FURUNO

INSTALLATION MANUAL

COLOR SCANNING SONAR

MODEL FSV-84

FURUNO ELECTRIC CO., LTD.

www.furuno.co.jp

ECF
(Elemental Chlorine Free)
The paper used in this manual
is elemental chlorine free.

9-52 Ashihara-cho,
Nishinomiya, 662-8580, JAPAN

Telephone : +81-(0)798-65-2111
Fax : +81-(0)798-65-4200

・FURUNO Authorized Distributor/Dealer

 Printed in Japan

A : SEP. 2006
B3 : JUN. 21, 2007

Pub. No. IME-13290-B3

(DAMI) FSV-84

＊０００１５７４２９１１＊

SAFETY INSTRUCTIONS

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

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

Warning, Caution Prohibitive Action Mandatory Action

DANGER

Keep away from raise/lower shaft in hull unit when it is moving.

Gears will cause serious injury.

WARNING

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

High voltage exists inside the equipment, and a residual charge remains in capacitors severalminutes after the power is turned off. Improperhandling can result in electrical shock.

Turn off power at the switchboard before beginning the installation.

Electrical shock or fire can result if the the power is left on.

WARNING

Do not install the equipment where it may get wet from rain or water splash.

Water can cause fire or electrical shock, or damage the equipment.

Be sure no water leaks in at the transducer installation site.

Water leakage can sink the vessel. Also confirm that the transducer will not loosen by ship's vibration. The installer of the equipment is solely responsible for the proper installation of the equipment. FURUNO will assume no responsibility for any damage associated with improper installation.

Install the specified transducer tank in accordance with the installation instructions. If a different tank is to be installed the shipyard is solely responsible for its installation, and it should be installed so the hull will not be damaged if the tank strikes an object.

The tank or hull may be damaged if the tank strikes an object.

⚠ WARNING

If a steel tank is installed on a wooden or FRP vessel, take appropriate measures to prevent electrolytic corrosion.

Electrolytic corrosion can damage the hull.

Be sure to power each unit with proper voltage.

Connection of an improper power supply can cause fire or damage the equipment.

⚠ CAUTION

Maximum speed while the transducer is projected or being raised or lowered is as below, to prevent damage to the transducer.

	Projected	Raising/ Lowering
800 mm stroke	Max. 18 kt	Max. 15 kt
1100 mm stroke	Max. 18 kt	Max. 15 kt

Observe the following compass safe distances to prevent interference to a magnetic compass:

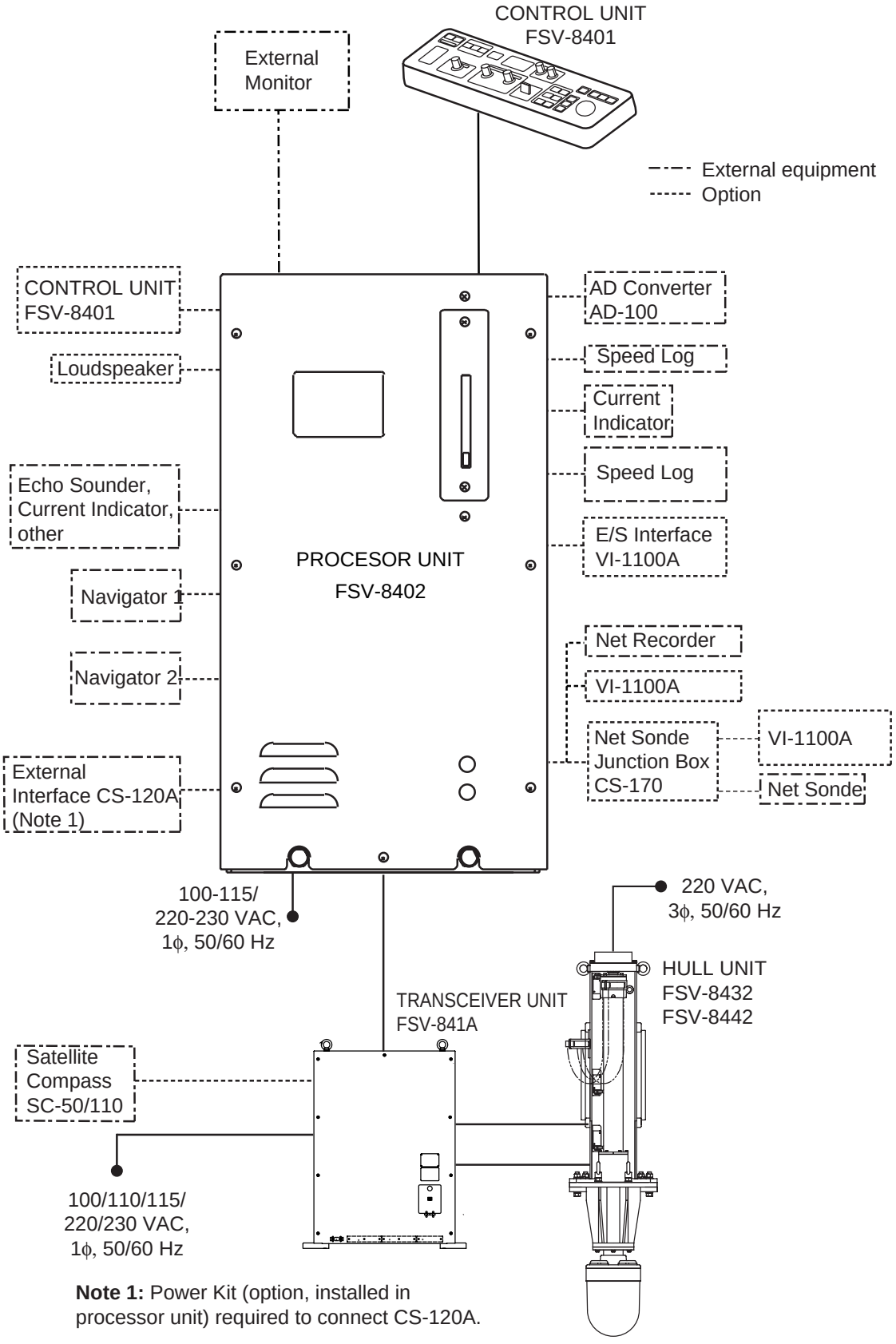
	Standard compass	Steering compass
Processor Unit	2.05 m	1.35 m
Control Unit	0.20 m	0.15 m
Monitor Unit	1.25 m	0.85 m

Ground the equipment to prevent electrical shock and mutual interference.

TABLE OF CONTENTS

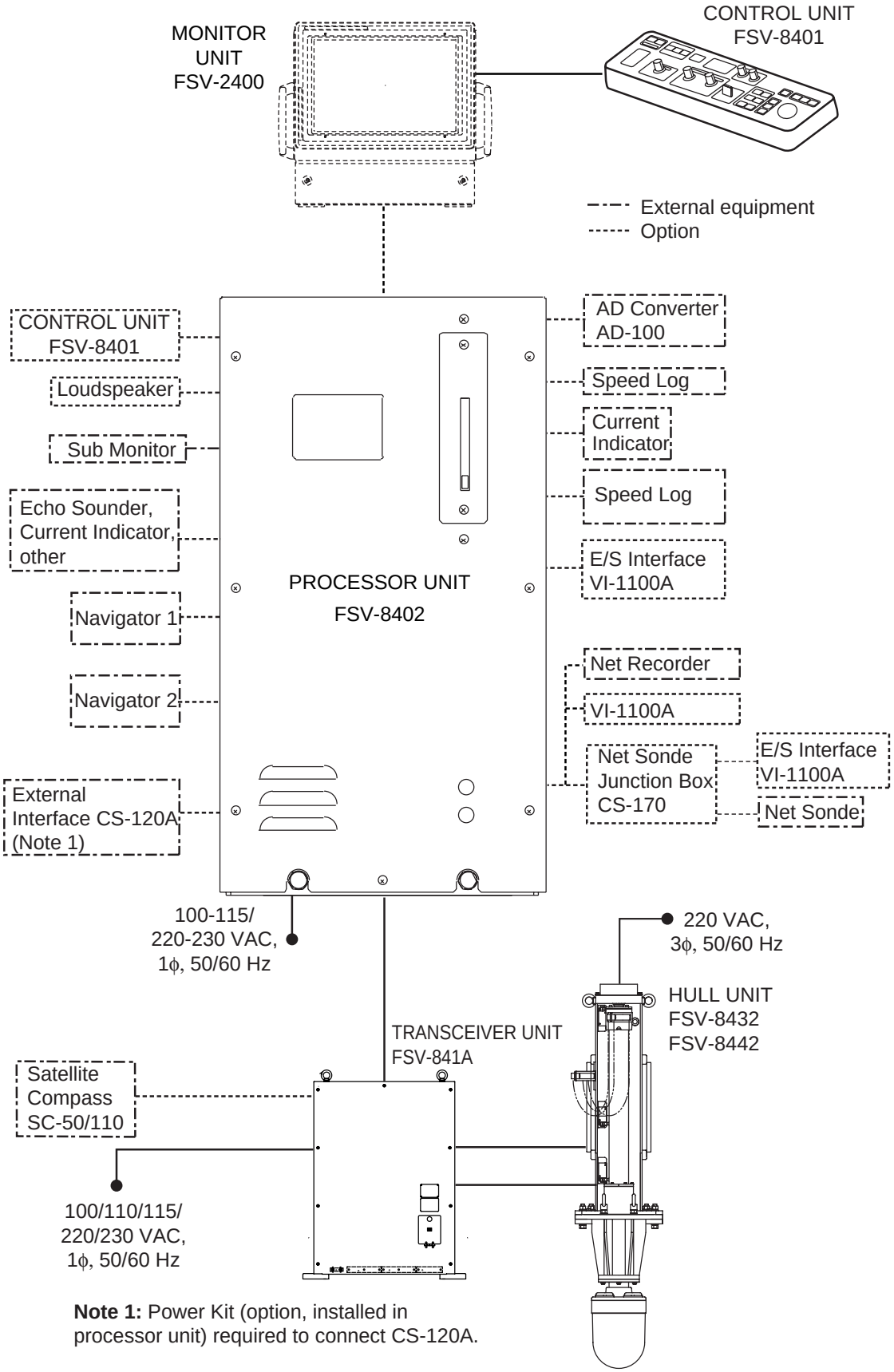
SYSTEM CONFIGURATION

System with locally supplied monitor



Note 1: Power Kit (option, installed in processor unit) required to connect CS-120A.

System with FURUNO monitor



Note 1: Power Kit (option, installed in processor unit) required to connect CS-120A.

EQUIPMENT LISTS

Standard supply

Name	Type	Code No.	Qty	Remarks
Control Unit	FSV-8401-10	—	1	w/10 m cable
Processor Unit	FSV-8402-100	—	1	110 VAC
	FSV-8402-200	—		220 VAC
Transceiver Unit	FSV-841A	—	1	
Hull Unit	FSV-8432	—	1	800 mm stroke w/motion sensor & no dome
	FSV-8442	—		1100 mm stroke w/motion sensor & no dome
Installation Materials*	CP10-06000	000-067-071	1 set	Cable between transceiver unit and hull unit, 8 m
	CP10-07011	001-005-660	1 set	For transceiver unit
	CP10-06100	000-067-067	1 set	For processor unit, CP10-04502, CP10-04506
Accessories*	FP10-02901	007-008-780	1 set	For processor unit
	FP10-02201	006-922-390	1 set	Memory card for control unit
Spare Parts*	SP10-03101	007-008-530	1 set	For transceiver unit
	SP10-02601	006-921-340	1 set	For processor unit
	SP10-02603	006-921-360	1 set	For hull unit

Optional equipment

Name	Type	Code No.	Qty	Remarks
Power Kit for CS-120A	FSV-2403	000-067-013	1	For CS-120A
Hood	FP03-06503	008-490-970	1	For monitor unit
Loudspeaker	SEM-21Q	000-144-917	1	
Cable Assy.	MJ-A6SPF0012-050C	000-154-053-10	1	5 m, NMEA, 6P-6P
	MJ-A6SPF0012-100C	000-154-037-10	1	10 m, NMEA, 6P-6P
8-core Cable	VVS 0.3×8C *6M*	000-555-043	1	6 m, for echosounder, 02S8040
37-core Cable	10S1258	000-101-006	1	Length specified by user
E/S Interface	VI-1100A	—	1	
Net Sonde Junction Box	CS-170	—	1	
Monitor Unit	FSV-2400-10	—	1	CP10-04501, FP03-06201, FP10-02201, FP10-02202, FP10-02203, Dust cover
Control Unit	FSV-8401-5	—	1	w/5 m cable
	FSV8401-10	—		w/10 m cable
Installation Material for interface*	CP10-04801	006-934-240	1	
Attachment Kit	OP10-30	00-067-179		See section 1.7.
Retraction Tank	OP10-28	000-067-077	1	For steel vessel
	OP10-29	000-067-178		For FRP vessel
Controller Extension Kit	FSV-846	—	1	For control box in hull unit

* See packing list at back of this manual.

1. MOUNTING THE EQUIPMENT

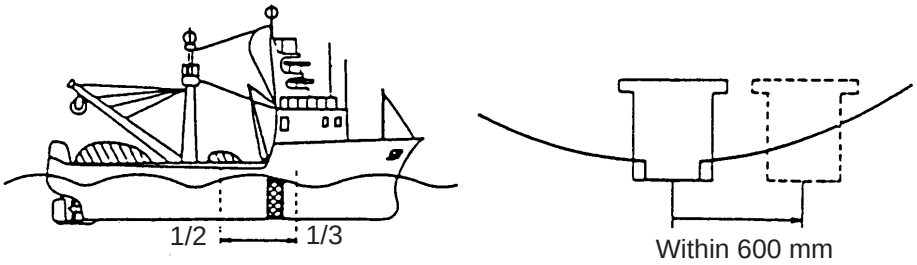
1.1 Hull Unit

Note 1: The raise/lower control box on the hull unit contains a motion sensor. Therefore, never drop the hull unit.
Note 2: Handle the transducer carefully. Shock will damage its sensitive components.

1.1.1 Mounting considerations

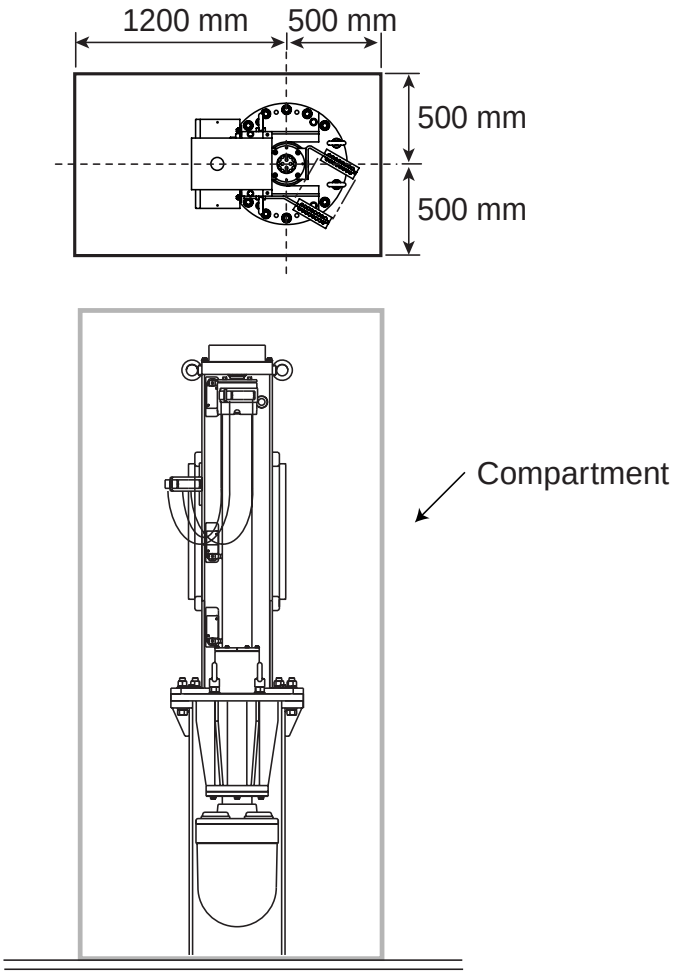
Decide the location of the hull unit through consultation with the dockyard and ship owner. When deciding the location, the following points should be taken into account.

- Choose an area where propeller noise, cruising noise, air bubbles and interference from turbulence are at a minimum. Generally, the point at 1/3 to 1/2 of the ship's length from the bow on or near the keel is optimum. On-the-keel installation is advantageous for minimizing oil consumption in comparison with off-the-keel. If the hull unit can not be installed on the keel, the center of the retraction tank should be within 600 mm of the keel to prevent a rolling effect. **For large ship with deep draft,** the hull unit can be installed at the bow.



Hull unit mounting location

- Choose a place where the hull bottom is flat and the draft is sufficiently deep. Normally, the transducer should protrude at least 500 mm beyond the keel to minimize the effect of air foam and bubbles.
- Choose a place where interference from other transducers is minimal. The hull unit should be at least 2.5 m away from the transducers of other equipment.
- No obstacle should be in the fore direction since it causes a shadow zone and aerated water, resulting in poor sonar performance.
- The physical distance between the hull unit and the transceiver unit should be no more than 5 m.
- The space shown in the figure on the next page is required around the hull unit for wiring and maintenance.
- If the ambient temperature around the unit will be below 0°C, provide the sonar compartment with a heater to keep the temperature above 0°C. See the next page for details.

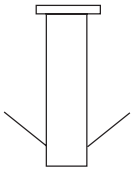
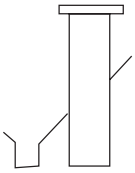
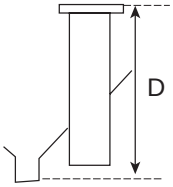
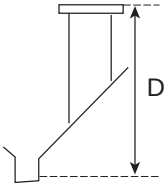


Maintenance space, example sonar compartment

Note: After mounting the equipment, be sure to install anti-vibration stays, as shown on page 1-6.

1.1.2 Shortening the retraction tank

Shorten the tank as necessary so that the transducer positions well below the keel when it is fully lowered. The following table provides guidelines for shortening the tank. Refer also to the retraction tank installation drawing at the back of this manual.

Installation Method / Stroke				
800 mm stroke	Remove 0-50 mm from the bottom.	Same as left.	Remove 0-50 mm from the bottom. Note that the length "D" must be less than 1000 mm.	Same as left.
1100 mm stroke	Remove 0-50 mm from the bottom.	Same as left.	Remove 0-50 mm from the bottom. Note that the length "D" must be less than 1200 mm.	Same as left.

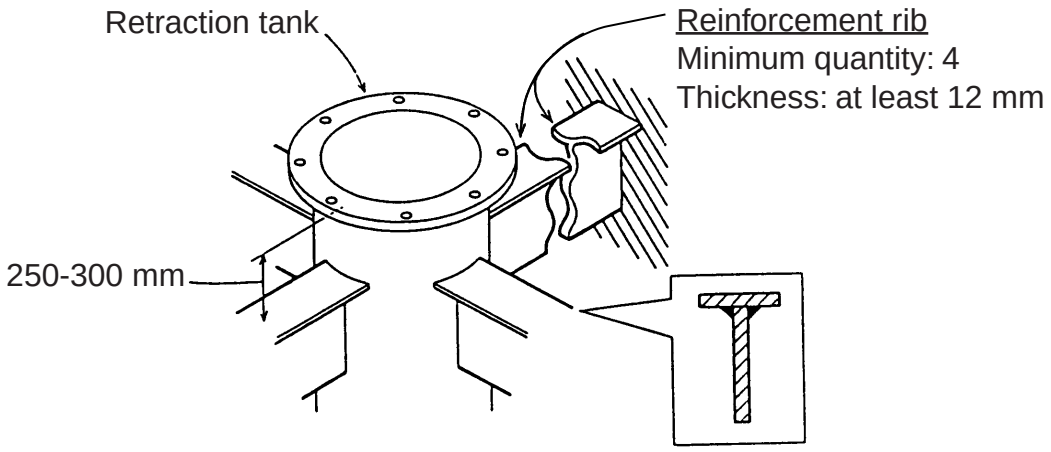
Guidelines for shortening the retraction tank

Note 1: The transducer will lower to mid-protrusion (500/800 mm stroke) if the tank is not shortened. However, if it is shortened more than 50 mm, the transducer cannot be completely retracted.

Note 2: When maximum length is removed and “D” is minimum, the effect of air foam is minimized because the transducer fully protrudes in water.

1.1.3 Remarks for installation of retraction tank

1. Install, if possible, the tank on the keel where the tank can be most firmly fixed.
2. Install the reinforcement ribs as near as possible to the top of the retraction tank, allowing space for tightening of nuts and bolts.



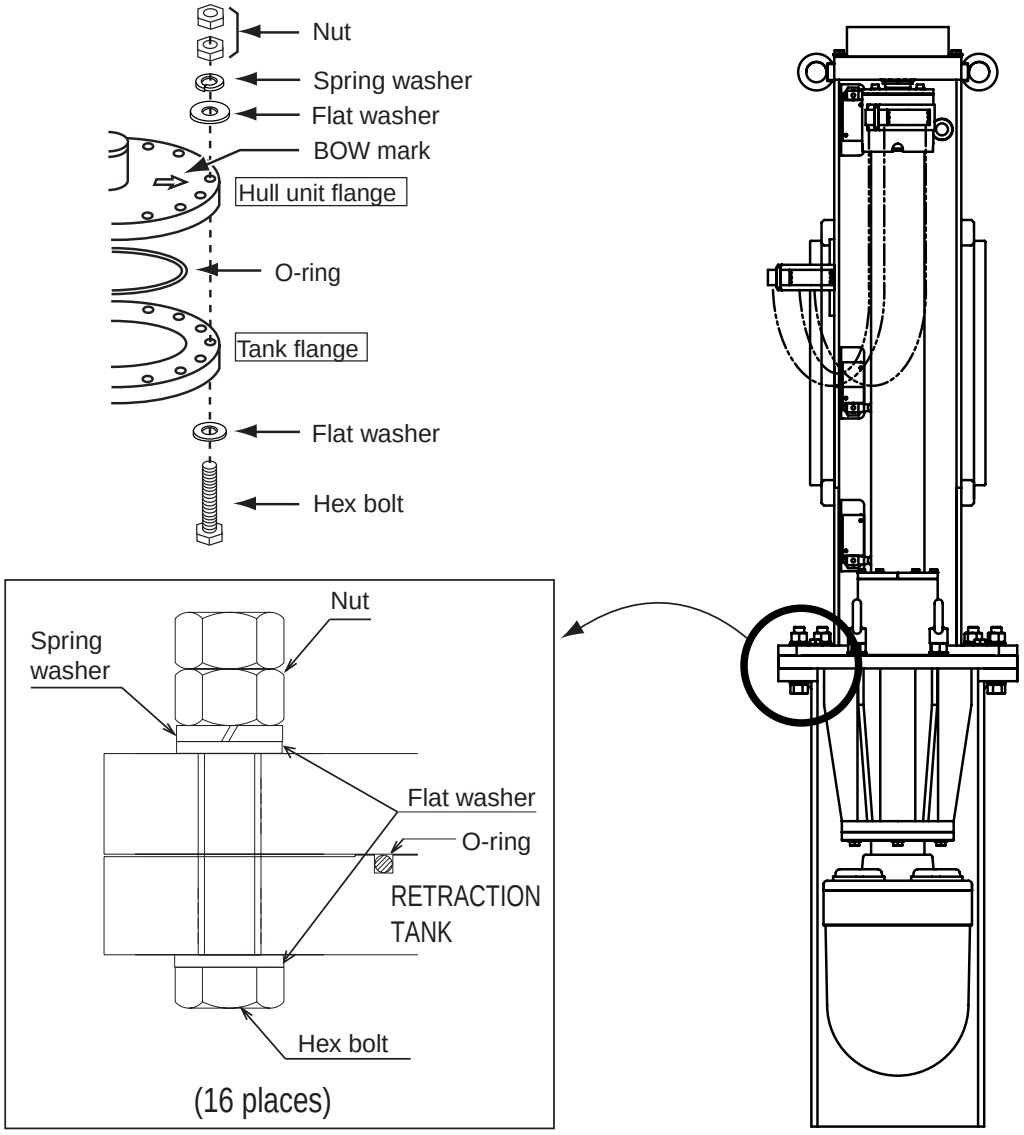
How to install reinforcement ribs

3. Add a doubling plate (a plate added to another to give extra strength or stiffness) at the location where the retraction tank is welded to the hull bottom. The size of the doubling plate is such that it may lie across two bottom frames.

1.1.4 Installing hull unit on retraction tank

After welding the retraction tank and allowing sufficient time for cooling, install the hull unit as follows:

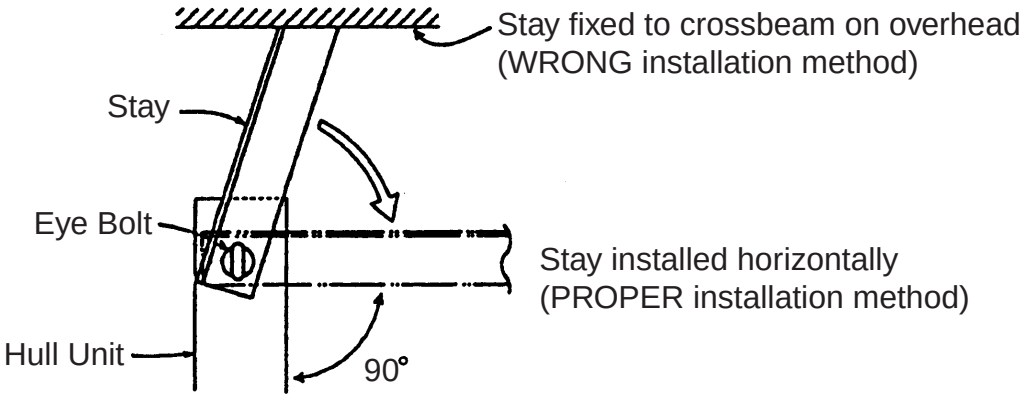
1. Clean the hull unit flange, the O-ring and O-ring groove. Coat them with a slight amount of grease. Place the O-ring in position on the tank flange.
2. Orient the hull unit so that the bow mark (inscribed) on its flange points toward the ship's bow. Note that heading adjustment is required if the bow mark is not facing the ship's bow.
3. Confirm that the O-ring is in position. Place the hull unit on the tank.
4. Coat every washer, nut and bolt with a slight amount of grease to ease removal. Fasten the hull unit to the retraction tank with flat washers, spring washers and hex bolts.
5. Reinforce the hull unit against vibration by extending stays to the ship's hull from the two eye bolts at the top of the hull unit, referring to the procedure on the next page.



Installation of hull unit

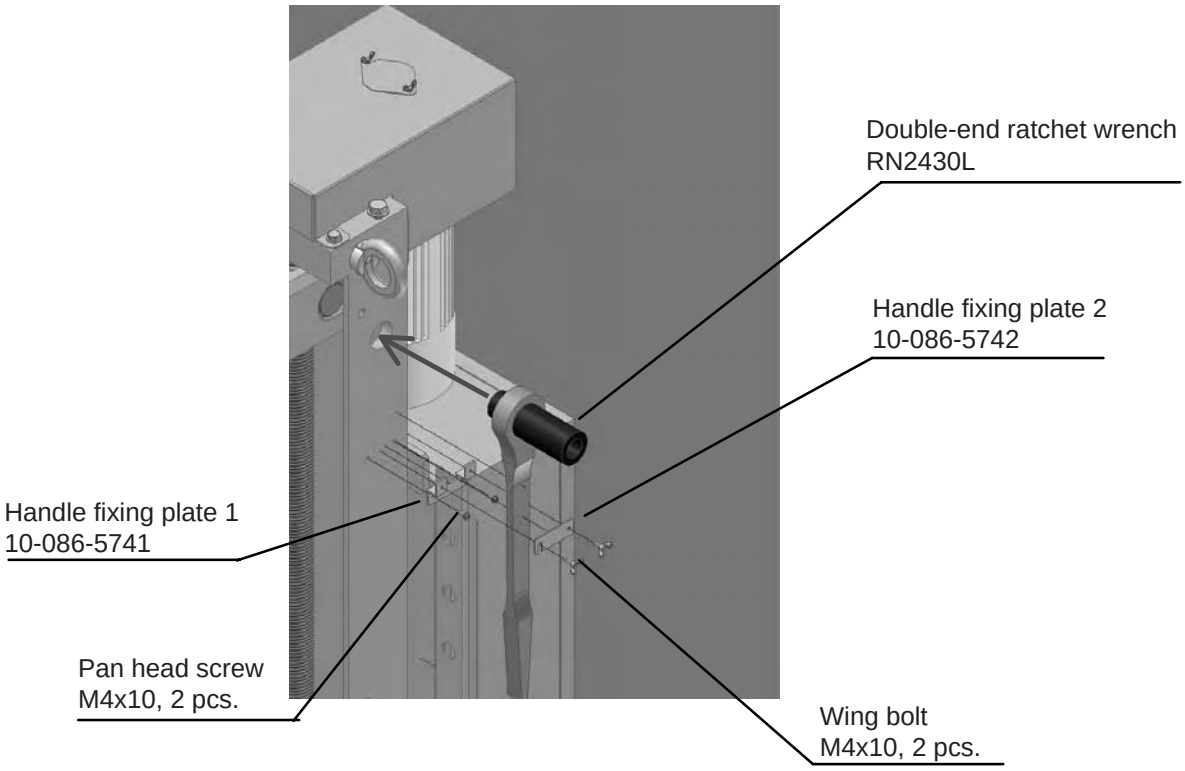
1.1.5 Installing stays (anti-vibration measure)

Install stays from the top of the hull unit to the ship's hull. The stays should be angle iron with a size of 75×75×9 mm or more and at least two pieces should be used; one each to ship's bow and stern directions. **This measure must be done to prevent damage to the transducer.**



Proper installation of stays

After installing the hull unit, attach the hand crank to the location shown in the figure below.



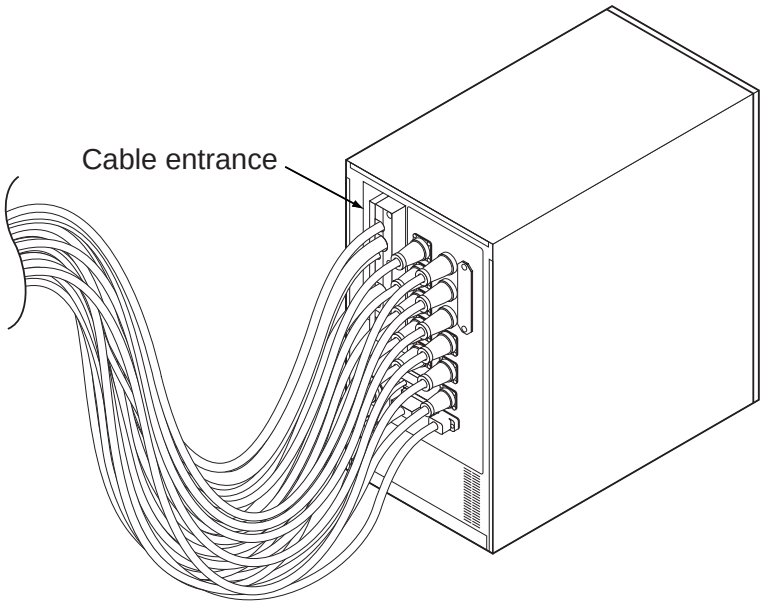
Fixing hand crank to hull unit

1.2 Processor Unit

Mounting considerations

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

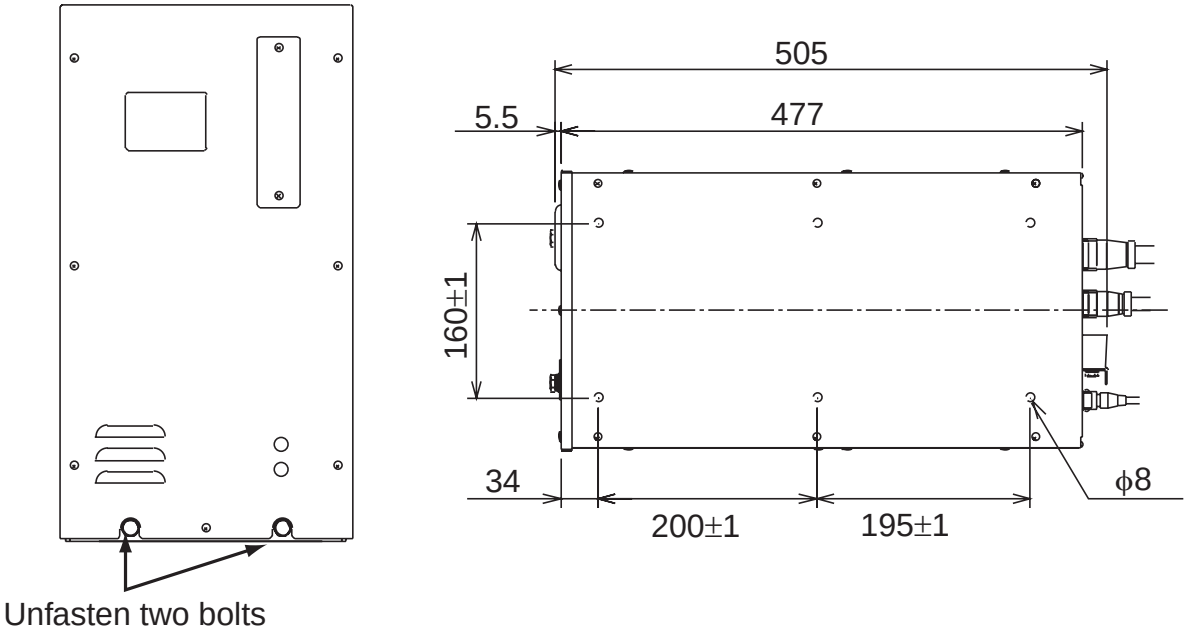
- The processor unit must be mounted upright.
- Locate the unit out of direct sunlight and away from heat sources because of heat that can build up inside the cabinet.
- Do not locate the equipment where it may be subjected to water splash or rain.
- Be sure the mounting location is strong enough to support the weight of the unit under the continued vibration which is normally experienced on the ship. If necessary reinforce the mounting location.
- Determine the mounting location considering the length of the cables below.
  - Signal cable from the transceiver unit
  - Monitor cable from the monitor
  - Control cable from the control unit (when locally supplied monitor is used)
- Leave sufficient space on the sides and rear of the unit to facilitate maintenance. Also, leave a foot or so of "service loop" in cables behind the unit so it can be pulled forward for servicing or easy removal of connectors. See the outline drawing for recommended maintenance space.
- Observe the compass safe distances shown on page ii to prevent interference to a magnetic compass.
- Make free space of at least 40 cm between the processor unit and bulkhead to prevent cable stress.
- Prepare cable entrance ABOVE the unit. Consider cable bend with cable fixed by cable clamp at rear of the unit.



