

3000M

Ultrasound Scanner



User's Manual

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Contents

Chapter 1 General Description	5
1.1 Introduction	5
1.2 Features	5
1.3 Structure	6
1.4 Suitable using range	6
1.5 Technical specifications.....	6
1.6 Operating conditions	7
Chapter 2 Safety	8
2.1 Symbol and meaning	8
2.2 Safety classification.....	8
2.3 Safety note.....	8
2.4 Requirement for environment.....	9
2.5 Attentions for operation.....	10
2.5.1 Main unit.....	10
2.5.2 Probe	10
2.5.3 Battery.....	10
2.5.4 Power adapter.....	11
Chapter 3 Installation	12
3.1 Outlook.....	12
3.2 Battery	12
3.3 Control panel	12
3.4 Installing the main units	14
3.4.1 Connecting the probe	14
3.4.2 Connecting the electric power.....	14
Chapter 4 Operation	15
4.1 Attentions for operation.....	15
4.2 Start the system	15
4.3 Selection of probe types and work frequency.....	15
4.4 Mode selection	15
4.4.1 B Mode.....	16
4.4.2 2B Mode.....	16
4.4.3 BM Mode	17
4.4.4 M Mode.....	18
4.4.5 4B Mode.....	18
4.5 Control and adjust image.....	19
4.6 Control image	21
4.6.1 Focus position	21
4.6.2 Depth adjust	21
4.6.3 Scroll function.....	21
4.6.4 Center line	21
4.6.5 Scanning angle	21

4.6.6	Image reversing	21
4.6.7	Color and pseudo-color.....	22
4.7	Sleep mode	22
4.8	Disable touchpad	22
Chapter 5	Measurement and calculation.....	23
5.1	Introduction	23
5.2	Enter into measurement.....	23
5.3	Keys used in measurement	23
5.4	Normal measurement- B Mode	23
5.4.1	Distance.....	23
5.4.2	Circumference and Area (Trace method)	24
5.4.3	Circumference and Area (Ellipse method)	24
5.4.4	Volume measurement (Three-axis method).....	24
5.5	General measurement - M mode	25
5.5.1	Distance.....	25
5.5.2	Velocity	25
5.5.3	Heart-rate measurements.....	26
5.6	OB measurement	26
5.6.1	Gestational age measurement.....	26
5.6.2	Fetal weight calculation	28
5.7	Measurement of cardiology.....	28
5.7.1	Measurement of cardiology in B mode	28
5.7.2	Cardiac measurements in M Mode.....	30
Chapter 6	Annotation	32
6.1	Keys used in edit	32
6.2	Information of patient.....	32
6.2.1	New patient	32
6.2.2	Modify patient's information	32
6.3	Annotation in image	33
6.4	Annotation in body mark.....	33
6.5	Chinese character input	33
Chapter 7	Storing and reading image	34
7.1	Cine-loop.....	34
7.1.1	Manual playback	34
7.1.2	Automatic playback.....	34
7.2	Flash permanent memory	35
7.2.1	Storing image	35
7.2.2	Reading image.....	35
7.3	Upload image to computer	35
Chapter 8	Setup function	36
8.1	System constitution	36
8.2	IP setting.....	39
Chapter 9	Biopsy	41

Chapter10 Report	42
Chapter 11 Print via video printer	44
Chapter 12 Troubleshooting & Maintenance	44
12.1 System maintenance	44
12.1.1 Clear the system	44
12.1.2 Move the system	44
12.1.3 The safety checks	44
12.2 Troubleshooting.....	45
12.3 Enviromental protection.....	45
12.4 Declaration.....	45
Chapter 13 Warranty	46

Chapter 1 General Description

1.1 Introduction

The series B ultrasound diagnostic system adopts a truly original approach. The images displayed by the system are crystal clear, stable and with high resolution due to adopting the latest techniques, such as continuous dynamic variable aperture, automatic multi-stage focusing, TGC, dynamic filtering, image edge enhancement, frame correlation, 256 gray scales image display, wide dynamic range and dynamic broadband with low noise preamplifiers, logarithmic compression etc.

The system has multi-probe connector, which can use convex, linear, micro-convex probe etc.

This is versatile ultrasound diagnostic system with excellent performance and compact structure. Even with strong functions, it has user-friendly interface and is easy to operate.

This is a general specification. The function of every type is not the same. Please note while you read.

1.2 Features

1. Five modes of image display: B, B/B, B/M, M, and 4B. In the M- or B/M- mode, four kinds of sweep speed of image display, 2s 4s 6s and 8s, are provided.
2. Multi-step display magnifications, depth change, zoom and scroll control.
3. The images displayed by the system are crystal clear, stable and with high resolution due to adopting the latest techniques, such as continuously variable aperture, automatic multi-stage focusing, TGC, dynamic filtering, image edge enhancement, frame correlation, 256 gray scales image display, wide dynamic range and wide-band low noise preamplifiers, logarithmic compression etc.
4. It supports the measurements of distance, circumference, area, volume and fetal weight, as well as the automatic calculation and direct presentation function, including the fetal age and due date, heart rate etc. It supports the measurements of distance, circumference, area, volume, heart rate, heart velocity, fetal age, expected date of childbirth and fetal weight due to different formula selected in the SETUP item, etc. And the calculated result would be presented automatically in the result area.
5. 192 frames of cine-memory and 1024 frames of permanent flash memory.
6. Realized read-write function through USB connection and SD connection.
7. This system supports the read-write in Bmp form or Dicom form.
8. Through the special-purpose image gathering software, this system implements the real-time image upload to the computer.
9. Image reversing: up/down, left/right and black/white.
10. Adjustments of total gain, brightness and contrast; wide range multi-frequency are available.
11. Acoustic output can be controlled.
12. It supports the variety's probe and four kinds of scan center frequency as well.
13. Puncture guidance.
14. It supports the colored surface, the ultrasonic area pseudo-color.
PreSet: hospital name, date, time, image format etc.
15. Chinese character input.
16. USB mouse action.

17. Printing function.
18. Power save mode.

1.3 Structure

The series B ultrasonic diagnostic system falls into two kinds: portable and cart type.

F- (15, 16, 17): cart type, Main unit (including software, monitor), probe, display.

F- (10, 11, 12, 13, 14, 18, 19): portable, Main unit (including software, monitor), probe.

1.4 Suitable using range

The system can be used for examination and diagnosis of abdominal (Transvaginal) organs, and other small parts with different probe.

1.5 Technical specifications

- **Scan mode:** Electronic linear scan, Electronic convex scan
- **Power supply:** AC 100~240V, 50/60Hz
- **Power consumption:** ≤200VA
- **Scanning depth:** ≥170mm(depend on probes)
- **Gray scale:** 256
- **Geometric position precision:** ≤5%(depend on probes)
- **Average no failure operation period:** ≥3000 hours

FREQUENCY	3.5 MHz±15%	3.5 MHz±15%	6.0 MHz±15%	7.5 MHz±15%
TYPE	R= 60mm convex	R= 20mm convex	R=13mm convex	L=40mm linear
SCAN DEPTH , mm	≥ 160	≥ 140	≥ 40	≥ 50
SIDE , mm	≤3 (Depth≤80) ≤4 (80< Depth ≤130)	≤3 (Depth≤80) ≤4 (80< Depth ≤130)	≤2 (Depth ≤30)	≤2 (Depth ≤40)
STALK , mm	≤2 (Depth ≤80) ≤3 (80< Depth ≤130)	≤2 (Depth ≤80)	≤1 (Depth ≤40)	≤1 (Depth ≤50)
BLIND AREA ,mm	≤5	≤7	≤4	≤3
ERROR ARGINS .%	≤15 (Transverse) ≤10 (Longitudinally)	≤20 (Transverse) ≤10 (Longitudinally)	≤10 (Transverse) ≤5 (Longitudinally)	≤10 (Transverse) ≤5 (Longitudinally)

1.6 Operating conditions

- Ambient temperature: $5^{\circ}\text{C} \sim 40^{\circ}\text{C}$
- Relative humidity: $30\% \sim 80\%$
- Atmospheric pressure: $86\text{kPa} \sim 106\text{kPa}$



Note: The system should be placed in a well-ventilated dry environment and kept away from strong electromagnetic interference, as well as poisonous and corrosive gas. Direct exposure to sunlight and rain should be avoided.



Caution: Because of instability of the local electricity voltage in some areas, a power supply stabilizer is recommended to be used to protect the system and to ensure the steady image display.



Warning: Choose the power cord acknowledged by the manufacture. The system should be plugged into a fixed power socket with protective grounding. The converters, such as three-phase switch to two-phase or two-phase switch to three-phase, are not allowed.

Chapter 2 Safety

2.1 Symbol and meaning



Note



Caution



Warning



Dangerous high voltage



BF application part



Power on/off



Protective earth (ground)



Earth (ground)



Potential equalization conductor terminal

2.2 Safety classification

- **According to the type of protection against electric shock :** Class I system
- **According to the degree of protection against electric shock:** Type BF applied part
- **According to the degree of protection against harmful ingress of water:** IPX 0 (enclosed system without protection against ingress of water)
- **According to the degree of safety of application in the presence of flammable anaesthetic mixture with air or with nitrogen or nitrous oxide:**
System is not suitable for use in the environment of flammable anesthetic mixture with air or with nitrogen or nitrous oxide
- **According to the mode of operation:** Continuous operation device

2.3 Safety note

1. The age in 10 weeks of embryo gestation, if these is no the special medical science advertise for, don't recommend a super voice check; but after 10 weeks it can be used for a routine examination.
2. Please do not put the probe at the same part of the patient for long time, especially ocular region and the fetus which is growing bones and tissue cells, so that to avoid unnecessary radiation to human body.
3. The system should be operated by qualified operator or under the qualified operator's instructions.
Patient is not allowed to touch the system.
4. Choose the power cord acknowledged by the manufacturer. The system should be plugged into a fixed

power socket with protective grounding. The converters, such as three-phase switch to two-phase or two-phase switch to three-phase, are not allowed.

