

FURUNO

Installation Manual
INMARSAT FLEET F77
SHIP EARTH STATION FELCOM 70

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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 4 meters 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 | distance |
|--------------------------------------|----------|
| 100W/m ² | nil |
| 25W/m ² | 2.0 m |
| 10W/m ² | 4.0 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 equipment damage. The voltage rating appears on the label at the rear of the display unit.

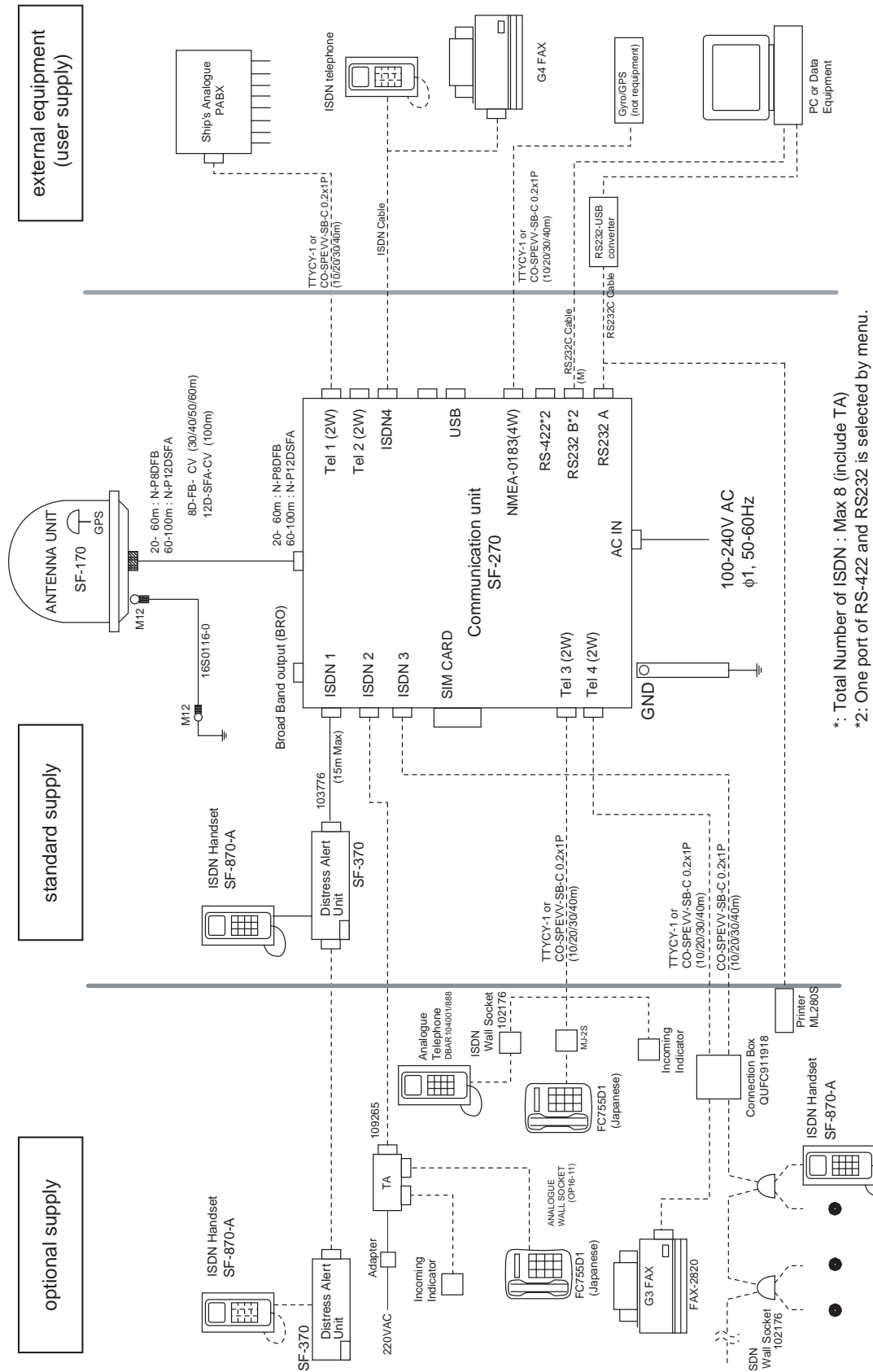
Use the correct fuse.

Use of a wrong fuse can cause fire or equipment damage.

Keep the following compass safe distances.

| | Standard | Steering |
|---------------------|----------|----------|
| Antenna Unit | 0.65 m | 0.30 m |
| Communication Unit | 1.00 m | 0.60 m |
| Distress Alert Unit | 0.30 m | 0.30 m |
| ISDN Handset | 0.70 m | 0.50 m |
| Facsimile | 1.30 m | 0.80 m |
| Telephone | 0.50 m | 0.40 m |

SYSTEM CONFIGURATION



*: Total Number of ISDN : Max 8 (include TA)
 *2: One port of RS-422 and RS232 is selected by menu.

EQUIPMENT LISTS

Standard Supply

| Name | Type | Code No. | Qty | Remarks |
|------------------------|-------------|-------------|-----|--------------------------------------|
| Antenna Unit | SF-170 | | | |
| Communication Unit | SF-270 | - | 1 | |
| ISDN Handset | SF-870-A | - | 1 | |
| Distress Alert Unit | SF-370 | - | 1 | |
| Installation Materials | CP16-02800 | 000-043-251 | 1 | Power cable for communication unit |
| | CP16-02801 | 001-058-410 | 1 | Cable bands for cables |
| | CP16-02701* | 004-446-480 | 1 | for antenna unit |
| | CP16-02700 | 000-043-209 | 1 | Cable 8D-FB-CV (30m), CP16-02702* |
| | CP16-02710 | 000-043-210 | | Cable 8D-FB-CV (50m), CP16-02702* |
| | CP16-02730 | 000-043-470 | | Cable 8D-FB-CV (60m), CP16-02702* |
| | CP16-02720 | 000-043-219 | | Cable 12D-SFA-CV (100m), CP16-02703* |
| | CP16-02740 | 000-043-526 | | Cable 8D-FB-CV (40m), CP16-02702* |
| | CP16-02900 | 000-043-445 | 1 | Signal cable for Distress alert unit |
| Spare Parts | SP16-01501* | 004-446-470 | 1 | for antenna unit |
| | SP16-01601* | 004-447-160 | 1 | Fuses for communication unit |
| Accessories | FP16-02000 | 000-011-678 | 1 | CD-ROM for communication unit |
| | FP16-02100 | 000-011-787 | 1 | For ISDN handset |

*: See lists at the back of this manual.

Optional Supply

| Name | Type | Code No. | Qty | Remarks |
|---------------------|-------------------------|-------------|-------|-------------------------------|
| Facsimile | FAX-2820 | - | 1 set | w/CP16-03500* |
| Drum Unit | DR-20J | 000-157-272 | 1 | For FAX-2820 |
| Toner Cartridge | TN-25J | 000-157-273 | 1 | For FAX-2820 |
| Telephone | FC755D1 | - | 1 set | w/CP16-00511, 00512* |
| Antenna Cover | QB05-1801 | 100-079-480 | 1 | |
| Modular Jack Box | OP16-10 | 000-043-278 | 1 | Box type |
| | OP16-11 | 000-043-279 | 1 | Flush mount type |
| Modular Jack Set | OP16-13 | 000-043-228 | 1 | |
| Lifting Materials | OP16-32 | 004-447-730 | 1 | Lifting rope and shackles |
| 2-pair cable | CO-SPEVV-SB-C 0.2x2P | 000-120-792 | 1 | For ISDN connection, 10m |
| | | 000-120-794 | | For ISDN connection, 20m |
| | | 000-120-214 | | For ISDN connection, 30m |
| | | 000-132-827 | | For ISDN connection, 40m |
| | | 000-132-826 | | For ISDN connection, 50m |
| 1-pair cable | CO-SPEVV-SB-C 0.2x1P | 000-110-681 | 1 | For Analog Telephone, 10m |
| | | 000-138-789 | | For Analog Telephone, 20m |
| | | 000-138-790 | | For Analog Telephone, 30m |
| | | 000-138-791 | | For Analog Telephone, 40m |
| | | 000-138-792 | | For Analog Telephone, 50m |
| Analogue Telephone | DBAR 104001/888 | 000-147-693 | 1 | |
| Terminal Adapter | 109265 | 000-169-708 | 1 | |
| ISDN Wall Socket | 102176 | 000-147-699 | 1 | |
| ISDN Handset | SF-870-A | 000-043-252 | 1 | |
| Connection Box | QUFC911918 | 000-147-700 | 1 | |
| Distress Alert Unit | SF-370 | - | 1 | |
| Incoming Indicator | KK-893-3977 | 000-148-478 | 1 | For analogue telephone line |
| Printer | ML280S | - | 1 | Serial Printer, w/CP16-03400* |

*: See lists at the back of this manual.

1. PLANNING

1.1 Placing the antenna unit

General

FELCOM 70 is delivered either with mast mounted or deck mounted radome. The mast mounted version includes a hatch which provides access for service and repair, whereas the deck mounted version must be lifted down. Interfering objects (especially metallic objects such as 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

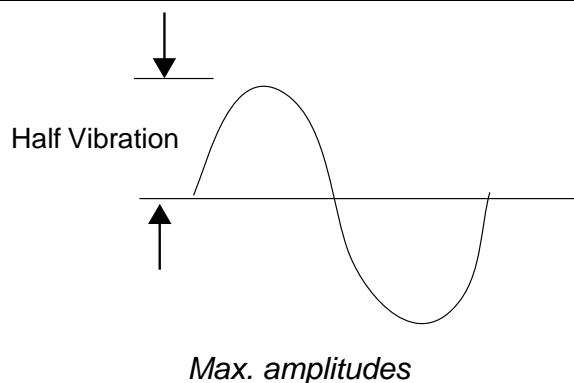
The ideal mounting location secures an unobstructed path between the antenna unit and the satellites, from horizontal to zenith. In other words, whatever the direction the antenna unit is pointing there are no interfering objects within the main beam (16 degrees). While this might be feasible on some vessels, on others it is impossible due to space considerations. The antenna unit should be located at least 3 meters away from masts having a diameter less 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 at the top of the next page. Consult with the shipyard to determine the mounting location which meets the requirements shown in the table.

The table at the top of the next page is taken from Inmarsat's System Definition Manual (SDM) and defines frequency and maximum vibration amplitude.

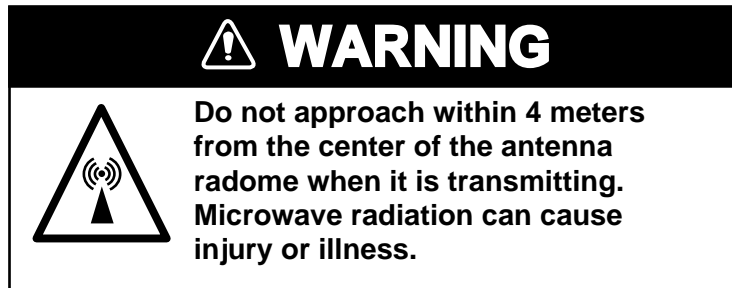
| Freq. Range | Max. Amplitude |
|-------------|---------------------------------------|
| 4 to 10 Hz | 2.54 mm (max. 9.8 m/s ²) |
| 10 to 15 Hz | 0.76 mm (max. 6.86 m/s ²) |
| 15 to 25 Hz | 0.40 mm (max. 9.8 m/s ²) |
| 25 to 33 Hz | 0.23 mm (max. 9.8 m/s ²) |



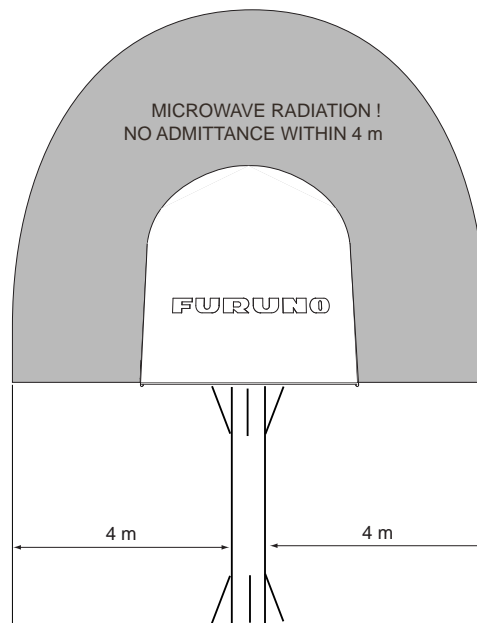
Locate away from passengers and crew

Radio waves can be harmful to the human body. Since safe distances vary by country and ship construction there is no uniform formula for calculating safe distance. However, below are general guidelines.

- Personnel should not approach an area in which the radiation level is higher than 10 W/m², i.e., within 4 m from the center of the antenna unit.



Construct a protection fence around the antenna unit in order that personnel can not approach the antenna unit within 4 m. Also, 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 4 m from the antenna unit.



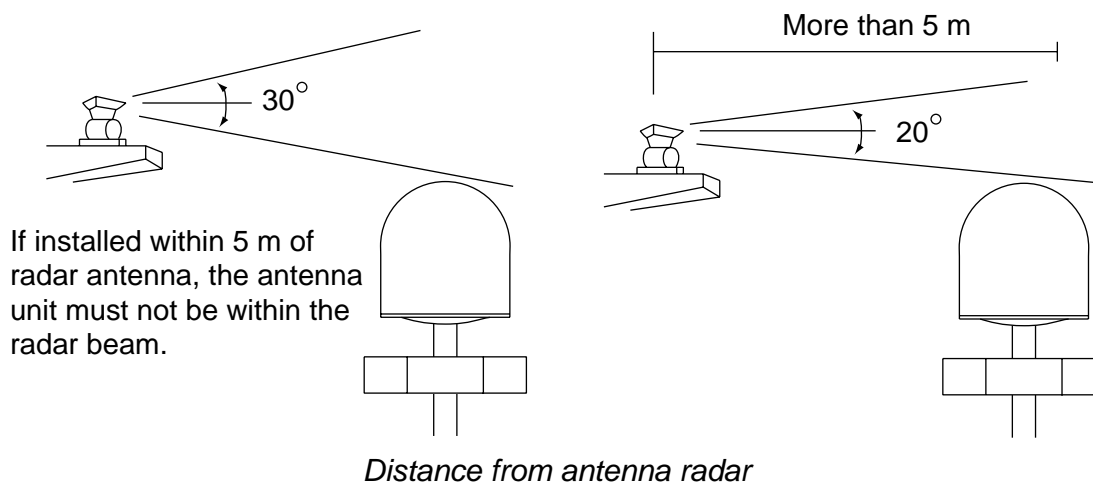
Minimum distance from other antennas

HF antennas, communication/navigation antennas:

The FELCOM 70 antenna should be at least 5 meters from a HF antenna. VHF, satellite navigation antenna and other communication antennas should be at least 4 meters away.

Radar:

The FELCOM 70 antenna should be at least 5 meters away to protect the low noise amplifier in the radar antenna. However, if this distance cannot be secured be sure the FELCOM 70 antenna unit is not within the radar beam.



Compass safe distance

Locating the antenna unit too close to a compass can affect compass performance. The compass safe distance is 0.65 meters, steering compass, 0.30 meters, standard compass.

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.

1.2 Designing antenna mast

General

To facilitate servicing, construct a mast more than 1 meter in height from the deck. The paragraphs which follow provide guidelines for selection and construction of the mast. Refer to the drawing at back of this manual.

Guardrail, platform

When the mast is tall, fit it with a guardrail and platform (or steps), for serviceman's safety and convenience.

For servicing ease, the distance between hatch and the deck (or platform) to the antenna unit should be about 1 meter. (In most installations the serviceman stands on the platform while checking the radome. Thus this distance should be secured for ease of servicing.) The guardrail should be as high as possible for sufficient safety.

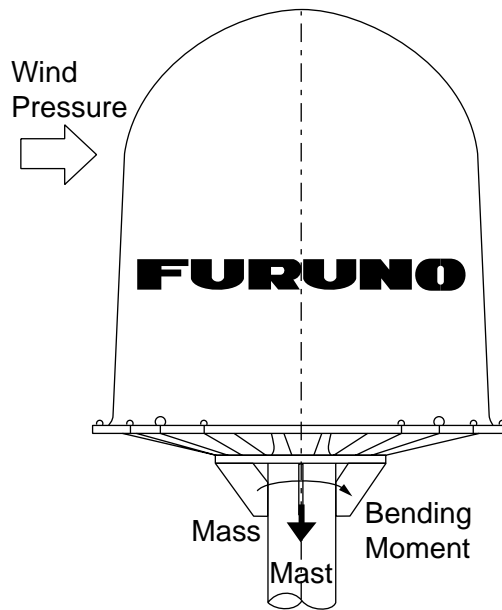
1. PLANNING

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 of ice and snow. Special consideration should be given if the unit is operated in areas of heavy snow or freezing temperature.
- Mast bending moment must be able to withstand expected maximum pitching, rolling and wind pressure.

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



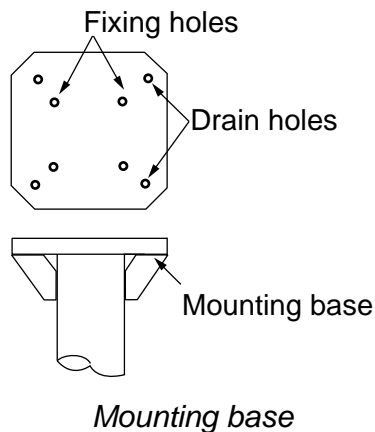
Fixing radome

| Item | Mass |
|--|-------------|
| Antenna unit mass | 65 kg ± 10% |
| Platform, guardrail mass | |
| Expected ice and snow | |
| Maximum wind pressure (at wind speed 75 m/s) | 2080 N |
| Maximum bending moment (at wind speed 75 m/s) | 1248 N•m |
| Maximum bending moment (at wind speed 75 m/s, rolling angle 30 degrees) | 1440 N•m |
| Maximum bending moment (at wind speed 75 m/s, rolling angle 30 degrees including 0.5 G speed added by rolling.) | 1630 N•m |

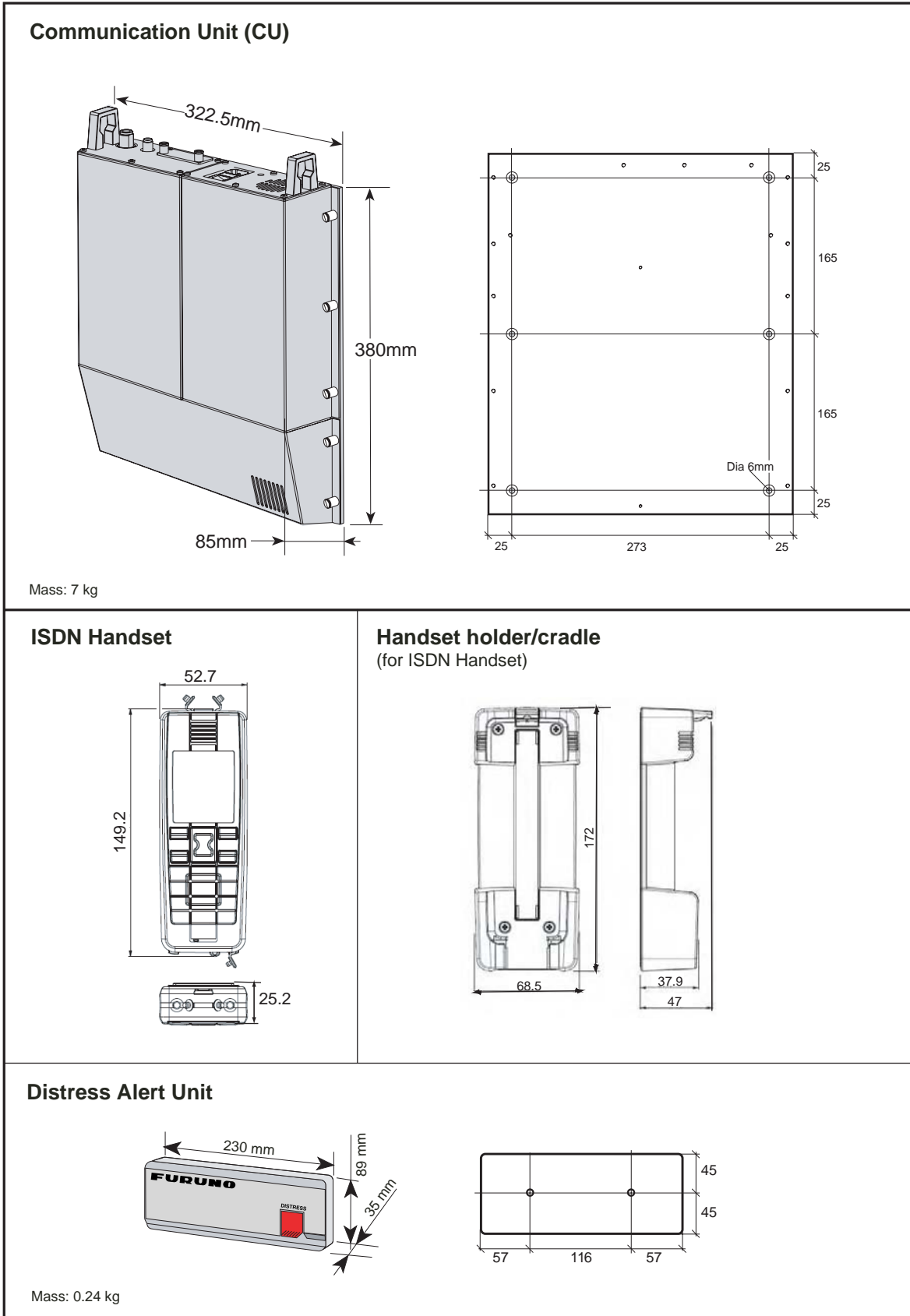
Mounting base

A mounting base is installed between the mast and the antenna unit. Below are guidelines for installation of the mounting base.

1. The face of the mounting base should be flat as possible (tolerance: within 2 millimeters of the horizontal plane).
2. The mounting base should be parallel with ship's horizontal plane (tolerance: ± 1 degree).
3. The fixing bolts of the mounting base should be parallel with the ship's keel line (tolerance: ± 2 degrees).
4. Weld a ground bolt (stainless steel, M10x40, local supply) to the mast within 50 cm of the ground terminal on the antenna unit. The length of the ground wire (supplied) is 50 cm.
5. Make four holes on the mounting base to face drain holes of the antenna unit. See outline drawing at the back of this manual.

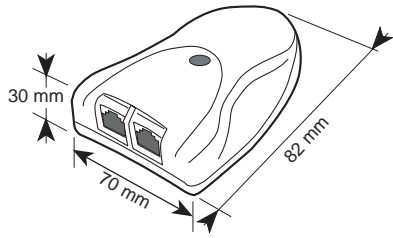


1.3 Physical characteristics of units

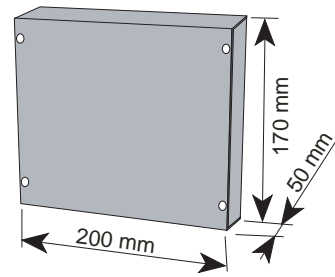


Units: mm

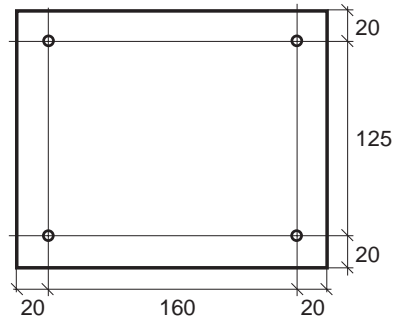
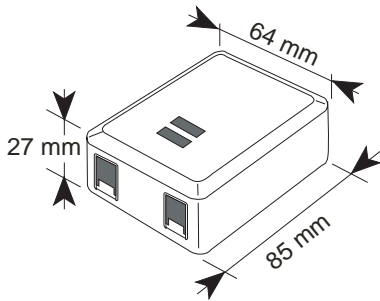
**ISDN wall socket
(option)**



