CE

KODEN

OPERATION MANUAL

Digital Sonar

Broadband

KDS-6000BB

This product is specifically desingned 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.

KDS-6000BB.OM.E 0093160002-00

Declaration of Conformity

(As referred to in Annex IV 2. of Directive 2004/108/EC)

Declares under his sole responsibility that the produced Digital Broadband Sonar manufactured by

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Identified by the type number KDS-6000BB to which this declaration refers conforms to the relevant essential requirements of Directive 2004/108/EC and is in conformity with the EMC requirements of EU harmonised standard

EN60945: 2002

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Signed .....
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Dated 28 Aug, 2014

Document No. 74-2731U-X001

KDS-6000BB Operation Manual

Doc No: 0093160002

Document Revision History

No.	Doc. No.- Rev. No.	Revised Date (Y/M/D)	Revised Content
0	0093160002-00	2014/09/30	First edition
1			
2			
3			
4			
5			
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8			
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10			

Document No. Revised Version Norm

When part of the document needs to be revised, the document has advanced revision number.

The document No. is indicated at the lower right side on the cover and at the left or right side of the footer region of each page.

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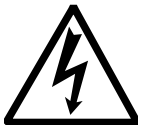
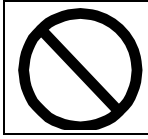
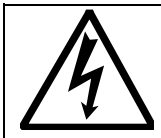
For Your Safe Operation

Symbol used in this Operation Manual

The following pictograms are used in this manual. The meaning of each symbols shall be well understood and the maintenance and inspection shall be carried out.

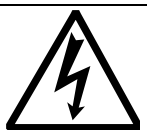
Symbol	Meaning
 Warning	**Mark for warning** This mark denotes that there is a risk of death or serious injury when dealt with incorrectly.
	**Mark for danger of high voltage** This mark denotes that there is a risk of death or serious injury due to electric shock when dealt with incorrectly.
 Caution	**Mark for caution** This mark denotes that there is a risk of slight injury or damages of devices when dealt with incorrectly.
	**Mark for prohibition** This mark denotes prohibition of specified conducts. Description of the prohibition is displayed near the mark.

Caution items on equipment

	**Be careful of high voltage inside** High voltage, which may risk your life, is used. This high voltage may remain in the circuit even after the power is switched off. To prevent contact with the high voltage circuits accidentally, a protective cover or the label with this mark is provided on the high voltage circuit. When the inside is to be checked, ensure to switch off the power and to discharge the residual voltage for safety. An engineer authorized by Koden shall carry out the inspection and maintenance works.
 Warning	**Power off in the boat** An accidental power-on during works may result in worker's electrification. To prevent such accident in advance, ensure that power in the boat and on the equipment are switched off. Furthermore, it is safer to hang a caution tag saying "Under work" near the power switch of equipment.
 Warning	**Be careful of dust** Inhaled dust may cause respiratory affection. At the time of cleaning the inside of equipment, be careful not to inhale dust. Wearing a safety mask is recommended.

 **Caution**	**Caution on location of installment** The equipment shall not be installed at locations which are excessively damp and suffers from water drops. Otherwise, dew condensation may occur inside the display screen, and corrosion may occur inside the unit box.
 **Caution**	**Measures against static electricity** Static electricity may be generated from the carpet on the floor in the cabin or clothes made of synthetic fiber, and it may destroy the electronic components on circuit boards. The circuit boards shall be handled with appropriate measures against static electricity.
 **Caution**	**Caution at installation of Transducer unit** Transducer unit shall be installed at locations where there is no effect by bubble and noise. Bubble and noise may seriously degrade the performance of this equipment.

Cautions on handling

 **Warning**	No disassembly or modification of this equipment is allowed. It may lead to failure, firing, smoking or electric shock. In case of failure, please contact Koden's dealers or Koden.
 **Warning**	In case of smoking or firing, switch off the power in the boat and of this equipment. It may lead to firing, electric shock or damages.
	**Be careful of residual high voltage** High voltage may remain in capacitors for several minutes after switching off the power. Before inspection of the inside, please wait at least 5 minutes after switching off or discharge the residual electricity in an appropriate manner. Then, start the work.
 **Caution**	The information displayed on this equipment is not intended to use for your navigation. For your navigation, be sure to see the specified materials.
 **Caution**	Please use the specified fuses. If un-specified fuses are used, they may cause firing, smoking or damages.
 **Caution**	Be sure to submerge the Transducer unit in water before transmission. If not, it may be damaged.

Contents

Introduction

KDS-6000BB is a digital broadband sonar with broadband Transducer units.

This unit equipped with the latest digital process can accurately display circumstances in the water under all conditions.

KDS-6000BB is the Black Box type without the display unit, for which customer can select the display monitor of preference. The external monitor and connecting cable are user supply.

The signal to an external monitor is analog VGA.

Koden has 17 inches LCD monitor as option.

The main features of this unit are as follows:

• This unit is a digital broadband sonar with broadband Transducer units. It can be set in a range of 130 to 210 kHz.

• With a simple operation on a menu, frequencies can be optionally set within a wide range.

• The operation units can be easility installed from the front side by flush mounting.

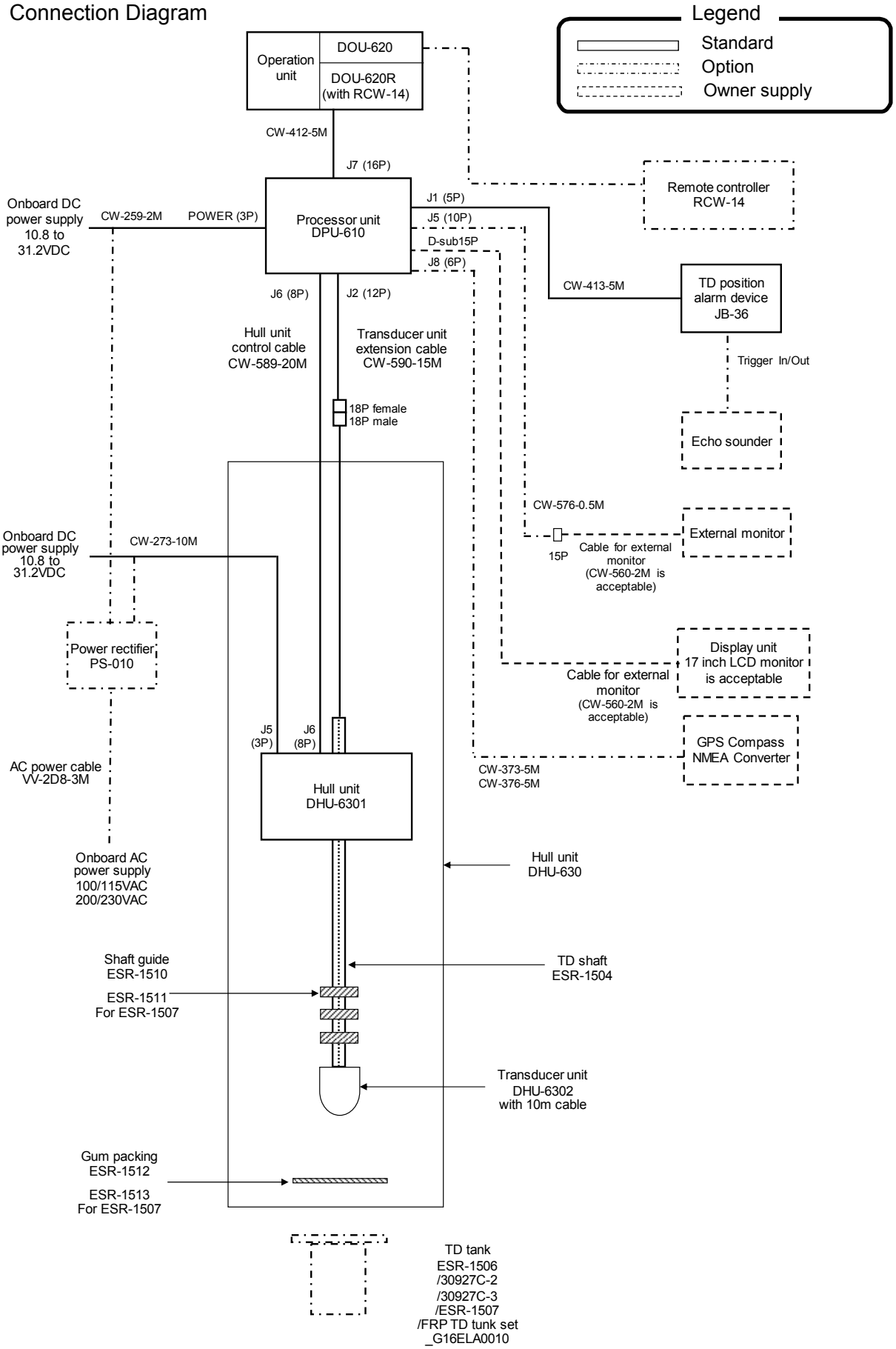
• VGA analog output to an external monitor unit is provided as standard. The use of external monitor enables to observe the sonar images from the place distant from the main unit (External monitor is owner supply).

• The data for image, waypoint and setting data can be backed up to the USB memory, to be recalled.

• As the operation unit is separated, operation away from the processor unit is possible.

System Configuration

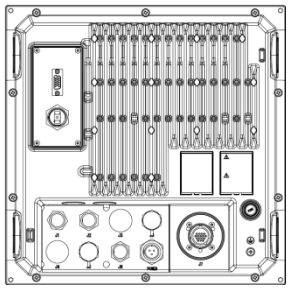
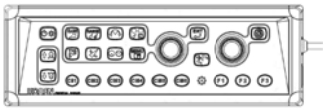
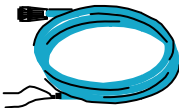
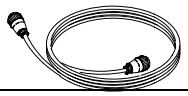
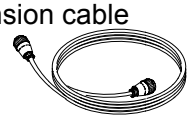
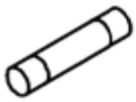
Connection Diagram



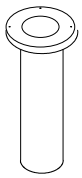
Configuration of Equipment

Standard Equipment Configuration List

a. DPU-610 (Processor unit) / DOU-620 (Operation unit)

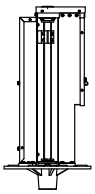
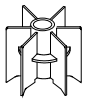
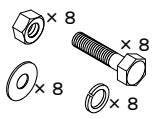
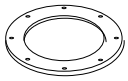
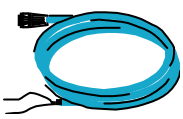
No	Name of item	Type	Remark	Weight/ Length	Qty
1	Processor unit 	DPU-610	No display unit VGA output	5.1kg	1
2	Operation unit 	DOU-620	With mounting bracket (CW-412-5M, Processor unit - Operation unit)	1.1kg/ 5m	1
3	TD position alam device	JB-36	With CW-413-5M (With 5P connector and one end plain)	5m	1
4	DC power cable 	CW-259-2M	With 3P connector and one end plain	2m	1
5	Hull unit control cable 	CW-589-20M	With 8pin water resistant connectors at both ends	20m	1
6	Transducer unit extension cable 	CW-590-15M	With a 18pin connector and a 12pin water resistant connector	15m	1
7	Fuse 	F-7161-10A/N30C-125 V Cylinder (ø 6.4x30)	Normal fusion type for main power		3
8	Operation manual	KDS-6000BB.OM.E	English		1
9	Quick Reference	KDS-6000BB.QR.E	English		1
10	Installation manual	KDS-6000BB.IM.E	English		1

b. TD tank / TD shaft

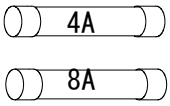
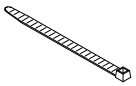
No	Name of item	Type	Remark	Weight/ Length	Qty
1	TD tank 	ESR-1506 (PVC) 1230mm 30927C-2 (PVC) 1500mm 30927C-3 (PVC) 1800mm ESR-1507 (FRP) 1500mm	Select according to equipment. *Refer to Option list	9.0kg 11.0kg 13.0kg 12.0kg	1
2	TD shaft 	ESR-1504	1411mm	6.0kg	1

Caution: TD tank is option.

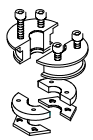
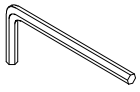
c. DHU-630 (Hull unit)
Package 1

No	Name of item	Type	Remark	Weight/ Length	Qty
1	Hull unit 	DHU-6301		17.0kg	1
2	Shaft guide 	ESR-1510	For TD tank of PVC		3
3	Bolt set 	SUS-M16-55-Assy (M16x55L, 2W16U, SW16U, N16U)			EACH 8
4	Gum packing for flange 	ESR-1512	Gum		1
5	DC power cable 	CW-273-10M	With 3P connector and one end plain	10m	1

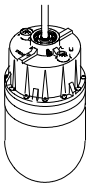
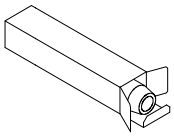
Package 2

No	Name of item	Type	Remark	Weight/ Length	Qty
1	Crank handle 	OB-03			1
2	Grease 			100g	1
3	Fuse 	F-7161-4A F-7161-8A	At input of 12 V At input of 24 V		EACH 3
4	ANP base 	ANP-1			2
5	Binding Band 	AB-100-1000			2

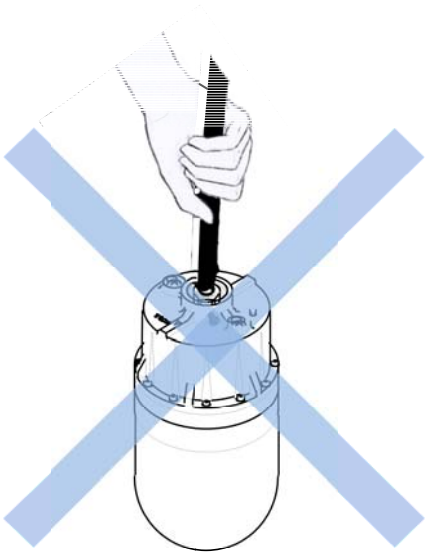
Package 3

No	Name of item	Type	Remark	Weight/ Length	Qty
1	Damper 	34924D			1
2	Fixing collar 	32681D			2
3	Pipe cap  1 SET	34378D			1
4	Cap bolt 	CB4╳10U			4
5	HEX rod wrench 	1.5mm × 1 2.5mm ×1 3.0mm ×1 5.0mm ×1			EACH 1

Package 4

No	Name of item	Type	Remark	Weight/ Length	Qty
1	Transducer unit 	DHU-6302	With 10m cable (With 18P water resistant and one end plain)	9.0kg	1
2	Bath cork 	Bath cork (White) 50g		50g	1

Caution: Don't carry the Transducer unit (DHU-6302) by holding its cable. Such manner may cause breakage of the equipment.



Option List

No	Name of item	Type		Remark
1	Remote controller	RCW-14		With 5m cable, (with Operation unit)
2	TD tank (For *xxxx mm of TD shaft) *TD shaft length	ESR-1506		PVC, 1230mm (For 1411mm of TD shaft)
		30927C-2		PVC, 1500mm (For 1681mm of TD shaft)
		30927C-3		PVC, 1800mm (For 1981mm of TD shaft)
		ESR-1507		FRP, 1500mm
		FRPTD tank set (With Shaft guide and Gum packing)		ESR-1507(1)、ESR-1513(1)、ESR-1510(2)、ESR-1511(2)
3	Shaft guide	ESR-1510		1pc ESR-1506 (TD tank of PVC)
		ESR-1511		1pc ESR-1507 (TD tank of FRP)
4	Gum packing	ESR-1513		1pc ESR-1507 (TD tank of FRP)
5	Power rectifier	PS-010		With 2 pieces of 5A fuse
6	AC power cable	VV-2D8-3M		Both ends plain
7	Connecting cable	CW-372-5M	5m	With 5P water resistant connector and one end plain
		CW-373-5M	5m	6P water resistant connectors at both ends
		CW-376-5M	5m	With 6P water resistant connector and one end plain
	Cable for external monitor	CW-576-0.5M	0.5m	With 10P water resistant connector and D-Sub connector
		CW-560-2M	2m	D-Sub 15P connectors at both ends
8	Junction box	JB-35		1 input, 3 outputs with CW-376-5M
9	TD shaft	32679C-2		ESR-160_1681mm
		32679C-3		ESR-160_1981mm
		40φ-4t-3000mm		ESR-160_3000mm
10	Monitor	17inch LCD Monitor		With power cable and signal cable

Basic knowledge for making use of sonar

We suppose that you, the user of sonar, already know how to use sonar. In this section we will theorize your experience to improve your fishing.

1. Propagation of ultrasonic wave

(1) Propagation speed of ultrasonic wave

The propagation speed of ultrasonic waves in the sea water is said to be about 1,500m per second.

However it differs very much depending on the seasons and sea areas during a year.

The cause of the difference depends on the following 3 factors:

- Sea water temperature (°C)
- Salt concentration (%)
- Water pressure (water depth) (m)

Consequently, when thinking of the propagation speed at the surface layer zone, the speed differs according to the sea area and also, even in the same sea area, it becomes different on account of vertical propagation.

As a result of surveys conducted at various sea areas in the world, it has been made clear that the difference between maximum and minimum speeds is as much as 100 (m/sec). In a sea area having a fixed salt concentration, the propagation speed of ultrasonic wave increases on an average by the following:

- About 3m/sec every time sea water temperature rises 1°C
- About 1.7m/sec every time water depth increases 100M (about 10 atmospheric pressure)

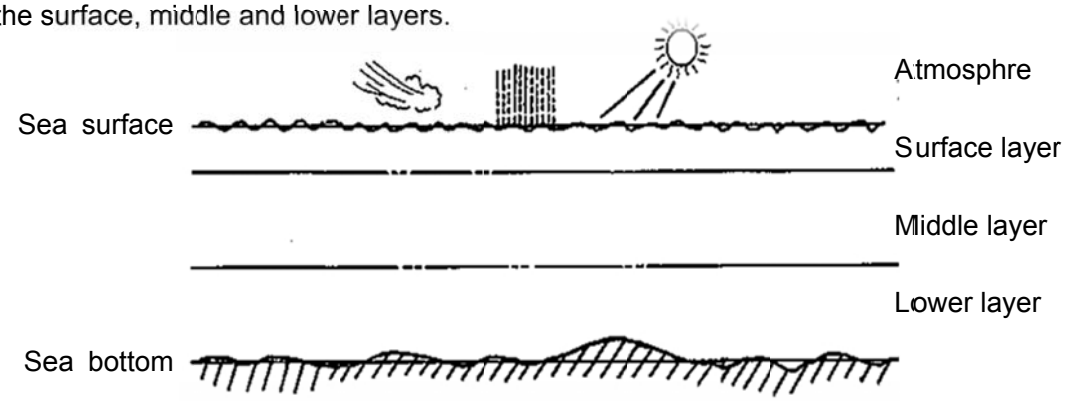
(2) Absorption and attenuation of ultrasonic wave

When an ultrasonic wave is emitted into the sea water, the energy attenuates progressively as the distance becomes farther. It indicates that the higher the frequency becomes, the greater the absorption and attenuation of ultrasonic wave become. The main causes are;

- Attenuation of ultrasonic wave caused by the decrease of the acoustic energy density due to the reflection, refraction and dispersion in water.
- Attenuation of ultrasonic wave caused by the conversation from the acoustic energy to other energy due to absorption by the viscosity of medium.

(3) Influence by marine conditions

The sea water temperature changes according to the three layers which are roughly classified into the surface, middle and lower layers.



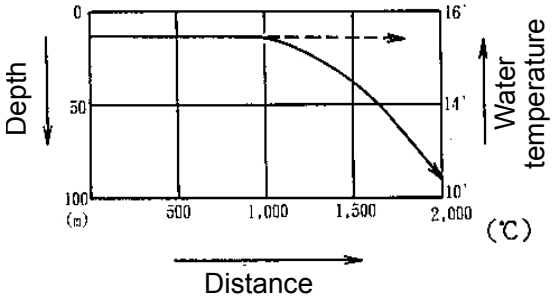
Surface layer:
This layer is greatly affected by the natural phenomena (e.g., sun, wind, rain, etc.) since it is adjacent to the atmosphere. Besides, the propagation route of ultrasonic wave refracts on the boundary where the temperature variations in addition to the difference in temperature between daytime and night are the greatest depending on the temperature distribution.
Also, not only the temperature changes but much noise is produced. Noise at the sea surface having an effect on the sonar is seriously influenced by the wind and sometimes, the sea surface becomes rough. This phenomenon causes the irregular reflection of ultrasonic wave in the vicinity of the sea surface.

Middle layer:
This layer is not subjected to the same direct factors as the above surface layer and often presents a fixed temperature because the respective factors negate with each other, and as the water depth increases, the water temperature falls almost linearly. Thus, in this layer, the ultrasonic wave propagates relatively in a stable condition.

(4) Refraction of ultrasonic wave
A phenomenon so called “Refraction of ultrasonic wave” is greatly affected by the propagation speed.

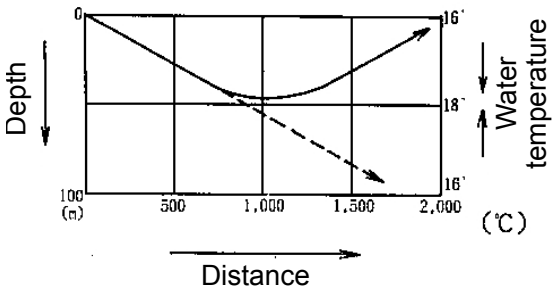
In case the temperature in the surface layer is high:

The propagation route bends down, therefore, it becomes very hard to detect the fish school in the surface layer in the distance.



