U50
Diagnostic Ultrasound System
Version 2.4

User Manual

EDAN

About this Manual

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Responsibility of the Manufacturer

EDAN only considers itself responsible for any effects on safety, reliability and performance of the equipment if:

● Assembly operations, extensions, re-adjustments, modifications or repairs are carried out by persons authorized by EDAN.

● The electrical installation of the relevant room complies with international standards, and

● The equipment is used in accordance with the instructions for use.

Terms Used in this Manual

WARNING

A **WARNING** label advises against certain actions or situations that could result in personal injury or death.

CAUTION

A **CAUTION** label advises against actions or situations that could damage equipment, produce inaccurate data, or invalidate a procedure.

NOTE

A NOTE provides useful information regarding a function or a procedure.

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Chapter 1 Introduction

1.1. Overview

The U50 is a portable Diagnostic Ultrasound System, which applies advanced technologies such as Phased Inversion Harmonic Compound Imaging (eHCI), Multi-Beam-Forming (mBeam), Speckle Resistance Imaging (eSRI), and Spatial Compounding Imaging, etc. Various image parameter adjustments, 12.1 inch LCD and diverse probes are configured to provide clear and stable images.

Essential Performance:

Satisfying 2D imaging and basic functions of color ultrasonic system (such as color flow imaging and spectral Doppler imaging). Please check details as below:

1.   Compliant with essential performance requirements of EN60601-2-37.

2.   2D Imaging: It provides B mode and M mode imaging, and complies with requirements of GB10152-2009.

3.   Color flow imaging: It complies with the performance requirements of YY 0767-2009.

4.   Spectral Doppler imaging: It complies with the performance requirements of YY 0767-2009.

1.2. Features

◆ **Multi-language displays**

◆ **256 gray scale**

◆ **Two probe sockets**

◆ **Display modes**:

B, B+B, 4B, B+M, M, B+PW, B+Color, B+Color+PW, B+PDI/DPDI, B+PDI/DPDI +PW.

B+CW, B+Color+CW, B+PDI/DPDI +CW

◆ **Generic Measurements and Calculations:**

a). B/Color Mode: Distance, Area (Ellipse/Trace), Volume (2-Axis/3-Axis), Ratio, Angle, and Histogram.

b). M Mode: Distance, Time, Slope and Heart Rate (two cycles).

c). D Mode:

Velocity, Heart Rate, Time, Acceleration, Resistance Index (RI), Pulsatility Index (PI) and Auto Trace (auto trace is available only for PW mode)

1.3. Indications for Use/Intended Use

The diagnostic ultrasound system (U50) is applicable for adults, pregnant women, pediatric patients' ultrasound evaluation in hospitals and clinics. It is intended for use in abdominal, obstetrics, gynecology, pediatric, small parts, urology, peripheral vascular, musculoskeletal (conventional and superficial), endovaginal and cardiac clinical applications, by or on the order of a physician or similarly qualified health care professional.

1.4. Model

U50

1.5. Contraindications

◆ The equipment is not intended for ophthalmic use or any use causing the acoustic beam to pass through the eye.

Chapter 2 Safety Guidance

2.1. Warnings and cautions

In order to use the equipment safely and effectively, and avoid possible dangers caused by improper operation, please read through the user manual and be sure to be familiar with all functions of the equipment and proper operation procedures before use. Always keep this manual with the equipment.

Please pay more attention to the following warning and caution information.

2.1.1. Safety Warnings

NOTE:

The reliability of the device and the safety of operators and patients are considered during product design and production. The following safety and preventive measures should be carried out:

WARNING

1. This equipment is not intended for treatment.

2. This equipment is not intended for home use.

3. The diagnosis and examination function of the ultrasonic imaging management system should be integrated with the clinical situation of patients, and the diagnostic results are only for the physician's reference.

4. EXPLOSION HAZARD-Equipment is not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

5. The device should be operated by qualified operators or under their instructions.

6. The device should be operated appropriately to avoid mechanical damage to the transducer.

7. The device is not waterproof. Do not use it in locations where water or any liquid leakage may occur.

8. Do not use any fluid onto the system surface, as fluid seepage into the electrical circuitry may cause excessive leakage current or system failure.

9. Do not spray cleaners on the system, as this may force cleaning fluid into the system and damage electronic components. It is also possible for the solvent fumes to build up and form flammable gases or damage internal components.

WARNING

10. If the device breaks down, please shut down the machine immediately and contact EDAN or authorized representatives.

11. Only accessories supplied or recommended by EDAN can be used, the battery and probes of EDAN can be only used on EDAN's systems. Otherwise, the performance and electric shock protection can not be guaranteed. If electrical or mechanical equipment from other companies need to be connected to the device, please contact EDAN or authorized representatives before connection.

12. The equipment should be installed by a qualified service engineer. Do not try to access the interior of the main unit. Only authorized service personnel may remove the unit cover.

13. To avoid the risk of an electric shock, this equipment must only be connected to supply mains with protective earth.

14. To ensure grounding reliability, only connect the system to a hospital-grade power receptacle.

15. To ensure grounding reliability, connect the system only to an equivalent outlet.

16. To avoid electrical shock, inspect whether the grounding wire is connected prior to powering on the system. And disconnect the grounding wire after powering off the system.

17. If you have any questions about the grounding connection, use the battery but not the AC power supply. Prior to using the AC power supply, an inspection of grounding connection is recommended. If it is necessary, consult EDAN or authorized representatives for service.

18. Equipment connected to the U50 and located near the patient must be powered from a medically-isolated power source or must be a medically-isolated device. Equipment powered from a non-isolated source can cause your system to exceed leakage current limits. Enclosure leakage current created by an accessory or device connected to a non-isolated outlet may add to the enclosure leakage current of the imaging system.

19. When more than one medical device is connected to the patient, the combined leakage current must comply with IEC/EN 60601-1.

20. SHOCK HAZARD-Do not attempt to connect or disconnect a power cord with wet hands. Make sure that your hands are clean and dry before touching a power cord.

21. SHOCK HAZARD - Don't connect non-medical electrical equipment, which has been supplied as a part of the system, directly to the wall outlet when the non-medical equipment is intended to be supplied by a multiple portable socket-outlet with an isolation transformer.

WARNING

22. Use an extension cord or multi-socket outlet setup to provide power to the ultrasound system or to the system's peripheral devices, may compromise the system grounding and cause your system to exceed leakage current limits.

23. Multiple portable socket-outlet is not intended for the device, anybody, who connects it to the signal input or output connector to configure a medical system, must make sure that it complies with the requirement specified in Chapter 16 of IEC 60601-1, or the multi-socket is with an isolation transformer.

24. SHOCK HAZARD - Don't connect electrical equipment, which has not been supplied as a part of the system, to the multiple portable socket-outlets supplying the system.

25. If a multiple socket-outlet is necessary, ensure that it is not placed on the floor.

26. Do not exceed the maximum permitted load when using multiple portable socket-outlets to supply the system.

27. Do not use the additional multiple portable socket-outlet or extension cord in the medical electrical system, unless it's specified as part of the system by the manufacturer. And the multiple portable socket-outlets provided with the system shall only be used for supplying power to equipment which is intended to form part of the system.

28. Do not touch accessible parts of electrical equipment and the patient simultaneously.

29. A damaged probe can increase the risk of electric shock if conductive liquids come in contact with internal live parts. Inspect probes prior to use for cracks, openings, or other damage that could allow liquid entry.

30. To avoid electrical shock, never modify the ultrasound system's AC power circuits.

31. To avoid electrical shock and damage to the system, turn off and disconnect the device from the AC power source before cleaning and disinfecting.

32. Don't touch the signal input or output connector and the patient simultaneously.

33. To avoid the possibility of electrostatic shock and damage to the system, avoid using aerosol spray cleaners on the monitor screens.

34. Any non-medical equipment is not allowed to be used within the patient vicinity (1.5m/6ft.).

35. Periodically have the integrity of the system ground checked by a qualified service engineer.

36. This device is not suitable for intracardiac use or direct cardiac contact.

WARNING

37. EDAN makes every effort to manufacture safe and effective probes. You must take all necessary precautions to eliminate the possibility of exposing patients, operators, or third parties to hazardous or infectious materials. These precautions should be considered in the use of any application that may indicate the need for such care and during endocavity scanning.

38. If the liquid crystal material leaks from the panel, it should be kept away from the eye or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.

39. **EMI Limitations**

    Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air of wiring. Ultrasound machines also generate EMI. The U50 complies with limits as stated on the EMC label. However, there is no guarantee that interference will not occur in a particular installation.

    Possible EMI sources should be identified before the unit is installed.

    Electrical and electronic equipment may produce EMI unintentionally due to one of the following defects: High frequency electrotome, Transformer, Defibrillator, Wireless LAN equipment, Medical lasers, Scanners, Cauterizing guns, Computers, Monitors, Fans, Gel warmers, Microwave ovens, Light dimmers, Portable phones

    The presence of a broadcast station or broadcast van may also cause interference.

    If you find strong interference shows on the screen, please check the sources.

40. Ultrasound may be harmful to the human body. This device should be used for valid reasons, for the shortest period of time, and at the lowest mechanical and thermal indices necessary to produce clinically acceptable images. According to the ALARA (As Low As Reasonably Achievable) principles, the acoustic output should be set to the lowest level required to satisfactorily perform the examination. Long time exposure should be avoided. For the parameters of sound output, please refer to appendix II. The U50 complies with the requirements of applicable International Electrotechnical Commission (IEC) standards in terms of safety and acoustic output levels.

41. Contact with natural rubber latex may lead to a severe anaphylactic reaction in persons sensitive to the natural latex protein. Sensitive users and patients must avoid contact with these items. EDAN strongly recommends that health-care professionals identify their latex-sensitive patients, and refer to the March 29, 1991 Medical Alert on Latex products. Be prepared to treat allergic reactions immediately.

WARNING

42. If a sterile probe cover becomes compromised during an intraoperative application involving a patient with transmissible spongiform encephalopathy, such as Creutzfeldt-Jakob disease, follow the guidelines of the U.S. Disease Control Center and this document from the World Health Organization: WHO/CDS/APH/2000/3, WHO Infection Control Guidelines for Transmissible Spongiform Encephalopathies. The probes for your system cannot be decontaminated using a heat process.

43. When the device works with the mobile trolley, DO NOT place the device on slopes. It may suddenly slide, resulting in injury and/or equipment damage.

44. To ensure safety, two people are required to move the device across slopes when the device works with the mobile trolley.

45. All repairs on products must be performed or approved by EDAN. Unauthorized repairs will void the warranty. In addition, whether or not covered under warranty, any product repair shall be exclusively be performed by EDAN certified service personnel.

46. To ensure optimal imaging, begin the scan session by selecting the correct probe and application for each examination.

47. The medical electrical equipment needs to be installed and put into service according to *Appendix IV EMC Information*.

48. Portable and mobile RF communications equipment can affect medical electrical equipment. Refer to the recommended separation distances provided in *Appendix IV EMC Information*.

49. The use of cables, transducers and accessories not supplied by the manufacturer may result in increased emissions or decreased immunity of the equipment.

50. The equipment should not be used adjacent to or stacked with other equipment, refer to the recommended separation distances provided in *Appendix IV EMC Information*.

51. The system and its accessories shall not be serviced or maintained while in use with a patient.

52. The mains plug is used to isolate the system from the main power. Position the system so that it is easy to disconnect the device.

53. Assembly of the system and modifications during actual service life shall be evaluated based on the requirements of IEC60601-1.

54. This system cannot be used together with high-frequency surgical equipment.

55. DO NOT perform any unauthorized modification of the equipment.

NOTE:

The probe stops transmission after freezing, disconnecting, falling off, or entering sleeping mode. Main control software checks the probe connection all the time, once probe disconnects from the probe socket, the system stops transmission.

Electromagnetic Compatibility (EMC)

Operating the U50 in close proximity to sources of strong electromagnetic fields, such as radio transmitter stations or similar installations may lead to interference visible on the monitor screen. However, the device has been designed and tested to withstand such interference and will not be permanently damaged.

2.1.2. Battery Safety

To prevent the battery from igniting, emitting fumes, bursting, injuring personal, damaging equipment, pay attention to the following precautions.

WARNING

1   Improper operation may cause the internal li-ion battery (hereinafter called battery) to be hot, ignited or exploded, and it may lead to the decrease of the battery capacity. It is necessary to read the user manual carefully and pay more attention to warning messages.

2   Only qualified service engineers authorized by the manufacturer can open the battery compartment and replace the battery, and batteries of the same model and specification should be used.

3   **DANGER OF EXPLOSION** -- Do not reverse the anode and the cathode when installing the battery.

4   Charge the battery only when the ambient temperature is between 0°C and 40°C.

5   When the battery is out of power, please wait for 0.5-1 hours before you charge it, in order to avoid charging abnormality caused by battery cell overheating.

6   Do not use the battery near heat sources or when the ambient temperature is over 40°C. Do not heat or splash the battery or throw it into fire or water.

7   Do not destroy the battery; do not pierce the battery with a sharp object such as a needle; do not hit with a hammer, step on or throw or drop to cause strong shock; do not disassemble or modify the battery. Otherwise, it may be hot, smoking, distorted or ignited and result in injury.

8   When leakage or foul smell is found, stop using the battery immediately. If your skin or cloth comes into contact with the leaked liquid, cleanse it with clean water at once. If the leakage liquid splashes into your eyes, do not wipe them. Irrigate them with clean water first and go to see a doctor immediately.

9   When the battery reaches the end of its service life, or foul smell, deformation, discoloration, or distortion is found, stop using the battery immediately, replace it with

a new one, and properly dispose of or recycle the depleted battery according to local regulations.

10 Only when the device is off can the battery be installed or removed.

11 Remove the battery from the device when the device is not used for a long time.

12 Periodic checks on the battery performance are required. Replace the batteries if necessary.

NOTE:

1. It is recommended to charge the battery after the system is switched off, so that you can save the charging time.

2. If the battery is stored alone and not used for a long time, we recommend that the battery should be charged at least once every 6 months to prevent overdischarge.

2.1.3. General Cautions

CAUTION

1. Before use, you must make sure that there is no visible evidence of damage to the equipment, cables and probes, which may affect patient safety or diagnostic capability. The recommended inspection interval is once per week or less. If damage is evident, replacement is recommended before use.

2. If the power cord of the system is missing, damaged or not provided, please purchase the power cord meeting the specification requirements for the original one and complying with the local regulations.

3. It is necessary to take the probe out of the probe bracket during moving and transporting; otherwise, the probe or probe bracket may be broken.

4. The normal ultrasonic examination is recognized as being safe. To avoid burns, do not scan in the same area for a long period of time. Always minimize the exposure time while acquiring necessary clinical information

5. To ensure proper grounding and leakage current levels, it is the policy of EDAN to have an authorized EDAN representative or an EDAN approved third party to perform all on-board connections of documentation and storage devices to the U50.

6. The device and accessories are to be disposed of according to local regulations after their useful lives. Alternatively, they can be returned to the dealer or the manufacturer for recycling or proper disposal. Batteries(including button cell on the main board) are hazardous waste. Do not dispose them together with house-hold garbage. At the end of their life hand the batteries over to the applicable collection points for the recycling of waste batteries. For more detailed information about recycling of this product or battery, please contact your local Civic Office or the shop where you purchased the product.

7. Please use the standard power cord as the input line of the network power supply for the adapter to reduce risk.

8. Federal (U.S.) law restricts this device to sale by or on the order of a physician.

9. To avoid misdiagnosis from inaccurate measurement values, ensure that the target area of interest and image are correct, and the measurement area is valid.

10. No user serviceable parts are inside the system. All repairs on the system must be performed by EDAN certified service personnel.

11. The internal storage space of the system is limited. It is highly recommended to back up patient data and settings regularly.

12. The packaging is to be disposed of according to local or hospital's regulations; otherwise, it may cause environmental contamination. Place the packaging at a location that is inaccessible to children.

13. Properly dispose of used cleaning agents or disinfectants according to your hospital's regulations.

14. Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

NOTE:

To avoid damaging the system, DO NOT use it in an environment as below:

1. Locations exposed to direct sunlight.
2. Locations subject to sudden changes in ambient temperature.
3. Dusty locations.
4. Locations subject to vibration.
5. Locations near heat sources.
6. Locations with high humidity.

2.1.4. Network Security Cautions

CAUTION

1. Keep your ultrasound system safe to protect the patient information and data from being modified, damaged or disclosed caused by unauthorized disassembly.

2. Always ensure the privacy of patient information and data displayed/stored in the ultrasound system or exported to external storage devices.

3. The software upgrade can only be performed by EDAN-qualified service professionals with upgrade files of known provenance.

4. Make sure the ultrasound system is used under secure network environment, and all the approved devices connecting with the ultrasound system are physically secure.

5. Anti-virus measures such as USB device virus scanning should be carried out prior to using the USB flash drive.

6. Do not connect an USB device with unknown provenance to the ultrasound system.

7. When the ultrasound system is returned for maintenance, disposed of, or removed

from the medical institution for other reasons, ensure all patient data are removed from the ultrasound system.

8. Hide your password wherever possible when entering it, protecting it from being disclosed.

2.2. Labeling Symbols

Descriptions of symbols of the device are shown in *Table 2-1*.

No.	Symbol	Definition
1.	SN	Serial Number
2.	P/N	Part Number
3.	(symbol)	Date of Manufacture
4.	(symbol)	Manufacturer
5.	(symbol)	Operating instructions
6.	(symbol)	Warning (Background: Yellow; Symbol & outline: Black)
7.	(symbol)	Refer to User Manual (Background: Blue; Symbol: White)
8.	(symbol)	Caution
9.	(symbol)	Biological Risks
10.	(symbol)	Disposal method. It indicates that the equipment should be sent to special agencies according to local regulations for separate collection after its useful life.
11.	Rx only	Caution: Federal (U.S.) law restricts this device to sale by or on the order of a physician.
12.	EC REP	Authorized Representative in the European Community
13.	CE 0123	CE marking

14.	ETL CLASSIFIED (Intertek 4005997)	Conforms to UL Std. 60601-1, IEC Std. 60601-2-37 Certified to CSA Std. C22.2 No 601.1, CSA Std. C22.2 No 60601-2-37
15.		Type BF Applied Part
16.		Alternating Current (a.c.)
17.		"ON" (power)
18.		"OFF" (power)
19.		Equipotential grounding
20.	VGA	VGA output, External Monitor
21.		Video Output
22.		Fuse
23.		Probe for sector-shaped sound field
24.		Computer network
25.		Foot switch To identify a footswitch or the connection for a foot switch.
26.		Protective earth (ground)
27.		Recording on an information carrier
28.	EDAN	Trademark
29.		USB (Universal Serial Bus) Connection
30.		Dangerous voltage
31.		Variability, for rotating movement Rotate clockwise to increase the value, and counterclockwise to decrease.

32.		Variability Adjust right to increase the value, and left to decrease.
33.		Running indicator
34.		Battery check
35.	IPX7	Degree of protection provided by enclosures (IP Code): temporary immersion. For the probe but not including the probe connector.
36.		Power off/on the system
37.		Brightness
38.		Sound muting
39.		Loudspeaker To adjust the volume in PW mode
40.		Non-sterile. Indicates a medical that has not been subjected to a sterilization process.

Table 2-1 Descriptions of Symbols

Descriptions of symbols of the packaging are shown in table 2-2:

No.	Symbol	Definition
1		This way up
2		Fragile. handle with care
3		Keep dry
4		General Symbol for Recovery / Recyclable
5		Stacking limit by number
6		Do not step on!
7		Handle with care

Table 2-2 Descriptions of Packaging Symbols

NOTE:
The user manual is printed in black and white.

Chapter 3 System Overview

3.1. Appearance

3.1.1.Front View
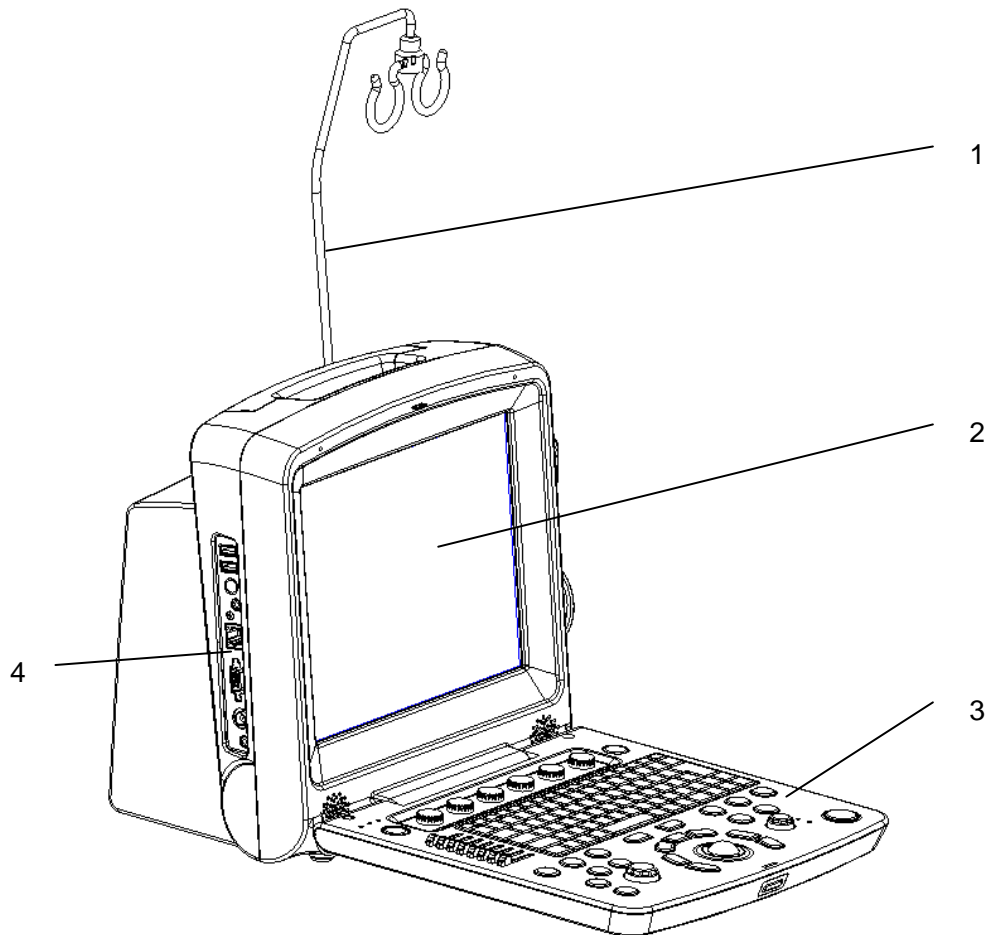
Figure 3-1 Front View

1. Cable holder

2. Display screen

3. Control panel

4. I/O ports

NOTE:

1. Please check the details of I/O ports on *Figure 4-7 I/O Ports on the Left Panel*.

2. The pictures and interfaces in this manual are for reference only.

3.1.2.Rear View
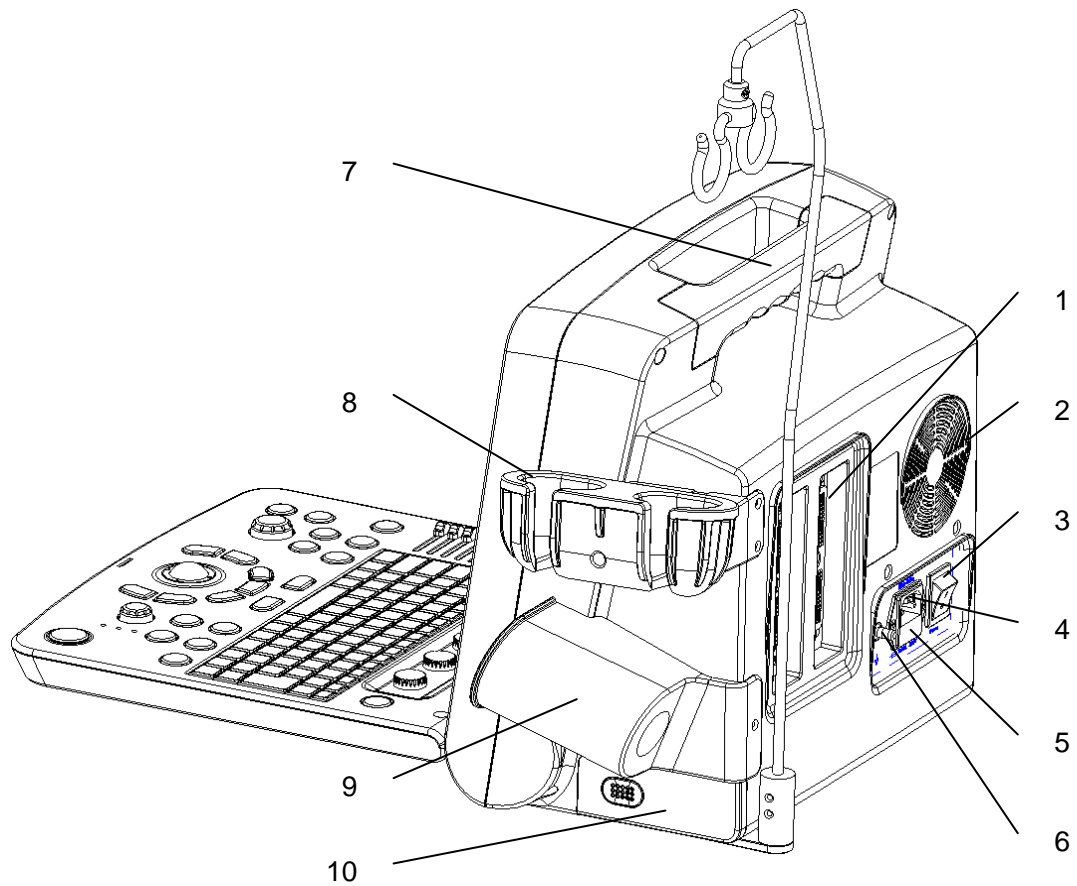
Figure 3-2 Rear View

1   Probe sockets

2   Heat dissipation orifice

3   AC power switch

4   Appliance inlet

5   Fuse-box

6   Equipotential terminal

7   Handle

8   Probe holder

9   Coupling gel trough

10   Battery compartment door

CAUTION

Ensure system vents are clear and unobstructed.

3.2. Configuration

3.2.1. Standard Configuration

- ◆ 1 main unit
- ◆ 1 power cord
- ◆ 1 ground wire
- ◆ 2 pieces of fuse, φ5×20, T3.15AH250V
- ◆ 1 Dustproof keyboard film
- ◆ 2 USB disks
- ◆ 1 probe cable holder
- ◆ 1 bottle of coupling gel, 250 mL
- ◆ 1 user manual
- ◆ 2 packing lists

3.2.2. Options

The Diagnostic Ultrasound System supports the following options:

- ◆ Linear array probe: L1042UB/ L742UB/ L552UB/ L15-7b
- ◆ Endocavity probe: E612UB
- ◆ Micro convex probe: C612UB/ C6152UB/ C422UB
- ◆ Convex array probe: C5-2b, C352UB
- ◆ Phased array probe: P5-1b
- ◆ Rechargeable lithium-Ion battery
- ◆ Needle Guide Bracket Kit

Model	Name	Description
BGK-R50UB	R50UB Needle Guide Bracket Kit	For the probe C352UB, Supports: 14G~23G
BGK-L40UB	L40UB Needle Guide Bracket Kit	For the probe L742UB/L1042UB/L15-7b, Supports: 14G~23G
BGK-CR10UA	CR10UA Needle Guide Bracket Kit	For the probe E612UB, Supports: 16G，18G
BGK-R10UB	R10UB Needle Guide Bracket Kit	For the probe C612UB, Supports: 14G~23G
BGK-R15UB	R15UB Needle Guide Bracket Kit	For the probe C6152UB, Supports: 14G~23G

BGK-R20UB	R20UB Needle Guide Bracket Kit	For the probe C422UB, Supports: 14G~23G
BGK-L50UB	L50UB Needle Guide Bracket Kit	For the probe L552UB, Supports: 14G~23G
BGK-C5-2	BGK-C5-2 Needle Guide Bracket Kit	For the probe C5-2b, Supports :14G~23G

Table 3-1 Needle Guide Bracket Kits

◆ DICOM 3.0

◆ Freeze footswitch

◆ Mobile trolley MT-805

◆ Hand carried bag

◆ Dustproof cloth

Supported Peripheral Accessories:

◆ The recommended printers are listed as follows:

Printer Type	Interface	Recommended Models
Black /white Video Printer	Video	SONY UP-897MD, MITSUBISHI P93W_Z
	Video/USB	SONY UP X898MD
Color Video Printer	S-Video	SONY UP-25MD
	USB	SONY UP-D25MD
Graph/text Report Printer	USB	HP2010，HP Laserjet Pro 400 M401d ，HP Deskjet 1010，HP Laserjet 1510，HP DeskJet lnk Advantage Ultra 2029，HP DeskJet 1112，HP403D，HP Deskjet 2050，HP Deskjet 1050 CANON_E518, CANON_IP_2780, EPSON_L130, EPSON_L310, EPSON_L383

Table 3-2 Printers

The video printer output:

Color: Paper size: 100mm*94mm;

Print area: 96mm*72mm

B/W: Paper size(general display:only one page): 110mm*100mm；

Print area 99mm*74mm

The graph/text report printer output: A4 paper, 210 mm×297 mm

◆ Hard disk

◆ Recommended DVD drives: SAMSUNG SE-208, LENOVO DB75 and LITEON eBAU108

Chapter 4 Installation Instructions

4.1. Environmental Requirements

Keep the device away from equipment with a strong electric field, strong magnetic and high voltage field, and protect the display screen from direct exposure to strong sunlight. Keep good ventilation.

4.2. Unpacking Inspection

Visually examine the package prior to unpacking. If any signs of mishandling or damage are detected, contact the carrier to claim for damage. After unpacking the device, you should follow the packing list to check the product carefully and to make sure that no damage has occurred during transportation. For installation, please contact your local distributor or the EDAN service department at: support@edan.com.cn.

WARNING

1. Do not use the device if it is found to be damaged or defective.

2. Do not drop or collide with the probe. Otherwise you shall give up using it.

3. Make sure the AC power supply complies with the following specifications: 100V-240V~, 50Hz/60Hz.

4.3. Connecting Procedure

1. Take the main unit and accessories out of the package.

2. Connect the cable holder and battery (if it is configured) to the main unit correctly.

3. Connect the probes to the main unit correctly.

4. Connect the printer and load the recording paper.

5. Connect the power cable

   1) Connect the main unit and the common earth terminal firmly via a potential equalization conductor.

   2) Plug one end of the power cable to the power socket of the main unit, and the other end to the special power output socket of the hospital.

6. Switch on the main unit.

   Press power switch on the rear side of the main unit, and press the power on/off key on the top left of the control panel. You can operate the main unit after the main interface appears.

4.3.1. Installing and Uninstalling a Cable Holder

To install the cable holder:

1. Take out the cable holder, three screws (M3×12) and packing foam from the package.
2. To avoid scraping the main unit, put one piece of packing foam on flat ground.
3. Carefully turn the main unit upside down and put it on the packing foam and assemble the screws to the main unit with a cross-head screw driver as shown in *Figure 4-1*.
4. Carefully turn the main unit with a cable holder to the normal state as shown in *Figure 4-2*.

M3×12 (3×)

Figure 4-1 Assembling Cable Holder to Main Unit

Figure 4-2 Main Unit with Cable Holder

To uninstall the cable holder:

Uninstall the cable holder in a reverse procedure.

4.3.2. Installing and Uninstalling a Battery

To install a battery (if necessary):

1. Turn off the device, and take out the battery from the package.
2. Press the button on the battery compartment door and pull the door out.
3. Turn the lever counterclockwise to hide it and push the battery into place.
4. Turn the lever clockwise to keep the battery in place.
5. Replace the battery compartment door.

①Press the button   ②Pull the battery compartment door out
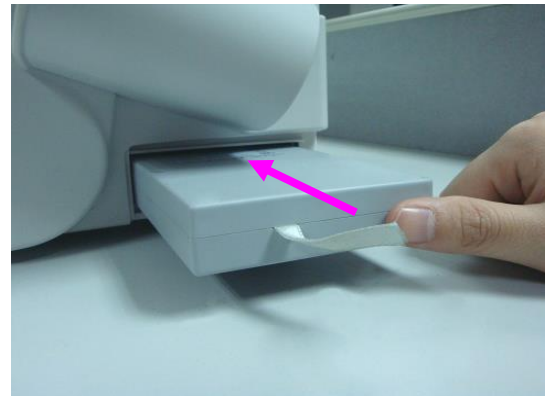
③Turn the lever counter-clockwise to hide it   ④Push the battery into place
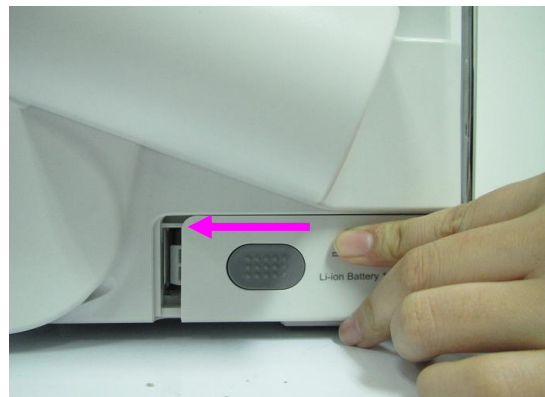
⑤Turn the lever clockwise to keep the
battery in place   ⑥Replace the battery compartment door

Figure 4-3 Installing Battery to Main Unit

To uninstall a battery:

1. Turn off the device, and press the button on the battery compartment door and pull the door out.

2. Turn the lever counterclockwise to hide it.

3. Pull the battery out.

4. Replace the battery compartment door.

①Press the button

②Pull the battery compartment door out
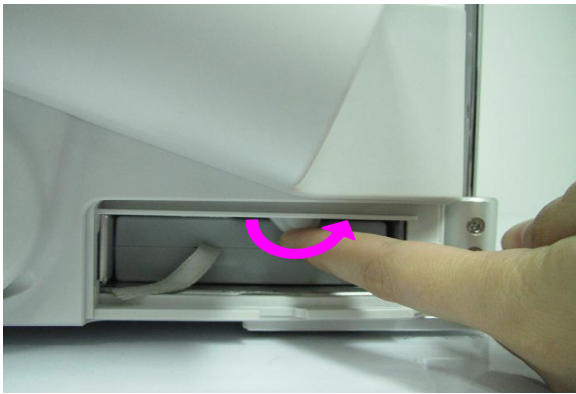
③Turn the lever counter-clockwise to hide it

④Pull the battery out
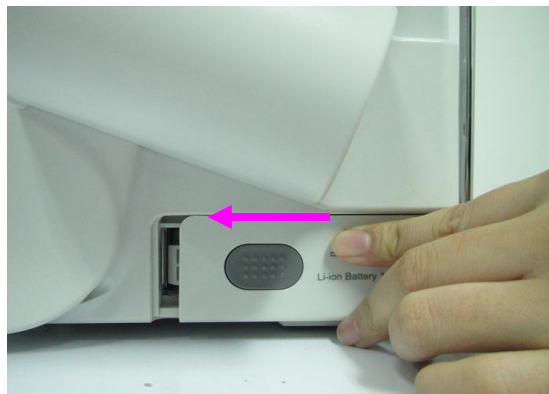
⑤Replace the battery compartment door

Figure 4-4 Uninstalling Battery from Main Unit

4.3.3. Connecting and Disconnecting Probes

NOTE:

Ensure that the system is shut down, or the image is frozen, before connecting and disconnecting probes.

The scan direction mark located at the side of the probe indicates the beginning direction of scanning. The scan direction mark is shown below.