**Connection box
(option)**

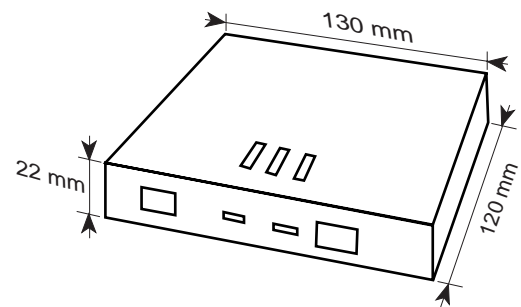


**Incoming indicator
(option)**



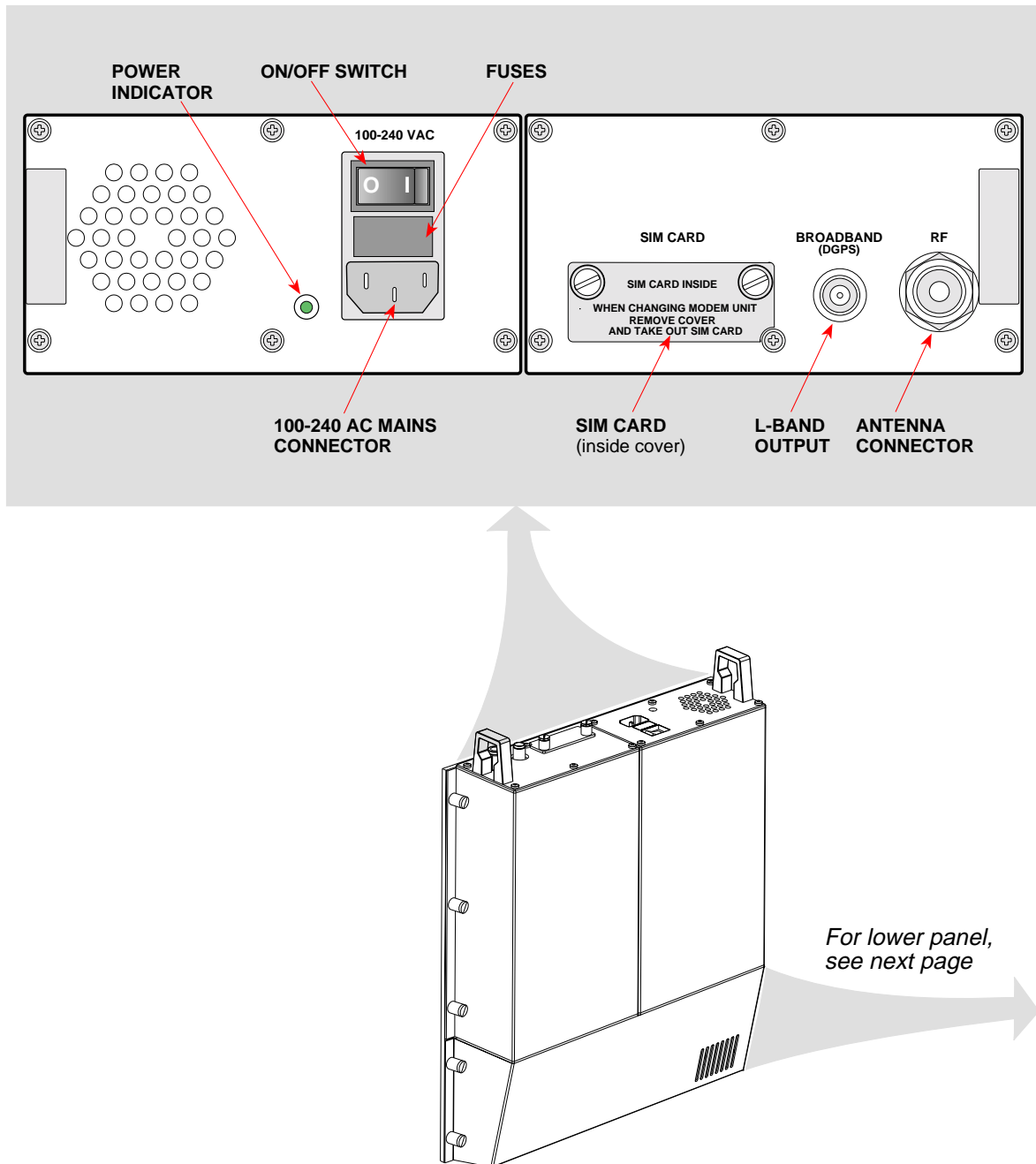
Mass: 0.6 kg

**Terminal Adapter
(option)**

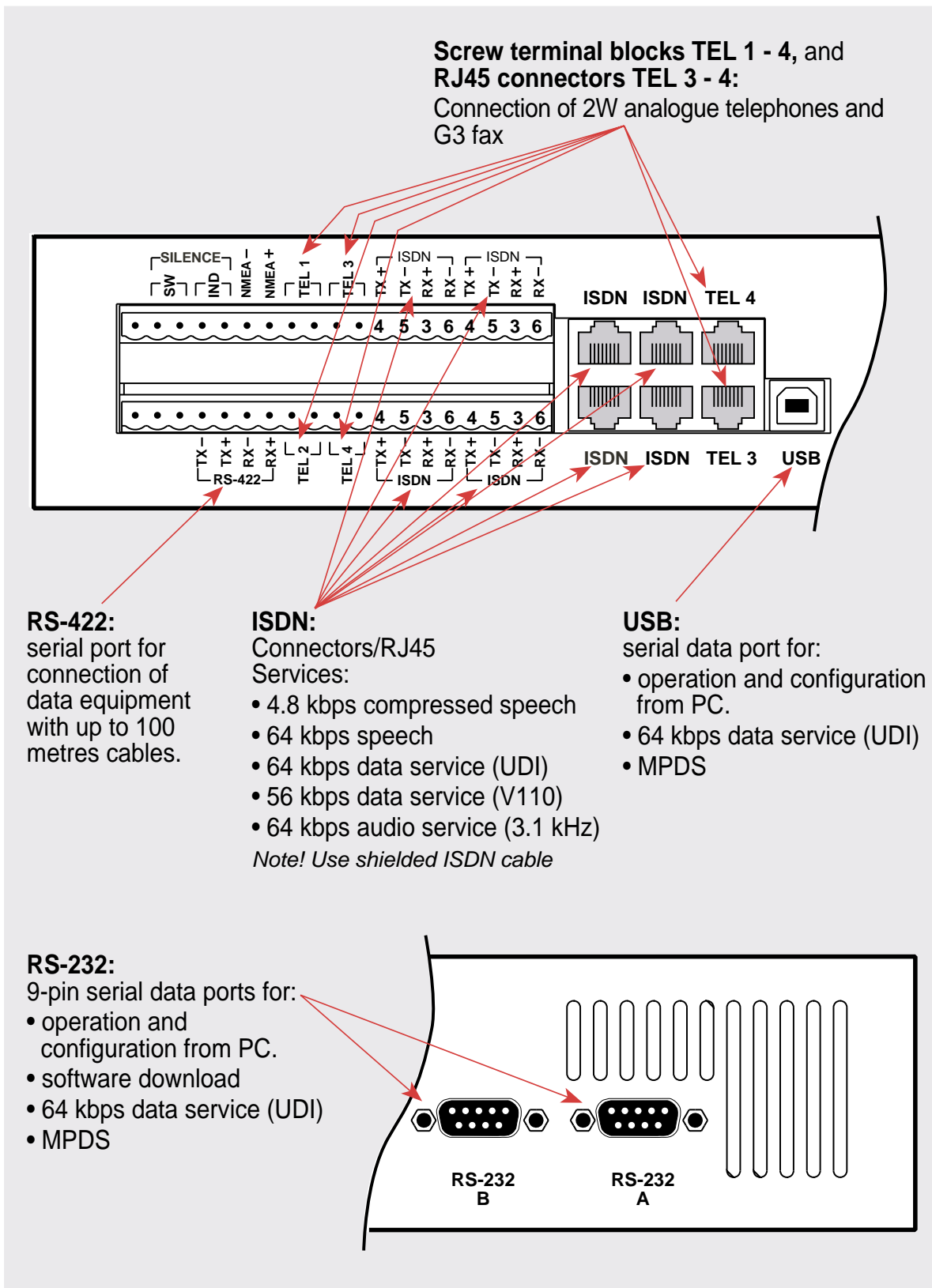


1.4 CU connectors

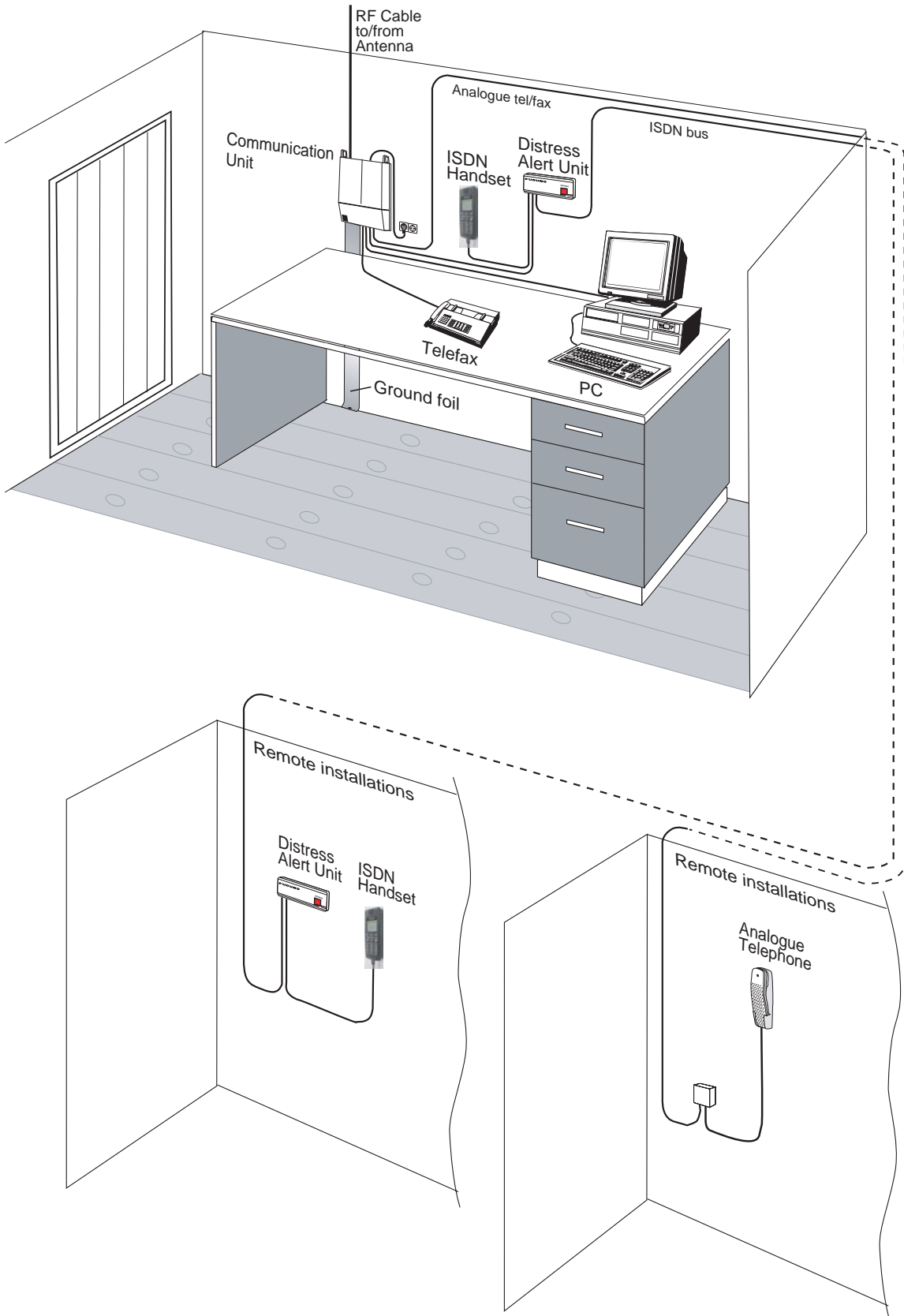
Upper connector panel



Lower connector panel

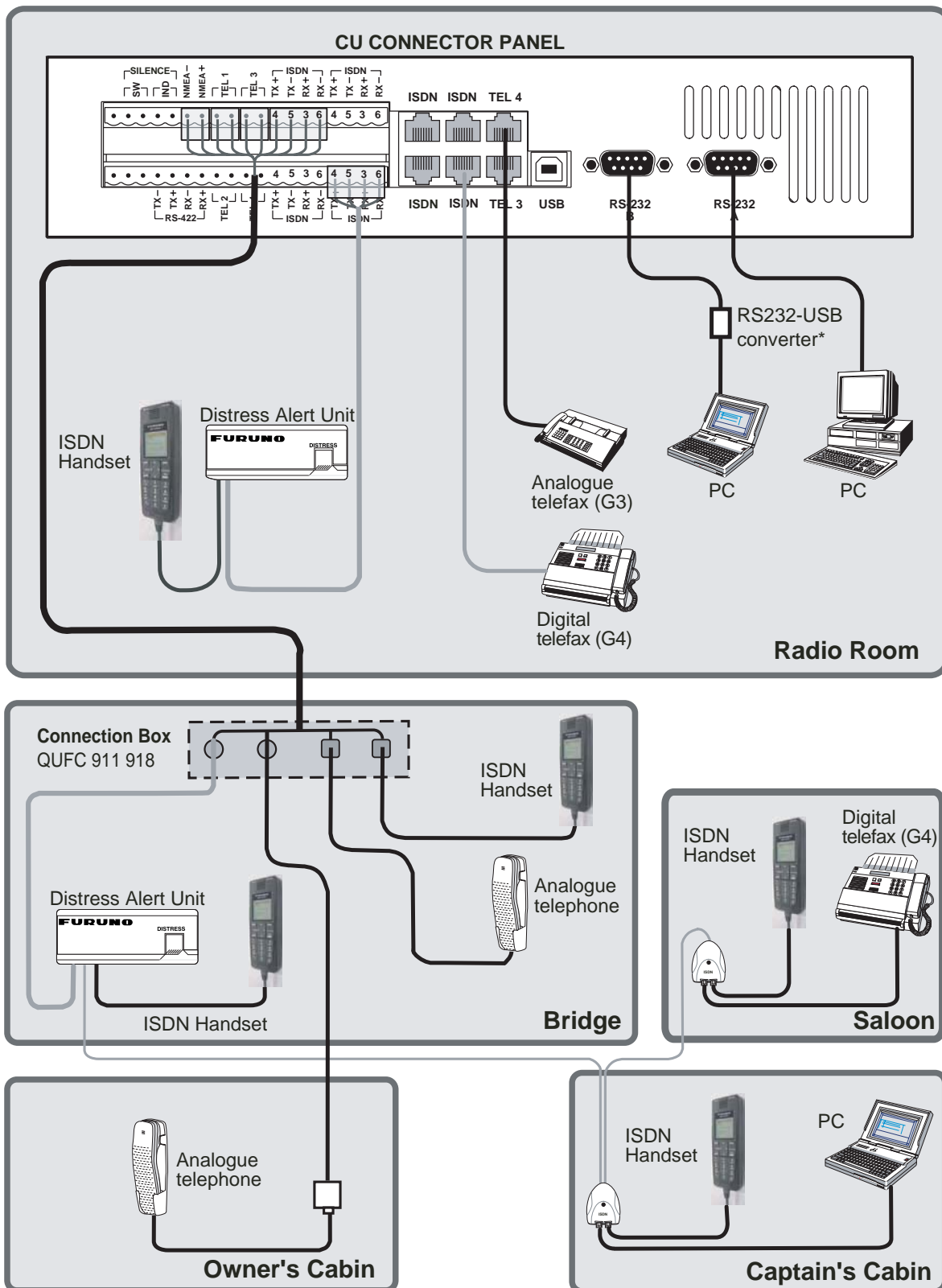


1.5 Example of installation



Example of cabling arrangement

The installation includes five ISDN Handsets (two w/Distress Alert Unit), Group 3 and 4 telefaxes, PC w/printer, Data Equipment and two Analogue Telephones.



*: Recommended RS-232-USB Converter : USB-RSAQ2 by I-O DEVICE INC.

1.6 Placing units

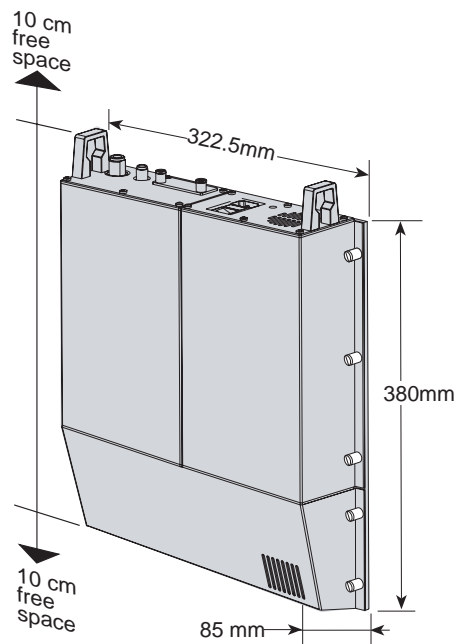
Placing the Communication Unit (CU)

The Communication Unit should be placed in a ventilated area. To ensure adequate cooling of the CU a 10 cm unobstructed space must be maintained above and below the unit. A space of 10 cm above the CU is also required to allow removal of units.

For grounding, see "1.7 Grounding considerations" on page 14 and "Location and grounding of units" on page 23.

Ambient temperature range 0° - 45°C.

The CU is manufactured as a cabinet for wall or desktop installation with dimensions as shown. Six holes through the CU mounting plate allows the unit to be secured to the wall or desk top.



Placing the Distress Alert Unit & ISDN Handset

The Distress Alert Unit is operated in conjunction with an ISDN Handset.

The ISDN Handset functions as a display and communication unit for alert transmission.

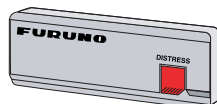
It may also be used for normal voice communication.

Up to two (2) Distress Alert Units & ISDN Handsets may be connected in series. The units may be installed anywhere onboard the vessel.

Four separate ISDN ports are available on the CU as RJ45 jacks or screw terminal blocks.

Max cable length: 100 m, 4 x 0.22 mm².

See "ISDN telephones/equipment" on page 34.



Placing the ISDN Handset as a standard telephone

The ISDN Handsets may be installed as standard telephones. The units may be installed anywhere onboard the vessel.

Four separate ISDN ports are available on the CU as RJ45 jacks or screw terminal blocks.



Placing the telefax (option)

A digital telefax (Group 4) can be connected to one of the ISDN outlets, or to an ISDN bus for transfer at 64 kbps rate.

An analogue telefax (Group 3) should be connected to the FAX (GR3) outlet, providing up to 28.8 kbps transfer speed.

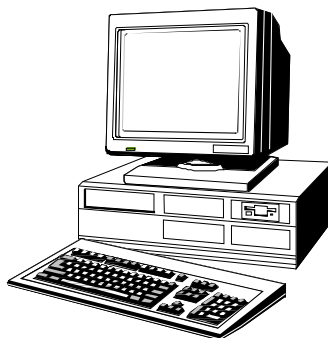
Placing the PC (user supply)

A PC w/ISDN card can be connected to one of the ISDN outlets, or to an ISDN bus for 64 kbps rate data communication for installation up to 100 m away from the CU.

With the PC connected to the USB/RS-232/RS-422 port it can also be used for control and configuration of the Communication Unit.

This requires that the vtLite Marine program accessible on the FELCOM 70 CD is installed. Connection to the USB/RS-232/RS-422 port also allows 64 kbps data transmission.

See *the User Manual*.



Cable lengths:

- ISDN port: See *"ISDN telephones/equipment"* on page 35.
- USB port: 3 m
- RS-232 ports: 3 m
- RS-422 port: 100 m

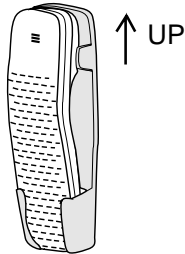
Placing analogue telephones (option)

Analogue 2-wire telephones can be installed anywhere onboard the vessel.

Four separate analogue ports TEL1-TEL3 and FAX (GR.3) are available on the CU.

TEL3 and FAX (Gr.3) are in addition available as RJ45 jacks.

The analogue telephone DBAR 104001/888 (option) should be installed on a bulkhead.



1.7 Grounding considerations

A successful installation of a maritime satellite terminal must take into account the noisy environment in which the equipment shall operate.

Electrical noise

The electrical environment on board a ship is usually quite noisy.

Powerful electrical installations cause voltage variations and transients, as well as low and high frequency noise. Radio and radar equipment radiate radio frequency signals which frequently impregnate cables on board with unwanted interference.

Ground plane

Most ships have a steel hull. One should think that the steel construction of the ship would constitute a good ground plane.

This is often not quite true. Rust, other forms of corrosion, paint and grease, often prevent a good ground connection. A consequence of this is that high energy power distribution on board a ship can cause significant ground potential differences.

Antenna unit

Adequate grounding of the Antenna Unit depends on the fastening bolts making good contact with the top flange of the mast. This is obtained by removing paint and using enclosed toothed washers and nuts.

Antenna cable

The antenna coaxial cable normally has a solid or meshed metal screen which must be terminated to ground both at the antenna pedestal and at the CU. The length of the cable can often be more than 40 metres. If the ground potential level at the two points differ, the current passing through the screen of the coaxial cable can be quite strong. The antenna cable screen constitutes a heavy gauge wire, which is capable of conducting large amounts of current.

Below Deck Equipment

The CU must be provided with a good electrical connection to the ship's hull for grounding. This is obtained by using *copper foil*. (See *Installation: "Location and grounding of units" on page 23.*)

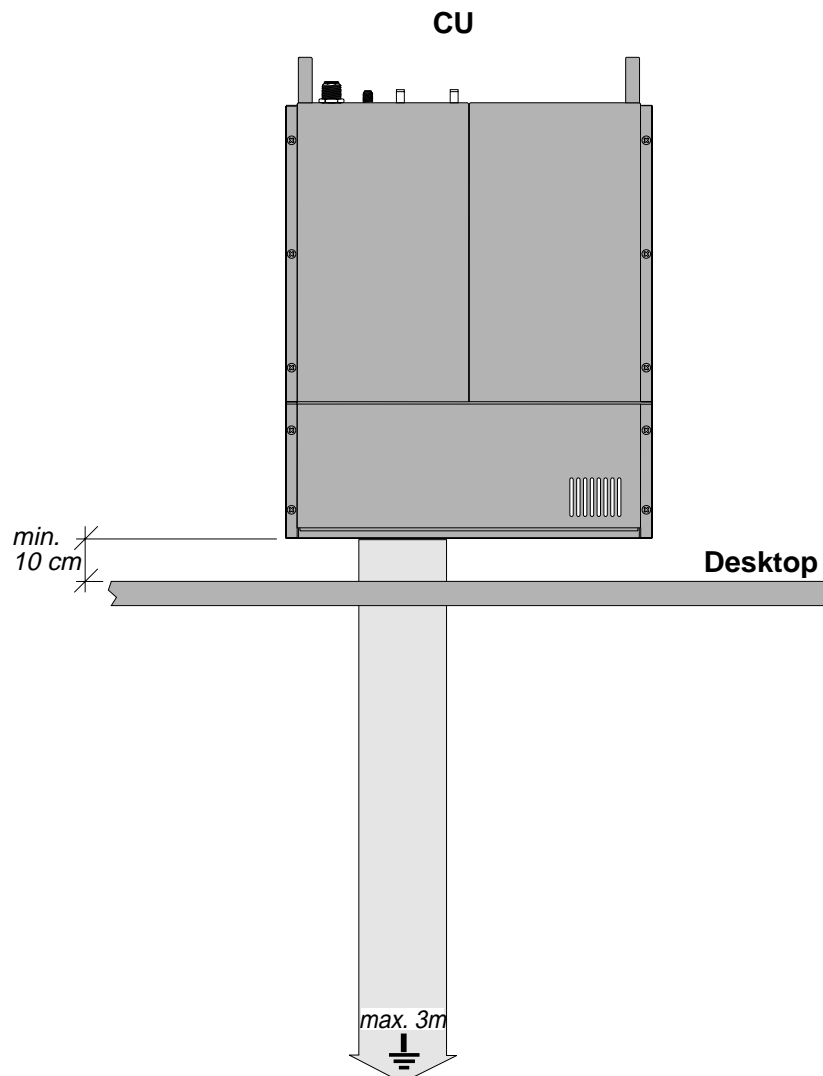
Length of copper foil/10 cm should not exceed 300 cm. The foil should be connected to ship's hull (deck or roof) by hard-soldering (or screws) to steel.

Mains power/ground

Mains ground is secured to the common grounding point through the external supply. It is therefore important to use the same mains branch for additional equipment connected to the CU (Fax, PC w/printer etc.).

Location of the Below Deck Unit for best possible grounding.

See also *INSTALLATION: "Location and grounding of Units" on page 23.*



1.8 Laying cables

General

The coaxial cable for connection between the CU and the Antenna Unit should, if possible, be laid before the equipment arrives. Make sure sufficient length of cable is ordered.

Where exposed to mechanical wear (on deck, through bulkheads etc.), the cable should be protected by steel pipes.

Standard procedures should otherwise be followed for cabling in ship installations.

Special attention to existing safety regulations is required if the cable passes through zones where there may be flammable or explosive gases. Use suitable gasproof cable glands or bushings.

At the Antenna Unit

A free end of approximately 1.5 m of the antenna cable above the radome bottom should be provided for connection to the coaxial connector in accordance with the installation instructions in "**Connecting the antenna cable to the CU**" on page 28.

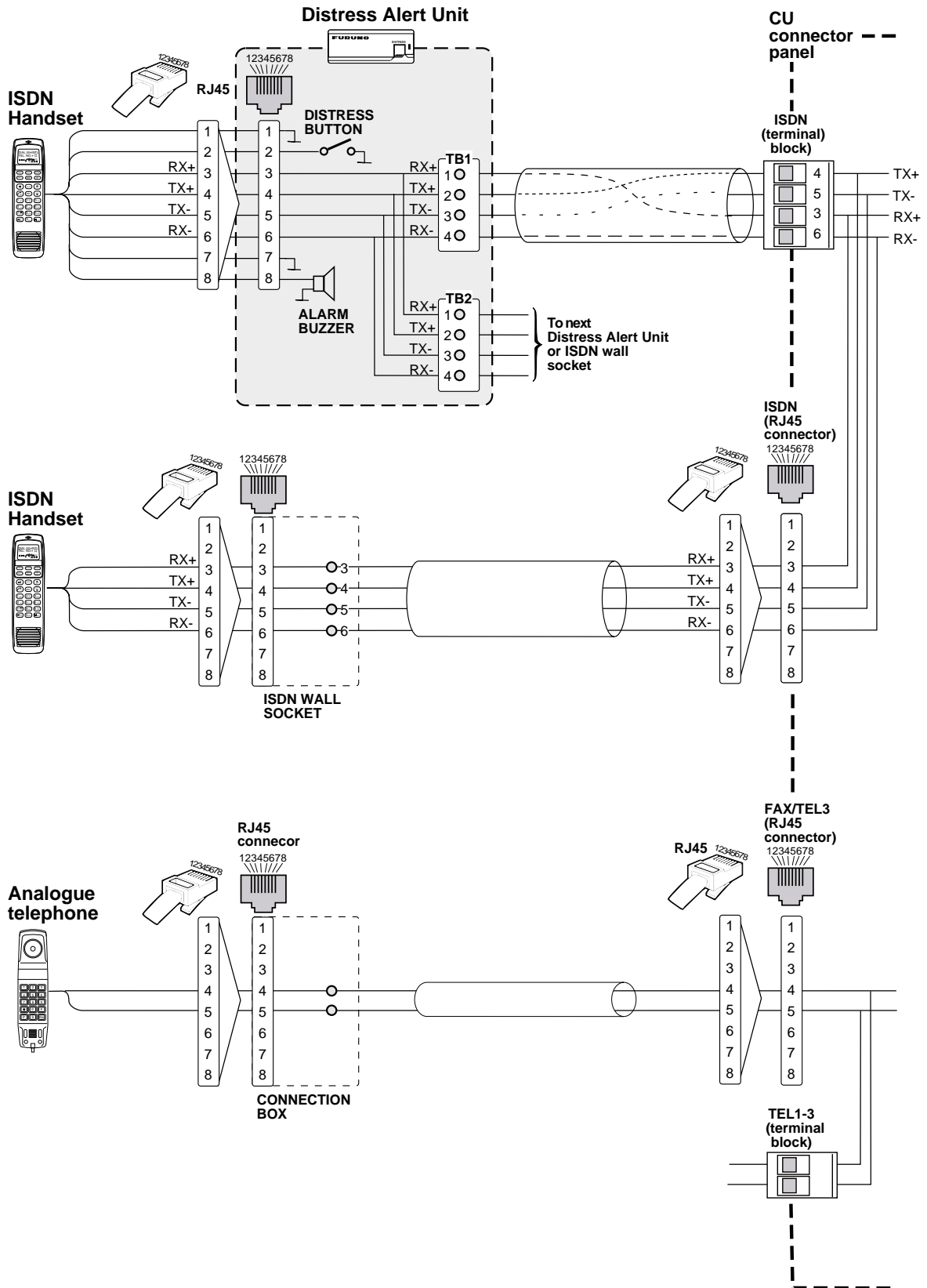
At the Communication Unit

The coaxial cable from the Antenna Unit should be given a free end of approximately 0.5 m at the CU location.

ISDN Telephone, Distress Alert Unit, telefax or analogue telephone

Choose the position for the required wall sockets and lay the cables leaving a free end of 0.5 m. Also allow a free end of 0.5 m at the Connection Box.

1.9 Telephone wiring



2. INSTALLATION

Open all boxes supplied and check the contents with the enclosed packing list. Inspect units and parts for possible transport damage.

2.1 Installing the Above Deck Equipment (ADE)

Unpacking

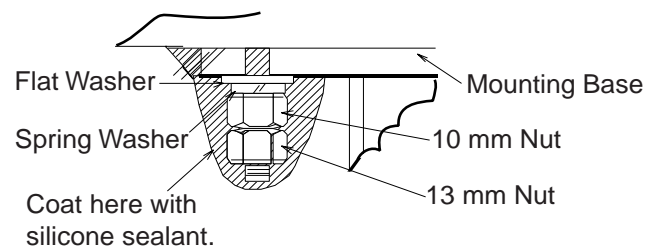
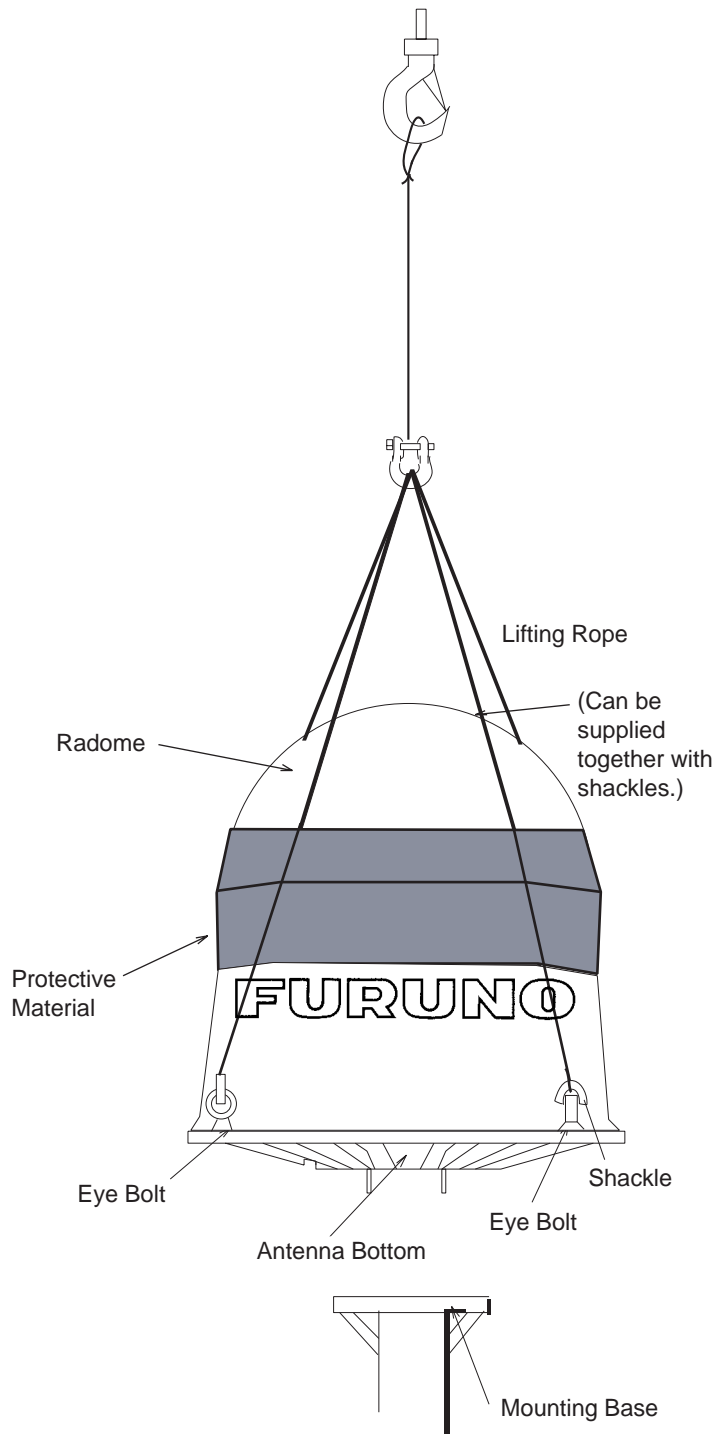
- Check that if the antenna unit is damaged by shipment.
- Unpack the antenna unit carefully so as not to damage it.