Processor unit, rear view

Mounting procedure

1. Unfasten two bolts from the bottom of the front side of the processor unit. Pull the unit toward you to separate it from the mounting base.
2. Use six bolts (supplied as installation material) to fix the mounting base.
3. Place the processor unit in front of the mounting base.
4. Push the unit forward until it touches the end of the mounting base.
5. Refasten two bolts removed at step 1 to fix the unit to the mounting base.



Mounting dimension for processor unit

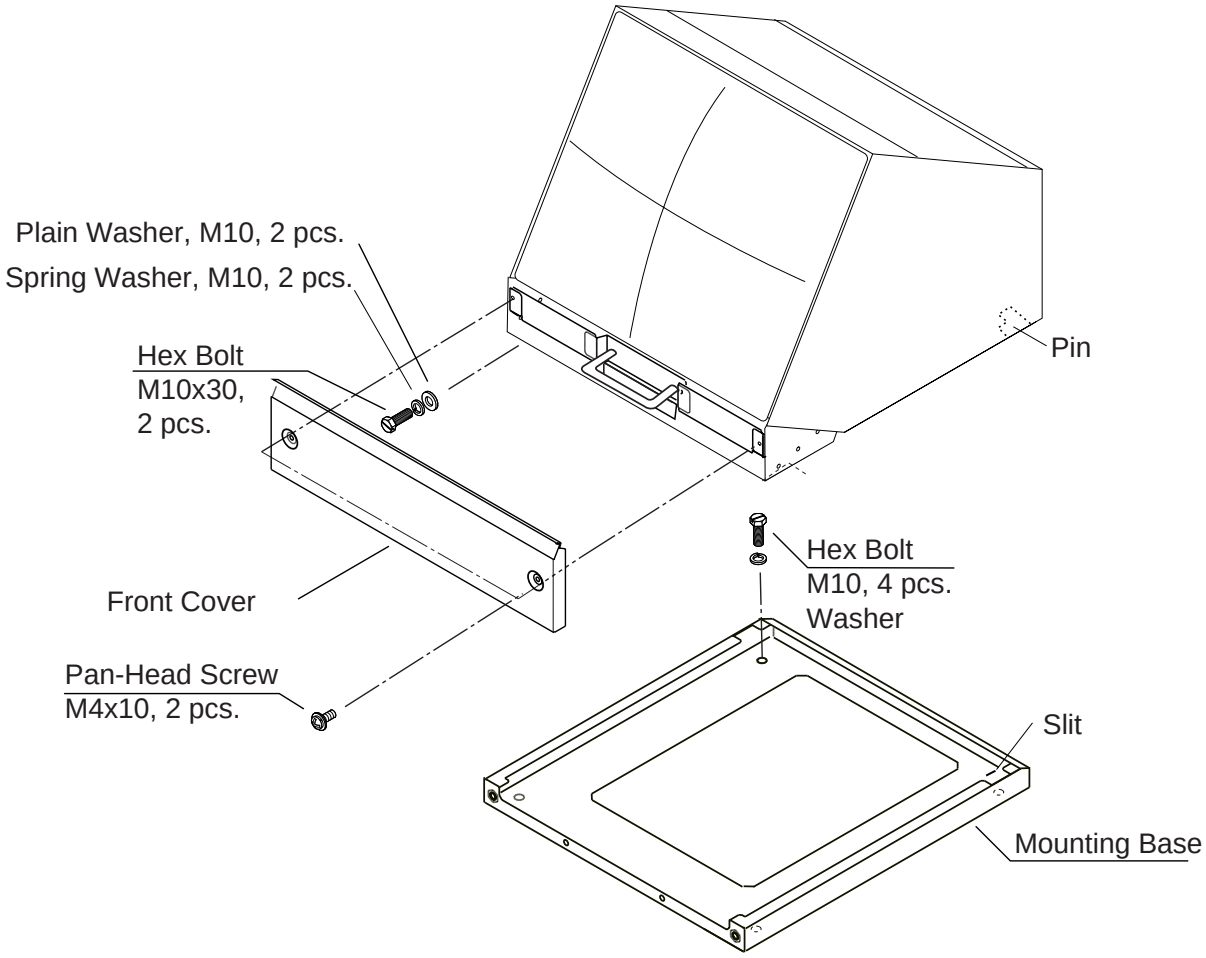
1.3 Monitor Unit (option)

Mounting considerations

- The monitor unit is designed for mounting on a tabletop.
- Locate the monitor unit where it can be easily operated while viewing the screen and operating the control unit.
- Locate the monitor unit out of direct sunlight and away from heat sources because of heat that can build up inside the cabinet.
- Do not locate the equipment where it may be subjected to water splash or rain.
- Be sure the mounting location is strong enough to support the weight of the unit under the continued vibration which is normally experienced on the ship. If necessary reinforce the mounting location.
- The length of the monitor cable which runs between the control unit and the monitor unit is 10 m. Keep this distance in mind when choosing a mounting location.
- Leave sufficient space on the sides and rear of the unit to facilitate maintenance.
- Observe the compass safe distances shown on page ii to prevent interference to a magnetic compass.

Mounting procedure

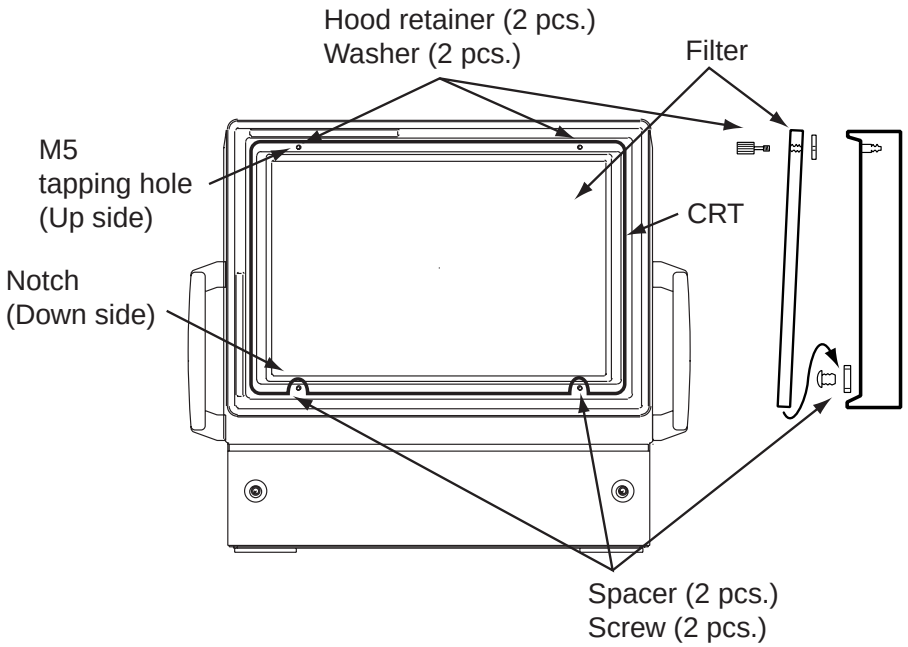
1. Drill four holes of 12 mm in diameter in the mounting location, referring to the outline drawing for mounting dimensions.
2. Unfasten two M4×10 screws to dismount the front cover.
3. Unfasten two sets of M10 bolts, plain washers and spring washers to separate the monitor from the mounting base.
4. Pull the monitor forward about 4 cm and then lift it to separate it from the mounting base.
5. Fasten the mounting base to the mounting location with M10 bolts, nuts and washers (local supply).
6. Lay the monitor on the top of the mounting base, mating the rear pin on the monitor to the slit in the mounting base. Fix the monitor to the mounting base with the two sets of bolts, nuts and washers unfastened at step 3.
7. Close the front cover.



Monitor unit

Attaching the CRT filter

1. Attach two spacers (5×2.5, supplied) with screws (M5×10, supplied) to the location shown below.
2. Screw two hood retainers (supplied) into the filter (supplied).
3. Set two washers (supplied) into the two hood retainers attached at step 2.
4. Attach the filter to the monitor unit as shown below.



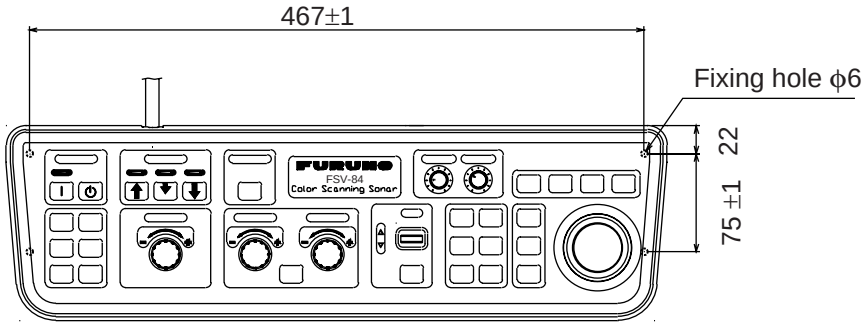
How to attach the hood

1.4 Control Unit

The control unit is designed for mounting on a tabletop, with or without the KB (keyboard) fixing plate (supplied), which mounts the control unit at an angle. If the control unit is not to be fixed permanently, lay it atop the rubber feet (supplied as accessories). Be sure to observe the compass safe distances noted on page ii to prevent interference to a magnetic compass.

Mounting without KB fixing plate

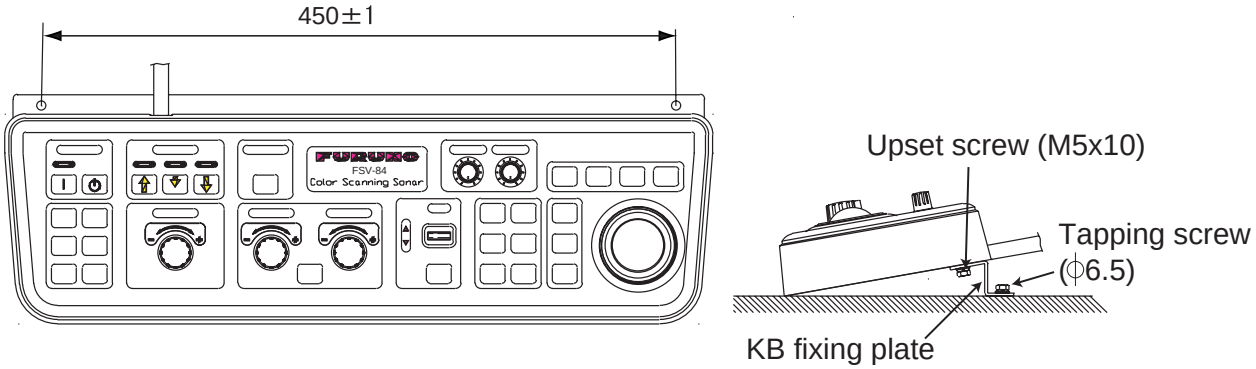
1. Drill four mounting holes of 6 mm diameter to fasten the control unit, referring to the outline drawing at the back of this manual.
2. Referring to the outline drawing for the control unit at the back of this manual, make a cutout in the mounting location large enough to accommodate the name plate so the control unit will lie flat.
3. Fix the control unit with four bolts (M5) from under the tabletop. (M5 bolts with a sufficient length for the thickness of the tabletop should be provided locally.)



Control unit

Mounting with KB fixing plate

1. To fix the control unit to a desired location at an angle, fasten the KB fixing plate to the control unit and desired location with two upset screws (M5×10, supplied) and two tapping screws (ϕ6.5, local supply) as below.



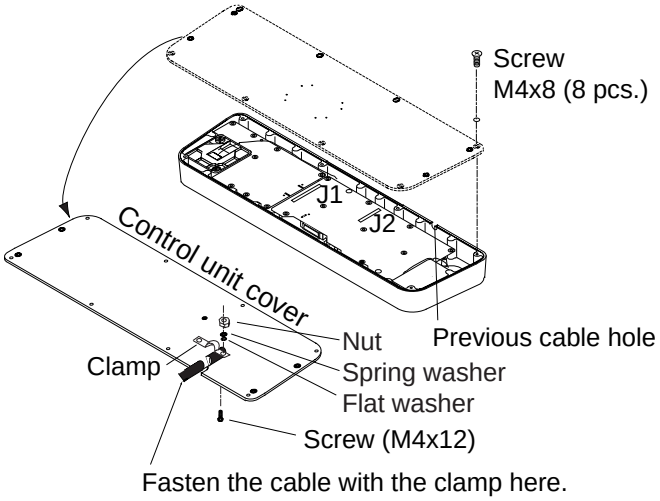
How to attach KB fixing plate

2. Set dust cover (supplied) to the control unit.

Passing the cable through the bottom of the control unit (for permanent mounting)

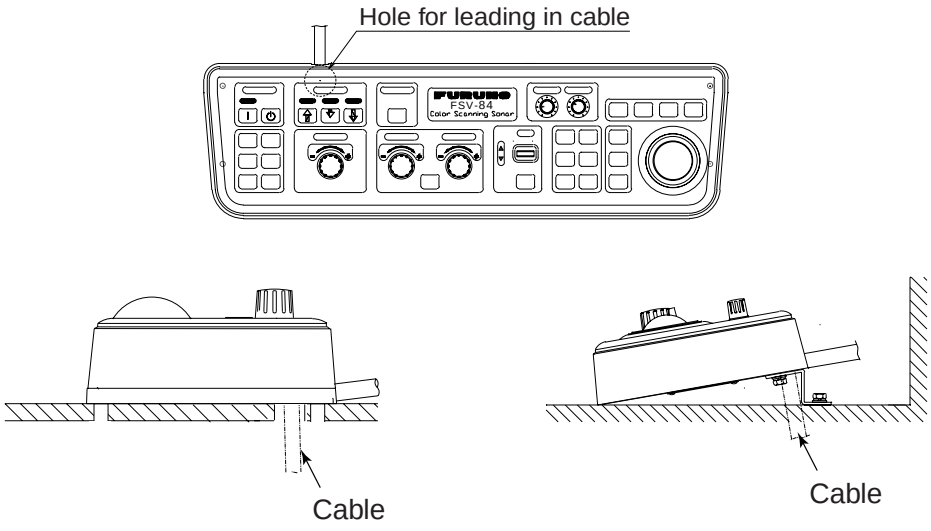
For permanent mounting methods (2) and (3), the control cable can be passed through the bottom of the control unit as follows:

1. Unfasten eight screws (M4) to remove the cover from the bottom of the control unit.
2. Unscrew two screws (M4×10) to remove the cable clamp.
3. Disconnect two connectors J1 and J2 from the circuit board.
4. Attach the control cable to the control unit cover with the cable clamp (removed at step 2), two flat head screws (M4), flat washers, spring washers and nuts (hardware: supplied).
5. Re-connect two connectors disconnected at step 3.
6. Fasten eight screws to attach the control unit cover.



Control unit, cover removed

7. Attach the connector seal (supplied) to the hole at the rear of the control unit.
8. Drill a hole of 30 mm in diameter to pass the cable from the bottom of the control unit through the tabletop
9. Attach the connector seal (supplied) to the hole at the bottom of the control unit when the above modification is not done.
10. Fix the control unit referring to (2) or (3) on the previous page.

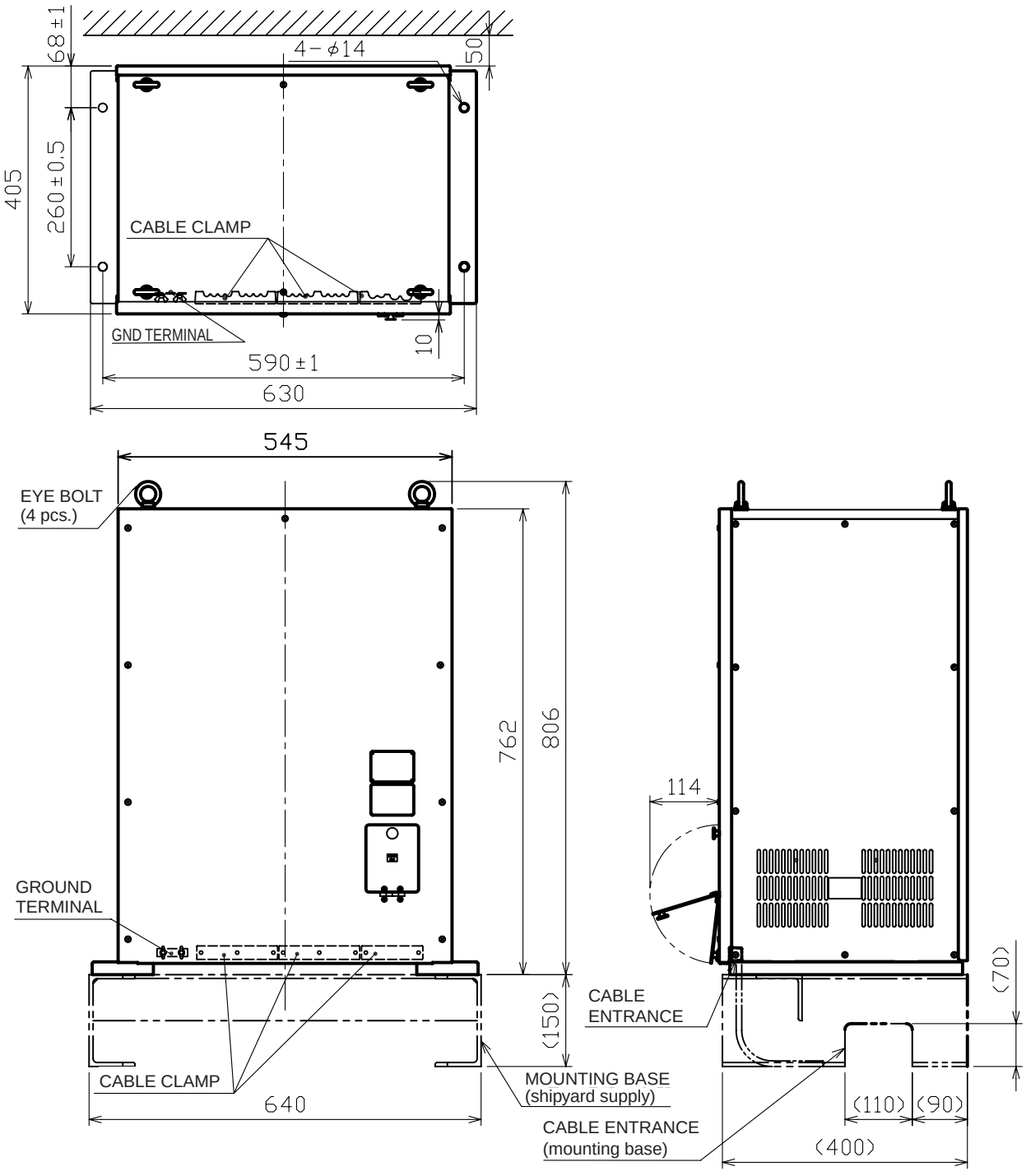


Without KB fixing plate *With KB fixing plate*

Control unit, side view

1.5 Transceiver Unit

The length of the cable between the transceiver unit and the hull unit is 5 m, so choose a mounting location within 5 m of the hull unit. The transceiver unit should be fixed to a mounting base (shipyard supply) whose dimensions are as shown in the outline drawing at the back of this manual. Reinforce the transceiver unit against vibration by stays extending from the eyebolts on the top of the unit. Fasten four bolts (M12, local supply) at the bottom of the transceiver unit to fix the unit to the mounting location.



Mounting dimensions for transceiver unit

1.6 Attachment Kit (option)

The attachment kit permits use of the tank for the CSH-80 series.

Attachment kit (Type: OP10-30, Code no.: 000-067-179)

Name	Type	Code No.	Qty
Insulation gasket (1)	SHG-0003-0	100-038-570	1
Insulation gasket (2)	MS-1000-68	000-857-221	16
O-ring	C00117A	000-158-976-10	1

1. Clean the hull unit flange, the O-ring and O-ring groove. Coat them with a slight amount of grease. Place the O-ring in position on the tank flange.

2. Lay the insulation gasket (1) on the top of the tank flange.

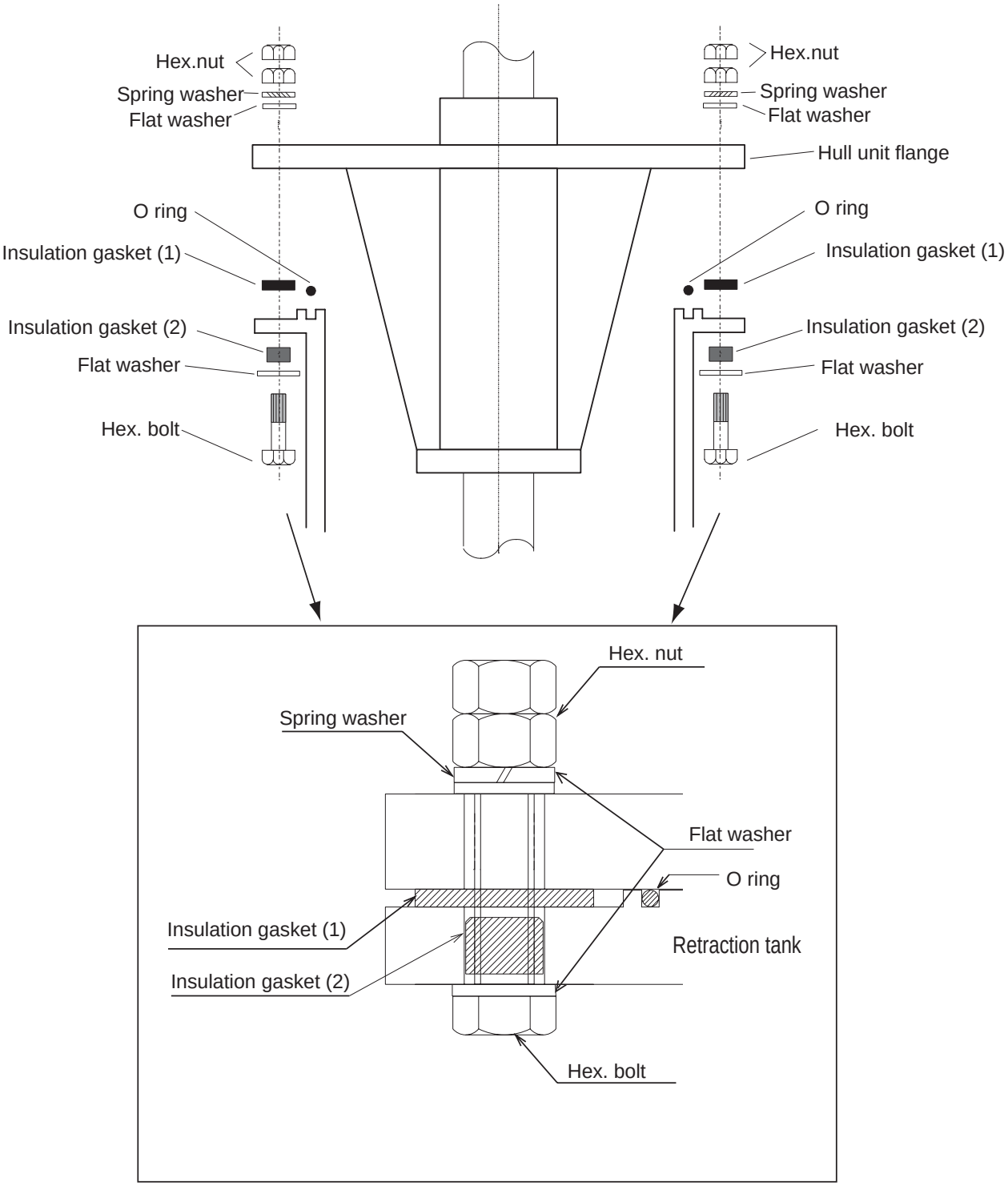
3. Orient the hull unit so that the bow mark (inscribed) on its flange points toward the ship's bow. Note that heading adjustment in the monitor unit is required if the bow mark does not face the ship's bow.

4. Confirm that there is no foreign material on the surface of the retraction tank flange, and then do the following:
   a) Place the hull unit on the tank.
   b) Confirm that the O-ring and the insulation gasket (1) are in position.

5. Insert the insulation gasket (2) into the bolt holes of the tank flange.

6. Coat every bolt, washer and nut with a slight amount of grease to ease removal. Fit the insulation gasket (2) into the bolt holes of the tank flange.

6. Fasten the hull unit to the retraction tank with insulation gasket (2), flat washers, spring washers and hex bolts.


Hex.nut
Spring washer
Flat washer
Hex.nut
Spring washer
Flat washer
Hull unit flange
O ring
Insulation gasket (1)
O ring
Insulation gasket (1)
Insulation gasket (2)
Flat washer
Insulation gasket (2)
Flat washer
Hex. bolt
Hex. bolt
Hex. nut
Spring washer
Flat washer
O ring
Insulation gasket (1)
Retraction tank
Insulation gasket (2)
Hex. bolt

1.7 FRP Tank (option)

Caution for installing FRP tank

Use an FRP tank supplied by FURUNO. Other makes of tank may be used, however watertightness cannot be guaranteed. A non-FURUNO make of tank should meet the following requirements:

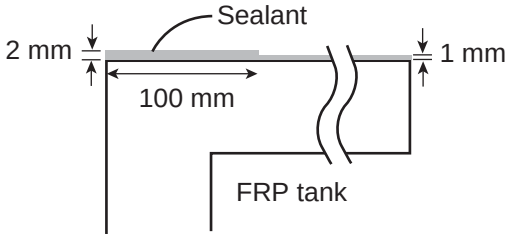
- The surface of the FRP tank flange must be flush (within 0.5 mm) with tank.
- Use the sealant recommended by shipyard.

Contents of FRP retraction tank installation kit

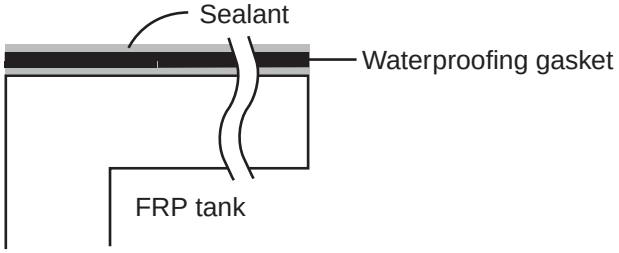
Name	Type	Code No.	Qty
Retraction Tank (FRP)	OP10-29-1	007-022-920	1
Waterproofing Gasket	SHH-0003-1	660-800-031	1
Three Bond	1101 200G	000-854-101	1

Fasten the hull unit to the retraction tank (after installing the retraction tank) as follows:

1. Clean the surface of the tank flange. Coat the flange with about 1mm thickness of sealant (Three Bond, supplied). USE ONLY THE SUPPLIED SEALANT.

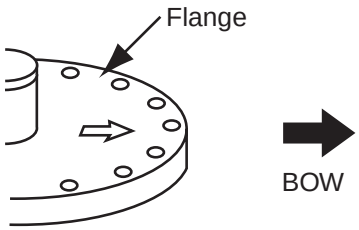


2. Lay the waterproofing gasket on the tank flange and coat the gasket with about 1 mm thickness of sealant.

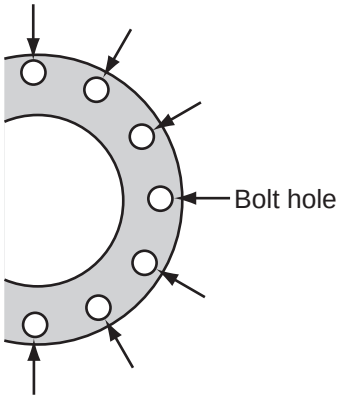


Note: Use only specified waterproofing gasket.

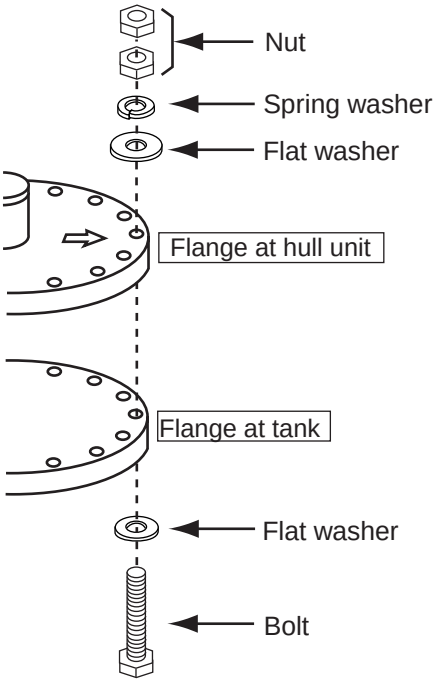
3. Orient the bow mark (arrow) on the hull unit flange toward ship's bow. (If the mark cannot be perfectly oriented toward ship's bow, adjust heading after installation, as shown later in this manual.



4. Set the hull unit on the top of the retraction tank, observing the following cautions:
   - Clean the hull unit flange to make sure no foreign material has fallen into the retraction tank.
   - Confirm that the waterproofing gasket is properly in place.

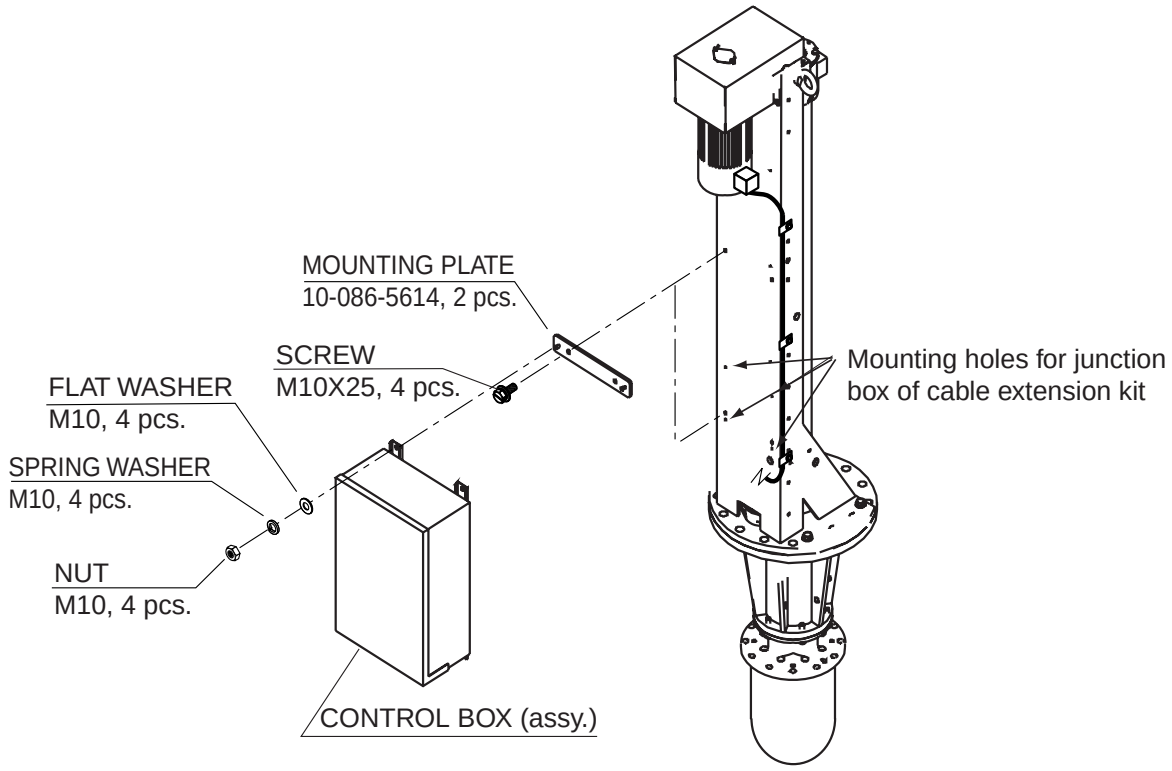


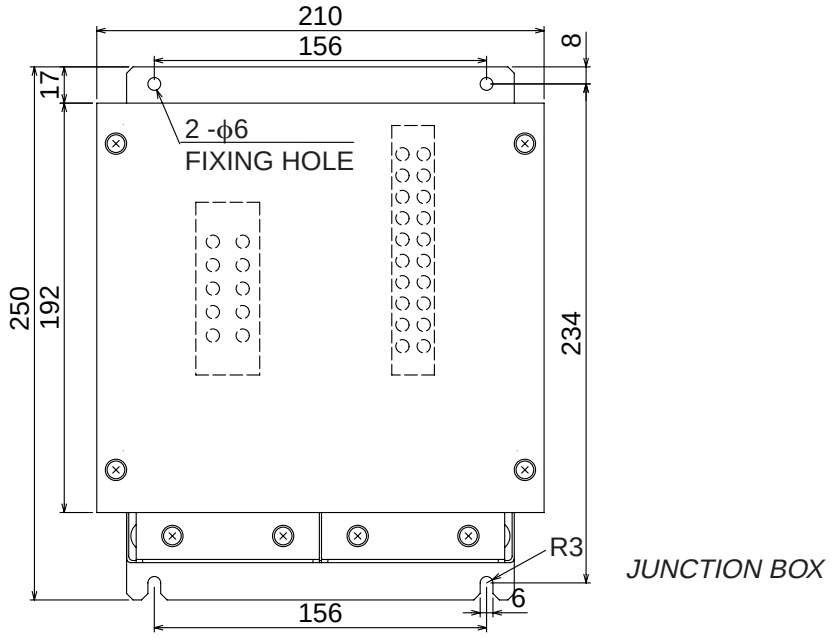
5. As shown in the figure below use bolts, nuts and washers to fasten the hull unit to the retraction tank.



