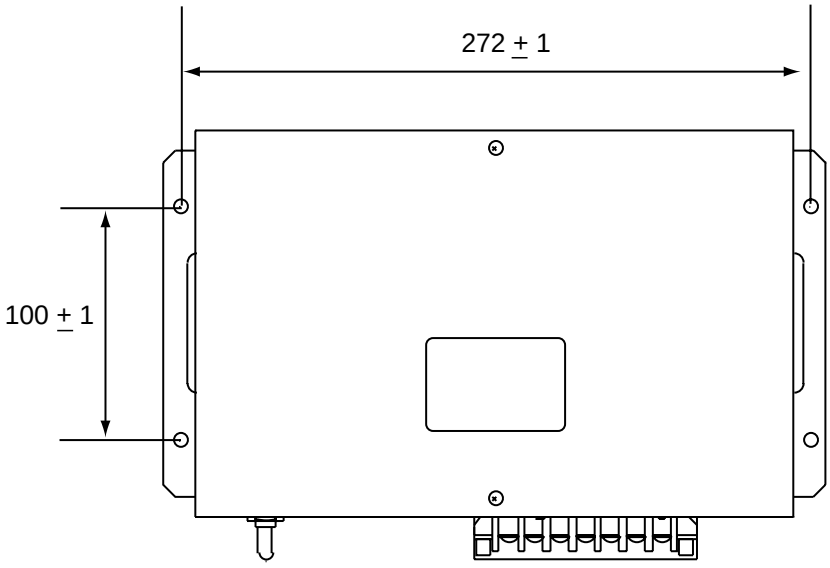
Printer PP-510

PP-505 (option)

1. Fix the hanger on a table with four tapping screws.
2. Screw knobs into printer.
3. Set printer to hanger and tighten knobs.

1.5 AC/DC Power Supply Unit PR-240-CE (option)

Fix the unit on a table with four tapping screws.

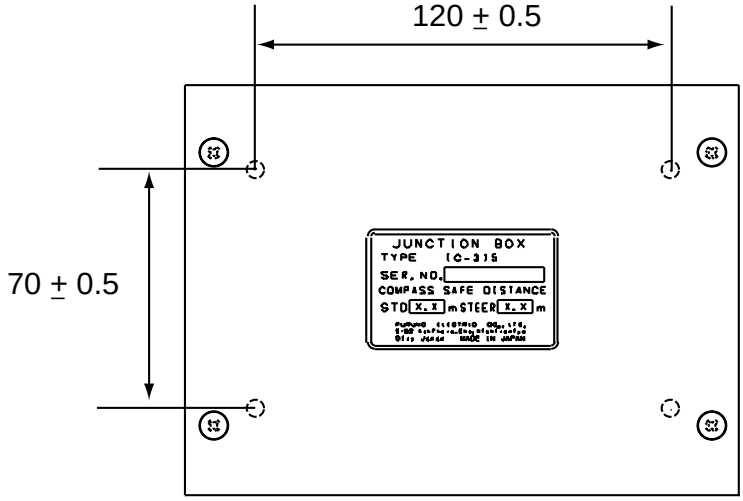


AC/DC power supply unit, dimensions

1.6 Junction Box IC-315

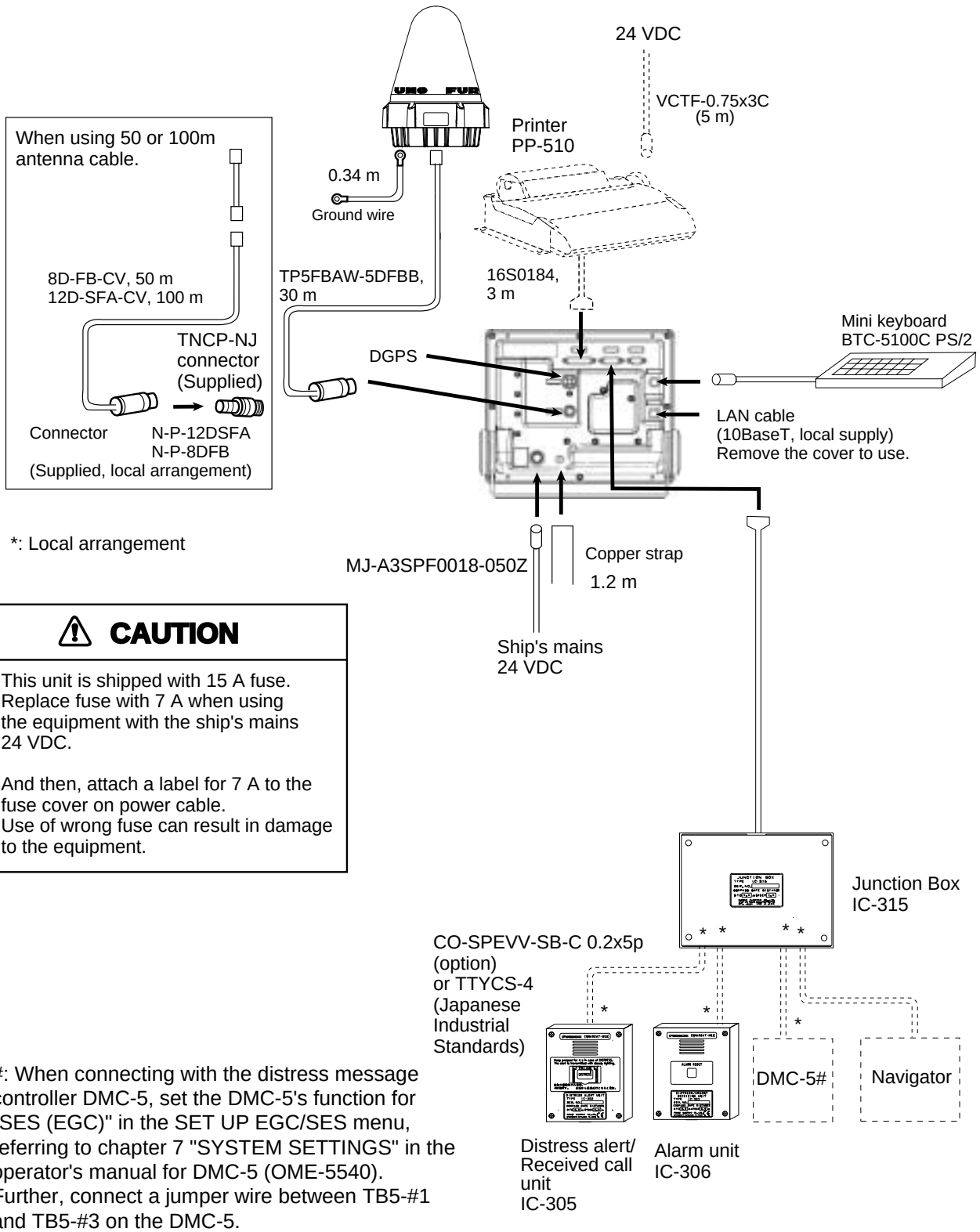
The junction box IC-315 is connected to the terminal unit by using the cable assy 16S0344 (2 m, attached to the junction box). Install the junction box within 2 m from the terminal unit.

1. Remove four screws from the unit to separate the bottom chassis from the top chassis.
2. Fix the bottom chassis to the mounting location with four tapping screws (4x16: supplied).
3. Connect the cables appropriately referring to Chapter 2.



Junction box IC-315, dimensions

2. WIRING



⚠ CAUTION

This unit is shipped with 15 A fuse. Replace fuse with 7 A when using the equipment with the ship's mains 24 VDC.

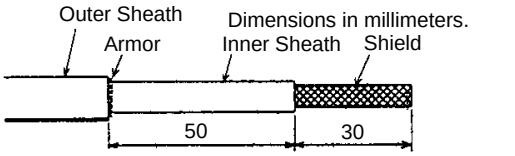
And then, attach a label for 7 A to the fuse cover on power cable.
Use of wrong fuse can result in damage to the equipment.

#: When connecting with the distress message controller DMC-5, set the DMC-5's function for "SES (EGC)" in the SET UP EGC/SES menu, referring to chapter 7 "SYSTEM SETTINGS" in the operator's manual for DMC-5 (OME-5540). Further, connect a jumper wire between TB5-#1 and TB5-#3 on the DMC-5.

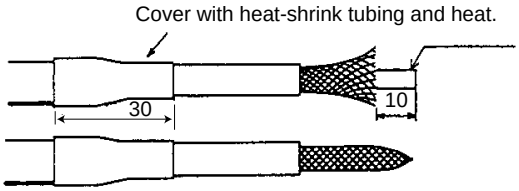
Wiring of FELCOM 15

2.1 Antenna Cable Connector at the Terminal Unit

8D-FB-CV (50 m)

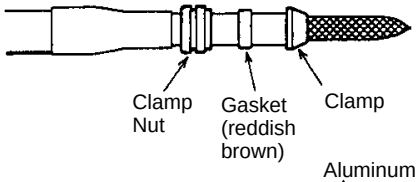


Remove outer sheath and armor by the dimensions shown left.
Expose inner sheath and shield by the dimensions shown left.

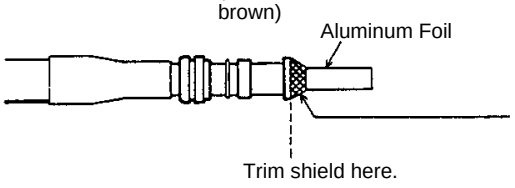


Remove insulator and core by 10 mm.

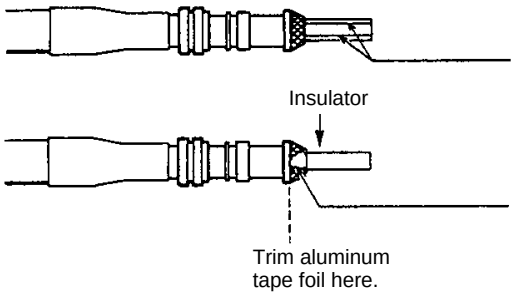
Twist shield end.



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



Fold back shield over clamp and trim.

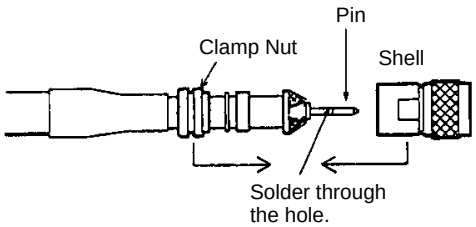


Cut aluminum foil at four places, 90° from one another.

Fold back aluminum tape foil onto shield and trim.

Expose the insulator by 1 mm.

Expose the insulator by 5 mm.

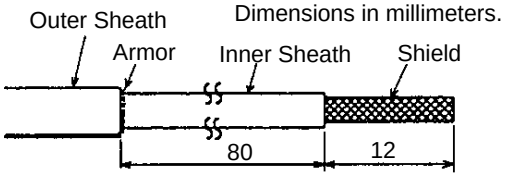


Slip the pin onto the conductor. Solder them together through the hole on the pin.

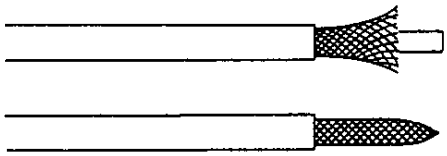
Insert the pin into the shell. Screw the clamp nut into the shell.
(Tighten by turning the clamp nut. Do not tighten by turning the shell.)

How to fabricate antenna cable 8D-FB-CV (50 m)

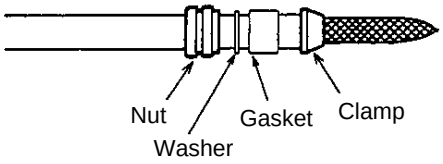
12D-SFA-CV (100 m)



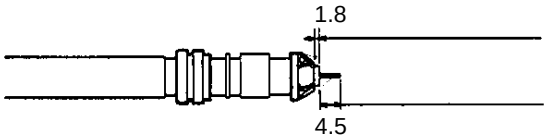
Remove outer sheath and armor by the dimensions shown left.
Expose inner sheath and shield by the dimensions shown left.



Twist shield end.

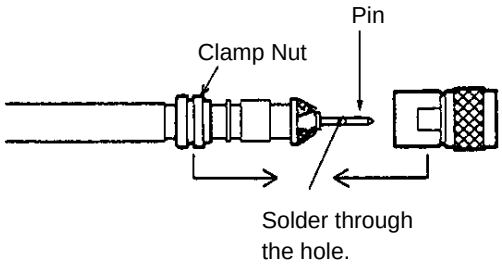


Slip on clamp nut, gasket and clamp as shown left.



Expose the insulator by 1.8 mm.

Expose the core by 4.5 mm.



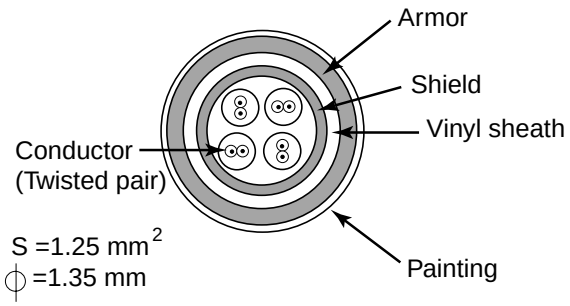
Slip the pin onto the conductor. Solder them together through the hole on the pin.

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 fabricate antenna cable 12D-SFA-CV

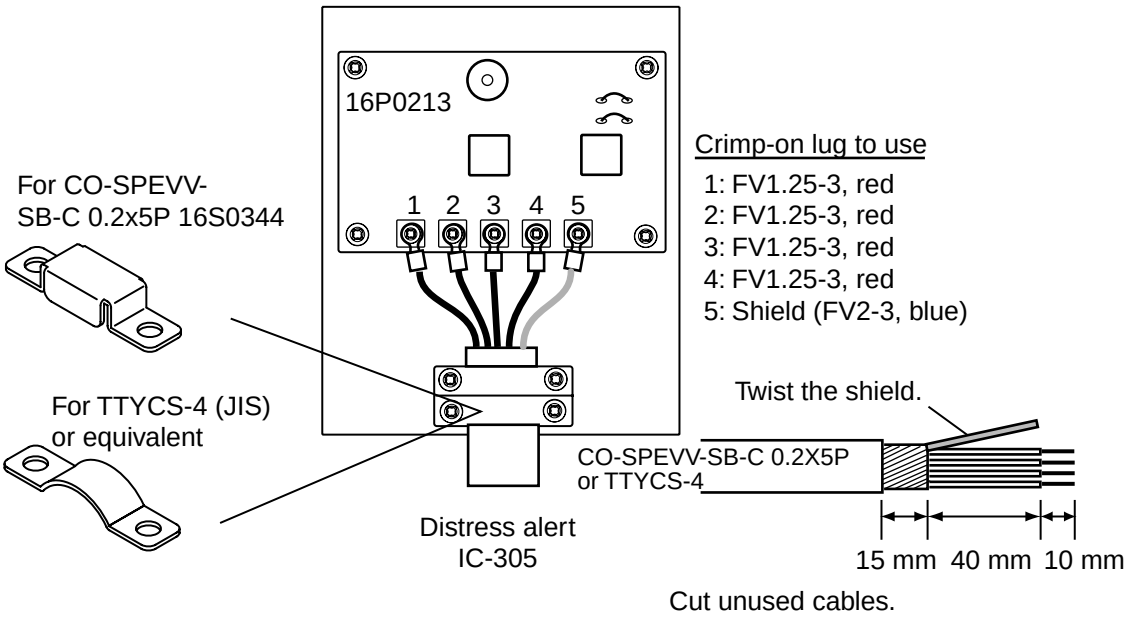
2.2 Distress Alert/Received Call Unit IC-305

Use the installation material CP16-02201 to connect the distress alert IC-305. The optional CO-SPEVV-SB-C 0.2x5P cable or JIS cable (Japan Industrial Standards) TTYCS-4 or equivalent are available to connect with the junction box IC-305. Select the cable clamp attached depending on the diameter of cable, and fix the armor of cable with the clamp.