Remove hex nut, spring washer, flat washer, large washer and fixing material to dismount the antenna unit. This hardware can be discarded.

Mounting procedure

See next page for illustration

1. Run lifting rope through eye bolts and shackles.
2. Cover the portion of the radome which contacts the lifting rope with protective material (rubber mat, etc.), to prevent damage to the radome when hoisting it to the mounting location.
3. Hoist the antenna unit to the mounting location.
4. Fix the antenna unit to the mounting base (see note on next page) with nuts, keeping in mind hatch direction (standard direction is stern).
5. If necessary, replace eye bolts with hex. bolts (supplied).
6. Coat all bolts and nuts with silicone sealant to prevent electrolytic corrosion.



FIXING OF RADOME

Note: Do not use a rubber gasket on the mounting base. The face of the mounting base should be flat as possible (tolerance: within 2 mm of the horizontal plane). If tolerance is more than 2 mm, insert a metal spacer between the antenna bottom and the mounting base. For earth wiring, see Chapter 2.

2. INSTALLATION

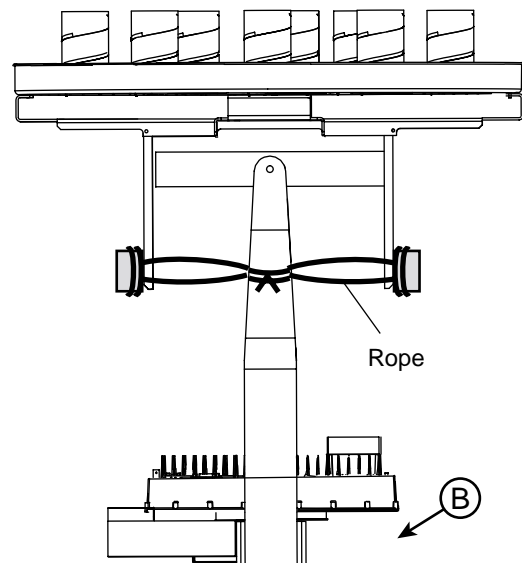
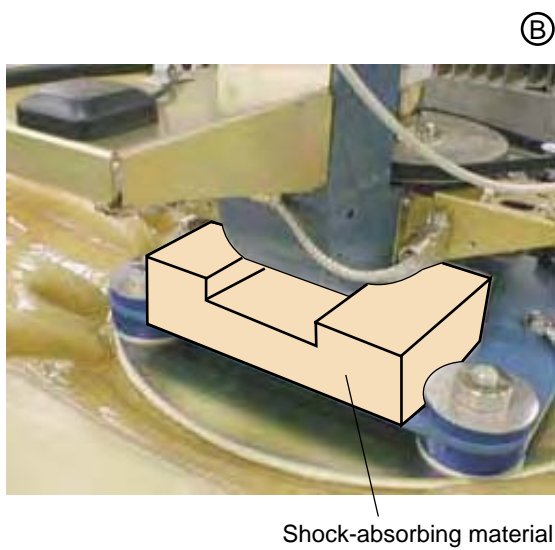
Attach electromagnetic wave caution label

The label which warn of electromagnetic waves is supplied with the installation materials. Attach it, considering to the following points.

- To the radome mast where it can easily be seen.
- In a conspicuous location in the stairwell leading to the deck where the antenna unit is installed.

Removing ropes

The stabilizer in the radome is tied by the rope and shock-absorbing material to prevent damage to it during shipment and installation. Cut and remove them after finishing the installation.



2.2 Connecting antenna cable to ADE

ADE - Connecting antenna cable to Mast Mounted Antenna

- 1 Lead in the antenna cable 1100 mm from the cable entry in the antenna base.
- 2 Fix the cable with cable clamp.
- 3 Connect the coaxial connector and secure it by the cable gland.



Connection the antenna cable in here.

Cable gland

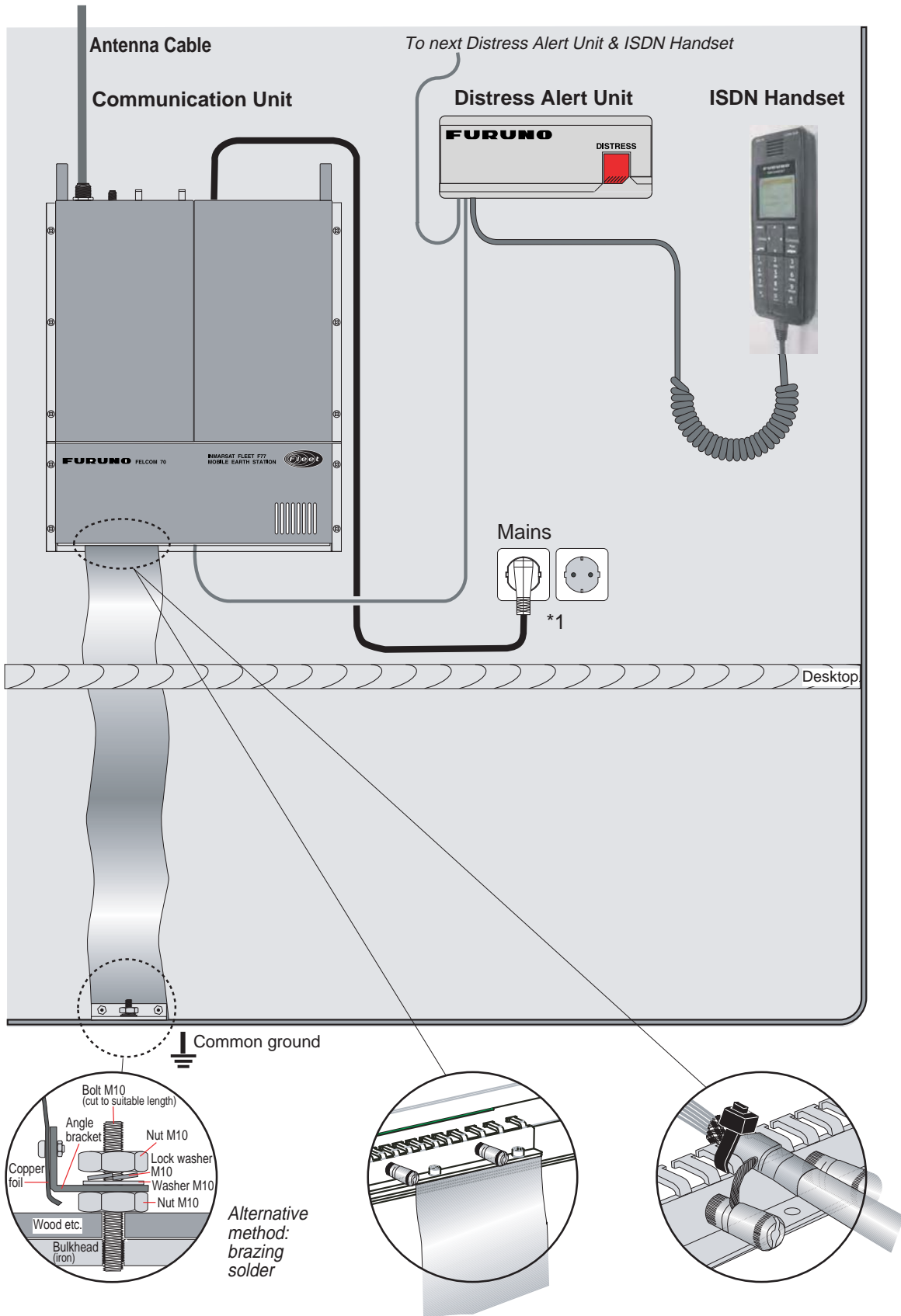
Fasten the cable with cable-tip.

Note: Bending radius "R" can be $R \geq D \times 10$, where as "D" is a diameter of coaxial cable.



2.3 Installing the Below Deck Equipment (BDE)

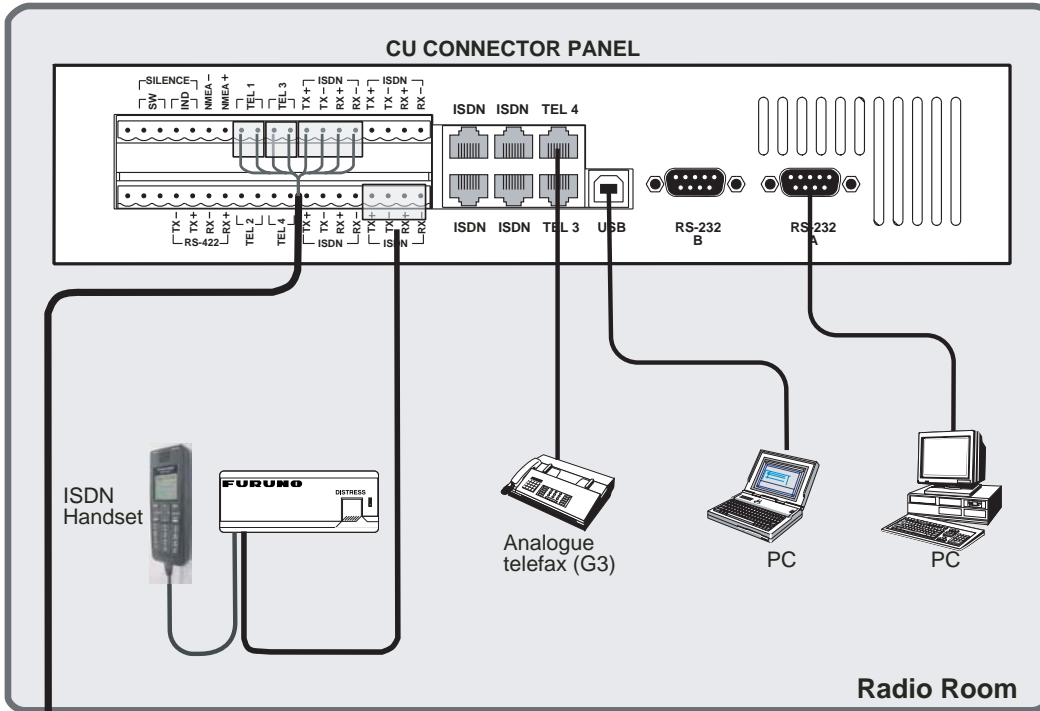
Location and grounding of units



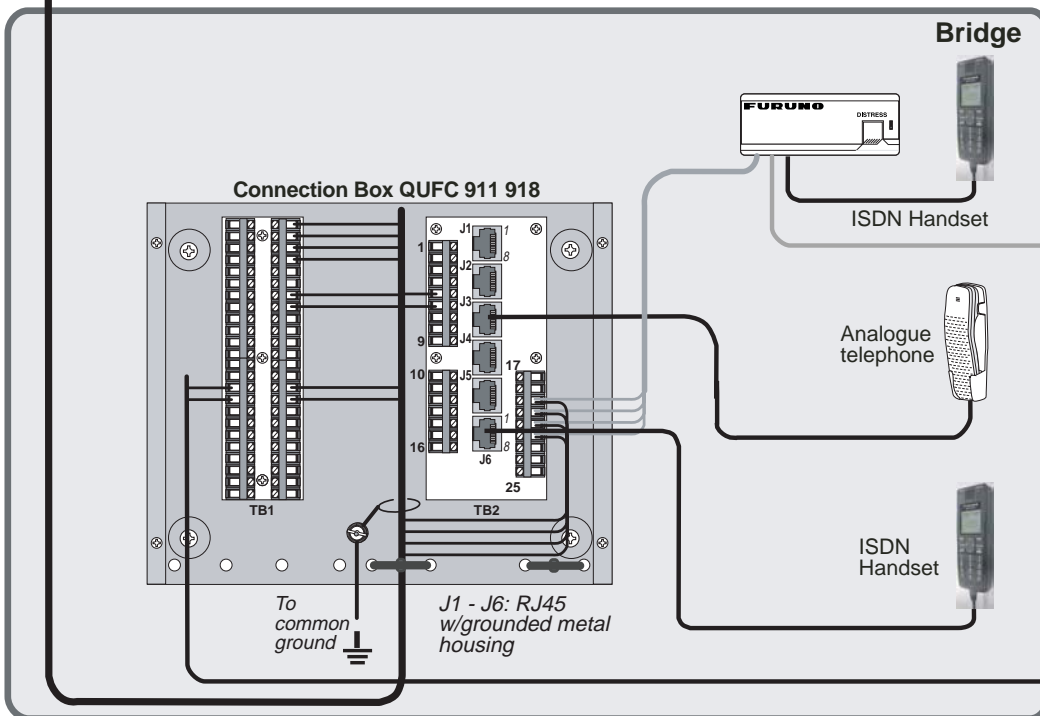
*1: If the AC plug is not mated to a ship's jack, cut the plug and connect to the ship's mains, using a junction box (shipyard supply).

BDE - Example of local or near-by installation

The installation includes five ISDN Handsets (two w/Distress Alert Unit), Group 3 and Group 4 telefaxes, PC and two analogue telephones.



*1
(Next page)

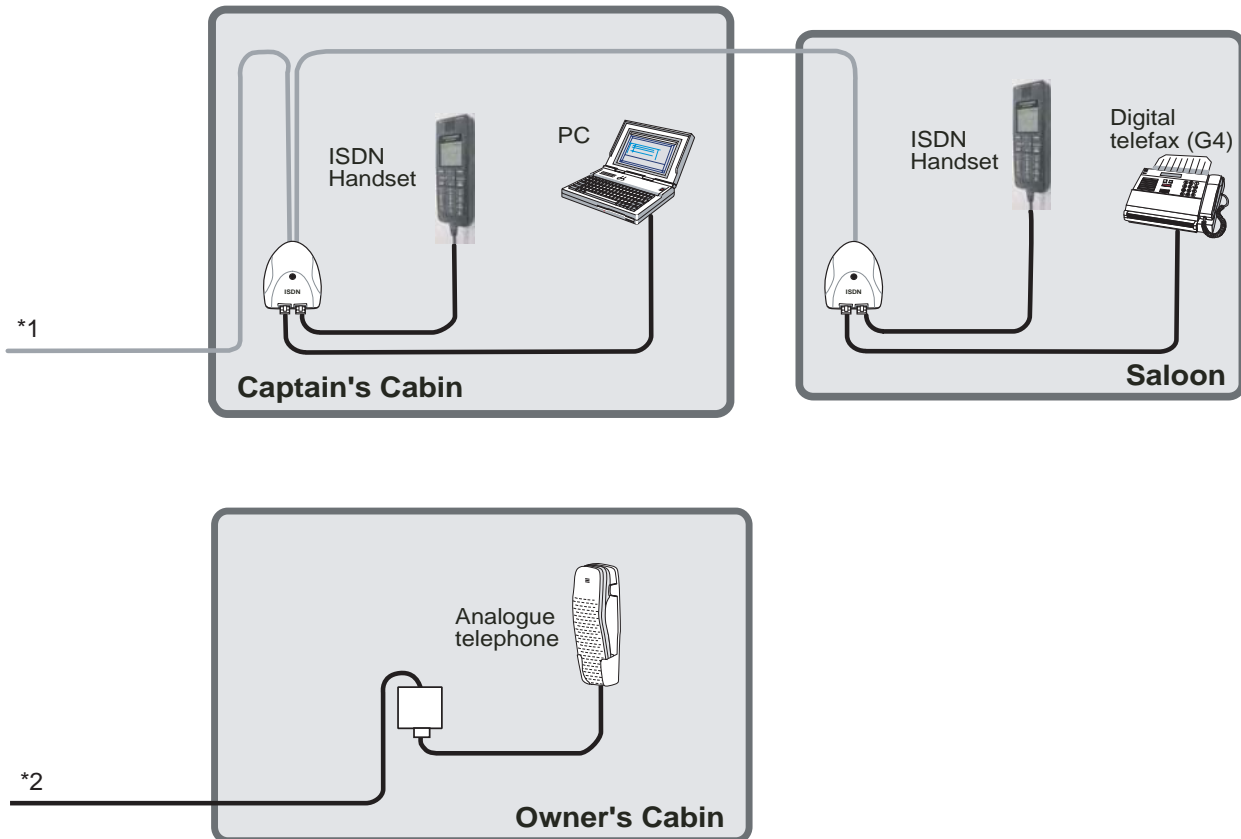


*2
(Next page)

2. INSTALLATION

BDE - Example of remote installation

The installation includes two ISDN Handsets connected to the ISDN bus via wallboxes with two 8-pin RJ45 jacks and analogue telephone.



ISDN Handset

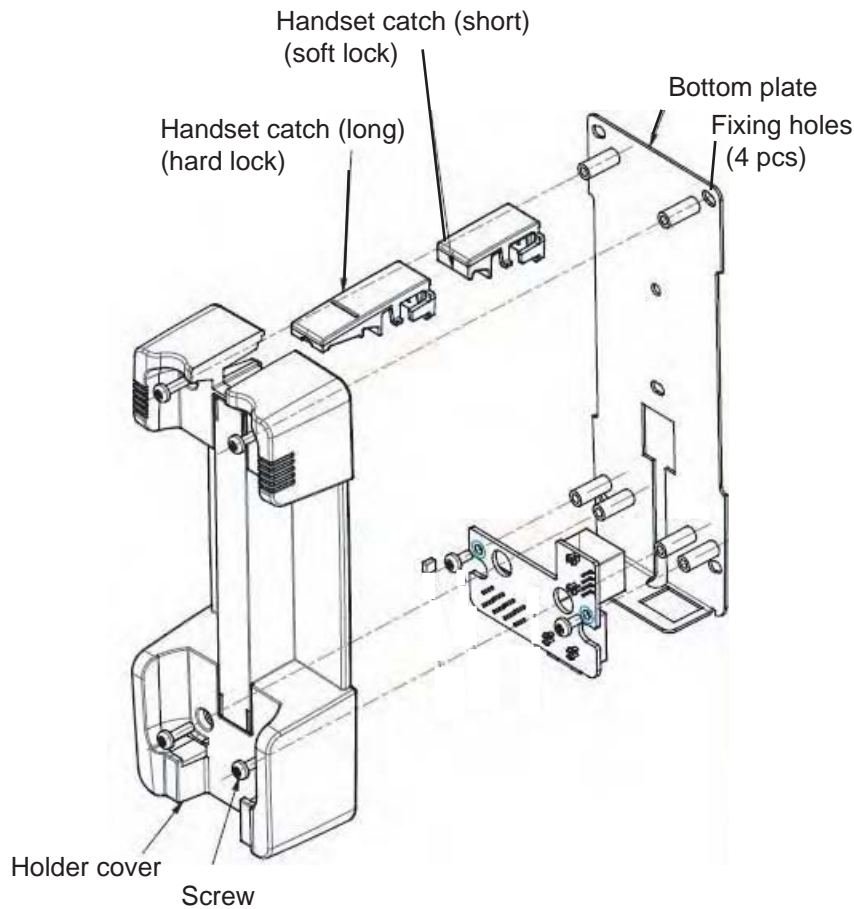
The ISDN Handset is to be plugged into the **ISDN** socket located on the connector panel of the CU, or to the Distress Alert Unit (if installed).

Note: It is not recommended to extend the handset cable by more than 6 m.

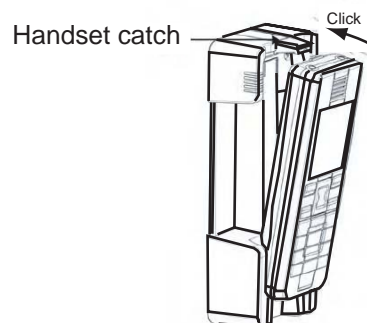


Handset holder/cradle

The handset holder/cradle may be mounted on a tabletop or a bulkhead. Unfasten four screws from the holder, and then remove the holder cover. Attach the bottom plate of the holder to a bulkhead or tabletop with four self-tapping screws.



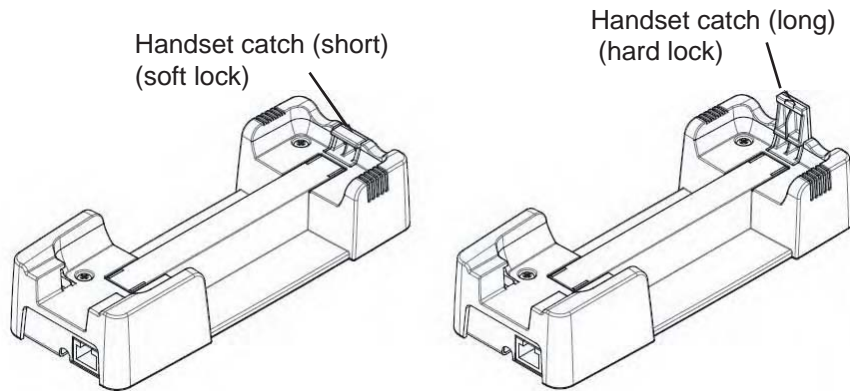
Place the handset on the holder as shown below. Push the handset in the direction of the arrow until you hear a click.



Note: Two types of handset catch are available for the handset holder. The long catch “locks” the handset more firmly than the short catch. To release handset, push catch upward slightly.

The long catch is fixed to the holder at the factory and the short catch is included in the packing box. The catch can be exchanged in the field.

2. INSTALLATION



Handset and handset holder connection examples

1) No connection between handset and handset holder



Handset is connected directly to the distress alert unit or the communication unit.

When a call is received, press the speaker button with handset set to handset holder to answer call hands free. You can also answer the call with off-hook state. After finishing a call, place the handset in the holder to return to on-hook state.

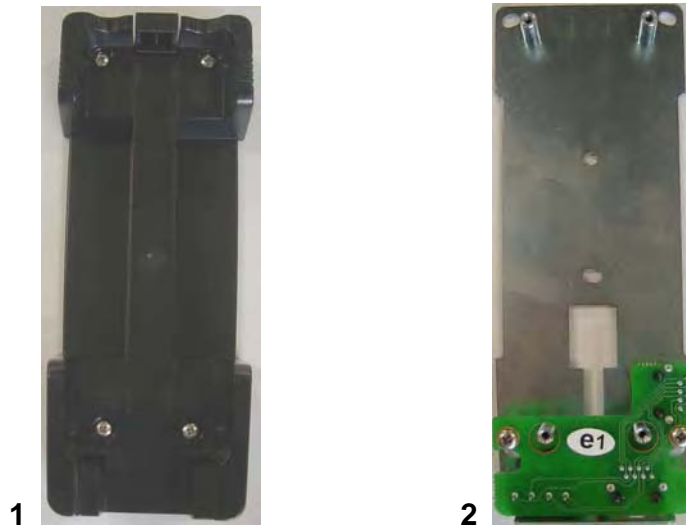
2) Cable connected between handset and handset holder



The handset cable is connected to the handset holder. Connect the handset holder to the distress alert unit or the communication unit with other cable.

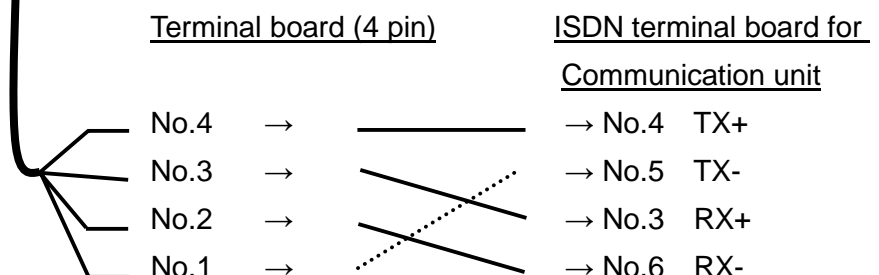
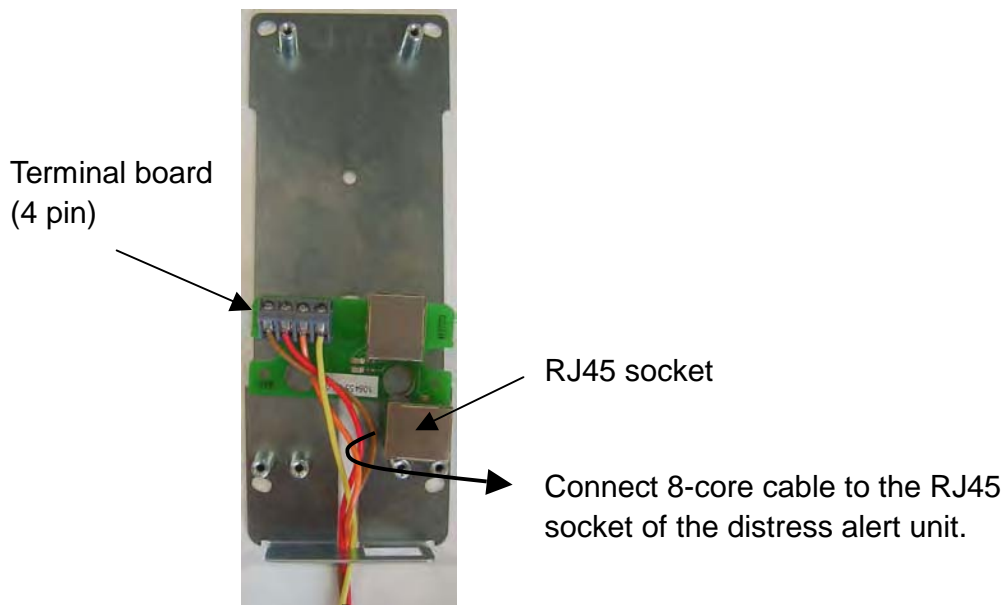
Connect the handset holder to the distress alert unit or the communication unit with cable as shown below. Reverse the procedure to assemble the handset holder.

- 1 Unfasten four screws from the holder, and then remove the holder cover.
- 2 Unfasten two screws, and then remove the PCB from the bottom plate of the handset holder.



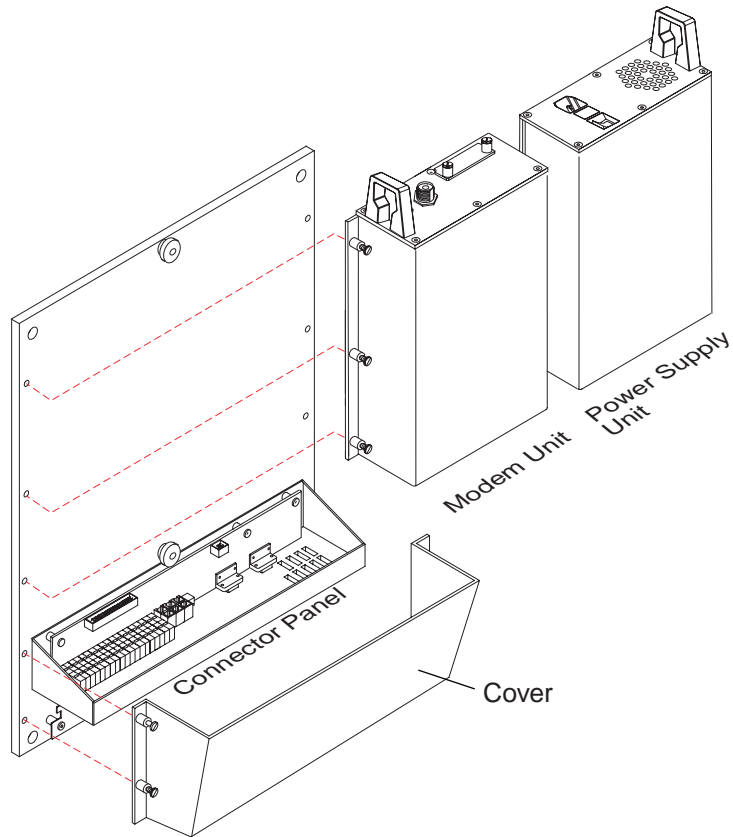
- 3 Invert the PCB, and then connect the applicable cable to the terminal board or the RJ45 socket.

