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FURUNO

INSTALLATION MANUAL

COLOR SOUNDER

MODEL FCV-30

FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN

(Elemental Chlorine Free)
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⚠ SAFETY INSTRUCTIONS

⚠ WARNING

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

Only qualified personnel should work inside the equipment.

Turn off the power at the switchboard before beginning the installation.

Fire or electrical shock can result if the power is left on.

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

Water in the equipment can result in fire, electrical shock or equipment damage.

Be sure no water leaks in at the transducer mounting location.

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.

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

Connection of an incorrect power supply can cause fire or equipment damage. The voltage rating of the equipment appears on the label above the power connector.

⚠ WARNING

Install the transducer according to the installation instructions.

Failure to install the transducer correctly may result in water leakage and damage to the ship's hull.

For wooden or FRP vessel using a steel tank, attach a zinc plate to the hull to prevent electrolytic corrosion.

Electrolytic corrosion can, in the worst case, result in loss of the transducer.

⚠ CAUTION

Ground the equipment to prevent mutual interference.

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

	Standard compass	Steering compass
CV-301	0.85 m	0.55 m
CV-302	1.55 m	0.95 m
CV-300	1.25 m	0.70 m
CV-304	1.10 m	0.70 m

Do not allow warm water or any other liquid other than seawater or freshwater to contact the transducer.

Damage to the transducer may result.

Do not install the transducer where noise or air bubbles is present.

Performance will be affected.

⚠ CAUTION

The transducer cable must he handled carefully, following the guidelines below.

- **Keep fuels and oils away from the cable.**
- **Locate the cable where it will not be damaged.**
- **The cable sheath is made of chlorophrene or polychloride vinyl, which are easily by damaged plastic solvents such as toulene. Locate the cable well away from plastic solvents.**

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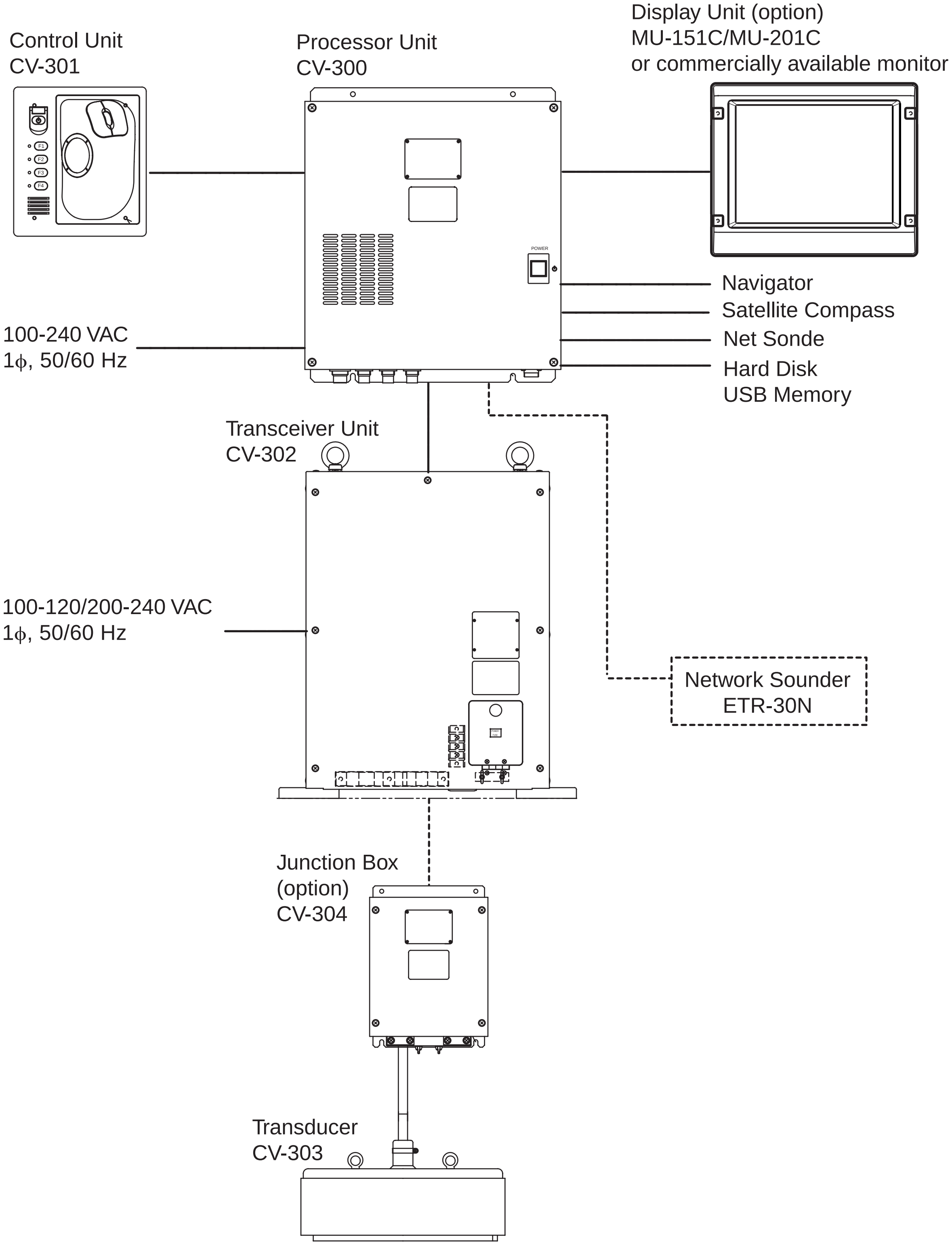
SYSTEM CONFIGURATION


Control Unit
CV-301
Processor Unit
CV-300
Display Unit (option)
MU-151C/MU-201C
or commercially available monitor
F1
F2
F3
F4
POWER
Navigator
Satellite Compass
Net Sonde
Hard Disk
USB Memory
100-240 VAC
1ϕ, 50/60 Hz
Transceiver Unit
CV-302
100-120/200-240 VAC
1ϕ, 50/60 Hz
Network Sounder
ETR-30N
Junction Box
(option)
CV-304
Transducer
CV-303

EQUIPMENT LISTS

Standard supply

Name	Type	Code No.	Qty	Remarks
Processor Unit	CV-300	–	1	With spare parts SP02-04801, SP02-05101 and installation materials CP06-01401
Control Unit	CV-301	–	1	With FP03-09860 & CP03-25604
Transceiver Unit	CV-302	–	1	With SP02-04901 & CP02-07801
	CV-302-MS			
Transducer	CV-303	–	1	
Thru-hull pipe	TFB-1600	000-012-539	1	
Installation Materials	CP03-28900	000-082-658	1 set	Connector CP03-28901 (MPS588-C: 000-148-322, 2 pcs) & cable FR-FTPC-CY *10m*
	CP03-28910	000-082-659		Connector CP03-28901 (MPS588-C: 000-148-322, 2 pcs) & cable FR-FTPC-CY *20m*
	CP03-28920	000-082-660		Connector CP03-28901 (MPS588-C: 000-148-322, 2 pcs) & cable FR-FTPC-CY *30m*

Installation Materials CP06-01401: 001-403-810

Name	Type	Code no.	Qty	Remarks
Connector	SRCN6A13-3S	000-508-665	1	For power line

Installation Materials CP03-25604: 008-539-850

Name	Type	Code no.	Qty	Remarks
Screw	M4x12	000-881-447	4	

Installation Materials CP02-07801: 001-416-080

Name	Type	Code no.	Qty	Remarks
Crimp-on lug	FV5.5-S4	000-538-121	3	

Spare parts SP02-05101: 001-416-060

Name	Type	Code no.	Qty	Remarks
Fuse	FGMB 5A AC250V	000-157-570-10	2	

Spare parts SP02-04901: 001-416-070

Name	Type	Code no.	Qty	Remarks
Fuse	FGMB 10A AC125V	000-157-470-10	2	
Fuse	FGMB 5A AC250V	000-157-570-10	2	

Accessories SP03-09860: 008-535-690

Name	Type	Code no.	Qty	Remarks
Cushion	TM-180-302	000-803-043	2	
Grommet	G-49	000-871-309	1	
Blind seal	22-020-1005	100-173-591	3	
KB fixing metal	03-163-7821	100-306-291	1	
Pan head screw	M4x12	000-881-447	2	

Optional equipment

Name	**Type**	**Code No.**	**Qty**	**Remarks**
Junction box	CV-304-10	000-012-540	1	With cable Z-FNH-SB 68XP26AWG, 10 m
	CV-304-20	000-012-541		With cable Z-FNH-SB 68XP26AWG, 20 m
Transducer tank	T-625	000-012-545	1	

1. MOUNTING

1.1 Control Unit

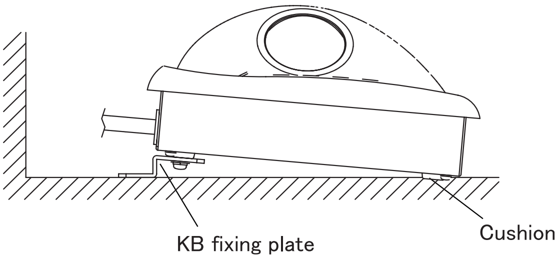
Mounting considerations

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

- Select a location where the control unit can be operated conveniently.
- Locate the unit away from heat sources because of heat that can build up inside the unit.
- Locate the equipment away from places subject to water splash and rain.
- Determine the mounting location considering the length of the signal cable between the control unit and the processor unit. (The length of the signal cable is 5 m.)
- Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

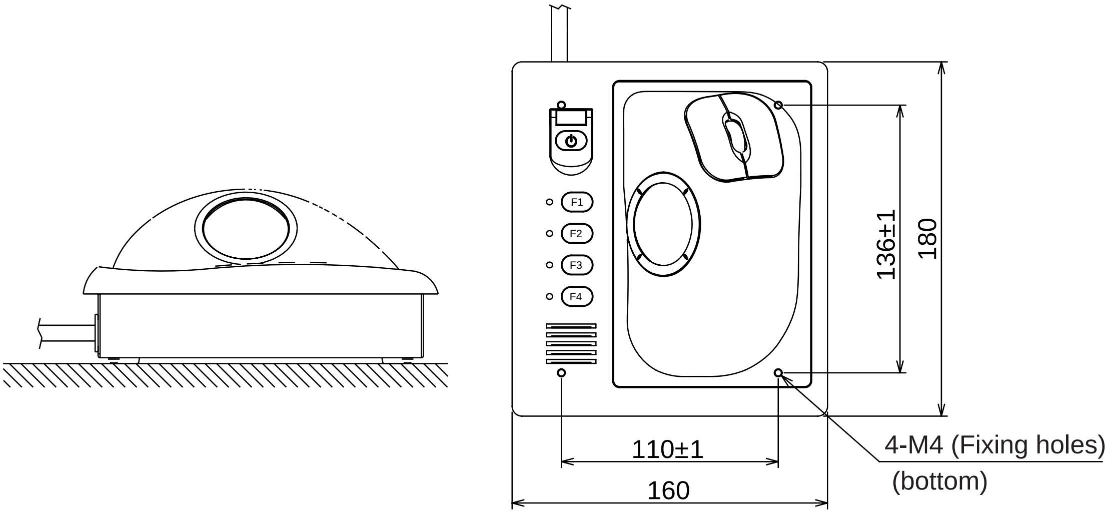
Fixing with KB fixing plate

1. Fix the KB fixing plate to the bottom of the control unit.
2. Attach cushions to the bottom of the control unit as shown below.
3. Fix it to a desired location with self-tapping screws (local supply).



Fixing without KB fixing metal

1. Drill four mounting holes of 5 mm diameter referring to the drawing below.
2. Fix the control unit with four screws (M4) from under side of the desktop. Use M4x12 (supplied) for mounting panel thickness “t” between 2 and 5 mm. For greater thickness, screw length shall be M4x(t+7.8±2).

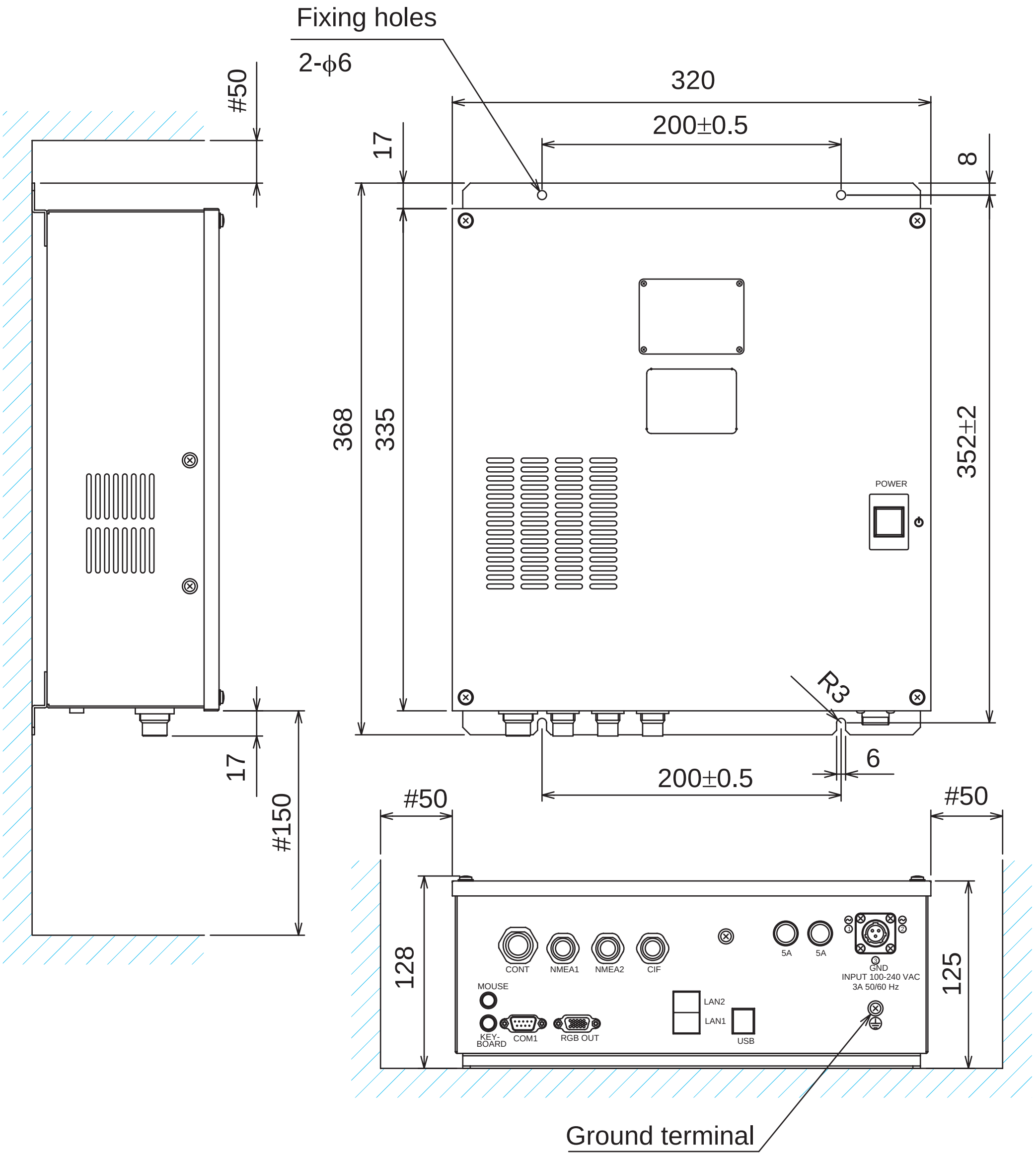

F1
F2
F3
F4
136±1
180
110±1
160
4-M4 (Fixing holes)
(bottom)

1.2 Processor Unit

The processor unit can be mounted on the deck, a desktop or on a bulkhead. Select a mounting location considering the points below.

