OPERATION MANUAL

HE-773B





INTRODUCTION

Thank you very much for purchasing our product.

- ■Please be sure to read this operating manual carefully and understand the contents before the actual operation in order to keep your safety.
- ■Please store this manual safely at the convenient place so that you can read it when needed.
- ■Please pass this manual to new owner when you resell or give this unit to someone else.
- ■We are not responsible for any physical injuries and property damages under product liability (PL) law by wrong usage or any other operations not described in this manual.



- manual due to the specification changes etc.
- •Please inform us if you see errors and/or unclear descriptions in this manual.

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CAUTION ON SAFETY (BE SURE TO READ THIS)

This section explains the important cautions in order to prevent the users and surrounding people from physical injuries and property damages.







**Be sure to hold and pull the plug itself for the removal.

Do not put any pressure on cables when installing the unit. It causes line cut and shortage.

3. HANDLING OF TRANSDUCER AND WATER TEMP SENSOR



4. HANDLING OF REMOTE



5. CAUTION OF OPERATION

Power OFF when Starting Engine

Battery voltage varies when the engine starts. It may cause some damage onto the unit. Set the power OFF when starting the engine.

Power Supply 11~30V

Operate the unit within the range of DC 11~30V.

Organic Solution is Prohibited

Do not clean the unit with organic solution like thinner or alcohol etc because most parts are made with plastic. For heavy dirt, soak the soft cloth in synthetic detergent and clean it after wring.

FEATURE

★Ultra-compact size sensor

Only 75mm diameter for sensor extended from the vessel bottom.

★All direction scanning

All around 360deg scanning is possible with the sonar sensor.

★High-speed scanning

High-speed scanning is achieved with precise and compact motor and digital processing.

★Digital sonar

Clear presentation with high sensitivity and reduced noise performance.

BASIC FEATURE

	Frequency	Mode			
Transducer		Sonar	Bottom Sonar	Sounder	Multi Scan Area
TD303	290kHz	0	0	0	180° Hemisphere Full swing
TD304	140~ 240kHz	0	0	0	180° Hemisphere Full swing

DISPLAY

[Sonar Mode Example]



%1 When connecting to optional water temp sensor.

2 Only when auto hull unit is selected.



%1 When connecting to optional water temp sensor.

2 Only when auto hull unit is selected.

[Sounder Mode Example]



%1 When connecting to optional water temp sensor.%2 Only when auto hull unit is selected.

※[RSE]

"RSE" will appear when TD check is not completed correctly. TD check occurs right after turning ON the power. RSE also appears when not connected to any transducer. When RSE shows up often, please check the connection between display unit and transducer. Also, disconnect / reconnect it to make sure. Lastly, turn OFF the power and reboot the power with calm conditions such as less waves and no interference from engine vibration. If "RSE" still continues to pop up, please consult with your dealer for the service.

₩[ME]

"ME" will appear when the transducer detects any shocks or damages and the calibration of motor location is in effect.

Please check "SCAN-PORT setup" and reboot the power under calm conditions with little wave and no vibrations coming from engine. Please contact your dealer for the service if "ME" still shows up on the screen.

1. MAIN UNIT



①Water temp sensor (8P) (optional)

Auto hull unit controller(8P)(optional) ②NMEA(GGA, VTG or RMC) output device(6P) ③Remote (10P) ④Water temp sensor(8P) (optional) ⑤DVI ⑥Transducer (12P) ⑦DC power supply (2P) ⑧Earthing

2. REMOTE (CR09)



①CLR (p13)

Cancel the menu.

②DIRECTION

(Up/Down/Left/Right) (p13)(p34)(p36)(p38)

To move the selected item, to change the value etc.

*For sounder mode.

When opening the menu, it moves the selected item and changes the set-up.

When not opening the menu, Up/Down keys, \blacktriangle/∇ , moves the range of manual expansion, and Left/Right keys, $\checkmark/\triangleright$, moves the depth marker toward water surface or bottom direction.

③MENU (p13)

Display menu.

④SET (p13)

Execution button for selection.

(5)MODE (p14)

Switch to Sonar, Bottom Sonar, or Sounder mode.