Terminal board: 4 pin, for connecting communication unit
 RJ45 socket: 8-core cable, for connecting distress alert unit

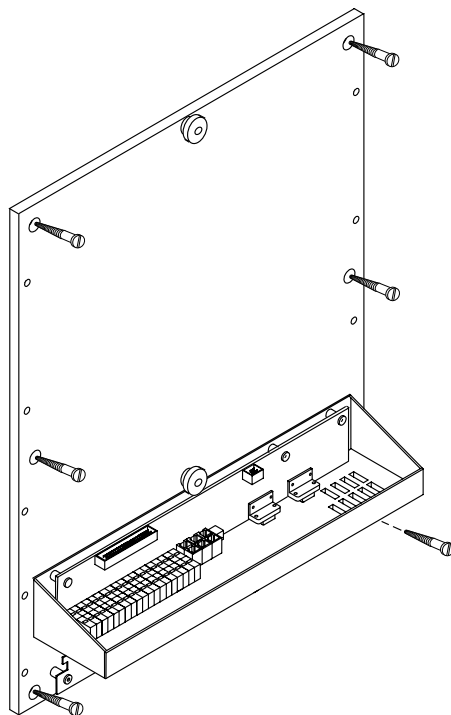


Mounting the Communication Unit (CU)

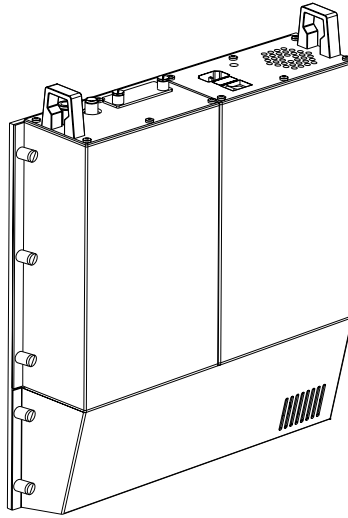
- 1 Unscrew the Power Supply Unit and the Modem Unit and pull them carefully out. Remove the cover protecting the connector panel.



- 2 Attach the bottom plate to the wall using six wood screws or tapping screws. *Ensure a free space above and below the CU of at least 10 cm for adequate cooling, and to allow removal of the Modem Unit and Power Supply Unit.*

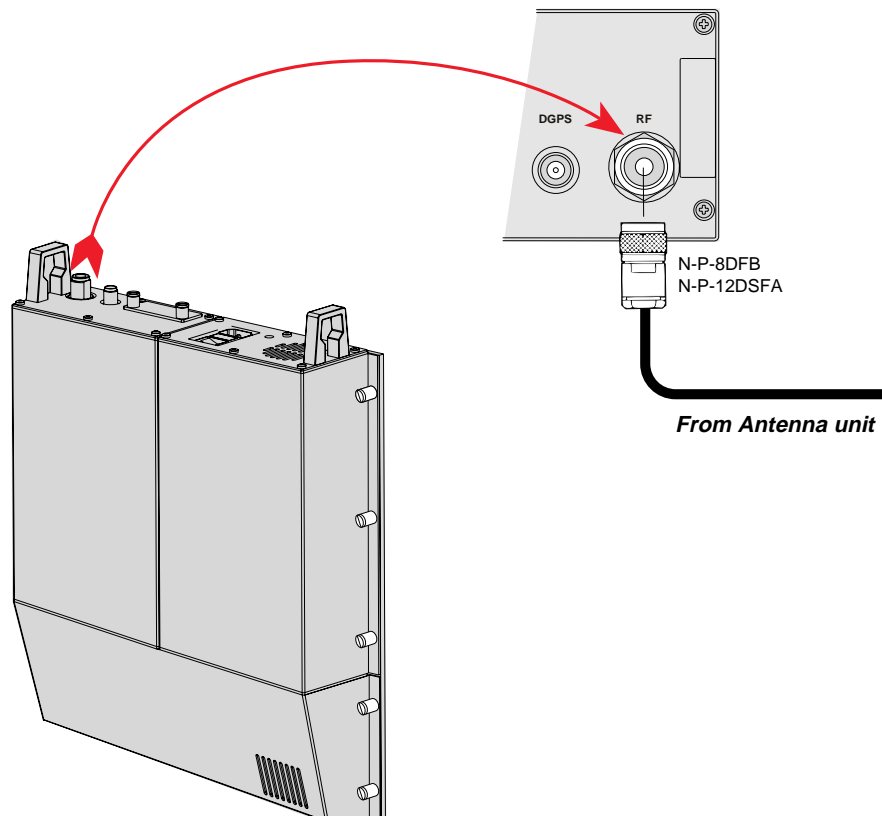


- 3 Mount the Power Supply Unit and Modem Unit. Remount the connector panel cover after connection of cables.



Connecting the antenna cable to the CU

- 1 Strip the Antenna coaxial cable leaving sufficient slack for connection to the CU.
- 2 Mount the N-plug on the cable in accordance with the instructions (*see next pages*).

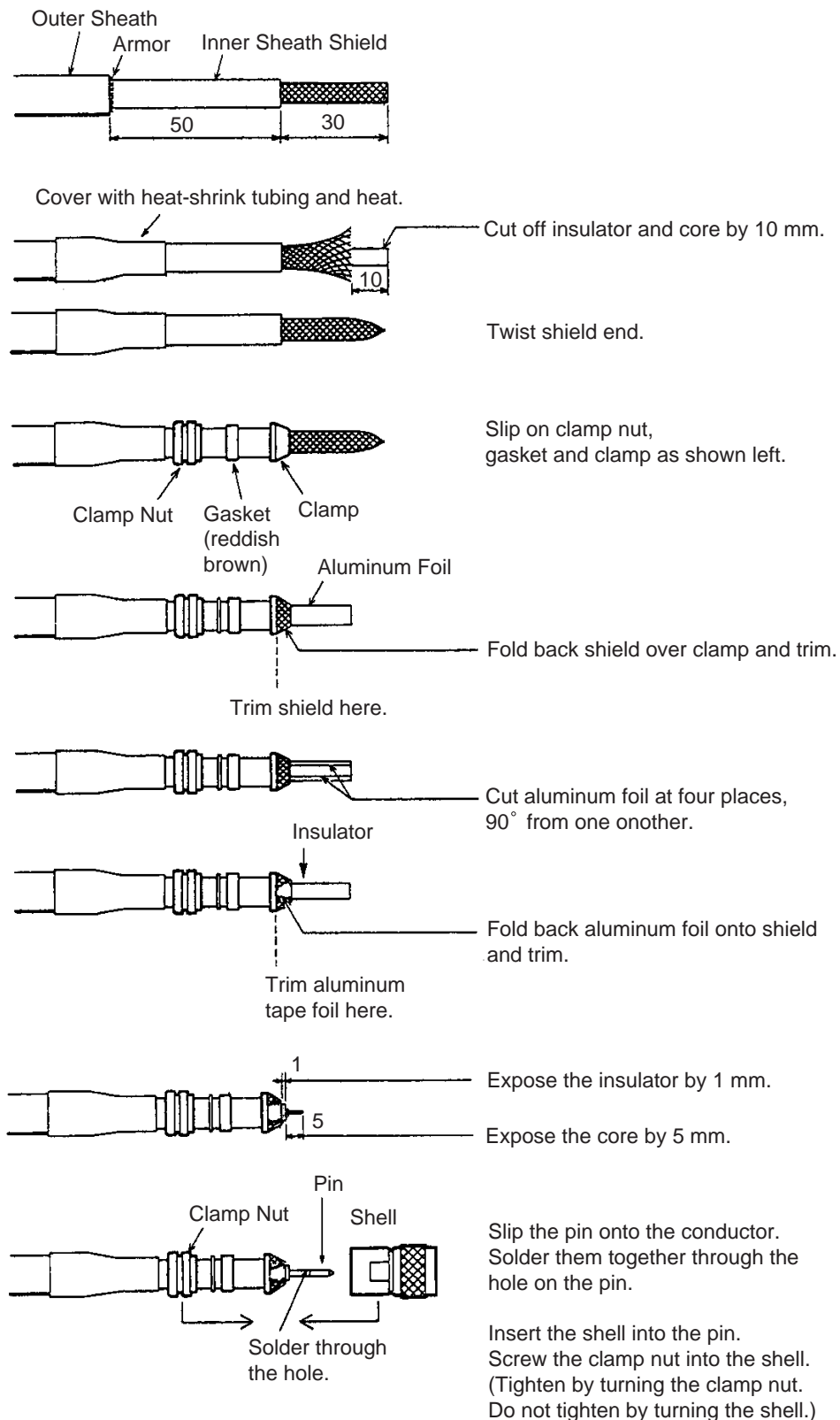


2. INSTALLATION

N-P-8DFB connector

Fabricate the antenna cable as shown below to connect the antenna cable to the communication unit.

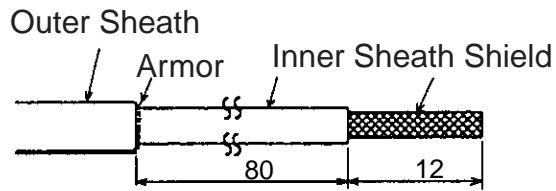
(Dimensions in millimeters.)



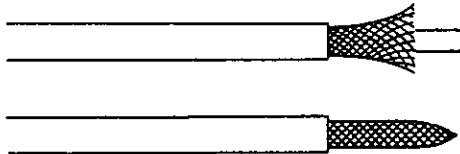
How to attach the antenna cable connector N-P-8DFB

N-P-12DSFA connector

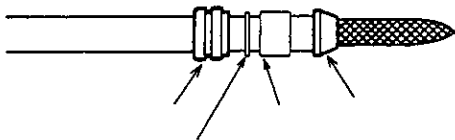
(Dimensions in millimeters.)



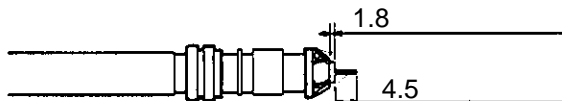
Remove outer sheath and armor by the dimensions shown left.
Expose inner sheath and shield by the dimensions shown left.



Twist shield end.

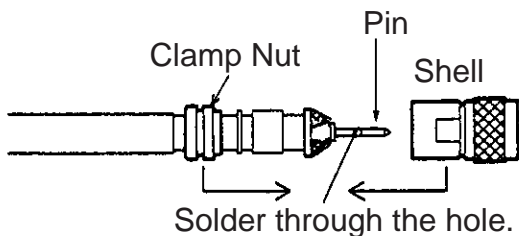


Slip on clamp nut, gasket and clamp as shown left.



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 shell into the pin.
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-12DSF

2. INSTALLATION

Distress Alert Unit

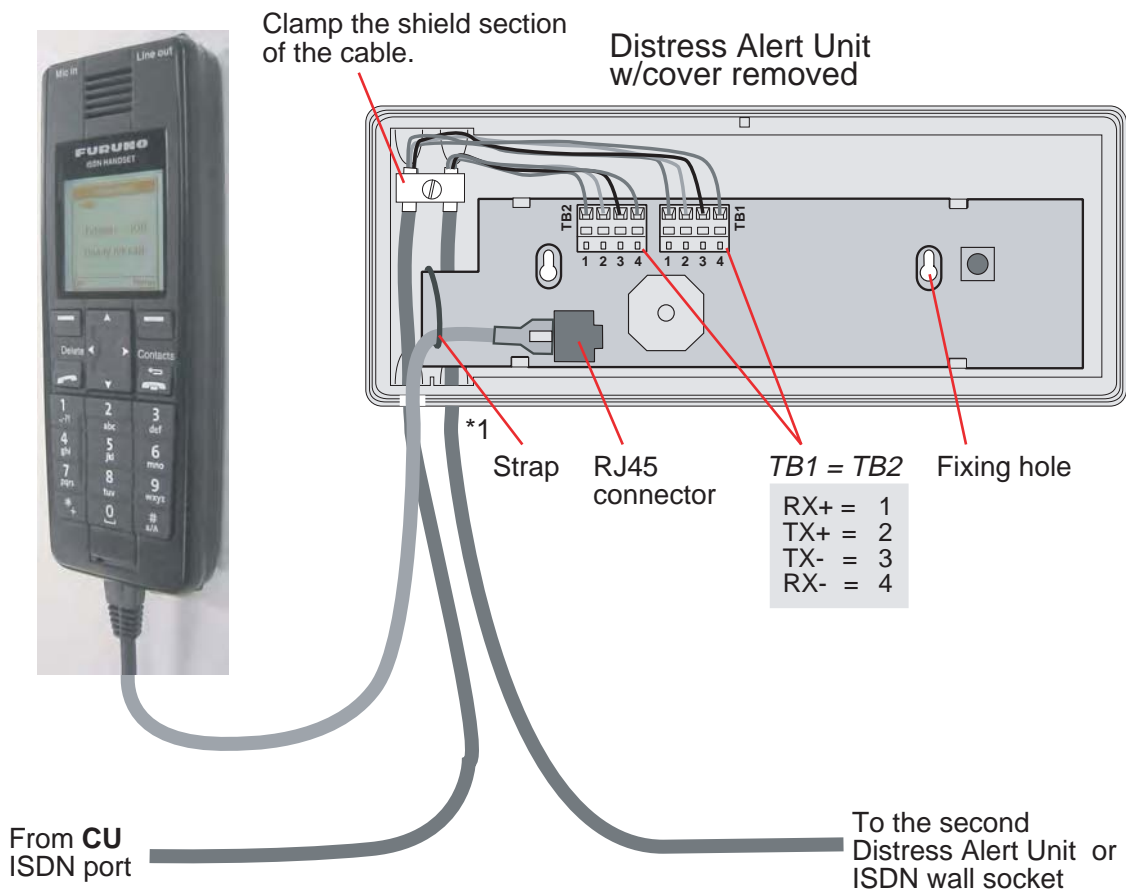
The Distress Alert Unit is connected to the ISDN bus/connector on the CU.

The maximum number of Distress Alert Unit is limited to *two*.

When connected to the Distress Alert Unit, in addition to regular ISDN voice service the ISDN Handset will also include the capability for Distress handling (Transmit & Receive).

1. Remove the cover of the Distress Alert Unit.
2. Mount the unit with two topping screws to a suitable places.
3. Connect cables as shown below.

ISDN Handset



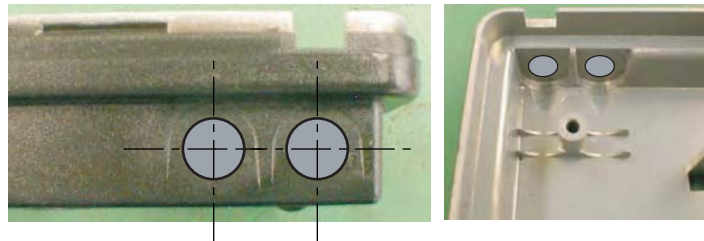
*1 To connect second Distress Alert Unit or ISDN wall socket, make a hole $\phi 8$ by using drill.

Procedure

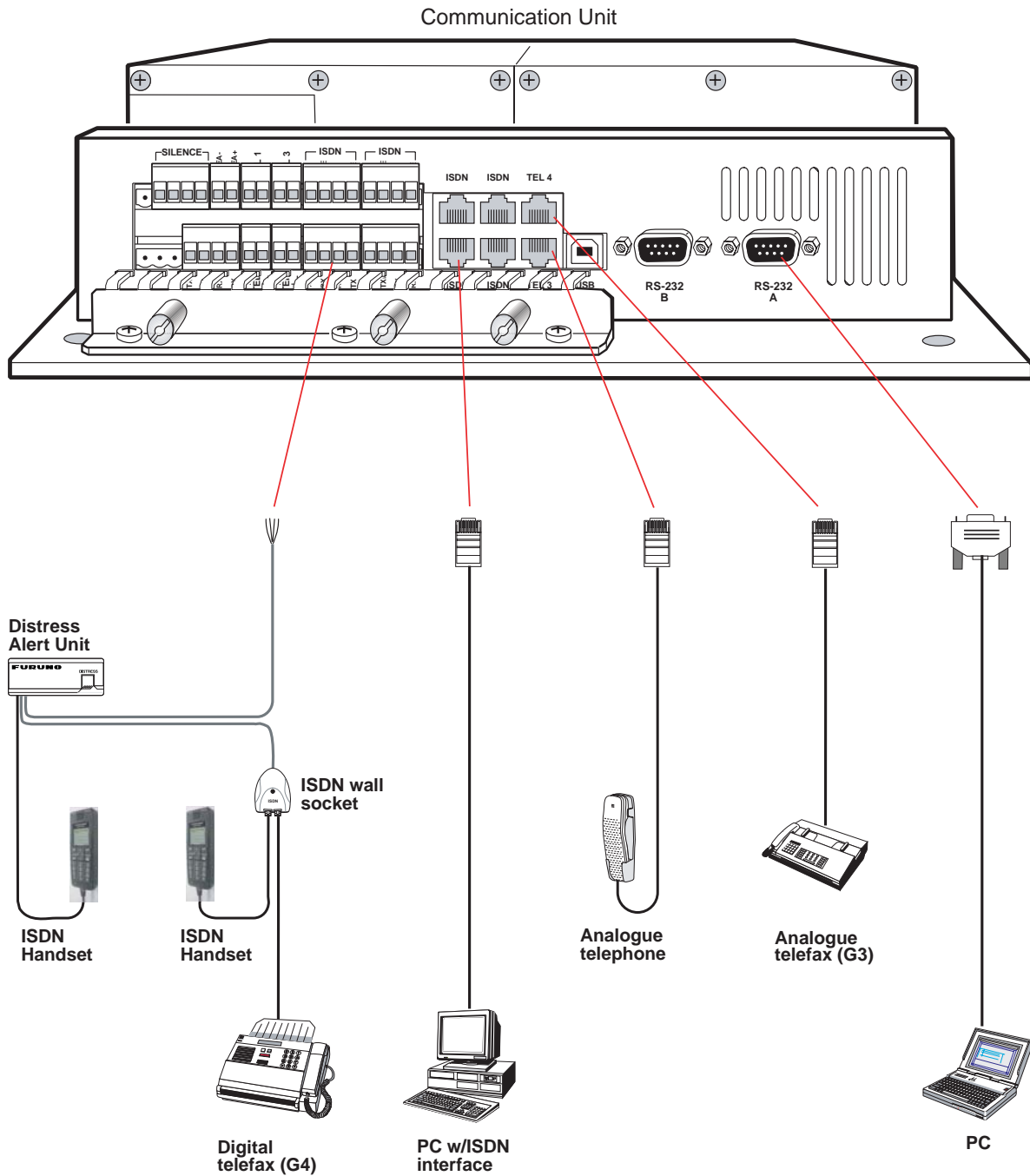
1. Open the lid of the Distress Alert Unit.
2. Remove the printed circuit board.



3. Make a hole of $\phi 8$ mm at “a”, “b” or “c” position shown in the figure above.
4. Remove burrs at the inside and outside of the case.



Examples of Below Deck Equipment

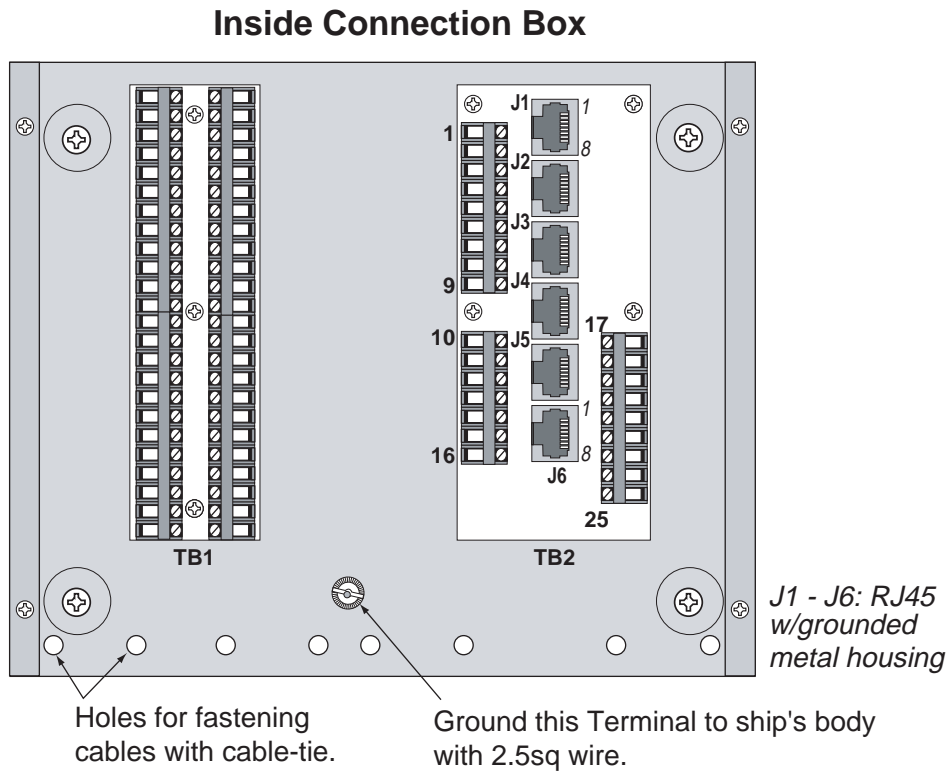


Cable Bands

20 cable bands are provided for labeling cables. Attach them to cables for easy identification when reconnecting.

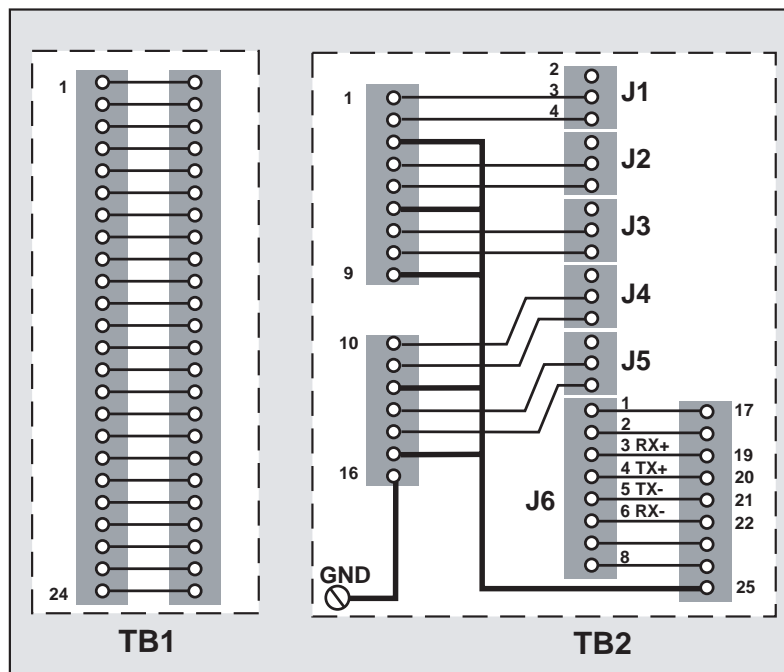
2.4 Installing option units

Connection Box QUFC 911 918 (option)



Note: Before installing the connection box, connect cables and fasten the cables with cable ties.

Wiring

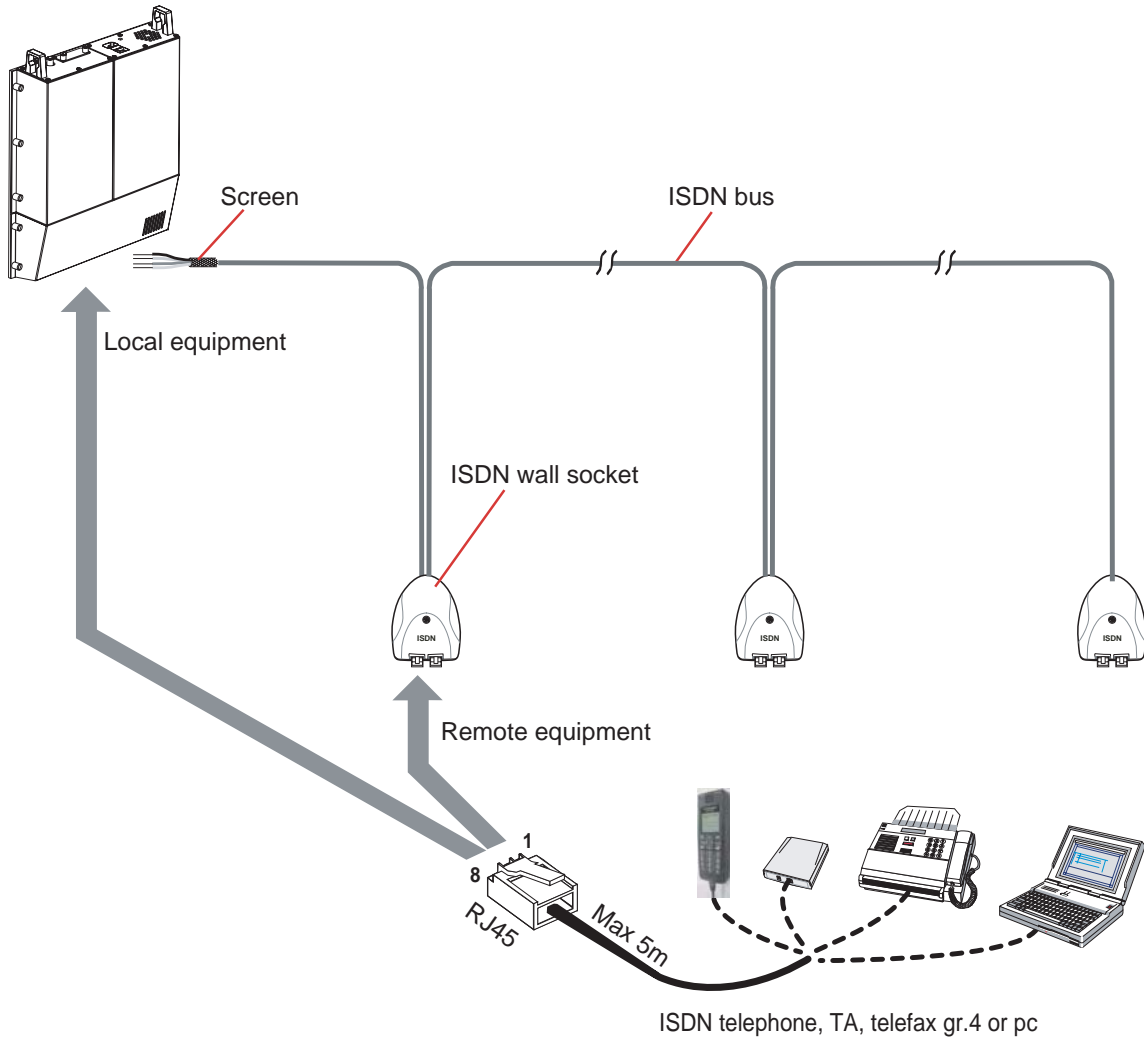


ISDN telephones/equipment

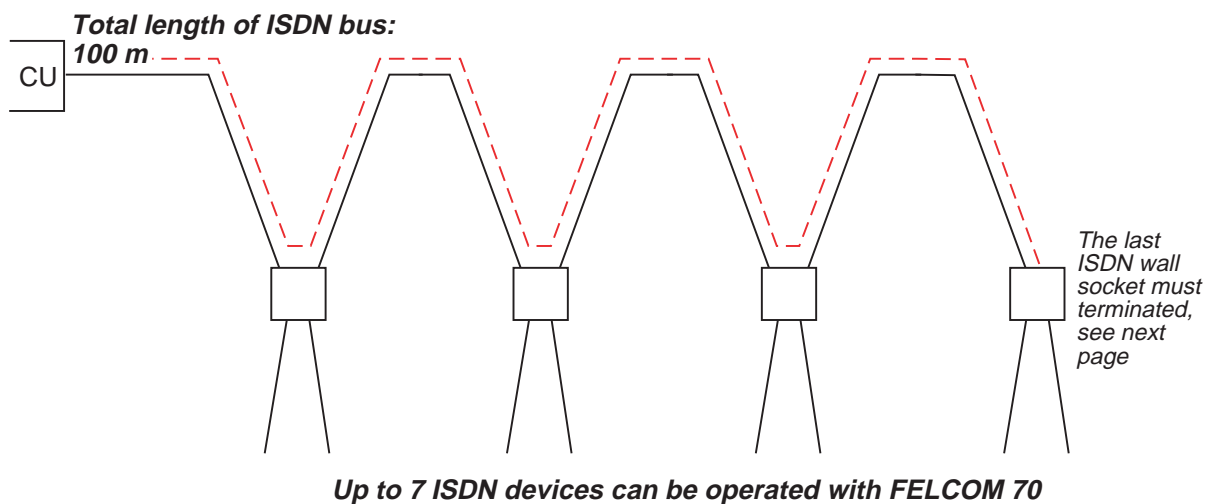
ISDN equipment is connected to the **ISDN** outlets on the CU connector panel, either to terminal blocks or RJ45 jacks.