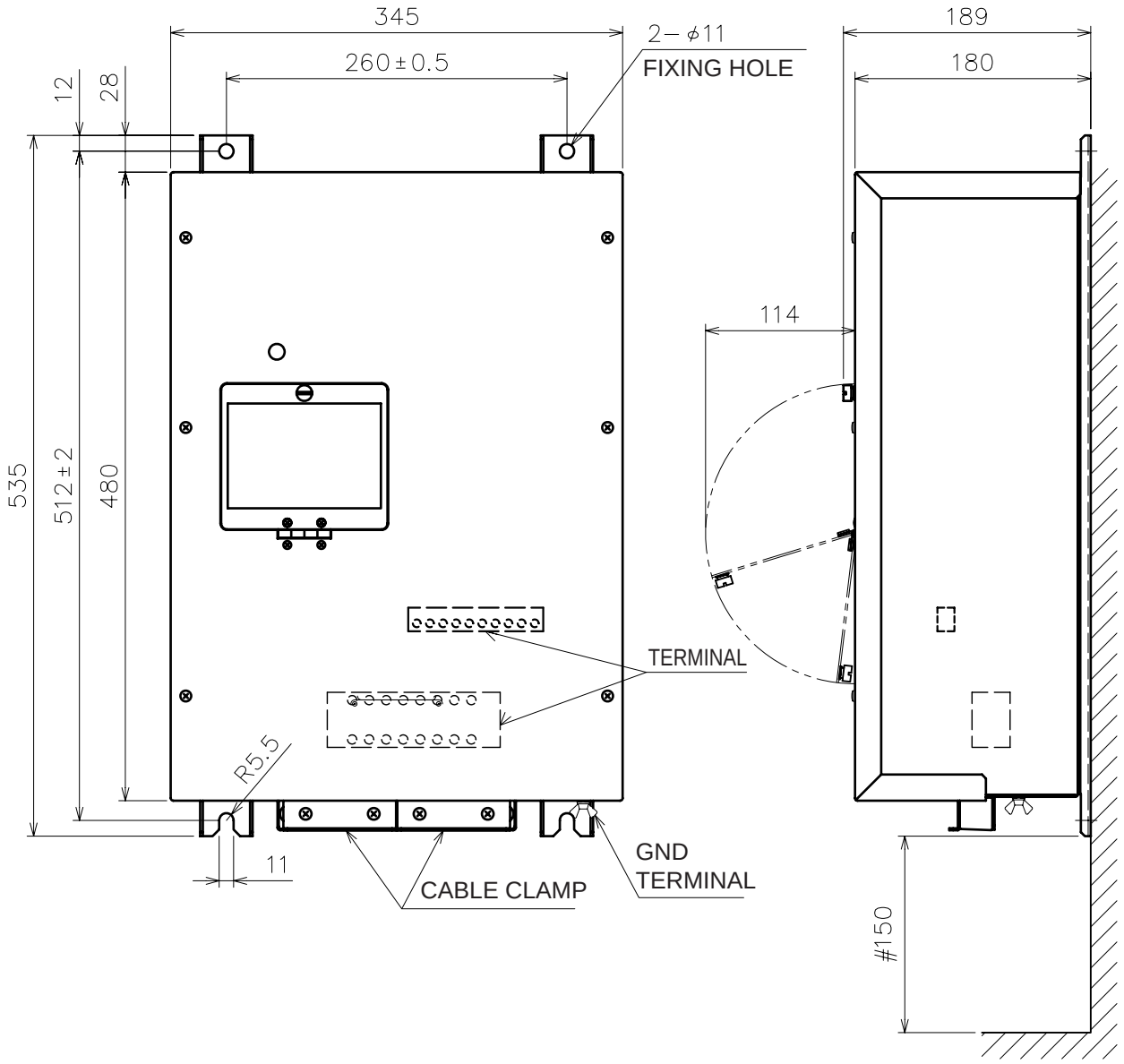
1.8 Control Box Extension Kit (option)

The control box may be mounted separately from the hull unit. Detach the control box and mounting plate from the hull unit and fix the junction box of the control box extension kit to the hull unit, with four M5 bolts





Fix the control box to bulkhead with four M10 bolts.

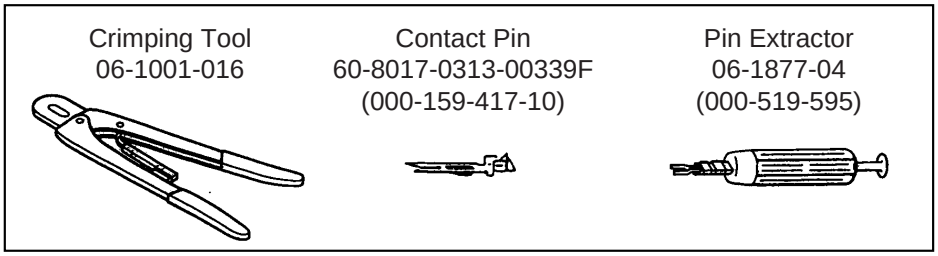


This page intentionally left blank.

2. WIRING

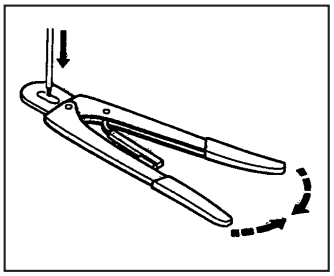
2.1 How to Use the Crimping Tool, Pin Extractor

A special crimping tool is necessary for connection of wires to the contact pins of the 38P connector. The pin extractor removes the contact pin from the connector body. This paragraph describes how to crimp and extract the contact pin.



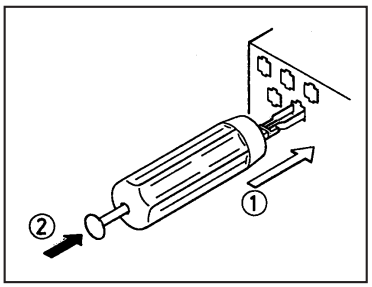
Crimping tool, contact pin, pin extractor

2.1.1 How to use the crimping tool



1. Remove the vinyl sheath by 3 to 4 mm to expose the core.
2. Hold the crimping tool horizontally and insert the contact pin with its slit facing downward into the crimp hole on the crimping tool.
3. Insert the wire onto the contact pin and squeeze the handle until the rachet releases. (The wire should be placed deep enough into the contact pin so that its end comes in contact with the stopper plate of the crimping tool.) With crimping completed, pull the wire while holding the contact pin to make sure that it is tightly fastened.

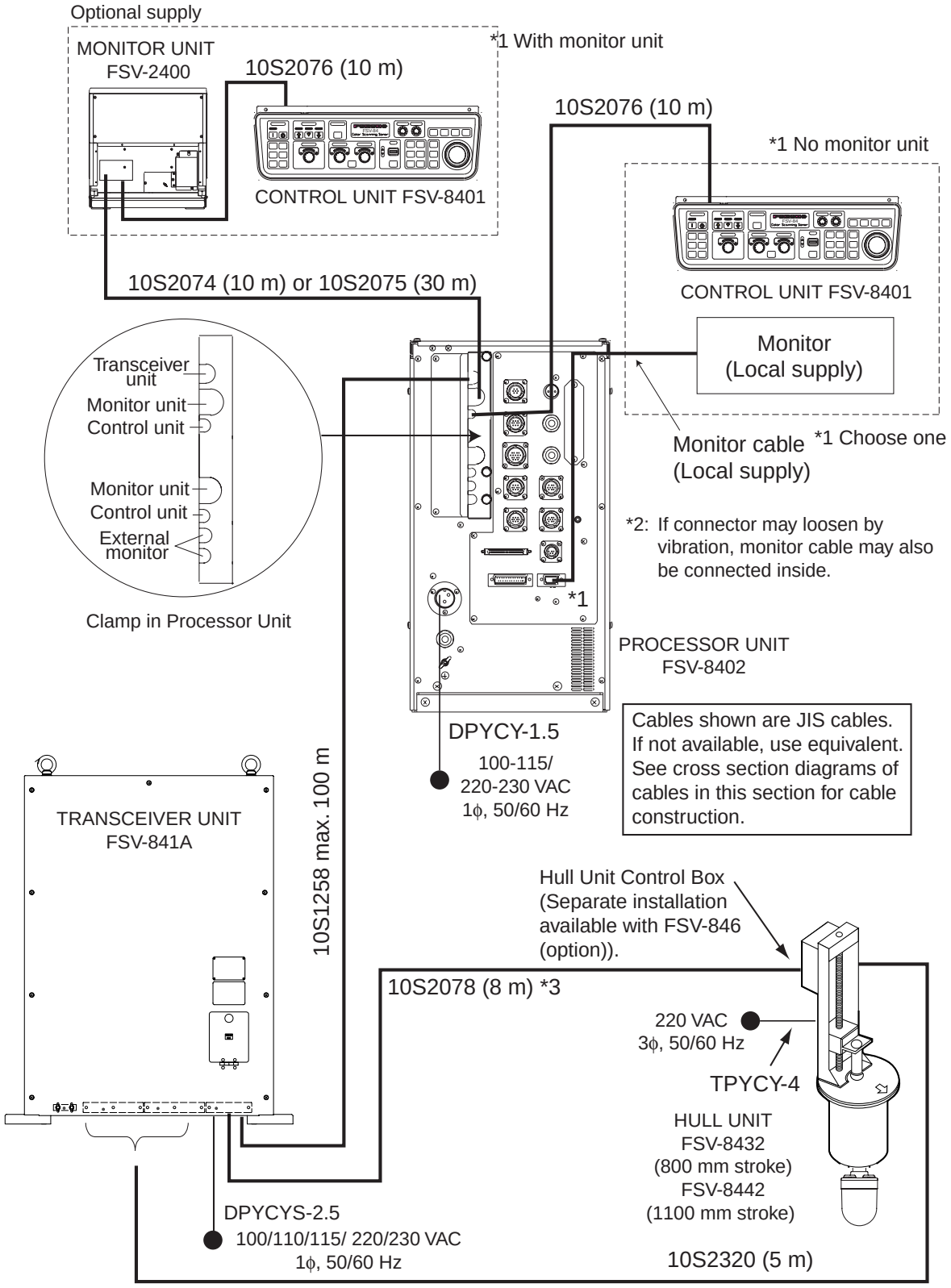
2.1.2 How to use the pin extractor



If a contact pin is inserted into an incorrect hole on the connector body, remove it with the pin extractor.

1. Push the pin extractor into the pin hole from the side opposite to the pin inserting side.
2. Push in the head of the pin extractor. The retaining spring comes free and the contact pin can be removed.

2.2 Wiring

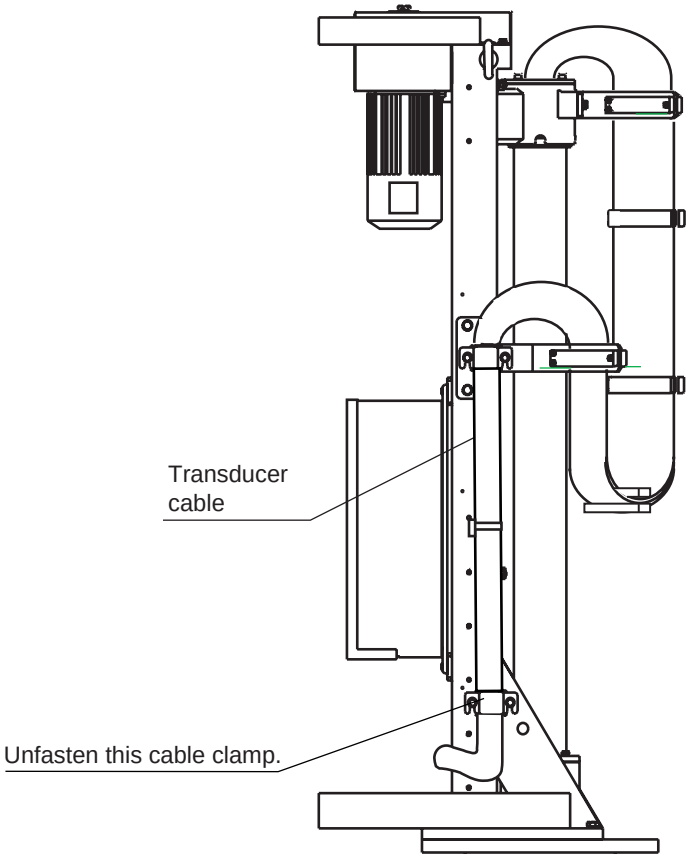


*3 To connect cable 10S2078, connect the end where the peeled portion is longer to the transceiver unit and connect the other end to the hull unit.

Wiring

Transducer cable

If the transducer cable is not quite long enough, unfasten the cable clamp shown in the figure below to release the cable. This will allow a separation of 5 m between the hull unit and transceiver (or junction box). With the cable fastened by the cable clamp, the units may be separated from each other up to 4.5 m.

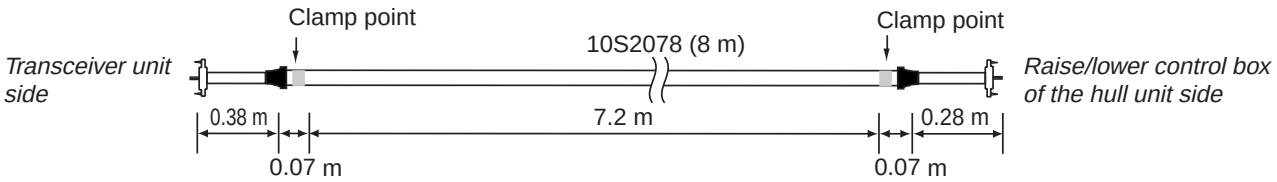


Ground

Ground the processor unit and the hull unit, using an IV-8SQ wire or copper strap, to prevent electrical shock. The monitor unit and transceiver unit also must be grounded, also with an IV-8SQ wire or copper strap. Both the transceiver unit and the junction box (option) are supplied with a copper strap.

Cable (10S2078) between hull unit and transceiver unit

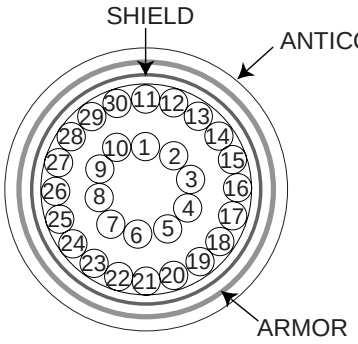
The length of the cable between the hull unit and transceiver unit is 8 m. Arrange it as shown below.



2.3 Monitor Unit (option)

2.3.1 Fabrication of cable from processor unit

One of the cables 10S2074 (10 m) or 10S2075 (30 m) runs between the processor unit (FSV-8402) and the monitor unit (FSV-2400). Pass it through the cable clamp at the rear of the monitor unit and connect.

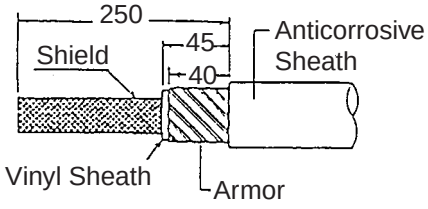


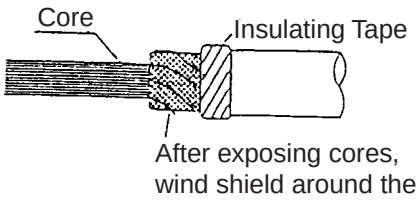
1. GRY (No.1)	9. GRY (No.5)	17. WHT/BRN	25. GRN/BLU
2. BLK/WHT	10. BLK/BLU	18. WHT/PPL	26. GRN/BRN
3. GRY (No.2)	11. BLK/BRN	19. RED/GRN	27. GRN/PPL
4. BLK/RED	12. BLK/PPL	20. RED/YEL	28. YEL/BLU
5. GRY (No.3)	13. WHT/RED	21. RED/BLU	29. YEL/BRN
6. BLK/GRN	14. WHT/GRN	22. RED/BRN	30. YEL/PPL
7. GRY (No.4)	15. WHT/YEL	23. RED/PPL	
8. BLK/YEL	16. WHT/BLU	24. GRN/YEL	

1, 3, 5. 7, 9: Coaxial cables
Others: Twisted pair cables

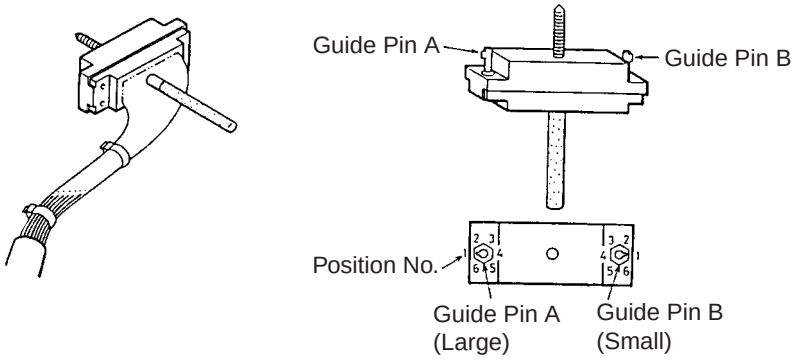
Cable 10S2074, sectional view

Fabrication of 38P connector 00-8016-038-313761HV (CN-A303)





Fabrication of cable for 38P connector 00-8016-038-313761HV



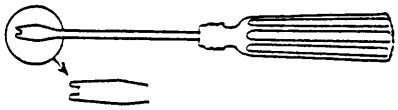
Assembling 38P connector

Positioning guide pins

Guide pins of the connector identify the mating receptacle. They are;

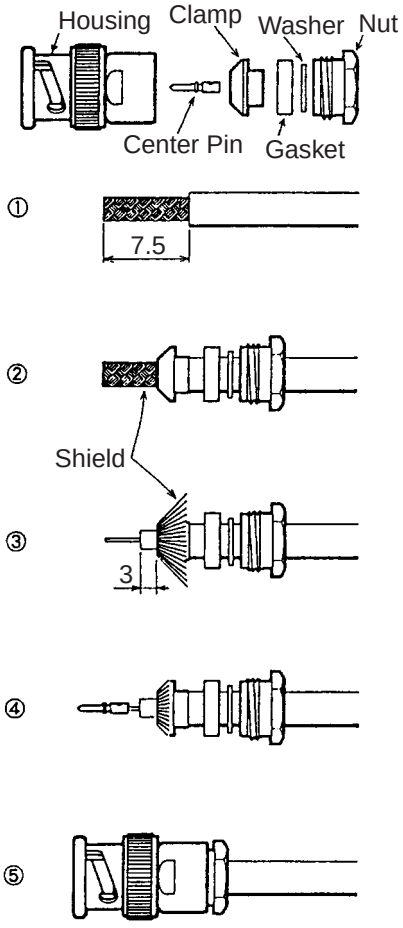
- Guide pin A (Large): 4
- Guide pin B (Small): 1

Use the tool (Type: 10-910-0179-0) shown below to position guide pins.

Connector / Guide Pin	CN-A303	Tool
Guide Pin A (Large)	4	 Guide pin insertion tool (notch in head)
Guide Pin B (Small)	1	

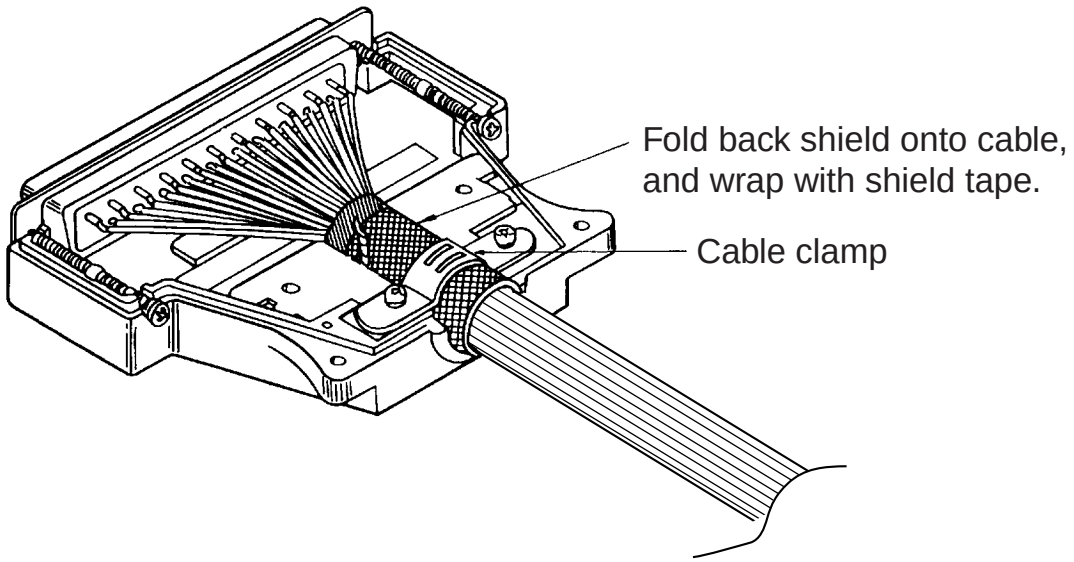
Assembling BNC connector (CN-A304 to CN-A 308)

1. Remove vinyl sheath of the cable by 7.5 mm.
2. Pass the cable through the nut, washer, gasket and clamp.
3. Unravel the shield and fold it back onto the clamp.
4. Remove the insulator, leaving 3 mm.
5. Trim the shield as shown in the drawing. Solder the center chip to the conductor of the cable.
6. Pass the cable through the housing and tighten the nut.



Assembling D-SUB connector (CN-A302)

1. Remove vinyl sheath of cores by 3 mm.
2. Pass the cores through shrink tubing (local supply).
3. Solder cores to connector pins referring to the interconnection diagram at the back of this manual.
4. Assemble the connector.



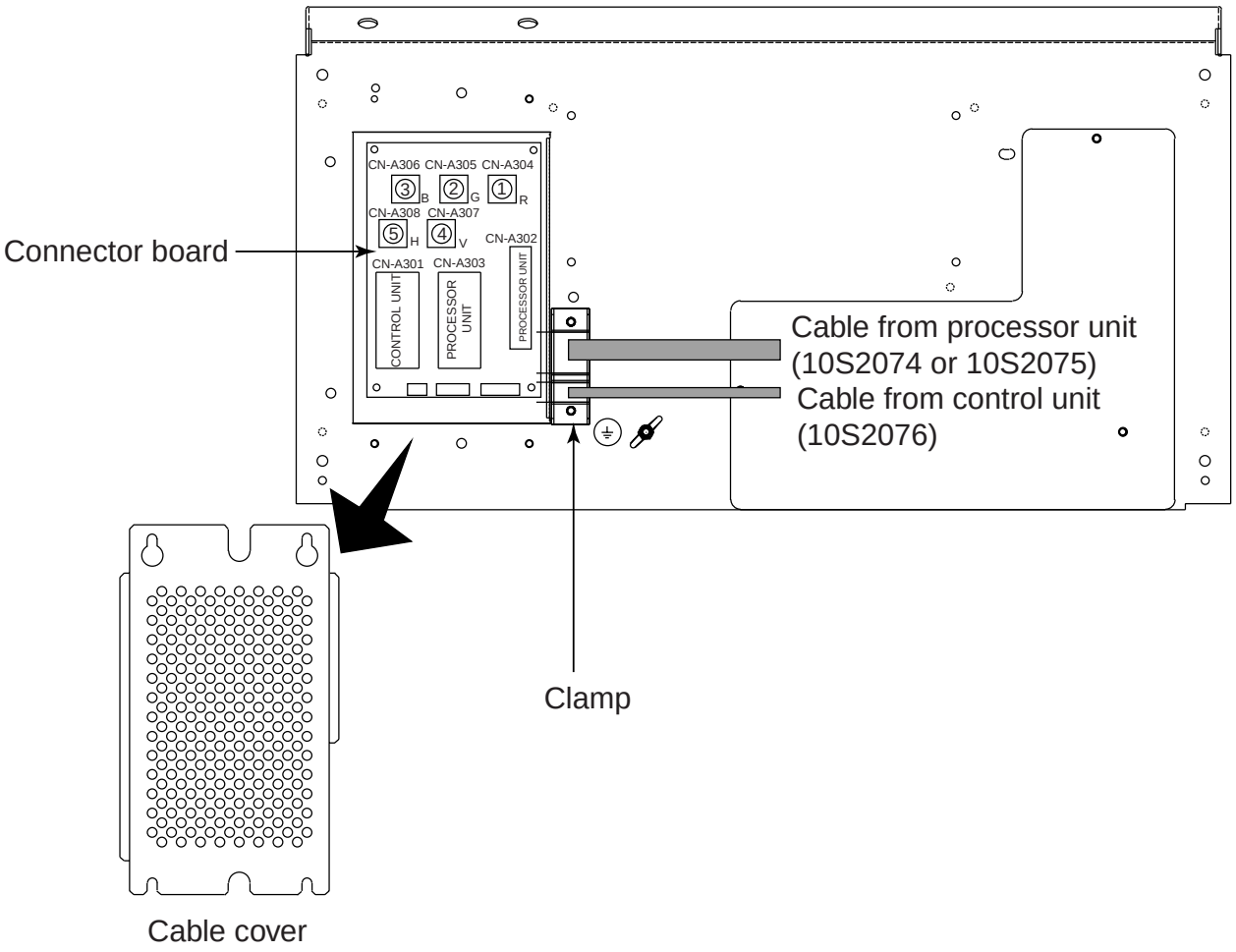
Assembling D-sub connector

2.3.2 Connecting cable between processor unit and monitor unit

For the FURUNO-supplied monitor, connect the cable (10S2074 or 1022075) from the processor unit (FSV-8402) to the CN-A302 – CN-A308 connectors on the monitor unit (FSV-2400).

Attach connector from processor unit and control unit as below.

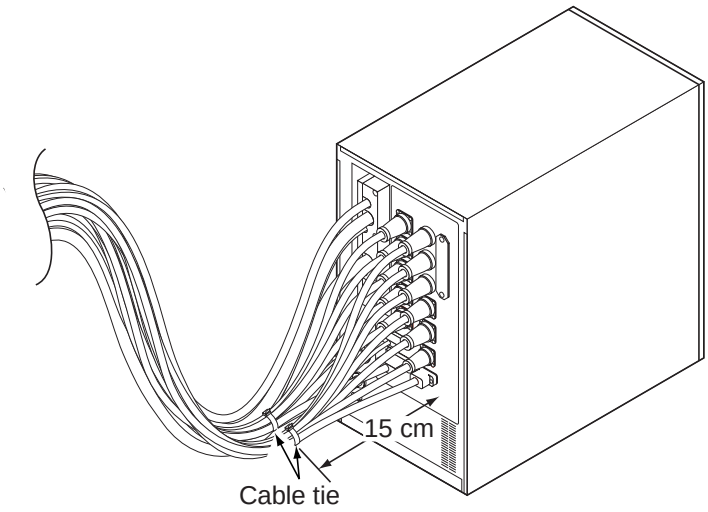
1. Unfasten four screws (M4×10) at the rear of the monitor to loosen the cable cover.
2. Lift and pull the cable cover to remove it.
3. Unfasten two screws (M4×10) to remove the clamp cover.
4. Lay the monitor and control cables on the clamp, and then reattach the clamp plate to fix cables.
5. Connect eight connectors referring to the instruction sticker by the connector board.
6. Reattach the cable cover.



Monitor unit, rear view

2.4 Processor Unit

Cables from the monitor unit, transceiver unit and other equipment are connected to the CONE Board (10P6905) in the processor unit.



Group cables according to left side and right side connection point and bind each group with cable tie, 15 cm from connector. Confirm that no stress is placed on any cable when it is plugged in.

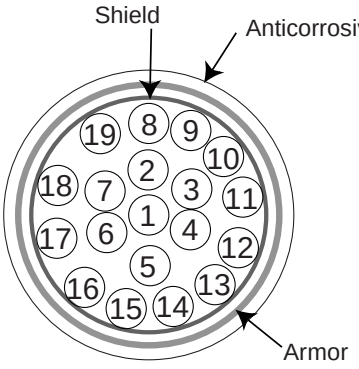
Processor unit, right side view

Processor unit, rear view

Processor unit

2.4.1 Cable from transceiver unit

This cable (10S1258) runs between the processor unit and transceiver unit (FSV-841). Pass it through the cable clamp in the processor unit and connect it to CN-A101 on the CONE Board.

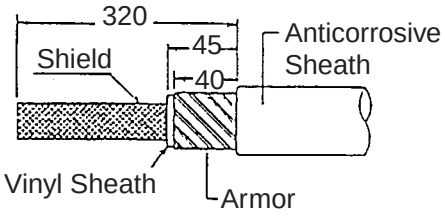


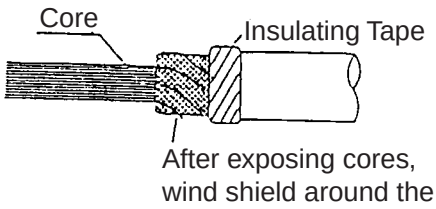
1. BLK	9. BLK/GRY	17. BRN/GRY
2. BLK/BRN	10. BLK/WHT	18. BRN/WHT
3. BLK/RED	11. BRN/RED	19. RED/ORG
4. BLK/ORG	12. BRN/ORG	
5. BLK/YEL	13. BRN/YEL	
6. BLK/GRN	14. BRN/GRN	
7. BLK/BLU	15. BRN/BLU	
8. BLK/PPL	16. BRN/PPL	

1: Coaxial cable
2 to 19: Twisted pair cable

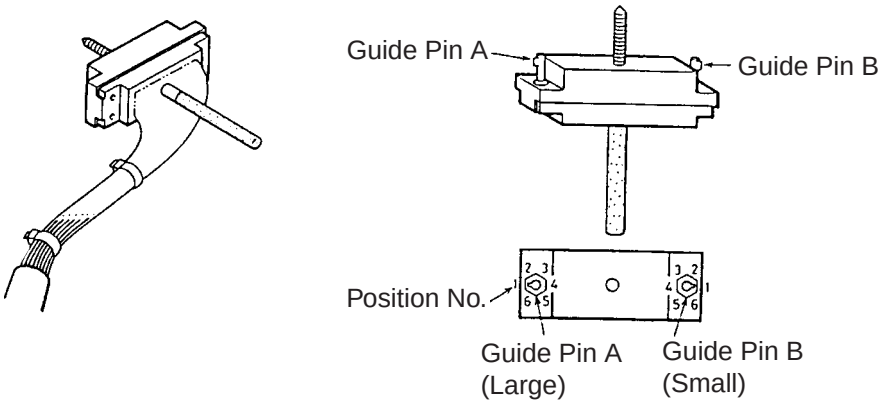
Cable type 10S12581, sectional view

Fabrication of 38P connector 00-8016-038-313761HV (CN-A101)





Fabrication of cable for 38P connector 00-8016-038-313761HV



Assembling 38P connector

Positioning guide pins

Guide pins of the connector identify the mating receptacle. They are;

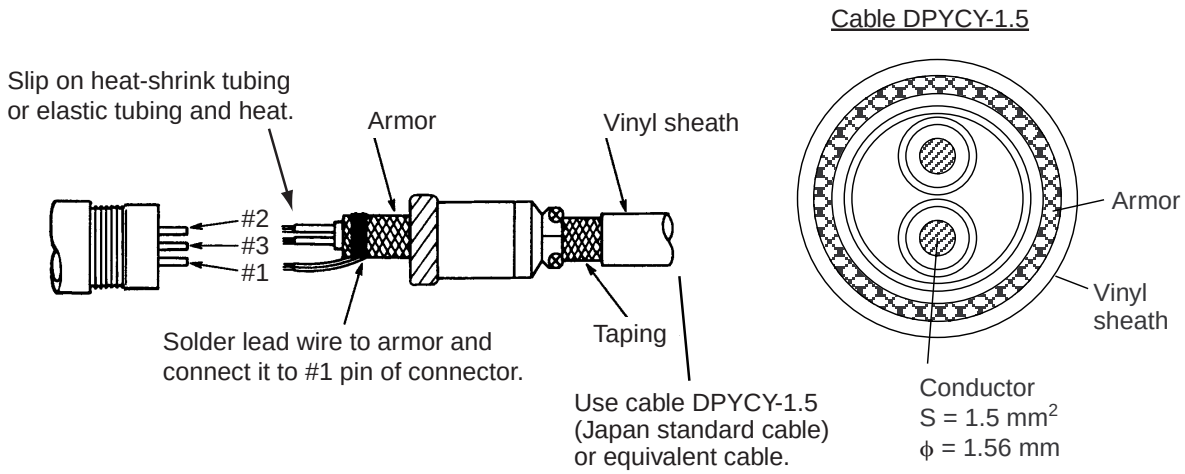
- Guide pin A (Large): 1
- Guide pin B (Small): 1

Use the tool (Type: 10-910-0179-0) shown below to position guide pins.

Connector / Guide Pin	CN-A101	Tool
Guide Pin A (Large)	4	
Guide Pin B (Small)	1	Guide pin insertion tool (notch in head)

2.4.2 Power cable

Attach the NCS-253-P connector to the power cable (DPYCY-1.5 or equivalent) and connect to the CN-A110 on the rear of the processor unit.



Assembling connector NCS-253-P

2.4.3 Cable from monitor unit

Connect the cable 10S2074 (10 m) or 10S2075 (30 m) from the monitor unit to the connectors in the processor unit as shown below.

38P connector: CN-A103 (For the optional sub-monitor display, CN-A108)
D-sub 25 pin: CN-A102 (For the optional sub-monitor display, CN-A107)
D-sub 15 pin: CN-A104 (For the optional sub-monitor display, CN-A109)

2.4.4 Cable from control unit

For blackbox configuration, attach the cable (10S2076) from the control unit (FSV-8401) to CN-A103 on CONE Board (10P6905) in the processor unit, passing it through the cable clamp in the processor unit.

2.4.5 Optional equipment

Optional equipment (navigator, current indicator, AD converter, speed log, etc.) are connected at the rear of the processor unit.

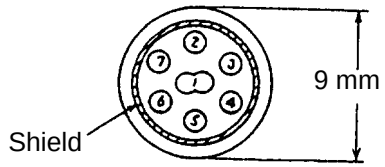
Use the SRCN connectors (optionally supplied, Type: CP10-04801, Code no.: 006-934-240) to connect equipment to the rear of the processor unit.