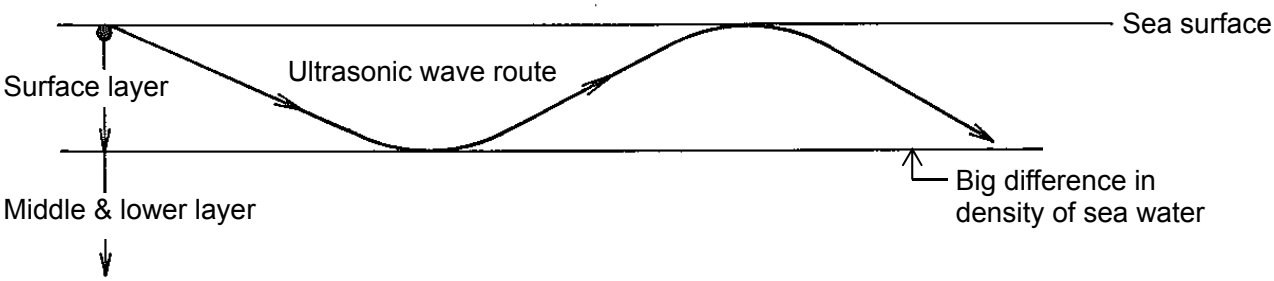
In case the temperature in the surface layer is low:

The propagation route bends up, therefore, it becomes easier to detect the fish school in the surface layer in the distance.



(As the temperature distribution always changes depending on the natural phenomena such as seasons, sea areas and current etc., some fish schools may not be detected according to the areas no matter how high you may turn up the Gain control. Keep this in mind when you use your sonar.)

(5) Reflection of ultrasonic wave
This is a phenomenon caused by the difference of the water temperature between surface and the middle or lower layers.
For instance, there is a big difference in destiny of sea water between the surface zone and middle zone whose boundary exists about 100m deep.
In this case the ultrasonic wave emitted in the underwater direction propagates in the water within 100m at the surface layer as shown in the next figure.



Therefore, even a small fish school may be detected from a long distance unexpectedly, on the other hand even a big fish school cannot be detected from a distance.

(6) Shadow zone
In the shallow sea area, reflected ultrasonic waves from the surface reflect on the boundary with a big difference in density or on the sea bottom and it appears on the surface. The area out of the propagation route becomes “SHADOW ZONE” and the echoes become weak. This zone differs according to the marine conditions and sea areas, therefore, be careful when you use your sonar in long-distance detection.

2. Difference of detectability according to transmitting frequencies
The intensity of sonar ultrasonic echoes returned back from a fish school is attenuated by the following causes as well as the curvature of ultrasonic waves due to a change of water temperature (See 1. “Propagation of ultrasonic wave”), and the fish school detection becomes difficult.

(1) Attenuation of ultrasonic waves due to the turbidity of sea water
If the sea water is not clear due to the mixing of very fine sand and mud, the ultrasonic echoes are weakened, and the detection distance become shorter as the transmitting frequency becomes higher.

(2) Deviation of ultrasonic beams due to the rolling and pitching of a ship
The transmitting direction of ultrasonic waves changes due to the rolling and pitching of the ship. As the transmitting frequency becomes higher, the ultrasonic beam width becomes narrower, and as a result, the missing of echoes increases due to the rolling and pitching of the ship.
(In order to reduce this failure, KDS-6000BB provides a built-in stabilizer function.)

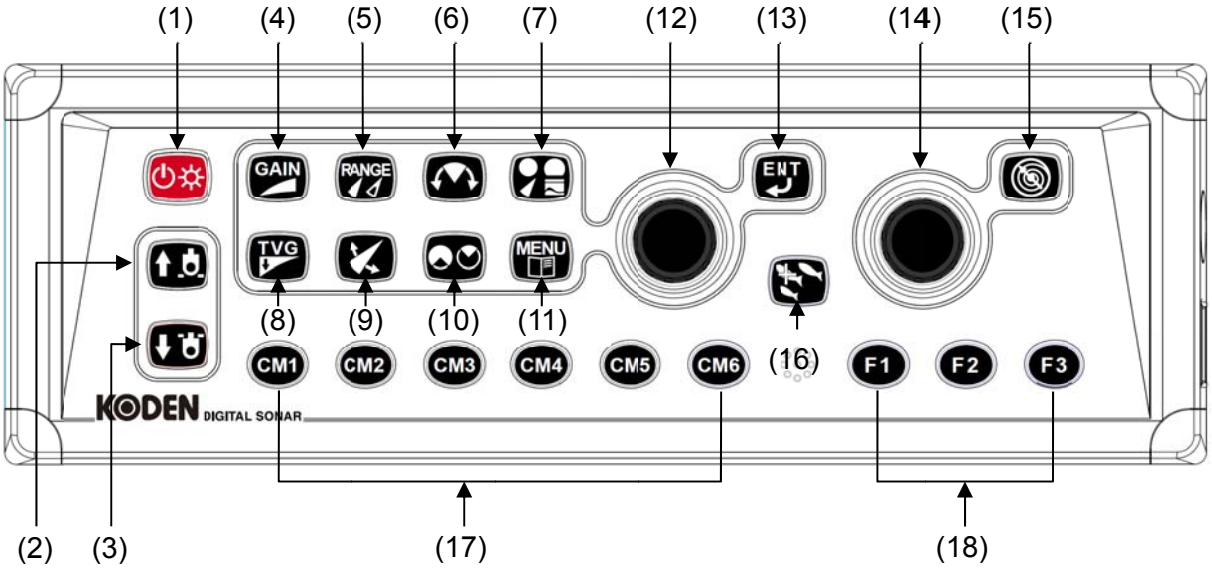
(3) Reduction of gain due to traveling noise
Noises produced by the engine rotation, propeller rotation, and the friction between the ship’s hull and sea water are mixed into echoes to reduce the detecting gain of echoes.
As the transmitting frequency becomes lower, the effect of traveling noises increases.

(4) Attenuation of ultrasonic waves by the bubbles produced in tracks
The vicinities near the tracks of your own ship and other ships are filled with bubbles produced by the rolling from the sea level into the sea, and the propagation of ultrasonic waves is interrupted by these bubbles. As the transmitting frequency becomes lower, the attenuation of ultrasonic waves due to bubbles increases.

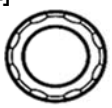
Chapter 1 Preparation

1.1 To use keys

Operation unit of KDS-6000BB



No.	Key Name	Description
1	[Power/Panel brightness] 	Press: Power on. Adjust brilliance of Operation unit (panel brightness). Long press: Power off.
2	[Hoist] 	Press: Upload the Transducer unit to the upper limit position and stop it automatilally.
3	[Lower] 	Press: Download the Transducer unit to the lower limit position and stop it automatilally.
4	[Gain] 	Press: Adjust gain
5	[Range] 	Press: Change the range setting Long press: Indicate the range setting menu
6	[Bearing center] 	Press: Change the angle of sector
7	[Presentation mode] 	Press: Select / Confirm of the presentation modes [Sonar] [Sonar (Off-center)] [Bottom-scan] [Echo sounder]

8	[TVG] 	Press: Change of TVG setting
9	[Tilt] 	Press: Change of the tilt angle
10	[Sector] 	Press: Change of the scan sector
11	[Menu] 	Press: Open/Close/Switch the menu
12	[Knob/left] 	Turn:Change the setting item of operation keys • GAIN • RANGE • Bearing center • TVG • Tilt • Sector • Menu • Presentation mode Press: Enter the setting of change
13	[Enter] 	Press: End input of setting value digits for Menu. Temporary erasing of displayed items on screen.
14	[Knob/right] 	Turn: Change the position setting of marker (Direction/Distance). Press: Change the markers
15	[VRM] 	Press: Switch between the marker and the cursor. Close the menu
16	[Target lock] 	Press: Reverse the bearing direction or search a target automatically.
17	[CM1 to CM6] 	Press: Setting operation mode / Recall CM setting Long press: Start copy of CM
18	[F1 to F3] 	Press: Select the item to register/ Recall directly the item registered Long press: Select and save the item to register

There are two types of pressing of keys, which are Press and Long-press.

1. Press: Press the key with a finger and release immediately.
2. Long press: Keep pressed until the screen display responds.

Normal operation is done with [Press].

When the relevant key is long-pressed, the menu box of the function defined for the key is displayed. Release the finger from the key, once the menu box is displayed.

Operation of the knobs (left/right)  are in two ways, [Turn] and [Press].

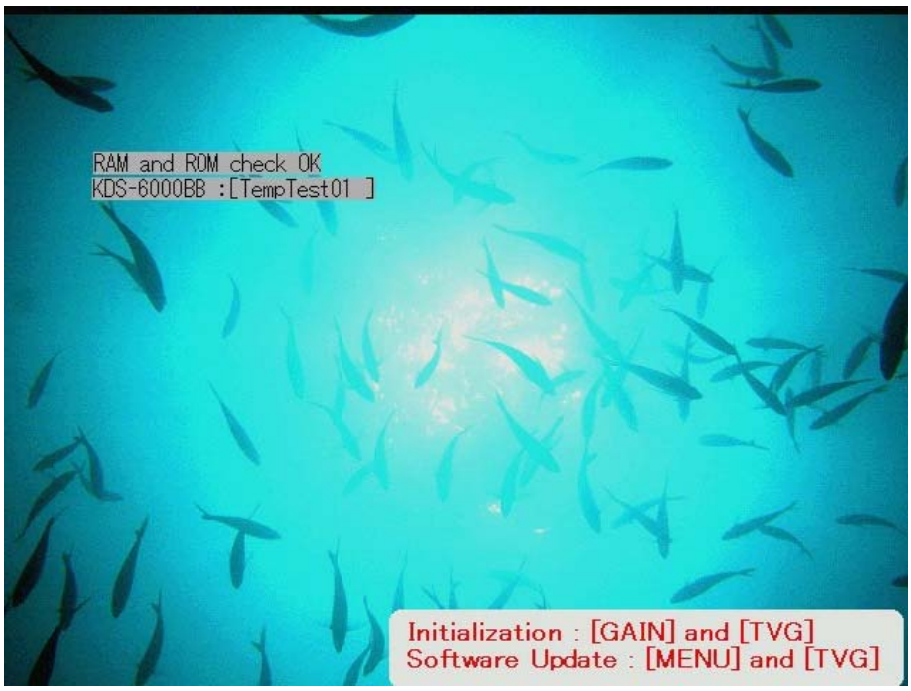
1. Turn: Turn the knob clockwise or anticlockwise
2. Press: Press the top of the knobs.

1.2 Power On/Off

1.2.1 Power On

Press  to power on.

The start-up screen is displayed. On start-up, the internal memory (ROM and RAM) is automatically checked. If the checking completes normally, the message is displayed as below.

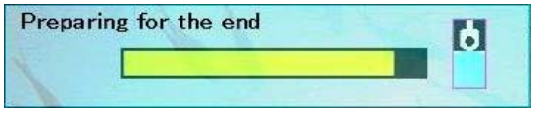


⚠Caution: If an error occurs during the memory check, it's possible failure of the unit. In this case, please contact a dealer of Koden or Koden.

⚠Caution: Please wait until the screen is displayed after the power is turned on. It takes about 30 seconds.

1.2.2 Power Off

Keep pressing  for 3 seconds to power off. After countdown for power shut down, when the message of [Preparing for the end] and the indication below is displayed, release the finger off from the key. After a few tens of seconds, power is switched off automatically.



1.2.3 Power Voltage Alarm

When nonstandard power voltage (out of 10.8 to 312.2V) is detected, the icon 

starts blinking.

1.3 Selection of language to be displayed

When the power is switched on for the first time after installation, the following [Language] screen is displayed.

1. Turn  to select a language using.

> **Caution: There are the other languages than English and Japanese for selection.**

2. Press 

.

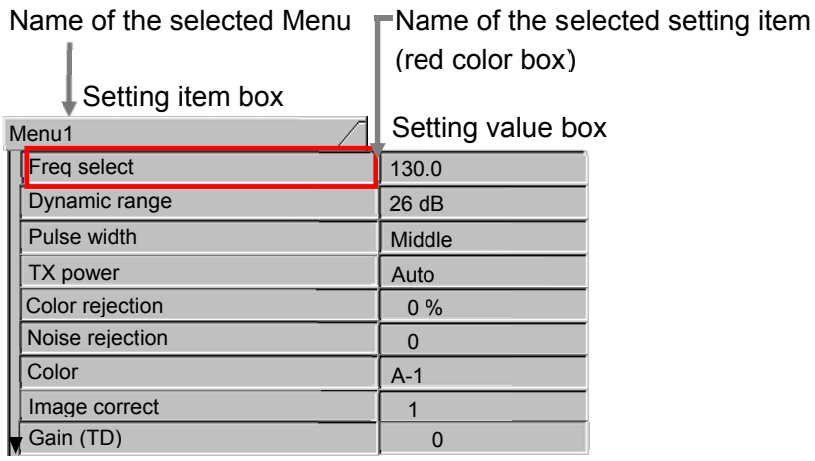
1.4 To use Menu

KDS-6000BB has three kinds of menu; [Menu1], [Menu2] and [Menu3].

1.4.1 Open/Close the Menu

To display the menu, press MENU .

Each time MENU is pressed, [Menu1] / [Menu2] / [Menu3] are switched over.



To close the menu, press MENU .

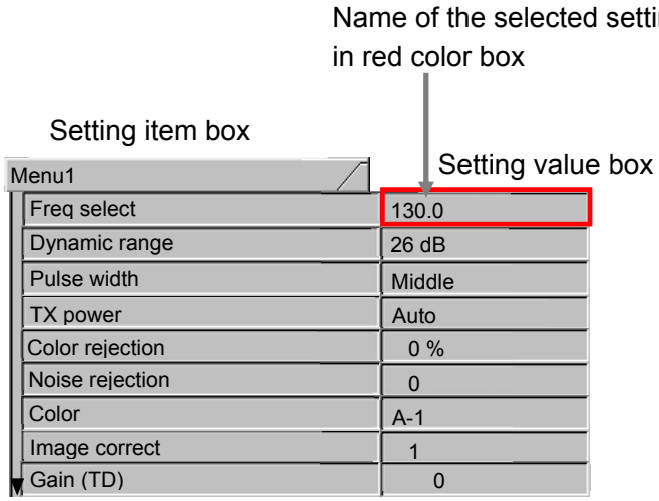
Each time MENU is pressed, [Menu1] => [Menu2] => [Menu3] => [Off] are switched over, and the Menu on the screen disappears.

Or press , the Menu on the screen disappears directly.

1.4.2 Operation of the Menu

1. Turn [knob/left] to select a menu item while Menu is displayed.

2. Press (knob/left) or ENT, to move setting value box.



3. Turn (knob/left) to change the setting.

4. Press (knob/left) or ENT to confirm the setting value.

5. Press to close the menu.

- **When the above process 4 is not done, the setting value is changed.**
- **The menu can also be closed with pressing MENU a few times.**

When MENU is long-pressed, the Maintain menu is displayed.

As for the details of Maintain menu, see the Installation manual.

1.5 Adjustment of brilliance

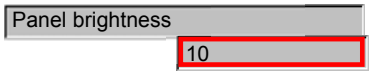
1.5.1 Adjustment of LCD brilliance

Caution: For KDS-6000BB the screen brilliance cannot be adjusted by pressing . Please adjust brilliance by the LCD monitor's operation. Please refer to the operation manual of the LCD monitor.

1.5.2 Adjustment of panel brilliance

The brilliance of operation panel can be adjusted by pressing .

1. When is pressed, the [Panel brightness] box is displayed.

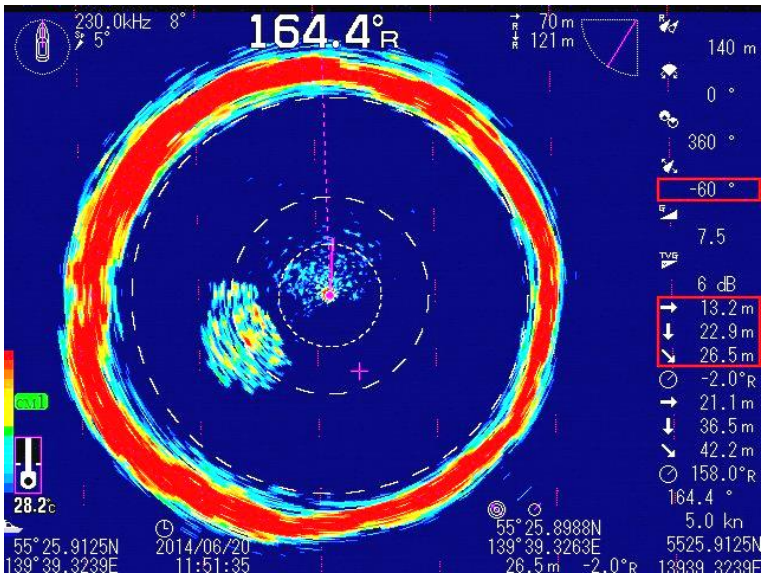


2. If (knob/left) is turned to right, the brightness increases.
   If turned to left, the brightness decreases.
3. Press to close the menu.

1.6 Screen display

The screen data presentation system is as follows.

The KDS-6000BB offers a variety of display modes in split screen by combination of Mode dials and Menu.



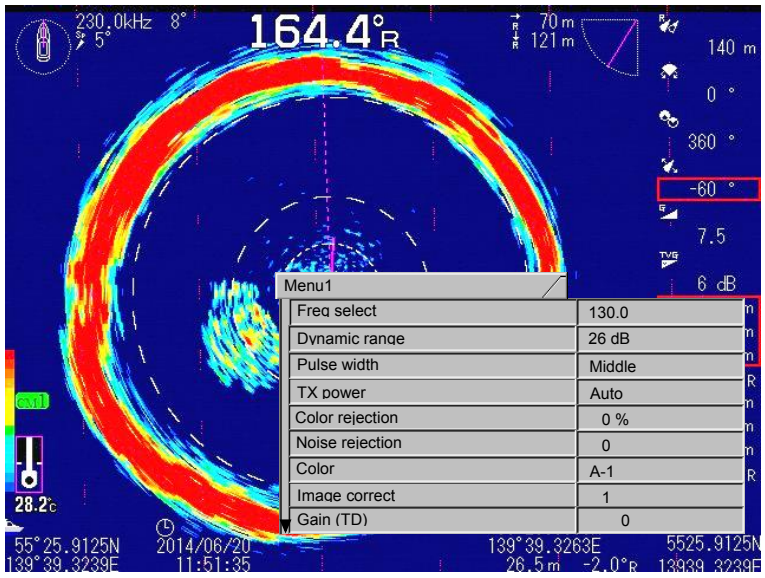
Split screen left

Split screen right

[Sonar] [Sonar (Off-center)]
[Bottom-scan] [Echo sounder]

Select display mode of the presentation modes.

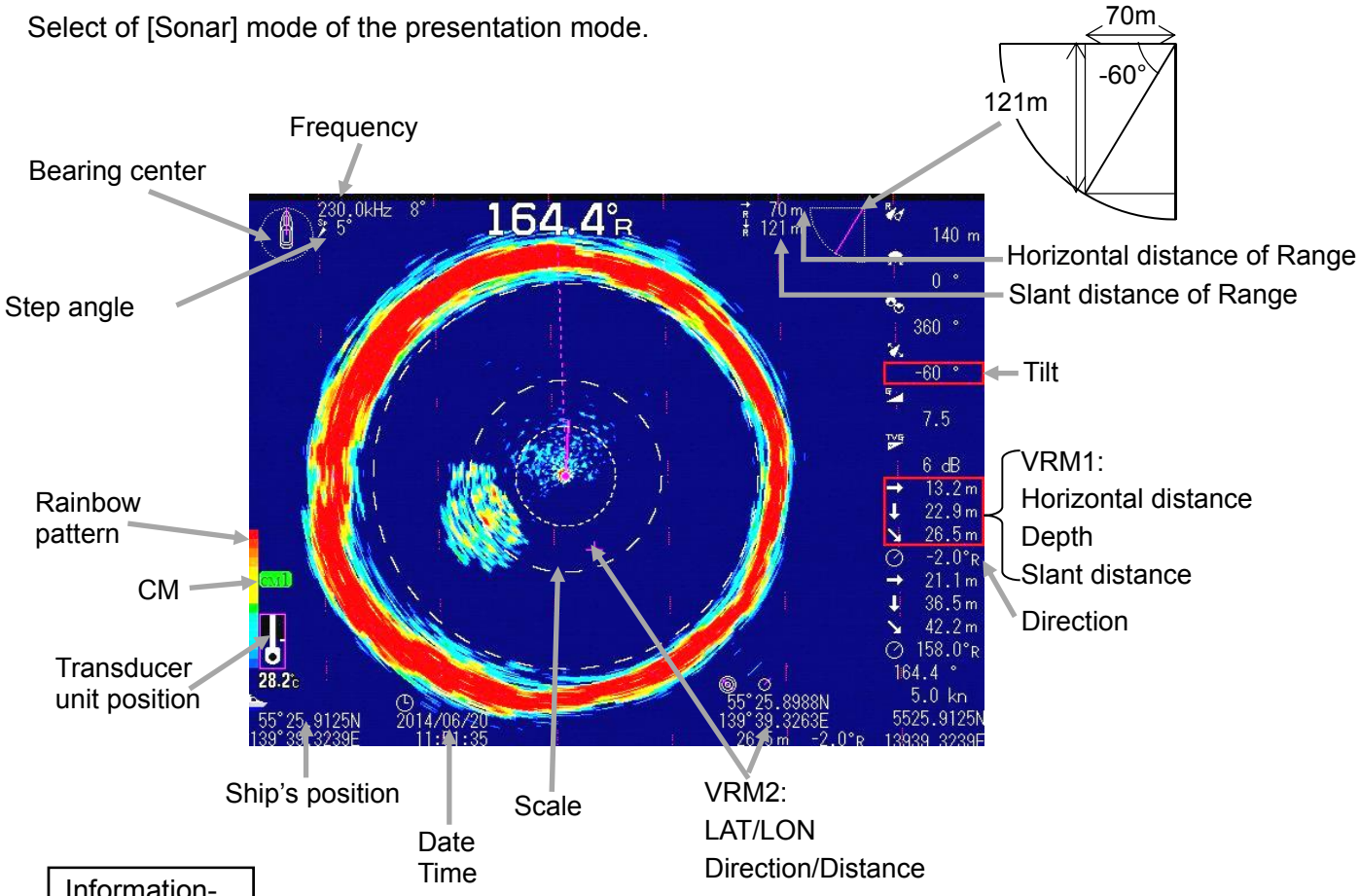
[Information-Data display]



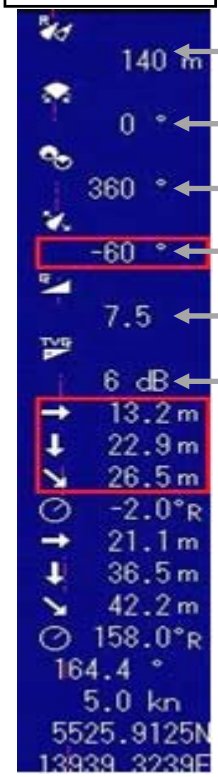
[Menu1] [Menu2] [Menu3]

1.6.1 Sonar mode display

Select of [Sonar] mode of the presentation mode.