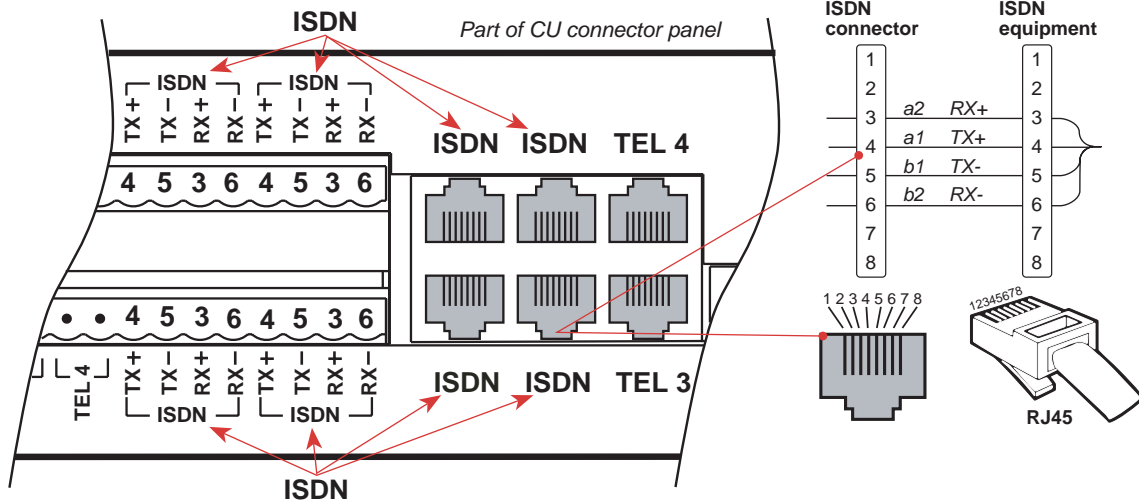
An ISDN bus can be connected to *one* of the ISDN outlets.

Max. extension length: 100 m, min. 0.22 mm².

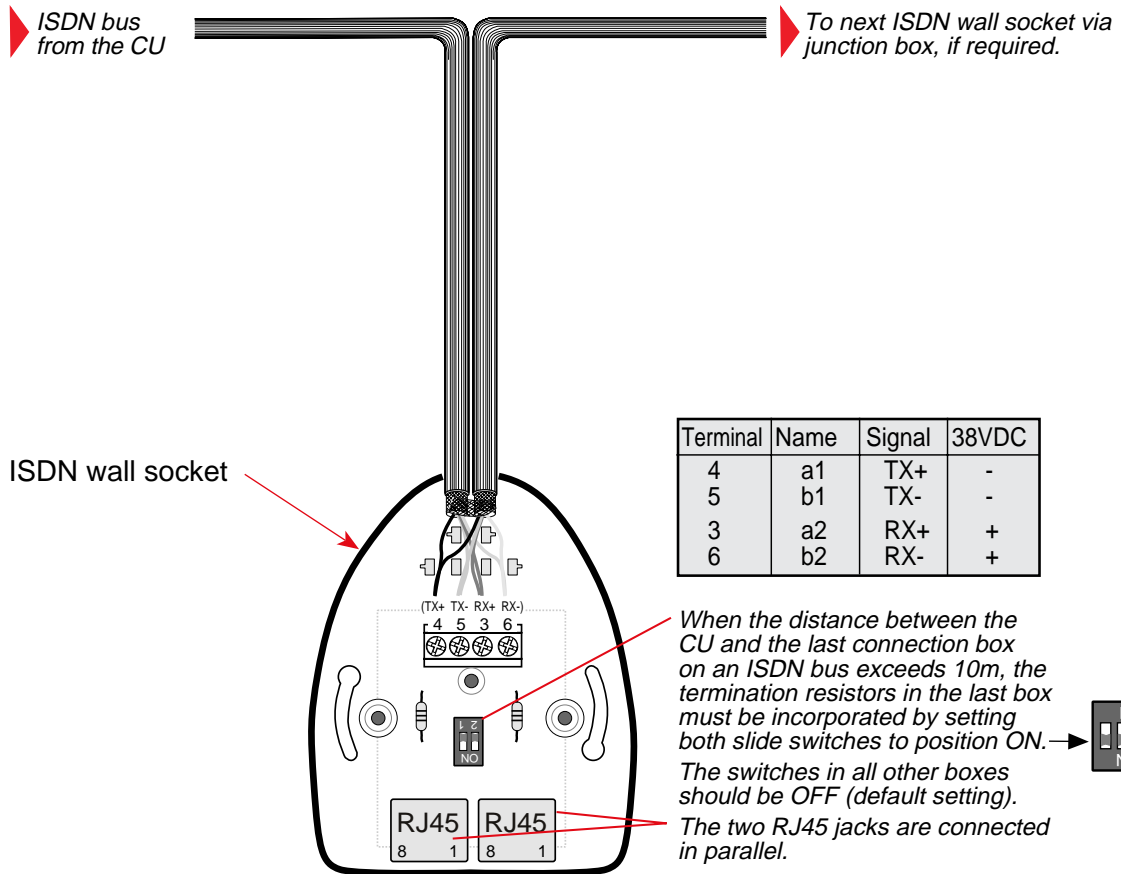


ISDN cable lengths





ISDN wall socket



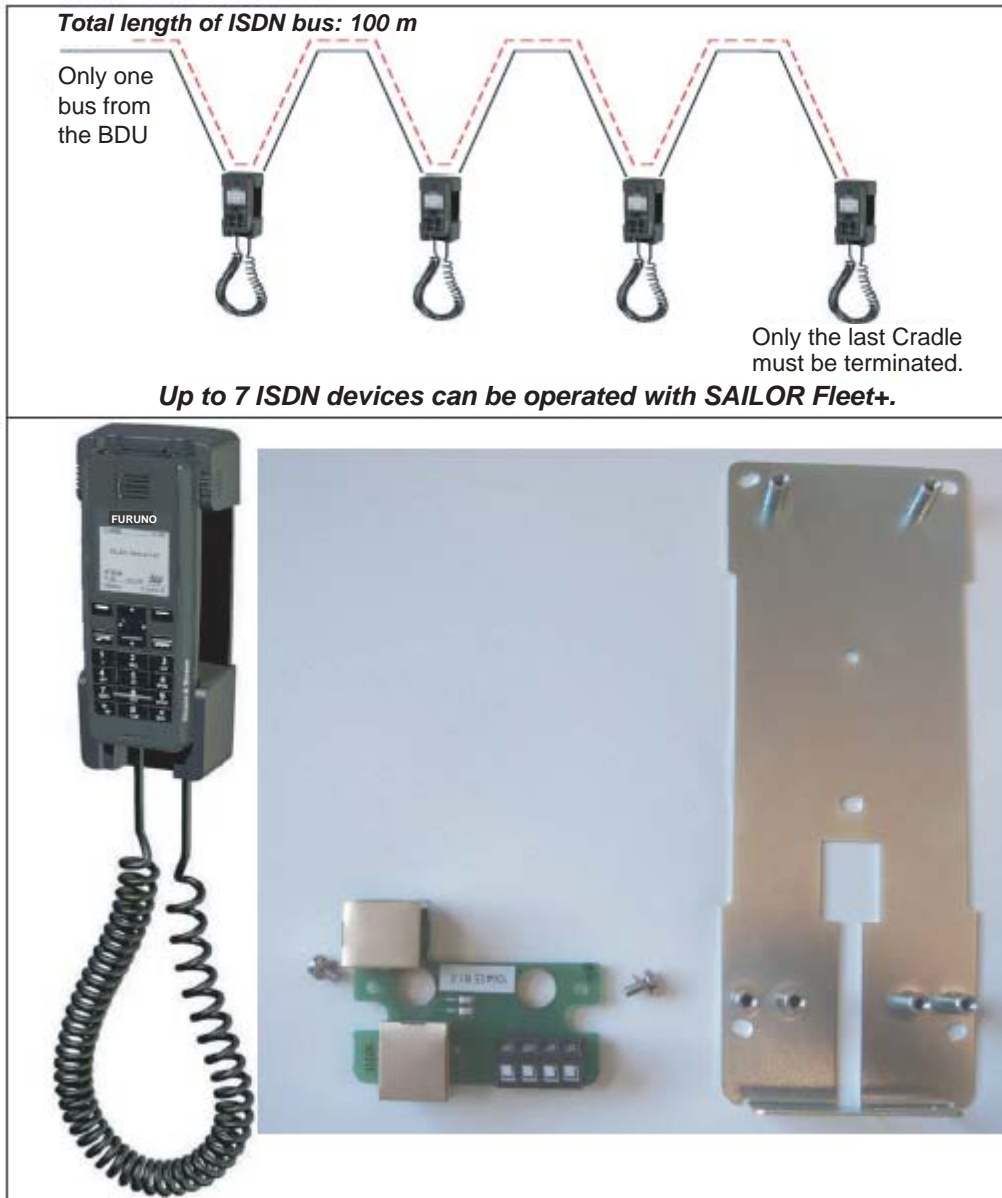
2. INSTALLATION

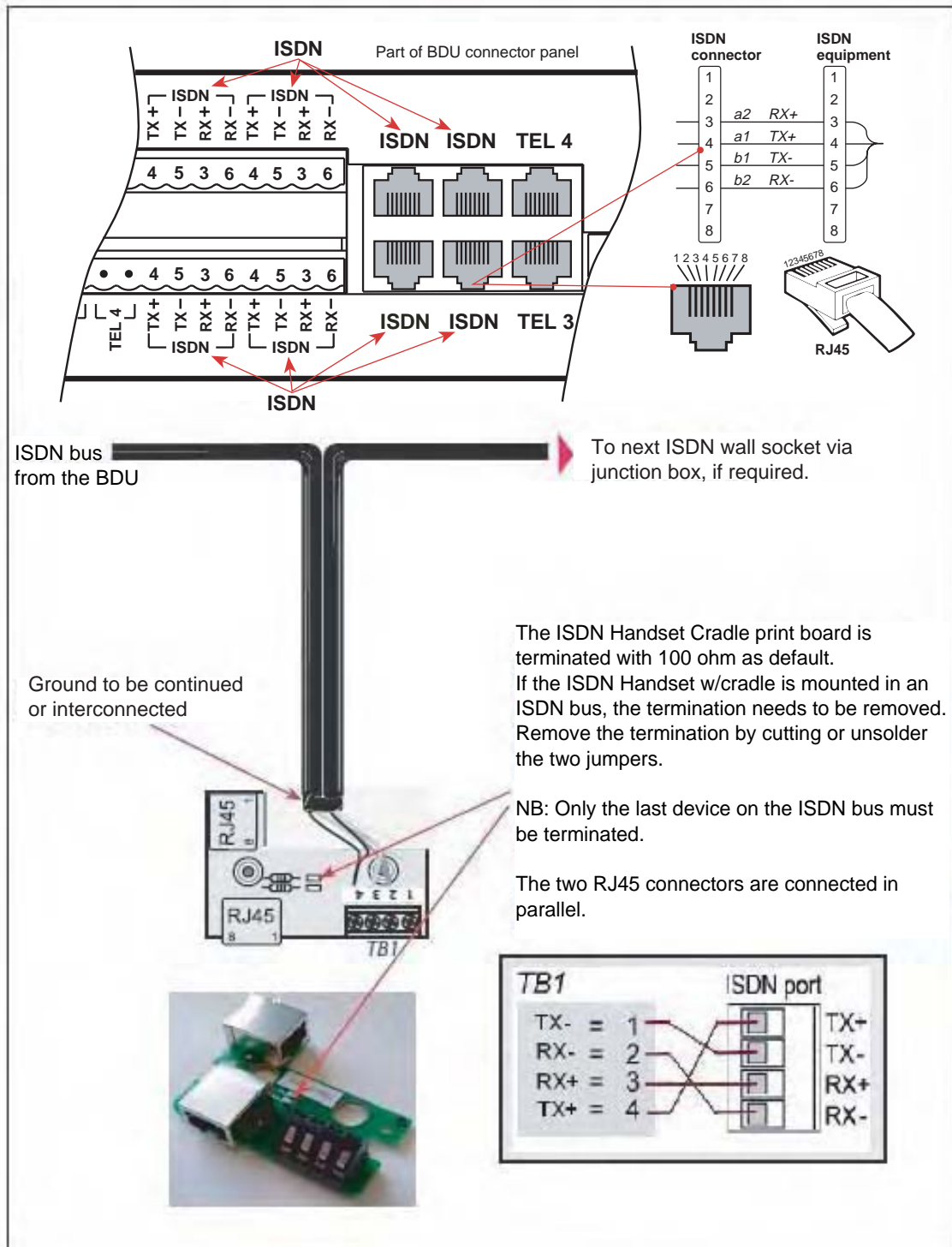
ISDN Handset Cradle

The ISDN Handset Cradle can be connected to the ISDN bus/connector on the BDU. The ISDN Handset cable can then be connected to the Cradle connector. A standard RJ45 ISDN cable can also be used to connect the cradle with the BDU.

Setting ISDN handset in an ISDN bus:

Remember to remove the termination in all cradles (the cradle is default terminated with 100ohm), only the last cradle / wall socket must be terminated.

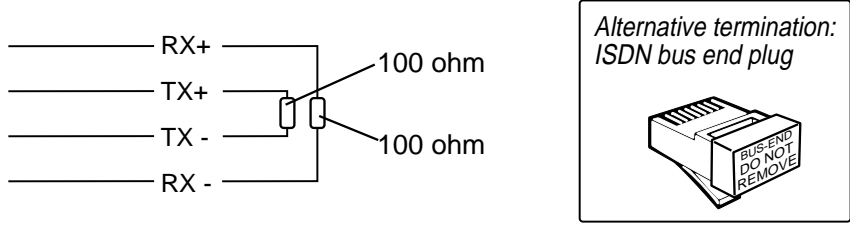




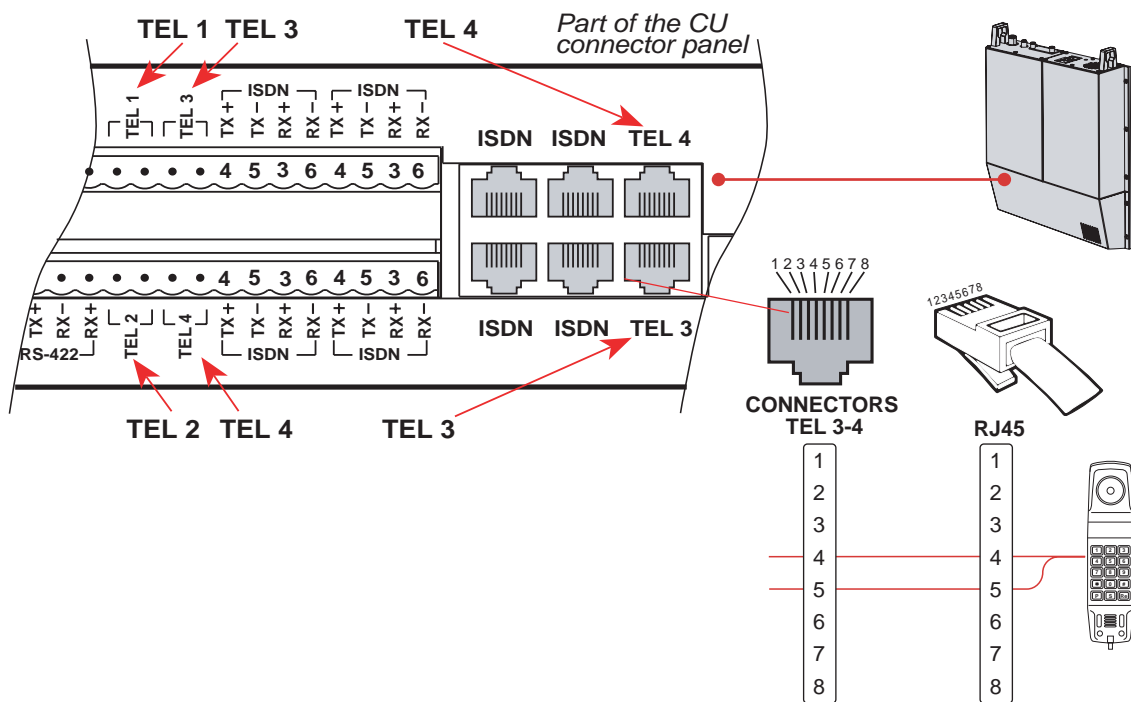
ISDN bus termination

When longer than 10 metres, the end of the ISDN bus must be terminated by two resistors as shown below. Only one bus/termination per CU.

Be aware that only one ISDN cable is permitted to be longer than 10 metres.



Analogue telephones



Analogue telephones and G3 fax are connected to the **TEL1** through **TEL4** outlets.

For TEL3 and TEL4 RJ45 jacks are provided in parallel.

See diagrams for RJ11 pin configuration.

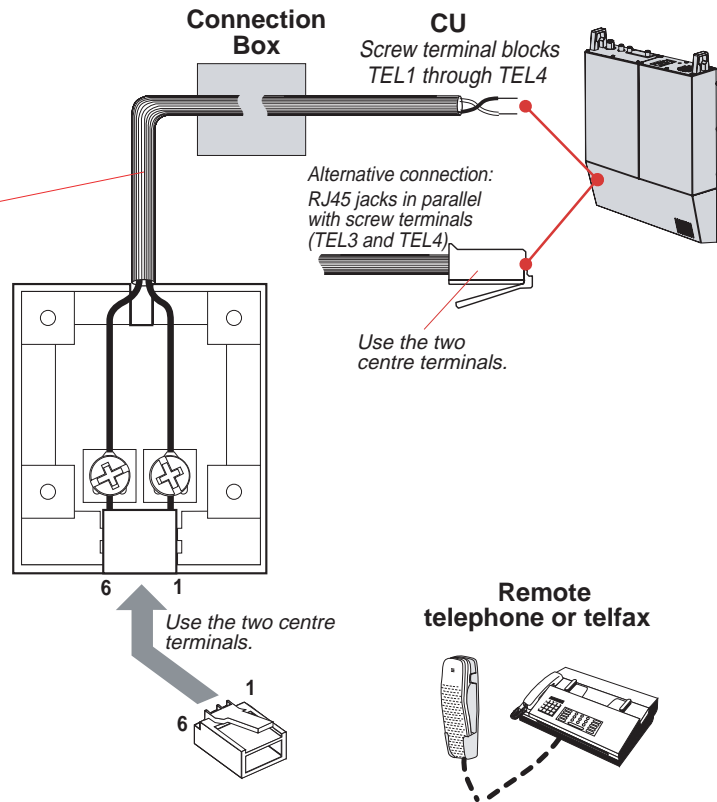
Max. extension length: 150 m, min. 0.22 mm² .

Wall socket for analogue telephone/telex gr.3 (option)

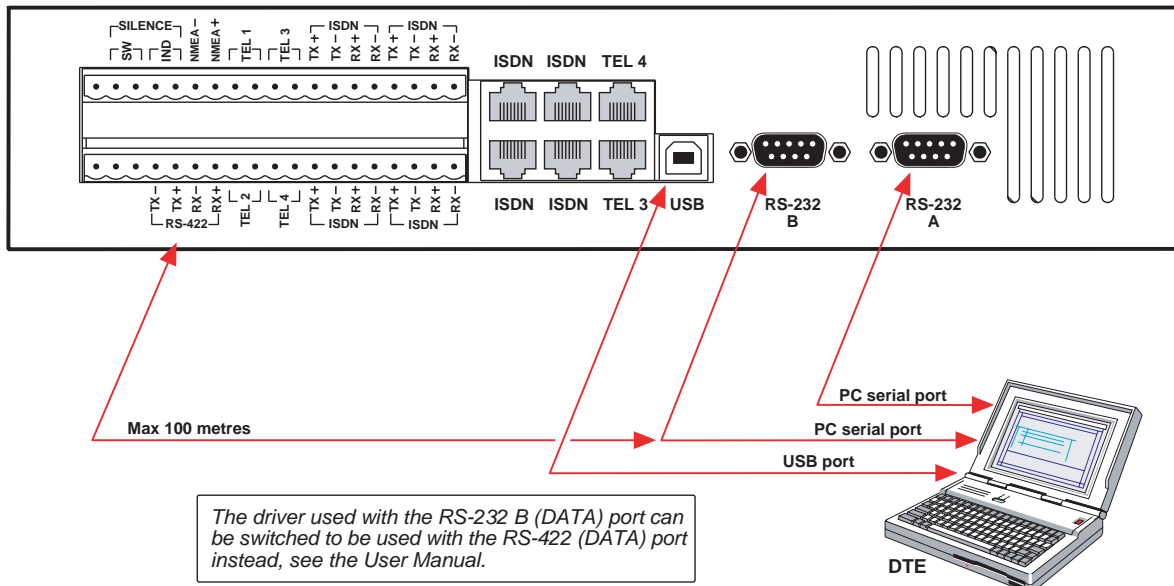
The telephone and/or telex cable can be terminated in a modular jack, as shown.

Remove approx. 3 cm of the jacket from the cable end, strip off 1 cm of the insulation from each core and connect to centre terminals 3 and 4.

Interchanging of the wires at terminals 3 and 4 has no effect.



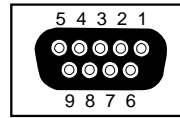
PC - asynchronous data communication



2. INSTALLATION

RS-232 connector pin assignments

| Pin number | Mnemonic | Circuit | DIN | CCITT circuit | Signal source | Description |
|------------|----------|---------|-----|---------------|---------------|---------------------|
| 1 | CD | | | 109 | DCE | Carrier detect |
| 2 | RXD | BB | D1 | 104 | DTE | Received Data |
| 3 | TXD | BA | D2 | 103 | DCE | Transmitted Data |
| 4 | DTR | | | 108 | DTE | Data terminal ready |
| 5 | GND | | | 102 | | Signal ground |
| 6 | DSR | | | 107 | DCE | Data set ready |
| 7 | RTS | CA | S2 | 105 | DTE | Request To Send |
| 8 | CTS | CB | M2 | 106 | DCE | Clear To Send |
| 9 | RI | | | 125 | DCE | Ring indicator |



Signal source DTE means that the signal goes from the PC to FELCOM 70.

Signal source DCE means that the signal goes from FELCOM 70 to the PC.

Signal descriptions

102 Signal Ground

Digital ground, return line.

103 Send Data

Data transmitted from DTE (PC) to DCE (FELCOM 70).

104 Receive data

Data Received from DCE (FELCOM 70) to DTE (PC).

105 Request To Send

OFF requests DCE (FELCOM 70) to suspend transmission to DTE (PC).

ON requests DCE (FELCOM 70) to resume transmission to DTE (PC).

106 Clear to send

OFF indicates that DCE (FELCOM 70) cannot accept data from DTE (PC).

ON indicates that DCE (FELCOM 70) is prepared to accept data from DTE (PC).

107 Data Set Ready

Signal from FELCOM 70 that when ON indicates that a data call setup is in progress.

108 Data Terminal Ready

Signal from PC. This signal is used in the Hotline mode and indicate when going from OFF to ON that the PC wants to make a data call. The PC clears the call by setting the signal from ON to OFF.

109 Receive Signal Indicator

Signal from FELCOM 70 that when ON indicates that connection is established and received data will be delivered on circuit 104, Received Data.

125 Ring Indicator

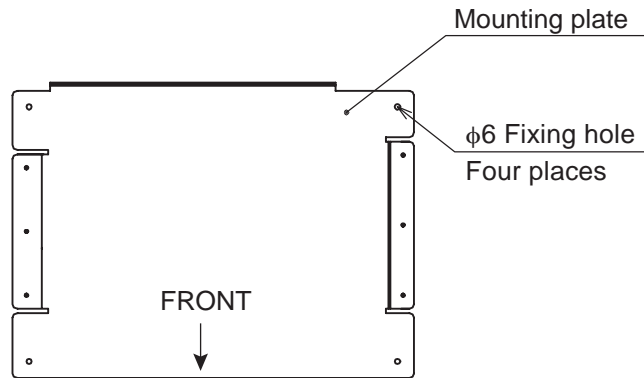
Signal from FELCOM 70. This signal is used in the Auto answer OFF mode and when ON indicates that an incoming call is in progress. The signal will go OFF when the call is answered by the PC by turning circuit 108 Data Terminal Ready ON.

Facsimile FAX-2820

Note that the hooks supplied are not used in the installation.

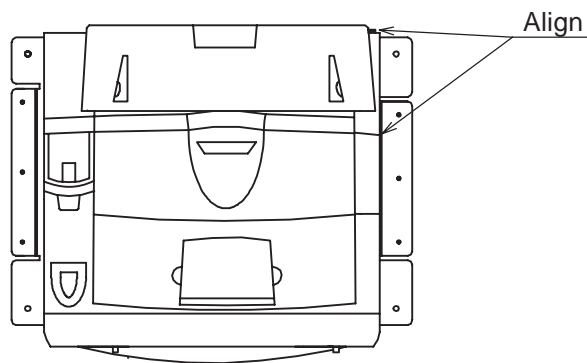
Note: When ship's main is 110/115 VAC, the optional transformer E-300 is required.

1. Fix the mounting plate to the mounting location with four 5x20 self-tapping screws.



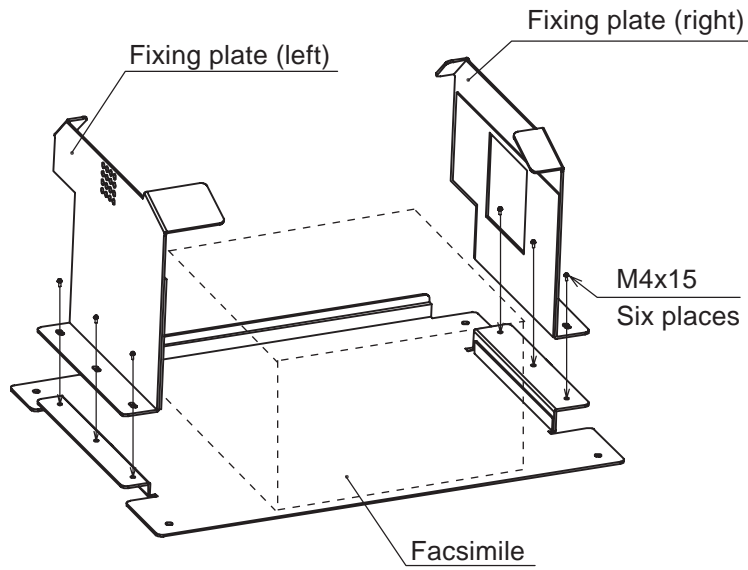
Facsimile, bottom view

2. Lay the facsimile on the top of the mounting plate.
3. Align right side and rear with the projection on the mounting plate.

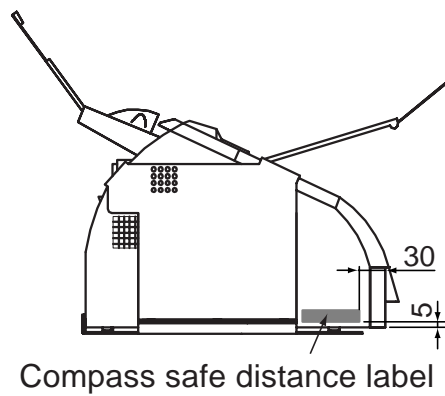


2. INSTALLATION

4. Fasten fixing plates (left, right) to the facsimile with six M4x15 pan head screws.



5. Attach the compass safe distance label at the location shown below.



Changing modem settings

1. Press [Menu/set], [*], [2], [8], [6] and [4] keys in this sequence to enter the maintenance mode. The fax machine beeps for approx. one sec and displays "MAINTENANCE" on the LCD. This means it 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=X1X2X3X4X5X6X7X8" appears on the LCD. (default: WSW13=01011011)
4. Press [0], [0], [0], [1], [1], [0], [1], [0] and [Menu/Set] keys in this order. (WSW13=00011010) "WSW00" appears after pressing [Menu/Set] key.
5. Press [0], [0], [0], [1], [1], [0], [1], [0] and [Menu/Set] keys in this order. (WSW13=00011010) "WSW00" appears after pressing [Menu/Set] key.
6. Press [9] key twice to exit from the maintenance mode and return standby.

