

# User Manual



## Portable Digital Ultrasound Scanner

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# Responsibility on Manufacturer

All information contained in this manual is believed to be correct. Shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

Is responsible for the effects on safety, reliability and performance of this product, only if:

- z all installation operations, expansions, changes, modifications and repairs of this product are conducted by authorized personnel;
- z the electrical installation of the relevant room complies with the applicable national and local requirements; and
- z the product is used in accordance with the instructions for use.

## **Note:**

This equipment must be operated by skilled/trained clinical professionals.

## **Warning:**

It is important for the hospital or organization that employs this equipment to carry out a reasonable service/maintenance plan. Neglect of this may result in machine breakdown or personal injury.

Contents of this manual are subject to change without prior notice

# Unpacking Check

Please make sure that all things you purchased (marked in “√”), including the main unit, probe(s) and accessories, are all in packed in the box.

S/NO	Description		QTY	Package	Remarks
				Confirmation	
1	Main unit		1	√	
2	Probe	3.5MHz convex probe	1	Optional	
		7.5MHz rectal probe	1	Optional	
		5.0MHz micro convex	1	Optional	
		8.5MHz linear probe	1	Optional	
3	AC Power cable		1	√	
4	Built-in rechargeable battery		1	√	
5	User manual		1	√	

## Warranty

This warranty is exclusive and is in lieu of all other warranties. Expressed or implied, including warranties of merchantability or fitness for any particular purpose.

**The standard warranty period is as below:**

- ▲ **Main unit:** 12 months from shipment.
- ▲ **Probes:** 12 months from shipment.
- ▲ **Consumables:** N/A.

## Definitions

- **Main unit:** Integrated facilities which implements the specified function separately. Generally speaking, the main unit should include power supply, control system and some functional modules.
- **Accessories:** Materials connected to the main unit to extend or implement specified function.
- **Consumables:** Disposable or short-life parts which should be replaced each time after use or periodically like batteries.

## Exemptions

The obligation or liability under this warranty does not include any transportation fee, postage or other charges or liability for direct, indirect or consequential damages or delay resulting from the improper use or application of the product or the use of parts or accessories not approved by or repairs by people other than authorized personnel.

**This warranty shall not extend to:**

- ▲ Malfunction or damage caused by improper use or man-made failure.
- ▲ Malfunction or damage caused by unstable or out-of-range power input.
- ▲ Malfunction or damage caused by force majeure such as fire and earthquake.
- ▲ Malfunction or damage caused by improper operation or repair by unauthorized people.
- ▲ Malfunction of the instrument or part whose serial number is not legible enough.

# Return Policy

## Return Procedure

In the event that it becomes necessary to return this product, the following procedure should be followed:

**1. Return authorization:**

Contact the Customer Service Department by e-mail. Please provide the model number, serial number, and a brief description of the reason for return. It is for the purpose to obtain a Return Materials Authorization (RMA) number.

This (RMA) number must appear on the outside of the shipping container. Any returned shipments will not be accepted if the number is not clearly visible.

**2. Freight policy:**

The customer is responsible for freight charges when this product is shipped for service.

The freight will be paid by us if the returning scanner (parts) is in warranty.

**3. Return address:**

The Customer Service Department will send you the return address when RMA number provided.

## Important Information

1. The responsibility for maintenance and management of the product after delivery resides with the customer who has purchased the product.

2. The warranty does not cover the following items, even during the warranty period:

- (1) Damage or loss due to misuse or abuse.
- (2) Damage or loss caused by Acts of God such as fires, earthquakes, floods, lightning, etc.
- (3) Damage or loss caused by failure to meet the specified conditions for this system, such as inadequate power supply, improper installation, or unacceptable environmental conditions.
- (4) Damage or loss due to use outside the territory in which the system was originally sold.
- (5) Damage or loss involving system purchased from a different company or seller.

3. This system shall not be used by persons other than fully qualified and certified medical personnel.

4. Do not make changes or modifications to the software or hardware of this product.

5. We are not liable for problems, damage or loss caused by relocation, modification, or repair performed by personnel other than those designated by our company.

6. The purpose of this system is to provide physicians with data for clinical diagnosis.

The responsibility for diagnostic procedures lies with the physicians involved.

7. Important data must be backed up on external recording media such as clinical records, notebooks etc.

8. We shall not be liable for loss of data stored in the memory of this system caused by operator error or accidents.

9. This manual contains Warnings regarding foreseeable potential dangers. Be alert at all times to dangers other than those indicated. Shall not be liable for damage or loss that results from negligence or from ignoring the precautions and operating instructions contained in this user manual.

10. On the occasion of change of the administrator or manager for this system, be sure to hand over this user manual.

# Preface











To ensure safe and correct operation of the system, carefully read and understand this user manual before operating the system.

## Product Information

Product Name: Portable Digital Ultrasound Scanner.

## Symbols in Operator's Manual

The following table explains the safety symbols that may be used in this manual

Symbol	Signification
	Indicates the points requiring attention. Be sure to read the operator's manual concerning these points before using the system.
	(a) Cautions that the system must not be used around flammable gasses. (b) Urges Caution related to handling of the transducers. For handling of the transducers, refer to the transducers' manuals.
	Cautions that the system must not be removed covers because the high voltage may cause electric shock.
	Type-BF applied part
	Power switch OFF
	Power switch ON
	Video output
	USB port
	VGA port
	Equipotential terminal

## Packing and transportation labels explanation



Handle carefully



Temperature limit



Upward



Piling layer limit



Keep dry



Protect against heat

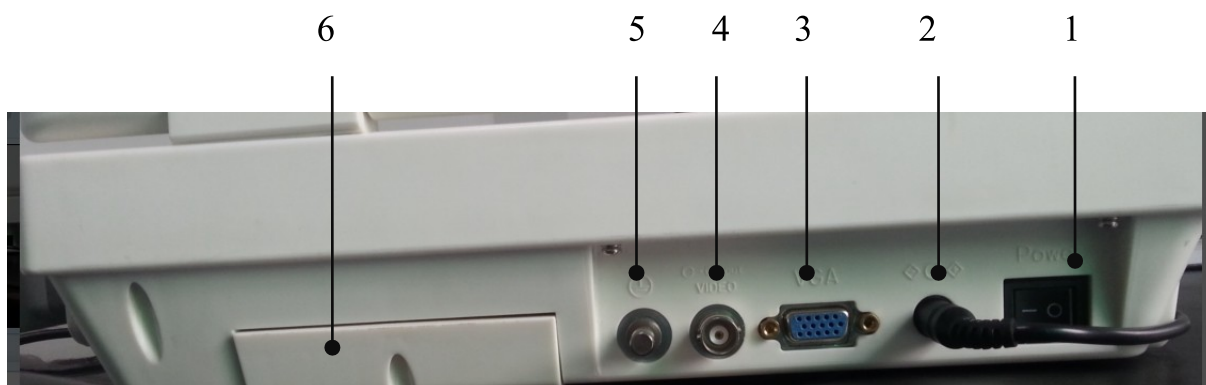


# 1 System Basics

## 1. 1 Structure



No.	Part	Description
1	10-inch TFT color LCD	Displays images, parameters, etc.
2	Keyboard	Operation keys
3	Probe socket	Probe connection



No.	Part	Description
1	Power switch	Power on/off of the system
2	Power input port	Connects the power cable of the system
3	VGA port	Connects the display, etc.

4	Video output port	Video output port
5	Equipotential terminal	Used for equipotential connection.
6	Battery	Built-in battery

## 1.2 Technical Specifications

Probe		6.5MHz Rectal probe	Optional XT-7.5MHz HF linear	Optional WT-20R/5.0MHz Micro convex	Optional 3.5 MHz convex probe
Display depth (mm)		240 (max)			
Maximal detect depth (mm)		≥190	≥80	≥90	≥90
Resolution (mm)	Lateral	≤2 (depth≤80) ≤3 (80 < depth≤130)	≤1 (depth≤60)	≤1 (depth≤40)	≤2 (depth≤80) ≤3 (80 < depth≤130)
	Axial	≤1 (depth≤80)	≤0.5 (depth≤80)	≤0.5 (depth≤40)	≤1 (depth≤80)
Blind zone(mm)		≤3	≤3	≤2	≤3
Geometric position precision	Horizontal	≤0	≤3	≤4	≤0
	Vertical	≤3	≤5	≤2	≤3
Monitor size		10.4Inch			
Display mode		B, B+B, B+M, B+M/M, M, 4B			
Image gray scale		256 Scale			
Cine loop		342 Frame			
Image storage		64 Frame			
Scan angle		Adjustable			
Scan depth		40mm-240mm			
Image flip		Up/down, left/right, black/ white			
Image Process		GAMA, Image Smoothen, THI, Histogram, Zoom			
Focus		Focus Number, Focus position, Focal space			
Measure		Distance, circumference, area, volume, heart, GA, FW, EDD			
Character display		Date, clock, name, PID, age, Sex, hospital name, doctor			
Notation		Full-screen character editor, posture mark, Position indication			
Output report		4 types			
USB port		USB2.0			
Power consumption (MAX)		200VA			
Size		1220mm×665mm×468mm			

# 2 System Connections

This chapter introduces how to connect the power supply, equipotential terminal, transducers and peripherals to the system.

**NOTE** : Before connecting the system, put the scanner in a proper place and ensure at least 20cm of clearance at the back and sides of the system.  
The transportation, storage and operating environments of the scanner must meet requirements listed in this manual.  
This chapter introduces how to connect the power supply, equipotential terminal, transducers and peripherals to the system.  
Store and use the system in a clean location where there is no direct sunlight, no sudden changes in temperature, no condensation, few dust, no vibration, and far from heat generators.

## 2.1 Connecting Power Supply

Connect the power plug of the system to an outlet meeting the following requirements:

- ◇ **Voltage:** 100-240V
- ◇ **Frequency:** 50/60Hz

**WARNING** : Do not connect the system to outlets with the same circuit breakers and fuses that control current to devices such as life-support systems. If the system malfunctions and generates an over current, or when there is an instantaneous current at power ON, the circuit breakers and fuses of the building's supply circuit may be tripped.

## 2.2 Connecting Peripherals

When the system is connected with other equipment such as printers, be sure to connect the equipotential terminal of the system and those of other equipment with lead wire.

**WARNING** : When the system is connected with other equipment, be sure to connect their equipotential terminals before inserting any of their power plugs into a receptacle, and also, be sure to remove the power plugs from receptacles before disconnecting the equipotential terminals.

### ● Video graphic printer

Connect the video input of the printer to video output on the rear of the unit.

**NOTE** : The printer should be operated according to the operation manual. The video graphic printers are SONY UP-895 MD / (SYN) and MITSUBISHI P91E or compatible with the two models.

**IMPORTANT :** Please use the appointed printer otherwise the user has to bear the responsibility of damaging the inner power.

## 2.3 Connecting probe and main unit

Check the power supply to see if it is in the expected range (AC110V ~ 130V/220V ~ 240V , 50Hz/60Hz), then connect the equipment and the power socket with the cable.

**Connect the probe:**



### **Warning:**

Do not by all means unplug or plug the probe connector at state of log on in case the probe and main unit be damaged.

Once the probe is connected with the main unit, do not unplug nor plug it at discretion in case poor contact happen.

The probe should be protected from falling off or crashing and the manufacturer assumes no responsibility for the kind of hazard.

Must not touch the contact pin in the probe connector.

Please handle the equipment carefully.

# 3

## Startup/Shutdown

### 3.1 Startup

- 1 Before the startup, complete the following checks:
  - The ambient temperature, humidity and atmospheric pressure meet requirements listed in the appendix.
  - The scanner is placed in a clean location where there is no direct sunlight, no sudden changes in temperature, no condensation, few dust, no vibration, and far from heat generators. Ensure at least 20cm of clearance at the back and sides of the system.
  - The scanner and peripherals have no deformation, damage or dirt. If necessary, clean the scanner (see Chapter 8 for details).
  - There are no obstacles in the area where the scanner can be moved and near the radiator holes of the system.
  - All power cables and connection cables are intact.
  - The probe(s) has (have) been cleaned and disinfected (see Chapter 8.3 for details).
  - The probe(s), connector(s) and cable(s) are intact.
  - The probe(s) is (are) connected to the system.
  - Peripherals to be used are connected to the system.
  - All connections are secure.
- 2 Ensure the power plug of the scanner is connected to an outlet meeting all requirements. For peripherals to be used, ensure their power plugs are connected to receptacles meeting requirements.
- 3 Turn on the scanner. For peripherals to be used, turn them on.
- 4 After the startup, check the system as follows.

**WARNING:** If you find any abnormality, turn off the system and see if the section lists any solution for the problem. If not, contact our company's Customer Service Department.

- Check whether the startup is normal.
- Check whether the system has any abnormal noise or smell or is overheated.
- Check by hand whether the surface of transducer is overheated.

**WARNING :** Using overheated transducers may burn patients.

- Check whether the keys and trackball on the control panel can work properly.
- Check whether the image is normal.
- Check whether any error information appears.
- Check whether the system date and time are the same as current ones and whether they are displayed correctly. If not, modify the system date and time.

If the system date and time are not the same as current ones, misdiagnosis may occur.

## 3.2 Shutdown

- 1 Put the probe (s) on its holder.
- 2 Turn off peripherals connected to the scanner.
- 3 Turn off the scanner.
- 4 If the scanner is not to be used for a period of time, remove power plugs of the system and peripherals from receptacles.
- 5 Clean and disinfect the probe(s) (see 10.4 probe maintenance and 10.5 cleaning for details)
- 6 And keep the probe(s).

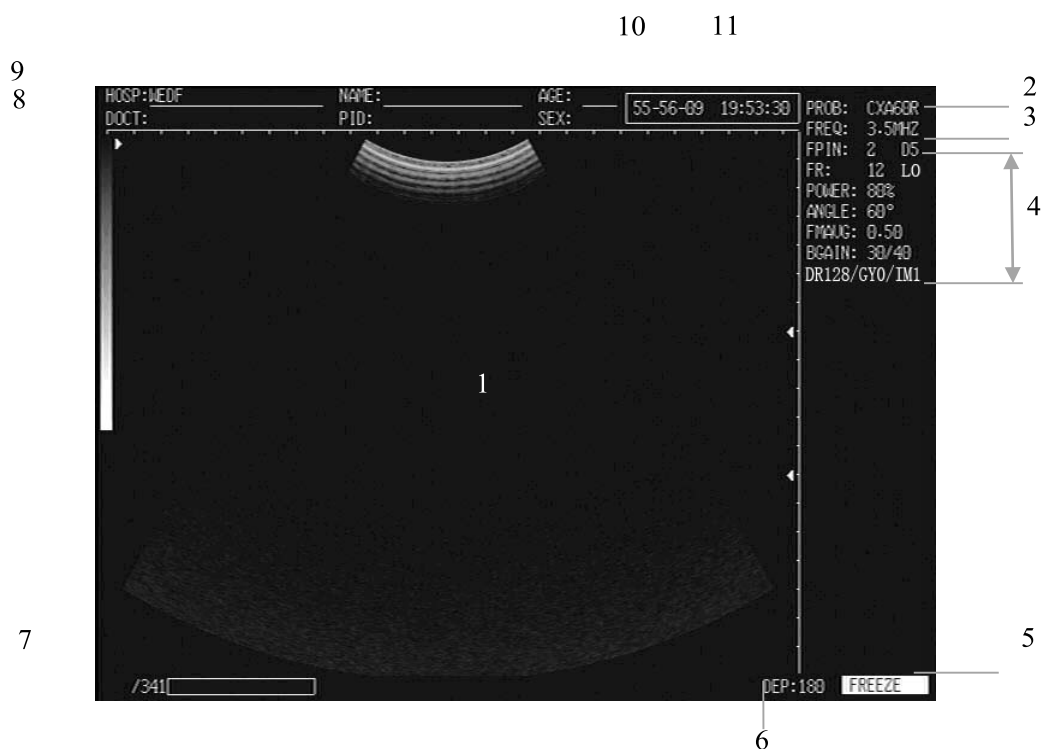
The system cannot be turned on again at least 10 seconds after it is turned off.