Scan Direction Mark
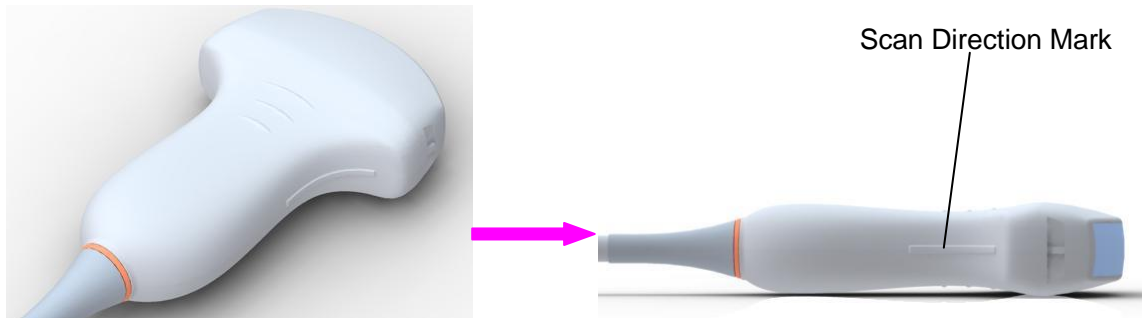
Figure 4-5 Probe Scan Direction Mark Schematic Diagram

There is information about Model and SN on the probe connector.

To connect a probe:

1. Place the probe's carrying case on a stable surface and open the case.
2. Carefully remove the probe and unwrap the probe cable.
3. Do not allow the probe head to hang free. Impact of the probe head could result in irreparable damage.
4. Turn the connector locking handle counterclockwise to the horizontal position.
5. Align the connector with the probe port and carefully push it into place.
6. Turn the locking handle on the transducer connector clockwise to the vertical position. This ensures the connector in position and ensures the best possible contact.
7. Place the probe in the probe holder.

To disconnect a probe:

1. Turn the locking handle on the connector housing counterclockwise to the horizontal position.
2. Firmly grasp the probe connector and carefully remove it from the system port.
3. Store each probe in its protective carrying case.

Probe connectors　　　　Open　　　　Lock
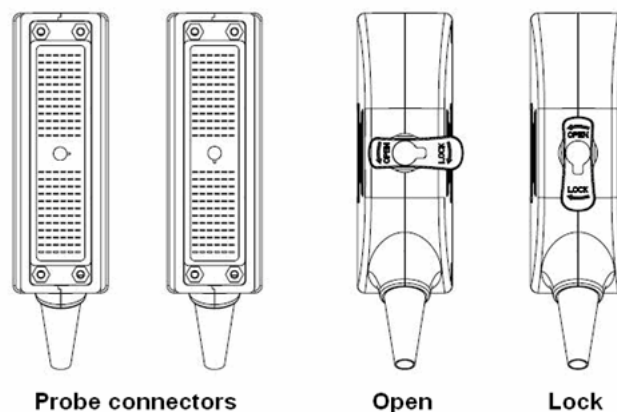
Figure 4-6 Lock and Open Marks on Probe Connectors

WARNING

Do not touch the pin of the probe connector.

CAUTION

Do not plug in or pull out the connector when the device is activated. This is to avoid uncontrollable damage to the probe and the main unit.

NOTE:

Once the probe is connected to the main unit, please do not reinstall it frequently. This is to avoid poor contact between the probe and the main unit.

4.3.4. Peripheral Connections

Video connections are located on the left panel of the U50.

WARNING

1. Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC/EN standards (e.g. IEC/EN 60950 for data processing equipment and IEC/EN 60601-1 for medical equipment). Furthermore, all configuration shall comply with the valid version of the standard IEC/EN 60601-1. Therefore, anybody, who connects additional equipment to the signal input or output connector to configure a medical system, must make sure that it complies with the requirements of the valid version of the system standard IEC/EN 60601-1. If in doubt, consult our technical service department or your local distributor.

2. Parts and accessories used must meet the requirements of the applicable IEC/EN 60601 series safety standards, and/or the system configuration must meet the requirements of the IEC/EN 60601-1 medical electrical systems standard.

3. Connecting any accessory (such as an external printer) or other devices (such as the computer) to this equipment makes a medical system. In that case, additional safety measures should be taken during installation of the system, and the system shall provide:

   a) Within the patient environment, a level of safety comparable to that provided by medical electrical equipment complying with IEC/EN 60601-1;

   b) Outside the patient environment, the level of safety appropriate for non-medical electrical equipment complying with other IEC or ISO safety standards.

4. Parts and accessories must be connected to the I/O ports designated in *Figure 4-7*. For example, only the supplied or recommended USB device can be connected to the USB ports; DO NOT connect telephone line to the network port; DO NOT connect earphone to the footswitch port or remote port.

CAUTION

To ensure proper grounding and leakage current levels, it is the policy of EDAN to have an authorized EDAN representative or EDAN approved third party perform all on-board connections of documentation and storage devices to the U50.
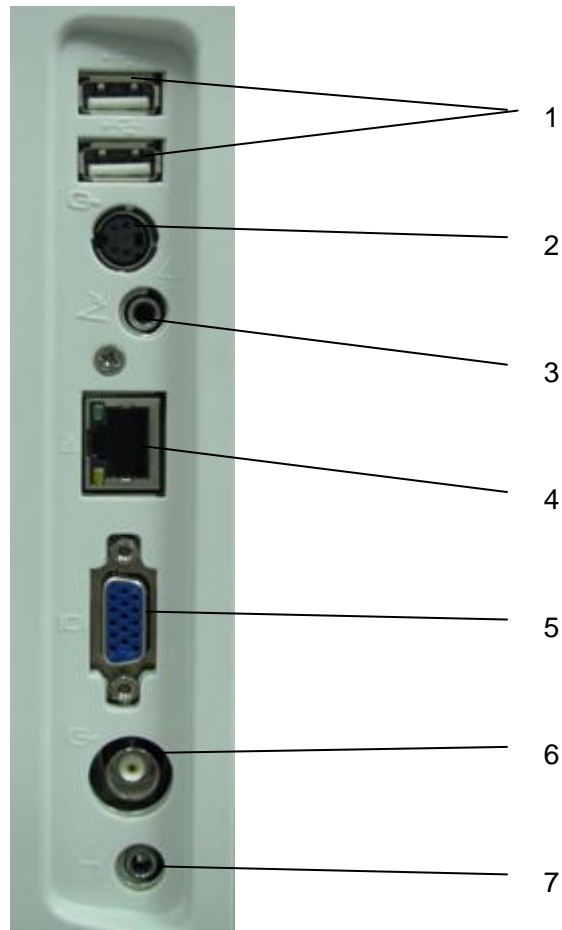
Figure 4-7 I/O Ports on the Left Panel

Peripheral ports:

1	USB ports	5	VGA output port (15 pin)
2	S-Video output port	6	Video output port
3	Footswitch port	7	Remote port
4	Network port (DICOM 3.0)		

4.3.5. Equipotential Bonding
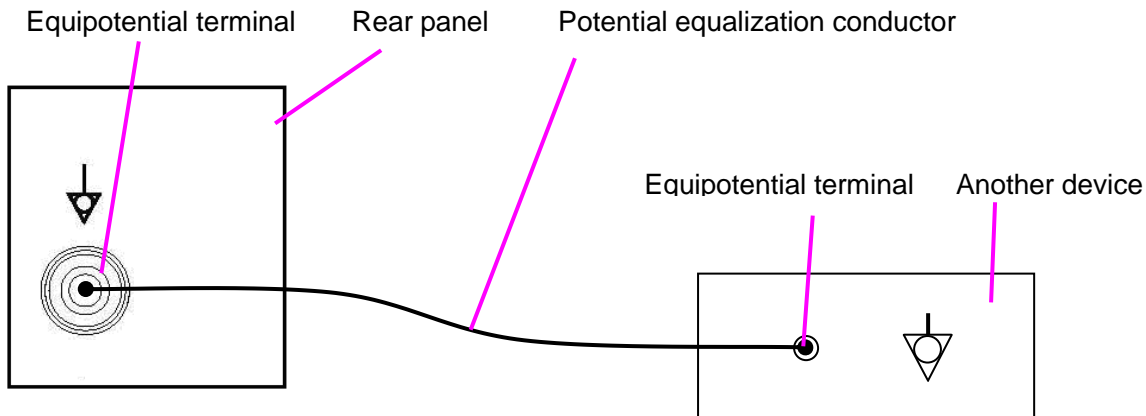
Figure 4-8 Equipotential Bonding

Any use of other devices with the system is at the user's risk and may void the system warranty. In order to fulfill IEC/EN 60601-1 requirements, connections of peripheral equipment to the U50 must adhere to one of the following conditions:

◆ The peripheral equipment itself is a medical device approved according to IEC/EN 60601-1.

◆ Non-medical peripheral equipment approved according to any other EN or IEC standard must use the following setup for connection:

  ➢ Connect the equipotential connector of U50 to an independent protective earth terminal with a potential equalization conductor.

  ➢ The peripheral equipment is located at least 1.5 meters (1.8 meters in Canada and the U.S.A) outside the patient environment. A patient environment is defined as the area in which medical examination, monitoring, or treatment of the patient takes place.

  ➢ The peripheral equipment is connected to a main outlet outside the patient environment but still within the same room as the ultrasound system.

WARNING

1. Equipotential bonding: when the device is running with other instruments jointly, consideration should be given to equipotentiality.

2. Doctors and patients might be exposed to the hazardous and uncontrollable effects of compensating current caused by unbalanced equipotentiality between indoor medical device and touchable conducting parts. The safest solution is to build a unified equipotential network, to which the medical device is connected, using an angular plug.

4.3.6. Printer Installation

This system supports video printers and graph/text report printers. For printers connecting via USB port, select the printer model in the **System Preset** prior to printing, refer to section 5.7.3 for details.

To install a video printer:

1. Power off the main unit and the printer.

2. Connect the VIDEO IN (video input) of the video printer and the S-Video output/Video output/USB port of the main unit with a data cable.

3. Connect the REMOTE of the video printer with the REMOTE of the main unit.

     Reference   *Figure 4-7 I/O Ports on the Left Panel*.

4. Power on the main unit and run the printer.

NOTE:

The video printers are used in patient vicinity.

To install a graph/text report printer:

1. Power off the main unit and the printer.

2. Connect the printer with the main unit by using a USB cable.

3. Power on the main unit and run the printer.

NOTE:

1. Chromatic aberration, unfriendly brightness, contrast or overall appearance may occur if you print images with default presetting of video printer. To obtain good printings, please adjust the video printer parameters according to the images.

2. Please check the printer user manual for details about printer installation. If the printer does not work normally, check the Report printer presetting through **System preset**, see Section *5.7.3 System Preset*.

3. To obtain good printings, EDAN recommends you to connect the color printer with the S-Video output, and connect the monochrome printer with Video output.

4. Multiple portable socket-outlet is not intended for the device, anybody, who connects it to the signal input or output connector to configure a medical system, must make sure that it complies with the requirements of the valid version of the system standard IEC/EN 60601-1. If in doubt, consult our technical service department or your local distributor.

5. If you want to use a multiple portable socket-outlet to supply power to the whole U50 system, you are suggested to calculate the system power consumption when building a U50 system so as to match the system power consumption with the power sustained by a multiple portable socket-outlet.

6. When using Video printer SONY UP X898MD, please configure the printer driver to " DRIVER: DRV 898" on the printer prior to printing.

Chapter 5 System Control

5.1. Powering On/Off Device

◆ To power on the device

Before powering on this device, check as below:

1. Check the potential equalization conductor and make sure it is connected properly.

2. Check all the cables and make sure there is no scrape or crack.

3. Check the control panel and the monitor and make sure there is no crack.

4. Check the probe and the connection and make sure there is no scrape or crack.

5. Check the power socket and the switch and make sure there is no damage.

To power on:

1. Connect the device to a standard three-pin power supply socket via the power cable, switch on the AC power switch on the rear panel; Or

    Use the battery as the power supply.

2. Press the power on/off key on the top left of the control panel, and a startup interface appears. When you use the battery as the power supply, press and hold down the power on/off key to switch on the device.

◆ To Login

If Password Protection is enabled (see section 5.7.13), the system displays a Login dialog when booting up the system. Select user name from the User Name drop-down list, then enter password and click **Login**.

For emergency use, click on **Emergency** to log on directly without entering user name and password.

   NOTE:

1. When both Admin1 and Admin2 password are forgotten, please contact the serviceman for the system password reset.

2. It is not suggested to use Emergency login under non-Emergency situation. Please login the system with your account or switch to your account through the Switch User function (See "To Switch Users" below) prior to image scanning.

3. Ensure the privacy of patient information and data created through Emergency login. It is suggested to remove the patient exam data from the ultrasound system after Emergency scanning for protecting patient data from being accessed by

unauthorized users.

◆   To Switch Users

If Password Protection is enabled, switching users is allowed without restarting the system.

1.   Press Power on/off key, and the system will display a confirmation dialog box.

2.   Select **User** from the confirmation dialog box. A login information dialog box will be displayed providing access to changing user.

3.   Select another user from the User Name drop-down list and then enter password to login.

◆   To shut down the device

1.   Press the power on/off key on the top left of the control panel and the system displays a confirm dialog box.

2.   Select **Yes** to power off the system.

Or,

If the system breaks down, long press the power on/off key on the top left of the control panel to shut down the system directly.

NOTE:

Please unplug the AC power cord from the power socket and disconnect the battery if the device is to remain idle for a long time.

<u>**CAUTION**</u>

1.   Do not unplug the power cord before switching off the system.

2.   Wait approximately five seconds between powering the system off and then on again. This allows the system to complete its shutdown process.

Standby mode

To place the system in standby mode:

Press the power on/off key and select **Standby** from the confirmation dialog box, or press **Stndby** on PC keyboard once ("Stndby" is the abbreviation of "Standby"), the system goes into the maximum power saving state: Standby Mode. But the archived patient information, measurement and images will be kept.

To wake up the system from standby mode:

Press the power on/off key or press **Stndby** on PC keyboard once to come out of Standby Mode, the system resumes working immediately.

◆   To restart the device

If there is any trouble described as below, please press the power on/off key to switch off the device and then press it again to restart the device.

➢ The device displays the wrong information and it lasts a long time.

➢ The device displays abnormally.

➢ The device can not execute an operation.

5.2. Examining

Apply an appropriate amount of coupling gel (medical ultrasound coupling agent) to the body area to be examined, and then contact the area with the acoustic window of the probe firmly. A cross-sectional image of tissues will be displayed on the screen. Adjust **brightness**, **gain**, **TGC**, **focus combination**, etc properly. Adjusting the monitor's contrast and brightness is one of the most important factors for best image quality. If these controls are set incorrectly, the **gain**, **TGC**, **and focus combination** may have to be changed more often than necessary to compensate. Meanwhile, properly move the probe to obtain an optimal image of the target area. Or if necessary, adjust **sweep speed** to get satisfying images in the M mode, and adjust **D gain**, **sample line**, **Sample Volume**, **Base Line**, **Correction Angle**, **D WallFilter**, **PRF** (Pulse Repetition Frequency), etc in the PW mode.

CAUTION
1.   Please be gentle when contacting the target area with a probe. This is to avoid making the probe damage or the patient disturbed.
2.   Please choose a proper probe for the target area with an appropriate frequency to begin the diagnostic operation.
3.   Adjust the gain knob slowly.

5.3. Screen Layout
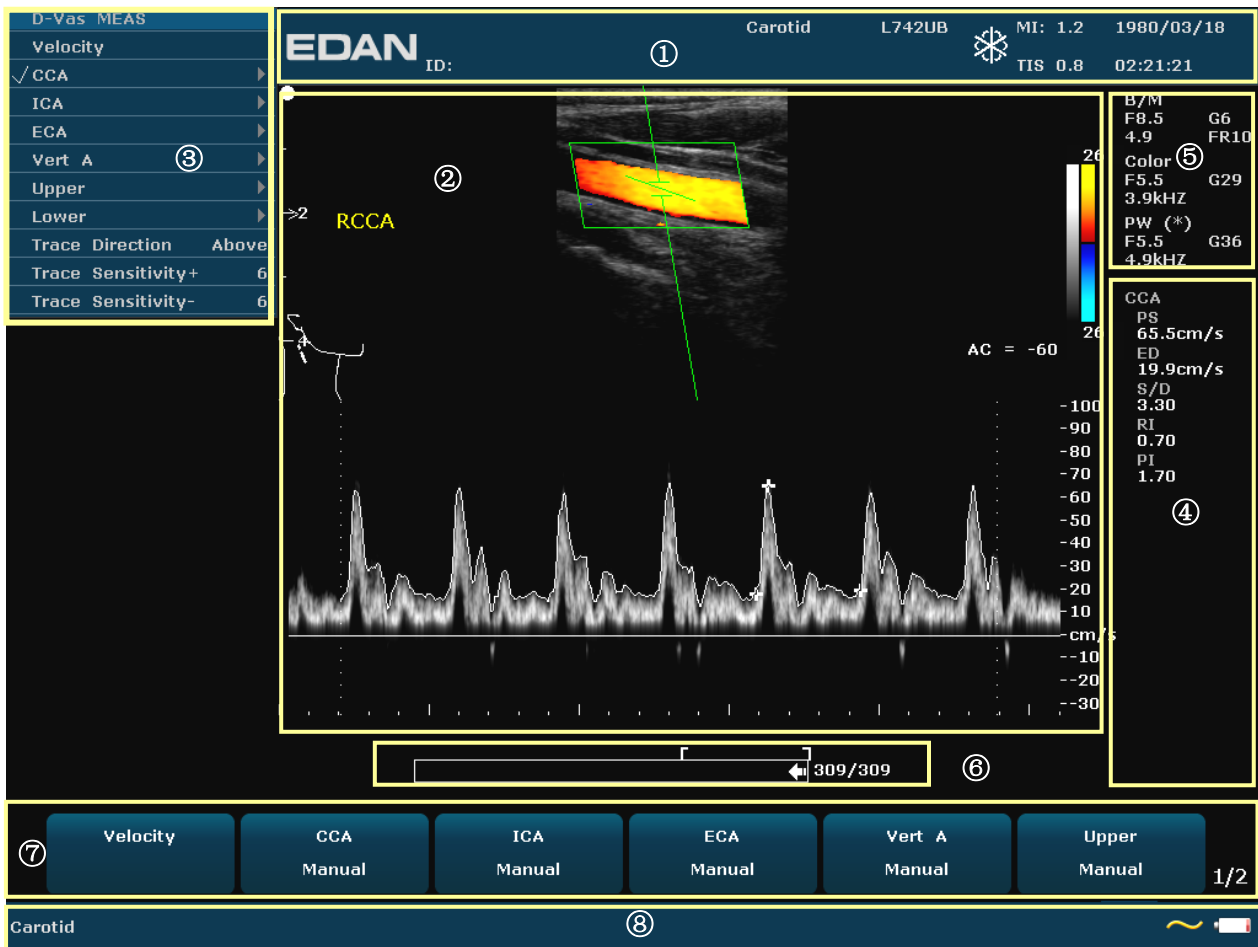
Figure 5-1 Monitor Display

① **Information Field**：

Manufacturer logo, Institution/Hospital name, Patient name, Patient ID, Current examination type, Probe model, Probe frequency, "Freeze" icon, MI, TI, System date and time, etc.

② **Image Field:**

Ultrasound image (B/Color/PDI/PW/CW/M mode), Gray map bar, Color map bar, Depth scale, Focus mark, Sample line of PW/M mode, Center Line, Sample volume of PW mode, Scan area window of Color mode (also referred to as the region of interest, or ROI), Needle guide line, Probe scan direction mark, Comments (texts or arrows), Body marks, Measurement caliper, TGC curve, etc.

③ **Menu Field:**

Image control menus /control program menus. The content of menus depends on system status.

④ **Measurement Results Field:**

The field displays the measurement and calculation items and results in different rows.

⑤ **Parameter Field:**

It displays the principal image parameters of each mode. Parameters of the currently active mode are marked with "*" symbols. Parameters of B mode: Freq, Gain, Depth, and Frame Rate; Parameters of Color /PW/CW mode: Freq, Gain, and PRF.

⑥ **CINE Review Progress Bar**

⑦ **Menu Controls Field:**

Image parameters adjustment/ program menus control, the items correspond to system menus in different modes or status.

⑧ **Status Prompt Field:**

The lower left side of the field displays operation prompt, examination type;

The lower right side of the field shows the state of USB, the state of power supply, input method, brightness or volume adjusting information (the icon is displayed only during adjustment)

Battery Status Icon:

: Battery capacity more than 80%.

: Battery capacity 60%-80%.

: Battery capacity 40%-60%.

: Battery capacity 20%-40%.

: Battery capacity lower than 20%, turns red.

: AC power supply, with the battery connected;

: AC power supply, without battery connected.

: Battery power supply.

When the battery capacity is ≤20%, the battery status icon turns red.

When the battery capacity is reduced to 20%, the system displays a prompt "**Battery capacity is too low, please recharge!**"

When the battery capacity is reduced to 10%, the system displays the prompt again "**Battery capacity is too low, please recharge!**"

5.4. Control Panel
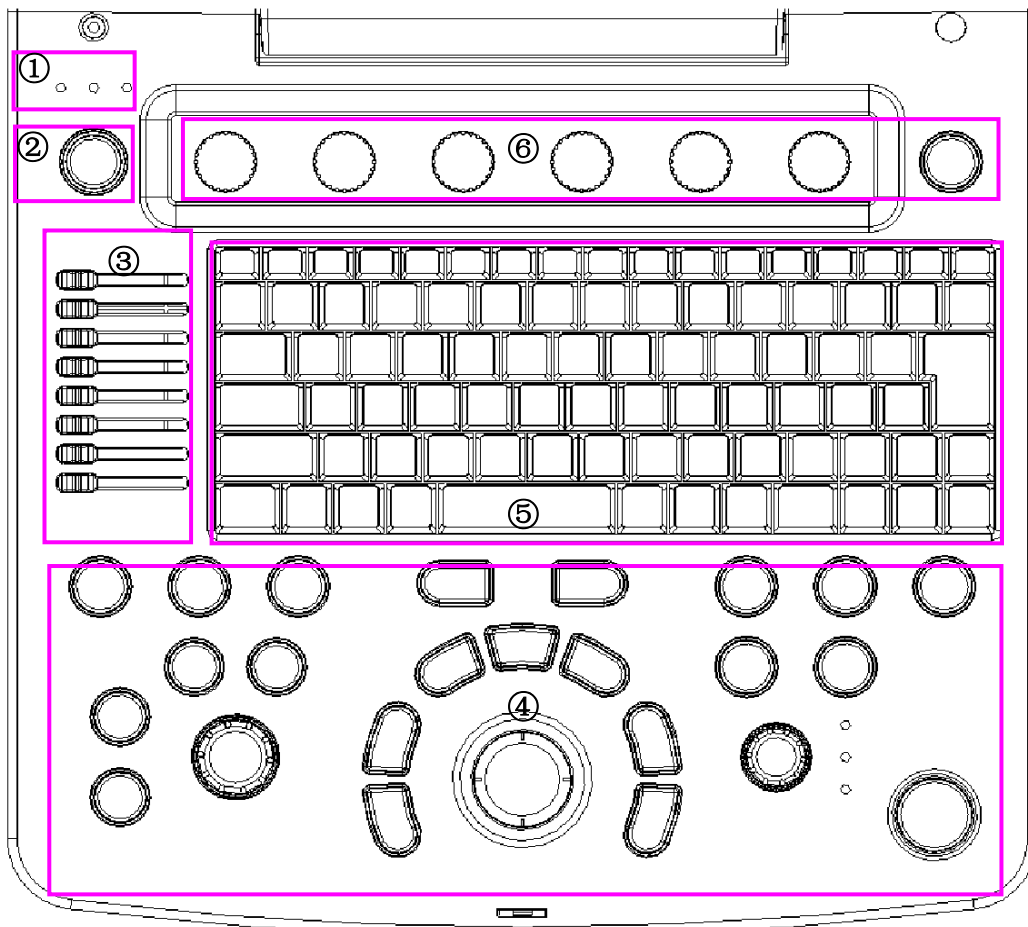
Figure 5-2 Control Panel

① Power/running indicators   ② Power on/off key   ③ TGC sliders
④ Function controls   ⑤ PC keyboard   ⑥ Menu Controls

5.4.1. Trackball

The trackball operation is easy and convenient. It can achieve the following functions:

◆ Move the measurement cursor during measurement.

◆ Move to select menu items in menu-based operations.

◆ Move the comment cursor in the comment status.

◆ Move the M Mark in the B+M mode.

◆ Move the scan area of Color mode, increase or decrease the size of the scan area of Color mode.

◆ Move the sample line in the PW mode.

◆ Realize single frame playback in the frame-by-frame playback status.

◆   Move the zoomed window in the zoom status.

NOTE:

1.   Please be gentle when running the trackball.

2.   Please keep the surface of trackball clean.

5.4.2. "0~9" Numeric Keys

Numbers are used for time calibrating, data setting, age notating, and comment adding etc.
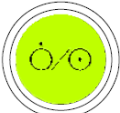
5.4.3. Alphabetic Keys
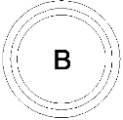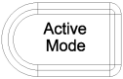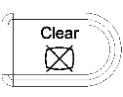
The system supports some language-specific characters through the use of SHIFT with a combination of keys on the keyboard. Press any of these keys in the annotation mode and the comment mode to display the character on the cursor position.
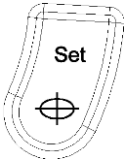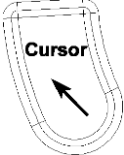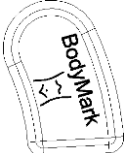
<table>
<tr><td colspan="2" align="center">**German Characters**</td><td colspan="2" align="center">**French Characters**</td></tr>
<tr><td>**Symbol**</td><td>**Key Combination**</td><td>**Symbol**</td><td>**Key Combination**</td></tr>
<tr><td>**ä**</td><td>SHIFT-A</td><td>**è**</td><td>SHIFT-Z</td></tr>
<tr><td>**ö**</td><td>SHIFT-S</td><td>**à**</td><td>SHIFT-X</td></tr>
<tr><td>**ü**</td><td>SHIFT-D</td><td>**ó**</td><td>SHIFT-C</td></tr>
<tr><td>**β**</td><td>SHIFT-F</td><td>**é**</td><td>SHIFT-V</td></tr>
<tr><td>**ñ**</td><td>SHIFT-G</td><td>**ç**</td><td>SHIFT-B</td></tr>
<tr><td>**ø**</td><td>SHIFT-H</td><td>**å**</td><td>SHIFT-N</td></tr>
</table>
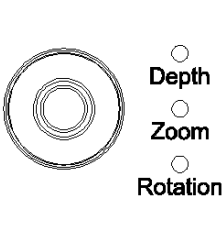
Table 5-1 German and French Characters
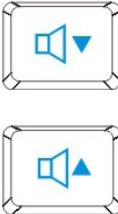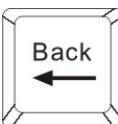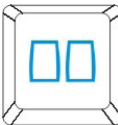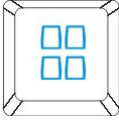
5.4.4. Function Controls

No.	Key	Name	Description
1.		Power on/off	Press to power on the system or display the shut down interface.
2.		/	Press to turn to next page of Menu Controls field. It will return to the first page if the current page is the last one.
3.	1-6	Menu Controls	The 6 combination rotary dials/push buttons corresponds to the items displayed in the menu controls field and also to the items of system menu in different modes or status.
4.	TGC	TGC	Glide the slide controls to adjust the TGC, glide the upper segments to adjust the near field gain, and the lower segments to adjust the far field gain; glide rightward to increase TGC, and glide leftward to decrease.

5.	Patient	Patient Info	Patient information annotation key Press to view, edit or input the patient data.
6.	Probe	Probe	Press to display an onscreen menu for connected probe and exam type selections.
7.	End Exam	End Exam	Press to erase cache memory of the last exam (including comments, measurements, calculations and reports except for archived Images) before the exam ends, and begin a new exam.
8.	B	B Mode	Press to enter B Mode.
9.	Color	Color Mode	press to enter or exit Color Mode
10.	PW	PW Mode	In B mode, press to display the sample line, and press this key again to enter B+PW mode; in B+PW mode, press this key to exit PW mode and enter B mode.
11.	CW	Continuous Wave Doppler Mode (CW Mode)	In B mode, press to display the sample line, and press this key again to enter B+CW mode; in B+CW mode, press this key to exit CW mode and enter B mode.
12.	M	M Mode	Press to enter M Mode.
13.	Gain	Gain	Rotate the control to increase or decrease the overall gain of the current mode.
14.	Active Mode	Active Mode	1. Press to toggle between current image modes in duplex or triplex. 2. After the image is frozen, the system enters Cine Review status by default. Press **Active Mode** to switch between different frozen imaging modes and Cine Review status. When switching between different frozen imaging modes, the currently available parameters are highlighted, you can use the menu controls to adjust options. (Such as Pseudo Color, and Gray Map). **NOTE**: In measurement status, the **Active Mode** key is inactive.
15.	Clear	Clear	Press to clear all the measurements, calculations, comments, and body marks displayed in the current image.

16.		Trackball	A multifunction trackball used for various system activities (increase or decrease the size of ROI, position Color ROI, position Calipers, position annotations etc.)
17.		Set	Set key 1. Press to confirm the selection of a specific function or command. 2. Use this key to anchor calipers, select a menu item or image graphic. 3. Press to move the scan area of Color mode, increase or decrease the size of scan area of color mode with the trackball. (In color mode, it enters ROI position adjusting status firstly, you can press trackball to move the ROI; after you press **Set,** it enters ROI size adjusting status, you can move the trackball to increase or decrease the size of ROI; if you press **Set** once again, it returns to ROI position adjusting status.) 4. Press to move the zoomed window in the zoom status together with the trackball.
18.		Cursor	Press to hide or display the cursor
19.		BodyMark	Body Mark Key Press to activate or exit the body mark function. It is to indicate the examine position and scan direction.
20.		Generic Measurement	Generic Measurement key Press to activate or exit the generic measurement function.
21.		Update	1. In annotation status, press to display the comment library. 2. In measuring status, you can press **Update** once to change the settled point and the active point 3. In unsynchronized Mode, such as B+M, B+PW, B+Color, B+PDI/DPDI, B+PDI/DPDI+PW or B+Color+PW mode, press to active real time image window.
22.		Application Measurement	Application Measurement key Press to activate or exit the application measurement function.

23.	Comment	Comment	Comment key Press to activate or exit the annotation function.
24.	Report	Report	Press to activate or exit current patient report.
25.	SaveImg	Save Image	Press to save the current image to Local disk or USB disk according to the present saving path and image format.
26.	Cine	Cine	Cine key Press to enter or exit the frame-by-frame cine mode.
27.	Print	Print	Print key Press to do the video printing
28.	Depth ○ Zoom ○ Rotation ○	Multi-function knob	◆ In real time mode, rotate to adjust depth. ◆ Press to activate or exit the zoom function. ◆ When an arrow is added, rotate this button to adjust the arrow direction. ◆ When a body mark is added, rotate this button to adjust the scanning direction.
29.	Freeze	Freeze	Freeze key Press this key to switch between the frozen and real-time states. When an image is frozen, the system inserts " ❄ " next to the system time clock and the clock pauses. When unfreezing the system, all the measurements, calculations, body marks, and comments will be erased.
PC Keyboard			
30.	Esc	ESC	To return back to the previous status; Or cancel current operations such as saving PDF report, sending DICOM files, etc.
31.	Preset	Preset	Preset key Press this to activate or to deactivate the preset function. Reference Section *5.7 Presetting*

32.	File	File	File management key Press this key to enter or to exit the file management system. Reference Section *6.12 File Management*
33.	Menu	Menu	Press this to display or to hide the menu.
34.	Stndby	Standby	Press to enter to come out of standby mode.
35.	☼▼ ☼▲	/	Brightness adjustment keys Press these two keys to adjust the brightness. And the brightness symbol will be displayed at the bottom of the screen
36.	🔊▼ 🔊▲	/	Volume adjustment keys Press these two keys to adjust the volume in the PW mode. And the volume symbol will be displayed at the bottom of the screen
37.	🔇	/	Sound muting key Press this to close the loudspeaker in the PW mode. And the mute symbol will be displayed at the bottom of the screen
38.	Del	Del	In the comment status, press to delete the selected comment; When modifying a comment, press to delete by character.
39.	Back	Back	In the measurement status, press to delete the generic measurement results one by one; In the comment status, press to delete the selected or editable comment by character.
40.	▢▢	/	Dual Press to select Dual and switch between a live or frozen, single or multi-mode A/B split screen display.
41.	▤	/	Quad Press to select Quad and cycle through a live or frozen A/B/C/D single or multi-mode split screen display.
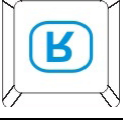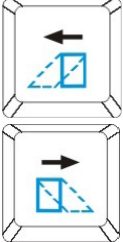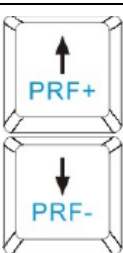
42.	PDI	PDI	Press to enter or exit Power Doppler Imaging Mode (PDI)
43.		/	Press to display or hide the M/D cursor. In B/C mode, press it to display the sample line, after positioning the sample line, press M or PW to enter M mode or PW mode.
44.	Я	/	Image left/right Flip key Press this key to flip the image horizontally.
45.	R	/	Image up/down Flip key Press this key to flip the image vertically.
46.		/	Steering angle adjusting key(only applicable to linear probes) : In PW mode, press to adjust the Doppler sample volume steering angle. In Color mode, press to adjust the ROI steering angle
47.	PRF+ PRF-	/	PRF adjusting keys Press these two keys to adjust the PRF (Pulsed Repetition Frequency) in the PW mode.
48.	F1-F4	F1-F4	Reserved keys/ User defined keys

Table 5-2 Function Controls

Menu Controls:

The 6 menu controls on the control panel correspond to items in the menu controls field. The currently available items are highlighted, and unavailable items are in gray color; they also correspond to items on the system menu in different modes or status, such as the image menu, preset menu, file menu, needle guide menu, Cine Review menu, measurement menu, etc. You can press or rotate the menu control, or use the trackball and **Set** in the menu field to switch/adjust parameters, or activate a function.

Operations of menu controls:

● To switch options/adjust parameters:

> If an item of the menu has a submenu or several parameter values, press or rotate the menu control to switch between options or adjust values. (You can adjust values circularly by pressing menu controls, rather than by rotating them)

> For example, in File menu, press or rotate the **FileType** menu control to switch the image format before saving it; in B mode, press or rotate the **Dyn Rng** menu control to increase or decrease the value of dynamic range.

● To activate a function:

> (1)   If an item of the menu has a submenu or several options, rotate the menu control to select submenu items or options, and press the menu control to activate the function.
>
> For example, in B-generic measurement menu, rotate **Volume** menu control to select **2-Axis/3-Axis/3-Axis (LWH)**, and press the menu control to activate the option.
>
> (2)   If an item of the menu has no submenu or option, press the menu control to activate the function directly.
>
> For example, in File menu, press **File Manager** menu control to display the **File Manager** dialog box directly.

● Page down: You can press ⊘ on menu controls panel to flip through pages of the menu controls field. Press the key again, and it returns to the first page circularly if the current page is the last one.

5.4.5. Imaging Functions
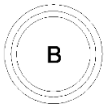
Ⓑ B mode Imaging Control

Press this key to enter the B mode. The system displays a single real-time B mode image.

B indicates brightness, or two-dimensional (2D) gray scale imaging.

NOTE:

To return to a real-time B mode image from any imaging mode, press B control. This also deletes all measurements, calculations, comments, or body marks that are displayed on the screen.
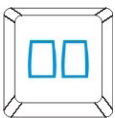
▢▢ 2B mode Imaging Control

This key has two functions:

◆ Press this key to enter the 2B mode.

◆ Press this key to activate one of the dual images. The probe direction of the activated image is brighter than that of the frozen image.
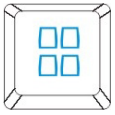
4B mode Imaging Control

Press this key to enter the 4B mode. The system divides the image area into four quadrants: the first quadrant is on the top left, the second on the top right, the third on the bottom left, and the fourth on the bottom right.

Press it repeatedly to active one of the four images. The probe direction of the activated image is brighter than the direction of the frozen images. The four images are obtained separately and only one image at a time is displayed in real time.