Telephone FC755D1

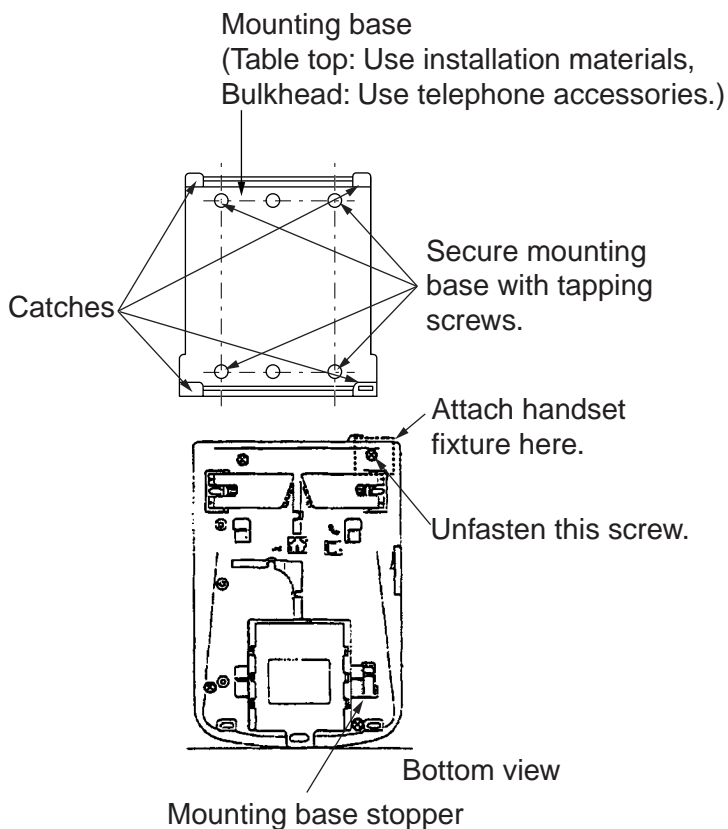
General

The telephone can be installed on a tabletop or a bulkhead. Select a location where the unit can easily be operated.

- For installation on a wooden table, use the mounting base and tapping screws (supplied).
- For installation on a steel table, fix the telephone with nuts and bolts.
- For bulkhead mounting, use the bulkhead mounting base (supplied with telephone accessories).

Mounting location

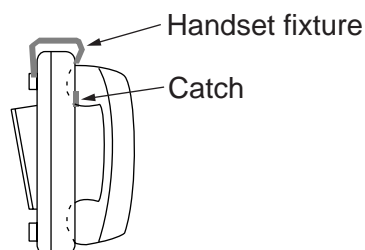
Select a location where temperature and humidity are moderate and stable. Secure sufficient space around the unit for ease of operation and maintenance.



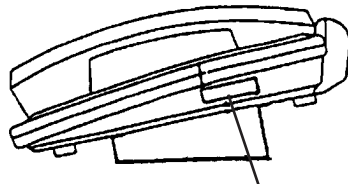
Mounting

The mounting dimensions are given in the outline drawing at the back of this manual. Determine the mounting location, leaving sufficient space around the unit, and then fix the mounting base to the mounting location. The mounting base is different for bulkhead and tabletop mounting, however the mounting procedure is the same for all.

1. Fix the mounting base to the mounting location with four tapping screws (4x16).
2. On the underside of the telephone, unfasten the screw shown in the figure. (The screw may be discarded.) Attach vulcanizing tape (supplied) to the handset fixture. Fasten the handset fixture to the underside of the telephone with a screw (3x14, supplied).



3. The catch in the receiver cradle functions to hang up the handset completely. Set the catch in the upward position as shown in left. (To detach the handset from the hanger, slide the handset upward.)
4. Set the telephone to the four catches in the mounting base and then slide it toward you until you hear a click
5. Attach the "SLIDE" label (supplied) to the handset.
6. Attach English language label (supplied) to the telephone.
7. Attach the label for compass safe distance (16-007-6927-0) and as shown below.



Label (16-007-6927-0)

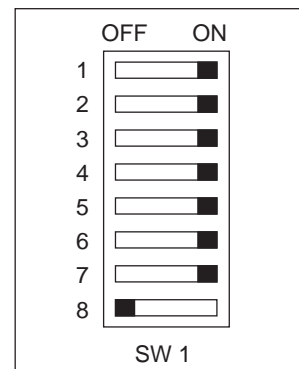
Serial printer ML280S

Set the DIP switches in the ML280S as shown below. These switches are under the small cover on the top of the printer. (See the printer's manual for the location.)

Switch bank 1

| Switch no. | OFF | ON | FUNCTION |
|------------|------------|--------------|------------------------------|
| 1 | Even | Odd * | Parity |
| 2 | With | No * | Parity |
| 3 | 7 | 8 * | Databits |
| 4 | X-on/X-off | Ready/Busy * | Protocol |
| 5 | Monitor | Circuit * | Test Select |
| 6 | Test | Print | Mode Select |
| 7 | | ON * | Busy line RTS (-9V) pin 4 |
| 8 | Off * | | |

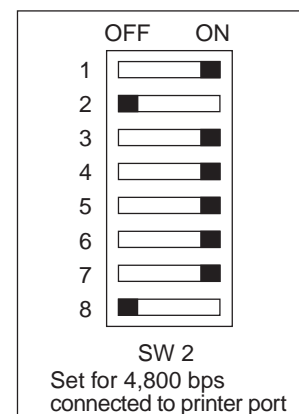
* Normal setting



Switch bank 2

| Switch no. | OFF | ON | FUNCTION |
|------------|--------------------|--------------------|--------------------|
| 1 | | ON * | Baud rate 4,800 |
| 2 | Off * | | |
| 3 | | ON * | |
| 4 | Invalid | Valid * | DSR I/P Signal |
| 5 | 512 Bytes | 32 Bytes * | Bufers Threshold |
| 6 | 1 sec. | 200 ms * | Min. Busy Time |
| 7 | High when selected | High at Power on * | DTR Signal |
| 8 | * | — | Not Used |

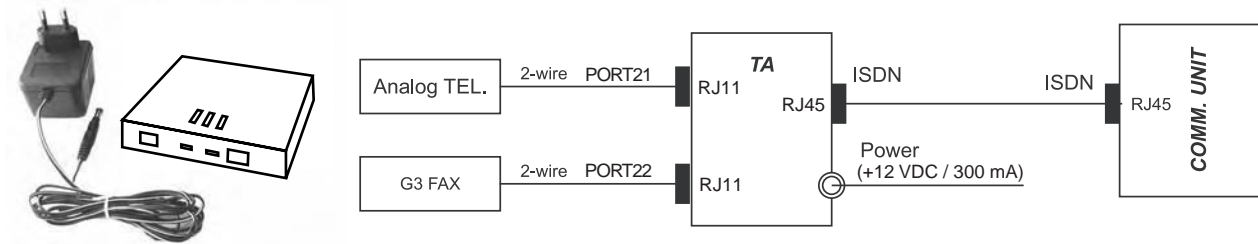
* Normal setting



2.5 Terminal Adapter (109265) Setting

The terminal adapter (TA) is used to connect analog devices to the ISDN port. The analog device supports 4.8k speech, 64k speech, 3.1k audio (G3 FAX) and 9.6kbps fax.

Before setting the TA, open the Device Manager in the Configuration menu of the SAILOR vtLite software, and set the ID and MSN (Multiple Subscriber Number) for each device, referring to the operator's manual of the FELCOM 70.



How to set the TA

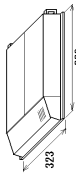
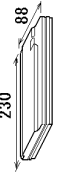
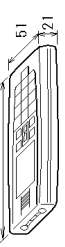
You can set the TA using the "R" button of the telephone, connected to the analog port 21. Assign the MSN to the TA as follows.

1. Pick up the handset and press [R], [*], [7], [9] and [9] to enable the setting mode. You can hear the long and short beeps.
2. Replace the handset and pick it up. You can hear the short beep.
3. Press [1], [1], [0], [1], [MSN]. This MSN is for port 21.
4. Replace the handset and pick it up. You can hear the short beep.
5. Press [1], [1], [0], [2], [MSN]. This MSN is for port 22.
6. Replace the handset and pick it up. You can hear the short beep.
7. Press [1], [4], [1]. You can hear the long and short beeps.
8. Replace the handset and pick it up. You can hear the short beep.
9. Wait 10 seconds and the beep stops. This completes the setting of the TA.

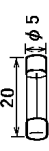
PACKING LIST SF-270/370/870-J/E

16AM-X-9851-9

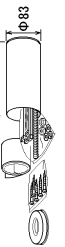
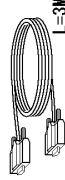
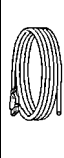
1/1

| NAME | OUTLINE | DESCRIPTION/CODE No. | Q'TY |
|--------------------------------|---|----------------------------|------|
| 通信制御ユニット COMMUNICATION UNIT |  | SF-270 000-043-220-00 | 1 |
| 遭難警報発呼器 DISTRESS ALART UNIT |  | SF-370 000-043-444-00 | 1 |
| ISDNハンドセット ISDN HANDSET |  | SF-870-A 000-011-786-00 | 1 |

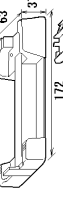

通信制御用予備品 COMMUNICATION UNIT SPARE PARTS SP16-01601

| | | | |
|------------------------------|---|------------------------------|---|
| ヒューズ FUSE GLASS TUBE TYPE |  | NGH24104/5 000-148-338-00 | 2 |
|------------------------------|---|------------------------------|---|

通信制御用材 COMMUNICATION UNIT INSTALLATION MATERIALS

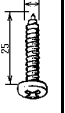

| | | | |
|-----------------------------------|--|---------------------------|---|
| BDE工事材料 BDE GROUNDING/MOUNTING |  | 101987 000-148-339-00 | 1 |
| ケーブル組品 CABLE ASSY. |  | R006686 000-148-340-00 | 1 |
| 電源ケーブル組品 POWER CABLE |  | P16-5-2 004-446-960-00 | 1 |

ISDNハンドセット用付属 ISDN HANDSET ACCESSORIES

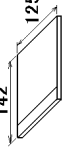
| | | | |
|---|---|--------------------------|-----------|
| ISDNハンドセットホルダ ISDN HANDSET HOLDER |  | 108967 000-166-166-00 | 1 (*1) |
| ハンドセットケーブル ISDN HANDSET COILED CABLE |  | 108066 000-166-674-00 | 1 (*1) |

1.コード番号末尾の「*」は、選用品の代表コードを表します。
CODE NUMBER ENDED BY "*" INDICATES THE NUMBER OF TYPICAL MATERIAL.
2.(*1)は、ISDNハンドセットに同梱されています。
(*1): SHIPPED WITH THE ISDN HANDSET.

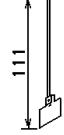
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

| NAME | OUTLINE | DESCRIPTION/CODE No. | Q'TY |
|--|---|-------------------------------|------|
| 遭難警報器用工材 DISTRESS ALARM UNIT INSTALLATION MATERIALS | | | |
| ナハ・タビ・ソネン SELF-TAPPING SCREW |  | 5X25-50S304 000-163-887-10 | 2 |
| 信号ケーブル組品 SIGNAL CABLE ASSY. |  | S16-4-15 004-446-970-00 | 1 |

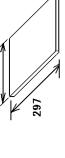
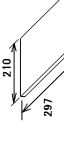
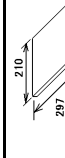


通信制御用付属品 COMMUNICATION UNIT ACCESSORIES

| | | | |
|--------|---|----------------|---|
| CD-ROM |  | 1650197* | 1 |
| CD-ROM | | 001-023-360-00 | |

工事材料 INSTALLATION MATERIALS CP16-02801

| | | | |
|-----------------------|---|----------------------------|----|
| ケーブルバンド CABLE BAND |  | PLIFIM-M 000-116-921-10 | 20 |
|-----------------------|---|----------------------------|----|

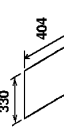
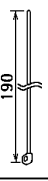
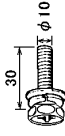



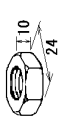
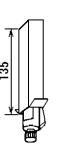
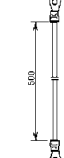
図書 DOCUMENT

| | | | |
|---|---|-----------------------------------|---|
| 77° リケーションフォーム REGISTRATION FOR SERVICE ACTIVATION |  | J5-950010-* 7/1 000-807-330-1* | 1 |
| 取扱説明書 OPERATOR'S MANUAL |  | 01M*-56340-* 000-147-662-1* | 1 |
| 操作要領書 OPERATOR'S GUIDE |  | 05*-56340-* 000-147-664-1* | 1 |
| 装備要領書 INSTALLATION MANUAL |  | 11M*-56340-* 000-147-666-1* | 1 |
| 遭難通信要領 DISTRESS COMMUNICATION |  | T1C-56340-* 000-147-668-1* | 1 |

型式/コード番号が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.
16AM-X-9851

工事材料表






INSTALLATION MATERIALS

| CODE NO. | | 16AM-X-9404-11 | | 1/1 | |
|-----------------|-----------------------------------|---|---|-----------|---|
| TYPE | | CP16-02701 | | | |
| INMARSAT-F1 MES | | | | | |
| FELCOM70 | | | | | |
| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名/規格 DESCRIPTIONS | 数量 QTY | 用途/備考 REMARKS |
| 1 | 放射危険ラベル RADIATION HAZARD LABEL |  | 16-016-1802-0 ROHS CODE NO. 100-312-020-10 | 1 | アンテナへの接近警報 CAUTION FOR APPROACHING ANT. |
| 2 | ケーブルタイ CABLE TIE |  | CV-200HT CODE NO. 000-162-191-10 | 1 | アンテナユニット固定用 ANTENNA UNIT FIXING |
| 3 | 上付ネジ UPSET SCREW-B |  | M10X30 SUS304 CODE NO. 000-162-569-10 | 4 | アンテナユニット固定用 ANTENNA UNIT FIXING |
| 4 | バネ座金 SPRING WASHER |  | M16 SUS304 CODE NO. 000-167-400-10 | 4 | アンテナユニット固定用 ANTENNA UNIT FIXING |
| 5 | フラット平座金 FLAT WASHER |  | M16 SUS304 CODE NO. 000-167-448-10 | 4 | アンテナユニット固定用 ANTENNA UNIT FIXING |
| 6 | 六角ナット HEX. NUT |  | M16 SUS304 CODE NO. 000-167-474-10 | 4 | アンテナユニット固定用 ANTENNA UNIT FIXING |
| 7 | 六角ナット3種 HEX. NUT |  | M16 SUS304 CODE NO. 000-167-503-10 | 4 | アンテナユニット固定用 ANTENNA UNIT FIXING |
| 8 | シリコン SILICON RUBBER |  | S-8400W 7#シリコン S-8400W 7#シリコン CODE NO. 000-158-483-10 000-158-483-00 | 1 | アンテナユニット固定用 ANTENNA UNIT FIXING |
| 9 | ワイヤアセンブリ WIRE ASSEMBLY |  | M12 500MM CODE NO. 000-132-825-10 | 1 | アンテナユニット接地用 GROUND FOR ANTENNA UNIT |

型式/コード番号が2段の場合、下段より上段に代わる標準部品であり、どちらが入っています。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.)

工事材料表

INSTALLATION MATERIALS

| CODE NO. | | 16AM-X-9401-2 | | 1/1 | |
|------------|-------------------------------------|---|---|-----------|---------------------|
| TYPE | | | | | |
| SF-170/171 | | | | | |
| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名/規格 DESCRIPTIONS | 数量 QTY | 用途/備考 REMARKS |
| 1 | ケーブル組品 CABLE ASSY. |  | 12D-SFA-CV *100M* CODE NO. 000-138-866 | 1 | *選択 TO BE SELECT |
| 2 | アンテナケーブル組品 ANTENNA CABLE ASSY. |  | 8D-FB-CV *30M* CODE NO. 000-111-547 | 1 | *選択 TO BE SELECT |
| 3 | ケーブル組品(アンテナ) ANTENNA CABLE ASSY. |  | 8D-FB-CV *40M* CODE NO. 000-150-921 | 1 | *選択 TO BE SELECT |
| 4 | アンテナケーブル組品 CABLE ASSY. |  | 8D-FB-CV *50M* CODE NO. 000-117-599 | 1 | *選択 TO BE SELECT |
| 5 | ケーブル組品(アンテナ) CABLE ASSY. |  | 8D-FB-CV *60M* CODE NO. 000-149-238 | 1 | *選択 TO BE SELECT |


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

FURUNO

| | | | |
|----------|----------------|----------------|-----|
| CODE NO. | 004-446-490-00 | 16AM-X-9402 -1 | 1/1 |
| TYPE | CPI16-02702 | | |

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 | コネクタ CONNECTOR |  | N-P-8DSFA CODE NO. 000-167-921-10 | 1 | アンテナケーブル用 FOR ANTENNA CABLE. |

FURUNO

| | | | |
|----------|-------------|----------------|-----|
| CODE NO. | 004-446-500 | 16AM-X-9403 -0 | 1/1 |
| TYPE | CPI16-02703 | | |

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 | コネクタ CONNECTOR |  | N-P-12DSFA CODE NO. 000-136-422 | 1 | アンテナケーブル用 FOR ANTENNA CABLE. |

型式/コード番号が2段の場合、下段より上段に代わる標準部品であり、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.

16AM-X-9402

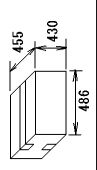


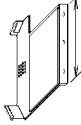
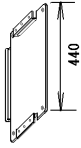
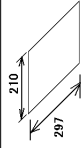
16AM-X-9403

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

PACKING LIST

FAX-2820

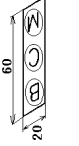

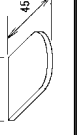
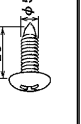
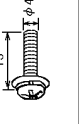
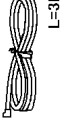
A-6
16A1-X-9854 -1 1/1

| NAME | OUTLINE | DESCRIPTION/CODE No. | QTY |
|-------------------------------|---|----------------------|-----|
| ユニット | | | |
| FAX (エフエーシー) |  | FAX-2820 | 1 |
| FACSIMILE MACHINE | | 000-156-880 | |
| 工事材料 | | | |
| INSTALLATION MATERIALS | | | |
| 工事材料 |  | 0P16-03504 | 1 |
| INSTALLATION MATERIALS | | 004-450-540 | |
| 工事材料 | | | |
| INSTALLATION MATERIALS | | | |
| 固定板 (右) 組品 |  | 0P16-03502 | 1 |
| FIXING PLATE ASSY. | | 004-450-520 | |
| 固定板 (左) 組品 |  | 0P16-03503 | 1 |
| FIXING PLATE ASSY. | | 004-450-530 | |
| 取付板組品 |  | 0P16-03501 | 1 |
| MOUNTING PLATE ASSY. | | 004-450-510 | |
| 図書 | | | |
| FAX取付方法 |  | 052-00204-* | 1 |
| FAX INSTALLATION PROCEDURES | | 000-146-784 | |

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)
16A1-X-9854

FURUNO

A-7

| CODE NO. | 16A1-X-9412 -6 | | | | |
|-------------------------------|----------------|---|---|--------|---------------|
| | 004-450-540-00 | 1/1 | | | |
| TYPE | CP16-03504 | | | | |
| 工事材料表 | | | | | |
| INSTALLATION MATERIALS | | | | | |
| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名/規格 DESCRIPTIONS | 数量 QTY | 用途/備考 REMARKS |
| 1 | ラベル (11MMR) |  | 16-007-6919-0 ROHS CODE NO. 100-217-010-10 | 1 | |
| 2 | ストッカー |  | 16-007-6927-0 ROHS CODE NO. 100-222-480-10 | 1 | |
| 3 | フック付板 |  | 16-011-4301-0 CODE NO. 100-330-470-10 | 1 | |
| 4 | 自己付着ネジ |  | 5X20 SUS304 CODE NO. 000-162-608-10 | 4 | |
| 5 | ワッシャー付ネジ |  | MAX15 G2700W HBN12 CODE NO. 000-163-183-10 | 6 | |
| 6 | モジュラーコード |  | BCM23 IV BCM23 IV CODE NO. 000-170-701-10 000-136-773-00 | 1 | |

型式/コード番号が2段の場合、下段より上段に代わる通線部品であり、どちらが入っています。なお、品名は変わりません。
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. DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO., LTD.

16A1-X-9412

| | | | |
|----------|----------------|---------------|-----|
| CODE NO. | 004-438-410-00 | 16AG-X-9412-4 | 1/1 |
| TYPE | CP16-00511 | | |

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 | ラベル (SLIDE) LABEL (SLIDE) | | 16-007-6405-0 ROHS CODE NO. 100-222-470-10 | 1 | |
| 2 | ラベル (IMMAR) LABEL (IMMAR) | | 16-007-6919-0 ROHS CODE NO. 100-217-010-10 | 1 | |
| 3 | ラベル LABEL | | 16-007-6927-0 ROHS CODE NO. 100-222-480-10 | 1 | |
| 4 | 受話器固定具 HANDSET FIXTURE | | 16-011-7101-1 ROHS CODE NO. 100-273-831-10 | 1 | |
| 5 | 接着テープ VULCANIZING TAPE | | 16-011-7103-0 ROHS CODE NO. 100-273-840-10 | 1 | |
| 6 | キール LABEL | | 16-011-7111-0 ROHS CODE NO. 100-273-850-10 | 1 | |
| 7 | シート (TEL.) SHEET (TEL.) | | 16-011-7112-0 ROHS CODE NO. 100-273-860-10 | 1 | |
| 8 | ネジ (P4付ネジ) SCREW | | 3X14 SWCH16A CODE NO. 000-168-110-10 | 1 | |
| 9 | ネジ (P4付ネジ) SELF-TAPPING SCREW | | 4X16 SUS304 CODE NO. 000-162-605-10 | 4 | |
| 10 | 壁掛金具 MOUNTING BASE | | FC755WM CODE NO. 000-808-704-00 | 1 | |

型式/コード番号が2段の場合、下段より上段に代わる通線部品であり、どちらが入っています。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.)

| | | | |
|----------|----------------|---------------|-----|
| CODE NO. | 004-438-420-00 | 16AG-X-9413-1 | 1/1 |
| TYPE | CP16-00512 | | |

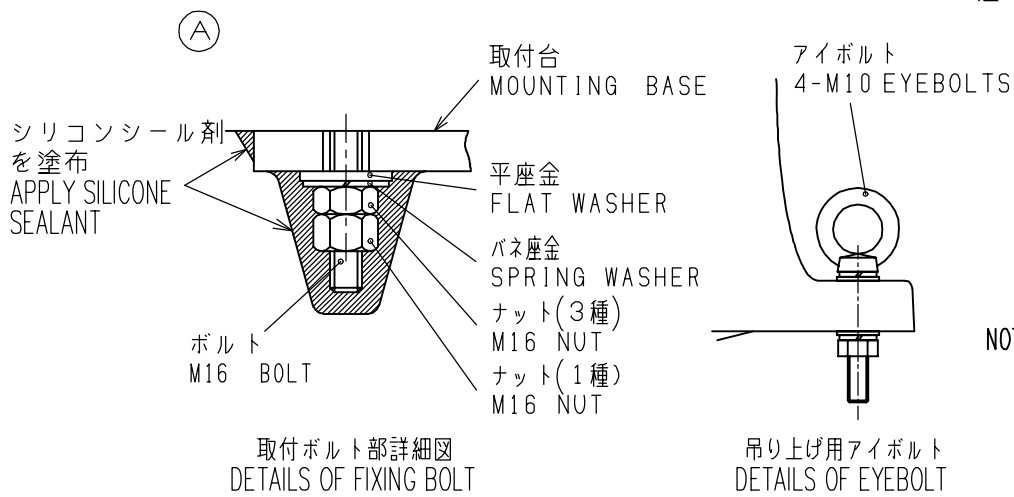
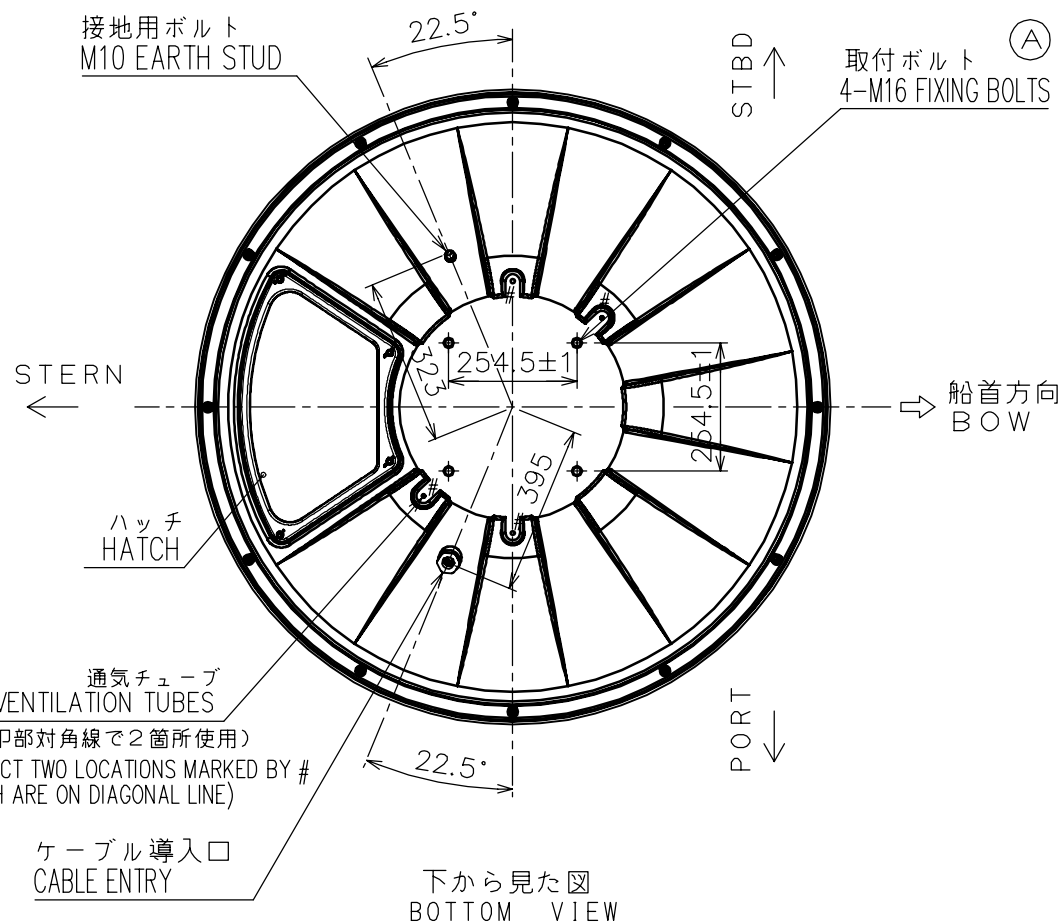
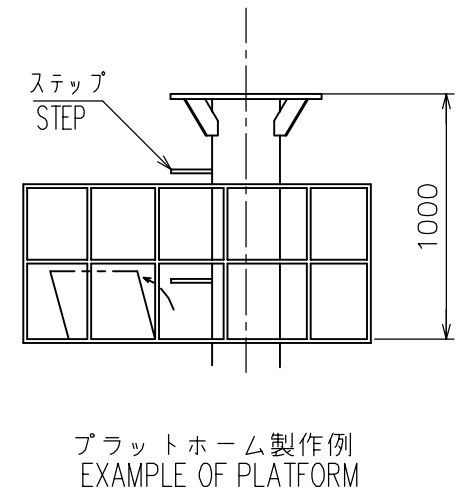
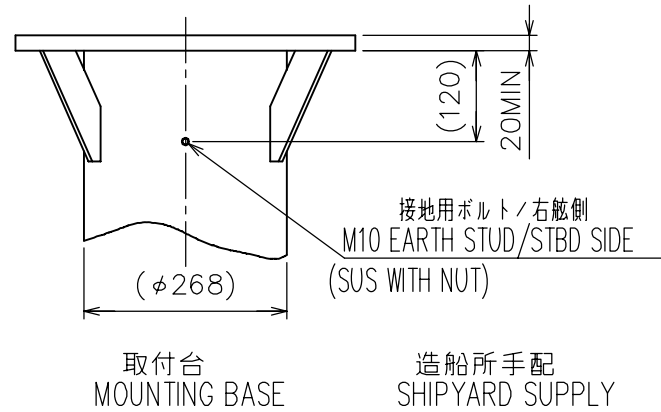
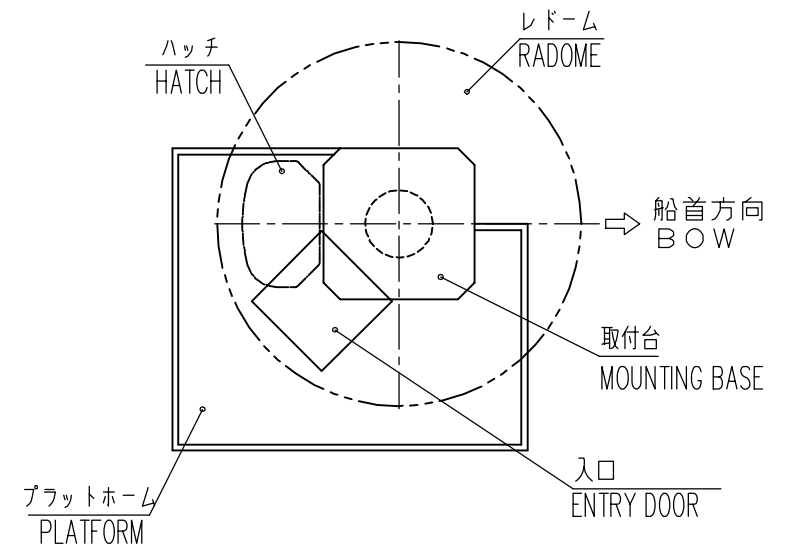
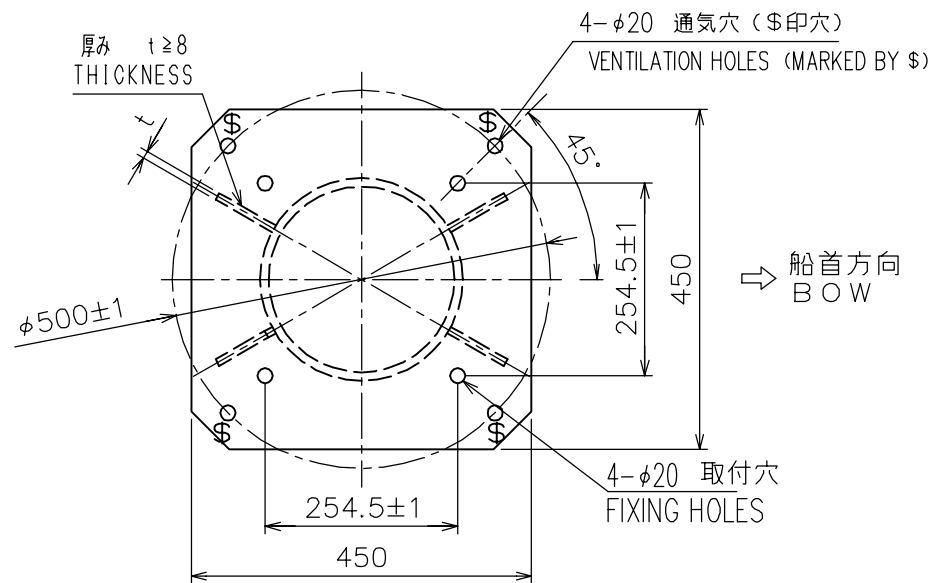
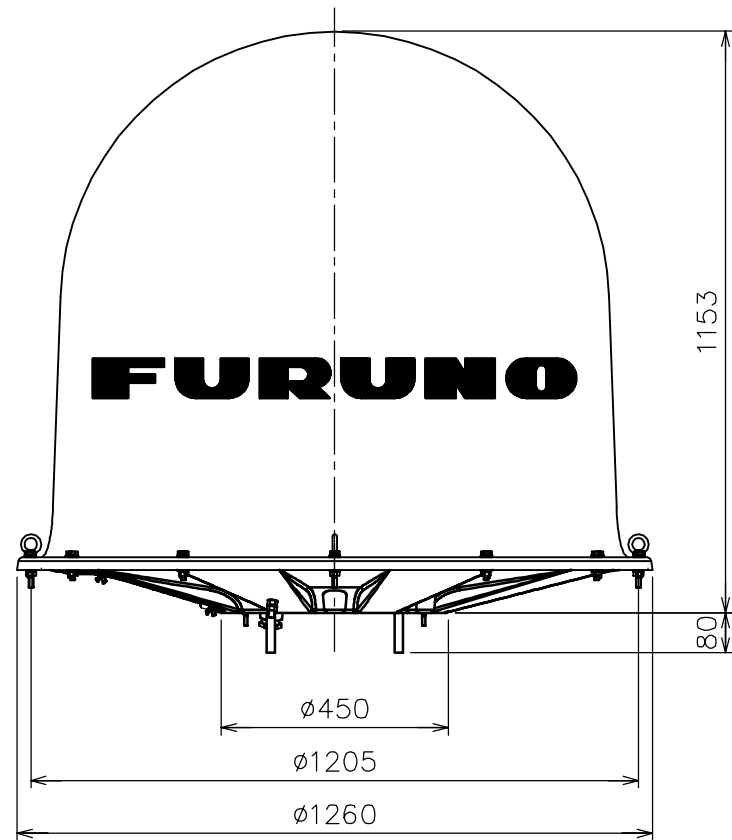
工事材料表