6 OFF-CENTER (p21) Display off-center picture.

OUSER KEY (p53)

Possible to assign one function from OFF / FREQ SET / VERTICAL / REVERSE

8TRAIN (p15) (SHIFT (p29))

Rotate the guiding center for sounder mode. Set-up the shift(display range shift)

(9)SECTOR (p19) (GAIN2 (p32))

Switch the sector angle. Set-up the gain for sounder mode.

10GAIN (p31)

Adjust the sensitivity.

①Auto hull unit controller

UP/DOWN (p51)

XOnly effective when auto hull unit is used.

12 RANGE (p28)

Set-up the display range of depth.

(13)TILT (p17, 18)

Set-up the tilt motor angle for single-display normal mode.

(4) POWER (p11)

Power ON/OFF



· Remote (CR09) is wired specs only. Wireless not supported.

POWER ON / OFF



BRIGHTNESS AJUSTMENT FOR THE CR09







SONAR MODE SWITCH

Switches to Sonar, Bottom Sonar, or Sounder Mode.

%The transducer set-up will take a few seconds during mode change.



SCAN DIRECTION (SONAR / BOTTOM SONAR MODE)

Rotate the detecting direction from ship location.





TILT ANGLE(SONAR / BOTTOM SONAR MODE)

Change the tilt angle





DETECTION RANGE (SONAR / BOTTOM SONAR MODE)



SWEEPING STEP (SONAR / BOTTOM SONAR MODE)



HIGH SPEED SCAN MODE (SONAR MODE)



SHIP MARK (SONAR / BOTTOM SONAR MODE)

Ship Mark	
Ship mark is displayed on the screen. Ship mark tells you the direction of ship visually.	
1 Go to MENU1 – 2. SHIP MARK.	
OFF: Mark OFF	
ON : Mark ON	

OFF-CENTER MODE (SONAR / BOTTOM SONAR MODE)

Display Off-Center image to expand the target area.

Move the ship in a lower direction so that forward view is expanded. Shift the ship to left to expand the right area.





ANIMATION DISPLAY (SONAR / BOTTOM SONAR MODE)



VERTICAL DISPLAY (SONAR MODE)

Vertical Display





SAVE IMAGE TO MEMORY CARD

Possible to save the displayed image into memory card, KD05-C-P(optional). The file format/size is BMP(bitmap)/640x480 which is easy to handle with PC.

Caution) Saved image cannot be displayed on the unit.

\neg	Save Image
1	Go to MENU2 –INITIALIZE – SAVE IMAGE W/ SET.
2	Set "Save image with SET key". OFF: Disabled ON : Press ser to save the image

	Memory Card	1
1	Remove the card-cover on card slot.	
2	Insert a memory card, KD05-C-P, into the slot.	
3	Press ser to save the image. "Saving" message will appear on the screen. <i>XThis function does not work while MENU is opened.</i>	
4	Possible to see the saved image on the memory card, KD05-C-P, with PC etc.	
	CLR MENU USER TR/ SET DO CONSTRUCTION (SHI SET (Execution Key)	
*	Refer to the following page for handling of the card.	

MEMORY CARD



DISPLAY RANGE



SHIFT (DISPLAY RANGE SHIFT) (SOUNDER MODE)

Shift (Shift of Display)

Possible to shift the display range. For example, initial displayed range becomes to 4m and display range becomes 4-12m when shifting 4m downward at 0-8m depth range. Also, using expand feature would help to enlarge the target area much bigger.



SLOW SCAN SPEED (SONAR MODE)

The reflected echo from sea bottom might appear when using shallower range than the actual depth (distance). Slow the scan speed to decrease or eliminate the ghost image.

\frown	Scan Sp	beed Set-up
Go	to MENU	11 – 7.OTHER SONAR.
2 Go	to 1.SCA	N SPEED.
5	STD _OW	 Normal When you use shallower range (short range) than actual bottom depth (distance), Select this low speed when ghost image appears.
*1	This functi	on is effective less than 60m range when using S1 or S2.

SENSITIVITY

Digital sounder is capable of changing the sensitivity for whole screen (past image) simultaneously. This feature makes easy manual setting possible by sensitivity adjustment while looking at the past image.

Independent sensitivity setting is possible in sonar mode, bottom sonar mode, sounder mode respectively.


