

Ultrasonic Convex-Scanner

INSTRUCTIONS

Note:

Customers are requested to read the manual in detail before using the equipment and to adhere strictly to the attention of the matters, properly custody if necessary, to refer for further guidance.

Dear Customer,

Thanks for purchasing this ultrasonic scanner. Before use , please read the manual carefully and follow the instructions contained here. Please keep the manual for future reference.

Follow these steps before your operation of the apparatus:

1. Make sure that the existing configuration of the apparatus is consistent with the packing list. If not, please contact the sales representatives or dealers of our company.
2. Please fill in the product warranty card carefully, and send the return receipt back to our company soon. Otherwise, it will influence the services for you in future.
3. Please read the documents about the apparatus carefully and keep them for future reference.

Thanks for choosing the enhanced electronic convex-array ultrasonic diagnostic apparatus .In order to ensure this machine to work safely and properly, read the specific content in the user's guide, which includes the apparatus features, operation method, operation user's guideline, maintenance, packaging, storage, transportation etc. Please read the operation instruction carefully before operating the apparatus. We believe that it is conducive for you to operate the apparatus efficiently.

The information and technical data provided in the user's guide are accurate and reliable. However, in the process of printing, it is difficult to avoid some undiscovered mistakes and oversights caused by uncontrollable factors. Thanks. We might most likely change hardware and software in order to improve the capabilities and reliabilities of the apparatus, which may cause some differences with the information of the user's guide.

If you encounter problem during the process of using the apparatus, please call us or mail letters to us for enquiry.

CONTENTS

1 INTRODUCTION	4
2 TECHNICAL SPECIFICATIONS	7
3 ENVIRONMENTAL REQUIREMENT	8
4 APPARATUS SETTING UP	9
5 FUNCTION OF KEYBOARD	10
6 OPERATION	16
7 OPTIONAL ACCESSORIES	26
8 MAINTENANCE	26
9 TRANSPORTATION AND STORAGE	28
10 TROUBLE SHOOTING	29
11 MANUFACTURER'S COMMENTS	31
12 SERVICE GUIDELINES	32
APPENDIX1	33

1. Introduction

1.1 Features

- ✦ With the advance of VLSI and SMT, the apparatus is more reliable compared with other products.
- ✦ By adopting multistage dynamic focalizing, variable aperture, digital scanning, related digital graphic processing, etc., the apparatus can provide sensitive, steady, clear, high-resolution pictures.
- ✦ Equipped with B, B+B, B+M, M display modes and the 256 gray scales screen.
- ✦ Display frozen pictures, two pictures in the same frame, and freeze one of the two pictures or both the two pictures. Moreover, the displayed picture has the feature of polarity reversal and bilateral reversal.
- ✦ Magnifications of picture are adjustable in the process of operation.
- ✦ Upgrade of the depth of the picture.
- ✦ Full screen editable characters, real-time clock, body-position indication, operating indicator of Route Ball Mouse.
- ✦ Multi-measurement of length, perimeter, area, M-type conventional examination and gestational measurement.
- ✦ Terminal output of standard PAL system, which will meet the requirement of different users.
- ✦ Soft-touch keyboard, plastic exterior case, which are good-looking, portable, and convenient to operate.

1.2 Applicable fields

- ✦ Suitable for diagnosis of heart, liver, gallbladder, kidney, spleen, pancreas, heart, thyroid gland, breast, uterus, bladder, ovary, etc.
- ✦ Widely used for clinical examination and diagnosis of abdomen and department of obstetrics and gynecology in the hospitals of county, rural-town and town.
- ✦ Used in the supervising stations of Planned Parenthood in the city, county, rural-town and town to be suitable for the examinations of early pregnancy, contraceptive ring, perinatal period of pregnant woman, etc.

1.3 CAUTION

FOR THOSE WOMEN AT THEIR EARLY PERIOD OF PREGNANCY, LONG TIME OF IRRADIATION IS NOT SUITABLE.

1.4 Safety Standards

- ⊕ Design and production strictly conform to GB10152-1997 B-Type Ultrasonic Diagnose Apparatus and enterprise standard Electronic Linear Array/Convex Array Type B Ultrasonic Diagnose Apparatus. Safety type: class I type B apparatus.
- ⊕ Electric power socket in the apparatus operating room shall be standard tri-hole power socket, grounding terminal of which shall connect to the grounding conductor of the grounding field in the power protection system.
- ⊕ If the power socket does not have protective grounding contact (terminal) or isn't connected with the grounding conductor of the grounding field in the power protection system, user shall use special grounding conductor provided by our company, one end of which is connected with the protective grounding terminal and the other is connected with the ground.
- ⊕ Setting of the grounding conductor shall be performed by the user according to the related standards or under the user's guideline of an experienced electrician.