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 | 取付板 MOUNTING BASE | | 16-011-7102-0 ROHS CODE NO. 100-273-840-10 | 1 | |
| 2 | ネジ (P4付ネジ) SELF-TAPPING SCREW | | 4X16 SUS304 CODE NO. 000-162-605-10 | 4 | |

For Telephone FC755D1

型式/コード番号が2段の場合、下段より上段に代わる通線部品であり、どちらが入っています。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.)



- 注 記 1) 指定外の寸法公差は表1による。
2) 図は標準のアンテナ取付方向で、アンテナ取付方向は変更可能。
3) 通気チューブ用の穴は、取付台幅が420mm以上の場合は必ず設けること。取付台部にかかる通気チューブは2箇所であるが、アンテナ取付方向の変更を考慮して、取付台には通気穴を4箇所設けること。
4) 取付台への接地用ボルトの取付位置はアンテナユニットの取付方向にあわせて場所の変更すること。

- NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. DIAGRAM SHOWS STANDARD ANTENNA UNIT FIXING DIRECTION. IT MAY BE CHANGED AS REQUIRED.
3. WHEN MOUNTING BASE WIDTH IS 420 mm OR MORE, MAKE VENTILATION HOLES (AT LEAST TWO) FOR VENTILATION TUBES. IT IS RECOMMENDED TO MAKE TWO ADDITIONAL HOLES WHEN MOUNTING DIRECTION IS CHANGED.
4. CHOOSE LOCATION FOR BOLT FOR GROUND ON MOUNTING BASE ACCORDING TO ANTENNA UNIT INSTALLATION DIRECTION.

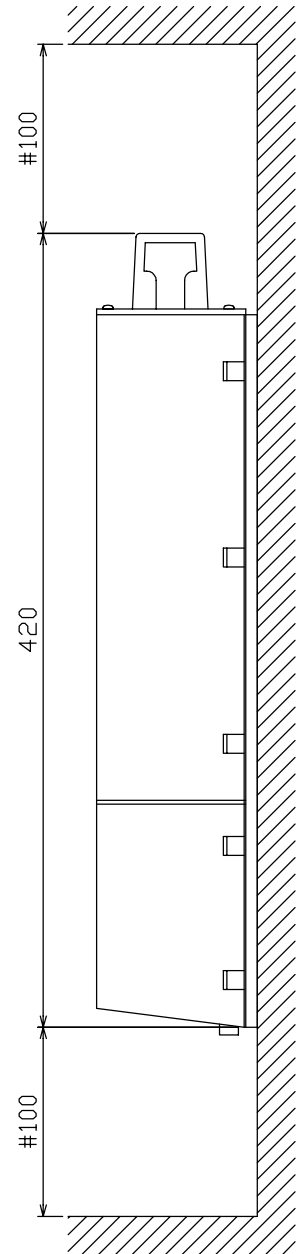
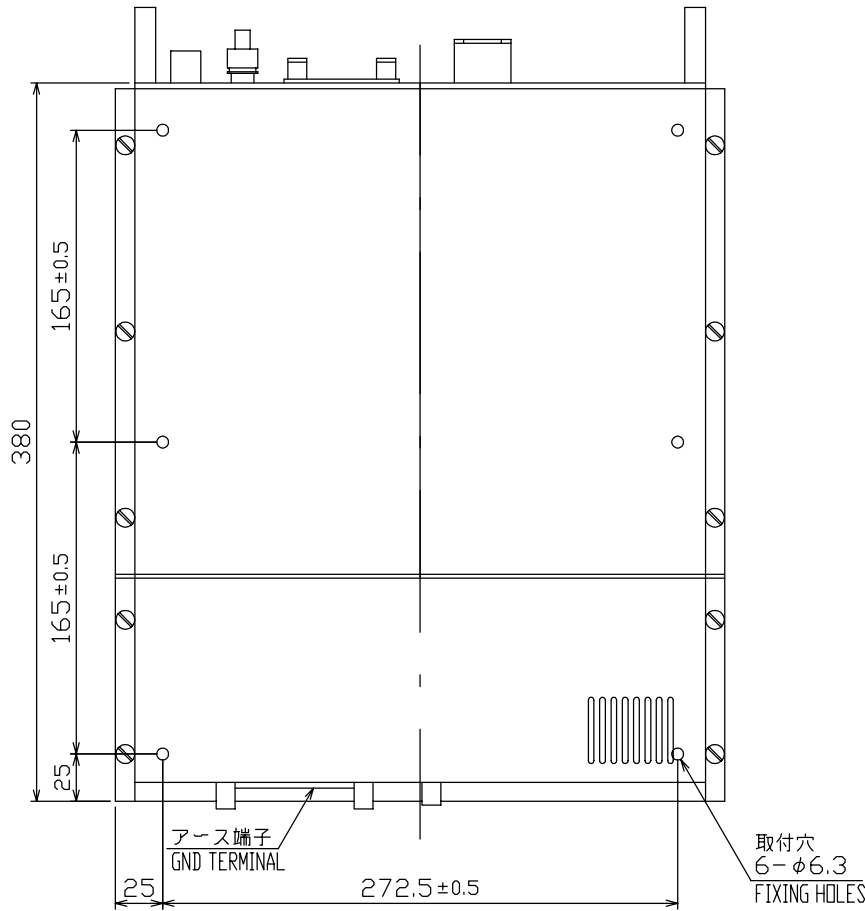
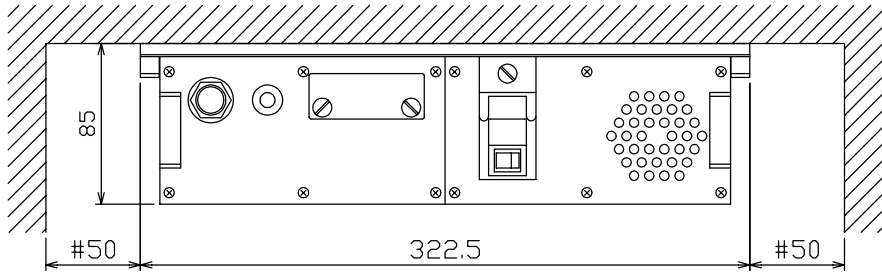
表1 TABLE 1

| 寸法区分 (mm) DIMENSIONS | 公差 (mm) TOLERANCE |
|-------------------------|----------------------|
| L ≤ 50 | ± 1.5 |
| 50 < L ≤ 100 | ± 2.5 |
| 100 < L ≤ 500 | ± 3 |
| 500 < L ≤ 1000 | ± 4 |
| 1000 < L ≤ 2000 | ± 5 |

| | | | |
|----------|-------------------------|---------------|-----------------|
| DRAWN | MAY 24 '06 E. MIYOSHI | TITLE | SF-170 |
| CHECKED | TAKAHASHI. T | 名称 | アンテナユニット |
| APPROVED | Y. Hatai | FELCOM 70 | 外寸図 |
| SCALE | 1/15 MASS 66 ±10% kg | NAME | ANTENNA UNIT |
| DWG.No. | C5634-G04-H | 16-016-100G-5 | OUTLINE DRAWING |

| 寸法区分 (mm) DIMENSIONS | 公差 (mm) TOLERANCE |
|-------------------------|----------------------|
| $L \leq 50$ | ± 1.5 |
| $50 < L \leq 100$ | ± 2.5 |
| $100 < L \leq 500$ | ± 3 |

表 1 TABLE 1



注記

- 1) 指定なき寸法公差は表 1 による。
- 2) # : 推奨する最小サービス空間寸法。

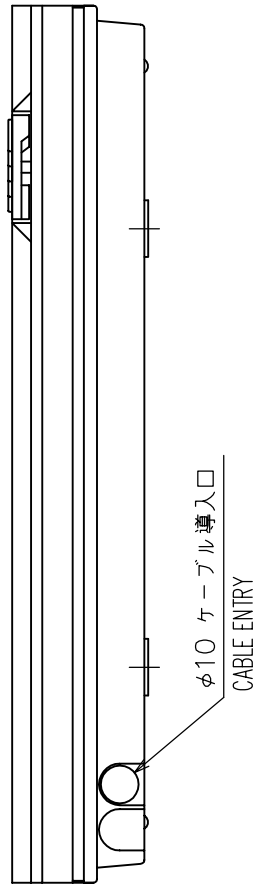
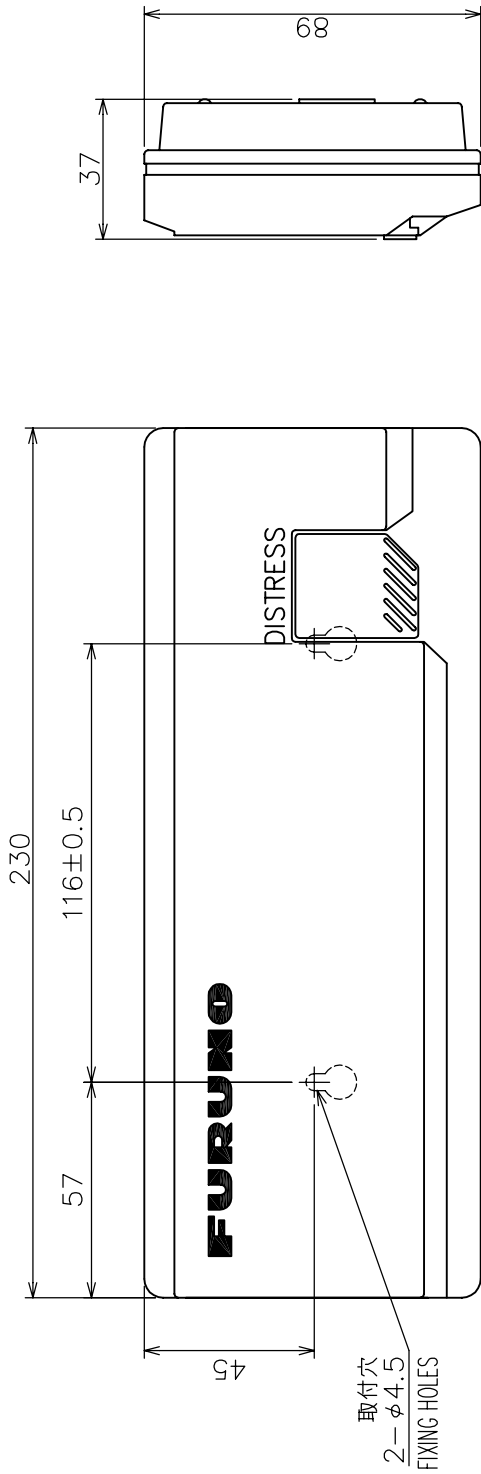
NOTE

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

| | | | | |
|----------|----------------------------------|---------------------------|-------|--------------------|
| DRAWN | Nov. 7 '03 T.YAMASAKI | | TITLE | SF-270 |
| CHECKED | Nov. 7 '03 T.MATSUGUCHI | | 名称 | 通信制御ユニット |
| APPROVED | Nov. 10 '03 <i>T. Matsuguchi</i> | FELCOM 70 | | 外寸図 |
| SCALE | 1/4 | MASS $\pm 10\%$ 7.4 kg | NAME | COMMUNICATION UNIT |
| DWG No. | C5634-G01-A | 16-016-200G-0 | | 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) 指定なき寸法公差は表 1 による。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

| | |
|--|-----------------------------|
| DRAWN Nov. 18 '03 I. YAMASAKI | TITLE SF-370 |
| CHECKED Nov. 18 '03 I. Matsuguchi | 名称 遭難警報発呼器 |
| APPROVED Nov. 18 '03 R. Matsuguchi | 外寸図 |
| SCALE 1/2 | NAME DISTRESS ALERT UNIT |
| DWG.No. C5634-G03-D | OUTLINE DRAWING |
| | 16-016-300G-0 |

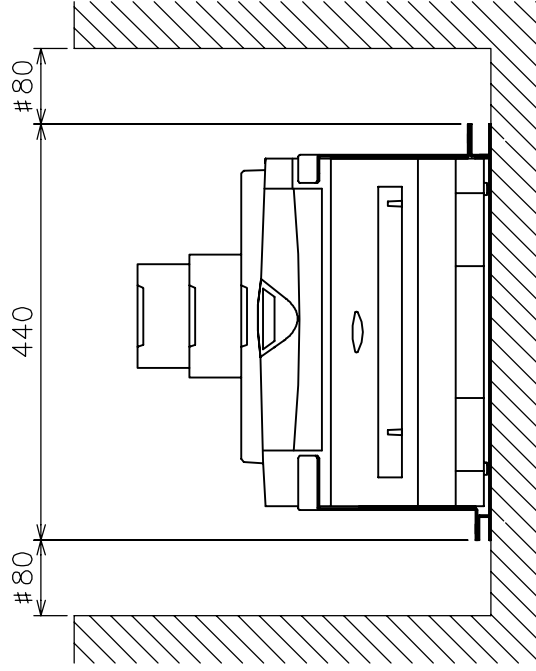
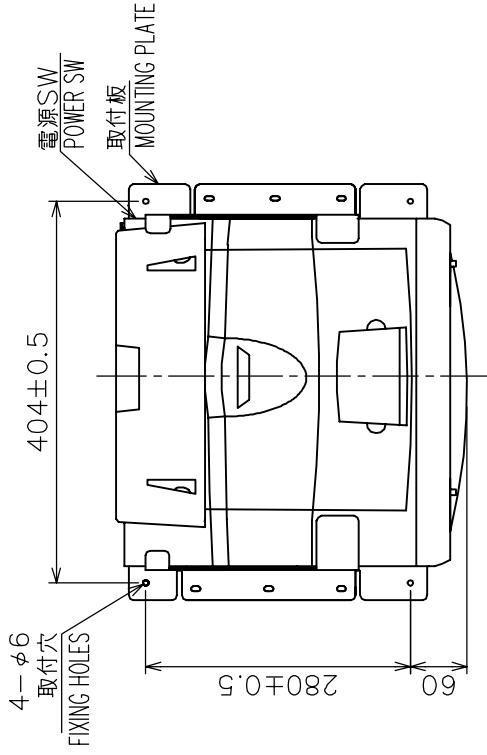
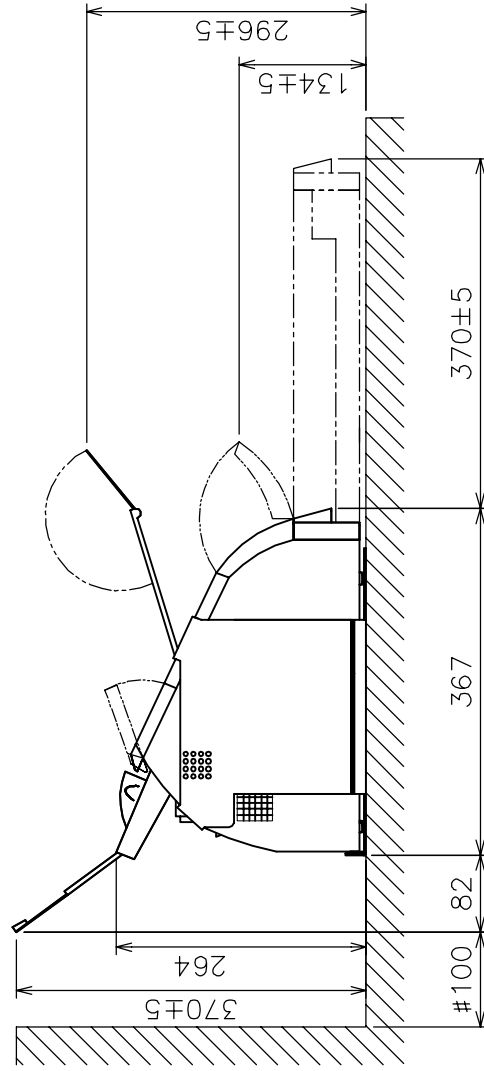
表 1 TABLE 1

| 寸法区分 (mm) DIMENSIONS | 公差 (mm) TOLERANCE |
|-------------------------|----------------------|
| L ≤ 50 | ±1.5 |
| 50 < L ≤ 100 | ±2.5 |
| 100 < L ≤ 500 | ±3 |

- 注 記
- 1) #印寸法は最小サービスイ間寸法とする。
 - 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ツピンネジ呼び径5×20を使用のこと。

NOTE

1. # MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE SELF-TAPPING SCREWS 5x20 FOR FIXING THE UNIT.

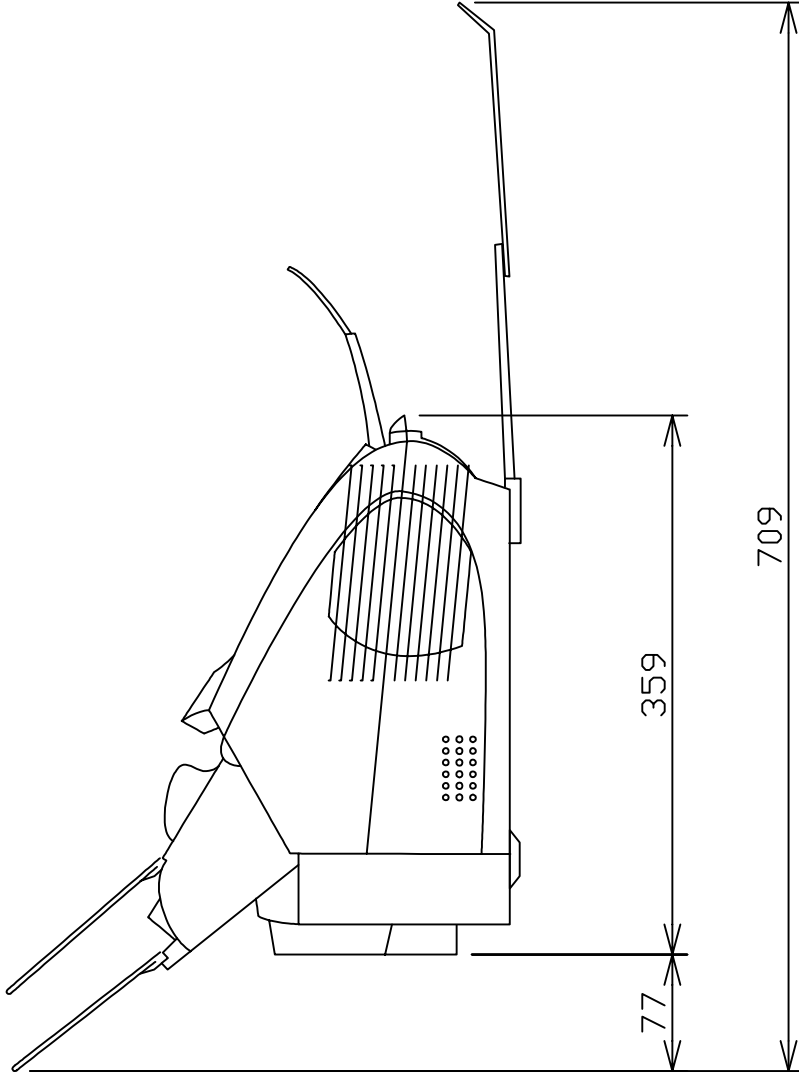
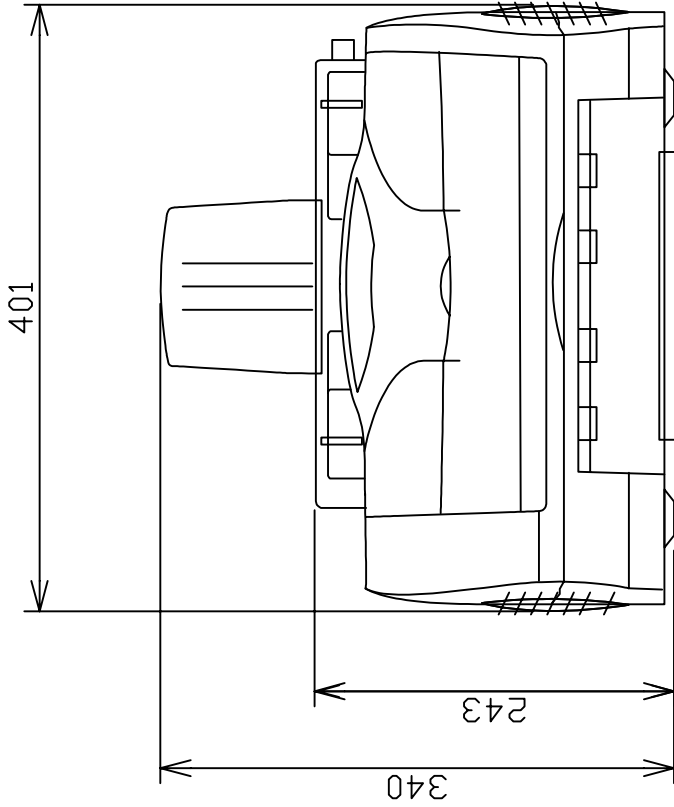


| | | | | |
|----------|--------------|---|-------|---------------------|
| DRAWN | Nov. 10, '05 | E. MIYOSHI | TITLE | FAX-2820 |
| CHECKED | | TAKAHASHI, T | 名称 | ファクシミリ (英文) |
| APPROVED | | Y. Hatate | 外寸図 | |
| SCALE | 1/8 | FELCOM 80/70/50/30 質量は取付板を含む。 MASS INCLUDES MOUNTING PLATE. | NAME | FACSIMILE (ENGLISH) |
| DWG No. | C5624-G19-B | 16-011-420G-1 | | OUTLINE DRAWING |

4

3

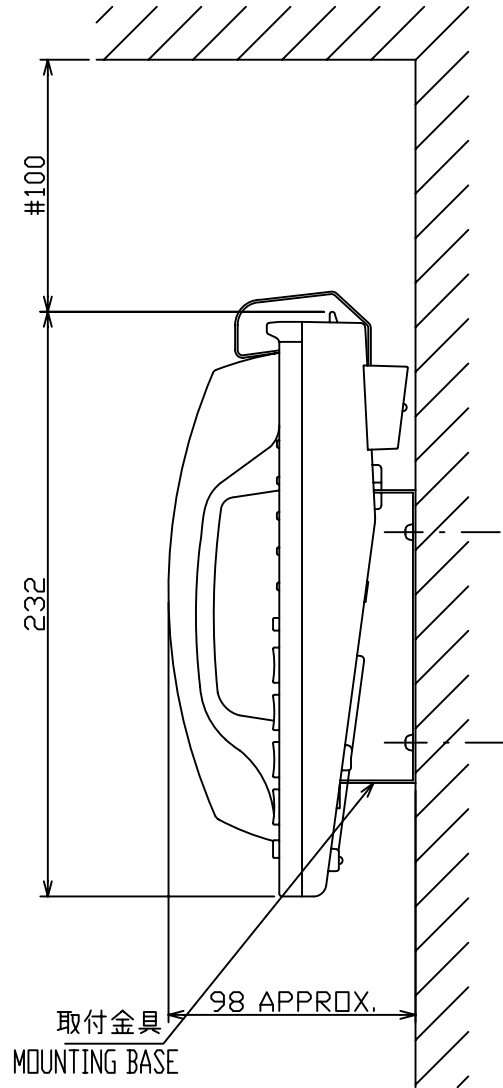
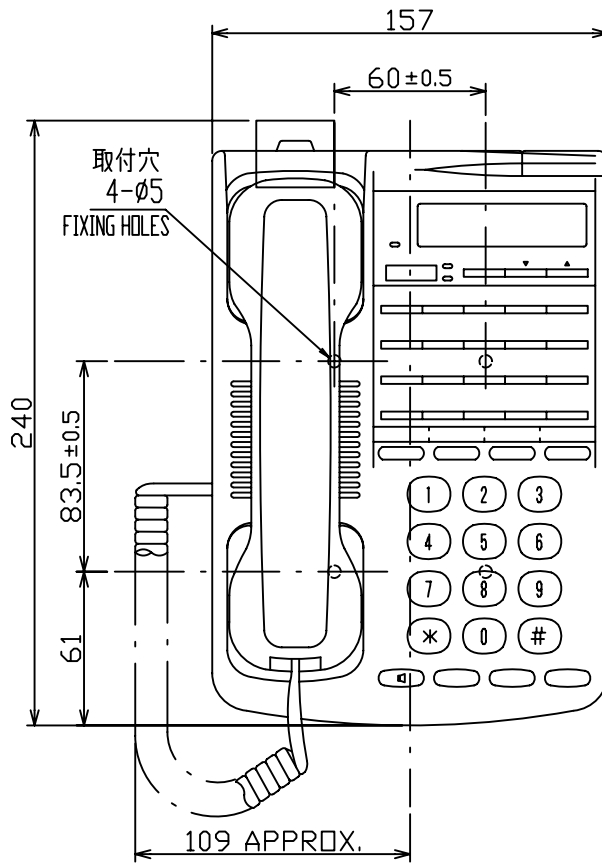
2



| | | | | |
|----------|-------------|------------------|-------|-----------------|
| DRAWN | Dec. 9 '02 | I. YAMASAKI | TITLE | FAX-8070P |
| CHECKED | Dec. 9 '02 | Y. KIMURA | 名称 | ファクシミリ |
| APPROVED | Dec. 12 '02 | <i>Y. Kimura</i> | 外寸図 | |
| SCALE | 1/5 | MASS 7.5 kg | NAME | FACSIMILE |
| DWG.No. | C5624-G16-A | | | OUTLINE DRAWING |