# 4 Operations

## 4.1 Keyboard



## 4.2 Screen Display



No.	Part	Description
1	Echo Area	The echo image showing here.
2	Probe	Current probe Rectal 6.5MHz: (probe may be different.)
3	Freq:6.5MHz	The current probe's working frequency.
4	Current Image Parameters	<ul style="list-style-type: none"> <li>● FPIN: 2 D5 --- Select focus point and place its position</li> <li>● FR: 12 H1 --- Set frame rate</li> <li>● POWER -----Select the acoustics power</li> <li>● ANGLE: 60° ----Select the scanning angle</li> <li>● FMAVG: 0.50 ----Frame rate setting</li> <li>● GAIN: 30/40 ---- Set over-all gain</li> <li>● DR128/GY0/IM1 -----Dynamical rate, Gama correction and Image Procession (reference Article 4.3, Article 4.7,3, Article 4.7.4)</li> </ul>
5	Freeze	Defining the echoes is in real-time or frozen.
6	Dep: 180	Current Scanning depth
7	*** /540	Cine Loop (see Article 4.6 Cine Loop)
8	→/←	Probe scanning direction. ---- The director where the letter "→" shows the initial scan position of the probe "→" means the first scan line from the left is the initial scan position of the probe; "←" means the first scan line from the right is the initial scan position of the probe.
9	Annotations	<ul style="list-style-type: none"> <li>● Hosp:----- Hospital name.</li> <li>● Name----- Patient name</li> <li>● DOC-----Doctor's name.</li> <li>● PID----- Patient ID number.</li> <li>● AGE ---- Patient's age.</li> <li>● SEX----- Patient's sex by F and M defined.</li> </ul> (see Article 4.5 Annotation Menu)
10	Current Date	Current date of the scanner (the date displayed on the frozen image is the date when the image is frozen)
11	Current Time	Current time of the scanner (The time displayed on the frozen image is the time when the image is frozen)

## 4.3 Operating procedure

1. Turn on the scanner by switch on its power-switch on the rear panel.
2. There is a word "welcome" showing on the screen. Then to press any one of key on the keyboard to have the system get into working-ready interface.
3. Press the key of "Annotation" to input all the needed information of patient, such as NAME, PID, AGE, SEX, HOPITAL and DOCTOR.
4. Spread ultrasonic coupling agent on the probe acoustic shadow surface, and close to the scanning area, then the real-time image can be observed on the screen.
5. Freeze the image first when the measurement needed to be done on the image.
6. Generate the Report and to print the report and image by the connecting the video printer.



## 4.4 General Setting

You have to do the following general setting before you do the scanning in accordance with the current probe and the focus where you want to scan. The parameters at the top right corner of the screen will be changed while you do the setting.

PROB: CXA60R FREQ: 6.5MHZ FPIN: 1 D0 FR: 20 H1 POWER: 80% ANGLE: 60 FMAVG: 0.40 BGAIN: 30/40 DR090/GY0/IM0
--

### 4.4.1 Probe Type

The probe will be identified automatically when it is mounted into the system.

### 4.4.2 Probe Frequency



- The current probe frequency is shown at the side of FREQ: on the top corner of screen.
- Press [FPEQUNCY] key if you want to change the current frequency of the probe. This key is loop designed and the frequency can be set by pressing it circularly.
- Difference probe has its difference frequency defined in the system (reference the following table):

No.	Probe	Frequency
1	L64/6.5MHz Rectal Probe	5.0MHz、 6.5MHz、 7.5MHz
2	R20/5.0MHz Micro-convex Probe	4.5MHz、 5.0MHz、 5.5MHz
3	R60/3.5MHz Convex Probe	2.5MHz、 3.5MHz、 5.0MHz
4	L40/7.5MHz Linear Probe	6.5MHz、 7.5MHz、 8.5MHz



- The current frequency shows by the side of FREQ: at the top right corner of the screen.
- Press [CANCEL] to exit the procedure.

### 4.4.3 Focus Setting

Select 1 or 2 points

- Press [Fpin] key to light the parameter of FPIN at the top corner of screen.
- This key is also loop designed for selecting “1” or “2” by re-pressing it. One (1) indicator of “ ” will appears on the caliper bar at the right side of screen, and two (2) indicators of “ ” will be on.
- The image frame rate would be decreased whenever “2” is selected.
- There are 5 difference space defined as 2, 3, 4,5,6 when [Fpin] is pressed circularly.
- Press [CANCEL] to exit the procedure.



#### Move focus

- When “2” point is selected, press [  ] or [  ] key to place the points on difference position. The indicators will be moved up or down along the caliper bar. Please to have them set on the interested position.
- Press [CANCEL] to exit the procedure.

#### **4.4.4 Acoustics Power Setting**

- This setting could not be done when the system is in frozen.
- Press [D/Spower] key to light the parameter of “POWER” at the top corner of screen. Then, re-pressing it to select the needed 80% or 100%.
- Strongly to suggest you not to select the highest rate to avoid any damage on human.
- Press [CANCEL] to exit the procedure.



#### **4.4.5 Scanning Angle Setting**

- This setting only can be done when the system is in real-time.
- Press [ANGLE] key to have the parameter of “ANGLE” light first. Then, press [  ] or [  ] key to select the needed number.
- Difference probe has its calculated angle in order to obtain the best image quality. Please reference the following table:

No.	Probe	Calculated Angle	Cine-loop frames
1	R603.5MHz Convex Probe	60° ~ 41 °	Max. 497 frames
2	R20/5.0MHz Micro-convex Probe	90° ~	Max.
3	R13/6.5MHz Transvaginal Probe	120° ~	Max.

- The number of its cine loop would be changed when difference angle is setting on difference probe. The max. frames could be referenced in accordance with the above table.
- Press [CANCEL] to exit the procedure.



#### **4.4.6 Frame-rate Setting**

- This setting only can be done when the system is in real-time B, 2B,4B modes.
- Press [M/velocity correlation] key to light the parameter of “FMAVG” at the top corner of screen. Then, press [  ] or [  ] key to set the needed rate. The rate number will be shown at the side of FMAVG.
- The setting range is between 0.20~0.95.
- Press [CANCEL] to exit the procedure.

#### **4.4.7 Gain Setting**

- Knob Over-all Gain controlling at the front panel to finish this setting.
- There are four steps defined in the system by 25, 30, 35, 40.
- Over-all gain range is from 0~62 degree.

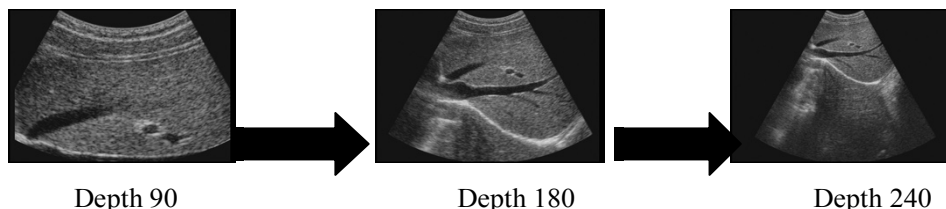
#### **4.4.8 Dynamic-range Setting**

- This setting could not be done when the system is in frozen.
- Press [Dr] key to have the parameter of DR light on the top corner of screen. Then, press [  ] or [  ]

- key to set the needed number on.
- The dynamic range of this scanner is from 0~192dB, and the adjustment here is from 064~192dB.
- Press [CANCEL] to exit the procedure.

#### 4.4.9 Scanning Depth Setting

- Scanning depth setting can be done when the system is in real-time.
- Press [Depth ↑] or [Depth ↓] key to adjust the scanning depth of this scanner. The image would be rolled up and down while the pressing.



- Difference probe has difference defined depth in the system. Please reference the following table when you do this adjustment.

No.	Probe	Depth Range (mm)
1	L64/3.5MHz Rectal Probe	65 ~ 140
2	R20/5.0MHz Micro-convex Probe	80 ~ 150
3	R603.5MHz Convex Probe	90 ~ 250
4	L40/7.5MHz Linear Probe	40 ~ 105

- Press [CANCEL] to exit the procedure.

#### 4.4.10 M Rate Setting

- This setting only can be done when the system is in real-time B+M and M modes.
- Press [B+M/M] key to have the system in Mode. There is a parameter "ST=0\*\*S" shown beside of Depth at the bottom of screen.
- When M mode is in moving, press [M/velocity Correlation] key to set the rate and the numerical number will be displayed at the side of "ST=" automatically.
- There are 4 steps defined in this system. They are by 6.00S, 5.00S, 4.00S, 2.50S.
- Press [CANCEL] to exit the procedure.

#### 4.4.11 Current Date Setting

(reference Article 4.5.7)

#### 4.4.12 Current Time Setting

(reference Article 4.5.7)

## 4.5 Annotation Menu

Press "Annotation" to generate Annotation Menu showing on the screen.

```
-----V1.16-----
1.  NAME:
2.  PID:
3.  AGE:
4.  SEX:
5.  COMMENT:
6.  TIME
7.  HOSP
8.  DOCT
9.  ERASE
```

### 4.5.1 Software Version

-----V1.16----- This is the software version installed in this system.

### 4.5.2 Name Inputting

```
-----V1.16-----
1.  NAME:
2.  PID:
3.  AGE:
4.  SEX:
5.  COMMENT:
6.  TIME
7.  HOSP
8.  DOCT
9.  ERASE
```

---- Select 1 by pressing numerical key "1", the following sub-menu appears on the screen:

```
PLEASE ENTER NAME:
■
```

---- Press the letters needed and then press [ENTER] to confirm.

---- 15 bytes allowed to be input here only.

---- Press [N/NEW P] key, then [ANNOTATION] if only patient info renewed only.

---- Press [CANCEL] key to exit the procedure.

### 4.5.3 Patient ID Inputting

```
-----V1.16-----
1.  NAME:
2.  PID:
3.  AGE:
4.  SEX:
5.  COMMENT:
6.  TIME
7.  HOSP
8.  DOCT
9.  ERASE
```

---- Select 2 by pressing numerical key "2", the following sub-menu appears on the screen:

```
PLEASE ENTER PID:
■
```

---- Press the numbers needed and then press [ENTER] to confirm.

---- 8 bytes allowed to be input here only.

---- Press [CANCEL] key to exit the procedure.

#### 4.5.4 Patient Age Inputting

-----V1.16-----

1. NAME:
2. PID:
3. AGE:
4. SEX:
5. COMMENT:
6. TIME
7. HOSP
8. DOCT
9. ERASE

---- Select 3 by pressing numerical key “3”, the following sub-menu appears on the screen:

PLEASE ENTER AGE:  
■

---- Press the numbers needed and then press [ENTER] to confirm.  
---- 3 bytes allowed to be input here only.  
---- Press [CANCEL] key to exit the procedure.

#### 4.5.5 Patient Sex Inputting

-----V1.16-----

1. NAME:
2. PID:
3. AGE:
4. SEX:
5. COMMENT:
6. TIME
7. HOSP
8. DOCT
9. ERASE

---- Select 4 by pressing numerical key “4”, the following sub-menu appears on the screen:

PLEASE ENTER SEX:  
3. MALE, 2. FEMALE

---- Select “1” or “2” by the numerical key “1” or “2”. Then, “M” and “F” will be shown at beside of SEX.  
---- Press [CANCEL] key to exit the procedure.

#### 4.5.6 Annotation on Image

-----V1.16-----

1. NAME:
2. PID:
3. AGE:
4. SEX:
5. COMMENT:
6. TIME
7. HOSP
8. DOCT
9. ERASE

---- Select 5 by pressing numerical key “5”, a cursor appears on the screen.  
---- Move the cursor with the trackball to the position where the annotation should be on the image. Then, input the needed characters.  
---- This scanner is full screen editor allowed.  
---- Press [CANCEL] key to exit the procedure.

#### 4.5.7 Current Time and Date Setting

-----V1.16-----

1. NAME:
2. PID:
3. AGE:
4. SEX:
5. COMMENT:
6. TIME
7. HOSP
8. DOCT
9. ERASE

---- Select 6 by pressing numerical key “6”, the following sub-menu appears on the screen:

YY-MM-DD  
■  
HH-MM-SS  
■

---- 2 bytes allowed in each item. Input “13” to indicate the year of 2018.  
---- 24 hours setting for the current time.  
---- Press [CANCEL] key to exit the procedure.

#### 4.5.8 Hospital Name Inputting

```
-----V1.16-----
1.  NAME:
2.  PID:
3.  AGE:
4.  SEX:
5.  COMMENT:
6.  TIME
7.  HOSP
8.  DOCT
9.  ERASE
```

---- Select 7 by pressing numerical key “7”, the following sub-menu appears on the screen:

```
PLEASE ENTER HOSP:
■
```

---- Press the name of the hospital and then press [ENTER] to confirm.

---- 18 bytes allowed to be input here only.

---- Press [CANCEL] key to exit the procedure.

#### 4.5.9 Doctor Name Inputting

```
-----V1.16-----
1. NAME:
2. PID:
3. AGE:
4. SEX:
5. COMMENT:
6. TIME
7. HOSP
8. DOCT
9. ERASE
```

---- Select 8 by pressing numerical key “8”, the following sub-menu appears on the screen:

```
PLEASE ENTER DOCT:
■
```

---- Press the name of the doctor and then press [ENTER] to confirm.

---- 14 bytes allowed to be input here only.

---- Press [CANCEL] key to exit the procedure.

#### 4.5.10 Images Erase

```
-----V1.16-----
1.  NAME:
2.  PID:
3.  AGE:
4.  SEX:
5.  COMMENT:
6.  TIME
7.  HOSP
8.  DOCT
9.  ERASE
```

---- Select 9 by pressing numerical key “9”, the following sub-menu appears on the screen:

```
ERASE ALL STORAGE?
1.YES  2.NO
```

---- Select 1 or 2 by pressing its related numerical key “1” or “2”.

---- There is a prompt in words of “ERASING....” appeared on the left top of screen when “1” is selected. Any operation is forbidden when this prompt is on.

    This prompt will be disappeared automatically when it is finished.

---- Press [CANCEL] key to exit the procedure.

## 4.6 Keyboard Function

### [ B ] B-mode

Press down this key, then the screen goes back to single-B display mode. Be able to “zoom local” and “picture in picture” while the image magnifications is  $\times 1.0$  only in the single-B display mode.

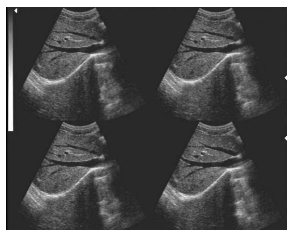
### [ B+B ] B+B-mode

The double B-mode key selects dual images on the screen, if the screen is already in dual image mode; press down the same key is used to select the live image at the left side or at the right side on the screen.

### [ B+M/M ] B+M and M mode

- First press [ B+M/M ] key, both B and M images will be displayed on the screen. There is a reference line with dots showing on B-mode image, which can be moved with the trackball.
- Press [ B+M/M ] key again to have M mode displayed on the screen only.
- Press [ M/velocity Correlation ] key when M mode is in real-time to change its moving speed (reference in Article 4.4.10). The speed is showing in number in the parameter of ST=\*\*\*S at the bottom of screen.

### [ 4B ] 4B mode



- 4 difference images will be displayed on the screen when this key is pressed down.
- One of them is in real-time, and the others are in frozen status. To switch the frozen image into real-time by pressing this key continuously.
- Confirm the displaying mode before menu operation.