**  : B-type apparatus indicator

** **No**: Serial number of product

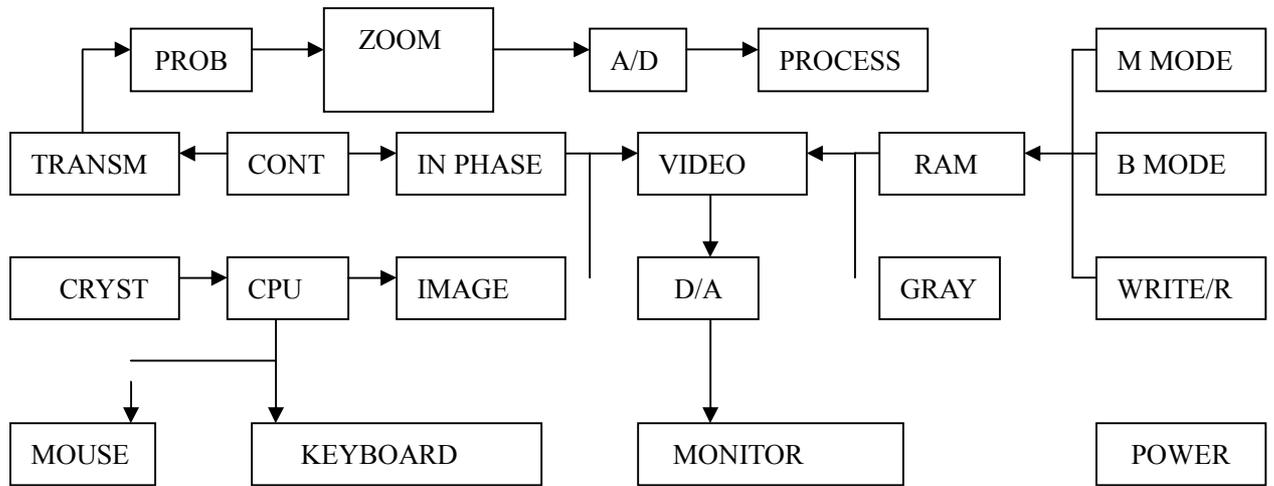
** **I**: Main power on

**  : Main power off

**  : Protective grounding indicator

**  : Physiological phenomenon indicator: please read the operation user's guide for the cleaning, sterilizing requirement of probe, which will be found in the 8—"maintenance of probe"

1.5 Principle block diagram of product.



2. Technical Specifications

2.1 Functions and Specification

Main Probe	3. 5MHz Electronical Convex Scanning (R=60) (2.0M---5.0M F.C.)	
Optional Probe	6. 5MHz Electronical Convex Scanning (R=13) (5.0M---8.0M F.C.) 7.5MHz Electronical Lining Scanning (Fleet Surface) (5.0M---10.0M F.C)	
Max.DisplayDepth (mm)	≥240	
Distinguish Rate (mm)	Oriental	≤3 (Depth≤80mm) ≤4 (80mm< Depth ≤130mm)
	Portrait	≤2 (Depth ≤80mm) ≤3 (80mm< Depth ≤130mm)
Blind area (mm)	≤5	
Geometry Position	Oriental	≤15
Precision (%)	Portrait	≤10
Monitor Screen	10" (Portable)、14" (Trolley/Benchtop)	
Display Mode	B、B+B、4B、B+M、M	
Gray Scale	256	
Magnifications of picture	×1.0, ×1.2, ×1.5, ×2.0	
TGC Adjusting	8 segment	
Cinema Replay	256 frames	
Power off Storage	8 frames	
USB	Large capability storage of images(Optional)	
Clock	Time display	
Electronical Focus	Free combination of 4 focus.	
Frame Correlation	4 types in the mode of B、B+B	
Image Rotation	Up/Down, Left/Right,White/Black	
Measurement Application	Distance, Perimeter, Area, Ellipse,Volume, Heart Rate,Pregnant Weeks,Fetus Weight,Estimated Date of Childbirth.	
Character Note	Date, Patient No, Age, Sex, Focus Combination, Frame Correlation, full-screen editable note	
Posture Indication	30	
Input power (MAX)	≤70VA	

2.2 Power of Ultrasonic Output

SEE APPENDIX 1

3. Environmental Requirement

3.1 Operation Environmental Requirement

Environmental tests of the apparatus conform to the requirements of climatic environmental test group and mechanical environmental test group II in GB/T14710-93 Environmental Requirements and Testing Methods of Medical Electric Apparatus.

- ⊕ Ambient Temperature: $+41^{\circ}\text{F} \sim +104^{\circ}\text{F}$
- ⊕ Relative Humidity: $\leq 80\%$
- ⊕ Air Pressure: 800hPa-1060hPa
- ⊕ Power Supply: AC $220\text{V} \pm 10\%$, $50\text{Hz} \pm 1\text{Hz}$
- ⊕ Keep away from strong electrical field, magnetic field and high-volt devices.
- ⊕ The illumination inside the operating room shall be relatively dark and avoid direct irradiation of strong light at the monitor.
- ⊕ Keep the apparatus in ventilation, desiccation, and dustproof place.

3.2 Transportation and Storage Environment Requirement

- ⊕ Ambient Temperature: $23^{\circ}\text{F} \sim +104^{\circ}\text{F}$
- ⊕ Relative Humidity: $\leq 80\%$
- ⊕ Air Pressure: 500hPa-1060hPa

4. Apparatus Setting up

4.1 Unpacking Check

At the time of unpacking, please pay attention to the instructions on the packing box.

After unpacking, check the apparatus and count accessories and documents supplied with the apparatus (stated in the following table) according to the packing list.

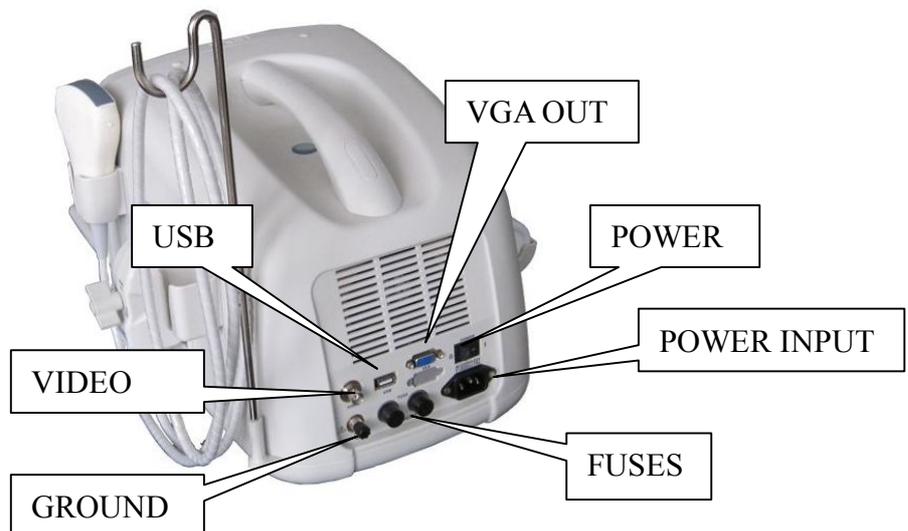
4.2 Setting up

After setting up the apparatus, let us show you around the machine.

