



KODEN

OPERATION MANUAL

Digital

COLOR ECHO SOUNDER

CVS-126



This product is specifically designed to be installed on boats and other means of maritime transport. If your country forms part to the EU, please contact your dealer for advice before attempting to install elsewhere.



Declaration of Conformity

(As required by Article 7 (1) of Directive 89/336/EEC)

Declares under his sole responsibility that the produced Echo Sounder manufactured by

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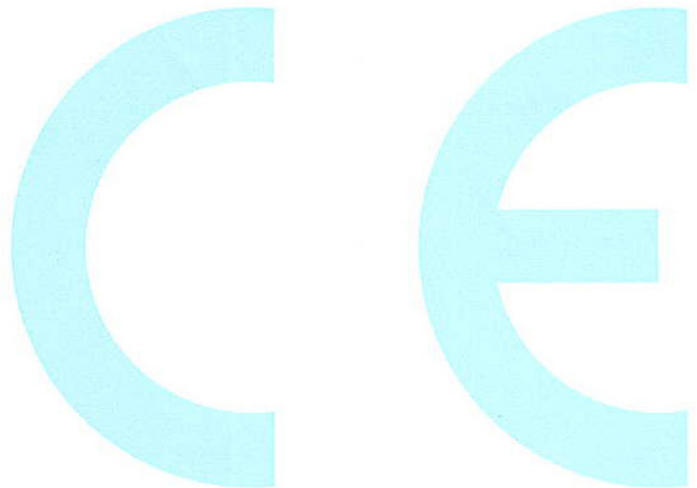
Identified by the type number **CVS-126** to which this declaration refers conforms to the requirements of Directive 89/336/EEC amended by 92/31/EEC and 93/68/EEC and is in conformity with the EMC, Health and Safety standards of

EN60945: 2002

Signed
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Dated **10 Jun. 2008**

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N.B. As this product is for Maritime use compliance with Directive 72/23/EEC is not required.

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For Your Safe Operation



Pictorial used in this Instruction Manual

This Instruction Manual uses the following pictorials. Understand the meaning of each pictorial and implement the maintenance and inspection.







Symbol	Meaning
 Warning	Mark for warning This symbol denotes that there is a risk of death or serious injury when not dealing with it correctly.
	Mark for danger high voltage This symbol denotes that there is a risk of death or serious injury caused by electric shock when not dealing with it correctly.
 Caution	Mark for caution This symbol denotes that there is a risk of slight injury or damage of device when not dealing with it correctly.
	Mark for prohibition This symbol denotes prohibition of the specified conduct. Description of the prohibition is displayed near the mark.

Caution Item on Handling

 Warning	Do not disassemble or modify. It may leads to trouble, fire, smoking or electric shock. In case of trouble, contact our dealer or our company.
 Warning	In case of smoke or fire, boat power off and the power of this unit. It may cause fire, electric shock or damage.
	Be cautious of remaining high voltage. A high voltage may remain in the capacitor for several minutes after you have powered off. Before inspecting inside, wait at least 5 minutes after powering off or discharge the remaining electricity in an appropriate manner. Then, start the work.
 Caution	The information displayed in this unit is not provided directly for your navigation. For your navigation, be sure to see the specified material.

 Caution	Use the specified fuse. If un-specified fuse is used, it may cause a fire, smoke or damage.
 Caution	Whenever transmitting, be sure to submerge the transducer in water first. If transmitted without submerging the transducer, it may be damaged.

Caution Item on Equipment

	Be careful of a high voltage inside. A high voltage, which may risk your life, is used. This high voltage remains in the circuit after you have powered off switch. To prevent touching the high voltage circuit inadvertently, the hard cover is provided to the high voltage circuit and the high voltage caution label is affixed. Ensure to power off switch for your safety and discharge the electricity remaining in the capacity before starting to check. An engineer authorized by our company should inspect and maintain
 Warning	Be sure to power off in the boat. If the power switch is inadvertently powered on during work, you will be electrified. To prevent such accident from occurring, ensure to power off in the boat and the power of equipment. Furthermore, it is safer to hang the caution tag described as [Under Work] near the power switch of equipment.
 Warning	Be careful of dust Inhaling dust may cause A respiratory disease. When cleaning the inside of equipment, be careful not to inhale dust. Wearing a safety mask is recommended.
 Caution	Caution on location of equipment Do not install the equipment where it is excessively damp and suffers from excessive water drops.
 Caution	Escaping from static electricity The static electricity may be generated from the carpet on the floor in the cabin or clothes made of synthetic fiber. The static electricity may destroy the electronic parts on the circuit board. Handle the circuit board, taking the measure of static electricity free.
 Caution	Install the transducer at the location where it is not affected by bubble and noise The bubble and noise seriously degrade the performance of this unit.

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Introduction

The CVS-126 is a Dual frequency (50kHz/200kHz) Color LCD display echo sounder.

This unit equipped with digital process displays the circumstance in the water under all conditions, matching with the high luminance 5.7 inch LCD.

The main features of this unit are as follows.

- With the digital reception process, the compatibility of the high resolution in a shallow depth and the noise rejection capability in a deep depth are established. The auto mode function provides the best image.
- The unit can be installed in an open bridge and is highly waterproof.
- Up to 10 images can be stored. If you connect the optional GPS, the homing function, that directs your board to navigate easily to the location desired, is available by marking the event mark when recalling the stored image.
- The unit is designed to save power consumption. The white LED is adopted for illuminating the LCD and the power consumption is minimal in this class. The unit emits less heat and the occurrence of condensation is rare.
- The various alarm functions are available. (Bottom, school of fish, water temperature*, board speed*, arrival*, XTE*, power) (Note: The mark * denotes that the connection of option is mandatory)
- When flush-mounting, the unit can be easily installed from front side.

System Configuration

Connection Diagram

CVS-126 Display unit



GPS sensor

GPS-20A

External Navigation Equipment
 External water temperature meter
 External speaker (For speaker with amplifier)
 (Prepared by a user)

TD: transducer
 * (Inner-hull, through-hull)

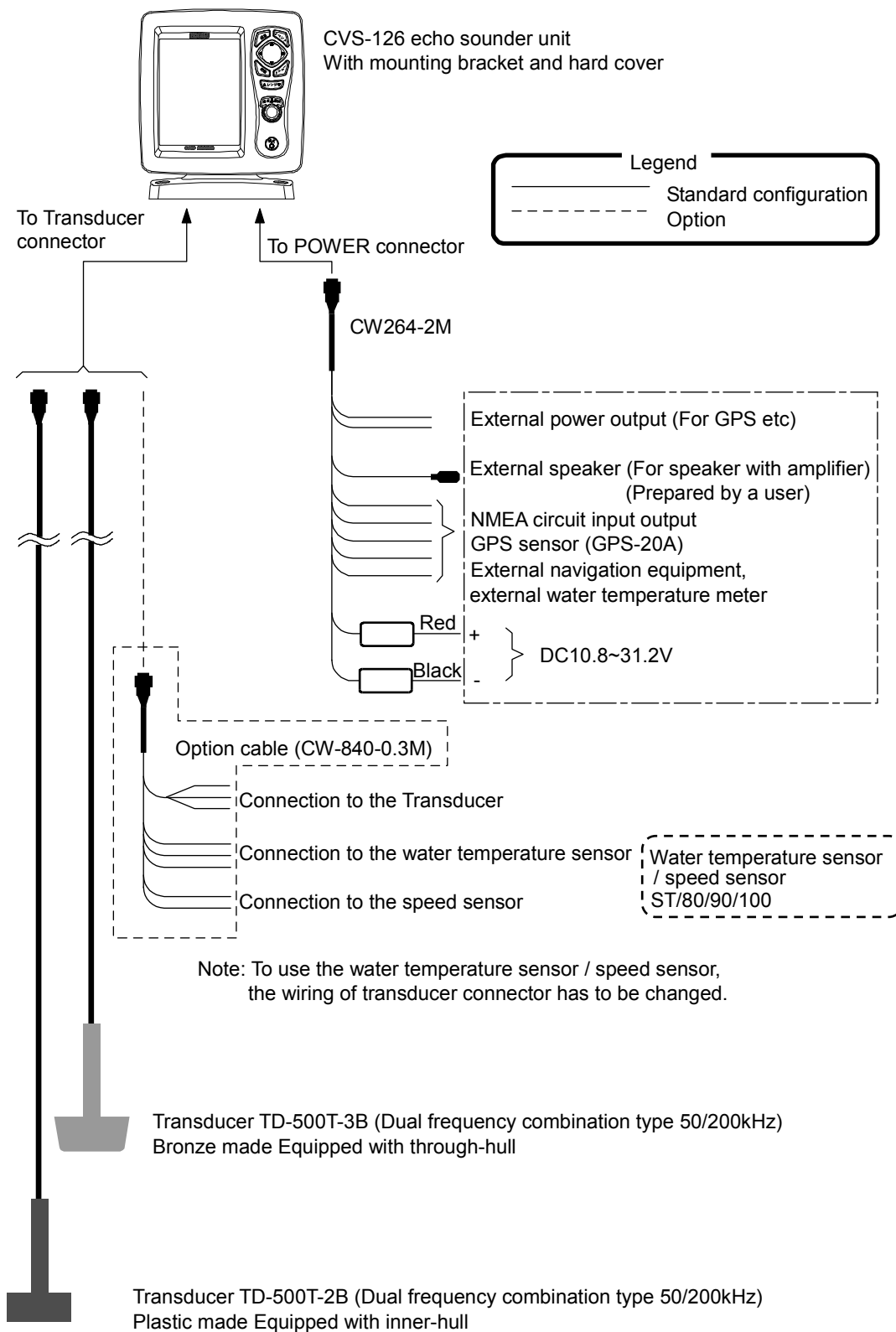
- * TD-500T-2B (Inner-hull)
 - * TD-500T-3B (through-hull)
- (Dual frequency combination type 50/200kHz)

Water temperature sensor / speed sensor
ST-80/90/100

Requirement: Option cable (CW-840-0.3M)
 Note: To use the water temperature sensor / speed sensor, the wiring of transducer connector has to be changed.


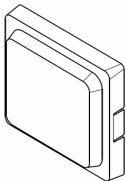

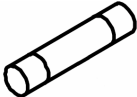
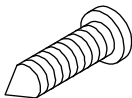
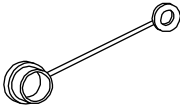
DC10.8-31.2V

————— : Standard
 - - - - - : Option



Configuration of Equipment

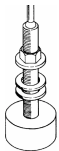
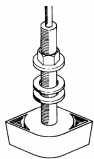
Standard Equipment Configuration List

No	Name of item	Type	Remark	Weight/ Length	Quantity
1	Transmission-receiver display unit 	CVS-126	600W output with mounting bracket and knob	1.3 kg	1
2	Hard cover 	C38MB12020		150g	1
3	DC power cable (Complex cable) 	CW-264-2M	With 12 connector at one end/ un-treated at the other end	2m	1
4	Fuse 	F-7161-2A Cylinder (ø6.3x32)	Normal fusion type for main power		2
5	Trans Tapping Screw 	TPT5 x 20U	For fixing CVS-126 Display unit		4
6	Cap 	LTWCAP-DABCFXC1	For transducer cable connector		1
7	Instruction Manual	CVS-126.OM.E	English		1
8	Quick Reference	CVS-126.QR.E	English		1

Essential Option

No	Name of item	Type	Remark	Weight/ Length	Quantity
1	Transducer	Type of transducer	transducer cable (with connector at one end)	9m	1

Type of transducer

No	Specification	Frequency	Material	Mounting method
1	TD-500T-2B 	50/200kHz	Plastic	Inner-hull (The inner-hull kit is needed.)
2	TD-500T-3B 	50/200kHz	Bronze	Through-hull

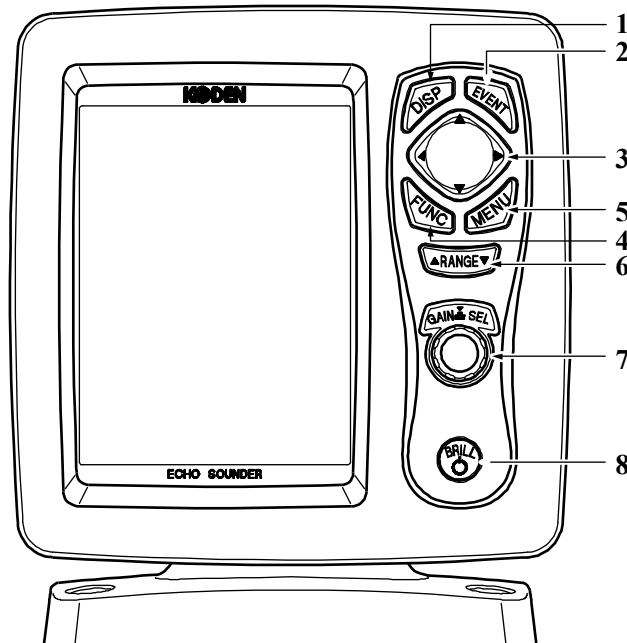
Option List

No	Name of Item	Specification	Remark	Weight/Length
1	Water temperature sensor / speed sensor	ST-80	For transom mounting Plastic made (with cable)	0.3kg/ 8m
		ST-90	For through-hull mounting Plastic made (with cable)	0.6kg/ 8m
		ST-100	For through-hull mounting Bronze made (with cable)	1.2kg/ 8m
2	GPS sensor	GPS-20A-10M-3	For GPS measuring (With power & signal cable)	250g/10m
3	Inner-hull kit	MFB-04	Plastic made for installing the transducer TD-500T-2	1.3kg
4	Cable for transducer	CW-840-0.3M	Needed when using the optional water temperature sensor / speed sensor.	30cm
5	Connector for GPS sensor	LTWBD-06PMMP-LC	Needed when using the GPS-20A (Type B) sensor.	

Chapter 1 Basic Operation

1.1 How to use the key

CVS-126 Display unit

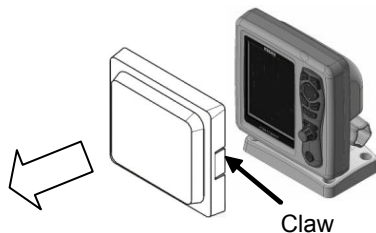


In addition, for your convenience when operating keys other than keys in the menu by the【MENU】 key, the menu displayed automatically closes.

No.	Key Name	Explanation
1	【DISP】	It switches to the High frequency or Low frequency of echo sounder image, zoom and navigation menu.
2	【EVENT】	It notifies the external equipment of the present position. It presets the menu. It begins a homing.
3	【Cursor】	It selects the menu item. It changes the set value. It moves the VRM marker. It moves the marker for notifying the event.
4	【FUNC】	It recalls directly the item preset.
5	【MENU】	It opens or closes the menu.
6	【▲RANGE▼】	It changes the range setting.
7	【Knob】	Press: It recalls the gain adjustment. Rotate: It changes the gain value. It selects the item in the menu.
8	【BRILL☉】 / Power	Press: Power on. It adjusts the brilliance and brightness of panel. Long-press: Power off.

How to remove the hard cover

While widening the claws at right and left sides of hard cover, draw the hard cover towards you.

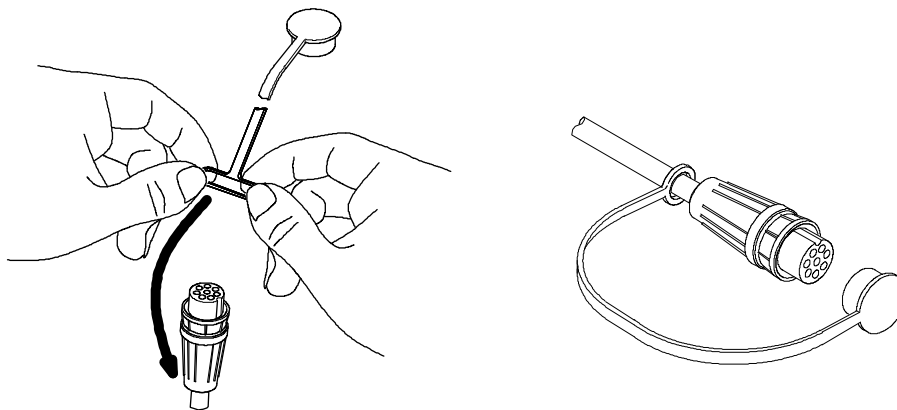


When removing CVS-126 Display unit:

To prevent dust from entering, cap the connector at the rear of CVS-126 Display unit and the power cable with caps.

Install the supplied cap to the transducer cable as shown in the figure and cap it.

Caution: Do not pull the cable strongly. If you do so, it will be broken.