Color mode Imaging Control

Follow the same procedure as described under B Mode to locate the anatomical area of interest. After optimizing the B mode image, press **Color**, move the scan area of interest as close to the center of the image as possible; Or after entering Color mode, press **PW** to display the sample line, and press **PW** again to enter triplex mode (B+Color+PW). Optimize the Color mode image parameters.
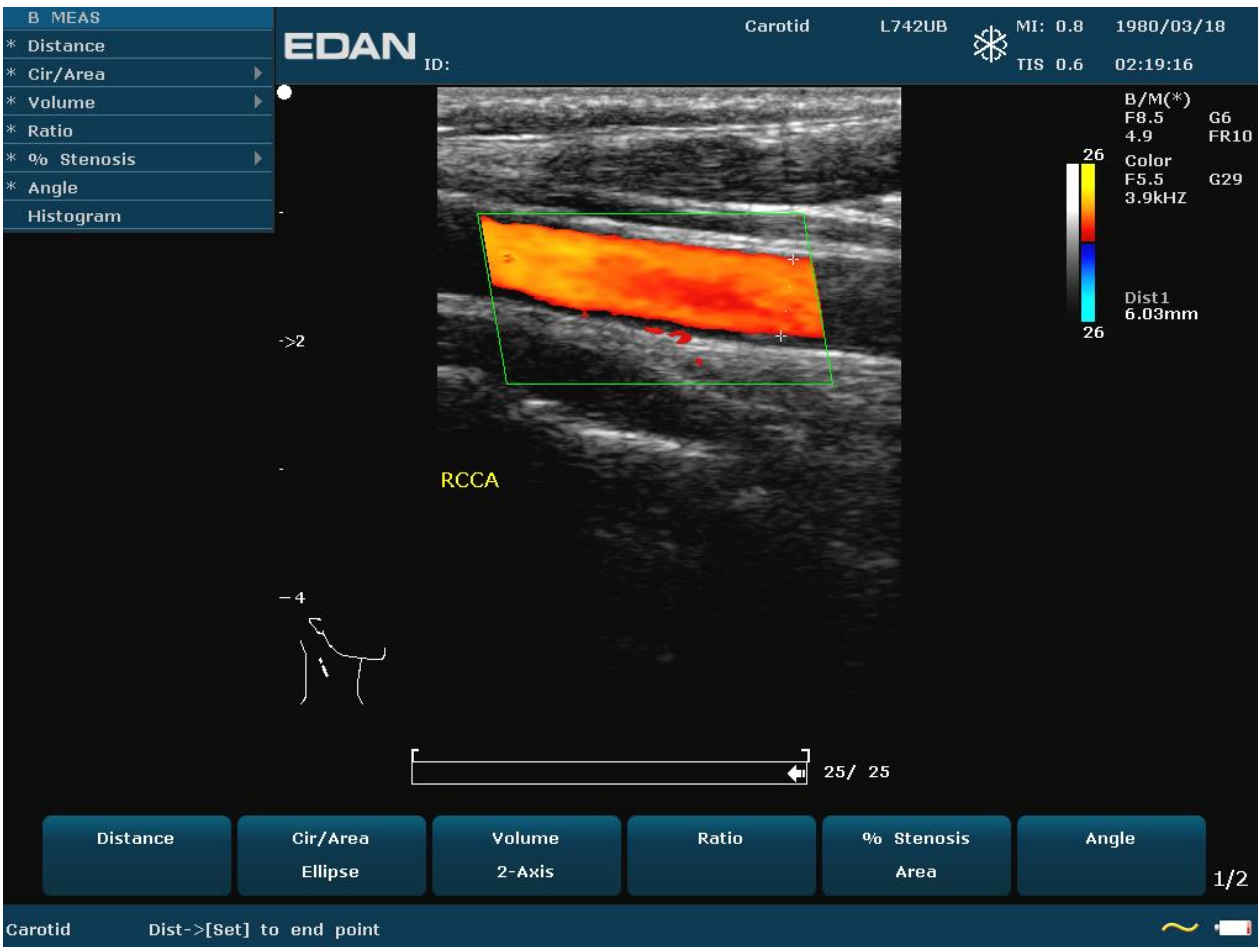
Figure 5-3 Example of B+Color Scan

PDI mode Imaging Control

Follow the same procedure as described under B Mode to locate the anatomical area of interest. After optimizing the B mode image, press **PDI**, move the scan area of interest as close to the center of the image as possible; Or after entering PDI mode, press **PW** to display the sample line, and press **PW** again to enter triplex mode (B+PDI+PW). Optimize the PDI mode image parameters; In PDI mode, rotate the **Map** menu control until the value is among 4-7, the system enters **Directional Power Doppler Imaging mode** (DPDI).

Dual-split mode of B+Color/PDI:

✓ In dual-split mode of 2B, press **Color/PDI,** and then press to enter dual-split mode of B+Color/PDI, the two windows are in B+Color/PDI mode.

✓ In single B+Color/PDI mode, press to enter dual-split mode of B+Color/PDI, the two windows are in B+Color/PDI mode.

✓ In dual-split mode of B+Color/PDI, press **Color/PDI,** the currently active window exits color mode and enters 2B mode.

Pulsed-Wave Doppler mode Display Control

In B mode, press this key to display the sample line, and press this key again to enter B+PW mode; in B+PW mode, press this key to exit PW mode and enter B mode.

A pulsed-wave Doppler (PW) scan produces a series of pulses used to study the motion of blood flow in a small region along a desired scan line, called the sample volume.

The X-axis of the graph represents time, and the Y-axis represents Doppler frequency shift. The shift in frequency between successive ultrasound pulses, caused mainly by moving red blood cells, can be converted into velocity and flow if an appropriate angle between the insonating beam and blood flow is known.

Shades of gray in the spectral display represent the strength of the signal. The thickness of the spectral signal is indicative of laminar or turbulent flow (laminar flow typically shows a narrow band of blood flow information).

Pulsed-Wave Doppler mode and B mode are shown together in a mixed mode display. This combination lets you monitor the exact location of the sample volume on the B image in the B Image Display window, while acquiring Pulsed-Wave Doppler data in the Time Series window.

Operations:

In the B scan, the long line lets you adjust the sample line position, the two parallel lines (that look like =) let you adjust the sample volume (SV) size and depth, and the line that crosses them lets you adjust the correction angle (PW angle).
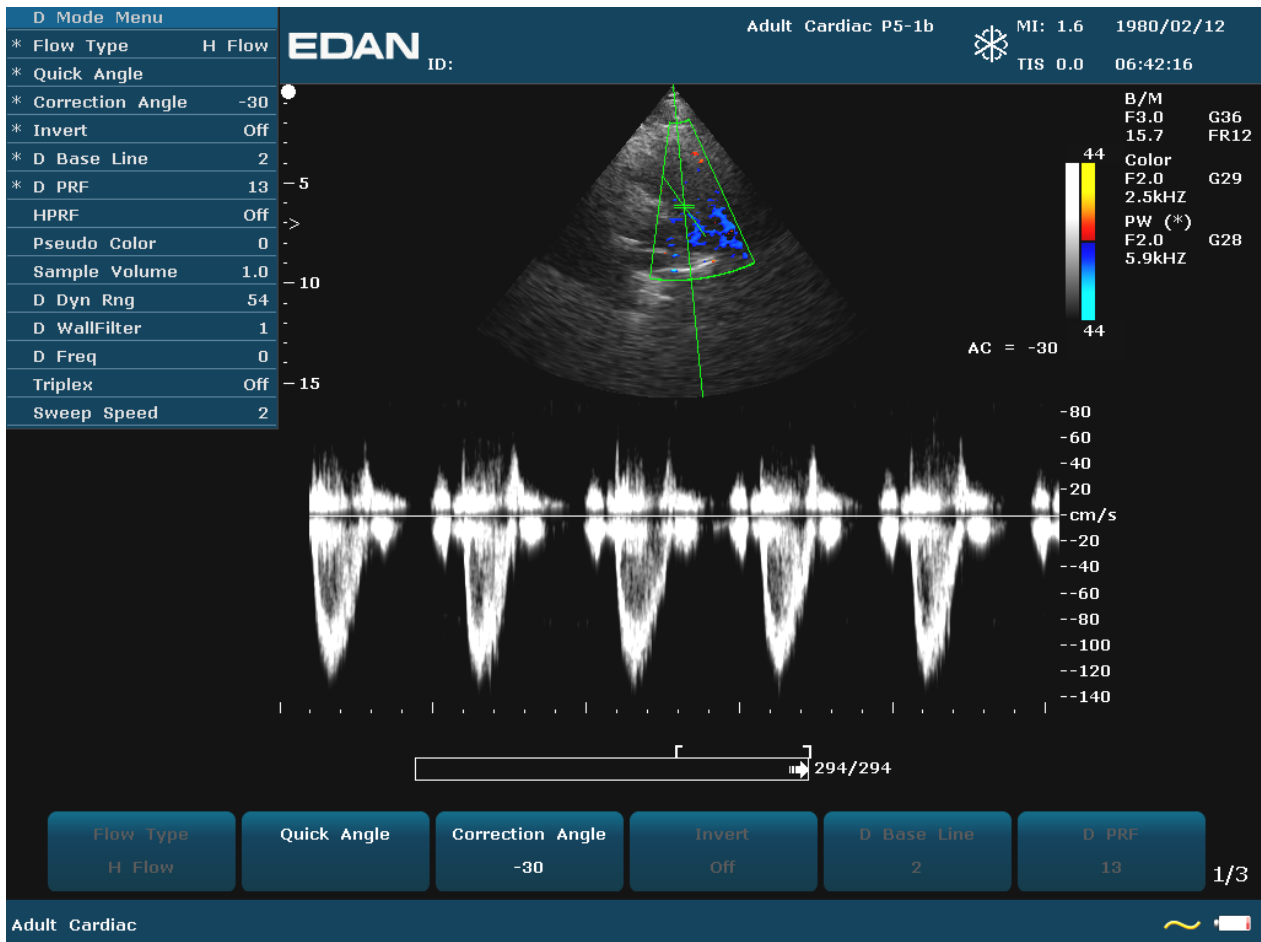
Figure 5-4 Example of B+Color+PW Scan

In B+PW mode, you can choose scanning in synchronized or unsynchronized mode by pressing **Duplex/Triplex** menu control: in unsynchronized mode, the active mode is PW; while, in synchronized mode, the B and PW mode are both active. When you are scanning in unsynchronized mode either the B or the time series window receives data. This lets you independently change the PW PRF. When scanning in simultaneous mode, both the 2D and the time series window receive data. This feature lets you define which method is used, based on the exam type.

The sample volume indicator allows you to start a scan in a B scan mode, set the sample volume, and switch to Doppler mode. The sample volume locks in position.

Switch between the frozen PW and real-time PW images

✓ After entering B+PW, or B+Color/PDI+PW mode, the B or B+Color/PDI image is frozen by default, and PW image is active.

✓ After entering B+PW, or B+Color/PDI+PW mode, in unsynchronized mode, press **Update** to switch between the frozen and real-time PW images. When PW image is frozen, move the trackball to adjust the sample line, rotate the menu controls to adjust the sample volume, and the correction angle, etc. Then press **Update** to switch to real-time PW images.

✓ After entering B+PW, or B+Color/PDI+PW mode, in unsynchronized mode, roll the trackball to move the sample line and sample area, the B or B+Color/PDI image is active, and PW image is frozen; when the trackball stops moving, the B or B+Color/PDI image is frozen, and PW image is active.

To enter PW mode:

1. Press **B** to enter B mode and adjust all image control settings appropriate for the current exam.

2. Place the cursor inside the vessel of interest.

3. Press **PW** to display sample line, move the trackball to adjust the sample line, rotate the menu controls to adjust the sample volume, and the correction angle, etc.

4. Press **PW** again to enter B+PW mode. The system locks the sample volume indicator and adds the Time Series window.

Or, you can scan in PW mode as follows:

1. Press **B** to enter B mode, after optimizing the B mode image, press ⊕ on PC keyboard to display the sample line;

2. Move the trackball to adjust the sample line, place the sample gate inside the vessel of interest. Rotate the menu controls to adjust the sample volume, and the correction angle, etc.

3. Press **PW** to enter B+PW mode.

HPRF Mode:

HPRF (High Pulse Repetition Frequency) is a special operating mode of PW Doppler. You can activate the HPRF mode when detected velocities exceed the processing capabilities of the currently selected PW Doppler scale or when the selected anatomical site is too deep for the selected PW Doppler scale.

In order to detect the higher velocities in HPRF, the system changes the PW processing in a way that makes it ambiguous as to the location of the PW sample volume. In order to allow for proper interrogation of the target anatomy, the system will display additional sample volumes (also

known as virtual gates) along the sample line. These additional sample volumes are annotated as an = sign, but without the angle correction line. The displayed Doppler signal will have information from all sample volumes included. To avoid having unexpected data included in the Doppler trace, use B or C mode to ensure that the virtual gates do not coincide with locations of potential flow.

NOTE:

1. The HPRF mode is possible with C5-2b, P5-1b and L15-7b probes only.

2. The HPRF mode can be activated only in real-time mode.

3. The HPRF mode is available according to the following table. At each sample volume depth, HPRF will first occur at the scale range and PRF listed.　Other higher PRFs and ranges are available up to the highest listing in the table (e.g. for the C5-2b, at 270mm PRFs 9-12 would be available).

Depth (mm)	C5-2b	P5-1b	L15-7b
70			160 cm/sec PRF=15
80			160 cm/sec PRF=15
90			100 cm/sec PRF=14
			160 cm/sec PRF=15
100			100 cm/sec PRF=14
150			N/A (Depth can only reach 100mm)
160	200 cm/sec PRF=12	200 cm/sec PRF=12	N/A
170	160 cm/sec PRF=11	160 cm/sec PRF=11	N/A
180	160 cm/sec PRF=11	160 cm/sec PRF=11	N/A
190	160 cm/sec PRF=11	160 cm/sec PRF=11	N/A
200	160 cm/sec PRF=11	140 cm/sec PRF=10	N/A
210	140 cm/sec PRF=10	140 cm/sec PRF=10	N/A
220	140 cm/sec PRF=10	120 cm/sec PRF=9	N/A
230	120 cm/sec PRF=9	120 cm/sec PRF=9	N/A
240	120 cm/sec PRF=9	120 cm/sec PRF=9	N/A
250	120 cm/sec PRF=9	120 cm/sec PRF=9	N/A
260	120 cm/sec PRF=9	100 cm/sec PRF=8	N/A
270	120 cm/sec PRF=9	100 cm/sec PRF=8	N/A
280	120 cm/sec PRF=9	100 cm/sec PRF=8	N/A
290	100 cm/sec PRF=8	100 cm/sec PRF=8	N/A
300	100 cm/sec PRF=8	100 cm/sec PRF=8	N/A

CW **CW mode Display Control**

To enter CW mode:

1. In B or B+Color/ PDI/ DPDI mode, adjust image parameters;

2. Press **CW** to display sample line, move the trackball left or right to position the sample line in the region of interest, move the trackball up or down to adjust the depth of focus;

3. Press **CW** again to enter B+CW or B+Color/ PDI/ DPDI+PW mode, optimize the imaging with the menu controls. You can move the trackball to reposition the sample line, the B or B+Color/ PDI/ DPDI image is active and CW image is frozen; when the sample line is fixed, the B or B+Color/ PDI/ DPDI image is frozen, and CW image is active.

NOTE:

The CW mode only works with P5-1b probe.
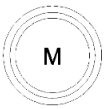
M **M mode Display Control**

Press it to enter the B+M mode, the B mode and the M mode images are displayed on the screen at the same time (Abbreviated as B+M). A line called M Mark is displayed on B mode image. Roll the trackball to move the M Mark. Press **Set** to locate the M Mark.

Or, you can press [icon] on PC keyboard to display the M Mark, roll the trackball to move the M Mark, and press **M** to enter B+M mode. Move the trackball to move the M Mark again, and then press **Set** to locate the M Mark. Or, press **Cursor** to activate the M Mark again.

Press this key again to enter the single M mode. It displays an M mode sweep. The slope of this mode has four levels.

5.5. Menu

Menus are displayed on the left of the screen. Only one menu can be activated at a time. The types are shown as follows:

Imaging menu:

In imaging, menu provides information about the current imaging mode. In 2B and 4B modes, it indicates the status and parameters of the active image. In B+M mode, it indicates the status and parameters of M sweep. In the PW mode, it indicates the status and parameters of Doppler wave and 2D image. Following is the imaging menu of B mode.

Figure 5-5 B Mode Imaging Menu

Measurement and calculation menu:

Perform an operation. For instance, begin a distance measurement, and then the measurement cursor is displayed.

The following are generic and application measurement and calculation menus.

Figure 5-6 B Mode Generic Measurement and Calculation Menu

Figure 5-7 Obstetric Measurement and Calculation Menu in B mode

Submenu:

The symbol "►" indicates that there is a submenu associated with the menu option. Roll the trackball to highlight the menu option with "►", the system displays a submenu for the selected option.

Example: The submenu of **Cir/Area** contains **Ellipse** and **Trace**, shown as below.

After entering B mode, press **Caliper** to display the menu below, and highlight the option **Cir/Area**, the system will display the submenu **Ellipse** and **Trace**.
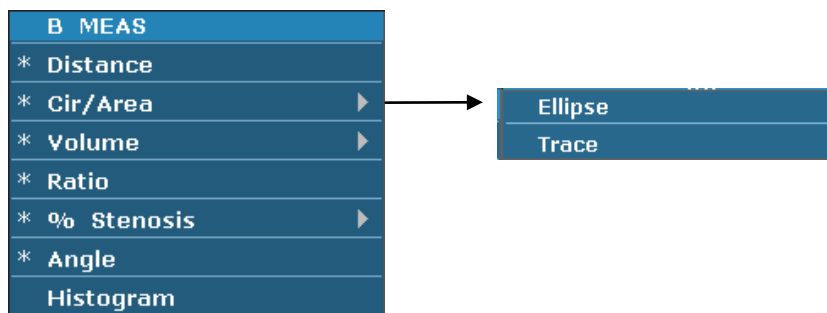
Figure 5-8 Submenu

Other menus:

Including preset menu, cine review menu, file menu, and needle guide menu.

5.6. Dialog Box Operation

The dialog box may have a few tabs, as shown below. You can select one tab at a time with trackball and **Set**. Also, you can modify the parameter following the prompt instruction, and then highlight **OK** and press **Set** to save the modified parameters and close the dialog box; or highlight **Cancel** to give up the modification and close the dialog box directly.
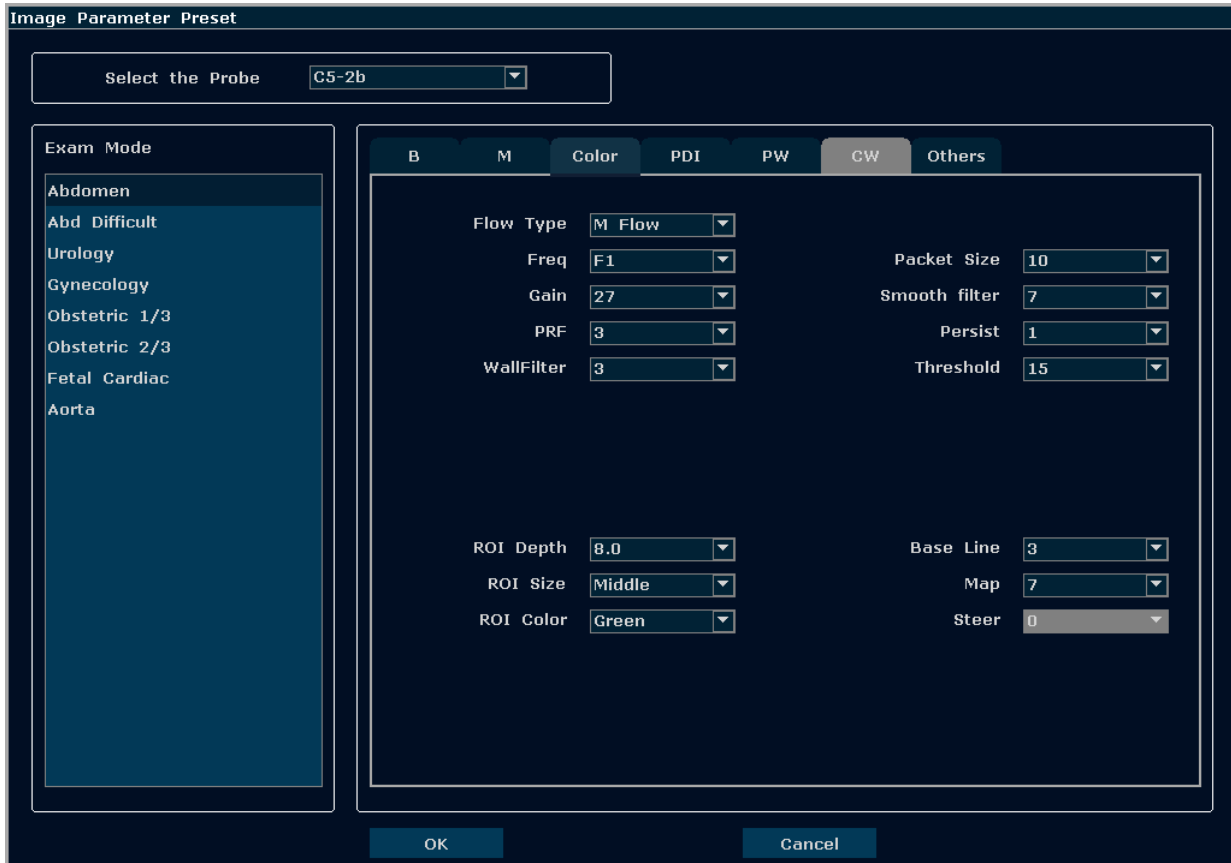
Figure 5-9 Image Parameter Preset Dialog Box

5.7. Presetting

5.7.1. Entering Presetting

Press **Preset**, and the system displays the preset menu, as shown below.

Figure 5-10 Preset Menu

5.7.2. Displaying / Modifying Presetting Parameters

Select a type of preset and press **Set** to display the relevant dialog box, and you can modify the parameter following the prompt instruction.

 <u>Reference</u>   Section *5.6 Dialog Box Operation*.

5.7.3. System Preset

1. In preset menu, move the cursor to highlight **System preset** and press **Set** to display **System preset** dialog box, as shown below.

2. Roll the trackball to highlight an item and then press **Set**. Then use the keyboard to enter text.

Figure 5-11 System Preset Dialog Box

Preset items	Options	Functions
Hospital Name	Input freely	Set hospital name displayed on the top left of the screen and diagnosis report.
Language	Chinese, English, etc.(The language options vary with language software installed.)	Set the system language
SnapShot Type	BMP/JPG/FRM/DCM (if DICOM is installed)	Set the storage file format type of snap shot.
SnapShot Device	Fixed(Local disk) or USB disk(A:\, B:\)	Set the storage device of snap shot. Note: "Local disk" is the hard disk when the system is intalled with a hard disk.
PW Velocity Units	cm/s, kHz	Set the velocity units of PW spectrum
System Sleep	√/ Null	Select whether the device enters sleep mode when no operation is performed for certain minutes.
Keyboard Sound	√/ Null	Turn on or off the keyboard sound.
Date Format	Set freely	YYYY/MM/DD, MM/DD/YYY or DD/MM/YYYY.
Date	Set freely	Set the system date.
Time	Set freely	Set the system time, format: H/M/S.

Waiting time	5-60 min	Set the system waiting time to enter sleep mode (5-60 min), then screensaver is displayed and acoustic output is disabled.
Refresh Speed	1-10	Set the grade of refresh speed during system dormancy.
Comment Active	Green/ Yellow/ White/ Red/ Orange	Set the color of the comment when entering comments.
Comment Inactive	Green/ Yellow/ White/ Red/ Orange	Set the color of the comment when comments are already saved.
Guide Line	Green/ Yellow/ White/ Red/ Orange	Set the color of the needle guide line.
TI	TIS/TIB	Select the types of thermal index.
Brightness	0-14	Set the brightness of monitor
Color Temp	0-3	Set the tones of monitor color
Video Mode	PAL/NTSC	Set the output video mode
Video Color Type	Colorized/ Monochrome	Set the output video color
Video Paper	Small/Large	Set the video printer paper size.
Video Printer	SONY_UP-D25MD, SONY_UP-DX898MD	Select the same video printer as that you connect with the system via the USB cable.
Report printer	HP Deskjet 1010 Series, HP DeskJet 1110 Series, HP Deskjet 1510 Series, HP Deskjet 2050 J510 Series, HP Laserjet Pro 400 M401, etc	Select the same report printer as that you connect with the system, or select the report printer series that your printer belongs to. Note: The software supports all the report printers in the report printer list, but only the report printers recommended in Section 3.2.2 are tested. It is suggested to only use the recommended printers.
Button F1/F2/F3/F4	None, Save Frame, Save Cine, Save AVI, File Manager, Send DCM Image (If DICOM is installed), Send Cine Images(If DICOM is installed), Save Preset Data, Needle guide.	Define the F1/F2/F3/F4 keys, select one of the pull-down options.
Only print the images	√/ Null	Set whether to only print images in the report.

Table 5-3 System Preset Information

You must restart the system to validate the change, including **Language** and **Keyboard Sound**. After you perform those presetting, and press **OK**, the system displays a confirm dialog box to prompt you whether to restart the system.

5.7.4. Probe Preset

In preset menu, move the cursor to highlight **Probe Preset** and press **Set** to display **Probe preset** dialog box, as shown below.
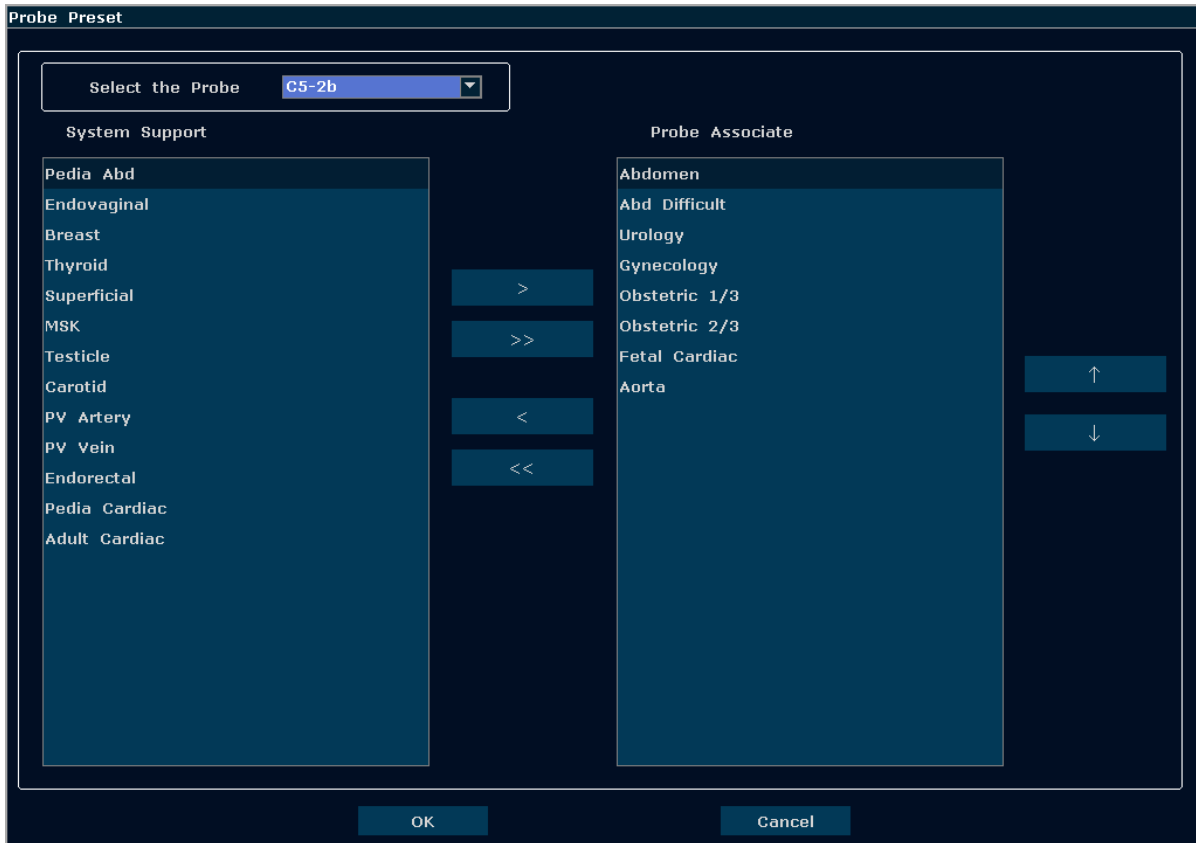
Figure 5-12 Probe Preset Dialog Box

The **Probe preset** dialog box displays probe selection and Exam mode selection. This page is used to assign an exam type to a specific probe.

Operation:

1. Select the desired probe: move the cursor onto the column "C5-2b ▼", and select the probe model you need through the pull-down menu.

2. Select exam mode for the probe: the left side is the "System Support", which lists all exam modes supported by the system. The right side is the "Probe Associate", which lists exam modes already associated with the probe. To add an exam associated with the probe, select the exam from the left and click on ⟩ . To add all of the different exams from the left to the right, click on ⟩⟩ . To delete an exam associated with the probe, select the exam first, and then click on ⟨ . To delete all exams associated with the probe, click on

[<<] .

3. Arrange the sequence of the associated exams: after the exams associated with the probe are set, you can select an exam, and click on [↑] or [↓] to adjust the sequence of it gradually.

4. Click on [OK] to confirm the modification, or click on [Cancel] to give up.

5.7.5. Exam Preset

Exam Preset is used to add exam mode and set the application associated with the probe. Application types include abdomen, obstetrics, gynecology, pediatric, small parts, urology, peripheral vascular, musculoskeletal, and cardiac.
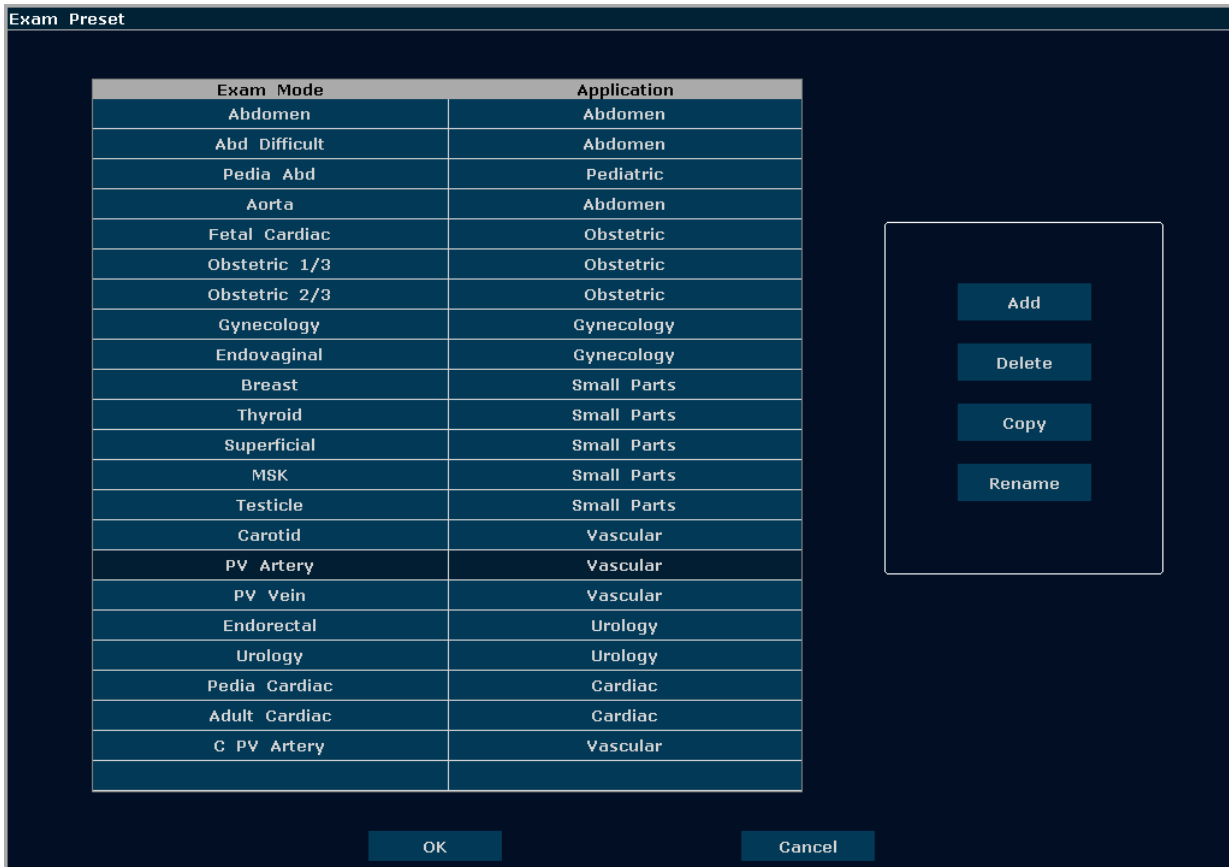
Figure 5-13 Exam Preset Dialog Box

Operations:

➢ To get a copy of the existing exam: Select the desired exam mode, and click on **Copy**. For example, select the exam "**PV Artery**", and press **Copy** to get "**C PV Artery**", a copy of the exam "**PV Artery**'. To rename the "**C PV Artery**" exam, click on **Rename.**

➢ To delete an exam: Select a desired exam mode, click on **Delete**, the system displays a prompt "**Delete the exam?**" Click on **Yes** to delete the exam, or click on **No** to exit.

➢ To add an exam: Press **Add** to display the **Add new Exam Mode** dialog box, as shown below. Input an exam name in the "Exam name" blank, select an application for the exam upon you needs, and press **OK** to close the dialog box, and then the new exam mode will be displayed in the **Exam Preset** dialog box.
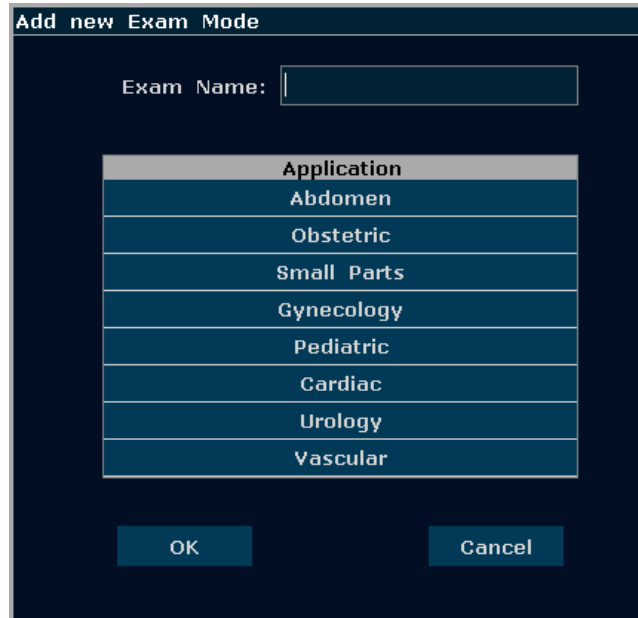
Figure 5-14 Add new Exam Mode Dialog Box

NOTE：

The default exam modes can not be deleted or renamed.

➢ To configure relevant parameters for the newly added exam mode, such as probes, or image parameters, press **Probe Preset** or **Image Preset** on preset menu.

5.7.6. Image Parameter Preset

Image parameter preset:

Press **Preset**>I**mage Preset**, and select **Image Preset** in the submenu to open the **Image Parameter Preset** dialog box.