Front view



Rear view



4.2.1 Power Check

Please check the power supply condition and ensure that the electricity supply conform to the required standard. Electric power socket in the apparatus operating room shall be standard tri-hole power socket, grounding terminal should connect with the grounding conductor of the grounding field in the power protection system.

4.2.2 Connect the Probe

Insert the probe plug in the socket exactly. Revolve the locking handle by 90 degree to fasten it.

To uninstall the probe, revolve the locking handle in reverse direction by 90 degree and unplug it.

Caution: It is strictly forbidden to pull out or insert the plug when the machine is power on. To disconnect the probe, hold the plug instead of pulling the cord to avoid damage of the apparatus.

4.3 Grounding Protection

If no grounding socket is available, or grounding conductor is not connected, you should use a metal wire, whose cut-area is $<1\text{ mm}^2$, to connect the grounding conductor to the ground.

Caution: the setting up of grounding protection should be under the instruction of the experienced electrician or relevant standard.

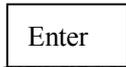
5. Function of the Keyboard

5.1 Key and its function

 Letter key
Press the key, the relevant letter appears on the cursor position.

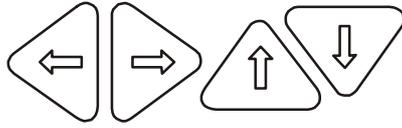
 **Press “L” 3 second, and the light of keyboard light will be power on or power off**

 Press this key, one blank space appears on the screen.

 Enter is used as the confirm key. In the mode of partial display, press this key and the image could be zoomed. In the mode of Cine, press this key and the images

could be displayed continuously.

0 -- **9** : Numeric keys. For setting the clock, date, patient's number, age, measurements, etc.



: Direction keys. Press these keys for moving the cursor in the mode of measurement. Or moving the windows when zooming partially. In the mode of B/M, press them for moving the sample lines right or left; in Cine mode, to replay the individual image backward or forward.

Fast Press this key to change the speed of the measuring cursor.

Shift In the measurement of distance, press this key to transfer the movable cursor. At the time of measuring the perimeter and acreage, press this key to start or end the measurement.

Clear To erase the result of measurement, body mark and message information on the screen.

Note Press this key to activate the note menu which appears in the centre of the screen.

1. ID
2. SEX
3. AGE
4. HOSPITAL
5. DOCTOR
6. COMMENT
7. DATE
8. TIME
9. EXIT

Note Menu

Probe For shifting the type of the probes

Before shifting the type of the probe, ensure the proper connection of the probe, then press this key to shift to the actual interface. The current probe type and the frequency showed on the right of the screen. To set the type of the probe, simply press this key one more time.

Frequency Press this key to shift the normal working frequencies.

Cine

Press this key to start the cinema function.

Focs

For the selection of the focus.

In B,B/B mode,the apparatus offers 4 periods adjustable focuses.By the combination of the focuses, the much more clear images could be obtained.The current combination of the focuses appear on the right of the screen.Press this

key,“Foc”is highlighted,and it is possible to adjust the combination of the focuses. Then

press

to select the points. If the number appears behind the key “Foc”, it means that the point has been selected. Press this key again and again to shift the focuses to be selected or canceled.

Press

again to escape from the adjustment of the focuses.

Possible combination available in the apparatus:

Points	Possible combination of the points					
One point Focus	1	2	3	4		
Two-point Focus	1-2	2-3	3-4	1-4	2-4	1-3
Three-point Focus	1-2-3	2-3-4	1-3-4	1-2-4		
Four-point Focus	1-2-3-4					

Reset

Press this key when the machine is “dead ”by accident or mis-operationd

(and no other keys workable)to re-start this machine for all the functions.

Zoom

For enlarging the image by rate

There are 4 mode for the enlarging rate:1.0, 1.2, 1.5, 2.0.Press this key

continuously to set the enlarging rate in circle.

P.Enl

To enlarge the image partially.

Picturedeal

To activate the menu of dealing with the pictures. Press this key, the

window will appear on the screen as following:

1. UP--DOWN
2. LEFT--RIGHT
3. BLACK—WHITE
4. Per:
5. γ : 1
6. EXIT

“1.UP—DOWN” indicates to overturn the image up and down. “2.LEFT—RIGHT” means to turn the image to left or right. “3. BLACK—WHITE” indicates the shift of the image from white to black. “4. Per” means the frame selection which is divided into 4 grades. “5. γ : 1” is the option item for Gamma correction, which is divided into 4 grades. “6. EXIT” is to escape from the menu.

Body

Body Mark

To activate the body mark which has 30 kinds displayed by selection.

Color

The selection key of color

Measure

To activate the menu of measurement. Press this button, and the menu appears on the screen.

- 1、 DISTANCE
- 2、 AREA
- 3、 ELL AREA
- 4、 VOLUME
- 5、 ANGLE
- 6、 EXIT

Gest.

Gestational menu key. Press this key to activate the obstetric menu and it will appear on the screen.

1. BPD-FW
2. CRL
3. GS
4. FL-FW
5. HC-FW
6. AC-FW
7. EDD
8. AFI
9. EXIT

"1.BDP-FW" for the biparietal diameter fetal weight; "2. CRL" for the first long arm; " 3. GS" for the pregnancy sac; " 4. FL-FW" for the long femur fetal weight; " 5. HC - FW "for the re-fetal head circumference;" 6. AC-FW "for the abdominal circumference fetal weight;" 7. EDD "for expected date of childbirth." 8. AFI "for the amniotic fluid index;" 9. EXIT "to withdraw from the menu.

Freez

Image Freeze key. For the freezing of the real time pictures.

B

B mode to activate the right mode by pressing this key.

B/B

Double B mode key.