Information-Data display



- Range
- Bearing center
- Sector
- Tilt
- Gain
- TVG
- VRM1 (Range marker, Bearing marker)
- VRM2 (Cross cursor)
- Bearing
- Speed
- Ship's position

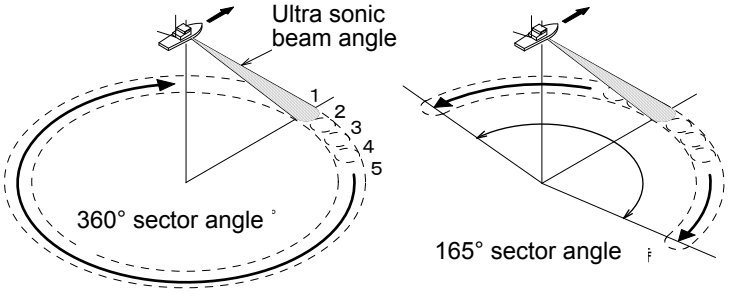
Caution: To present this info will require the KDS-6000BB is connected to an external navigator.

1.6.2 Sonar mode Operation

The Transducer unit sends out a beam of ultrasonic sound which sweeps in the specified sector and bearing.

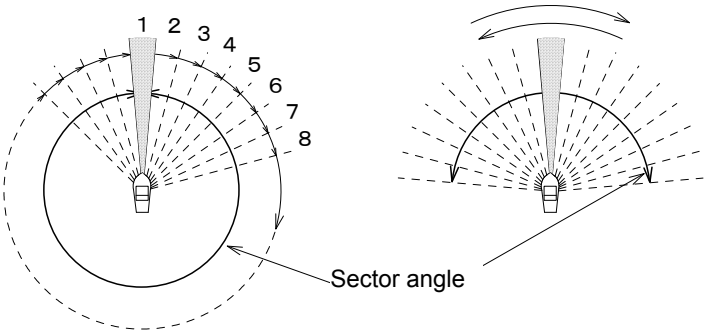
The echoes of reflected sound waves are picked up by the Transducer unit and displayed like a radar in their respective range and direction on the Display unit screen.

By adjusting the tilt and bearing the sonar beam may be trained from the surface to the bottom.

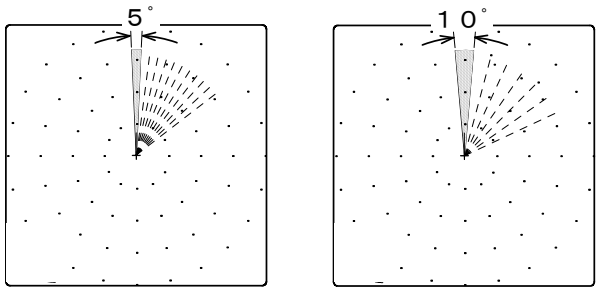


• Send out a beam of ultrasonic sound which sweeps in the specified sector and bearing.

• Changing the sector angle makes it possible to detect in various ranges.
(Refer to page 3-2)



• The echoes received from the sound beam (1→2→3~) are displayed on the screen in that order.



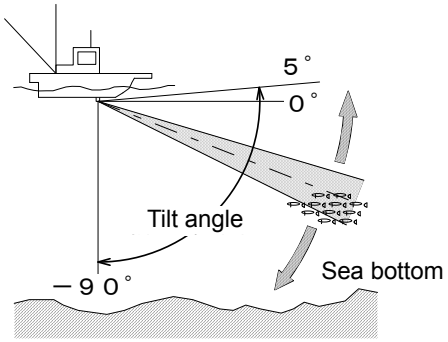
• The sector is covered by the Sonar beam in the selected step angle.

• The reflected echoe is displayed in order in the angle specified.

• The step angle can be selected in Menu2 [Step (sonar, Off-center)].
(Refer to page 2-16)

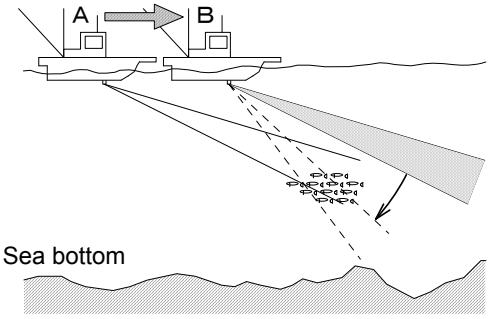
• A narrow step gives a more detailed image on the screen, however more sweep time is requested than a wide step.

The tilt angle can be changed from 5° above horizontal to -90° vertical in a 1° step.



• With this range all dorections from extremely shallow waters to deep areas may be searched.

• When adjusting the tilt angle please consider the conditions such as boat speed and water depth.



• If the vessel should proceed with the sonar beam at the same angle at point A, the fish school echo will be displayed but when the vessel reaches point B. The beam will pass above the fish school and no echo will be displayed.

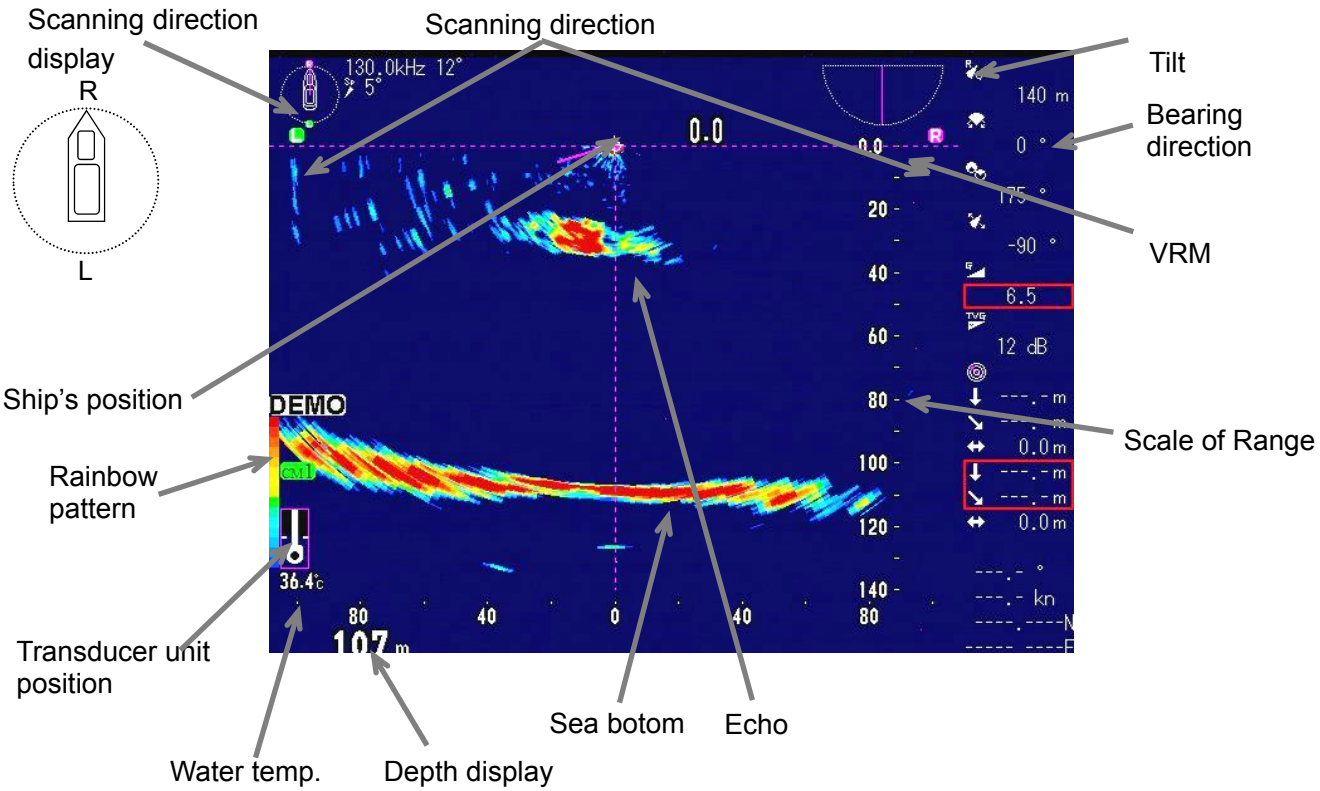
• In order to display the fish school at point B, adjust the tilt angle so that the sonar beam strikes the target.

• The tilt angle of the sonar sound beam can only be changed when the sound beam is in [Sonar] mode, [Bottom-scan] mode and [Echo sounder] mode.

(Refer to page 3-6)

1.6.3 Bottom-scan mode display

Select of [Bottom-scan] modeof the presentation mode.
Indicate the Scanning direction as L (Left) in green and R (right) in pink.



Information-Data display

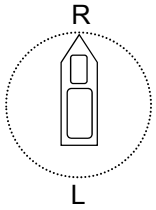
Range
Bearing center
Sector
Tilt
Gain
TVG

VRM1
(Depth, Direct distance, Horizontal distance from the intersection of the Depth marker and the side marker.)

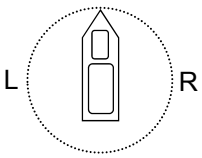
VRM2 (Depth, Direct distance, Horizontal distance from the cross cursor)

Bearing
Speed
Ship's position

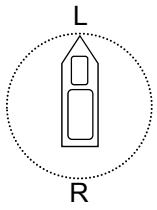
Bearing direction 0°



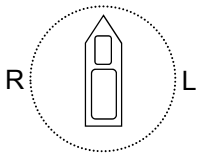
Bearing direction 90°



Bearing direction 180°



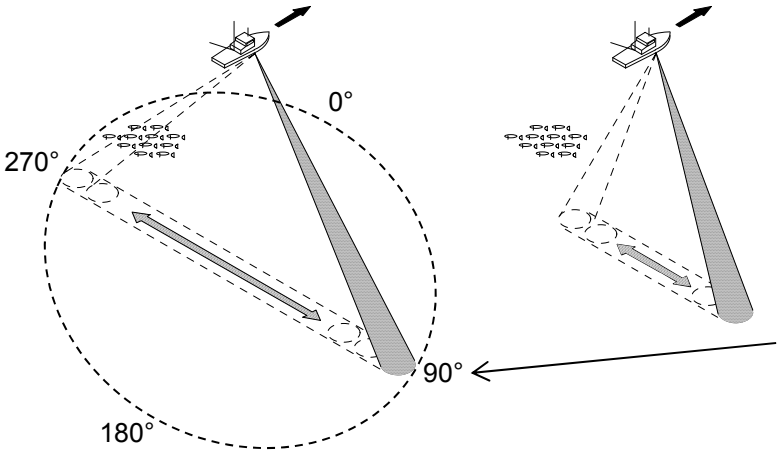
Bearing direction 270°



Caution: To present this info will require the KDS-6000BB is connected to an external navigator.

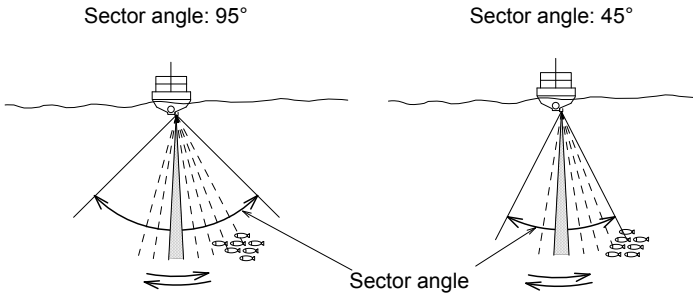
1.6.4 Bottom-scan mode operation

The sonar beam sweeps from side to side underneath the vessel.
The screen will clearly display echoes from the middle depth and sea-bottom contour.



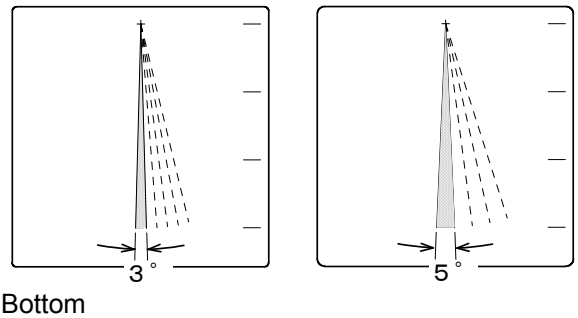
• The ultra sonic sound beams out as the beam sweeps from side to side.

•Sector angle can be changed at every 5 degree. The scan direction can be changed from front to back and from side to side.



• Choose the size of the area to be scanned by changing sector angle.
(Refer to page 3-2)

• The specified sector angle is centered on the bearing line.
(Refer to page 3-5)



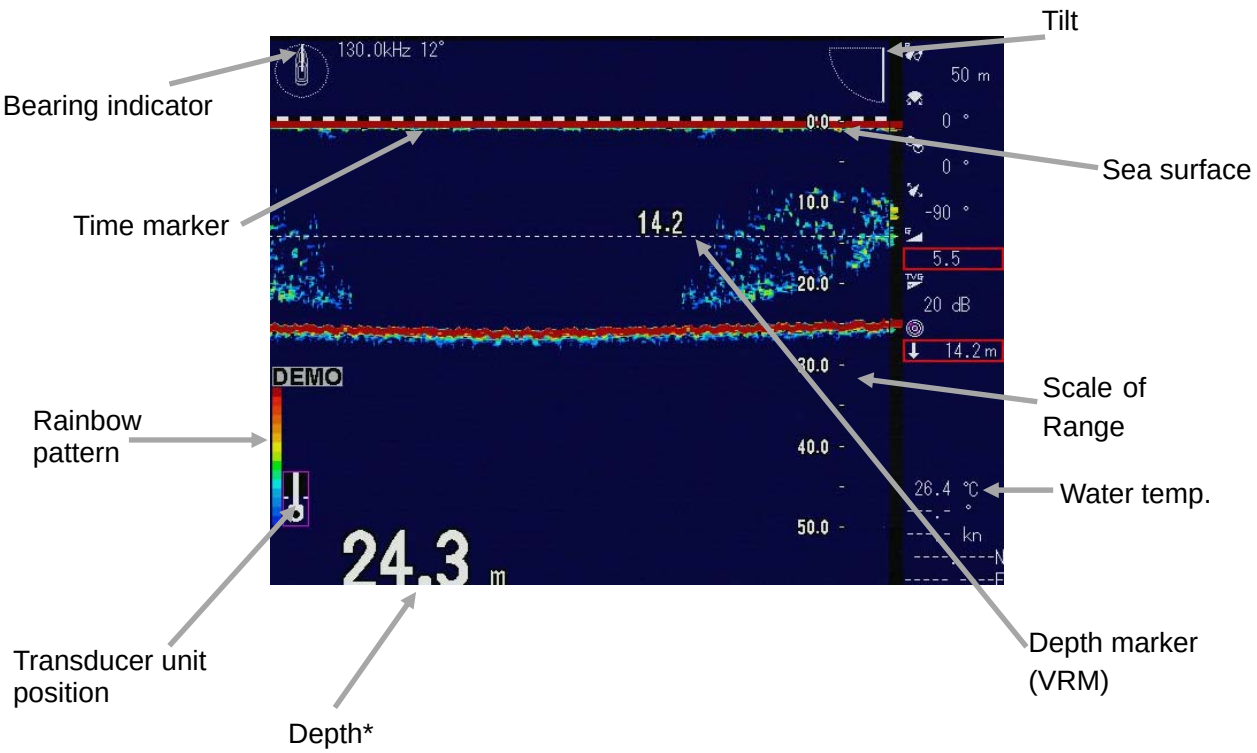
• The sector is coverd by the sonar beam in steps of the spacified angle.

• The reflected echo is displayed in order in the angle specified.

• The step angle may be selected in the Menu2 [STEP (Bottom-scan)].
(Refer to page 2-16/17)

1.6.5 Echo sounder mode display

Select of [Echo sounder] mode of the presentation mode.



*The depth display can be appeard when the tilt angle is set to -90° only.

Information-Data display

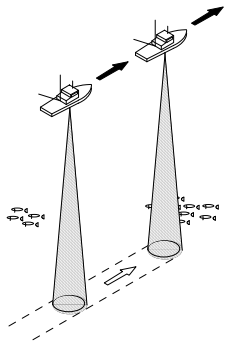
Range
Bearing center
Sector
Tilt
Gain
TVG
Depth display (VRM)
Water temp.
Bearing
Speed
Ship's position

Caution: To present this info will require the KDS-6000BB is connected to an external navigator.

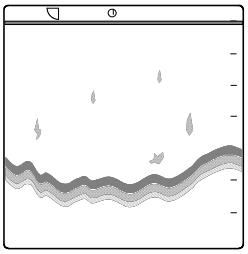
1.6.6 Echo sounder mode operation

The sonar beam sweeps underneath the vessel and the KDS-6000BB can be used as echosounder mode by selecting of [Echo sounder] mode of the presentation mode.

The screen will clearly display echo sounder images from the middle depth and the sea-bottom contour.



Echo sounder mode

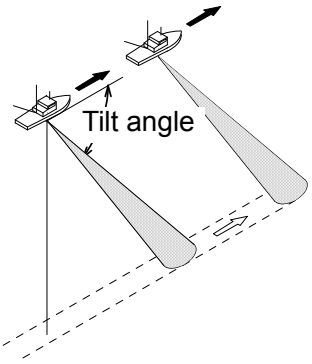


detects underneath the vessel.

• When operating in the [Echo sounder mode], the Transducer unit tilt 90° and stops rotating and the sounder image is displayed on the screen.

• The beam width is relative to the frequency.

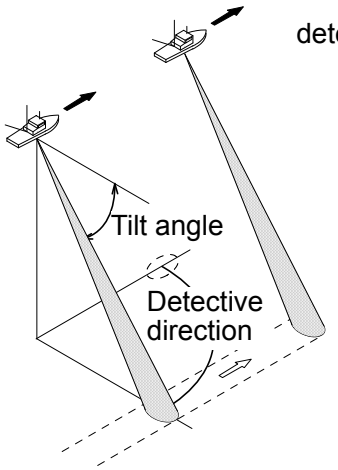
detects fore by changing tilt angle.

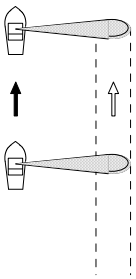


• The sounder image other than that of undernearth the vessel can be displayed by changing tilt angle and detective direction.

(Refer to page 3-6/7)

detects fore by changing tilt angle and bearing.





Chapter 2 Function setting

2.1 Menu configuration

2.1.1 Initial setting

The factory default setting is shown in square.