Image parameter preset is used to set image parameters for a specific probe in a specific exam mode. Parameters for each image mode are different, but the setting ways are similar. See the example below, the **Image Parameter Preset** dialog box for the probe C5-2b in Color Mode, Abdomen exam:
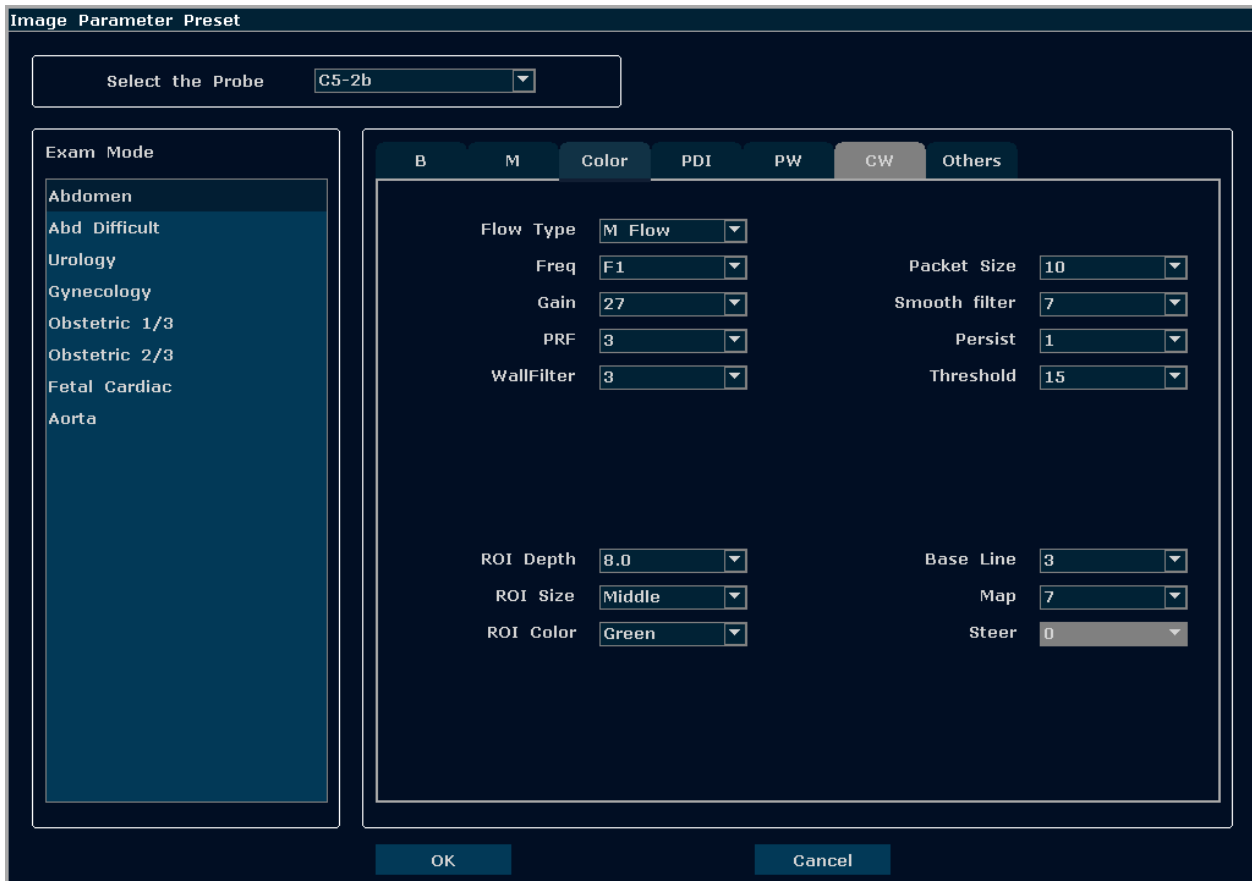
Figure 5-15 Image Parameter Preset Dialog Box

The Exam Mode field on the left side of the dialog box displays all exam modes supported by the probe. While the right side of the dialog box displays all parameter settings for the probe in different image modes.

Select probe C5-2b from the probe pull-down menu firstly. Move the trackball to highlight **Abdomen** in the Exam Mode column and press **Set,** roll the trackball onto the **Color** tab to enter Color Mode image parameter presetting page for the probe C5-2b, Abdomen exam. You can set the parameters by selecting an option from the pull-down menu, or ticking on the option.

Preset Items	Options	Functions
Image Type	Detail/ Soft/ HContrast/ Penetration	Set the default image type
Freq	F1/F2/F3/THI1/THI2 (5 levels of frequency)	Set the default frequency of probe, F1-THI2 represents five levels of frequencies
Gain	0-130	Set the default gain of B mode
Dyn Rng	30-150, in increments of 4	Set the default dynamic range of B mode
eSRI	0-8	Set the default eSRI (Speckle Resistance Imaging)
Focus Num	1/2/3/4	Set the default number of focuses.
Focus Pos	0-15	Set the default position of focuses
Spatial Comp	On/Off	Set if the spatial compounding is activated by default or not (This function is not available for probe P5-1b)
Frame Persist	0-7	Set the default factor of frame persist

Gray Map	0-14	Select the default post-processing gray curve map
Rejection	0-7	Set the default rejection
Scan Mode	HiDen/HiFPS	Set the default scan mode
Depth	1.9 cm-32.4 cm（C5-2b）	Set the default examine depth
Scan Angle	0/1/2/3	Set the default scan angle
Pseudo Color	0-6	Set the default colorization colors
B/W Invert	On/Off	Set if the image is B/W inverted by default
90° Rotate	0/1/2/3	Set the default display direction of image
H Reverse	√/×	Set if image is inverted horizontally by default or not
V Reverse	√/×	Set if image is inverted vertically by default or not
Line Average	0-7	Set the default line average of M mode
Sweep Speed	0-3	Set the default sweeping speed of M mode
B/M Display	U/D, L/R	Set the default display layout of dual-split mode B+M: Up/Down, Left/Right.

Table 5-4 B/M Mode Image Parameter Preset Information

Preset Items	Options	Functions
Flow Type	H Flow /M Flow/ L Flow	Set the default flow type (high/ medium/ low speed)
Freq	F1/F2	Set the default frequency of probe in color mode
Gain	1-80	Set the default gain of Color mode
PRF	0-15	Set the default PRF of Color mode
WallFilter	0-7	Set the default wallfilter of Color mode
Packet Size	4 levels, 8,10,12,14	Set the default packet size
Smooth filter	0-7	Set the default smooth filter
Persist	0-7	Set the default persist
Threshold	0-15	Set the default threshold
ROI Depth	Options for this parameter depend on the depth range of each probe.	Set the default ROI depth of Color Mode
ROI Size	Small/Middle/Large	Set the default size of ROI of Color Mode
ROI Color	Yellow/Green	Set the default frame boundary color of ROI
Base Line	0~6	Set the default position of base line
Map	In Color mode:0-7 In PDI mode: 0-3 (PDI) 4-7 (DPDI)	Set the default map displayed in Color/PDI mode
Steer	-10°、0°、10°	Set the steering angle of the ROI box. (Only available for Linear transducers)

Table 5-5 Color/PDI Mode Image Parameter Preset Information

Preset Items	Options	Functions
Flow Type	H Flow /M Flow/ L Flow	Set the default flow type (high/ medium/ low speed)
Freq	F1/F2	Set the default frequency of probe in PW mode

Gain	1-80, in increments of 1	Set the default gain of PW image
PRF	0-15, 0.9kHz-14.7kHz	Set the default PRF in PW mode
WallFilter	0-3	Set the default wallfilter in PW mode
Dyn Rng	30-90, in increments of 2	Set the default dynamic range of PW mode
Sample Volume	0.5-20.0	Set the default size of the sample volume
SV Depth	Options for this parameter depend on the depth range of each probe.	Set the default depth of sample volume
Pseudo Color	0-6	Set the default colorization colors
Correction Angle	-79°-79°	Set the default correction angle
Sweep Speed	0-5	Set the default sweeping speed
Base Line	0-6	Set the default position of base line
Sound Volume	0-7	Set the default volume of Doppler
Steer	-10°、0°、10°	Set the steering angle of the sample line (for linear array probes)
Duplex/Triplex	√/×	Set whether to scan in duplex/triplex mode by default or not
Invert	√/×	Set the default direction of PW spectrum （above/ below the base line）
HPRF	√/×	Set whether to turn on the HPRF mode by default or not (this mode only works with C5-2b, P5-1b and L15-7b probes)

Table 5-6 PW Mode Image Parameter Preset Information

Preset Items	Options	Functions
Flow Type	H Flow /M Flow/ L Flow	Set the default flow type (high/ medium/ low speed)
Gain	1-80, in increments of 1	Set the default gain of CW image
Dyn Rng	30-90, in increments of 2	Set the default dynamic range of CW mode
PRF	0-31, 0.8kHz-80kHz	Set the default measurable range of flow velocity
WallFilter	0-3	Set the default wallfilter in CW mode
Pseudo Color	0-6	Set the default colorization colors
Correction Angle	-79°-79°	Set the default correction angle
Sweep Speed	0-5	Set the default sweeping speed
Base Line	0-6	Set the default position of base line
Sound Volume	0-7	Set the default volume of Doppler
Invert	√/×	Set the default direction of CW spectrum （above/ below the base line）

Table 5-7 CW Mode Image Parameter Preset Information

To set a default exam mode for a probe:

1. Select a probe and an exam mode in the **Image Parameter Preset** dialog box.

2. Roll the trackball onto the "**Others**" tab and press **Set**.

3. Select a default exam mode from the **Default Image Mode** pull-down menu.

4. Click on **OK**, a hint of **"**Are you sure you want to permanently save changes**"**pops out, click **Yes** to confirm the setting, or click on **Cancel** to exit.
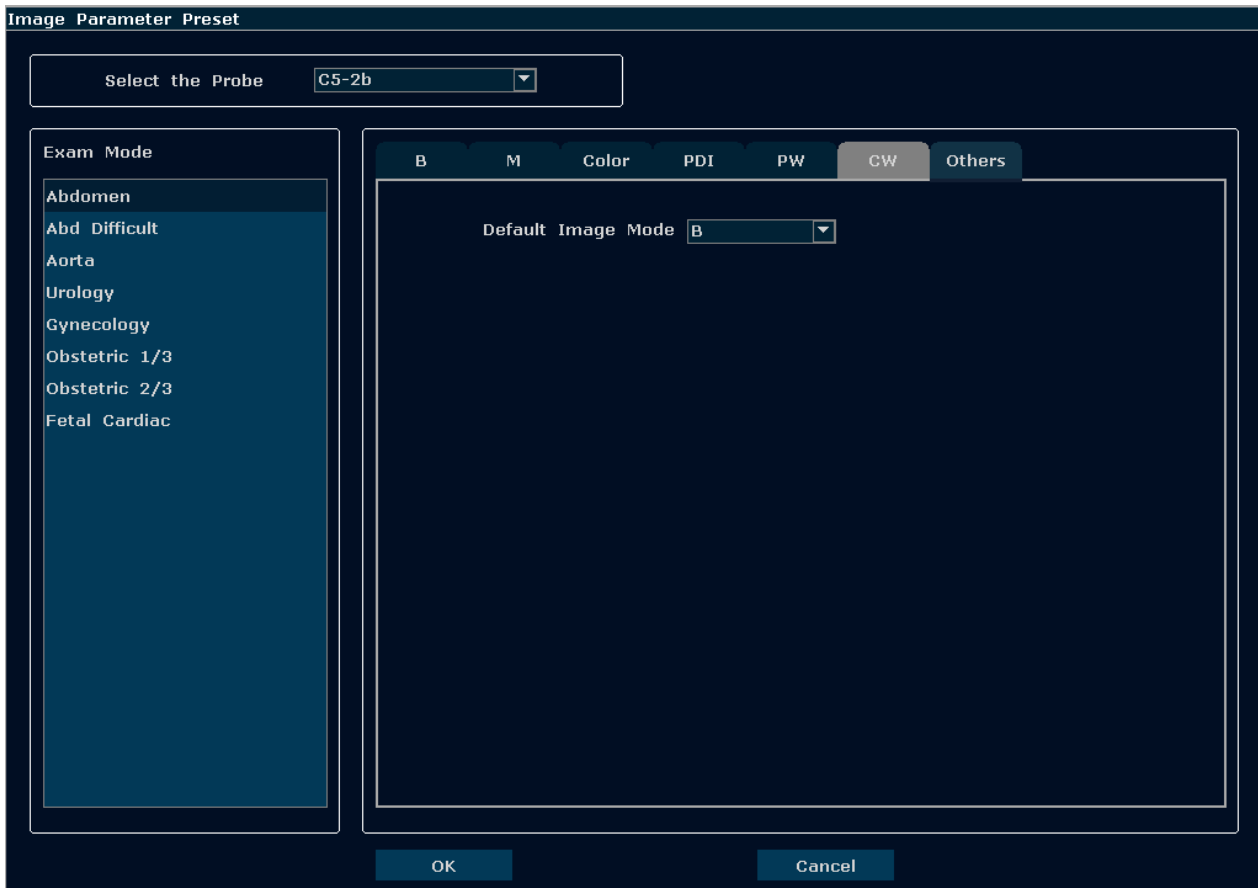
Figure 5-16 Default Image Mode Preset Dialog Box

5.7.7. Measurement Preset

In the preset menu, move the cursor to highlight **Measure Preset** and press **Set** to display **Measure Preset** dialog box, as shown below:
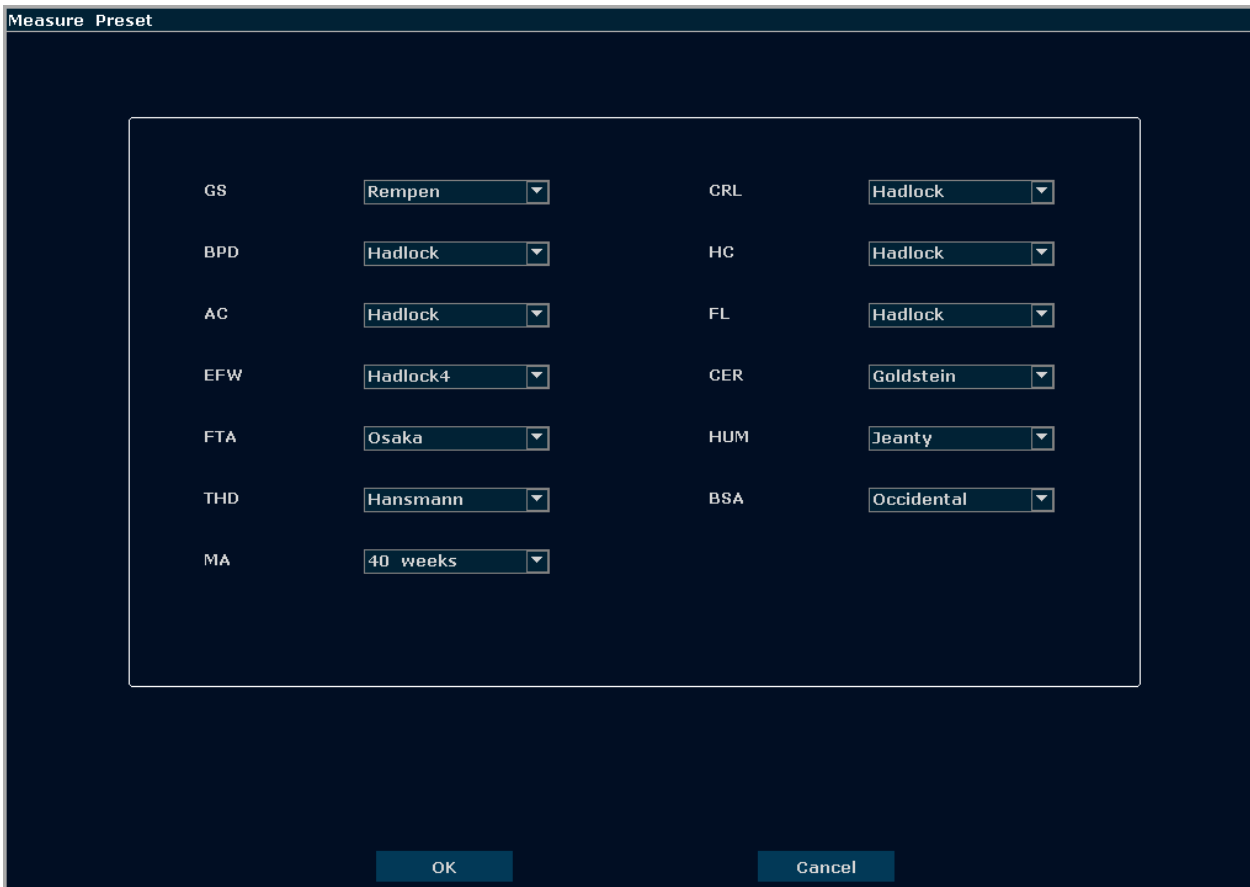
Figure 5-17 Measure Preset Dialog Box

Parameter	References	Parameter	References
GS	Tokyo Hellman Rempen China	CRL	Tokyo Hadlock Hansmann China Robinson
BPD	Tokyo Hadlock Merz Rempen Osaka China Hansmann	EFW	Tokyo Hadlock1 Hadlock2 Hadlock3 Hadlock4 Shepard Campbell Merz1 Merz2 Hansmann Osaka
AC	Hadlock Merz Hansmann	FL	Tokyo Hadlock China Jeanty

				Merz
				Osaka
				Hansmann
HC	Hadlock, Merz, Hansmann	HUM	Jeanty
FTA	Osaka	CER	Goldstein
THD	Hansmann	BSA	Oriental, Occidental
MA	40 weeks, 41 weeks		

Table 5-8 Measurement Preset Information

5.7.8. Comment Preset

The comment library includes eight tabs: Abd, OB, Sml, Gyn, Ped, Card, Uro, and Vas. Each tab has a few sets of comments defined at the factory, and you can create up to 16 user-defined comments for each tab by using the **Add** button. You can also modify or delete the user-defined comments.

Operations:

1. Press **Preset** on the keyboard to activate the presetting function.

2. Roll the trackball to highlight **Comment Preset** and then press **Set**. Then the **Comment Preset** dialog box is displayed, as shown below:
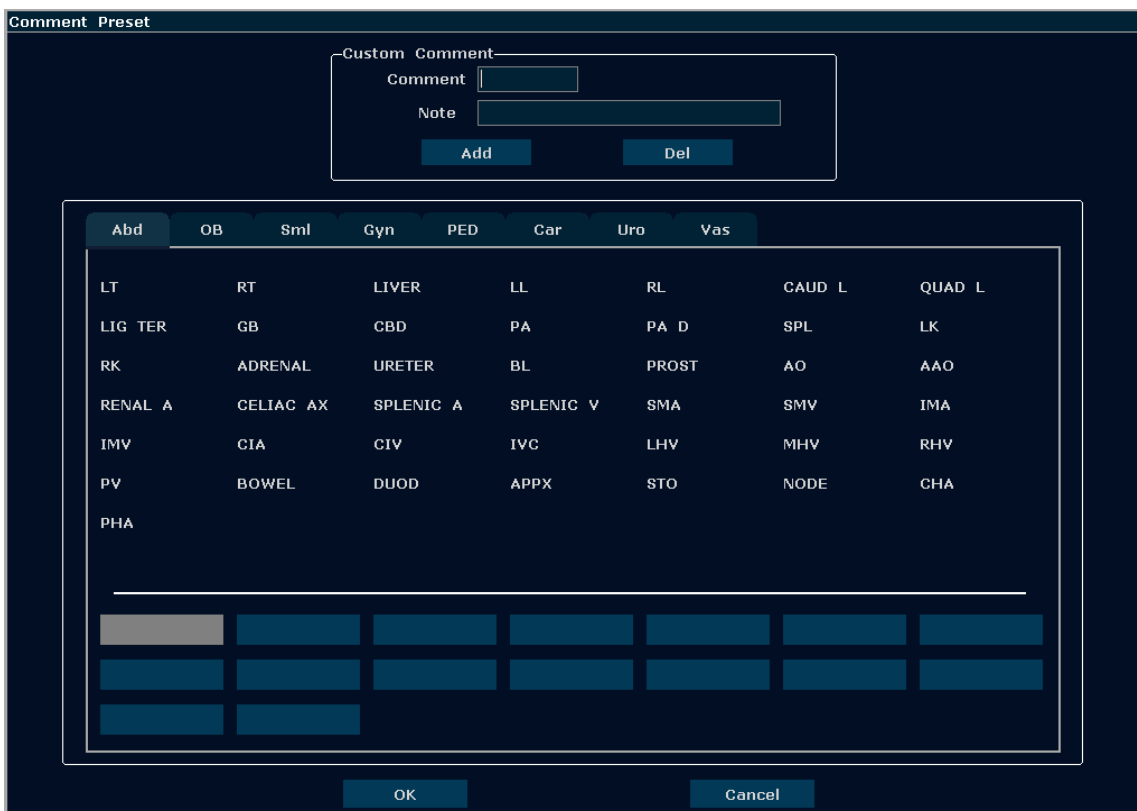
Figure 5-18 Comment Preset Dialog Box

To create user-defined comments (take **Abd** tab for instance):

1. Press **Abd** tab to open the **Abd** comment library.

2. Roll the trackball to the Comment editable filed in the Custom Comment box, and press **Set**. Then the cursor turns to "׀", as shown below. You can enter comment with the keyboard.
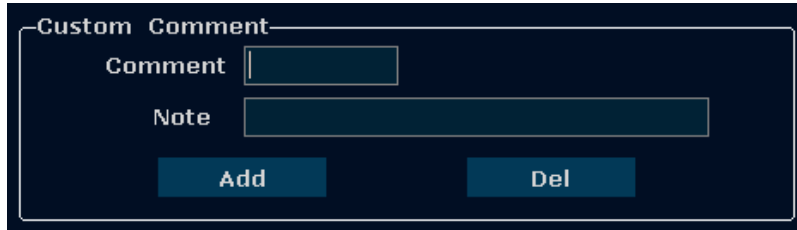
Figure 5-19 Custom Comment Library

3. Roll the trackball to the Note editable field in the Custom Comment box, and press **Set**. Then the cursor turns to "׀", as shown below. You can enter some detailed help information about the newly created comment with the keyboard.
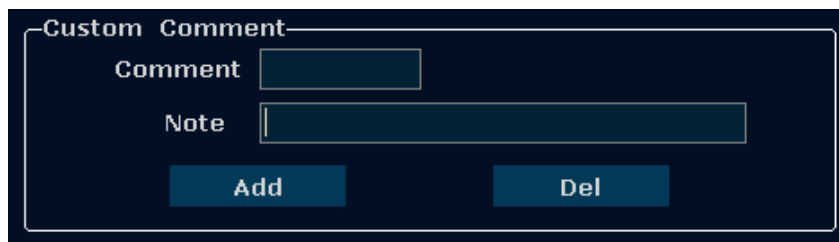
Figure 5-20 Custom Detailed Information of Comment Library

4. Roll the trackball to highlight **Add** to add the newly created comment to one of the custom comments of **Abd**. All the added user-defined comments are displayed below the System-defined Comment Library.

5. Press **OK** to save the modification, or press **Cancel** to give up and close the dialog box.

To modify user-defined comments (take **Abd** tab for instance):

1. Press **Abd** to open the **Abd** comment library.

2. Roll the trackball to highlight a user-defined comment, and press **Set**.

3. Roll the trackball to the Comment or Note editable filed in the Custom Comment box, and press **Set**. Then the cursor turns to "׀", modify the name or detailed help information of the user-defined comment with the keyboard.

4. Press **OK** to save the modification, or press **Cancel** to give up and close the dialog box.

To delete user-defined comments (take **Abd** tab for instance):

1. Press **Abd** to open the **Abd** comment library.

2. Roll the trackball to highlight a user-defined comment, and press **Set**.

3. Press **Del** to delete the comment.

4. Press **OK** to save the modification, or press **Cancel** to give up and close the dialog box.

5.7.9. Preset Data

Press **Preset**, roll the trackball to highlight **Preset Data**, and you can view three options in Preset Data submenu: **Import**, **Export** and **Factory Default.**

➢ To Export Preset Data

   This function is used to save all user preset data to an USB disk for back-up.

   Roll the trackball to highlight **Export** and press **Set**. The system displays a dialog "Import/export will cover the files that have the same file names! Contiunes? ". Click "OK" to continue. The preset data named "Settings" will be exported to the U50 folder in the USB disk.

➢ To Import Preset Data

   This function is used to import the existing preset data to the system. The system will be reset and operate according to the newly imported preset data.

   Roll the trackball to highlight **Import** and press **Set**. The system displays "Preset data exists, replace it?" dialog. Click "OK" to continue. The preset data file should be named "Settings" and put under the U50 folder of the USB disk.

WARNING

Be careful, if you confirm to import existing preset data, all of the previous preset will be cleared, and the system will operate according to the newly imported preset data.

➢ To Restore Factory Default Presetting

   Roll the trackball to highlight **Factory Default** and press **Set**. The system will restore the factory presetting.

WARNING

Be careful, if you confirm to restore factory default presetting, all of the previous preset will be cleared, and the system will restore preset data at the factory.

5.7.10. Connectivity

Press **Preset**, roll the trackball to highlight **Connectivity**, and press **Set.** Then the **Connectivity** dialog box is displayed, as shown below.
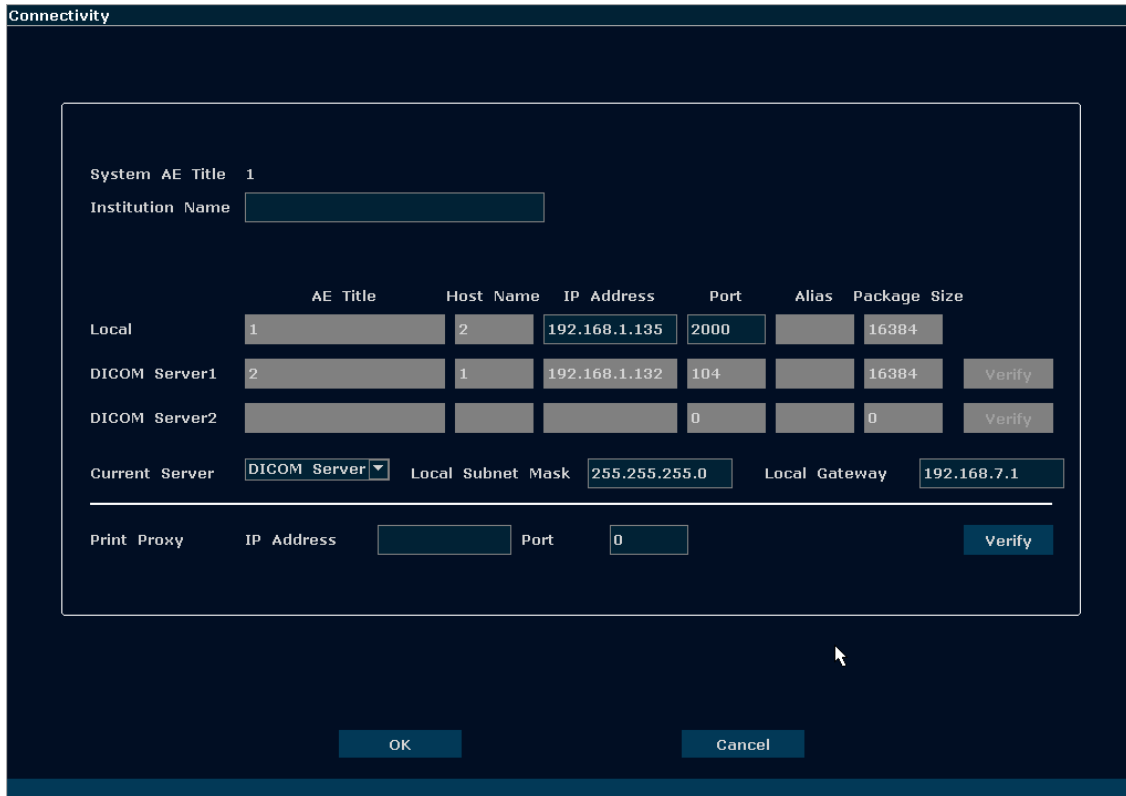
Figure 5-21 Connectivity Preset

Item	Description	
System AE Title	The same as the title set in the **AE Title** of **Local**	
Institution Name	Set the name of the institution	
Local	AE Title	Set the local AE title
	Host Name	Set the local host name
	IP Address	Set the local IP address
	Port	Set the local port
	Alias	Set the alias of the local system
	Package Size	Set the PDU transmission package size, from 4K to 64K, and the default value is **16K**.
Server 1/2	AE Title	Set the server AE title, the same as the **System AE Title** displays
	Host Name	Set the server host name
	IP Address	Set the server IP address
	Port	Set the server port
	Alias	Set the alias of the server
	Package Size	Set the PDU receiving package size, from 4K to 64K, and the default value is **16K**.

Verify	After presetting the server information, press **Verify** to verify the server's connection.	
Local Subnet Mask	Set the local subnet mask	
Local Gateway	Set the local gateway	
Current Server	To choose the current server that is connected to the system.	
Print Proxy	IP Address	Input the IP address as shown on the print proxy app installed on PC.
	Port	Input the port number as shown on the print proxy app installed on PC.
	Verify	Verify the connection with the print proxy app installed on PC.

Table 5-9 Connectivity Presetting Information

Press **OK** to save the presetting and exit, or **Cancel** to exit without saving the presetting.

NOTE:

1. Do not set the same IP Address for the local system and the server.
2. Ensure that you have turned on the server before verifying it.
3. The DICOM service is only available when the system is installed with DICOM software.

WARNING

1. Please build a secure network environment for your ultrasound system to protect the patient data from being attacked during network transmissions.

2. Patient data transmitted by the system is not encrypted. Please ensure the physical security of the network by trying the following measures:

    a) Install IDS(Intrusion Defense System) and IPS(Intrusion Protection System) software in the network environment where your ultrasound systems are used.

    b) Use a network that is isolated from the external environment by a firewall.

    c) Do not connect the ultrasound system and non-medical devices to a same network.

3. Anti-virus software is not installed on this device. Please take anti-virus measures in the network environment where your ultrasound systems are used.

5.7.11. Maintenance

The maintenance can be only done by EDAN authorized personnel. Operations such as installing DICOM and upgrading software can be accessed on the maintenance menu.

5.7.12. System Information

In the preset menu, move the cursor to highlight **System Info** and press **Set** to display System information interface.

5.7.13. User Login

Press **Preset**, roll the trackball to highlight **User**, and press **Set.** Then the **User** dialog box is displayed, as shown below.
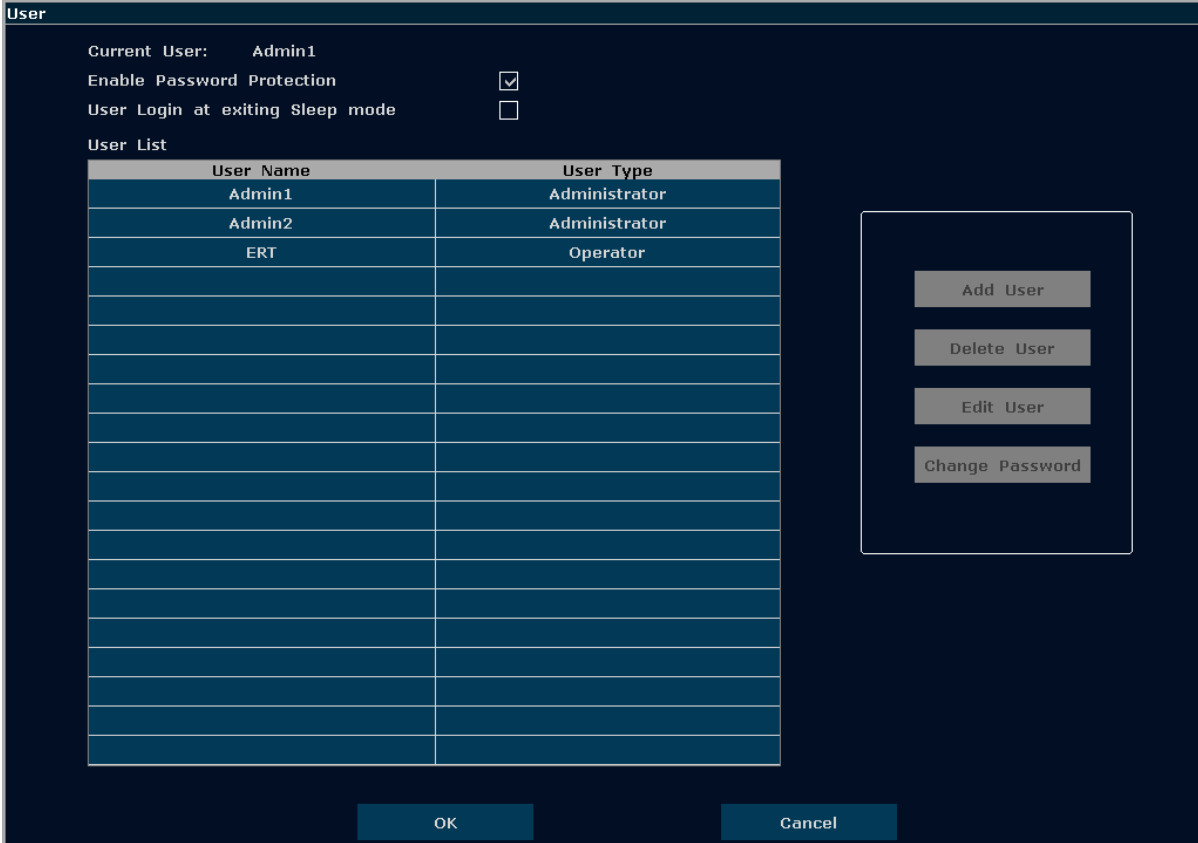
Figure 5-22 User Login

Item	Options	Description
Current User	/	Display the user name of current login.
Enable Password Protection	√/×	Show or hide the login dialog when booting up the system. Password is required to enable password protection function.
User Login at exiting Sleep mode	√/×	Set whether to display the User Login dialog for user login when exiting the sleep mode.
User List	√/×	Show all users displaying user name and user type. Click the an user to select it for editing operation

Table 5-10 User Login Presetting Information

User type includes Administrator and Operator.

- Administrator users have authority to enable/disable password protection, add/delete/edit users and can view all exams in the patient database. There are two pre-defined administrator users called Admin1 and Admin2.

- Operator users can only edit their own user information, change their own password, and view exams that they created.

- There's one pre-defined operator user called Emergency for Emergency login without entering password. The exams created by Administrator and Operator can not be viewed through Emergency login.

There's a couple of buttons for different user edit operation. It includes Add User, Delete User, Edit User, and Change Password.

- **Add User**: Click it to add user in the user list.

- **Change Password**: Click it to change the password of the users.

- **Delete Use**r: Click it to delete the highlighted user in user list.

- **Edit User**: Click it to modify the user information.

Caution

1. For security consideration, a password with high secure intensity is suggested for each user account, and the password should be changed periodically.

2. Please keep your user name and password safe.

3. Change the passwords of two pre-defined administrator users:Admin1 and Admin2 immediately when you get the ultrasound system.

4. Always enable the function of user login with password protection.

5.8. Printing

To connect a video printer:

1. Connect a video printer. Refer to *4.3.6 Printer Installation* for details.

2. Check the printer, referring to the printer user manual.

3. If the video printer is connected via an USB cable, make sure the **Video Printer** option in the **System Preset** window is set correctly.

4. Run the printer.

Video printing:

Press **Print** on the keyboard to print the image currently displayed.

To connect a graph/text report printer:

1. Connect a graph/text report printer. Refer to *4.3.6 Printer Installation* for details.

2. Check the printer, referring to the printer user manual.

3. Check the **Report Printer**　in **System Preset**.

4. Enter the desired worksheet to edit the examination and diagnosis information.

5. Run the printer.

Graph/text report printing:

Press **Print** in the worksheet dialog box to print the report.

Print area:

The print area includes information field, image field, parameter field, and measurement results field.

NOTE:

1. When using a monochrome printer, preset the video color to "monochrome" through **System Preset**; When using a color printer, EDAN recommends you to preset the video color to "Colorized", but "monochrome" is also workable.

2. Before printing, make sure there is enough paper for printing.

3. Before printing, make sure the presetting printer type is correct.

4. Before printing, make sure the printer power cord and the USB cable are connected well.

5. Do not cut off the printer power supply or the USB cable during printing.

6. If the printer can not work normally, please restart the printer and the U50.

To use the print proxy function for graph/text report printing:

The print proxy function allows you to connect the ultrasound system with a PC, and then all the graph/text report printing work can be done by the graph/text printers connected to the PC, which provides you wide choices of printers for graph/text report printing.

1. Install the print proxy app "Print Proxy_Server" on a PC.

2. Connect the ultrasound system with the PC with a network cable.

3. Open the "Print Proxy_Server" app on the PC, which will display you an IP address and a port number.

4. Press **Preset** and open the **Connectivity** page.

5. Input the IP address and port number displayed on the "Print Proxy_Server" app at the **Print Proxy** field. Then make sure the local IP of the ultrasound system and the IP of PC are in the same network segment.

6. Press **Verify** button to verify the connection between the ultrasound system and the PC.

7. Connect a graph/text printer you've got to the PC. Make sure that the PC has been installed with the driver of the printer you connect.

8. Open the worksheet dialog box after exam, and press **Print** to print the report.

Note:

1. PC referred here could be a personal computer, a laptop or a mini PC module.

2. The operating system of the PC should be WindowsXP, Windows 7, Windows 8 or Windows 10.

Chapter 6 Operation

6.1. Entering or Editing Patient Information

NOTE:

Before a patient exam, **EndExam** should be pressed. Pressing **EndExam** will automatically erase all cache memory (Including patient data, comments, measurements, calculations and reports of the last exam，except for archived Images.)