- Locate the unit out of direct sunlight.
- Select a location where temperature and humidity are moderate and stable.
- Locate the unit where its cover can be easily removed and cabling easily accessed.
- For mounting on a bulkhead be sure the mounting location is strong enough to support the unit under the pitching and rolling normally encountered on the vessel.
- Leave sufficient space around the unit for maintenance and servicing. Recommended maintenance space “#” appears in the figure below.

Tabletop or deck mounting: Fasten with four tapping screws.
Bulkhead mounting: Screw in two tapping screws in mounting location for lower mounting holes of the unit, leaving 5 mm protruding. Set the processor unit to the screws, tighten screws and screw in two tapping screws for upper mounting holes of the unit.

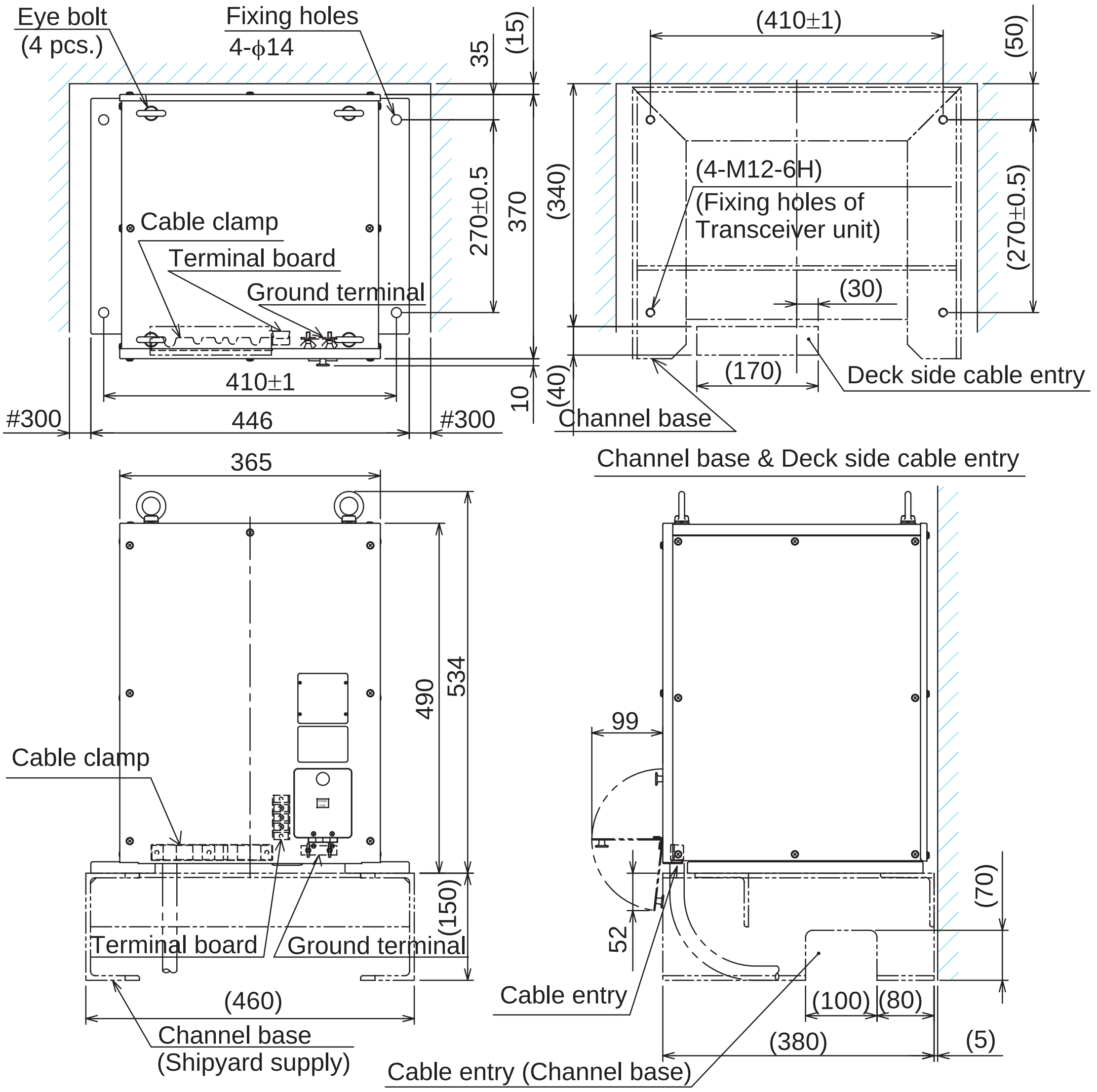

Fixing holes
2-φ6
320
200±0.5
#50
17
8
368
335
352±2
POWER
R3
6
200±0.5
17
#150
#50
#50
128
125
CONT
NMEA1
NMEA2
CIF
5A
5A
GND
INPUT 100-240 VAC
3A 50/60 Hz
MOUSE
KEY-BOARD
COM1
RGB OUT
LAN2
LAN1
USB
Ground terminal

1.3 Transceiver Unit

The transceiver unit is designed to be mounted on the deck. Select a mounting location considering the points below.

- The transceiver unit generates heat so the mounting location should be well ventilated and dry.
- The unit is only designed for deck mounting.
- Secure the maintenance space “#” shown in the figure below for ease of maintenance and service.
- For the CV-302-MS (transceiver unit with motion sensor), install it horizontally in the location where the ambient temperature is lower than 45°C. If the front panel of the unit is oriented to port, its motion sensor faces the bow, i.e., the arrow mark on the NOTE label on the transceiver unit orients to bow. After installation, compensate for installation angle error, referring to chapter 3.

If necessary, install a channel base on the mounting location, consulting with the shipyard. Fasten the transceiver unit to the channel base with M12 bolts. If necessary, reinforce the transceiver unit against vibration by stays extending from the eyebolts.


Eye bolt
(4 pcs.)
Fixing holes
4-ϕ14
35
(15)
270±0.5
370
Cable clamp
Terminal board
Ground terminal
410±1
#300
446
#300
10
(410±1)
(50)
(340)
(4-M12-6H)
(Fixing holes of
Transceiver unit)
(270±0.5)
(30)
(170)
(40)
Deck side cable entry
Channel base
Channel base & Deck side cable entry
365
490
534
Cable clamp
(150)
Terminal board
Ground terminal
(460)
Channel base
(Shipyard supply)
99
52
Cable entry
(70)
(100)
(80)
(380)
(5)
Cable entry (Channel base)

1.4 Transducer

The performance of the color sounder depends upon the transducer position.

- A place least affected by air bubbles should be selected since turbulence blocks the sounding path.
- Select a place not influenced by engine noise.
- Further, select a place not influenced by other electronic device.

Install the transducer on the hull, orienting it so the bow mark is facing the ship’s bow.

Note: Carefully handle the transducer. Do not lift the transducer by holding the cable, nor drop it.

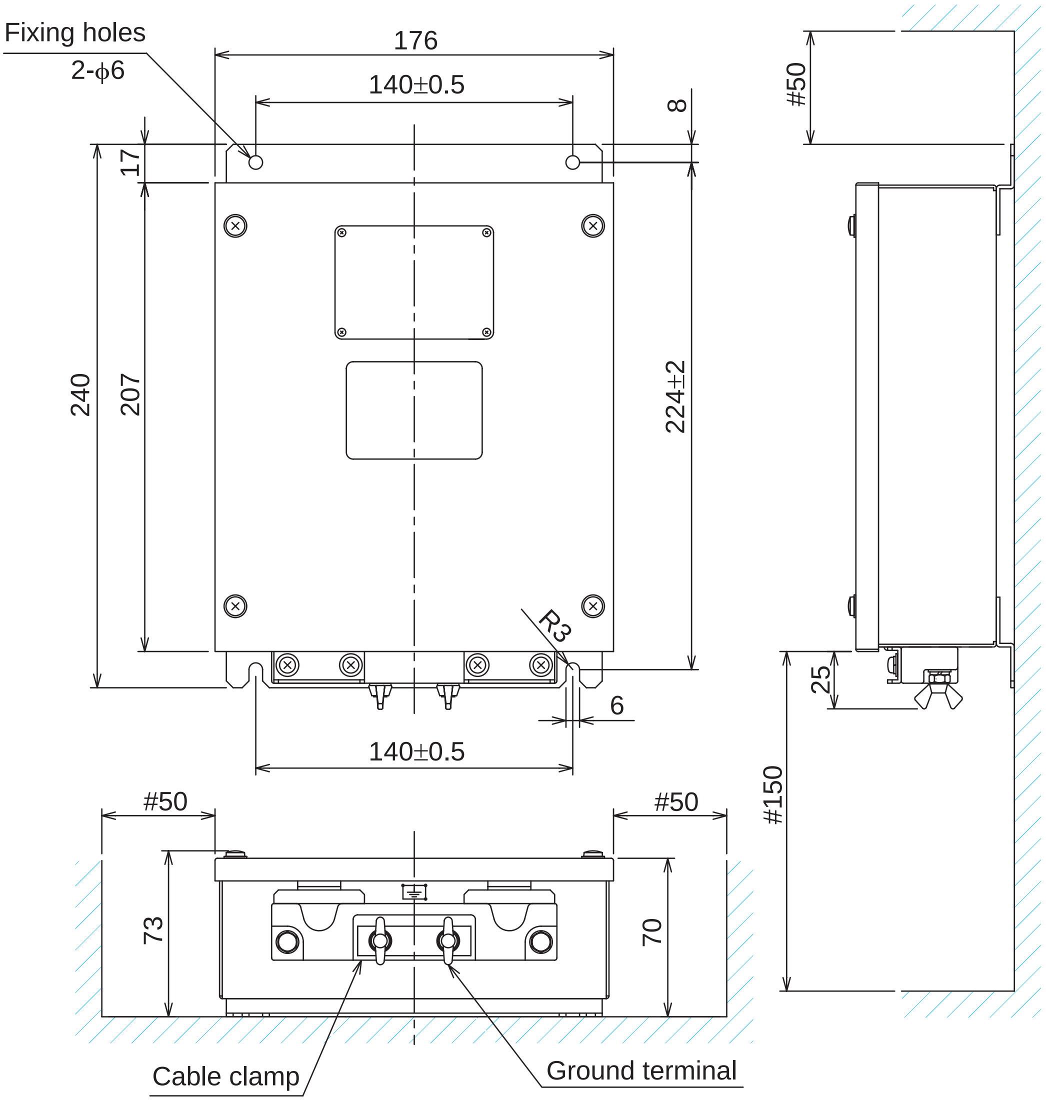
It is known that air bubbles are fewest at the place where the bow first falls and the next wave rises, at usual cruising speed. In small, slow-speed boats, the position between 1/3 and 1/2 of the ship’s length from the bow is usually a good place. The face of the transducer must be facing the sea bottom in normal cruising trim of the boat.

Refer to the installation drawing for the transducer, combined with the thru-hull pipe TFB-1600 and optional transducer tank T-625.

1.5 Junction Box

If the length of cable between the transducer and transceiver unit is more than 15 m, the optional junction box (with 10 m or 20 m cable) can be used for cable extension.

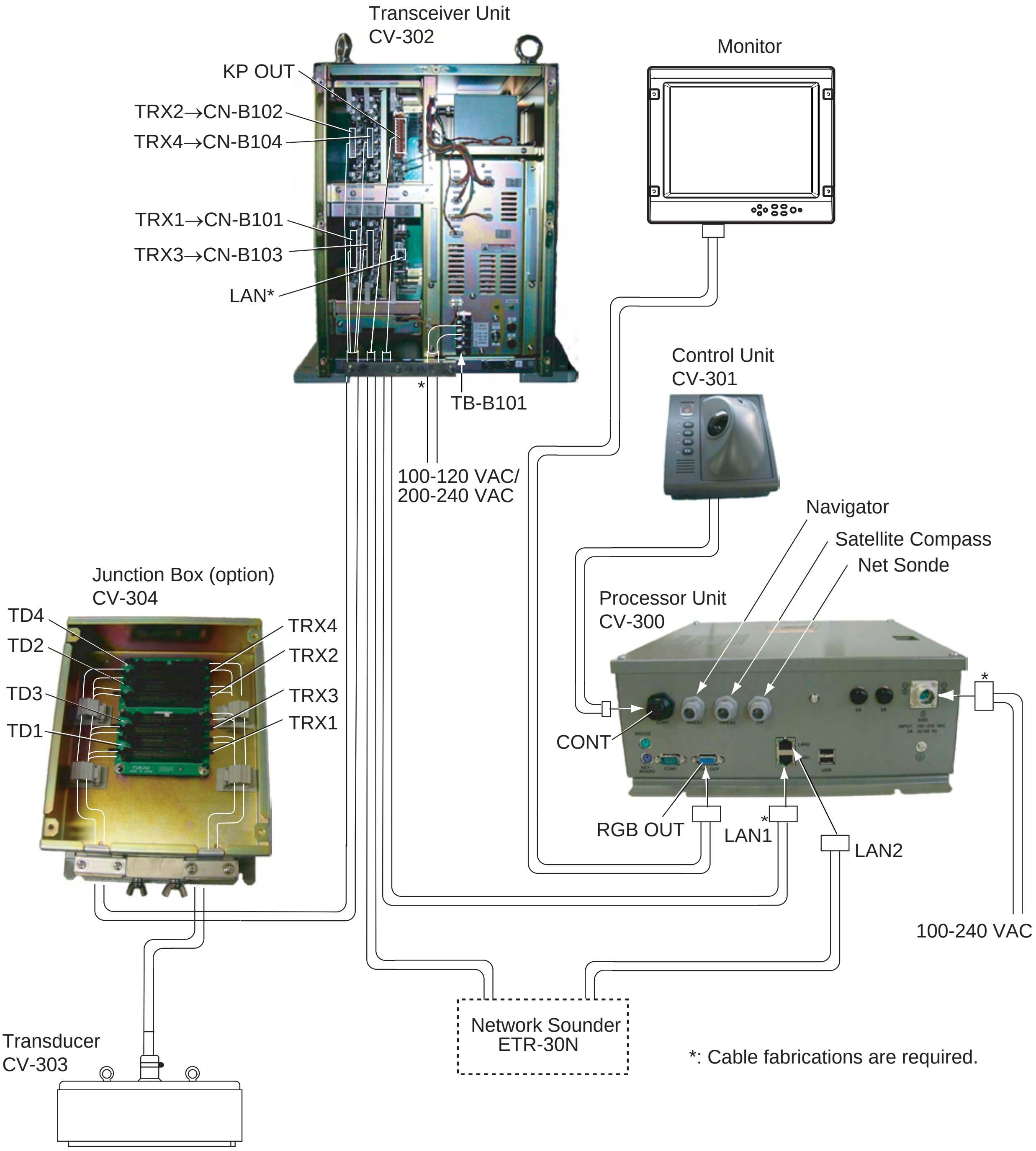
For bulkhead mounting, orient the cable entry downside and fix the junction box with M5 bolts (shipyard supply).