5. Do not use the devices not provided or unacknowledged by the manufacturer on this ultrasound system, including probes and other accessories such as power adapters.
6. Never open the plastic case or panel when the system is power on. If you need to open it, please let the qualified operator do it after the system is power off.
Do not open the enclosure or panel without permission. If do need to open, please contact our authorized staff to operate.
7. The system acoustic output parameter announces to meet the provision GB16846-1997. The acoustic output report is chapter 12.

2.4 Requirement for environment

- **The ultrasound system should be operated, preserved and transported under the following conditions:**

Parameters Conditions	Operation	Preservation	Transportation
Temperature	5°C~ 40°C	-5°C~40°C	-30°C~55°C
Humidity	30%~80%, no condensation	< 80%, no condensation	≤95%, no condensation
Atmospheric pressure	86kPa~ 106kPa	86kPa~ 106kPa	50kPa~ 106kPa



Caution: When moved into a room from outside, the ultrasound system might be still too cold or too warm comparing to the indoor temperature. Because of the temperature difference, water may condense inside the machine. So before turning on the power, the system should be put inside the room for a while to adapt to the environment. If the outside temperature is below 10°C or above 40°C, the system need to be put for half an hour for adapting. And the adapting time need to be prolonged for one hour for each additional temperature difference of 2.5°C.

Never let the system operate under the following environments:

- Environment which is flammable, explosive or with poisonous gas
- Environment might be spilled by water or with mist
- Environment with direct sunshine
- Environment with strong impact or shaking
- Environment with large fluctuation of AC power
- Environment with strong electromagnetic field nearby, such as transformer.
- Environment with high-frequency radioactive device nearby, such as mobile phone



Note: The ultrasound system should be used far away from the electricity generator, X-ray machine, ultrasonic atomization machine, ultracausal—harmonic scalpel, physiotherapy instrument, broadcasting station, TV station, computer and transmission cable to avoid interference to the image. The system should be operated in the room with air-condition.

2.5 Attentions for operation

2.5.1 Main unit

1. When the system operates, please make sure the fans on the rear panel keep working (with slight sound). If the fans stop working, the system should be stopped operating. Never cover the window of the fans so that the heat can be radiated.
2. Please wait at least 1 minute to restart the system after it is turned off.
3. If there is anything abnormal event occurred during scanning, please stop scanning at once and turn off the system.
4. Please do not over press the keyboard panel, in case the lifespan of the system will be shortened.
5. At the end of work of system, please turn it off and put the system on a specialized package.
6. Please turn on and check the system regularly if it is not used for long time.

2.5.2 Probe

1. The probe must be connected or disconnected only when the system is powered off.
2. Do not knock the probe or let the probe fall down to the ground, as it may damage the delicate probe completely.
3. Do not heat the probe. If the surface temperature of the probe is below 10°C, please let it get warmed gradually.
4. Do not curve or pluck the power cord of the probe.
5. Do not touch the probe and its power cord with lubricant, lotion or any other oil liquid.
6. Only the ultrasonic gel without any oil and acknowledged by the manufacturer can be used on the surface of the probe tip. In order to keep the surfaces of the probe tip being dry, please clean the gel with soft paper or cotton after using the probe. Please note that the rough paper or rough cloth is not allowed to clean the probe as it may shorten the lifespan of the probe. Please use alcoholic cotton to clean the surface of the probe for disinfections everyday.
7. Please put the probe in the probe case when it is not used.
8. Do not activate the 6.0MHz/R13 probe in vitro, otherwise it would possibly interfere the using of other systems in the environment.

2.5.3 Battery

1. Do not place the battery in a fire or heat it.
2. Do not place the battery into water or get it wet.
3. Do not charge the battery in a extreme heat circumstance.
4. Do not decompose the battery in any way.
5. Avoid any severe mechanical vibration to the battery.
6. Avoid the storages of battery with any other metal objects, which may cause a short circuit.
7. Once any abnormal features of the battery appear, stop using it.
8. You should charge the battery once for each 3-4 month if you do not use it for a long time.

2.5.4 Power adapter

1. Please use the accompanying AC adapter.
2. Make sure the adapter is placed safely, avoid falling, and the cable should not be tripped or stepped on.
3. Place the adapter in a well-ventilated place, and do not cover on the adapter with other objects while using it.

Chapter 3 Installation

3.1 Outlook

The series B ultrasonic diagnostic system falls into two kinds: portable and cart type.

3.2 Battery

The system can be specified for operation to a supply mains and alternatively using an internal electrical power source.

When the battery capacity is short in 10%, the bottom right of screen will show warning information to notice user that battery capacity will be insufficient and needs to be charged.

3.3 Control panel

Key mapping Information

KEY	FUNCTION
New	The system will clear all examination information of previous patient and start examining a new patient.
ID	Input and edit current patient information
Report	Display the report
Print	1. Printer printing. 2. When not connecting to printer, save to USB equipment. 3. When not connecting to printer or USB equipment, start video printing function
Mem	Image storage and browsing
Cine	Enter or withdrawal the cine-memory state.
Note	Input annotation in image area.
☀▼ / ☀▲	Brightness control
B	B mode
2B	2B mode. Press the key in 2B mode the original active image is frozen and another image is activated.
M	M mode
BM	BM mode
4B	4B mode. Press the key in 4B mode the original active image is frozen and the other three images are activated.

Biopsy / Punc	At real-time mode, press Biopsy/Punc the puncture line will be displayed
AO	Acoustic output
Freq	Select the current probe frequency
IP	Select the image processing way
Zoom	Local enlargement
Gain▼ / Gain▲	Regulate the gain value in the real-time state Manual playback in the frozen state,
TGC N▼ / TGC N▲	Adjust the near-field gain
TGC M▼ / TGC M▲	Adjust the mid-field gain
TGC F▼ / TGC F▲	Adjust the far-field gain
Focus▼ / Focus▲	Adjustment focal point position
Depth▼ / Depth▲	Adjustment enlarge magnification
Scroll▼ / Scroll▲	Regulate the image top and bottom ambulation
Adj▼ / Adj▲	Adjust key
Measure	Display the measure menu
Obs	Display the OB examination measurement menu
Cord	Display cardiology examination measurement menu
Menu	Display the main menu
Body	Display the selected body marks
Freeze / Space	Freeze or defreeze the image in non-input state & Space in input state
Touchpad	Position
Set	Used for fixing the start point and end point during measurement. Confirm the selected item.
End	Used for canceling the selected option or exiting the measurement step
← / ↑ / → / ↓	Direction keys
Tab	Shift cursor in the patient information input blank while New or ID key is pressed.(just like Enter key). Shift option in the buttons on menus.
Caps Lock	Used to cut over big or small letters
Shift	Used to cut over sings or letters
Ctrl	Combination key
Clear	Used to clear the screen or the content/relative storage

Bksp	Moves the "blinking cursor" to the left, wiping out letters Delete the left character of the cursor in input mode.
Enter	The vertical line jumps down to the beginning of the next line. Move the cursor to the next line Confirm the selected item (just like the Set key)
Realized the mouse action through the USB connection/ System supports an external USB mouse. The function of mouse-key show below	
Mouse left key	Function like the Set key
Mouse right key	Function like the End key
Mouse wheel key	Function like the touchpad Adjust the values

3.4 Installing the main units

3.4.1 Connecting the probe



Caution: Probe should be connected or disconnected only in the power-off state.



Warning: Before connecting the probe, please carefully check the probe, cable and connectors and check whether there is anything abnormal, such as cracks, shelling off. Once using any abnormal probe, there is possibility of electricity shock.

3.4.2 Connecting the electric power

Specified for operation to a supply mains and alternatively using an internal electrical power source.

- **Internal electrical power source (F- (13、14、18、19)):**



Note: When battery power supply, the screen demonstrates , the right side demonstrators dump energy, when the dump energy is short in 10%, the screen demonstrates **LOW BATT 9%**.

- **Main electrical power source:**

1. After making sure that the AC power in hospital is in normal state, connect one terminal of the power cord to the AC 100~240V 50/60Hz socket at the rear panel of the system, and connect the other terminal to the AC power socket in hospital.
2. Turn on the power switch on the left of the main unit panel, and the system will start working.



Caution: The AC power plug of the system is three-pin grounded plug, which cannot be replaced or transformed by two-pin plug which is not grounded. The ultrasound system must be connected to the isolated electric power or devices. Otherwise it may cause the leaked current exceeding the safe lever.



Warning: The system must use the power cord provided by the manufacturer, and the power cord cannot be replaced freely. Meanwhile reliable grounded protection must be assured.

Chapter 4 Operation

4.1 Attentions for operation

Please make sure that the AC power supply of the system is three-pin grounded plug

Please make sure that the AC power supply of the system is “220V, 50Hz”

Please make sure that there isn’t any abnormal situation with the electricity cable or the probe.

4.2 Start the system

- Ensure power supply.
- Please turn on the power switch of the system and check the system start normally or not.



Power on/off

- Make sure the image and keyboard is in normal state.



Note: Please wait for at least 1minute before restart the system after switching off.



Warning: If the system malfunctions, please read chapter11 Troubleshooting & Maintenance or promptly contact the manufacturer. Do not disassemble the machine, Please send repair work to qualified service personnel.