Cable list

Outline of core	
○	Simple
◎	w/shield
⊂⊃	Twisted

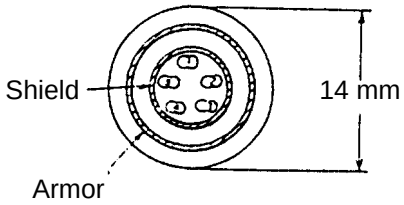
Sectional view of cables

02S8040



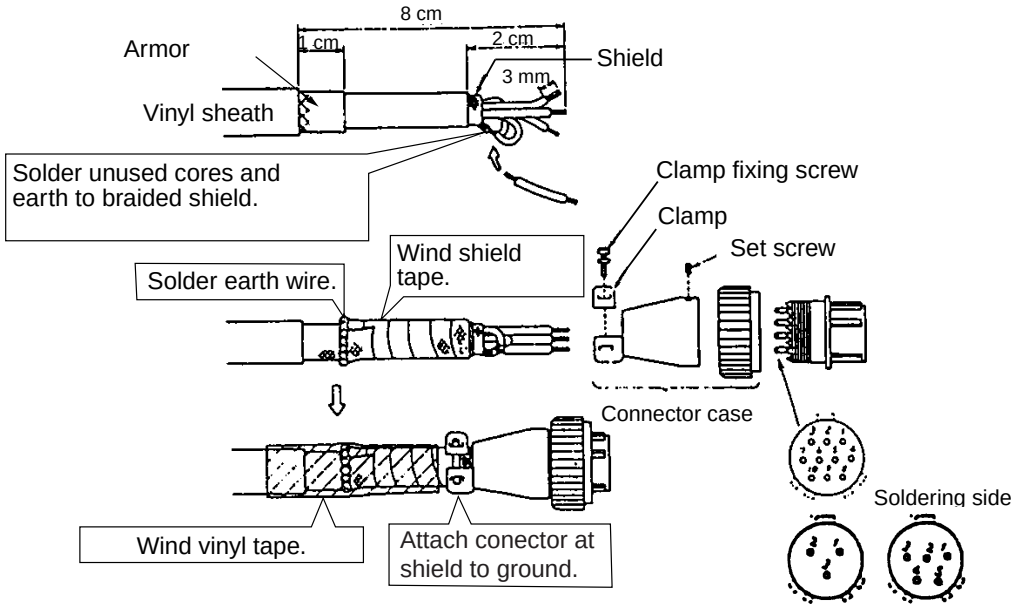
No.	Color
1	WHT/BLU
2	BLK
3	PNK
4	GRN
5	ORG
6	YEL
7	RED

CO-SPEVV-SB-C 0.2sq, 5P

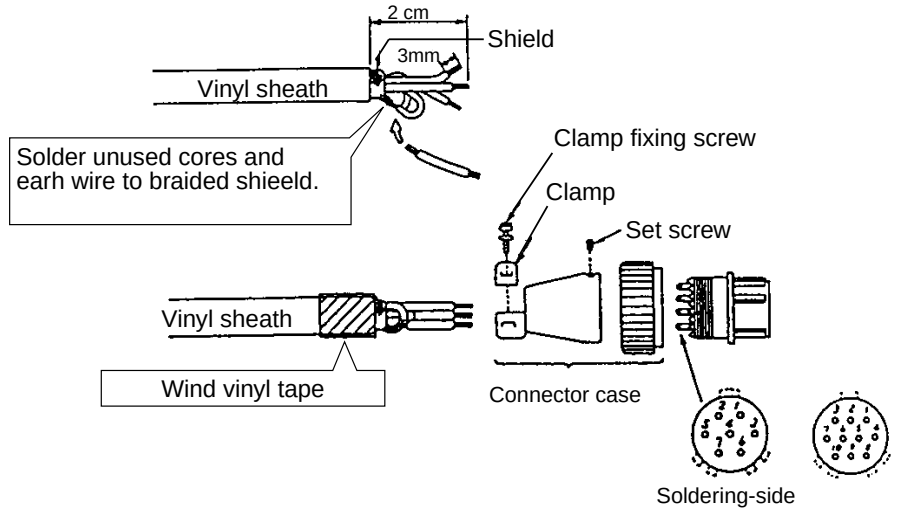


No.	Color
1	YEL/BLK
2	YEL/WHT
3	YEL/RED
4	YEL/BLU
5	YEL/GRN

Cable with armor	J5 (CIF1) : SRCN6A13-5P J7 (GYRO) : SRCN6A16-10P J8 (LOG) : SRCN6A13-3P J10 (FNZ) : SRCN6A21-10P J13 (EXT-KP) : SRCN6A21-10S



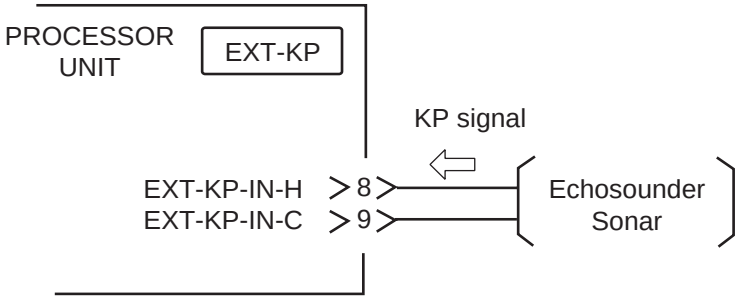
Cable without armor	J9 (ES1) : SRCN6A16-7P J12 (ES2/NET): SRCN6A16-10P



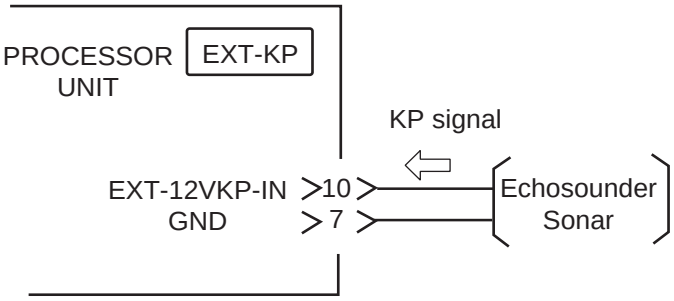
Synchronizing with echo sounder or other sonar

To synchronize the transmission of the FSV-84 with an echo sounder or other type of sonar, make connections as shown below.

- **Current driven KP input**

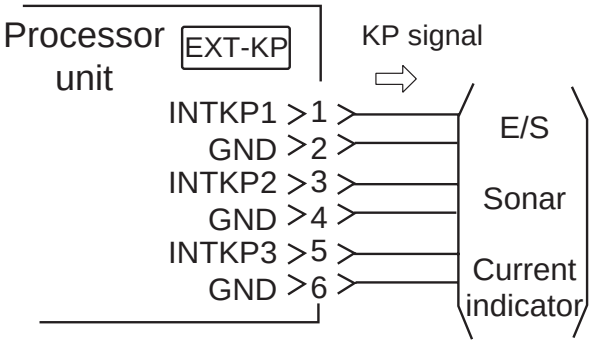


- **Voltage driven KP input**



For KP sync with external echosounder/sonar make the following connections.

- **Voltage driven KP output**



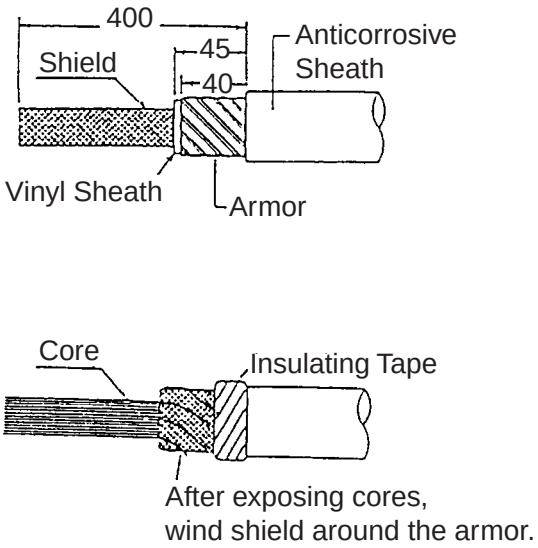
Menu setting

See EXT KP INPUT and EXT KP OUTPUT on the SYSTEM MENU/INTERFACE SETTING menu according to other party. For further details, see page 3-8.

2.5 Transceiver Unit

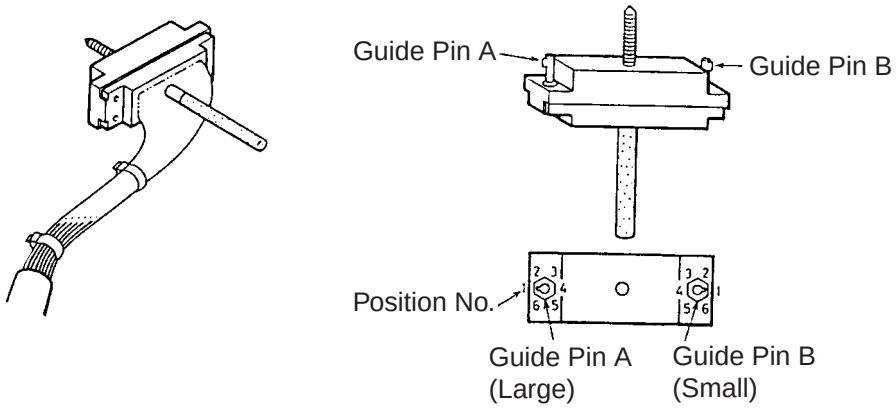
2.5.1 Fabrication of 38P connector 00-8016-038-313761HV (CN-B101)

Pass the cable (10S2158) from the processor unit (FSV-8402) through the cable clamp on the transceiver unit (FSV-841) and connect it to CN-B101.



Fabrication of cable for 00-8016-038-313761HV

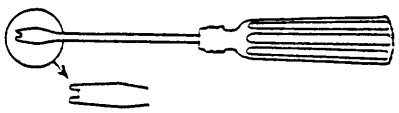
Shorten the unused wires appropriately and treat their ends with vinyl tape to prevent short circuit.



Assembling 38P connector

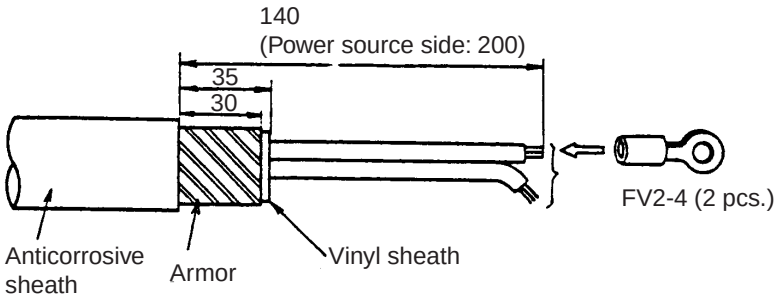
Positioning guide pins

Use the tool (Type: 10-910-0179-0) shown below to position guide pins.

Connector / Guide Pin	CN-B101	Tool
Guide Pin A (large)	1	
Guide Pin B (small)	1	Guide pin insertion tool (notch in head)

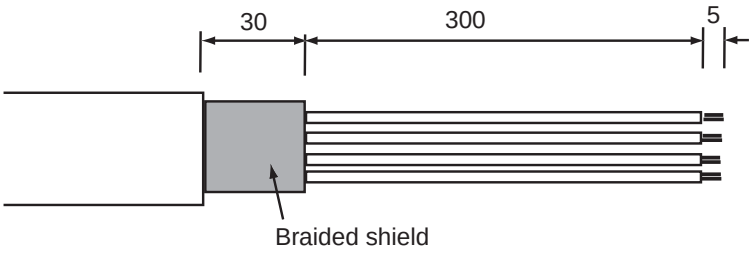
Power cable fabrication

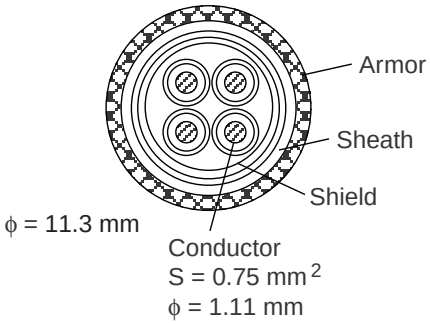
Use power cable DPYCY-2.5 or equivalent.



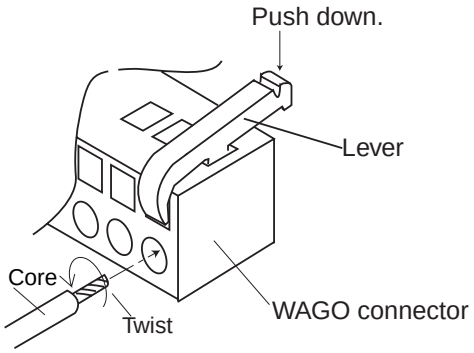
Satellite compass cable fabrication

Use cable type TTYCS-1Q and connect it to TB B102.

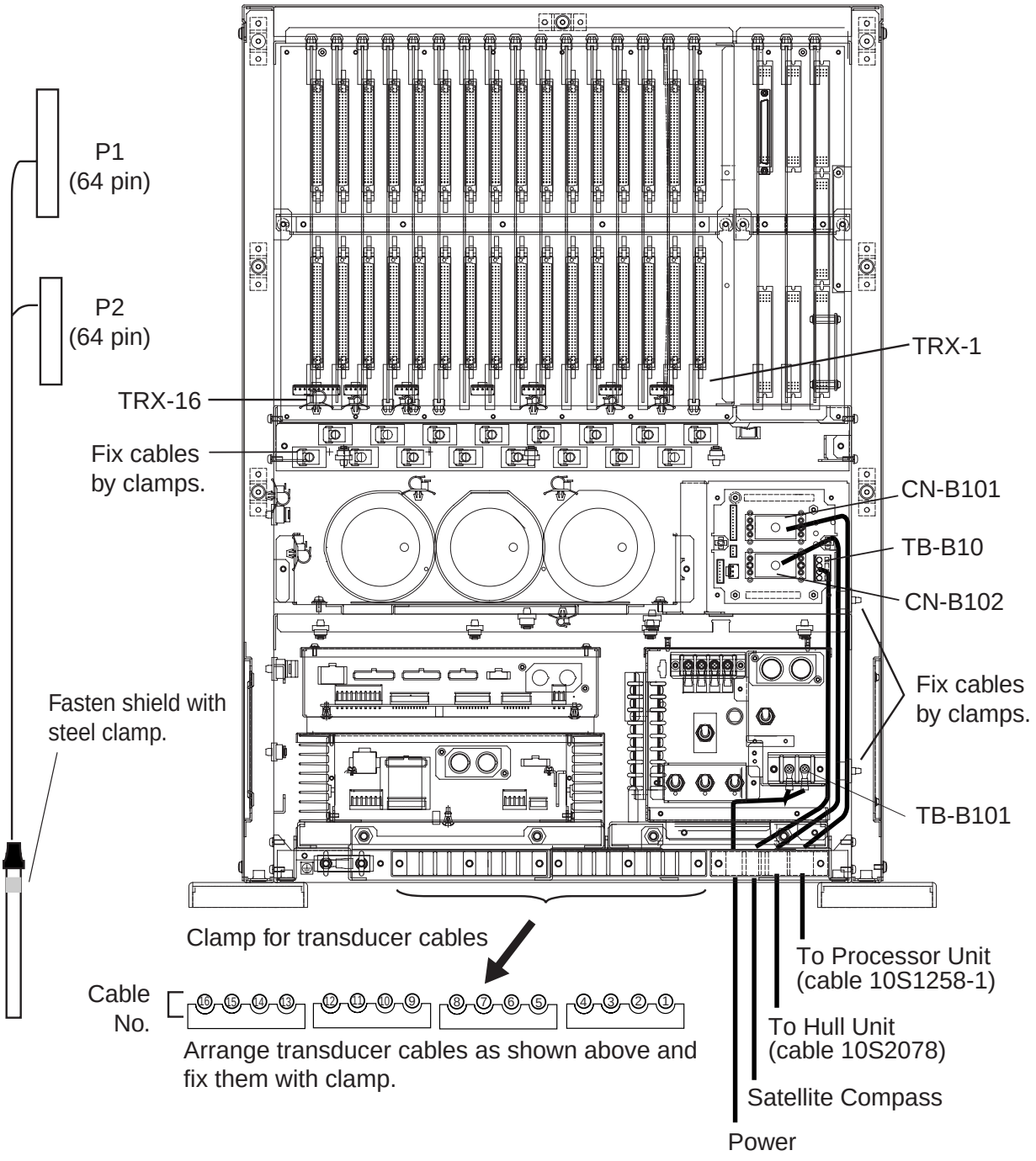




Wiring WAGO connector



Procedure
1. Twist core.
2. Insert lever and push down.
3. Insert core in hole.
4. Release lever.
5. Tug on wire to mark sure it is in place firmly.



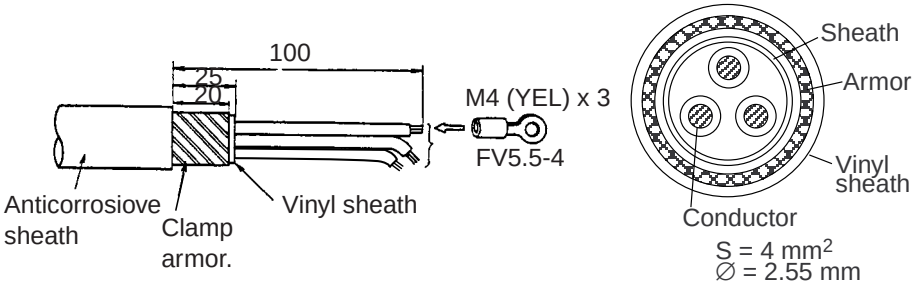
Transceiver unit, inside view

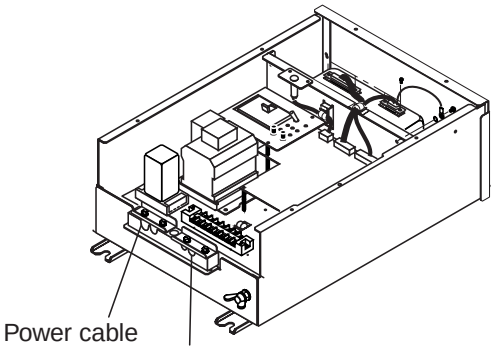
Connect transducer cable (cables from transducer or cables from Junction Box FSV-845) referring to cable no. labeled on the chassis and connector no. labeled on each pc board. Connector is locked properly when you hear a “click” sound. For the cable (10S2078) from the control box of the hull unit connect the longer peeled portion of the cable to the transceiver unit.

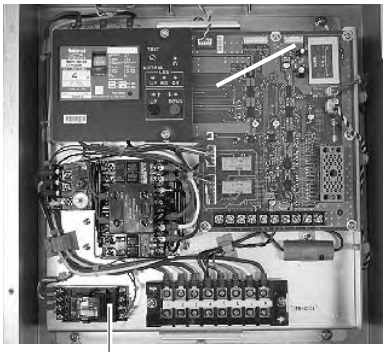
Note: When removing or inserting TRX board when the transducer cable is not connected, lock the connector lock of the transducer cable connector (HIF connector).

2.6 Control Box of Hull Unit

Connect the power cable TYPCY-4 (3ϕ) and the transceiver unit cable (10S2078, end with shorter peeled portion) as shown below.







Confirm LED after completing the installation. The LED lights (in red) if power connection is correct. If it is off, turn off power from the mains switchboard, reconnect any two lines of the power cable, turn on the power, and check if the LED is lit. The hull unit does not work if this connection is wrong.

Normal phase: LED lights (in red).
Phase reversal: LED does not light.

2.7 Input Voltage and Fuses

The transceiver unit is shipped from the factory with its input voltage set for 230 VAC and a 10 A fuse inserted in F601 and F602. For other voltages, change toggle switch positions and fuses as below.

Input voltage

Set the toggle switches S603, S604 and S605 according to input voltage, referring to the table below.

Input (TB-B101)	S603	S604	S605	Default setting
100 VAC	L	L	L	
110 VAC	H	L	L	
115 VAC	H	H	L	
220 VAC	H	L	H	
230 VAC	H	H	H	Default setting

Fuses

Change the fuse in F601 and F602 according to input voltage, referring to the table below.

Input (TB-B101)	Fuse		Default setting
	F601	F602	
100 VAC	20A	20A	
110 VAC			
115 VAC			
220 VAC	10A	10A	Default setting
230 VAC			

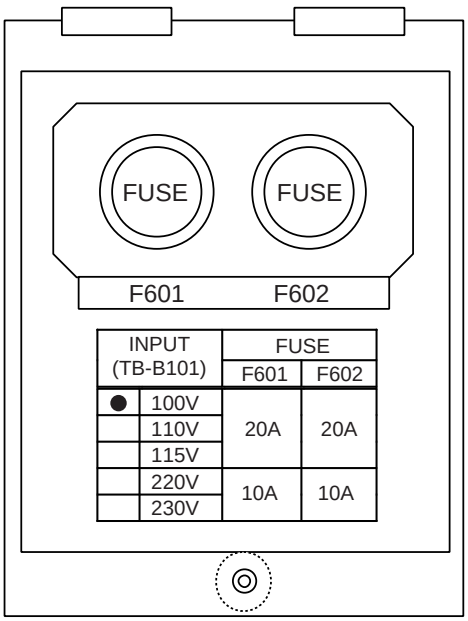
⚠ WARNING

Use the proper fuse.

Use of a wrong fuse can result in damage to the equipment or cause fire.

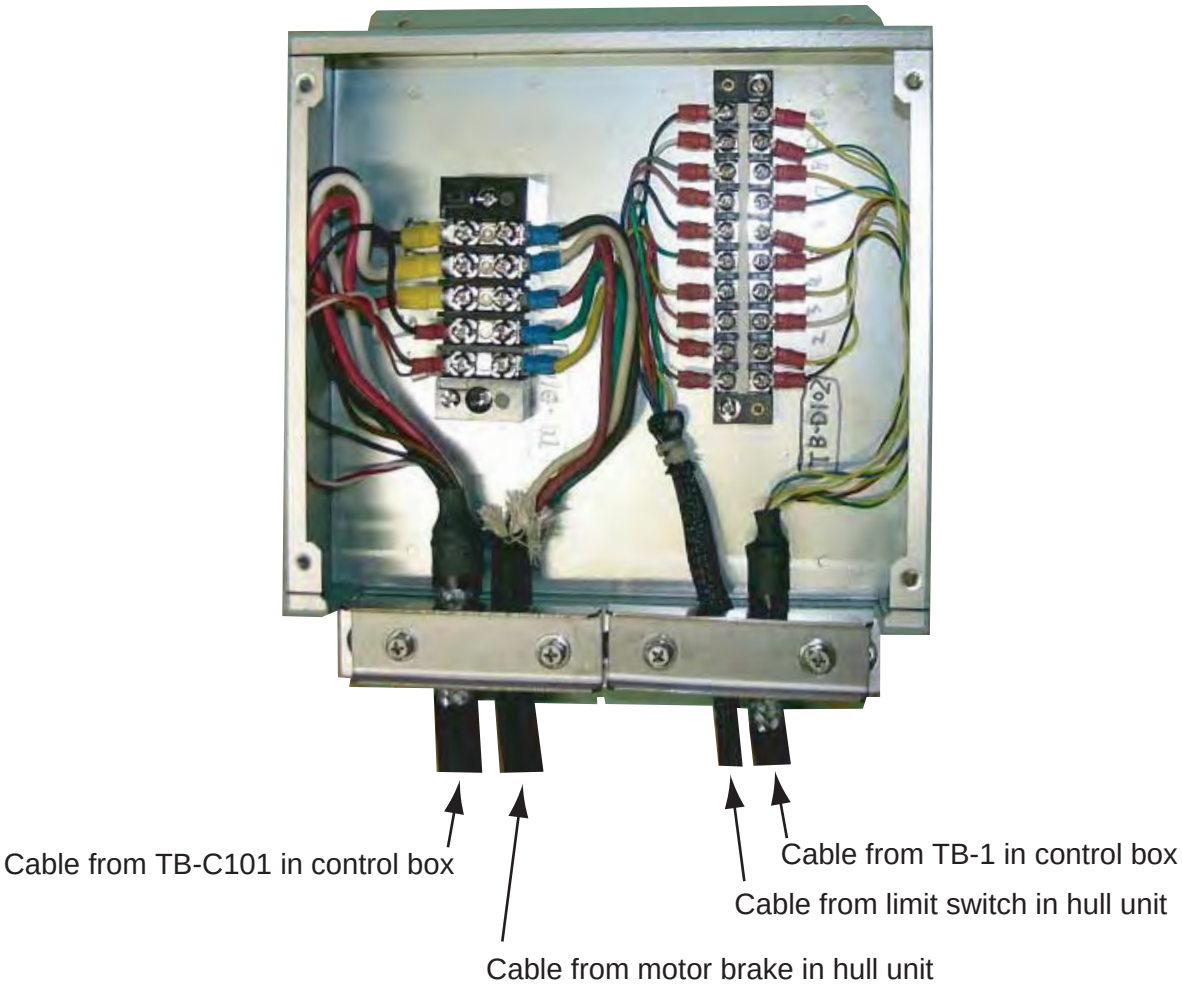
Marking the label

After setting toggle switches and changing the fuses, mark the label on the inside of the cover with the voltage that applies. In the example shown right, 100 V is marked so 20A fuses must be used.



2.8 Controller Extension Kit (Junction Box)

Wire the junction box of the controller extension kit as shown below.



This page intentionally left blank.

3. ADJUSTMENT AND CHECK

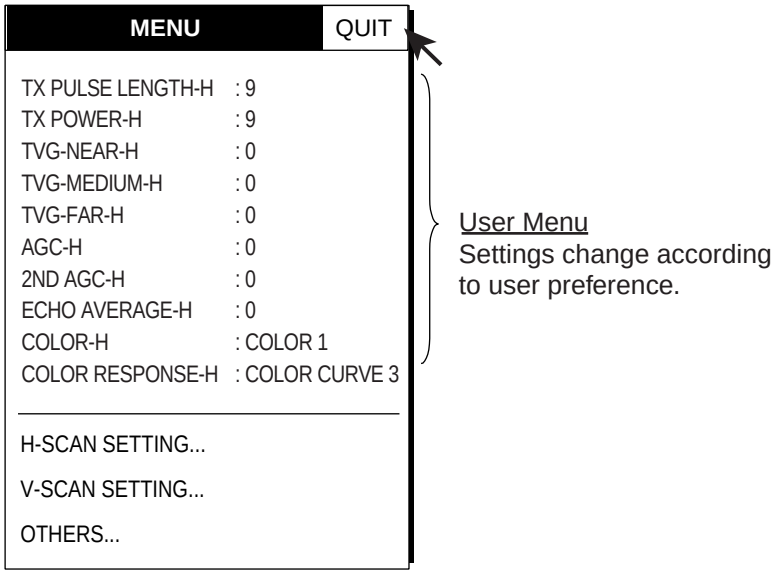
3.1 Hull Unit Check

Setting transmission on

Default setting of transmission is OFF. Set the transmission on as follows:

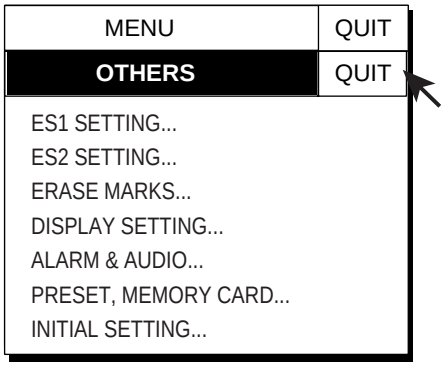
Note: NEVER transmit when the vessel is in drydock.

1. Turn on the power, and then press the [MENU] key to show the main menu.



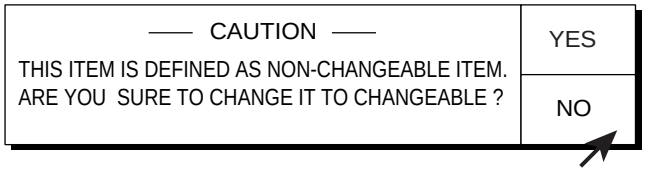
Main menu

2. Use the trackball to choose OTHERS and press the [MENU] key.

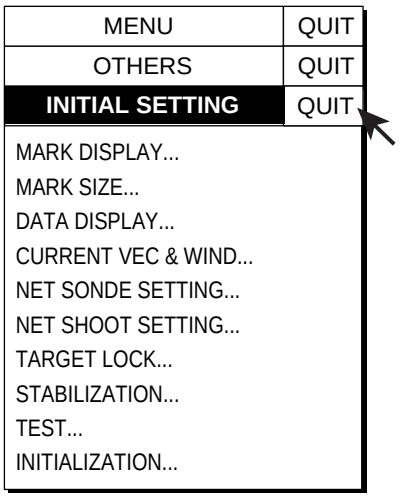


OTHERS menu

3. Choose INITIAL SETTING and press the [MENU] key.

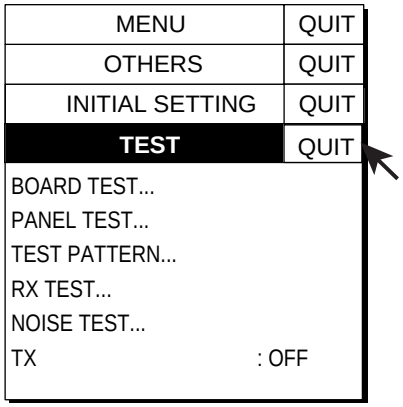


4. Choose YES and press the [MENU] key.



INITIAL SETTING menu

5. Choose TEST and press the [MENU] key.

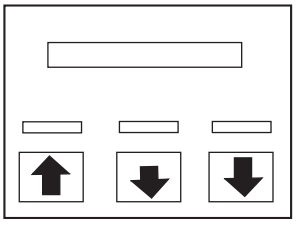


TEST menu

6. Choose TX and press the [MENU] key.
7. Choose ON and press the [MENU] key.
8. Choose QUIT at the top of the menu and press the [MENU] key.

How to check the hull unit

1. Press the POWER (|) switch on the control unit to turn on the equipment. Confirm that " ON" lamp above the POWER switch and the ⬇ switch light.



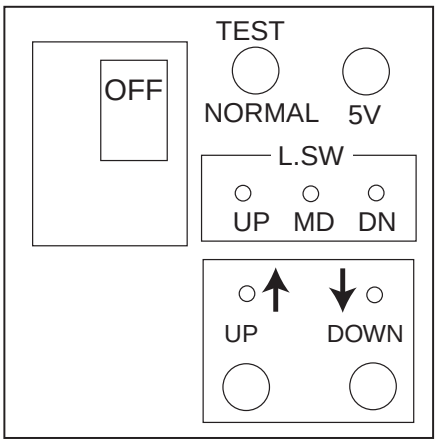
Transducer switches of the control unit

2. Confirm that the 5V and UP lamps on the raise/lower control box are lit.

3. Remove the cover of the raise/lower control box and use a multimeter to measure the following voltages:

Terminal	Terminal No.	Voltage
TB-C101	(1) – (2) (2) – (3) (1) – (3)	220 VAC 220 VAC 220 VAC

4. In the raise/lower control box, set the TEST/NORMAL switch to TEST. Press the [DOWN] switch to confirm that the transducer lowers. Also, while the transducer is being lowered, check that the MD LED lights when the MD L. SW kicks. Note that the MD L. SW does not stop the transducer when the TEST/NORMAL switch is in the TEST position.



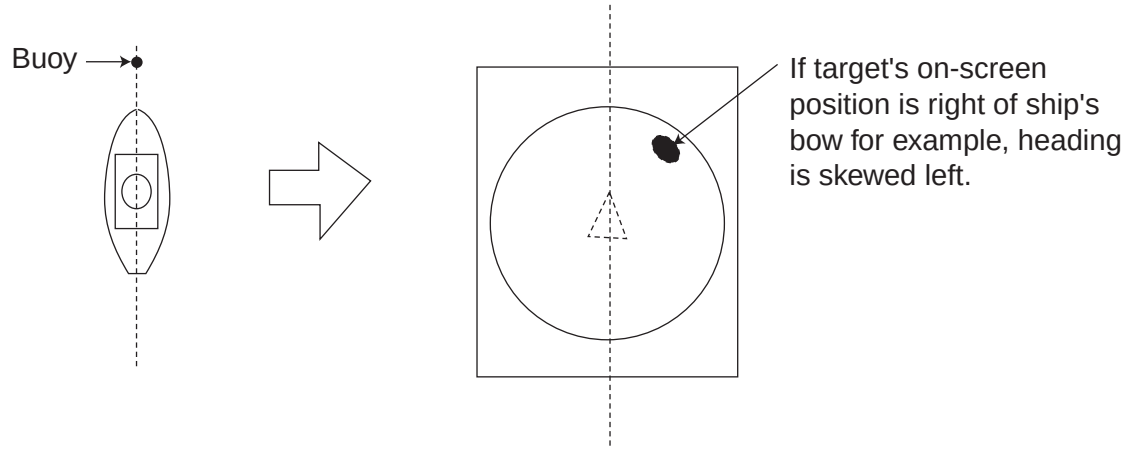
Control unit (in hull unit)

5. Press and release the [DOWN] switch. Confirm that the transducer stops at the moment the switch is released.
6. Press the [DOWN] switch again. Confirm that the transducer stops at the moment the lower limit switch kicks.
7. Confirm that the [UP] switch operates in a similar manner.
8. Check that LEDs on the panel of the raise/lower control box light as follows:
   1) UP, MD and DN LEDs light when corresponding limit switch is kicked.
   2) UP and DN LEDs light while UP and DOWN switches are pressed and extinguish when the switches are released.
9. Set the TEST/NORMAL switch to NORMAL.
10. At the control unit, press the ⬇ (mid position) switch. Confirm that the lamp above the switch blinks while the transducer is being lowered, a short beep sounds when the mid limit switch kicks, and the lamp lights when the transducer is lowered to the mid position.
11. Press the ⬇ switch (fully lowered position). Confirm that the lamp above the switch blinks while the transducer is being lowered, a short beep sounds when the mid limit switch is kicked, and the lamp lights when the transducer is fully lowered.
12. Press the OFF switch. Confirm that the transducer is completely retracted and then the power is turned off.
13. Press the ⬆ switch. Confirm that the lamp above the switch blinks while the transducer is being raised, a short beep sounds when the mid limit switch is kicked, and the lamp lights when the transducer is fully raised.
14. With the transducer lowered (mid or fully lowered), confirm that the transducer is raised when ⬆ or the OFF is pressed.

3.2 Heading Adjustment

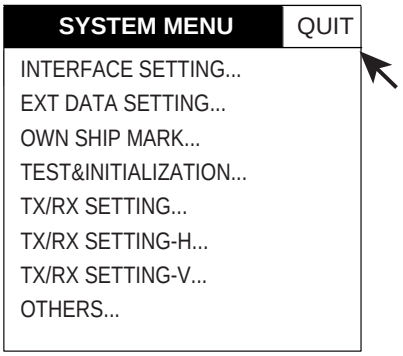
When the BOW mark on the flange of the hull unit cannot be directed toward ship's bow, adjust the heading so an echo which is dead ahead appears dead ahead on the display.

1. Referring to the previous section, set the TX (transmission) to ON.
2. Locate a target in the bow direction (buoy, for example) and display it on a near range. If the target appears at 12 o'clock the heading alignment is correct. If it does not, measure the error and go to next step.



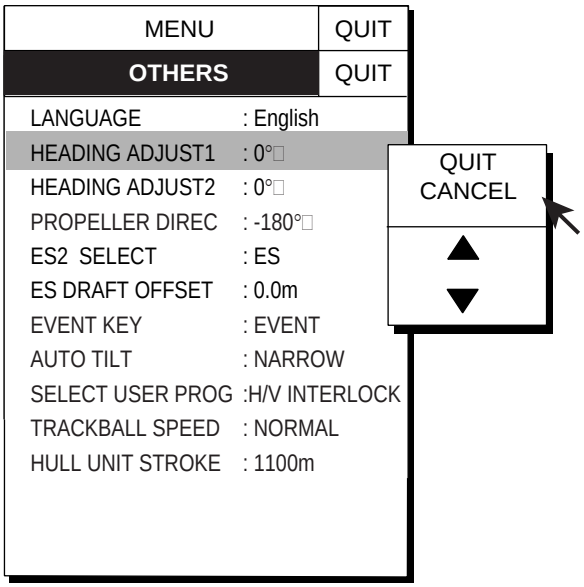
Heading adjustment

3. Turn off the power and then turn it on again while pressing and holding down the [MENU] key. Release the [MENU] key after the self-test screen appears. After the picture appears, press the [MENU] key three times to open the SYSTEM menu.