CAUTION

To avoid patient information errors, always check the information with the patient. Make sure the correct patient information appears on all the screens and reports.

Press **Patient** to display the **Patient Data Input Dialog** box, as shown below:

Figure 6-1 Patient Data Input Dialog Box

To switch the input text box: press **Enter**;

To enter the patient information, use the keyboard;

To save patient information, select **OK** or press **Enter.**

To give up the modification, press **Cancel** to exit.

To modify the patient data, press **Patient** before the exam ends, and edit in the patient input dialog box.

Note:

"LMP " is only displayed for entering LMP date in Obstetric exams.

6.2. Selecting a Probe and an Examination Type

Connect a probe to the system, and press **Probe** to open a dialog box as shown in the figure below. Roll the trackball to select the desired exam type corresponding to the probe, such as abdominal, obstetrics, gynecology, pediatric, small parts, urology, peripheral vascular, musculoskeletal (conventional and superficial), and cardiac exams. Press **OK,** or double click on the exam type to confirm.
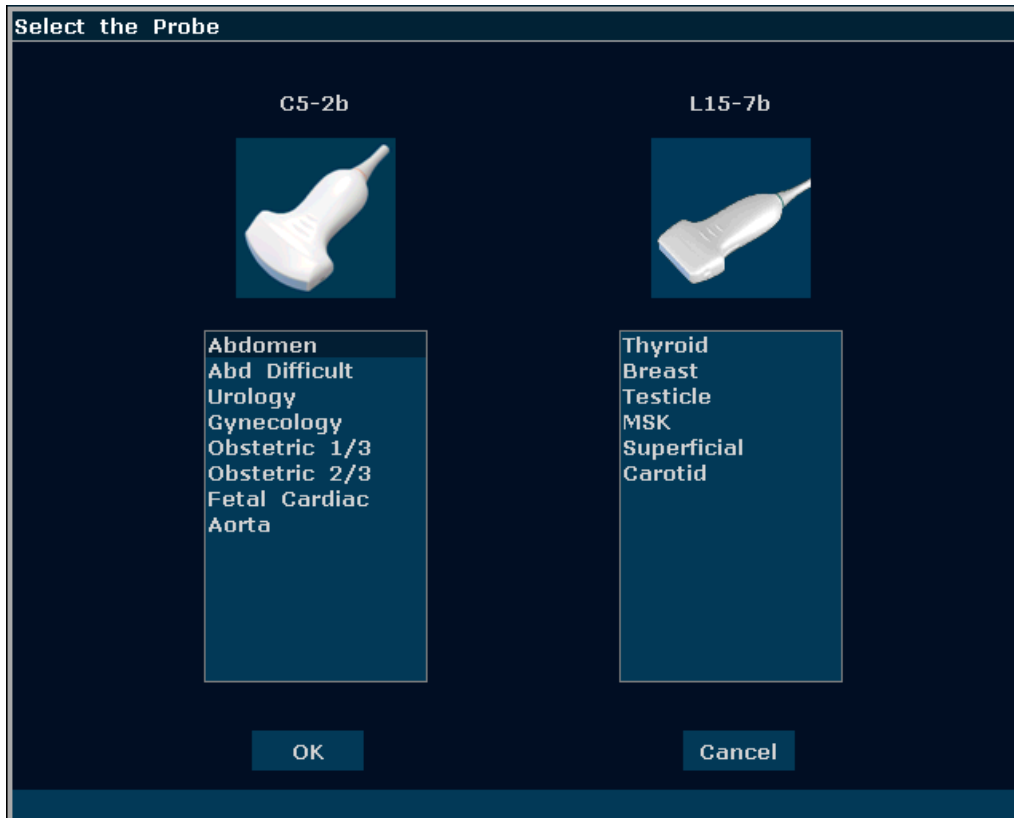
Figure 6-2 Probe and Examination Selection Menu

While multiple probes are connected to the ultrasound system, only one can be activated at a time. The model of the activated probe is displayed in the top right corner of the screen.

Press **Freeze** to activate or deactivate a probe. In frozen status, the "Freeze" icon ❄ is displayed on the upper right part of the screen.

NOTE:

1. You can preset examination types for each probe in **Probe Preset**, see section *5.7.4 Probe Preset*.

2. The maximum surface temperatures of probe E612UB, L742UB, C6152UB and P5-1b are respectively 41.5℃, 42.4℃, 42.4℃ and 41.9℃ in simulated operation.

The system limits patient contact temperature to 43℃ and the acoustic output below the maximum acoustic output limits for track 3.

6.3. Selecting an Imaging Mode

The system will display the default mode after it is powered on. You can select an imaging mode

by pressing (B), (Color), (PW), (CW), (M), ⬚⬚, ⬚⬚, or PDI and then begin an examination.

6.4. Image Adjustments

The U50 also provides the following additional control functions, which are available through status menus and Menu Controls panel.

Control Functions	Description	Parameter Range	Operations
Gain	Increases or decreases the amount of echo information. It may brighten or darken the B mode image.	0-130, in increments of 2	Gain Knob
Image Type	This function is used to optimize images quickly according to characteristics of current tissues. And values of associated parameters will be changed together with it.	Detail/Soft/ HContrast/ Penetration	Menu Controls
eSRI (Speckle Resistance Imaging)	Eliminates from the B mode image of low level echoes resulting from speckle noise. Thin image granules, enhance the image boundary layers, and reserve more details of the image.	0-8	
Dyn Rng (Dynamic Range)	Adjust the gray display range of B image. The smaller the value, the narrower gray display range and the lower contrast resolution, and vice versa.	30dB-150dB	
Focus Pos (Focus Position)	Adjust the position of focuses.	0-15	
Focus Num	Set the number of focuses.	1-4	
Freq	Set the frequency of probe.	5 levels	
Pseudo Color	Set the colorization of a conventional B/PW mode image to enhance the visibility so as to distinguish B, M and PW mode intensity.	6 types	

Spatial Comp (Spatial Compounding Imaging)	This function is used to increase target signals, weaken the speckle noises, enhance image contrast of the target area, and decrease influences of sound shadow, ultrasound loss and the occurrence of reverberation.	On/Off	Menu Controls
Frame Persist	Remove the bright spot noise that appears randomly in B mode image. The bigger the value the stronger the effect, but the frame rate will not be affected.	0-7	
Gray Map	Adjust the gray scale distribution to obtain the optimum images.	0-14	
Rejection	Eliminates from the B mode image of low level echoes resulting from flicker noise. 0 represents no Rejection. The bigger the value, the stronger the effect.	0-7	
ScanAngle (sector angle/ scan width)	Adjusts the sector angle for curve probes, and the scan width for linear probes, providing a larger field of view in the far field. The larger angle, the faster frame rate, and vice versa.	0-3	
90° Rotate	Rotate the image by 90 degrees (in B mode).	0, 1, 2, 3	Image Parameter Preset
B/W Invert	Set the color to black or white.	On/Off	
H Reverse	Set the attribute of Horizontal reversal, which means Left/Right flip.	On/Off	Menu Controls
		/	Press 🄡 on PC keyboard
V Reverse	Set the attribute of Vertical reversal, which means Up/Down flip.	On/Off	Menu Controls
		/	Press 🄡 on PC keyboard
M/D Sample Line	Set the position of sample before entering PW mode. Press to display or hide the sample line.	/	Press ⊕ on PC keyboard
Dual	Press to select Dual, and press it again to switch between a live or frozen, single or multi-mode A/B split screen display.	/	Press ▢▢ on PC keyboard

Quad	Press to select Quad, and press it again to cycle through a live or frozen A/B/C/D single or multi-mode split screen display.	/	Press ⊞ on PC keyboard

Table 6-1 B Mode image parameters

Control Functions		Description	Parameter Range	Operations
Gain		CFM: Increase the overall strength of color flow echoes, but the color map will not be affected. PDI: Power Doppler Imaging. The larger the gain the more number of reflectors and the brighter of the PDI map.	1-80, in increments of 1	Gain knob
Scan area of Color Mode (ROI)	Size	/	The maximum height of ROI is only 1/2 of the physical height of the image field.	Trackball. By default, roll the trackball to position the ROI, and press **Set** to switch to ROI size adjusting status.
	Position	/	Within B Mode imaging area	
	Color	/	Yellow/Green	Image Parameter Preset
Flow Type		This function is used to optimize flow images quickly according to current flow state. And values of associated parameters will be changed together with it.	H Flow /M Flow / L Flow	Menu controls
Dual Live		On: the window will be automatically switched to the dual real-time status (the left one is B image, and the right one is B+Color/PDI image). Off: non-dual-live status.	On/Off	
Persist		The bigger the value, the more persistence among frames, and the more continuity of color maps.	0-7	
Smooth filter		Adjust to smooth out the color image. Similar to spatial smooth. The bigger the value, the stronger the effect.	0-7	
WallFilter		Filter out low velocity flow signals in order to hide unusable motion. It helps to get rid of motion artifacts caused from breathing and other patient motion. The bigger the value, the more signals of low velocity will be filtered out.	0-7	
PRF		Adjust to raise or lower the flow	0-15	

	velocity range. The bigger the value, the higher the maximum velocity will be detected. Frame rate will be affected by excessive lower PRF. Aliasing may occur if low velocity range is set for high velocity flow.	
Invert	Reverse the color of blood flow. Off: Red toward (positive velocities) and Blue away（negative velocities） On: opposite to the above.	On/Off
Base Line	Adjust the velocity range of forward flow /reverse flow. Minimize aliasing by displaying a greater range of forward flow or reverse flow.	7 levels
Map	Each map displays velocity/power according to colors. In PDI mode, 7 kinds of maps are provided: 0-3 belongs to Power Doppler Imaging (PDI) Mode maps. While, 4-7 belong to Directional Power Doppler Imaging (DPDI) Mode maps.	In Color mode:0-7 In PDI mode: 0-3 (PDI) 4-7 (DPDI)
Packet Size	The bigger the value, the stabler the flow signals, but the frame rate will be decreased. Adjust properly according to practical applications.	4 levels: 8,10,12,14
Threshold	Set the gray scale level at which strong echoes inside vessel walls will be rejected. The smaller the value, the lower the gray scale level, and the more gray scales will be recognized as echoes inside vessel walls, and the information will be rejected.	0-15
Freq	The lower the frequency, the better the force of penetration; the higher the frequency, the better spatial resolution.	2 levels

The rightmost column spanning the above rows reads: **Menu controls**

| Steer | Adjust the ROI steering angle of the Color Flow linear image to get more information without moving the probe. The Angle steer function only applies to linear probes. | -10°,0°,10° | Menu controls

Press [icon] or [icon] on PC keyboard |

Table 6-2 Color/PDI Mode image parameters

Control Functions	Description	Parameter Range	Operations
Gain	Increases or decreases the amount of echo information. It may brighten or darken the PW mode image.	1-80, in increments of 1	Gain knob
Position of sample volume	The sample volume can be positioned anywhere within B images; In B+ Color/PDI+PW mode, the sample box moves with sample volume.	/	Trackball
Flow Type	This function is used to optimize flow images quickly according to current flow state. And values of associated parameters will be changed together with it.	H Flow /M Flow / L Flow	Menu controls
Quick Angle	Adjust the correction angle faster in increments of 30°.	-79°-79°	
Correction Angle	The correction line should be set parallel to the sample vessel. Correct the PW velocity caliper to obtain accurate measurement of velocity.	-79°-79°	
Invert	Vertically inverts the spectral trace without affecting the baseline. Off: Above the baseline (towards the probe, positive velocities) and below the baseline（away from the probe,. negative velocities） On: opposite to the above.	On/Off	
Base Line	Adjust the baseline position. It helps to increase positive/negative spectral range for evaluation.	7 levels	
PRF	Adjust to raise or lower the flow velocity range. The bigger the value, the higher the maximum velocity will be detected. Frame rate will be affected by excessive lower PRF. Aliasing may occur if low velocity range is set for high velocity flow.	0-15	
HPRF	When exceeding the maximum sampling frequency at certain sample volume depth by further increasing the PRF, the HPRF mode is activated automatically; when decreasing the depth and the PRF is not limited by depth, the system exits HPRF mode; or, switch the HPRF menu control to "Off", the system exits HPRF mode.	On/Off	
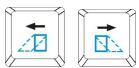
Pseudo Color	Set the colorization of a conventional B/PW mode image to enhance the visibility so as to distinguish B, M and PW mode intensity.	6 types	Menu controls
Sample Volume	The echoes information in the sample volume is used to evaluate spectral. Adjust the sample volume properly and keep it within the sample area.	0.5-20.0, 16 levels	
Dyn Rng (Dynamic Range)	Adjust the gray display range of PW image. The smaller the value, the narrower gray display range and the lower contrast resolution, and vice versa.	30-90dB in increments of 2	
WallFilter	Insulate the Doppler signal from excessive noise caused from vessel movement The bigger the value, the more low velocity signals will be filtered out.	0-3	
Freq	The lower the frequency, the better the force of penetration; the higher the frequency, the better spatial resolution.	2 levels	
Duplex/Triplex	Set whether B (B+Color) and PW images are displayed synchronously.	On/Off	
Sweep Speed	Adjust the scanning speed level of the PW mode image.	0-5	
Volume of PW mode	Decrease/ increase the volume of Doppler; Or mute the sound.	7 levels, or mute	Press one of the three keys on PC keyboard 🔉 🔊 🔇
Steer	Adjust the steering angle of the sample line. The angle steer function only applies to linear probe.	-10°,0°,10°	Menu controls / Press one of the two keys on PC keyboard
M/D Sample Line	Set the position of sample before entering PW mode.	Display/hide	Press ⊕ on PC keyboard

Table 6-3 PW Mode image parameters

Control Functions	Description	Parameter Range	Operations
Gain	Increases or decreases the amount of echo information. It may brighten or darken the CW mode image.	1-80, in increments of 1	Gain knob
Position of sample line	Within image	/	Trackball
Flow Type	This function is used to optimize flow images quickly according to current flow state. And values of associated parameters will be changed together with it.	H Flow /M Flow / L Flow	Menu controls
Quick Angle	Adjust the correction angle faster in increments of 30°.	-79°-79°	
Correction Angle	The correction line should be set parallel to the sample vessel. Correct the CW velocity caliper to obtain accurate measurement of velocity.	-79°-79°	
Invert	Vertically inverts the spectral trace without affecting the baseline. Off: Above the baseline (towards the probe, positive velocities) and below the baseline（away from the probe,. negative velocities） On: opposite to the above.	On/Off	
Base Line	Adjust the baseline position. It helps to increase positive/negative spectral range for evaluation.	7 levels	
PRF	Adjust to raise or lower the flow velocity range. The bigger the value, the higher the maximum velocity will be detected. Frame rate will be affected by excessive lower PRF. Aliasing may occur if low velocity range is set for high velocity flow.	0-31	
Pseudo Color	Set the colorization of a conventional B/CW mode image to enhance the visibility so as to distinguish CW mode intensity.	6 types	Menu controls
Dyn Rng (Dynamic Range)	Adjust the gray display range of CW image. The smaller the value, the narrower gray display range and the lower contrast resolution, and vice versa.	30-90dB in increments of 2	

	Insulate the Doppler signal from excessive noise caused from vessel movement The bigger the value, the more low velocity signals will be filtered out.	0-3	
WallFilter			
Sweep Speed	Adjust the scanning speed level of the CW mode image.	0-5	
Volume of CW mode	Decrease/ increase the volume of Doppler; Or mute the sound.	7 levels, or mute	Press one of the three keys on PC keyboard

Table 6-4 CW Mode image parameters

Control Functions	Description	Parameter Range	Operations
Gain	Increases or decreases the amount of echo information. It may brighten or darken the M mode image.	0-130, in increments of 2	Gain knob
M-Mark	Position the sample line.	Within B Mode image area	Trackball
Sweep Speed	Adjust the scanning speed level of the M mode image.	0-3	Menu controls
Display Layout	Set the display layout of dual-split mode of B+M: Up/Down, Left/Right.	U/D, L/R	
Rejection	Eliminates from the M mode image of low level echoes resulting from flicker noise. 0 represents no Rejection. The bigger the value, the stronger the effect.	0-7	
Dyn Rng (Dynamic Range)	Adjust the gray display range of M image. The smaller the value, the narrower gray display range and the lower contrast resolution, and vice versa.	30-150dB	
Focus Pos (Focus Position)	Adjust the position of focuses.	0-15	
Freq	Set the frequency of probe.	5 levels	
Pseudo Color	Set the colorization of a conventional M mode image to enhance the visibility so as to distinguish M mode intensity.	6 types	
Line Average	Set image line softening attribute.	0-7	
Gray Map	Adjust the gray scale distribution to obtain the optimum images.	0-14	

Table 6-5 M Mode image parameters

Save image parameter preset:

1. After the image parameter adjustments, press **Save Preset Data** key (user-defined key F1/F2/F3/F4).

2. Press **OK** in the "**Save current image parameters data?**" dialog box.

3. Press **OK** in the "**Overwrite the current exam preset data?**" dialog box to save the image parameter preset to the current exam mode; Or press **Cancel**, and enter a new exam name in the "**Add new Exam mode**" dialog box to save the image parameter preset to the new exam mode.

6.5. Generic Measurements and Calculations

Mode	Generic Measurement & Calculation Items
B/Color	Distance, Area (Ellipse/Trace), Volume (2-Axis/3-Axis), Ratio, Angle, and Histogram
M	Distance, Time, Slope and Hear Rate (two cycles)
D	Velocity, Heart Rate, Time, Acceleration, Resistance Index (RI), Pulsatility Index (PI) and Auto Trace (auto trace is available only for PW mode)

Table 6-6 Generic measurement & calculation Items

Distance and circumference will be presented in mm or cm; area, in mm^2, cm^2, or dm^2; volume, in mm^3, cm^3, dm^3, mL or L; time in ms or s, and heart rate in bpm, etc.

After entering B/ Color/ PDI/ PW/ CW/ M mode, press **Caliper** to activate the B/ Color/ PDI/ PW/ CW/ M mode generic measurement function, and the light will be on.

There is one type of mark in B mode measurement: "+".

There are three types of marks in M mode measurement: "+", big "+", and a line.

The measurement results will be displayed in real-time. After measurement, the outcome is displayed in measurement result window with a serial number. You can measure one to eight groups of data. If you continue to measure, the earliest group will be automatically covered by the newest one.

NOTE:

1. When you exit measurement status, or press **EndExam/Clear,** all the measurements will be cleared.

2. During general measurement, press **Back** to delete the previous operation.

3. After a complete general measurement, press **Back** to erase a measurement at a time.

6.5.1. Generic Measurements in B Mode

The default measurement of B mode is distance measurement. B mode measurement menus are shown as follows:
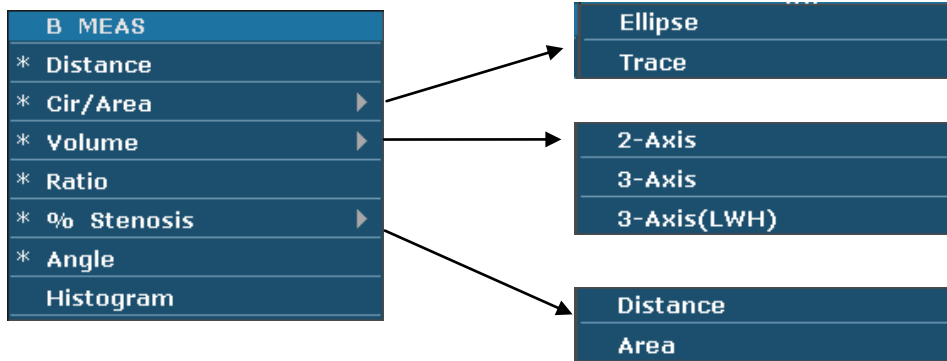
Figure 6-3 B Mode Generic Measurement and Calculation Menu

Distance

To measure distance:

1. Press **Caliper** to activate generic measurement function.

2. Roll the trackball to highlight **Distance**, press **Set** to activate a measurement cursor "+" on the screen.

3. Roll the trackball and press **Set** to anchor the start point.

4. Roll the trackball and press **Set** to anchor the end point.

5. Roll the trackball and press **Set** to begin a new distance measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window, as shown below.

6. Press **Caliper** to finish and exit.

Figure 6-4 Distance Measurement and the Results

Circumference/Area   ● **Ellipse Method**

To measure Circumference / Area:

1. Press **Caliper** to activate generic measurement function.

2. Roll the trackball to highlight **Cir/Area**. Then select **Ellipse**, and press **Set** to activate a measurement cursor "+" on the screen.

3. Roll the trackball and press **Set** to anchor the start point of fixed

axis of ellipse.

4. Roll the trackball and press **Set** to anchor the end point of fixed axis of ellipse.

5. Roll the trackball, and press **Set** to define the size of the ellipse.

6. Roll the trackball and press **Set** to begin a new circumference/area measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window, as shown below.

7. Press **Caliper** to finish and exit.
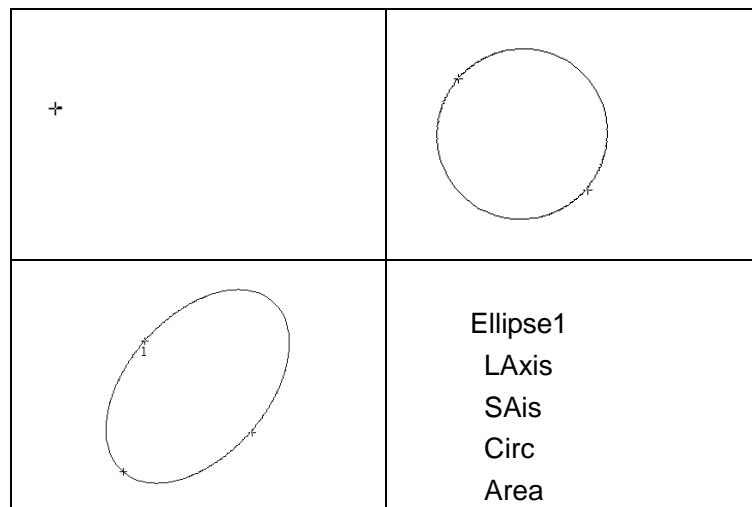
Figure 6-5 Ellipse Circumference/Area Method and the Results

● **Trace Method**

To measure Circumference / Area:

1. Press **Caliper** to activate generic measurement function.

2. Roll the trackball to highlight **Cir/Area**. Then select **Trace**, and press **Set** to activate a measurement cursor on the screen.

3. Roll the trackball and press **Set** to anchor the start point.

4. Roll the trackball to outline the region of interest. As you move the trackball, the system displays dots to outline the structure. To correct an error in the trace, press **Back** to move in reverse along the traced outline. Roll the trackball to move forward again. The system automatically closes the loop when the last measurement marker is moved very near to the start point. Or press **Set** to close the loop. The system draws a line from the position of the active measurement marker to the beginning of the loop.

5. Roll the trackball and press **Set** to begin a new circumference/area measurement. You can measure a maximum of eight groups of data.

The outcome will be displayed in the measurement result window, as shown below.

6. Press **Caliper** to finish and exit.
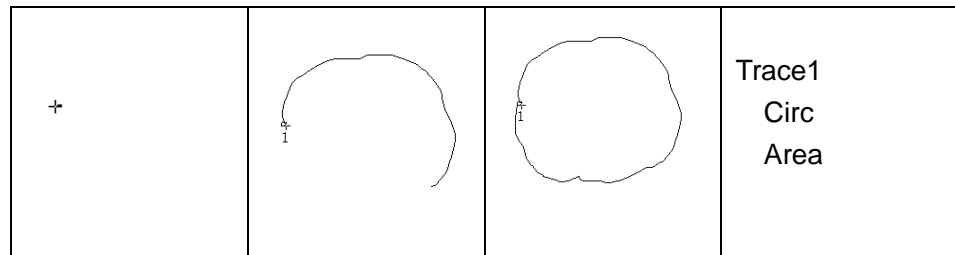
Figure 6-6 Trace Circumference/Area Method and the Results

Volume

● **2-Axis volume method**

$V = (\pi/6) \times A \times B^2$, (A: the length of major axis. B: the length of minor axis)

Two-axis volume method can be used to perform volume measurement by calculating only one set of measured data.

Operating Method:

The two-axis volume method is similar to the generic B mode Cir/Area measurement ellipse method. You can measure a maximum of eight groups of data.

● **3-Axis method**

$V = (\pi/6) \times A \times B \times M$,

(A: the length of major axis. B: the length of minor axis. M: the length of the third axis.)

Three-axis method can be used to perform volume measurement by calculating two sets of measured data, EA and the length of the third axis. To complete volume measurement, first measure EA by ellipse method, and then measure the length of the third axis with the distance measurement method, and the value of volume will be displayed automatically.

To measure volume:

In the **B mode**

1. Obtain a cross-section image and freeze the system.

2. Measure the lengths of the major axis and the minor axis of the cross section with the ellipse method.

3. Unfreeze the system to acquire a new image (vertical-section image), and then freeze it.

4. Measure the length of the third axis in the vertical section image with

the distance measurement method. The outcome will be displayed in the measurement result window.

In the **2B mode** or **4B mode**

To measure volume:

1. Obtain the cross-section image and the vertical-section image.

2. Measure the length of the major axis and the minor axis of the cross section with the ellipse method.

3. Roll the trackball to the next image, vertical section image, measure the length of the third axis with the distance measurement method. The outcome will be displayed in the measurement result window, as shown below.

4. Press **Caliper** to finish and exit.
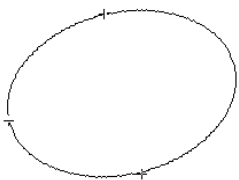
+	(ellipse image)
(dashed line measurement)	LAxis SAxis 3rdAxis Volume

Figure 6-7 3-Axis Volume Method and the Results

● **3-Axis (LWH) method**

$V = (\pi/6) \times L \times W \times H,$

(L: the length. W: the width. H: the height.)

Three-axis (LWH) method can be used to perform volume measurement by calculating 3 sets of distance data, L, W, and H. Measure the three pieces of data by the method of B mode generic distance measurement, and then the value of volume will be displayed automatically.

To measure volume:

In the **B mode**

1. Obtain a cross-section image and freeze the system.

2. Measure the length and the width.

3. Unfreeze the system to acquire a new image (vertical-section image),

and then freeze it.

4. Measure the height. The outcome will be displayed in the measurement result window.

In the **2B mode** or **4B mode**

1. Obtain the cross-section image and the vertical-section image.

2. Measure the length and the width.

3. Roll the trackball to the next image, vertical section image, measure the height. The outcome will be displayed in the measurement result window, as shown below.

4. Press **Caliper** to finish and exit.
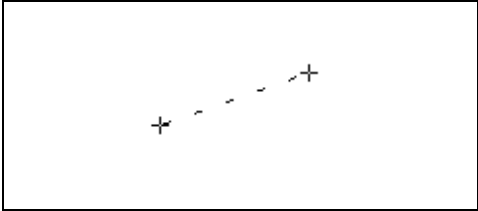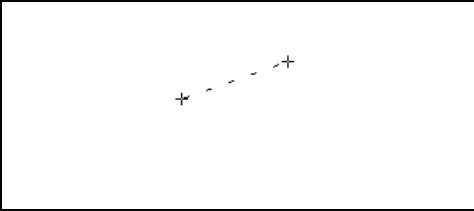
	Length Width Height Volume

Figure 6-8 3-Axis (LWH) Volume Method and the Results

Ratio

To determine the ratio, perform two measurements: A and B. The system calculates the ratio: A/B or B/A.

To measure ratio:

1. Press **Caliper** to activate generic measurement function.

2. Roll the trackball to highlight **Ratio**, press **Set** to activate a measurement cursor on the screen.

3. Measure the first distance A with the distance measurement method.

4. Measure the second distance B, move the cursor and press **Set** to anchor the start point, and the mark "+" appears. Move the cursor with trackball, Measurement Results displays the real time measurement value and calculation result.

5. During measurement, you can press **Update** once to change the settled point and the active point; if you press **Update** a second time, the system interchanges the numerator and denominator.

6. Roll the trackball and press **Set** to complete the measurement, and the calculation result will be displayed in the measurement result window.

7. Roll the trackball and press **Set** to begin a new ratio measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

8. Press **Caliper** to finish and exit.

✚	+ 1 +
+ 1 + + + 1	Dist11 Dist12 Ratio1

Figure 6-9 Ratio Measurement and the Results

% Stenosis   ● **Distance stenosis**

To determine the distance stenosis, perform two distance measurements: A and B. The system calculates the stenosis: (A-B)/A * 100%.

To measure distance stenosis:

1. Press **Caliper** to activate generic measurement function.

2. Roll the trackball to highlight **% Stenosis**, and select **Distance**, and then press **Set** to activate a measurement cursor on the screen.

3. Measure the first distance with the distance measurement method.

4. Measure the second distance, move the cursor and press **Set** to anchor the start point, and the mark "+" appears. Move the cursor with trackball. Measurement Results displays the real time measurement value and calculation result.

5. During measurement, you can press **Update** to change the start point and the end point; if you press **Update** again, the system interchanges the numerator and denominator.

6. Roll the trackball and press **Set** to complete the measurement, and the calculation result will be displayed in the measurement result window.

7. Roll the trackball and press **Set** to begin a new stenosis measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

8. Press **Caliper** to finish and exit.
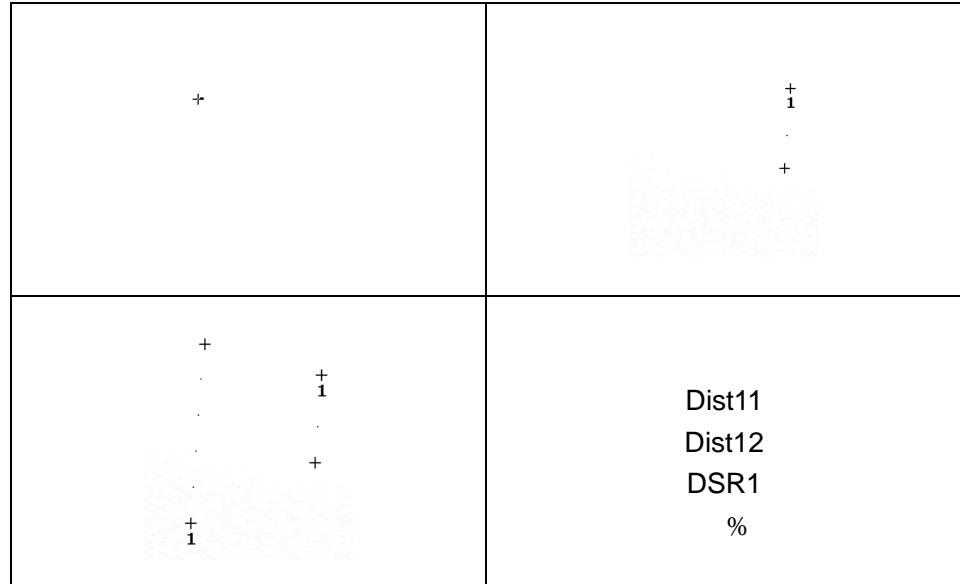
Figure 6-10 Distance Stenosis Measurement and the Results

● **Area stenosis**

To determine the area stenosis, perform two area measurements: A and B. The system calculates the stenosis: (A-B)/A * 100%.

To measure area stenosis:

1. Press **Caliper** to activate generic measurement function.

2. Roll the trackball to highlight **% Stenosis**, and select **Area**, and then press **Set** to activate a measurement cursor on the screen.

3. Measure the first area with the ellipse method.

4. Measure the second area, move the cursor and press **Set** to anchor the start point, and the mark "+" appears. Move the cursor with trackball. Measurement Results displays the real time measurement value and calculation result.

5. During measurement, you can press **Update** to change the start point and the end point.

6. Roll the trackball and press **Set** to complete the measurement. You can measure a maximum of eight group of data. The outcome will be displayed in the measurement result window.

7. Press **Caliper** to finish and exit.
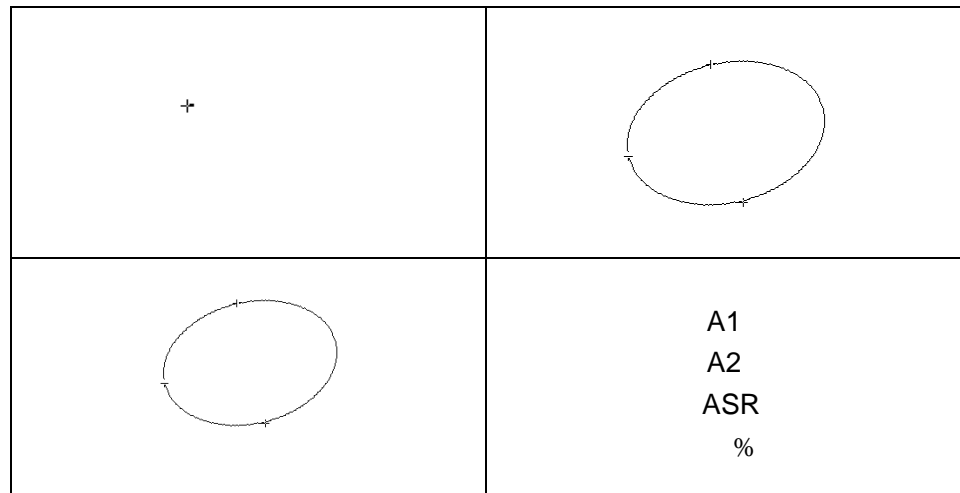
Figure 6-11 Area Stenosis Measurement and the Results

Angle   To determine an angle, draw two lines: A and B. The system calculates the angle.

To measure angle:

1. Press **Caliper** to activate generic measurement function.

2. Roll the trackball to highlight **Angle**, and then press **Set** to activate a measurement cursor on the screen.

3. Draw the first line A with the distance measurement method.

4. Draw the second line B, move the cursor and press **Set** to anchor the start point, and the mark "+" appears. Move the cursor with trackball. Measurement Results displays the real time measurement value and calculation result.

5. During measurement, you can press **Update** to change the start point and the end point; if you press **Update** again, the system interchanges line A and line B.

6. Roll the trackball and press **Set** to complete this measurement.

7. Roll the trackball and press **Set** again to begin a new angle measurement. You can measure a maximum of eight groups of data. The angles formed by the two lines are displayed in measurement result window, in units of degrees. The outcome will be displayed in the measurement result window.

8. Press **Caliper** to finish and exit.
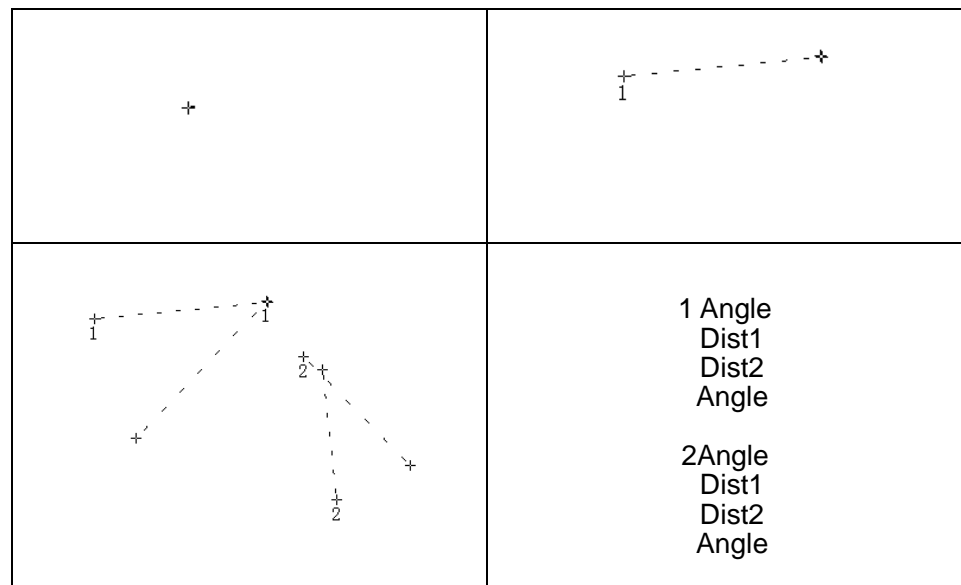
Figure 6-12 Angle measurement

Histogram

The image will be frozen automatically after entering histogram measurement.