4.3 Selection of probe types and work frequency

- Once the system is switched on; it will automatically search for the probe and recognize the current probe type.
- In case no probe is detected, all the parameters will be Set as default parameters (corresponding to the parameters of the 3.5MHz convex array probe)

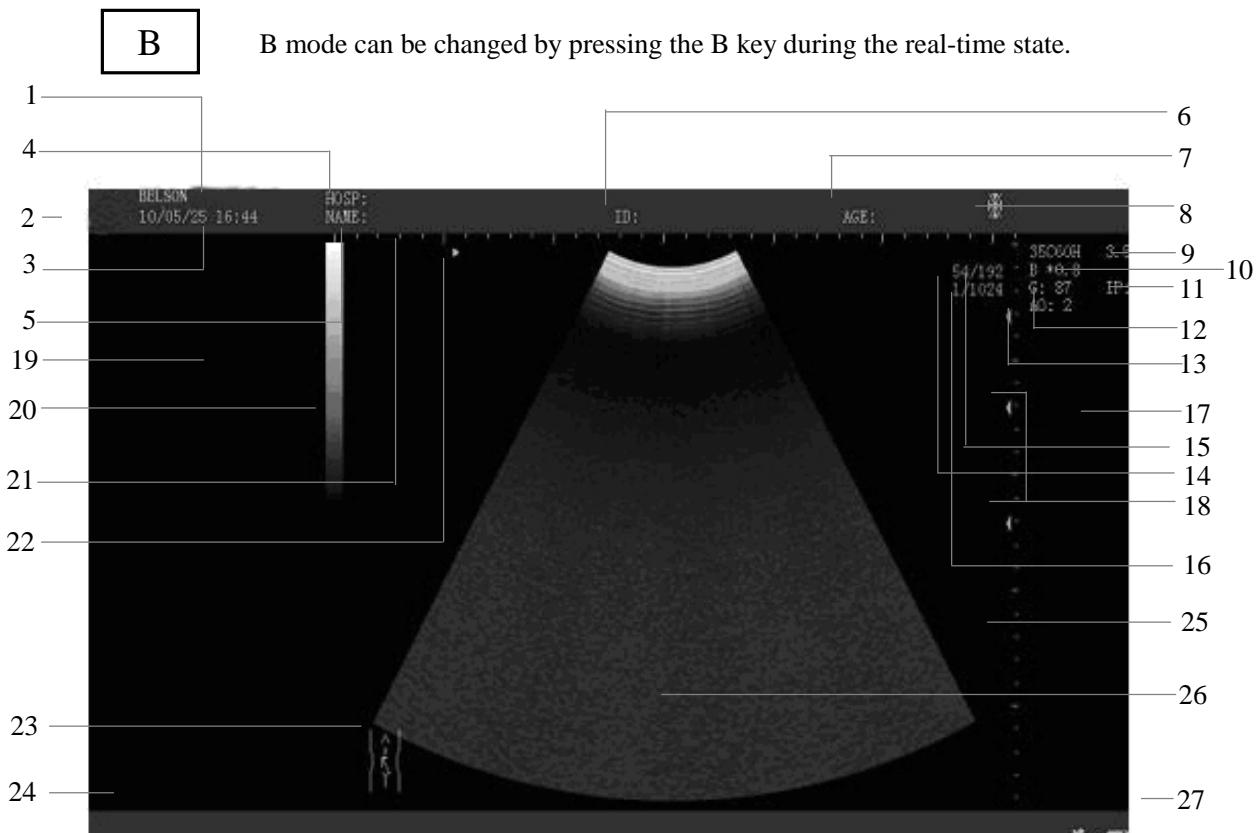
Selection of probe types:

In real-time state, the work frequency of probe can be chosen by pressing the **[Freq]** key .Low frequency is suitable for fatter patient, high frequency is suitable for thinner patient

4.4 Mode selection

The system has five scanning modes—B, B/B, B/M, M and 4B. Scanning modes can be changed only during the real-time state. A description of all the scanning modes for this convex array probe is given below.

4.4.1 B Mode



- B mode menu:

Menu in real-time state: 1. FR, 2. GM, 3. DR, 4. EE, 5. CL, 6. ANGLE, 7. U/D , 8. L/R, 9.SAVE.

Real-time menu on B mode is same to the other mode. U/D is invalid in BM and M mode.

Menu in the frozen state: 1. SETUP, 2. IP SETUP, 3. U/D, 4. POS/NEG.

Freeze menu on B mode is same to the other mode; U/D is invalid in BM and M mode.

- Press 【Freeze】 key to freeze the image; press 【Freeze】 key again, the current image will be activated and come back to the real-time state.
- In the real-time state, press 【B】 or 【M】 key, press the other mode key but 【B】 key can shift to the corresponding mode.

4.4.2 2B Mode

2B

2B mode can be changed by pressing the 2B key in the real-time state.



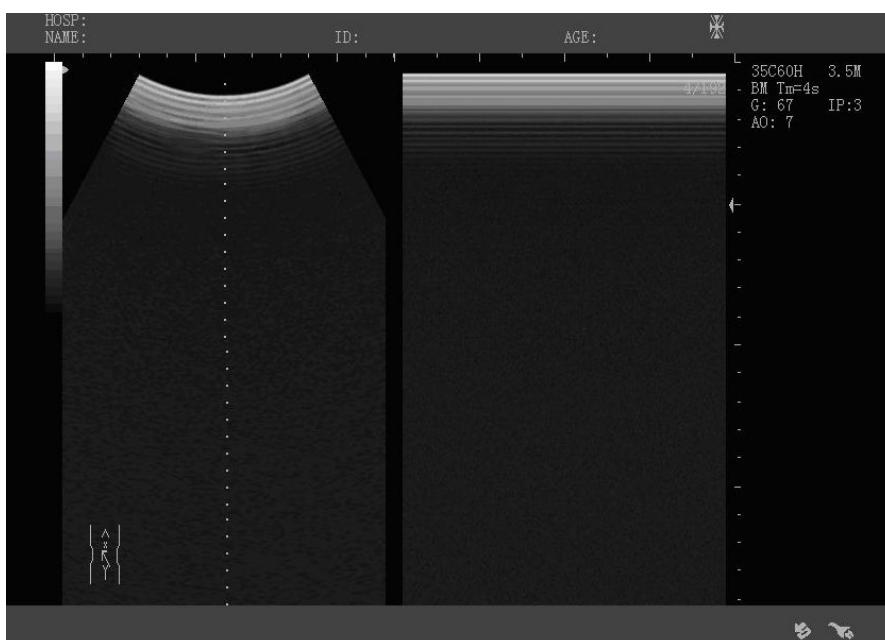
2B Mode

- Press 【2B】key to display double B mode images side by side. One image is in real-time state; the other is in frozen state. The real-time image is marked by“▼”.
- Press 【2B】 key in 2B mode, the current active image is frozen and the other is activated.
- Press 【Freeze】 key to freeze the image; press 【Freeze】 key again, the current image will be activated and come back to the real-time state.
- In the real-time state, press 【B】 or 【M】 key, press the other mode key but 【2B】 key can shift to the corresponding mode.

4.4.3 BM Mode

BM

BM mode can be changed by pressing the BM key in the real-time state.



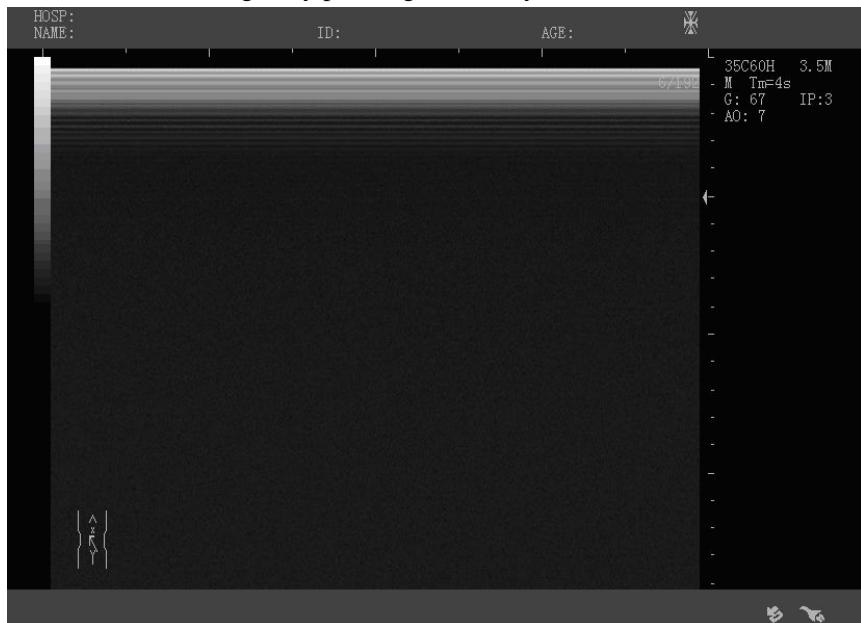
BM Mode

- Press 【BM】 key to display both B-mode image and M-mode image simultaneously. And a dotted line-sampling line will appear in the B-mode image area; move the sampling line by trackball to a certain area of heart in the B mode image area, a corresponding M-mode image is presented in the M-mode image area.
- Press 【Freeze】 key to freeze both B mode image and M mode image; press 【Freeze】 key again, the frozen images will be activated.
- The system has four scanning speeds-2s、4s、6s、8s. Press【Menu】key in BM mode and then use the adj key to adjust the desired scanning speed.
- In the real-time state, press the other mode key but【BM】key can shift to the corresponding mode

4.4.4 M Mode

M

M mode can be changed by pressing the M key in the real-time state



M Mode

- Press 【M】 key on BM mode to display single M mode image. M mode image reflects movement of tissues at the points on the sampling line. The M mode image display varies with time, so it is especially suitable for heart examination.
- Press 【Menu】 key in M mode and then use the 【Adj】 key to adjust the desired scanning speed.
- In the real-time state, press the other mode key but 【M】 key can shift to the corresponding mode.