Gain Adjustment (Sounder Mode) \times Select 1 screen display, 2 screen display by menu. (\rightarrow p36) Single Freq Display [Lower Sensitivity] Press GAIN (, or SECTOR (GAIN2)), to lower the sensitivity. [Higher Sensitivity] Press GAIN (A), or SECTOR (GAIN2) (1), to increase the sensitivity. 2 Split Displays [Lower Sensitivity] Press GAIN (•) to lower the sensitivity of right display. Press SECTOR (GAIN2) () to lower the sensitivity of left display. [Higher Sensitivity] Press GAIN (to increase the sensitivity of right display. Press SECTOR (GAIN2) (1) to increase the sensitivity of left display. SECTOR GAIN USER SECTOR (GAIN2) GAIN

NEAR/FAR GAIN (SONAR MODE)



NEAR/FAR GAIN DISTANCE SET-UP (SONAR MODE)

Near/Far Gain Distance Set-up

Possible to change the distance applied for NEAR/FAR GAIN (p33)

Go to MENU1 – 7. OTHER SONAR – 2. NEAR/FAR GAIN TYPE.

2 Select the type. S or L Short: 0, 10, 20, 50m Long: 0, 20, 40, 100m

MARKER (SONAR MODE)

Marker

Press any keys < lacktrian to display light-blue line.

Press any keys \blacktriangle \triangledown to display yellow-circle marker.

The line shows the bearing direction. The bearing is shown in light-blue color digit at center position.

Press ► to rotate the line clockwise. Press ◄ to rotate the line counter-clockwise. The circle marker shows the distance from ship. Vertical/Horizontal distance appears in yellow color on the display.

Press \blacktriangle key to enlarge the circle marker. Press \blacktriangledown key to reduce the marker size Press clear key $\boxed{\ccreak}$, mode key $\boxed{\ccreak}$, off-center mode key $\boxed{\ccreak}$ to disable the ring marker.



COUNTER-ROTATING SENSOR (SONAR MODE)



DEPTH MARKER (BOTTOM SONAR / SOUNDER MODE)

Depth Marker Press **b** to display the depth marker line moving downward. Press < to move the marker upward. The marker depth figure appears on the line. Left Depth Marker Line Depth (Line moves upward.) n. 290 10 -USER TRAI MENU CIR 90° Q 20-21'0 MOD Step \$4 Sector 120° Step 30-Range 40 m 40 24.4°c 22.6 v 20 Right (Line moves downward.)

DISPLAY SWITCH (SOUNDER MODE)

Display Switch					
Go to Men	Go to Menu1 – DISPLAY.				
2 _{Freq} Freq-Freq	:Single Freq display :Same Freq in 2 split screens (You can adjust each sensitivity on left and right display when you show the same frequency's on both displays.→p32)				
**Sonar/Bottom Sonar Mode: 2 split screens cannot be displayed. **Sonar/Bottom Sonar Mode: No display switch feature.					

SWEEPING SPEED (SOUNDER MODE)

Sweeping Speed

[Sounder display consists of the consecutive latest image (image beneath the vessel) at the right edge and keep shifting the past image to the left side. Sweeping speed is the speed to shift the image. Whole display appears differently with this set-up value.

[Relation between Sweeping Speed and Sounding Rate]

Sweeping speed can be selected from 6 different types. The following is the reference of sounding rate for each set-up.



[High Speed Mode]

- High speed mode is selected with "S".
- Max.1,800 times/min is possible for 5m range.
- ※ Pulse length is shorter for S mode.
- % Detectable depth of S mode is shallower than normal mode.
- ※ Do not use this mode when having problems with low sensitivity due to short pulse length or strange reflection of 2nd echo.
- % No advantage of using this mode for the depth of 50m or deeper.

A-MODE (SOUNDER MODE)

A-Mode

A-mode appears between sounder image and depth indication. The thickness changes depending on the strength of reflected echo signal.

Select MENU1 – SOUNDER – 2. A-MODE.
 Set 2. A-MODE.
 ON : A-Mode ON
 OFE : A-Mode OFE



Expansion Ratio Expansion ratio can be selected from x2, x4, x8. **1** Select MENU1 – SOUNDER – 4. EXP RATE. **2** Set 4. EXP RATE. ×2, ×4, ×8

SHIFT EXPANSION POSITION (SOUNDER MODE)

Shift Expanded Area

Possible to move the expanded area toward water surface or bottom side.