表 1 TABLE 1

| 寸法範囲 (mm) DIMENSIONS | 公差 (mm) TOLERANCE |
|-------------------------|----------------------|
| $L \leq 50$ | ± 1.5 |
| $50 < L \leq 100$ | ± 2.5 |
| $100 < L \leq 500$ | ± 3 |



注記

- 1) 指定外の寸法公差は表1による。
- 2) #: 最小サービス空間寸法。
- 3) 取付にはトラスタッピンネジ4×16 SUS304を使用のこと。

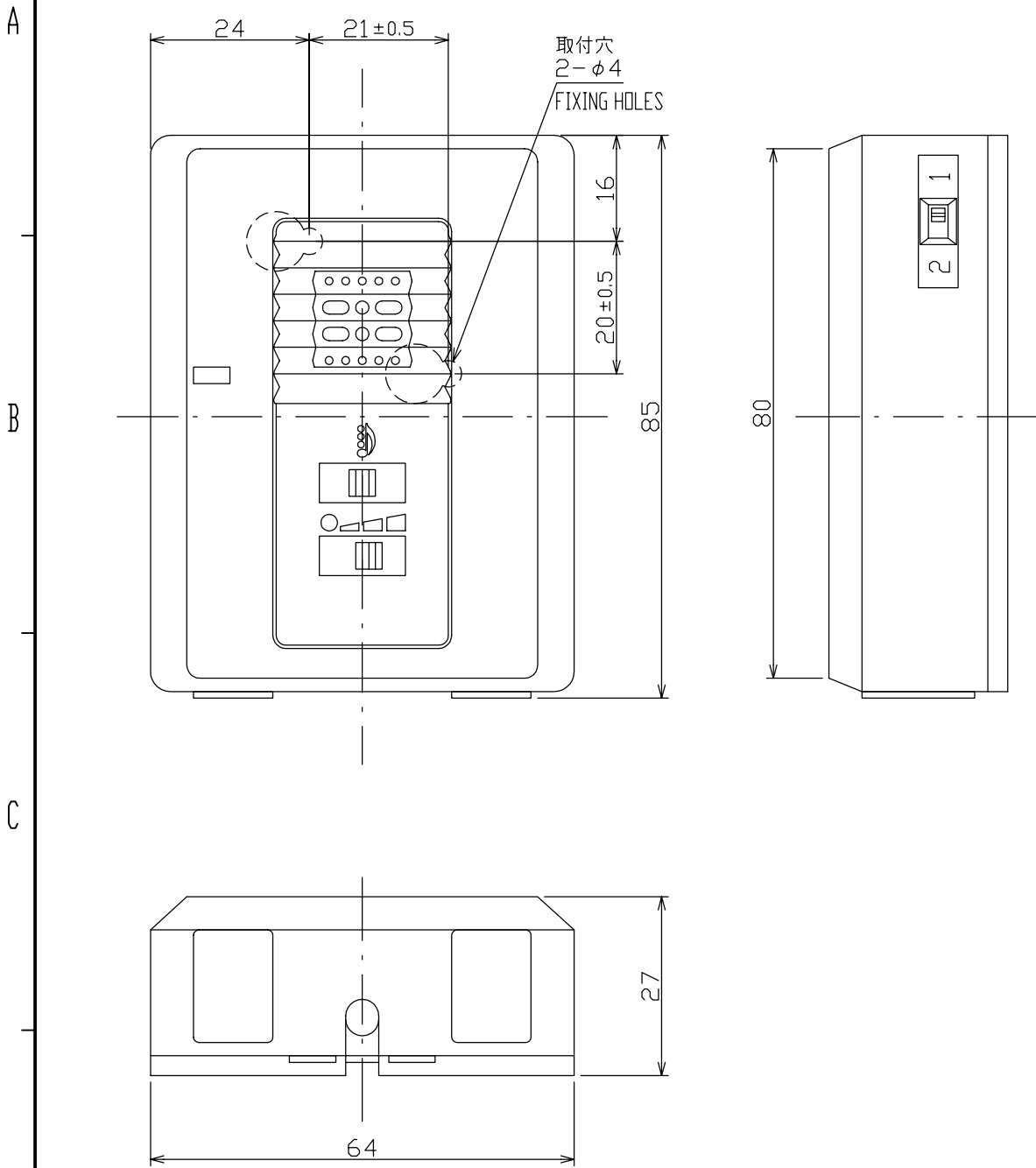
NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS 4x16 SUS304 FOR FIXING THE UNIT.

| | | | |
|-------------------------|-------------------------|-----------------|------------------------------------|
| DRAWN Feb. 9 '06 | T. YAMASAKI | | TYPE FC755D1 |
| CHECKED Feb. 9 '06 | T. TAKENO | | 名称 電話機 (壁掛装備) |
| APPROVED Feb. 15 '06 | T. Matsuguchi | FELCOM 81/82/70 | 外寸図 |
| SCALE 1/3 | MASS 0.83 ±10% kg | | NAME TELEPHONE (BULKHEAD MOUNT) |
| DWG.No. C5589-G19- D | 16-011-710G- 0 | | OUTLINE DRAWING |

表1 TABLE 1

| 寸法区分(mm) DIMENSIONS | 公差(mm) TOLERANCE |
|------------------------|---------------------|
| $0 < L \leq 50$ | ± 1.5 |
| $50 < L \leq 100$ | ± 2.5 |



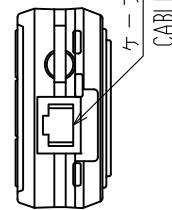
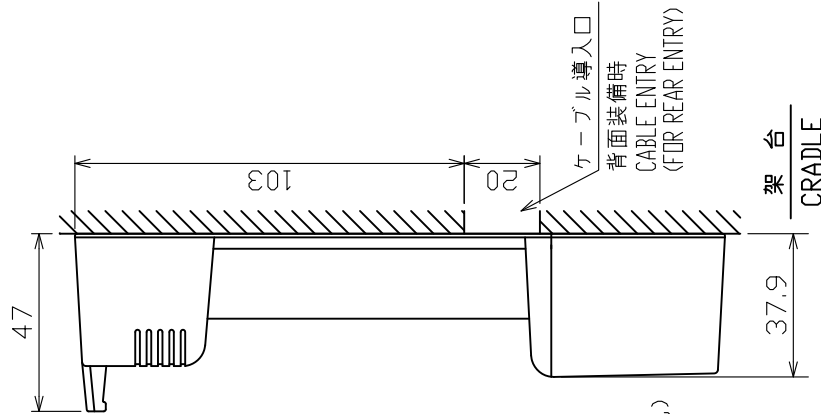
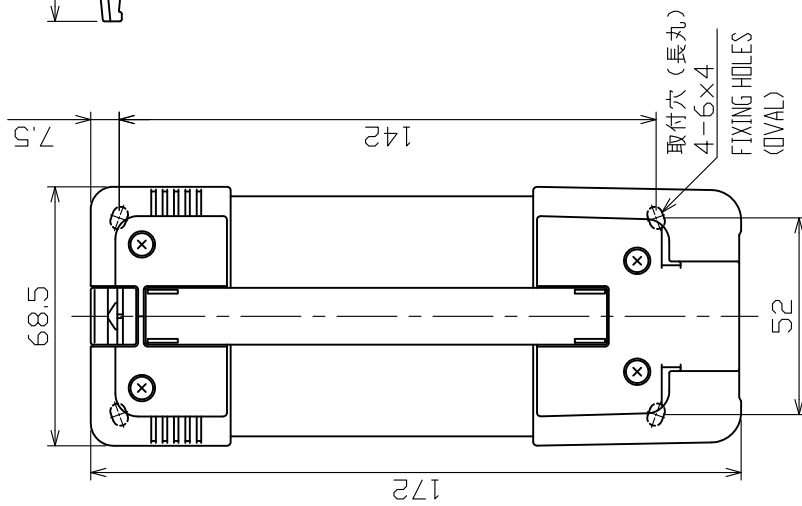
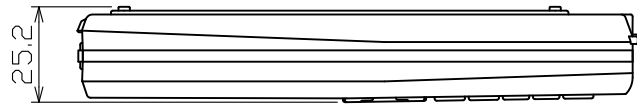
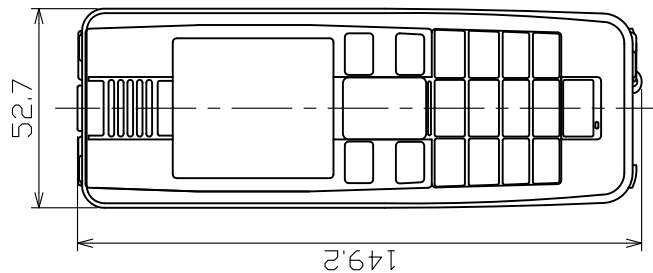
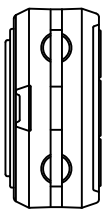
注記

1) 指定なき寸法公差は表1による。

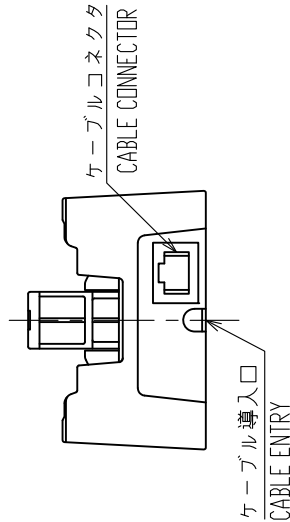
NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

| | | |
|---------------------------------|------------------------|----------------------------|
| DRAWN Jan. 29 '04 E. MIYOSHI | | TITLE KK-893-3977 |
| CHECKED Takahashi T. | | 名称 着信指示器 |
| APPROVED Y. Hatai | FELCOM 70 | 外寸図 |
| SCALE 1/1 | MASS 0.1 ±10% kg | NAME INCOMING INDICATOR |
| DWG.No. C5634-G07-B | | OUTLINE DRAWING |



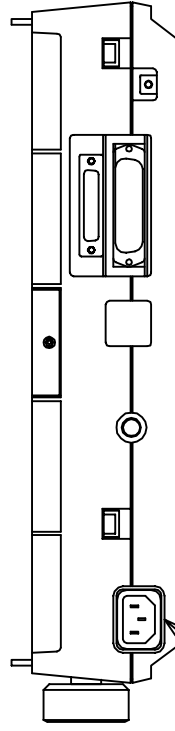
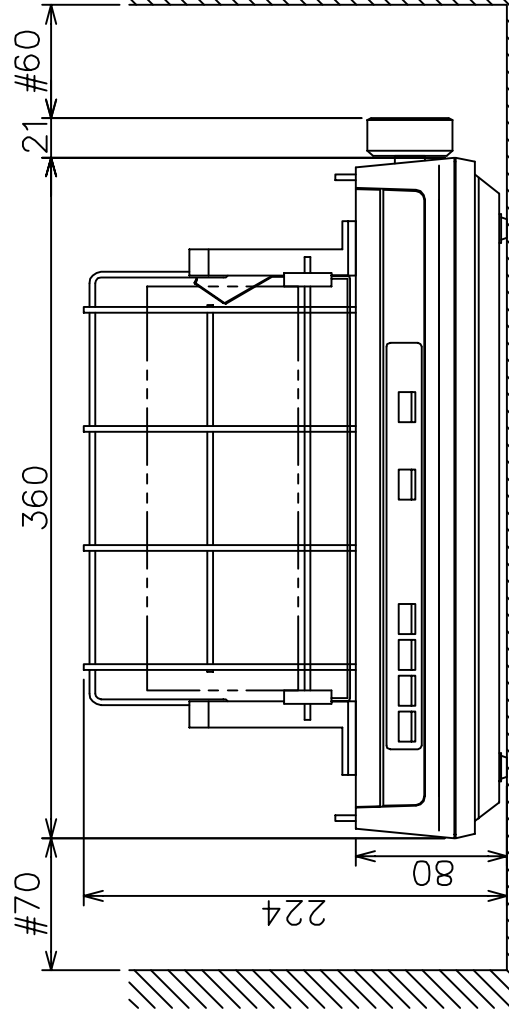
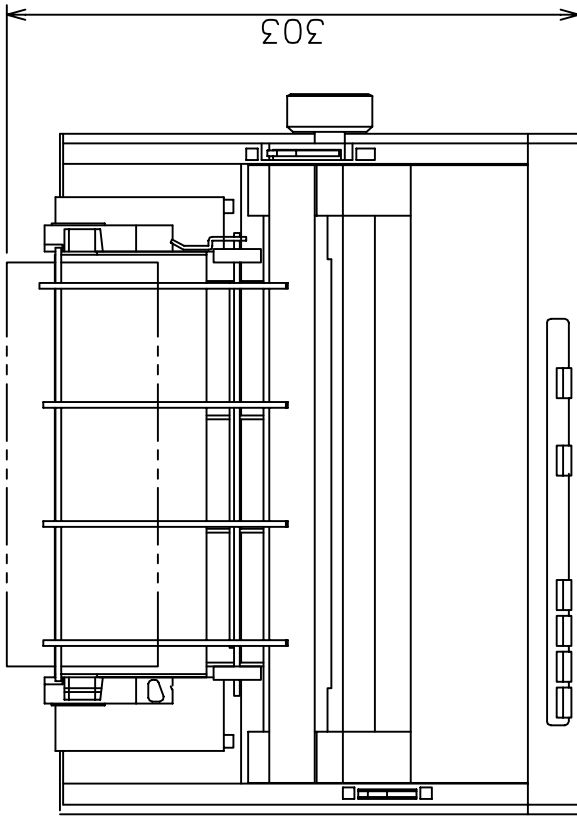
ハンドセット
HANDSET



架台
CRADLE

| | | | | |
|----------|-------------|---------------------------------|-----------------|--------------------------|
| DRAWN | Aug. 21 '07 | I. YAMASAKI | TITLE | SF-870-A |
| CHECKED | Aug. 21 '07 | I. TAKENO | 名称 | ISDNハンドセット (架台含む) |
| APPROVED | Aug. 24 '07 | R. Esumi | 外寸図 | |
| SCALE | 1/2 | 質量 0.31 kg | NAME | ISDN HANDSET (W/ CRADLE) |
| FIG. No. | C5634-G11-A | FELCOM 30/50/70 質量はケーブルコネクタを含まず | OUTLINE DRAWING | |

4
3
2
1



電源
POWER SOURCE

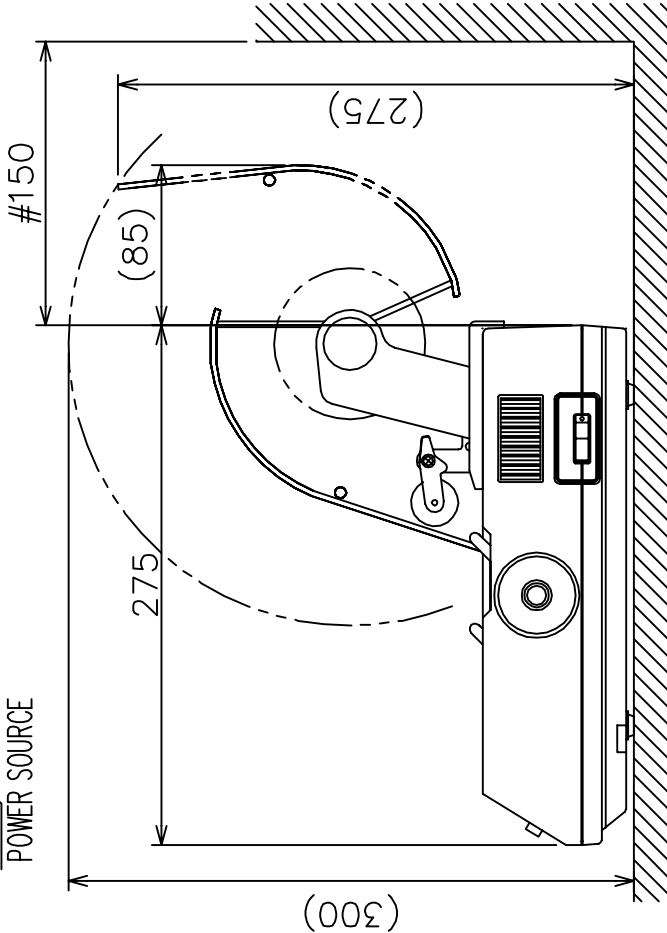


表1 TABLE 1

| 寸法区分 (mm) DIMENSIONS | 公差 (mm) TOLERANCE |
|-------------------------|----------------------|
| L ≤ 50 | ±1.5 |
| 50 < L ≤ 100 | ±2.5 |
| 100 < L ≤ 500 | ±3 |

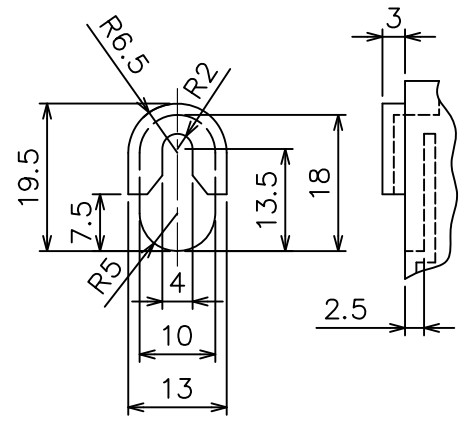
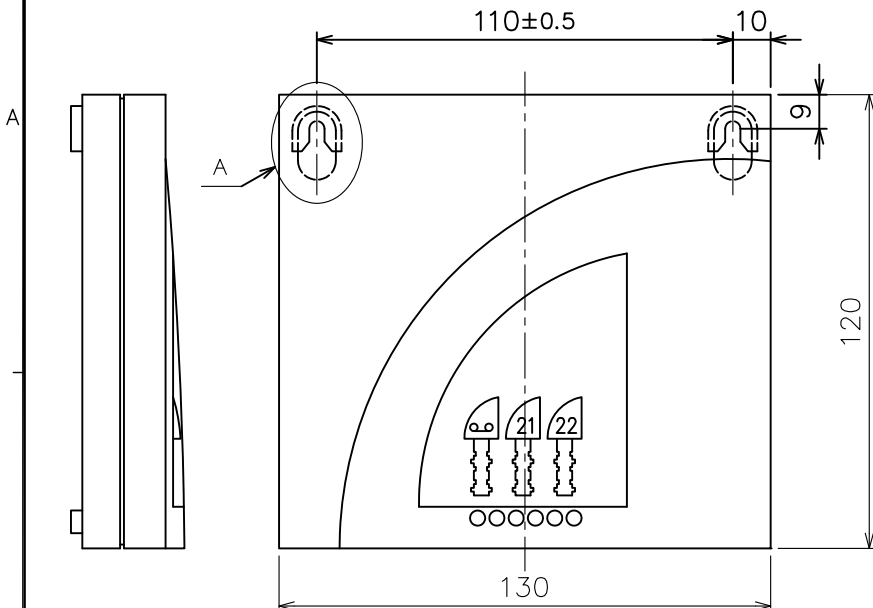
注記 1) 指定外の寸法公差は表1による。
 2) #印は最小サービスマン寸法とする。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. # MINIMUM SERVICE CLEARANCE.

| | |
|------------------------------------|-----------------|
| DRAWN Feb. 4, '05 E. MIYOSHI | TITLE ML280S |
| CHECKED TAKAHASHI, T | 名称 プリンタ |
| APPROVED Y. Hatai | 外寸図 |
| SCALE 1/4 | NAME PRINTER |
| DWG. No. C5634-G10-A | 16-016-500G-0 |
| OUTLINE DRAWING | |

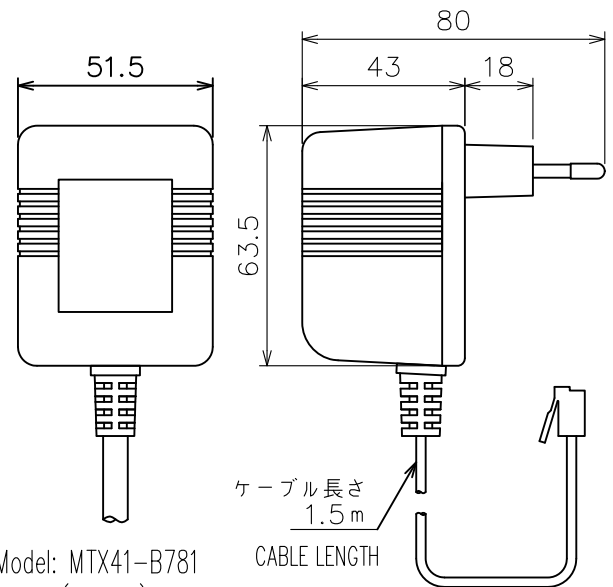
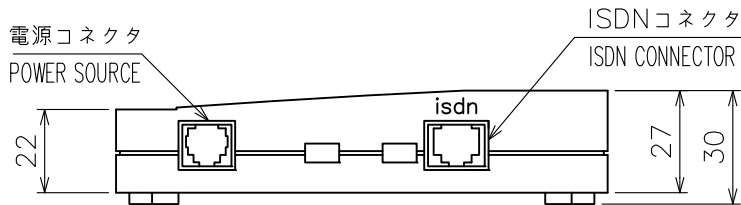
表1 TABLE 1

| 寸法区分 (mm) DIMENSION | 公差 (mm) TOLERANCE |
|------------------------|----------------------|
| $L \leq 50$ | ± 1.5 |
| $50 < L \leq 100$ | ± 2.5 |
| $100 < L \leq 500$ | ± 3 |



A部 詳細 (尺度 1 : 1)

DETAIL A (SCALE: 1/1)



Model: MTX41-B781

質量 (Mass): 0.3 kg

ターミナルアダプタ用ACアダプタ
AC ADAPTER FOR TERMINAL ADAPTER

注 記

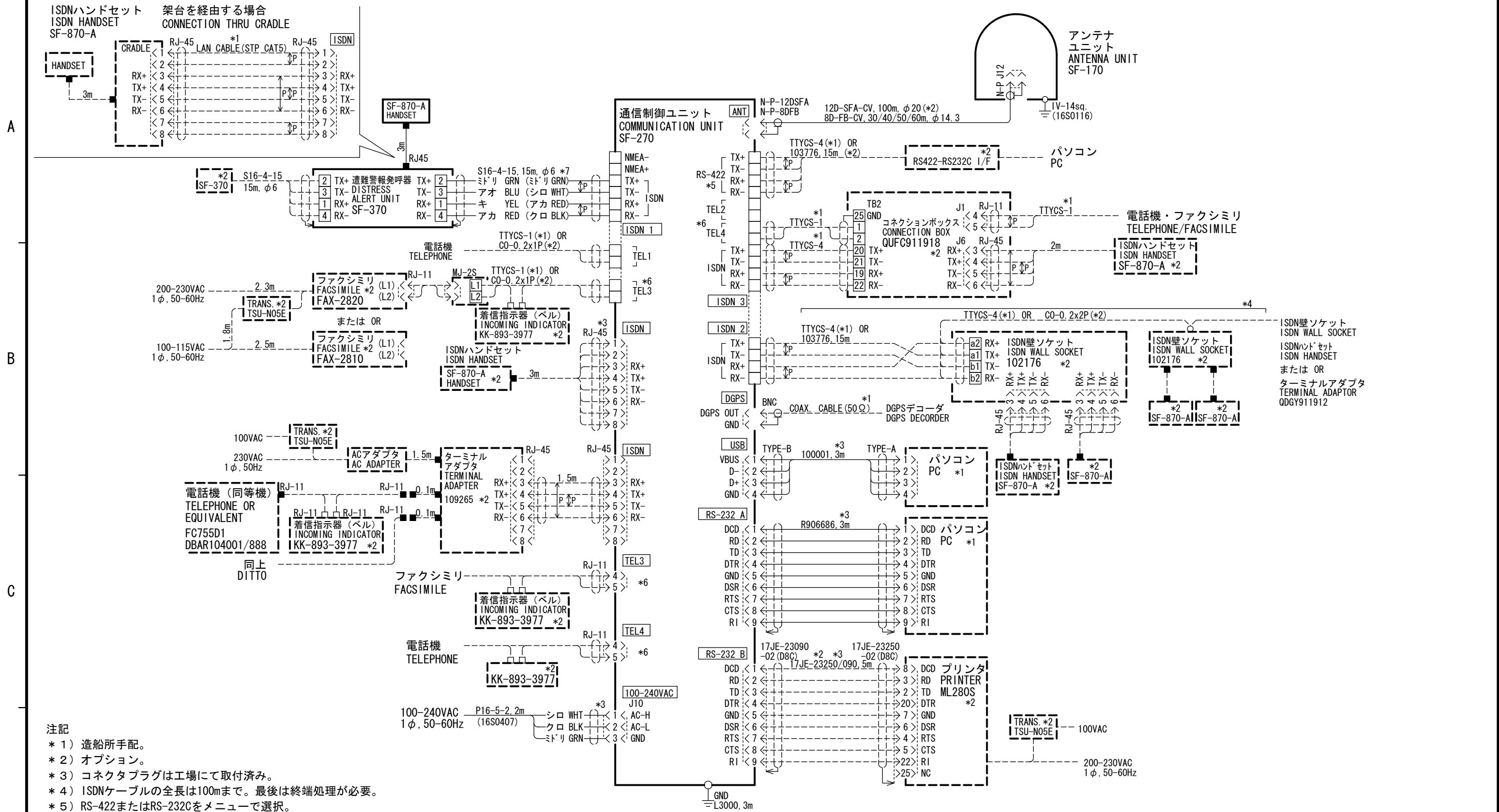
1) 指示なき寸法公差は表1による

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

| | | | |
|----------|----------------------|------------------------|--|
| DRAWN | 11/Sep/08 T.YAMASAKI | TITLE | VERONA II |
| CHECKED | 12/Sep/08 T.TAKENO | 名称 | ターミナルアダプタ |
| APPROVED | 12/Sep/08 R.Esumi | FELCOM 70/50/30 | 外寸図 |
| SCALE | 1/2 | MASS $0.2 \pm 10\%$ kg | 質量はACアダプタ、ケーブルを含まず。 MASS W/O AC ADAPTER OR CABLE. |
| DWG. No. | C5634-G14-A | REF. No. | 16-016-110G-0 |
| | | | NAME TERMINAL ADAPTER OUTLINE DRAWING |

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- 注記
- * 1) 造船所手配。
 - * 2) オプション。
 - * 3) コネクタプラグは工場にて取付済み。
 - * 4) ISDNケーブルの全長は100mまで。最後は終端処理が必要。
 - * 5) RS-422またはRS-232Cをメニューで選択。
 - * 6) コネクタTEL3/TEL4は、端子台TEL3/TEL4と並列。
 - * 7) () 内の緑色は、2対ケーブルの場合。

- NOTE
- *1: SHIPYARD SUPPLY.
 - *2: OPTION.
 - *3: CONNECTOR PLUG FITTED AT FACTORY.
 - *4: TOTAL ISDN CABLE LENGTH UP TO 100m. THE LAST SOCKET SHOULD BE TERMINATED.
 - *5: SELECT RS-422 OR RS-232C FROM MENU.
 - *6: CONNECTOR TEL3/TEL4 ARE IN PARALLEL WITH TERMINAL TEL3/TEL4.
 - *7: () COLORS SHOW CORES OF TWO TWISTED-PAIRS CABLE.

CO-0.2x1P: CO-SPEVV-SB-C 0.2x1P, φ8.5
 CO-0.2x2P: CO-SPEVV-SB-C 0.2x2P, φ10.5

| | | | |
|----------|----------------------|----------|-------------------------|
| DRAWN | 8/Dec/08 T. YAMASAKI | TITLE | FELCOM 70 |
| CHECKED | 8/Dec/08 T. TAKENO | 名称 | インマルサットFLEET F77 船舶地球局 |
| APPROVED | 9/Dec/08 R. Esumi | | 相互結線図 |
| SCALE | MASS kg | NAME | INMARSAT FLEET F77 MES |
| DWG No. | C5634-C01- N | REF. No. | INTERCONNECTION DIAGRAM |