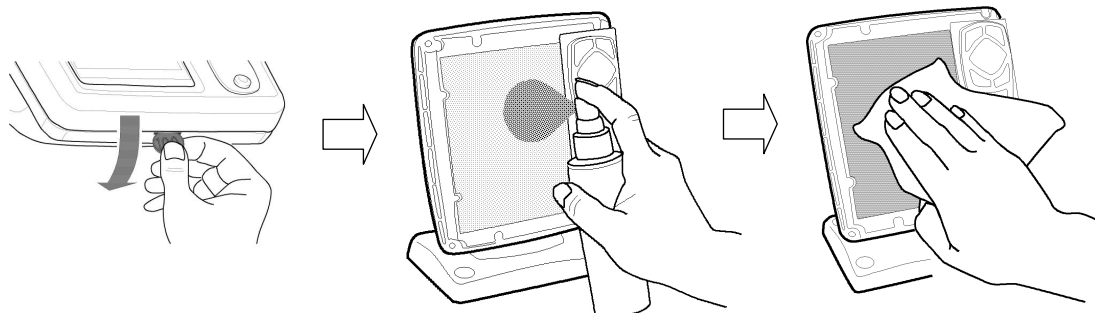


The clean of CVS-126 Display :

The cleaning of the display goes after removing the front-frame. After removing the front-frame, use a synthetic detergent and OA cleaner and wipe the display lightly. Then dry sufficiently, and return the front- frame to original position.

Caution: The display has a special coating. Do not use a solvent such as paint thinner, acetone, alcohol, and benzene, etc.

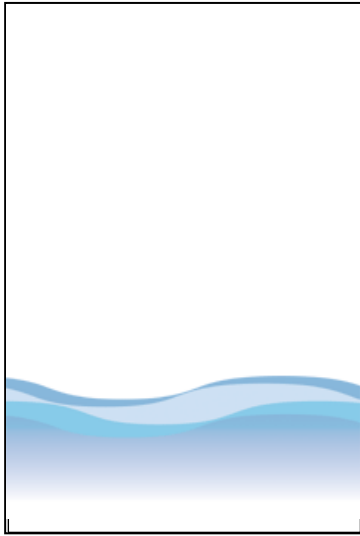
Caution: Strong rubbing may cause bruising, scratching.



1.2 Power On/Off

Power on

- 1 Press the **[BRILLÓ]** key to power on. The startup menu is displayed. When started up, the memories (ROM, RAM) are automatically checked. When checking is normally finished, the menu below is displayed.



Caution: If an error occurs in the memory check, the LED on the operation panel blinks. The unit may not function normally. If you suspect trouble, contact the dealer of your purchase or our company.

- 2 Language Selection at Initial Startup.

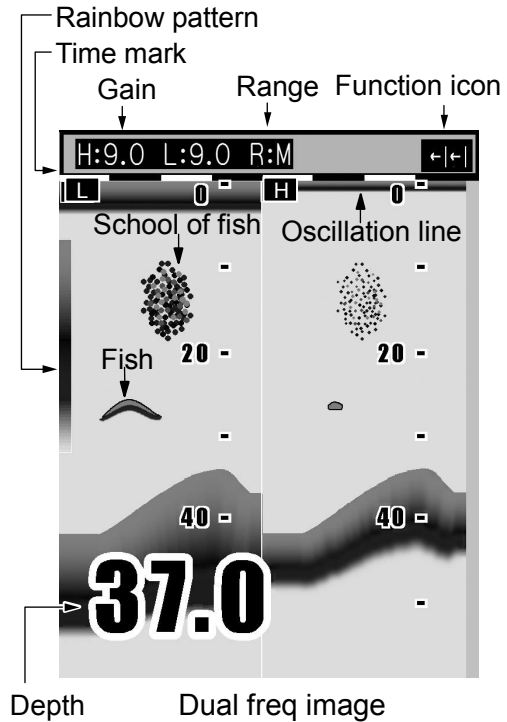
When powering on first, after the [Initialize] is processed, the [Language] menu is displayed.



Select the language with **[▲]** key or **[▼]** key. (The language can be selected by rotating the [knob] .)

Press the **[MENU]** key to decide the language.

- 3 After a few seconds pass, the menu selected in **[DISP]** is displayed.



Type of Gain
 H: High frequency gain,
 L: Low frequency gain

Type of Range
 R: M: Manual Range, R: A: Auto Range,
 R: AS: Auto Shift

Power off

- 1 When powering off, keep pressing the **[BRILLÓ]** key for 3 seconds. The remaining time for the power to shut off is displayed on the menu.

Alarm of Power Voltage

If detecting the malfunction of the voltage, the icon blinks and the alarm beeps.

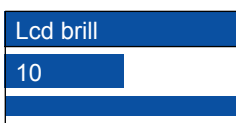
Caution: In case of the low voltage or the high voltage, it shuts down. The precision of Power Voltage is ± 0.5 V.

1.3 LCD Brilliance Adjustment

Adjustment of LCD Brilliance

The [Lcd brill] and [Panel brill] can be switched every time when pressing the [BRILL] key.

- 1 Press the [BRILL] key for a short period of time to display the menu ([Lcd brill]).
- 2 Rotate the [Knob].
When "1" is selected, it is darkest. When "10" is selected, it is brightest.

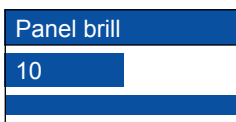


- 3 Press the [MENU] key to close the menu.

Brightness Adjustment of Panel Brilliance

The brightness of panel can be adjusted,

- 1 Press the [BRILL] key for a short period of time to display the menu ([Panel brill]).
- 2 Rotate the [Knob].
When "1" is selected, it is darkest. When "10" is selected, it is brightest.



- 3 Press the [MENU] key to close the menu.

1.4 Switch-over of Menu

7 kinds of displays are provided in all. Select the display suitable for your purpose.

- 1 Press the [DISP] key.

- 2 Select the display you desire to display.

Disp
NAV1/ Normal (H)
Normal (H)
Zoom (H)
Dual Freq
Zoom (L)
Normal (L)
NAV2/ Normal (L)

(High): High frequency

(Low): Low frequency

NAV1: Navigation display1

NAV2: Navigation display2

- 3 Press the [MENU] key to close the menu.

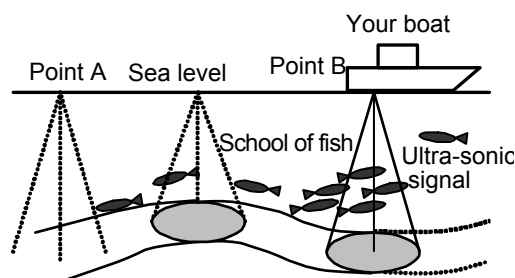
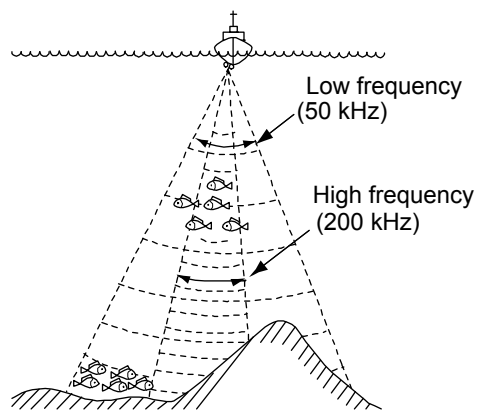
Normal Image (Low frequency, High frequency)

Low frequency(50kHz)

Since the beam width is wide, the search range becomes wide so that the beam can search the deep depth.

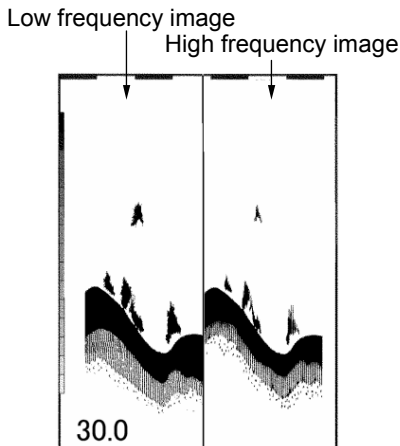
High frequency(200kHz)

Since the beam width is narrow, it is hard to be interfered by noise and bubble in the sea so that the school of fish can be searched in a high resolution.



Dual frequency

The High frequency image can be displayed in the right half side and the Low frequency image can be displayed in the left half side. Since the beam width differs depending on frequency, the school of fish and sea bottom look different.



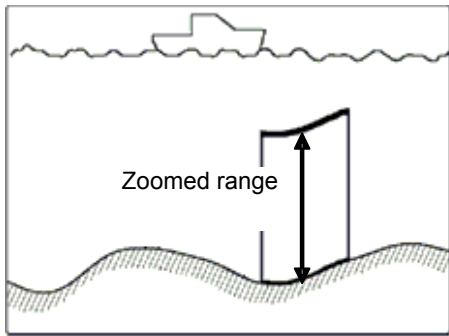
Zoom (Low frequency, High frequency)

A part of normal image can be zoomed. (1) [Bottom], (2) [Bottom Discrimination], [zoom], (4) [Bottom Zoom] and (5) [Bottom Follow Zoom] are provided for zoom.

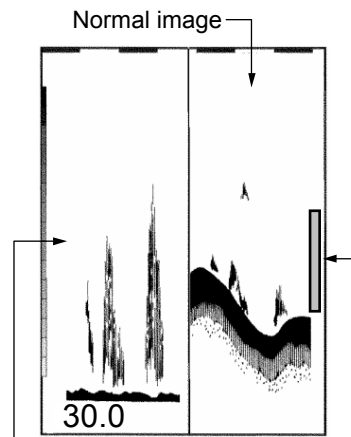
The unit is set to (1) [Bottom] at ex-factory. To change to other zoom display, set it in the menu. (See [2.7 Setting of Zoom Range].)

Zoom type	Zoom start position	Zoomed range	Purpose
Bottom	It displays the position of the bottom in the fixation in the display bottom part.	It displays the bottom and upper in the zoom.	It is convenient to see a school of fish near the bottom.
Bottom Discrimination	It displays the position of the bottom in the fixation in the position of 1/4 under the display.	It displays the bottom and upper in the zoom, it displays under the bottom in the ordinary. (Under the bottom, it doesn't display in the zoom).	It is convenient to see a school of fish and a bottom quality near the bottom.
Zoom	It displays a zoom start position in the fixation at the top of the display.	It displays in the zoom from the zoom start position to the range you set.	It is convenient to see the specified range in the zoom.
Bottom Zoom	It displays the position of the bottom in the position which is the same as the ordinary display.	It displays upper side of the bottom in the zoom except the bottom.	It is convenient to see a school of fish near the bottom and the form of the bottom.
Bottom Follow Zoom	It always displays the position of the bottom in the lower part of the display.	It displays the bottom and upper and lower sides in the zoom.	It is convenient to see a school of fish near the bottom and the form of the bottom.

(1) Bottom

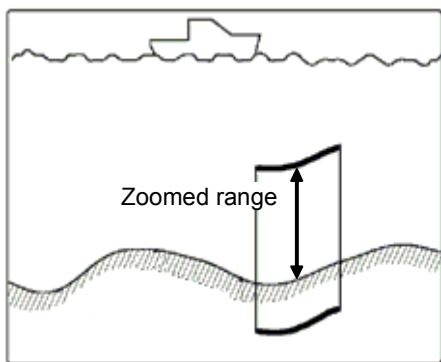


The display width of zoom is displayed in orange.

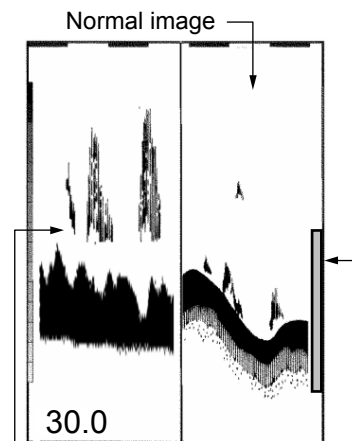


Zoom image

(2) Bottom Discrimination

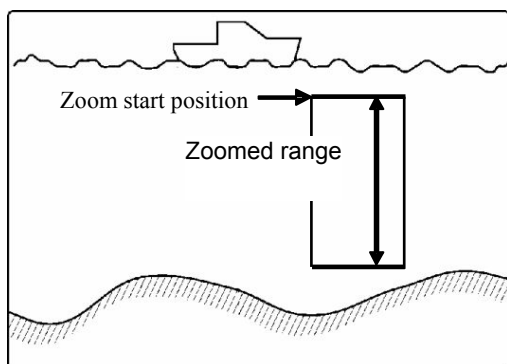


The display width of zoom is displayed in orange.

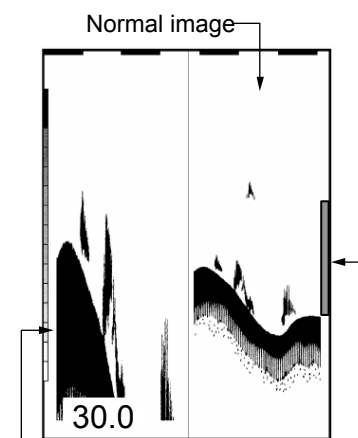


Zoom image

(3) Zoom

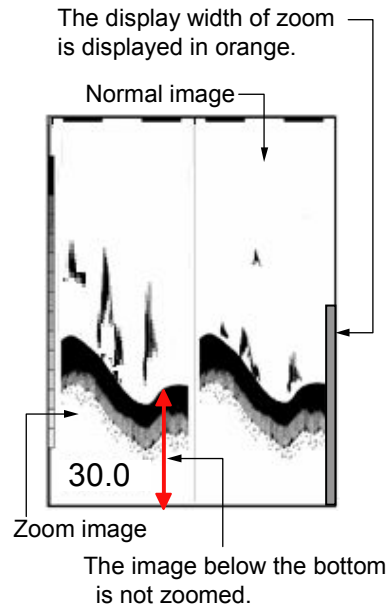
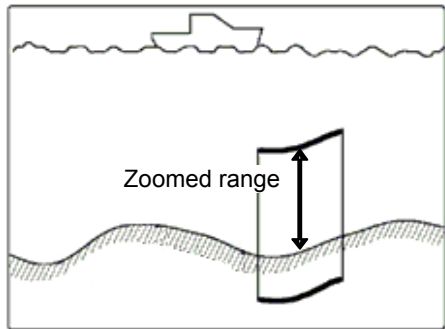


The display width of zoom is displayed in orange.

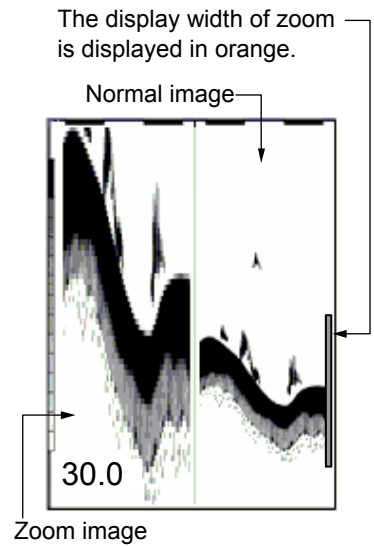
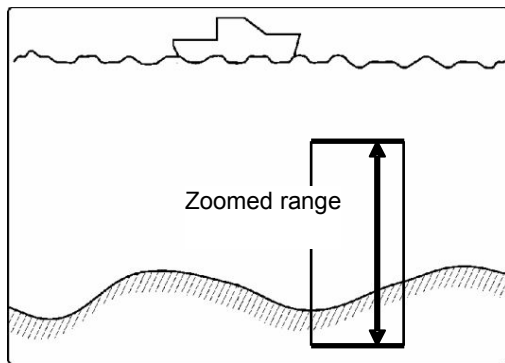


Zoom image

(4) Bottom Zoom

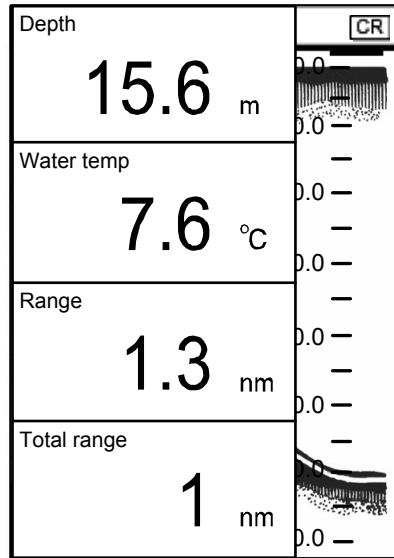
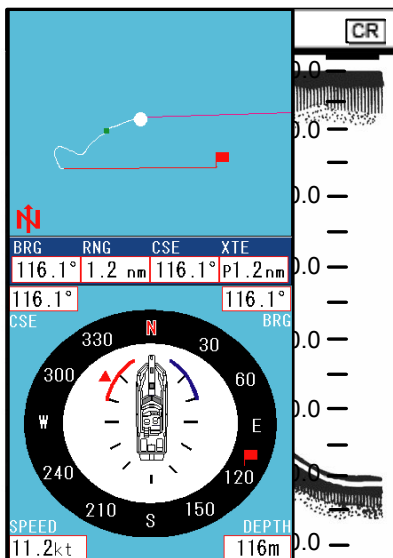


(5) Bottom Follow Zoom



Navigation Menu (NAV1, NAV2)

The navigation menu can be displayed at the left side on the display. To display the information other than depth, sensors need to be connected. (See [2.16 Selection of NAV Display].)



1.5 Switch-over of Range

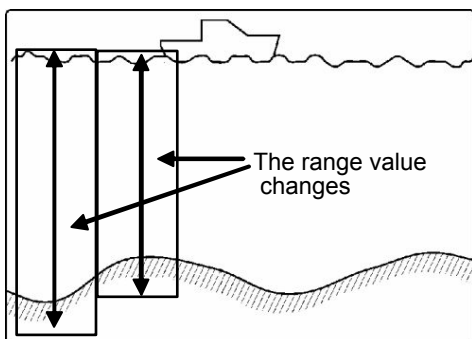
The range of measured depth displayed on the display can be changed.