Select the expansion ratio from x2, x4, x8.Default set-up: x4 for manual/auto expansion



CLEAN ECHO (SOUNDER MODE)



WATER TEMP GRAPH (SOUNDER MODE)



FISH ALARM (SOUNDER MODE) Fish Alarm Alarm is ON when the fish is detected. 1 Select MENU1 – SOUNDER – 5.0THER SOUNDER – 3.FISH ALARM. 2 Select 3.FISH ALARM. 2 Select 3.FISH ALARM. 2 Select 3.FISH ALARM. 2 Select 3.FISH ALARM. 5 : High sensitivity mode to detect small/big fish schools. L : Low sensitivity mode to detect only big fish school. OFF : Fish alarm is OFF. Caution) Fish alarm may react to the objects other than fish.

DEPTH ALARM (SOUNDER MODE)



SUPER RANGE (SOUNDER MODE)

Super Range			
Whole past image changes automatically according to the current depth (displayed depth range on screen) if changed any.			
1	Select MENU1 – SOUNDER – 5.OTHER SOUNDER -5.SUPER RANGE		
2	Select 5.SUPER RANGE. ON : Use OFF : No Use		

DEPTH DISPLAY (SOUNDER MODE)



SWEEPING STEP (SOUNDER MODE)

Sweeping Step Select the sweeping step (line numb	per) per each. (1, 2, 3)
1	Select MENU1 – SOUNDER – 5.OTHER SOUNDER – 7.SWEEPING STEP.
2	Select 7.SWEEPING STEP 1, 2, 3
	<i>X</i> "2 lines" means that same echo picture appears for 2 lines at once.

BACKGROUND COLOR

Visual image of display looks differently by surrounding brightness. It is easier to see the image by selecting the background color from 4 different colors.



Select MENU2 - 1.BACK GROUND .



2 Select 1.BACK GROUND . (black, cyan, blue, white)

COLOR TONE

Color Tone

Set-up the color tone of display. Day mode is for brighter display. Night mode is for darker display.

Select MENU2 - 2.COLOR TONE.

2 Select 2.COLOR TONE. (DAY / NIGHT)

COLOR CONFIGURATION

Color Configuration

Reflected signal of sound wave is converted into 17 ranks of digital signal according to the strength of reflection. Color configuration is the color set-up for 16 ranks except background color. Fish finder image is shown by the color configuration. The displayed color shows the strength of reflection. Also, specific reflection can be emphasized by changing the color configuration.

> Select MENU2 - 3.COLOR SETTING -1.COLOR CONFIG.

Select 1.COLOR CONFIG. 3 patterns: 0~2

COLOR ERASE

Color Erase

Fish schools and sea bottom are displayed on screen according to the reflected echo and selected color pattern.

"Color Erase" function deletes the color of the weakest reflection one by one so that fish schools can be judged easier by erasing the colors of planktons or dirt inside the water.

Select MENU2 – 3.COLOR SETTING – 2.COLOR ERASE.

2 Select 2.COLOR ERASE. 13 levels: OFF~12

INTENSE LEVEL



Clutter Remove unnecessary weak noise and distinguish the fish school clearly. **1** Select MENU2 – 3.COLOR SETTING – 4.CLUTTER. -1 Standard 1 2 V Stronger noise reduction

WATER TEMP ALARM

Water Temp Alarm

Alarm is ON within or exceeding the range of 2 different water temp. *XOptional water temp sensor is required for water temp alarm.*



OUTPUT POWER	
Output Power Select the type of output power.	
1	Select MENU2 – 5.OUTPUT POWER.
2	Select 5.OUTPUT POWER. OFF, Low, High (OFF: No transmit. Receiver is ON.)
<i>※Factory set-up: "High". Lower the</i>	output power when needed.

PULSE LENGTH



SENSITIVITY MODE



SCALE LINE (BOTTOM SONAR / SOUNDER MODES)





VOLTAGE CORRECTION





RESET TRANSDUCER



FREQUENCY CHANGE

Possible to change the freq, when using TD304.				
1	Go to MENU2-0.INITIALIZE-6.FREQ SET UP. Press SET key.			
2	<preq set=""> cmenuj: end ◄ 180kHz ►</preq>			
	 Key : Lower Freq Key : Higher Freq MENU key : close the box 			
<i>X</i> Close the freq. set-up box to complete.				