(Sectional view)

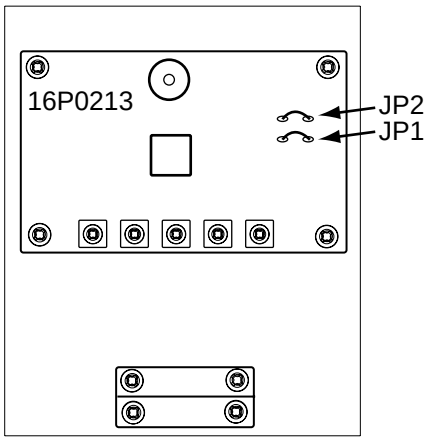
TTYCS-4 cable, sectional view



Wiring of distress alert IC-305

2.3 Alarm Unit IC-306

Maximum two alarm units can be connected to the junction box IC-315 in parallel. To distinguish the incoming indictors, set jumper wires for the second alarm unit as below. For connection, refer to the “2.2 Distress Alert/Received Call Unit IC-305.”



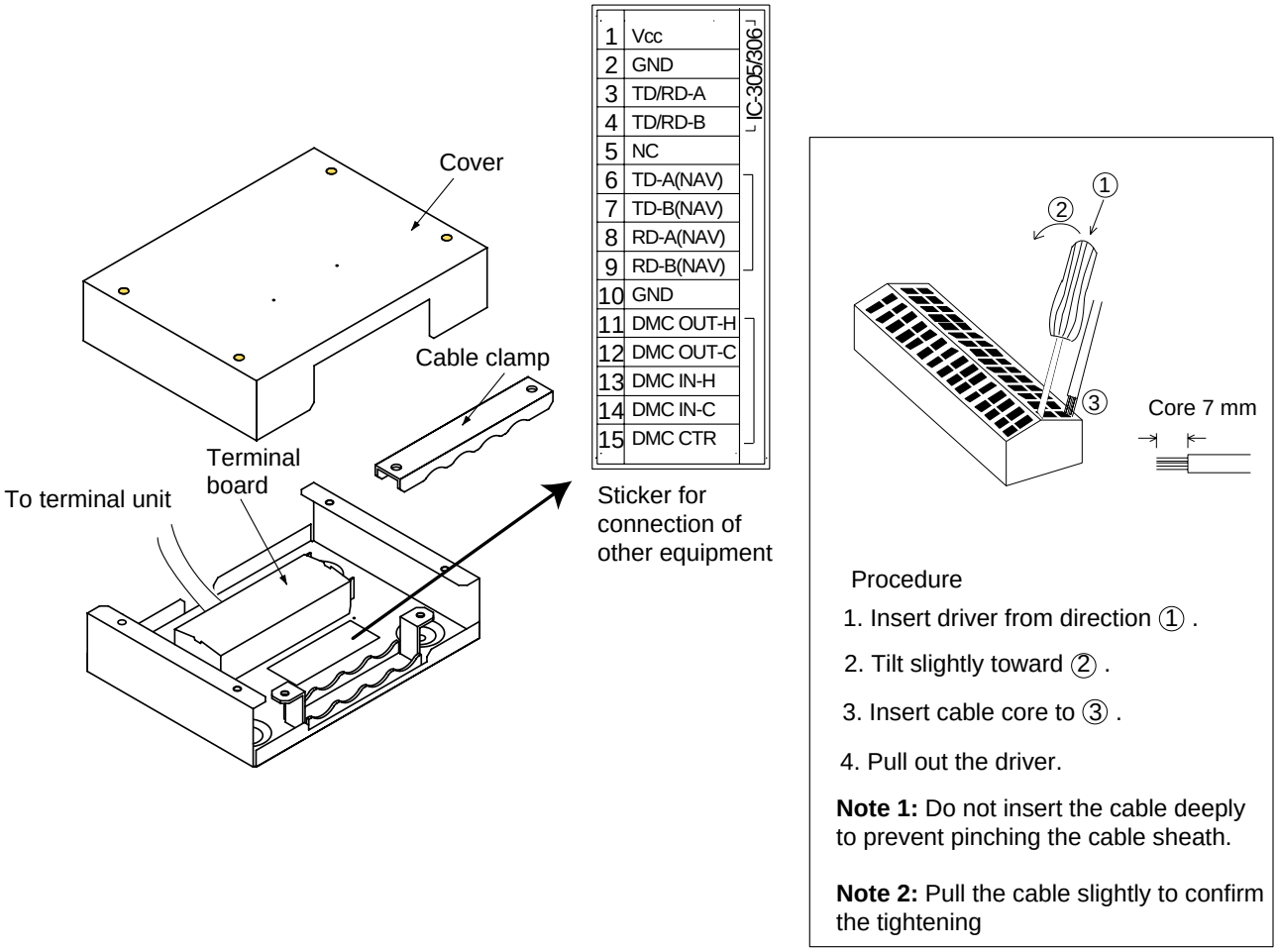
Alarm unit IC-306

	No. 1 (default setting)	No. 2
JP1	Cut	Cut
JP2	Shorten	Cut

2.4 Junction Box IC-315

Use the junction box IC-315 to connect the distress alert/received call unit IC-305 and other unit (max. four units) to the terminal unit.
Unfasten four screws to remove the box cover to connect cables.

For connection, use the optional 5 pair cable CO-SPEVV-SB-C 0.2x5P, JIS cable (Japan Industrial Standards) TTYCS-4 or equivalent. When using the CO-SPEVV-SB-C 0.2x5P cable, replace the cable clamp with the cable clamp 16-018-6008-1, supplied with IC-315.



Junction Box IC-315

Input/output sentences

The following sentences can be input/output with the navigator connected.

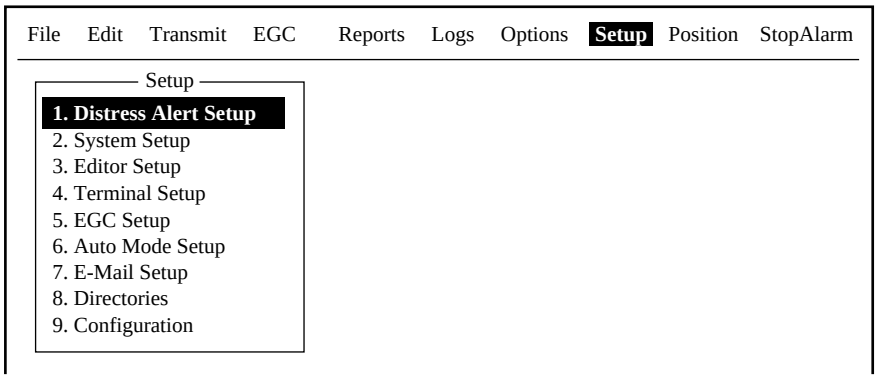
Input sentences	Output sentences
GGA, GLL, VTG, WPL, RMA, RMB, RMC, MTW, DBT, BWC, BWR, VDR, ZDA	GGA, ZDA, GLL, VTG, RMC, GSV

3. INITIAL SETTINGS

3.1 Setting the IMN (INMARSAT MOBILE NO.)

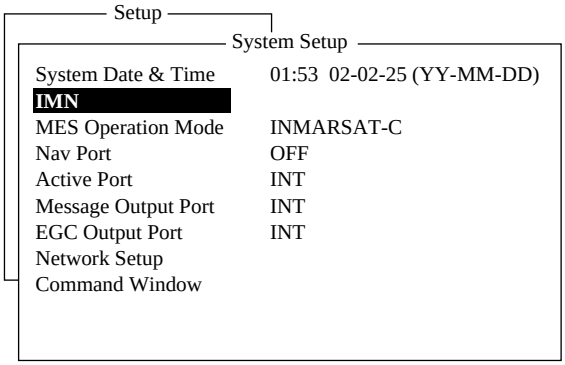
After the wiring, set your IMN (Inmarsat Mobile No.) as below.

1. Turn the power on.
2. Press the function key [F8] to show the Setup menu.



Setup menu

3. Press [2] key to display the System Setup menu.



System Setup menu

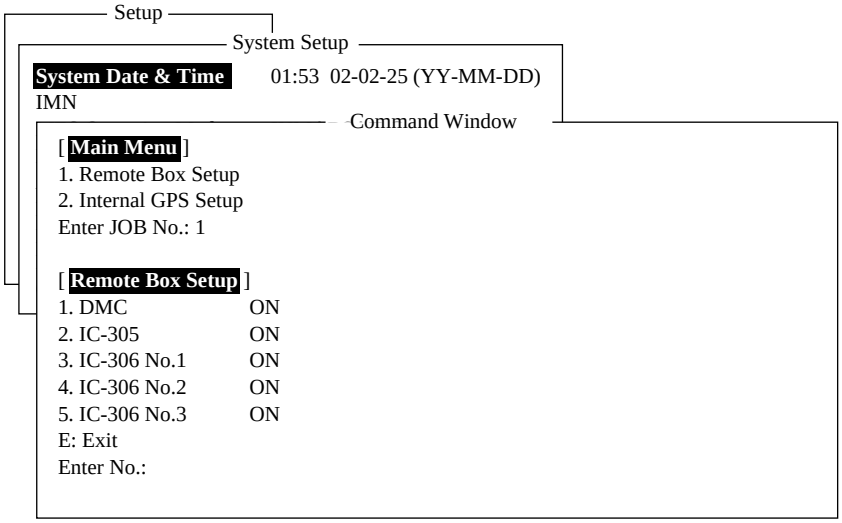
4. Confirm that the IMN is selected, and then press the [Enter] key.
   The entering field appears.
5. Key in your IMN.
6. Press the [Enter] key.
7. Press the [Esc] key to disappear the entering field.
8. Press the [Enter] key.

To clear the IMN, press [I] [M] [N] in order while pressing the [Alt] key down at step 5.

3.2 Setting for External Equipment

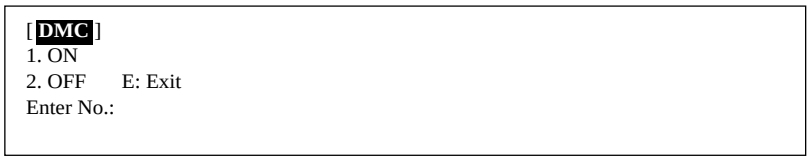
The FELCOM 15 system had been set to accommodate to distress alert/received call unit IC-305, alarm unit IC-306 and distress message controller DMC-5 at factory. If less than three units are connected, change the setting to OFF as below.

1. Press the [F8] key to show the Setup menu.
2. Press the [2] key to show the System Setup menu.
3. Press the [↓] key to select “Command Window”, and then press [Enter] key to show the Command Window screen.
4. Referring to the service manual for FELOM15, fill in the “Enter JOB No.:” and then press the [Enter] key.
5. As similar to step 4, fill in the “PASSWORD:”, and then press the [Enter] key.
   [Main Menu] is highlighted.
6. Press the [1] and [Enter] keys in order.



Command Window screen

7. Press the number key for unit not connected, and then press the [Enter] key.
   For example, press the [1] and [Enter] keys when the DMC-5 is not connected.



Setting window for DMC-5

8. Press the [2] key, and the [Enter] key.
   Instead of a numeric key, press the [E] key to return to Remote Box Setup menu.
9. Repeat steps 7 to 8 for other unit not connected.
10. Press the [Esc] key several times to close the menu.

4. INSTALLATION OF GPS RECEIVER (OPTION)

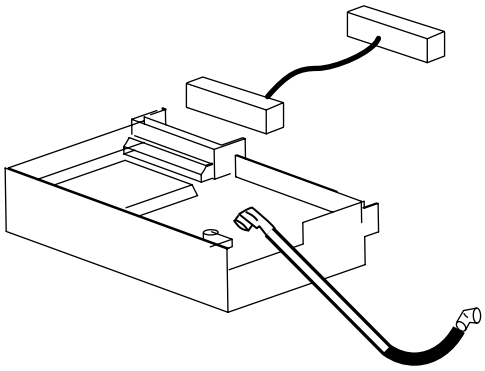
A GPS receiver board can be installed in the terminal unit IC-215.

Name: GPS receiver
Type: OP16-24
Code No.: 004-438-940

Name	Type	Code No.	Qty	Remarks
Connector assy.	51065-0700-PHR7-L040	000-146-174	1	w/PH-7P
GPS receiver board	GN-79L5A-N	000-146-179	1	
Connector assy.	H.FL-2LP-FHSB-A (100)	000-146-259	1	Mini pin
Pan head screw	M2x4	000-803-232	2	

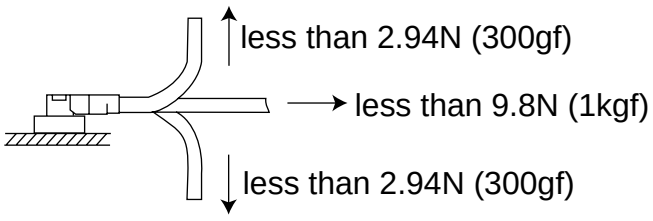
Note: Use antistatic groves to treat items.