### [ CLEAR ] Screen Cleaning

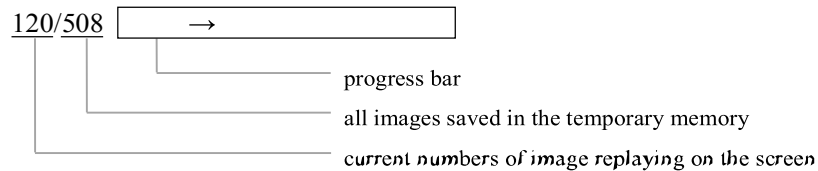
Press down this key to clear the text annotation on the screen.

### [ FREEZE ] Freeze

Press down this key to enable the image in frozen and unfrozen.

### [ Cine Loop ] Cine Loop

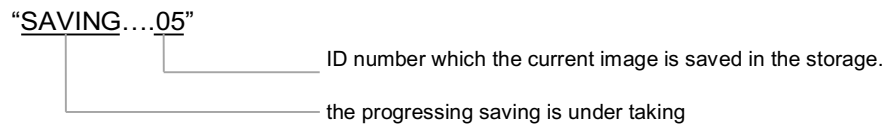
- Press [FREEZE] key to have all images saved in the temporary memory when real-time diagnosis is finished.
- The max. time for collecting is about 30 seconds.
- Press [Cine Loop] key to replay images saved in the temporary memory. The state of replaying is showing both in live numbers and the progress bar at the bottom of screen.



- You can use the trackball or [↑] and [↓] keys to scroll forward or backward through cine-loop one by one.
- Press [B+B] key to switch the window when the scanner is in B+B mode.
- Cine-loop would not work if the probe changed during playback, either display mode is changed.
- Cine-loop time would be increased or decreased if the angle is changed. The current time is showing beside ST=\*\*\*S at the bottom of screen.
- Press [FREEZE] key to exit the procedure.

### [ SAVE ] Image Saving

- The memory capability of the scanner is defined as Max. 64 frames. This function is permanent.
- Press [FREEZE] key first when the real-time diagnosis is finished.
- Once pressing [Save] key, there is a prompt in words of "SAVING....05" appeared on the left top of screen



- Any operation is forbidden when the prompt is shown on, and it will be disappeared when the saving is completed.
- Usually the image ID number is sequenced from 01~64 circularly. A number once is occupied and then deleted in the memory, it could be randomized as a new ID.
- The sub-menu will be displayed on the screen when 65 images are saved in the memory:

STORAGE IS FULL. ERASE NO.01 ?  
1. YES    2. NO

- Press number key "1" to allow the new image to overwrite the previous image and defined as NO.1.
- Press number key "2" to give up saving the new image on No. 1. Then, another ID will be recommended by the system when you attempt to save a new image.
- Press [FREEZE] key to exit the procedure.

### [ LOAD ] Image Recalling

- Press [RECALL] key to generate a sub-menu shown on the screen:

PLEASE ENTER STORAGE NO.:  
■

- Input ID number of the saved image, or any other ID, then press [CONFIRM] key, the wanted image recalled showing on the screen. Its ID number will be shown as format in \*\*/64 at the bottom of screen.
- Press [FREEZE] key to exit the procedure.



### **[Up/Down]** Image Up/Down

- Press [Up/Down] to have the image converted up and down
- There is no UP/down function when system is in 4B mode.




Up



Down

### **[Left/Right]** image Left/Right

- Press [Left/Right] key to have the image converted left and right.
- Probe director mark  which is on the left top corner of screen, will be changed in accordance with the pressing and the current direction is shown on.



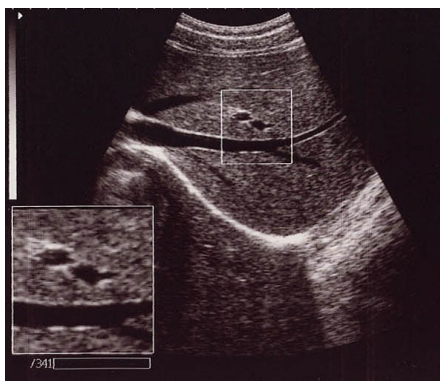
Left



Right

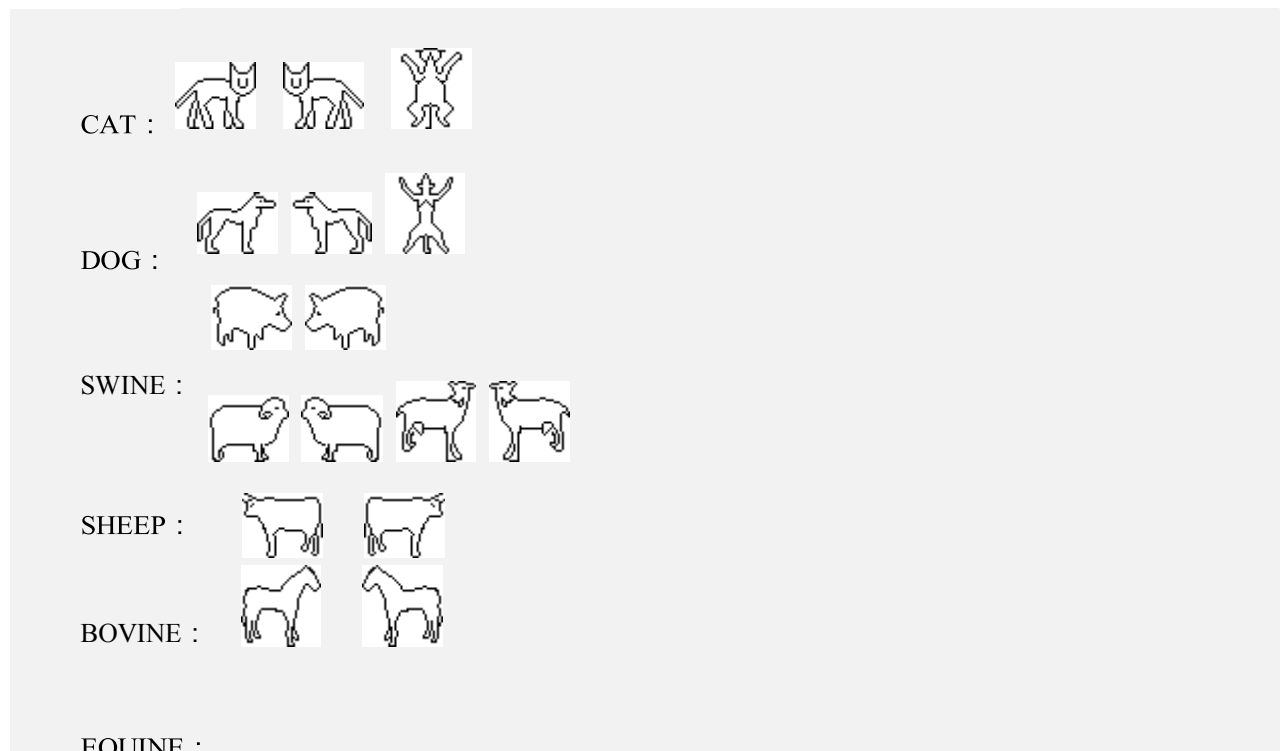
### **[ Zoom]** Zoom

- Press [ZOOM] key to display a ZOOM picture in picture.
- Move the ZOOM picture with the trackball to the interested position on the image. The size of ZOOM could be changed by pressing [ ↑ ] and [ ↓ ] keys.
- The picture in ZOOM is in 2-times of the original.
- Re-press the key or press [CLEAR] to exit.



## [BODY MARK] Body Mark

---- Press “**Body mark**” key to active body mark. There are 40 body marks, press this key repeatedly to display these marks circularly



### Position indicator

---- Press [Body Mark] key to have its mark showing on, and select the right one by pressing it circularly.  
---- Press [CONFIRM] key to have “↖” appeared on the mark. Then press [REF.] to turn the indicator till it is on right direction.  
---- Press [CANCEL] to exit.

## 4.7 Image Processing

### [Image Processing] Image

---- There is [Image Processing] key among the alphanumeric. It is for starting on the post-processing.  
---- Press [Image Processing] key to display a sub-menu on the screen.

```
-----V1.16-----  
1.  IMG-PROC  
2.  NOM-IMG  
3.  NOM-THI  
4.  POSI-NEGA  
5.  GAMA-GREY  
6.  HISTOGRAM
```

---- There are differences ways for image post-processing by pressing its corresponding number to enter.  
---- Press [CANCEL] to exit the procedure.

### 4.7.1 Image Smoothing

- Press [Image Processing] key to have its sub-menu shown on the screen, then choose "IMG-PROC" by pressing numerical key "1".
- "IM0" in General Setting is lighten in accordance with key "1" pressing.
- There are 4 levels for you to select: "IM0, IM1, IM2, IM3". Choose them by pressing [↑] and [↓] keys.
- Press [CANCEL] to exit the procedure.



Ordinary image



Processed image by smoothing

PROB: L64  
FREQ: 6.5MHZ  
FPIN: 1 D0  
FR: 20 H1  
POWER: 80%  
ANGLE: 60  
FMAVG: 0.40  
BGAIN: 30/40  
DR090/GY0/IM0

- V1.16-----
1. **IMG-PROC**
  2. NOM-IMG
  3. NOM-THI
  4. POSI-NEGA
  5. GAMA-GRE
  6. HISTOGRAM

### 4.7.2 Tissue Harmonic Imaging

- Press [Image Processing] key to have its sub-menu shown on the screen.
- Choose "NOM-THI" by pressing numerical key "3". "THI" also will be lightened on the bottom of screen.
- Re-pressing "3" key, back to normal.
- Press [CANCEL] to exit the procedure.



Close THI



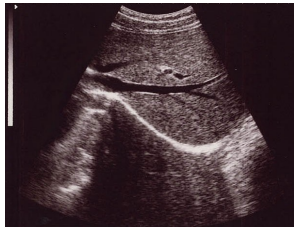
Open THI

- V1.16-----
1. IMG-PROC
  2. NOM-IMG
  3. **NOM-THI**
  4. POSI-NEGA
  5. GAMA-GRE
  6. HISTOGRAM

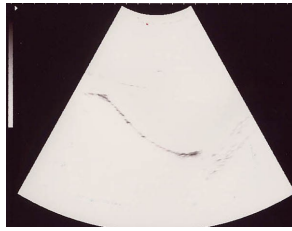
### 4.7.3 Image Black/White

- Press [Image Processing] key to have its sub-menu shown on the screen.
- Choose "POSI-NEGA" by pressing numerical key "4". The image will be converted into WHITE negative. Repeat pressing, converted back to normal
- Press [CANCEL] to exit the procedure.

- V1.16-----
1. IMG-PROC
  2. NOM-IMG
  3. NOM-THI
  4. **POSI-NEGA**
  5. GAMA-GRE
  6. HISTOGRAM



Normal



White

#### 4.7.4 Gray correction

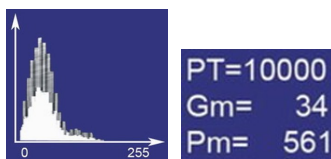
- Press [Image Processing] key to have its sub-menu shown on the screen.
- Choose "GAMA-GREY" by pressing numerical key "5". "GY0" in General Setting is lightened in accordance with key "5" pressing.
- There are 4 levels for you to select from GY0 to GY7. Choose them by pressing [↑] and [↓] keys.
- This function would be converted into Gray-scale Correction if an external monitor is connected with this scanner.

PROB:L64  
FREQ: 6.5MHZ  
FPIN: 1 D0  
FR: 20 H1  
POWER: 80%  
ANGLE: 60  
FMAVG: 0.40  
BGAIN: 30/40  
DR090/GY0/IM0

- V1.16----
1. IMG-PROC
  2. NOM-IMG
  3. NOM-THI
  4. POSI-NEGA
  5. GAMA-GRE
  6. HISTOGRAM

#### 4.7.5 Histogram

- The function is valid when the system is in frozen only.
- Press [Image Processing] key to have its sub-menu shown on the screen.
- Choose "HISTOGRAM" by pressing numerical key "6". Then, there is a square frame appeared on the screen.



- V1.16----
1. IMG-PROC
  2. NOM-IMG
  3. NOM-THI
  4. POSI-NEGA
  5. GAMA-GRE
  6. HISTOGRAM

- Move this square frame to the interested position on the image. It's size could be changed by pressing [↑] and [↓] keys.
- Press [Measure] key on the keyboard to dictate the calculation, and its statistics result will be displayed on automatically on the bottom right of screen.

PT-----the totality pixel in the frame.  
GM-----the gray value at the peak.  
PM-----the number of pixel at peak.

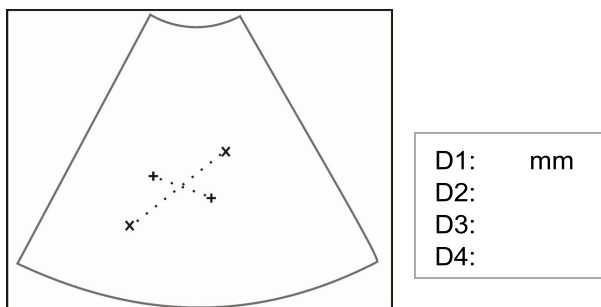
- Press [CLEAR] to exit.

# 5 Measurements

## 5.1 Normal Measurement

### 5.1.1 Distance

- First, freeze the image.
- Second, press [DIST] to have a caliper shown on the screen.
- Move the caliper to the measuring start point with the trackball.
- Then, press [REF.] key to confirm this start point. Move the caliper again to the end point. The distance result will be shown in numbers at the right side of screen along this moving.
- “Start point” and “End point” can be exchanged by pressing [REF.] key.
- Repeat above steps to do next measurement. There are 4 difference calipers designed in the system so that 4 groups measurement can be done on the same image, and their results will be shown at the right side of screen.
- Press [CANCEL] key to exit.



### 5.1.2 Circumference & Area

There are difference ways to do these measurements.

#### Free-hand Measurement

- Press [CLEAN] key to clear all the measuring on the image.
- Press [A/C] key generate a sub-menu appeared on the screen:

PLEASE ENTER:  
1.FREEHAND 2.ELLIPSE

- Choose “FREEHAND” way by pressing key “1”, and a caliper will be shown on the screen.
- Move the caliper to the start point with the trackball, then [REF.] key to confirm this point.

- Move the caliper along the edge of focus then Press [REF.] again when the path is close to the end. Then the path will be closed automatically and its result will be shown at right side of screen.
- Repeat above steps to do next measurement, max.4 groups in all. The results will be shown at the right side of screen.

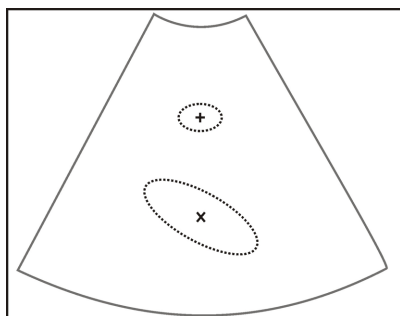


### Elliptical method measurement

- First, [FREEZE] the image.
- [CLEAN] all data on the screen.
- Press [A/C] key to generate a sub-menu displayed on the screen:

PLEASE ENTER: 1.FREEHAND    2.ELLIPSE
--

- Choose "ELLIPSE" way by pressing key "2", and a round frame will be shown on the screen.
- Move the round frame to interesting position with the trackball.
- Press down [CONFIRM] key, then to adjust the size of round frame with the trackball.
- Press down [REF.] key, then to turn around this frame with the trackball too.
- Keep pressing [CONFIRM] and [REF.] keys 5~7 times alternately till the round frame matching the focus.
- The result will be shown automatically while the round frame is in adjustment.
- Max.2 groups could be done in the procedure. The results will be shown at the right side of screen.
- Don't forget to clean the screen before re-measurement done.