Depth Unit Select from "Meter ", "Feet", "Fathom" or "Brazas". 1 Select MENU2-0. INITIALIZE -3. DEPTH UNIT. 2 Select 3. DEPTH UNIT. m, ft, fa, br

AUTO HULL UNIT

When you use auto hull unit, please select "AUTO" for HULL UNIT of TD SET-UP (p12,49). "Auto Hull Unit Indicator" appears on the display. UP/DOWN of auto hull unit is enabled. %Please operate UP/DOWN of auto hull unit when the vessel is in still condition.

(5 knots or less speed). Otherwise, it causes damage to the hoist system.

[Auto Hull Unit Indicator] Display the location of sonar dome.



- ※ Please consider auto hull unit indicator as the brief reference. The location status may vary from the actual location, (When buzzer of auto hull unit alerts, hull unit is being operated.)
- When the transducer is projected under hull unit, it flashes in blue and red over 5 knots and lights in red over 11 knots. (It is effective when GPS mark is shown(→P52).)



NMEA INPUT

USAGE OF GPS DATA

When you input NMEA data (GGA, VTG or RMC) relating to positioning into the unit, GPS mark is shown. (%Unless positioning, GPS mark is not shown.) When GPS mark is shown (when positioning), some functions of hoist unit become effective.



IR (Interference Rejection : SONAR/BOTTOM SONAR MODES)



USER KEY Possible to assign one function from OFF / FREQ SET */ VERTICAL / REVERSE to USER key. This activates the selected function even though the menu is closed. USER KEY set-up 1 Go to MENU2 – 0. INITIALIZE – 6. REMOTE SETTING – 1. USER KEY1 or 2. USER KEY2. 2 Select one function. *Only when TD304 is used.

X Factory set-up: Items shown with underlined block letter

<MENU 1>

••••••				
1. STEP		[S1 , S2 , S4 , <u>S6</u> , S6F]	→P20	
2. SHIP MARK		[<u>OFF</u> , ON]	→P21	
3. MODE		[SONAR , BTM SONAR , SOUNDER]	→P14	
4.ANIMATION		[OFF , <u>ON</u>]	→P23	
5.NEAR/FAR GAIN			→P33	
	1.VERTICAL DISPLAY	[<u>OFF</u> , ON]		
6.VERTICAL DISPLAY	2.CONTRAST TARGET	[OFF , FRONT , REAR]	→P24	
	3.CONTRAST LEVEL	[LOW , <u>MID</u> , HIGH]	1	
	1.SCAN SPEED	[<u>STD</u> , LOW]	→P30	
7.OTHER SONAR	2.NEAR/FAR GAIN TYPE	[<u>S</u> ,L]	→P34	
	3.IR	[0.NORMAL , 1.IR-1 , 2.IR-2]	→P53	
	4.FISH ALARM	[<u>OFF</u> , ON]		
	1.STABILIZER	[<u>OFF</u> , ON]		
	2.ROLL/PITCH ADJUST			
8.STABILIZER※1	3.ROLL ADJUST	[-5°~5°] <u>0°</u>		
	4.PITCH ADJUST	[-5°~5°] <u>0°</u>		
	5.G-SENSITIVITY	[1 , 2 , <u>3</u> , 4 , 5]		
AUTO HOIST SYSTEM ※	2	[<u>UP</u> , DOWN]	→P51	

*※*1 Only when heading sensor (option) is used.

X2 Only when hoist system is set "AUTO".

<MENU 1>

Bottom Sonar

1.STEP		[S1 , S2 , S3 , <u>S4</u> , S5 , S6]	→P20
2. SHIP MARK		[<u>OFF</u> , ON]	→P21
3.MODE		[SONAR , BTM SONAR , SOUNDER]	→P14
4.ANIMATION		[OFF , <u>ON</u>]	→P23
5.OTHER BTM SONAR	1.IR	[<u>0.NORMAL</u> , 1.IR-1 , 2.IR-2]	→P53
AUTO HOIST SYSTEM %1		[<u>UP</u> , DOWN]	→P51

X1 Only when hoist system is set "AUTO".