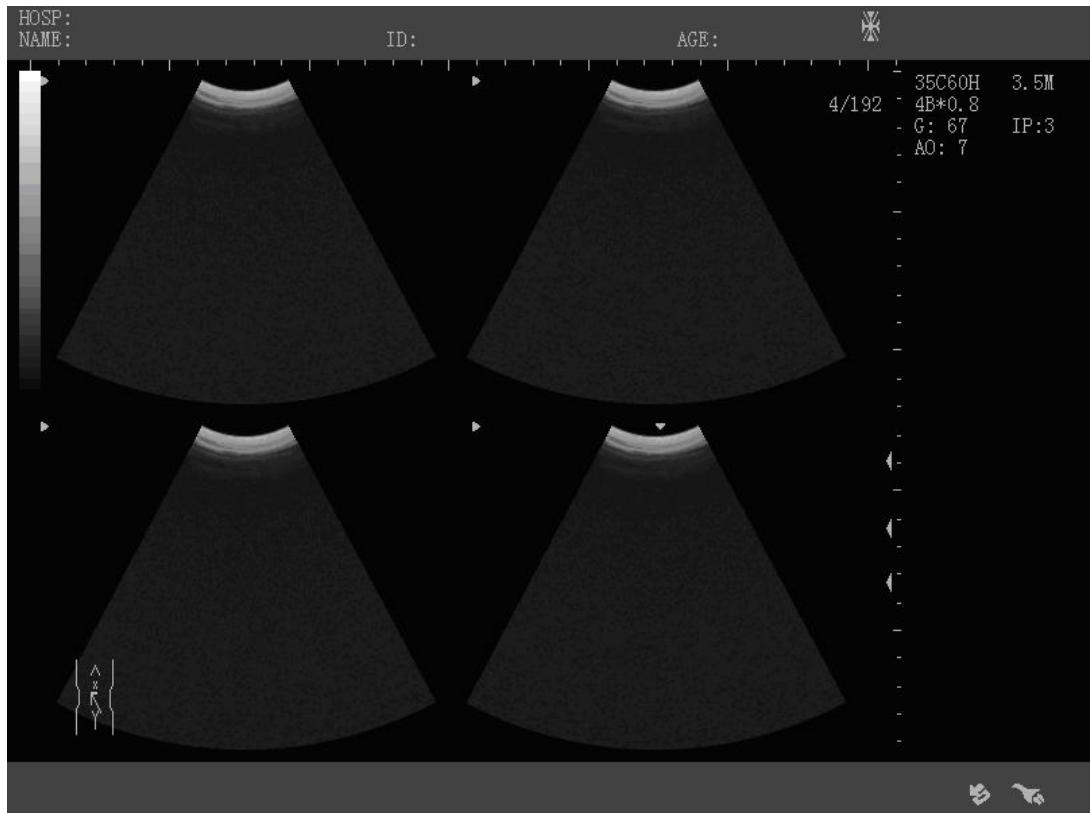
4.4.5 4B Mode

4B

4B mode can be changed by pressing the 4B key in the real-time state

- Press 【4B】 key to display 4B mode images side by side. One image is in real-time state; the other three are in frozen state. The real-time image is marked by“▼”.
- Press 【4B】 key mode key in 4B mode, the current active image is frozen and the next image is activated.

- Press 【Freeze】key to freeze the image; and then press 【Freeze】key again, the current image will be activated and come back to the real-time state.;
- In the real-time state, press the other mode key but 【BM】key can shift to the corresponding mode.



4B Mode

4.5 Control and adjust image

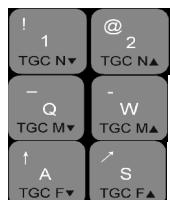
4.5.1 Adjust the total gain

- Gain value



In the real-time state, press the Gain▼ / Gain▲ to adjust the gain from 39 to 99dB. Gain value is displayed in the parameter result area at the upper part of the screen.

- TGC



TGC(TIME GAIN COMPENSATE)key in the keyboard can be used for adjusting different depth gain compensation. Each segment of depth gain compensation can be adjusted separately.

N: near-field M: mid-field F: far-field



Caution: In frozen state, pressing TGC key is invalid.

4.5.2 Brightness of image

- **Brightness control**



Press the brightness key to adjust the brightness of the screen.



Note: Normally, it's suggested to Set the contrast and brightness to the extent that the gray scale area at the lower left portion of screen is well displayed. In that setting, a clear image with good gradation will be displayed.

4.5.3 Acoustic output

The Acoustic output can be adjusted.

Ultrasound may produce harmful effects to human tissue. So it is necessary to shorten the time of patient exposure to the ultrasound, as well as minimize the acoustic output as possible. It should increase the acoustic output only when a appropriate quality diagnostic images is required.

Press **【AO】** key in real-time state can adjust the acoustic output. The acoustic output has 8 levels.

4.5.4 Frame Relation

- FR is the way to adjust the smoothness of the image, reduce image noise.
- FR range: 0, 1, 2, 3.
- Press **【Menu】** key in real-time state, select FR menu then press **【Adj】** key to select the right value, finally select the save item and exit to the main menu.



Note: FR values 3.

4.5.5 GM

- Transformation by grayscale images more clearly observed
- The system has four gray curves can be selected.
- Press **【Menu】** key in real-time state, select the GM menu, then press the Set, Enter or **【Adj】** key to Set the GM value, finally select the save item and exit the main menu.
- GM values of different:
 - GM:0, Linear curve, the curve does not enhance the image structure
 - GM:1, High gray-scale image brightness is weaken. Soften the image is enhanced and the surrounding tissue (for diagnosis of soft tissue).
 - GM: 2, High-brightness gray-scale image was enhanced further weakening of magnitude than the curve 1 (for the diagnosis of soft tissue).
 - GM:3, Medium brightness of the grayscale is weaken, showing a higher contrast. And image would become clearer (for the diagnosis of hypo echoic structure).



Note: GM values 2.

4.5.6 DR

- Dynamic range can be adjusted for B Mode contrast resolution, compression or expansion the display rang of the gray scale.
- Dynamic range of 30 ~ 75, the minimum adjustment unit 5
- Press **【Menu】** key in real-time state, select the DR item, then press the **【Set】**, **【Enter】** or **【Adj】** key to Set the DR value, finally choose the save menu and exit to the main menu.



Note: DR values 55.

4.5.7 EE

- Edge enhancement can highlight the image contour; you can more clearly identify the boundary of organizational structure in the image could be identified more clearly.

- The higher value of EE is more obvious for edge enhancement.
- Press 【Menu】 key in real-time state, select EE item, then press the 【Set】 , 【Enter】 or 【Adj】 key to Set the value of EE, finally choose the save menu and exit to the main menu.



Note: EE values 1.

4.6 Control image

4.6.1 Focus position

- In the real-time state, press 【Focus▼】 / 【Focus▲】 key to select the focus number and focus position.

4.6.2 Depth adjust

- The image has 8 classes to enlarge. Magnification of probe: 0.8、0.9、1.0、1.1、1.2、1.3、1.4、1.5.
- It is valid only in real-time B mode image. And the current magnification factor will be displayed on the screen.

In the real-time state, press 【Depth▼】 / 【Depth▲】 key to select the Depth.

4.6.3 Scroll function

- Scroll function of image is realized by 【Scroll▼】 and 【Scroll▲】 key.
Press 【Scroll▼】 and 【Scroll▲】 key to active scroll function and then image can be vertically moved. It is invalid while the image is at the least depth value.

4.6.4 Center line

- Center line of 48~ 208, the minimum adjustment unit 5.
- Doctors can adjust the center line according to their needs.
- Press 【Menu】 key in real-time state, and select CL menu, then press the 【Set】 , 【Enter】 or 【Adj】 key to Set the value of CL, finally select the save item and exit the main menu.

4.6.5 scanning Angle

- Scanning angle can be adjust in the real-time state with four levels.
- Doctors can adjust the scanning angle according to their needs.
- Press 【Menu】 in real-time state, select Angle item, then press the 【Set】 , 【Enter】 or 【Adj】 key to Set the value of angle, finally choose the save menu and exit the main menu.

4.6.6 Image reversing

Steps:

1. In the real-time state, Press 【Menu】 key to display the main menu,
2. Choose the Option-L/R or U/D,
3. Press the 【Set】 key to Set it,
4. Press 【End】 key to exit.

4.6.7 Color and pseudo-color

Press 【Menu】 key in frozen state, select the COLOR item in SETUP menu, then select the options you want, finally Press the CONFIRM button..

4.7 Sleep mode

In many cases the system can enter the sleep mode in order to achieve the purpose of saving power:

1. No action for ten minutes in frozen state, the system automatically enters sleep mode, press any key to wake up the system;
2. Close the screen, the system enters sleep mode, open the screen to wake up the system;
3. In the system Settings, the power button function is Set to sleep mode, press the power button then the system enters sleep mode, press the power button again to wake up.

4.8 Disable touchpad

To prevent misuse of touchpad, the system support disable the function of touchpad. Press 【Ctrl】 key and then press the 【M】 key, you can disable or enable the touchpad. Once disable the touchpad the indicator light will be turn on, otherwise it will be turn off.

Chapter 5 Measurement and Calculation

5.1 Introduction

Main content of this chapter:

- Keys used in measurement
- How to enter into different measurement menus
- Distance measurement
- Area and circumference measurement
- Volume measurement
- Measure speed and time
- Abdomen, Cardiology, OB/GYN measurement

It can display up to four distance results or two area results or one volume result at the result area.

5.2 Enter into measurement

Normal measurement: Press 【Measure】 key and enter into measurement

OB measurement: At the B, 2B, BM and 4B mode press 【Obs】 key and enter into measurement

Heart rate measurement: At the M, BM mode press 【Measure】 key and enter into measurement

Cardiology measurement: Press 【Measure】 key and enter into measurement



Note: In the frozen state press 【Set】 or 【Enter】 key and enter into measurement

5.3 Keys used in measurement

Touchpad:

Select the item and move the cursor

Set (Enter or Mouse left key):

Select the measurement item, begin to measure. Determine the starting point and ending point of measurements.

End (Mouse right key): Exit the measurement.