SYSTEM menu

4. Use the trackball to choose OTHERS and press the [MENU] key.
5. Choose HEADING ADJUST1 and press the [MENU] key.



OTHERS menu, HEADING ADJUST

6. Choose ▲ or ▼ to choose direction (plus or minus, respectively) in which to increment or decrement setting and then press the [MENU] key to set. Each pressing of the [MENU] key changes the setting in increments of 1°. The setting range is -180° to +179°.
7. Choose QUIT to finish the adjustment and press the [MENU] key.
8. Choose QUIT at the top of the menu screen and press the [MENU] key to close all menus.

Heading adjustment for motion sensor

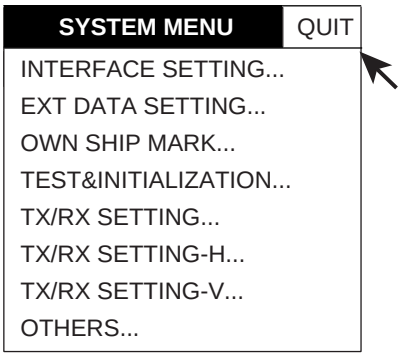
HEADING ADJUST2 (on the SYSTEM menu) is used for heading adjustment of motion sensor. Adjust the heading according to type of motion sensor connected, referring to the guidelines below.

- If the standard motion sensor is used where the hull unit and control box are installed together, use the same value as set for HEADING ADJUST1.
- If the control box is installed separately, set angle measured from bow. The angle is 0 degrees if the lid of the control box is directed toward ship's stern precisely.
- If GPS gyro is selected as motion sensor, set 0 degrees.

3.3 Configuring Own Ship Mark

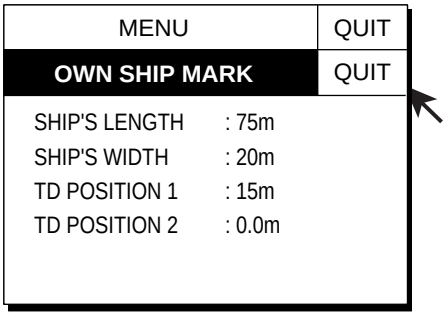
Set own ship's dimensions and the location of the transducer to accurately display the own ship mark on the display.

1. Press the [MENU] key to display the SYSTEM menu.



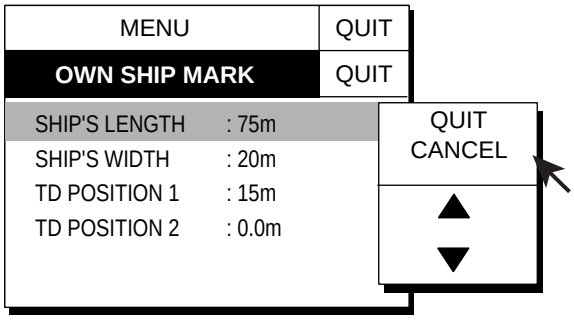
System menu

2. Use the trackball to choose OWN SHIP MARK and press the [MENU] key.



OWN SHIP MARK menu

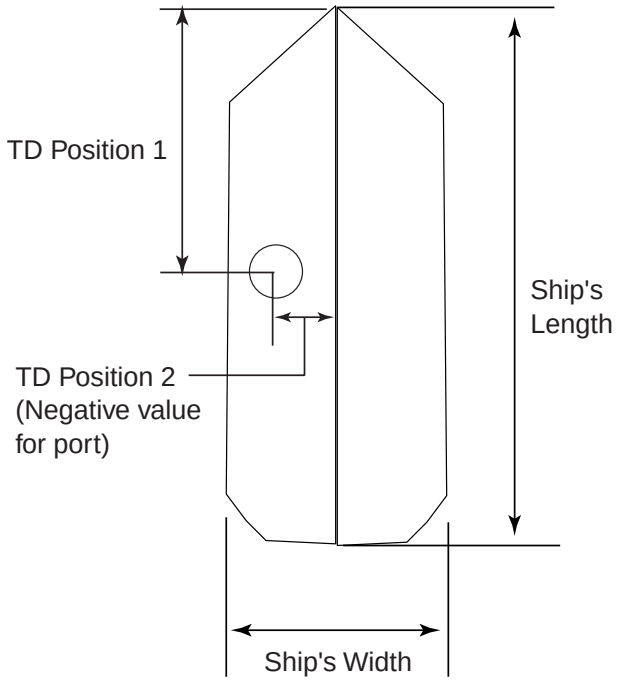
3. Use the trackball to choose SHIP'S LENGTH.
4. Press the [MENU] key to show the setting window.



OWN SHIP MARK menu, setting window

5. Choose ▲ or ▼ and then operate the [MENU] key to set the ship's length (15 to 150 m).
6. Choose QUIT to finish the setting.
7. Set the SHIP'S WIDTH (5 to 30 m), TD POSITION 1 (5 to 50 m) or TD POSITION 2 (-10.0 to 10.0 m) similarly.

   TD POSITION 1: Set the transducer's distance from the bow.
   TD POSITION 2: Set the transducer's distance from the keel. Choose [+] for starboard, [-] for port.
8. Choose QUIT at the top of the menu screen and press the [MENU] key to close all menus.



Ship shape description

3.4 Other SYSTEM Menu Items

This section mainly shows you how to set up according to external equipment connected. Default settings are underlined.

3.4.1 INTERFACE SETTING menu

MENU	QUIT
INTERFACE SETTING	QUIT
NMEA 1 BAUD RATE	: 4800 bps
NMEA 2 BAUD RATE	: 4800 bps
CIF BAUD RATE	: 4800 bps
AUX BAUD RATE	: 19200 bps
SENSOR BAUD RATE	: 38400 bps
EXT KP INPUT	: DISABLE
EXT KP OUTPUT	: NEGATIVE
Future use → LAN SETTING...	

INTERFACE SETTING menu

NMEA 1 BAUD RATE: Set the transmission rate for the NMEA 1 port. (4800 bps, 9600 bps, 19200 bps, 38400 bps)

NMEA 2 BAUD RATE: Set the transmission rate for the NMEA 2 port. (4800 bps, 9600 bps, 19200 bps, 38400 bps)

CIF BAUD RATE: Set the transmission rate for the CIF port. If the CS-120A is connected, choose “2400 bps”. (2400 bps, 4800 bps, 9600 bps, 19200 bps)

AUX BAUD RATE: Set the transmission rate for the AUX port. (2400 bps, 4800 bps, 9600 bps, 19200 bps)

SENSOR BAUD RATE: Set baud rate of satellite compass, connected to the transceiver unit. (4800 bps, 9600 bps, 19200 bps, 38400 bps.) For SC-50/SC-110, select 38400 bps.

Note: Set NMEA output for SC-50/SC-110 as follows:

- Output format: IEC ed1
- Sentence: ATT, HVE (turn off all other sentences except those two)
- Baud rate: 38400 bps
- Interval: 25 ms

(Any talker)

EXT KP INPUT: Set the input logic of KP from external equipment. (DISABLE, ↑, ↓)

DISABLE: Disable external KP.

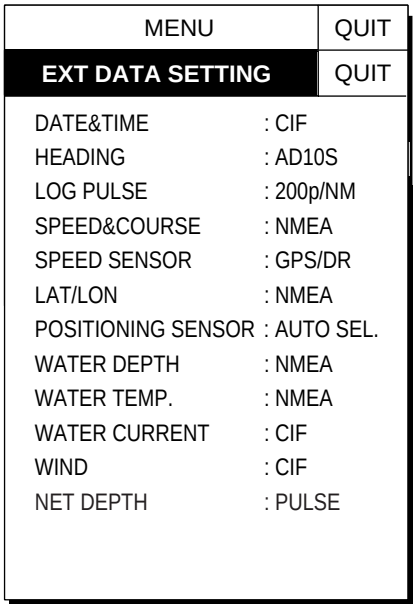
↑: Synchronize with leading edge of input pulse.

↓: Synchronize with trailing edge of input pulse

Note: To transmit with external KP, set the TX INTERNAL to “0” in the H-SCAN SETTING menu.

EXT KP OUTPUT: Choose the KP output logic, POSITIVE or NEGATIVE. (POSITIVE, NEGATIVE)

3.4.2 EXT DATA SETTING menu



EXT DATA SETTING menu

DATE & TIME: Choose the input format for data and time data. (NONE, CIF, NMEA)

HEADING: Choose the input format for heading data. (NONE, AD10S, CIF, NMEA)

LOG PULSE: Set the log pulse rate for the log signal. (200 p/NM, 400 p/NM)

SPEED & COURSE: Choose the input format for ship's speed and course data. When choosing the LOG&HEADING, the heading data is used instead of the course data. (NONE, LOG&HEADING, CIF, NMEA)

SPEED SENSOR: Choose the input format for speed and course data. This setting is ineffective when LOG&HEADING is selected as speed and course source. (NONE, GPS/DR, DOPPLER/DR)

LAT/LON: Choose the input format for ship's position data. (NONE, CIF, NMEA)
POSITIONING SENSOR
Choose the type of the navigator to use. For AUTO SEL., the priority is GPS/DR>LORAN-C. (LORAN-C, GPS/DR, AUTO SEL.)

WATER DEPTH: Choose the input format for depth data. (NONE, CIF, NMEA)

WATER TEMP.: Choose the input format for water temperature data. (NONE, CIF, NMEA)

WATER CURRENT: Choose the input format for water current data. (NONE, CIF, NMEA)

WIND: Choose the input format for wind data. (NONE, CIF, NMEA)

NET DEPTH: Choose the input format for net depth data. (NONE, CIF, PULSE)

Data sentences

NMEA Input sentences

Sentence	Main data source	Main data
GNS	GPS	Latitude, longitude
GGA	GPS	Latitude, longitude
RMA	Loran C	Latitude, longitude
RMC	GPS	Latitude, longitude, speed
GLL	GPS	Latitude, longitude
ZDA	GPS	Time, date
VBW	Ship speed, tide speed	Speed thru water, speed over ground
VHW	Tide speed	Speed thru water
VTG	GPS	True course, speed over ground
VDR	Tide speed	Tide speed and direction
HDT	Compass	Heading
HDM	Compass	Heading
HDG	Compass	Heading
HCD	Compass	Heading
HCC	Compass	Heading
DPT	Echo sounder	Depth
DBT	Echo sounder	Depth
DBS	Echo sounder	Depth
MTW	Echo sounder, Temperature indicator	Water temperature
MWV	Windmeter	Wind speed and direction
CUR	Current indicator	Tide speed and direction

NMEA output sentences

Sentence	Main data
TLL	Event, Net shoot, latitude and longitude of target mark
FKV	Fish school speed
TFM	Relative direction, distance, depth and speed of fish school
TLM	Relative direction, distance, depth of position mark
EVT	Bearing, distance and depth of event mark
FMG	Bearing, distance, depth and volume of estimate mark
FVC	Bearing, distance, depth and speed of fish school mark
SHT	Bearing and distance of net shoot mark
TLF	SV, area and volume of fish echo
SD3～SD8	Scan setting parameters for each Tx and Rx

3.4.3 OTHERS menu

MENU		QUIT
OTHERS		QUIT
LANGUAGE	: English	
HEADING ADJUST1	: 0°	
HEADING ADJUST2	: 0°	
PROPELLER DIREC	: -180°	
ES2 SELECT	: ES	
ES DRAFT OFFSET	: 0.0m	
EVENT KEY	: EVENT	
AUTO TILT	: NARROW	
SELECT USER PROG	:H/V INTERLOCK	
TRACKBALL SPEED	: NORMAL	
HULL UNIT STROKE	: 800m	
TD TYPE	: NON-DOME	

OTHERS menu

LANGUAGE: Choose the language to use. (JAPANESE, ENGLISH)

HEADING ADJUST1: See “3.2 Heading Adjustment”.

HEADING ADJUST2: Compensate for installation error in motion sensor (in hull unit) or satellite compass, in bow direction. (-180 to 179(°)).

PROPELLER DIREC: Set bow reference bearing for screw as viewed from transducer position. This is for suppressing screw noise, by specifying screw bearing. (-180 to 179(°)).

ES2 SELECT: Choose the equipment connected to the ES2 port; echo sounder or net recorder. (ES, NET REC)

ES DRAFT OFFSET: When connecting an echosounder, you may enter the ship’s draft if you prefer to display depth from the draft rather than depth from the transducer. (0.0 m to 10.0 m, increments of 0.1 m)

EVENT KEY: Choose the key to use to enter own ship’s position, EVENT or SHOOT. When choosing SHOOT, the shoot function becomes inoperative. (EVENT, SHOOT)

AUTO TILT: Choose the range for the auto tilt form WIDE (±2 to 10°, ±4 to 16°, ±6 to 20°) or NARROW (±1 to 4°, ±2 to 6°, ±3 to 8°). (WIDE, NARROW)

SELECT USER PROG: Choose whether to program horizontal and vertical displays together or individually, by the USER PROG control. H/V INTERLOCK, the default setting, commonly applies control settings to the horizontal and vertical displays. H/V INDVIDUAL enables individual adjustment of horizontal and vertical displays.

TRACKBALL SPEED: Choose the speed of trackball movement (inside menu window only). (SLOW, NORMAL, FAST)

HULL UNIT STROKE: Choose the stroke length of the hull unit. (800 mm, 1100 mm).

TD TYPE: Choose the type of transducer used: DOME.

3.5 CONE Board Setting in the Processor Unit

Adjust the potentiometers on the CONE Board in the processor unit, referring to the table shown below.

Location No.	Name	Resistance value	Function	Adjustment
R118	ALARM VOLUME	10 kΩ	Adjust the volume of audio alarm.	CW: Large CCW: Small
R119	ES2_OFFSET	1 kΩ	Adjust ES2 signal offset.	CW: Noise decrease CCW: Noise increase
R167	ES2_GAIN	10 kΩ	Adjust ES2 signal gain.	CW: Gain increase CCW: Gain decrease
R168	ES1_OFFSET	1 kΩ	Adjust ES1 signal offset.	CW: Noise decrease CCW: Noise increase
R209	ES1_GAIN	10 kΩ	Adjust ES1 signal gain.	CW: Gain increase CCW: Gain decrease

CW: Clockwise, CCW: Counterclockwise

3.5.1 Adjustment of signal level (echo sounder connected)

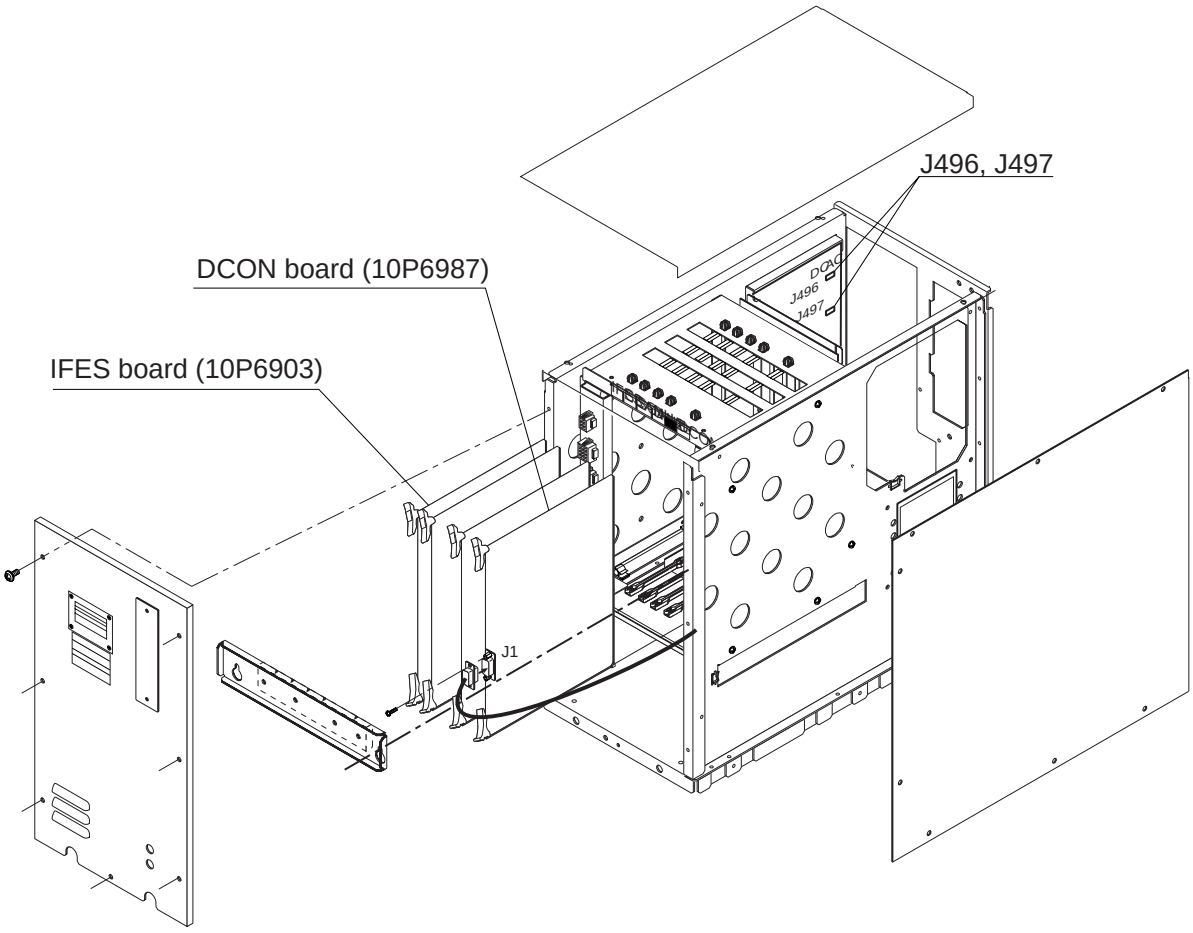
Adjusts the output level of the echo sounder on the CONE Board as below.

1. Choose an echo sounder display (ES1 or ES2) from the menu.
2. For ES1, adjust R168 to suppress noise, and then adjust R209 so that the picture condition is similar to that of connected echo sounder connected to the FSV-84.
3. For ES 2, adjust R119 to suppress noise, and then adjust R167 so that the picture condition is similar to that of echo sounder connected to the FSV-84.

3.5.2 Adjusting the volume of the audio alarm

The volume of the audio alarm cannot be adjusted from the control unit. If necessary, adjust R118 on the CONE Board to choose appropriate volume.

3.6 DIP Switch Setting

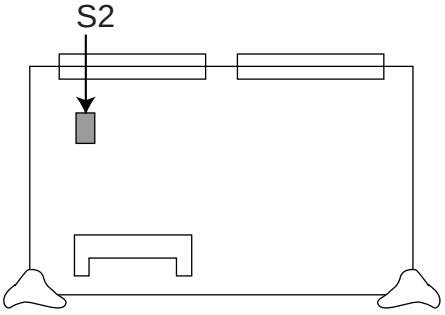


Processor unit, inside view

3.6.1 CIF2/NMEA2 connector interface selection

The signal format for the CIF2/NMEA2 port (at the back of the processor unit) can be set for CIF or NMEA by DIP switch S2-8 on the IFES Board (10P6903). The default format is OFF (CIF).

DIP switch setting	Format
S2-#8: ON	NMEA
S2-#8: OFF	CIF



IFES Board (10P6903)

3.6.2 Choosing echosounder signal

There are two kinds of echosounder signals, AC signal and DC signal. Set the appropriate jumper on the CONE board (10P6905) as below according to the input port. The default setting is AC. See previous for parts location.

Input port	Jumper
ES1	J496
ES2/NET	J497

Note: The SIGOUT (AC signal) terminal and REC terminal (DC signal) in the output port are provided for a FURUNO echosounder. Therefore, when using the SIGOUT terminal, it is not necessary to change the above-mentioned jumper setting.

4. CONNECTING EXTERNAL INTERFACE CS-120A

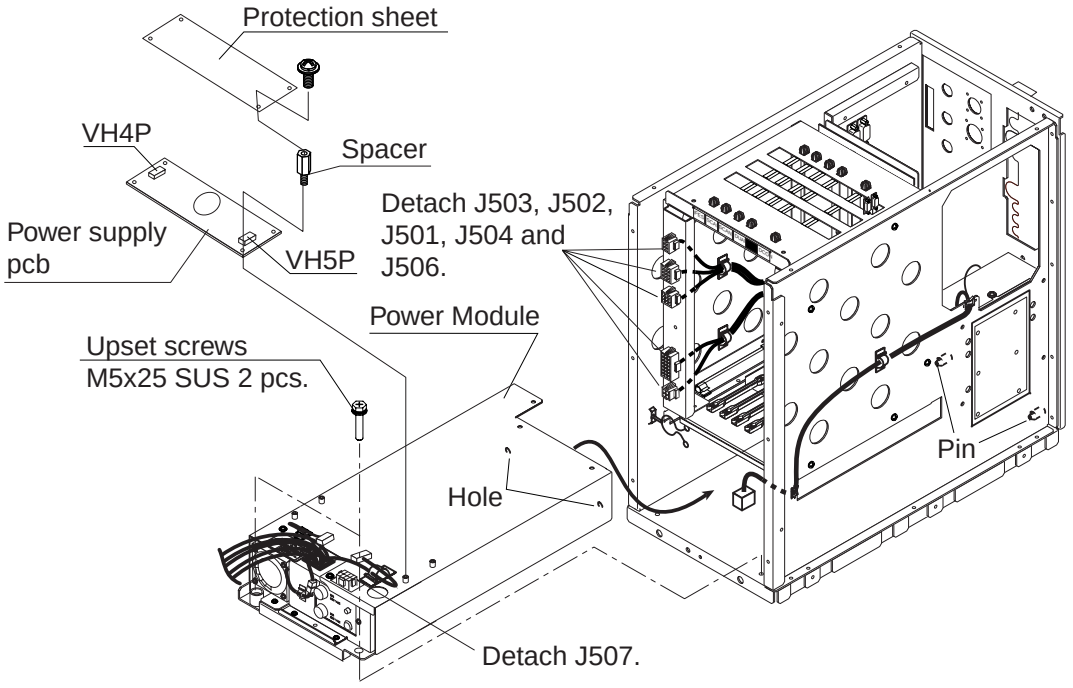
The External Interface CS-120A functions to enable upgrading from a past CSH series sonar. However, we recommend that you connect external devices directly to the processor unit, to avoid signal delay. Connect echo sounder and net sonde directly to the processor unit.

Install the following power supply kit (option) in the processor unit to enable use of the CS-120A.

Name: Power Supply Kit
Type: FSV-2403
Code No.: 000-067-013

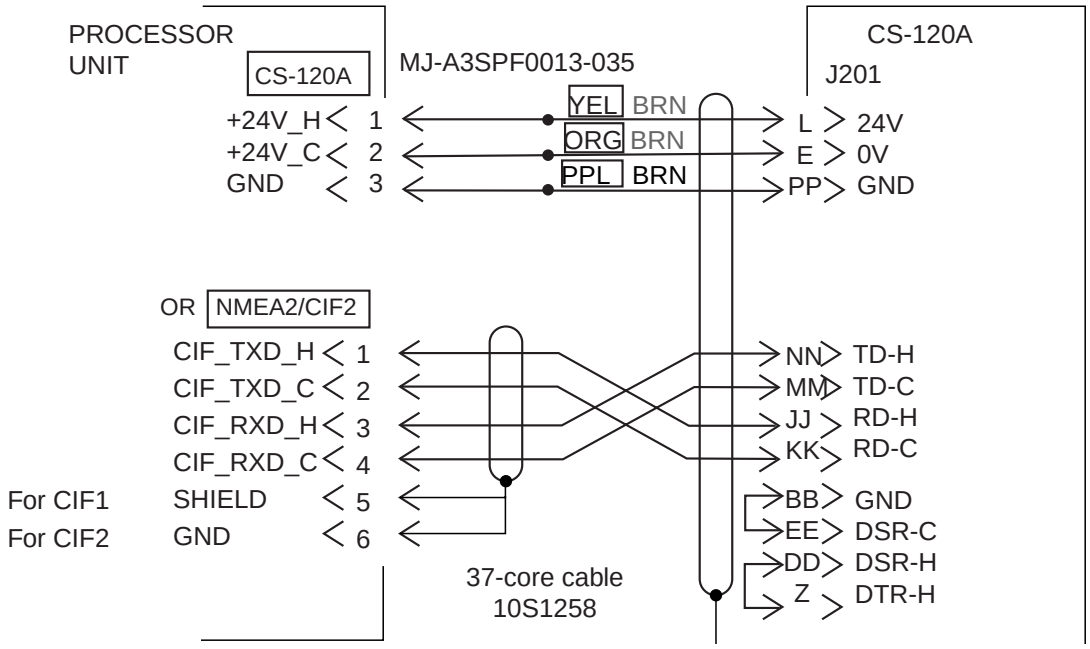
Name	Type	Code No.	Qty	Remarks
Power supply pcb	LEA50F-24-XFND	000-143-913	1	
Spacer	SQ-22	000-802-742	4	
Protection sheet	10-071-3508	100-290-712	1	
Screw	M3×8 C2700W	000-881-404	4	
Connector(NJC)	NJC-203-PM	000-506-702	1	

1. Unfasten seven screws to remove the front cover of the processor unit.
2. Unfasten two upset screws, detach the plugs J503, J502, J501, J504, J506 and J507, and then pull out the power module.



Processor unit, front view

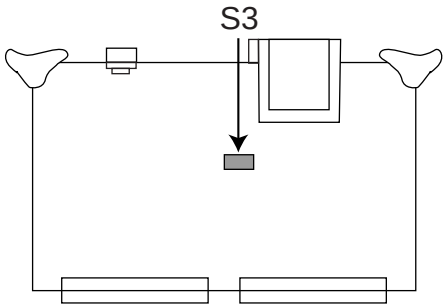
3. Fix the power supply pcb (supplied) to the power module with four spacers (supplied).
4. Connect two VH connectors (provided on the power module) to the power supply pcb.
5. Lay the protection sheet (supplied) on top of the spacers and fasten with pan head screws (M3×8).
6. Reattach the power module.
7. Connect between the processor unit and CS-120A as follows.



Wiring between processor unit and CS-120A

8. Set the DIP switch on the DCON Board as follows.

Input port	DIP switch setting on DCON Board
CIF1	S3-#2: ON
NMEA2/CIF2	S3-#3: ON



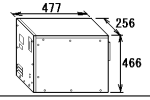
DCON Board (10P6987)

For connection to NMEA2/CIF2 port, the #8 segment of S2 on the IFES board should be OFF (CIF).

Note: If the CIF1 format is selected, change baud rate to 2400 bps. See CIF BAUD RATE on page 3-8 for details.

PACKING LIST

FSV-8402-60/70

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
指示装置制御部 PROCESSOR UNIT		FSV-8402-* 000-010-123-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP10-02601 006-921-340-00	1
付属品 ACCESSORIES			
付属品 ACCESSORIES		FP10-02901 007-008-780-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP10-04502 006-921-240-00	1
工事材料 INSTALLATION MATERIALS		CP10-04506 006-921-290-00	1

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

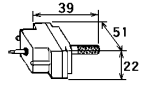
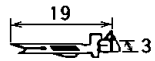
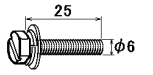
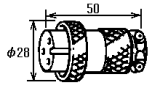
型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	006-921-240-00	10C0-X-9402 -5
TYPE	CP10-04502	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	ｺﾈｸﾀ(8016) CONNECTOR(8016)		008016-038-313761HVF CODE NO. 000-159-017-10	1	制御部用 FOR PROCESSOR UNIT
2	ｺﾝﾀｸﾄ ﾋﾟﾝ (8017) CONTACT PIN (8017)		60-8017-0313-00339F+ 60-8017-0313-00-339 CODE NO. 000-159-417-10 000-519-542-00	2	制御部用 FOR PROCESSOR UNIT
3	六角ｽﾘﾜﾘ ｾﾑｽB HEX.BOLT (SLOTTED,WASHER HEAD)		M6X25 SUS304 M6X25 SUS304 CODE NO. 000-162-949-10 000-802-771-00	6	制御部用 FOR PROCESSOR UNIT
4	ｺﾈｸﾀ(NCS) CONNECTOR(NCS)		NCS-253-P *ROHS* NCS-253-P CODE NO. 000-160-153-10 000-506-503-10	1	制御部用 FOR PROCESSOR UNIT

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

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

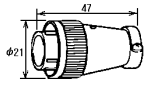
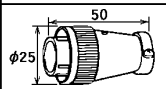
FURUNO ELECTRIC CO ., LTD

FURUNO

CODE NO.	006-921-290	10C0-X-9406 -2
TYPE	CP10-04506	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	コネクタ(SRCN) CONNECTOR(SRCN)		SRCN6A13-5P CODE NO. 000-508-661	1	
2	コネクタ(SRCN) CONNECTOR(SRCN)		SRCN6A16-10P CODE NO. 000-508-663	1	

10C0-X-9406

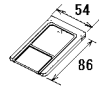
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	007-008-780	10CT-X-9501 -0
TYPE	FP10-02901	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾒﾓﾘｶｰﾄﾞ組品 MEMORY CARD		FP10-02902 CODE NO. 007-008-790	1	制御部用 FOR PROCESSOR UNIT

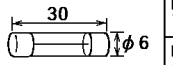
10CT-X-9501

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

FURUNO

CODE NO.	006-921-340	10C0-X-9301 -1 1/1
TYPE	SP10-02601	BOX NO. P

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

ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	QUANTITY SPARE	REMARKS/CODE NO.
1	ﾋｭｰｽﾞ FUSE		FGBO 250V 10A PBF	2		2	指示装置＞制御部用 FOR DISPLAY UNIT
			FGBO 10A AC250V				000-155-839-10
							000-549-067-00

MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	10C0-X-9301	1/1

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

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

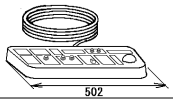
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

PACKING LIST

10CU-X-9864 -0 1/1

FSV-8401-J-5/J-10/E-10

A-6

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
操作部 CONTROL UNIT		FSV-8401-* 000-010-120-00 **	1
付属品 ACCESSORIES		FP10-02201	
付属品 ACCESSORIES		FP10-02201 006-922-390-00	1

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

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

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

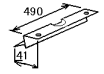
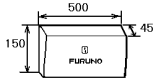
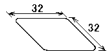
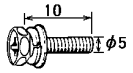
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	006-922-390-00	10C0-X-9501 -2
TYPE	FP10-02201	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	KB直付け金具 KB FIXNG PLATE		03-144-1691-1 CODE NO. 100-263-941-00	1	操作部用 FOR CONTROLL UNIT
2	ﾀﾞｽﾄｶﾊﾞｰKB DUST COVER KB		03-144-1693-0 CODE NO. 100-271-760-00	1	操作部用 FOR CONTROLL UNIT
3	ｺﾈｸﾀｼｰﾙ DUMMY FILM		05-040-0108-0 CODE NO. 100-117-120-00	1	操作部用 FOR CONTROLL UNIT
4	六角ﾅｯﾄ 1種 HEX. NUT		M4 C2700W MBNI2 CODE NO. 000-863-206-00	2	操作部用 FOR CONTROLL UNIT
5	バネ座金 SPRING WASHER		M4 C5191W MBNI2 CODE NO. 000-864-206-00	2	操作部用 FOR CONTROLL UNIT
6	ﾐｶﾞｷ平座金 FLAT WASHER		M4 C2600P MBNI2 CODE NO. 000-864-106-00	2	操作部用 FOR CONTROLL UNIT
7	ﾅｻﾗﾊﾅﾈｼﾞ OVAL HEAD SCREW		M4X12 C2700W MBNI2 CODE NO. 000-163-309-10	2	操作部用 FOR CONTROLL UNIT
8	+ｱﾌﾞｾｯﾄUﾅｾﾑｽB +HEX.BOLT (WASHER HEAD)		M5X10 SUS304 CODE NO. 000-163-757-10	2	操作部用 FOR CONTROLL UNIT
9	ゴム足 RUBBER FEET		SJ-5003 ｸﾛ SJ-5003 ｸﾛ CODE NO. 000-165-669-10 000-801-787-00	4	操作部用 FOR CONTROLL UNIT

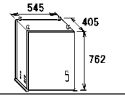
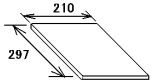
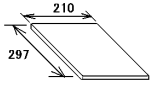
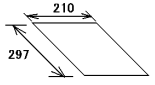
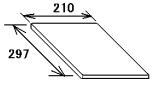
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

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

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

PACKING LIST

FSV-841A/B

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
送受信装置 TRANSCEIVER UNIT		FSV-841A/B 000-010-117-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP10-03101 007-008-530-00	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP10-07011 001-005-660-00	1
図書 DOCUMENT			
取扱説明書 OPERATOR'S MANUAL		OM*-13290-* 000-157-426-1* **	1
装備要領書 INSTALLATION MANUAL		IM*-13290-* 000-157-428-1* **	1
電源設定書 INPUT JOLTAGE SETTING		C12-00602-* 000-162-177-1*	1
操作要領書 OPERATOR'S GUIDE		OSE-13290-* 000-167-237-1*	1 (*1)

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.
2.(*1)の図書は、英文仕様のみ必要です。
(*1) IS ONLY REQUIRED FOR ENGLISH SPECIFICATION.