<MENU 1>

Sounder

1.SWEEP			[STOP , 1 , 2 , 3 , <u>4</u> , S]	→P37
2.A-MODE			[OFF , ON]	→P38
3. EXP MODE			[<u>OFF</u> , BOTTOMLOCK, AUTO-EXP, MANUAL-EXP]	→P38
4. EXP RATE			[×2 , <u>×4</u> , ×8]	→P39
5. OTHER SOUNDER 1.C-ECHO			[OFF , <u>L ,</u> M , H]	→P39
	2.TEMP GRAPH		[<u>OFF</u> , ON]	→P40
	3.FISH ALARM		[<u>OFF</u> ,S,L]	→P40
	4.DEPTH ALARM	1.ALARM	[OFF , IN RANGE , OUTRANGE]	→P41
	2.DEPTH SET 1 3.DEPTH SET 2 5.SUPER RANGE 6.DEPTH DIGIT		[1m ~ 800m] <u>10m</u>	→P41
			[1m ~ 800m] <u>500m</u>	→P41
			[<u>OFF</u> , ON]	→P42
			[OFF , S , <u>M</u> , L]	→P42
7.SWEEPING STEP			[<u>1</u> ,2,3]	→P42
6.MODE			[SONAR , BTM SONAR , SOUNDER]	→P14
7. DISPLAY			[FREQ , FREQ-FREQ]	→P36
AUTO HOIST SYSTEM ※1			[<u>UP</u> , DOWN]	→P51

*※*1 Only when hoist system is set "AUTO".

<MENU 2>

1.BACK GROUND			[BLACK , <u>CYAN</u> , BLUE , WHITE]	→P43		
2.COLOR TONE			[<u>DAY</u> , NIGHT]	→P43		
3.COLOR SETTING 1.COLO		1.COLOR CO	COLOR CONFIG		[0,1, <u>2]</u>	→P43
		2.COLOR ERA	ASE		[<u>OFF</u> ~ 12]	→P44
		3.INTENSE C	OL		[Low , <u>STD</u> , Hi]	→P44
		4.CLUTTER			[-1 , <u>STD</u> , 1 , 2]	→P44
4.TEMP ALARM	I	1.ALARM SET			[OFF , IN RANGE , OUT RANGE]	→P45
		2.TEMP.SET1			0.0 ~ 50.0°C <u>15.0°C</u>	→P45
		3.TEMP.SET2			0.0 ~ 50.0°C <u>20.0°C</u>	→P45
5.OUTPUT POV	VER				[OFF , LOW , <u>HIGH</u>]	→P45
6.PULSE LENG	тн				[SHORT , <u>NORM</u>]	→P46
7.SENSITIVITY					[<u>STD</u> , HIGH]	→P46
8.SCALE LINE					[<u>OFF</u> , ON]	→P47
9.ADJUST	1.TE	EMP.CORRECT	Т		-3.0°C~ +3.0°C <u>0.0°C</u>	→P47
	2.V0	OLT.CORRECT			-3.0V ~ +3.0V <u>0.0V</u>	→P48
0.INITIALIZE	1.IN	TIAL ALL				→P48
	2.TI	D SET-UP	1.TC) SET-UP	[TD303 , TD304]	→P49
			2.SC	CAN_PORT	[<u>A</u> ,B,C,D]	→P49
			4.HC	DIST SYSTEM	[<u>MANUAL</u> , AUTO]	→P49
	3.DI	EPTH UNIT			[<u>m</u> , ft , fa , br]	→P50
	4.SAVE IMAGE W/ SET			[<u>OFF</u> , ON]	→P26	
	5.BANDWIDTH			[WIDE , <u>STD</u> , NAR-1, NAR-2]		
6.R			1.USE	R KEY1	[<u>OFF</u> , FREQ SET <u>※1,</u> VERTICAL , REVERSE]	→P53
		6.REMOTE SETTING		R KEY2	[<u>OFF</u> , FREQ SET <u>※1,</u> VERTICAL , REVERSE]	→P53
				OTE BRIGHTNESS	[DARK , BRIGHT]	→P11
	7.FREQ SET <u><i>*</i></u> 1			→P50		

*※*1 Only when TD304 is used.

DIMENSIONAL DRAWING

<MAIN UNIT>

Unit : mm





<Remote (CR09) Dimensions>

Unit : mm



HULL UNIT DIMENSIONS

%Please refer to operation manual supplied with auto hull unit for auto hull unit.

Unit : mm

Case of minimum-size drawing when the waterline is 200mm.

*1:Keep the tank length of 300mm or more even if waterline is below 200mm.



MAIN UNIT CONNECTION



CONNECTOR INFO

Caution: Connector image when looking at the main unit.