Clear: Delete record.

5.4 Normal measurement- B Mode

5.4.1 Distance

Function: To measure the distance between two points. It also can be used in M mode.

Steps:

1. Press 【Measure】 key: 1.distance 2.trace 3.ellipse 4.volume;
2. Press 【Set】 or 【Enter】 key to select the distance menu, then the screen appears the cursor

- “+”;
3. Move the cursor to the beginning point with touchpad or direction key;
 4. Press 【Set】 or 【Enter】 key to fix it, and then appears the second cursor “+”;
 5. Move the cursor to the ending point with touchpad or direction key;
 6. Press 【Set】 or 【Enter】 key to fix it, and the measurement results are displayed in the result area. If you want to measure server times, repeat the above steps. The system each can display up to four data values in the result area;
 7. Press 【End】 key to exit.

5.4.2 Circumference and Area (Trace method)

Function: To measure the circumference and area of a close area by trace method.

Steps:

1. Press 【Measure】 key: 1.distance 2.trace 3.ellipse 4.volume;
2. Press 【Set】 or 【Enter】 key to select the distance menu, then the screen appears the cursor “+”;
3. Move the cursor to the beginning point with touchpad or direction key;
4. Press 【Set】 or 【Enter】 key to fix it, and then appears the second cursor “+”;
5. Move the cursor to the ending point with touchpad or direction key, the action will leave a trace on the screen; Press 【Set】 or 【Enter】 key to fix it; The perimeter and area results will be displayed in the result area. If you want to measure server times, repeat the above steps. The system each can display up to two perimeter and area values in the result area;
6. Press 【End】 key to exit.

5.4.3 Circumference and Area (Ellipse method)

An ellipse can be used to measure the circumference and area of organ.

Steps:

1. Press the 【Measure】 key: 1.distance 2.trace 3.ellipse 4.volume;
2. Press 【Set】 or 【Enter】 key to select the distance menu, then the screen appears the cursor “+”;
3. Move the cursor to the beginning point with touchpad or direction key;
4. Press 【Set】 or 【Enter】 key to fix it, and then appears the second cursor “+”;
5. Move the cursor to the ending point with touchpad or direction key, the action will leave a trace on the screen (The other end of the long axis of the ellipse);
6. Press 【Adj】 key to Increase or decrease the short axis of the ellipse;
7. Press 【Set】 key to fix it. The perimeter and area results will be displayed in the result area. If you want to measure server times, repeat the above steps. The system each can display up to two perimeter and area values in the result area;
8. Press 【End】 key to exit.

5.4.4 Volume measurement (Three-axis method)

Three-axis method: Both the vertical profile and the horizontal profile of the target need to be measured

Steps:

1. Press 【Measure】 key: 1.distance 2.trace 3.ellipse 4.volume;
2. Press 【Set】 or 【Enter】 key to select the distance menu, then the screen appears the cursor “+”;
3. Move the cursor to the beginning point with touchpad or direction key;
4. Press 【Set】 or 【Enter】 key to fix it, and then appears the second cursor “+”;
5. Move the cursor to the ending point with touchpad or direction key;
6. Press【Set】or【Enter】key to fix it and the measure result will be displayed in the result area.



Note:

- Repeat the above steps to measure the second distance;
- Repeat the above steps to measure the third distance;
- After the three distance values measured, the volume value is displayed in the result area;
- If you want to measure server times, repeat the above steps. The system each can display up to only one volume value;
- Press 【End】 key to exit.

Supplement:

- Three-axis method needs to measure three distances (Length D1, Width D2, Depth D3) ,the system automatically calculates the volume based on the following formula:

$$\text{Volume} = 3.1415 * D_1 * D_2 * D_3 / 6$$

- Volume unit: cm^3



Caution: This computation use oval to simulate human organs, the results may have some deviation with the actual volume.

5.5 General measurement - M mode

5.5.1 Distance

Step the same as“5.4.1 Distance”

5.5.2 Velocity

Function: To measure the slope (speed) between two points.

Steps:

1. Press 【Measure】 key in M mode: 1. distance 2. velocity 3. heart-rate;
2. Press 【Set】 or 【Enter】 key to select the velocity menu, then the screen appears the cursor “+”;
3. Move the cursor to the beginning point with touchpad or direction key;
4. Press 【Set】 or 【Enter】 key to fix it, and then appears the second cursor “+”;
5. Move the cursor to the ending point with touchpad or direction key, Press 【Set】 or 【Enter】 key to fix it and the measure result will display in the result area;
6. If you want to measure server times, repeat the above steps. The system can display up to four data values;
7. Press 【End】 key to exit.

5.5.3 Heart-rate measurements

The heart-rate can be measured only in M mode. The number of heart rate in beats per minute, in order to ensure proper measurement, please select the starting point and ending point in the same state of the heart cycle point, such as with the trough or crest to obtain the most accurate measurement information.

Steps:

1. Press 【Measure】 key in M mode: 1. distance 2. Velocity 3. heart-rate;
2. Press 【Set】 or 【Enter】 key to choose the h-rate menu, then the screen appears the cursor “+”;
3. Please select the starting point and end point in the same state of the heart cycle, then measure the distance of the two points;
4. The heart-rate measurement result will display in the result area. If the starting point and ending point separated the two periods, the actual heart rate, heart rate is shown twice, and so on;
5. If you want to measure server times, repeat the above steps. The system can display up to four data values;
6. Press 【End】 key to exit.



Caution: M-mode measurement is also applicable to M image in BM model, but not for B image.

5.6 OB measurement

This section introduces two index to evaluate the situation of fetal growth:

- Gestational age
- Fetal weight calculation

The system can measure the BPD, GS, CRL, AD, AC, FL, HC, FTA, APTD, TTD, and automatically calculating the gestational age, fetal weight, due date and display the measurement results in the result area.

5.6.1 Gestational age measurement

- BPD- Bipartite Diameter

Steps:

1. Freeze the image. Press 【Obs】 key and then select BPD item and press 【SET】 key to start measurement;
2. To measure BPD, refer to the “5.4.1 Distance” measurement;
3. The result of BPD, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new BPD measurement.

- GS-Gestation Sac

Steps:

1. Freeze the image. Press 【Obs】 key and then select GS item and press 【SET】 key to start measurement;
2. To measure GS, refer to the “5.4.1 Distance” measurement;
3. The result of GS, GA and EDD will be displayed in the result area;

4. Repeat the above steps to start a new GS measurement.

- CRL- Crown Rump Length

Steps:

1. Freeze the image. Press **【Obs】** key and then select CRL item and press **【Set】** key to start measurement;
2. To measure CRL, refer to the “5.4.1 Distance” measurement;
3. The result of CRL, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new CRL measurement.

- AD-Abdominal Diameter

Steps:

1. Freeze the image. Press **【Obs】** key and then select AD item and press **【Set】** key to start measurement;
2. To measure AD, refer to the “5.4.1 Distance” measurement;
3. The result of AD, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new AD measurement.

- AC-Abdominal Circumference

Steps:

1. Freeze the image. Press **【Obs】** key and then select AC item and press **【Set】** key to start measurement;
2. To measure AC, refer to the “5.4.1 Distance” measurement;
3. The result of AC, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new AC measurement.

- FL-Femur Length

Steps:

1. Freeze the image. Press **【Obs】** key and then select FL item and press **【Set】** key to start measurement;
2. To measure FL, refer to the “5.4.1 Distance” measurement;
3. The result of FL, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new FL measurement.

- HC-Head Circumference

There are two methods available to measure HC: Ellipse method and Trace method.

Steps:

1. Freeze the image. Press **【Obs】** key and then select HC item and press **【Set】** key to start measurement;
2. To measure HC, refer to the “5.4.1 Distance” measurement;
3. The result of HC, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new HC measurement.

- FTA

Steps:

1. Freeze the image. Press **【Obs】** key and then select FTA item and press **【Set】** key to start measurement;
2. To measure FTA, refer to the “5.4.1 Distance” measurement;
3. The result of FTA, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new FTA measurement.

- APTD

Steps:

1. Freeze the image. Press 【Obs】 key and then select APTD item and press 【Set】 key to start measurement;
2. To measure APTD, refer to the “5.4.1 Distance” measurement;
3. The result of APTD, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new APTD measurement.

- TTD

Steps:

1. Freeze the image. Press 【Obs】 key and then select TTD item and press 【Set】 key to start measurement;
2. To measure TTD, refer to the “5.4.1 Distance” measurement;
3. The result of TTD, GA and EDD will be displayed in the result area;
4. Repeat the above steps to start a new TTD measurement.

5.6.2 Fetal weight calculation

There are four formulas available to calculate fetal weight as below:

1. Osaka University Method (BPD, FL, FTA) :

$$\text{EFBW} = 1.25647 * \text{BPD3} + 3.5065 * \text{FTA} * \text{FL} + 6.3$$

2. Tokyo University 1 (BPD, APTD, TTD) :

$$\text{EFBW} = 0.00173 * \text{BPD3} + 0.238 * \text{APTD} * \text{TTD} - 217$$

3. Tokyo University 2 (BPD, APTD, TTD, FL) :

$$\text{EFBW} = 0.00107 * \text{BPD3} + 0.00342 * \text{APTD} * \text{TTD} * \text{FL}$$

4. Merz Method (BPD, AC) :

$$\text{EFBW} = -3200.4 + 157.07 * \text{AC} + 15.9 * \text{BPD2}$$

The formulae of fetal weight can be selected in SETUP menu (See section 8.1.3).

Step: Measure all the parameters involved in the formula selected, and then the fetal weight result would display in the result area.



Note: OB measurement is just applicable in B or BM mode.



Note: Once the obstetric item is measured, the result will be saved to the memory. It will be showed in the report after pressing 【Report】 key. And all measurement results belonging to the current patient will be deleted after pressing 【New】 key.