To meet your purpose, select the range of measured depth.

Set the range switching to auto range.

By following automatically the bottom, the image of echo sounder in the suitable range of measured depth can be displayed.

This mode is convenient to display always the range from sea level to bottom.



- 1 Press the [MENU] key to display the menu.
- 2 Select [Display Range] → [Range Mode].
- 3 Select the [Auto Range].

Range Mode
Manual
Auto Range
Auto Shift

(See [2.6 Setting of Shift].)

- 4 Press the [MENU] to close the menu. When the [Auto Range] is set, the [R : A] is displayed a the upper side of menu.

Set the range switching to Manual range.

- 1 Press the [▲] key of [▲range▼] key or [▼] key.
- 2 Select the range you desire to set.

	Range	
[▲]	5.0	
▲	10.0	
	50.0	
	80.0	
	100.0	
	150.0	
	300	
	500	[▼]

- 3 Press the [MENU] key to close the menu. When the [Manual] is set, the [R : M] is displayed at the upper side of menu.

Caution: By selecting the [D.range] → [Range preset], the range can be preset.

1.6 Gain Adjustment

The gain can be adjusted in the auto mode (Echo sounder mode, Depth mode) or manual mode.

[Cruising mode]

Eliminating the weak echo, it displays clearly the sea bottom of strong echo. It is suitable for cruising to the fishery ground.

[Fishing mode]

It displays clearly the weak echo reflected from the school of fish. It is suitable for searching the school of fish.

Basic Operation of Gain

Every time when rotating the [Knob], the [Gain] and [Auto Gain Select] are switched.

By rotating the [Knob], the gain adjustment or auto gain can be selected.

Selection of Echo sounder mode and Depth mode

The gain adjustment can be set to [Auto Adjust].

- 1 Press repeatedly the [Knob] until the [Auto Gain Select] menu is displayed.
- 2 Select the [Depth mode] or [Echo sounder mode] by rotating the [Knob].

Gain select
Manual
Cruising
Fishing

- Press the [MENU] key to close the menu. When the [Cruising mode] is set, the [A : AC] is displayed at the upper side of menu. When the [Fishing mode] is set, the [A : AF] is displayed at the upper side of menu.

Fine-adjusting the Auto Gain

When the [Cruising mode] or [Fishing mode] is set, the gain can be fine-adjusted.

- Press repeatedly the [Knob] until the [Auto Gain Select] menu is displayed.
- Select the [Cruising mode] or [Fishing mode] by rotating the [Knob] .
- Press the [Knob] to display the Auto Gain Adjustment].
- Fine-adjust the gain by rotating the [Knob] . The [▲range▼] key menu position can be moved.

Auto adjust high
0

- Every time when pressing the [Auto Gain Select] and [Auto adjust high] or [Auto adjust low] are alternately displayed.
- Press the [MENU] key to close the menu.
- When pressing the [Knob] again, the previous menu before pressing the [MENU] key is displayed.

Adjust the gain manually.

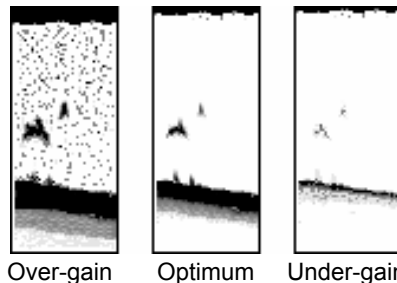
When the image of High frequency only is displayed on the display, the High frequency gain can be adjusted.

When the image of Low frequency only is displayed on the display, the Low frequency gain can be adjusted.

When both of the High frequency image and Low frequency image are displayed, by pressing the [Knob], the adjustable frequency can be changed.

Caution: If you increase the gain too much,

noise will appear on the entire image, resulting in an unclear image. Adjust properly the gain so that the optimum image can be always displayed.



- Press the [Knob] .
- Select the [Manual] by rotating the [Knob] .
- Press the [Knob] .
- Adjust the gain by rotating the [Knob] . The [▲range▼] key menu position can be moved.

Gain (H)
0

Stop increasing the gain just before noise appears on the image.

- When the [Disp] is set to other than [Dual freq], every time when pressing the [Knob], the [Gain (H)] or [Gain (L)] → [Gain select] is displayed. **When the [Disp] is set to the [Dual freq],** every time when pressing the [Knob], the [Gain (H)] -> [Gain (L)] → [Gain select] is displayed.
- Press the [MENU] to close the menu.
- When pressing the [Knob] again, the previous menu before pressing the [MENU] key is displayed.

Easy Gain Adjustment

Depending on the item of [Auto Gain Select], the adjustment menu differs.

- Rotate the [Knob] .
- The gain adjustment menu is displayed and the gain can be adjusted.
- Press the [MENU] to close the menu.

Confirm the gain state.

The present set value of frequency (High frequency or Low frequency) adjusted last is displayed at the upper left side of menu.

Example)

The High frequency gain is 8.0 → H: 8.0.

H:8.0	R:M	12.6V
-------	-----	-------

1.7 Use of [EVENT] key

By pressing the [EVENT] key, three functions of [Store Position], [Store Image] and [Homing] are available.

The homing is the function to instruct your boat to navigate easily to a point where you desire to go back.

[Save pos]: The latitude and longitude of a point can be stored.

[Store image]: An image of the fish finder can be stored in the internal memory.

[Homing]: The WPT navigation starts, using the latitude and longitude of a point which is set as a destination by pressing the [EVENT] key. Simultaneously, the latitude and longitude of the point can be stored in the destination list.

Select the event.

Select the functions when pressing the [EVENT] key.

- 1 Press the [MENU] key.
- 2 Select [NAV] → [EVENT Key set].
- 3 Change the setting of [EVENT key set].

EVENT Key set
Store pos
Store image
Homing

(Refer to [2.6 Setting of Shift].)

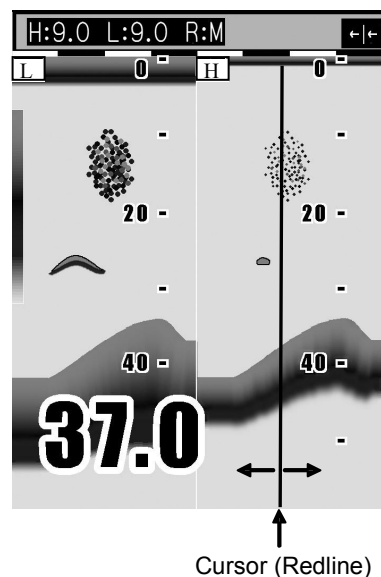
- 4 Press the [MENU] to close the menu.

Preset the destination.

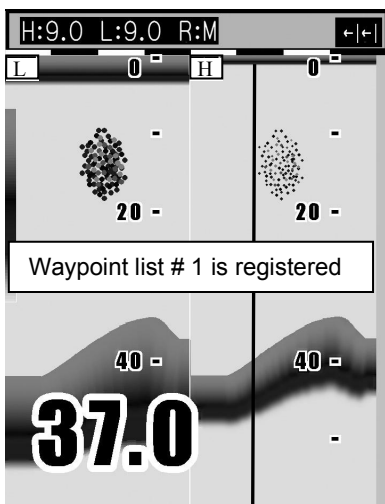
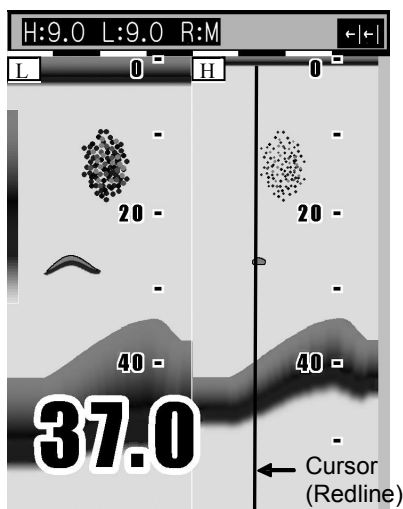
When you find the school of fish or tide, its location can be preset as a destination. (10 locations at maximum)

When presetting the destination, switch [NAV] → [EVENT Key set] → [Store pos].

- 1 In the state that no other key is pressed, press the [◀] key or [▶] key.
- 2 Move the cursor (Redline) with the [◀] key or [▶] key to the location to be preset as a destination.



- 3 Press the [EVENT] key. When decided, the red line is drawn at the designated location on the echo sounder menu and the latitude and longitude of designated location are registered in the destination list. At this moment, the list number of preset destination is displayed.



- 4 After a certain time passes, the message disappears and presetting the destination is finished.

Caution: When pressing the [EVENT] key, if [In out] → [NMEA output data] → [TLL] is set to ON, the latitude and longitude of location above-designated is output to the navigation system connected.

Caution: If the destination list is full, the preset destination list is not deleted, showing the message that the list is fully filled. After a certain time passes, the message disappears.

A Wpt list is full.
Registration is not completed

Store the image.

When you find the school of fish or tide, its location can be stored as a destination. (10 locations at maximum)

When storing the image, switch [NAV] → [EVENT Key set] → {Store pos}.

- 1 Press the [EVENT] key. The image of echo sounder presently displayed is stored and the list number of stored image is displayed.

Image data list # 1 is registered

- 2 After a certain time passes, the message disappears and storing the image is finished.

Caution: If the destination list is fully filled, the preset destination list is not deleted, showing the message that the image is fully filled. After a certain time passes, the message disappears.

A list of Pic is full.
Registration is not completed.

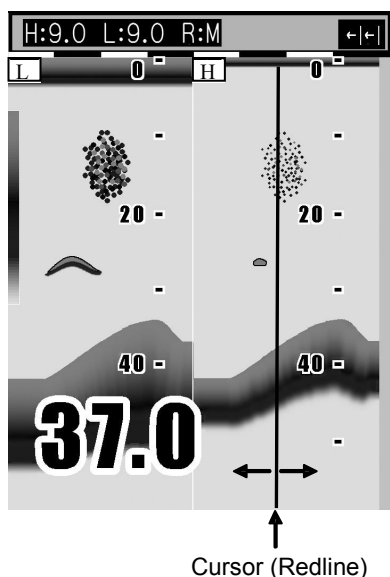
Start the homing

When you find a school of fish or a tidal flow, your boat can go back easily to that point.

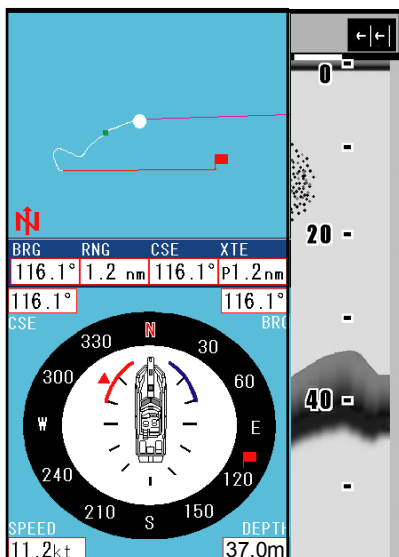
Your boat can go back to any point on an image you saved. (See [2.13 WPT navigation].)

To perform the homing, it is necessary to select [Navigation] → EVENT key set → [Homing].

- 1 In the state that no other key is pressed, press the [◀] key or the [▶] key.
- 2 Move the cursor (red line) to a point you desire to go back with the [◀] key or [▶] key.



- 3 Press the [EVENT] key.
When you decide, the red line is drawn on the image of the fish finder at the point you designate and the latitude and longitude of the point you designate is stored in the destination list.
At this moment, the number of the stored destination list is displayed.
- 4 The navigation display (NAV1) is displayed and the WPT navigation starts.



Note: The display of NAV1/Normal (H) is displayed.

1.8 Use of [FUNC] key

When factory-shipped, the [Image Speed] is assigned to the [FUNC] key. The function settable to the [FUNC] key can be selected among [Image Speed], [Interference Rejection], [Color Rejection], [Noise Rejection], [Range Mode], [Shift], [Zoom Range], [Zoom Start], [Background] and [White Line]. Set the function frequently used for your convenience.

How to use the [FUNC] key

- 1 Press the [FUNC] key.
- 2 Change the setting by rotating the [Knob].

In case of [Image speed]

Image Speed
2/1
1/1
stop
1/1.5
1/2
1/2.5
1/3
1/3.5
1/4
1/4.5











- 3 Press the [MENU] key to close the menu.

Preset of [FUNC] key

- 1 Press the [MENU] key.
- 2 Select [System] → [FUNC key set].
- 3 Select the function.

FUNC key set
Image Speed
IR
Color Rejection
Noise Rejection
Range Mode
Shift
Zoom Range
Zoom Start
Background Color
White L

- 4 Press the [MENU] key to close the menu. The icons of functions preset are displayed at the upper right side on the menu.

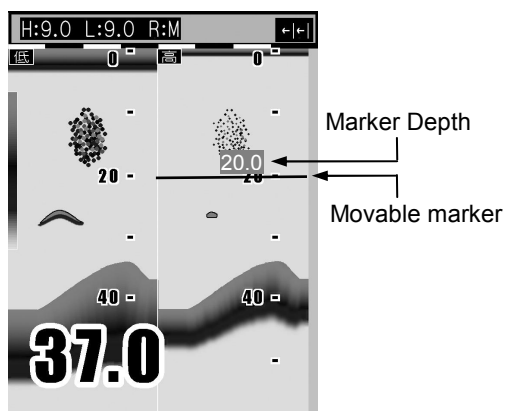
-  ← Image Speed
-  ← IR
-  ← Color Rejection
-  ← Noise Rejection
-  ← Range Mode
-  ← Shift
-  ← Zoom Range
-  ← Zoom Start
-  ← Background Color
-  ← White Line L

1.9 Operation of VRM

The VRM (movable marker) shown by the green line can be moved up and down.

It is convenient to measure the depth by aligning with the target such as school of fish.

- 1 Press the [▲] key or [▼] key. The movable marker (straight line) is displayed.
- 2 Press the [▲] key or [▼] key. The movable marker moves up and down. The movable marker and the numerical of marker depth are simultaneously highlighted.



When displaying dual images, if the [◀] key or [▶] key is pressed, the movable marker moves to the neighboring image.

Caution: When several seconds pass after finishing the VRM operation, the numerical of marker depth becomes normal display.

Chapter 2 How to use the Menu

2.1 How to operate the menu

Display the menu. / Stop the display of menu.

- 1 Press the [MENU] key.
The menu and explanation of operation are displayed.

Menu column	Setting item	Setting value
Adjust	Image speed	1/1
D.range	IR	Strong
Image	Color rejection	0%
Alarm1	Noise rejection	0
Alarm2	TGV	Medium
NAV	TX power	Auto
Disp	Return	
Sonar		
Next		

Guide

It is displayed when the [Operation Guide] is set to ON.
(See [3.4 Setting of System Item].)

- 2 Press the [MENU] key.
The menu and explanation of operation close.

Menu Operation

- 1 When the menu is displayed, press the [▲] key or [▼] key to select the menu name. Depending on the selected menu name, the content in the set item column at the right side changes.
(The menu name can be selected by rotating the [Knob].)

Adjust	Range mode	Manual
D.range	Shift	0m
Image	Zoom select	Bottom
Alarm1	Zoom range	10.0m
Alarm2	Zoom start	0m
NAV	Range preset	
Disp	Return	
Sonar		
Next		

- 2 Press the [▶] key.
The cursor appears in the set item column.
(The cursor appears by pressing the [Knob].)
- 3 Select the set item you desire to change with the [▲] key or [▼] key.
(The set item can be selected by rotating the [Knob].)

Adjust	Range mode	Manual
D.range	Shift	0m
Image	Zoom select	Bottom
Alarm1	Zoom range	10.0m
Alarm2	Zoom start	0m
NAV	Range preset	
Disp	Return	
Sonar		
Next		

- 4 Press the [▶] key.
The set menu corresponding to the selected item is displayed.
(It can be displayed by rotating the [Knob].)

Range mode	Shift
Manual	10
Auto range	0~300 m
Auto shift	

- 5 Change the set content with the [▲] key or [▼] key.
(It can be changed by rotating the [Knob].)
- 6 Press the [◀] key.
The cursor returns to the set item column.
(It can be displayed by rotating the [Knob].)
- 7 To select the menu name of other, press

the [◀] key.
The cursor returns to the menu column.

- 8 Press the [MENU] key to close the menu.

2.2 Change of Image Speed

The image speed of echo sounder can be changed. Even if the school of fish and bottom are same, the image changes depending on the image speed.

The setting of image speed is shown by the comparison with the normal image speed "1/1".

"2/1" image speed is two times the normal image speed. "1/2" is a half time the normal image speed. When "Stop" is selected, the image speed is stopped.

- 1 Press the [MENU] key.
- 2 Select the [Adjust] → [Image Speed].
- 3 Change the setting of [Image Speed].