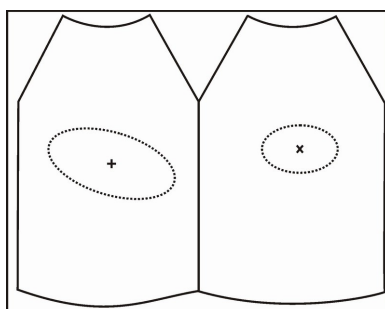
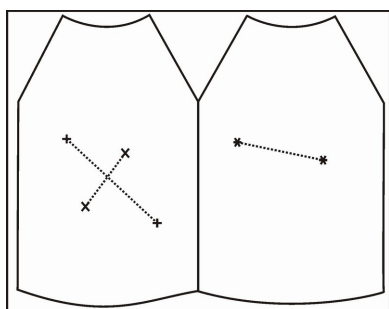


\*C1:      mm

## 5.1.3 Volume Measurement

### Axial method

- B+B mode is selected first, and to obtain the echoes both in longitudinal and transversal direction.
- Use the way of "distance" to do 2 measurements in axial and horizontal, and to the 3<sup>rd</sup> measurement on the other echoes.
- The system will calculate these 3-group data automatically and the volume result will be shown on the right side of screen when the 3<sup>rd</sup> measurement is finished.
- Max.2 groups could be done in this procedure.
- Press [MEAS.] or [CANCEL] to exit.



V1:      mm3  
V2:      mm3

## 5.2 Cardiac Measurement

- Switch on the system in B+M or M mode when the cardiac measurement should be done.
- Press [MEASURE] key to generate a sub-menu displayed on the screen.

-----V1.16-----	
4. LV<VF>	---- Left Ventricular
5. AV	---- Aortic Valve
6. MV	---- Mitral Valve
7. PV	---- Pulmonary Valve
	---- Tricuspid Valve
8. TV	
9. HR	---- Heart Rate

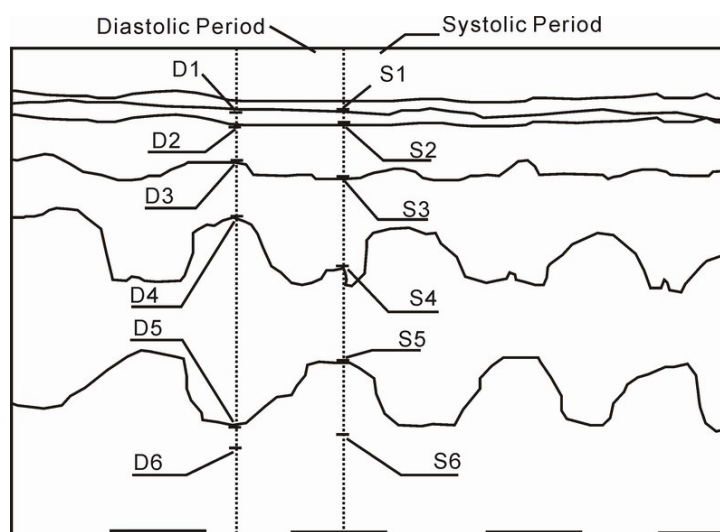
- Press [CANCEL] to exit.

## 5.2.1 Left Ventricular

By measuring the diastolic period and systolic period: posterior wall of the right ventricular, anterior wall of the interventricular septum, posterior wall of the interventricular septum, endocardium of the posterior wall of the left ventricular, epicardium; to calculate the diastolic period and systolic period respectively: thickness of the left cardiac wall, diameter of the right ventricular, diameter of the left ventricular, thickness of the posterior wall of the left ventricular, thickness of the interventricular septum, volume of the left ventricular, heartbeat flow, ECG output, systolic fraction and ejection fraction.

### Operation Procedure:

1. Enter the B/M mode, and move the mouse to change the position of the sampling lime. Press the "Freeze" key when the proper M mode image appears;
2. Press [Measure] key and the cardiac measurement menu will appear;
3. Press the "1" key to select "**LV<VF>**", a vertical time bar will appear in the M image;
4. Move the time bar to the end of the diastolic period and press [Confirm] key, mark the anterior wall of the right ventricular (D1) with [Confirm] key. Some mark points of the diastolic period are described as follows and mark the following several points with the same method: D2——  
Posterior Wall of the Right Ventricular in the Diastolic Period  
D3——Anterior Wall of the Interventricular Septum in the Diastolic Period D4——  
Posterior Wall of the Interventricular Septum in the Diastolic Period D5——  
Endocardium of the Posterior Wall of the Left Ventricular in the Diastolic Period D6——  
Epicardium in the Diastolic Period
5. (D6) After marking, the second-time bar will appear, move the time bar to the end of the diastolic period and press [Confirm] key and mark the anterior wall of the right ventricular (S1) of the systolic period with [Confirm] key. Some mark points of the diastolic period are described as follows and mark the following several points with the same method:  
  
S2——Posterior Wall of the Right Ventricular in the Systolic Period S3——  
——Anterior Wall of the Interventricular Septum in the Systolic Period S4——  
——Posterior Wall of the Interventricular Septum in the Systolic Period  
S5——Endocardium of the Posterior Wall of the Left Ventricular in the Systolic Period S6——  
Epicardium in the Systolic Period
6. (S6) After the marking finishes, the measurement results will display on the right side of the screen automatically.



Left Ventricular Measurement



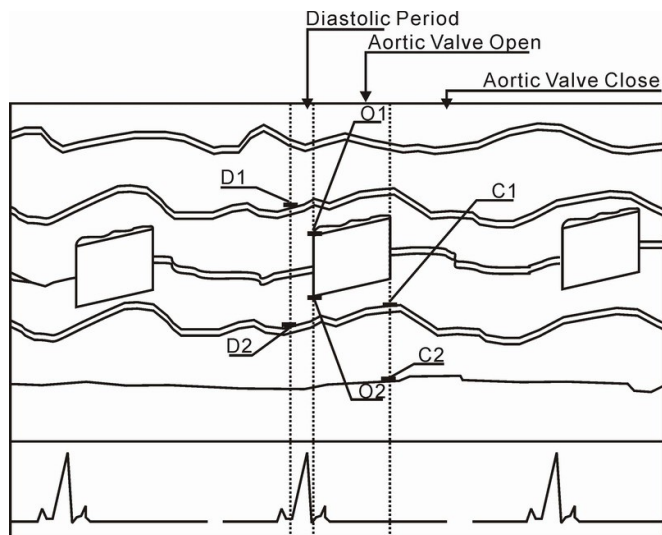
RHWD—Thickness of the Right Cardiac Wall in the Diastolic Period (mm)  
 RHWS—Thickness of the Right Cardiac Wall in the Systolic Period (mm)  
 RVD—Right Ventricular Diameter in the Diastolic Period (mm) RVS—  
 Right Ventricular Diameter in the Systolic Period (mm) LVDD—Left  
 Ventricular Diameter in the Diastolic Period (mm) LVDS—Left Ventricular  
 Diameter in the Systolic Period (mm)  
 PLVWD—Thickness of the Posterior Wall of the Left Ventricular in the Diastolic Period ( mm)  
 PLVWS—Thickness of the Posterior Wall of the Left Ventricular in the Systolic Period (mm)  
 IVSD—Thickness of the Interventricular Septum in the Diastolic Period (mm)  
 IVSS—Thickness of the Interventricular Septum in the Systolic Period (mm)  
 LVEDV—Left Ventricular Volume at the end of the Diastolic Period (ml)  
 LVESV—Left Ventricular Volume at the end of the Systolic Period (ml)  
 SF—Systolic Fraction (%)  
 EF—Ejection Fraction (%) SV—  
 Heartbeat Volume (ml) CO—  
 ECG Output (ml)

## 5.2.2 Aortic Valve Measurement

Calculate the aortic valve diameter, open size of the aortic valve and the ratio between the aortic valve and left atrium to study the aortic valve.

### Operation Procedure:

1. Enter the B/M mode and move the mouse to change the position of the sampling line. Press [Freeze] key when proper M mode image appears;
2. Press [Measure] key and the cardiac measurement menu will appear;
3. Press the “2” key to select “AV”, and a vertical time bar will appear in the M image;
4. Move the time bar to the end of the diastolic period and press [Confirm] key, mark the anterior wall of the aortic valve (D1) and the posterior wall of the aortic valve (D2) with “Confirm” key, the second-time bar will appear after the marking;
5. Move the time bar to the open point of the aortic valve and press [Confirm] key, mark the anterior lobe of the aortic valve (O1) and posterior lobe of the aortic valve (O2) with the same method, the third-time bar will appear after the marking;
6. Move the time bar to the close point of the aortic valve and press [Confirm] key, mark the posterior wall of the aortic valve (C1) and posterior lobe arterial wall (C2);
7. When all the measurements finish, the calculation results of the aortic valve will display on the right side of the screen.



Aortic Valve Measurement

AO—The Aortic Root Diameter at the end of the Diastolic Period (mm)

LA—Diameter of the Left Ventricular at the end of the Systolic Period (mm)

AVO—Distance between the Aortic Anterior Lobe and Posterior Lobe and the Open Point of the Aortic Valve (mm)

LAR—Left Atrium/Aorta Ratio

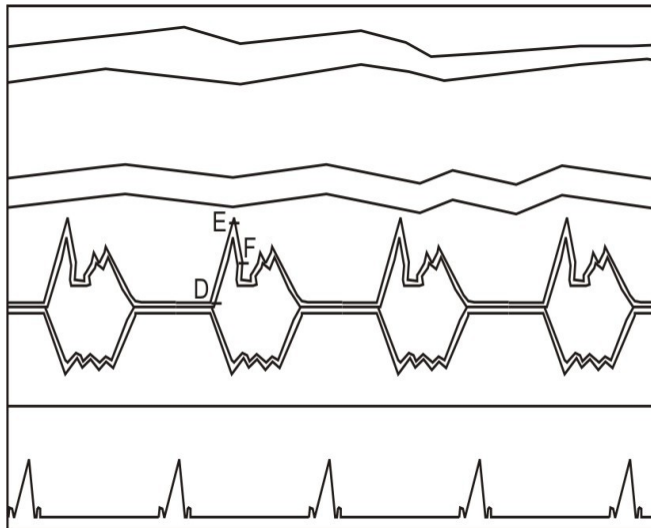
LVET—Left Ventricular Ejection Time (second)

### 5.2.3 Mitral Valve Measurement

The research of the mitral valve allows the user to estimate the D-E and E-F displacement, D-E and E-F slope, D-E and E-F time on the D wave, E wave and F wave under the M mode and BM mode.

#### Operation Procedure:

1. Enter the B/M mode and move the mouse to change the position of the sampling line, press [Freeze] key when the proper M mode image appears;
2. Press [Measure] key and the cardiac measurement menu will appear;
3. Press the “3” key to select “MV”, move the cursor to the Q wave position of the M mode image area and press [Confirm] key, mark “D”;
4. Mark the following mitral valve waves with the same method;
  - E: E Wave
  - F: F Wave
5. After the marking finishes, the measurement results will display on the right side of the screen automatically.



Mitral Valve Measurement

DE<EX>—Distance from Point D to E on the Y Axis (mm)

EF<EX>—Distance from Point E to F on the Y Axis (mm)

DE<TM>—DE Time (second)

EF<TM>—EFTIME (second)

DE<SL>—slope= (Point E on the Y Axis –Point D on the Y Axis)/ (Point F on the X Axis-Point D on the X Axis) (mm/second)

EF<SL>—slope= (Point E on the Y Axis –Point F on the Y Axis)/(Point F on the X Axis- Point E on the X Axis) (mm/second)

## 5.2.4 Pulmonary Valve Measurement

In this measurement, it is a characteristic calculation parameter. Calculate the pulmonary valve according to the following point marking position.

A: Maximum Downward Position of the Valve of the Atrial Systolic Period

B: Start Point of the Ventricular Systolic Period

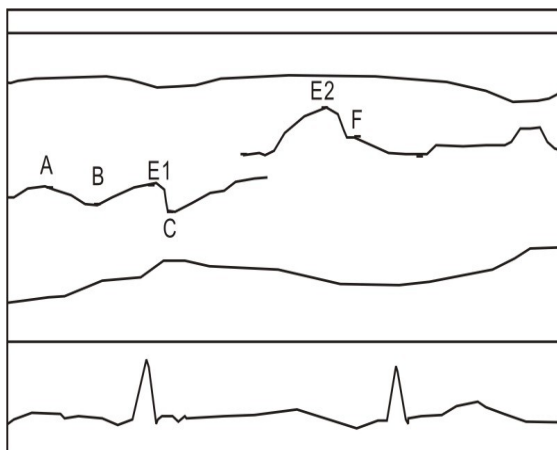
C: Maximum Open Point of the Lobule

E1: Start Point of the Ventricular Diastolic Period

E2: Complete Close Point of the Valve

F: Start Point of the Atrial Systolic Period

Mark the above points with the method described above, when the marking finishes, the measurement results will display on the right side of the screen automatically.



Pulmonary Valve Measurement

A<DEP>——Depth:

The distance from point F to point A is the distance from the start point of the atrial systolic period to the maximum downward position of the pulmonary valve. The distance from point F to A on the Y axis is the maximum movement range of the pulmonary valve in the atrial systolic period.

$A<DEP>Depth = AY - FY$  (mm)

AY is point A on the Y axis, and FY is point F on the Y axis.

EF<SL>——Slope:

When the initial blood flow from the atrium, E1 is the start point of the ventricular diastolic period and F is the inflow start point of the atrial systolic period.

$EF<SL>Slope = (FY - E1Y) / (FX - E1X)$  (mm/second)

FY is point F on the Y axis, E1Y is point E1 on the Y axis, FX is point F on the X axis and E1X is point E1 on the X axis.

BC<DS>——Diameter:

BC is the open part of the pulmonary valve in the ventricular systolic period and the part on the Y axis the movement distance of lobule when the pulmonary valve opens to the maximum.

$BC<DS> diameter = CY - BY$  (mm)

CY is point C on the Y axis, and BY is point B on the Y axis.

BC<SL>——Slope:

$BC<SL>Slope = (CY - BY) / (CX - BX)$  (mm/second)

CY is point C on the Y axis, BY is point B on the Y axis, CX is point C on the X axis and BX is point B on the X axis.

RVET——Ejection Time of the Right Ventricular:

Ejection time of the right ventricular is the time from point B to E2 of the opening of the pulmonary valve.

$RVET = E2X - BX$  (second)

E2X is point E2 on the X axis, and BX is point B on the X axis.

## 5.2.5 Tricuspid Valve Measurement

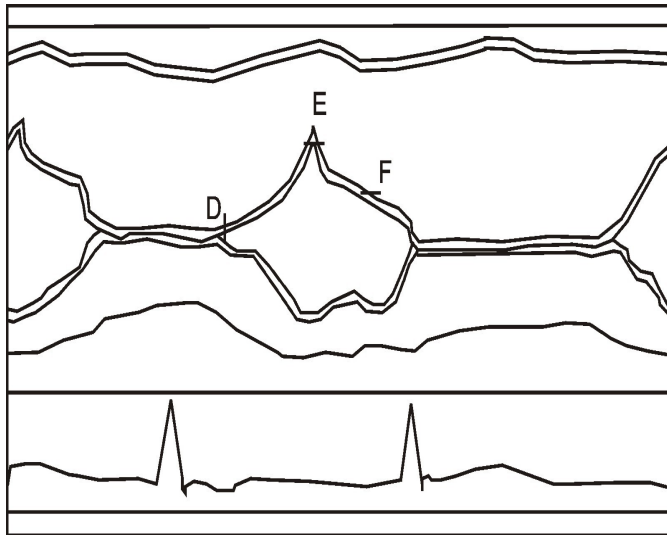
Tricuspid valve measurement is similar to mitral valve measurement, and the following three points are used for:

D: Open point of the tricuspid valve and the end of the systolic period of the right ventricular

E: Maximum Point of the Tricuspid Valve Orifice

F: The tricuspid valve closes completely

Mark the above points with the method described above, when the marking finishes, the measurement results will display on the right side of the screen automatically.