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

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

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

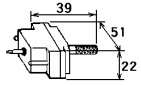
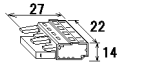
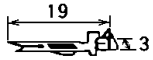
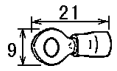
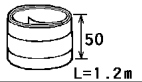
FURUNO

CODE NO.	001-005-660-00	10CU-X-9416 -1
TYPE	CP10-07011	1/1

工事材料表

INSTALLATION MATERIALS

FSV-841A/841B

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(8016) CONNECTOR(8016)		008016-038-313761HVF CODE NO. 000-159-017-10	1	
2	操作ﾚﾊﾞｰ TERMINAL OPENER		231-131 CODE NO. 000-165-800-10	1	
3	ｺﾈｸﾀ(231) OONNECTOR		231-304/026-FUR CODE NO. 000-147-429-11	1	
4	ｺﾝﾀｸﾄﾋﾟﾝ(8017) CONTACT PIN(8017)		60-8017-0313-00339F+ CODE NO. 000-159-417-10	2	
5	圧着端子 CRIMP-ON LUG		FV2-4 ｱｵ CODE NO. 000-538-118-00	3	
6	ｱｰｽ板 COPPER STRAP		WEA-1004-0 CODE NO. 500-310-040-00	1	

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

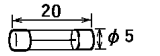
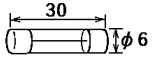
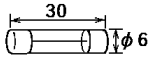
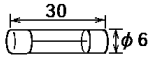
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

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

FURUNO

CODE NO.	007-008-530	10CT-X-9301 -2 1/1
TYPE	SP10-03101	BOX NO.　P

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

ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	QUANTITY SPARE	REMARKS/CODE NO.
1	ﾋｭｰｽﾞ FUSE		FGMB 250V 5A PBF			5	送受信装置用 FOR TRANSCEIVER UNIT 000-157-570-10
2	ﾋｭｰｽﾞ FUSE GLASS TUBE TYPE		FGBO 250V 15A PBF			5	送受信装置用 FOR TRANSCEIVER UNIT 000-157-874-10
3	ﾋｭｰｽﾞ FUSE		FGBO 250V 20A FGBO 20A AC250V			5	送受信装置用 FOR TRANSCEIVER UNIT 000-155-786-10 000-148-279-00
4	ﾋｭｰｽﾞ FUSE		FGBO AC250V 10A PBF FGBO 10A AC250V			5	送受信装置用 FOR TRANSCEIVER UNIT 000-155-839-10 000-549-067-00

MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	10CT-X-9301	1/1

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

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

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

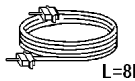
FURUNO

CODE NO.		10C0-X-9408 -3
TYPE		1/1

工事材料表

INSTALLATION MATERIALS

FSV-24/24S

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=8M	10S2078 10S2078		1	送受信装置ー上下装置
			CODE NO.	000-160-862-10 000-144-389-00		

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

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

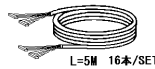
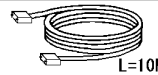
FURUNO

CODE NO.	000-067-117-00	10CU-X-9410 -0
TYPE	CP10-06900	1/1

工事材料表

INSTALLATION MATERIALS

FSV-845-5

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	ｹｰﾌﾞﾙ組品 CABLE ASSEMBLY	 L=5M 16本/SET	HIF/VVSB66/HIF-L5M CODE NO.	000-160-822-10	1	
2	ｹｰﾌﾞﾙ組品 CABLE ASSEMBLY	 L=10M	10S2078 *10M* CODE NO.	000-160-406-10	1	

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

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

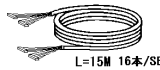
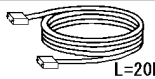
FURUNO

CODE NO.	000-067-118-00	10CU-X-9411 -0
TYPE	CP10-06910	1/1

工事材料表

INSTALLATION MATERIALS

FSV-845-15

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｹｰﾌﾞﾙ組品 CABLE ASSEMBLY		HIF/VVSB66/HIF-L15M CODE NO. 000-160-823-10	1	
2	ｹｰﾌﾞﾙ組品 CABLE ASSEMBLY		10S2078 *20M* CODE NO. 000-160-408-10	1	

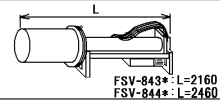
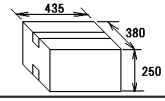
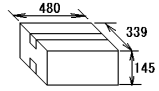
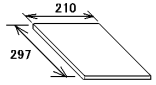
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

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

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

PACKING LIST

FSV-843*-T/FSV-844*-T

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
上下装置 HULL UNIT		FSV-843*/844* 000-067-169-00 **	1
予備品 SPARE PARTS		**SP10-02603**	
予備品 SPARE PARTS		SP10-02603 006-921-360-00	1
現地組部品 LOCAL ASSEMBLING PARTS			
現地組部品箱詰品 LOCAL ASSEMBLING PARTS COMPLETE SET		FSV-84/84L-D-T 001-008-150-00	1 (*1)
現地組部品箱詰品 LOCAL ASSEMBLING PARTS COMPLETE SET		FSV-84/84L-T 001-008-160-00	1 (*1)
図書 DOCUMENT			
装備要領書 INSTALLATION MANUAL		IM*-13290-* 000-157-428-0* **	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.
(*1)の現地組部品は仕様により選択願います。
*1:CHOOSE ONE ACCORDING TO SPECIFICATION.

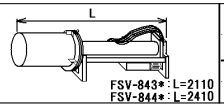
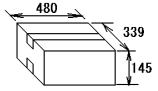
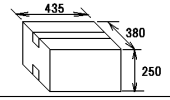
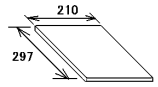
型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

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

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

PACKING LIST

FSV-843*-N/FSV-844*-N

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
上下装置 HULL UNIT		FSV-843*-N/FSV-844*-N 000-010-183-00 **	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP10-02603 006-921-360-00	1
現地組部品 LOCAL ASSEMBLING PARTS			
現地組部品箱詰品 LOCAL ASSEMBLING PARTS COMPLETE SET		FSV-84/84L 007-023-460-00	1 (*1)
現地組部品箱詰品 LOCAL ASSEMBLING PARTS COMPLETE SET		FSV-84/84L-D 007-023-010-00	1 (*1)
図書 DOCUMENT			
装備要領書 INSTALLATION MANUAL		IM*-13290-* 000-157-428-0* **	1

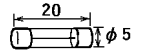
1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.
2.(*1)の現地組部品は仕様により選択願います。
*1.CHOOSE ONE ACCORDING TO SPECIFICATION.

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

FURUNO

CODE NO.	006-921-360	10C0-X-9303 -1 1/1
TYPE	SP10-02603	BOX NO. P

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

ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	QUANTITY SPARE	REMARKS/CODE NO.
1	ﾋｭｰｽﾞ FUSE		FGMB 250V 2A PBF FGMB 2A 250V	1		1	上下装置(制御器用) FOR HALL UNIT 000-157-497-10 000-122-000-00

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

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

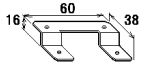
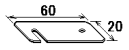
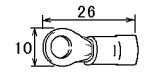
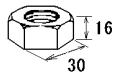
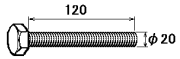
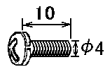
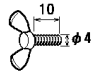
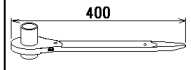
MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	10C0-X-9303	1/1

FURUNO

CODE NO.	007-023-460-00	10CU-X-9402 -3
TYPE	FSV-84/84L	1/1

現地組部品
LOCAL ASSEMBLING PARTS

FSV-84/84L
上下装置　ドーム有り、タンク無し

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾊﾝﾄﾞﾙ固定板1 HANDLE FIXING PLATE1		10-086-5741-0 CODE NO. 100-334-030-10	1	
2	ﾊﾝﾄﾞﾙ固定板2 HANDLE FIXING PLATE2		10-086-5742-0 CODE NO. 100-334-040-10	1	
3	圧着端子 CRIMP-ON LUG		FV5.5-4 CODE NO. 000-538-123-00	3	
4	六角ﾅｯﾄ 1種 HEX.NUT		M20 SUS304 CODE NO. 000-863-116-00	32	
5	ﾐｶﾞｷ平座金 FLAT WASHER		M20 SUS304 CODE NO. 000-864-136-00	32	
6	ﾊﾞﾈ座金 SPRING WASHER		M20 SUS304 CODE NO. 000-864-270-00	16	
7	六角ﾎﾞﾙﾄ 全ﾈｼﾞ HEXAGONAL HEAD SCREW		M20X120 SUS304 CODE NO. 000-162-825-10	16	
8	ﾜｰﾅﾍﾞｾﾑｽﾈｼﾞA WASHER HEAD SCREW		M4X10 C2700W MBNI2 CODE NO. 000-881-145-00	2	
9	蝶ﾎﾞﾙﾄ 2ｼｭ WING BOLT		M4X10 SUS304 CODE NO. 000-162-684-10	2	
10	両口ﾗﾁｪｯﾄﾚﾝﾁ RATCHET WRENCH		RN2430L CODE NO. 000-158-252-10	1	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品でどちらかが入っています。 なお、品質は変わりません。

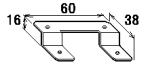
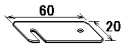
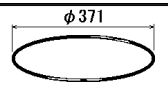
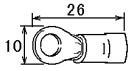
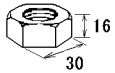
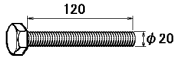
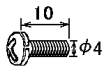
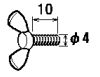
TOW TYPES AND CODES MAY BE LISTED. THE BOTTOM PRODCT MAY BE SHIPPED IN PLACE OF THE TOP PRODUCT. QUALITY THE SAME.

FURUNO

CODE NO.	001-008-160-00	10CU-X-9418 -1
TYPE	FSV-84/84L-T	1/2

現地組部品
LOCAL ASSEMBLING PARTS

FSV-84/84L-T

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾊﾝﾄﾞﾙ固定板1 HANDLE FIXING PLATE1		10-086-5741-0 CODE NO. 100-334-030-10	1	
2	ﾊﾝﾄﾞﾙ固定板2 HANDLE FIXING PLATE2		10-086-5742-0 CODE NO. 100-334-040-10	1	
3	Oﾘﾝｸﾞ O-RING		C00117A CODE NO. 000-158-976-10	1	
4	圧着端子 CRIMP-ON LUG		FV5.5-4 CODE NO. 000-538-123-00	3	
5	六角ﾅｯﾄ 1種 HEX.NUT		M20 SUS304 CODE NO. 000-863-116-00	32	
6	ﾐｶﾞｷ平座金 FLAT WASHER		M20 SUS304 CODE NO. 000-864-136-00	32	
7	ﾊﾞﾈ座金 SPRING WASHER		M20 SUS304 CODE NO. 000-864-270-00	16	
8	六角ﾎﾞﾙﾄ 全ﾈｼﾞ HEXAGONAL HEAD SCREW		M20X120 SUS304 CODE NO. 000-162-825-10	16	
9	ﾜｰﾅﾍﾞｾﾑｽﾈｼﾞA WASHER HEAD SCREW		M4X10 C2700W MBNI2 CODE NO. 000-881-145-00	2	
10	蝶ﾎﾞﾙﾄ 2ｼｭ WING BOLT		M4X10 SUS304 CODE NO. 000-162-684-10	2	

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品でどちらかが入っています。 なお、品質は変わりません。

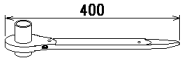
TOW TYPES AND CODES MAY BE LISTED. THE BOTTOM PRODCT MAY BE SHIPPED IN PLACE OF THE TOP PRODUCT. QUALITY THE SAME.

FURUNO

CODE NO.	001-008-160-00	10CU-X-9418 -1
TYPE	FSV-84/84L-T	2/2

現地組部品
LOCAL ASSEMBLING PARTS

FSV-84/84L-T

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	両口ラチェットレンチ RATCHET WRENCH		RN2430L CODE NO. 000-158-252-10	1	

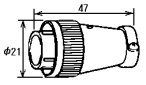
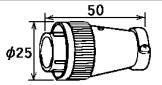
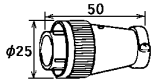
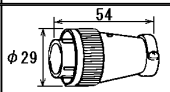
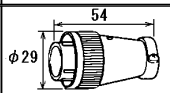
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品でどちらかが入っています。 なお、品質は変わりません。

TOW TYPES AND CODES MAY BE LISTED. THE BOTTOM PRODCT MAY BE SHIPPED IN PLACE OF THE TOP PRODUCT. QUALITY THE SAME.

FURUNO

CODE NO.	006-934-240-00	10C0-X-9410 -1
TYPE	CP10-04801	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	ｺﾈｸﾀ(SRCN) CONNECTOR(SRCN)		SRCN6A13-3P CODE NO. 000-508-660-00	1	
2	ｺﾈｸﾀ(SRCN) CONNECTOR(SRCN)		SRCN6A16-10P CODE NO. 000-160-728-10	1	
3	ｺﾈｸﾀ(SRCN) CONNECTOR(SRCN)		SRCN6A16-7P CODE NO. 000-160-730-10	1	
4	ｺﾈｸﾀ(SRCN) CONNECTOR(SRCN)		SRCN6A21-10P CODE NO. 000-160-735-10	1	
5	ｺﾈｸﾀ(SRCN) CONNECTOR(SRCN)		SRCN6A21-10S CODE NO. 000-160-736-10	1	

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

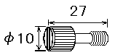
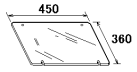
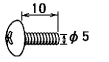
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	006-924-320	10CO-X-9503 -0
TYPE	FP10-02202	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾌｰﾄﾞﾋﾞｽ HOOD RETAINER		03-144-1336-1 CODE NO. 100-266-311	2	表示部用 FOR MONITOR UNIT
2	ﾏｷｽﾍﾞｰｻｰ SPACER		5X2.5 CODE NO. 000-808-429	2	表示部用 FOR MONITOR UNIT
3	CRTﾌｨﾙﾀｰ FILTER		10-071-1141-0 CODE NO. 100-289-020	1	表示部用 FOR MONITOR UNIT
4	+ﾄﾗｽﾈｼﾞ SCREW		M5X10 C2700W CODE NO. 000-808-430	2	表示部用 FOR MONITOR UNIT
5	抜け止めﾜｯｼｬ WASHER		TM-147-3 CODE NO. 000-801-878	2	表示部用 FOR MONITOR UNIT

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

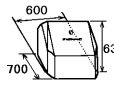
FURUNO

CODE NO.		03FS-X-9506 -5
TYPE		1/1

付属品表

ACCESSORIES

FR-2135S/2135S-B, FR-2135SW/2165DS/B/2135SW-MSA, GD-680/GP-680, FSV-24

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾀﾞｽﾄｶﾊﾞｰCRT DUST COVER		03-144-1338-0 CODE NO. 100-271-750-00	1	

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

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

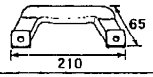
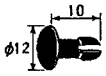
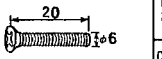
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	008-478-830	03FS-X-9501 -5
TYPE	FP03-06201	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	取手 HANDLE		14-002-1125-2 CODE NO. 840-211-252	2	
2	ｽﾅｯﾌﾟﾎﾞﾀﾝ PLASTIC RIVET		KB-133ｳ ﾎﾞﾀﾝｸﾛ CODE NO. 000-570-276	4	
3	ﾛｰｾﾞｯﾄ座金 ROSETTE WASHER		M6 C2700W ﾎﾞﾘｼｰﾙ ｸﾛ CODE NO. 000-864-910	4	
4	十丸皿小ﾈｼﾞ OVAL COUNTERSUNK HEAD SCREW		M6X20 C2700W ﾎﾞﾘｼｰﾙ ｸﾛ CODE NO. 000-861-475	4	
5	波座金 WAVE WASHER		WW-6 SUS CODE NO. 000-864-350	4	

DWG NO.
C3464-F01- F

FURUNO ELECTRIC CO ., LTD.

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

FURUNO

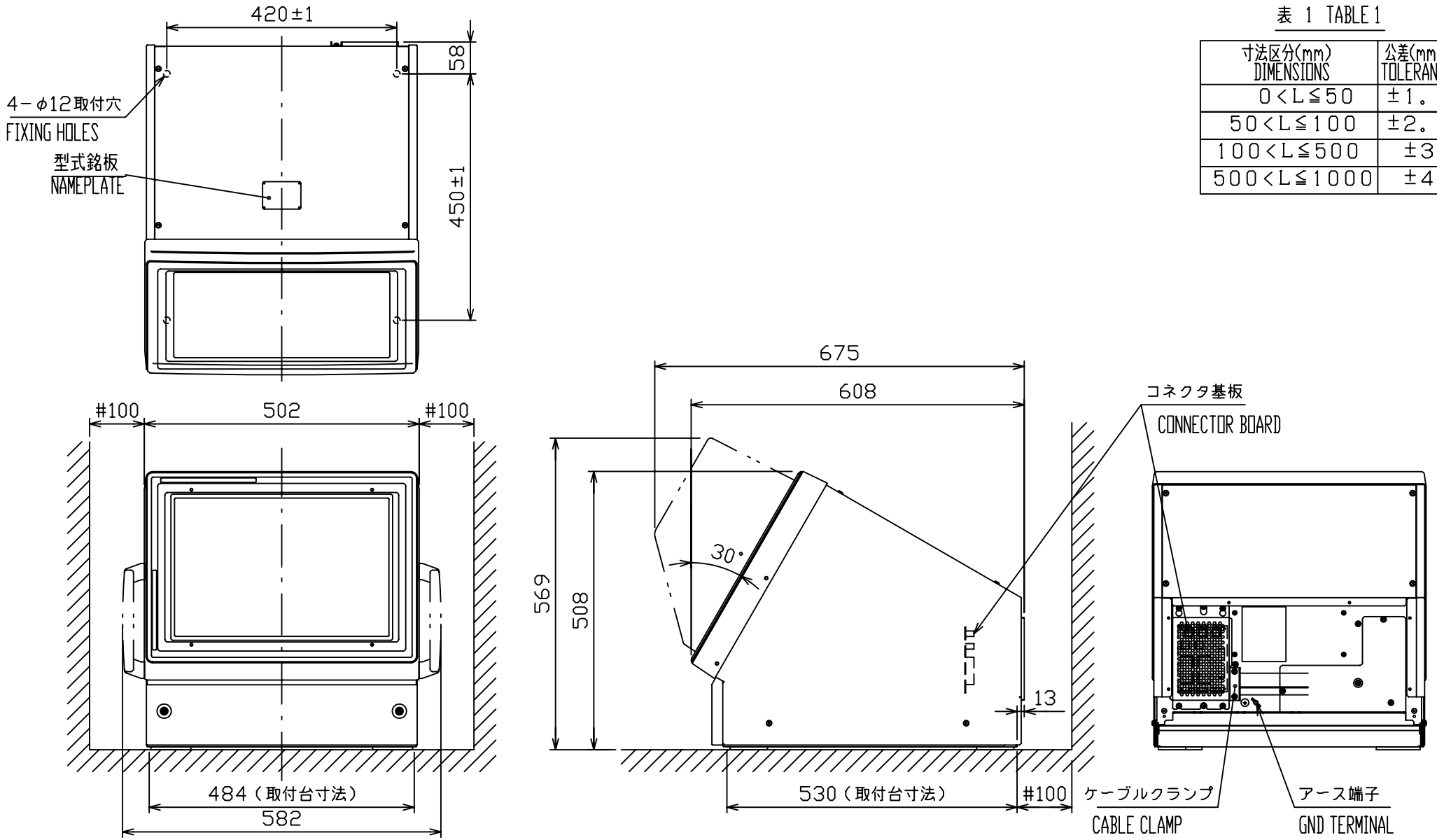


表 1 TABLE 1

寸法区分(mm) DIMENSIONS	公差(mm) TOLERANCE
0＜L≦50	±1．5
50＜L≦100	±2．5
100＜L≦500	±3
500＜L≦1000	±4

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M10ボルト、またはコーチボルト呼び径9を使用のこと。

NOTE　1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M10 BOLTS OR COARCH SCREWS ø9 FOR FIXING THE UNIT.

DRAWN Jul. 28 '06 E. MIYOSHI		TITLE	FSV-2400
CHECKED TAKAHASHI. T		名称	表示部
APPROVED Y. Hatai	FSV-24/30/84		外寸図
SCALE 1/10 MASS 48 ±10% kg		NAME	MONITOR UNIT
DWG.No. C1318-G01- D	10-071-100G- 3		OUTLINE DRAWING

D-1

FURUNO ELECTRIC CO., LTD.

FURUNO

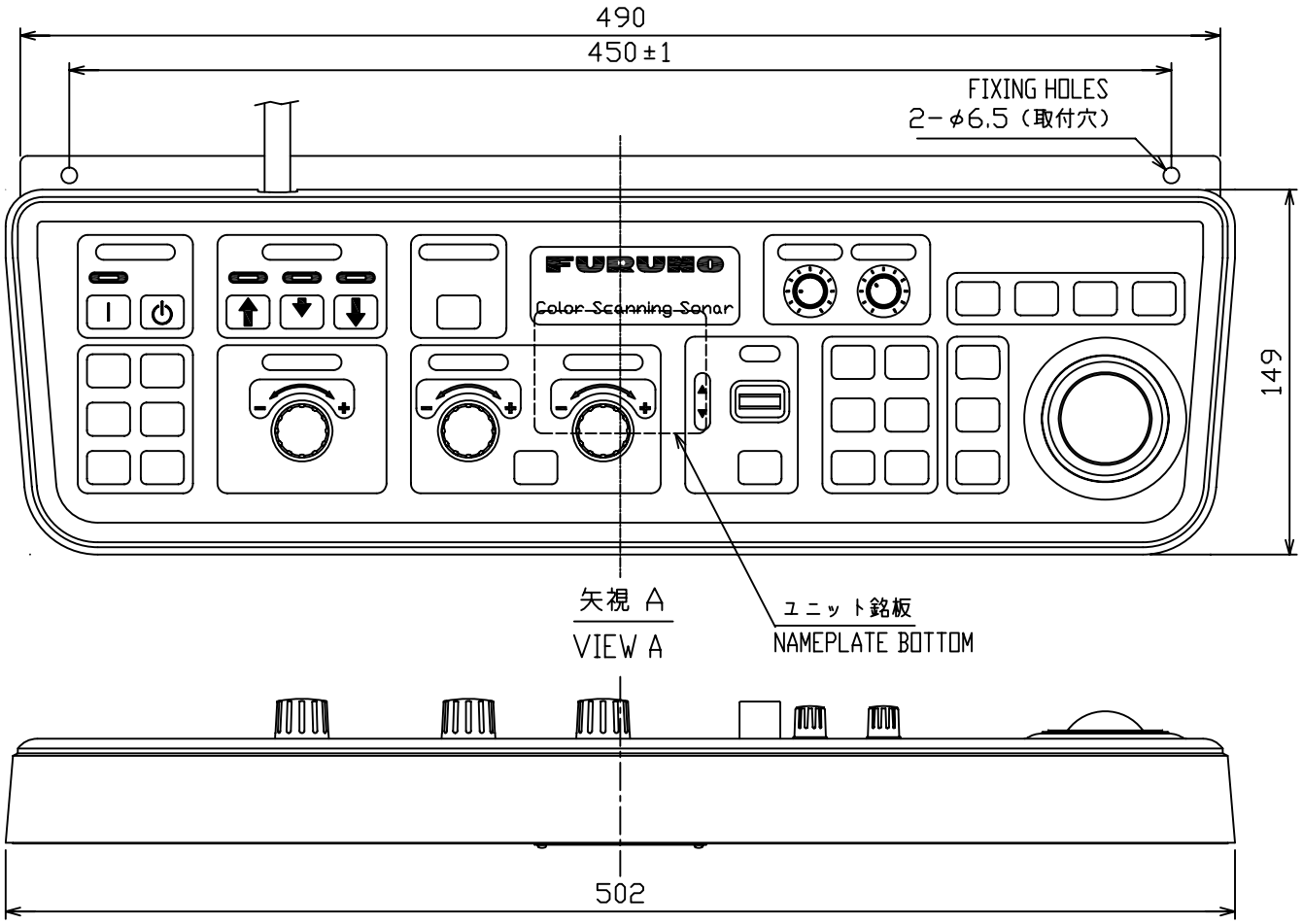
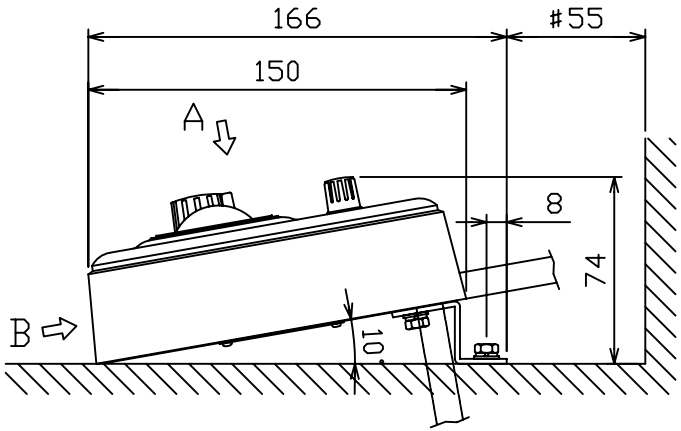


表 1 TABLE 1

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



矢視 B
VIEW B

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） 質量はＫＢ直付け金具、及びケーブル（５ｍ）を含む。
4） 取付用ネジはトラスタッピンネジ呼び径５、またはＭ５ボルトを使用のこと。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATRES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. MASS INCLUDES KB FIXING PLATE AND CABLE (5M).
4. USE M5 BOLTS OR TAPPING SCREWS φ5 FOR FIXING THE UNIT.

DRAWN Aug. 21 '06 Maki		TITLE	FSV-2401/3001/8401
CHECKED TAKAHASHI. T		名称	操作部（KB直付け金具あり）
APPROVED Y. Hatai	FSV-240/300		外寸図
SCALE 1/3 MASS 4.2 ±10% kg	質量はケーブル重さを含む。 MASS W/ CABLE.	NAME	CONTROL UNIT (w/KB FIXING PLATE)
DWG No. C1318-G03- E	10-079-200G-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

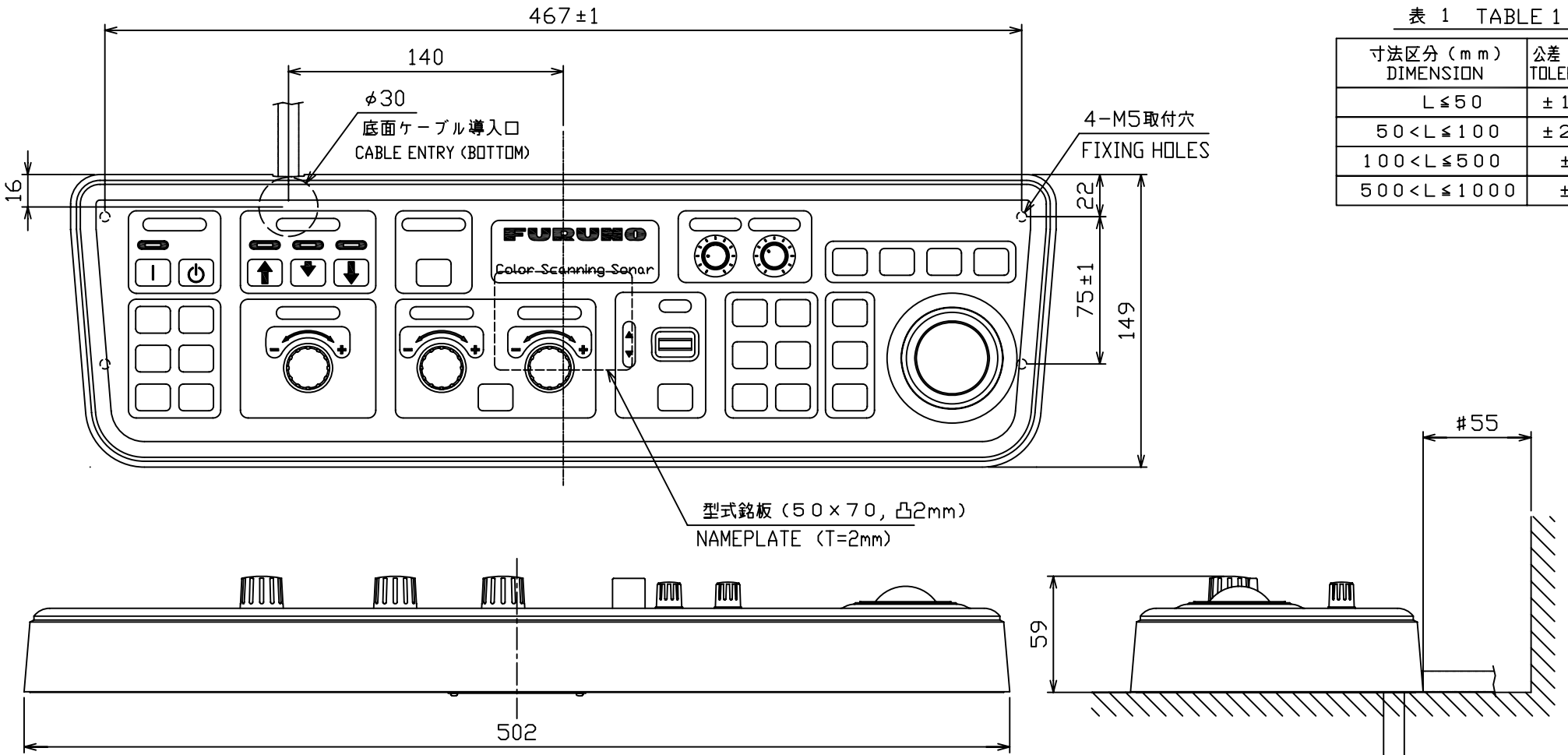


表 1　TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1．5
50<L≦100	±2．5
100<L≦500	±3
500<L≦1000	±4

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）　質量は、ケーブル（5m）を含む。
　　4）　取付用ネジはM5ボルトを使用のこと。但し、ボルトが内部に20mm以上入り込まないこと。

NOTE　1.　#: MINIMUM SERVICE CLEARANCE.
　　2.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　3.　MASS W/CABLE (5M).
　　4.　USE M5 BOLTS FOR FIXING THE UNIT.
　　DO NOT FASTEN BOLTS INTO UNIT MORE THAN 20 mm.

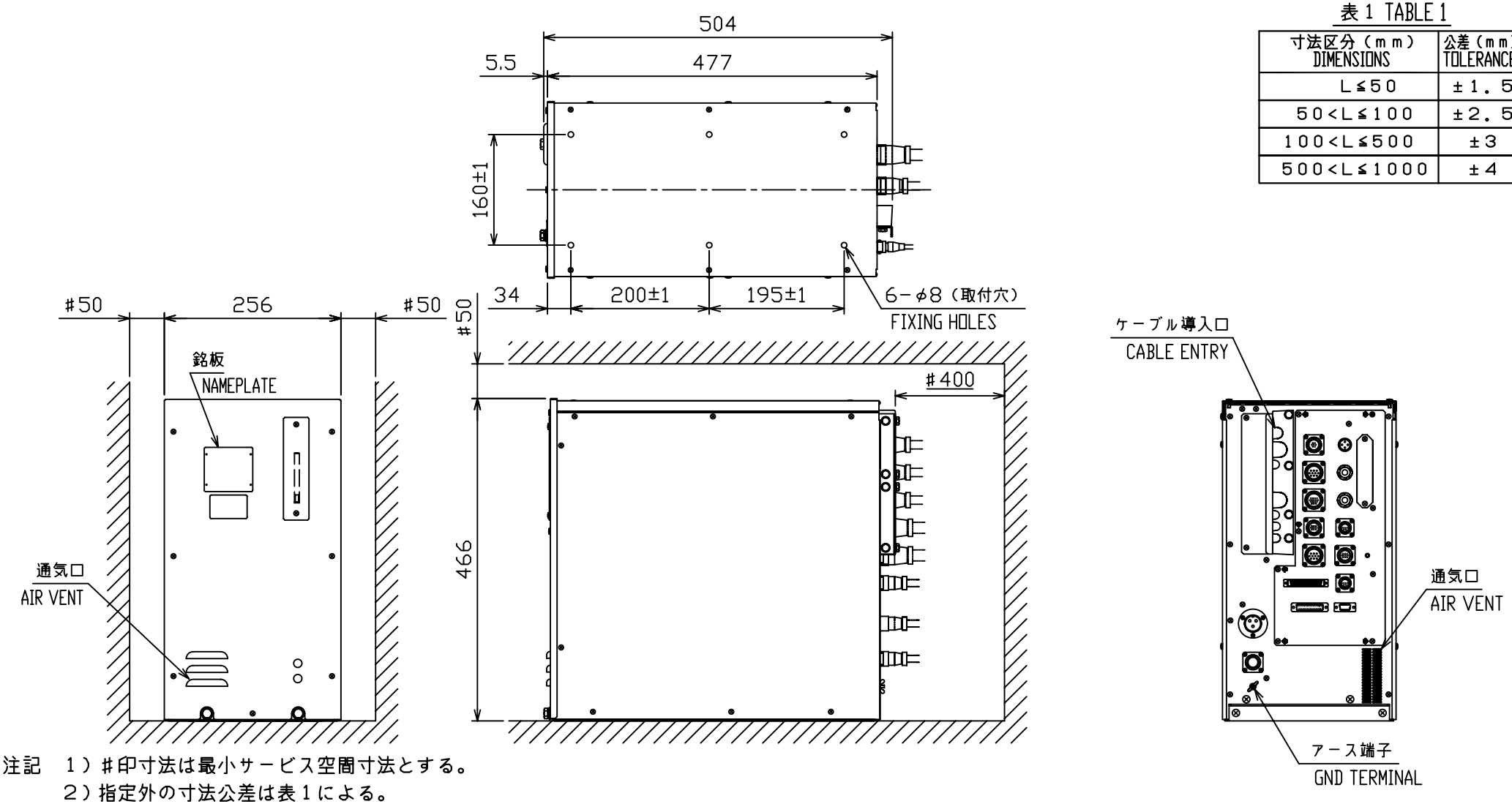
DRAWN Aug. 21 '06 Maki		TITLE	FSV-2401/3001/8401
CHECKED TAKAHASHI. T		名称	操作部（KB直付け金具なし）
APPROVED Y. Hatai	FSV-24/24S/30/30S		外寸図
SCALE 1/3	MASS 3.6 ±10% kg 質量はケーブル重さを含む。MASS W/ CABLE.	NAME	CONTROL UNIT (w/o KB FIXING PLATE)
DWG No. C1318-G08- E	10-079-2106-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

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

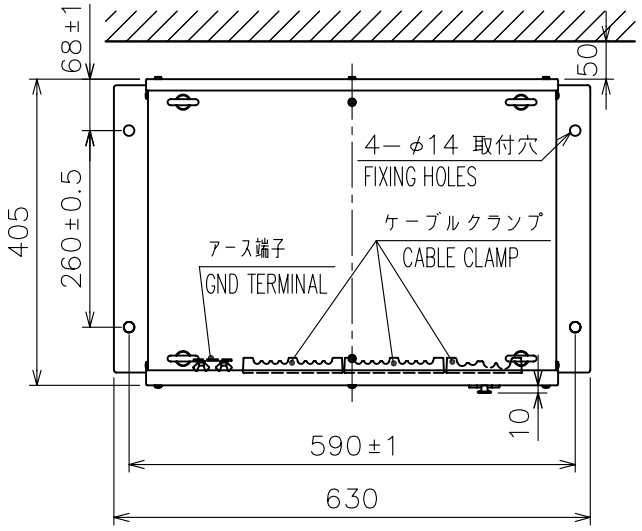


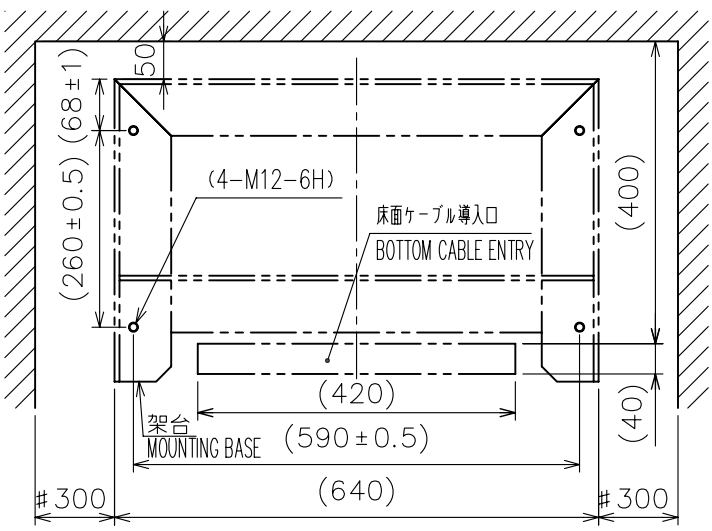
注記　1）#印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表 1 による。
3）取付用ネジはM6ボルトを使用のこと。
4）装備ケーブルはサービス時、筐体を前方に十分引き出せるよう余裕を持たせること。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M6 BOLTS FOR FIXING THE UNIT.
4. KEEP SUFFICIENT CABLE LENGTH BEHIND UNIT.