Image speed
2/1
1/1
Stop
1/1.5
1/2
1/2.5
1/3
1/3.5
1/4
1/4.5

- 4 Press the [MENU] key to close the menu

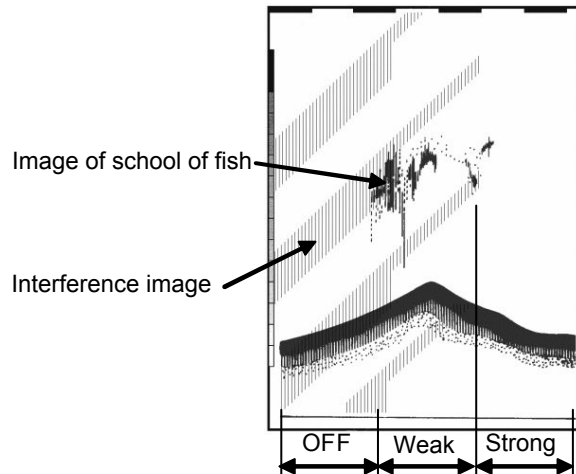
2.3 Rejection of Interference

Interference Rejection

The interference noise from the echo sounder of other boats can be reduced.

If a neighboring boat uses the echo sounder

having the same frequency and same firing times as those your boat has, the interference noise may be displayed. If you set the interference rejection, the interference noise can be reduced. In the order of weak → strong, the noise rejection capability becomes high.



- 1 Press the [MENU] key.
- 2 Select the [Adjust] → [Interference Rejection].
- 3 Change the setting of [Inference Rejection].

IR
OFF
Weak
Strong

- 4 Press the [MENU] key to close the menu.

2.4 Color Rejection of Weak Echo

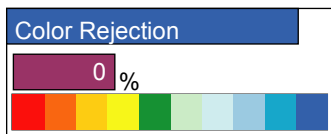
Color Rejection

The color of weak echo can be rejected.

Rejecting noise on the entire image and weak echo around the school of fish makes it easier to see the school of fish. It is the convenient function when displaying the echo stronger than the specific signal. (setting:0~50%)

- 1 Press the [MENU] key.
- 2 Select the [Adjust] → [Color Rejection].

- 3 Change the setting of [Color Rejection].



- 4 Press the [MENU] key to close the menu.

2.5 Rejection of Noise

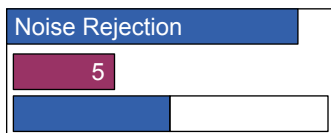
Noise Rejection

The influence of noise can be reduced.

Due to echo reflected from plankton and trash, the speck-like noise may appear on the entire image. Setting the [Noise Rejection] reduces the speck-like noise and makes it easier to see the image of school of fish.(setting:0~10)

The greater the set value becomes, the stronger the effect of noise rejection becomes.

- 1 Press the [MENU] key.
- 2 Select [Adjust] → [Noise Rejection].
- 3 Change the setting of [Noise Rejection].



- 4 Press the [MENU] key to close the menu.

2.6 Setting of Shift

The [Fixed Shift] and [Auto Shift] are provided.

Fixed Shift:

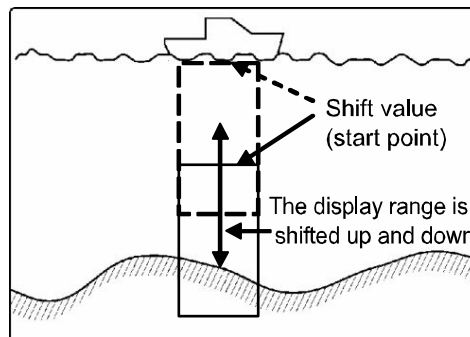
The image range is shifted up and down.(setting:except ft:0~300,ft:0~1000)

Auto Shift:

Since the bottom is always displayed in the lower side, if the depth changes, the image is shifted automatically. (In the depth direction)

Setting of Fixed Shift

The scope of range starting with the shift value is displayed.



- 1 Press the [MENU] key.
- 2 Select [D. Range] → [Shift].
- 3 Change the set value of [Shift].

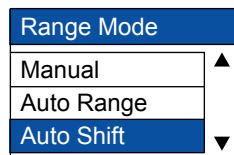


- 4 Press the [MENU] key to close the menu.

Setting of Auto Shift.

The image is automatically shifted so that the bottom is always displayed.

- 1 Press the [MENU] key.
- 2 Select [D. Range] → [Range Mode].
- 3 Select the [Auto Shift].



- 4 Press the [MENU] key to close the menu. [R: AS] is displayed at the upper side of menu.

2.7 Setting of Zoom Range

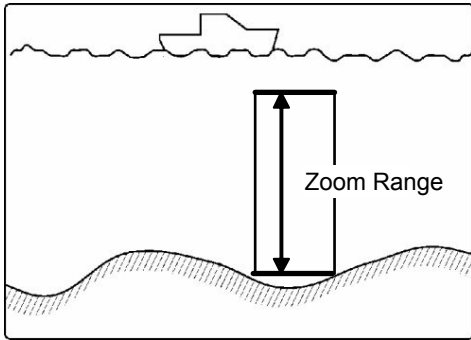
Set the zoom range in each mode of [BTM], [Bottom Discrimination], [Zoom], [Bottom Zoom]

and [Bottom Follow Zoom]

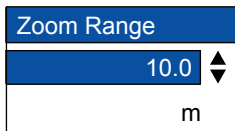
The zoom range of each mode is identical.

(See [1.4 Switch-over of Menu].)

(setting:except ft:2.5~200,ft:10.0~650)



- 1 Press the [MENU] key.
- 2 Select [D. Range] → [Zoom Range].
- 3 Change the set value of [Zoom Range].



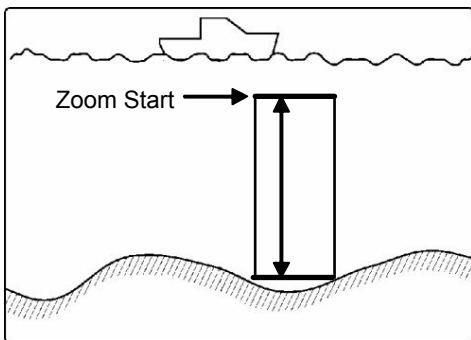
- 4 Press the [MENU] key to close the menu.

2.8 Setting of Zoom Start

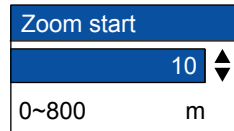
Select the zoom start in the [Zoom].

(See [1.4 Switch-over of Menu].)

(setting:except ft:0~800,ft:0~2800)



- 1 Press the [MENU] key
- 2 Select [Display Range] → [Zoom Start]
- 3 Change the set value of [Zoom Start].

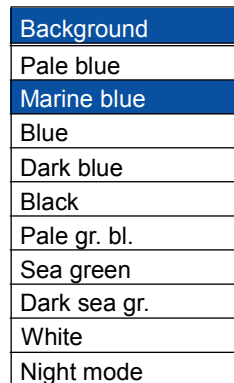


- 4 Press the [MENU] to close the menu.

2.9 Setting of Background Color

Responding to the ambient brightness, the background color of display can be changed.

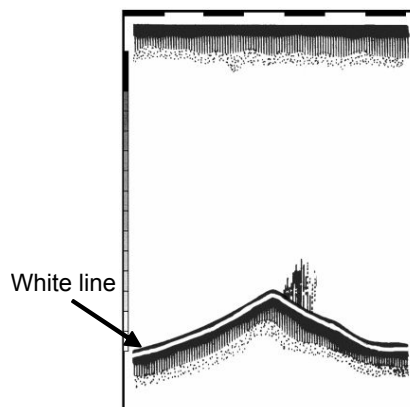
- 1 Press the [MENU] key.
- 2 Select [Display] → [Background Color].
- 3 Change the setting of [Background Color].



- 4 Press the [MENU] to close the menu.

2.10 Setting of White Line

As the surface of bottom is marked with the white line of constant width, the school of fish at the bottom can be easily identified.



- 1 Press the [MENU] key

- 2 Select [Disp] → [White Line].
- 3 Change the setting of [White Line].
“1” is narrowest. “5” is widest.
In the auto mode, responding to the strength of echo reflected from the bottom, the width of white line changes.

White line
OFF
1
2
3
4
5
Auto

- 4 Press the 【MENU】 key to close the menu.

2.11 Preset of Range

The range switched with the 【▲range▼】 key can be set.

Preset the set value suitable for you purpose.

(setting:except ft:0~800,ft:0~2800)

- 1 Press the 【MENU】 key.
- 2 Select [Display Range] → [Range Preset] → [Range 1 to 8].
- 3 Select the set value of [Range 1 to 8].

Range1
20.0 ▲▼
m

- 4 Press the 【MENU】 key to close the menu.

2.12 Setting of Alarm

6 alarms of bottom alarm, fish alarm, water temp alarm, speed alarm, arrival alarm and XTE alarm can be set.

They are notified by alarm sound and alarm display.

[Bottom alarm] issues the alarm when the position recognized as the bottom is shallower than the upper limit or deeper than the lower limit. It is convenient when keeping the specific depth.(setting:except ft:0~800,ft:0~2800)

[Fish alarm] issues the alarm when an echo recognized as school of fish exists in the set range. (setting:except ft:0~800,ft:0~2800)

It is convenient for you to judge whether the echo of school of fish is present or not.
(setting:except ft:0~800,ft:0~2800)

Caution: In the [Level], select the strength of echo reflected from the school of fish in the [Fish alarm].

[Water temp alarm] issues when the water temp is within or out of the set range. It is convenient to keep the specific water temp region.(setting:-5~45°C,23~113°F)

[Speed alarm] issues when the boat speed is faster or slower than the set range. It is convenient when the speed limit is obliged.(setting:0~80)

[Arrival alarm] can be used in the state that the destination is set. The alarm is issued when your boat arrives within a certain range of destination. A certain range is set in the [NAV alarm range]. (See [1.7 Use of 【Event】 key].)

[XTE alarm] can be used in the state that the destination is set. The alarm is issued when your boat is off a certain distance from the course on the line drawn straightly from destination to the location when setting the destination. A certain distance is set in the [NAV alarm range].

In the [NAV alarm range], select the alarm range of [Arrival alarm] and [XTE alarm].(setting:5~999m)

Stopping the alarm sound

To stop the alarm sound and the alarm display, press 【MENU】 key.

Setting the alarm

Adjust	Bottom alarm	OFF
D.range	Upper depth	5m
Image	Lower depth	50m
Alarm1	Fish alarm	OFF
Alarm2	Position	5m
NAV	Range	50m
Disp	Level	Medium
Sonar	Return	
Next		

Adjust	Water temp warm	OFF
D.range	Upper temp alarm	20.0 C
Image	Lower temp alarm	15.0 C
Alarm1	Speed alarm	OFF
Alarm2	Speed limit	0kt
NAV	Arrival alarm	OFF
Disp	XTE alarm	OFF
Sonar	NAV alarm range	10m
Next	Return	

- 1 Press the [MENU] key.
- 2 Select your desired alarm from [Alarm 1] or [Alarm 2].
- 3 Select the [ON] of alarm you desire.
- 4 If the setting of [Alarm range] is provided in the alarm desired, select the alarm range.
- 5 Change the set value of alarm range.
- 6 Press the [MENU] key to close the menu.

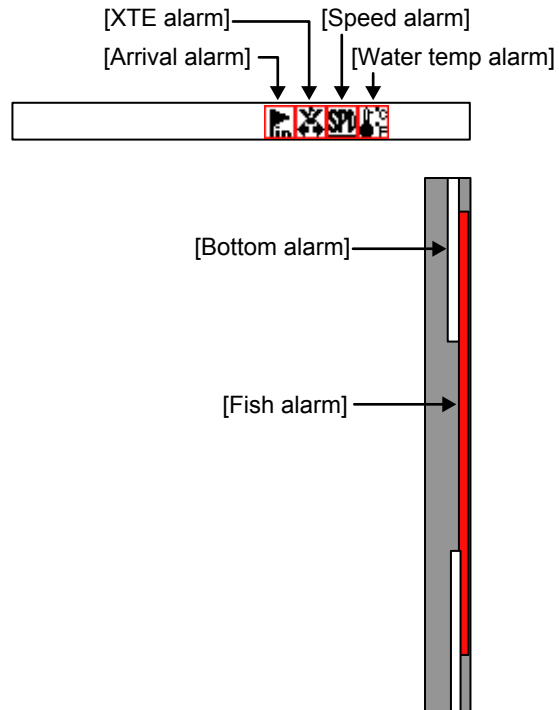
Release the alarm.

- 1 Press the [MENU] key.
- 2 Select the alarm to be released from [Alarm 1] or [Alarm 2].
- 3 Select the [OFF] of alarm to be released.
- 4 Close the menu with the [MENU] key.

Confirm the alarm state.

The set state of [Bottom alarm] and [Fish alarm] can be confirmed on the bar at the right corner of display. However, when the display is out of the range, they are not displayed.

The set state of [Water temp alarm], [Speed alarm], [Arrival alarm] and [XTE alarm] can be confirmed by the icons at the upper side of display.



2.13 Preset/ WPT edit/ WPT delete of Destination

NAV Start.

The NAV can be started by selecting the destination from the destination list.

To perform the NAV start, the destination must be preset. (See [1.7 Use of [Event] key].)

- 1 Press the [MENU] key.
- 2 Select [NAV] → [NAV start].
- 3 Select the [Destination list] preset.

NAV start			
No.	Comment	Latitude	Longitude
1	WPT00001	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
2	WPT00002	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
3	WPT00003	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
4	WPT00004	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
5	WPT00005	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
6	WPT00006	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
7	WPT00007	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
8	WPT00008	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
9	WPT00009	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
10	WPT00010	XX° XXXX.XXXXN	XXX° XXXX.XXXX E

Caution: The list No. selected is reversed in red.

- After selecting the number, press the **[▶]** key or the **[Knob]**.
- Select the **[Yes]** in the confirmation menu and press the **[MENU]** key. Then, the NAV starts.

NAV starts
Yes
No

Cancel the NAV.

The NAV started can be canceled halfway.

- Press the **[MENU]** key
- Select **[NAV] → [NAV cancel]**.
- Press the **[Yes]**.

NAV cancel
Yes
No

- Press the **[MENU]** key. Then, the NAV is released.

Edit the destination.

By entering the latitude and longitude, the destination can be preset.

The list preset in the past can be edit.

- Press the **[MENU]** key.
- Select **[NAV] → [WPT edit]**.
- Select the list No. to be edited from the

[WPT edit] list.

WPT edit			
No.	Comment	Latitude	Longitude
1	WPT00001	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
2	WPT00002	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
3	WPT00003	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
4	WPT00004	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
5	WPT00005	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
6	WPT00006	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
7	WPT00007	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
8	WPT00008	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
9	WPT00009	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
10	WPT00010	XX° XXXX.XXXXN	XXX° XXXX.XXXX E

- After selecting the number, press the **[▶]** key or the **[Knob]**.
- Select the character with the **[▲]** key or **[▼]** key. (character: A~Z,blank,0~9,+,-./)

WPT edit			
No.	Comment	Latitude	Longitude
1	WPT00001	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
2	WPT00002	3X° XXXX.XXXXN	XXX° XXXX.XXXX E
3	WPT00003	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
4	WPT00004	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
5	WPT00005	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
6	WPT00006	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
7	WPT00007	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
8	WPT00008	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
9	WPT00009	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
10	WPT00010	XX° XXXX.XXXXN	XXX° XXXX.XXXX E

- Move the position of characters to be reversed with the **[◀]** key or **[▶]** key.

WPT edit			
No.	Comment	Latitude	Longitude
1	WPT00001	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
2	WPT00002	35° XXXX.XXXXN	XXX° XXXX.XXXX E
3	WPT00003	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
4	WPT00004	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
5	WPT00005	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
6	WPT00006	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
7	WPT00007	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
8	WPT00008	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
9	WPT00009	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
10	WPT00010	XX° XXXX.XXXXN	XXX° XXXX.XXXX E

Caution: At this moment, if the [Knob] is

pressed, the setting is cancelled and the menu returns to the menu item.

Caution: If the values of latitude and longitude are abnormal or are not entered, they cannot be preset.

- 7 After finishing the edit work, press the [MENU] key.
- 8 Select the [Preset] in the confirmation menu and press the [MENU] key. Then, the edit is finished.

Edit is finished
Yes
No

Delete the destination.

The destination list preset in the past can be deleted.

The deletion takes some time.

- 1 Press the [MENU] key.
- 2 Select [NAV] → [WPT delete].
- 3 Select the list number of destination to be deleted from the [WPT delete].

WPT delete			
No.	Comment	Latitude	Longitude
1	WPT00001	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
2	WPT00002	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
3	WPT00003	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
4	WPT00004	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
5	WPT00005	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
6	WPT00006	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
7	WPT00007	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
8	WPT00008	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
9	WPT00009	XX° XXXX.XXXXN	XXX° XXXX.XXXX E
10	WPT00010	XX° XXXX.XXXXN	XXX° XXXX.XXXX E

- 4 After selecting the number, press the [▶] key or the [Knob] .
- 5 Select the [Yes] in the confirmation menu and press the [MENU] key. Then, the destination is deleted.

Destination is delete
Yes
No

Caution: If the [Knob] is pressed at this moment, it is canceled.

- 6 Press the [MENU] key. Then, the destination is deleted and the menu closes.