Tricuspid Valve Measurement

DE<EX>— Distance from point D (right ventricular in the front of the tricuspid valve orifice) to point E (maximum tricuspid valve orifice) (mm)

EF<EX>—Distance from point E to point F on the Y axis (mm)

DE<TM>—DE time (second)

EF<TM>—EF time (second)

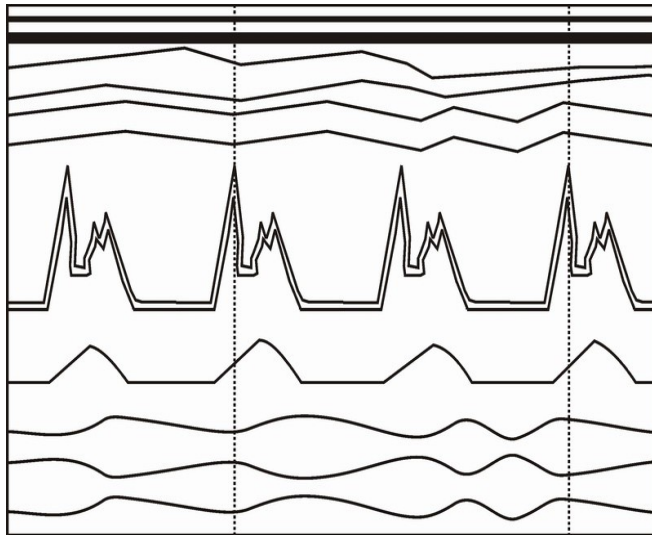
DE<SL>—Slope= (Point E on the Y axis–Point D on the Y axis)/ (Point F on the X axis – Point D on the X axis) (mm/second)

EF<SL>—Slope= (Point E on the Y axis–Point F on the Y axis) / (Point F on the X axis – Point E on the X axis) (mm/second)

## 5.2.6 Heart Rate Measurement

### Operation Procedure:

1. Enter the B/M mode, move the mouse to change the position of the sampling line, press [Freeze] key when proper M mode image appears;
2. Press [Measure] key and the cardiac measurement menu will appear;
3. Press the “6” key to select “HR”, a vertical time bar appears in the M image;
4. Move the time bar to the first wave peak and press [Confirm] key, the second-time bar appears;
5. Move the time bar to the third wave peak and press [Confirm] key;
6. The measurement finishes and the measurement results will display on the right side of the screen.



Heart Rate Measurement

TM—Time (second)  
HR— Heart Rate (times/minute)

## 5.3 Obstetric Calculation

The equipment can calculate gestation age, expected date of delivery according to 7 parameters such as BPD, FL, AC , HC, CRL,GS, first day of the last menses. Therein, BPD can be used to calculate fetus weight.

---- [FREEZE] first, then press [OB table] key to generate the obstetrics menu appeared on the screen.  
---- Press [ESC] key to exit.

——V1.16——
1. EQUINE—GSD
2. BOVINE—BL
3. BOVINE—SL
4. BOVINE—HL
5. SWINE—HL
6. SHEEP—USD
7. CAT—HD
8. CAT—BD
9. DOG—GSD
A. DOG—CRL

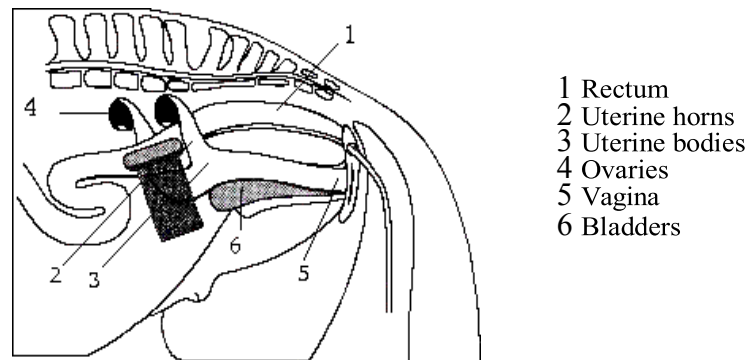
Repeat the above operation to select the required obstetrics table circularly (It can be showed the expected date of childbirth of DOG and CAT).

After that, select the distance parameter according to distance measurement method, the corresponding gestation age data will be automatically showed below “G·A=”, the expected date of childbirth will be automatically showed below “EDD=”, details are given below:

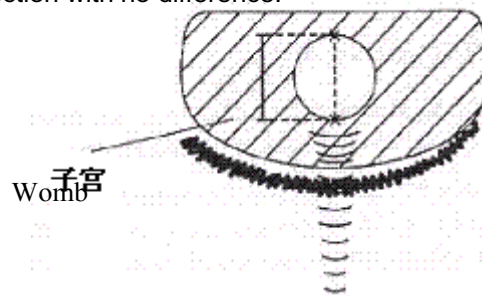
## 1. EQUINE: Estimate horse gestation age according to GS

Check routine on horse:

- ①. Clean out the excreta in horse's rectum.
- ②. Palpate by hand and preliminary estimate the gestation state to determine the germinal tissue for B ultrasonic scanning.
- ③. Hold the probe, and insert it into the rectum with hand on the probe closely to ensure that your hand will feel any following situation firstly. Position your hand dorsal part between the rectum wall and the transducer.
- ④. The internal structure of horse is displayed on the screen. Bladder lies in the vertical crossed part; the following parts are cervix tissue and uterine body. Observe horizontally, uterine horn usually looks in round shape. Move the probe inside the rectum until the coupling section of uterine horn and uterine body is displayed, and then diverse the transducer to the direction of uterine horn as the following figure shows:



- ⑤. The measuring method of GS diameter is given in the following figure. It can go in horizontal direction or vertical direction with no difference.



- ⑥ Measure selected parameter distance according to distance measurement method, the corresponding gestation age data will automatically shows behind "G·A". Through measurement, a chart can be made to determine growth curve and hereby to judge the gestation age corresponding to the embryo size. Gestation age calculation begins from the copulation day instead of the impregnation day.

## 2. Moo-cow - BL: Estimate gestation age according to cow body length.

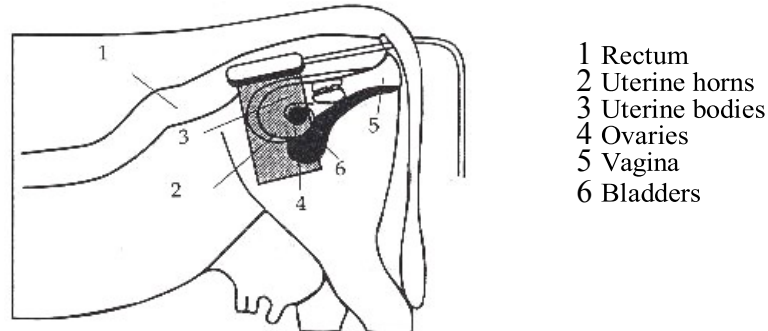
Check routine on cow:

- ① Clean out the excreta in cow's rectum.
- ② Palpate by hand and preliminary estimate the gestation state to determine the germinal tissue for B ultrasonic scanning.
- ③ Hold the probe, and insert it into the rectum with hand on the probe closely to ensure that your

hand will feel any following situation firstly. Position your hand dorsal part between the rectum wall and the transducer.

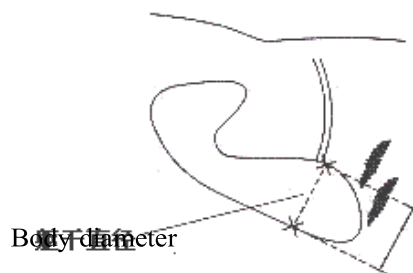


- ④. The internal structure of cow is displayed on the screen. Bladder lies in the vertical crossed part; the following parts are cervix tissue and uterine body. Observe horizontally, uterine horn usually looks in round shape. Move the probe inside the rectum until the coupling Section of uterine horn and uterine body displayed, and then diverse the transducer to the direction of uterine horn as the following figure shows:



- ⑤. To measure fetal body diameter, a vertical Section should be selected, that is a plane covers from both sides through fetal neck, chest cavity and abdomen. Body diameter could be measured within 60 to 150 days gestation.

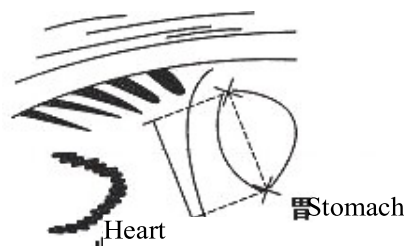
Body diameter measuring method is given in the following figure:



- ⑥. Measure selected parameter distance according to distance measurement method, the corresponding gestation age data will automatically show behind "G·A".

### 3. Moo-cow – SL: Estimate gestation age according to cow stomach length.

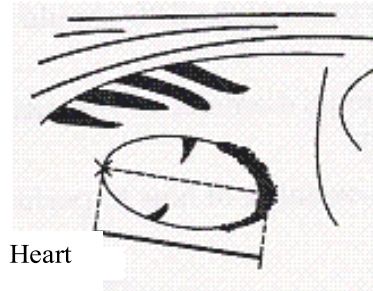
- ①. Make the cow in a state of stand.
- ②. Put the probe, a little bit left or right of the centre, on the ventral abdominal wall closely. If there is mud on this part, clean with water first in case the abdominal pelvic structure could not be displayed accurately.
- ③. The screen should be big enough to display the maximum stomach longitudinal length. With the growth of gestation age, the fetal stomach macro-axis increases regularly. Measuring method of stomach maximum macro-axis is given in the following figure:



- ④. Measure selected parameter distance according to distance measurement method, the corresponding gestation age data will automatically show behind "G·A".

#### 4. Moo-cow - HL: Estimate gestation age according to cow heart length.

- ①. Make the cow in a state of stand.
- ②. Put the probe, a little bit left or right of the centre, on the ventral abdominal wall closely. If there is mud on this part, clean with water first in case the abdominal pelvic structure could not be displayed accurately.
- ③. To measure the heart macro-axis, screen should display the maximal longitudinal axis of heart. With the growth of gestation age, the fetal heart macro-axis grows regularly. Measuring method of maximal macro-axis of heart is given in the following figure:

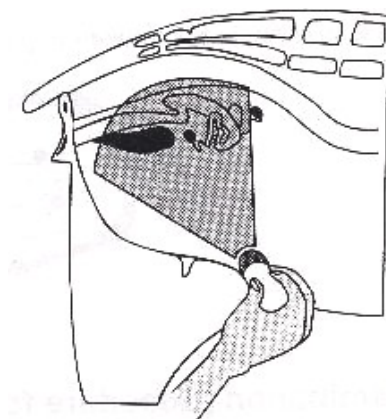


- ④. Measure selected parameter distance according to distance measurement method, the corresponding gestation age data will automatically show behind "G·A".

#### 5. SWINE-HL: estimate gestation age according to pig heart length

Check routine on pigs:

- ①. Make the cow in a state of stand.
- ②. Put the probe, a little bit left or right of the centre, on the ventral abdominal wall closely along the side of teats and skull to rear leg. If there is mud on this part, clean with water first in case the abdominal pelvic structure could not be displayed accurately.



- ③. To measure the heart macro-axis, screen should display the maximal longitudinal axis of heart. With the growth of gestation age, the fetal heart macro-axis increases regularly. Measuring method is given in the following figure:



Heart

④. Measure selected parameter distance according to distance measurement method, the corresponding gestation age data will automatically show behind "G·A".

## **6. SHEEP-USD: Estimate gestation age according to hilum-spine length of sheep**

There are two methods to check pregnant ewe with B ultrasound:

Use convex probe or linear probe check the abdomen; and recta probe for rectum. These two methods are both quite useful to diagnose pregnancy. On the base of some publication, we agree that both the methods on pregnancy diagnosis are proved to be effective.

With 35 days pregnancy, result of rectal way is more precise than that of abdominal way ;

During 35 to 70 days pregnancy, both are equally effective.

After 70 days pregnancy, abdominal method would be better. This way would be more practical for the Bigger womb.

Abdomen check

①. Abdomen check can be done when the ewe is standing, lying or squatting. Put the probe on the middle abdomen without fur and is set to be the proper position for checking in advance.

②. If there is mud on this part, clean with water first in case the abdomen pelvic structure could not be displayed accurately.

③. Measure the hilum-spine length.

④. Measure selected parameter distance according to distance measurement method, the corresponding gestation age data will automatically show behind "G·A".

## **7. CAT - HD: Estimate gestation age according to cat head diameter**

To measure the head diameter is to measure the interior maximum diameter of skull between ventral and dorsal part.

Measuring method of head diameter is given in the following figure:



## **8. CAT-BD: Calculate the gestation age according to cat BD**

After fetal head formed, binary top diameter measurement becomes a routine in ultrasonic examination.

The measuring method is:

According to distance measurement method to measure distance of selected parameters, the corresponding gestation age data will automatically show behind "G·A".

## **9. DOG-GSD: Calculate the gestation age according to dog gestation saccus diameter**

The method is the same as that of horse.

### **A. DOG-CRL: Calculate the gestation age according to dog CRL**

The method is the same as the cow's.

### **B.DOG-HD: Calculate the gestation age according to dog HD**

The method is the same as the cat's.

### **C. DOG-BD: Calculate the gestation age according to BD**

The method is the same as the cat's.

After measurement, press "Clear" key to clear the screen for the next measurement. Otherwise.

Press "D" to select "D. Exit" to exit OB table.

**NOTE: the system will not show the relative items when the distance is less than the**

*measurements defined as the table below:*

EQUINE-GSD	D1<6mm
BOVINE-BL	D1<8mm
BOVINE-SL	D1<1mm
BOVINE-HL	D1<3mm
SWINE-HL	D1<31mm
SHEEP-USD	D1<15mm
CAT-HD	D1<15mm
CAT-BD	D1<17mm
DOG-GSD	D1<1mm
DOG-CRL	D1<1mm
DOG-HD	D1<14mm
DOG-BD	D1<16mm

PLEASE ENTER LMP: MM—DD



Reminder: enter the first date of the pregnant woman's last menses in the date format MM-DD. For example: May 11, put in 05-11. When the correct date is put, measuring result will displays at "EDD" on screen right in the format of YY-MM-DD, for example 18-02-21 means that the expected date of delivery is on February 21 in 2018.

### Note

**In expected date of delivery calculation, the system date must be correct.**

**The default standard pregnancy period in the system is 40 weeks. In last menses method measuring, if the time interval between the input date and the system date exceeds 40 weeks, the inward date will not be accepted and need to be put in again.**

**Under the condition of item 1, if the inward date is bigger than the current system date, it will be regarded as the date of the last year.**

### NOTE:

**Head circle (HC)、 abdomen circle (AC) only have the Headlock form , this equipment does Not provide the HC, AC form under the Tokyo formula**

# 6 Reports

The device will store the patient information, diagnosis annotation, measurement result and hospital, data, time, doctor and some other information in the report page with the diagnosis. The abdominal, cardiac, obstetrics and urological reports will generate automatically according to different measurement items, and store the last measurement results.

When the corresponding measurement is done, press [FREEZE] and then [R/report] key, the report menu will appear for choosing.

1.ABDOMEN    2. CARDIAC    3. OB    4. UROLOGY

Choose the needed report by pressing its corresponding number key.  
Press any of the keys to exit this menu.