Functions	Factory setting (in the item □)	Setting Menu
Menu1		Change at
Freq select	[130], 130.1, 130.2 => 209.8, 209.9, 210	Menu1
Dynamic range	12, 14, 16, 18, [20], 22, 24, 26, 28, 30, 32	Refer to
Pulse width	Short, [Middle], 1• • •100	page 2-3
TX power	[Auto], 20, 30, 40, 50, 60, 70, 80, 90, 100	
Color rejection	[0], 5, 10, 15, 20, 25• • • • • •70, 75, 80	
Noise rejection	[0], 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	
Color	[A-1], 2, 3, 4, B-1, 2, 3, 4, C-1, 2	
Image correct	Off, [1], 2, 3	
Gain (TD)	-50• • • •[0]• • • •+50	
FIR	[Auto], 1, 2, 3, 4, 5, 6, 7	
Range (Sonar, Off-center)	[10, 20, 50, 80, 100, 140, 200, 300, 500] => 1000	
Range (Bottom-scan)	[10, 20, 50, 80, 100, 140, 200, 300, 500] => 1000	
Range (Echo sounder	[10, 20, 50, 80, 100, 140, 200, 300, 500] => 1000	
Remoto key set	[Refer to page 3-9]	
Sub-screen selection	[Wake disp (H up)], Wake disp (N up), Wake disp (S up)	
Sub-screen display	[Off], Small, Large	
Wake range (Sub-screen)	0.1 • • • [1.0] • • • 10.0	
Language	[English], Japanese, Korean, Traditional Chinese, Vietnamese	
Menu2		Change at
Step (Sonar, Off-center)	5°, [10°], 15°, 20°	Menu2
Step (Bottom-scan)	3°, [5°]	Refer to
Off-center position	[Fore], Back, Right,Left	page 2-15
Target lock	[Reverse] ,Mode1, Mode2, Marker Mode1, Marker Mode2	
A scope	[Off], On	
White line	[Off], 1, 2, 3, 4, 5	
Scale	Off, [1], 2, 3, 4, 5, 6	
Internal buzzer volume	0, 1, 2, 3, 4, 5 => 96, 97, 98, 99, [100]	
NMEA monitor	[Off], On	
Compass display	[Off], On	
Wake display	[Off], On	
Wake memory interval	[1], 5, 10, 30 (second)	
Sonic speed	-7.0 • • • [0.0] • • • 2.0% (0.1%step)	
Power freq adjust	[250.0] => 300.0kHz (0.1step)	
Depth unit	[M], ft, fm, l.fm	
Range & Speed unit	[NM, kn], km, km/h	
Temperature unit	[°C], °F	

Functions	Factory setting (in the item □)	Setting Menu
Temperature adjustment	-9.9 • • • •[0.0] • • • •9.9	
Train correct	-180.00 => [0.00] => +180.00 (1.25°step)	
Ext synchronized	[Off], ↑, ↓	
Bearing display	[Off], Small, Large	
True / Relative bearing	[Relative], True	
Step (Bearing center)	1 • • [5] • • • • •30	
Menu3		Change at Menu3 Refer to page 2-31
Baud rate	[4800], 9600, 19200, 38400	
DBT output	[Off], On	
DPT output	[Off], On	
GGA output	[Off], On	
GLL output	[Off], On	
MTW output	[Off], On	
RMC output	[Off], On	
TLL output	Off, [On]	
VTG output	[Off], On	
ZDA output	[Off], On	
Simulation	[Off], On	
Menu time-out period	Off, 5, 6 • • [10] • • • •58, 59, 60 (1sec/step)	
Hull unit auto up	Off, 1 • • 5 • • [15] • 17 (1sec/step) kn	
	Off, 1 • • [15] • • 29 • 30 (1sec/step) km/h	
Hull unit operation at the start	[No], Yes	
Transducer unit baud rate	4800, 9600, [19200]	
Slow down the Bearing speed	[0], 10, 20 • • 100, 200, 300, 400, 500	
Menu (transparent)	[0] • • 10 • • 20 • • 25	
Message (transparent)	[0] • • 10 • • 20	
Sub-screen (transparent)	[0] • • 10 • • 20	
Information display	[Off], Lat/long, Date, Lat/long/Date	
Localtime offset	-11.0 • • -5.0 • • [0.0] • • 5.0 • • 10.0 • • 14.0	
Dynamic range standard	[Top], Under	

CM keys, F1/F2/F3 key

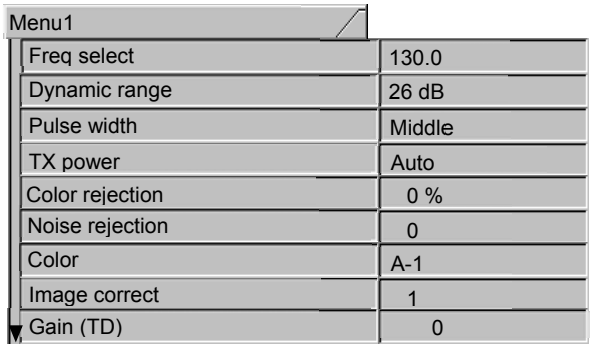
Functions	Factory setting (in the item □)	Setting Menu
CM keys	Refer to 2.5.1 “Initial setting of [CM] keys”	Change at CM menu Refer to page 2-41
F1 key Event (TLL)	[No data]	Change at each F key by long-press Refer to page 2-45
F2 key Frequency	[130.0] to 210.0	
F3 key Dynamic range	12 • 14 • 16 • 18 • [20] • 22 • 24 • 26 • 32	

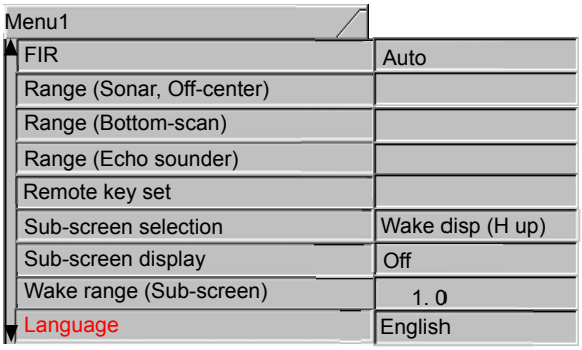
2.2 Menu1

To display the menu, press 

and select [Menu1].

The selected menu item will be displayed in red color box.
There are 18 setting items in [Menu1] box.





Basic Operation of the Menu

1. Turn  (knob/left) to select the setting item.

2. Press  (knob/left) or 

to confirm of the setting item.

2.2.1 Frequncy

On KDS-6000BB, the frequencies can be set in a range of 130 to 210 kHz.

1. Press 

to be displayed [Menu1].

2. Turn  (knob/left) to select [Freq select].

Menu1	
Freq select	130.0
Dynamic range	26 dB
Pulse width	Middle
TX power	Auto
Color rejection	0 %
Noise rejection	0
Color	A-1
Image correct	1
Gain (TD)	0

3. Press  (knob/left) or  to move setting value box.

The setting value will be displayed in red color box.

4. Turn  (knob/left) to select frequency.

Freq select	130.0

5. Press  to close the menu.

2.2.2 Range (Sonar, Off-center) (Bottom-scan) (Echo sounder)

One of eight ranges can be quickly selected using this function and each of these ranges can be set by the user to meet his own requirements.

1. Press  to be displayed [Menu1] and select [(Sonar, Off-center), (Bottom-scan) or (Echo sounder)].

   Or Keep pressing  .

2. [Range setting box] will be displayed.

Range1	20 m
Range2	50 m
Range3	80 m
Range4	100 m
Range5	140 m
Range6	200 m
Range7	200 m
Range8	500 m

[Range setting value: 10 to 1000m]

3. Turn  (knob/left) to select [Range number].

4. Press  (knob/left) or  to move setting value box.

The setting value will be displayed in red color box.

5. Turn (knob/left) to select [Range setting value].

Set as the same way [Range 2 to Range 8] as above setting.

6. Press RANGE or to close the menu.

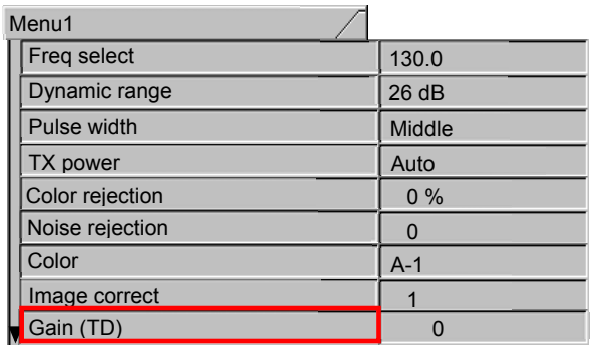
The range initial setting of [Sonar, Off-center], [Bottom-scan], [Echo sounder] are different. Set the depth unit by setting box of [Menu2].

The range setting method of the all presentation mode (Sonar, Sonar (Off-center), Bottom-scan and Echo sounder) is same, but the range setting value should be set each other.

2.2.3 GAIN (TD)

The insufficient gain due to ultrasonic signal attenuation can be corrected. Accuracy of bottom detection is adjusted. Such false recognition can be corrected that a deeper position is recognized as sea bottom than actual, or large fish school is recognized as sea bottom.
It is not necessary to do this gain correction, as the factory default setting is optimized.

1. Press MENU to be displayed [Menu1].
2. Turn (knob/left) to select [GAIN (TD)].



3. Press (knob/left) or ENT to move setting value box.

The setting value will be displayed in red color box.

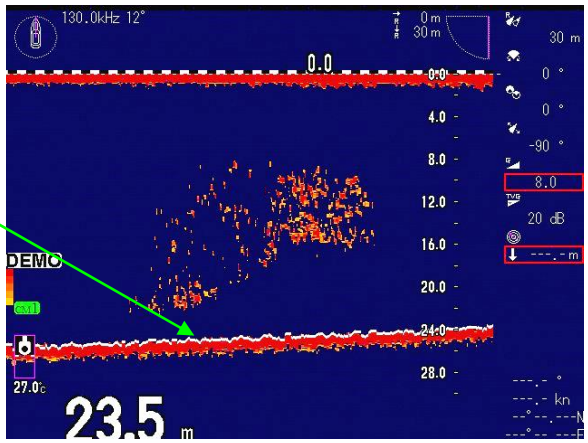
4. Turn (knob/left) to select [GAIN (TD) setting value].

Gain (TD) adjustment

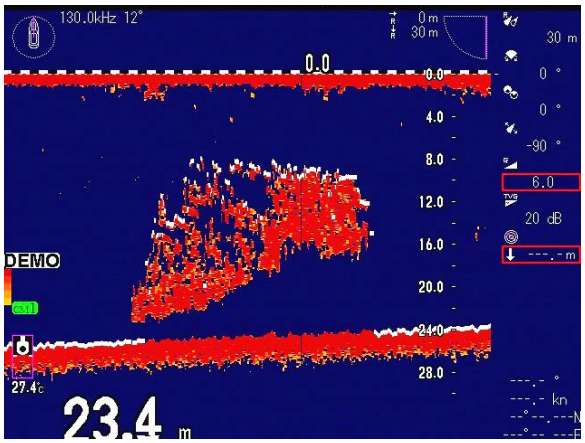
When the bottom cannot be detected or when the bottom is of mud pool or seaweed, [Gain (TD)] shall be turned up. When transfer to fish schools, etc. frequently occurs, [Gain (TD)] shall be turned down.

Adjustment shall be made under conditions where the white line is displayed. To display the white line, select [White line] in [Menu2].

The gain (TD) setting shall be adjusted in such a way that the white line in sea bottom has the same thickness as that of the strongest signal color area.



Optimum
The white line is displayed on the sea bottom.



Over-Gain
The white line moves to fish school.

White line should have the same thickness as the (darkest) color for the strongest signal.

5. Press  to close the menu.

2.2.4 Dynamic range

By shifting the dynamic range, the display to reflect the received echo more precisely or the display to discriminate their density is selected.

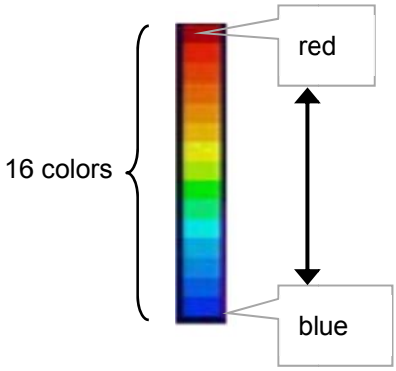
1. Press  to be displayed [Menu1].

2. Turn  (knob/left) to select [Dynamic range].

Menu1	
Freq select	130.0
Dynamic range	26 dB
Pulse width	Middle
TX power	Auto
Color rejection	0 %
Noise rejection	0
Color	A-1
Image correct	1
Gain (TD)	0

3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [12dB] to [32dB].



When the value is small, the target is easy to recognize because the weaker signal will become undistinguished.

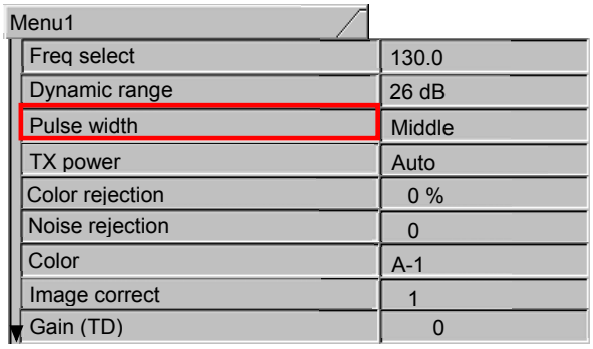
5. Press to close the menu.

2.2.5 Pulse width

The transmitted pulse width can be set.

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [Pulse width].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Short], [Middle] or [1] to [100].

Short: automatically changes the transmit pulse width according to the range (normal) listed below.
Middle: automatically the normal transmit pulse width x 1.5
A longer pulse width provides high sensitivity as increasing the detective ranges.

Range (m)	Pulse width (ms)
0 to 59	0.52
60 to 79	0.74
80 to 99	0.95
100 to 119	1.05
120 to 159	1.47

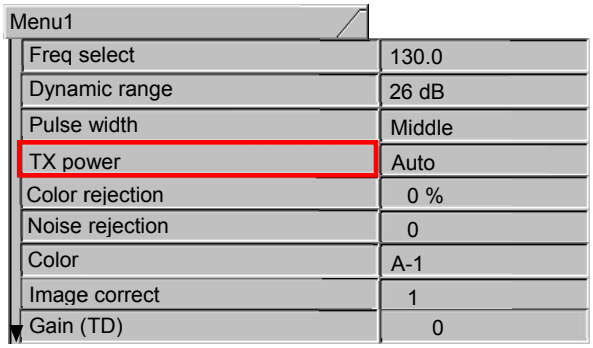
Range (m)	Pulse width (ms)
160 to 199	1.89
200 to 239	2.31
240 to 399	3.99
400 and more	4.20

5. Press  to close the menu.

2.2.6 TX power

The output power of the ultrasonic sound wave may be selected.

1. Press  to be displayed [Menu1].
2. Turn  (knob/left) to select [TX power].



3. Press  (knob/left) or  to move setting value box.

4. Turn  (knob/left) to select the setting value from [Auto] or [20] to [100].

In crowded fishing areas, this function may be used to reduce power and avoid interference to other fishing boat's sonars and echo sounders.
[100] indicates the maximum power and then gradualy reduced by moving from [90] → [80] → [70] → → → [20] that is the minimum power.

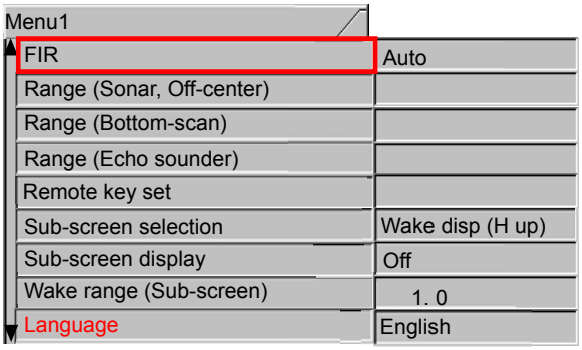
5. Press  to close the menu.

2.2.7 FIR (Bandwidth)

Change the frequency bandwidth. To avoid the noise, interference, etc., set the frequency bandwith to narrow.

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [FIR].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Auto] or [1] to [7].

[7] indicates the maximum power and the gradually reduced by moving from [6]→[5]→[4]→[3]→[2]→[1] that is the minimum power.

Caution: If the frequency bandwidth is wide, the resolution becomes high. It is easy to find the small targets, but there is too much noise to make distinctions with signs of fish. If it is narrow, resolution becomes low, and the noise becomes reduced.

5. Press to close the menu.

2.2.8 Noise rejection

When the response from dust and plankton is to be diminished regardless of water depth and echo, [Noise rejection] is effective.
For [Noise rejection] function, by narrowing the dynamic range and reducing tone graduation of colors, the color of weak response level becomes less visible.

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [Noise reduction].

Menu1	
Freq select	130.0
Dynamic range	26 dB
Pulse width	Middle
TX power	Auto
Color rejection	0 %
Noise rejection	0
Color	A-1
Image correct	1
Gain (TD)	0

3. Press (knob/left) or ENT to move setting value box.

Noise reduction	0

4. Turn (knob/left) to select the setting value from [0] to [10].

[0] is the minimum effect and and the gradually increased by moving from [0]→[1]→[2] → that is the maximum effect.

5. Press to close the menu.

2.2.9 Image correction

The image of the sonar mode can be corrected.

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [Image correct].

Menu1	
Freq select	130.0
Dynamic range	26 dB
Pulse width	Middle
TX power	Auto
Color rejection	0 %
Noise rejection	0
Color	A-1
Image correct	1
Gain (TD)	0

3. Press (knob/left) or ENT to move setting value box.

Image correct	1

4. Turn (knob/left) to select the setting value from [Off], [1], [2] or [3].

[Off]: No effect
[1]: Weak effect
[2]: Midium effect
[3]: Strong effect

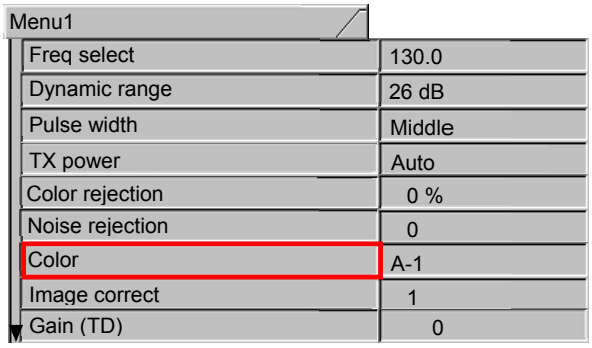
5. Press to close the menu.

2.2.10 Color selection

Color tone and background color can be selected from [A-1 to 4], [B-1 to 4] or [C-1 to 2].

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [Color].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [A-1 to 4], [B-1 to 4] or [C-1 to 2].

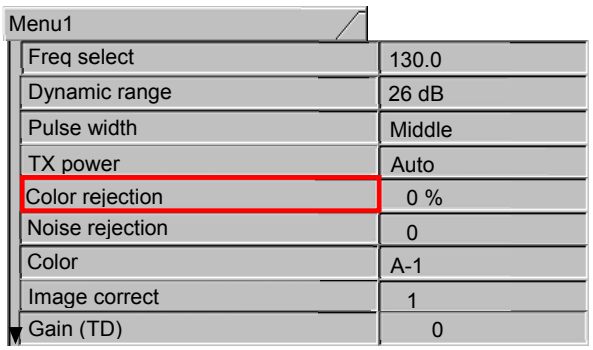
5. Press to close the menu.

2.2.11 Color rejection

When the response from dust and plankton displayed in light bluish color is to be erased, it is effective to use [Color rejection] function.
The color of aimed fish images and appearance of expanding response are displayed as it is and unnecessary response from dust and plankton is erased.

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [Color rejection].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [0%] to [80%].

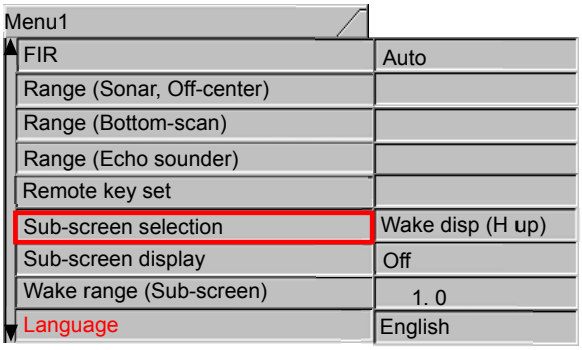
5. Press to close the menu.

2.2.12 Sub-screen selection

Select the Sub-screen to be displayed and display the multi information into the window.

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [Sub-screen selection].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Wake disp (H up)],

[Wake disp (N up)] or [Wake disp (S up)].

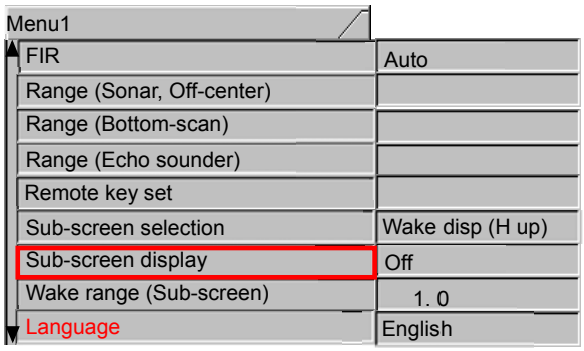
5. Press to close the menu.

2.2.13 Sub-screen display

Sub-screen display can be selected from [Off], [Small] and [Large].

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [Sub-screen display].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Off], [Small] or [Large].

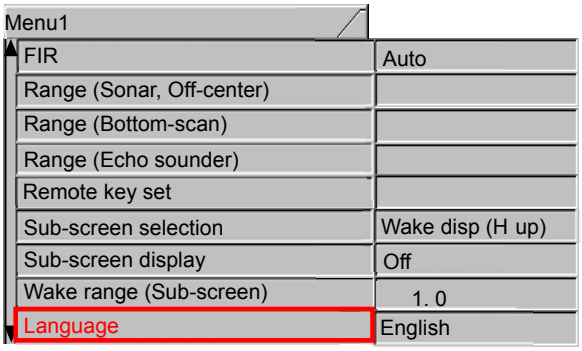
5. Press to close the menu.

2.2.14 Language

Displayed language can be changed.

1. Press MENU to be displayed [Menu1].

2. Turn (knob/left) to select [Language].



3. Press (knob/left) or ENT to move setting box.

4. Turn to select a language to be used.

5. Press to close the menu.

2.3 Menu2

To display the menu, press 

and select [Menu2].

The selected menu item will be displayed in red color box.
There are 23 setting items in [Menu2] box.

Menu2

Step (Sonar, Off-center)	10°
Step (Bottom-scan)	5°
Off-center position	Fore
Target lock	Reverse
A scope	Off
White line	Off
Scale	1
Internal buzzer volume	100
NMEA monitor	Off

Menu2

Compass display	Off
Wake display	Off
Wake memory interval	1 Second
Sonic speed	0.0%
Power freq adjust	250.0
Depth unit	m
Range & Speed unit	NM kn
Temperature unit	℃
Temperature adjustment	0.0

Menu2

Depth unit	m
Range & Speed unit	NM kn
Temperature unit	℃
Temperature adjustment	0.0
Train correct	0.00
Ext synchronized	Off
Bearing display	Off
True / Relative bearing	Relative
Step (Bearing center)	1

Basic Operation of the Menu

1. Turn  (knob/left) to select the setting item.

2. Press  (knob/left) or 

to confirm of the setting item.

2.3.1 Step (Sonar, Off-center)

The step angle (scanning angle) in the Sonar mode may be selected.

1. Press MENU to be displayed [Menu2].

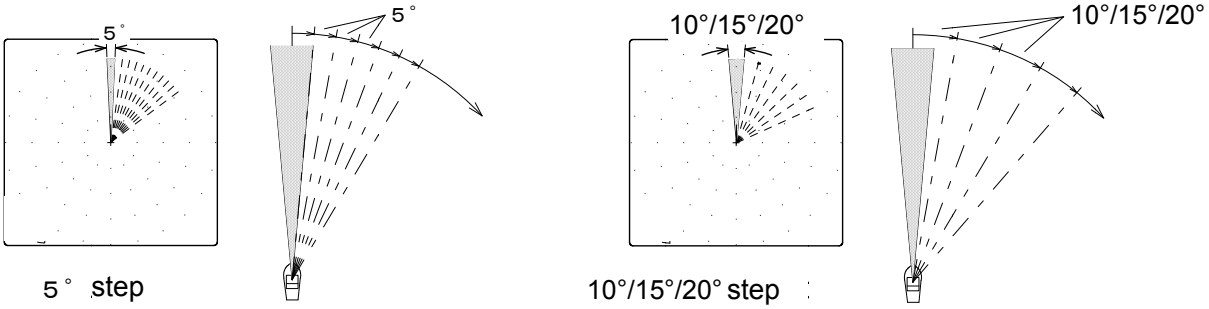
2. Turn (knob/left) to select [Step (Sonar, Off-center)].