1. Attach connector assemblies (51065/0700-PHR7-L040 and H.FL-2LP-FHSB-A (100)) to the GPS receiver board (GN-79L5A-N).



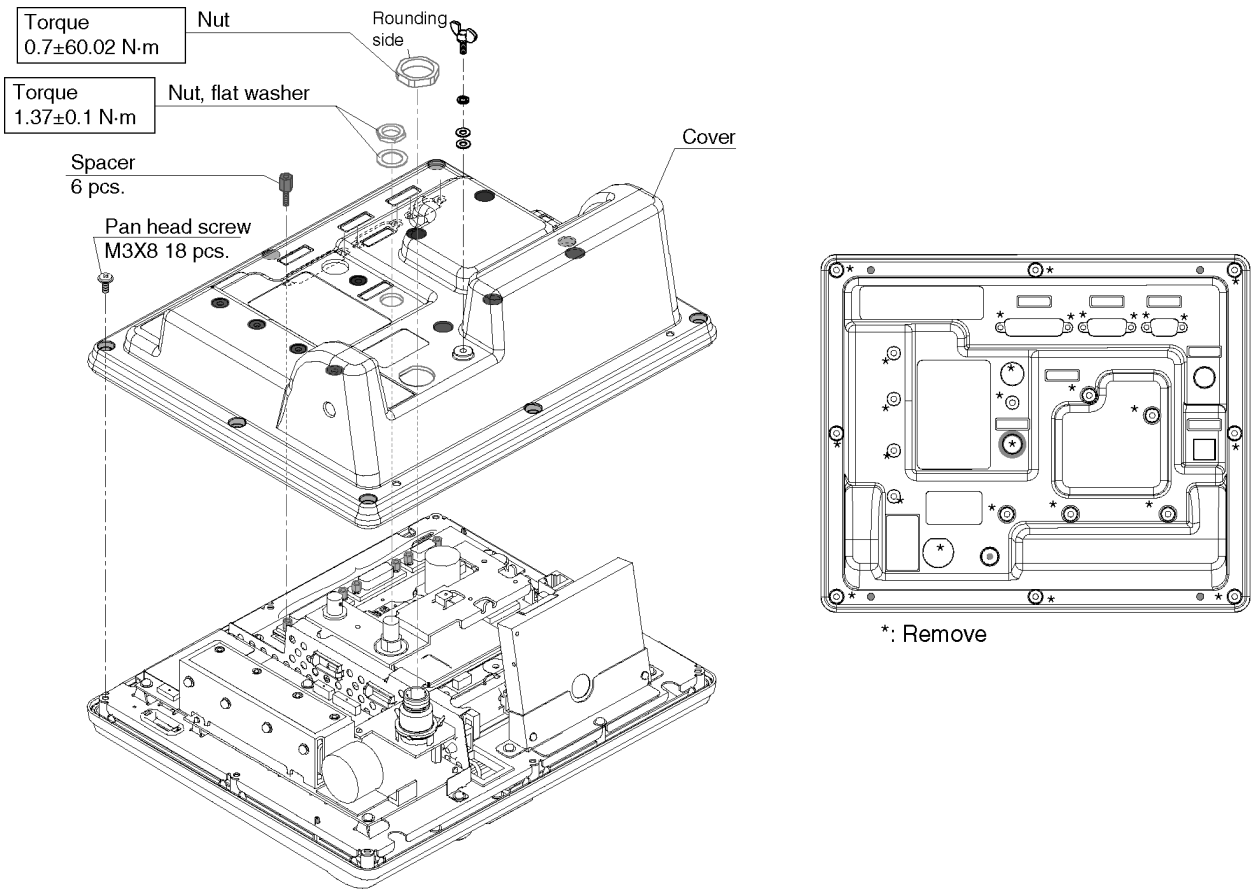
How to treat connectors

1. Attach the connector at right angle.
   If not, connector pins may be bent.
2. After connecting connector assemblies, the load on their cables should be as below.



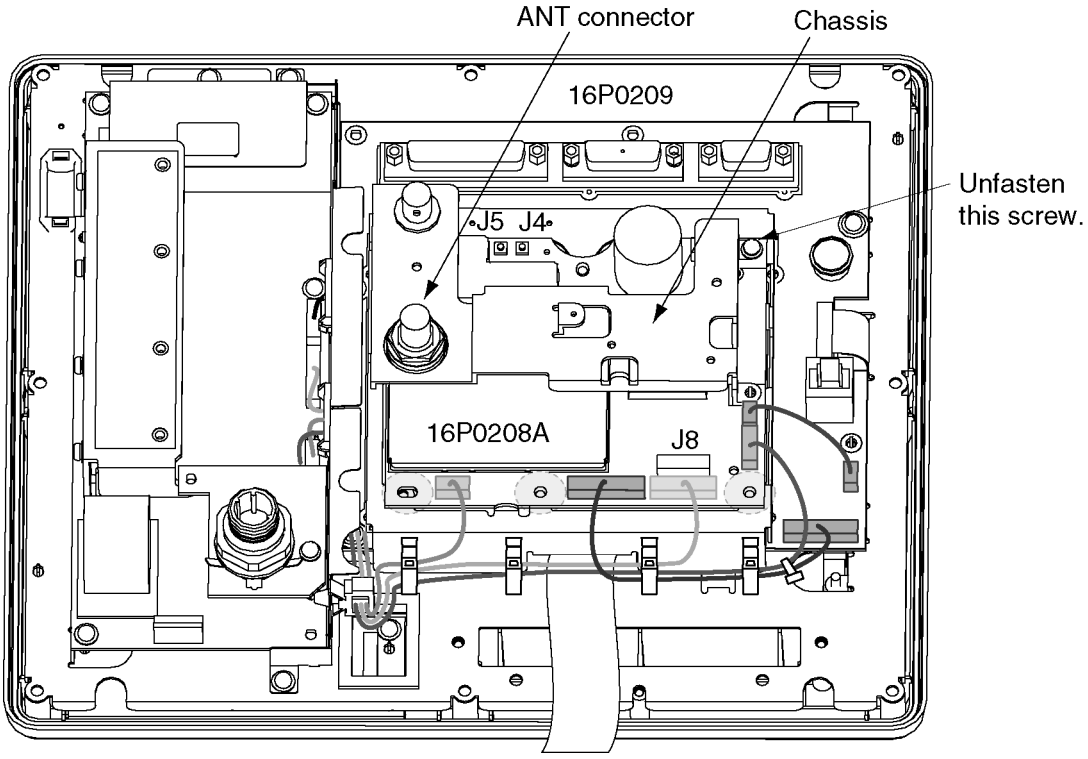
Assembling GPS receiver

2. Unfasten 18 screws, six spacers, three nuts to remove the terminal unit cover.



Terminal unit, cover removed (1)

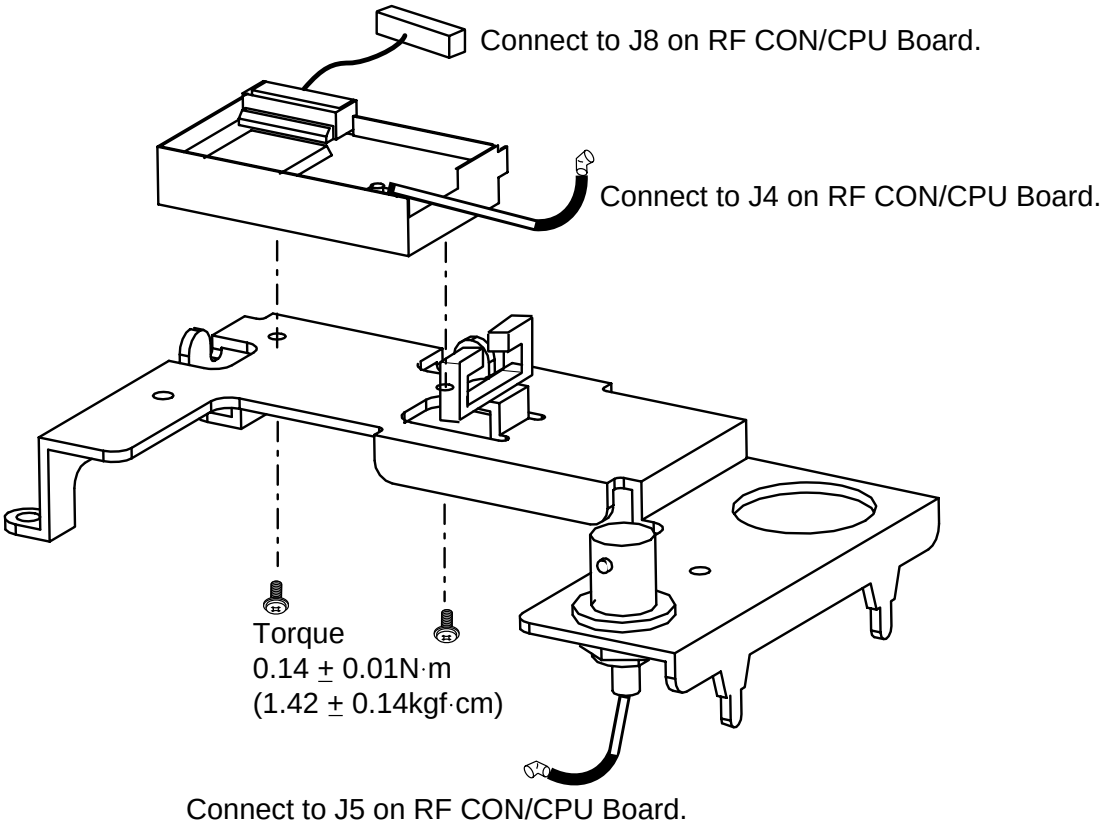
3. Remove the coaxial cable from J5 on RF CON/CPU Board (16P0208A).



Terminal unit, cover removed (2)

4. Unfasten the screw shown in above to remove the chassis from RF CON /CPU Board.

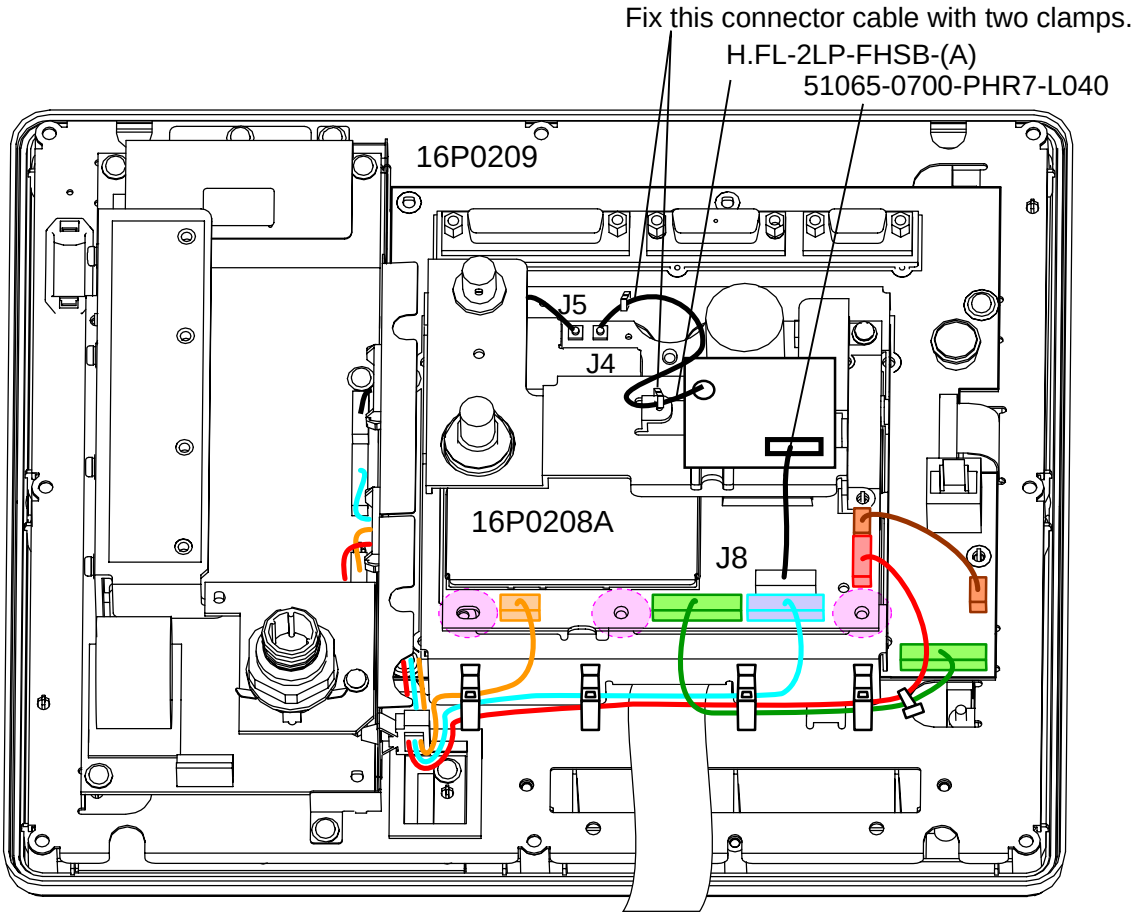
5. Fasten two pan head screws (M2x4, supplied with option kit) to fix GPS receiver board to the chassis removed at step 4.



Fixing GPS receiver board

6. Fasten the screw (removed at step 4) to remount the chassis on RF CON/CPU Board.

7. Reattach the coaxial cable (removed at step 3) to J5.
8. Attach the connector 51065-0700-PHR7-L040 to J8 on RF CON/CPU Board.