After activating this mode, there will be two B mode pictures on the screen, of which one is the frozen image and the other is the real time photo. Press this key repeatedly, and you can shift the two photos as Freeze and Real time.

4B

4B display mode key. Press this key to enter the 4B mode. Repeatedly press this key ,you can activate the 4 pictures of

UP-LEFT,UP-RIGHT,DOWN-LEFT,DOWN-RIGHT.

B/M

The display key of B mode and M mode. Press this key to activate B/M mode.

The screen will display the images of the two modes at the same time (in short B/M or B+M).On the left of the screen, it is the real time picture of Mode B. On the right ,it is the real time picture of Mode M. In the picture from the Mode B, there is one vertical bright dot-line or a upright line, which was called M-sampling line.

M

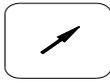
The single M key for the fast/slow shift. Repeatedly press this key to Shift the speed.

CH/EN

The shift key of language from Chinese to English.

Cap. /Sm

Key to shift from the capital letter to small letter.



Indicator key

It is used to indicate the diagnosing parts or the pathological changes. In the mode of body mark notes, press this key and you can have different directions of the indicator, and it is movable in the area of the body mark which shows the diagnosing part. Without any operation, press “body mark” key, and turn the contrail ball or the indicator key to move the arrowhead out of the body mark area, the key can be used to indicate the pathological parts and it is possible to move around the full screen.



Delete key.

In the wording notes, move this key leftward to delete a character.

Stor

Repl

The key to store or replay the images.

Storever

Move

To store the images forever. The apparatus can store total 8 images forever, even when the power is off.



The key to adjust the depth.

5.2. The contrail ball

This key can be moved    (Left, Right and Middle):

The ball can be used to replace any direction key in the keyboard, which is:

-  Press this key at any time to activate the sign “+” for measurement, to mark the terminal point for the distance.
-  Press this key to mark the beginning and the terminal point in the measurement of the perimeter and the acreage.
-  Press this key to mark the beginning point in the distance measurement, or to adjust the comparative position between the beginning and the terminal point.

6. Operation

6.1 Switching on

First, turn on the magnetic lock on the front panel of apparatus, then press down the Power button, which will light the power-indicate LED on the keyboard.

When apparatus runs into normal working state, you can use brightness, contrast, gain and near-restrain buttons to get required image.

6.2 Diagnosis

The patient should lie on his (her) back on the bed, and apply the contact agent (medical ultrasonic coupling) on the to-be-checked part of the patient. At this point, the section picture of the part is displayed on the screen with the probe contacted the to-be-checked part closely. With the altering the directions and gradient, various section pictures can be observed. Choose the section picture you need and press “Freeze” to get the picture as basis of diagnosis. During the period, if the brightness, contrast and gain of the picture remains unsatisfying, you can adjust the BRIGHT and CONT, or the signal gain—NEAR, FAR and GAIN until the clear picture is displayed.

6.3 Measurement

Through diagnosis, freeze the optimal picture and measure the specifically concerned position. The measurement contains: distance, perimeter, area, M-type regular examination, and gestational examination, the relevant methods for measuring are listed below:

Measurement of distance

- ⊕ Press the “Distance” key, and a “+” indicator will appear on the screen.
- ⊕ Use the direction keys to move the indicator to the measured position. Use “Enter” key to get the second “+” indicator, and a line consisting of bright dots between the two “+” indicators will appear on the screen.
- ⊕ Press the “Enter” to get the results, which will be shown automatically on the bottom

of the screen. (Unit: cm)

- ✦ When measurement is over, repeat the third step to conduct multiple measurement. Three sets of results will be shown on the bottom of the screen. (Unit: cm)

Measurement of perimeter and area

- ✦ Press the “Measurement” key to activate the prompt menu of measurement; press the key 2 to select the “2.Area” and a “+” indicator will appear on the screen.
- ✦ Use the direction keys to move the indicator to the measured position. Use “Shift” key to get the second “+” indicator, and a closed trace consisting of bright dots embrace the specific area will appear on the screen.
- ✦ Press the “Enter” to get the results of perimeter (Unit: cm) and area (Unit: cm^2). If the trace is not closed, the route of measurement will join together automatically according to the shortest distance.
- ✦ Repeat the above steps to conduct multiple area measurement of perimeter and area.
- ✦ NOTE: the perimeter and area measurement could be conducted through route ball mouse as well.

Measurement of M-type parameter

- ✦ Firstly, choose the B/M mode and use the direction keys to move the M-type sampler to the measured position. The M-type real-time picture will display on the screen.
- ✦ Press the M mode key and switch to the M-type display mode. When the picture is optimal, press the “Freeze” key to freeze the M-type picture and conduct the M-type measurement.
- ✦ The method for this measurement should follow the “Measurement of distance”. The expected M-type parameters will be shown on the top of the screen.
- ✦ NOTE of M-type parameter:
- ✦ HR: heart rate (Unit: time/minute)

How to use the contrail ball (route ball mouse)

Click the “L” key to activate the first indicator “+”, move this “+” to the initial point of the measurement; click the “R” key of the ball to mark the beginning point of the measurement and at the same time to activate the second indicator “+”(Note: click the “L” key repeatedly may change the comparative position of the beginning and terminal point); move the second “+” to the terminal point of the measurement, click the ball to finish the measurement.

Repeat the above steps to get more data of measurement.

Measurement of Volume

Follow below steps on the keyboard:

1. Press and hold the “Measurement” key to activate the measurement menu and choose “4.VOLUME” in the menu, the indicator “+” appears on the screen.
2. Use the direction key to move the “+” to the initial position for measurement.
3. Press the “Shift” key to fix the beginning position and shift to another indicator.
Use the direction key to move the second indicator to the final position of the measurement.
4. Press the “Confirmation” key to show D: the distance of the two points.
5. Repeat the steps mentioned above to obtain 3 groups of the data to finish the measurement of Volume. It will appear at the down right of the screen “V:”

How to operate by the contrail ball:

1. Click the Left key of the ball to activate the first indicator “+”, move the indicator to the beginning point of the measurement.