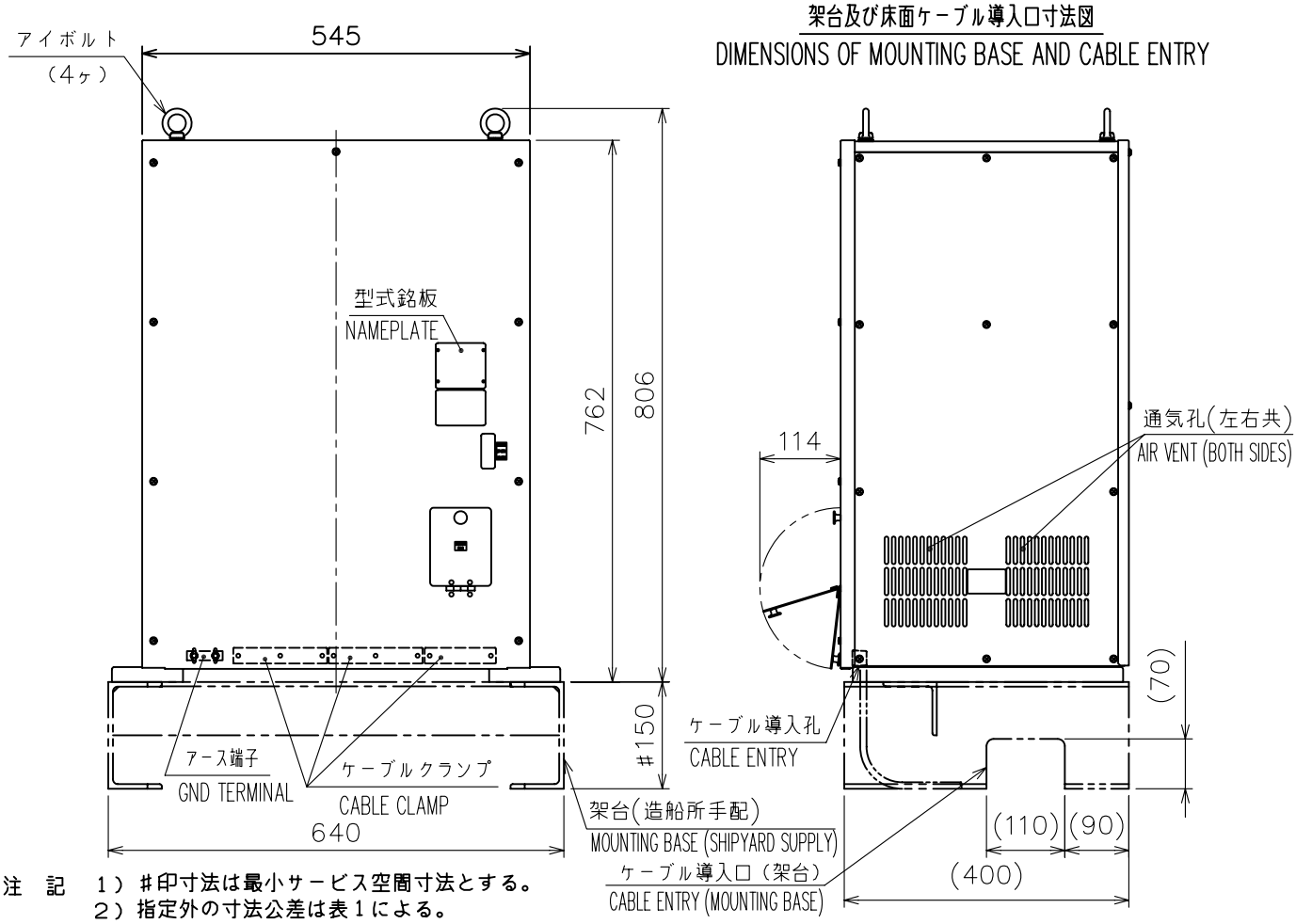
DRAWN Jul. 28 '06 E. MIYOSHI		TITLE	FSV-2402/2402S/3002/3002S/8402
CHECKED TAKAHASHI. T		名称	制御部
APPROVED Y. Hatai	FSV-24/24S/30/30S84/B4L		外寸図
SCALE 1/8 MASS 29.0 ±10% kg		NAME	PROCESSOR UNIT
DWG No. C1318-G02- E	10-079-300G-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.





架台及び床面ケーブル導入口寸法図
DIMENSIONS OF MOUNTING BASE AND CABLE ENTRY



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Ｍ１２ボルト（材質：ＳＵＳ３０４）を使用のこと。
4）架台（高さ150mm以上）及び床面ケーブル導入口の寸法は参考寸法とする。
直接床置きの場合のみ床面ケーブル導入口を設ける。（架台材質：SS400）

NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M12 BOLTS (SUS304) FOR FIXING THE UNIT.
4. DIMENSIONS OF MOUNTING BASE (HEIGHT: AT LEAST 150 mm, MATERIAL: SS400) AND CABLE ENTRY ARE FOR REFERENCE ONLY. CABLE ENTRY ON DECK REQUIRED ONLY WHEN MOUNTING ON DECK DIRECTLY.

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

DRAWN Jan. 18, '07 E. MIYOSHI		TITLE	FSV-841A/841B
CHECKED TAKAHASHI. T		名称	送受信装置
APPROVED Y. Hatai	FSV-84		外寸図
SCALE 1/10	MASS 95 ±10% kg	NAME	TRANSCEIVER UNIT
DWG. No. C1329-G08- C	10-086-600G-0		OUTLINE DRAWING

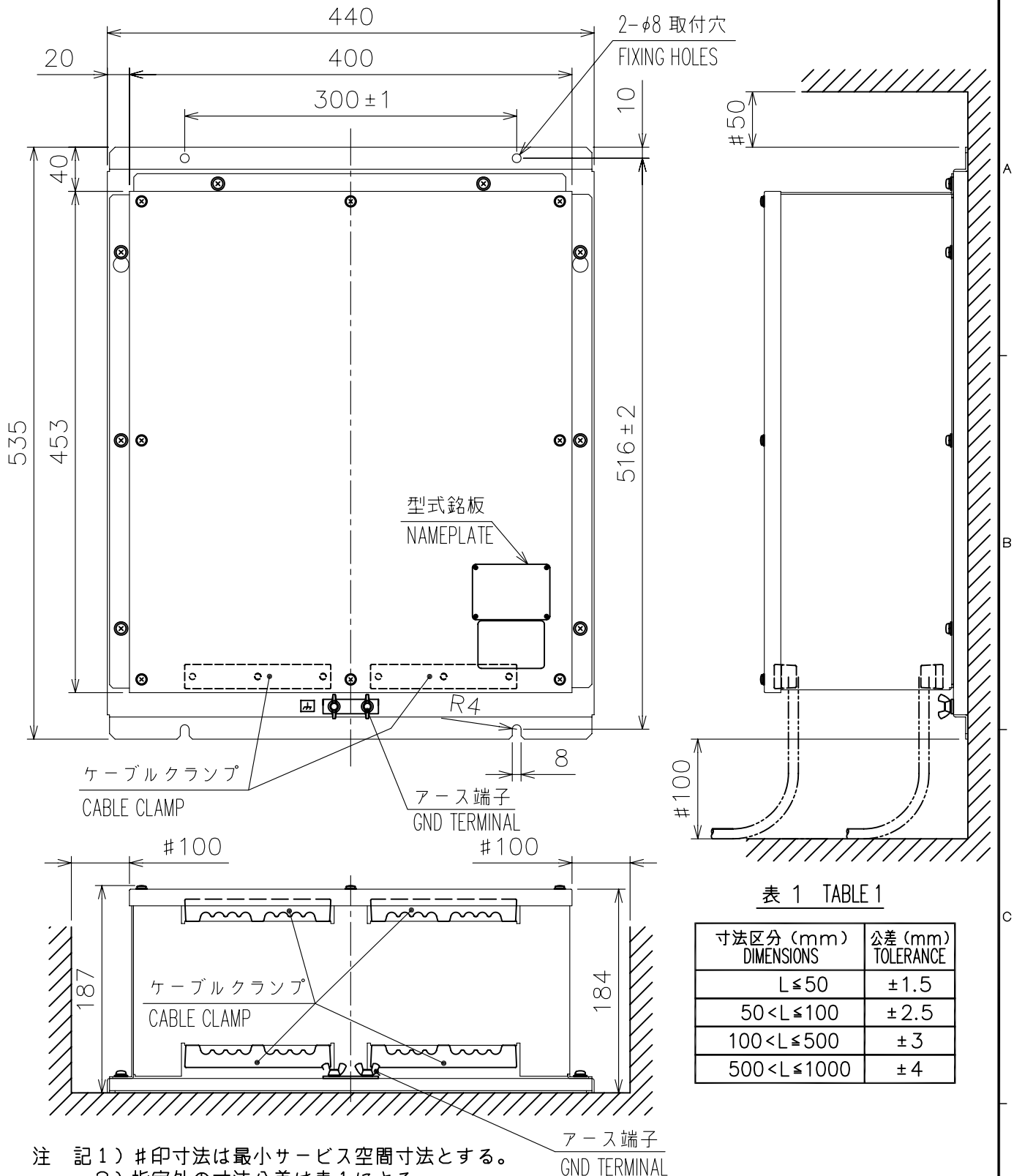


表 1 TABLE 1

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

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）取付用ボルトはM6を使用のこと。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M6 BOLTS FOR FIXING THE UNIT.

DRAWN Oct. 4, '06 E. MIYOSHI		TITLE	FSV-845
CHECKED TAKAHASHI. T		名称	接続箱
APPROVED Y. Hatai	FSV-84		外寸図
SCALE 1/5 MASS 19 ±10% kg		NAME	JUNCTION BOX
DWG.No. C1329-G05- B	REF.No. 10-086-790G- 3		OUTLINE DRAWING

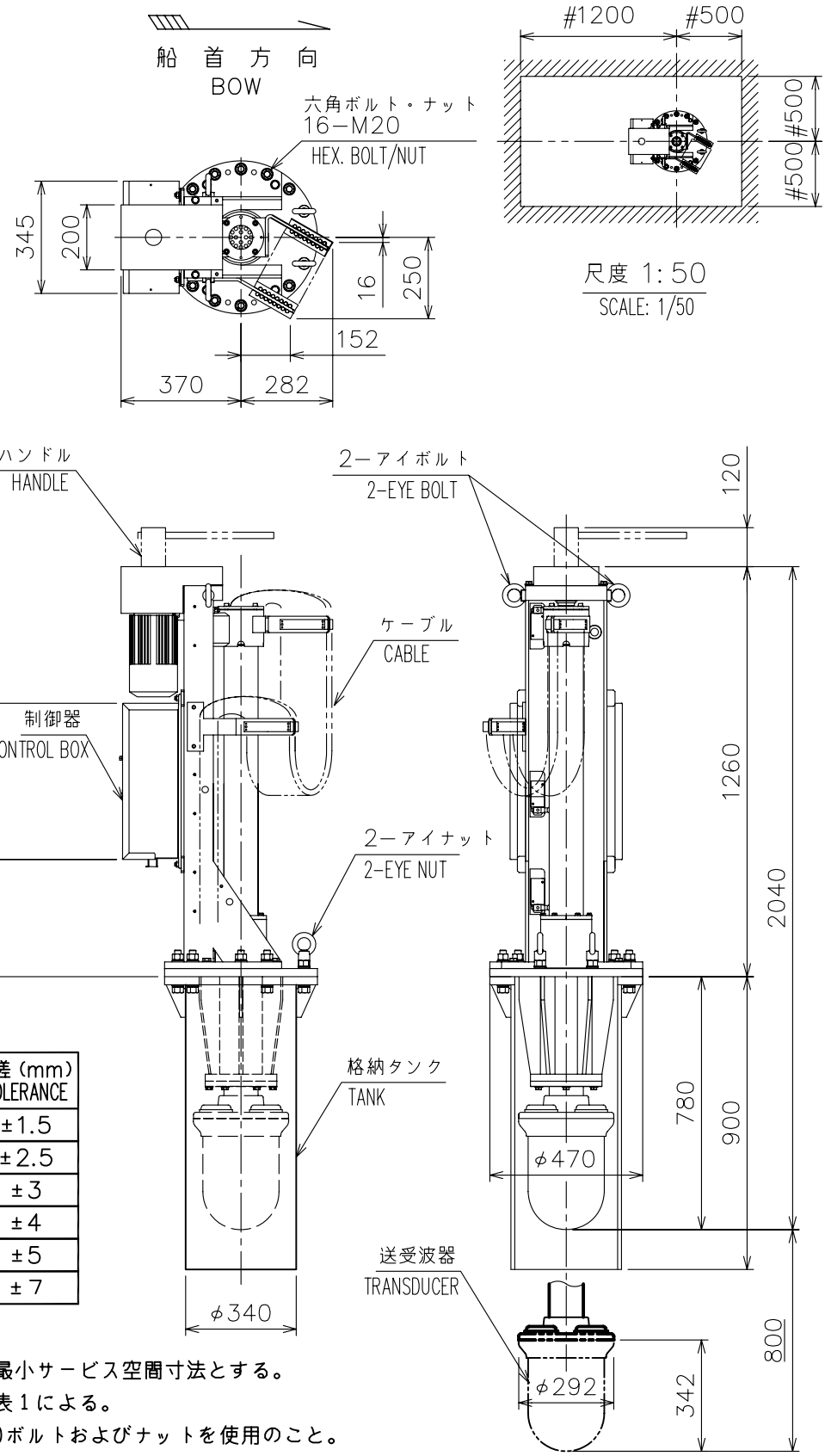


表 1 TABLE 1

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
2000<L≦4000	±7

注 記 1) #印寸法は最小サービス空間寸法とする。
2) 寸法公差は表1による。
3) 取付はM20ボルトおよびナットを使用のこと。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE M20 BOLTS AND NUTS FOR FIXING THE UNIT.

DRAWN Nov. 24, '06 E. MIYOSHI		TITLE	FSV-8432/8434
CHECKED TAKAHASHI. T		名称	上下装置 (ドーム無、800ストローク)
APPROVED Y. Hatai	FSV-84		外寸図
SCALE 1/20 MASS 350±10% kg	質量は格納タンクを含まず。 MASS DOES NOT INCLUDE RETRACTION TANK.	NAME	HULL UNIT (W/O SOUNDOME, 800 TRAVEL)
DWG.No. C1329-G02- B	REF.No. 10-086-551G- 3		OUTLINE DRAWING

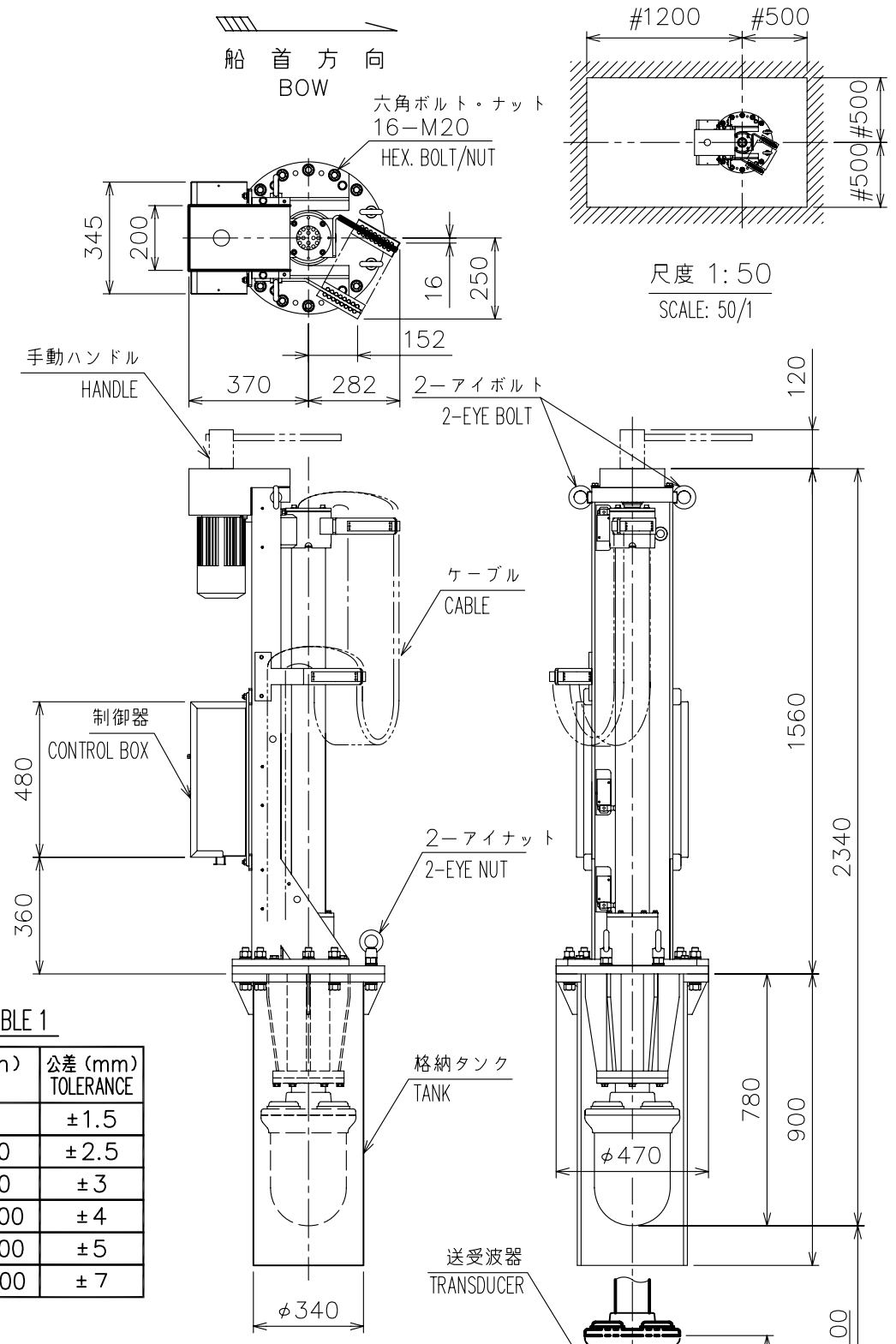


表 1 TABLE 1

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
2000<L≦4000	±7

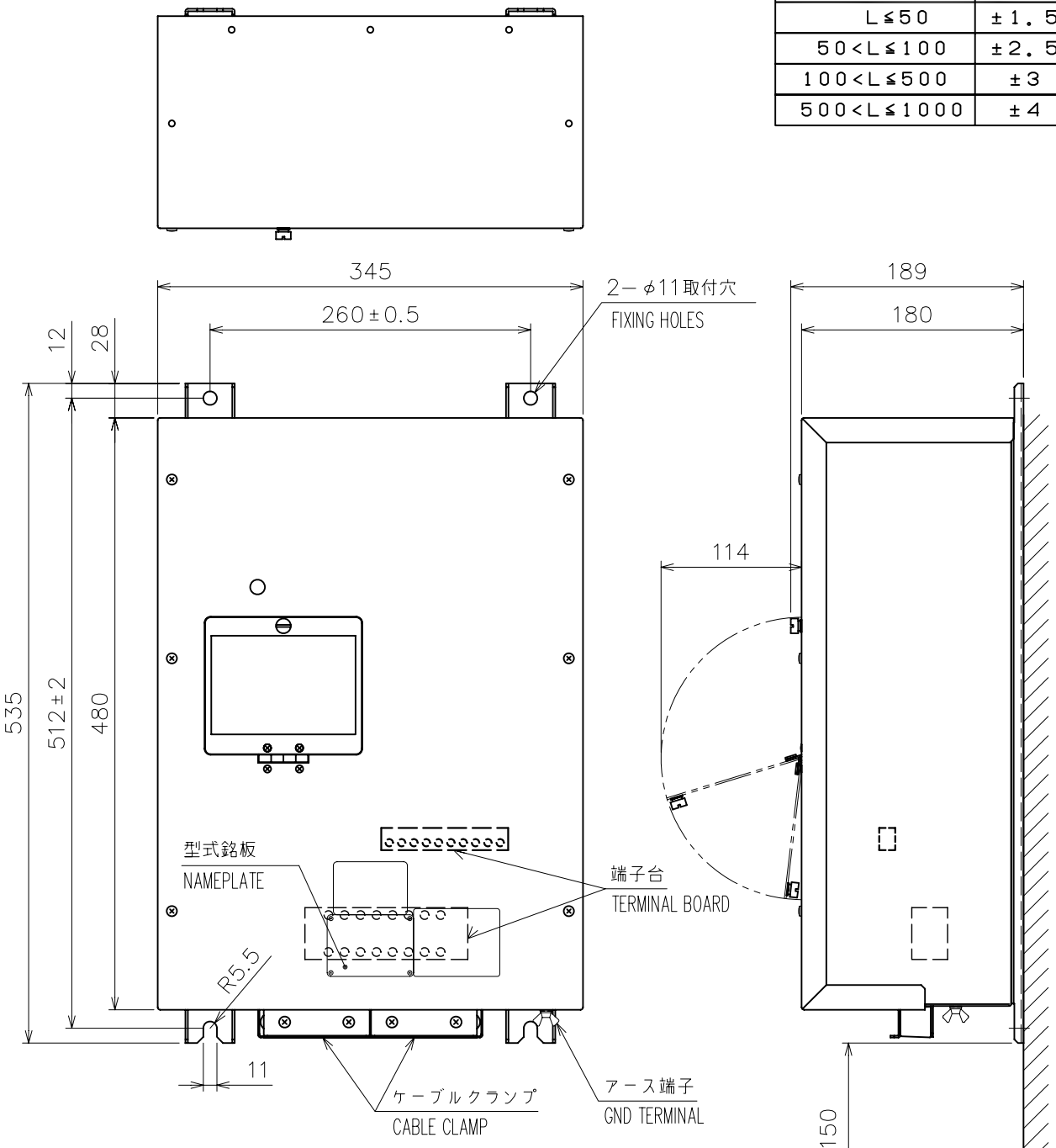
注 記 1) ＃印寸法は最小サービス空間寸法とする。
2) 寸法公差は表1による。
3) 取付はM20ボルトおよびナットを使用のこと。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE M20 BOLTS AND NUTS FOR FIXING THE UNIT.

DRAWN Nov. 24, '06 E. MIYOSHI		TITLE	FSV-8442/8444
CHECKED TAKAHASHI. T		名称	上下装置（ドーム無、1100ストローク）
APPROVED Y. Hatai	FSV-84		外寸図
SCALE 1/20 MASS 370±10% kg	質量は格納タンクを含まず。 MASS DOES NOT INCLUDE RETRACTION TANK.	NAME	HULL UNIT (W/O SOUNDOME, 1100 TRAVEL)
DWG.No. C1329-G04- B	REF.No. 10-086-561G- 3		OUTLINE DRAWING

表 1 TABLE 1

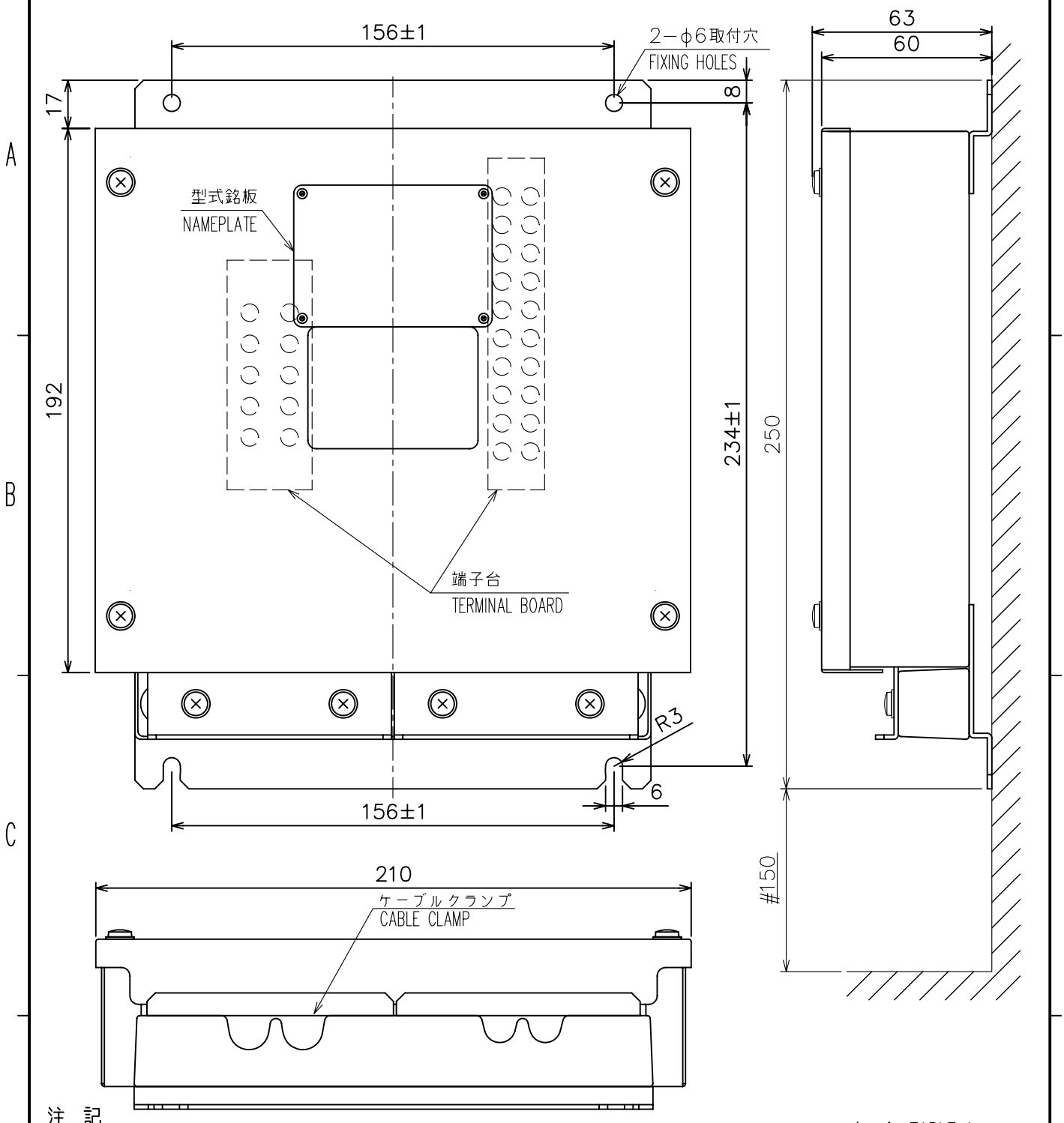
寸法区分（mm） DIMENSIONS	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4



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）取付はM10ボルトを使用のこと。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M10 BOLTS FOR FIXING THE UNIT.

DRAWN Mar. 16, '06 E. MIYOSHI		TITLE	FSV-8420/8421
CHECKED TAKAHASHI. T		名称	上下装置制御器（壁掛け装備）
APPROVED Y. Hatai	FSV-84		外寸図
SCALE 1/5 MASS 16 ±10% kg		NAME	CONTROL BOX FOR HULL UNIT (BULKHEAD MOUNT TYPE)
DWG.No. C1329-G06- A	REF.No. 10-086-570G-0		OUTLINE DRAWING



注 記

1) 指定外の寸法公差は表1による。
2) #印寸法は最小サービス空間寸法とする。
3) 取付用ネジはM5ボルトを使用のこと。

NOTE

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

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

DRAWN Nov. 14 '06 T.YAMASAKI		TITLE	FSV-846
CHECKED Nov. 15 '06 T.TAKENO		名称	上下装置制御器延長キット
APPROVED Nov.22'06 T.Matsuguchi	FSV-84		外寸図
SCALE 1/2 MASS 1.6 ±10% kg		NAME	CONTROL BOX EXTENSION KIT
DWG.No. C1329-G09- B	REF.No. 10-086-590G-2		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

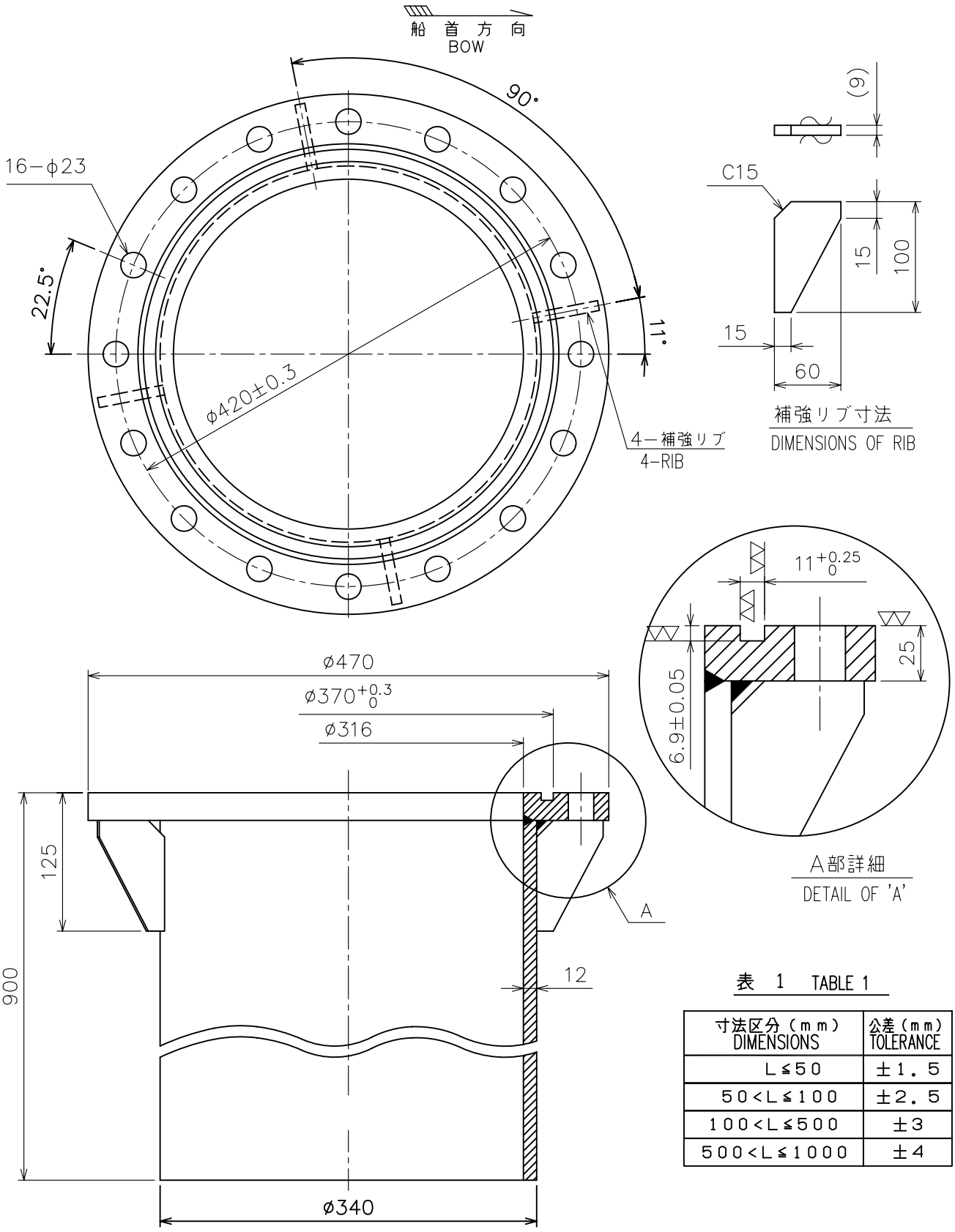
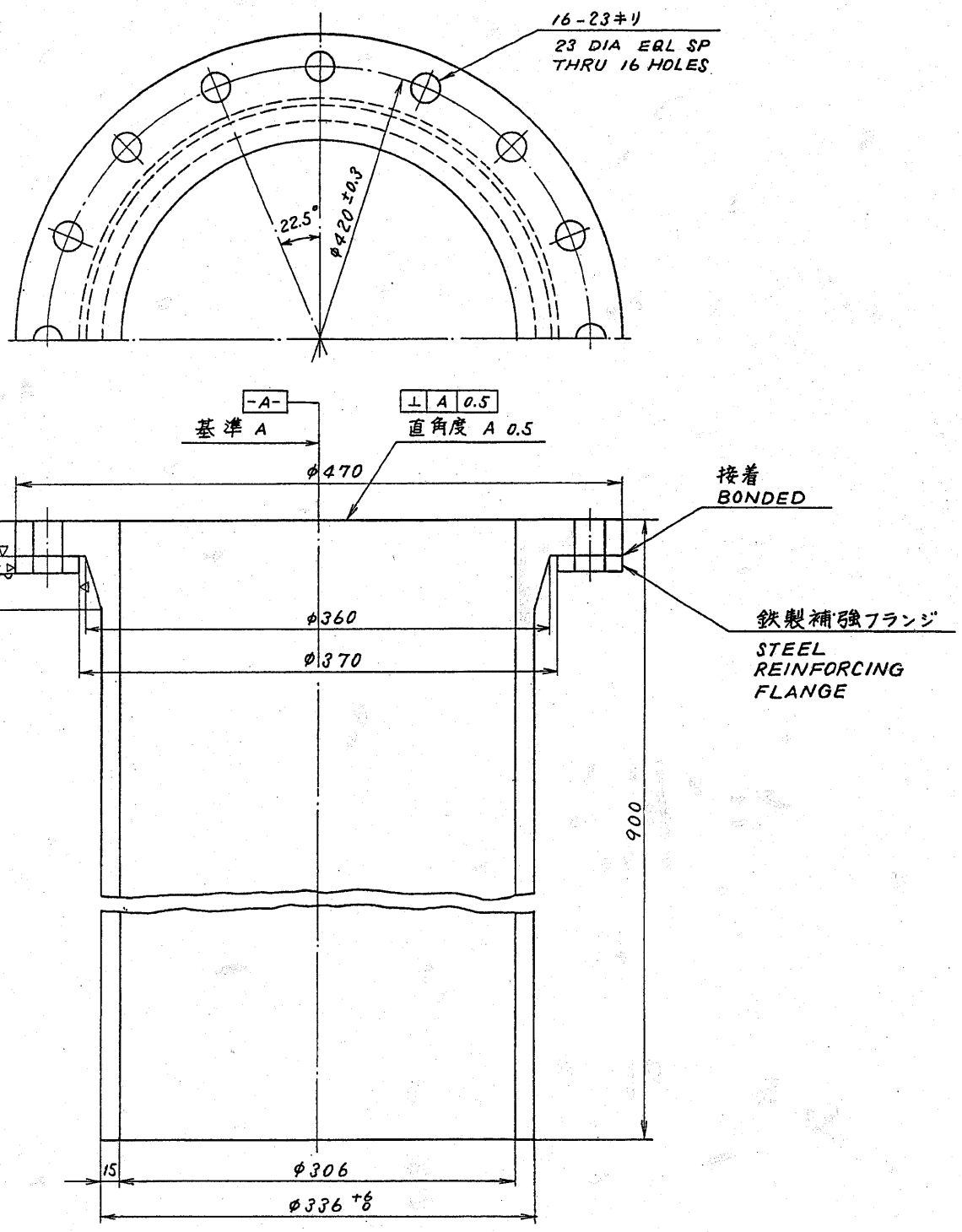