## Abdominal Report, Urological Report:

HOSP: 9999HHH		DOCT:	ABDOMEN
PID:		09-06-06	
NAME:	AGE:	SEX:	02:04:49
+D1=	+C1=		
XD2=	+A1=2		
%D3=	XC2=		
*D4=	XA2=2		
D1/D2= 0%	C1/C2= 0%		
D3/D4= 0%	A1/A2= 0%		
Um1=	Um1=		
COMMENT:			

## Cardiac Report:

HOSP: 9999HHH		DOCT:		CARDIAC	
PID:				09-06-06	
NAME:		AGE:	SEX:	02:05:05	
LU<UF>	AU	MU	PU	TU	
:	:	:	:	:	
RHID= mm	AO = mm	DE<EX>= mm	A<DEP>= mm	DE<EX>= mm	
RHIS= mm	LA = mm	EF<EX>= mm	BC<DS>= mm	EF<EX>= mm	
RUD= mm	AUD = mm	DE<TM>= 00.0 S	EF<SL>= 000mm/S	DE<TM>= 00.0 S	
RUS= mm	LAR = mm	EF<TM>= 00.0 S	BC<SL>= 000mm/S	EF<TM>= 00.0 S	
LUOD= mm	LUET= 00.0 S	DE<SL>= 000mm/S	RUET= 00.0 S	DE<SL>= 000mm/S	
LUOS= mm		EF<SL>= 000mm/S		EF<SL>= 000mm/S	
PLUD= mm					
PLUS= mm					
IUSD= mm					
IUSS= mm					
LVEDU= 000.0m1					
LUESU= 000.0m1					
SF= %					
EF= %					
SU= 000.0m1		HR			
		:			
CO= 0m1		TM= 00.0 S			
		HR= B/M			
COMMENT:					

## Obstetrics Report:

HOSP: 9999HHH		DOCT:		OB	
PID:				09-06-06	
NAME:		AGE:	SEX:	02:05:21	
	1	2	3	AUG	G.A:
BPD:					EOD:
FL :					FW:
AC :					
HC :					
CRL:					
GS :					
TOTAL-AUG :		P5W.#0		10-00-02	
FW<BPD.AC>:					
RATIO:	HC/AC=	0%	FL/AC =	0%	
			FL/BPD=	0%	
COMMENT:					

Re-press **[R/report]** key to exit reporting procedure.



## **NOTE:**

You can press the “Annotation” key on the report interface and then annotate information in the annotation box, Press “Confirm” to exit.

In the obstetrics report 1, 2, 3 means that biparietal diameter (BPD), femur length (FL), Crown-rump length (CRL) and gestational sac (GS) can be measured at most for three times, and AVG is the average value of the three measurement results. TOTAL-AVG is the average value of the gestational age (GA) and expected date of delivery (EDD).

In the obstetrics report, fetal weight (BPD, AC) is calculated through the biparietal diameter (BPD) and abdominal circumference (AC), and when the measured BPD and AC are unequal to zero, fetal weight will display here automatically.

## **How to clear the contents in the report?**

All the annotation, data on the image and info in reports will be clean when [New P] key is pressed, no matter the system is in real-time or freeze.

# 7

## Puncture Guide

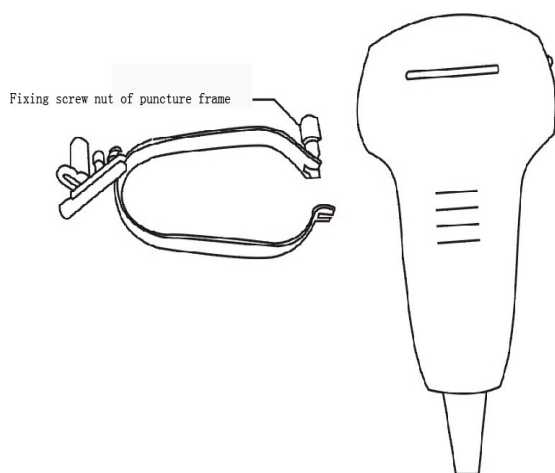
### Warning:

The puncture guiding line must be calibrated before performing a new puncture. If the puncture needle is not consistent with the puncture guiding line, please do not perform the puncture operation.

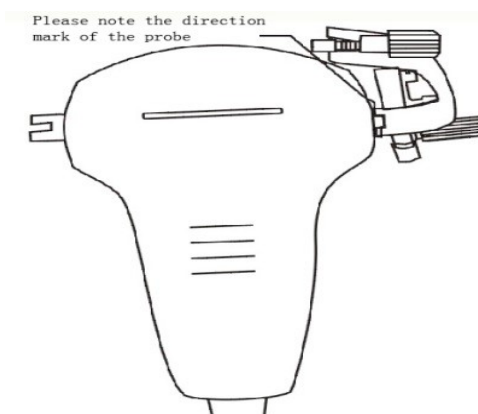
It is with risk when performing the puncture guided under ultrasound, thus it should be operated by operators with the proper qualification and capability and the preparative work before operation such as examination of clotting time, BPC, electrocardiogram, blood pressure, sterilization of puncture set and puncture probe and signing of operation agreement should be done strictly.

## 7.1 Guide Mounting

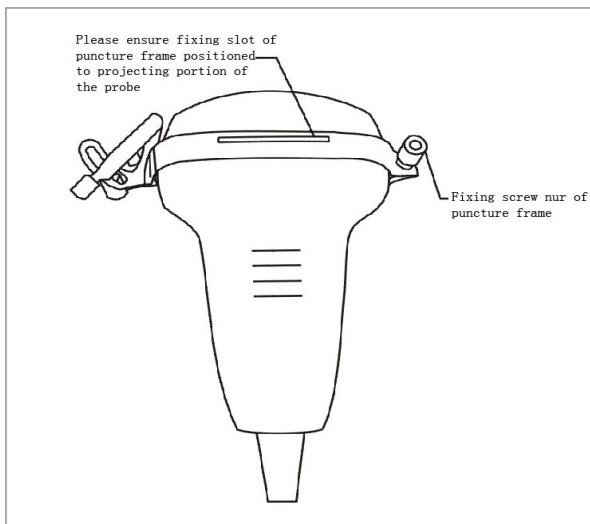
### 7.1.1 Guide in R60/3.5MHz convex probe



Mount the puncture frame on the probe



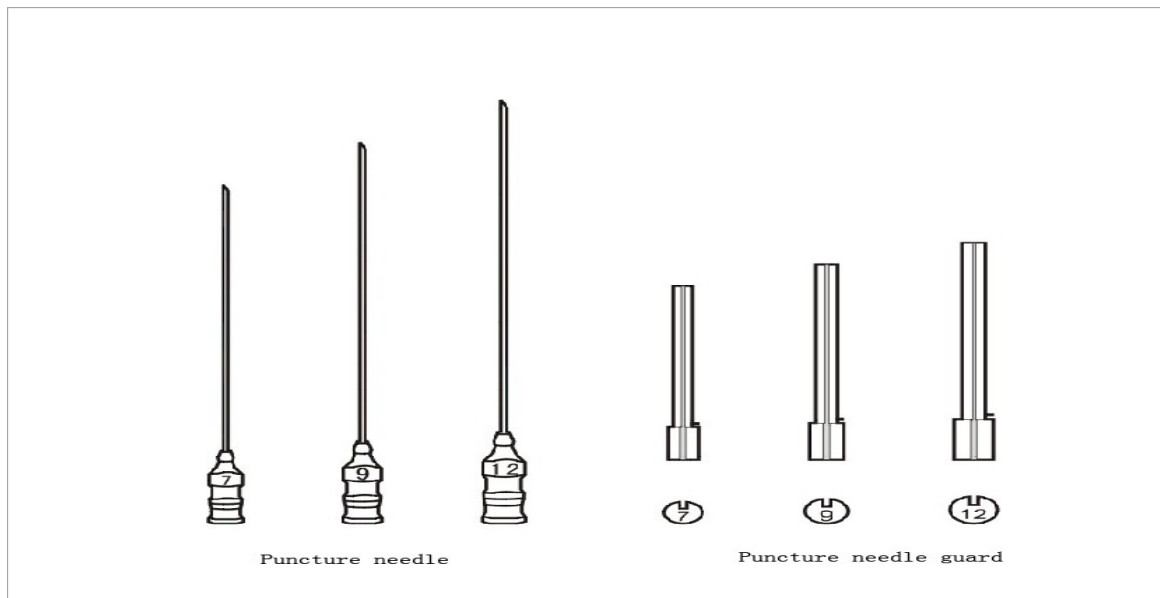
Put the probe aside, then loosen the fixing screw nut on the puncture frame.



Buckle on the puncture frame and turn over the probe, then fasten the fixing screw nut of the puncture frame

## 7.2 Needle Selection

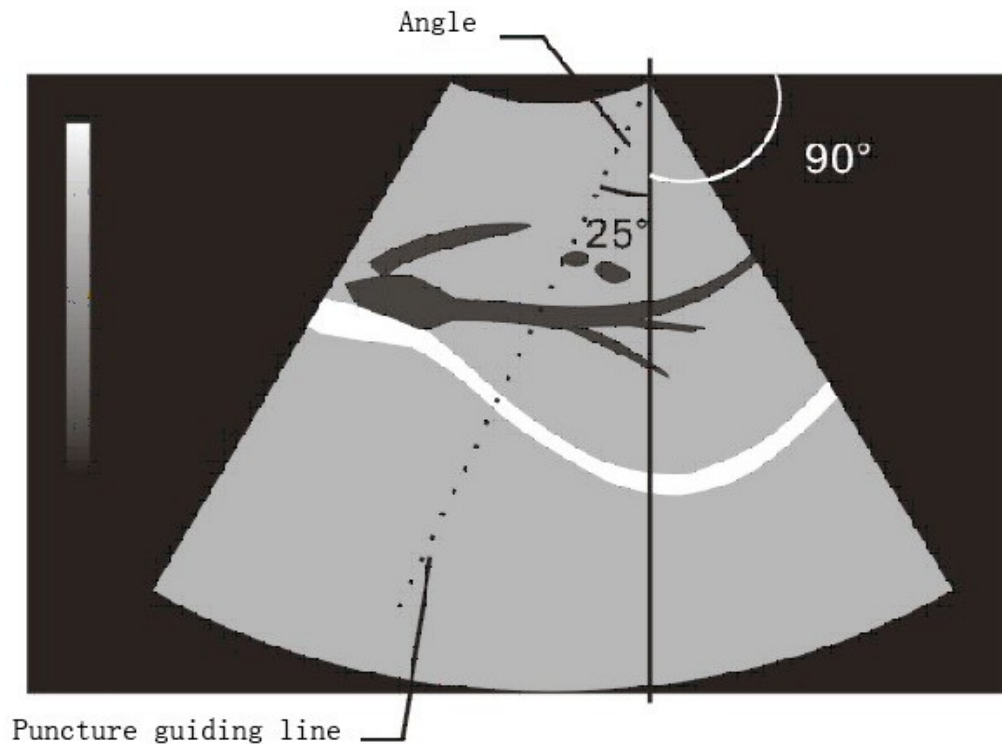
There are 3 difference needles in all for the puncture. They are No.7. No.9 and No.12. You should choose the right needle and its guard for your application.



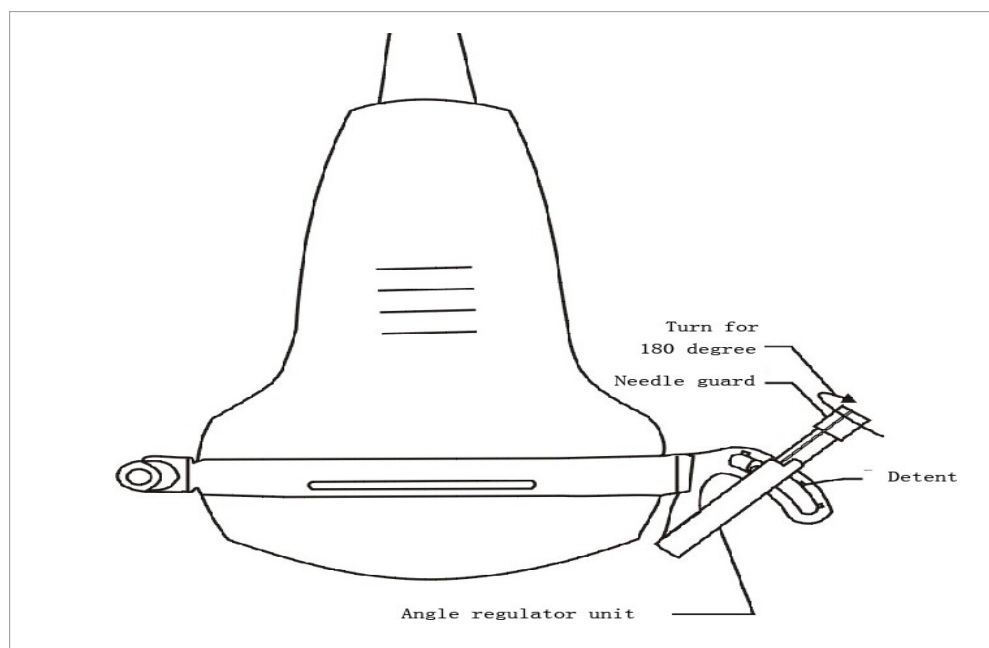
Buckle on the puncture frame over the probe, then fasten the fixing screw nut of the puncture frame

## 7.3 Puncture Line

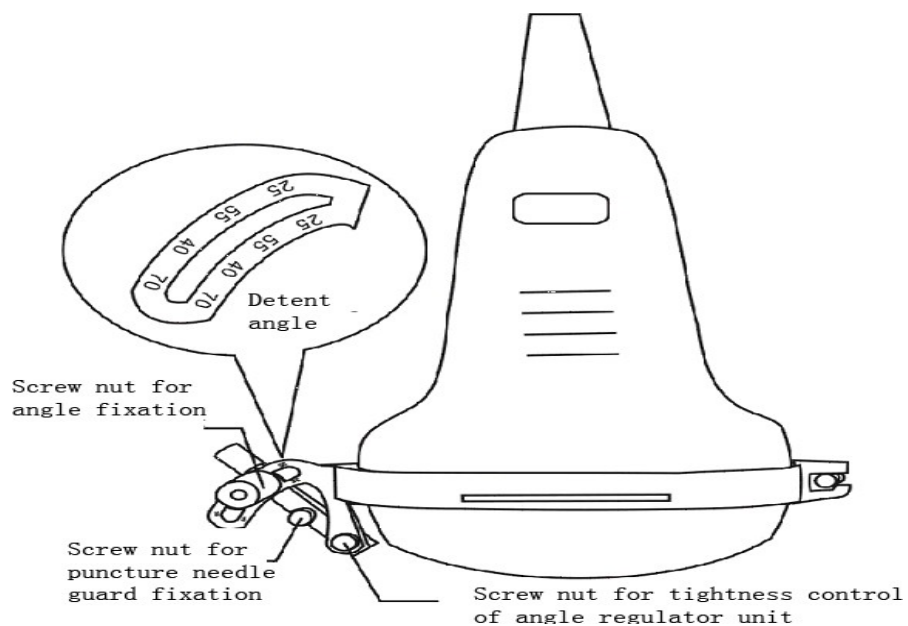
- Place the probe in the wanted position and the image is in real-time single B mode.
- Press [ P ] key to have a fictitious line showing on the image, named as Puncture Line.
- Press [ 1 ] and [ 4 ] keys to adjust the angle the wanted position.
- Press [CANCEL] or [CLEAR] to exit this procedure.