Click the Right key of the ball to mark the beginning point of the measurement and at the same time activate the second indicator “+”;

2. Move the second “+” to the final point of the measurement, click the Left key to finish the measurement. Repeat the steps above for three times to obtain 3 groups of the figure to finish the measurement of the Volume. The data will show on the down right of the screen “V:”

How to use the ellipse measurement

Using the contrail ball:

1. Press the Left key and an indicator appears. Move the indicator to any position, press the Middle key to get another indicator. The Shift key may be used to exchange the moving indicators. Turn the ball to revise the long pathway and the circumrotating direction. The middle of the direct line is the centre of the elliptical circle.

2. Press the Left key and a elliptical circle appears. The up and down of the ball can be used to change the size of the circle with the direction of the long pathway or the short pathway. The Shift key may used to exchange the direction

Of the long/short pathway.

3. Press the Left key and the figure of the elliptical circle and the perimeter Appear on the screen. Press the Middle key to escape from the current measurement.

Angle Measurement

1. Press the Measurement key and select “5.ANGLE”.

2. Wait for the indicator “+” and move it to any position by the ball, press the Right key for the second indicator “+” to draw a direct line. Press the Right key to exchange the moving indicator, and turn the ball to change the length and the direction of the line. Press the Left key to fix the first line. Another indicator will appear. Draw the second line by the same way as above, press the Left key of the ball to fix the second line. At this time, the angle of the two lines will appear on the screen.

In the picture, α indicates the angle between the first line or its extending line turning contrarotately to the second line; β indicates the angle between the first line or its extending line turning clockwise to the second line.

($\alpha+\beta=180^\circ$); This is the first measurement.

3. Every time when the measurement is finished, the mark + and * will exchange automatically. Repeat the step 2, you can do many

measurements as you like.

4. To escape from the measurement, press the Middle key or any key in the mode of notes.

Measurement of Heart Rate

This measurement is available only in the B/M mode and M mode:

Just like the measurement of distance, and there will be 3 varied groups of figures appearing on the screen with the moving of the indicator. From left to right, they are: EF (pitch by mm/s), HR (heart rate) and T (time by ms).

In the mode of B/M, press the Middle key to exchange the B or M mode.

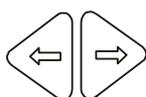
Function of the cinema replay

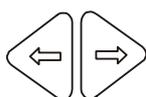
The system provides 256 frames of the pictures for cinema replay.

Turn on the machine and enter the mode of real time scanning, the system starts to collect the images for the replay.

To replay the images, set the apparatus into the Freeze mode first. Under the Freeze mode, press the Cine key to replay the stored pictures circulatory.

To stop the replay, press the key Cine again.



During the automatic replay, press  to enter the mode of displaying individual picture by hand. In this mode, press the Confirm key to return to the cinema replay mode again.

Function of the image storage

How to store the images permanently

Store:

1. Freeze the appeared pictures.
2. Press the key “In flash”, and the sentence “PLEASE INPUT 1,2,...8”.

3. Store the images by orders:

i) in the order of numbers: press “1”, the apparatus starts to store the picture, and on the screen, it shows “Please wait 20 S...”.In 20 seconds, the first image has been stored permanently. If you want to continue the storage of other pictures, press the Freeze key first, then follow the steps mentioned above and you can store the rest pictures easily.

ii) without any order: press any Number key and the storage begins. You can read “PLEASE WAIT 20 S...”. In 20 seconds the permanent storage of the pictures has been finished.

4. Flash out the pictures

i) Press the Freeze key to unfreeze the images.

ii) Press Flash out, and you can read “PLEASE INPUT 1,2...8” on the screen.

iii) Press the number keys, and the machine replay the stored picture by the number.

To repeat the steps to show the rest of the pictures stored.

How to store the images temporarily:

1. Store

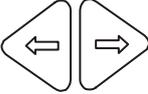
i) To freeze the appeared pictures: press Store key, and the number of the images will appear on the screen “x x x”(001-032). The picture is stored then.

To continue, just follow the step again. You may store totally 32 pictures.

2. Flash out

1) Clear the screen first.

2) Press Flash Out key.

3) Use the Direction key  to flash the right pictures. The number of the picture will show the storage number.

Measurement of gestational section

Calculation of the obstetric table

1) Press the "Obstetric table" to activate the soft menu of the obstetric table ,of which:

1. BDP-FW for the biparietal diameter;
2. CRL for the first long arm;
3. GS for the pregnancy sac;
4. FL-FW for the long femur;
5. HC-FW for the head surrounding;
6. AC-FW for the abdominal circumference;
7. EDD for Estimated Date of childbirth;
8. AFI for the amniotic fluid index;
9. EXIT to withdraw from the menu.

2) Press the corresponding number keys to select the desired obstetric table. Selected, the corresponding characters of the obstetric table appear on the lower right corner of the screen. Do as the way of the perimeter area of the measurement method to measure a set of values, the corresponding data immediately shows on the lower right corner of the screen, and each obstetric computing shows four measurement results.

For example, choose "1. BPD-FW" into the biparietal diameter obstetric software, on the bottom right of the screen shows "BPD:" and "FW". And then activated the "measure" button, enter the measurement menu, select "1. DISTANCE" (distance measurement). At this time two cursors appeared on the screen, turn the trackball or press the direction key to move the first point to the location of the measurement, press the "shift" key to change the cursor. Move the second point to the location of measurement. Then the lower right corner of the screen shows "D: XXXmm" (which means the biparietal diameter measurement for XXXmm);and

"BPD: WW + D" (which means the gestational age of the fetus by weeks plus the days);
"MM-DD-YYYY" (which means the fetal's date of birth);
"FW: XXXg" indicates the fetus' fetal weight by XXX grams.