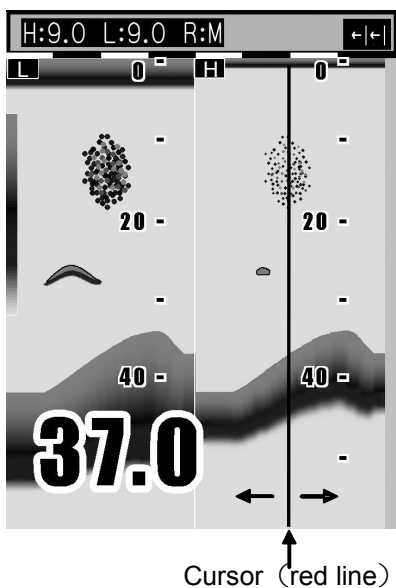
Recall the image stored and preset it as a destination.

Call the image stored in the past and it can be preset as a destination. (See [1.7 Use of [Event] key].)

- 1 Press the [MENU] key.
- 2 Select [NAV] → [Image recall].
- 3 Select the image No. from the [Image recall] list.

Image recall	
No.	Comment
1	PIC00001
2	PIC00002
3	PIC00003
4	PIC00004
5	PIC00005
6	PIC00006
7	PIC00007
8	PIC00008
9	PIC00009
10	PIC00010

- 4 Press the [▶] key or the [Knob] .
- 5 Move the cursor to the location preset as a destination with the [◀] key or [▶] key and select it.



Caution: You can switch to other stored image with the [▲] or [▼] key.

- 6 When starting the NAV, press the [EVENT] key.
- 7 When you do not start the NAV, press the [MENU] key.

2.14 Store/Recall/Deletion of Image

Store the image.

The present image of echo sounder can be stored.

To memorize, it takes some time.

To memorize the image, the [EVENT] key must be switched to the [Store image].

- 1 Press the [MENU] key.
- 2 Select [NAV] → [EVENT key set].
- 3 Select the [Store image].

EVENT key set
Store pos
Store image
Homing

- 4 Press the [MENU] key to close the menu.

- 5 When the echo sounder image to be stored appears, press the [EVENT] key.
- 6 When the image store is fully filled, it shows that the [Store image] is fully filled. After deleting the unwanted image, try it again.

Recall the stored image.

The image stored in the past can be recalled.

During recalling, the image cannot be stored.

- 1 Press the [MENU] key.
- 2 Select [NAV] → [Image recall].
- 3 Select the number of image to be recalled from the [Image recall] list.

Image recall	
No.	Comment
1	PIC00001
2	PIC00002
3	PIC00003
4	PIC00004
5	PIC00005
6	PIC00006
7	PIC00007
8	PIC00008
9	PIC00009
10	PIC00010

- 4 After selecting the number, press the [▶] key or [Knob] to enter.
- 5 Press the [MENU] key to return to the normal menu.

Caution: When other stored image exists beside the recall image, switch to other image with the [▲] and [▼] key.

Delete the stored image.

The image stored in the past can be deleted.

To delete, it takes some time.

- 1 Press the [MENU] key.
- 2 Select [NAV] → [Image delete].
- 3 Select the number of image to be deleted from the [Image delete] list.

Image delete	
No.	Comment
1	PIC00001
2	PIC00002
3	PIC00003
4	PIC00004
5	PIC00005
6	PIC00006
7	PIC00007
8	PIC00008
9	PIC00009
10	PIC00010

- After selecting the number, press the **[▶]** key or **[Knob]** to enter.
- Select the [Yes] in the confirmation menu and press the **[MENU]** key. Then, the preset image is deleted.

Confirm image	
Yes	
No	

Add the comment to the stored image.

It is convenient to judge the stored image.

- Press the **[MENU]** key.
- Select **[NAV] → [Image comment]**.
- Select the number of image to which the comment is added from the **[Image comment]**.

Image comment	
No.	Comment
1	PIC00001
2	PIC00002
3	PIC00003
4	PIC00004
5	PIC00005
6	PIC00006
7	PIC00007
8	PIC00008
9	PIC00009
10	PIC00010

- After selecting the number, press the **[▶]** key or the **[Knob]**.
- Select the character with the **[▲]** key or **[▼]** key. (character: A~Z, blank, 0~9, +, -, /)

Image comment	
No.	Comment
1	PIC00001
2	PIC00002
3	PIC00003

- Select the comment position with the **[◀]** key or **[▶]** key.

Image comment	
No.	Comment
1	PIC00001
2	PIC00002
3	PIC00003

Caution: At this moment, if the [Knob] is pressed, the setting is cancelled and the menu returns to the menu item.

- After finishing the edit, press the **[MENU]** key.
- Select the [Register] in the confirmation menu and press the **[MENU]** key. Then, the edit is finished.

Edit is finished	
Register	
Not register	

2.15 Selection of Zoom

Set the zoom display with the display mode ([zoom (H)] or [zoom (L)]).

The [Bottom], [Bottom Discrimination], [Zoom], [[Bottom Zoom] and [Bottom Follow Zoom] are provided. (See [1.4 Switch-over of Menu].)

- Press the **[MENU]** key.
- Select **[Display range] → [Zoom image]**.
- Select the zoom image.

Zoom select
BTM.
B.D.
Zoom
B.Z.
B.F.Z.

4 Press the [MENU] key to close the menu.

For each zoom display, refer to [1.4 Switch-over of display].

2.16 Selection of NAV Display

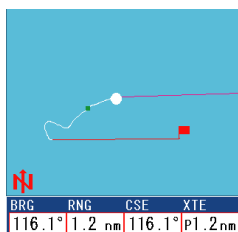
The information can be displayed on the NAV display (NAV 1, NAV2).

Type of NAV Display

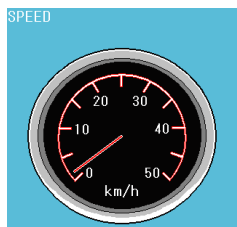
Depending on the division method (2 division, 4 division), the information to be displayed differs.

2 division

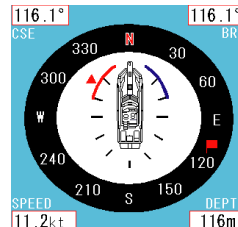
display1
display2



Simple plotter



Speed meter



Compass

Information displayed in 1 and 2
Simple plotter, speed meter and compass

4 division

display1
display2
display3
display4

RNG 0.7 nm BRG 102.1°	HDG 32.0°
Water temp 14.1 °C	The time required 00h29m
Course 109°	Wind dir. PORT 160.2°
XTE PORT 1.02 nm	Lat/Lon 35° 59.0000N 135° 25.0000E
Boat speed 3.5 kt	Wind speed 3.5 kt
Depth 52.3 m	

Information to be displayed in 1 to 4
Wpt dist dir., Time required, Wind dir., Wind speed, depth, Lat/Lon, Boat speed, course, water temp, Heading and XTE

Dividing Method of Display

- 1 Press the [MENU] key.
- 2 Select [Display] → [NAV 1] → [NAV 2].
- 3 Select the dividing method (2 division, 4 division).

NAV1
2
4

4 Press the [MENU] key to close the menu.

Selection of NAV Menu

- 1 Press the [DISP] key.
- 2 Select the [NAV1/Normal (H)] or the [NAV2/Normal (L)].
- 3 Press the [▶] key.
The [NAV1 display1] is displayed.

NAV display1
Simple Plotter

- 4 Select by rotating the [Knob] .
- 5 To change the [NAV 2], press the [▼]

key.

Caution: Every time when pressing the [▼] key, the [Display] switches in the order of [NAV1] to [NAV4].

- 6 Select the [NAV] by rotating the [Knob] .
- 7 Press the [MENU] key to close the menu.

2.17 Explanation of Sonar

Switch-over of Sonar Tone

The sonar can be outputted to the built-in speaker by selection.

The school of fish and condition of bottom on the display of echo sounder can be confirmed by hearing the sonar.

Sonar tone
OFF
ON

- 1 Press the [MENU] key.
- 2 Select the [Sonar] → [Sonar tone].
- 3 Select the [ON] or [OFF] of Sonar tone].

Caution: When set to [OFF], the built-in speaker does not output the sonar.

When set to [ON], the built-in speaker outputs the sonar.

- 4 Press the [MENU] key to close the menu.

Connection of External Speaker

Connect the external speaker with amplifier (option) so that you can hear the sonar easily.

The sonar is always outputted. Adjust the speaker volume with the volume provided on the speaker.

Caution: The external speaker is an option.

2.18 Explanation of Menu Item

The various items in the menu are explained.

TVG

The TVG corrects the difference of strength between echo reflected from the shallow depth and echo reflected from deep depth so that the reflection can be uniformed.

The deeper the depth is, the weaker the reflected signal of echo sounder becomes due to attenuation. Thus, comparing with the signal reflected from the same size fish in the shallow depth, the signal reflected from the fish in the deep depth becomes weak. The TVG corrects the echo signal reflected from the deep depth to be equal to that reflected from shallow depth by increasing the receiver gain so that the effect that the strength of echo signal reflected from the deep depth looks same as that reflected from the shallow depth provided. The correction gain due to the depth increases in the order of weak → medium → strong. When set to “weak”, the TVG also provides the effect that reduces noise in the shallow depth.

- 1 Select the [Adjust] → [TVG].
- 2 Select the [weak, medium, strong].

TVG
Weak
Medium
Strong

Change the TX power.

The strength of transmission output (power) can be changed.

When the noise of interference with the neighboring echo sounder occurs, if the powers of transmission outputs at both sides are weakened, the interference noise can be suppressed.

In the [Auto] setting, the transmission output is automatically adjusted.

Adjust	Image speed	1/1
D.range	IR	Strong
Image	Color Rejection	0%
Alarm1	Noise Rejection	0.0
Alarm2	Clutter	5
NAV	TGV	Medium
Disp	TX power	Auto
Sonar	Return	
Next		

- 1 Select the [Adjust] → [TX power].
- 2 When selecting the smaller number, the transmission power becomes weak.

TX power
20
30
40
50
60
70
80
90
100
Auto

Display the A scope. / Stop the display of A scope.

The echo strength of latest echo can be displayed at the right side of echo sounder display.

The strength of echo sounder image is expressed by the horizontal width. This expression is called [A scope].

The width for strong echo is wide and the width for weak echo is narrow. This makes it easier for you to see the echo.

Adjust	A scope	OFF
D.range	White line	OFF
Image	Background color	Marine blue
Alarm1	Color tone	64 color
Alarm2	Depth value	Large
NAV	Water temp graph	OFF
Disp	Return	
Sonar		
Next		

- 1 Select the [Display] → [A scope].
- 2 To display the A scope, select the [ON]. To stop the display of A scope, select the [OFF].

Change the display color of echo sounder image

The [Monochrome], [8 color], [16 color] and [64 color] can be selected.

- 1 Select the [Display] → [Color tone].
- 2 Select the [Color tone].

Change the depth value.

The display size of depth value and the scale value can be changed.

- 1 Select the [Display] → [Depth display].
- 2 Select the size of display.

Display the water temp graph. / Stop the display of water temp graph.

The latest water temp value and the graph of past water temp data can be displayed.

- 1 Select the [Display] → [Water temp graph].
- 2 To display the water temp graph, select the [ON]. To stop the display of water temp graph, select the [OFF].

Disp Width

When the image is zoomed or the High frequency / Low frequency displayed, the disp width can be changed.

Adjust	Disp width	Center
D.range	Image swap	A B
Image	NAV 1	[2]
Alarm1	NAV 2	[4]
Alarm2	Return	
NAV		
Disp		
Sonar		
Next		

- 1 Select the [Disp] → [Disp. width].
- 2 Select the width of image.

Image Swap

The images of echo sounder at the right and left sides can be swapped.

- 1 Select the [Display] → [Image swap].
- 2 Select the swap state.

Chapter 3 How to use the system menu

3.1 Display of System Menu

After powering on, besides the menu displayed first with the [MENU] key, the system menu, of which setting is not frequently changed, is provided.

[In out],[Correct],[System],[Setting],[Maintain]

Display the system menu

- 1 Press the [MENU] key.
- 2 Select the [Next].

Adjust	In out
D.range	Correct
Image	System
Alarm1	Setting
Alarm2	Maintain
NAV	
Disp	
Sonar	
Next	

- 3 Press the [▶] key to display the system menu.

Prev	Adjust
In out	D.range
Correct	Image
System	Alarm1
Setting	Alarm2
Maintain	NAV
	Disp
	Sonar

Return to the normal menu.

- 1 Select the [Prev].
- 2 Press the [▶] key to display the normal menu.

3.2 Setting of External In/Out

Set the setting related to the input/output.

Prev	Buzzer Setting	OFF
In out	Temp source	Sensor
Correct	Speed source	Sensor
System	Baud rate	4800
Setting	NMEA monitor	OFF
Maintain	NMEA output data	
	Return	

Buzzer Setting

Set the buzzer sound to ON/OFF.

Temp Source

Switch the Sensor/NMEA.

Use the built-in water temp meter for sensor.

Use the external input value for NMEA.

Speed Source

Switch the Sensor/NMEA.

Use the built-in speed meter for sensor.

Use the external input value for NMEA.

Baud Rate

Change the transmission speed of external input/output.

Match the transmission speed with that of external equipment connected.(setting: 4800,9600,19200,38400)

NMEA Monitor

The external input data can be displayed.

To return to the original menu, press the [MENU] key.

NMEA Output Data

The output of NMEA sentence can be set to ON/OFF.

- 1 Select the sentence name.
- 2 Press the [▶] key.

Prev	Prev	
In out	DBT	ON
Correct	DPT	ON
System	GGA	OFF
Setting	MTW	OFF
Maintain	TLL	ON
	VHW	OFF
	VTG	OFF
	ZDA	OFF
	Return	

- 3 Select the ON/OFF.
- 4 Select the [Prev].
- 5 Press the [▶] key.

Caution: If you omit steps 4 and 5, the setting is valid. But, when selecting the [In out] menu next, the [NMEA out data] is displayed.

3.3 Setting of Correct Item

Prev	Draft set	0.0m
In out	Sonic speed	Seawater
Correct	Water temp	0.0°C
System	Boat speed	0%
Setting	Inner-hull	0
Maintain	Return	

Draft Set

The tolerance of depth can be corrected.

Set the depth from the sea level to the set depth of your transceiver/receiver. Normally set draft value of your boat. (setting: expect ft: -10.0~10.0, ft: -30.0~30.0)

Sonic Speed

Set the [Seawater] or [Freshwater]. Change to meet the usage,

Water Temp

The error of water temp value can be corrected. (setting: -10.0~10.0°C, -10~10°F)

Boat Speed

The tolerance of boat speed value can be corrected.

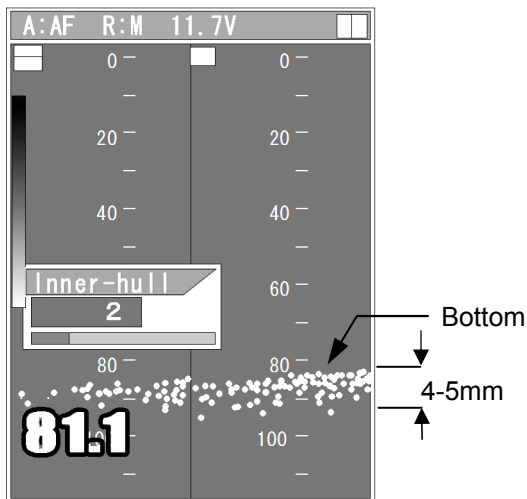
When the [Speed source] is set to the [Sensor], it is corrected by %. (setting: -50~50%)

When the [Speed source] is set to the [NMEA], it is corrected by numeral. (setting: -10.0~10.0)

Inner-hull

The reduction in sensitivity due to signal attenuation in inner-hull use can be corrected. (setting:0~10: through-hull: 0)

- 1 Select the [Correct] → [Inner-hull] .
- 2 Press [▶] key. The image displays bottom only. It may show very strong fish targets.



Inner-hull image

- 3 Adjust the number to have the thickness of bottom to be 4-5mm on the image with High frequency (200 kHz) at 50-100m depth.
- 4 Press [◀] key.

Caution: Inner-hull setting value widely varies upon installation conditions such as material of hull and installation method. Low frequency (50 kHz) may not be used due to large signal attenuation.

3.4 Setting of System Item

Prev	Simple menu	OFF
In out	Operation Guide	ON
Correct	FUNC.key setting	Image speed
System	Language	English
Setting	Return	
Maintain		

Simple Menu

Set the simple menu display.

The items displayed in the menu are limited only to the setting items of minimum requirement.

When making the setting change fewer, it is convenient.

Operation Guide

When displaying the menu, it sets whether or not the operation guide is displayed at the lower part on the display.

When setting to “No display of operation guide”, the echo sounder image can be easily seen at the menu operation.

FUNC key set

Set the function assigned to the [FUNC] key. (See [1.8 Use of [FUNC] key].)

Language

Switch to the language to be displayed. (See [1.2 Power On/ Off].)

3.5 Setting of Basic Set Item

Prev	Range & Speed unit	nm.kt
In out	Depth unit	m
Correct	Temperature unit	°C
System	Local time offset	0.0
Setting	GPS select	KODEN GPS
Maintain	GPS initialize	No
	Return	

Range & Speed Unit

It switches the display unit to [nm, kt] or [km, km/h].

Depth Unit

It switches the unit of depth to fm, l.fm and ft.

Temperature Unit

It switches the unit of temperature to °C, °F.