5.7 Measurement of Cardiology

Measurement of the cardiology is usually in M mode or BM mode.

The inspection items of the cardiology include: distance, heart rate, left ventricular function, mitral valve, aortic.

5.7.1 Measurement of cardiology in B mode

This measurement is usually carried out in B mode or BM mode.

The items of the cardiology include: distance, heart rate, left ventricular function, mitral valve, aortic.

- **Simpson**

$$V = (A_m + 5 \cdot A_p / 18) \cdot L$$

A_m: The area of the left ventricular in Short axis view of mitral valve.

A_p: The Cross-sectional area of left ventricular in Papillary muscle short axis view.

L: Long axis of left ventricular.

- **Single-plane ellipse**

Measurement should be carried out in Left ventricular long axis view(Apical of four-chamber or two-chamber cross section). Left ventricular volume could be obtained by the following formula:

$$V = (\pi / 6) \cdot L \cdot D^2$$

L: Long axis of left ventricular.

D: Short axis of left ventricular.

- **Double-Plane Ellipse**

Measurement should be carried out in Mitral valve short axis view and apical of two-chamber cross section. Left ventricular volume obtained by the following formula:

$$V = (8/3) \cdot A_m \cdot A_i / (\pi \cdot D)$$

D: Short axis of left ventricular.

A_m: The area of the left ventricular in Short axis view of mitral valve.

A_i: The area of the left ventricular in Apical view.

- **Bullet Ellipse**

Measurement should be carried out in Short axis view of mitral valve and cross section of apical two-chamber. Left ventricular volume obtained by the following formula:

$$V = (5/6) \cdot A_m \cdot L$$

A_m: The area of the left ventricular in Short axis view of mitral valve.

L: Long axis of left ventricular.

Steps:

1. Press **Cord** key in B or BM mode in frozen state, and then press **Set** key to select the single-plane ellipse with **Set** or **Enter** key in the sub-menu;

2. The following parameters should be measured in the end of systolic period of the left ventricular:

Long axis of left ventricular SL: Approach with "5.4.1 Distance Measurement";

Short axis of left ventricular SD: Approach with "5.4.1 Distance Measurement";

The following parameters should be measured in the end of diastolic period of the left ventricular:

Long axis of left ventricular DL: Approach with "5.4.1 Distance Measurement";

Short axis of left ventricular DD: Approach with "5.4.1 Distance Measurement";

The results of EDV (the end diastolic volume) and ESV (the end systolic volume) will display in the result area.

3. After the measurement, the stroke volume (SV) and ejection fraction (EF) will display in the result area.

5.7.2 Cardiac measurements in M Mode

Left ventricular function, mitral valve, aortic measurement can be carried out in M mode.

● Left ventricular function

The volume of heart calculation can be calculated with two formulas: Teichholz and Feigenbaum

◆ Teichholz:

$$V=7.0*D^3 / (D+2.4)$$

◆ Feigenbaum:

$$V=D^3$$

V: volume of left ventricular

D: Bore of left ventricular

Steps:

1. Press 【Cord】key in M mode in frozen state, select the LV (left ventricular function) menu, then select the TEICHHOLZ or FEIGENBAUM item with 【Set】 or 【Enter】 key in the sub-menu;
2. Move the cursor to the end of systolic period of the left ventricular to measure the inside diameter of left ventricular-ESD. Approach with "5.5.1 Distance Measurement ".The ESD measurement and the volume of heart in end systolic (ESV) calculation will display in the display area;
3. Move the point to end diastolic of the left ventricular to measure the short axis of left ventricular-EDD. Approach with "5.5.1 Distance Measurement ".The EDD measurement and the volume of heart end diastolic (EDV) calculation will display in the result area;
4. After the measurement, the stroke volume(SV), ejection fraction(EF)and fractional shortening (FS) will display in the result area.

● Measurement of mitral

Measurement of mitral have four items: EF speed, AC rate of decrease, ratio of A/E peak and mitral flow.

◆ The measurement of EF speed, AC rate of decrease, and ratio of A/E peak and mitral flow is similar.

Steps:

1. Press 【Cord】 key in M mode in frozen state; select the MITRAL menu, then press the 【Set】 key to choose the option you want;
2. The measurement of EF speed is approach with "5.5.2 ";
3. The measurement of AC rate of decrease is approach with "5.5.2 ";
4. The measurement of ratio of A/E peak: Measuring the peak A and peak E respectively. The measurement is approach with "5.5.2 ". The results will display in the result area.

◆ Quantity of mitral valve -QMV:

Formula:

$$QMV=4*DEV*DCT$$

Steps:

1. Press【Cord】key in M mode in frozen state; select the MITRAL menu, then press the【Set】 key to choose the VALVE V menu;
2. The measurement of DEV is approach with "5.5.2 ";
3. The measurement of DCT is approach with "5.5.3 ";
4. The measurement of QMV will display in the result area.

● Measurement of aorta

Measurement of aorta have two options: LAD/AOD and AVSA.

◆ Measurement of LAD/AOD:

1. Press 【Cord】 key in M mode in frozen state; select the AORTA menu, then press the 【Set】 key to choose the LAD/AOD menu;
2. The measurements of LAD and AOD are approach with "5.5.1";
3. The measurement of LAD/AOD will display in the result area.

◆ Measurement of AVSA:

Formula:

$$\text{AVSV} = (\text{MAVO1} + \text{MAVO2}) * \text{LVET} * 50 + \text{AA}$$

MAVO1: Start opening from the aorta

MAVO2: Close opening from the end of aortic

AA: Range of motion of aortic wall

Steps:

1. Press【Cord】key in M mode in frozen state; select the AORTA menu, then press the【Set】 key to choose the AVSA menu;
2. The measurement of MOV01 is approach with "5.5.1";
3. The measurement of MOV02 is approach with "5.5.1";
4. The measurement of AVSA will be display in the result area.

Chapter 6 Annotation

6.1 Keys used in edit

1. 【Shift】 key is used to switch between upper and lower character on one key.
2. 【Bkap】 key is used to delete the left character of cursor or delete two left characters of cursor in Chinese input mode.
3. 【CTRL】 key: Together with C key, it can shift between Chinese and English input mode (See section 6.5)
4. 【Caps Lock】 key is used to shift between capital letters and lower case letters.
5. 【Clear】 key is used to clear the screen or the content.

6.2 Information of patient

New patient information can be inputted or modified only when image is in frozen state. In the area of the patient's name up to 15 characters and the exam NO. area up to 7 characters can be written in.

6.2.1 New patient

New patient information can be inputted only when image is in frozen state.

Steps:

1. Press 【New】 key in frozen state, then the cursor"_" appears in the input area of the patient's name. After completion of input, press 【Enter】 or 【Tab】 key to move the cursor to the input area of exam NO., press 【Enter】 or 【Tab】 key again, the cursor will be moved to the input area of patient's age.
2. The cursor can also be moved to the area you wanted with touchpad or direction key quickly.
3. Press 【End】 key to exit.



Caution: Press 【New】 key , the system will clear all examination information of previous patient and start examining a new patient.



Note: Support Chinese input.

6.2.2 Modify patient's information

Can modify patient's information but do not clear information of last time.

Steps:

1. At frozen status press 【ID】 key to enter the patient information input status. After entering the information, Press 【Enter】 or 【Tab】 key to shift to the next input item;
2. Press 【End】 or 【Enter】 key to exit from the state.



Note: Support Chinese input.

6.3 Annotation in image

Steps:

1. Press 【Note】 key in frozen state and the cursor “_” will appear in the screen.
2. Use the touchpad or direction key to move the cursor to the position and enter the characters.
3. Press 【End】 key to exit.



Note: Support Chinese input.

6.4 Annotation in body mark

Steps:

1. Press 【Body】 key and all the body marks would be displayed in image area.
2. Move the cursor to adjust the body mark;
3. Press 【Set】 or 【Enter】 key and the body marks on image area would be cleared and the selected body mark would be moved to the lower left of the screen;
4. Moving the cursor to the position of arrow;
5. Use 【Adj】 key to change its direction to right direction;
6. Press 【Set】 key to exit from the body mark annotation state.

See the following **body marks**:



35 kinds body marks

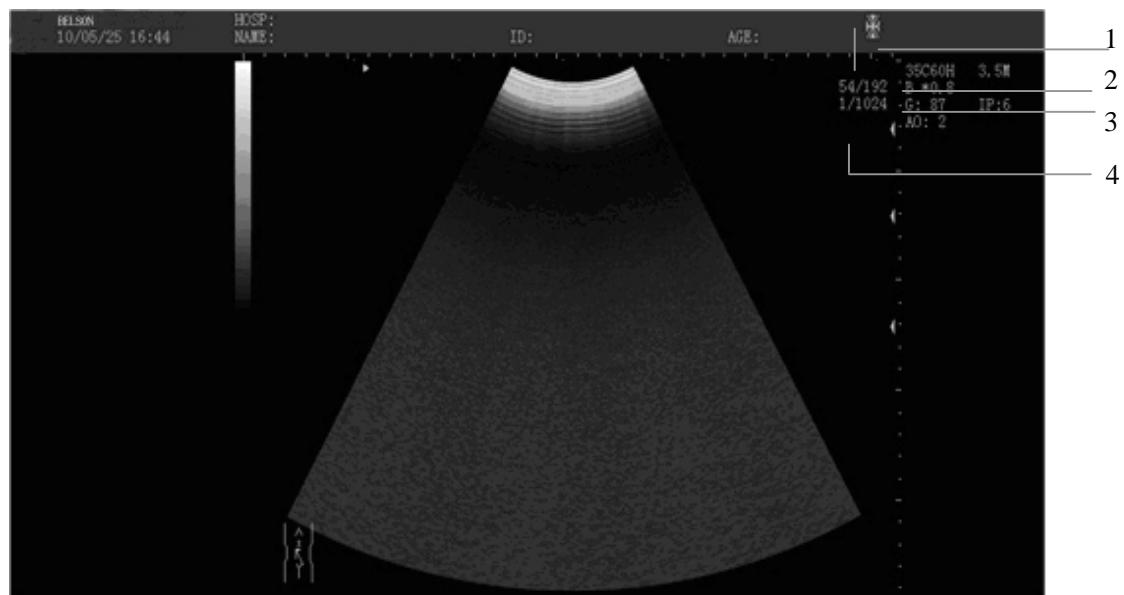
6.5 Chinese character input

Using the 【Ctrl】 and 【C】 key in the input state, it can shift between English and Chinese input mode.