1. Press **Caliper** to activate generic measurement function.

2. Roll the trackball to highlight menu **Histogram**, and then press **Set** to activate a measurement cursor on the screen.

3. Roll the trackball, and press **Set** to anchor the start point.

4. Roll the trackball, adjust the position and size of the histogram, and then press **Set** to anchor the end point.

5. During measurement, you can press **Update** to change the start point and the end point.

6. Roll the trackball and press **Set** again to begin a new histogram measurement. You can measure a maximum of four groups of data. The outcome is displayed in Measured Results.

7. Press **Caliper** to finish and exit.

Note:

1. Please freeze the image before Histogram measurement.

2. Do not use Histogram measurement when the image is zoomed.

3. All the measurements you have done will be cleared when selecting Histogram measurement.

6.5.2. Generic Measurements in M Mode

M mode measurements and calculations include distance, time, slope and heart rate (2 cycles). These are for B+M and M display modes only. The default measurement of B+M and M mode is heart rate measurement. M mode measurement menus are shown as follows:
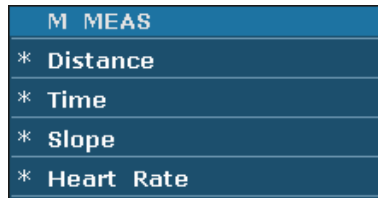
Figure 6-13 M Mode Generic Measurement and Calculation Menu

Distance   To measure distance:

1.   Press **Caliper** to activate a measurement cursor "+".

2.   Roll the trackball to highlight **Distance** and press **Set**.

3.   Roll the trackball and press **Set** to anchor the start point, and a big "+" is displayed.

4.   Roll the trackball and press **Set** to anchor the end point.

5.   Roll the trackball and press **Set** to begin a new distance measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window, as shown below.

6.   Press **Caliper** to finish and exit.
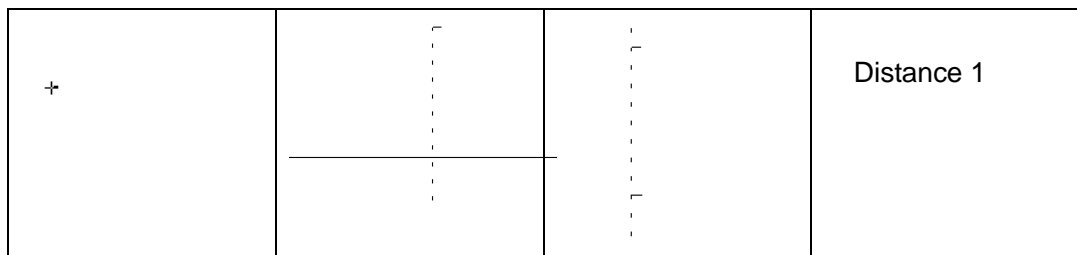
Figure 6-14 Distance Measurement and the Results

Time   To measure time:

1.   Press **Caliper** to activate a measurement cursor "+".

2.   Roll the trackball to highlight **Time** and press **Set**.

3.   Roll the trackball to move the first measurement cursor at the beginning of the time interval and then press **Set**, and the measurement mark turns to a vertical line.

4.   Roll the trackball to move the first measurement cursor at the end of the time

interval and then press **Set**.

5. Roll the trackball and press **Set** to begin a new time measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window, as shown below.

6. Press **Caliper** to finish and exit.

+			Time1
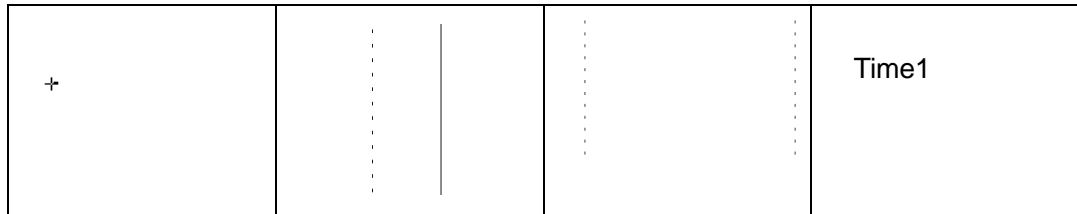
Figure 6-15 Time Measurement

Slope   To measure slope:

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **Slope** and press **Set** and a big "+" is displayed.

3. Roll the trackball and press **Set** to anchor the start point, and displays a big "+".

4. Roll the trackball and press **Set** to anchor the end point.

5. Roll the trackball and press **Set** to begin a new slope measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window, as shown below.

6. Press **Caliper** to finish and exit.

+			Time Distance Slope1
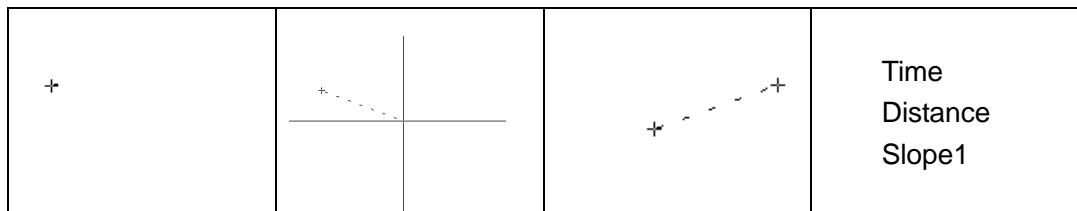
Figure 6-16 Slope Measurement and the Results

Heart Rate To measure heart rate:

1. In the **B+M mode**, roll the trackball to change the position of the M Mark and press **Set** to obtain a satisfying electrocardiogram, and then freeze it.

2. In the **M mode**, freeze the desired image.

Measure the distance between two peaks of cardiac cycles with the time measurement method.

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **Heart Rate** and press **Set** and a "+" is displayed.

3. Roll the trackball to move the first measurement maker on the first peak systole

and then press **Set** to anchor start position, and the measurement mark turns to a vertical line.

4. Roll the trackball to move the second measurement maker on the peak systole following two complete cycles and then press **Set** to anchor end position.

5. Roll the trackball and press **Set** to begin a new heart rate measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

6. Press **Caliper** to finish and exit.
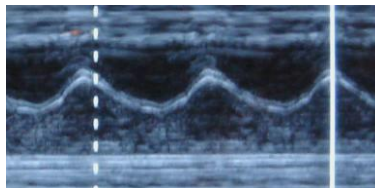
Figure 6-17 Heart Rate Measurement

NOTE:

1. In **B+M mode**, you should define the M Mark position, and then begin the measurement.

2. During heart rate measurement, make sure the start point and end point are exactly in two cardiac cycles. Otherwise, the measurement result will be incorrect.

6.5.3. Generic Measurements in Color/PDI Mode

The generic measurements in Color /PDI mode are the same as those in B Mode

6.5.4. Generic Measurements in D Mode

The measurement menu is shown below.
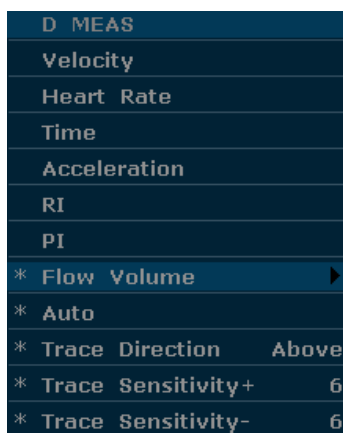
Figure 6-18 PW Mode Generic Measurement and Calculation Menu (In non-cardiac exam)

NOTE:

Heart rate and time measurement methods are the same as those in the M mode.

Reference Section *6.5.2 Generic Measurements in M Mode*.

Velocity To measure velocity of a point on the Doppler wave:

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **Velocity** and press **Set** and a "+" is displayed.

3. Roll the trackball and press **Set** to anchor the point, measuring velocity.

4. Roll the trackball and press **Set** to begin a new velocity measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window, as shown below.

5. Press **Caliper** to finish and exit.

Acceleration To measure velocities of two points on the Doppler wave, and calculate the acceleration:

Acceleration = (Vel1－Vel2) / Interval

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **Acceleration** and press **Set** and a "+" is displayed.

3. Roll the trackball and press **Set** to anchor the first point, measuring **Vel1**.

4. Roll the trackball and press **Set** to anchor the second point, measuring **Vel2** and **Interval**, and calculating **Acceleration**.

5. Roll the trackball and press **Set** to begin a new acceleration measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window, as shown below.

6. Press **Caliper** to finish and exit.

RI

(Resistance

Index)

To measure velocities of two peak points on the Doppler wave, and calculate RI and S/D:

RI =｜PS－ED｜/｜PS｜
PS: Peak systolic velocity
ED: End diastolic velocity

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **RI** and press **Set** and a "+" is displayed.

3. Roll the trackball and press **Set** to anchor the first peak point, measuring **Vel1**.

4. Roll the trackball and press **Set** to anchor the second peak point, measuring **Vel2**, calculating **RI**.

5. Roll the trackball and press **Set** to begin a new RI measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

6. Press **Caliper** to finish and exit.

PI (Pulsatility Index)

To measure velocities and pressure difference of two peak points on the Doppler wave, and calculate Pulsatility Index(PI):

$PI(\text{no unit}) = \mid (PS-ED) / TAMAX \mid$

TAMAX: Time Averaged Maximum Velocity

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **PI** and press **Set** and a "+" is displayed.

3. Roll the trackball and press **Set** to anchor the start point. Roll the trackball to trace along the Doppler wave forward, or press **Back** to erase the trace backward.

4. Press **Set** to anchor the end point; the system displays the results of PS, ED, RI, PI, etc. in measurement result window.

5. Roll the trackball and press **Set** to begin a new PI measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

6. Press **Caliper** to finish and exit.

Flow Volume
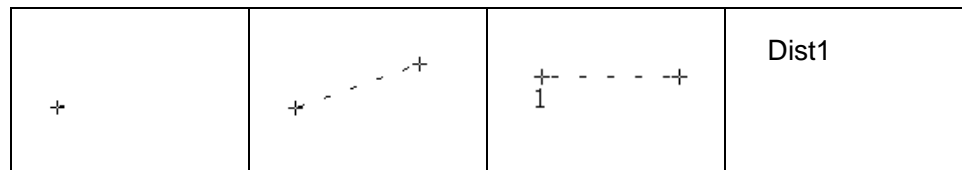
To measure flow volume:

1. Roll the trackball to highlight **Flow Volume**, select **Area** and press **Set**.

2. Roll the trackball and press **Set** to anchor the start point of vascular diameter in B image

3. Press **Set** to anchor the end point of the vascular diameter, the system displays the results.

4. Roll the trackball to highlight **Flow Volume**, select TAMEAN and press Set.

5. Roll the trackball and press **Set** to anchor the start point of TAMEAN in PW image.

6. Press **Set** to anchor the end point of TAMEAN, the system calculate the average flow volume between the two points and displays the results.

Auto

(Auto trace)

The trace in PW mode is shown below:
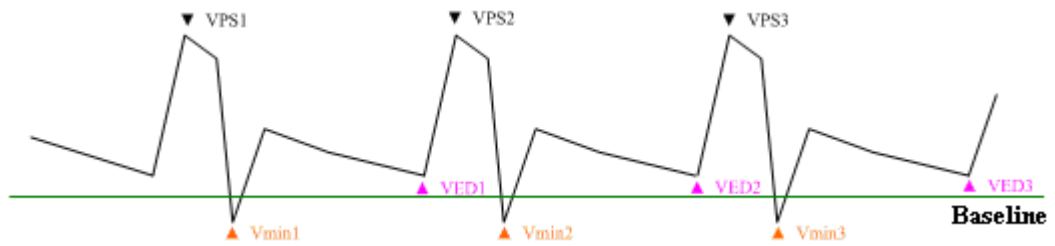
Figure 6-19 Trace Diagram

Where,

➢ VPS is the maximum velocity in the cycle;

➢ VED is the velocity at the end of diastole;

➢ V $_{min}$ is the minimum velocity in the cycle.

NOTE:

Freeze the system before performing the tracing function.

● **To perform Auto Trace function (automatic tracing)**

1. Press **Caliper** to activate a measurement cursor "+". Before tracing, press **Trace Direction** menu control, select **Above/Below/Both** to trace spectrum only above the baseline, or only below the baseline, or both above and below the baseline respectively.

2. Roll the trackball to highlight **Auto** and press **Set**.

3. A big "+" is displayed, roll the trackball and press **Set** to anchor the start point.

4. Roll the trackball press **Set** to anchor the end point, and the system displays the results of PS, ED, RI, PI, etc. in measurement result window.

5. After a trace measurement, press **Trace Sensitivity**+ menu control to increase the identification sensitivity to the spectrum, the bigger the value the higher the sensitivity, and the less spectrum information to be removed, and the higher degree of overlapping between trace line and spectrum. Or press **Trace Sensitivity-** to decrease the sensitivity.

6. Roll the trackball and press **Set** to begin a new tracing measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

7. Press **Caliper** to finish and exit.

6.6. Application Measurements and Calculations

To enter application measurements and calculations menu, select a probe and the examination type and press **Measure**, then you can choose the measurement item you need. Please find more information about application measurements and calculations in _Chapter 7_~_Chapter 14_.

The measurement & calculation items and results for each examination are shown in _Table 6-7_.

Examination	Application measurement & calculation items	Result
Abdomen	B mode: Liver, Portal V.Diam, CBD, Gallbladder, GB wall, Pancreatic, and Spleen.	Abdominal worksheet
Obstetric	B mode: GS, CRL, NT, BPD, HC, AC, FL, AFI, TAD, APAD, CER, FTA, HUM, OFD, THD, FBP, EDC and EFW	Fetus growth analysis curve and standard obstetric worksheet
	PW mode: FHR, Umb A, MCA, Fetal AO, Desc.AO, Placent A, and Ductus V	
	M mode:FHR	
Cardiology	B mode: LV, RV, PA, etc. M mode: LV, Aorta, Mitral Valve, Heart Rate, LVET, LVMW, etc.	Cardiac worksheet
Gynecology	B mode: UT, UT-V, Endo, OV-Vol, FO, CX-L, UT-L/CX-L	Gynecologic worksheet
	PW mode: L UT A, R UT A, L OV A, R OV A	
Small parts	B mode (Thyroid exam): L.THY-V, R.THY-V, Isthmus **NOTE**: Small parts application measurements are available for thyroid exam only; other small parts exams such as Breast/MSK/Testicle/Superficial have generic measurements only.	Thyroid worksheet/ Small Parts worksheet
Urology	B mode: BLV, RUV, Prostate Vol, ADR, KID, COR, and SPSA	Urologic worksheet
Peripheral Vascular	PW mode: CCA, ICA, ECA, Vert A, Upper, Flow Volume and Lower	Vascular worksheet
Pediatrics	B mode: HIP	HIP Worksheet

Table 6-7 Application measurement & calculation Items and Results

The system-defined examinations are abbreviated as follows:

Abd: Abdominal; OB: Obstetrics; Sml: Small Parts; Gyn: Gynecology; PED: Pediatrics

Urol: Urology; Vas: Vascular

After entering the application measurement, the first item of the measurement menu is activated by default. When you have measured the first item, and pressed **Set**, the cursor moves to the next item automatically; you can press **Set** to enter the measurement, or roll the trackball to select other items to measure.

In the application measurement menu, " √ " is displayed before the item that has been measured.

6.7. Worksheet (Report)

The system automatically generates a graph/text worksheet (report) for each exam. The worksheet includes hospital name, patient information, application measurement results, images and doctor diagnosis. To set the hospital name, press **Preset**>**System Preset**.

Press **Report** on the keyboard to open the worksheet after an exam. Here take Abdominal Worksheet as an example, see the figure below:
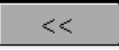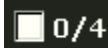
To edit the worksheet:

Move the trackball to the text box and edit the worksheet. Press OK to save.

To add images to the report:

Press **Image** in the worksheet dialog box to add at most four images to the report.

Press [<<] or [>>] button or press the drop-down box on the bottom of the screen to view the images stored in current Storage device, and check the box [☐ 0/4] to select the currently displayed image. The screen will show you how many images have been added, for example, [☐ 2/4] indicates there are two images added. Maximum four images can be added into the report. Press [Exit] to exit image adding.

To print a graph/text report:

Press **Print** in the worksheet after connecting a graph/text printer.

To Save as PDF report:

1. Press **Save PDF** in the worksheet, the system displays **Save PDF report** dialog box;
2. Select the destination drive and folder, or press **New Folder** to create a folder for storing PDF reports, and modify the file name; otherwise, the report will be saved to the default folder with a default file name.
3. Press **OK** to save the PDF report to the designated folder, or press **Esc** to give up.

6.8. Comment Function

The comment library is for positions and anatomical structures.

NOTE:

1. The entered text is in upper case by default.

2. The comments are in different colors under active/inactive status. To preset the comment colors, press **Preset**>**System Preset**.

To add a comment:

➢ **To add a comment by using the keyboard:**

1. Press **Comment**, and there is a cursor "l" displayed in the image area for annotating;

2. Enter text by using the keyboard;

3. Press **Set** or **Enter** to complete the comment.

➢ **To add a comment by using the comment library:**

1. Press **Comment**, and there is a cursor "l" displayed in the image area for annotating;

2. Press **Update,** the system displays the comment library of current exam by default. You can switch to other tabs by moving the trackball and pressing **Set**;

3. Highlight a comment in the comment library, and press **Set** to confirm the choice and complete the comment.

➢ **To add an arrow:**

1. Press **Comment**, and there is a cursor "l" displayed in the image area for annotating;

2. Press **Cursor** to display an arrow;

3. Move the trackball to move the position of the arrow; and the rotation function of Multi-function knob is automatically activated and the rotation light is on. You can rotate this knob to adjust the arrow direction;

4. Press **Set** to set the position of the arrow.

To move a comment:

1. Move the cursor to a comment that needs to be moved, and a rectangle appears around the comment;

2. Press **Set** and move the cursor to a new position;

3. Press **Set** to confirm the new position.

To modify a comment:

1. Move the cursor to a comment that is already added, and a rectangle appears around the comment;

2. Move the cursor to a desired position within the comment, enter text with the keyboard, or press **Update** and select a comment from the comment library; or press **Back** or **DEL** to

delete by character;

3. Press **Set** or **Enter** to confirm the modification.

To delete a comment:

Move the cursor to a comment that is already added, and a rectangle appears around the comment, press **DEL** to delete the comment.

Or, press **Clear** to cancel all of the comments at one time.

The comment library (**Abd** tab) is shown below:

Figure 6-20 System-defined Comment Library

6.9. Body Mark Function

To add a body mark:

1. Press **Body Mark**, the system displays the **Body Mark** dialog box of current exam by default. You can switch to other tabs by moving the trackball and pressing **Set**. The often-used body marks are listed under each tab, and you can press **More** to enter the page of seldom-used body marks, and press **Back** to return to the page of often-used body marks.

2. Highlight a body mark in the **Body Mark** dialog box, and press **Set** to confirm the choice to add the body mark. The selected body marks are displayed in the bottom left corner of the screen.

3. After adding a body mark, use the trackball to move the position of the probe; and the rotation function of Multi-function knob is automatically activated and the rotation light is on; you can rotate this knob to adjust the probe scanning direction.

4. Press **Set** to complete adding the body mark.

NOTE:

In dual or quad split mode, you can add a body mark to the currently active window; if you

press ⬚⬚ or ⬚⬚.to switch to another window, you can also add a body mark to the window.

To move a body mark:

1. Move the cursor to a body mark that needs to be moved, and a rectangle appears around the body mark;

2. Press **Set** and move the cursor to a new position;

3. Press **Set** to confirm the new position.

To delete a body mark:

Press **Clear** to delete all of the body marks at one time.

There are 150 types of body marks, and the **Abd** tab of system body mark library is shown below:

Figure 6-21 System Body Mark Library (Abd tab)

6.10. Zoom

Zoom is used to magnify images for better viewing.

◆ To zoom in real-time/frozen B mode:

In real-time or frozen B mode, press **Multi-function knob** till the zooming light is on, and the system displays a zooming window in the middle of the image; roll the trackball to move the zoom window to the desired area, press **Multi-function knob** again to enter Zoom state, and rotate the zooming adjustment knob to adjust magnification of the zoom window. Press **Set** to display the zoomed image, and then roll the trackball to move the zoomed image. If you press **Set** once again to anchor the image, you can still rotate the zooming adjustment knob to adjust magnification factor of the zoom window. Press **Multi-function knob** again to exit Zoom. In the zoomed B mode status, press **Color** or **PDI** to enter B+Color /PDI mode.

◆ To zoom in real-time 2B mode: Similar to zooming in B mode.

◆ To zoom in real-time B+Color/PDI mode:

After the position of ROI window (region of interest) is set, press **Multi-function knob** to magnify the ROI area; in zoom status, you can rotate the zooming adjustment knob to adjust magnification factor, or roll the trackball to move and adjust the ROI window. Press **Multi-function knob** again to exit Zoom; press **Color** or **PDI** again to exit zoom status and color imaging mode.

◆   To zoom in frozen B+Color/PDI mode:

In the frozen B+Color/PDI mode, press **Multi-function knob** till the zooming light is on, the system displays a zooming window, rotate the zooming adjustment knob to adjust magnification factor, and press **Set** to enter the zoomed status. But in the zoomed B+C status, the ROI cannot be displayed or moved.

◆   The Zoom range is 1.14-4.0 (7 levels)
NOTE:

To zoom an image in each mode, press Multi-function knob till the zooming light is on. Otherwise, the zoom function will not be activated.

6.11. CINE Review

Activate the device and enter the real-time imaging mode. Enable the system to collect images before CINE Review playback. The cine function includes frame-by-frame playback (manual playback) and motion playback (automatic playback). The cine review symbol is displayed on the bottom of the screen, as shown below:
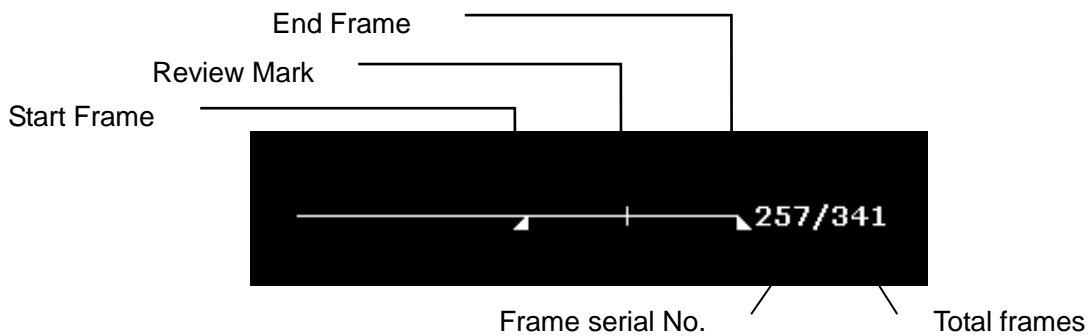
Figure 6-22 CINE Review Progress Bar

To perform the manual playback:

1.   Press **Freeze** to freeze the image, and the system displays the cine menu, as shown below:

Figure 6-23 Cine Review Menu

2.   Roll the trackball to start playing back frame by frame. Roll the trackball to the right to advance the cine data one frame at a time, or to the left to move the data in reverse. The loop of data wraps around when either end is reached. As the trackball moves, the current cine number is displayed on the right of the CINE Review Symbol.

3.   Press **Cine** to exit manual playback mode, or press **Freeze** to exit the CINE Review playback and enter the real-time scanning status.

To perform the automatic playback:

1.   Press **Freeze** to freeze the image, and the system displays the cine menu.

2.   Set the start frame: in manual playback status, roll the trackball to review frame by frame until the frame that you want to set as the start point, press **Start Frame** menu control to set it as the start frame, or rotate the **Start Frame** menu control to select a frame as the start frame.

3.   Set the end frame: in manual playback status, roll the trackball to review frame by frame until the frame that you want to set as the end point, press **End Frame** menu control to set it as the end frame, or rotate the **End Frame** menu control to select a frame as the end frame.

4.   Rotate the **FPS** menu control to adjust the review speed, and press **Play/Stop** menu control to start the automatic playback within the set region (Start frame-end frame).

5.   In automatic playback status, press **Play/Stop** to stop.

6.   Press **Cine** to go back to the manual playback status. Or, press **Freeze** to exit the CINE Review playback and enter real-time scanning status.

In dual or quad split screen status, freeze the image, and press or to toggle between the two or four windows, the CINE Review progress bar corresponds to the currently active image, you can perform manual/auto CINE Review for the currently active image. Only CINE images in the set region of currently active image can be saved.

In dual live mode of B and B+ (Color/PDI), freeze the image, then you can perform CINE Review and Save Cine for both images.

During playing back, press **Save As** to save the file in BMP, JPG, RFM, DCM, CIN or AVI format. You can save files to the local disk or USB disk. Or, press **File**>**Save Cine** to save the cine images of the set region. For details about operation method, please refer to *6.12.1 Saving Files*.

NOTE:

1.   Cine review can't be performed at the beginning of scanning or probe switching. You should wait until 30 seconds later.

2.   The FPS (frames per second) is adjustable, from 5 to 50, in increments of 5.

3.   After opening a cine file, you can perform measurements, add comments and the body mark on the image and print them in the report. See section *6.8 Comment Function* and section *6.9 Body Mark Function* for detailed operation information.

6.12. File Management

Press **File** to display the file menu, as shown below.
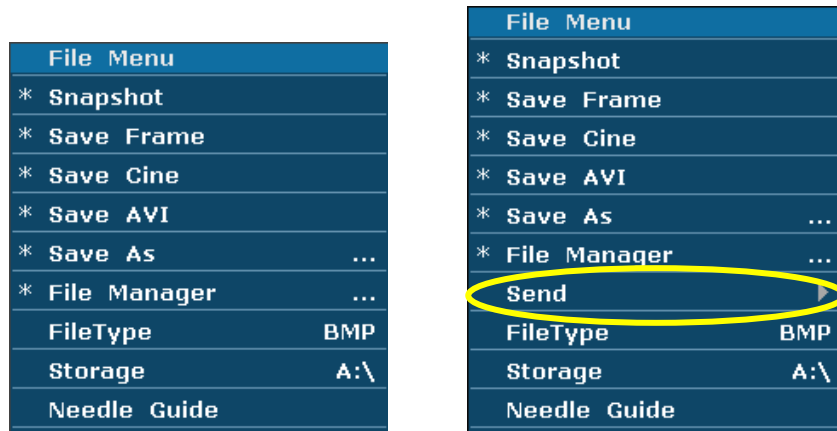
Figure 6-24 File Menu (the left—with no DICOM installed, the right—with DICOM installed)

6.12.1. Saving Files

File types:

The file types include BMP, JPG, DCM (if DICOM is installed) and FRM.

To choose a storage disk:

Highlight **Storage** in the file menu and press **Set** repeatedly to cycle between **Fixed** and USB-Disk (**A:**, **B:**). If no USB-disk is connected, only the **Fixed** storage disk will be available. You can set the default storage disk by using **Preset**>**System Preset**.

NOTE:

1. After connecting a removable disk, the interface displays a USB symbol on the bottom left corner.
2. "Local disk" is the hard disk when the system is intalled with a hard disk.

To set a file type:

The **File Type** in the file menu means the file type for the quick saved images.

To choose a file type for the quick saved images: highlight **File Type** in the file menu and press **Set** repeatedly to cycle between **JPG**, **BMP**, **FRM and DCM** (if DICOM is installed).

To save a file:

The system provides two ways to save images:

◆ Press **SaveImg** on the keyboard;

Press **SaveImg** on the keyboard to save the current displaying image in BMP, JPG, FRM or DCM (if DICOM is installed) format (set by **File Type** in the file menu, as shown above).

◆ Use **Snapshot**, **Save Frame, Save Cine**, **Save AVI**, or **Save As** of the file menu to save files.

➢ **Snapshot**

Highlight **Snapshot** in the file menu and press **Set** to save the current displaying image in BMP, JPG, FRM or DCM (if DICOM is installed) format (set by **File Type** in the file menu, as shown above).

➢ **Save Frame**

1. Press **Freeze** to freeze the system;

2. Play back and find the desired image;

3. Press **File** to open the file menu;

4. Highlight **Save Frame** in the file menu, and press **Set** to save the current displaying image.

➢ **Save Cine**

1. Press **Freeze** to freeze the system;

2. Press **File** to open the file menu;

3. Highlight **Save Cine** in the file menu, and press **Set**.

➢ **Save AVI**

1. Press **Freeze** to freeze the system;

2. Press **File** to open the file menu;

3. Highlight **Save AVI** in the file menu, and press **Set**.

NOTE:

The AVI files can not be viewed on this system; please use a USB disk to copy the AVI files to a PC, and view them by using video players.

➢ **Save As**

When obtaining a satisfying image:

1. Press **File** and select **Save As…**in the file menu to display the **File Save As** dialog box.

2. Select a destination drive from the **Drive** pull-down menu, and a folder from the directory on the left, or press **New Folder** to create a folder for storing files.

3. Press **Set** on the field next to **File Name**, enter a file name with the keyboard.

4. Press **OK** to save, or press **Cancel** to give up.
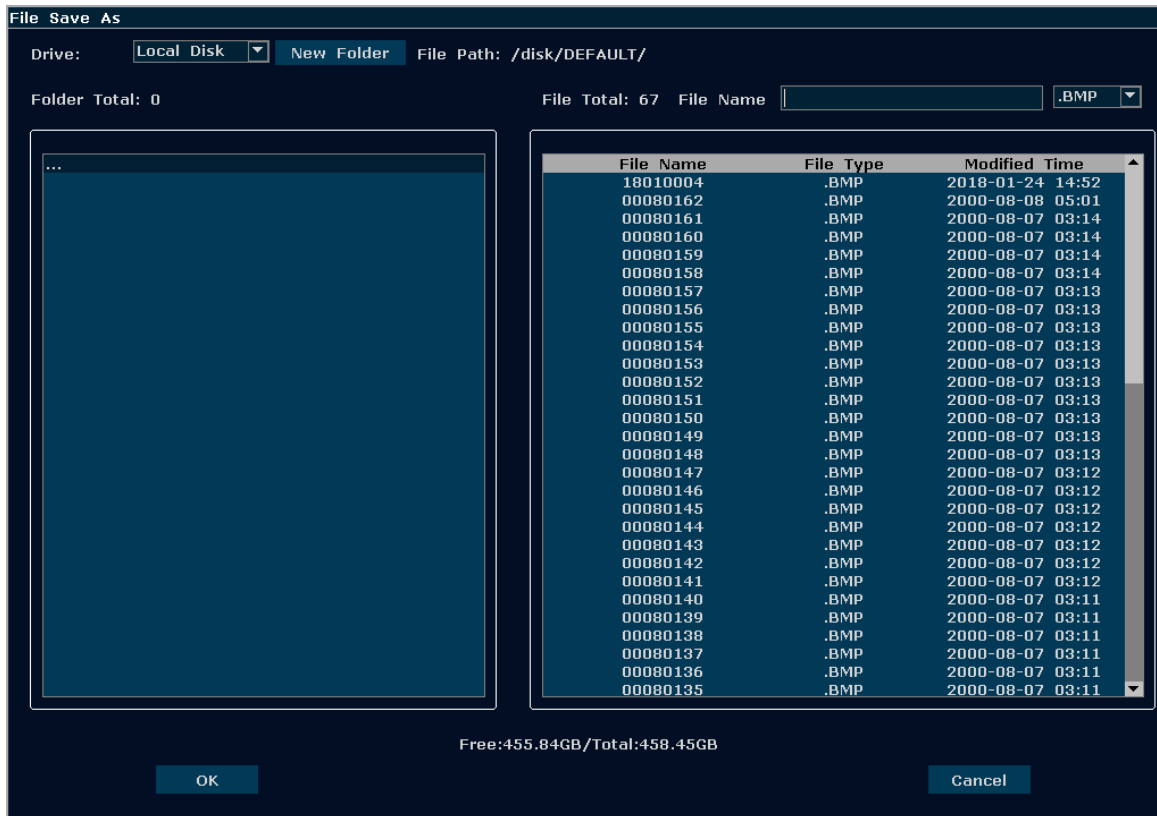
Figure 6-25 File Saving Dialog Box

NOTE:

If you do not enter the name for the file, the system will automatically number the file in sequence. For instance, if the latest number comes to YYMM0020 ("Y" stands for "year", and "M" stands for "month"), and if you save a file the next time, the file is numbered as YYMM0021.

When saving a file, the saving information is automatically displayed in the middle of image area.

6.12.2. File Manager

You can use the file manager to perform the file management or browse the images.

In real-time or frozen status, press **File** to display file menu**,** and select **File Manager,** the **File Manager** dialog box pops up, as shown below.
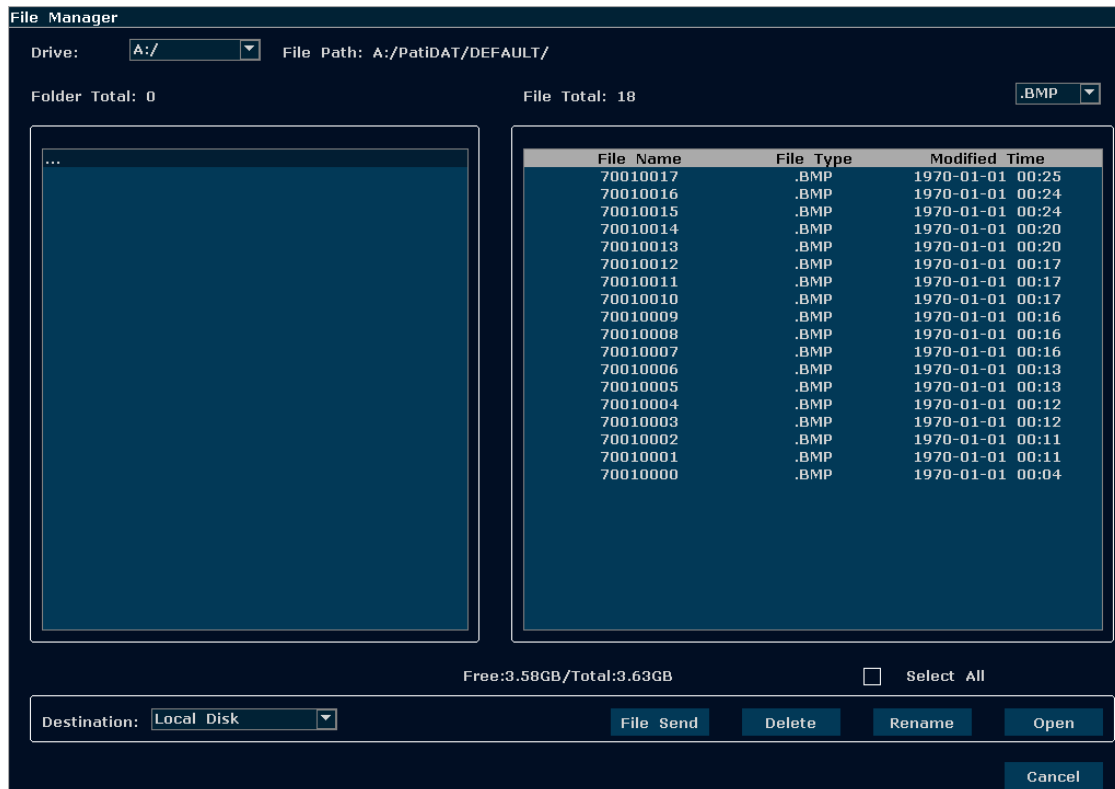
Figure 6-26 File Manager

Basic operations:

◆ Select a file format from the pull-down menu [.BMP ▼], such as BMP/ JPG/ DCM/ FRM/ CIN/ AVI/ PDF to display files in one type, or select *.* to display all files.

◆ Point to a file, press **Set** to select it, and press **Set** again to deselect it; the system supports multi-choice by default; check the **Select All** checkbox to select all files, and then you can perform following operations: **File Send**, **Delete** and **Open**.

◆ Click on the headings of the file list: **File Name**, **File Type** or **Modified Time** to rearrange the file sequence according to the file name, file type or modified time (in ascending/descending order).

NOTE:

1. When you are sending, deleting or renaming a file, do not connect or disconnect the USB disk.

2. USB disk must be in FAT32 format, while hard disk must be in EXT2 format.

3. Do not use the USB disk for other uses, but only for this device. Otherwise, the storage and the transmission function may not be stable.