Local time Offset

The local time offset can be set by 0.5 hours (30 minutes) unit. (setting:-11.0~14.0h)(UTC:0.0)

GPS select

It selects whether the GPS sensor is the KODEN made one or not.

GPS initialize

It is valid only when KODEN GPS is connected.

The GPS sensor is initialized.

When connecting the GPS sensor other than KODEN GPS, do not use this item.

3.6 Maintenance Menu

Prev	Simulation	OFF
In out	Initialize	No
Correct	System check	
System	All WPTs:DLT	
Setting	All IMG DT:DLT	
Maintain	Return	

Simulation

When the [Simulation] is set to ON, the pseudo image of echo sounder is displayed.

Initialize

It returns all the settings in the menu to the factory settings. However, the memorized data of display remains unchanged.

Caution: It returns to the factory settings and the power is automatically shut down.

System Check

It is used for diagnostic test.

(See [4.5 Diagnostic Test].)

All WPTs deletes

All WPT lists can be deleted.

All stored image deletes

All stored image lists can be deleted.

Chapter 4 Maintenance and Inspection

4.1 Inspection

The daily maintenance and inspection extends the life of equipment. To always keep the equipment in the best condition, implement periodically the inspection shown in the table below.

Item	Content of Inspection
Connector at the rear of CVS-126 Display unit	Check the looseness.
Wiring of cables	Check the wiring of cables connecting the equipment and the damage of cable.
Grounding of display unit	Scrape the rust off the ground terminal and make its contact well.

4.2 Cleaning

CVS-126 Display unit

To protect the LCD and enhance the visibility of display, the acrylic filter is installed to the surface of CVS-126 Display unit. If this part is dirty, an image becomes unclear. So, dip the soft cloth in the neutral or alcohol detergent and wipe the filter surface lightly with the cloth wrung lightly.



Caution NEVER use a thinner solvent. If done so, the filter surface will chemically decompose, resulting in of transparency.

Transducer

In case of through-hull equipped transducer, check the surface of opening of transducer (portion from which the ultra-sonic is emitted). If shells and oil are stuck, scrub the surface with a wooden or bamboo knife with caution not to damage the surface and remove stuck matters. If you scrub strongly, the surface will be damaged, resulting in deteriorated performance of transducer.

4.3 Fuse Replacement

Warning Use the specified fuse. If you use a fuse other than specified one, it may lead to a serious accident.

If the input voltage is too high, the over-current flows or a trouble occurs inside, the fuse will blow out. The fuse is housed in the power cable.

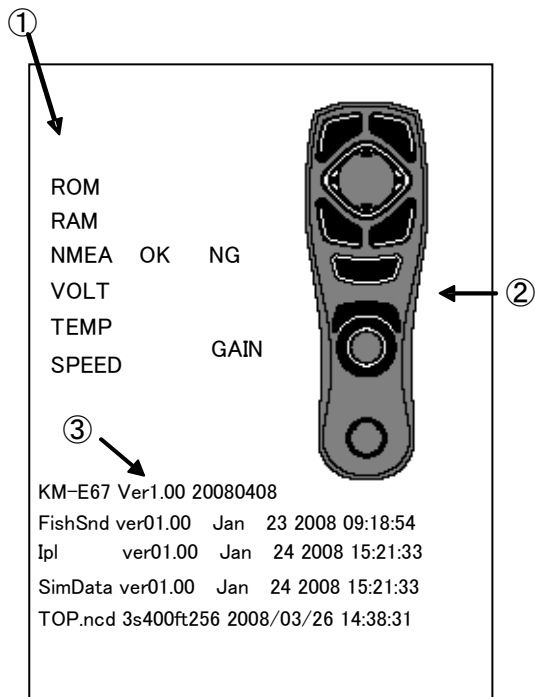
4.4 If you suspect a trouble

Symptom	Trouble cause	Countermeasure
Even if the power is powered on, nothing is displayed.	<ul style="list-style-type: none"> • Blown fuse. • The power voltage is out of specification (10.8 to 31.2 VDC). • Poor connection between power cable and battery. 	<ul style="list-style-type: none"> • Exchange a fuse.(See [4.3 Fuse Replacement]) • Use a proper power as per specification. • Confirm a connection between the power cable and the battery.
The unit starts up. But, nothing is displayed on the display.	<ul style="list-style-type: none"> • Connection between transducer and display unit. • Defect of LCD display block. 	<ul style="list-style-type: none"> • Confirm a connection between Transducer and Display unit. • Consult a repair shop or the distributor in your market.
Too much interference and noise.	<ul style="list-style-type: none"> • Installed position of transducer. • Interference from the echo sounder on other boat. 	<ul style="list-style-type: none"> • Confirm the position of transducer. (See [5.3 Installation of Transducer]) • Apply the interference rejection. (See [2.3 Rejection of Interference])
The display of water temperature / boat speed is abnormal or not displayed.	<ul style="list-style-type: none"> • Connection of sensor connector. • Input source of water temperature sensor / speed sensor. 	<ul style="list-style-type: none"> • Confirm the connection of the sensor connector. • Confirm the input source.
The display of present location/course is abnormal or not displayed.	<ul style="list-style-type: none"> • Connection between this unit and navigation equipment. 	<ul style="list-style-type: none"> • Confirm a connection between Display unit and the navigation equipment.

4.5 Diagnostic Test

Perform the operation diagnosis.

When checking the operation diagnosis of panel key, the state of sensor inside and the version of software, it is using.



Return to the normal menu.

Press the [MENU] key for more than 3 seconds.

Diagnose.

① displays the diagnostic result.

The result of ROM and RAM check displays OK when normal and NG when abnormal.

Caution: To test the NMEA, TEMP and SPEED, the special jig is necessary.

② implements the key input test. When pressing the key, the color of a part corresponding to the pressed key changes.

When pressing the [Knob], the LCD test is performed.

Confirm the version.

③ displays the information on the version of software.

When inquiring, inform us of verXX.XXX.

Chapter 5 Installation

5.1 Item of Caution on Installation

To exercise fully the performance of echo sounder, the installation of CVS-126 must be performed by an engineer who is officially authorized by our company. The installation work includes the following content.

- (1) Unpacking the configuration items
- (2) Inspection of configuration unit, spare, accessories and material for installation
- (3) Check of power voltage and capacity of current
- (4) Decision of installing location
- (5) Installation of CVS-126 Display unit and transducer
- (6) Installation of accessories
- (7) Plan and execution of cable laying and connection
- (8) Adjustment after completion of installation

Unpacking the configuration parts

Unpack the configuration items and confirm that all of the items match with the contents on the equipment configuration list. If not matched, Contact the dealer you purchased or our sales company.

Inspection of configuration items and accessories


Inspect the appearance of each configuration item and accessories and check that no dents or damage exist.

If any dents or damage exists and they are believed to be caused by accident during transportation, contact the transportation and insurance company and consult our sales company or our dealer nearest to you.

Decision of Installing Location

To exercise fully the performance of equipment, install the equipment, considering the points mentioned below.

- (1) Install the equipment at the location in the bridge so that its display can be easily seen.
- (2) Select a safe location where the equipment is not exposed to humidity, water splash, rain and direct sunshine.
- (3) Keep enough space for maintenance. Especially, secure enough space at the rear panel where many cables are concentrated.
- (4) Keep the equipment as far away from the wireless transmitter/receiver as possible.

	<p>Caution</p> <p>The equipment is not waterproofed. Avoid excessively damp place. Do not install the equipment in place suffering from excessive water-drops. Otherwise, the inside of display window mists over or corrosion may occur inside.</p>
---	---

Laying and Connection of Cable

- (1) Keep the transducer and power cable as far away from the cables of other electronic equipment as possible.
- (2) The cabinet of CVS-126 Display unit is securely grounded to the hull, using the ground terminal on the rear panel.

Caution: The ground side of power input of this equipment is connected to the ground terminal.

In case of + (positive) ground, it cannot be used. The power may short-circuit.

- (3) If you connect the power cable directly to the battery, the interference from other electronic equipment is not subject to occurrence. (See Fig. 5.1.)

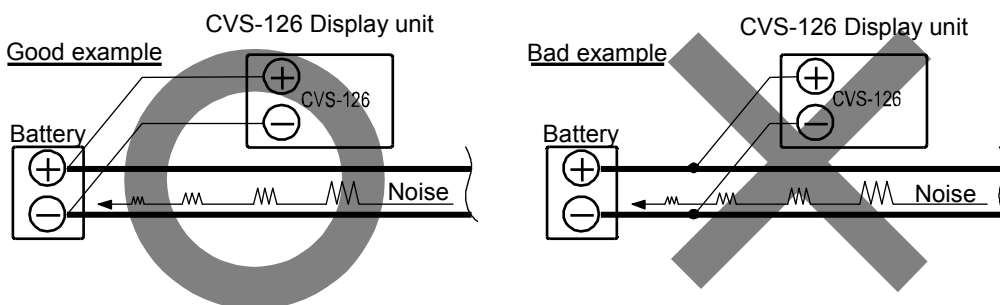


Fig. 5.1 Connection of Power Line

Confirmation after Installation

Be sure to confirm the following items before starting up this equipment. The confirmation is mandatory to operate the equipment normally.

- (1) Is the power voltage in the boat within the appropriate voltage range? Is the current capacity enough?
Voltage Range: 10.8 to 31.2V when measured at the power connector input.
- (2) Is the wiring of transducer cable correct? Is the wiring shorted?

5.2 Installation of CVS-126 Display unit

CVS-126 Display unit can be desk-top installed or flush-mount installed.

It cannot be installed in other method (Example: Suspended installation). Install in the following procedure.

Desk-top Installation

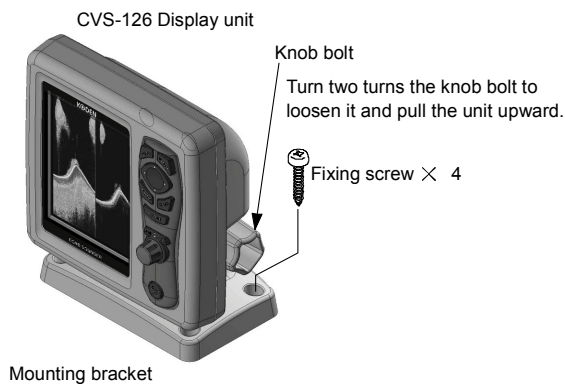


Fig. 5.2 Desk-top Installation

- (1) Loosen the knob bolt fixing CVS-126 Display unit to the mounting bracket, push the unit to the left side and pull the unit upward.
- (2) Place the removed unit to a safe and flat place.
- (3) Place the mounting bracket on the location for the unit to be installed and fix it with four screws (trans-tapping screws) supplied with installing materials.
- (4) Connect the connectors for power and transducer to the unit respectively.
- (5) Install the unit to the mounting bracket and fix the unit by turning clockwise the knob bolt

Flush-mount Installation

- (1) Make a square hole (160mm x 160mm) at the location to be installed. (See Fig. 5.4.)
- (2) Turn counter-clockwise the knob bolt fixing CVS-126 Display unit to the mounting bracket to loosen it, push the unit to the left side and pull the unit upward. The mounting bracket and knob bolt are no longer used.
- (3) Confirm that the unit matches with the square holes. If not matched, correct the square hole.
- (4) Remove the front frame of CVS-126 Display unit, pulling it toward you. (See Fig. 5.3.)
- (5) Connect the connectors for power and transducer to the unit respectively.
- (6) Install the CVS-126 Display unit in the installing location (square hole) and fix it with four tapping screws (4mm) (M4 or pan-head). (Prepare 4mm screws suitable for thickness of installing location.)
- (7) Install the front frame removed in step (4).

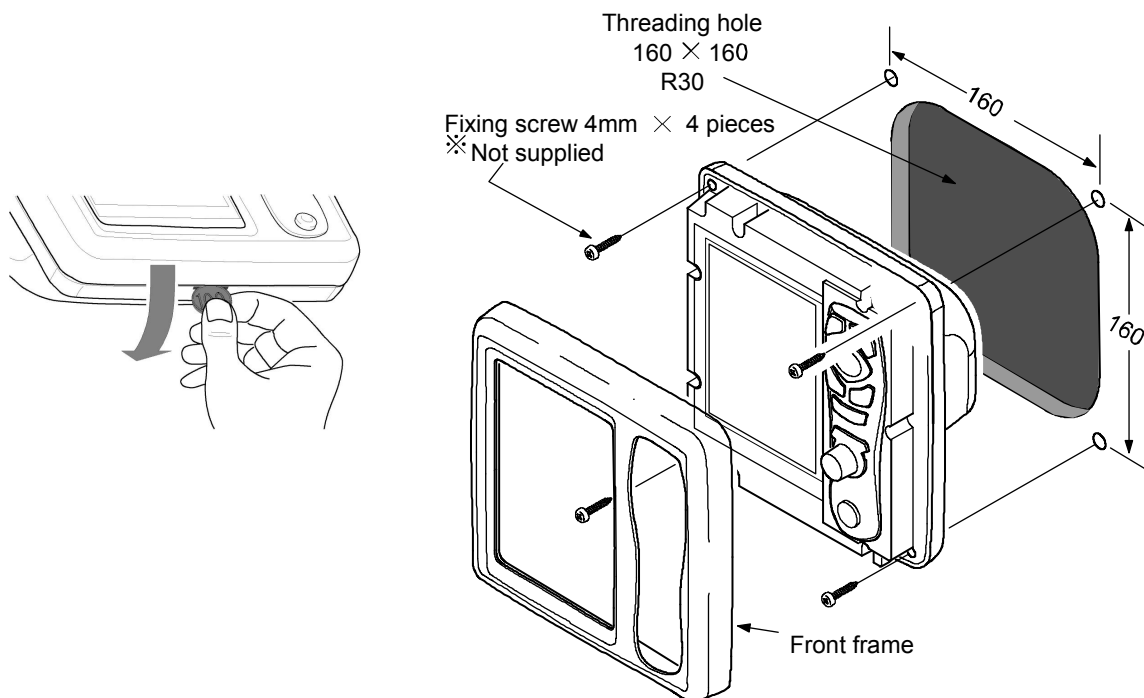


Figure 5.3 Flush-mount Installation

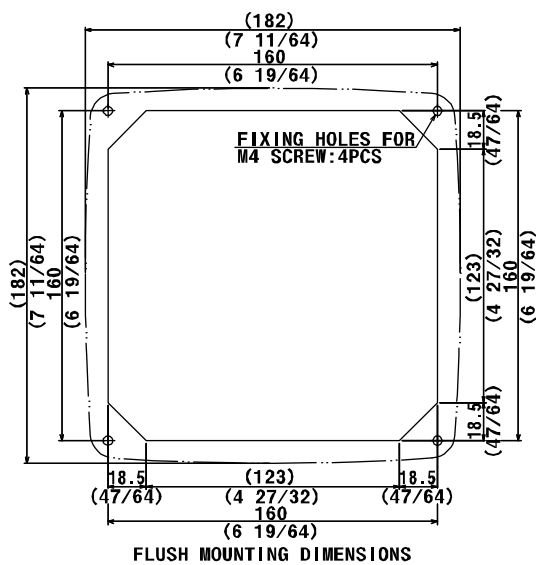


Figure 5.4 Work of flush-mount installation hole

5.3 Installation of Transducer

The standard installation of this echo sounder is shown in figure 5.5.

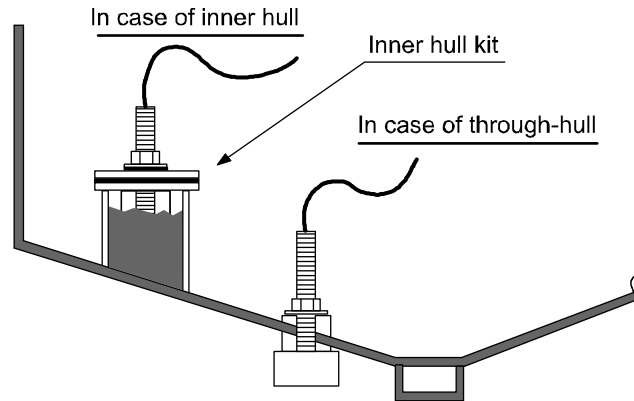


Figure 5.5 Installation of Transducer

In case of Inner-Hull

Using the optional inner-hull kit (MFB-04), install the transducer to the inner side of ship's bottom.

Caution on installation

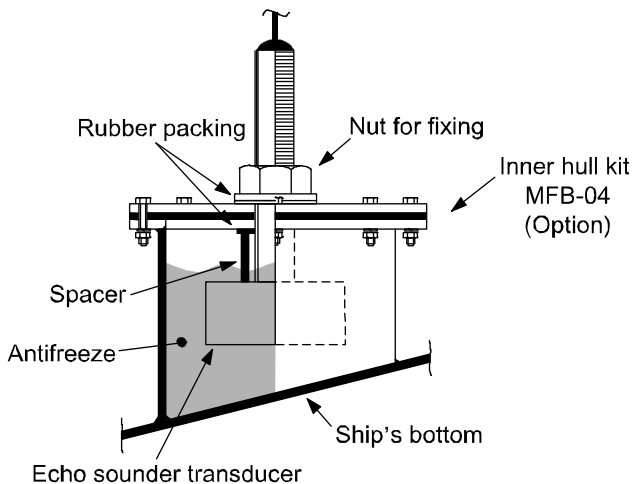


Figure 5.6 Inner-Hull installation

- (1) Select the location where no bubble is generated during navigation.
- (2) Select the relatively thin location of ship's bottom.
- (3) Be sure to remove oil on the contact surface. File the contact surface with sand paper (#400) so that the adhesive strength will increase.
- (4) The adhered surface will dry in about two hours.
- (5) Leave the unit for a whole day and fill in the coolant. More than 80% of the transducer should be submerged in the coolant.