For example: "D: 031mm" (that means the biparietal diameter is 31 mm);
"BPD: 15 +0" (that means the fetus' age is 15 weeks gestational age plus zero days);
"03-12-2006" (that means the fetus date of birth is 03-12-2006);
"FW: 130g" means the fetus' fetal weight is 130 grams.

Attention: the time of the apparatus must be set exactly.

Note: IN the head circumference (HC) and abdominal circumference (AC) measurement, using two measurements; that is satisfactory image, the first to outline a closed curve

measured region, and then were measured from the measurement of the Closed curves and the fraction of the long axis of value, can obtain the head circumference or abdominal circumference value.

3) How to calculate the estimated date of birth:

Select “ 7. EDD”, and on the screen shows following:

THE	LAST
MENSTRUATION :	
MM-DD	

It requires to input the pregnant woman’s first date of her last menstruation by the order of MM-DD (MONTH-DATE).For instance,05-11.When you type in the correct date, the result will appear on the down left of the screen “EDD” by the order of MM-DD-YYYY. For example, 2-21-2008 means the estimated date of birth is on Feb. 21,2008.At the meantime, the apparatus will also calculate the age of the fetus based on the current date of the system, which shows in “G\A” by the order of W+D.

For example,38+4 means the gestational age is 38 weeks plus 4 days.

Note: Please be sure to ensure the accuracy of date in the system.

1, The standard period of pregnancy in the system is 40 weeks .And if the importation of the date of the current system shows that the period between is more than 40 weeks, the system will not accept the importation of the date .All the information must be re-entered.

2, As long as the terms and conditions are fully matched to Note 1, if the input date is greater than the date of the current system, the system will automatically regard it as the previous year's period.

The measurement of the amniotic fluid index

Select "8.AFI" into the amniotic fluid index of measurement software. Amniotic fluid index in the B mode scanning, take the pregnant women’s umbilical as the center, to the upper and lower, left and right of the centre to four regions, then add the four amniotic fluid depth of the areas together, can get on the amniotic fluid index. the normal amniotic fluid index is 8 to 18 cm.

By pressing the "measure" button to enter the measurement menu, select "1. DISTANCE" (distance measurement), the two cursors will appear on the screen.Use the trackball or the direction keys to move the cursors to the ocation, and click "left", on the screen shows the measuring of distance . After get four connected groups of figures,on the right side of the screen shows "AFI: XXXX",which means that the amniotic fluid index is XXXX mm3.

The function of Notes

Press the Note key to activate the notes menu:

By selecting the numbers,

1. ID: to input the patient's recorder number, maximum 6 characters.
2. SEX: to select the gender of the patient, O stands for male, 1 for female.
3. AGE: to input the patient's age, maximum 3 digits.
4. HOSPITAL: to input the hospital's abbreviation letters, total 8 characters.
5. DOCTOR: to input the doctor's name, total 8 characters.
6. COMMENT: to add any comments for the images, possible to move the indicator by the direction key or the mouse.
7. DATE: to calibrate the date. The interface of the date is as following:

MM-DD-YYYY

"MM" stands for month, "DD" stands for date, "YYYY" stands for year.

- 8 TIME: to calibrate the time. The interface is as:

W-HH-MM-SS

"W" week, "HH" hour, "MM" minute, "SS" second.

- 9 EXIT: to escape from the note menu.

How to zoom the picture

This function is meaningful only when the image is frozen.

Press the Zoom key, two windows (one is smaller than the other) will appear on the screen. Use the direction key or the trackball to move the smaller one to the part which is needed to be enlarged, press the Confirm key to enlarge the image 4 times larger in the big window.

Press the Zoom key again, the two windows disappear from the screen and the function is closed.

USB function (Optional)

Insert the USB, when the indicator light is flashing,press the USB key to see a window on the screen:

1. USB WRITE
 2. USB READ
 3. EXIT

- 1、 “USB WRITE” to store the images; 2、 “USB READ” to read only the images from USB; 3、 “EXIT”.

Operating steps: by selecting the number and

- 1、 You can see “FILE:” on the screen, input the name of the picture by the 6 digits or letters, wait for about 20 minutes for “OK” appears on the screen. It means the images has been stored in USB. The storage format is “.BMP”.
- 2、 When you see “FILE:”, input the number or the letters of the images which have been stored in the USB. “ok” means the pictures have been moved from the USB.
- 3、 To escape from the menu.

Attention: Please insert USB in 3 minutes after the machine is turned on. Use FAT to format your USB equipment.

6.5 Photo and Print Photo

When the picture is frozen, use the instance camera or regular camera to take a photo of the picture.

Print

Connect the Video-Picture printer’s AV-input cable plug to the output socket of the apparatus. Turn on the printer, and follow the instruction of it to operate.

6.6 Turn off the apparatus

When operation is finished, turn off the power of apparatus; if it will not be used for a

long time, disconnect the power plug from the socket.

Caution: Do not un-plug the power cable when the apparatus is still working. Wait for 2-3 minutes to re-start the apparatus after shutting it down in order to protect the apparatus from being damaged.

7. Optional Accessories

The apparatus is equipped with a 3.5MHz electronic convex scanner probe. The additional probe should be the products of company in which you buy it and the installment of the probe should be in accordance with the instructions from our engineers and the manual.

Video printer is available for printing the diagnostic image and patient's record. The installment of the video printer should follow the instruction of our company or conducted by our company. The choosing of video printer should also follow the recommendation of our company.

8. Maintenance

8.1 Regular maintenance

Check the power supply on a scheduled basis. If the power supply is out of the normal range--AC220V \pm 10%, 50Hz \pm 1Hz, you should not turn on the apparatus at any time. Check the power supply cable and probe cable regularly, and replace it when any damage or rupture occurs.

8.2 Apparatus Maintenance

- ⊕ The environment should be confirmed to the standards mentioned in 3
- ⊕ Apparatus shall be kept clean. After the plug is pulled out, it shall be wiped with soft

cotton ball containing alcohol. When the interior part needs to be cleaned, use the fan to tidy the dust.