Fixing holes
2-φ6
176
140±0.5
8
17
240
207
224±2
R3
6
140±0.5
#50
#50
#50
25
#150
73
70
Cable clamp
Ground terminal

2. WIRING

2.1 Interconnection

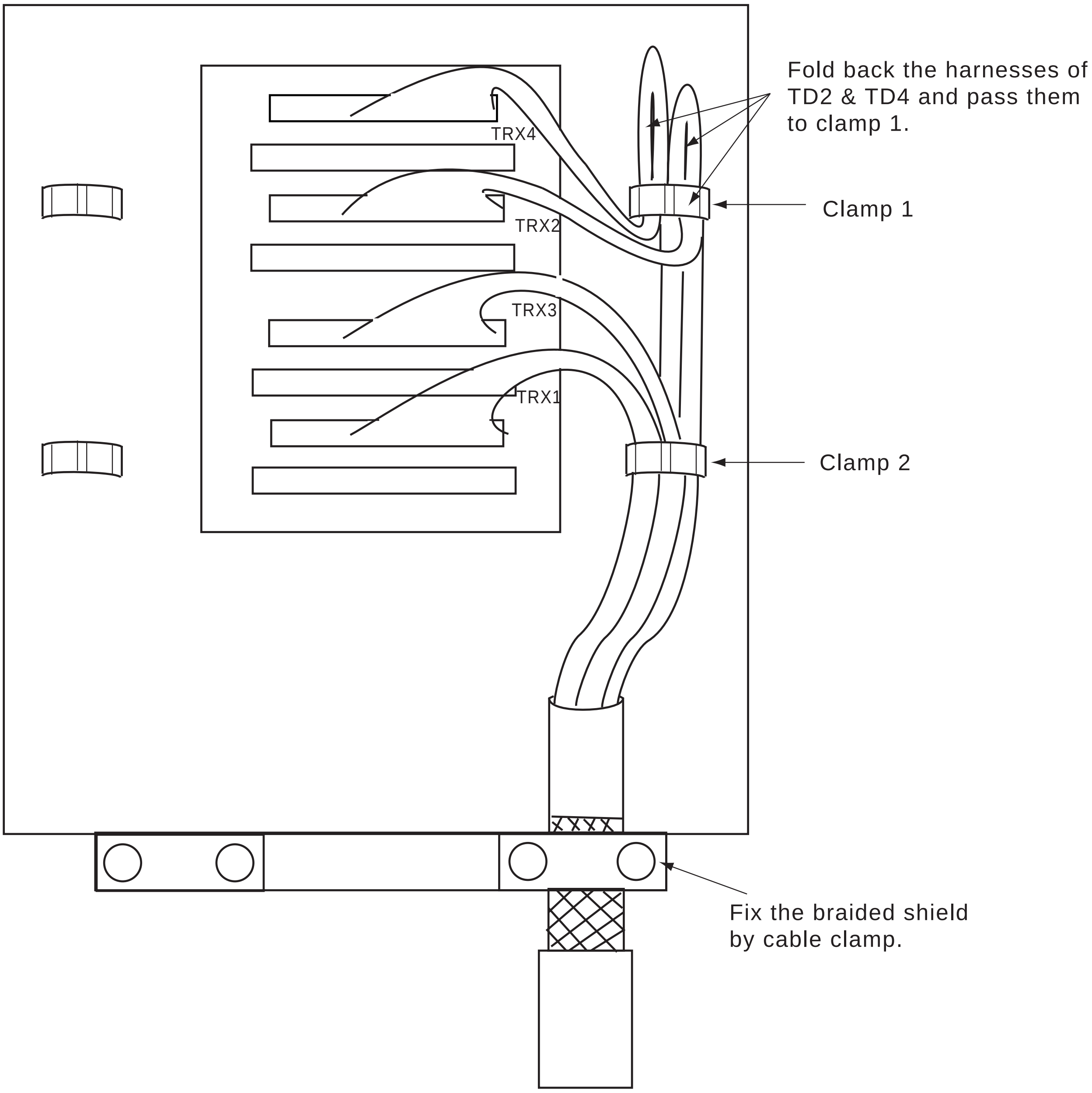
Refer to the interconnection diagram at the back of this manual for detailed information.


Transceiver Unit
CV-302
KP OUT
TRX2→CN-B102
TRX4→CN-B104
TRX1→CN-B101
TRX3→CN-B103
LAN*
*
TB-B101
100-120 VAC/
200-240 VAC
Monitor
Control Unit
CV-301
Navigator
Satellite Compass
Net Sonde
Processor Unit
CV-300
CONT
RGB OUT
LAN1
LAN2
*
100-240 VAC
Junction Box (option)
CV-304
TD4
TD2
TD3
TD1
TRX4
TRX2
TRX3
TRX1
Transducer
CV-303
Network Sounder
ETR-30N

*: Cable fabrications are required.

Wiring diagram

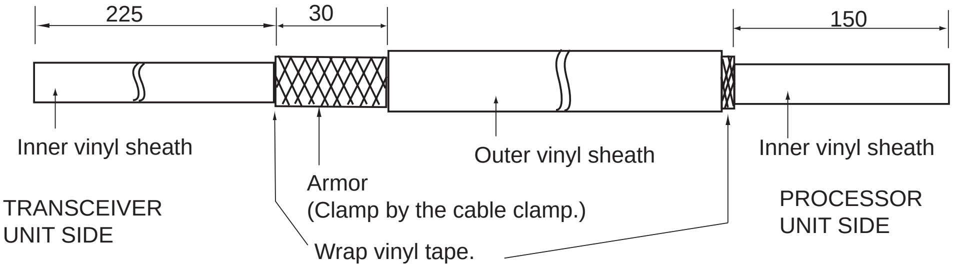
Cable running in the junction box


TRX4
TRX2
TRX3
TRX1
Fold back the harnesses of TD2 & TD4 and pass them to clamp 1.
Clamp 1
Clamp 2
Fix the braided shield by cable clamp.

2.2 Cable Fabrication

LAN cable

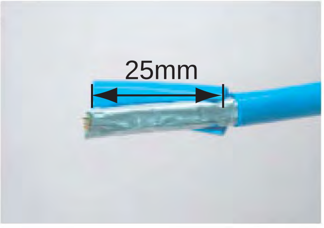
The LAN cable (FR-FTPC-CY 10, 20, or 30 m) connects between the processor unit and the transceiver unit. Cut armor and outer vinyl sheath as shown below and then connect the modular connector MPS588-C (supplied) to both ends.


225
30
150
Inner vinyl sheath
Outer vinyl sheath
Inner vinyl sheath
TRANSCEIVER
UNIT SIDE
Armor
(Clamp by the cable clamp.)
Wrap vinyl tape.
PROCESSOR
UNIT SIDE

1

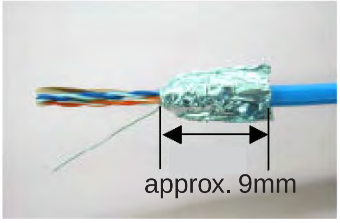
Expose inner vinyl sheath.

2



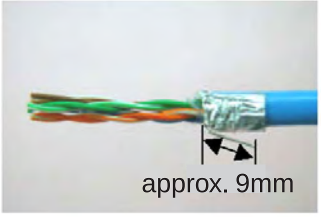
Remove the outer sheath by approx 25 mm. Be careful not to damage inner shield and cores.

3



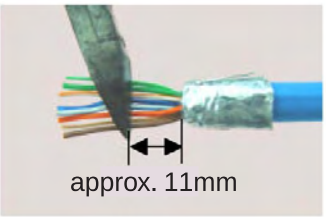
Fold back the shield, wrap it onto the outer sheath and cut it, leaving 9 mm.

4



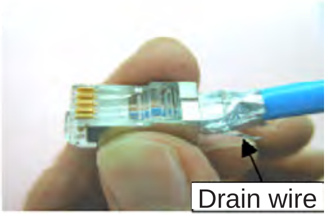
Fold back drain wire and cut it, leaving 9 mm.

5


approx. 11mm

Straighten and flatten the core in order and cut then, leaving 11 mm.

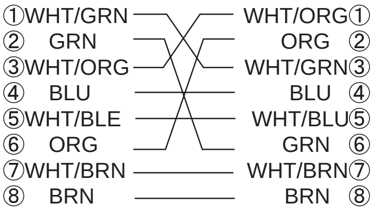
6

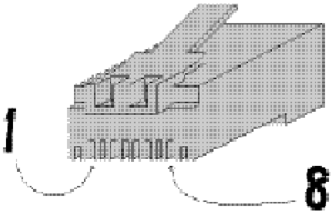


Insert the cable into the modular plug so that the folded part of the shield enters into the plug housing. The drain wire should be located on the tab side of the jack.

7

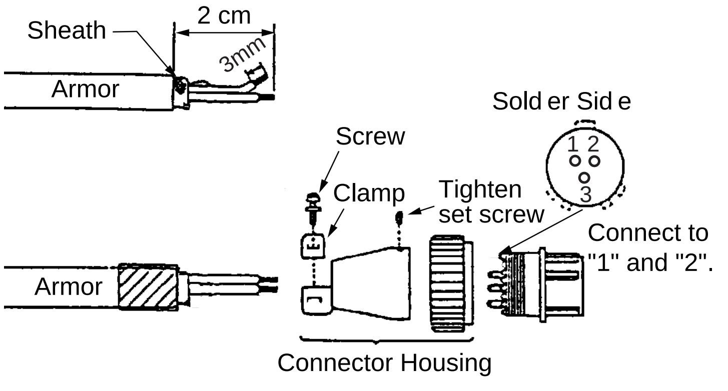
Using special crimping tool MPT5-8 (PANDUIT CORP.), crimp the modular plug. Finally check the plug visually.


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

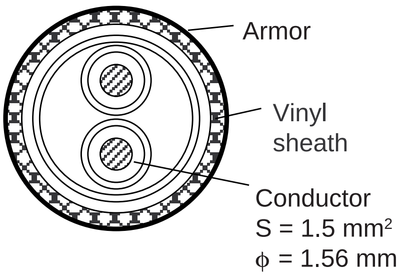


Power cable for the processor unit

Use power cable DPYC-2.5 (Japan industry standard cable) or equivalent. Connect connector SRCN6A13-3S (supplied) as follows.


Sheath
2 cm
3mm
Armor
Solder Side
Screw
1 2
3
Clamp
Tighten set screw
Connect to "1" and "2".
Armor
Connector Housing

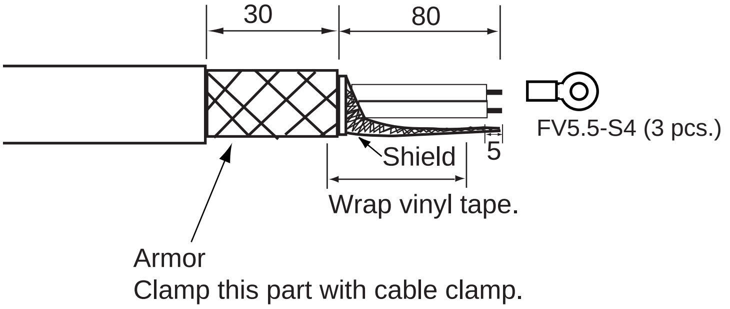
Attaching connector SRCN6A13-3S

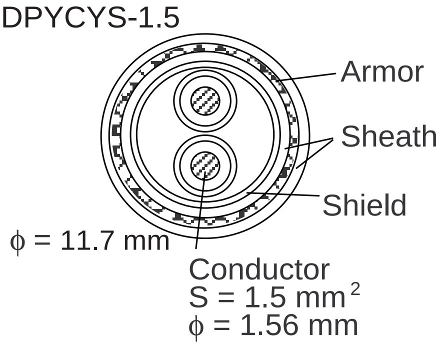

Armor
Vinyl sheath
Conductor
S = 1.5 mm²
ϕ = 1.56 mm

Sectional view of cable DPYC-1.5

Power cable for the transceiver unit

Use power cable DPYCYS-1.5 (Japan industry standard cable) or equivalent. Connect crimp-on lugs FV5.5-S4 (supplied) as follows.


30
80
FV5.5-S4 (3 pcs.)
Shield
5
Wrap vinyl tape.
Armor
Clamp this part with cable clamp.


DPYCYS-1.5
Armor
Sheath
Shield
ϕ = 11.7 mm
Conductor
S = 1.5 mm²
ϕ = 1.56 mm

Ground

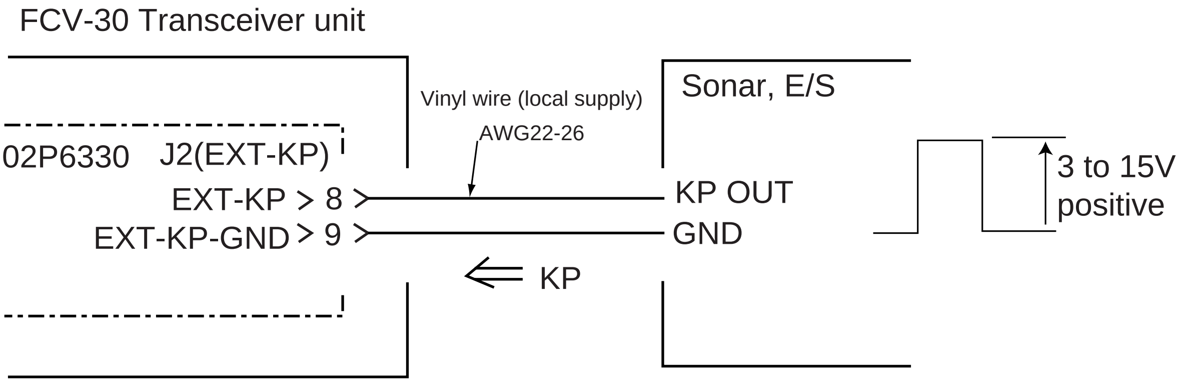
The processor unit, transceiver unit and junction box should be grounded to prevent electrical shock and mutual interference. Connect an earth plate or earth wire between unit and ship’s superstructure to ground.

⚠ **CAUTION**

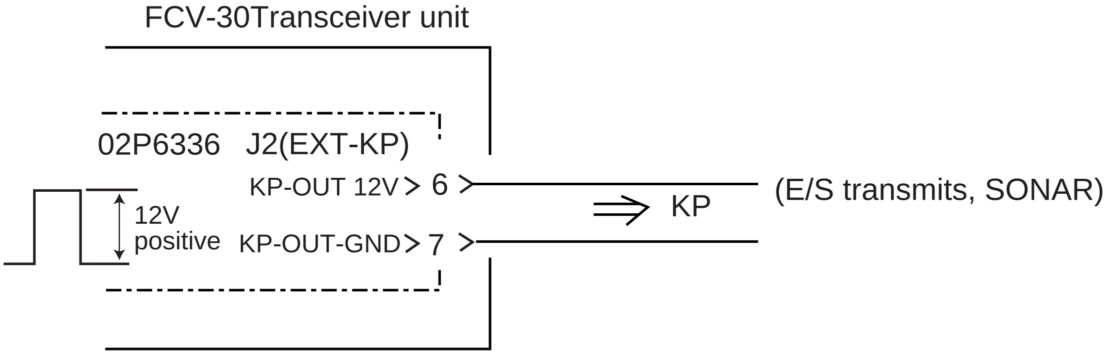
Ground the equipment to prevent electrical shock and mutual interference.

2.3 Synchronizing Transmission with Echo Sounder or Other Sonar

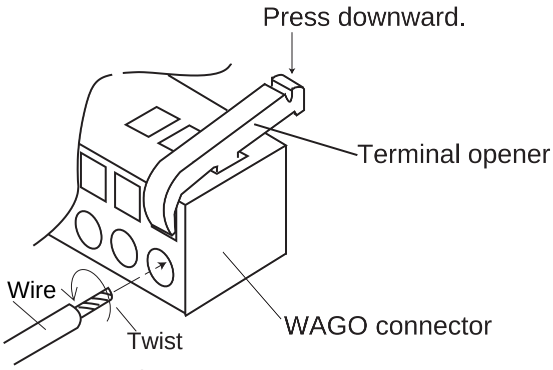
To synchronize transmission of the FCV-30 with an echo sounder or other type of sonar, connect it as shown below. Also, set the **Ping Setting** to **External**, referring to page 3-4 and 3-5 of the FCV-30 Operation manual.