Caution: Confirm a place of the installation of inner-hull in the manufacturer of the ship and so on. The inner-hull device is for more effective performance method. The gain falls in comparison with the through-hull performance dramatically. Low frequency (50 kHz) may not be used due to large signal attenuation. Depth range performance using 200 kHz Transducer in case of inner-hull will also be less about 50% than that of through-hull.

In case of through hull

Install the transducer directly to the ship's bottom

Installation Procedure

- (1) Select the installing location.
- (2) Remove the fixing nut and one piece of rubber packing.
- (3) If the slope of ship's bottom is greater than 5° , make a wooden base to fit to the slope of ship's bottom. To reduce the water resistance, cut the bow direction tip of wooden base at the outer side of ship's bottom in the triangle shape.
- (4) Make holes at the installing location. If the wooden base is used, make holes in the wooden base.
- (5) Thread the rubber packing in the transducer and then the cable.
- (6) To prevent water from seeping through the gap between the transducer and the hole, fill out the gap with FRP or silicon glue. (Glue the wooden base likewise.)
- (7) Thread the rubber packing and fix it with the fixing nut firmly.
- (8) Connect the transducer cable to the connector of CVS-126 Display unit.

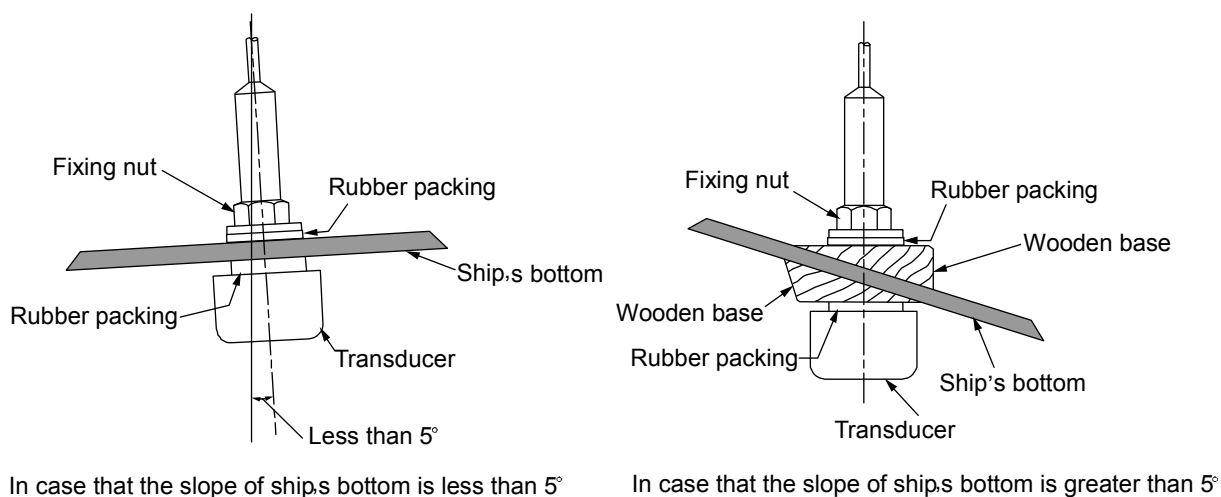
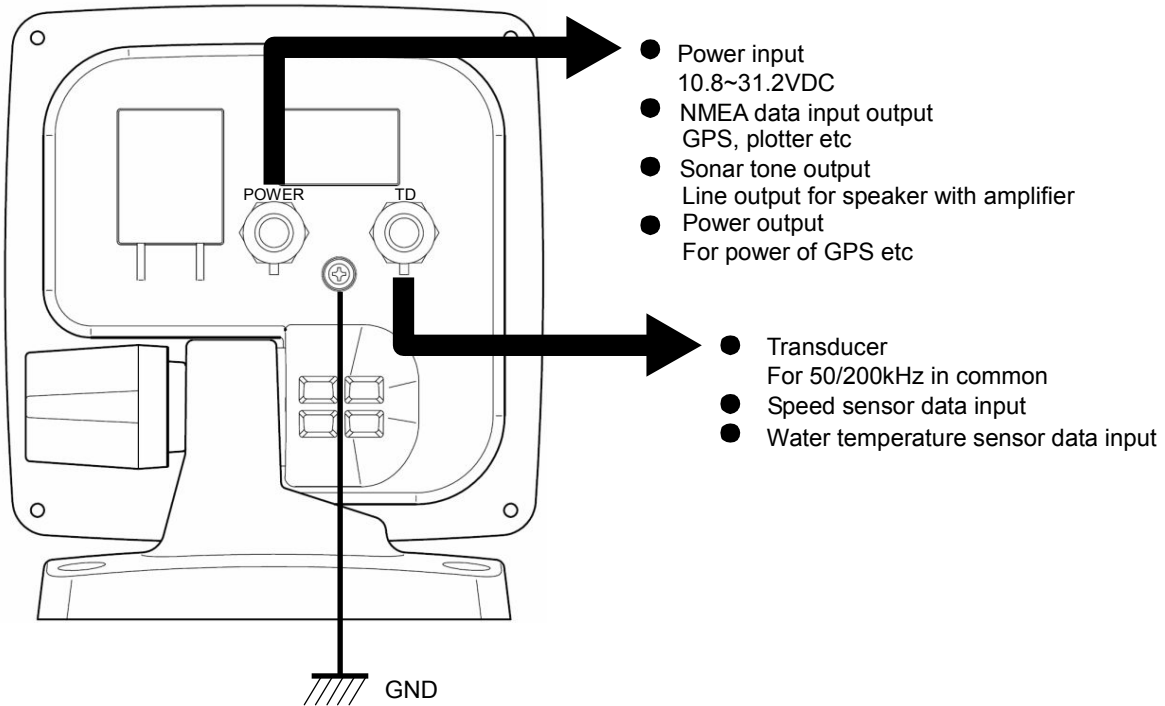


Figure 5.7 Through-hull Installation

5.4 Wiring

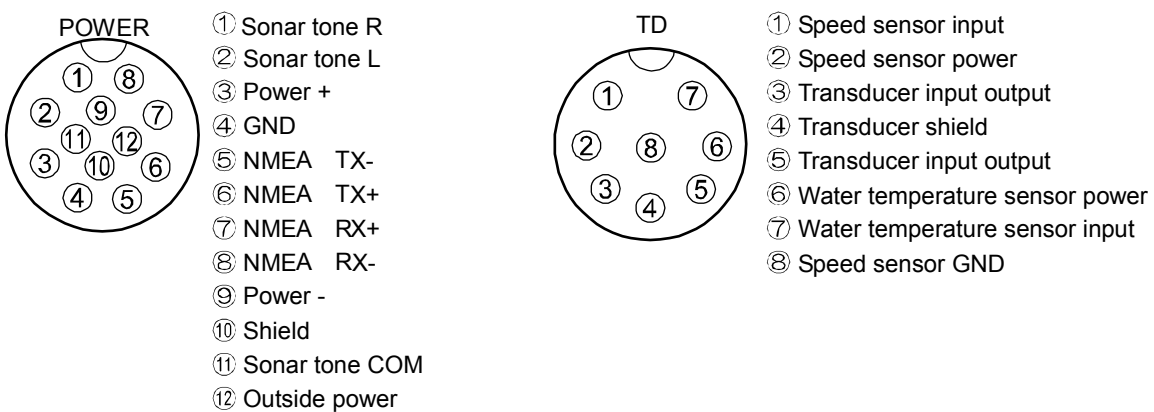
Connection of Cable to CVS-126 Display unit

Connect the power cable and transducer to the connectors of CVS-126 Display unit.



Pin Assignment of Rear Connector

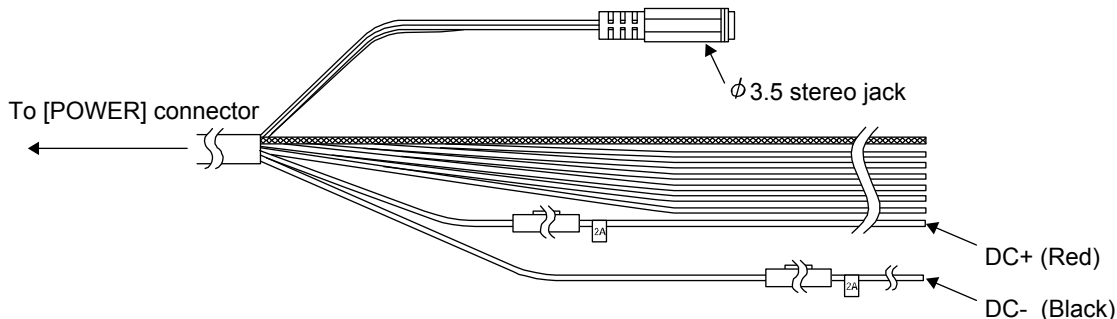
Pin assignment viewed from the rear of CVS-126 Display unit.



Connection of Power Cable and Transducer

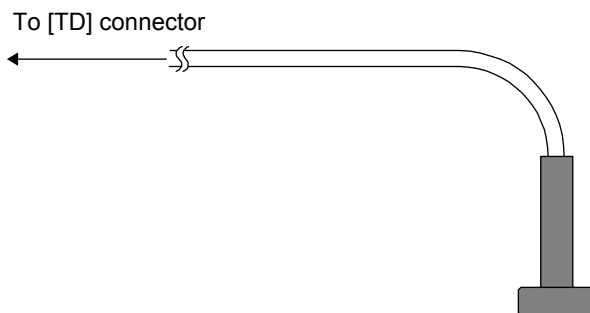
Connect the power cable to the [POWER] connector and the transducer to the [TD] at the rear of CVS-126 Display unit connector.

Connection of DC power cable (CW-264-2M)



Caution: Wind the insulation tape around the un-used lead wire for core-wires not to contact each other.

Connection of transducer



Grounding

- Use heavy gauge cable for grounding wire.
- Connect the grounding wire to the grounding material in a short distance.
- When connecting the external equipment of which positive polarity is connected to the ground line, do not connect the ground of signal line to the cabinet ground.

Connection with external equipment

The DC power cable contains the connection cables for external equipment such as navigation equipment and KODEN GPS sensor.

Color	Pin	Remark
Red	③	Power input+ (with 2A fuse)
Black	⑨	Power input- (with 2A fuse)
Orange	⑥	NMEA data output +
Blue	⑤	NMEA data output -
White	⑦	NMEA data input +
Green	⑧	NMEA data input -

Color	Pin	Remark
White	②	External speaker output (with ø3.5 stereo jack)
Red	①	
Black	⑪	
Yellow	⑫	Outside power
Gray	④	GND
Shield	⑩	

Connection with GPS-20A

After soldering, implement the waterproof and insulation treatment on the connected part with the self-melting tape.

CVS-126 DC power cable (CW-264-2M)		GPS-20A (No Type) Connecting up without using a connector	GPS-20A (Type B) Connecting up using a connector*
Color	Remark	Color	Pin
Orange	NMEA data output +	Orange	②
Blue	NMEA data output -	Blue	③
White	NMEA data input +	White	④
Green	NMEA data input -	Green	⑤
Yellow	Outside power	Red	⑥
Gray	GND	Black	①

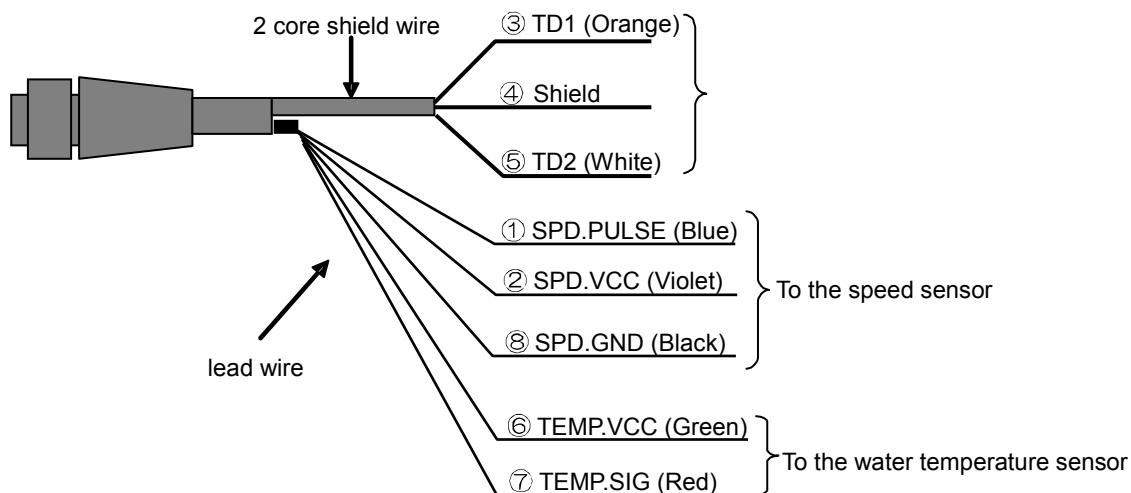
*Optional connector (LTWBD-06PMMP-LC) is necessary.

Connection with Speed Sensor or Water Temperature Sensor (Option)

When installing the optional speed sensor or water temperature sensor, connect to the [TD] connector together with the transducer via the transducer cable (Type: CW-840-0.3M). For wiring, see the figure below.

After soldering, implement the waterproof and insulation treatment on the connected part with the self-melting tape.

Structure of Transducer Cable



Connection Table of Transducer

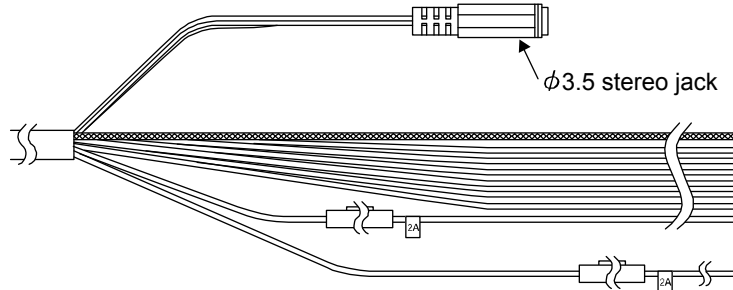
Transducer Cable		Transducer
No. of 2 core shield	Color of 2 core shield	TD-500T-2
		TD-500T-3
3	Orange	Red
4	Shield	Shield
5	White	White

Connection Table of Speed Sensor and Water Temperature Sensor

Transducer Cable		Water Temperature Sensor / Speed Sensor			
No. of lead wire	Color of lead wire	T-81	ST-80 ST-80-1	ST-90 ST-90-1	ST-100 ST-100-1
1	Blue	—	Green	Green	Green
2	Violet	—	Red	Red	Red
6	Green	Gray	White	White	White
7	Red	Gray	Brown	Brown	Brown
8	Black	—	Shield	Shield	Shield

Connection of External Speaker (Prepared by a customer)

The ø3.5 stereo jack is provided to the power cable.
 If you connect the speaker with the amplifier to the external, you can clearly hear the sonar sound.
 Adjust the volume of speaker with the amplifier equipped to the speaker



5.5 Serial Data

Input Data

The sentences of GGA, GLL, HDT, MTV, MWV, RMC, VHW, VTG and ZDA can be received.
 The type of NMEA0183 Ver.1.5, Ver.2.0 and Ver.3.0 can be inputted.

Information	Priority Order of Sentence	Information	Priority Order of Sentence
Latitude, Longitude	GGA>RMC>GLL	Wind Direction	MWV
Course	VTG>RMC	Wind Speed	MWV
Heading	HDT	Date	ZDA>RMC
Ground Speed	VTG>RMC	Time	ZDA>GGA
Water Speed	VHW	Water Temperature	MTW

Output Data

The sentences of DBT, DPT, GGA, GLL, HDT, MTW, MWV, RMC, TLL, VHW, VTG and ZDA can be transmitted.
 The output is performed in the type of NMEA0183 Ver.2.0. However, the DBT is performed in Ver.1.5.

Sentence	Information	Sentence	Information
DBT	Depth	MWV	Wind Direction, Wind Speed
DPT	Depth from the transducer	RMC	Latitude/Longitude, Course, Ground Speed, Date
GGA	Latitude/Longitude, Time	TLL	Target Position
GLL	Latitude/Longitude	VHW	Water Speed
HDT	Heading	VTG	Course, Ground Speed
MTW	Water Temperature	ZDA	Date, Time

Chapter 6 Table Attached

6.1 Menu List

The factory set value is shown by the bold and underline.