- ⊕ Do not turn on or turn off the apparatus frequently, Wait for 1-2 minutes to re-start up the apparatus after shut down in order to protect the apparatus from being damaged.
- ⊕ Apparatus shall be put steadily. Carry and place it lightly.
- ⊕ Avoid placing heavy things on the apparatus.
- ⊕ If the apparatus is idle for a relatively long time, put it in the package box and keep it properly. The environment should confirm to the requirement of 9.
- ⊕ If apparatus is idle for a long time (over 6 months), it shall be powered on twice a week for at least 2-4 hour every time.

8.3 Maintenance of the Probe

- ⊕ The Probe is a vulnerable component. During the application, avoid impacting, falling or squeezing. During the pause of diagnoses, the probe should be put into the probe box, and you should also press the “Freeze” key to keep the apparatus in a “freeze” state.
- ⊕ Contact agent which is applied on the probe shall be “medical ultrasonic coupling “. Strictly avoid any other type of corrosive coupling applying to the probe.
- ⊕ After clinical use , and contacting with the patient, the probe shall be sterilized and cleaned with medical alcohol. It must be put into the probe box.
- ⊕ It is not allowed to soak the probe in other conducting or corrosive liquid, otherwise the probe and its sheath will be corroded.

- ⊕ When the probe is soaked into liquid, the distance above the sound window should be more than 10mm; otherwise, the interior components would be damaged by the liquid which seeps into the probe. Check the exterior of probe regularly to ensure that the outer layer of the probe is fully closed.
- ⊕ If the connection between the probe and the apparatus is properly set up, you should not disconnect them randomly to avoid the connection problem of probe plug and socket.

NOTE: Petroleum or other organic solvent is forbidden to clean, sterilize, and disinfect the probe; otherwise, the probe will be destroyed.

Caution: When the apparatus is working, unplugging the probe is forbidden. Even slight impacting or falling down of the probe might damage the chip inside the probe, and this damage is irreparable. If the front film is broken, do not disassemble it at will, and do not use it any more since there is high-voltage electricity in the probe. Send it back to the manufacturer, and we will repair it for your further use.

9. Transportation and Storage

9.1 Transportation

The box for package follows the standard of GB191-2000. Inside the package there is simple shockproof facility, which is suitable for airplane, regular road, railway, and ship transportation. Avoid impacting, up side down, rain or snow.

9.2 Storage

If apparatus is idle for over 6-month , it shall be switched on for at least 2-4 hours. After checking, put the apparatus into package again. Do not pile up the packages. Do not put

the packages directly on the ground, quite close to the wall, or the ceiling.

10. Troubleshooting

There might be some troubles occurred during the operation. Since these kinds of trouble may have negative influence on user's working procedure, we provide you with some ways to avoid them. If the trouble still exists, call the technician for help, or contact the sales reps.

10.1 Regular Check

- ⊕ Check whether the power supply works properly, whether the power cable is connected to the socket.

- ⊕ Check whether the probe is correctly connected to the apparatus.

10.2 Troubleshooting

#	SYMPTOM	CORRECTIVE ACTION
1	When the power switch is turned on, power indicator isn't on, and there is no picture showed on the screen.	<ol style="list-style-type: none"> 1. Check the power. 2. Check power cable and its plug. 3. Make sure the fuse (fuse tube) isn't broken down. 4. Check control knobs of brightness and contrast of the monitor.
2	There is discontinuous stripe interference or snow noise points on the screen.	<ol style="list-style-type: none"> 1. Check the power of the apparatus (caused by arcing interference of other apparatus); 2. Check environment (caused by the interference of electromagnetic field around the apparatus); 3. Make sure the connection between power of the apparatus and the probe or the socket is in good conditions; 4. There is strong interference while holding the probe, but there is no interference while putting it down. If so, please find out the source of interference and avoid operating the apparatus with the source of interference; 5. Make sure the grounding is in good condition.
3	The picture is rolling on the screen.	<ol style="list-style-type: none"> 1. It might be caused by the no-synchronization of column and row on the screen; 2. Open the cover of the apparatus, and adjust the column and row synchronization potentiometers slightly to stabilize the screen.
4	No picture or the picture is not clear	<ol style="list-style-type: none"> 1. Adjust near strain and gain buttons; 2. Adjust the brightness and contrast button; 3. Clean the monitor light-sieving flake.
5	The apparatus is switched on, but no key is effective.	<ol style="list-style-type: none"> 1. Suffering from the improper impact or strong magnetic intervening. Press the RESET button, or turn off it and then re-start in 1-2 minutes.

10.3 Replacement of fuse

Revolve down the fuse anticlockwise, take out the broken fuse, and install the new one.

Then revolve the new fuse clockwise to fasten it.

Specification of the fuse: $\Phi 5 \times 20$, rating value: 2A/250V.

Caution: Do not the unfitted fuse, otherwise, it will destroy the apparatus.

11. Manufacturer's Comments

Products of our company are manufactured strictly under the national standards—GB 10152-1997 about “B-type Ultrasonic Diagnostic Device” and GB 9706.1-1995 about “Medical Electrical Device section 1: Requirements for Safe Operation”. All the relevant specifications are accordant with the national standards.

Our product will be under the terms of 3-guarantee for the domestic sales, they are:

1. Provide on-site service to repair the apparatus free of charge in one and a half year.

(Repairing of the probe free of charge in one year.)

2. Provide the life-long time of repairing charged for the cost of replaced parts.

3. Offer necessary technical support and maintenance training service.

In case any of the below event happens, we have the option not to carry out the 3-guarantee service and the relevant promises:

User does not follow the instruction to transport, install, maintain, and store the apparatus.

Without the permission from us or instruction from our technician, user installs, disassembles and repairs the apparatus. (As for the portable apparatus, user could install it without the technician; as for the movable apparatus, user could install the device only after reaching an agreement with the distributors or the supplier should assist user to install the device.)