- 1. Connector for Power Supply 1. Power Supply(+) 11~30V

 - 2. Power Supply(-)



2. Tx/Rx Connector 12P

Pin#	Line	Description
1	White	TD
2	Orange	Scan Motor- B
3	Yellow	Scan Motor - Ā
4	Red	Scan Motor-A
5	Purple	Tilt Motor- B
6	Cyan	Tilt Motor-B
7	Pink	Tilt Motor-A
8	Black	TD
9	Brown	Reed Switch
10	Blue	Scan Motor-B
11	Shield	
12	Green	Tilt Motor- A

3.8P Connector



- 1. GND
- 2. External synchronization output %n/a for 2nd 8P connector below.
- 3. Auto hull unit input (-) Xn/a for 2nd 8P connector below.
- 4. Auto hull unit input (+) %n/a for 2nd 8P connector below.
- 5. Electric motor device control output %n/a for 2nd 8P connector below.
- 6. Water temperature sensor (+)
- 7. Water temperature sensor (-)
- 8. n/a
- 4. NMEA(GGA , VTG or RMC)
 - 1. GND
- 2. Data input (-)
 - 3. Data input (+)
 - 4. n/a
 - 5. n/a
 - 6. DC10.5V (200mA) output

5. Remote (CR09)

- 1.12V
- 2.5V

)`2 91

- 3. REM
- 4. BUZZER
- 5. POWER SWITCH
- 6. POWER SWITCH
- 7. Brightness Adjustment
- 8. n/a
- 9. GND
- 10. SHIELD

MAIN UNIT INSTALLATION

Install the unit firmly.

If not, it may cause the human injuries.

%Install the unit correctly according to the following instruction.

[Procedure]

<Mounting the main unit>

Attach the main unit referring to the figure.

Mount the unit using 4pcs holes with enclosed screws.

Fix the main unit with the attached screws.





<Mounting the remote (CR09)> Using the mounting holes (4 places). Attach the remote (CR09) using the screws.



TRANSDUCER INSTALLATION

%Please refer to operation manual supplied with auto hull unit for auto hull unit.





1. Installation Location

Please be cautious when deciding the installation location with the consideration of following points.

- Choose the location where having less influence from air bubble, interference, and noise condition.
- Interference free condition.
- No obstacles near the hull unit. (especially for bow side)

The obstacles at bow side cause bubbling and detection problems in addition to the cut-off for ultrasonic beam.

2.Hull Unit

Please make sure to choose the proper location of hull unit to be installed. The important points to be concerned are safety (intensity and water tightness) and easy maintenance.



Add an extruding part of approx.5mm with FRP for the purpose of reducing the water pressure inside the pipe while sailing.



Pipe Length : Lt

The installation method defines the pipe length accordingly. Cut off the unnecessary parts. Also, take a note for the pipe length as the reference figure of adjusting upper/lower shafts.

Be sure to keep the room for the hull unit.

Pipe Length: Lt : Min.300mm (Stroke: 150mm)

(Full-loaded water line + Min.100mm at least)

%Min.300mm pipe length is required even when waterline is 200mm or less.

Remaining Length Yt: Min.70mm

Shaft Length: Pipe Length (Lt) + Stroke + Remaining Length (Yt) – 130mm

STORAGE OF TRANSDUCER

Please note the points below when installing and using the transducer.

- 1. Make sure that the transducer soundome is always placed/stored straight-up. The transducer is filled with oil inside the case. Placing side-way has the risk of leaking oil to the cable. Do not place it side-way.
- Transducer dome is consisted of precise components. It may be damaged by strong shock and vibration without having clear appearances such as scratch or dent etc. Handle with care.
- 3. Do not exceed 10 knots when lowering the transducer. The transducer may become damaged or malfunctioned when exceeding 10 knots. Make sure to raise the transducer when you gain speed.

HULL UNIT INSTALLATION

%Please refer to operation manual supplied with auto hull unit for auto hull unit.

1. Cut off Upper/Lower shafts according to pipe length Lt and remaining length Yt.

Shaft Length : Pipe Length (Lt) + Stroke + Handling Length (Yt) - 130mm Standard Length : Approx.1000mm

Put the marking at lowest position of Upper/Lower shaft (excluding the remaining length).