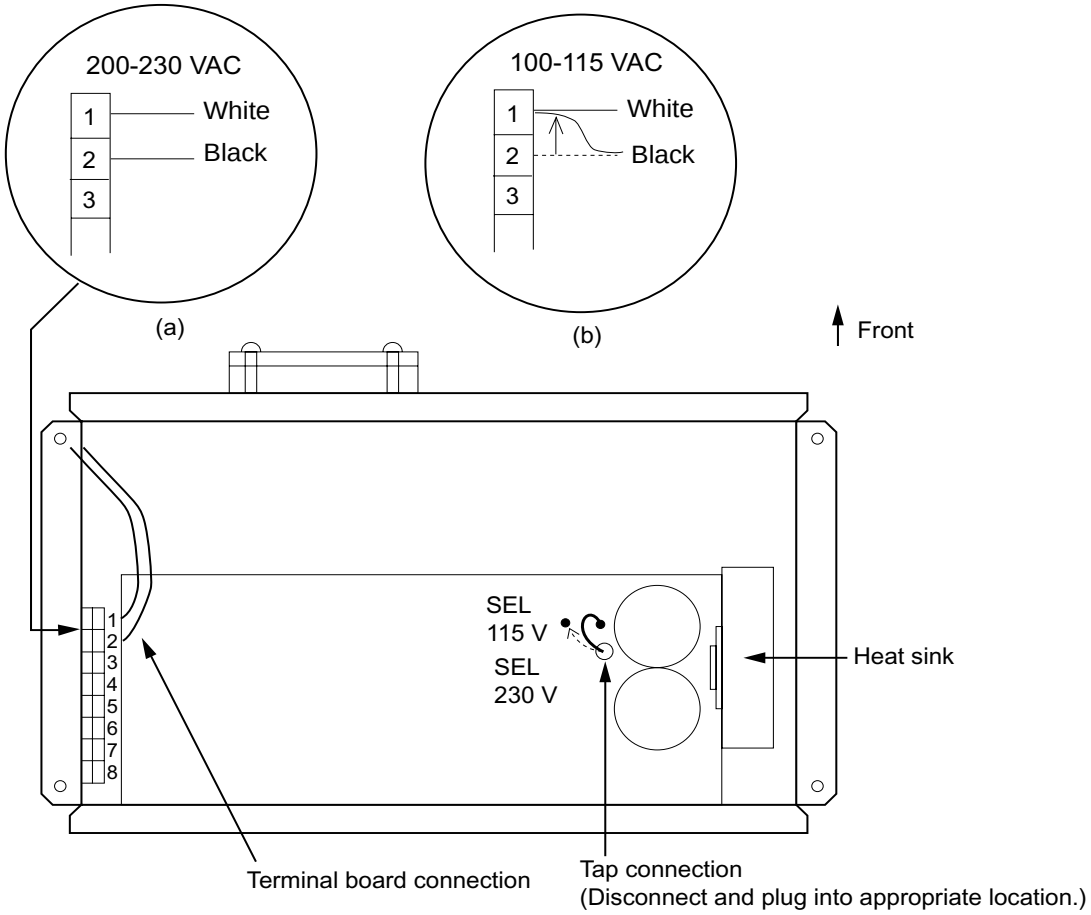
Terminal unit, cover removed (3)

9. Attach the connector H.FL-2LP-FHSB-A (100) to J4 on RF CON/CPU Board, and then fix it with the clamp near J4.
10. Reassemble the terminal unit.

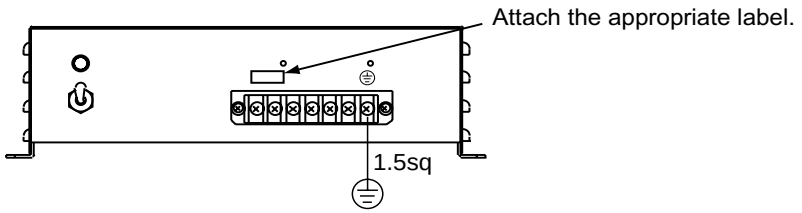
5. CHANGING SHIP'S MAINS SPECIFICATIONS

The power supply PR-240-CE (option) is shipped with 220 VAC (200-230 VAC) setting. If the ship's mains is 100 VAC – 115 VAC, change the top connection and terminal connection as follows.

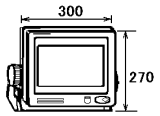
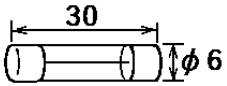
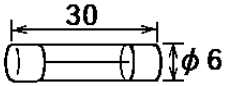
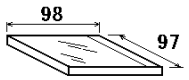
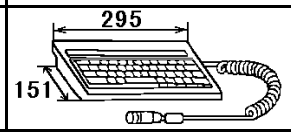
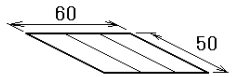
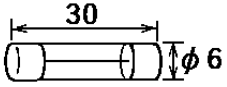
Ship's mains	Tap connection	Terminal board connection # 1& #2	Power supply label
100-115 VAC	SEL 115 V	b	100-115 VAC 2.3-2.0A 1ϕ 50/60 kHz
200-230 VAC	SEL 230 V	a	200-230 VAC 1.15-1.0 A 1ϕ 50/60 kHz

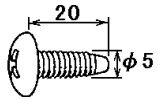
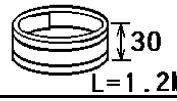
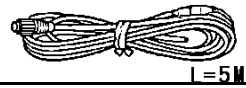
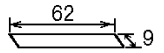
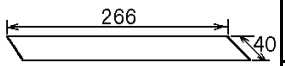
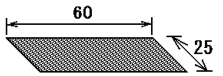
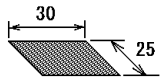


Top view (Cover removed)



PACKING LIST IC-215 J/E

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾀｰﾐﾅﾙﾕﾆｯﾄ TERMINAL UNIT		IC-215 000-043-432	1
予備品 SPARE PARTS		**SP16-01301**	
ﾋｭｰｽﾞ FUSE		FGBO 7A AC125V 000-549-013	1
ﾋｭｰｽﾞ FUSE		FGBO 15A AC125V 000-549-014	1
付属品 ACCESSORIES		**FP16-00600**	
ﾌﾛｯﾋﾟｰﾃﾞｨｽｸ組品 FLOPPY DISK		FP16-00601 004-439-400	1
ﾐﾆｷｰﾎﾞｰﾄﾞ MINI KEYBOARD		BTC-5100C PS/2 004-442-400	1
工事材料 INSTALLATION MATERIALS		**CP16-02301**	
ﾋｭｰｽﾞﾊﾘﾏｰｸ FUSE LABEL		03-153-1312-0 100-292-140	1
ﾋｭｰｽﾞ FUSE		FGBO 7A AC125V 000-549-013	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		5X20 SUS304 1ｼｭ 000-802-081	4
ｱｰｽ板 COPPER STRAP		05-003-0031 590-300-310	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A3SPF0018-050Z 000-139-872	1
工事材料 INSTALLATION MATERIALS		**CP16-02302**	
ﾊﾘﾏｰｸ (C.S.D) LABEL (C.S.D)		16-011-5804-0 100-248-060	1
ﾊﾘﾏｰｸ LABEL		16-011-5803-1 100-248-051	1
ﾌｧｽﾅｰ(4) HOOK LOOP FASTENER		16-007-6815-0 100-237-680	4
ﾌｧｽﾅｰ(3) HOOK LOOP FASTENER		16-007-6814-0 100-237-670	4

A-1

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

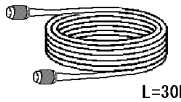
FURUNO

CODE NO.		16AK-X-9404 -1
TYPE		1/1

工事材料表

INSTALLATION MATERIALS

IC-115

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	ｹｰﾌﾞﾙ組品 CABLE ASSY.	 L=100M	12D-SFA-CV *100M*		1	選択 TO BE SELECTED
			CODE NO.	000-138-866		
2	ｱﾝﾃﾅｹｰﾌﾞﾙ組品 ANTENNA CABLE ASSY.	 L=50M	8D-FB-CV *50M*		1	選択 TO BE SELECTED
			CODE NO.	000-117-599		
3	ｹｰﾌﾞﾙ組品 CABLE ASSY.	 L=30M	TP5FBAW-5DFBB *30M*		1	選択 TO BE SELECTED
			CODE NO.	000-146-250		

FURUNO ELECTRIC CO ., LTD.

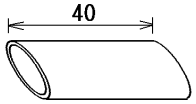
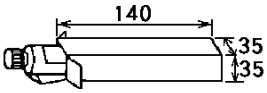
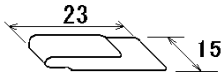
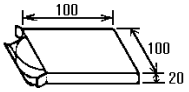
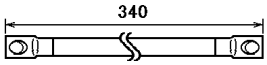
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	004-439-060	16AK-X-9401 -2
TYPE	CP16-02101	1/1

工事材料表

INSTALLATION MATERIALS

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	ｲﾗｯｸｽｽﾘｰﾌﾞ SCM2 SHRINK TUBING		07-1220 ｸﾛ *40MM* CODE NO.	000-147-037	1	
2	ｽﾘｰﾎﾞﾝﾄﾞ SEALANT		1211 50G CODE NO.	000-854-118	1	
3	ｹｰﾌﾞﾙ保護材 CABLE PROTECTOR		16-018-1251-1 CODE NO.	100-298-111	1	
4	ﾌﾞﾁﾙｺﾞﾑﾃｰﾌﾟ SELF-BONDING TAPE		NO.15 CODE NO.	000-835-526	1	
5	ｱｰｽ線 GROUNDING WIRE		RW-4747-1 03S4747-2 CODE NO.	000-566-000	1	

FURUNO ELECTRIC CO ., LTD.

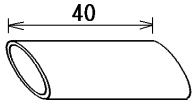
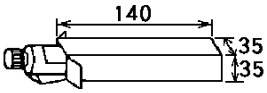
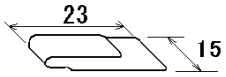
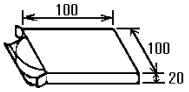
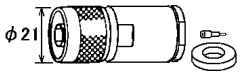
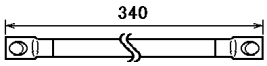
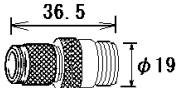
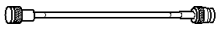
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	004-439-070	16AK-X-9402 -2
TYPE	CP16-02111	1/1

工事材料表

INSTALLATION MATERIALS

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｲﾗｯｸｽｽﾘｰﾌﾞ SCM2 SHRINK TUBING		07-1220 ｸﾛ *40MM* CODE NO. 000-147-037	1	
2	ｽﾘｰﾎﾞﾝﾄﾞ SEALANT		1211 50G CODE NO. 000-854-118	1	
3	ｹｰﾌﾞﾙ保護材 CABLE PROTECTOR		16-018-1251-1 CODE NO. 100-298-111	1	
4	ﾌﾞﾁﾙｺﾞﾑﾃｰﾌﾟ SELF-BONDING TAPE		NO.15 CODE NO. 000-835-526	1	
5	ｺﾈｸﾀ(N) CONNECTOR		N-P-8DFB CODE NO. 000-111-549	1	
6	ｱｰｽ線 GROUNDING WIRE		RW-4747-1 03S4747-2 CODE NO. 000-566-000	1	
7	ｺﾈｸﾀ CONNECTOR		TNCP-NJ CODE NO. 000-146-177	1	
8	ｹｰﾌﾞﾙ組品 CABLE ASSY.		TPA5FB0.3NJ5FBA-5DFB CODE NO. 000-146-251	1	

FURUNO ELECTRIC CO ., LTD.

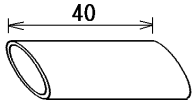
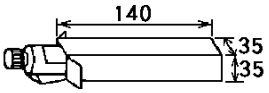
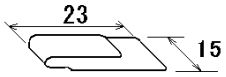
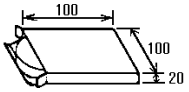
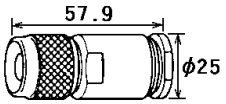
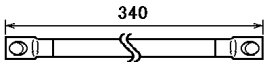
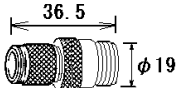
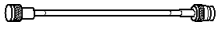
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	004-439-080	16AK-X-9403 -2
TYPE	CP16-02121	1/1

工事材料表

INSTALLATION MATERIALS

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｲﾗｯｸｽｽﾘｰﾌﾞ SCM2 SHRINK TUBING		07-1220 ｸﾛ *40MM* CODE NO. 000-147-037	1	
2	ｽﾘｰﾎﾞﾝﾄﾞ SEALANT		1211 50G CODE NO. 000-854-118	1	
3	ｹｰﾌﾞﾙ保護材 CABLE PROTECTOR		16-018-1251-1 CODE NO. 100-298-111	1	
4	ﾌﾞﾁﾙｺﾞﾑﾃｰﾌﾟ SELF-BONDING TAPE		NO.15 CODE NO. 000-835-526	1	
5	ｺﾈｸﾀ(N) CONNECTOR		N-P-12DSFA CODE NO. 000-136-422	1	
6	ｱｰｽ線 GROUNDING WIRE		RW-4747-1 03S4747-2 CODE NO. 000-566-000	1	
7	ｺﾈｸﾀ CONNECTOR		TNCP-NJ CODE NO. 000-146-177	1	
8	ｹｰﾌﾞﾙ組品 CABLE ASSY.		TPA5FB0.3NJ5FBA-5DFB CODE NO. 000-146-251	1	

FURUNO ELECTRIC CO ., LTD.

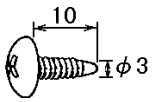
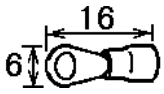
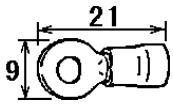
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	004-438-890	16AK-X-9406 -0
TYPE	CP16-02201	1/1

工事材料表

INSTALLATION MATERIALS

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ TAPPING SCREW		3X10 SUS304		4	
			CODE NO.	000-802-079		
2	圧着端子 CRIMP-ON LUG		FV1.25-3 ｱｶ		4	
			CODE NO.	000-538-113		
3	圧着端子 CRIMP-ON LUG		FV2-3		1	
			CODE NO.	000-108-424		

FURUNO ELECTRIC CO ., LTD.

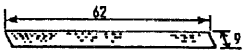
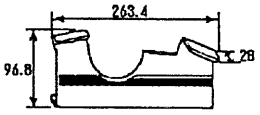
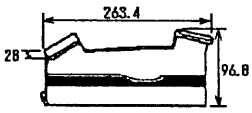
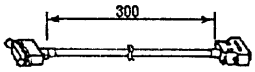
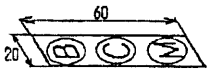
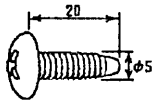
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	004-441-780	16AC-X-9420 -1
TYPE	CP16-01200	1/1

工事材料表
INSTALLATION MATERIALS

PP-510 ﾌﾟﾘﾝﾀｰ
PRINTER

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾊﾘﾏｰｸ LABEL		16-007-6927-0 CODE NO. 100-222-480	1	COMPASS SAFE DISTANCE
2	ﾌﾟﾘﾝﾀ取付板(2)組品 PRINTER FIXTURE		CP16-00502 SPCC 2.5GY5/1.5 #5-N CODE NO. 004-434-410	1	
3	ﾌﾟﾘﾝﾀ取付板(1)組品 PRINTER FIXTURE		CP16-00501 SPCC 2.5GY5/1.5 #5-N CODE NO. 004-434-400	1	
4	ｹｰﾌﾞﾙ組品 CABLE ASSY.		16S0184 CODE NO. 000-138-539	1	ﾀｰﾐﾅﾙﾕﾆｯﾄ用 / FOR TERMINAL UNIT
5	電源ｹｰﾌﾞﾙ組品 POWER CABLE ASSY.		16S0084(VCTF-0.75X3C *5M*) CODE NO. 000-132-249	1	
6	ﾊﾘﾏｰｸ(INMAR) LABEL (INMAR)		16-007-6919-0 CODE NO. 100-217-010	1	
7	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		5X20 SUS304 1ｼｭ CODE NO. 000-802-081	4	

DWG NO.
C5609-M07- D

FURUNO ELECTRIC CO ., LTD

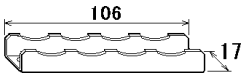
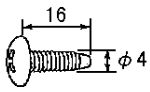
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	004-438-930	16AK-X-9407 -1
TYPE	CP16-02501	1/1

工事材料表

INSTALLATION MATERIALS

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	ｹｰﾌﾞﾙ押え(1-3) CABLE CLAMP		16-018-6008-1		1	
			CODE NO.	100-301-101		
2	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		4X16 SUS304 1ｼｭ		4	
			CODE NO.	000-802-080		

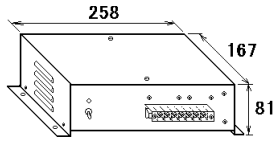
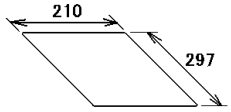
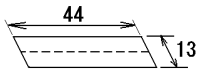
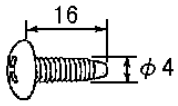
FURUNO ELECTRIC CO ., LTD.