4. We suggest that you use the USB disk or hard disk supplied or recommended by EDAN.

To send files

1. Press **File,** and select **File Manager** in the file menu.

2. Select a desired drive from the **Drive** pull-down menu and press **Set**, point to the file or folder that need to be sent and press **Set**.

3. Select a destination drive from the **Destination** pull-down menu. The destination drive includes local disk, USB-disk, DVD drive or DICOM server (If DICOM function is installed).

4. If the destination drive is DICOM server, press **File Send** to send the DICOM and CIN files to DICOM server directly.

   If the destination drive is local disk or USB-disk press **File Send** to open the **File Send** dialog box, select a target folder on the left, or press **New Folder** to create a folder for storing files. Press **OK** to send files to the target directory.

   If the destination drive is DVD drive, press **File Send** to burn the selected files to DVD disk directly.

To delete a file folder/file

1. Select a desired drive from the **Drive** pull-down menu and press **Set**.

2. Point to the file folder/file that needs to be deleted, and press **Set**.

3. Press **Delete**, and you will be prompted whether to delete the files.

4. Press **Yes** to delete the files, or **No** to give up.

To rename a file

1. Select a desired drive from the **Drive** pull-down menu and the file format, and then press **Set**.

2. Point to the file that needs to be renamed, and press **Set**.

3. Press **Rename** to open the **Input new name for the file** dialog box, enter a new file name with the keyboard.

4. Press **OK** to rename the file, or **Cancel** to give up.

To open files

1. Select a desired drive from the **Drive** pull-down menu and file format, and then press **Set**.

2. Point to the file that needs to be opened and press **Set**, press **Open** or double click on the file, a prompt *Loading file…* is displayed in the middle of the screen.

3. If the file format is FRM/CIN, cine images will be loaded. You can perform Cine review, measurements, or add comments/body marks and print them out in reports; if the file format is BMP/JPG/DCM, the system will enter image browsing status: check the multi-choice checkbox to browse the selected files in file list, uncheck the checkbox to browse all files.

   Press [<<] to open the previous image, and [>>] to open the next image; press

Play to perform automatic browsing, and press **Stop** to stop automatic browsing; press

Exit or **Esc** to exit.

4.   Press **Open** without selecting any file will open the first file.

NOTE:

1. Images that have not yet been saved in the saving zone can not be loaded.

2. When saving or loading an image is still in process (prompt instruction *Saving file…* or *Loading file…*), please do not perform any other operation. This is to avoid damaging the device.

3. You should freeze the system before opening Cine images.

4. The external DVD drive is connected to the system via an USB cable. The DVD/CD disk should be a new and blank one and it only supports single burning.

5. DVD drive only supports burning. The files burned to DVD/CD disk can not be read on this system.

6.12.3. Sending Files

If you have installed the DICOM software, and the DICOM presetting has been performed correctly, you can send images / files.
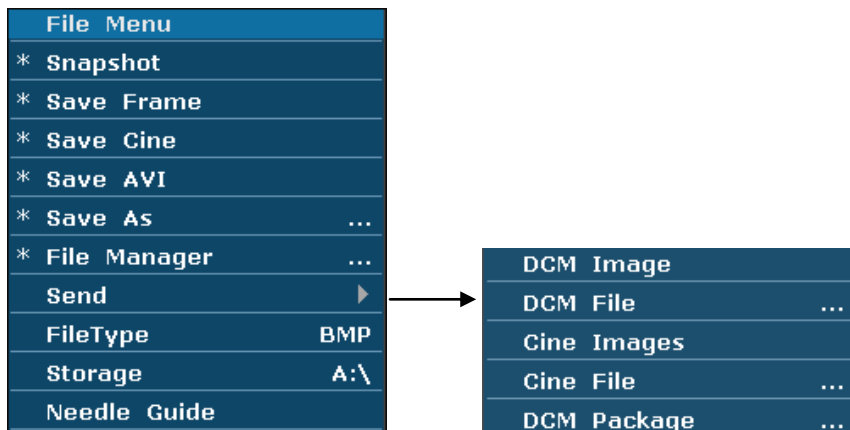
Figure 6-27 File Menu (with DICOM Function)

To send a DCM Image

1. Highlight the submenu **DCM Image**, and then press **Set**.

2. If the server is running normally, the current image will be sent to the server.

3. The system displays a prompt indicating the successful transmission.

To send a DCM file

1. Highlight the submenu **DCM File**, and then press **Set**.

2. The system displays the **File Opening** Dialog Box for selecting a DCM file to be transmitted.

3. If the server is running normally, the selected file will be sent to the server.

4. The system displays a prompt indicating the successful transmission.

To send a DCM package

1. Highlight the submenu **DCM package**, and then press **Set**.

2. The system displays the **File Opening** Dialog Box for selecting the drive: local disk or USB disk.

3. If the server is running normally, all the DCM files of the selected drive will be sent to the server.

4. The progress bar disappears after successful transmission.

To send Cine Images

1. Freeze the system.

2. Press **File** to enter the file menu.

3. Highlight the submenu **Cine Images**, and then press **Set**.

4. If the server is running normally, the current Cine images will be sent to the server.

5. The progress bar disappears after successful transmission.

To send a Cine File

1. Highlight the submenu **Cine File**, and then press **Set**.

2. The system displays the **File Openin**g Dialog Box for selecting a cine file to be transmitted.

3. If the server is running normally, the selected file will be sent to the server.

4. The progress bar disappears after successful transmission.

CAUTION

1. When the file transmission to DICOM server fails the system will display the prompt message"Fail to transmit!". In this case, it is recommnend to check the network connection and do the transmission manually again.

6.13. Needle Guide Function

NOTE: Use proper disinfection technique at all times to perform a biopsy.

Always follow these basic precautions:

<table>
<tr><td align="center"><u>WARNING</u></td></tr>
</table>

1. Sterilize the needle guide before the first use and after each subsequent use.

2. Always handle transducers and needle guide adaptors with care. Do not use a transducer or an adaptor if it has been dropped or struck against a hard surface until it is inspected by an EDAN customer engineer.

3. The displayed needle guide pathway on the EDAN video monitor is intended for reference during biopsy procedures. A variety of factors outside EDAN's control, such as changing tissue density, bending of the needle, off-axis pressure by the person holding the transducer, may cause deflection of a needle outside of the displayed video pathway even when the transducer, needle guide, and the system software are all performing as intended and within manufacturing specification. The specialist performing a biopsy procedure must be aware of potential external factors when executing an invasive procedure.

4. The caliper must be placed along the needle path. If not, the displayed measurements may be incorrect.

5. EDAN needle guides are designed and manufactured to attach firmly to designated transducers and should not require excessive force to assemble or disassemble. If it appears that excessive force or manipulation is required to assemble or disassemble needle guide components, please contact your EDAN customer engineer before using it.

6.13.1. Installing Needle Guide Bracket

<table>
<tr><td align="center"><u>WARNING</u></td></tr>
</table>

1. For illustration purpose only, transducer and bracket may be shown without a protective sheath. Always place a protective sheath on transducer and bracket to protect cross infection.

■ **BGK-C5-2/BGK-R15UB/BGK-R50UB/BGK-R20UB/BGK-R10UB/BGK-L50UB/BGK-L40UB**

The installation steps for these brackets are the same. Here we take one bracket for illustration.

Structures:
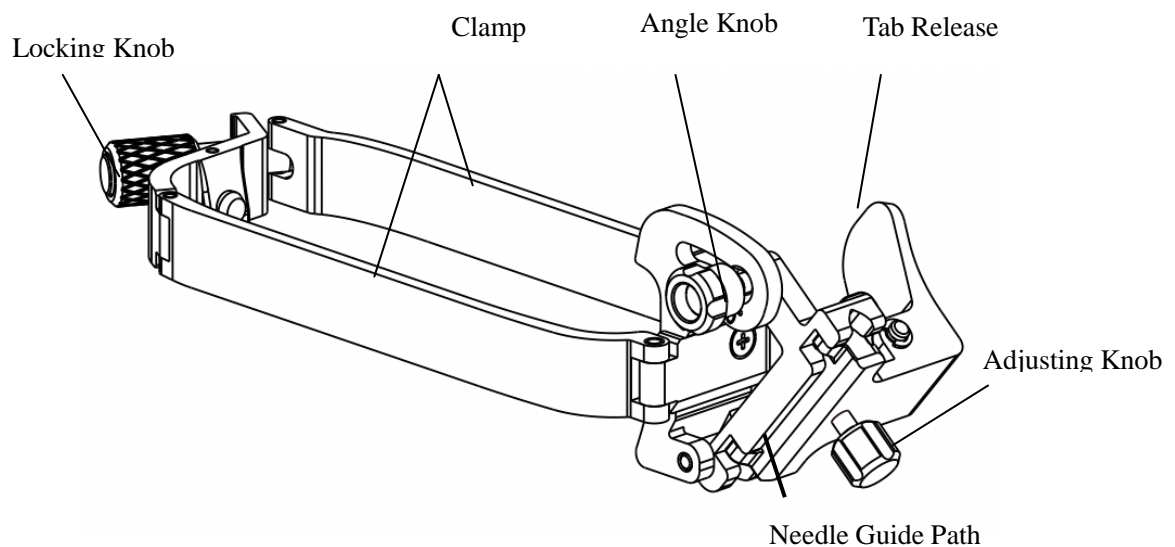
Installation and Use Steps:

1. Place an appropriate amount of gel on transducer surface, and insert transducer into the sheath.

2. Loosen the locking knob to open the clamp of bracket. Attach the bracket to the transducer by aligning the locating markers on the bracket and the transducer. Properly secure the clamp of bracket with the locking knob. Ensure the backet is firmly attached.
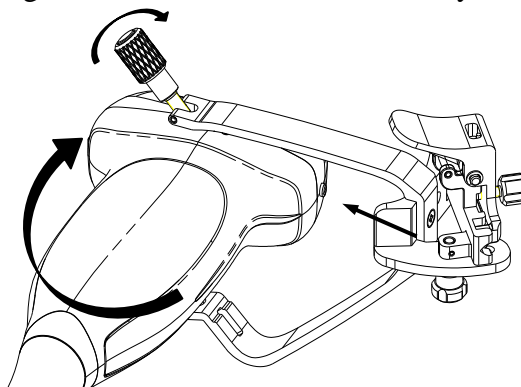
3. Secure the angle knob.

4. Press the tab release and place the biopsy needle into the needle guide path. Use the adjusting knob to properly secure the needle.
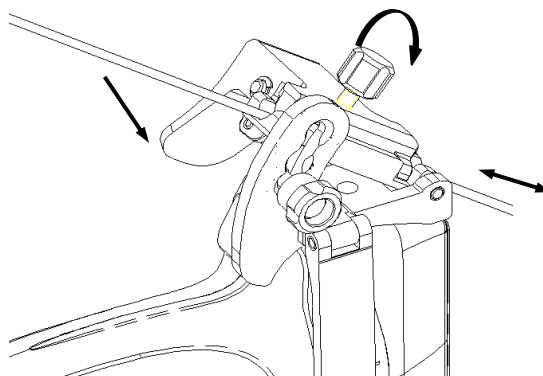
5. After biopsy, press the tab release to remove the needle, and loosen the locking knob to remove the bracket from the transducer.
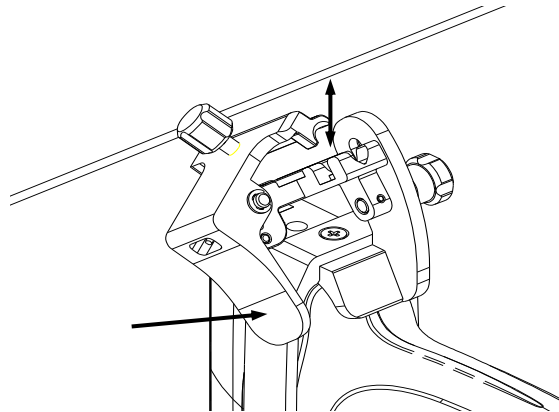
■   **BGK-CR10UA**

Structures:
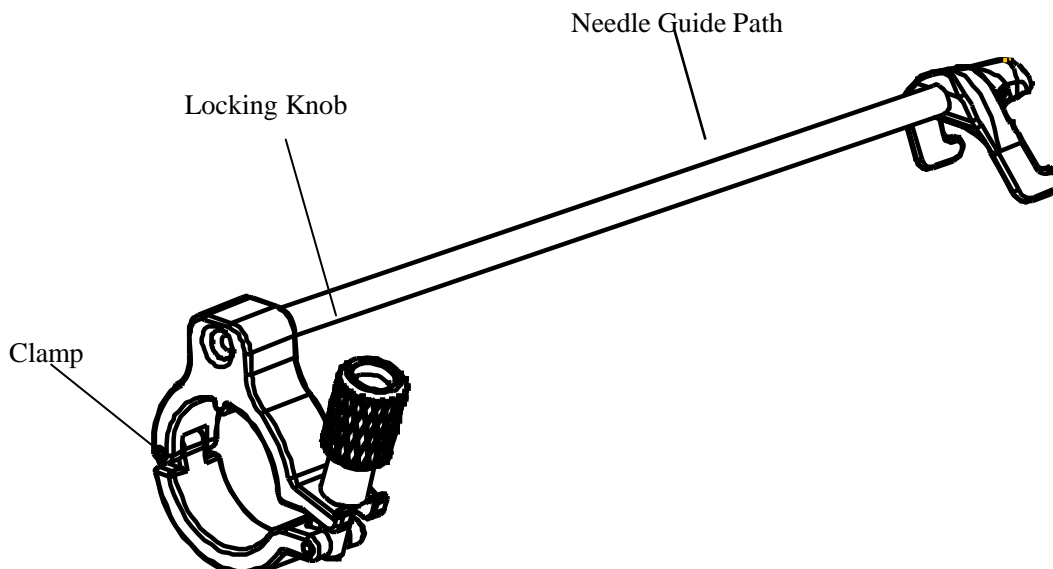
Installation and Use Steps:

1. Place an appropriate amount of gel on transducer surface, and insert transducer into the sheath.

2. Loosen the locking knob to open the clamp of bracket. Attach the bracket to the transducer by aligning the locating markers on the bracket and the transducer.
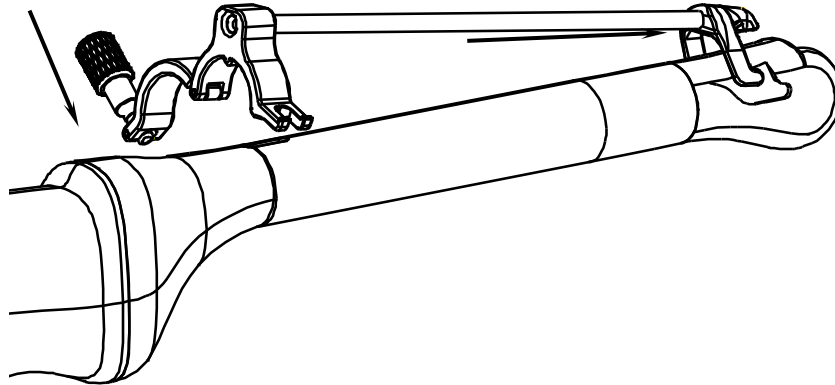
3. Properly secure the clamp of bracket with the locking knob. Ensure the backet is firmly attached, and then place the biopsy needle into the needle guide path.
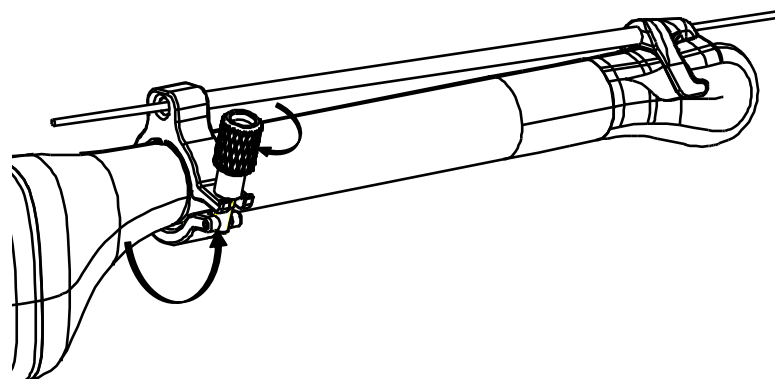
6.13.2. Activating Needle Guide Function

To enable the needle guide function:

1. In the real-time or measurement state of B mode imaging, press **File** on the keyboard, highlight **Needle Guide** and then press the **Set** to activate Needle Guide function.

   Or, press **Preset**>**System Preset**, and set one of the user–defined keys (**F1/F2/F3/F4**) as the Needle Guide key. In the real-time or measurement state of B mode imaging, press user defined keys **F1/F2/F3/F4** to activate Needle Guide function.

2. Prompt information "**Please calibrate the needle guide line before each puncture!"** is displayed on the screen. Press **OK** and enter the needle guide function and a needle guide menu is displayed, as shown below.

Figure 6-28 Needle Guide Menu

WARNING

DO NOT freeze the system when doing puncture.

6.13.3. To Select the Angle of Needle Guide Line

If the puncture frame has several kinds of angle, you can highlight **Guide Line** in the needle guide menu and press the **Set** to make a choice, and the system displays the angle.

6.13.4. To Display or To Hide the Needle Guide Line

Highlight **Display** in the needle guide menu, and press the **Set** key repeatedly to display or to hide the needle guide line.

6.13.5. To Adjust the Needle Guide Line

Needle guide line has been verified when the device is produced. The value is saved in Factory data. But after a period of use, the needle guide line needs to be adjusted since the real value may be changed.

WARNING

1. Prior to each puncture, calibrate the needle guide line.

2. If the needle position is not the same as the needle guide line position, do not do the puncture.

To calibrate the guide line (performing phantom cal):

1. Put the assembled puncture kit, put the probe into water phantom, and perform the water scan;

2. Adjust the position and angle of needle to comply with the guide line as shown below;

3. Select **Verify** to save the verified value.

◆   To verify the needle guide line:

Move the needle guide line horizontally

Highlight **Position**, and press the **Set** key to increase the value, or rotate the **Position** menu control to increase or decrease the value, and the value is displayed in the menu option.

◆   To adjust the angel of needle guide line:

Enter **Angle** option to adjust the angle. Operation procedure is the same as that of the **Position**.

◆   To save the verified value:

After verifying the position and the angle, highlight **Verify** and press the **Set** key, and the system saves the verified value. After restarting the system, the verified value is activated.

◆ To save the factory data:

Highlight **Factory Defaults** and press the **Set** key to load the factory data.

6.13.6. Performing Puncture Function

To perform puncture:
1. The needle guide line is displayed on the image of the ultrasound system, and the numbers on the right of the menu stand for the situation of puncture;
2. Align the needle guide line with the target;
3. Get the sample of the target;
4. Move the probe away from the patient carefully.

6.13.7. Center Line

The Center Line is a vertical dotted line displayed at the middle of the image field, representing the middle of ultrasound beam. The Center Line helps to locate the position and depth of a target disease focus .

To use Center Line:

1. Select **Center Line** from B-mode menu to activate Center Line.

2. A dotted center line is displayed vertically at the middle of the image field. The position and direction of the center line cannot be changed.

3. Move the transducer to locate the target.

4. Use the image depth scale at the left side of the image area to obtain the depth of the target:

Note:

Center Line is not available on Endocavity transducer E612UB and phased array transducer P5-1b.

Chapter 7 Abdominal Measurements & Calculations

7.1. Measurements and Calculations

The abdominal examination is usually performed in the B mode.

1. Press **Probe**, select the desired probe model and the exam mode **Abdomen/ Abd Difficult/ Aorta**, and then press **OK**, or double click on the exam type.

2. Press **B** to enter the B mode.

3. Press **Measure** to activate the application measurement function. The measurement menu is displayed.
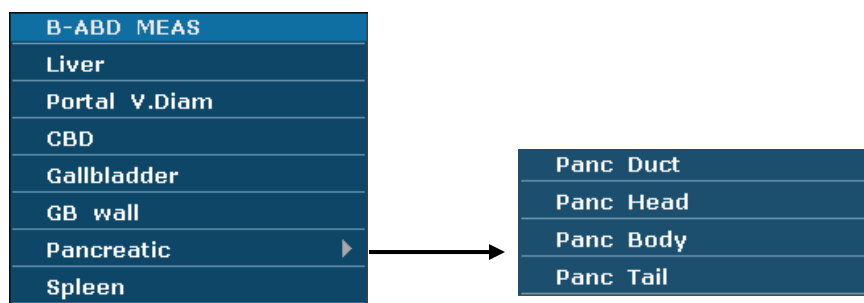
Figure 7-1 Abdominal Measurement and Calculation Menu

Items of Measurement and Calculation
Liver, Portal V. Diam, CBD, Gallbladder, GB wall, Pancreatic, Spleen

7.1.1. Liver

1. In the abdominal measurement menu, roll the trackball to highlight **Liver/Portal V. Diam**, press **Set**.

2. Measure three pieces of data: LIVER-L, LIVER-W, LIVER-H, or portal V. Diam by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the measurement, the result of Liver will be displayed in the measurement result window.

7.1.2. Gallbladder

1. In the abdominal measurement menu, roll the trackball to highlight **CBD/ Gallbladder/ GB wall**, press **Set**.

2. Measure CBD, or GB-L, GB-W and GB-H, or GB wall by the method of distance

measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the measurement, the result of gallbladder will be displayed in the measurement result window.

7.1.3. Pancreatic

1. In the abdominal measurement menu, roll the trackball to highlight **Pancreatic**, select **Panc Duct/ Panc Head/ Panc Body/ Panc Tail** from the submenu**,** and then press **Set**.

2. Measure Panc Duct/Panc Head/Panc Body/Panc Tail by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the measurement, the result of pancreatic will be displayed in the measurement result window.

7.1.4. Spleen

1. In the abdominal measurement menu, roll the trackball to highlight **Spleen**, press **Set**.

2. Measure three pieces of data: SPLEEN-L, SPLEEN-W, and SPLEEN-H, by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the three measurements, the result of spleen will be displayed in the measurement result window.

7.2. Abdominal Report

After the abdominal examination, the system generates an abdominal worksheet.

1. Select the desired probe model and the exam mode **Abdomen/ Abd Difficult/ Aorta**.

2. In B mode, after application measurements press **Report** to open **Abdominal worksheet**, as shown below:

Figure 7-2 Abdominal Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

For specific operations of editing or printing the report, please refer to Section 6.7 Worksheet(Report).

Chapter 8 Obstetric Measurements and Calculations

The obstetric examination is usually performed in the B mode, PW mode, and M mode.

8.1. Obstetric Measurements and Calculations in B Mode

To enter B mode obstetric examination:

1. Press **Probe**, select the desired probe model and the exam mode **Obstetric-1/3, Obstetric-2/3,** or **Fetal Cardiac**, and then press **OK,** or double click on the exam type.
2. Press **B** to enter B mode.
3. Press **Measure** to activate the application measurement function. The system displays the measurement menu, as shown in *Figure 8-1*.

Items of Measurement and Calculation:

B-OB MEAS: GS, CRL, NT, BPD, HC, AC, FL, AFI, EFW, TAD, APAD, HUM, CER, FTA, OFD, THD and FBP.
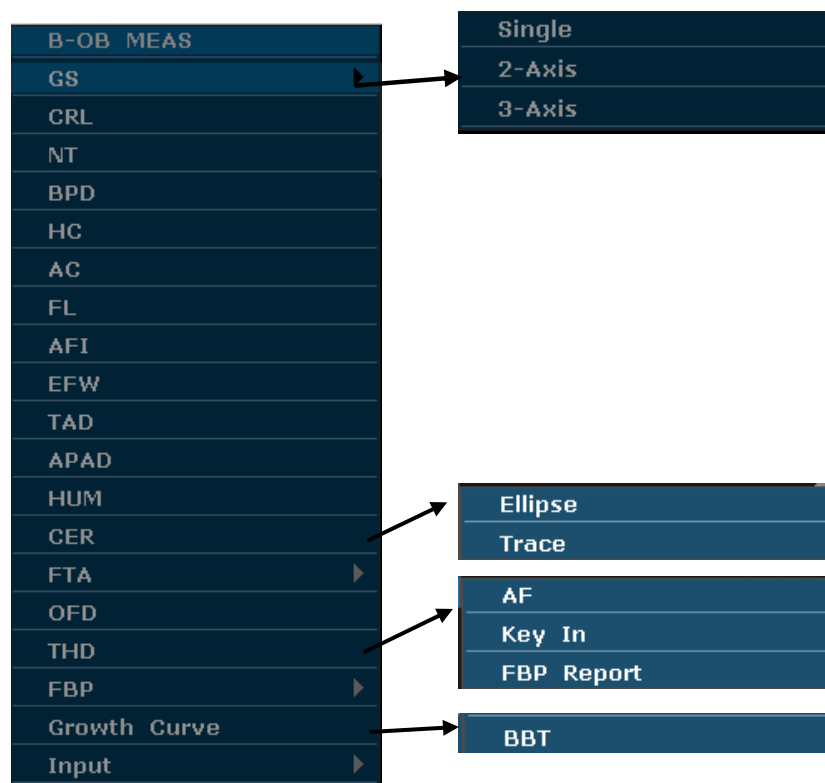
Figure 8-1 Obstetric Measurement and Calculation Menu in B mode

Items of input: BBT

Fetus growth is usually measured by the following parameters.

Abbreviations:

◆ EDC: Estimated Date of Confinement

◆ MA: Menstrual Age

◆ BBT: Basal Body Temperature

◆ EFW: Estimated Fetal Weight

B-OB MEAS 1:

Label	Description	Channel	Method	Results display
GS	Gestational Sac Diameter	1	Single Axis, 2-Axis, 3-Axis	The measurement results will be displayed in the result window.
CRL	Crown Rump Length	1	Distance (mm)	
NT	Nuchal Translucency	1		
BPD	Biparietal Diameter	1		
HC	Head Circumference	1	Ellipse (mm)	
AC	Abdominal Circumference	1		
FL	Femur Length	1	Distance (mm)	
AFI	Amniotic Fluid Index	1	Calculating AFI requires 4 sets of distance measurement data, AF1, AF2, AF3, and AF4.	
EFW	Estimated Fetal Weight	1	According to the selected formula, described as follows. (g or kg)	

Table 8-1 Obstetric Measurements 1 in B Mode

B-OB MEAS 2:

Label	Description	Channel	Method	Results display
TAD	Transverse Abdominal Diameter	1	Distance (mm)	The measurement results will be displayed in the result window.
APAD	Antero Posterior Diameter of the Abdomen	1		
CER	Cerebellum Diameter	1		
FTA	Fetus Trunk cross section Area	1	Ellipse or Trace Area $(mm^2$ or $dm^2)$	
HUM	Humerus Length	1	Distance (mm)	
OFD	Occipital Frontal Diameter	1		
THD	Thorax Diameter	1		

Table 8-2 Obstetric Measurements 2 in B Mode

The system will calculate MA and AVE EDC automatically after measuring each parameter.

8.1.1. GS

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **GS**, Select **Single**, **2-Axis** or **3-Axis,** press **Set**, and move the cursor to image and display "+". For **2-Axis** and **3-Axis**, it is required to measure the length of two and three axis of GS respectively, and the MA and EDD are calculated from average GS measurement results.

2. Measure GS by the method of distance measurement.

        Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new GS measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.2. CRL

To measure CRL:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **CRL**, press **Set**, and move the cursor to image and display "+".

2. Measure CRL by the method of distance measurement.

        Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new CRL measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.3. NT

To measure NT:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **NT**, press **Set**, and move the cursor to image and display "+".

2. Measure NT by the method of distance measurement.

        Reference   Section *6.5.1Generic Measurents in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new NT measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.4. BPD

To measure BPD:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **BPD**, press **Set**, and move the cursor to image and display "+".

2. Measure BPD by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new BPD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.5. HC

To measure HC:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **HC**, press **Set**, and move the cursor to image and display "+".

2. Measure HC by the method of ellipse circumference/area measurement.

Reference   Section *6.5.1 Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new HC measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.6. AC

To measure AC:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **AC**, press **Set**, and move the cursor to image and display "+".

2. Measure AC by the method of ellipse circumference/area measurement.

Reference   Section *6.5.1 Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new AC measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.7. FL

To measure FL:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **FL**, press **Set**, and move the cursor to image and display "+".

2. Measure FL by the method of distance measurement.

 Reference   Section *6.5.1 Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new FL measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.8. AFI

To measure AFI:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **AFI**, press **Set**, and move the cursor to image and display "+".

2. Measure four groups of AF by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results, AF1, AF2, AF3, AF4, and AFI are displayed in measurement result window.

4. To begin a new AFI measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.9. TAD

To measure TAD:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **TAD**, press **Set**, and move the cursor to image and display "+".

2. Measure TAD by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new TAD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.10. APAD

To measure APAD:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **APAD**, press **Set**, and move the cursor to image and display "+".

2. Measure APAD by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new APAD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.11. HUM

To measure HUM:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **HUM**, press **Set**, and move the cursor to image and display "+".

2. Measure HUM by the method of distance measurement.

Reference   Section *6.5.1 Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new HUM measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.12. CER

To measure CER:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **CER**, press **Set**, and move the cursor to image and display "+".

2. Measure CER by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new CER measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.13. FTA

To measure FTA:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **FTA**, press **Set**, and move the cursor to image and display "+".

2. Measure FTA by the method of ellipse or trace area measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new FTA measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.14. OFD

To measure OFD:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **OFD**, press **Set**, and move the cursor to image and display "+".

2. Measure OFD by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new OFD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.15. THD

To measure THD:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **THD**, press

Set, and move the cursor to image and display "+".

2. Measure THD by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in measurement result window.

4. To begin a new THD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.1.16. FBP

To measure AF:

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **FBP**, select **AF** and press **Set**.

2. Measure AF by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results are displayed in Measured Results window.

4. To begin a new AF measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

Fetal Biophysical Profile

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **FBP**, select **Key In** and press **Set**.

2. The Fetal Biophysical Profile window displays as the following figure shows. Select the parameters from the pull-down menu of FHR, FM, FBM, FT and PL, and then press **OK** to confirm, the biophysical evaluation result will be displayed in the FBP Report.

FBP Report

1. In the B-Obstetric measurement menu, roll the trackball to highlight the menu **FBP**, select **FBP Report** and press **Set** to get the FBP report window.

2. Press **Cancel** to exit.

NOTE: To get the Total result in the FBP report, you have to measure the AF and input the fetal biophysical profile and save them.

8.1.17. EDC Calculation

EDC Calculation by BBT

To calculate EDC according to BBT:

1. In the B-Obstetric measurement menu, roll the trackball to highlight **Input**, and the system will display the submenu automatically.

2. Select **BBT** in the list of input items and press **Set**, and the **BBT input** dialog box will be displayed.

Figure 8-2 BBT Input Dialog Box

3. Enter the BBT in YYYYMMDD ("Y" stands for "year", "M" stands for "month", and "D" stands for "day") format with the keyboard.

4. Select **OK** and press **Set** to do the calculation automatically, or **Cancel** to give up the calculation.

NOTE:

1. For EDC calculation, make sure that the system date is correct. The standard pregnancy period in the system can be set to 40 or 41 weeks. For the BBT method calculation, if the interval between the input date and the current system date exceeds 286 days, the system will not accept it.

2. The date format of EDC here accords with what you have set in the General Preset window.

8.1.18. EFW Calculation

This system can calculate EFW according to the measured data corresponding to different formulas.

Select a Formula in Preset

This system provides eleven types of EFW formula, as shown below.

Options	Formula	
Tokyo	$EFW = 1.07* (BPD^3)+3.42*APTD*TTD*FL$ EFW: g; Others: cm	
Osaka	$EFW = 1.25674* (BPD^3)+3.50665*FTA*FL+6.3$ EFW: g; FTA: cm^2; Others: cm	
HADLOCK1	$EFW = 10^{\{1.304+ (0.05281*AC)+ (0.1938*FL)- (0.004*FL*AC)\}}$	EFW: g; Others: cm
HADLOCK2	$EFW = 10^{\{1.335- (0.0034*AC*FL)+ (0.0316*BPD)+ (0.0457*AC) + (0.1623*FL) \}}$	EFW: g; Others: cm
HADLOCK3	$EFW = 10^{\{1.326- (0.00326*AC*FL)+ (0.0107*HC)+ (0.0438*AC) + (0.158*FL) \}}$	EFW: g; Others: cm
HADLOCK4	$EFW = 10^{\{1.3596- (0.00386*AC*FL)+ (0.0064*HC)+ (0.00061*BPD*AC) + (0.0424*AC)+ (0.174*FL) \}}$	
Shepard	$EFW = 10^{\{-1.7492+ (0.166*BPD)+ (0.046*AC) - (2.646*AC*BPD/1000)\}}$ EFW: kg; Others: cm	
Merz1	$EFW = (-3200.40479+ (157.07186*AC)+\{15.90391* (BPD^2)\}$	EFW: g; Others: cm
Merz2	$EFW = 0.1* (AC^3)\}$	EFW: g; Others: cm
Hansmann	$EFW = (-1.05775*BPD+0.0930707* (BPD^2) + \{0.649145*THD) - 0.020562* (THD^2) +0.515263$	EFW: kg; Others: cm
Campbell	$EFW = EXP\{-4.564+ (0.282*AC)-[0.00331* (AC^2)]\}$	

Table 8-3 Obstetric Calculation Formula

Measurement

Measurement items vary with formulas. So you should perform the measurement items according to the preset formula.

Take Osaka formula, for instance, to calculate EFW:

$$EFW = 1.25674* (\textbf{BPD}^3) + 3.50665*\textbf{FTA}*\textbf{FL}+6.3$$

1. In the obstetric menu, roll the trackball to highlight **EFW**, and then press **Set**.

2. Use the distance measurement method to measure **BPD**.

3. Use the ellipse method to measure **FTA**.

4. Use the distance measurement method to measure **FL**, and the result of EFW will be displayed in the measurement result window.

8.2. Obstetric Measurements and Calculations in PW mode

1. Press **Probe**, select the desired probe model and the exam mode **Obstetric-1/3, Obstetric-2/3,** or **Fetal Cardiac**, and then press **OK,** or double click on the exam type.

2. Press **PW** to display the sample line, and press this key again to enter the PW mode.

3. Press **Measure** to activate the application measurement function. The system displays the measurement menu, as shown below.

Items of Measurement and Calculation

FHR, Umb A, MCA, Fetal AO, Desc.AO, Placent A, and Ductus V.

Submenu of the obstetric measurement items in the PW mode:

Figure 8-3 Obstetric Measurement and Calculation Menu in PW mode

Label	Description	Channel	Method
FHR	Fetal Heart Rate	1	D trace
Umb A	Umbilical Artery	1	
MCA	Middle Cerebral Artery	1	
Fetal AO	Fetal Aorta	1	
Desc.AO	Descending Aorta	1	
Placent A	Placent Aorta	1	

Ductus V:	Ductus Venosus	1	

Table 8-4 Obstetric Measurements in PW Mode

8.2.1. FHR

To measure FHR:

1. In the PW-Obstetric measurement menu, select **FHR**.
2. Measure **FHR** by the method of heart rate measurement.

Reference   Section *6.5.2 Generic Measurements in M Mode*.

3. The results are displayed in measurement result window.
4. To begin a new **FHR** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.2.2. Umb A

To measure Umb A:

1. In the PW-Obstetric measurement menu, select **Umb A**.
2. Measure **Umb A** by the method of D trace measurement.

Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.
4. To begin a new **Umb A** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.2.3. MCA

To measure MCA :

1. In the PW-Obstetric measurement menu, select **MCA**.

2. Measure **MCA** by the method of D trace measurement.

Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **MCA** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.2.4. Fetal AO

To measure Fetal AO:

1. In the PW-Obstetric measurement menu, select **Fetal AO**.

2. Measure **Fetal AO** by the method of D trace measurement.

 Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **Fetal AO** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.2.5. Desc.AO

To measure Desc. AO:

1. In the PW-Obstetric measurement menu, select **Desc. AO**.

2. Measure **Desc. AO** by the method of D trace measurement.

 Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **Desc. AO** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.2.6. Placent A

To measure Placent A:

1. In the PW-Obstetric measurement menu, select **Placent A**.

2. Measure **Placent A** by the method of D trace measurement.

 Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **Placent A** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.2.7. Ductus V

To measure Ductus V:

1. In the PW-Obstetric measurement menu, select **Ductus V**.

2. Measure **Ductus V** by the method of D trace measurement.

![book icon] Reference　Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **Ductus V** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.3.　Obstetric Measurements and Calculations in M mode

1. Press **Probe**, select the desired probe model and the exam mode **Obstetric-1/3, Obstetric-2/3,** or **Fetal Cardiac**, and then press **OK,** or double click on the exam type.