Marking Position : Pipe Length (Lt) + Stroke - 130mm



3. Let Tx/Rx cable through Upper/Lower shaft.

4. Apply the adhesive bond for polyvinyl-chloride pipe onto the slid of pipe socket for one rotation. Tighten the pipe socket and transducer.

(Proper level of clamping torque: 8~10kgf.m)



5. Fix Upper/Lower shaft and transducer with pipe(tank) guide(A).



6. Use and fix it with Pipe(tank) guide (B) when pipe length is 410mm or more.



XNo need to use pipe(tank) guide (B) if pipe length is less than 410mm.
7. Confirm the bow mark on transducer and put the marking onto Upper/Lower shaft.



8. Loosen the knob of storage pipe cover so that the shaft goes through it.



Pipe guide

9. Lower the storage pipe cover until it hits the tank guide followed by tightening the knob.

- 10. Make sure not to cause any scratches to transducer dome when shifting the Upper/Lower shaft into storage pipe.
- 11. Adjust the direction of knob of the pipe cover for easier operation before the fixation.

12. Lower Upper/Lower shaft slowly while holding the edge of the shaft. Make sure to match the levels of the lower line and pipe clamp's upper edge.Face the bow mark to bow direction. Lastly, tighten the knob to fix the shaft.



13. Fix the positioning clip.

Put the marking on knob-side clip so that it always faces toward knob direction. If it faces the other way, sonar direction is 180deg opposite.



14. Sliding movement check.

Loosen the knob to confirm if the movement of Upper/Lower shaft is smooth from the top to the bottom. When stiff movement or locking occurs, remove the elements inside the pipe.

- 15. Fix the pipe cover with clamping.
- 16. Seal with a pipe cap.



17. Fix the handling guide with 4x8 screw to comfortable direction.



- After the completion of installation, confirm the operating condition for the hull unit.
 (1)Firstly, loosen the knob of storage pipe cover followed by moving the unit up and down.
 - ②After deciding the unit location, tighten the knob and fix the pipe. The positioning clip matches to the pipe clamp at the lower limit position.
 - ③Like the drawing below, the hull unit location is within the specified range. Lower position: Stroke 150mm
 - Upper position: Transducer is stored inside the pipe 20mm or more.



WATER TEMP SENSOR INSTALLATION

Water temp sensor is optional.



73

TC03-05 TC03-10

STANDARD CONFIGURATION



MANUAL HULL UNIT STANDARD COMPOSITIONS

%Please refer to operation manual supplied with auto hull unit for auto hull unit.



OPTIONS



SPECIFICATIONS

Main Unite	Display Style	Landscape
	Number of Pixel	640 × 480
	Operating Voltage	DC11V ~ 30V
	Dimensions (mm)	300(H) x 255(W) x 94(D)
	Weight	Main Unit Approx. 1.7kg, Remote Approx. 0.85kg
Sonar Mode	Train (Scan)	0° ~ 360° / in 1.8° steps
	Tilt	0° ~ 90° / in 1° step
	Sweeping Step	S1(1.8°),S2(3.6°),S4(7.2°), S6(10.8°),S6F
	Off-Center Mode	OFF / Front / Right / Left / Rear
Bottom Sonar Mode	Train (Scan)	0° ~ 180° / in 1.8° steps
	Range Sector	30° 60° 90° 120° 150° 180°
	Sweeping Step	S1(1.8°),S2(3.6°),S3(5.4°),S4(7.2°), S5(9°),S6(10.8°)
Sounder Mode	Sweep Speed	5 speeds + Stop
	A-Mode	OFF / ON
	Expansion	OFF / Bottom Lock / Auto Exp / Manual Exp
	Expansion Ratio	x2 / x4 / x8
	Clean Echo	OFF / L / M / H
	Water Temp Graph	OFF /ON
	Fish Alarm	OFF / S / L
	Depth Alarm	OFF / In Range / Out Range
	Super Range	OFF /ON
	Depth Digit	OFF / S / M / L
	Sweeping Step	1/2/3
Common	Display Range	0 ~ 800m
	Background Color	4 Colors (Black, Cyan, Blue, White)
	Color Configuration	3 Patterns
	Water Temp Alarm	OFF / In Range / Out Range
	Output Power	OFF / Low / High
	Pulse Length	Short / Normal
	Sensitivity	Standard / High

* Water temperature graph, water temperature alarm requires water temperature sensor (option).



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