Chapter 7 Storing and reading image

7.1 Cine-loop

- This system can provide 192 frames cine-loop.
- In the real time state, images in B-mode can be stored in the cine-memory at the unit of frame in time sequence.
- Cine-loop is very helpful for capturing valuable instantaneous image. 192 frames of previous images would be stored into memory while the image is frozen. Users can playback the 192 frame image automatically. And also users can playback the cineloop manually to search valuable image.
- At the cine-loop state the interface will be displayed as below.



1. Current frame
2. Total frame
3. Flash frames
4. Current flash memory frames

7.1.1 Manual playback

Steps:

1. Press 【Freeze】 key to freeze the image;
2. Press 【Gain▼】 / 【Gain▲】 key to playback the image save in cine-loop memory.

7.1.2 Automatic playback

Steps:

1. Press 【Freeze】 key to freeze the image;
2. Press 【Cine】 key to start Automatic playback;
3. Press 【Cine】 key again to stop Automatic playback.



Note: Cine-loop is valid just in B mode

7.2 Flash Permanent Memory

Users can store frozen image into U-disk or flash memory of this system.

Up to 1024 images can be allowed to save to the flash memory, and it would remain in the system even the system is powered off. This will allow the operator to save important and typical frames for future comparison and measurements.

7.2.1 Storing image

Steps:

1. Freeze the useful image;
2. Press 【Menu】 key and select the STORE item with 【Set】 key or direction key;
3. Select the save location you want with touchpad or direction key;
4. Press 【Set】 or 【Enter】 key to save.

7.2.2 Reading image

Steps:

1. Freeze the image;
2. Press 【Menu】 key and select the STORE item with 【Set】 or direction key;
3. Select the file you want to browse with touchpad or direction;
4. Press 【Set】 or 【Enter】 key to browse;
5. Use the touchpad or direction key to page;
6. If it don't have any images, the screen will appears "No Find Image ";
7. Press 【End】 key to exit.



Note: The page No. of the displayed image (1-8) and the date in the Flash memory will also be indicated at the upper left portion of the screen under displaying the image formerly stored. The information can't be re-edited.

7.3 Upload image to computer

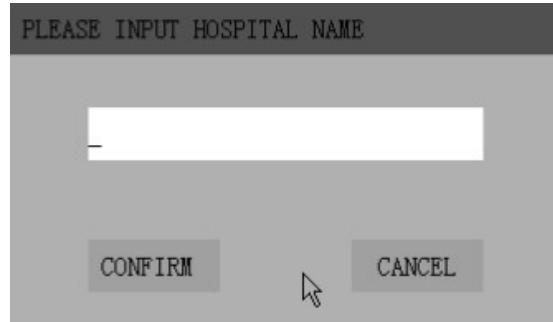
Through the High-speed miniUSB2.0 interface, you can upload the real-time images to computer. Install the USB device driver to computer. Run the image capture file, and fix the corresponding configuration. Then the image could be observed and stored into the computer.

Chapter 8 Setup function

8.1 System constitution

In frozen state, press 【Menu】 key to enter into “Setup ” menu. Open the sub-menu with 【Set】 or direction key. Press 【Set】 key to select the item you want to Setup. The system allows the follow parameters to be Settled: Hospital, Date, F.W. Formula, Language, Color, Image format, Switch setup, Gray scale and Screen saver.

8.1.1 Hospital name



Input hospital name

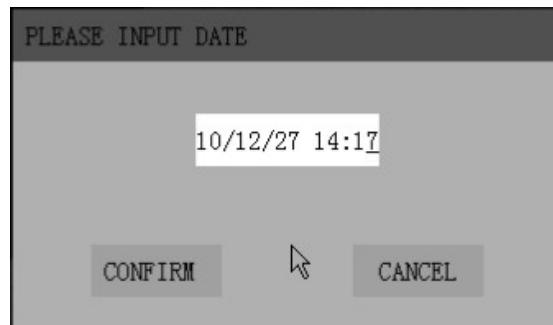
Steps:

1. Press 【Menu】 key to enter into “menu ” menu and then select the HOSPITAL item with 【Set】 key or direction key;
2. Input the hospital name and select the CONFIRM button to save the Settings;
3. Press 【End】 key to exit.



Note: Support Chinese input;

8.1.2 Date

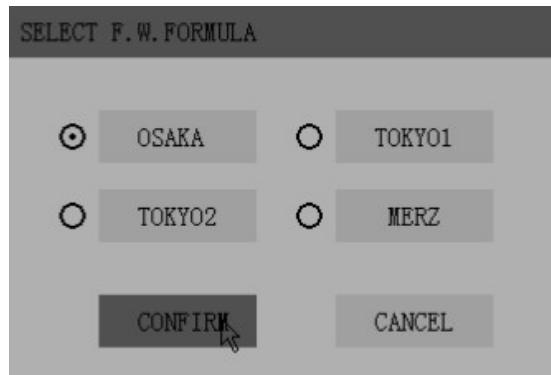


Input date

Steps:

1. Press 【Menu】 key to enter into “menu ” menu and then select the DATE item with 【Set】 key or direction key;
2. Input the Date time and select the CONFIRM button to save the Settings;
3. Press 【End】 key to exit.

8.1.3 Fetal weight formula



Fetal weight formula choosing interface

Steps:

1. Press 【Menu】key to enter into “menu ” menu and then select the F.W.FORMULA item with 【Set】key or direction key;
2. Select the formula you want and then select the CONFIRM button to save the Settings;
3. Press 【End】key to exit.

8.1.4 Language

This Setting can be switched in English and Chinese.



Language setup interface

Steps:

1. Press 【Menu】key to enter into “menu ” menu and then select the LANGUAGE item with 【Set】key or direction key;
2. Select the language you want and then select the CONFIRM button to save the Settings;
3. Press 【End】key to exit.

8.1.5 Color

This Setting can be switch in pseudo-color and black and white.



Color setup interface

Steps:

1. Press 【Menu】 key to enter into “menu ” menu and then select the COLOR item with 【Set】 key or direction key;
2. Select the color you want and then select the CONFIRM button to save the Settings;
3. Press 【End】 key to exit.

8.1.6 Image Format

This system supports BMP, DICOM image storage format.

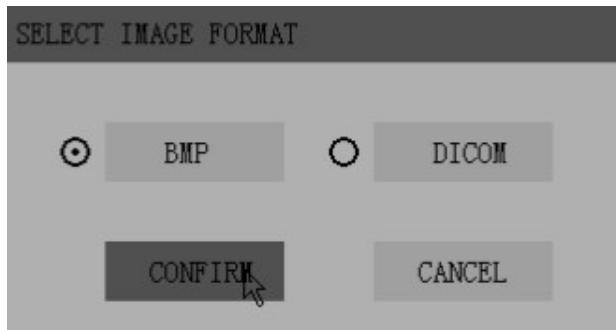


Image format Setup interface

Steps:

1. Press 【Menu】 key to enter into “menu ” menu and then select the IMAGE FORMAT item with 【Set】 key or direction key;
2. Select the format you want and then select the CONFIRM button to save the Settings;
3. Press 【End】 key to exit.

8.1.7 Power key functions

Through this Setting to Set the function of pressing the power key in short time.

Function 1, SLEEP: Press the power key the system will enter the sleep mode.

Function 2, SHUTDOWN: press the power key the system will be shutdown.

Function 3, NOACTION: the power key will not work.



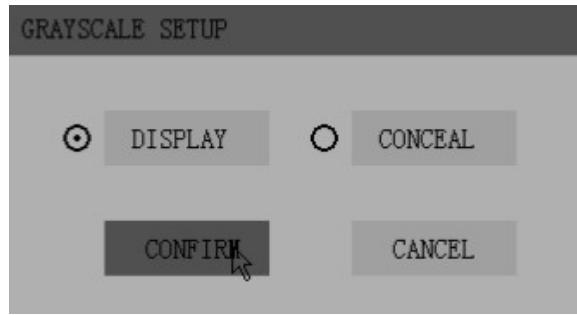
Function Setup interface

Steps:

1. Press 【Menu】key to enter into “menu ” menu and then select the SWITCH SETUP item with 【Set】 key or direction key;
2. Select the function you want and then select the CONFIRM button to save the Settings;
3. Press 【End】 key to exit.

8.1.8 Gray bar

The system supports gray bar to show or hide.



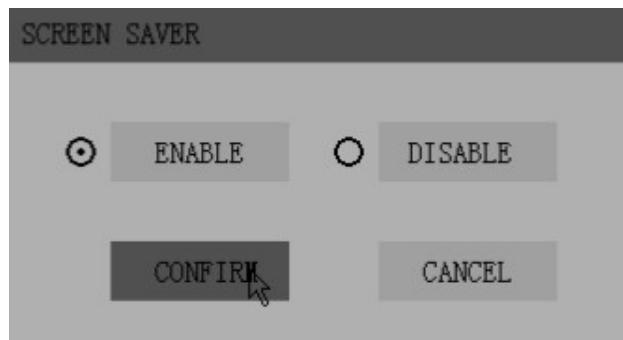
Gray bar Setup interface

Steps:

1. Press **【Menu】** key to enter into “menu ” menu and then select the GRAY SCALE item with **【Set】** key or direction key;
2. Select the option you want and then select the CONFIRM button to save the Settings;
3. Press **【End】** key to exit.