Menu2	
Step (Sonar, Off-center)	10°
Step (Bottom-scan)	5°
Off-center position	Fore
Target lock	Reverse
A scope	Off
White line	Off
Scale	1
Internal buzzer volume	100
NMEA monitor	Off

3. Press (knob/left) or ENT to move setting value box.

Step (Sonar, Off-center)	5°

4. Turn (knob/left) to select the setting value from [5°], [10°], [15°] or [20°].



5° step 10°/15°/20° step

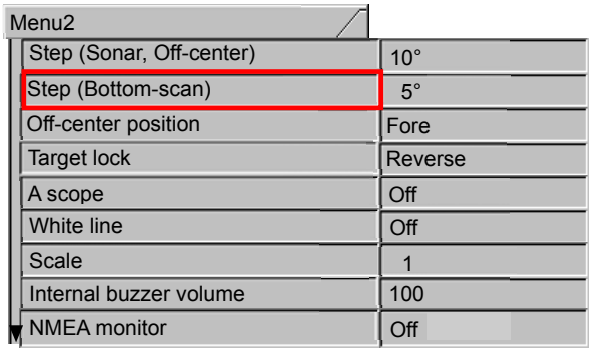
5. Press to close the menu.

2.3.2 Step (Bottom-scan)

The step angle (scanning angle) in the Bottom-scan mode may be selected.

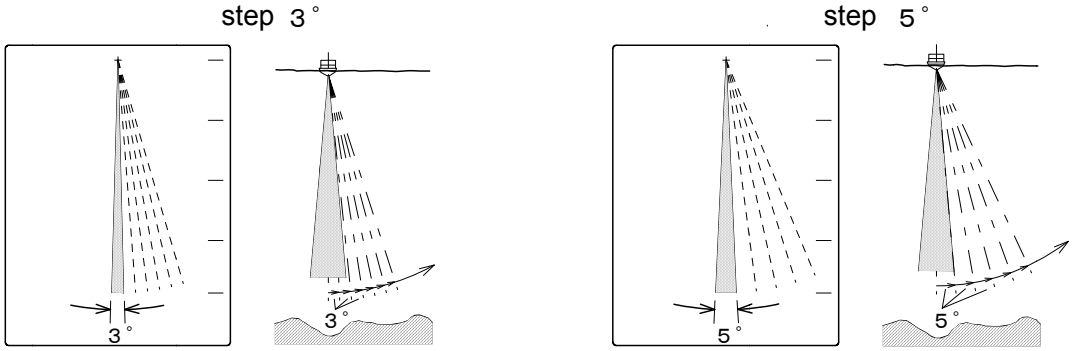
1. Press MENU to be displayed [Menu2].

2. Turn (knob/left) to select [Step (Bottom-scan)].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [3°] or [5°].



When a narrow step angel is selected, the image resolution becomes high, but the bearing speed becomes slow compared with a wide step angle.

5. Press to close the menu.

2.3.3 Off-center position

The ship's position on the screen may be selected in the Off-center mode.

1. Press MENU to be displayed [Menu2].

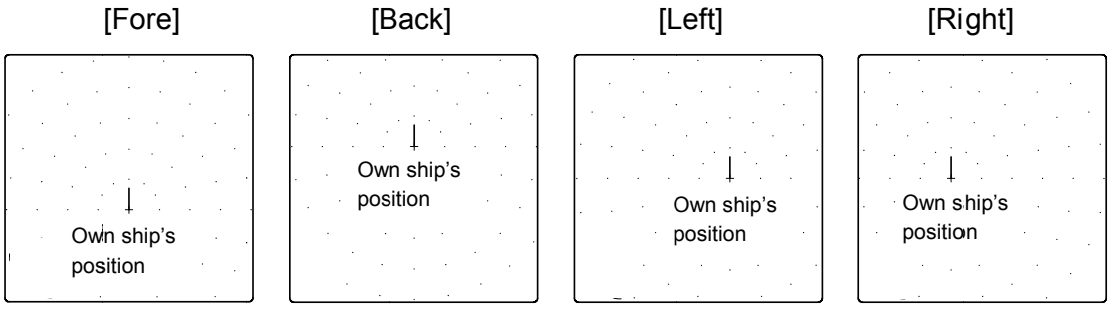
2. Turn (knob/left) to select [Off-center position].

Menu2	
Step (Sonar, Off-center)	10°
Step (Bottom-scan)	5°
Off-center position	Fore
Target lock	Reverse
A scope	Off
White line	Off
Scale	1
Internal buzzer volume	100
NMEA monitor	Off

3. Press (knob/left) or ENT to move setting value box.

Off-center position	Fore

4. Turn (knob/left) to select the setting value from [Fore], [Back], [Left] or [Right].



The ship's position can be selected from [Fore], [Back], [Left] or [Right] in the Off-center mode.

5. Press to close the menu.

2.3.4 Scale

The scale dots display under Sonar mode can be selected [Off] or 6 types.

1. Press MENU to be displayed [Menu2].

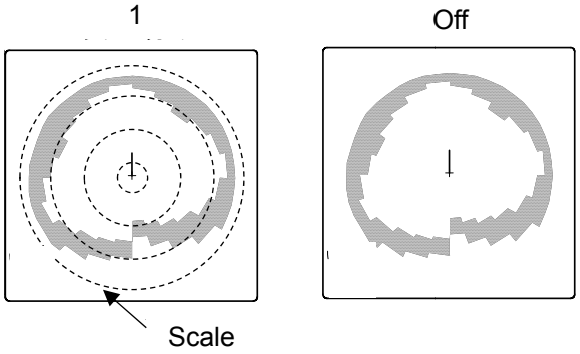
2. Turn (knob/left) to select [Scale].

.

Menu2	
Step (Sonar, Off-center)	10°
Step (Bottom-scan)	5°
Off-center position	Fore
Target lock	Reverse
A scope	Off
White line	Off
Scale	1
Internal buzzer volume	100
NMEA monitor	Off

3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Off], [1], [2], [3], [4], [5] or [6].



[Off] : displays no scale.
[1] to [6]: displays scale (dots). Select from 6 types.

When the scale display [Off] is selected, no scale appears on the screen in Sonar/Off-center modes. However the scale appears on the screen In Bottom-scan/Echo sounder modes.

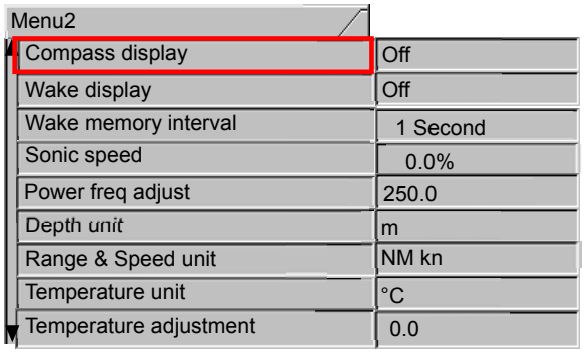
5. Press to close the menu.

2.3.5 Compass display

The points of the compass can be shown on the screen in the Sonar mode by connecting the KDS-6000BB to an external navigator.

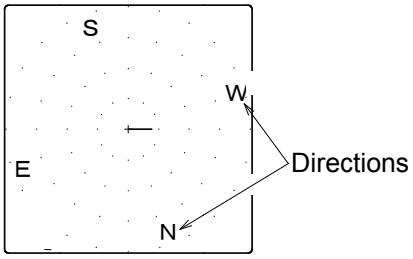
1. Press MENU to be displayed [Menu2].

2. Turn (knob/left) to select [Compass display].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Off] or [On].



[Off]: displays no points of the compass.
[On]: displays the points of the compass.

5. Press to close the menu.

2.3.6 Bearing display

The bearing display can be shown on the screen in the Sonar mode.

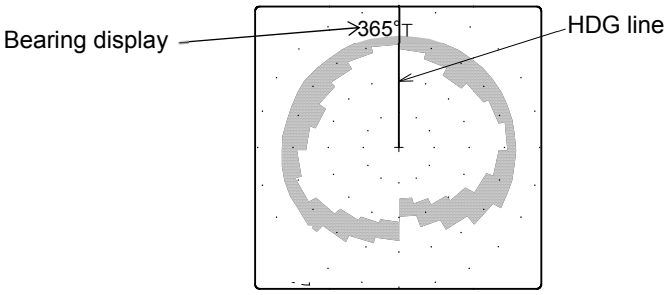
1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [Bearing display].

Menu2	
Depth unit	m
Range & Speed unit	NM kn
Temperature unit	℃
Temperature adjustment	0.0
Train correct	0.00
Ext synchronized	Off
Bearing display	Off
True / Relative bearing	Relative
Step (Bearing center)	1

3. Press (knob/left) or ENT to move setting value box.

Bearing display	Off

4. Turn (knob/left) to select the setting value from [Off], [Small] or [Large].



[Off] : displays no bearing.
[Small] or [Large]: displays the bearing (in small characters or in large characters).

5. Press to close the menu.

2.3.7 Wake display

The track line can be shown on the screen in the Sonar mode.

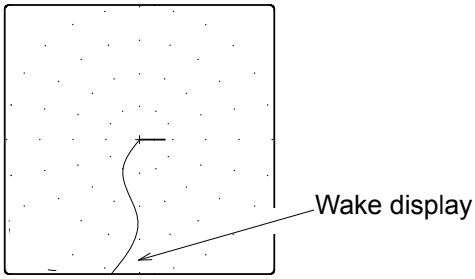
1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [Wake display].

Menu2	
Compass display	Off
Wake display	Off
Wake memory interval	1 Second
Sonic speed	0.0%
Power freq adjust	250.0
Depth unit	m
Range & Speed unit	NM kn
Temperature unit	°C
Temperature adjustment	0.0

3. Press (knob/left) or ENT to move setting box.

Wake display	On

4. Turn (knob/left) to select the setting value from [Off] or [On].



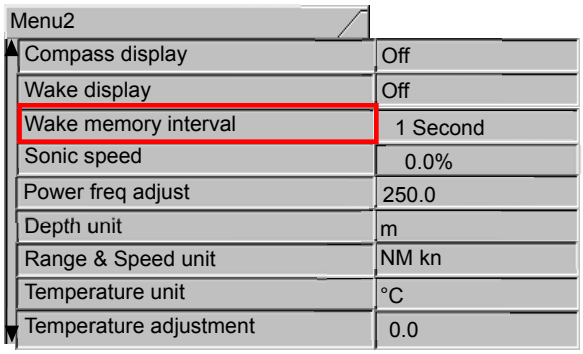
[Off]: displays no wake (trackline).
[On]: displays the wake (trackline).

5. Press to close the menu.

2.3.8 Wake memory interval

The track is saved into memory and its interval can be selected.

1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [Wake momory interval].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [1 sec], [5 sec], [10 sec] or [30 sec].

When Wake memory interval is set to the short time, the smooth trail is displayed, but the trail length is short compared with setting to the long interval.
When Wake memory interval is set to the long time, the trail length is long, but the zigzag trail is displayed compared with setting to the short interval.

The trail position data can be stored up to 1000 points. When the additional position data is stored, the oldest position is deleted and the newest position is stored.

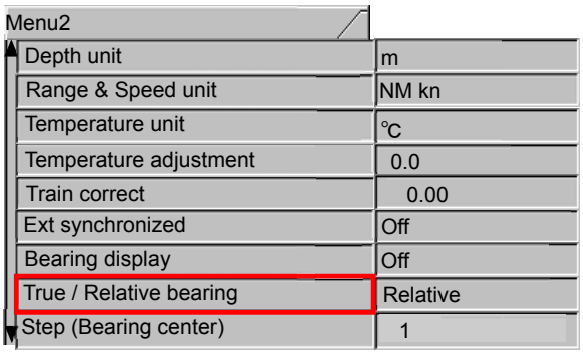
1 second: Recording interval 1sec., Storage time: 16m 40s
5 second: Recording interval 5sec., Storage time: 1h 23m 20s
10 second: Recording interval 10sec., Storage time: 2h 46m 20s
30 second: Recording interval 30sec., Storage time: 8h 20m 00s

5. Press to close the menu.

2.3.9 True / Relative bearing

Select the cursor display mode when an external navigation equipment is connected.

1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [True / Relative bearing].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [True] or [Relative].

True (with “T”): The settings available in the true bearing with the true north as 000 degree.
Relative (with “R”): The settings available in the relative bearing with the heading as 000 degree. Left side is indicated as the minus value. Right side is indicated as the plus value.

5. Press to close the menu.

2.3.10 Target lock

To select the desired Target lock function when is pressed during the operation in the Sonar mode.

This function changes the rotary direction or tracks the target automatically.

1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [Target lock].

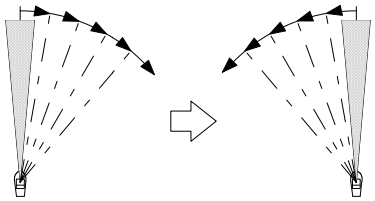
Menu2	
Step (Sonar, Off-center)	10°
Step (Bottom-scan)	5°
Off-center position	Fore
Target lock	Reverse
A scope	Off
White line	Off
Scale	1
Internal buzzer volume	100
NMEA monitor	Off

3. Press (knob/left) or ENT to move setting value box.

Target lock	Reverse

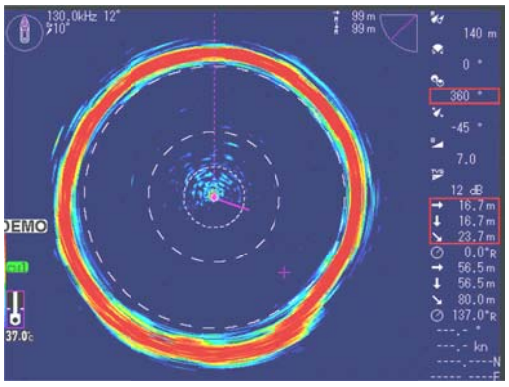
4. Turn (knob/left) to select the setting value from [Reverse], [Mode1], [Mode2], [Marker Mode1] or [Marker Mode2].

Reverse



The sector rotary direction is reversed by pressing .

Mode1



• When Mode1 is selected as a target lock mode, move the cross cursor to the echo and press the key.

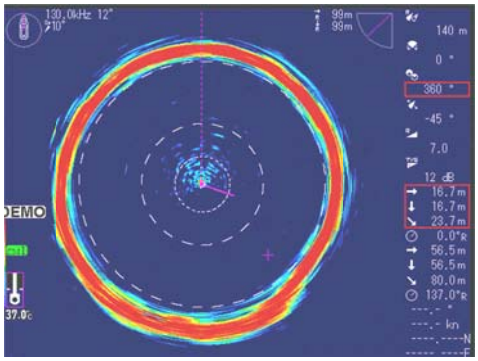
The sonar beam will track the echo automatically left and right.

If the echo is lost and not picked up again after a 60° sweep, the Target lock function will be released.

Mode2

• When Mode2 is selected as a target lock mode, the sonar beam will track the echo automatically up and down in addition to the Mode1 functions.

Marker Mode1 / Marker Mode2



• The target mark is displayed and tracked automatically by pressing .

With the VRM movement, VRM position is worked as a target position.

When Target lock ceases Bearing and Sector angles will return to their original positions.
Target lock function is not available in the Echo sounder mode.
In Bottom scan mode, reverse is only available only.

5. Press to close the menu.

2.3.11 Ext synchoronized

To select where the trigger signal is taken from either Internal or External.

1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [Ext synchronized].

Menu2	
Depth unit	m
Range & Speed unit	NM kn
Temperature unit	℃
Temperature adjustment	0.0
Train correct	0.00
Ext synchronized	Off
Bearing display	Off
True / Relative bearing	Relative
Step (Bearing center)	1

3. Press (knob/left) or ENT to move setting value box.

Ext synchronized	

4. Turn (knob/left) to select the setting value from [Off], [⌐¬] or [¬⌐].

Off : selects when the internal synchronized signal is used for external equipment.
⌐¬ : selects when the rise synchronized signal is used from external equipment.
¬⌐ : selects when the fall synchronized signal is used from external equipment.

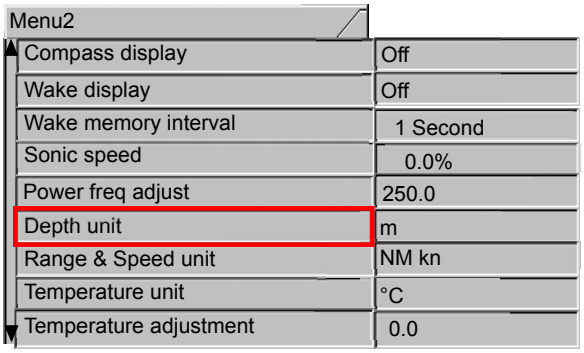
When KDS-6000BB is used with external equipment as synchronization movement, the bearing spped may be reduced depending on the range settings.
To avoid this, it is recommended to use with the internal synchronized signal of the KDS-6000BB as synchronization movement.
Refer to Installation Manual Chapter 1 Installation “1.6Wiring Connection of TD position alarm device (JB-36)”.

5. Press  to close the menu.

2.3.12 Depth unit

The user may select the displayed depth unit to be one of the following.

1. Press  to be displayed [Menu2].
2. Turn  (knob/left) to select [Depth unit].



3. Press  (knob/left) or  to move setting value box.

4. Turn  (knob/left) to select the setting value from [m], [ft], [fm] or [I.fm].

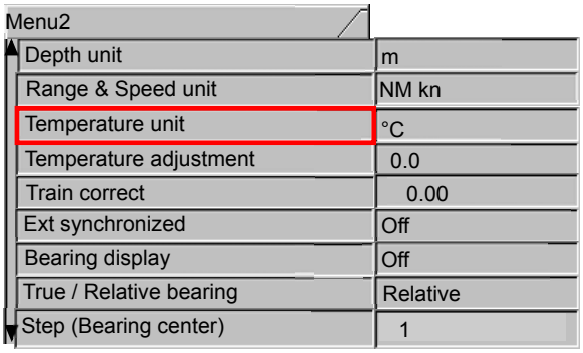
m ：Displays the unit meters.
ft ：Displays the unit feet. (1ft: 0.305m)
fm ：Displays the unit fathoms. (1fm: 1.83m)
I.fm ：Displys the unit Italian fathoms. (1I.fm: 1.5m)

5. Press  to close the menu.

2.3.13 Temperature unit

Temperature unit can be set to °C or °F.

1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [Temperature unit].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [°C] or [°F].

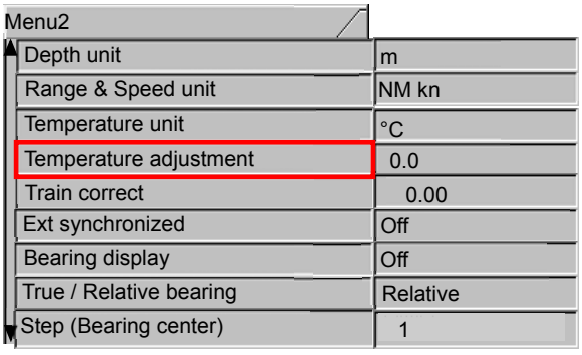
°C: Centigrade
°F: Fahrenheit

5. Press to close the menu.

2.3.14 Temperature adjustment

To adjust the water temperature displayed on the screen.

1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [Temperature adjustment].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [-9.9] to [9.9]. (every 0.1 steps)

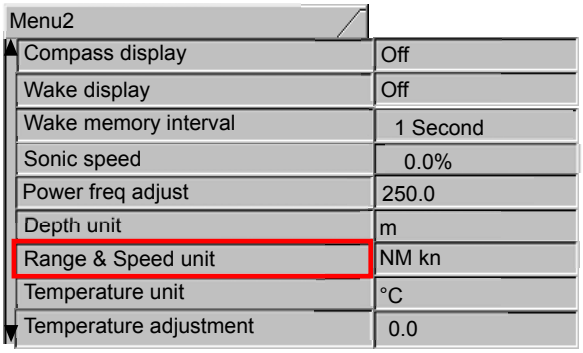
9.9° : maximized the value of the adjustment
↑ increases the value
0.0° : no adjustment
↓ decreases the value
-9.9° : minimized the value of the adjustment

5. Press to close the menu.

2.3.15 Range & Speed unit

It can be shown in [NM (nautical miles), kn (knots)] or [km, km/h].

1. Press MENU to be displayed [Menu2].
2. Turn (knob/left) to select [Range & Speed unit].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [NM kn] or [km km/h].

NM : measured in nautical mile. (1NM: 1.852km)
kn : measured in knot. (1knot: 1.852km/h)
km : measured in kilometer.
km/h : measured in kilometer.

5. Press to close the menu.

2.3.16 Train correct

To adjust the deviation of the bow direction (0°).

In the Sonar mode use  to adjust the Bearing toward Bow direction.

1. Press  to be displayed [Menu2].
2. Turn  (knob/left) to select [Train correct].

Menu2	
Depth unit	m
Range & Speed unit	NM kn
Temperature unit	°C
Temperature adjustment	0.0
Train correct	0.00
Ext synchronized	Off
Bearing display	Off
True / Relative bearing	Relative
Step (Bearing center)	1

3. Press  (knob/left) or  to move setting value box.

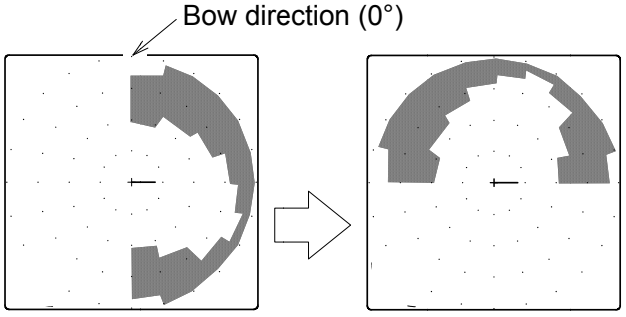
Train correct	0.00

4. Turn  (knob/left) to select the setting value from [-180.00] to [180.00].
5. Press  to close the menu.

Procedure of [Train correct] (90° setting)

1. Turn  (knob/left) to select the value of [90.00].
2. Press  to close the menu.

The screen display will be corrected 90° counterclockwise.