[Disp]key

- Disp ——— NAV1/Normal (H), Normal (H), Zoom (H), Dual freq, Zoom (L)
Normal (L), NAV2/Normal (L)

[▲ Range▼] key

- Range ——— 20, 30, 40, 50, 60, 70, 80, 90

[Knob]

- Auto gain select — Manual, Depth mode, fish finder mode
- Gain (H) ——— 0.0~10.0 : 6.0
- Gain (L) ——— 0.0~10.0 : 6.0

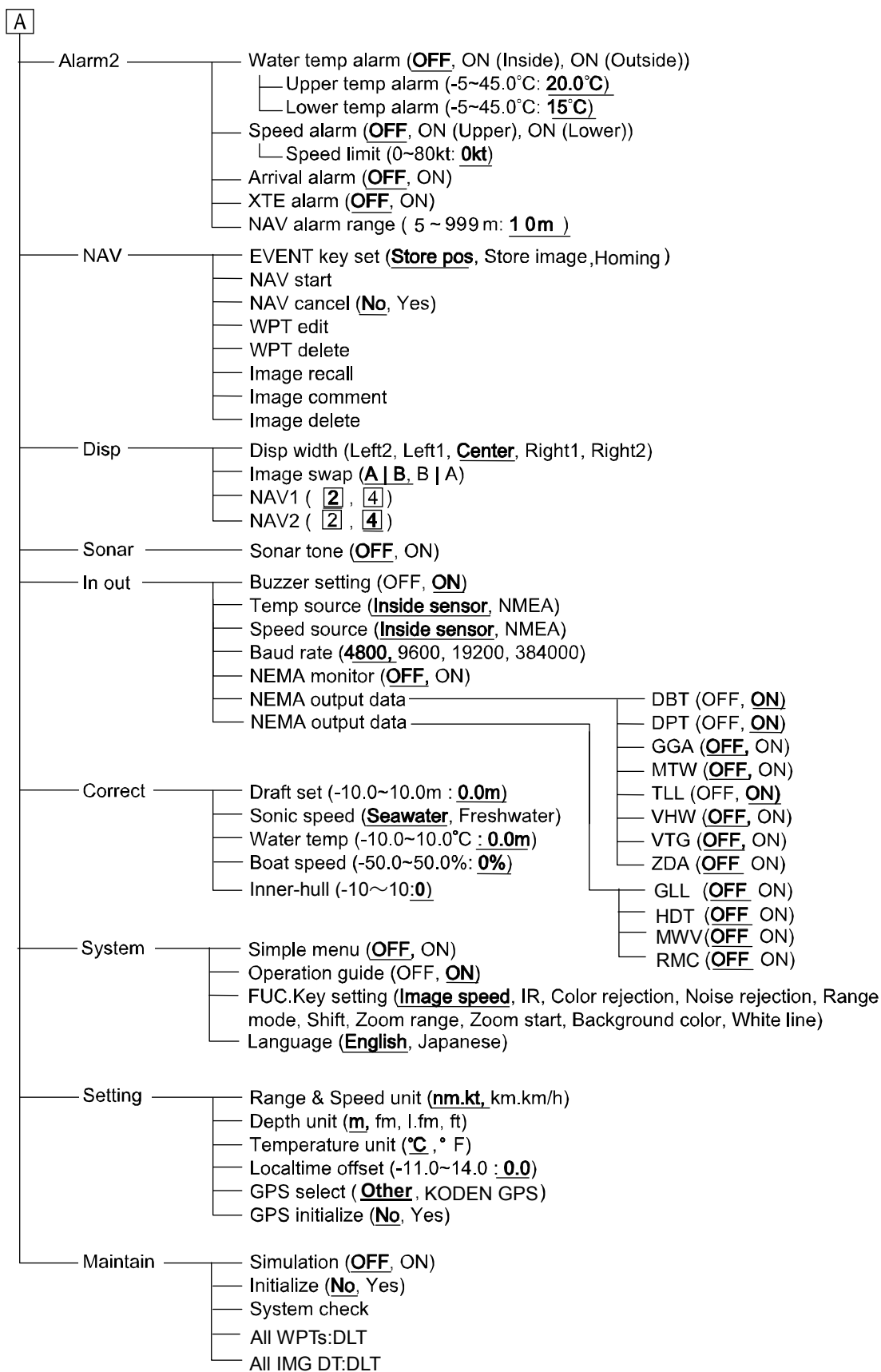
[Brill] key

- Panel brill ——— 1~10 : 10
- Lcd brill ——— 1~10 : 10

[MENU]key

- Adjust ———
 - Image speed (2/1, 1/1, stop, 1/1.5, 1/2, 1/2.5, 1/3, 1/3.5, 1/4, 1/4.5)
 - IR (OFF, weak, strong)
 - Color rejection (0~50% : 0%)
 - Noise rejection (0~10 : 0)
 - TVG (eak, medium, strong)
 - TX power (20, 30, 40, 50, 60, 70, 80, 90, 100, Auto)
- D.range ———
 - Range mode (Manual, Auto range, Auto shift)
 - Shift (0~300m : 0m)
 - Zoom select (Bottom, Bottom Discrimination, Zoom, Bottom Zoom, Bottom Follow Zoom)
 - Zoom range (2.5~200m, 23 stages: 10.0m)
 - Zoom start (0~800m: 0m)
 - Range preset ———
 - Range1 (0~800m : 5)
 - Range2 (0~800m : 10)
 - Range3 (0~800m : 20)
 - Range4 (0~800m : 50)
 - Range5 (0~800m : 100)
 - Range6 (0~800m : 150)
 - Range7 (0~800m : 300)
 - Range8 (0~800m : 500)
- Display ———
 - A scope (OFF, ON)
 - White line (OFF, 1, 2, 3, 4, 5, Auto)
 - Background color (Pale blue, Marine blue, Blue, Dark blue, Black, Pale gr. bl. , Sea green, Dark sea gr., White, Night mode)
 - Color tone (Monochrome, 8 color, 16 color, 64 color)
 - Depth value (Large, Small)
 - Water temp graph (OFF, ON)
 - Tide (OFF, ON)
- Alarm1 ———
 - Bottom alarm (OFF, ON)
 - Upper depth (0~800m: 5m)
 - Lower depth (1~800: 50m)
 - Fish alarm (OFF, ON)
 - Position (0~800m: 5m)
 - Range (1~800m: 50m)
 - Level (Weak, Medium, Strong)

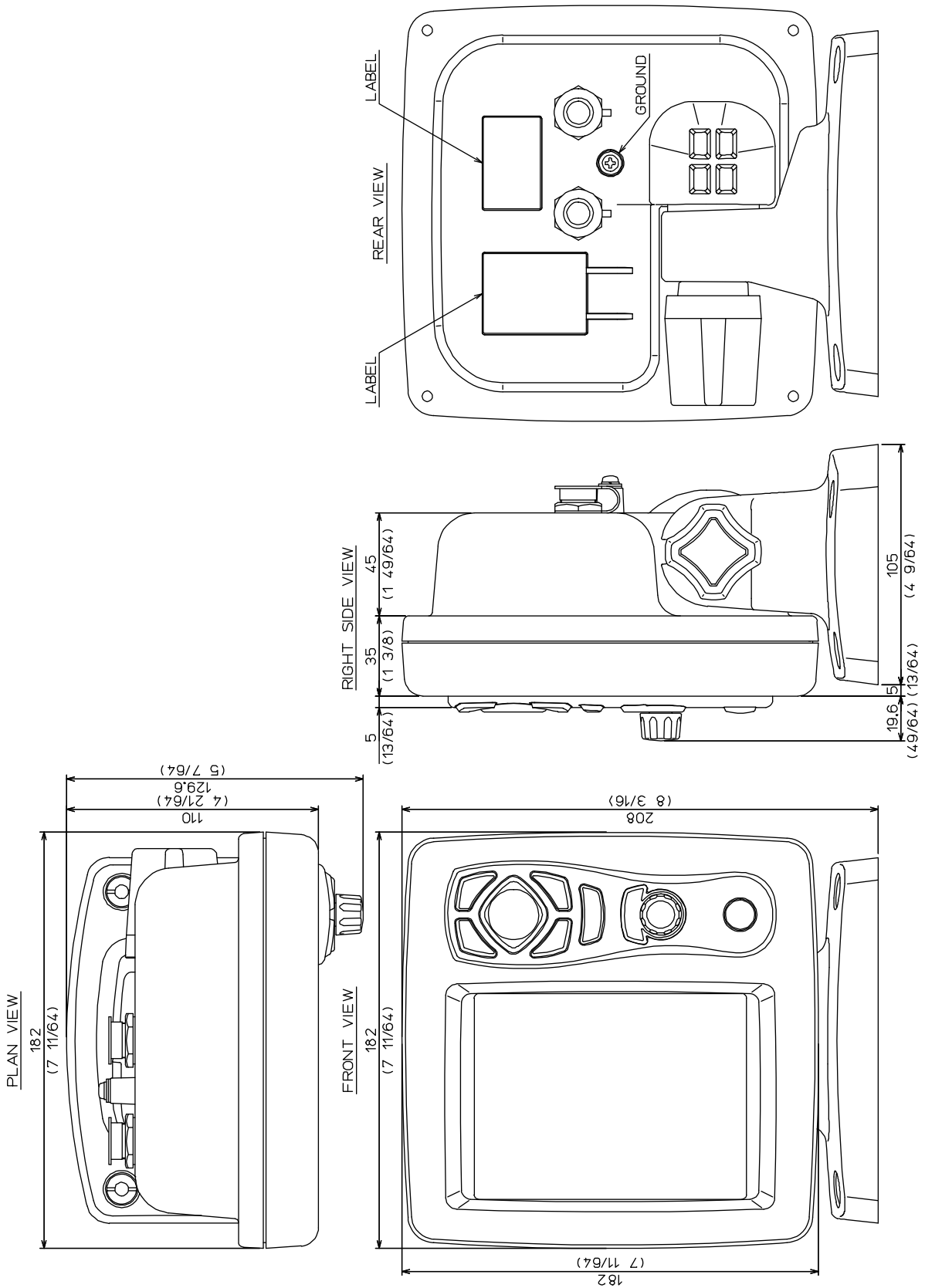
A



6.2 Specification

Item	Content		
Overall	Model	CVS-126	
	Transmission Frequency	50kHz/200kHz	
	Transmission Method	Single or alternate	
	Transmission Power	600W	
	Transmission Firing Times	5000 times/minute at maximum	
	Transmission Pulse Width	50 μ s to 30ms	
	Minimal Reception Gain	0dB μ V	
Indicator	Display	5.7 inch color TFT LCD QVGA	
	Display Mode	Normal, Dual frequency, Zoom, NAV (homing mode, compass), A scope, Tide	
	Zoom Mode	Bottom, bottom discrimination, zoom, bottom zoom, bottom follow zoom	
	Range	2.5 to 800m (It can be set at arbitrary 8 locations.)	
	Range Unit	m, fm, l.fm, ft	
	Shift Amount	0 to 300m (Maximum depth 1200m using Shift)	
	Zoom Range	2.5m to 200m	
	Image Speed	10 stages (2/1, 1/1, stop, 1/1.5, 1/2, 1/2.5, 1/3, 1/3.5, 1/4, 1/4.5)	
	Function Registration	Image speed, range method, shift, interference rejection, color rejection, noise rejection, zoom range, zoom depth, white line, background color	
	Color tone	Monochrome, 8 color, 16 color, 64 color	
Serial Data	Input Data	Type NMEA0183 Ver.1.5/2.0/3.0	
		GGA, GLL, MTW, MWV, RMC, VHW, VTG, ZDA	
	Output Data	Type NMEA0183 Ver.2.0 (DBT only Ver.1.5) DBT, DPT, GGA, GLL, MTW, RMC, TLL, VHW, VTG, ZDA	
Power	DC10.8—31.2V 10W		
Environment Condition	Range of Operating Temperature	-15°C to +55°C	
	Upper limit of Store Temperature	+70°C	
	Upper limit of humidity	93% \pm 3% (At +40°C)	
	Waterproof	IPX5	
	Vibration Resistant	When the following vibration is applied to equipment respectively under specified condition, its performance should not be affected. <ul style="list-style-type: none"> From 2 - 5Hz up to 13.2Hz vibration width \pm1mm \pm% (Maximum acceleration 7m/s² constant at 13.2Hz) From 13.2Hz up to 60Hz Maximum acceleration 7m/s² constant 	
	Size of Cabinet	Maximum 182x208x130 (Unit 182x182x85)	
	Weight	1.3kg	

6.3 Appearance



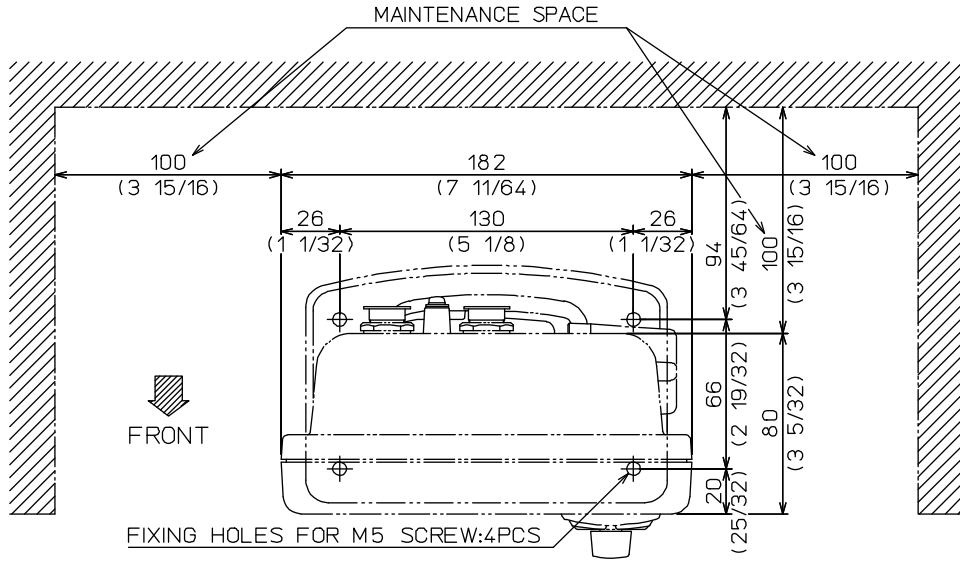
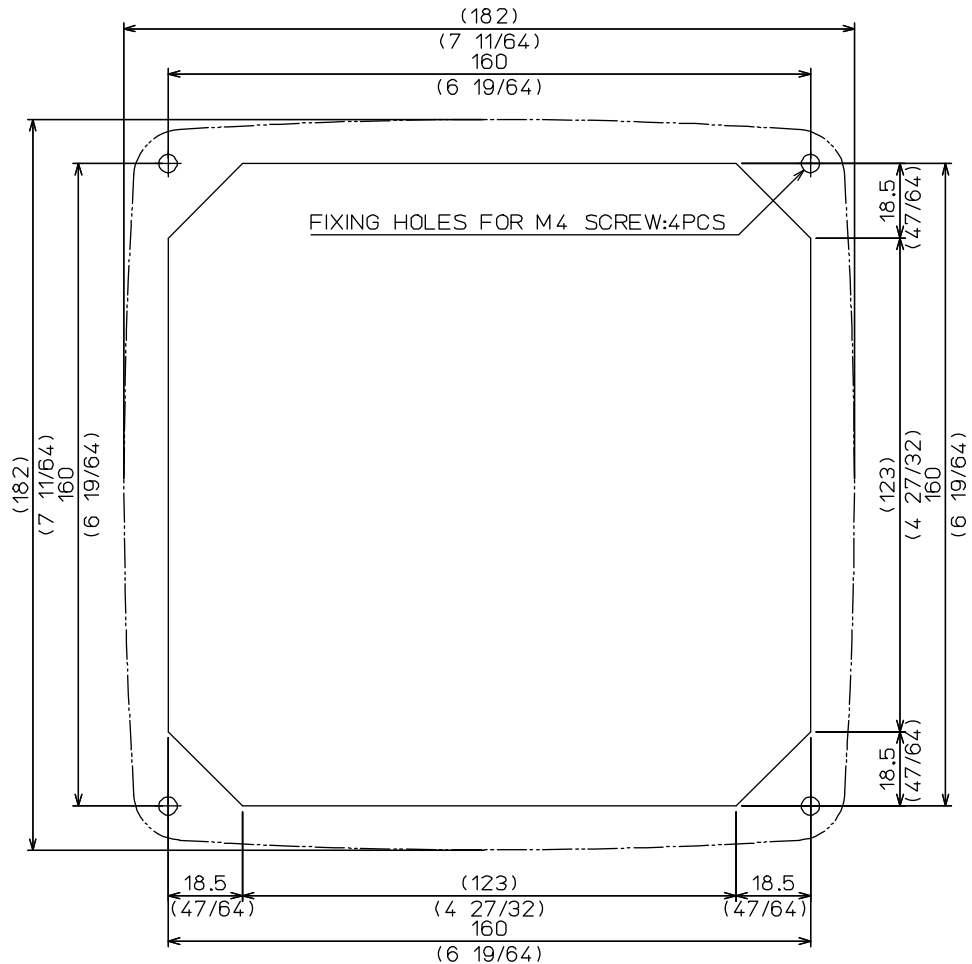


TABLE MOUNTING DIMENSIONS



FLUSH MOUNTING DIMENSIONS



Koden Electronics Co., Ltd.

Tamagawa Office:

2-13-24 Tamagawa, Ota-ku, Tokyo, 146-0095 Japan

Tel: +81-3-3756-6501 Fax: +81-3-3756-6509

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