FCV-30 Transceiver unit
02P6330
J2(EXT-KP)
EXT-KP > 8 >
EXT-KP-GND > 9 >
Vinyl wire (local supply)
AWG22-26
⇐ KP
Sonar, E/S
KP OUT
GND
3 to 15V
positive

Note: Outputting KP of FCV-30 to other sonar, echo sounder


FCV-30Transceiver unit
02P6336
J2(EXT-KP)
12V
positive
KP-OUT 12V > 6 >
KP-OUT-GND > 7 >
⇒ KP
(E/S transmits, SONAR)

Wiring for WAGO connector


Press downward.
Terminal opener
Wire
Twist
WAGO connector

Procedures
1. Twist the cores
2. Press the terminal opener downward.
3. Insert the wire to hole.
4. Remove the terminal opener.
5. Pull the wire to confirm that it is ecure.

2.4 Input/Output Sentences

Input sentences (talker not specified)

Sentence	Data	Remarks
GGA	Time, position	NMEA
GLC	GRI, TD (Loran C)	NMEA
GLL	Latitude and longitude	NMEA
GTD	TD (Loran C)	NMEA
MTW	Water temperature	NMEA
RMA	Loran C data (Latitude and longitude, TD, ground speed and course	NMEA
RMB	Recommended minimum navigation information	NMEA
RMC	GNSS data (Latitude and longitude, ground speed and course)	NMEA
VTG	Speed through the ground and course	NMEA
BWC	Bearing and distance to waypoint	NMEA
VHW	Water speed and heading	NMEA
GNS	GNSS fix data	NMEA
ZDA	Time and date	NMEA
hve	Heave information (Satellite compass) P sentence	SC
att	Roll and pitch angle (Satellite compass) P sentence	SC

Output sentences

Talker	Sentence	Data	Remarks
SD	DBS	Depth below sea surface	Ver. 1.5
SD	DBT	Depth below transducer	Ver. 1.5, 2.0, 3.0
SD	DPT	Depth below transducer	Ver. 2.0, 3.0
YC	MTW	Water temperature (With connection of water temperature sensor)	Ver. 1.5, 2.0, 3.0
SD	TLL	Target position	Ver. 1.5, 2.0, 3.0
SD	vrm	VRM depth, P sentence	Ver. 1.5, 2.0, 3.0
SD	btm	Seabed discrimination data	Ver. 1.5, 2.0, 3.0

CIF input signal

Signal	Data	Remarks
58	Temperature	
D3	Sonde no., water temperature, Net depth	

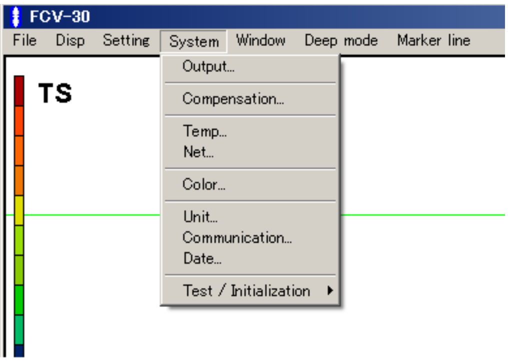
3. SYSTEM SETTINGS AFTER INSTALLATION

After installing all equipments, set up the equipment as shown in this chapter.
The FCV-30 is shipped from the factory ready for connection to an XGA monitor. To connect an SXGA monitor, contact a FURUNO agent or dealer.

System Setting

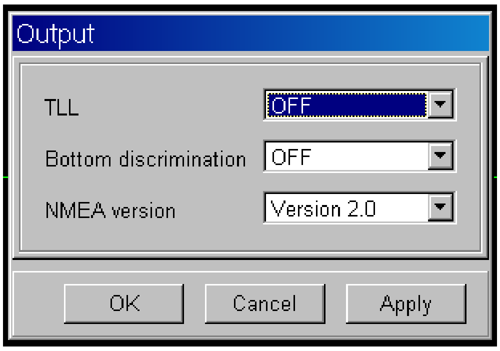
Do the system settings as follows.

1. Click **System** in the menu bar to open the system menu.


FCV-30
File
Disp
Setting
System
Window
Deep mode
Marker line
TS
Output...
Compensation...
Temp...
Net...
Color...
Unit...
Communication...
Date...
Test / Initialization

Output

1. Click **Output** in the system menu to show the OUTPUT dialog box.


Output
OK
Cancel
Apply

TLL OFF
Bottom discrimination OFF
NMEA version Version 2.0

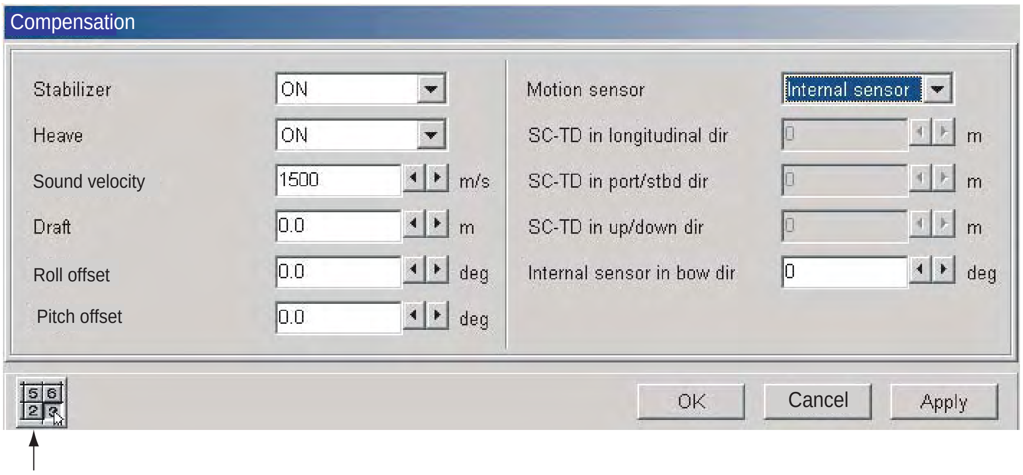
2. To output the TLL data (when the “Maker Line” in the menu bar is clicked) to external equipment via NMEA port, set **TLL** to **ON**.
3. To output the seabed data to external equipment via NMEA port, set **Bottom discrimination** to **ON**.

   Note that this function outputs bottom hardness/roughness in ten levels, however there is currently no receiving device which handles this data.

4. To set NMEA version according to equipment connected, choose the version among 1.5, 2.0 and 3.0.
5. Click the **OK** or **Apply** button.

Compensation

1. Click **Compensation** in the system menu to show the Compensation dialog box is displayed.



Compensation

Stabilizer: ON
Heave: ON
Sound velocity: 1500 m/s
Draft: 0.0 m
Roll offset: 0.0 deg
Pitch offset: 0.0 deg
Motion sensor: Internal sensor
SC-TD in longitudinal dir: 0 m
SC-TD in port/stbd dir: 0 m
SC-TD in up/down dir: 0 m
Internal sensor in bow dir: 0 deg

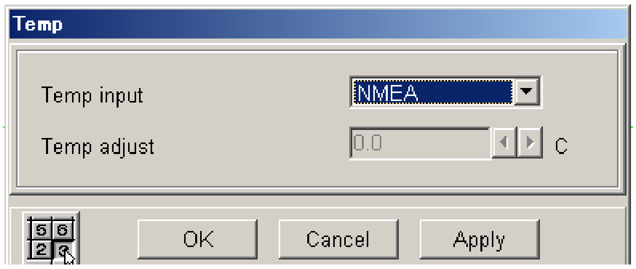
Ten key button

2. Set the following items. To enter numeric values, press the ten-key button at lower left-hand side to open the ten-key panel. Click appropriate numeric keys.
   Stabilize: Choose ON to activate the stabilization function.
   Heaving: Choose ON to enable the heaving correction function. The satellite compass is required to connect.
   Sound velocity: Compensate the sound speed if the depth indicated on the screen is different from the usual depth indication for the area. (Setting range: 1400 to 1600 m/s)
   Draft: Set the ship's draft if you want to display the depth from sea surface to seabed rather than from the transducer. (Setting range: -6.0 to +60.0 m)
   Roll offset: Compensate the roll angle error of the motion sensor. Set positive values when the starboard is up. (Setting range: -10.0 to +10.0 degrees)
   Pitch offset: Compensate the pitch angle error of the motion sensor. Set positive values when the bow is up. (Setting range: -10.0 to +10.0 degrees)
   - Note that the satellite compass has its own roll and pitch corrections. Enter compensations here or at the satellite compass; do not compensate at both.

   Motion sensor: Choose the internal sensor or SC (Satellite Compass) for stabilization.
   SC-TD in longitudinal dir: Set the longitudinal distance from satellite compass antenna (SC) to transducer (TD). If the TD is bow side, set positive values. (Setting range: -100.0 to +100.0 m)
   SC-TD in port/stbd dir: Set the transverse distance from SC to TD. If the TD is starboard side, set positive values. (Setting range: -100.0 to +100.0 m)
   SC-TD in up/down dir: Set a vertical distance from TD to SC, in positive values. (Setting range: -100.0 to +100.0 m)
   Internal sensor in bow dir: If so equipped, correct installation angle error of the internal motion sensor, i.e., the transceiver unit. If the transceiver unit is installed with its front panel facing to the port side exactly, the motion sensor faces the bow at zero degrees. If installed panel facing to the bow, enter 90. (Setting range: 0 to 360 degrees)
   - Inscribe this setting value on the NOTE label on the front panel of the transceiver unit.

Temperature

1. Click **Temp** in the system menu to show the “Temp” dialog box.



Temp input: NMEA

Temp adjust: 0.0 C

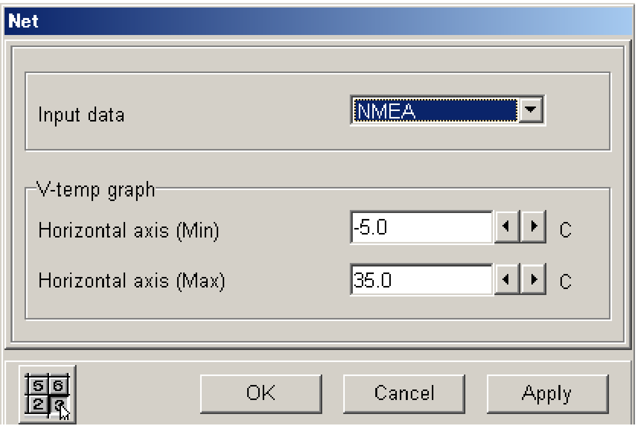
2. Set the following items.

   Temp input: Choose CIF or NMEA as the temperature data source as appropriate.

   Temp adjust: Enter compensation value for CIF input. (Setting range: -20.0 to +20.0 degrees)

Net

1. Click **Net** in the system menu to show the “Net” dialog box.



Input data: NMEA

V-temp graph

Horizontal axis (Min): -5.0 C

Horizontal axis (Max): 35.0 C

2. Set the following items.

   Input data: Choose CIF or NMEA as the net data source as appropriate.

   CIF: The temperature & depth data from the net recorder.

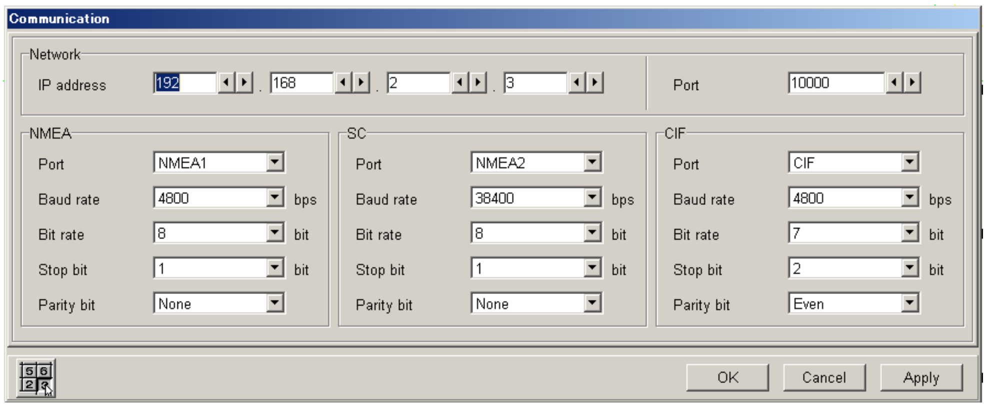
   NMEA: The temperature & depth data from the trawl sonar.

   Horizontal axis (Min): Set minimum value of the horizontal axis of the vertical temperature graph. (Setting range: -5.0 to +35.0 degrees)

   Horizontal axis (Max): Set maximum value of the horizontal axis of the vertical temperature graph. (Setting range: -5.0 to +35.0 degrees)

Communication parameters

1. Click **Communication** in the system menu to show “Communication” dialog box.



Communication

Network

IP address 192 . 168 . 2 . 3

Port 10000

	NMEA	SC	CIF
Port	NMEA1	NMEA2	CIF
Baud rate	4800 bps	38400 bps	4800 bps
Bit rate	8 bit	8 bit	7 bit
Stop bit	1 bit	1 bit	2 bit
Parity bit	None	None	Even

2. Set the following items.

IP address: Set the IP address of the network.

Port: Set the port number. Normally no change is required.

Port in the NMEA/SC/CIF field:

COM1: Choose this when an external equipment is connected to COM1 port of the processor unit.

NMEA1: Choose this when an external equipment is connected to NMEA1 port of the processor unit.

NMEA2: Choose this when an external equipment is connected to NMEA2 port of the processor unit.

CIF: Choose this when an external equipment is connected to CIF port of the processor unit.

Baud rate: Set baud rate of the transmission signal among 4800, 9600, 19200 and 38400 bps for NMEA and 600, 1200, 2400 and 4800 bps for CIF.

Bit rate: Set the character size of the transmission data between 7 bit and 8 bit.

Stop bit: Set the stop bit size of the transmission data among 1 bit, 1.5 bit and 2 bit.

Parity bit: Set the parity of the transmission data among none, odd and even.

Note: To output data from SC-50/110 in NMEA format, set the SC-50/110 as follows.

-Output format: IEC ed1

-Sentence: ATT, HVE (For others, set all OFF.)

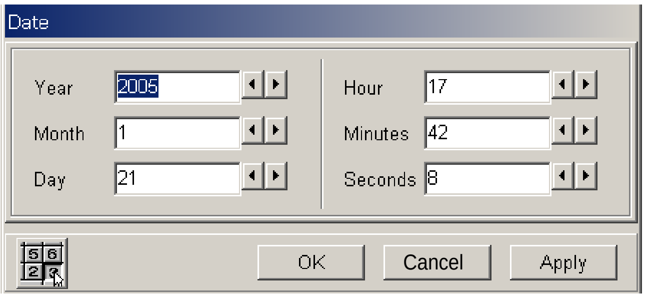
-Baud rate: 38400 bps

-Cycle: 25 ms

(Talker : any)

Setting the Date

1. Click the **Date** in the system menu. The Date dialog box is displayed.



Year 2005
Month 1
Day 21
Hour 17
Minutes 42
Seconds 8

Date
OK
Cancel
Apply

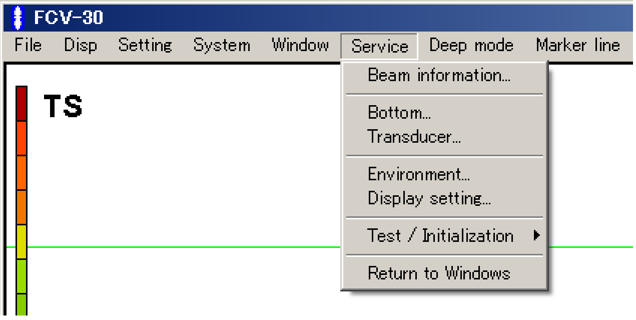
2. Using ◄ or ► or ten-key panel, enter current date and time.
3. Click the **OK** or **Apply** button. From this moment, the time counts up.