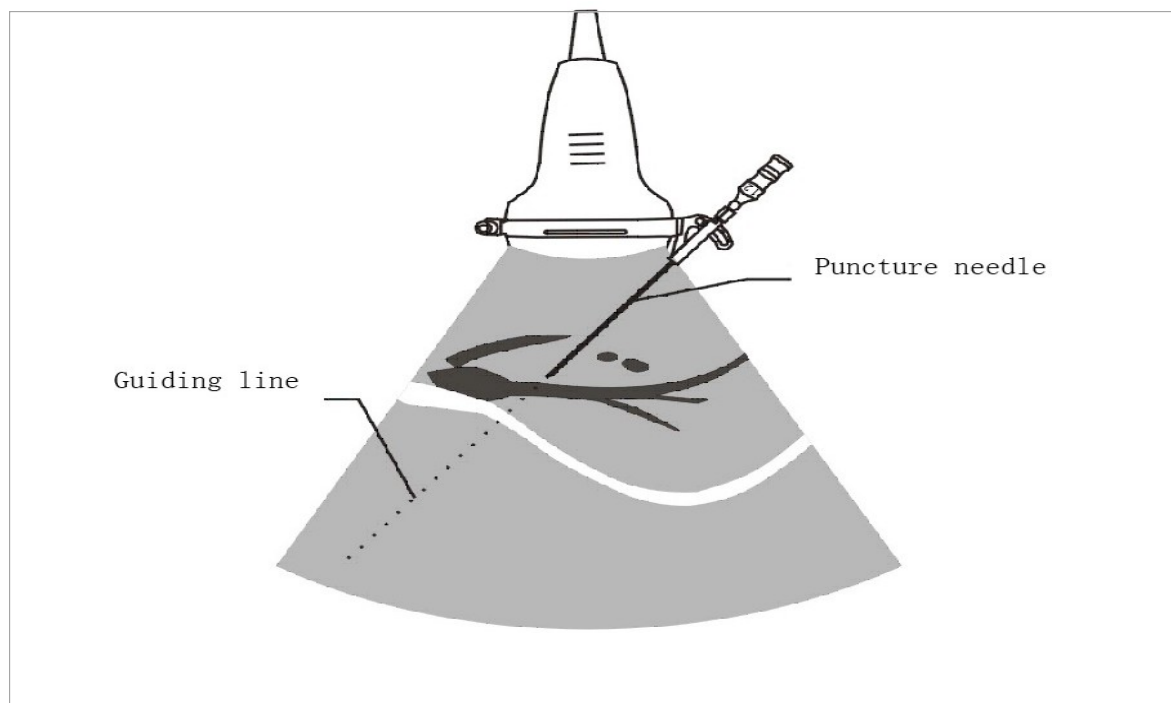
## 7.4 Adjustment of Guide Angle



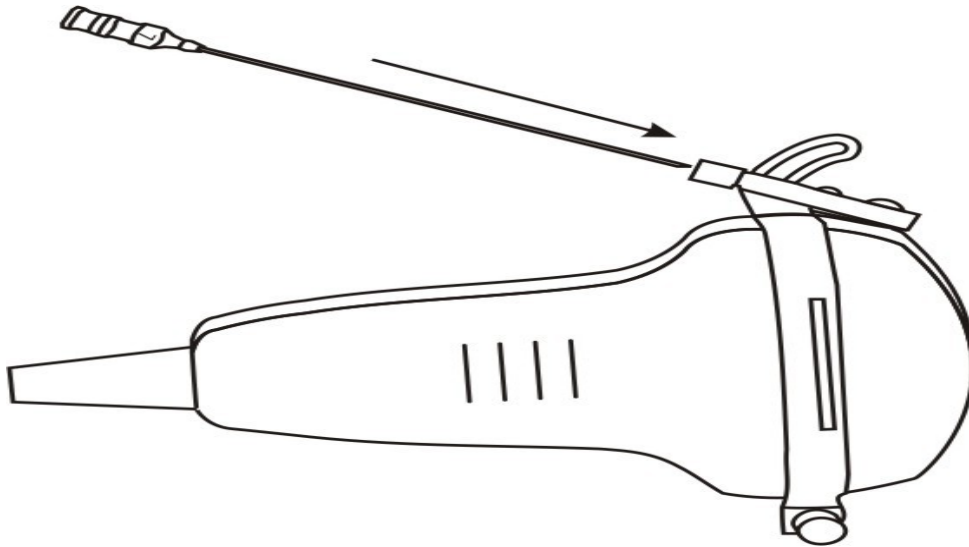
Fix the selected puncture needle on the angle regulator unit, then turn the puncture needle guard inward for 180 degrees. Thus, the puncture angle can be adjusted by the angle regulator unit on the puncture frame



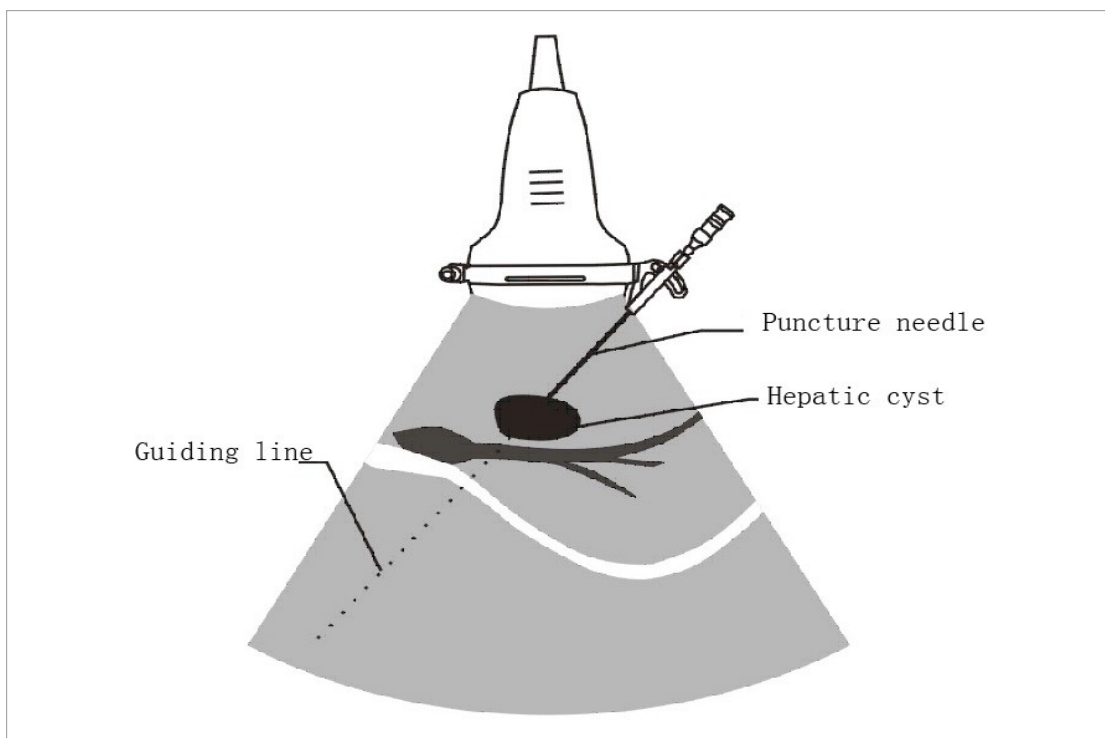
Please ensure that each type of angle should be identical with the detent (Detent Angle: 25°, 40°, 55° and 70°). The puncture needle angle should also be identical with the angle of puncture guiding line



## 7.5 Insertion of Puncture Needle

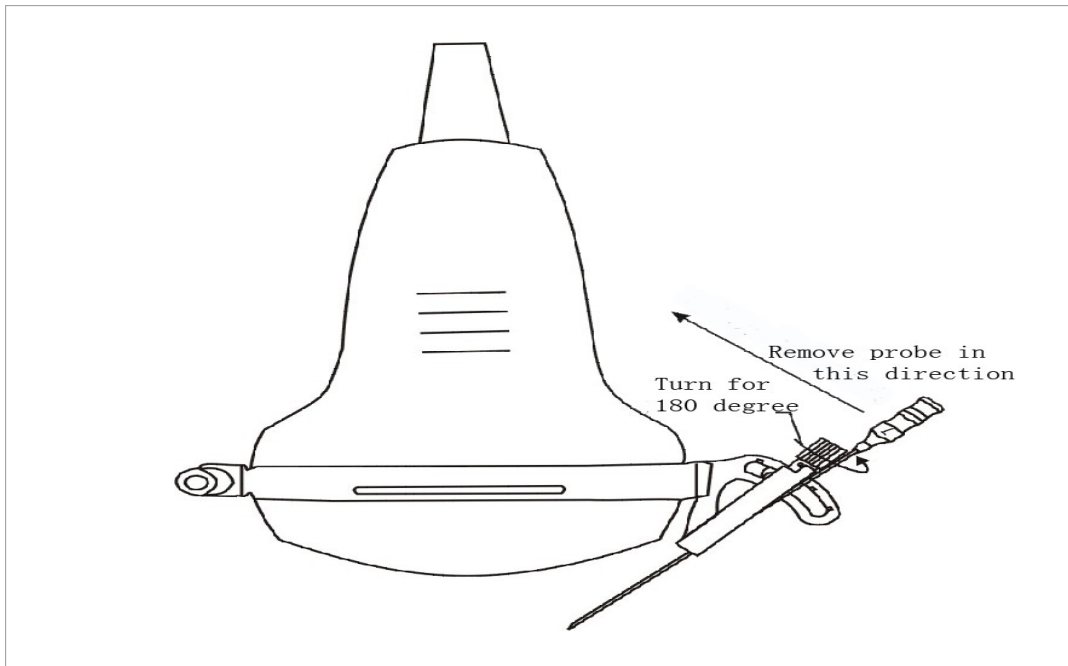


Please ensure that the tissue for puncture is on the puncture guiding line first. Then adjust the angle and insert the puncture needle slowly in the direction of needle guard



Please do not move the probe when inserting the puncture needle for ensuring the accuracy of the puncture operation

## 7.6 After Puncture



Turn the puncture needle guard outward for 180 degrees to make the rabbet of the puncture needle guard outward, then remove the probe from it

---- Press [Cancel] or [Clear] key to exit the procedure.

# 8

## Check and Maintenance

### 8.1 Service Life

Bases on the manufacturer's design, production related files, this model's use life is six years. The Product's material will gradually age, if the product continually used over the designed use life, it may bring the problem of the performance reduced and fault rate raise.

**Note :**

Discard the device according to local law.  
Do not discard it mixing with another household garbage.

### 8.2 Main unit maintenance

1. Instrumentation environment should accord with "Operation environmental requirement".
2. If device enclosure needs cleaning , shutdown the device first and then wipe with alcohol sponges.
3. Device should not turn on and off frequently.
4. When the device does not work for a long time, pack the device according to the instructions on the packing. Store it properly in the warehouse. The storage environment should accord with "Transportation and storage environmental requirements".

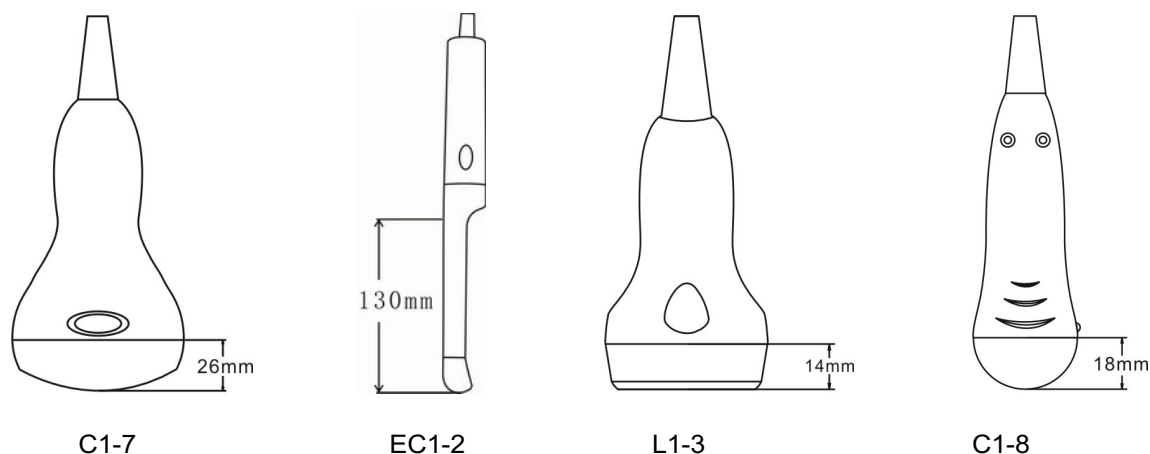
**Caution :**

---- Please refer to instructions prescribed by the manufacturer closely when using detergents.  
---- Be careful with cleaning of the display, because it is very easy to scratch and spoil. Please wipe it with dry soft cloth.  
---- Please do not clean the inner base of the device.  
---- Please do not place the device in liquid.  
---- Do not leave any detergent on the device surface.  
---- Though there will be no chemical reaction between the device enclosure and most of those detergents, we still suggest no detergent in cleaning lest the device surface is spoiled.

### 8.3 Probe maintenance

1. Probe is an expensive and frangible part. Never hit it or drop it on floor. When diagnoses pause put the probe in its case and press "**Freeze**" key to keep it in a state of "Frozen".
2. See to use medical ultrasound coupling gel during diagnosis. Degree of protection against harmful ingress of water is IPX7. For the probes, water should not immerge over the probe acoustic window (refer to figure). Regularly check the probe enclosure to ensure it is good incase liquid ingression spoil the inner components.





**Note:**

- Probe might be damaged due to long time covered coupling gel.
- Clean the probe head after every use.
- Do not clean the probe with a surgical brash neither soft brash. Only soft cloth can be used to clean it.
- Do not press the probe on the patient too long to avoid discomfort.

**Warning:**

- Must not use extender, ethylene oxide or any other organic solvent which tend to deface the probe's protective foil.
- Must not place the probe in liquid or detergent.
- Must keep the equipment or probe from any type of liquid's infiltration.
- Must not clean device or probe by airing or heating.

## 8.4 Correct usage of probe

In order to prolong probe's service life and obtain optimum performance follow these instructions:

1. Periodic inspection on probe cable, socket and acoustic window.
2. Shutdown the device first and then connect or disconnect the probe.
3. Do not drop probe or flint body and never hit the probe acoustic window, otherwise probe should be damaged.
4. Never heat the probe.
5. Never bend or pull probe cable, otherwise the internal connection should be broken.
6. Use coupling agent only on probe header and then clean probe.
7. Inspect probe acoustical window, enclosure and cable seriously after probe cleaning. Never use the probe again if any crack or breakage is found.

# 9

## Trouble Shouting

### 9.1 Check

1. Check if the power supply is ok or not, main unit power cable is connected well or not. When the supply voltage surpasses the equipment specified voltage range (a.c.110V ~ 130V/220V ~ 240V , 50Hz/60Hz), must not switch on the equipment.
2. Check if the probe and main unit are connected well.
3. Check power cable and probe lines regularly and replace the damaged or broken one if found.

### 9.2 Trouble shooting

No.	Malfunction phenomena	Troubleshooting
1	Open power switch of the device, with no signal appeared on the screen and the indicator light is not on.	1. Examine power supply; 2. Examine supply line and plug; 3. Examine whether the fuse is burned- out; 4. Examine the lightness adjusting knob of the monitor.
2	Discontinuous striae and snow appear on the screen.	1. Examine power supply: strike fire interferes of the other devices; 2. Environmental examination: Electric and magnetic field interfere; 3. Examine power and probe plugs: they are well connected.
3	Unclear image display	1. Adjust the brightness and contrast knobs on the front panel; 2. Adjust the 8 level TGC and the total gain knob on the front panel; 3. Clean the screen optical filter.
4	Unclear near field	1. Adjust the total gain knob on the front panel and the 8 level TGC; 2. Adjust the focus position to the near field;
5	Unclear far field	1. Adjust the total gain knob on the front panel and the 8 level TGC; 2. Adjust the focus number, space and position to set the focus in the far field.