The display is turned by 90° counterclockwise.

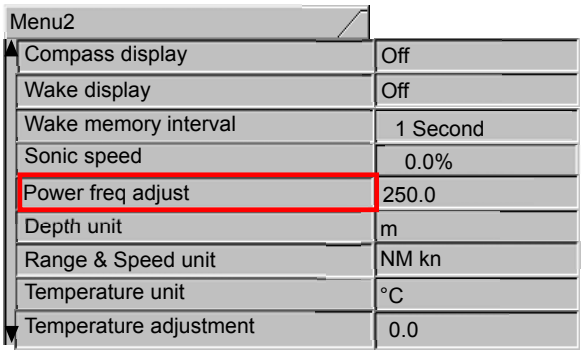
2.3.17 Power freq adjust

To adjust of swiching frequency of power supply.

1. Press 

to be displayed [Menu2].

2. Turn  (knob/left) to select [Power freq adjust].



3. Press  (knob/left) or 

to move setting value box.

4. Turn  (knob/left) to select the setting value from [250.0] to [300.0].
(every 0.1kHz steps)

> **Caution: The setting value should be set to “250.0 kHz” in normal use.**

5. Press  to close the menu.

2.4 Menu3

To display the menu, press 

and select [Menu3].

The selected menu item will be displayed in red color box.
There are 22 setting items in [Menu3] box.

Menu3

Baud rate	4800
DBT output	Off
DPT output	Off
GGA output	Off
GLL output	Off
MTW output	Off
RMC output	Off
TLL output	On
VTG output	Off

Menu3

ZDA output	Off
Simulation	Off
Menu time-out period	Off
Hull unit auto up	15
Hull unit operation at the start	No
Transducer unit baud rate	19200
Slow down the Bearing speed	0
Menu (transparent)	15
Message (transparent)	10

Menu3

Hull unit operation at the start	No
Transducer unit baud rate	19200
Slow down the Bearing speed	0
Menu (transparent)	15
Message (transparent)	10
Sub-screen (transparent)	0
Information display	Lat / long
Localtime offset	9.0
Dynamic range standard	Top

Basic Operation of the Menu

1. Turn  (knob/left) to select the setting item.

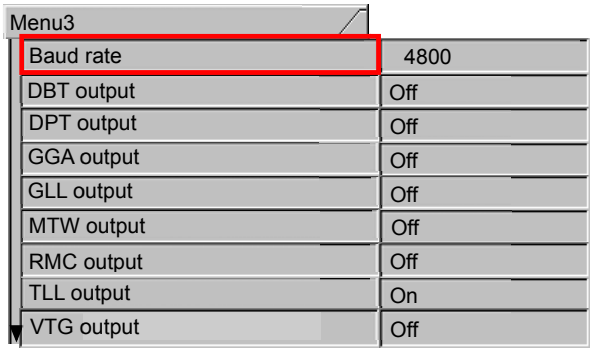
2. Press  (knob/left) or 

to confirm of the setting item.

2.4.1 Baud rate

Select the baud rate of NMEA1 when external equipment is connected.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Baud rate].



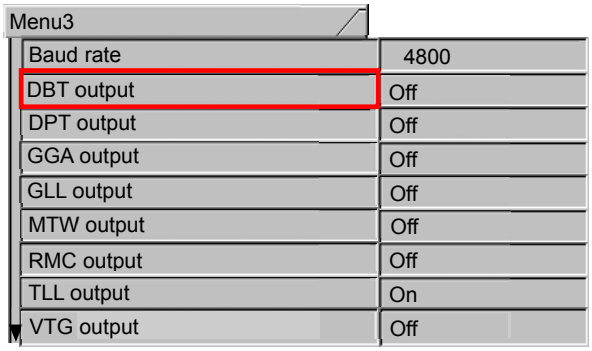
3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [4800], [9600], [19200] or [38400].
5. Press to close the menu.

2.4.2 Selection of MNEA output

Select to enable the output or to disable the output.
(DBT/DPT/GGA/GLL/MTW/RMC/TLL/VTG/ZDAoutput)

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Optional output].



3. Press (knob/left) or ENT to move setting value box.

DBT output	Off

4. Turn (knob/left) to select the setting value from [On] or [Off].

5. Press to close the menu.

2.4.3 Simulation

The actual movie stored in the internal memory can be played for the operating instructions. (In order to distinguish from the current real image, “DEMO” is indicated during playing the Simulation movie.)

1. Press MENU to be displayed [Menu3].

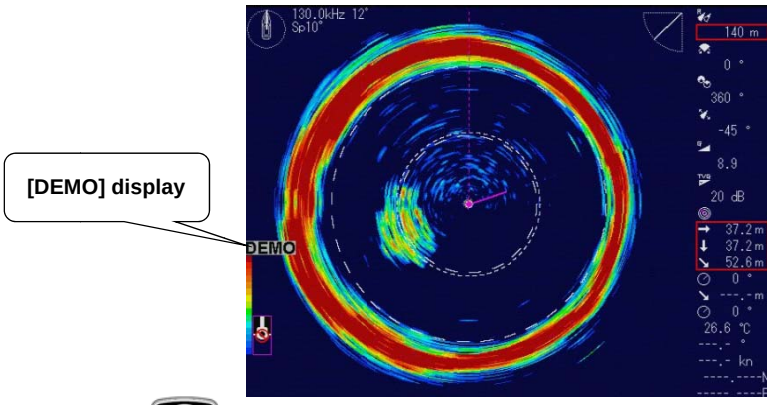
2. Turn (knob/left) to select [Simulation].

Menu3	
ZDA output	Off
Simulation	Off
Menu time-out period	Off
Hull unit auto up	15
Hull unit operation at the start	No
Transducer unit baud rate	19200
Slow down the Bearing speed	0
Menu (transparent)	15
Message (transparent)	10

3. Press (knob/left) or ENT to move setting value box.

Simulation	On

4. Turn (knob/left) to select the setting value from [On] or [Off].

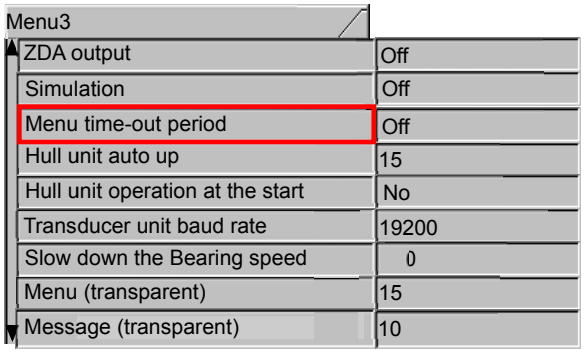


5. Press to close the menu.

2.4.4 Menu time-out period

You can set the Menu time-out period to close the menu automatically from the last menu operation.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Menu time-out period].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Off] or [5] to [60].

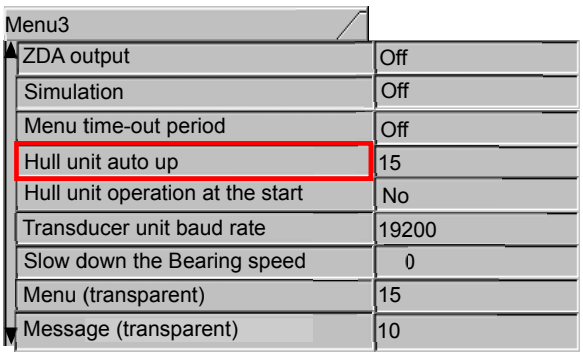
When [Off] is set, the menu is not closed automatically.

5. Press to close the menu.

2.4.5 Hull unit auto up

The Transducer unit can be retracted automatically when the ship speed is over a specified speed by connecting to an external equipment.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Hull unit auto up].



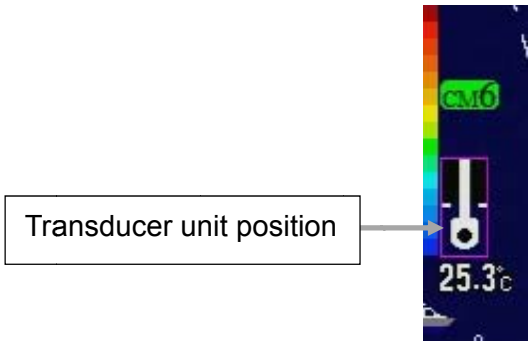
3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Off] or [1] to [17] (Spped unit:kn).

Or select from [Off] or [1] to [30] (Spped unit:km/h).

The setting range is changed whenthe speed unit is selected to kn or km/h.
The soundome can be retracted automatically when the ship speed is over a specified speed. This function is safe for forgetting to hoist the Soundome in the high speed.

Transducer unit position mark shows on the left bottom of the screen while the Transducer unit is lowering.
Transducer unit position mark shows on the left bottom of the screen when the Transducer unit is retracted automatically.



Caution: The setting value can be set up to 17kn (30km/h), but the ship speed it should be kept up15kn（27km/h） or less.

Caution: It is recommended to set to 12kn（22km/h） or less when you have forgotten to retract the soundome in the high speed.

5. Press to close the menu.

2.4.6 Hull unit operation at the start

Select the status of Hull unit after power on.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Hull unit operation at the start].

Menu3	
ZDA output	Off
Simulation	Off
Menu time-out period	Off
Hull unit auto up	15
Hull unit operation at the start	No
Transducer unit baud rate	19200
Slow down the Bearing speed	0
Menu (transparent)	15
Message (transparent)	10

3. Press (knob/left) or ENT to move setting value box.

Hull unit operation at the start	No

4. Turn (knob/left) to select the setting value from [Yes] or [No].

[Yes] : Transducer unit automatically will go down after iitial screen is displayed.

[No] : Transducer unit will not go down after iitial screen is displayed. Press to be lowering.

Caution: Transducer unit does not go down soon after power on.
When [Hull unit operation at the start] is set to "Yes", Transducer unit will go down soon after power on.

5. Press to close the menu.

2.4.7 Transducer unit baud rate

Set the baud rate between Processor unit and Transducer unit.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Transducer unit baud rate].

Menu3	
ZDA output	Off
Simulation	Off
Menu time-out period	Off
Hull unit auto up	15
Hull unit operation at the start	No
Transducer unit baud rate	19200
Slow down the Bearing speed	0
Menu (transparent)	15
Message (transparent)	10

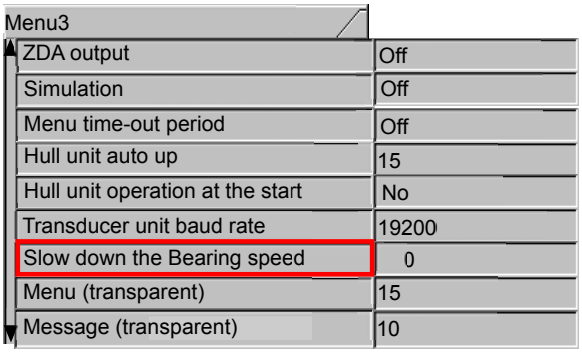
3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [4800], [9600] or [19200].
5. Press to close the menu.

2.4.8 Slow down the Bearing speed

The bearing speed may be unstable depending on the range settings.
In this case, it can be stable by change the bearing speed to be slow. However the image update rate will be slow.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Slow down the Bearing speed].



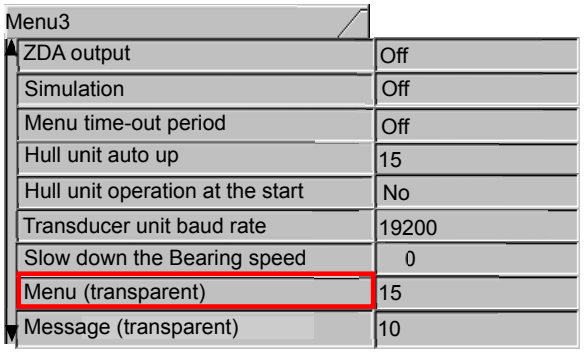
3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [0] to [500].
5. Press to close the menu.

2.4.9 Menu (transparent)

The background image can be easy to see by changing the transparent rate of the menu.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Menu (transparent)].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [0] to [25].

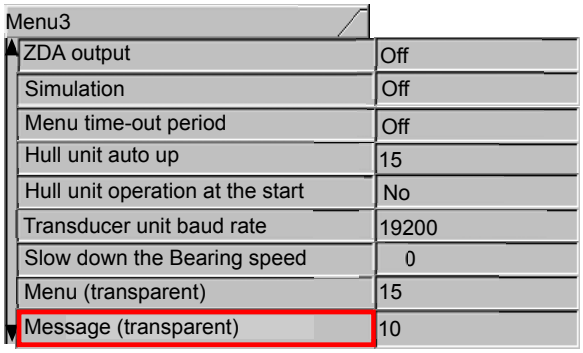
5. Press to close the menu.

2.4.10 Message (transparent)

The background image can be easy to see by changing the transparent rate of the message box.

1. Press MENU to be displayed [Menu3].

2. Turn (knob/left) to select [Message (transparent)].



3. Press (knob/left) or ENT to move setting value box.

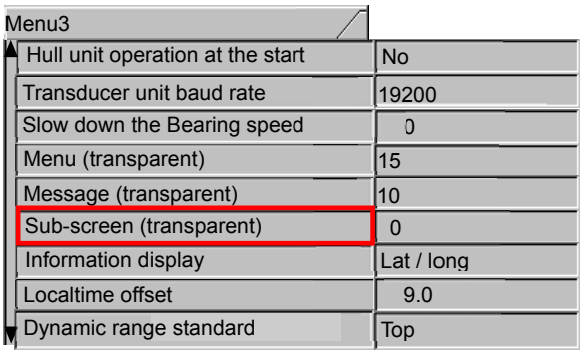
4. Turn (knob/left) to select the setting value from [10] to [20].

5. Press to close the menu.

2.4.11 Sub-screen (transparent)

The background image can be easy to see by changing the transparent rate of the sub-screen.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Sub-screen (transparent)].



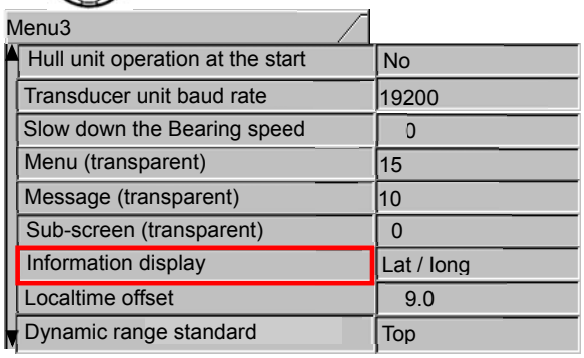
3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [10] to [20].
5. Press to close the menu.

2.4.12 Information display

Select the display of own ship's information from Lat/long or Date.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Information display].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [Off], [Lat/long], [Date], or [Lat/long/Date].

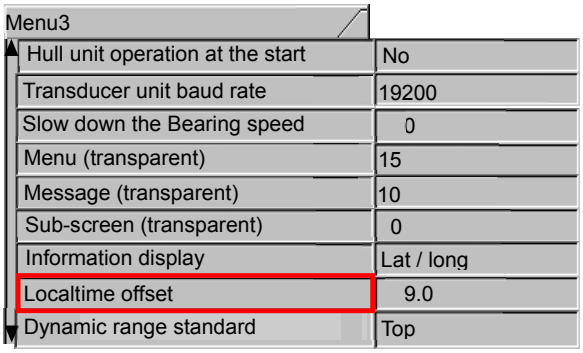
[Lat/long]: displays own position and VRM in numerical values of latitude and longitude.
[Date] : displays date.

5. Press to close the menu.

2.4.13 Localtime offset

Set time difference to the world standard time.

1. Press MENU to be displayed [Menu3].
2. Turn (knob/left) to select [Localtime offset].



3. Press (knob/left) or ENT to move setting value box.

4. Turn (knob/left) to select the setting value from [-11.0] to [14.0].

5. Press to close the menu.

2.5 [CM] keys

[CM] (Condition Memory) key is used to memorize setting conditions of sonar and recall them with one touch of a key button. For example, it is possible to switch the setting for seine fishing to the setting of squid fishing with one touch of a key button. KDS-6000BB is equipped with six [CM] keys, so can be used as if six units of sonars were used at a time.

2.5.1 Initial setting of [CM] keys

6 types of setting modes can be memorized with 6 keys of CM1 to CM6.

Initial setting of [CM] keys

	CM1	CM2	CM3	CM4	CM5	CM6
Presentation mode	Sonar	Sonar (Off-center)	Bottom-scan	Echo sounder	Sonar	Sonar
Panel brightness	10					
Gain	5.0					
TVG	20					
Range	140				80	200
Tilt	-45	-45	-90	-90	-50	-60
Bearing center	0					
Sector	360°	360°	175°	0°	360°	360°

Menu1	CM1	CM2	CM3	CM4	CM5	CM6
Freq select	130.0				210.0	150.0
Dynamic range	20					
Puse width	Middle					
TX power	Auto					
Color rejection	0%					
Noise rejection	0					
Color	A-1					
Image correct	1					
Gain (TD)	0					
FIR	Auto					
Sub-screen selection	Wake disp (H up)					
Sub-screen display	Off					
Wake range (Sub-screen)	1.0					

Menu2	CM1	CM2	CM3	CM4	CM5	CM6
Step (Sonar, Off-center)	10°				5°	10°
Step (Bottom-scan)	5°				3°	5°
Off-center position	Fore					
Target lock	Reverse					

A scope	Off
White line	Off
Scale	1
Internal buzzer volume	100
NMEA monitor	Off
Compass display	Off
Wake display	Off
Wake memory display	1 Second
Sonic speed	0.0%
Power freq adjust	250.0
Depth unit	m
Range & Speed unit	NM kn
Temperature unit	°C
Temperature adjustment	0.0
Train correct	0.00
Ext synchronized	Off
Bearing display	Off
True / Relative bearing	Relative

Menu3	**CM1**	**CM2**	**CM3**	**CM4**	**CM5**	**CM6**
Baud rate	4800					
DBT output	Off					
DPT output	Off					
GGA output	Off					
GLL output	Off					
MTW output	Off					
RMC output	Off					
TLL output	On					
VTG output	Off					
ZDA output	Off					
Simulation	Off					
Menu time-out period	Off					
Hull unit auto up	15					
Hull unit operation at the start	No					
Transducer unit baud rate	19200					
Slow down the Bearing speed	0					
Menu (transparent)	15					
Message (transparent)	10					
Sub-screen (transparent)	0					
Information display	Off					
Local time offset	9.0					
Dynamic range standard	Top					

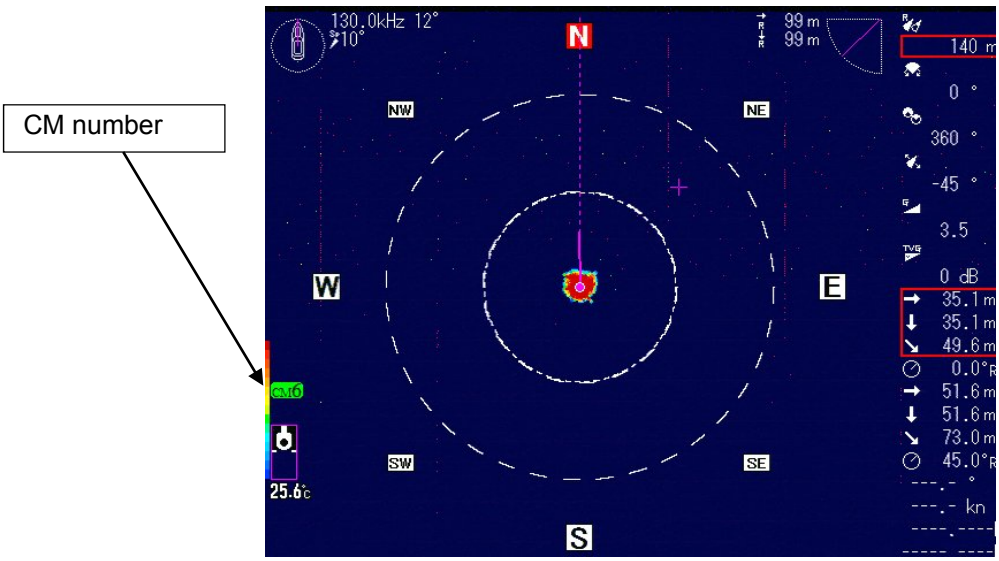
Remote key set	CM1	CM2	CM3	CM4	CM5	CM6
A1	Hul unit U/D					
A2	Target lock			Marker up	Target lock	
A3	Tilt angle up					
B1	Event (TLL)					
B2	Marker up			Marker down	Marker up	
B3	Tilt angle down					
C1	Marker left			Range up	Marker left	
C2	Marker switching			F1	Marker switching	
C3	Marker right			Bearing right	Marker right	
D1	Bearing right			Range down	F1	
D2	Marker down			F2	Marker down	
D3	Bearing left			Bearing left	F1	

Setting values for each mode can be memorized, recalled and switched with one touch of a [CM] key.

2.5.2 Function of [CM] keys

By pressing each key of CM1 to CM6, and the screen mode, Range, Shift, Gain and Menu setting item turn to the setting mode (Color of light turns green).

⚠ Caution: setting [CM] number displays on screen, down left.



Usually, settings of range, shift and gain value position are changed depending on fishing conditions in shallow or deep water. Once settings are memorized in CM keys, settings can be recalled by one touch of a button.
CM key function enables such switching as required, after saving maximum 6 different settings.

The present screen of the [CM] key lights green.