Note that the date and time are not displayed on the screen, however data files which are downloaded are named by date and time. The time is backuped by the internal battery cell.

Transducer parameters

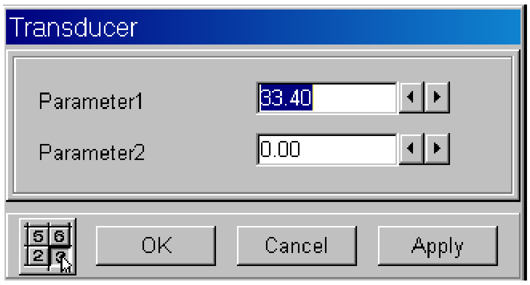
The data sheets about the transducer parameters are attached to the transducer. Detach them and attach one on the display unit and one to last page of the operator's manual. The compensation data on the sheet should be entered here. However, this compensation can be done by only serviceman.

1. Using the mouse wheel, double-chick the space just below the **CLOSE** button, and left-chick **2005** and **ENTER** to open the Service menu.



FCV-30
File
Disp
Setting
System
Window
Service
Deep mode
Marker line
TS
Beam information...
Bottom...
Transducer...
Environment...
Display setting...
Test / Initialization
Return to Windows

2. Choose **Service** – **Transducer** in the menu bar to show the Transducer dialog box.



Parameter1 33.40
Parameter2 0.00

Transducer
OK
Cancel
Apply

3. Enter the parameters in the Parameter1 and Parameter2 boxes, referring to the parameter sheet attached to the transducer cable. If the parameter 2 in the parameter sheet is blank, leave the setting 0.00.

4. Click the **OK** button to close the dialog box.

5. Using the mouse wheel, double-click the space just below the CLOSE button and left-click ENTER. The Service menu disappears. Also, the Service menu disappears by turning off and on the FCV-30.

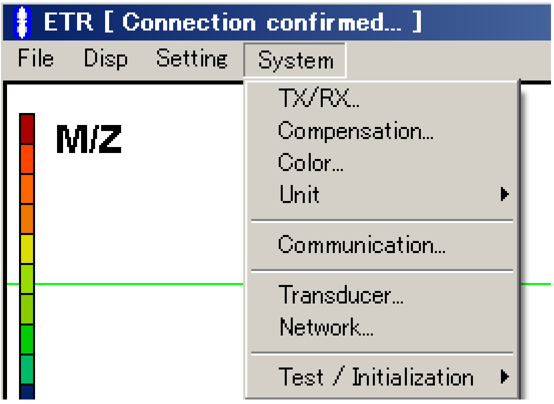
Note: Do not change the setting in the **Beam Information, Bottom** or **Environment** in the **Service** menu at installation.

Network Sounder Setting

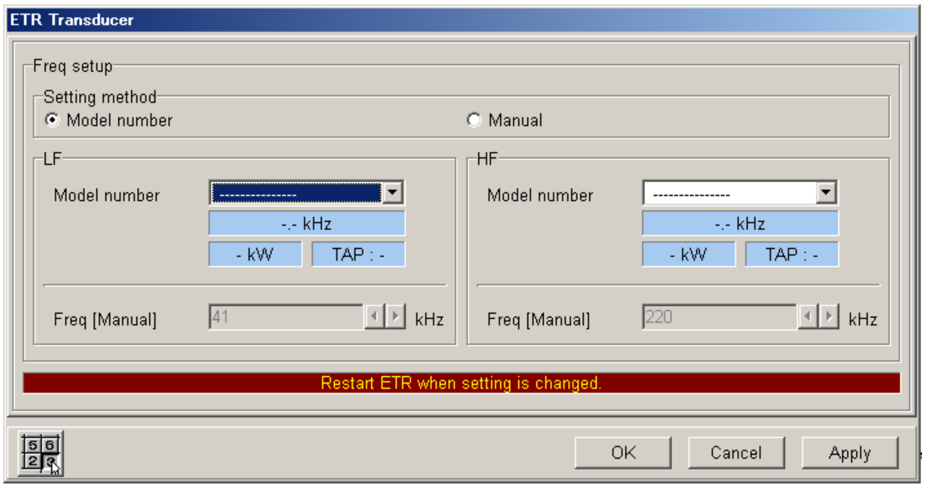
When connecting the network sounder ETR-30N, set the transducer (frequency) and network.

Transducer (frequency) setting

1. Click **ETR** in the **File** menu to show the ETR window.
2. Hold down [F1] and [F4] key and click the **System** in the ETR window.


ETR [Connection confirmed...]
File
Disp
Setting
System
M/Z
TX/RX...
Compensation...
Color...
Unit
Communication...
Transducer...
Network...
Test / Initialization

3. Click **Transducer** to show the ETR Transducer window.


ETR Transducer
Freq setup
Setting method
LF
HF
OK
Cancel
Apply

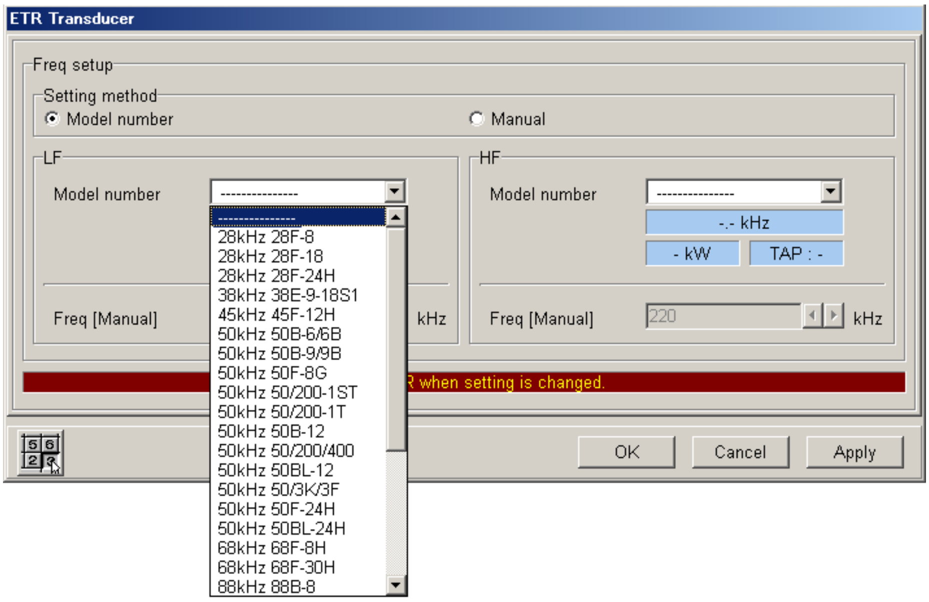
● Model number ○ Manual

LF
Model number: ---------------
-.- kHz
- kW
TAP : -
Freq [Manual]: 41 kHz

HF
Model number: ---------------
-.- kHz
- kW
TAP : -
Freq [Manual]: 220 kHz

Restart ETR when setting is changed.

4. If the transducer to be used is programmed in the FCV-30, choose **Model number** in the Setting method box, and choose the model in LF or HF box.


ETR Transducer
Freq setup
Setting method
LF
Model number

28kHz 28F-8
28kHz 28F-18
28kHz 28F-24H
38kHz 38E-9-18S1
45kHz 45F-12H
50kHz 50B-6/6B
50kHz 50B-9/9B
50kHz 50F-8G
50kHz 50/200-1ST
50kHz 50/200-1T
50kHz 50B-12
50kHz 50/200/400
50kHz 50BL-12
50kHz 50/3K/3F
50kHz 50F-24H
50kHz 50BL-24H
68kHz 68F-8H
68kHz 68F-30H
88kHz 88B-8
Freq [Manual]
kHz
HF
Model number

-.- kHz
- kW
TAP : -
Freq [Manual]
kHz
OK
Cancel
Apply

Setting method: ● Model number ○ Manual

HF Freq [Manual]: 220 kHz

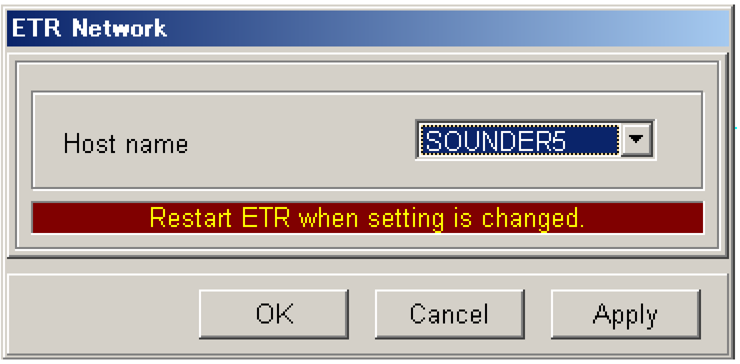
R when setting is changed.

Note: Change the tap inside the ETR-30N according to the character which appears next to "TAP": A to D displayed beneath the frequency. For details, see the Operator's Manual for the ETR-30N.

5. If the transducer is not programmed in the FCV-30, choose **Manual** in the Setting method box, and enter the frequency manually by the keyboard or use ◄ or ► button (Setting range: 25 to 220 kHz).
6. Click the **Apply** button and then the **OK** button.

Network Setting

1. Hold down [F1] and [F4] key and click the **System** in the ETR window.
2. Click Network to show the ETR Network window.


ETR Network
OK
Cancel
Apply

Host name: SOUNDER5

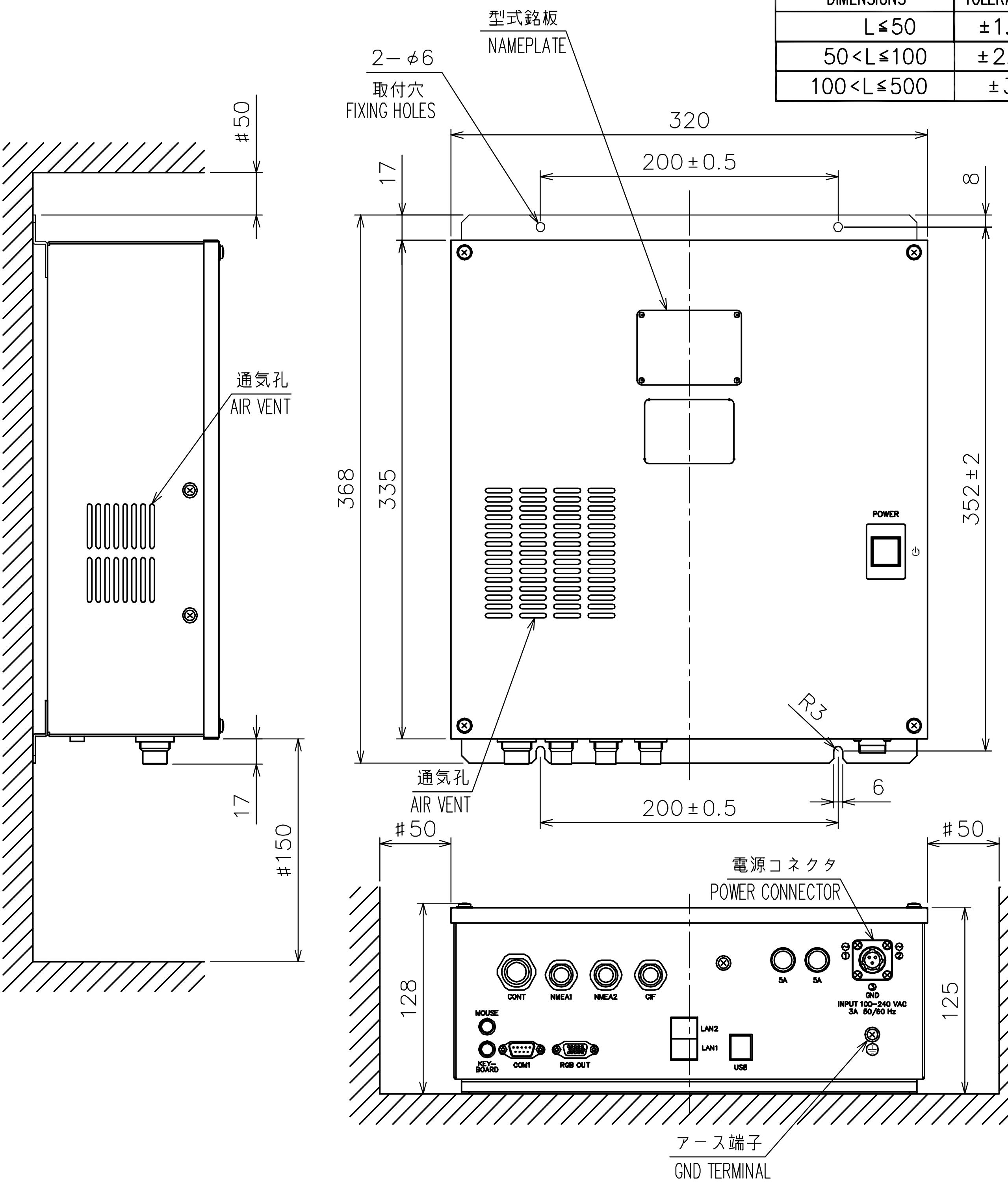
Restart ETR when setting is changed.

3. Choose the Host name from the drop-down menu according to ETR-30N setting. Choose **SOUNDER** when Host name of ETR-30N is 0, and choose **SOUNDER 1** when Host name of ETR-30N is 1, etc. For details, see the Operator's Manual for ETR-30N.
4. Click the **Apply** button and then the **OK** button.

Note: After changing setting, reboot ETR-30N.