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

PACKING LIST

24AA-X-9852 -5 1/1

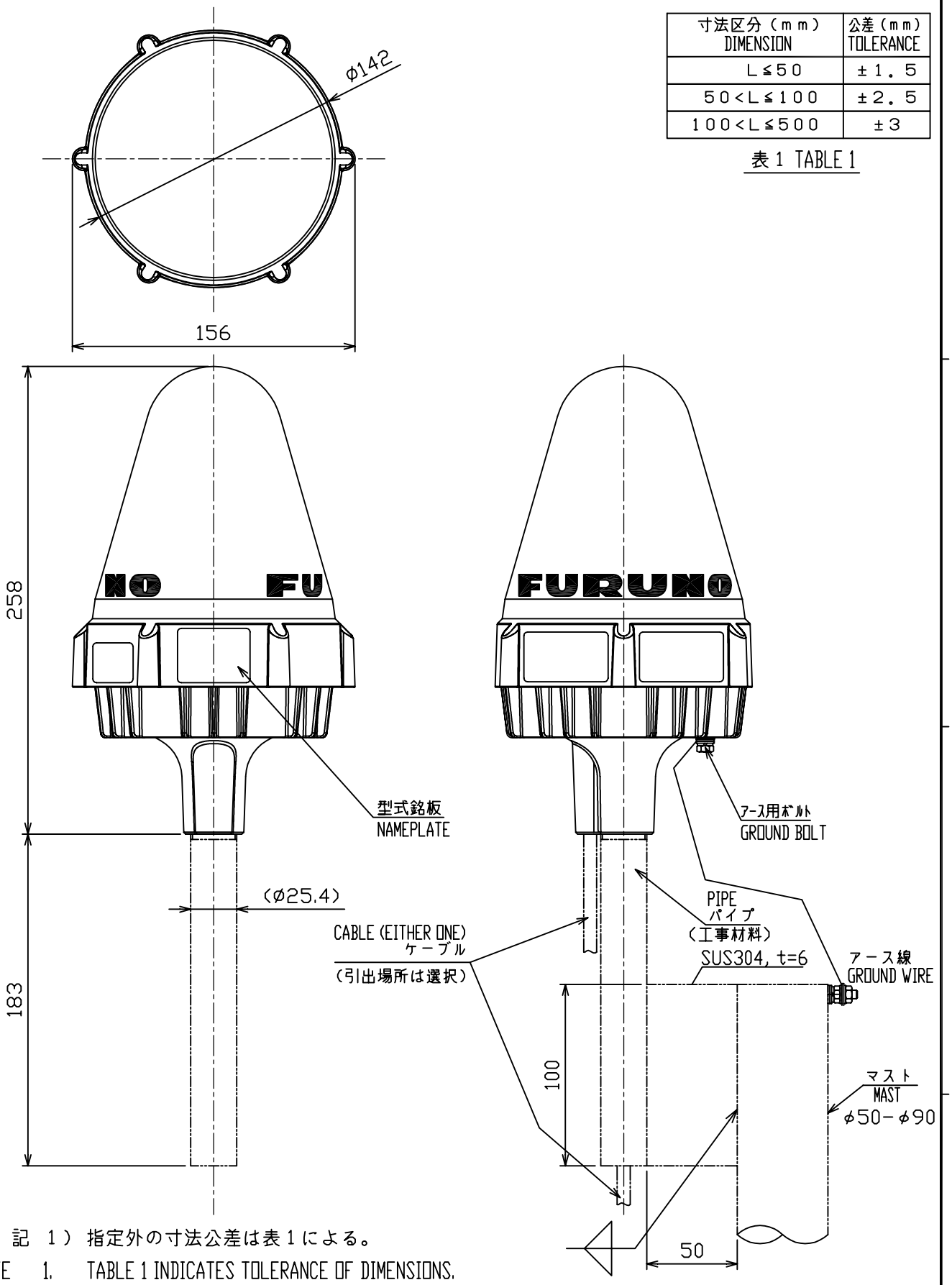
PR-240-CE

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
AC-DC電源 POWER SUPPLY UNIT		PR-240-CE 000-053-879	1
工事材料 INSTALLATION MATERIALS		**CP24-00151**	
PR-240-CE電源変更手順書 POWER MODIFICATION PROCEDURES		C52-00205-A 000-147-013	1
ﾃﾞﾝｹﾞﾝﾊﾘﾏｰｸ POWER LABEL		24-003-4101-3 100-299-773	1
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		4X16 SUS304 1ｼｭ 000-802-080	4

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

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

表1 TABLE 1

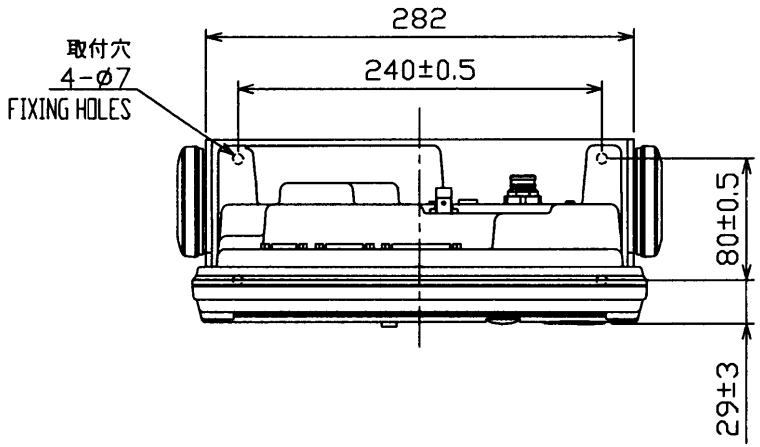


注　記　1）指定外の寸法公差は表1による。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

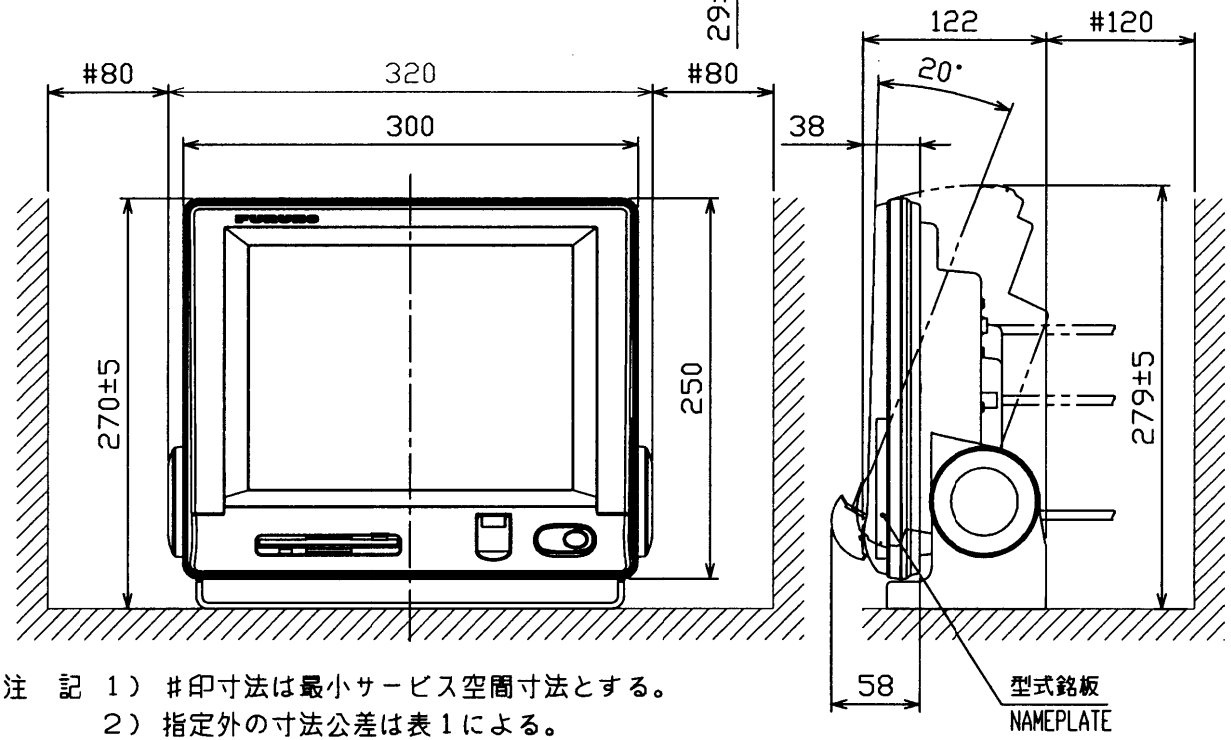
DRAWN Jan. 7 '03 T.YAMASAKI		TITLE	IC-115/116
CHECKED Jan. 7 '03 Y.KIMURA		名称	アンテナユニット
APPROVED Jan. 7, '03 Y. Kimura	FELCOM 15/16		外寸図
SCALE 1/3 MASS 1.4 ±10% kg	質量はパイプ工材を含まず。 MASS W/O FIXTURE PIPE.	NAME	ANTENNA UNIT
DWG No. C5635-G01- C	16-018-100G-1		OUTLINE DRAWING

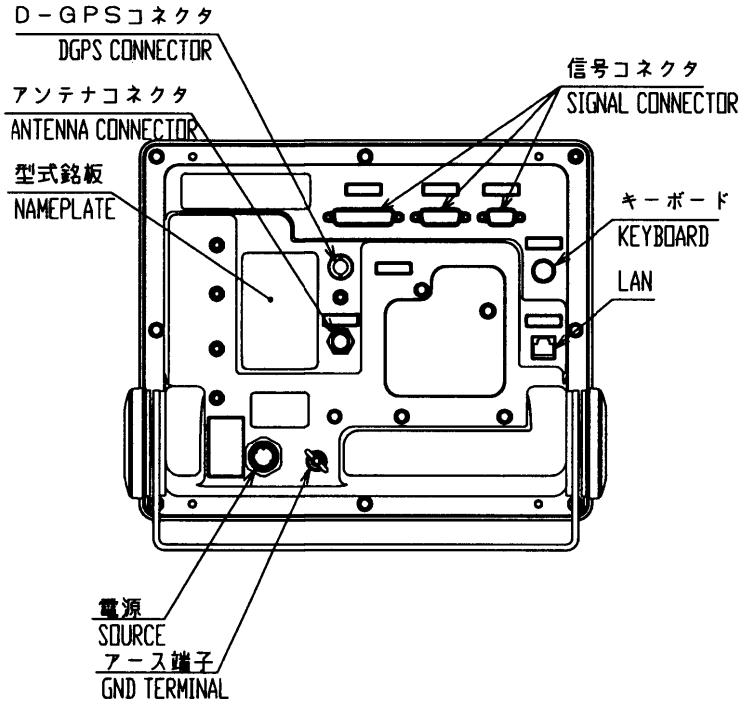
FURUNO



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

表1 TABLE 1





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5×20を使用のこと。

NOTE 1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 5x20 FOR FIXING THE UNIT.

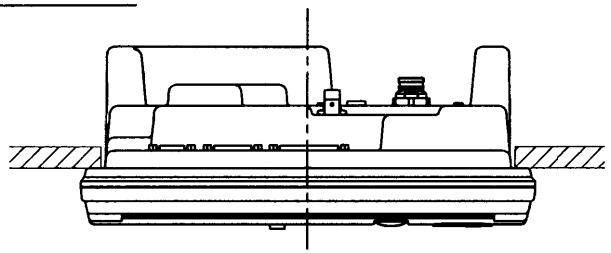
DRAWN Dec. 19,'02 T.YAMASAKI			TITLE IC-215
CHECKED Dec. 20,'02 Y.KIMURA			名称 ターミナルユニット（卓上装備）
APPROVED Dec. 20,'02 Y. Kimura	FELCOM 15		外寸図
SCALE 1/5	MASS 4.5 ±10% kg		NAME TERMINAL UNIT (DESKTOP MOUNT)
DWG No. C5635-G02-C	16-018-3006-3		OUTLINE DRAWING

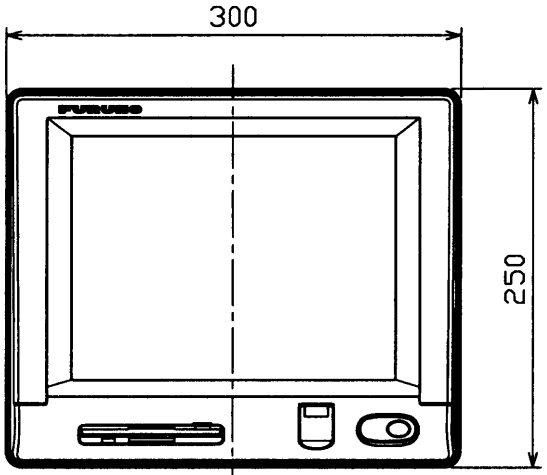
FURUNO ELECTRIC CO., LTD.