2.5.3 Store in [CM] keys

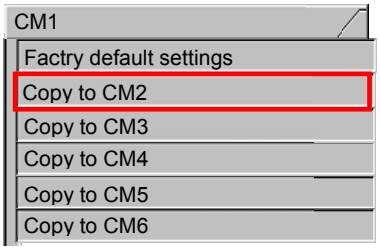
The present settings are stored in the [CM] key currently lit green.
There is no special operation necessary for storage.
Each time screen mode, range, shift, gain or setup of Menu, etc. is operated, the changes are stored in the [CM] keys lit green.

2.5.4 Store a new setting in another [CM] key based on a particular setting in a [CM] key

The setting can be stored easily by copying operation.
The setting in the present [CM] key is copied in the [CM] key to be stored.

When new setting is to be stored in [CM2] key, based on the present setting in [CM1] key

1. Keep pressed CM1 to be displayed the menu of [CM1].
2. Turn (knob/left) to select [Copy to CM2].



3. Press (knob/left) or ENT to move setting box.
4. Turn (knob/left) to select [Cancel] or [Excute].

5. Select [Excute] and press (knob/left) or ENT .
6. The pop-up message of [It has been executed.] is displayed and copy of the setup in [CM1] to [CM2] key is complete.
7. Press CM2. CM1 is switched over to CM2.
8. CM2 lights green. The setting of CM2 is the same as CM1.

Each time screen mode, range, shift, gain or setup of Menu, etc. is operated, the changes are stored in CM2 lit green.

2.6 Function keys ([F] keys)

[F] keys can be assigned with the functions used frequently, to be operated with one touch operation.

2.6.1 Setting to function to [F] keys

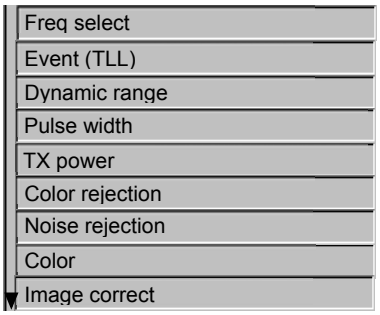
The functions can be assigned to F1 / F2 / F3.

Function
- Freq select
- Dynamic range
- Pulse width
- TX power
- Color rejection
- Noise rejection
- Color
- Image correct
- FIR

Function
- Step (Sonar, Off-center)
- Step (Bottom-scan)
- Off-center position
- Target lock
- A scope
- White line
- Power freq adjust
- Train correct
- Bearing display
- Event (TLL)

2.6.2 Assign intended operation to function keys

1. Keep pressing F1 / F2 / F3 (you desire to change) to display function key setting box.
2. Turn  (knob/left) to select [assigned function].



3. Press  to close the menu.

2.7 Remote control set

Select the [Remote control set] function at Menu2.
Refer to Chapter 3 “3.2 Remote control” (page 3-9)

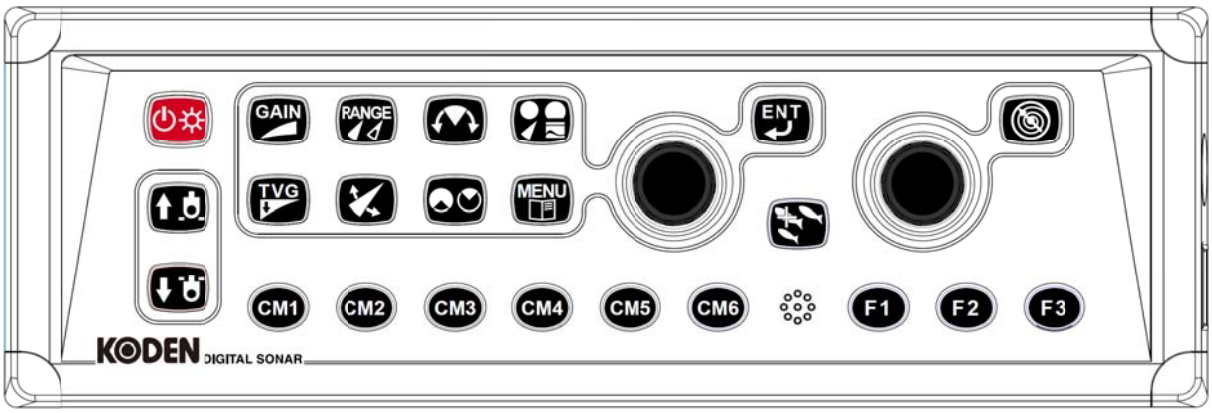
2.8 Maintenance

Refer to Installation Manual Chapter 3 “Maintenance”

Chapter 3 Operation keys

3.1 To use keys

Operation unit of KDS-6000BB



3.1.1 Presentation mode key

Select one of the display mode, [Sonar], [Sonar (Off-center)], [Bottom-scan] or [Echo sounder].
Refer to Chapter 1 Preparation “1.6 Screen display” (page 1-9)

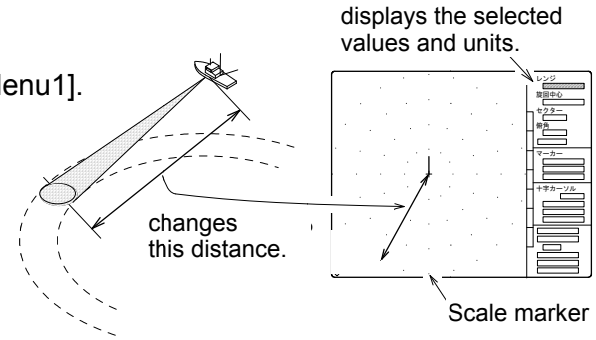
Own ship’s position on Off-center screen are accssed by using [Menu2**]**. (Refer to page 2-17)

3.1.2 Range key

Change the range setting.

The setting for 8 ranges is accesed by using [Menu1].
(Refer to page 2-4)

The setting for the depth units is accesed
by using [Menu2].
(Refer to page 2-26)

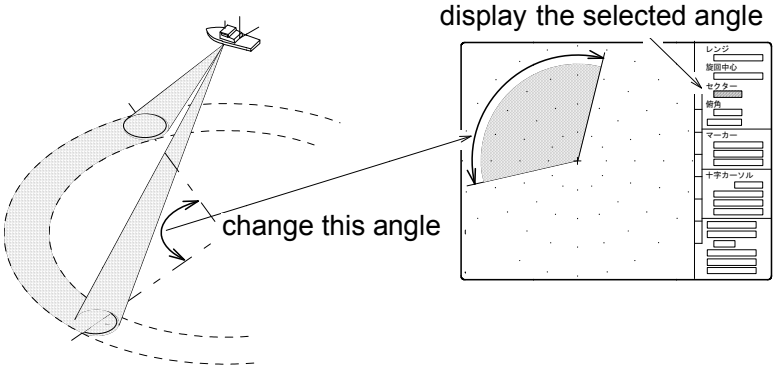


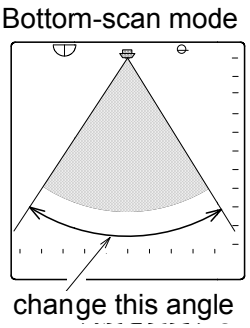
The scale display can be turned on or off by using [Menu2].
(Refer to page 2-18)

3.1.3 Sector key

Change the scanning historical angle (sector angle) in the Sonar mode.

Change the scanning sector angle (vertical angle) in the Bottom-scan mode.





Press  and turn  clockwise to widen the sector angle.

Turn counterclockwise to narrow the sector angle.

The setting for the step is accesed by using [Menu2].
(Refer to page 2-16/17)

Sonar mode operation

5° STEP	5°	25°	45°	85°	125°	165°	205°	360°
10° STEP	10°	30°	50°	90°	130°	170°	210°	360°
15° STEP	15°	45°	75°	105°	135°	165°	225°	360°
20° STEP	20°	60°	100°	140°	180°	220°	260°	360°

Bottom-scan operation

3° STEP	3°	27°	45°	63°	93°	117°	147°	177°
5° STEP	5°	25°	45°	65°	95°	115°	145°	175°

3.1.4 Gain key

Adjust gain.

The gain setting is changed with every 0.1 steps in 0.0 to 10.0

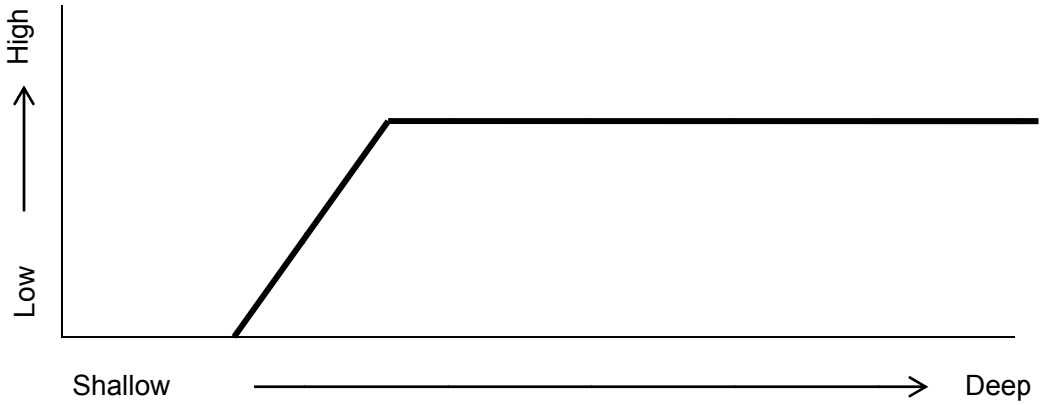
3.1.5 TVG key

TVG offsets the effects of propagation loss of sound as it passes through the water. Propagation loss of sound is the sum of spreading and attenuation losses.
The TVG curve is adjusted to counter the loss.

1. Press 

.

2. Turn  (knob/left) to change the setting.



TVG (0 to 40, --: **28**)
[TVG] is the correction rate in proportion to the distance.
[TVG] is set to "- -", the correction rate becomes constant value.
[TVG] is set to large, the correction ratio in proportion to the distance becomes high.

TVG adjustment (50 to 300: **170**)
[TVG adjustment] is the start depth of the TVG correction.
[TVG adjustment] is set to large, the start depth of the TVG correction becomes deep.

Emphasize (Off, 1 to 300: **Off**)
[Emphasize] is set to [OFF], the effect is disable.
[Emphasize] is set to any value, the echo is highlighted along with the TVG correction.
The larger setup becomes, the stronger effect becomes.

Emphasize depth (20 to 900: **100**)
[Emphasize depth] is the start depth of the Emphasize.
[Emphasize depth] is set to large, the start depth of the Emphasize becomes deep.

Caution: The TVG setting and gain setting have its affect mutually.

3.1.6 Power/Panel brightness key

Powe On/Off.

Powe On

Press  to power on.

On start-up, the internal memory (ROM and RAM) is automatically checked, if the checking completes normally, the start-up screen is displayed.

Powe Off

Keep pressing  for 3 seconds to power off.

When the message of [Preparing for the end] and countdown for power shut down are displayed, release the finger off from the key. The pop-up message of [Preparing for the end] is displayed. After 15 seconds, power is switched off automatically

Refer to Chapter 1 “Preparation 1.2 Power On/Off” (page 1-4).

3.1.7 Hoist/Lower key

• The Hull unit can hoist down/up during operation.

• When pressing  in operation, Soundome is hoist up and the Soundome status indication at the left down side of the screen is changed as  .

• When pressing  to hoist down Soundome again. In this case the indication is changed as  .

• When the Hull unit auto up function is done and Soundome is retracted automatically, press  key to hoist down Soundome after ship speed down.

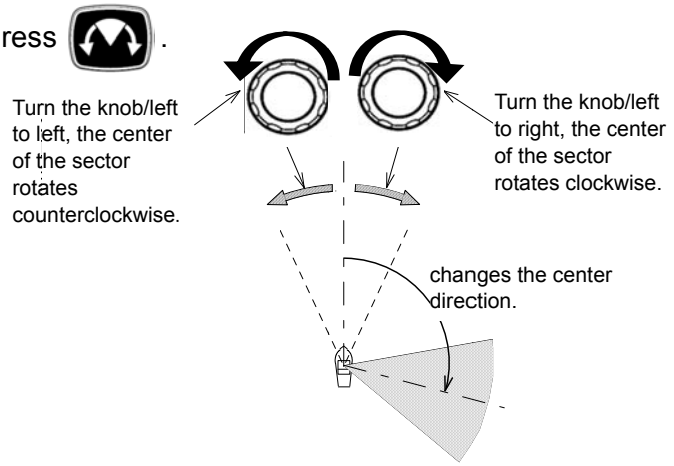
※When the falure is occurred about the hoisting up/sown of Soundome, the Soundome status indication at the left down side of the screen is changed as X in red.

3.1.8 Bearing center key

Use this key to define the center of current scanning sector **in Sonar mode.**

The bearing angle of the display is shifted with every 5° steps.

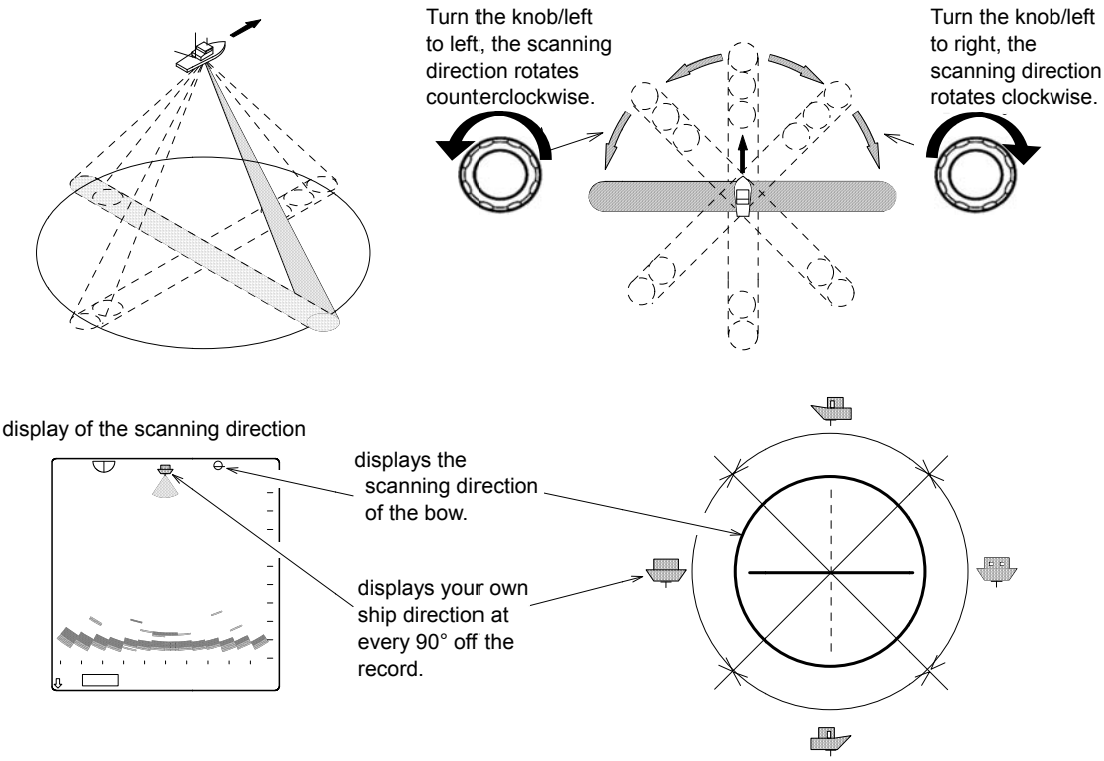
Press  .



Use this key to define the center of current scanning sector **in Bottom-scan mode.**

The bearing angle of the display is shifted with every 5° steps.

Press  .

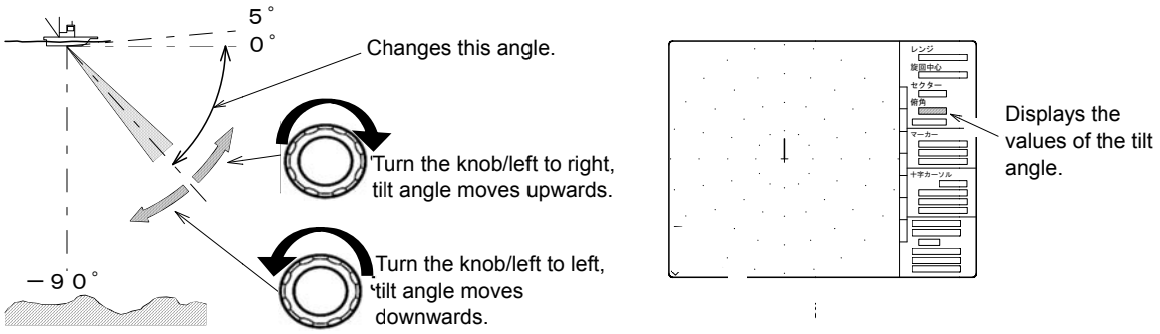


In case of Sonar mode [Tilt key] explained in the next section is collaborated with the bearing key. The shifted angles are the same as those of Botoom scan mode.
(Refer to page 2-16)

3.1.9 Tilt key

Use this key to control the tilt angle **in the Sonar mode.**

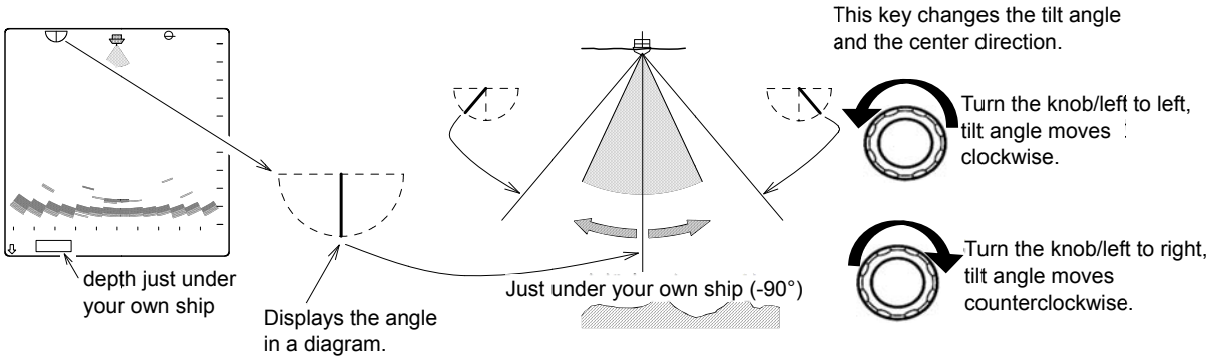
Press .

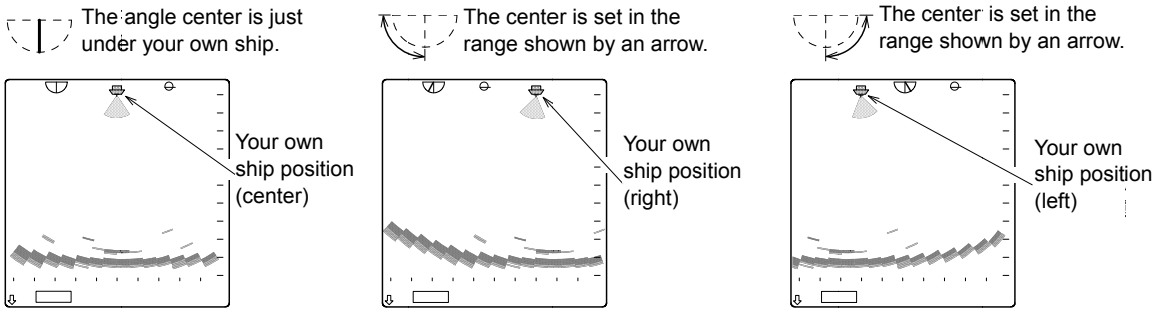


Variable tilt angle: 5° to 0° to -90° (every 1°)

Use this key to control the tilt angle **in the Bottom-scan mode.**

Press .



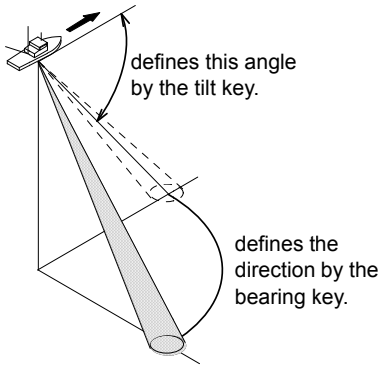


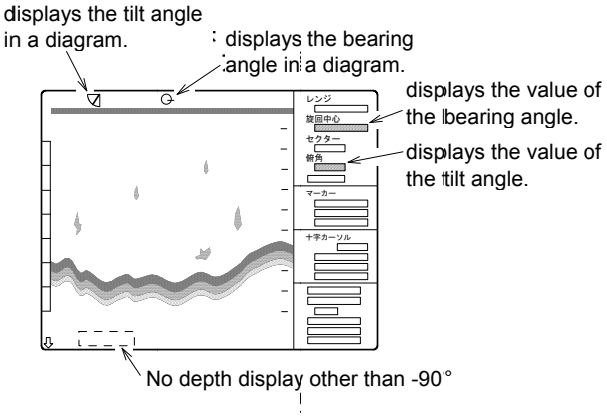
Variable tilt angle:
3° step: -3° to -90° (every 3°)
5° step: -5° to -90° (every 5°)

Refer to page 2-16 for step.

Use and to define the direction of the detection **in the Echo sounder mode.**

Press and turn (knob/left) to define the angle.





Variable tilt angle: 5° to 0° to -90° (every 1°)

Marker indicates the depth other than just below the ship (-90°).
Refer to the following [VRM key] for the marker.

3.1.10 VRM key

In Sonar mode, Sonar mode and Bottom-scan mode, there are two types of the cursor. You can read a horizontal distance, direct distance and the depth by changing two types of cursors depending on the intended use.
In Echo sounder mode, there is one type of a cursor.

Press and (knob/right) to select a cursol type and t (knob/right) to move the cursor.