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


型式銘板
NAMEPLATE
2−φ6
取付穴
FIXING HOLES
#50
320
200±0.5
17
8
通気孔
AIR VENT
368
335
352±2
POWER
R3
通気孔
AIR VENT
17
#150
6
200±0.5
#50
#50
電源コネクタ
POWER CONNECTOR
128
125
CONT
NMEA1
NMEA2
CIF
5A
5A
GND
INPUT 100-240 VAC
3A 50/60 Hz
MOUSE
KEY-BOARD
COM1
RGB OUT
LAN2
LAN1
USB
アース端子
GND TERMINAL

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Ｍ５ボルトを使用のこと。
4） 通気孔（２ヵ所）の前は塞がないこと。

NOTE

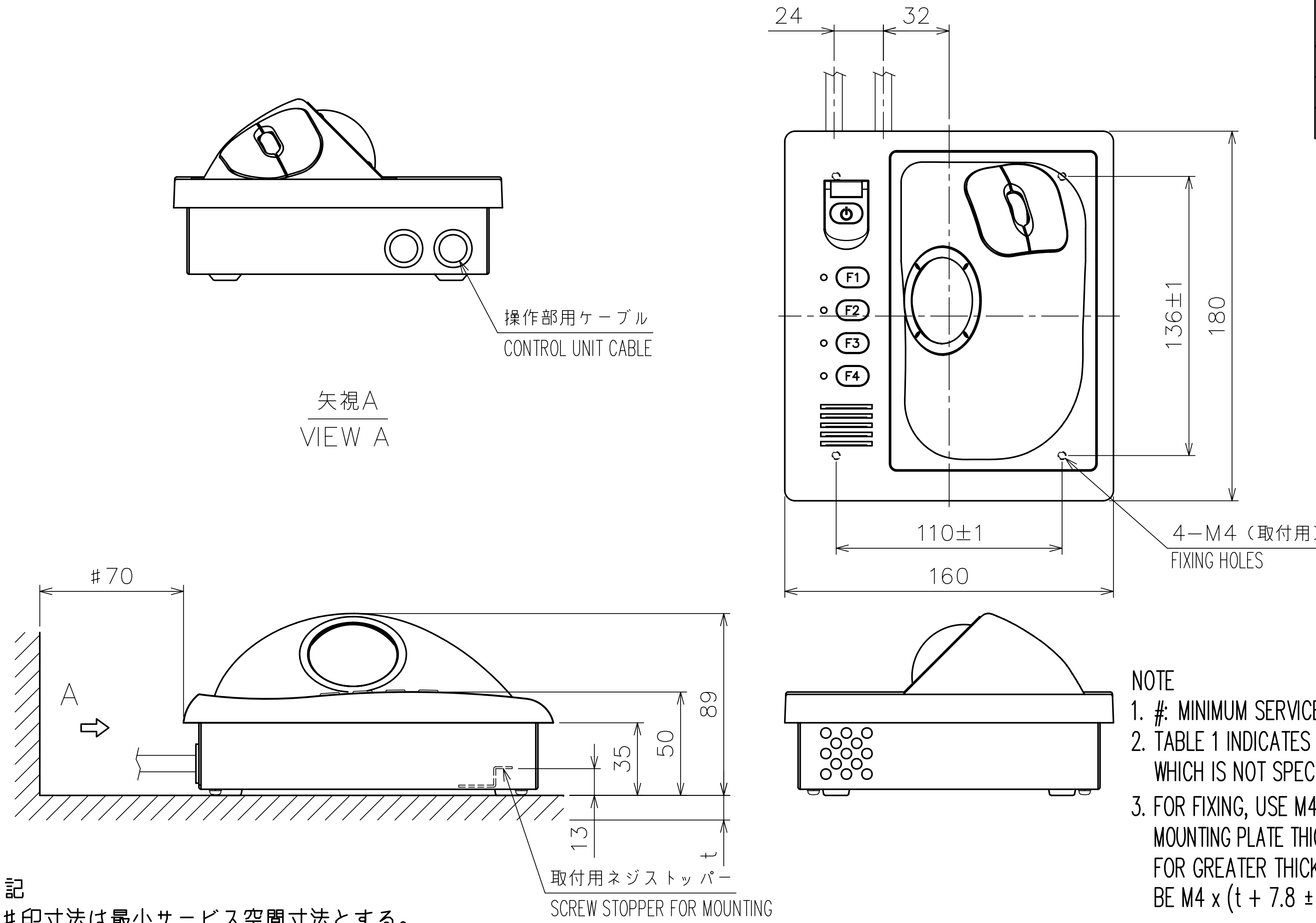
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M5 BOLTS FOR FIXING THE UNIT.
4. DO NOT OBSTRUCT VENTS (2).

DRAWN Jan. 19, '05 E. MIYOSHI			TITLE CV-300
CHECKED TAKAHASHI. T			名称 演算部（壁掛け装備）
APPROVED Y. Hatai	FCV-30		外寸図
SCALE 1/4	MASS 7.5 ±10% kg		NAME PROCESSOR UNIT (BULKHEAD MOUNT TYPE)
DWG.No. C2373-G02- A	02-153-100G- 0		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

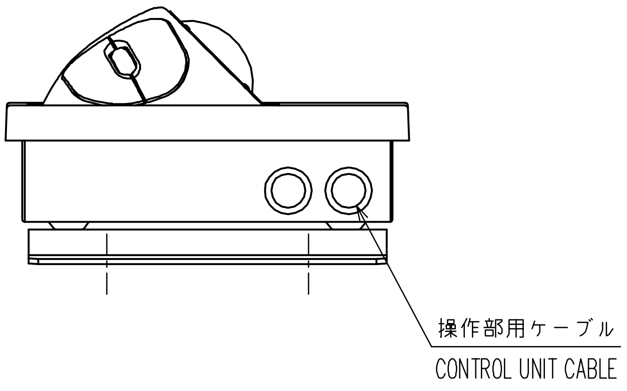

24
32
F1
F2
F3
F4
136±1
180
110±1
160
4−M4（取付用）
FIXING HOLES
操作部用ケーブル
CONTROL UNIT CABLE
矢視A
VIEW A
#70
A
89
50
35
13
t
取付用ネジストッパー
SCREW STOPPER FOR MOUNTING

NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. FOR FIXING, USE M4x12 SCREWS.
MOUNTING PLATE THICKNESS SHALL BE BETWEEN 2 AND 5 MM.
FOR GREATER THICKNESS, SCREW LENGTH SHALL BE M4 x (t + 7.8 ±2).

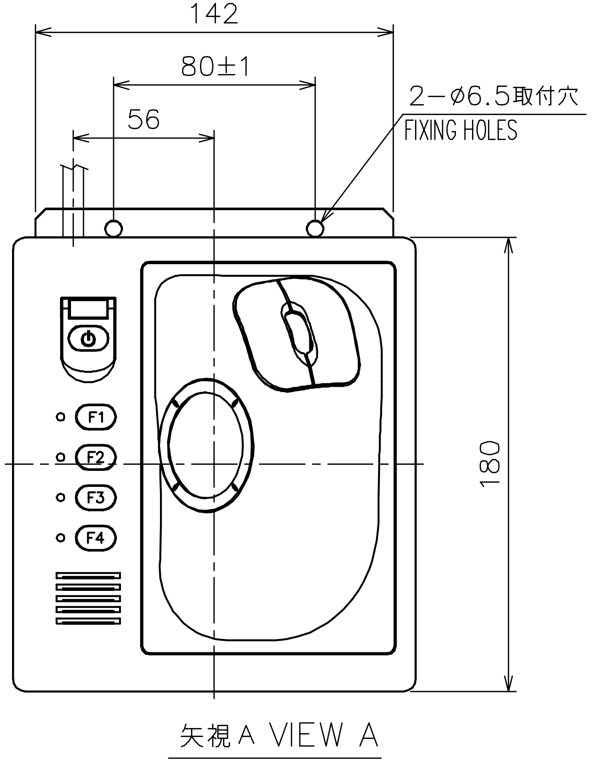
注　記
1） ＃印寸法は最小サービス空間寸法とする。
2） 指定外の寸法公差は表１による。
3） 取付用ネジは、セムスネジＢ M4X12を使用のこと。
取付面板厚は最小２最大５とする。
それ以外はネジ長さＭ４Ｘ（ｔ＋７．８±２）のセムスＢを使用のこと。

DRAWN	Jul. 17, '06 Maki	TITLE	CV-301
CHECKED	TAKAHASHI. T	名称	操作部（卓上装備）
APPROVED	Y. Hatai	FCV-30	外寸図
SCALE 1/3	MASS 1.8 ±10% kg	質量は5mケーブル重さを含む。 MASS W/ 5m CABLE	NAME CONTROL UNIT (TABLETOP MOUNT)
DWG.No.	C2373-G03- C	02-153-200G-1	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.


操作部用ケーブル
CONTROL UNIT CABLE

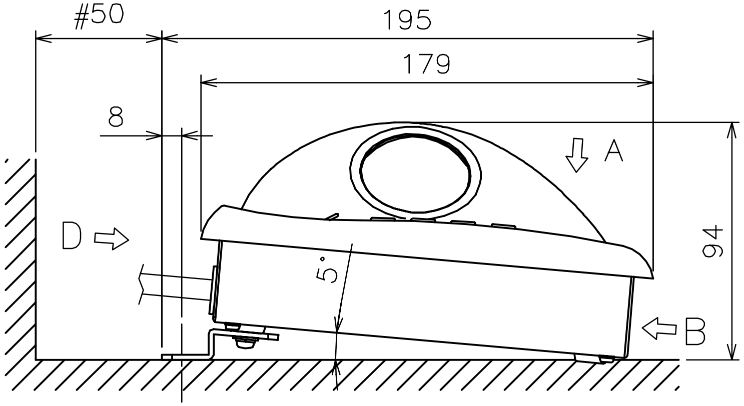
矢視D
VIEW D

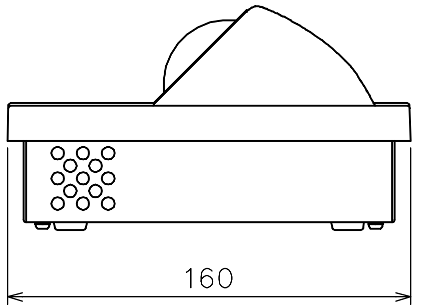

142
80±1
56
2−ø6.5取付穴
FIXING HOLES
F1
F2
F3
F4
180

矢視A VIEW A

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


#50
195
179
8
A
D
5°
B
94



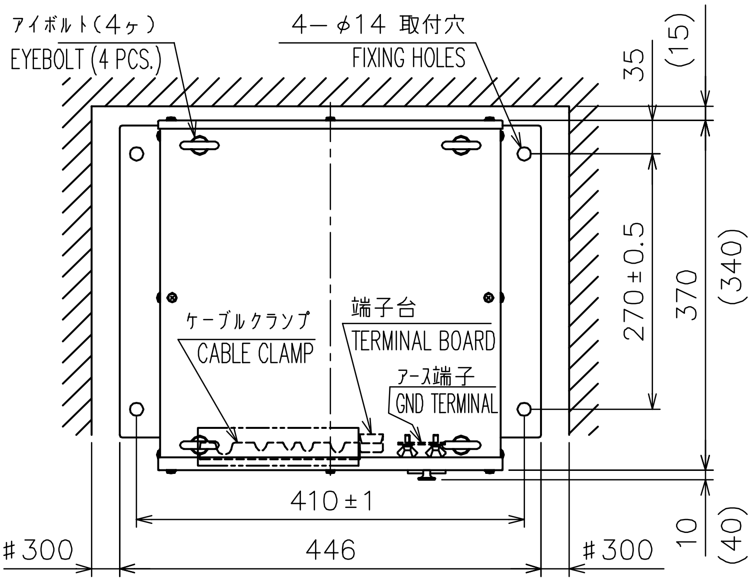
矢視B
VIEW B

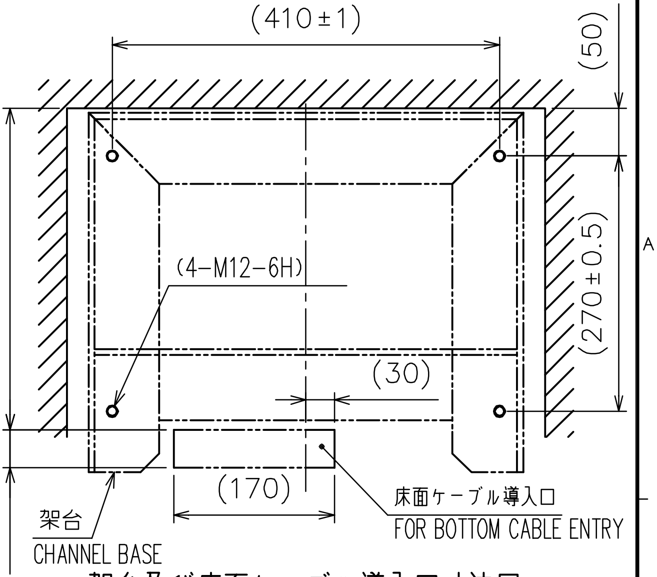
注　記　1）＃印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表１による。
3）取付用ネジはトラスタッピンネジ呼び径６、またはＭ６ボルトを使用のこと。

NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. FOR FIXING, USE M6 SELF-TAPPING SCREWS OR M6 BOLTS.

DRAWN Jan. 27, '05 E. MIYOSHI			TITLE	CV-301
CHECKED TAKAHASHI. T			名称	操作部（卓上装備金具付）
APPROVED Y. Hatai		FCV-30		外寸図
SCALE 1/3	MASS 1.8 ±10% kg	質量は5mケーブル重さを含む。 MASS W/ 5m CABLE	NAME	CONTROL UNIT (TABLETOP w/MOUNTING FIXTURE)
DWG.No. C2373-G06- A		02-153-201G-0		OUTLINE DRAWING

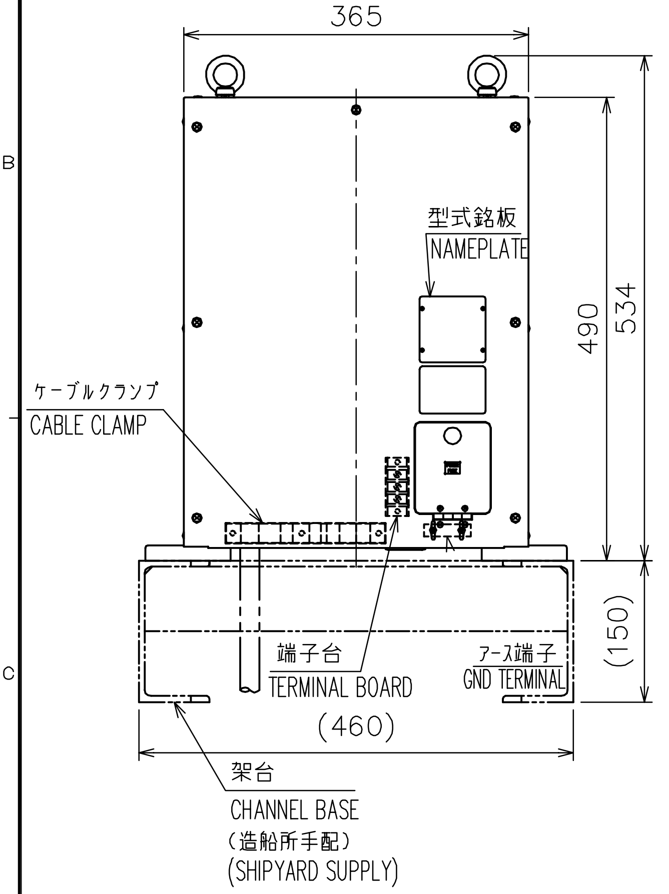
FURUNO ELECTRIC CO., LTD.