8.1.9 Screen saver

The system supports screen saver.



Screen saver Setup interface

Steps:

1. Press **【Menu】** key to enter into “menu ” menu and then select the SCREEN SAVER item with **【Set】** key or direction key;
2. Select the option you want and then select the CONFIRM button to save the Settings;
3. Press **【End】** key to exit.

8.2 IP Setting

IP Settings allow users to easily Set the parameters

Steps:

1. Press **【Menu】** key then select the IP SETUP menu with **【Set】** key;
2. Select the option to modify with direction key and then modify it with **【Adj】** key;
3. Select the CONFIRM button to save the Settings;
4. Press **【End】** key to exit.

IP SETUP						
	FR	GM	EE	DR	CL	ANGLE
IP1:	3	1	1	55	128	80
IP2:	3	1	1	55	128	80
IP3:	3	1	1	55	128	80
IP4:	3	1	1	55	128	80
IP5:	3	1	1	55	128	80
IP6:	3	1	1	55	128	80
IP7:	3	1	1	55	128	80
IP8:	3	1	1	55	128	80

IP Setup interface

 **Note:** The system can restore factory default values in IP Settings interface if you press the DEFAULT button.

Chapter 9 Biopsy

Puncture line is used to be guidance for moving probe to a proper place. it is used only in real-time status.

steps:

1. In real-time state, press 【Punc】 the puncture line will be displayed;
2. The puncture line can be moved by the touchpad arrow key or 【Adj】 key.

Chapter10 Report

According to the current measurement data, system could generate the examination reports of the patient. And doctors may add comment in this report about diagnostic information on basis of these measurements.

Steps:

1. After the examination, measure result will be saved to memory automatically;
2. Press 【Report】 key in frozen state, the patient's report page would display.
3. With the designated printer, press 【Print】 key can print report page.
4. Press 【End】 key to exit the report page.

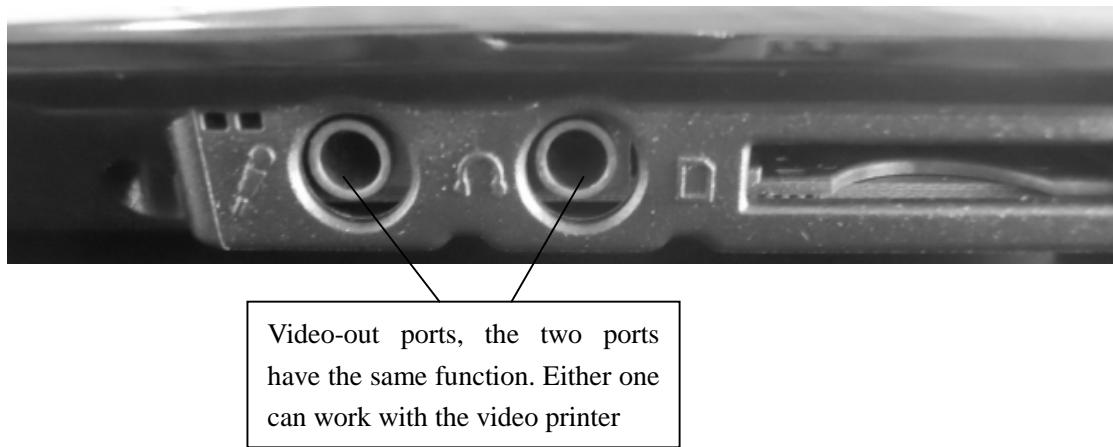
产科检查报告单			
医院: 姓名:_____	ID:_____	年龄:_____	性别:_____
BPD: GS: CRL: AD: AC: FL: HC: FTA: APTD: TTD: FW:			
医生诊断:			
检查医生: 10年08月06日			

Chapter 11 Print via video printer

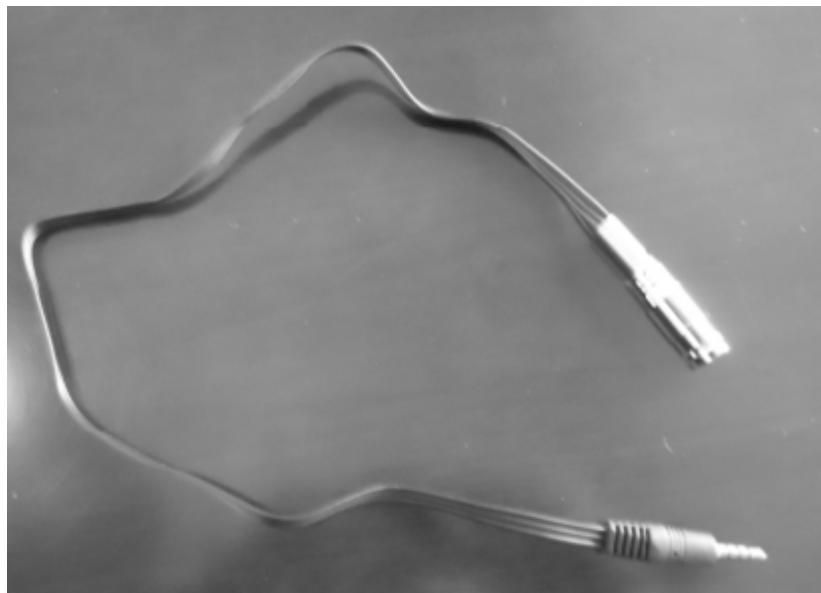
The video print function is new for 3000M. It can be used to print out the ultrasound image. We recommend the Mitsubishi P93 as a standard video printer for this function

Steps:

1. Connect the ultrasound machine and video printer with the video-out cable. The two ports in the following picture have the signal of video out. Either of them can be connected to the video printer
2. press 【Freeze】 key to freeze the ultrasound image
3. press “print” key on the video printer to print the ultrasound image



Video-out cable is as the following picture. It will become one part of the standard configuration in the future.



Chapter 12 Troubleshooting & Maintenance

12.1 System maintenance

It is very necessary to maintain the system regularly, as it can ensure the system being operated under safe state by eliminating possible trouble. And it can also shorten the checking and repair period, lower the service costs and reduce the operation danger.

12.1.1 Clear the system

Clear the system a week:

Unit: Please use soft wet cloth to clean the out-frame of the unit. If it is too dirty and still unable to clean, please use the soft wet cloth to dip the special non-corrosive detergent to clean it. Please avoid any liquid splashing into the unit.

Outward appearance noodles: Use a cake of soft and clean of dry the cloth to sweep outward appearance. Do not use soft detergent.

Keyboard controller: Sweep keyboard controller with the soft tiny and wet cloth; Increase a benefit knob the solid dust of the surroundings with the toothpick clearance.

12.1.2 Move the system

Notes:

1. Close system power supply.
2. All electric cables of connective peripherals should be dismantled from the system.
3. Make sure control -plank does not loosen dynamic thing up.
4. Put the probe into the box.
5. Put the gum into the gum box of the system on the side.
6. Fist the hand handle of the empress central part of system to push the systems.
7. Give a machine base to transport systems.
8. Reduce vibration's bad influence for machine as far as possible.

12.1.3 The safety checks

Use an ex-check each time:

Check damage of probe circumstance;

Check electric cable and power cable is well or not.

Check monthly:

Check whether the unit is without the problem;

Check whether the keyboard controller is without the problem;

Check the machine hasn't thrown to lose or is in need of hardware;

Check the track ball, sweep when it's necessary.

12.2 Troubleshooting

The most frequently occurred errors; system messages, their possible causes and solving methods are listed below:

Errors	Possible Cause	Solutions
When starting the system, power-indicating lamp is not lit.	1)Power cord might not be well connected to the electricity power socket; 2) Power fuse might be already burned.	1) Reconnect the power cord; 2) Replace the fuse.
When starting the system, power indicating lamp is lit, but monitor is dark.	Improperly adjusting brightness and contrast of monitor.	Appropriately re-adjust brightness and contrast of monitor.
Ultrasonic image is not clear.	Gain is improperly Set, or the brightness and contrast are not well adjusted.	Appropriately Set brightness, contrast and gain.
Image is interfered and distorted, or its lower portion in the far field is not clear.	There are electric motors, ultrasonic nebulizers, cars, computers, radio sets and other interference sources nearby; power supply is not grounded or is unstable.	Move or keep away from interference source; Use a separate power supply; The grounding terminal at the rear of main unit is well grounded.
The gray scale is S-twisted in the image area	Power supply voltage is too low.	Adjust supply voltage or use a voltage stabilizer.

12.3 Environmental Protection



Note: When dealing with the waste products, residues and the system or accessories, please obey relevant laws and regulations.

12.4 Declaration

We will make available on requested circuit diagrams, component part list, descriptions, calibration instructions, or other information which can assist the User's appropriately qualified technical personnel to repair those parts of systems which designated by the manufacturer as repairable.

Chapter 13 Warranty

- The warranty period for the main unit is 18 months accounted from ex-factory date, but the probe is 12 months
- The customer should obey the rule of store and use under condition. When quality problem caused by manufacturing occurs, we are responsible for free repair or replacement.
- If the product including probes is malfunctioned, please promptly contact the manufacturer or its authorized maintenance center. Please do not open the panel of main unit or ask the unauthorized person to repair them. For products disassembled or repaired before receiving the confirmation of the manufacturer, or repaired by agents which are not authorized by the manufacturer, the warranty will expire automatically and the manufacturer will not be responsible for free repair service any more, and the user will be responsible for all the results due to this.
- In free period, if manual instrumentation is damage because customers don't obey the operation, customers will undertaken all the fare.
- If the time exceeds the free period, our company is still responsible for maintaining, and take the material and maintaining expenses adequately.
- The software index sign and the function in this system is subject to change without prior notice.
- The index sign and the function is subject to change without prior notice.

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