Damage of some un-resistable reasons, or natural disasters.

12. Service Guidelines

If there is any trouble, please try the following steps:

- ✦ Refer to Section 10 for the simple trouble-shooting.
- ✦ Make sure that connection between the different parts is correct.
- ✦ You might solve the problem by yourself at first. Call the local dealer and engineer for further help.
- ✦ If you are not certain about the problem, please contact the local dealer and technician. When you call, please provide the following information:
 - ✦ The type of apparatus;
 - ✦ Serial number of the device;
 - ✦ Clear description of trouble and all the information on the monitor;
 - ✦ The technician will advise you his instruction according to your description.

Appendix 1. Sonic Output Power: Testing Mode: B Mode

#	Testing Desc.	Standards and Application No.	Test result	Comment	Remark
1	Max. Power (mW)	The average sonic output power in the max. space. GB16846-1997 4.2.2a)	91. 5	-----	Test Freq. 3.5MHz
2	P-(MPa)	Peak Value Sonic Pressure, -) GB16846-1997 4.2.2b)	2. 54	-----	
3	Iab(mW/cm ²)	Output strength of the sonic wave GB16846-1997 4.2.2c)	9. 77	-----	
4	Ispta(mW/cm ²)	Average strength of the sound at the peak space. GB16846-1997 4.2.2d)	18. 90	-----	
5	System Config.	Ultrasonic equipment main config. GB16846-1997 4.2.2e)	F2	-----	
6	Lp(mm)	The distance between the points of face-to-output sound pressure pulse to the largest square GB16846-1997 4.2.2f)	38	-----	
7	Wpb6(mm)	-6dB Width of the pulse wave GB16846-1997 4.2.2g)	(∥): 2. 45 (⊥): 5. 50	-----	
8	Prr(kHz)	The repeating frequency of the pulse. GB16846-1997 4.2.2h)	Inapplicability	-----	
9	Srr(Hz)	Frequency of the repeating scanning GB16846-1997 4.2.2h)	24. 27	-----	
10	Dimension of the output wave (cm ²)	Parallel to the (∥) and vertical (⊥) under the direction of the size of reference, in scanning mode, the only centre of scan lines, in many cases, particularly in the contact system can be used ultrasound transducer or ultrasonic Transducer element group of geometry. GB16846-1997 4.2.2i)	9. 36	-----	
11	Fawf(MHz)	Working frequency of the average arithmetic sound GB16846-1997 4.2.2j)	2.85	-----	
12	APF	The coefficient of the opening sound GB16846-1997 4.2.2k)	100%	-----	
13	Boot-strap mode	Corresponding to automatically determine the mode of operation and system settings of the provisions of state, if the state provides a decision by the operator, says start-up mode "not applicable" (referred to as n / a). GB16846-1997 4.2.2l)	B Mode	-----	
14	AIF	The initial coefficient of the sound GB16846-1997 4.2.2m)	100%	-----	
15	nitializing Mode	Corresponding to automatically determine the mode of operation and system settings of the provisions of state, if the state provides a decision by the operator, says start-up mode "not applicable" (referred to as n / a). GB16846-1997 4.2.2n)	B Mode	-----	
16	Sound output Freeze	Up to the actual system GB16846-1997 4.2.2o)	Yes	-----	

Inspection state: M mode

#	Description	Standards	Results	Comments	Remark
1	Max. Power (mW)	The max. average output power. GB16846-1997 4.2.2a)	39. 1	-----	Test Freq. 3.5MHz
2	P-(MPa)	Peak value minus sound pressure GB16846-1997 4.2.2b)	2. 88	-----	
3	Iab(mW/cm ²)	Sound strength of the output wave GB16846-1997 4.2.2c)	13. 92	-----	
4	Ispta(mW/cm ²)	The average sound strength of the peak value. GB16846-1997 4.2.2d)	244. 73	-----	
5	System setting up	The main unit setting up. GB16846-1997 4.2.2e)	F2	-----	
6	Lp(mm)	Face-to-output sound pressure pulse to the largest square of the distance between points. GB16846-1997 4.2.2f)	38	-----	
7	Wpb6(mm)	-6dB Width of the pulse wave. GB16846-1997 4.2.2g)	(∥): 3. 50 (⊥): 5. 49	-----	
8	Prr(kHz)	Pulse repeating frequency GB16846-1997 4.2.2h)	3. 906	-----	
9	Srr(Hz)	Scanning repeating frequency. GB16846-1997 4.2.2h)	No	-----	
10	Dimension of the output wave (cm ²)	Parallel to the (∥) and vertical (⊥) under the direction of the size of reference, in scanning mode, the only centre of scan lines, in many cases, particularly in the contact system can be used ultrasound transducer or ultrasonic Transducer element group of geometry. GB16846-1997 4.2.2i)	2. 808	-----	
11	Fawf(MHz)	Arithmetic sound average working frequency. GB16846-1997 4.2.2j)	2. 85	-----	
12	APF	The coefficient of the sound opening GB16846-1997 4.2.2k)	88. 19%	-----	
13	Opening Mode	Corresponding to automatically determine the mode of operation and system settings of the provisions of state, if the state provides a decision by the operator, says start-up mode "not applicable" (referred to as n / a). GB16846-1997 4.2.2l)	B mode	-----	
14	AIF	Sound initial coefficient GB16846-1997 4.2.2m)	88. 19%	-----	
15	Initial Mode	Corresponding to automatically determine the mode of operation and system settings of the provisions of state, if the state provides a decision by the operator, says start-up mode "not applicable" (referred to as n / a). GB16846-1997 4.2.2n)	B mode	-----	
16	Sound output Freeze	Up to the actual system. GB16846-1997 4.2.2o)	Yes	-----	

Specifications shown are for the current models unless otherwise indicated. E & O.E. Design and specifications subject to change without notice.