アイボルト（4ヶ）
EYEBOLT (4 PCS.)
4－φ14 取付穴
FIXING HOLES
35
(15)
270±0.5
370
(340)
ケーブルクランプ
CABLE CLAMP
端子台
TERMINAL BOARD
アース端子
GND TERMINAL
410±1
#300
446
#300
10
(40)


(410±1)
(50)
(4-M12-6H)
(270±0.5)
(30)
(170)
架台
CHANNEL BASE
床面ケーブル導入口
FOR BOTTOM CABLE ENTRY

架台及び床面ケーブル導入口寸法図

CHANNEL BASE & DECK-SIDE CABLE ENTRY


365
490
534
型式銘板
NAMEPLATE
ケーブルクランプ
CABLE CLAMP
(150)
端子台
TERMINAL BOARD
アース端子
GND TERMINAL
(460)
架台
CHANNEL BASE
（造船所手配）
(SHIPYARD SUPPLY)

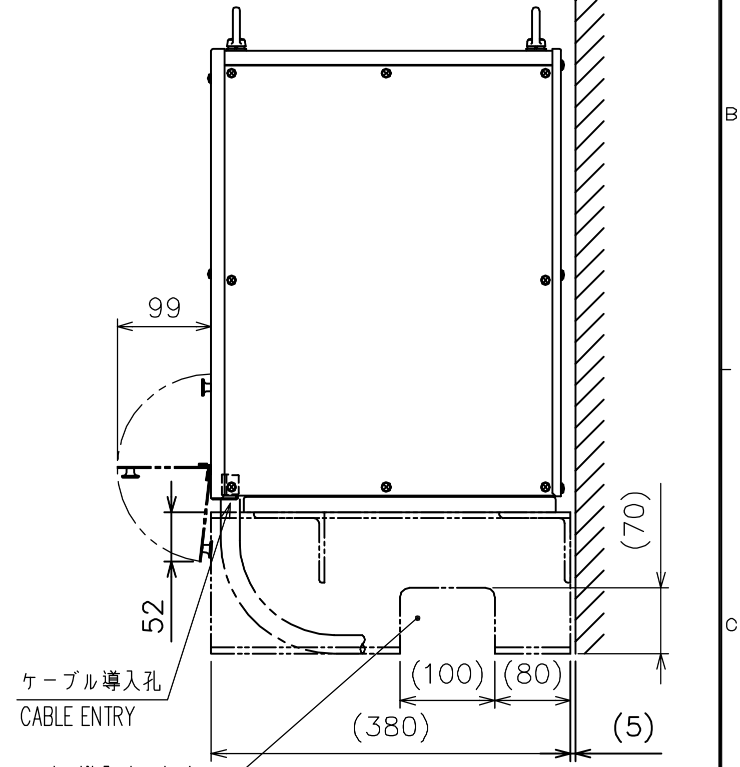

99
52
(70)
ケーブル導入孔
CABLE ENTRY
(100)
(80)
(380)
(5)
ケーブル導入孔（架台）
CABLE ENTRY (CHANNEL BASE)

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Ｍ１２ボルト（材質：ＳＵＳ３０４）を使用のこと。
4）　架台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、
架台取付けの場合架台は造船所手配とする。（架台材質：ＳＳ４００）

NOTE

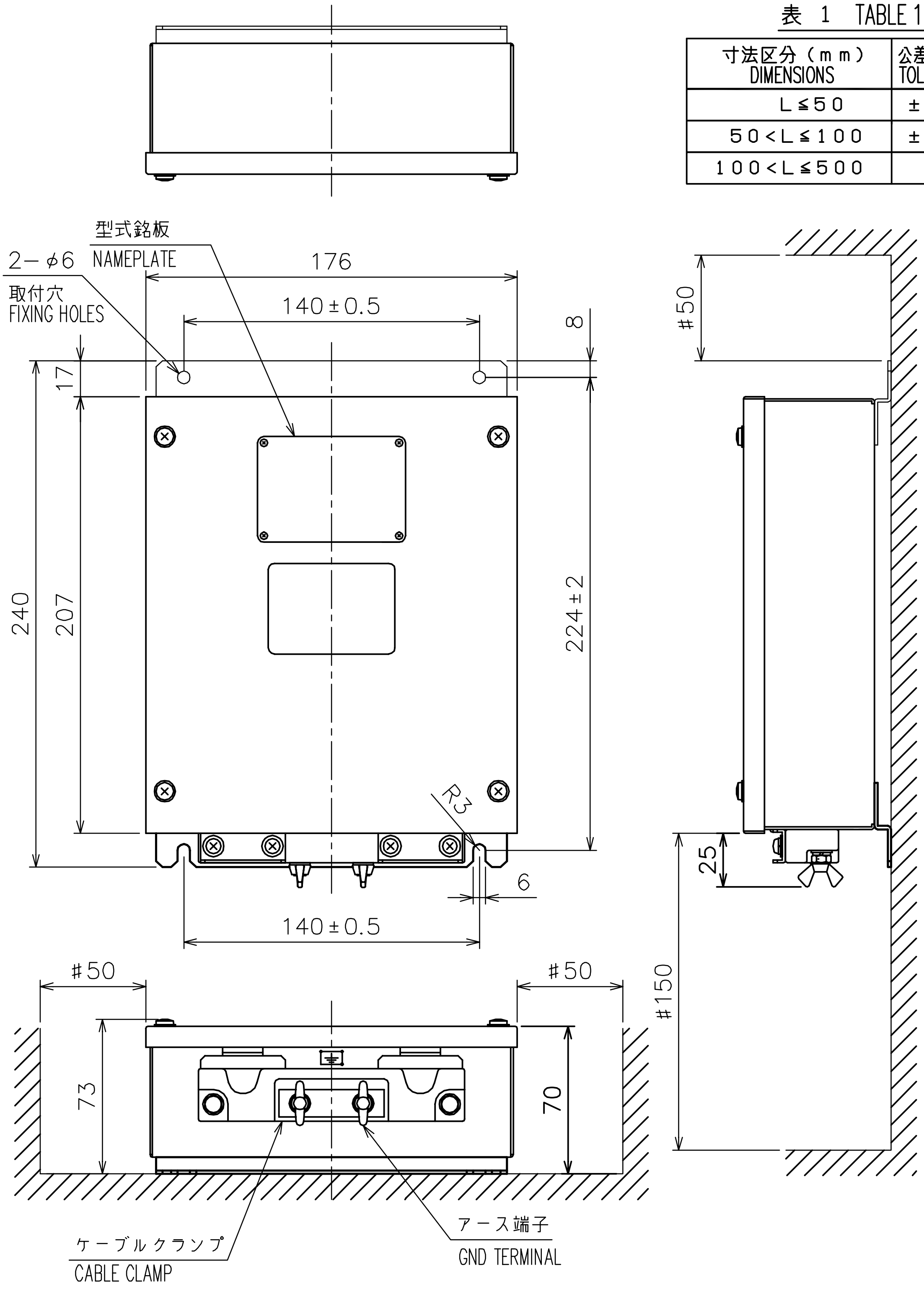
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M12 BOLTS (SUS 304) FOR FIXING.
4. DIMENSIONS OF MOUNTING BASE AND DECK SIDE CABLE ENTRANCE SHOWN FOR REFERENCE.
USE DECK SIDE CABLE ENTRANCE WHEN MOUNTING DIRECTLY ON DECK.
MOUNTING BASE SHOULD BE SUPPLIED LOCALLY. (MATERIAL: SS400)

DRAWN Jan. 27, '05 E. MIYOSHI		TITLE	CV-302
CHECKED TAKAHASHI. T		名称	送受信装置（床置きタイプ）
APPROVED Y. Hatai	FCV-30		外寸図
SCALE 1/8 MASS 34 ±10% kg		NAME	TRANSCEIVER UNIT (DECK MOUNT TYPE)
DWG.No. C2373-G04- A	02-153-300G- 1		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


型式銘板
NAMEPLATE
2−φ6
取付穴
FIXING HOLES
176
140±0.5
8
17
240
207
224±2
R3
6
140±0.5
#50
#50
73
70
#50
25
#150
ケーブルクランプ
CABLE CLAMP
アース端子
GND TERMINAL

注　記

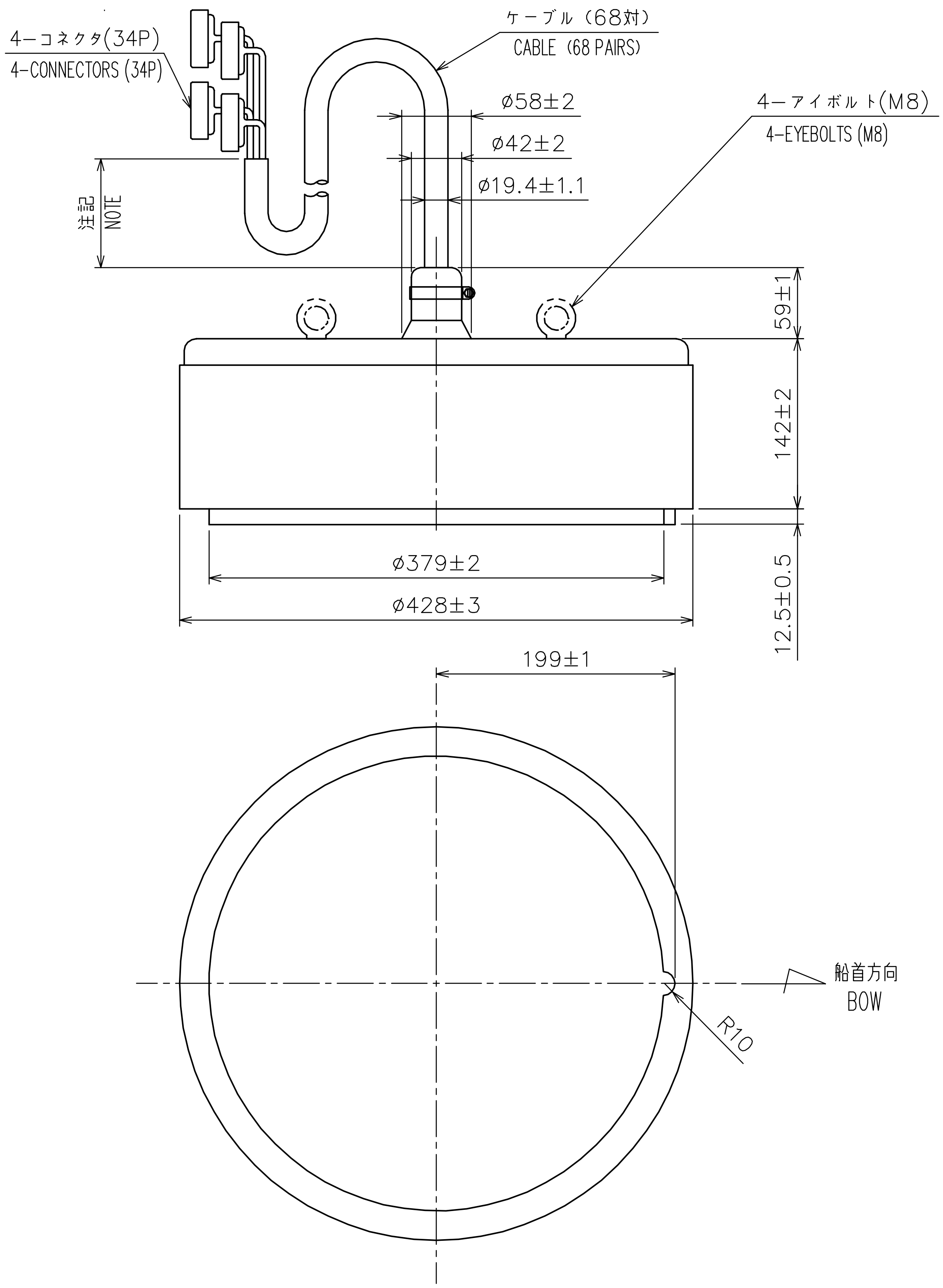
１）＃印寸法は最小サービス空間寸法とする。
２）指定外の寸法公差は表１による。
３）取付用ボルトはＭ５を使用のこと。

NOTE

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

DRAWN Jan. 19, '05 E. MIYOSHI		TITLE	CV-304
CHECKED TAKAHASHI. T		名称	接続箱（壁掛けタイプ）
APPROVED Y. Hatai	FCV-30		外寸図
SCALE 1/3	MASS 1.6 $^{\pm 10\%}$ kg	NAME	JUNCTION BOX (BULKHEAD MOUNT TYPE)
DWG.No. C2375-G05- A	02-153-500G- 0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.


ケーブル（68対）
CABLE (68 PAIRS)
4ーコネクタ(34P)
4-CONNECTORS (34P)
ø58±2
ø42±2
ø19.4±1.1
4ーアイボルト(M8)
4-EYEBOLTS (M8)
注記
NOTE
59±1
142±2
12.5±0.5
ø379±2
ø428±3
199±1
船首方向
BOW
R10

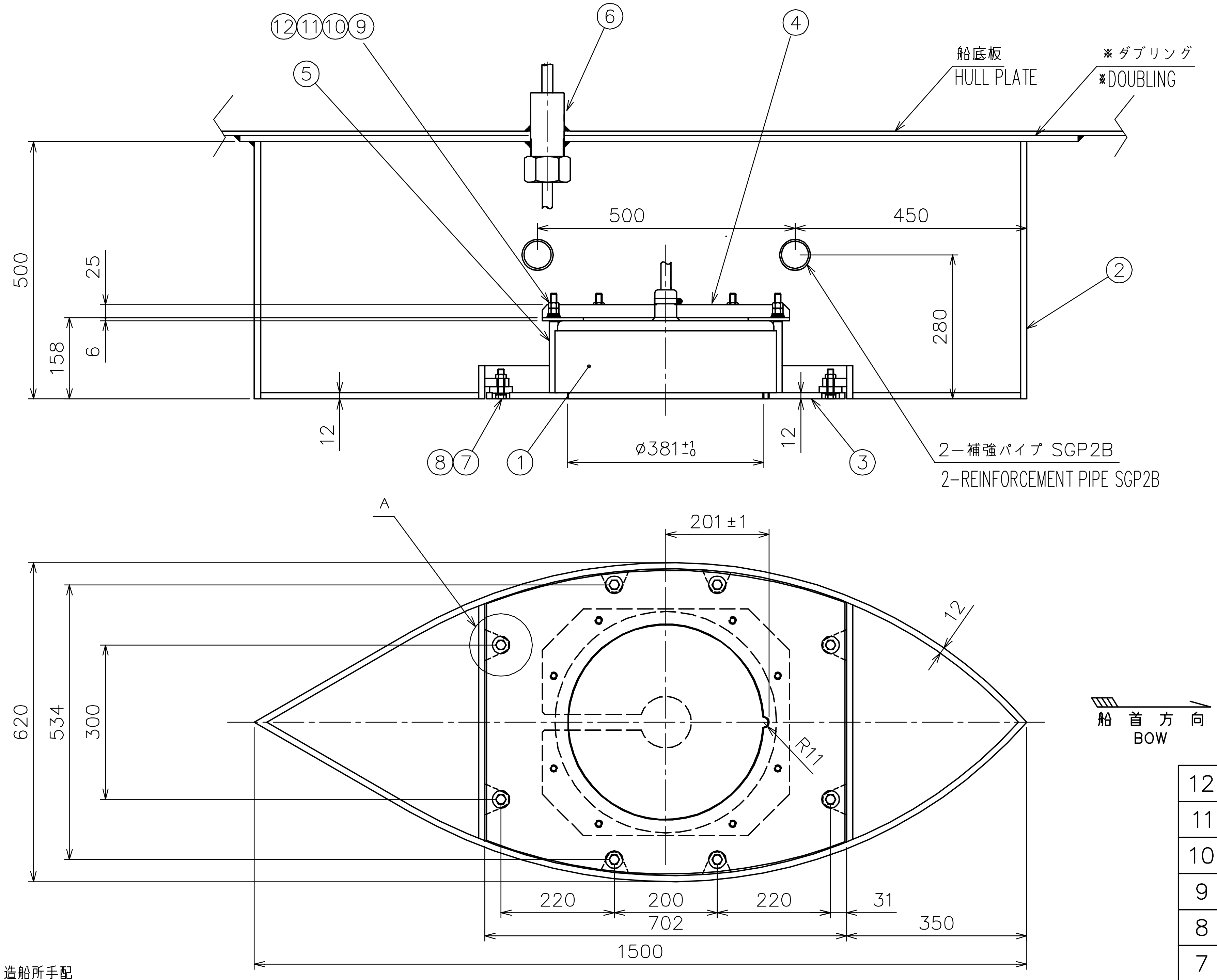
注　記　ケーブル長は、１５$^{+0.3}_{0}$ m

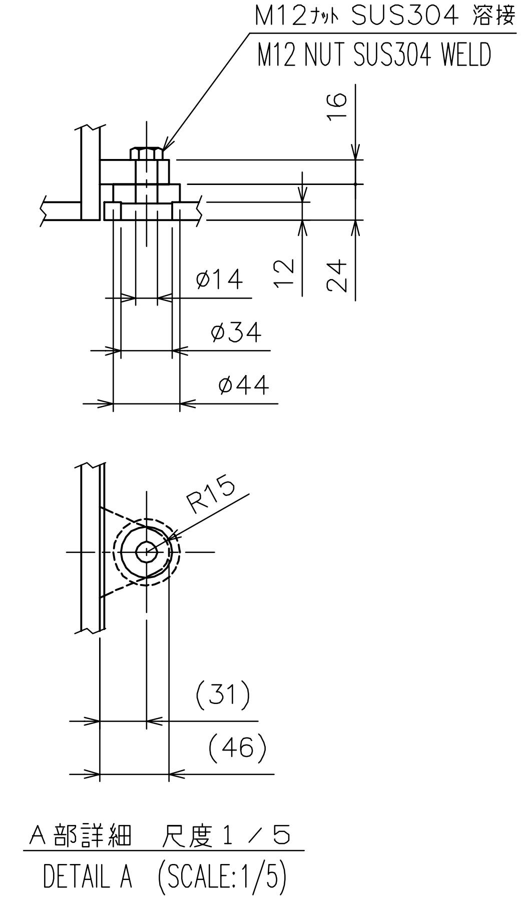
NOTE　CABLE LENGTH IS $15^{+0.3}_{0}$ m

DRAWN	Mar. 22, '05 E. MIYOSHI			TITLE	CV-303
CHECKED	TAKAHASHI. T			名称	送受波器
APPROVED	Y. Hatai	FCV-30			外寸図
SCALE 1/5	MASS 42 ±10% kg	質量は、ケーブルを含む。 MASS INCLUDES CABLE.		NAME	TRANSDUCER
DWG.No.	C2373-G01-A	02-153-400G-2			OUTLINE DRAWING