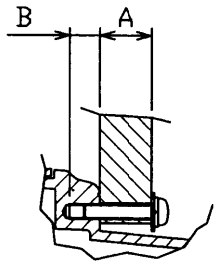
FURUNO

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

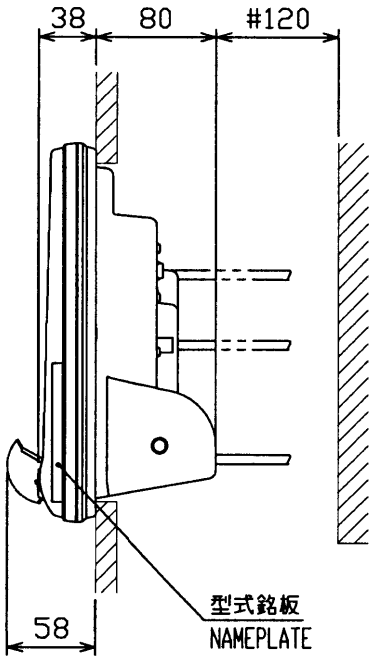
表1 TABLE 1

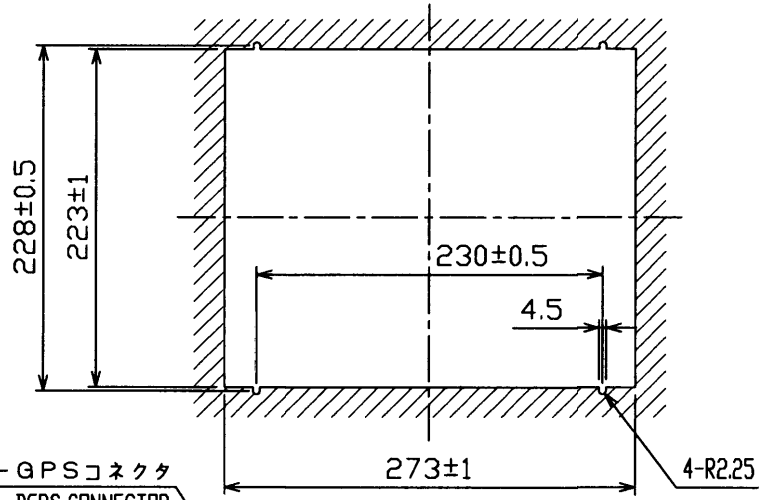




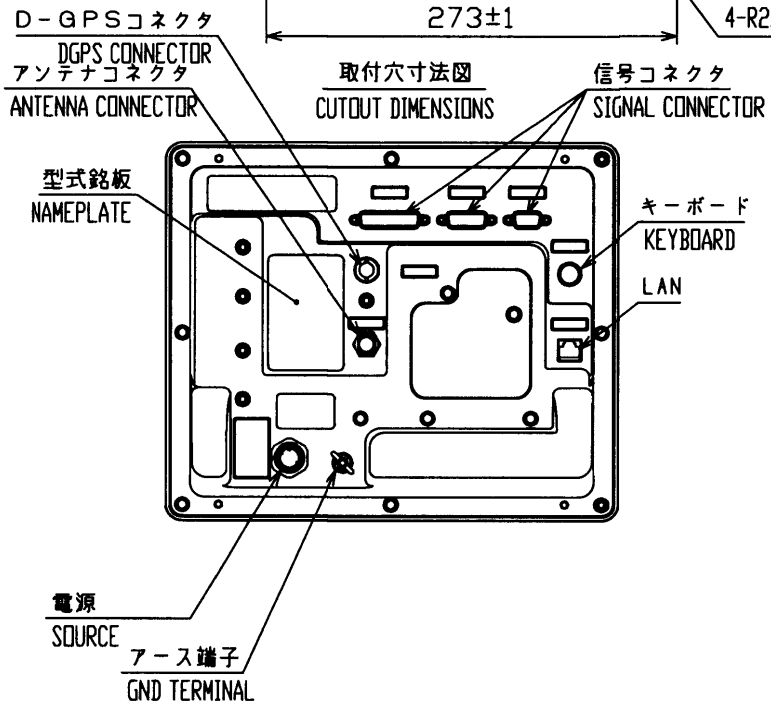


取付ネジ部断面 尺度 1/2
DETAIL FOR FASTENING (SCALE: 1/2)





取付穴寸法図
CUTOUT DIMENSIONS



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、セムスネジB M4×20を使用のこと。
壁の厚さ（A）は11≦A≦14とする。それ以外の壁に装備する場合、使用するネジ長さは（A+7.8）±2とする。
筐体にはネジ部（B）を8mm以上入れないこと。（B≦8）

NOTE 1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE SEMS SCREWS M4x20 FOR FIXING THE UNIT.
THICKNESS A: 11≦A≦14 OR SCREW LENGTH: (A+7.8)±2.
DO NOT FASTEN SCREWS INTO UNIT MORE THAN 8 mm (B≦8).

DRAWN Dec. 19 '02 T.YAMASAKI			TITLE IC-215
CHECKED Dec. 20 '02 Y.KIMURA			名称 ターミナルユニット（埋込装備）
APPROVED Dec. 20, '02 Y. Kimura		FELCOM 15	外寸図
SCALE 1/5	MASS 3.9 ±10% kg		NAME TERMINAL UNIT (FLUSH MOUNT)
DWG No. C5635-G03-C		16-018-3106-3	OUTLINE DRAWING

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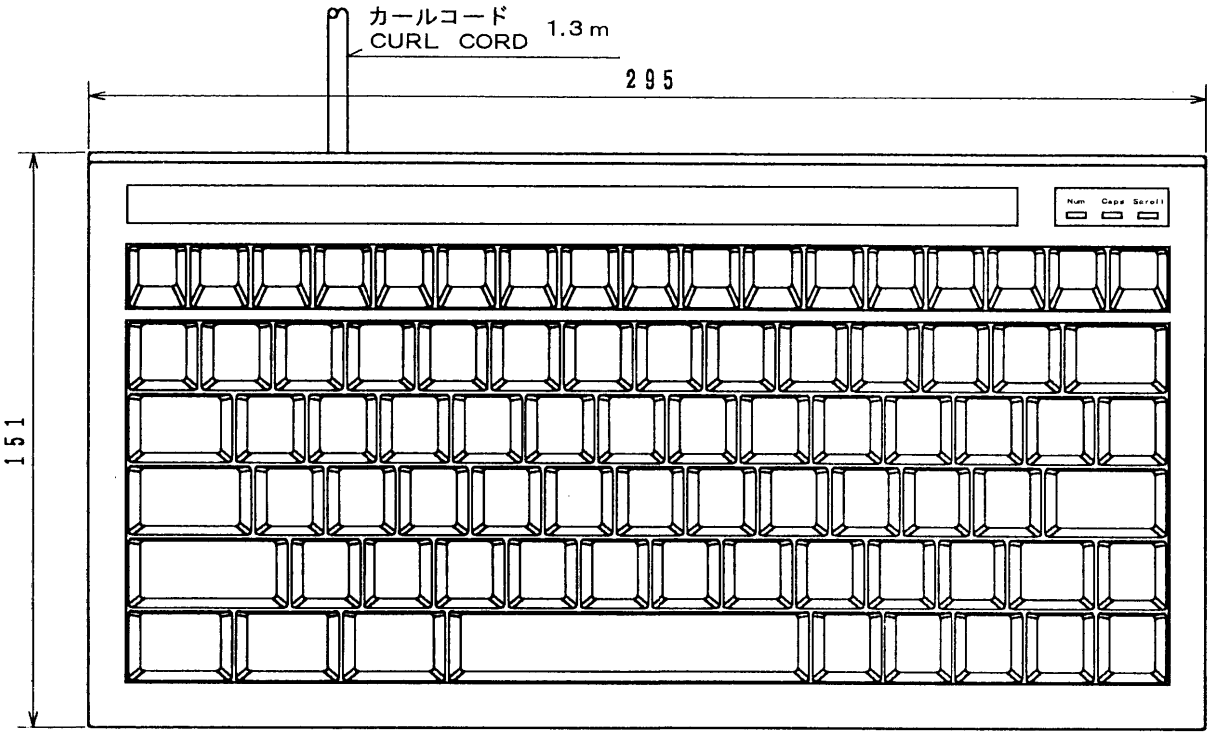
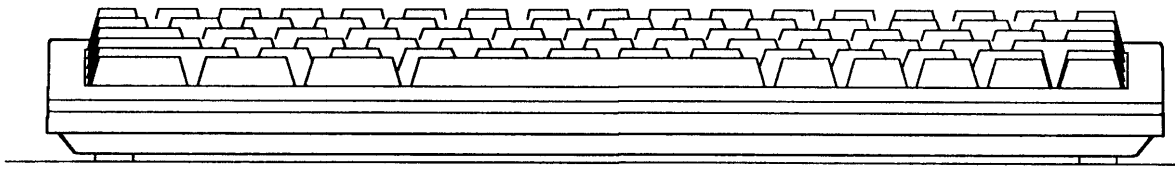
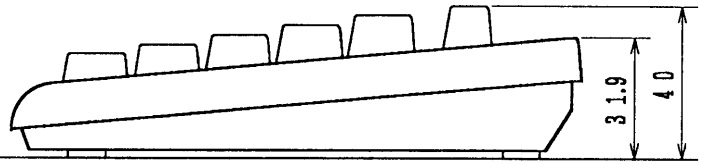
D-3

FURUNO







DRAWN Dec. 5'97 T.YAMASAKI			TITLE BTC-5100C PS/2
CHECKED Dec 5'97 K.Matsumoto			名称 キーボード
APPROVED Dec 5'97 H.Yamaguchi			外 寸 図
SCALE 1/2 MASS 0.7 kg			NAME KEYBOARD
DWG No. C5609-G05- B			OUTLINE DRAWING

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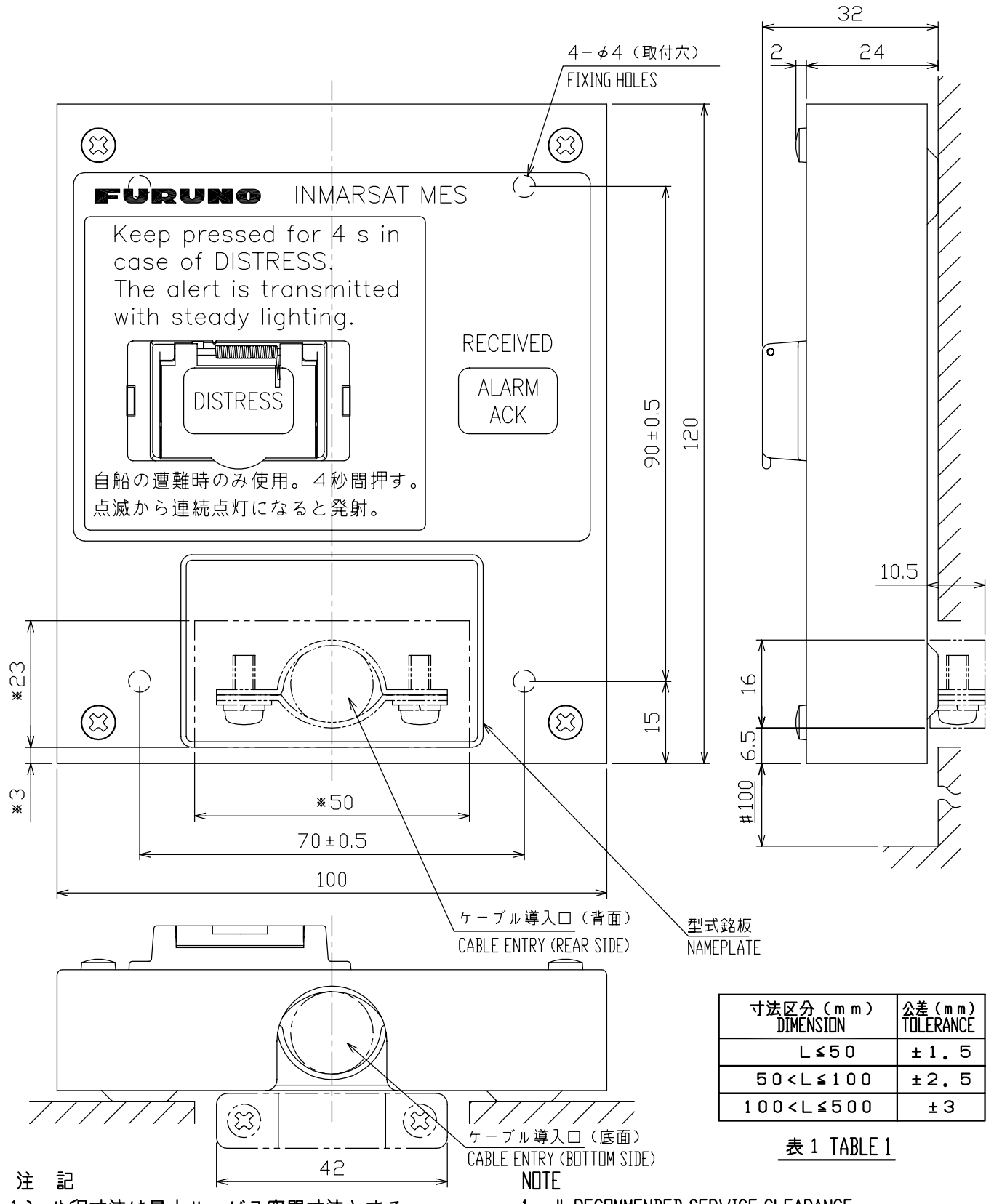


寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表１ TABLE 1

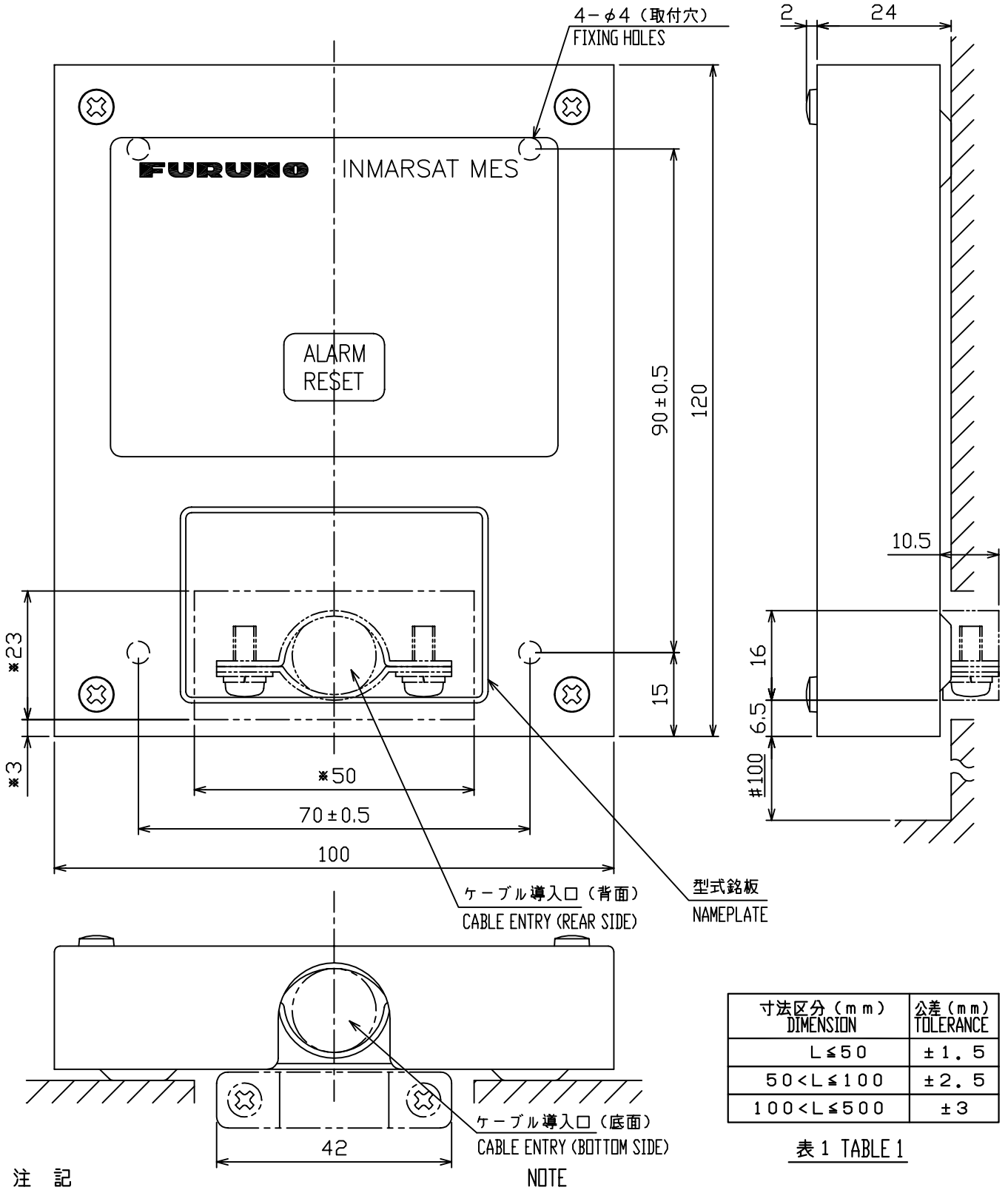
注　記

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＋タッピンネジ３×１０を使用のこと。
４） ※印寸法は、背面からのケーブル導入穴寸法。

NOTE

1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 3x10 FOR FIXING THE UNIT.
4. ※: CUTOUT DIMENSIONS FOR REAR SIDE CABLE ENTRY.

DRAWN July 11 '03 T.YAMASAKI			TITLE IC-305
CHECKED July 14 '03 T.Matsuguchi			名称 遭難警報器
APPROVED July 14'03 T.Matsuguchi		FELCOM 15/16	外寸図
SCALE 1/1	MASS 0.34 ±10% kg		NAME DISTRESS ALERT/RECEIVED CALL UNIT
DWG No. C5635-G04- B		16-018-400G-1	OUTLINE DRAWING



寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1．5
50<L≦100	±2．5
100<L≦500	±3

表 1 TABLE 1

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＋タッピンネジ３×１０を使用のこと。
4）※印寸法は、背面からのケーブル導入穴寸法。

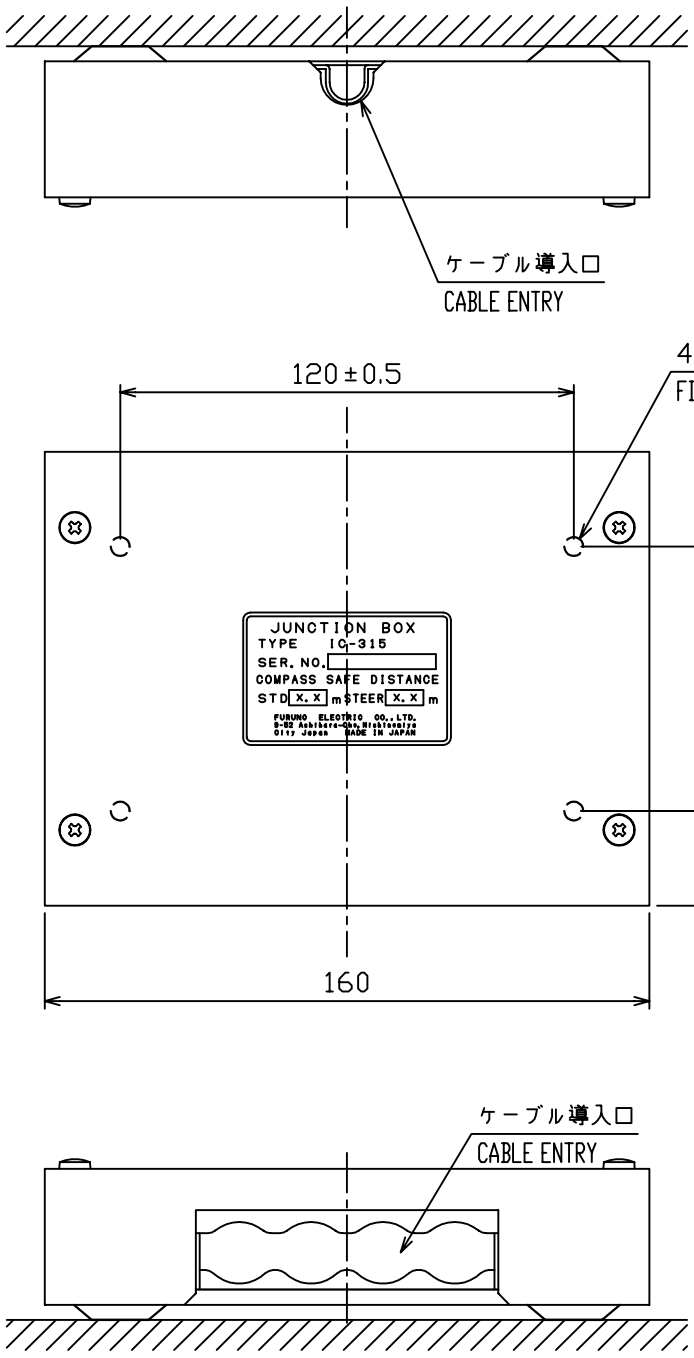
NOTE

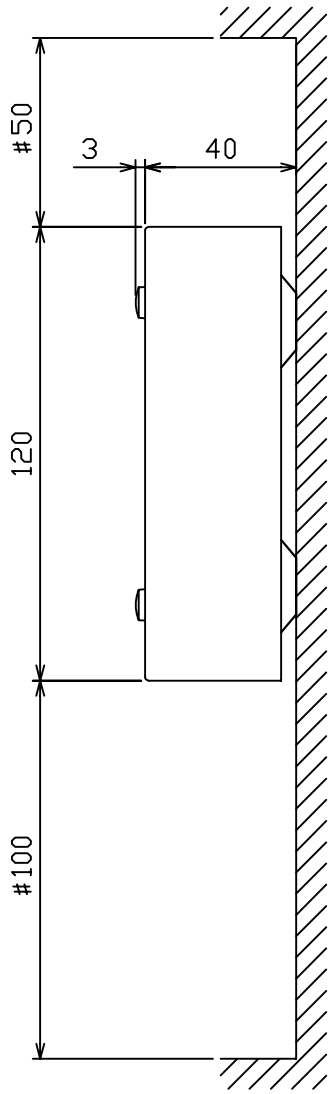
1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 3x10 FOR FIXING THE UNIT.
4. ※: CUTOUT DIMENSIONS FOR REAR SIDE CABLE ENTRY.

DRAWN Dec. 19 '02 T.YAMASAKI			TITLE IC-306
CHECKED Dec. 19 '02 Y.KIMURA			名称 アラームユニット
APPROVED Dec. 20, '02 Y. Kimura		FELCOM 15/16	外寸図
SCALE 1/1	MASS 0.33 ±10% kg		NAME ALARM UNIT
DWG No. C5635-G05- B		16-018-500G-1	OUTLINE DRAWING

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

表 1 TABLE 1



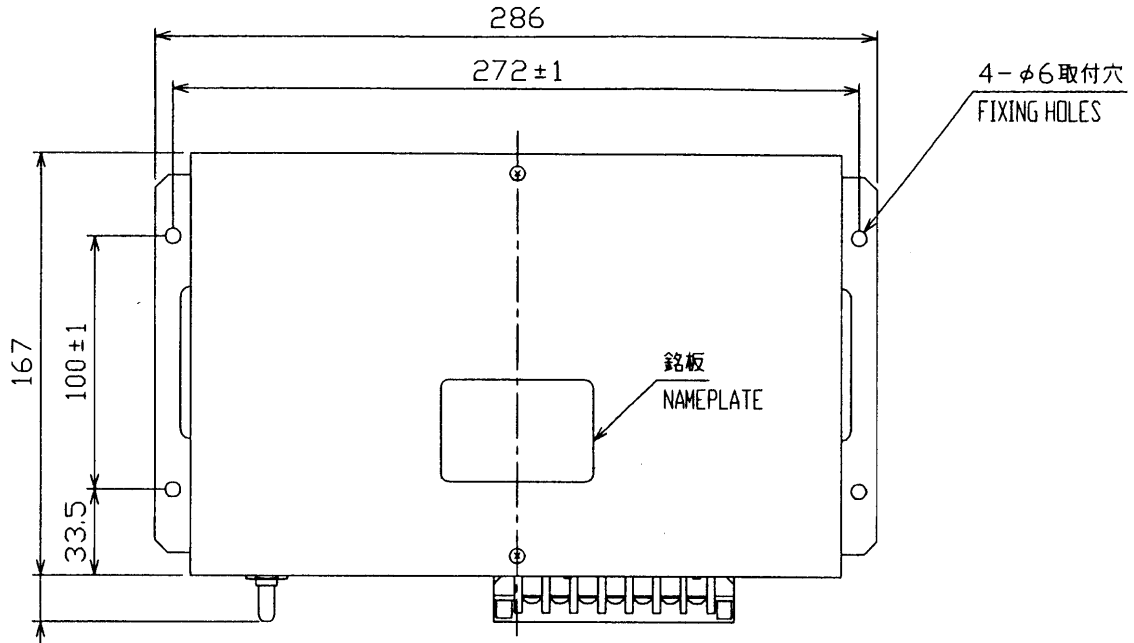


注　記　1）＃印寸法は最小サービス空間寸法とする。
　　2）指定外の寸法公差は表１による。
　　3）取付用ネジは＋タッピンネジ呼び径４を使用のこと。

NOTE　1. #: RECOMMENDED SERVICE CLEARANCE.
　　2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
　　3. USE TAPPING SCREWS φ4 FOR FIXING THE UNIT.

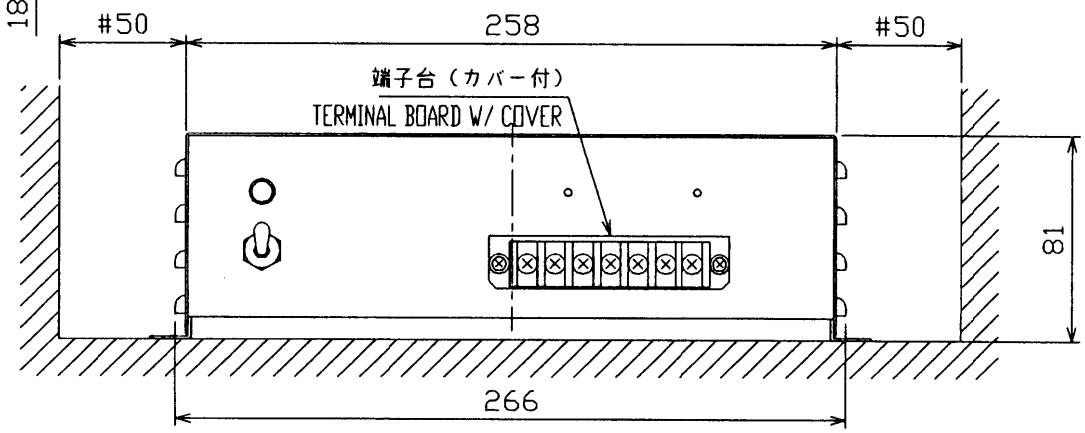
DRAWN Dec. 19 '02 T.YAMASAKI			TITLE IC-315
CHECKED Dec. 20 '02 Y.KIMURA			名称 ケーブル接続箱
APPROVED Dec. 20, '02 Y. Kimura		FELCOM 15	外寸図
SCALE 1/2	MASS 0.68 ±10% kg		NAME JUNCTION BOX
DWG No. C5635-G06- B		16-018-6006-1	OUTLINE DRAWING

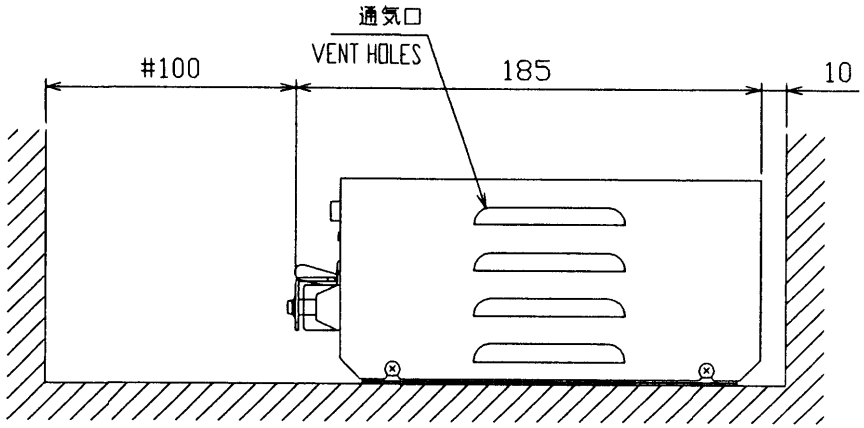
FURUNO



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

表 1 TABLE 1





注　記　1）指定なき寸法公差は表1による。
2）#印寸法は推奨する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.
2. #: RECOMMENDED SERVICE CLEARANCE.
3. USE TAPPING SCREWS 4x16 FOR FIXING THE UNIT.