Press Switch the marker
Long press: Cursor OFF


(knob/right)

Turn right: Increase the range (Ring marker), Move to the upper side (Cross cursor), Move to the depth direction (Depth marker), Move to the right direction (Side marker)

Turn left: Decrease the range (Ring marker), Move to the lower side (Cross cursor), Move to the shallow direction (Depth marker), Move to the left direction(Side marker)

Press: Switch the cursor type

When turn power on, no marker is displayed on the screen.

Press  to use the cursor.

3.1.11 Target lock key

When Menu2/Target lock/[Reverse is selected.

When pressing  in Sonar mode or Bottom-scan mode, the direction of sweep of the Sonar beam is reversed.

When Menu2/Target lock/[Mode1] or [Mode2] is selected.

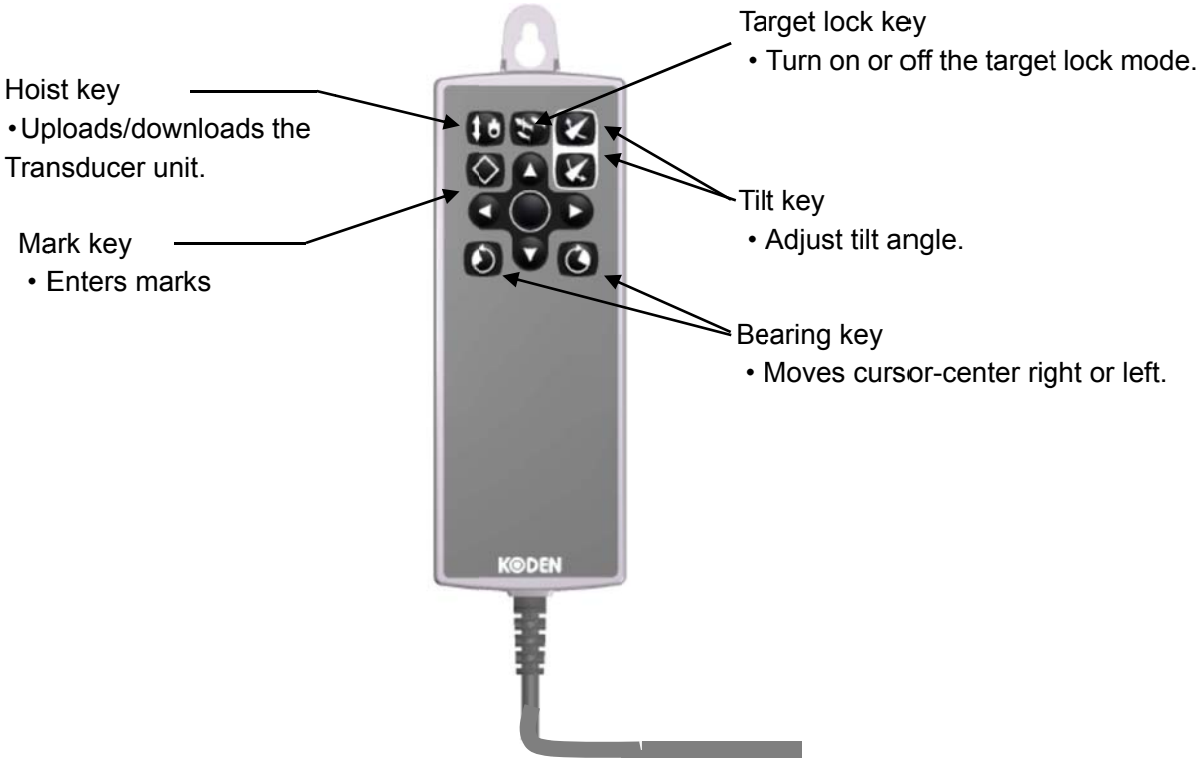
When pressing  in Sonar mode, the Sonar beam tracks the echo automatically.

When Menu2/Target lock/[Marker Mode1] or [Marker mode2] is selected by connected to an external navigator.

By pressing  the target in Sonar mode the target mark is displayed and tracked automatically.

Refer to Chapter 2 “2.3.10Target lock” (page2-23)

3.2 Remote control (RCW-14) (Optional)



3.2.1 Remote key set

Remote control key assignment can be changed as prefer setting.

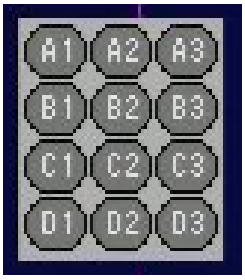
1. Press MENU to display [Menu1].
   Or keep pressing TVG to display [Remote control setting menu]. (This operation can omit item2 and 3 in the below.)
2. Turn (knob/left) to select [Remote key set].

Menu1	
FIR	Auto
Range (Sonar, Off-center)	
Range (Bottom-scan)	
Range (Echo sounder)	
Remote key set	
Sub-screen selection	Wake disp (H up)
Sub-screen display	Off
Wake range (Sub-screen)	1. 0
Language	English

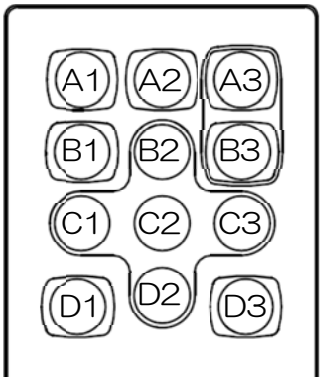
3. Press (knob/left) or ENT to move Remote key setting box.

A1	Hul unit U/D
A2	Target lock
A3	Tilt angle up
B1	Event (TLL)
B2	Marker up
B3	Tilt angle down
C1	Marker left
C2	Marker switching
C3	Marker right

4. Turn (knob/left) to select the setting number from [A1] to [D3]



The remote control key position and assignment.



5. Press (knob/left) or ENT to move setting function box.

A1	Hul unit U/D

6. Turn (knob/left) to select the setting function.

Setting function

- No entry
- Target lock
- Range down
- Tilt angle down
- Gain down
- Bearing left
- TVG
- Marker down
- Marker left
- Event (TLL)
- F2
- Presentation mode
- Hul unit U/D
- Range up
- Tilt angle up
- Gain up
- Bearing right
- Sector
- Marker up
- Marker right
- Marker switching
- F1
- F3

7. Press (knob/left) or ENT to confirm setting function.

8. Press to close the menu.

- Set as the same way as other Remote key setting.

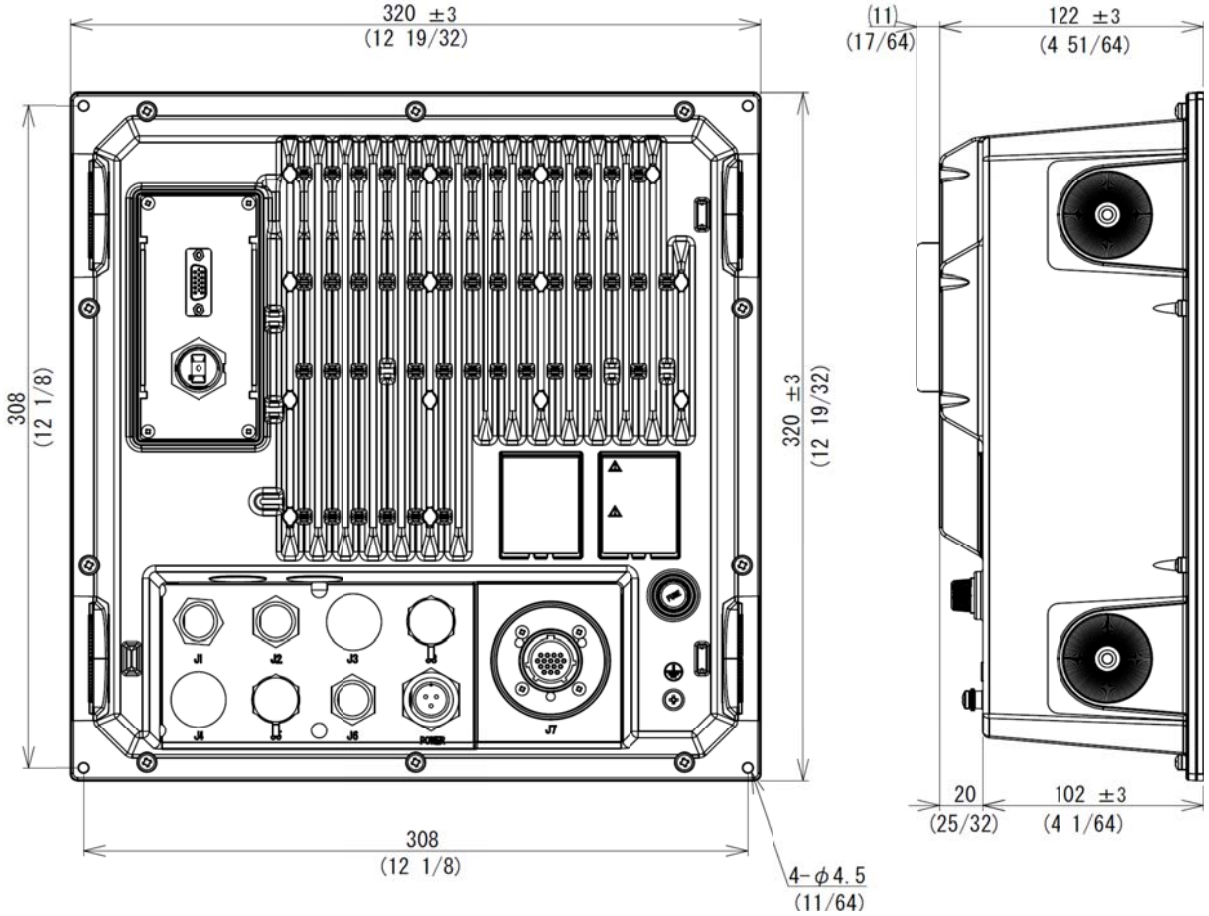
- The sheet of remote control key shows the initial setting of the remote control keys.

- The range operation of Remote control key;
  [Range up]: Move to shallow range.
  [Rang down]: move to deep range.

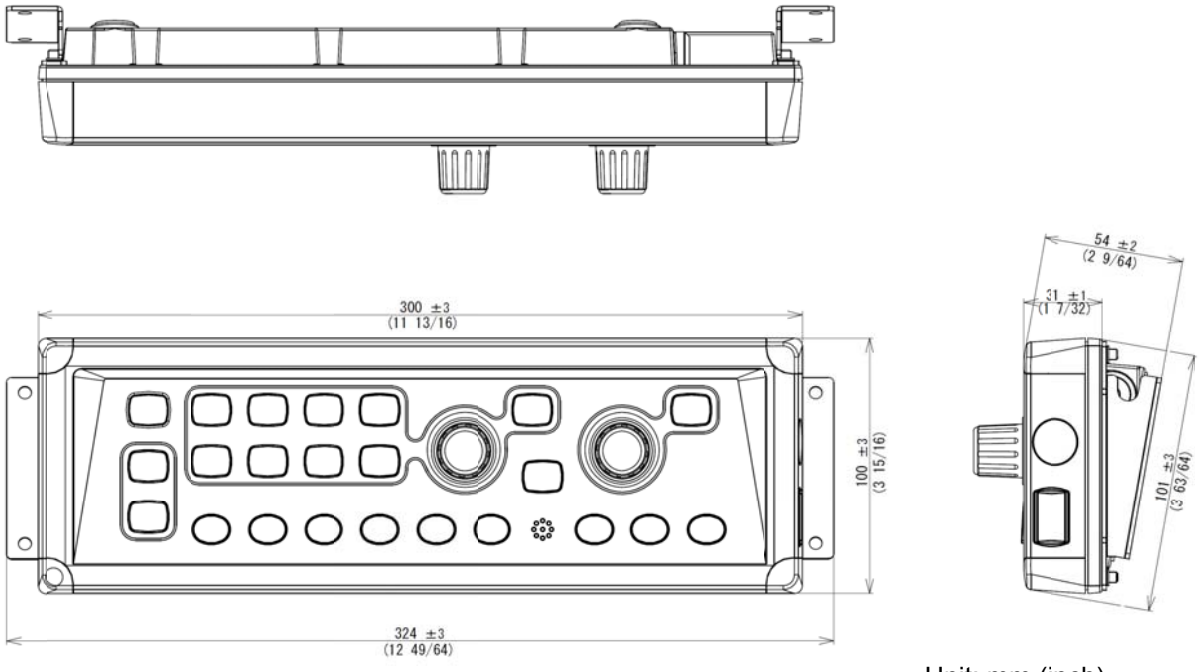
Chapter 4 Appendix

4.1 External view and dimensions

Processor unit (DPU-610)

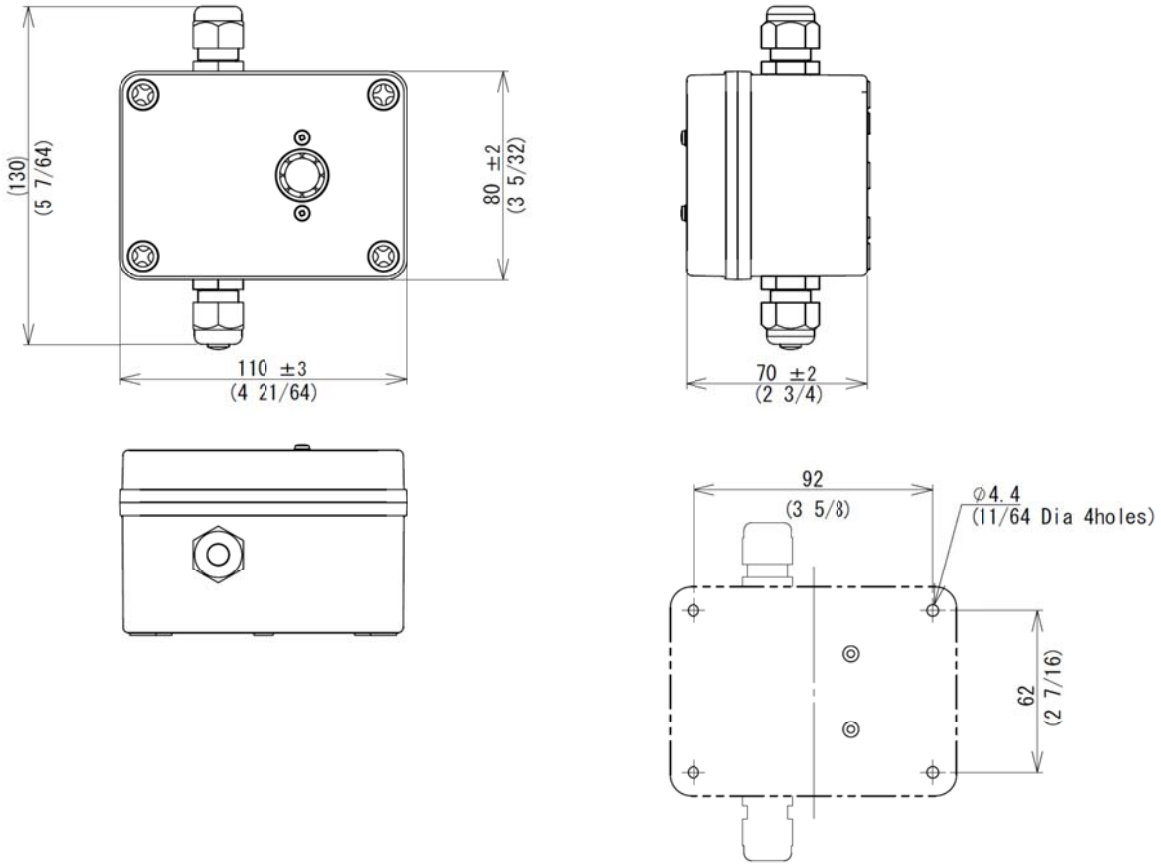


Operation unit (DOU-620)



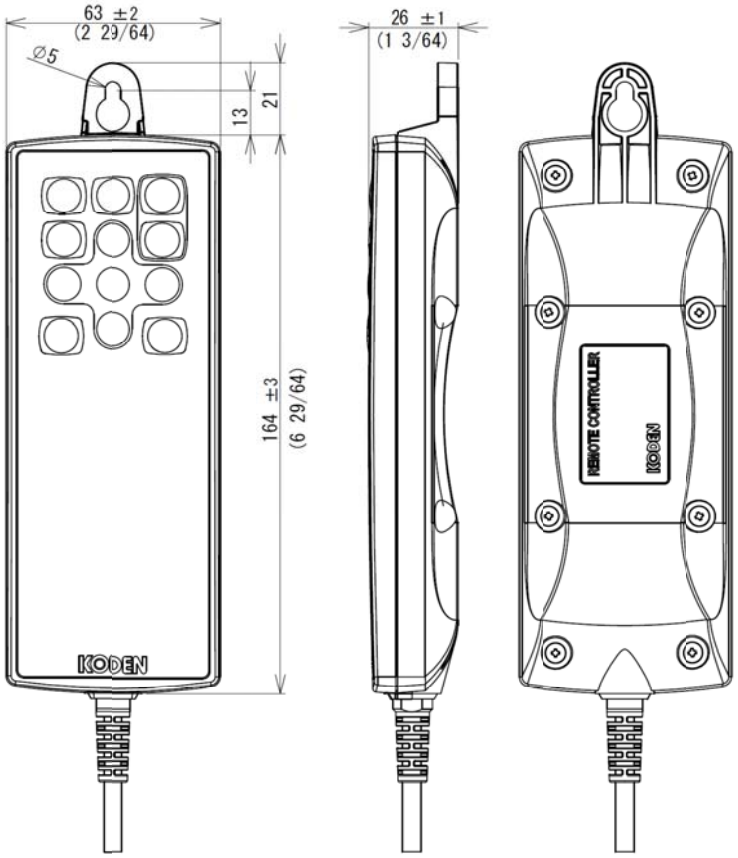
Unit: mm (inch)

TD position alam device (JB-36)



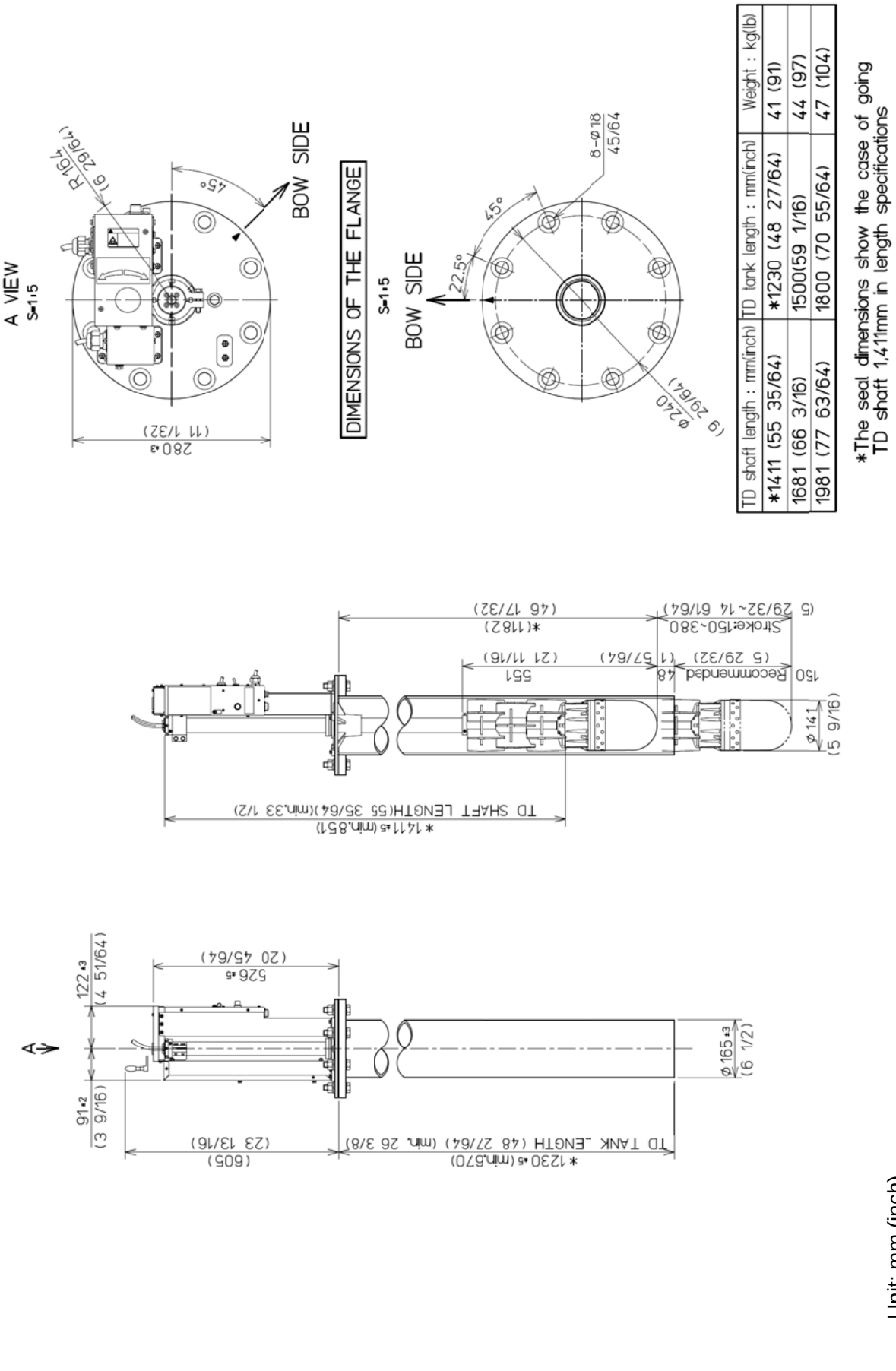
Installation dimensions

Remote controller (RCW-14) (Optional)



Unit: mm (inch)

Hull unit (DHU-630)



Unit: mm (inch)

TD shaft length : mm(inch)	TD tank length : mm(inch)	Weight : kg(lb)
*1411 (55 35/64)	*1230 (48 27/64)	41 (91)
1681 (66 3/16)	1500(59 1/16)	44 (97)
1981 (77 63/64)	1800 (70 55/64)	47 (104)

4.2 Disposal

Dispose of this equipment in accordance with local regulations.

Chapter 5 Index

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Printed in Japan