FURUNO

	D-7
装備法分類番号 INSTALLATION METHOD	T–
周 波 数 FREQUENCY	/ kHz





A部詳細 尺度1/5
DETAIL A (SCALE:1/5)

表1 (Table1)

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
1000<L≤2000	±5
2000<L≤4000	±7
4000<L≤8000	±10
8000<L	±15

要 目 表 PRINCIPAL ITEMS		
位置 POSITION	船首から FROM BOW	m
	キールから FROM KEEL	mm
突出量H PROJECTION		mm
取付状態 FIXING CONDITION		走行時水平 HORIZONTAL AT RUNNING
保護タンク PROTECTION TANK		

品番 ITEM	品 名 NAME	材 質 MATERIAL	数量 Q'TY	図 番 DWG.NO.	摘 要 REMARKS
12	平座金 FLAT WASHER	POM	8	T-201-11	
11	平座金 FLAT WASHER	SUS316L	8	M12	
10	バネ座金 SPRING WASHER	SUS316L	8	M12	
9	六角ナット HEX.NUT	SUS316L	16	M12	
8	バネ座金 SPRING WASHER	SUS316L	8	M12	
7	六角ボルト HEX.BOLT	SUS316L	8	M12X50	
6	電線貫通金物 THRU-HULL PIPE		1	TFB-1600	
5	スペーサ SPACER	SGP	8	02-153-4303	
4	押え板 FIXING PLATE	SS400	1	02-153-4302	
3	送受波器取付フランジ FIXING FLANGE	SS400	1	02-153-4301	
2	タンク本体 CASING	SS400	1	02-080-2001	
1	送受波器 TRANSDUCER		1	CV-303	表記質量に含まず NOT INCLUDED IN MASS.

注　記１。※：造船所手配

２。切断・溶接の際は、歪み防止のため送受波器を取り外した状態の ”送受波器取付フランジ”を必ず取り付けておいてください。

３。電線貫通金物を溶接する際は、パッキンを取外して行ってください。

４。送受波器ケース取付の際には船首、船尾の確認をしてください。

５。船尾側上端に空気抜き用穴（ϕ１０～ϕ２０程度）をあけてください。

６。電線貫通金物はフレーム等の邪魔にならない所で送受波器に当たらずキャップナットが容易に締め付けられる位置に取り付けてください。

７。網除け、保護タンクは必要に応じて造船所にて製作してください。

８。装備後はサビ止め塗装をはがした後正規の塗装をおこなってください。

９。塗装の際、送受波器面を塗装しない様に注意してください。

１０。送受波器取付け後、A 部の隙間をシリコン等で埋めてください。

１１。指定外の寸法公差は、表１のとおりです。

１２。ボルト類には焼き付き防止グリス(モリシーラ１９１０等)を塗布してください。

１３。表記質量に送受波器の質量は、含まれていません。

NOTE 1. ※:SHIPYARD SUPLLY

2. TO AVOID DISTORTION BY HEAT, PUT "FIXING FLANGE" (WITHOUT TRANSDUCER) ONTO CASING WHILE CUTTING AND/OR WELDING.

3. REMOVE GASKET FROM THRU-HULL PIPE BEFORE WELDING.

4. CASING SHOULD FACE BOW DIRECTION.

5. MAKE A HOLE OF 10 TO 20MM IN DIA ON STERN SIDE TO ALLOW AIR TO ESCAPE FROM TANK.

6. ALLOW ENOUGH CLEARANCE AROUND THRU-HULL PIPE FOR EASY TIGHTENING AND SERVICING.

7. IF NECESSARY, PROVIDE NET PROTECTOR AND PROTECTION TANK (BY SHIPYARD.)

8. AFTER INSTALLATION, REMOVE ANTICORROSIVE PAINT FROM CASING AND THEN PAINT ACCORDING TO SHIPYARD INSTRUCTIONS.

9. DO NOT PAINT TRANSDUCER FACE.

10. "A": FILL GAP AROUND BOLT WITH SILICON SEALANT.

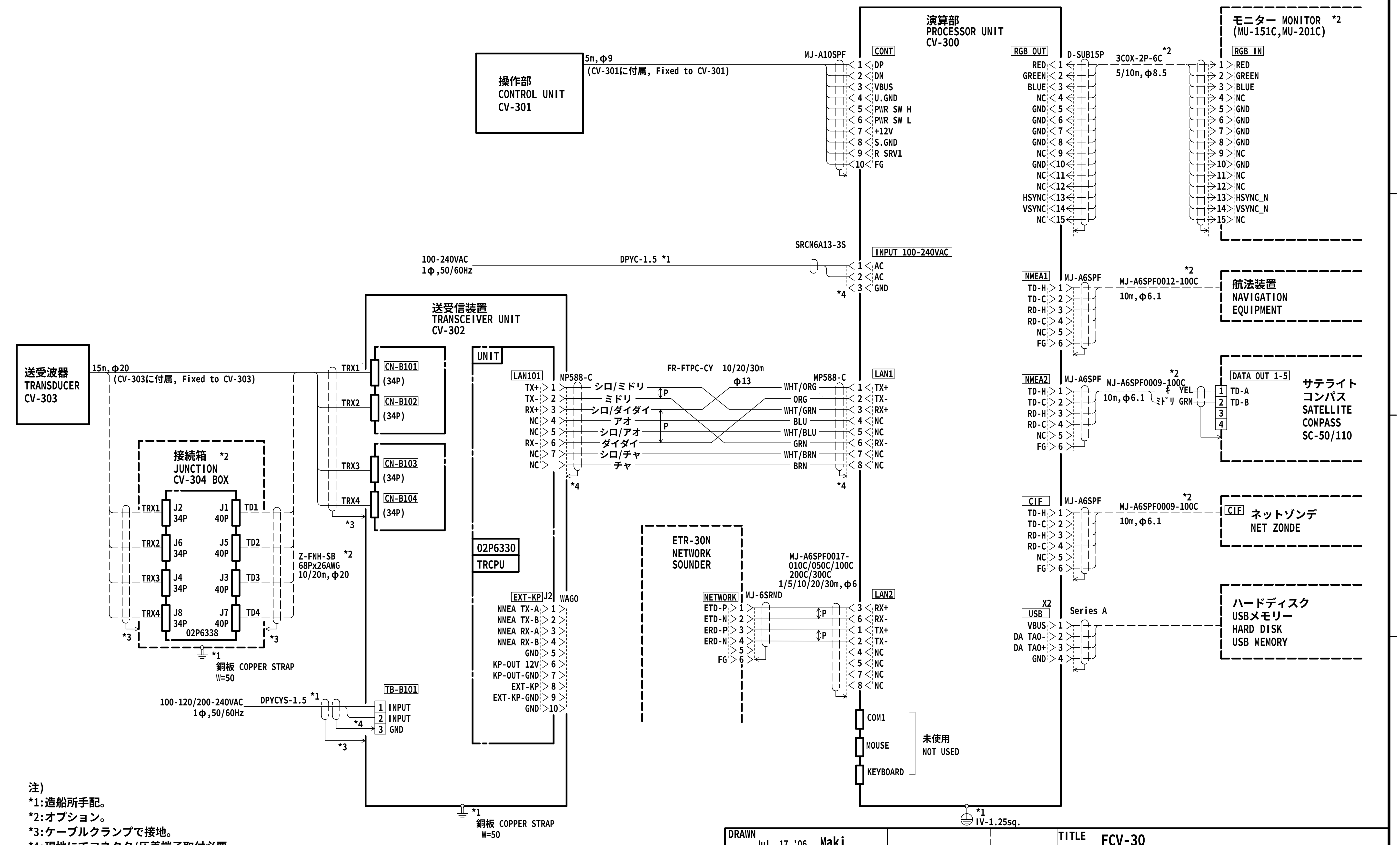
11. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

12. APPLY BURNPREVENTION GREASE TO BOLTS.

13. MASS SHOWN IS TANK WITHOUT TRANSDUCER.

DRAWN Apr. 5, '05	E. MIYOSHI	TITLE	T-625
CHECKED	TAKAHASHI. T	名称	送受波器
APPROVED	Y. Hatai	FCV-30	送受波器装備図
SCALE 1/10	MASS 215 ±10% kg	NAME	TRANSDUCER
DWG.No.	C2373-T01-C	02-153-4300-3	TRANSDUCER INSTALLATION

FURUNO ELECTRIC CO., LTD.


1
2
3
4
5
6
A
B
C
D
操作部
CONTROL UNIT
CV-301
5m,φ9
(CV-301に付属, Fixed to CV-301)
MJ-A10SPF
演算部
PROCESSOR UNIT
CV-300
CONT
1 DP
2 DN
3 VBUS
4 U.GND
5 PWR SW H
6 PWR SW L
7 +12V
8 S.GND
9 R SRV1
10 FG
RGB OUT
RED 1
GREEN 2
BLUE 3
NC 4
GND 5
GND 6
GND 7
GND 8
NC 9
GND 10
NC 11
NC 12
HSYNC 13
VSYNC 14
NC 15
D-SUB15P
3COX-2P-6C *2
5/10m,φ8.5
モニター MONITOR *2
(MU-151C,MU-201C)
RGB IN
1 RED
2 GREEN
3 BLUE
4 NC
5 GND
6 GND
7 GND
8 GND
9 NC
10 GND
11 NC
12 NC
13 HSYNC_N
14 VSYNC_N
15 NC
100-240VAC
1φ,50/60Hz
DPYC-1.5 *1
SRCN6A13-3S
INPUT 100-240VAC
1 AC
2 AC
3 GND
*4
NMEA1
TD-H 1
TD-C 2
RD-H 3
RD-C 4
NC 5
FG 6
MJ-A6SPF
MJ-A6SPF0012-100C *2
10m,φ6.1
航法装置
NAVIGATION
EQUIPMENT
送受信装置
TRANSCEIVER UNIT
CV-302
送受波器
TRANSDUCER
CV-303
15m,φ20
(CV-303に付属, Fixed to CV-303)
TRX1
TRX2
TRX3
TRX4
CN-B101 (34P)
CN-B102 (34P)
CN-B103 (34P)
CN-B104 (34P)
*3
UNIT
LAN101
TX+ 1
TX- 2
RX+ 3
NC 4
NC 5
RX- 6
NC 7
NC 8
MP588-C
シロ/ミドリ
ミドリ
シロ/ダイダイ
アオ
シロ/アオ
ダイダイ
シロ/チャ
チャ
P
FR-FTPC-CY 10/20/30m
φ13
MP588-C
WHT/ORG
ORG
WHT/GRN
BLU
WHT/BLU
GRN
WHT/BRN
BRN
LAN1
1 TX+
2 TX-
3 RX+
4 NC
5 NC
6 RX-
7 NC
8 NC
NMEA2
TD-H 1
TD-C 2
RD-H 3
RD-C 4
NC 5
FG 6
MJ-A6SPF
MJ-A6SPF0009-100C *2
10m,φ6.1
キ YEL
ミドリ GRN
DATA OUT 1-5
1 TD-A
2 TD-B
3
4
サテライト
コンパス
SATELLITE
COMPASS
SC-50/110
CIF
TD-H 1
TD-C 2
RD-H 3
RD-C 4
NC 5
FG 6
MJ-A6SPF
MJ-A6SPF0009-100C *2
10m,φ6.1
CIF
ネットゾンデ
NET ZONDE
接続箱 *2
JUNCTION
CV-304 BOX
TRX1 J2 34P
TRX2 J6 34P
TRX3 J4 34P
TRX4 J8 34P
J1 40P TD1
J5 40P TD2
J3 40P TD3
J7 40P TD4
02P6338
Z-FNH-SB *2
68Px26AWG
10/20m,φ20
*1
銅板 COPPER STRAP
W=50
02P6330
TRCPU
EXT-KP J2
WAGO
NMEA TX-A 1
NMEA TX-B 2
NMEA RX-A 3
NMEA RX-B 4
GND 5
KP-OUT 12V 6
KP-OUT-GND 7
EXT-KP 8
EXT-KP-GND 9
GND 10
ETR-30N
NETWORK
SOUNDER
NETWORK
ETD-P 1
ETD-N 2
ERD-P 3
ERD-N 4
5
FG 6
MJ-6SRMD
MJ-A6SPF0017-
010C/050C/100C
200C/300C
1/5/10/20/30m,φ6
LAN2
3 RX+
6 RX-
1 TX+
2 TX-
4 NC
5 NC
7 NC
8 NC
X2
USB
VBUS 1
DA TAO- 2
DA TAO+ 3
GND 4
Series A
ハードディスク
USBメモリー
HARD DISK
USB MEMORY
100-120/200-240VAC
1φ,50/60Hz
DPYCYS-1.5 *1
TB-B101
1 INPUT
2 INPUT
3 GND
*4
*3
COM1
MOUSE
KEYBOARD
未使用
NOT USED
*1
銅板 COPPER STRAP
W=50
*1
IV-1.25sq.

注)
*1:造船所手配。
*2:オプション。
*3:ケーブルクランプで接地。
*4:現地にてコネクタ/圧着端子取付必要。

NOTES)
*1:SHIPYARD SUPPLY
*2:OPTION
*3:GROUND THROUGH CABLE CLAMP.
*4:FIX CONECTORS/CRIMP-ON LUGS AT FIELD.

DRAWN Jul .17,'06	Maki		TITLE	FCV-30
CHECKED	TAKAHASHI.T		名 称	カラー魚群探知機
APPROVED	H. Hatai			相互結線図
SCALE	MASS kg		NAME	COLOR SOUNDER
DWG No.	C2373-C01- E			INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.