表 1 TABLE 1

寸法区分（mm） DIMENSIONS	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

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

DRAWN Nov. 15 '06 T.YAMASAKI			TITLE OP10-28
CHECKED Nov. 15 '06 T.TAKENO			名称 格納タンク（鉄）
APPROVED Nov.22'06 T.Matsuguchi	FSV-84		外寸図
SCALE 1/5	MASS 100 ±10% kg		NAME RETRACTION TANK (STEEL)
DWG.No. C1329-G07-B	10-086-5806- 0		OUTLINE DRAWING



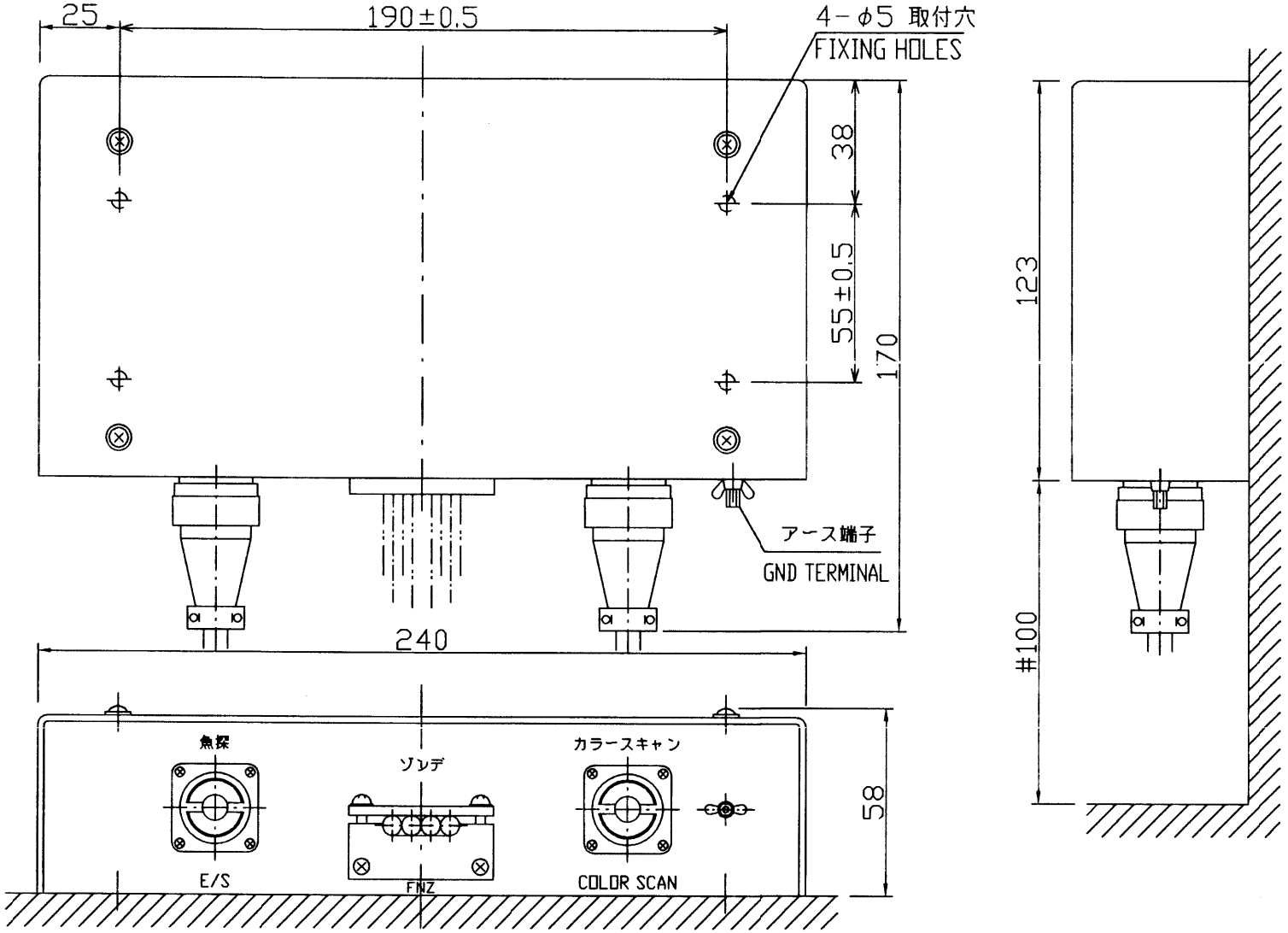
小型上下装置用
SH-754B/884B
SH-164B CSH-7080

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED	MAY. 30. '80	三角法 THIRD ANGLE PROJECTION		名称 TITLE	FRP 格納タンク外観図 FRP RETRACTION TANK
検図 CHECKED	MAY. 30. '80	尺度 SCALE	1/5		
製図 DRAWN	May. 26/80	重量 WEIGHT	30 kg	図番 DWG.NO.	C1217-086-C

FURUNO ELECTRIC CO., LTD.

FURUNO



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）#：推奨する最小サービス空間寸法。
2）指定なき寸法公差は表1による。

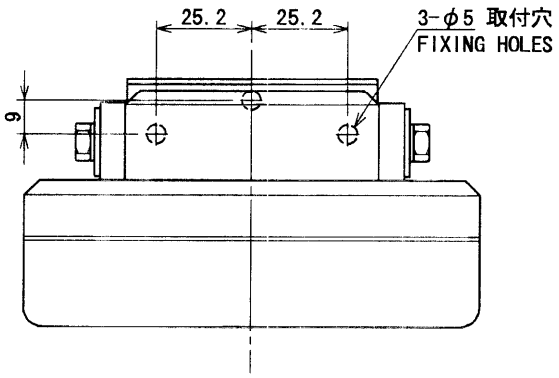
NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

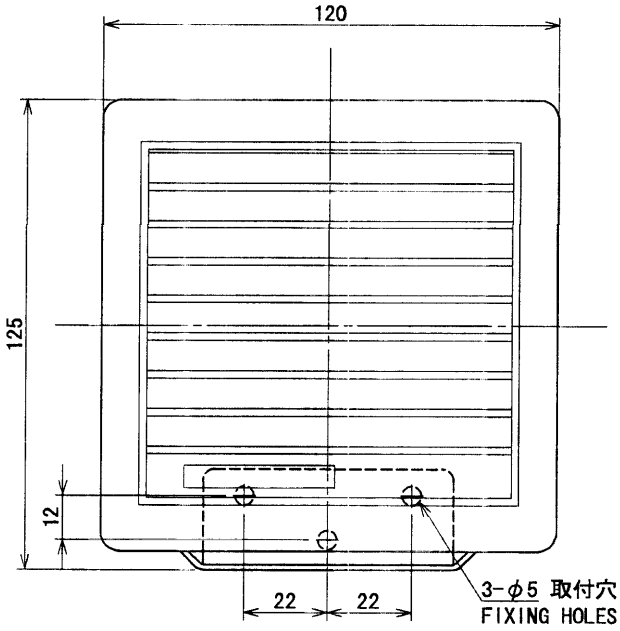
DRAWN Jul. 11 '01 T. YAMASAKI		TITLE CS-170
CHECKED Jul/16/'01 Y. K		名称 ネットゾンデ接続箱
APPROVED Jul/16 '01 Y.K		外寸図
SCALE 1/2 MASS 2 ±10% kg		NAME NET JOINT BOX
DWG.No. C1233-007- D		OUTLINE DRAWING

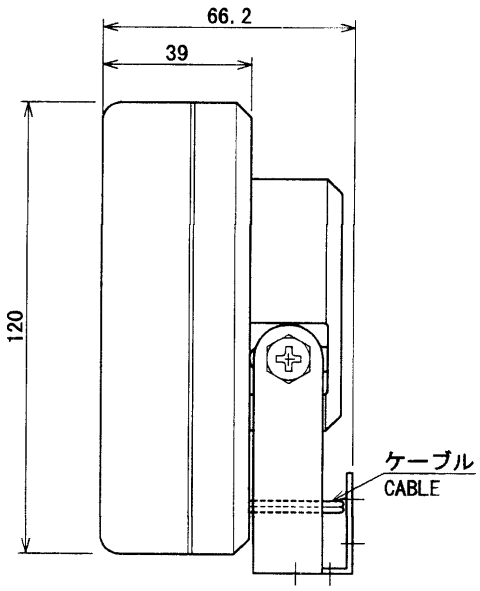
FURUNO ELECTRIC CO., LTD.

表1　TABLE 1

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







注記

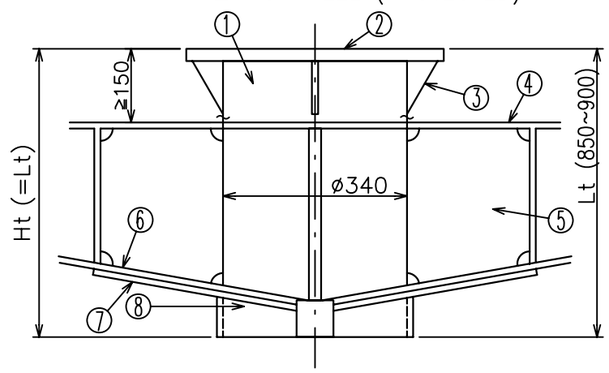
1）指定なき寸法公差は表1による。

NOTE

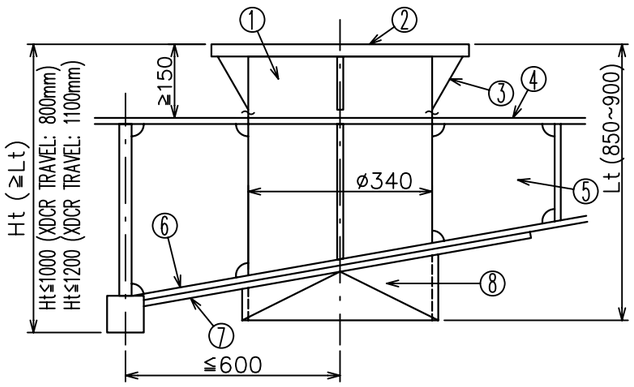
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

DRAWN May 23 '01 T. YAMASAKI		TITLE	SEM-21Q
CHECKED		名称	スピーカ
APPROVED			外寸図
SCALE 1/2 / MASS 0.54 kg ±10%	質量は2.8mケーブルを含む MASS W/ 2.8m CABLE	NAME	LOUDSPEAKER
DWG. No. C5016-G07- A			OUTLINE DRAWING

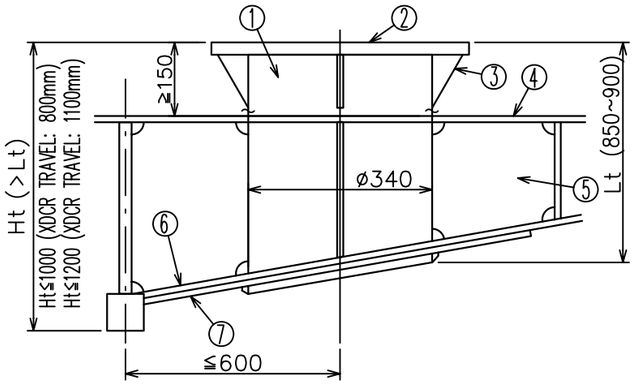
A. キール上（突出） ON KEEL (PROJECTED)



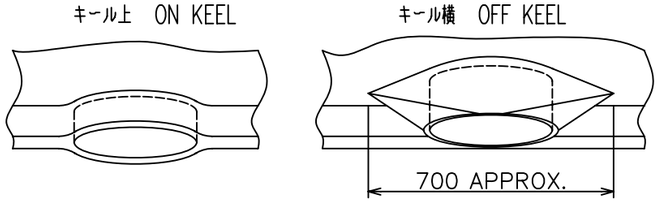
B. キール横（突出） OFF KEEL (PROJECTED)



C. キール横（非突出） OFF KEEL (NOT PROJECTED)



D. 整流覆 FAIRING PLATE



装備手順

1. 次の点に注意して、格納タンクを船底板に連続スミ肉溶接する。

   * タンクのフランジ面が標準走航時に水平になること。
   * フランジ面のボルト穴の中心が船首方向になること。
   * 送受波器を突出させたときに送受波ビームがキールで遮られないように、フランジ面のキールよりの高さ"Ht"を図示の範囲内にすること。
   * タンク下端がキールより下に出ないようにタンク長さ "Lt"は、"Ht"より短くする。かつ、送受波器がタンク下端より出ないように図示の範囲内にする（標準支給長900mm）

2. 格納タンクの周囲に外径ø700以上のダブリング ⑦ を取付ける。また、突出装備（A・B図）の場合には、整流覆 ⑧ （D図）を取付ける。ダブリングと整流覆には、船底板と同じ材質・肉厚のものを使用すること。

3. タンク周囲と隔壁 ⑤ を溶接する。

4. 上下装置本体を格納タンクにボルト締めするのに必要なスペースとしてフランジ面の位置を二重船底板より150mm以上離す。二重船底が高い船にはB図の方法で二重船底板を下げ、スペースを確保すること。

INSTALLATION METHOD OF RETRUCTION TANK

1. Install tank to hull plate with fillet welding taking the following points into account;

   * Flange face is exactly horizontal at normal ship's trim.
   * One of bolt holes on flange is faced dead ahead.
   * Allow height of flange face from keel bottom "Ht" mentioned in the drawings, othewize transducer beam is blocked by the keel, when transducer is fully lowered.
   * Tank's length "Lt" should be less than "Ht". If not so, bottom end of tank is placed below keel level. "Lt" is also limited as shown in the drawings so that the transducer can be fully retructed in tank. (The tank is supplied with 900mm long as standard.

2. Fit doubling plate ⑦ of outer dia. ø700 around the tank on hull plate. Fit fairing plate ⑧ reffering to the drawing 'D' for installation method 'A' and 'B'. Use same material and thickness of doubling and fairing plate as hull plate.

3. Weld the tank into bulkhead ⑤ around the tank.

4. Allow clearance of more than 150 mm below the flange face for easy bolting. Sink the inner hull plate as shown in the drawing 'B' for high inner hull plate.

ITEM 品番	NAME 品名	MATERIAL 材質	Q'TY 数量	DWG. NO. 図番	REMARKS 摘要
8	整流覆 FAIRING PLATE				
7	ダブリング DOUBLING				
6	船底板 HULL PLATE				
5	油槽隔壁 BULKHEAD				
4	二重船底板 INNER HULL PLATE				
3	補強リブ REINFORCEMENT RIB				
2	タンクフランジ TANK FLANGE				
1	格納タンク RETRUCTION TANK				

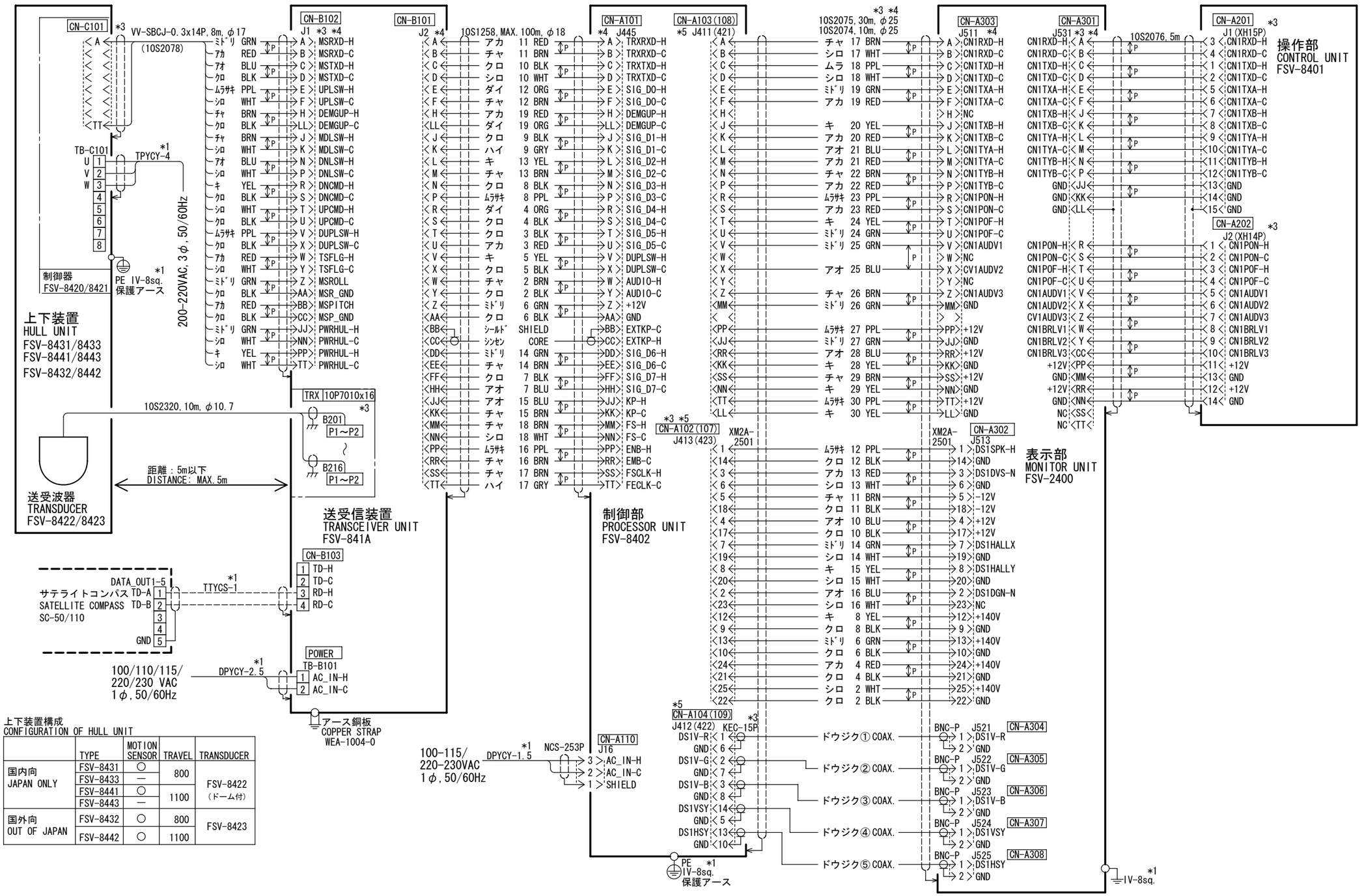
DRAWN	Mar. 13 '07 T.YAMASAKI	TITLE	OP10-28 (FSV-84/84L)
CHECKED	Mar. 13 '07 T.TAKENO	名称	格納タンク（鋼船用）
APPROVED	Mar.14'07 R.Esumi		装備要領
SCALE	MASS kg	NAME	RETRUCTION TANK (FOR STEEL HULL)
DWG No.	C1329-Y01- B		INSTALLATION PROCEDURE

FSV-84/84L

FURUNO ELECTRIC CO., LTD.

FURUNO

S-1



上下装置構成
CONFIGURATION OF HULL UNIT

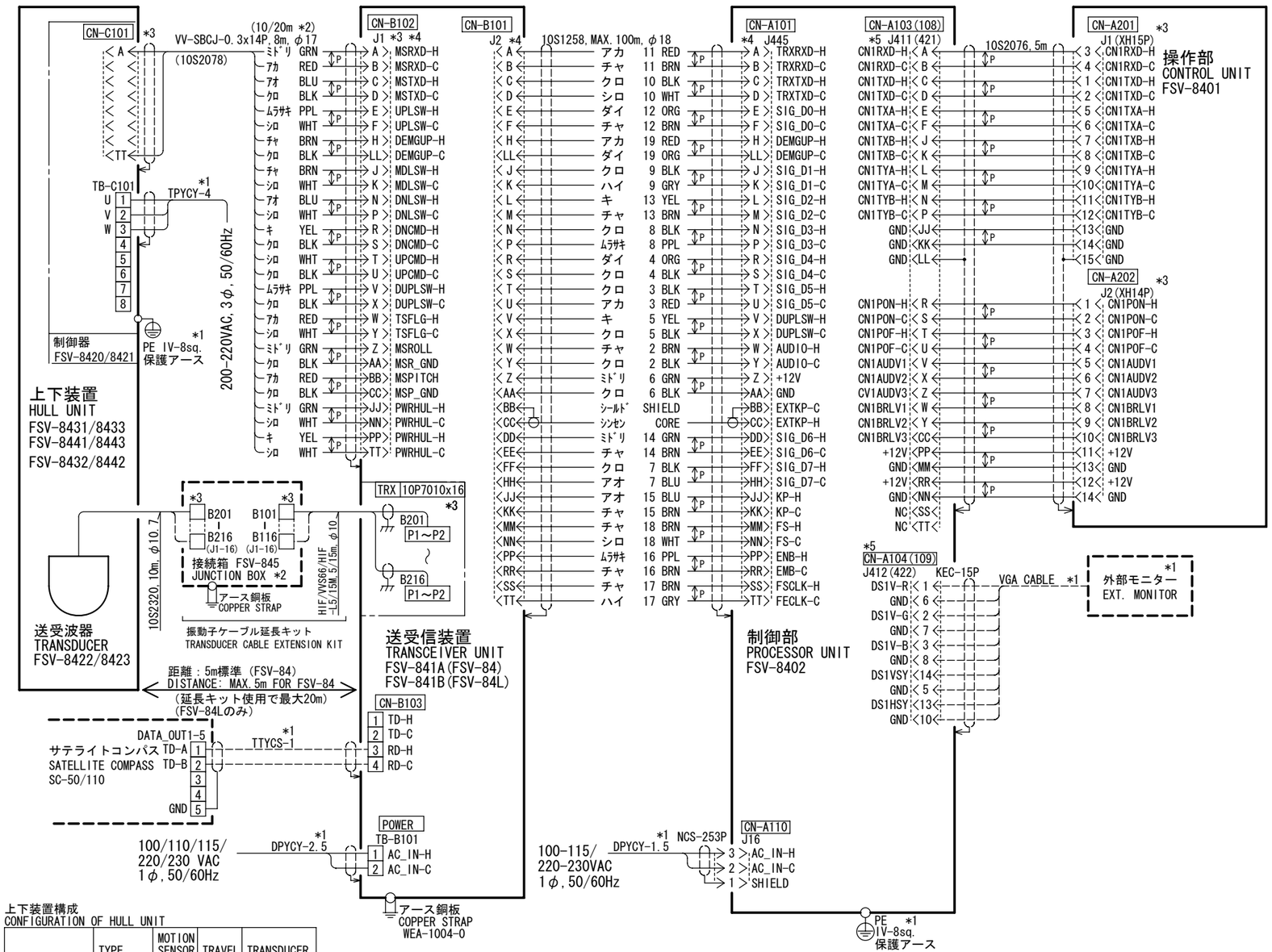
	TYPE	MOTION SENSOR	TRAVEL	TRANSDUCER
国内向 JAPAN ONLY	FSV-8431	○	800	FSV-8422 (ドーム付)
	FSV-8433	—		
	FSV-8441	○	1100	
	FSV-8443	—		
国外向 OUT OF JAPAN	FSV-8432	○	800	FSV-8423
	FSV-8442	○	1100	

注記
＊１）造船所手配。
＊２）オプション。
＊３）コネクタは工場にて取付済み。
＊４）00-8016-038-313761HVF
＊５）（ ）：副表示部用。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: CONNECTOR PLUGS FITTED AT FACTORY.
*4: 00-8016-038-313761HVF
*5: ( ): FOR SUB MONITOR UNIT.

DRAWN Mar. 20 '07 T. YAMASAKI			TITLE FSV-84
CHECKED Mar. 20 '07 T. TAKENO			名称 カラースキャニングソナー
APPROVED Mar.28'07 R.Esumi			相互結線図
SCALE	MASS kg		NAME COLOR SCANNING SONAR
DWG No. C1329-C01- D			INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.



上下装置構成
CONFIGURATION OF HULL UNIT

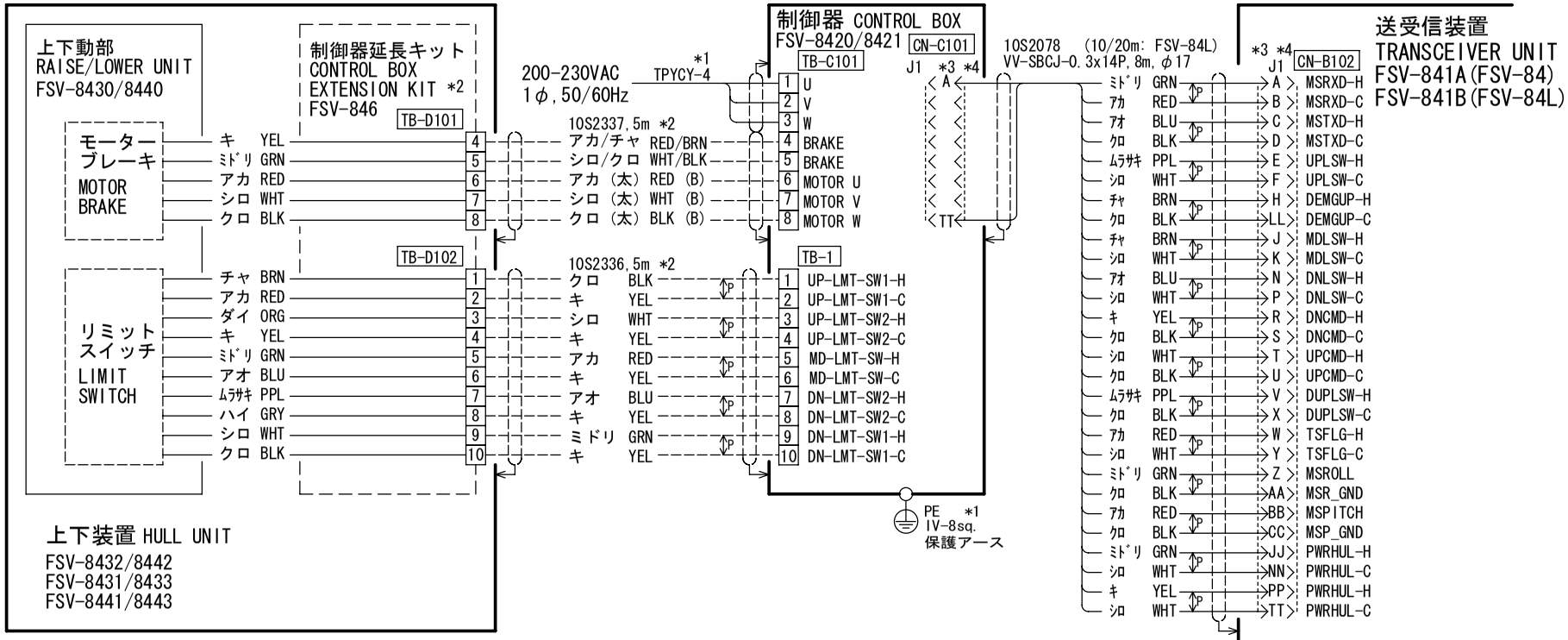
	TYPE	MOTION SENSOR	TRAVEL	TRANSDUCER
国内向 JAPAN ONLY	FSV-8431	○	800	FSV-8422 (ドーム付)
	FSV-8433	—		
	FSV-8441	○	1100	
	FSV-8443	—		
国外向 OUT OF JAPAN	FSV-8432	○	800	FSV-8423
	FSV-8442	○	1100	

注記
＊１）造船所手配。
＊２）オプション。
＊３）コネクタは工場にて取付済み。
＊４）00-8016-038-313761HVF
＊５）（ ）：副表示部用。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: CONNECTOR PLUGS FITTED AT FACTORY.
*4: 00-8016-038-313761HVF
*5: ( ): FOR SUB MONITOR UNIT.

DRAWN Mar. 20 '07 T.YAMASAKI			TITLE FSV-84/84L(BB)
CHECKED Mar. 20 '07 T.TAKENO			名称 カラースキャニングソナー（BBタイプ）
APPROVED Mar.28'07 R.Esumi			相互結線図
SCALE	MASS kg		NAME COLOR SCANNING SONAR (BB TYPE)
DWG No. C1329-C04- D			INTERCONNECTION DIAGRAM

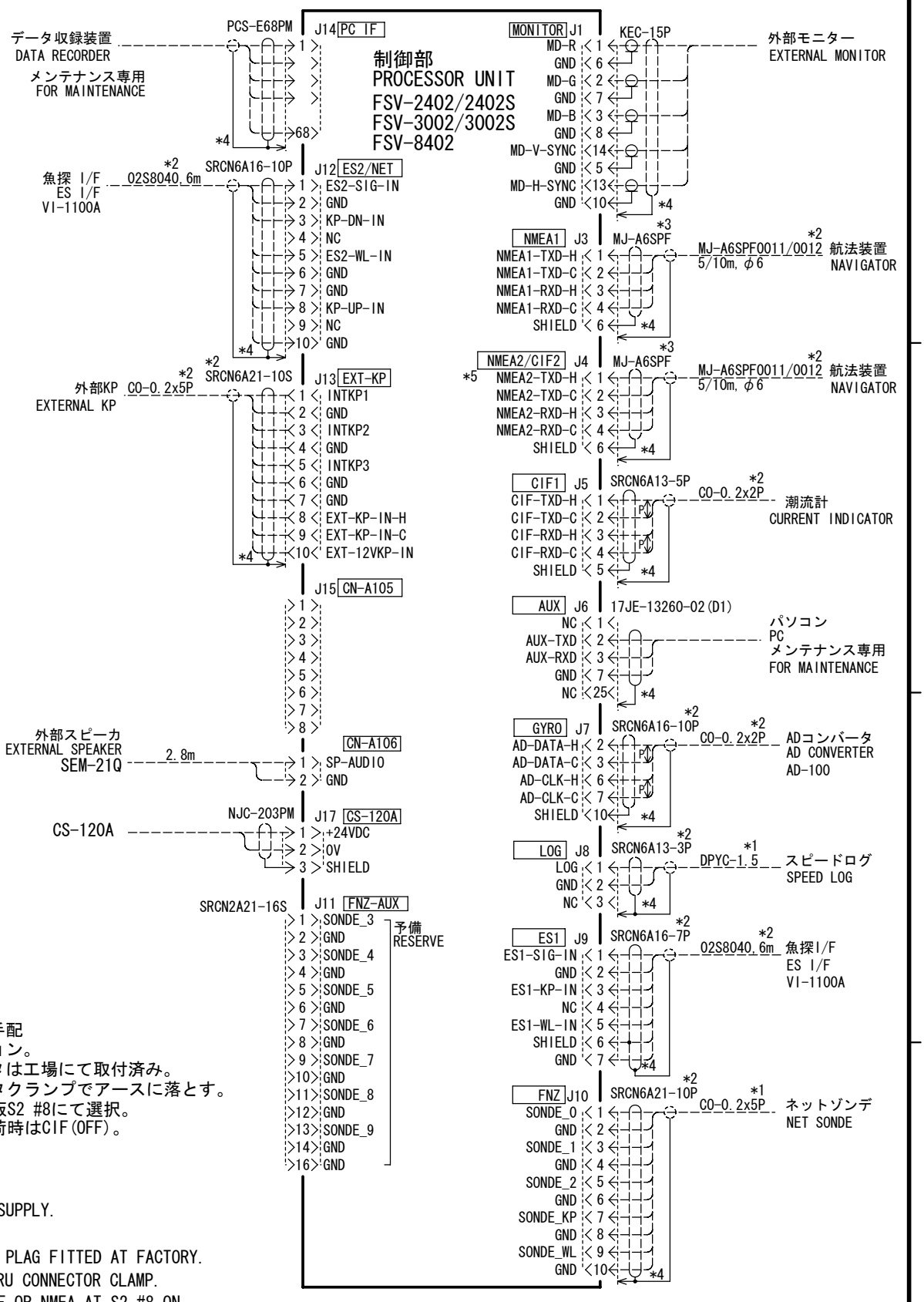
FURUNO



注記
＊１）造船所手配。
＊２）オプション。
＊３）コネクタは工場にて取付済み。
＊４）00-8016-038-313761HVF
NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: CONNECTOR PLUGS FITTED AT FACTORY.
*4: 00-8016-038-313761HVF

DRAWN Mar. 20 '07 T.YAMASAKI			TITLE FSV-846
CHECKED Mar. 20 '07 T.TAKENO			名称 制御器延長キット
APPROVED Mar.28'07 R.Esumi		FSV-84/84L	相互結線図
SCALE	MASS kg		NAME CONTROL BOX EXTENSION KIT
DWG No. C1329-C02- D			INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.



注記
＊１）造船所手配
＊２）オプション。
＊３）コネクタは工場にて取付済み。
＊４）コネクタクランプでアースに落とす。
＊５）IFES基板S2 #8にて選択。
　　工場出荷時はCIF(OFF)。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: CONNECTOR PLAG FITTED AT FACTORY.
*4: GROUND THRU CONNECTOR CLAMP.
*5: SELECT CIF OR NMEA AT S2 #8 ON
IFES BOARD. DEFAULT IS CIF (OFF).

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

DRAWN Dec. 26 '06 E.MIYOSI		TITLE	FSV-2402/2402S/3002/3002S/8402
CHECKED TAKAHASHI. T		名称	制御部外部信号接続
APPROVED Y. Hatai	FSV-24/24S/30/30S/84/84L		相互結線図
SCALE	MASS kg	NAME	PROCESSOR UNIT EXTERNAL INTERFACE
DWG.No. C1318-C03- N			INTERCONNECTION DIAGRAM