DRAWN Mar.8'02 T.YAMASAKI			TITLE PR-240
CHECKED Mar.8'02 Y.K			名称 AC/DC電源ユニット
APPROVED Mar.8'02 Y.K			外寸図
SCALE 1/3	MASS 2.8 ±10% kg		NAME AC/DC POWER SUPPLY UNIT
DWG No. C5003-G03-D	24-003-500G-2		OUTLINE DRAWING

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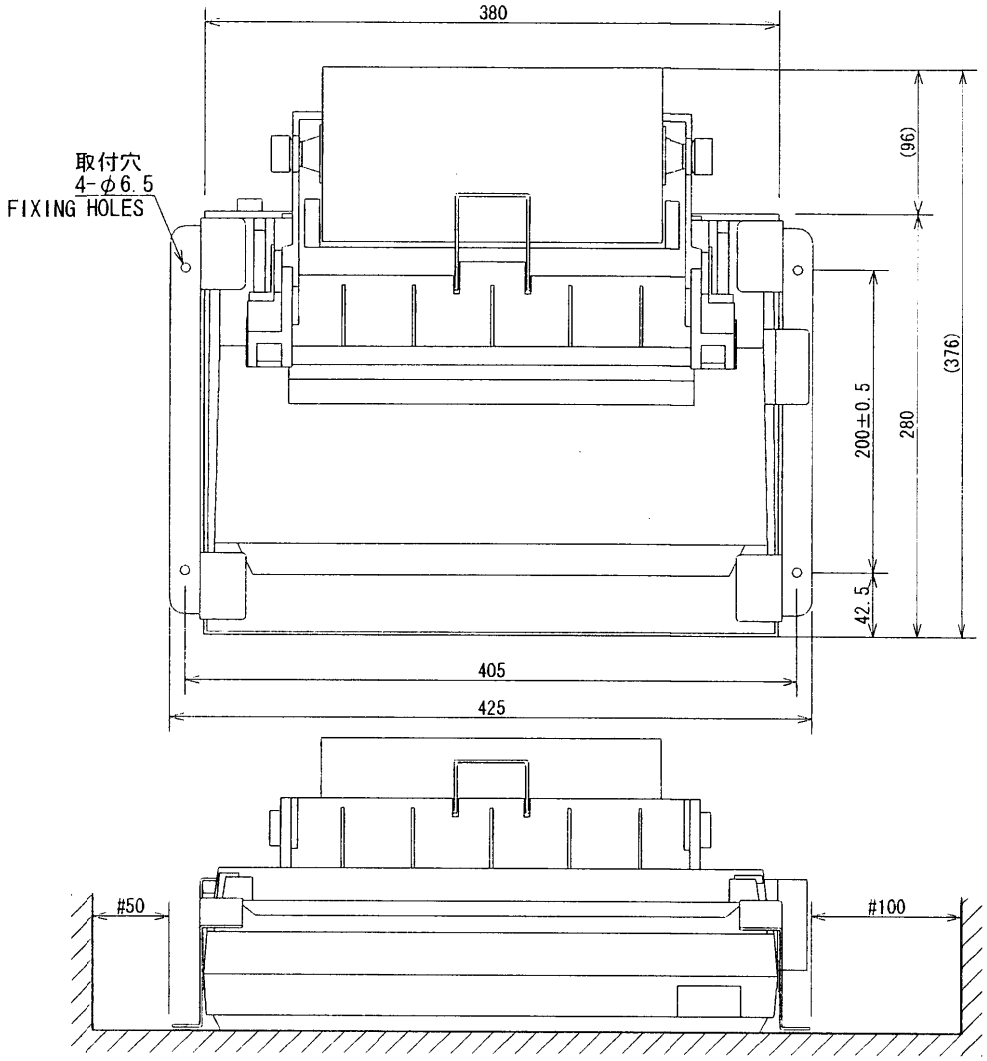
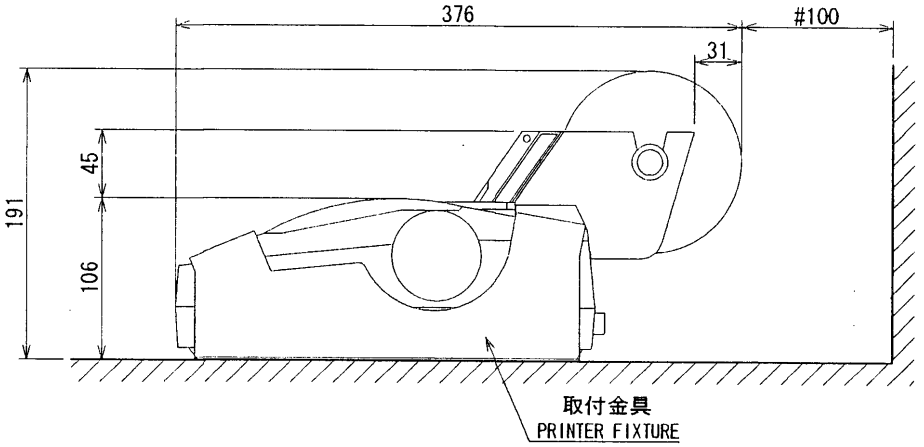


寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
0 ＜ L ≦ 50	±1．5
50 ＜ L ≦ 100	±2．5
100 ＜ L ≦ 500	±3

表 1
TABLE 1



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Ｍ６ボルトまたはコーチボルト呼び径６を使用のこと。

NOTE　1. #: RECOMMENDED SERVICE CLEARANCE.
　　2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
　　3. USE M6 BOLTS OR COACH BOLTS φ6 FOR FIXING UNIT.

DRAWN July 26'00 T.YAMASAKI			TITLE PP-510
CHECKED July 27'00 T.K			名称 プリンタ
APPROVED July 27'00 T.K			外寸図
SCALE 1/5	MASS ±10% 3.8 kg		NAME PRINTER
DWG. No. C5589-G08- H		16-007-660G- 2	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

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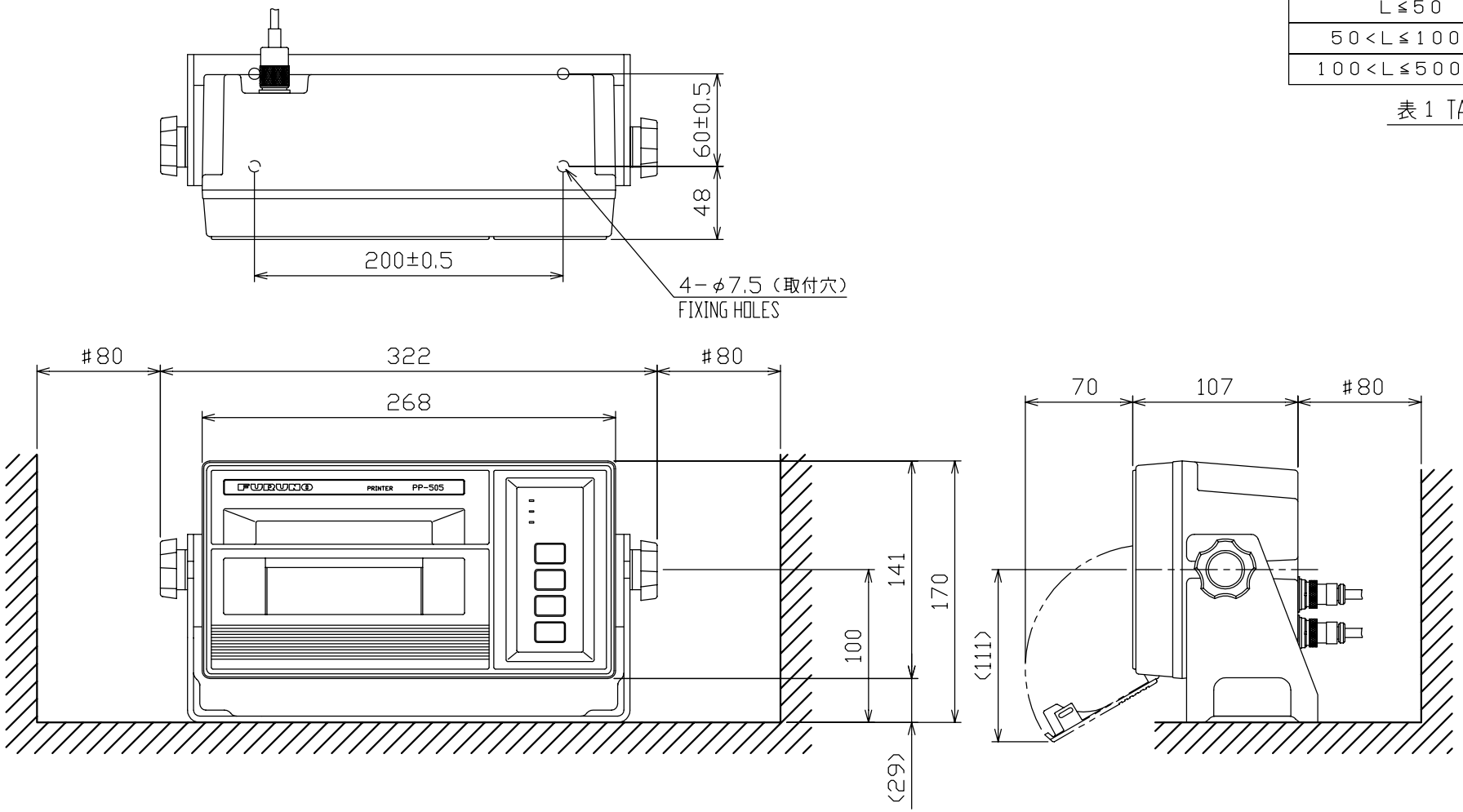
寸法区分（ｍｍ）DIMENSION	公差（mm）TOLERANCE
L≦50	±1．5
50<L≦100	±2．5
100<L≦500	±3

表 1 TABLE 1



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。

NOTE　1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
　　2. #: RECOMMENDED SERVICE CLEARANCE.

DRAWN May 15 '03 T.YAMASAKI		TITLE	PP-505
CHECKED May 20 '03 S.Asaumi		名称	EGCプリンタ/プリンタ（卓上装備）
APPROVED May 21 '03 T.Matsuguchi			外寸図
SCALE 1/4	MASS 2.9 ±10% kg	NAME	EGC PRINTER/ PRINTER (TABLETOP MOUNT)
DWG.No. C5540-G03- C	16-010-005G-0		OUTLINE DRAWING

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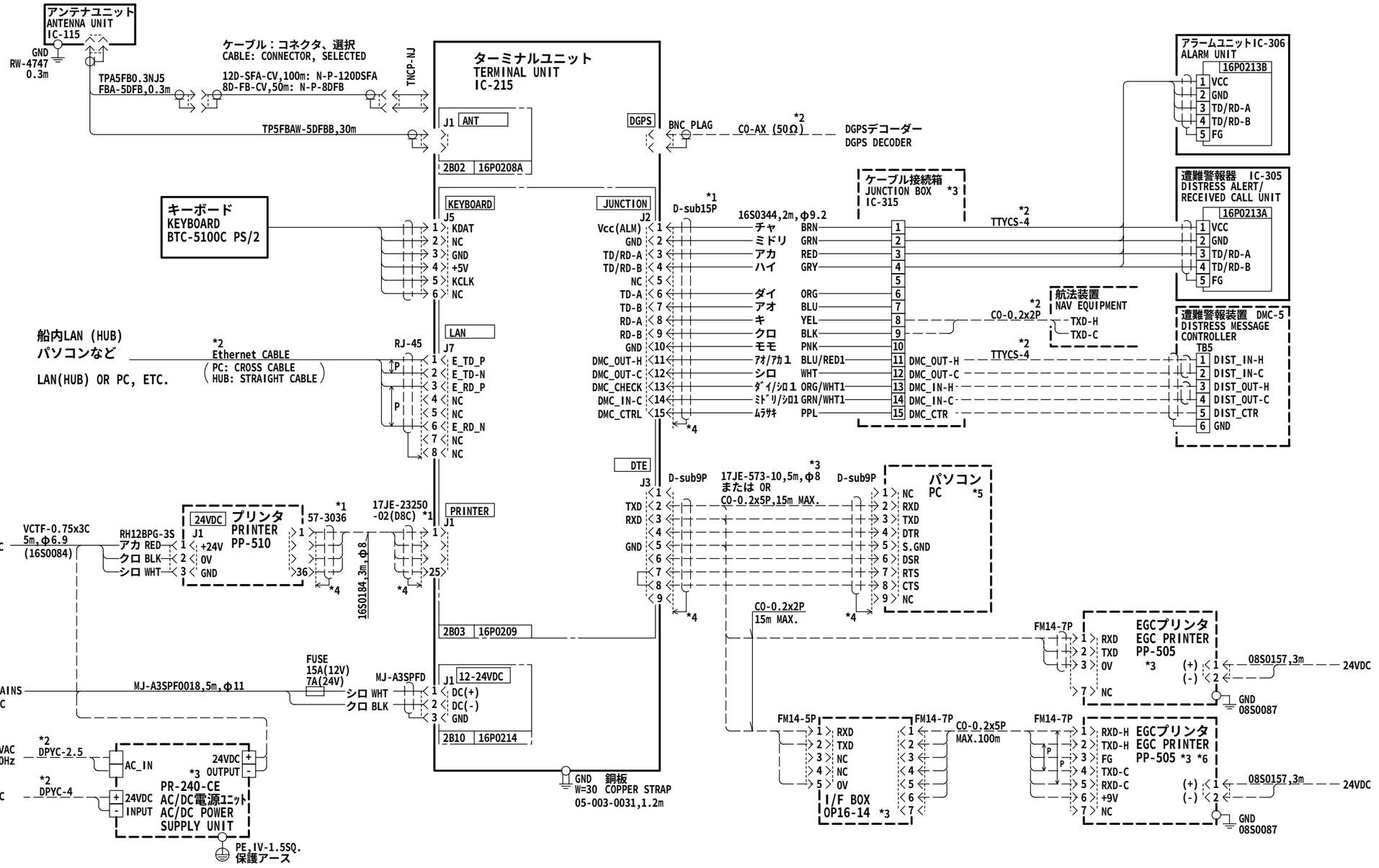
S - 1



注記
＊1）工場にて取付済み。
＊2）造船所手配。
＊3）オプション。
＊4）コネクタクランプでアースに落とす。
＊5）ユーザー手配。
＊6）TB基板（16P0116）が必要。

NOTE
*1. FITTED AT FACTORY.
*2. SHIPYARD SUPPLY.
*3. OPTION.
*4. GROUND THRU CONNECTOR CLAMP.
*5. USER SUPPLY.
*6. TB BOARD (16P0116) REQUIRED.

CO-0.2x2P: CO-SPEVV-SB-C 0.2x5P,φ10.5
CO-0.2x5P: CO-SPEVV-SB-C 0.2x5P,φ13.5

DRAWN Apr. 4 '03 T.YAMASAKI			TITLE FELCOM 15
CHECKED Apr. 4 '03 T.MATSUGUCHI			名称 インマルサットC船舶地球局
APPROVED Apr. 14 '03 T.Matsuguchi			相互結線図
SCALE	MASS kg		NAME INMARSAT-C MES
DWG No. C5635-C01- D			INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.