# Appendix A

## Acoustic output reporting table

B mode

Nominal frequency: 3.5MHz

Transducer Model: C3-1/60R/3.5MHz

Index label			MI	TIS		TIB	TIC	
				Scan	Non-scan			Non-scan
					A <sub>aprt</sub> ≤1cm <sup>2</sup>	A <sub>aprt</sub> > 1cm <sup>2</sup>		
Maximum index value			0.85	0.98	-	-	-	a
Associated acoustic parameters	P <sub>ra</sub> (MPa)		1.46					
	P (mW)			115.2	-		-	#
	Min.of [P <sub>α</sub> (Z <sub>s</sub> ), I <sub>zpta,α</sub> Z <sub>s</sub> ] (mW)					-		
	Z <sub>s</sub> (cm)					-		
	Z <sub>bp</sub> (cm)					-		
	Z <sub>b</sub> (cm)					-		
	Z at max. I <sub>pi,α</sub> (cm)		5.30					
	d <sub>eq</sub> (Z <sub>b</sub> ) (cm)						-	
	f <sub>awf</sub> (MHz)		2.91	2.91	-	-	-	#
	Dim of A <sub>aprt</sub>	X (cm)		1.64	-	-	-	#
Y (cm)			1.30	-	-	-	#	
Other information	t <sub>d</sub> (μsec)		0.52					
	p <sub>rr</sub> (Hz)		3787					
	p <sub>r</sub> at max. I <sub>pi</sub> (MPa)		2.48					
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)						-	
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		207.9					
Operating control conditions	F-PIN		1	1	-	-	-	#
	Power,%		80	80	-	-	-	#
	Angle, °		30	30				
	Focus position		7	7				

### Notes:

( a ) This probe is not intended for transcranial or neonatal cephalic use;

## Acoustic output reporting table

M mode (Inc. B mode)

Nominal frequency: 3.5MHz

Transducer Model: C3-1/60R/3.5MHz

Index label			MI	TIS		TIB	TIC	
				Scan	Non-scan			Non-scan
					A <sub>aprt</sub> ≤1cm <sup>2</sup>	A <sub>aprt</sub> > 1cm <sup>2</sup>		
Maximum index value			0.89	0.49	-	0.036-	0.11	{ <sup>a</sup>
Associated acoustic parameters	P <sub>ra</sub> (MPa)		1.51					
	P (mW)			82.0	-		4.7	#
	Min.of [P <sub>α</sub> (Z <sub>s</sub> ), I <sub>zpta,α</sub> Z <sub>s</sub> ] (mW)					2.61		
	Z <sub>s</sub> (cm)					2.94		
	Z <sub>bp</sub> (cm)					2.94		
	Z <sub>b</sub> (cm)						5.07	
	Z at max. I <sub>pi,α</sub> (cm)		5.30					
	d <sub>eq</sub> (Z <sub>b</sub> ) (cm)						0.35	
	f <sub>awf</sub> (MHz)		2.91	2.91	-	2.90	2.90	#
	Dim of A <sub>aprt</sub>	X (cm)		2.35	-	2.34	2.34	#
		Y (cm)		1.30	-	1.30	1.30	#
Other information	t <sub>d</sub> (μsec)		0.53					
	p <sub>rr</sub> (Hz)		4166					
	p <sub>r</sub> at max. I <sub>pi</sub> (MPa)		2.58					
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)						0.34	
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		203.9					
Operating control conditions	F-PIN		1	1	-	1	1	#
	Power,%		80%	80%	-	80%	80%	#
	Angle, °		30	30		30	30	#
	Focus position		7	7	-	7	7	#
	M Speed,S		1.25	1.25	-	1.25	1.25	#

### Notes:

( a ) This probe is not intended for transcranial or neonatal cephalic use;

## Acoustic output reporting table

B mode

Nominal frequency: 5.0MHz

Transducer Model: C1-6/20R/5.0MHz

Index label			MI	TIS		TIB	TIC	
				Scan	Non-scan			Non-scan
					A <sub>aprt</sub> ≤1cm <sup>2</sup>	A <sub>aprt</sub> > 1cm <sup>2</sup>		
Maximum index value			0.64	0.19	-	-	-	( a
Associated acoustic parameters	P <sub>ra</sub> (MPa)		1.26					
	P (mW)			10.0	-		-	#
	Min.of [P <sub>a</sub> (Z <sub>s</sub> ), I <sub>zpta,α</sub> Z <sub>s</sub> )] (mW)					-		
	Z <sub>s</sub> (cm)					-		
	Z <sub>bp</sub> (cm)					-		
	Z <sub>b</sub> (cm)					-		
	Z at max. I <sub>pi,α</sub> (cm)		2.98					
	d <sub>eq</sub> (Z <sub>b</sub> ) (cm)						-	
	f <sub>awf</sub> (MHz)		3.87	3.87	-	-	-	#
	Dim of A <sub>aprt</sub>	X (cm)		0.52	-	-	-	#
Y (cm)			0.79	-	-	-	#	
Other information	t <sub>d</sub> (μsec)		0.43					
	p <sub>rr</sub> (Hz)		4784					
	p <sub>r</sub> at max. I <sub>pi</sub> (MPa)		1.87					
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)						-	
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		117.2					
Operating control conditions	F-PIN		1	1	-	-	-	#
	Power,%		80	80	-	-	-	#
	Angle, °		90	90				
	Focus position		6	6	-	-	-	#

### Notes:

( a ) This probe is not intended for transcranial or neonatal cephalic use;

## Acoustic output reporting table

M mode (Inc. B mode)

Nominal frequency: 5.0MHz

Transducer Model: C1-6/20R/5.0MHz

Index label			MI	TIS		TIB	TIC	
				Scan	Non-scan			Non-scan
					A <sub>aprt</sub> ≤1cm <sup>2</sup>	A <sub>aprt</sub> > 1cm <sup>2</sup>		
Maximum index value			0.66	0.22	0.025	-	0.05	{ <sup>a</sup> }
Associated acoustic parameters	P <sub>ra</sub> (MPa)		1.29					
	P (mW)			11.6	1.35		1.35	#
	Min.of [P <sub>α</sub> (Z <sub>s</sub> ), I <sub>zpta,α</sub> Z <sub>s</sub> ] (mW)					-		
	Z <sub>s</sub> (cm)					-		
	Z <sub>bp</sub> (cm)					-		
	Z <sub>b</sub> (cm)						2.68	
	Z at max. I <sub>pi,α</sub> (cm)		3.00					
	d <sub>eq</sub> (Z <sub>b</sub> ) (cm)						0.31	
	f <sub>awf</sub> (MHz)		3.86	3.86	3.88	-	3.88	#
	Dim of A <sub>aprt</sub>	X (cm)		0.63	0.63	-	0.63	#
		Y (cm)		0.79	0.80	-	0.80	#
Other information	t <sub>d</sub> (μsec)		0.43					
	p <sub>rr</sub> (Hz)		4807					
	p <sub>r</sub> at max. I <sub>pi</sub> (MPa)		1.93					
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)						0.30	
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		119.1					
Operating control conditions	F-PIN		1	1	1	-	1	#
	Power,%		80%	80%	80%	-	80%	#
	Angle, °		90	90	90	-	90	#
	Focus position		6	6	6	-	6	#
	M Speed,S		1.25	1.25	1.25	-	1.25	#

### Notes:

( a ) This probe is not intended for transcranial or neonatal cephalic use;

## Acoustic output reporting table

B mode

Nominal frequency: 7.5MHz

Transducer Model: L3-1/7.5MHz

Index label			MI	TIS		TIB	TIC	
				Scan	Non-scan			Non-scan
					A <sub>aprt</sub> ≤1cm <sup>2</sup>	A <sub>aprt</sub> > 1cm <sup>2</sup>		
Maximum index value			0.54	0.64	-	-	-	( a
Associated acoustic parameters	P <sub>ra</sub> (MPa)		1.30					
	P (mW)			24.0	-		-	#
	Min.of [P <sub>a</sub> (Z <sub>s</sub> ), I <sub>zpta,α</sub> Z <sub>s</sub> ] (mW)					-		
	Z <sub>s</sub> (cm)					-		
	Z <sub>bp</sub> (cm)					-		
	Z <sub>b</sub> (cm)						-	
	Z at max. I <sub>pi,α</sub> (cm)		4.9					
	d <sub>eq</sub> (Z <sub>b</sub> ) (cm)						-	-
	f <sub>awf</sub> (MHz)		5.70	5.70	-	-	-	#
	Dim of A <sub>aprt</sub>	X (cm)		1.02	-	-	-	#
		Y (cm)		0.71	-	-	-	#
Other information	t <sub>d</sub> (μsec)		0.28					
	p <sub>rr</sub> (Hz)		5649					
	p <sub>r</sub> at max. I <sub>pi</sub> (MPa)		3.41					
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)						-	
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		109.6					
Operating control conditions	F-PIN		1	1	-	-	-	#
	Power,%		80%	80%	-	-	-	#
	Focus position		3	3	-	-	-	#

### Notes:

( a ) This probe is not intended for transcranial or neonatal cephalic use;

## Acoustic output reporting table

M-mode (Inc. B mode)

Nominal frequency: 7.5MHz

Transducer Model: L3-1/7.5MHz

Index label			MI	TIS		TIB	TIC	
				Scan	Non-scan			Non-scan
					A <sub>aprt</sub> ≤1cm <sup>2</sup>	A <sub>aprt</sub> > 1cm <sup>2</sup>		
Maximum index value			0.56	0.60	0.029	-	0.045	( a )
Associated acoustic parameters	P <sub>ra</sub> (MPa)		1.34					
	P (mW)			22.1	1.06		1.06	#
	Min.of [P <sub>α</sub> (Z <sub>s</sub> ), I <sub>zpta,α</sub> Z <sub>s</sub> ] (mW)					-		
	Z <sub>s</sub> (cm)					-		
	Z <sub>bp</sub> (cm)					-		
	Z <sub>b</sub> (cm)						2.47	
	Z at max. I <sub>pi,α</sub> (cm)		4.90					
	d <sub>eq</sub> (Z <sub>b</sub> ) (cm)						0.20	
	f <sub>awf</sub> (MHz)		5.70	5.70	5.70	-	5..70	#
	Dim of A <sub>aprt</sub>	X (cm)		1.01	1.00	-	1.00	#
Y (cm)			0.70	0.70	-	0.70	#	
Other information	t <sub>d</sub> (μsec)		0.28					
	p <sub>rr</sub> (Hz)		5681					
	p <sub>r</sub> at max. I <sub>pi</sub> (MPa)		3.52					
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)						0.19	
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		109.7					
Operating control conditions	F-PIN		1	1	1	-	1	#
	Power,%		80%	80%	80%	-	80%	#
	Focus position		3	3	3	-	3	#
	M Speed,S		1.25	1.25	1.25	-	1.25	#

### Notes:

( a ) This probe is not intended for transcranial or neonatal cephalic use;



## Acoustic output reporting table

B mode

Nominal frequency: 6.5MHz

Transducer Model: LV2-5/6.5MHz

Index label			MI	TIS		TIB	TIC	
				Scan	Non-scan			Non-scan
					A <sub>aprt</sub> ≤1cm <sup>2</sup>	A <sub>aprt</sub> > 1cm <sup>2</sup>		
Maximum index value			0.64	0.23	-	-	-	( a
Associated acoustic parameters	P <sub>ra</sub> (MPa)		1.38					
	P (mW)			10.0	-		-	#
	Min.of [P <sub>a</sub> (Z <sub>s</sub> ), I <sub>zpta,α</sub> Z <sub>s</sub> )] (mW)					-		
	Z <sub>s</sub> (cm)					-		
	Z <sub>bp</sub> (cm)					-		
	Z <sub>b</sub> (cm)					-		
	Z at max. I <sub>pi,α</sub> (cm)		2.48					
	d <sub>eq</sub> (Z <sub>b</sub> ) (cm)						-	
	f <sub>awf</sub> (MHz)		4.66	4.66	-	-	-	#
	Dim of A <sub>aprt</sub>	X (cm)		0.63	-	-	-	#
Y (cm)			0.79	-	-	-	#	
Other information	t <sub>d</sub> (μsec)		0.31					
	pr <sub>r</sub> (Hz)		4807					
	p <sub>r</sub> at max. I <sub>pi</sub> (MPa)		2.05					
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)						-	
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		120.1					
Operating control conditions	F-PIN		1	1	-	-	-	#
	Power,%		80	80	-	-	-	#
	Angle, °		120	120				
	Focus position		3	3	-	-	-	#

### Notes:

( a ) This probe is not intended for transcranial or neonatal cephalic use;

## Acoustic output reporting table

M-mode (Inc. B mode)

Nominal frequency: 6.5MHz

Transducer Model: LV2-5/6.5MHz

Index label			MI	TIS		TIB	TIC	
				Scan	Non-scan			Non-scan
					A <sub>aprt</sub> ≤1cm <sup>2</sup>	A <sub>aprt</sub> > 1cm <sup>2</sup>		
Maximum index value			0.65	0.23	0.014	-	0.026	{ <sup>a</sup>
Associated acoustic parameters	P <sub>ra</sub> (MPa)		1.41					
	P (mW)			10.2	0.62		0.62	#
	Min.of [P <sub>α</sub> (Z <sub>s</sub> ), I <sub>zpta,α</sub> Z <sub>s</sub> ] (mW)					-		
	Z <sub>s</sub> (cm)					-		
	Z <sub>bp</sub> (cm)					-		
	Z <sub>b</sub> (cm)						2.36	
	Z at max. I <sub>pi,α</sub> (cm)		2.34					
	d <sub>eq</sub> (Z <sub>b</sub> ) (cm)						0.26	
	f <sub>awf</sub> (MHz)		4.66	4.66	4.61	-	4.61	#
	Dim of A <sub>aprt</sub>	X (cm)		0.62	0.62	-	0.62	#
		Y (cm)		0.80	0.79	-	0.79	#
Other information	t <sub>d</sub> (μsec)		0.31					
	p <sub>rr</sub> (Hz)		4807					
	p <sub>r</sub> at max. I <sub>pi</sub> (MPa)		2.05					
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)						0.25	
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		124.1					
Operating control conditions	F-PIN		1	1	1	-	1	#
	Power,%		80%	80%	80%	-	80%	#
	Angle, °		120	120	120	-	120	#
	Focus position		3	3	3	-	3	#
	M Speed,S		1.25	1.25	1.25	-	1.25	#

### Notes:

( a ) This probe is not intended for transcranial or neonatal cephalic use;

## Appendix B Obstetrics

**Gestational Table 1: Equine**

Measurement(mm) (Gestational Sac Diameter)	Week	Day
6	1	4
8	1	4
10	1	5
12	1	6
14	1	6
16	2	0
18	2	0
20	2	1
22	2	2
24	2	3
26	2	5
28	4	1
30	4	2
32	4	3
34	4	4
40	5	0
42	5	2
44	5	3
46	5	4
48	5	5
50	5	6
52	6	1
54	6	2
56	6	3

All measurements +/- 3 days

**Gestational Table 2: Bovine**

<b>Measurement(mm) (Body Length)</b>	<b>Week</b>	<b>Day</b>
8	4	0
10	5	0
12	5	1
14	5	2
16	5	3
18	5	5
20	5	5
22	5	6
24	5	6
26	6	1
28	6	1
30	6	1
32	6	2
34	6	3
36	6	3

All measurements +/- 3 days

**Gestational Table 3: Sheep**

<b>Measurement(mm) (Umbilicus to Spine Distance)</b>	<b>Week</b>	<b>Day</b>
15	7	1
18	7	3
21	7	6
24	8	1
27	8	4
30	9	0
33	9	2
36	9	4
39	10	0
42	10	2
45	10	5
48	11	3
51	11	5
54	12	1
57	12	2
60	12	4
63	12	6
66	13	2
69	13	4
72	14	2
75	14	4
78	15	0
81	15	2
84	15	5
87	16	6
90	17	0
93	17	1
96	17	3
99	17	6

All measurements +/- 3 days