2. Press **M** to enter B+M mode**,** or press **M** again to enter single M mode.

3. Press **Measure** to activate the application measurement function. The system displays the measurement menu, as shown below.

M-OB MEAS
FHR
Time
Slope
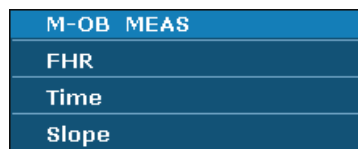
Figure 8-4 Obstetric Measurement and Calculation Menu in M mode

Items of Measurement and Calculation: FHR

To measure FHR:

1. In the M-Obstetric measurement menu, select **FHR**.

2. Measure **FHR** by the method of heart rate measurement.

![book icon] Reference　Section *6.5.2 Generic Measurements in M Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **FHR** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

8.4.　Results

Obstetric results include **Growth Curve** and **OB Worksheet**.

8.4.1. Growth Curve

You can define the fetus growth by comparing the measured parameter value with the fetus growth curve.

Operation procedure:

1. Measure one or more fetus growth parameters (GS, CRL, BPD, FL, AC, HC, CER, FTA, HUM, or THD).

2. Enter BBT.

3. In the B-obstetric menu, roll the trackball to highlight **Growth Curve** and press **Set**, and the **fetal growth analysis** dialog box will be displayed in the middle of the screen.

4. The default tab is GS and the formula of the current growth curve. Move the cursor to another formula in the pull-down menu, and press **Set** to display the normal growth curve based on the selected formula, which can define how the fetus grows.

5. Move the cursor to another tab in the pull-down menu, and press **Set** to display the growth curve of another measurement item and the phase of the growth corresponding to the measured data.

The signification of the growth curves is shown below and the x-coordinate shows the phase of the growth corresponding to the entered BBT, and the y-coordinate shows the measured data.

Move the cursor to **Close**, and press **Set** to exit.
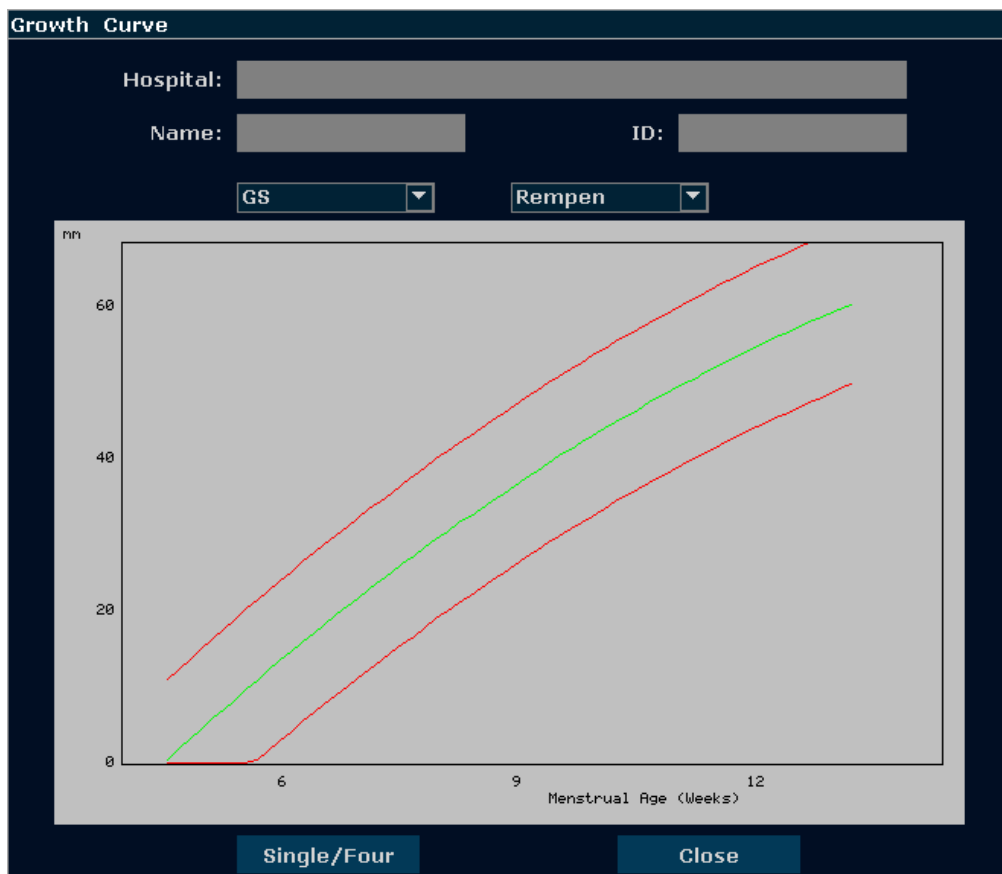
Figure 8-5 Fetal Growth Curve (Single)
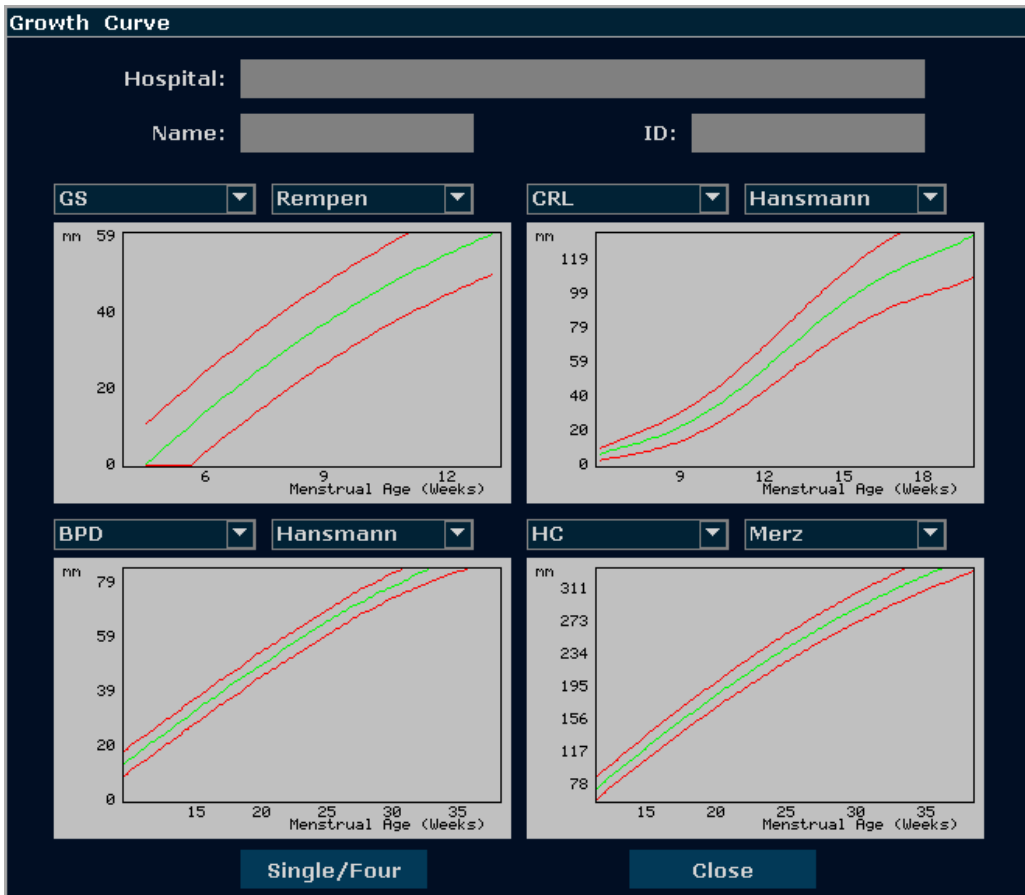
Figure 8-6 Fetal Growth Curve (Four)

NOTE:

Press **Single/Four** to display single growth graphics or four growth graphics.

8.4.2. Obstetric Report

After obstetric examination, the system will generate an obstetrical diagnosis worksheet automatically.

1. Select the desired probe model and the exam mode **Obstetric-1/3, Obstetric-2/3,** or **Fetal Cardiac**.

2. In B/PW/M mode, after application measurements press **Report** to open **Obstetric worksheet**.

Figure 8-7 Obstetric Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

NOTE:

1. The system will display the completed measurements and calculations; the uncompleted measurements and calculations will not be displayed.

2. You can check the measured items by opening the **Obstetric worksheet** dialog box whenever you want, during measurement or after that. Then press **OK** or **Cancel** to close the dialog box, and continue to measure.

For specific operations of editing or printing the report, please refer to Section 6.7 Worksheet(Report).

Chapter 9 Cardiac Measurements and Calculations

The cardiac examination is usually performed in the B mode, B+M mode or PW mode.

Press **Probe**, select the desired probe model and the exam mode **Adult Cardiac/ Pedia Cardiac**, and then press **OK**, or double click on the exam type.

The result of ventricle volume measurement is more exact in two-dimension. You can get the two-dimension heart image of end diastolic and end systolic exactly and conveniently in the B+M mode. So we suggest that you do the cardiac measurement and calculation in the B+M mode.

9.1. Cardiac Measurements and Calculations in M Mode

Press **M** to enter B+M mode**,** or press **M** again to enter single M mode. Press **Measure** to activate the application measurement function. The system displays the measurement menu, as shown below.
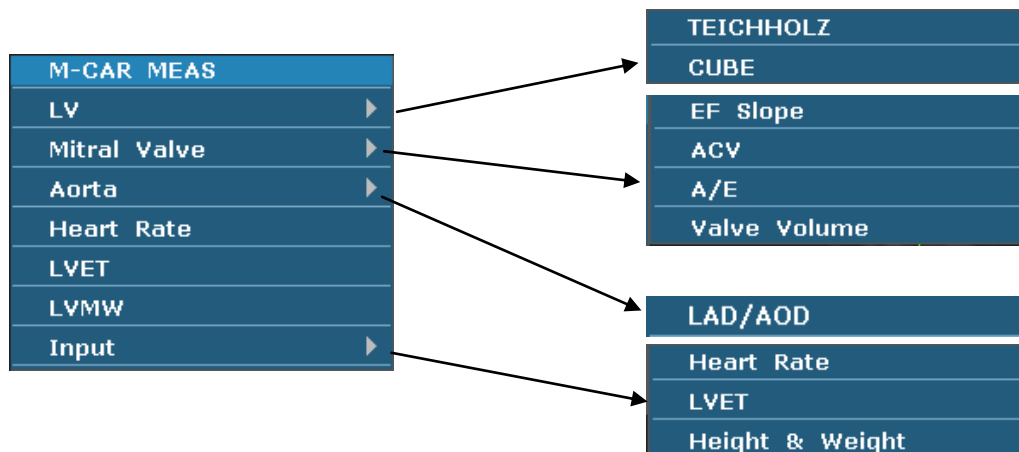
Figure 9-1 M Mode Cardiac Measurement and Calculation Menu

1. Items of Measurement and Calculation

    M-CARDIAC MEAS: LV, Mitral, Heart Rate, LVET, and LVMW.

2. Items of input

    Heart Rate, LVET, and Height &Weight.

    The formulas of B+M mode and M mode cardiac LV measurement include TEICHHOLZ and CUBE, as shown below, and the default formula is TEICHHOLZ.

1. CUBE formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVIDd	Left Ventricle Internal Diameter	Distance (mm)
LVIDs	Left Ventricle Internal Diameter	
ET	Ejection Time	Time (ms or s)
HR	Heart Rate	M mode heart rate measurement or key in (bpm)
EDV	End Diastolic Volume	$EDV\ (mL) = LVIDd^3(mm)^3/1000$
ESV	End Systolic Volume	$ESV\ (mL) = LVIDs^3(mm)^3/1000$
SV	Stroke volume	SV (mL) = EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min) = SV (mL) x HR (bpm)/1000
EF	Ejection fraction (M mode)	EF (No unit) = SV (mL)/ EDV (mL) x 100%
FS	Fractional Shortening	FS (No unit) = [{ LVIDd (mm)- LVIDs (mm)}/ LVIDd (mm)]x 100%
SI	Stroke Index	SI (No unit) = SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit) = CO (L/min)/ BSA (m^2)
MVCF	Mean Velocity Circumferential Fiber Shortening	MVCF (No unit) = { LVIDd (mm)- LVIDs (mm)}/ {LVIDd (mm) x ET (ms)/1000}
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 9-1 Measurement and Calculation Items with CUBE formula

The formulas of BSA calculation:

Oriental: $BSA = Weight^{0.425} * Height^{0.725} * 73.58/10000$

Occidental: $BSA = Weight^{0.425} * Height^{0.725} * 71.84/10000$

Height: height   cm.

Weight: weight   kg.

BSA: body surface area   m^2.

2. TEICHHOLZ formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVIDd	Left Ventricle Internal Diameter	Distance (mm)
LVIDs	Left Ventricle Internal Diameter	Distance (mm)
ET	Ejection Time	Time (ms or s)
HR	Heart Rate	M mode heart rate measurement or key in (bpm)
EDV	End Diastolic Volume	EDV (mL)＝$\{7 \times LVIDd^3 (cm)^3\}/\{2.4 + LVIDd\}$
ESV	End Systolic Volume	ESV (mL)＝$\{7 \times LVIDs^3 (cm)^3\}/\{2.4 + LVIDs\}$
SV	Stroke volume	SV (mL) = EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min) = SV (mL) × HR (bpm)/1000
EF	Ejection fraction (M mode)	EF (No unit) = SV (mL)/ EDV (mL) ×100%
FS	Fractional Shortening	FS (No unit) = [{ LVIDd (mm)- LVIDs (mm)}/ LVIDd (mm)] ×100%
SI	Stroke Index	SI (No unit) = SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit) = CO (L/min)/ BSA (m^2)
MVCF	Mean Velocity Circumferential Fiber Shortening	MVCF (No unit) = {LVIDd (mm)- LVIDs (mm)}/ {LVIDd (mm) x ET (ms)/1000}
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 9-2 Measurement and Calculation Items with TEICHHOLZ formula

3. Other measurement items:

Label	Description	Method
AOD	Aortic root Diameter	Distance (mm)
LAD	Left Atrium Diameter	
CA	Cardiac cycle apex A	
CE	Cardiac cycle apex E	
EF SLP	Ejection Fraction Slope	Slope (mm/s)
ACV	AC Decreasing Velocity	
DEV	Deceleration Velocity	
DCT	Deceleration Time	Time (ms or s)

MAVO1	Aortic Valve Volume Opened, beginning	Distance (mm)
MAVO2	Aortic Valve Volume Opened, ending	
AA	Aortic Amplitude	
LVMW	Left Ventricular Muscle Weight	LVMW (g) =1.04* ({IVSTd (cm)+LVIDd (cm)+LVPWd (cm)}^{3}-LVIDd^3 (cm)^3)-13.6
LVMWI	Left Ventricular Muscle Weight Index	LVMWI (No unit) = LVMW/BSA
A/E	The ratio of CA to CE	A/E (No unit) = CA (mm)/CE (mm)
LAD/AOD	Left Atrium Diameter / Aortic root Diameter	LAD/AOD (No unit) = LAD (mm) / AOD (mm)
QMV	Mitral Valve Flow	QMV (mL) = 4*DEV (cm/s)*DCT (s)

Table 9-3 Other Measurement Items

4. Calculation items:

Label	Description	Method
EDV	End Diastolic Volume	EDV (mL) = LVIDd^3 (mm^3)/1000 CUBE formula
ESV	End Systolic Volume	ESV (mL) = LVIDs^3 (mm^3)/1000 CUBE formula
SV	Stroke volume	SV (mL) = EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min) = SV (mL) × HR (bpm)/1000
EF	Ejection fraction (M mode)	EF (No unit) = SV (mL)/ EDV (mL) × 100%
FS	Fractional Shortening	FS (No unit) =[{LVIDd (mm)- LVIDs (mm)}/ LVIDd (mm)]x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
MVCF	Mean Velocity Circumferential Fiber Shortening	MVCF (No unit)= { LVIDd (mm)- LVIDs (mm)}/ {LVIDd (mm) × ET (ms)/1000}
BSA	Body Surface Area (m^2)	Calculate by to the selected formula
LVMW	Left Ventricular Muscle Weight	LVMW (g)=1.04*[{IVSTDd (cm)+LVIDd (cm) + LVPWd^3 (cm)}^{3}-LVIDd^3 (cm)^3]-13.6

LVMWI	Left Ventricular Muscle Weight Index	LVMWI (No unit)=LVMW/BSA
A/E	The ratio of CA to CE	A/E (No unit)= CA (mm)/CE (mm)
LAD/AOD	Left Atrium Diameter / Aortic root Diameter	LAD/AOD (No unit)= LAD (mm)/AOD (mm)
QMV	Mitral Valve Flow	QMV (mL)=4*DEV (cm/s)*DCT (s)

Table 9-4 Calculation Items

9.1.1. LV

The B+M mode and M mode measurements of LV are based on EDV and ESV measurements, which are calculated by LVIDd and LVIDs measurements.

After measuring LVIDd and LVIDs and entering Heart Rate, LVET, and Height & Weight, the system calculates some physiological parameters, such as EDV, ESV, SV, EF, FS, CO, MVCF, SI, and CI.

There are two calculation formulas for heart antrum volume in the B+M mode and the M mode, as shown below.

Item	Formula
TEICHHOLZ	EDV (mL)＝{7×LVIDd^3 (cm) ^{3}}/{2.4+ LVIDd} ESV (mL)＝{7×LVIDs^3 (cm) ^{3}}/{2.4+ LVIDs}
CUBE	EDV (mL) = LVIDd^3 (mm)^3/ 1000 ESV (mL) = LVIDs^3 (mm)^3/ 1000

Table 9-5 TEICHHOLZ and CUBE Formula

NOTE:

Ensure that the value of LVIDd is bigger than that of LVIDs, or the system can not display the calculation items.

SV and EF calculation is as below.

Measurement items:

LVIDd and LVIDs

To measure LV:

1. In the M-cardiac measurement menu, roll the trackball to highlight **LV**, and the submenu will be displayed. Select TEICHHOLZ or CUBE and press **Set**. Then move the cursor to the image area and a "+" is displayed.

2. Move the cursor to the end diastolic of left ventricle, and measure LVIDd The method is similar to generic M mode distance measurement. LVIDd and EDV will be displayed in the measurement result window.

3. Move the cursor to the end systolic of the left ventricle, and then measure LVIDs. The method is the same as the generic M mode distance measurement method. LVIDs, ESV, SV, EF, and FS will be displayed in the measurement result window.

To enter HR

1. In the M-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the submenu **Heart Rate** and press **Set** to display an **HR input** dialog box, as shown below.
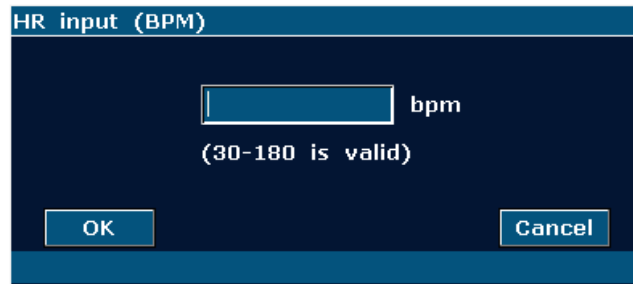
Figure 9-2 HR Input Dialog Box

2. Input a suitable value in the HR (bpm) box.

3. Roll the trackball to highlight **OK** and press **Set**, and after measuring LV, the result of CO will be displayed in the measurement result window.

To enter LVET

1. In the M-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the submenu **LVET** and press **Set** to display an **ET input** dialog box, as shown below.
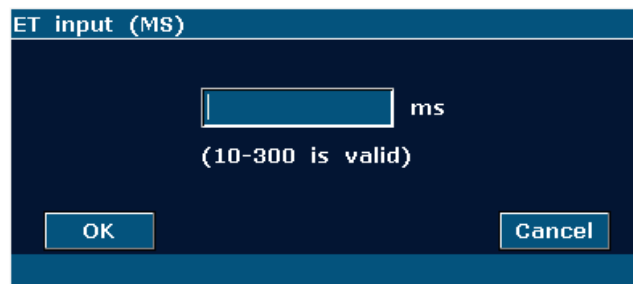
Figure 9-3 ET Input Dialog Box

2. Input a suitable value in the LVET (ms) box.

3. Roll the trackball to highlight **OK** and press **Set**.

To enter Height and Weight

1. In the M-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the submenu **Height & Weight** and press **Set** to display a **Height and Weight** entering dialog box, as shown below.
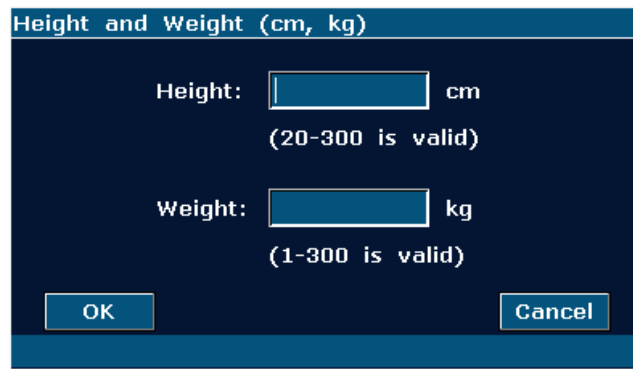
Figure 9-4 Height and Weight Input Dialog Box

2.   Input suitable values in the Height and Weight boxes.

3.   Roll the trackball to highlight **OK** and press **Set**.

The measurements and calculations of all the LV parameters are as below.

Measurement or input items:

Input or measurement items: HR, LVET, and Height & Weight;

Measurement items: LVIDd and LVIDs

To calculate all the LV parameters:

1. Input or measure HR, LVET, and Height & Weight.

2. Measure LVIDd and LVIDs following the prompt instruction.

3. All the LV parameters, EDV, ESV, SV, FS, EF, CO, MVCF, SI and CI will be displayed in the measurement result window.

9.1.2. Mitral Valve

Measurement items of mitral valve include EF slope, ACV, A/E, DEV, and DCT.

To measure EF slope, ACV, and A/E

1.   In the M-cardiac measurement menu, roll the trackball to highlight **Mitral Valve** to display the submenu.

2.   Roll the trackball to highlight **EF Slope**, **ACV**, or **A/E**, and press **Set**.

   a)   To measure **EF Slope** and **ACV**, by the method of generic M mode slope measurement;

   b)   To measure **A/E**, measure the breadth from apex A to point C and the breadth from apex E to point C respectively, by the method of generic M mode distance measurement.

3.   After the measurements, the results of EF SLP, ACV and A/E will be displayed in the measurement result window.

To measure Valve Volume (QMV)

Calculation formula:

QMV (mL) = 4*DEV (cm/s)*DCT (s)

Measurement operation procedure:

1. In the M-cardiac measurement menu, roll the trackball to highlight **Mitral** to display the submenu.

2. Roll the trackball to highlight **Valve Volume**, and press **Set**.

3. Measure DEV, by the method of generic M mode slope measurement.

4. Measure DCT, by the method of generic M mode time measurement.

5. After the measurement, the result of QMV will be displayed in the measurement result window.

9.1.3. Aorta

Aorta calculation is as below.

● Measurement items:

LAD/ AOD

● Aorta calculation

In the M-cardiac measurement menu, roll the trackball to highlight **Aorta** to display the submenu.

✧ **LAD/AOD measurement**

1. Roll the trackball to highlight **LAD/AOD** and press **Set**.

2. Measure LAD and AOD respectively by the method of generic M mode distance measurement.

3. The results will be displayed in the measurement result window.

9.1.4. LVMW, LVMWI

LVMW and LVMWI calculations are as below.

● Measurement items:

LVPWd, IVSTd and LVIDd

● The calculation formula

LVMW (g) = $1.04*[\{IVSTd\ (cm)\ +LVIDd\ (cm)\ +LVPWd\ (cm)\}^{3}-LVIDd^{3}\ (cm)^{3}]-13.6$

LVMWI = LVMW $(g)/BSA\ (m)^{2}$

● To calculate LVMW, LVMWI

1. In the M-cardiac measurement menu, roll the trackball to highlight **LVMW**, and press **Set**.

2. Measure LVPWd, IVSTd and LVIDd respectively following the prompt instruction.

3. After the measurements, the result of LVMW will be displayed in the measurement result

window. The system will display LVWMI if you have keyed in Height and Weight before the measurement. If you had measured LV before, it will renovate the LV results.

9.2. Cardiac Measurements and Calculations in B Mode

1. Press **Probe**, select the desired probe model and the exam mode **Adult Cardiac/ Pedia Cardiac**, and then press **OK**, or double click on the exam type.

2. In B mode, press **Measure**, the system enters B mode cardiac measurement. The B mode cardiac measurement menus are shown as follows:
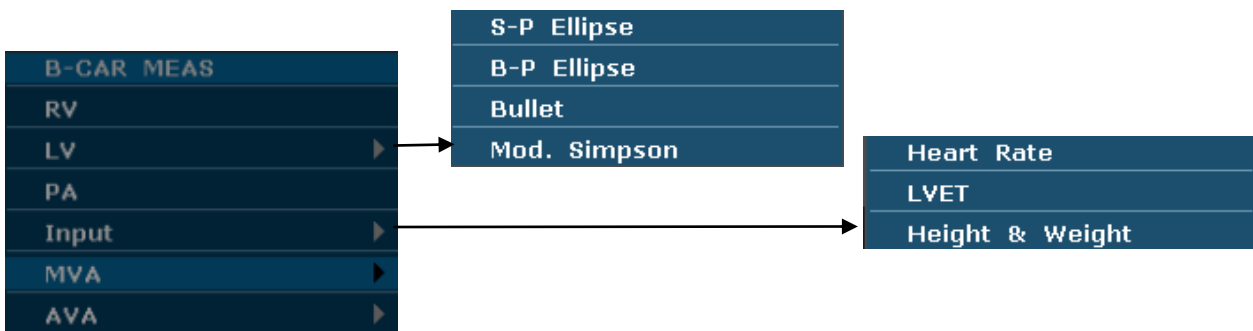
Figure 9-5 B Mode Cardiac Measurement and Calculation Menu

1. Items of Measurement and Calculation

   B-CARDIAC MEAS: RV, LV, and PA.

2. Items of input

   Heart Rate, LVET, and Height & Weight

   The default measurements are LVLs, LVALs, LVLd, and LVALd measurements, by the method of single-plane ellipse (S-P Ellipse) measurement.

   The formulas of B mode cardiac LV measurement include Single plane ellipse (S-P Ellipse), Dual plane ellipse (B-P Ellipse), Bullet, and Modified Simpson (Mod. Simpson), shown as follows:

1. Single plane ellipse formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVLd	Left Ventricle Long-axle Diameter	Distance (mm)
LVALd	Left Ventricle Area of Long-axle	Ellipse Area (mm^2, cm^2, or dm^2)
LVLs	Left Ventricle Long-axle Diameter	Distance (mm)
LVALs	Left Ventricle Area of Long-axle	Ellipse Area (mm^2, cm^2, or dm^2)
HR	Heart Rate	Key in (bpm)

EDV	End Diastolic Volume	EDV (mL)= (8/3π)×{LVALd (mm^2)}^{2}/LVLd (mm) /1000
ESV	End Systolic Volume	ESV (mL)= (8/3π)×{LVALs (mm^2)}^{2}/LVLs (mm) /1000
SV	Stroke volume	SV (mL)=EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min)= SV (mL) × HR (bpm)/1000
EF	Ejection fraction (B mode)	EF (No unit)= SV (mL)/ EDV (mL) x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 9-6 Measurement and Calculation Items with Single Plane Ellipse Formula

2. Dual plane ellipse formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVALd	Left Ventricle Area of Long-axle	Ellipse Area (mm^2, cm^2, or dm^2)
LVAMd	Left Ventricular Fractional Area of Mitral Valve	
LVIDd	Left Ventricle Internal Diameter	Distance (mm)
LVALs	Left Ventricle Area of Long-axle	Ellipse Area (mm^2, cm^2, or dm^2)
LVAMs	Left Ventricular Fractional Area of Mitral Valve	
LVIDs	Left Ventricle Internal Diameter	Distance (mm)
HR	Heart Rate	Key in (bpm)
EDV	End Diastolic Volume	EDV(mL)=(8/3π)×LVALd(mm^2)×LVAMd(mm^2)/LVIDd(mm) /1000
ESV	End Systolic Volume	ESV(mL)=(8/3π)×LVALs(mm^2)×LVAMs(mm^2)/LVIDs(mm) /1000
SV	Stroke volume	SV (mL)=EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min)= SV (mL) × HR (bpm)/1000
EF	Ejection fraction (B mode)	EF (No unit)= SV (mL)/ EDV (mL) x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)

CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 9-7 Measurement and Calculation Items with Dual Plane Ellipse Formula

3. Bullet volume formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVAMd	Left Ventricular Fractional Area of Mitral Valve	Ellipse Area (mm^2, cm^2, or dm^2)
LVLd	Left Ventricular Length	Distance (mm)
LVAMs	Left Ventricular Fractional Area of Mitral Valve	Ellipse Area (mm^2, cm^2, or dm^2)
LVLs	Left Ventricular Length	Distance (mm)
HR	Heart Rate	Key in (bpm)
EDV	End Diastolic Volume	EDV (mL)= (5/6)×LVLd (mm)×LVAMd (mm^2) /1000
ESV	End Systolic Volume	ESV (mL)= (5/6)×LVLs (mm)× LVAMs (mm^2) /1000
SV	Stroke volume	SV (mL)=EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min)= SV (mL) × HR (bpm)/1000
EF	Ejection fraction (B mode)	EF (No unit)= SV (mL)/ EDV (mL) x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 9-8 Measurement and Calculation Items with Bullet Formula

4. Modified SIMPSON formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVAMd	Left Ventricular Fractional Area of Mitral Valve	Ellipse Area (mm^2, cm^2, or dm^2)
LVLd	Left Ventricular Length	Distance (mm)

LVAPd	Left Ventricular Fractional Area of Papillary Muscles	Ellipse Area (mm^2, cm^2, or dm^2)
LVAMs	Left Ventricular Anterior Wall	
LVLs	Left Ventricular Length	Distance (mm)
LVAPs	Left Ventricular Fractional Area of Papillary Muscles	Ellipse Area (mm^2, cm^2, or dm^2)
HR	Heart Rate	Key in (bpm)
EDV	End Diastolic Volume	*1
ESV	End Systolic Volume	
SV	Stroke volume	SV (mL)=EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min)= SV (mL) x HR (bpm)/1000
EF	Ejection fraction (B mode)	EF (No unit)= SV (mL)/ EDV (mL) x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
BSA	Body Surface Area	Calculate by to the selected formula (m^2)

Table 9-9 Measurement and Calculation Items with Modified SIMPSON Formula

*1

$$EDV(mL) = LVLd(mm)/9 \times \left\{ 4 \times LVAMd(mm^2) + 2 \times LVAPd(mm^2) + \sqrt{LVAMd(mm^2) \times LVAPd(mm^2)} \right\}/1000$$

$$ESV(mL) = LVLs(mm)/9 \times \left\{ 4 \times LVAMs(mm^2) + 2 \times LVAPs(mm^2) + \sqrt{LVAMs(mm^2) \times LVAPs(mm^2)} \right\}/1000$$

5. Other measurement and calculation items:

Label	Description	Method
LVET	Left Ventricular Ejection Time	Time (ms)
FS	Fractional Shortening	FS (No unit)={ LVIDd (mm)- LVIDs (mm)}/ LVIDd (mm) x 100%
MVCF	Mean Velocity Circumferential Fiber Shortening	MVCF (No unit)= { LVIDd (mm)- LVIDs (mm)}/ {LVIDd (mm) x ET (ms)/1000}

Table 9-10 Other Measurement and Calculation Items

9.2.1. LV

LV measurement is as below.

Single plane ellipse (**S-P Ellipse**)

● Measurement items:

LVLd, LVALd , LVLs and LVALs,

● To measure LV:

1. In the B-cardiac measurement menu, roll the trackball to highlight **LV**. Then select **S-P Ellipse** and press **Set**.

2. During end diastolic, measure LVLd and LVALd respectively. The system calculates and displays the result of EDV.

3. During end systolic, measure LVLs and LVALs respectively, by the method of generic B mode distance measurement and generic B mode ellipse area measurement respectively. The system calculates and displays the results of ESV, SV, and EF.

Dual plane ellipse (B-P Ellipse), Bullet, and Modified Simpson (Mod. Simpson)

The operations in these methods are similar to those in the single plane ellipse method. Please refer to the relevant B mode generic measure method for details, and refer to the prompt instruction to help you.

CO calculation is as below.

● Measurement and input items:

Measure LV;

Key in: HR

● To calculate CO:

1. In the B-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the submenu **Heart Rate** and press **Set** to display an **HR input** dialog box, as shown below.
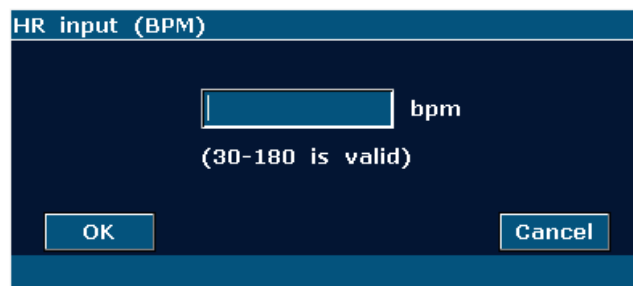
Figure 9-6 HR Input Dialog Box

2. Input a suitable value in the HR (bpm) box.

3. Roll the trackball to highlight **OK** and press **Set**. After measuring LV, CO will be displayed in the measurement result window.

MVCF calculation is as below.

● Measurement and input items:

Measure: LV;

Key in: LVET

● To calculate MVCF:

1. Move the cursor to **Input**. Then select the submenu **LVET** and press **Set** to display an **ET input** dialog box, as shown below.
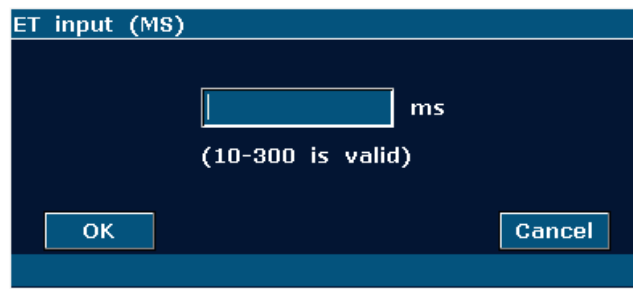
Figure 9-7 ET Input Dialog Box

2. Input a suitable value in the LVET (ms) box.

3. Roll the trackball to highlight **OK** and press **Set**. After measuring LV, MVCF will be displayed in the measurement result window.

CI and SI calculations are as below.

● Measurement and input items:

Measure: LV and HR;

Key in: Height and Weight

● To calculate CI and SI:

1. In the B-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the submenu **Height & Weight** and press **Set** to display a **Height and Weight** entering dialog box, as shown below.
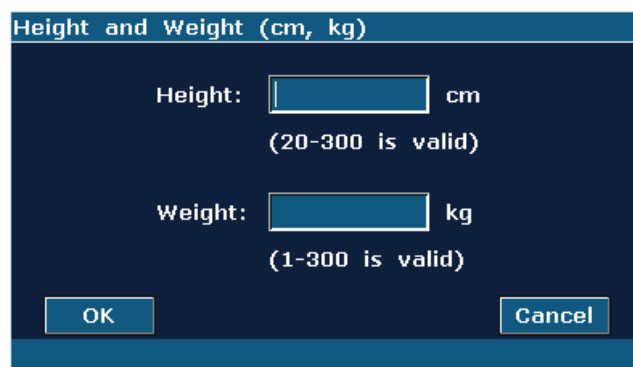
Figure 9-8 Height and Weight Input Dialog Box

2. Input suitable values in the Height (cm) and Weight (Kg) boxes.

3. Roll the trackball to highlight **OK** and press **Set**. BSA will be displayed in the measurement result window. After measuring LV and HR, SI and CI will also be displayed in measurement result window.

9.2.2. RV (Right Ventricle Internal Diameter)

1. In the B-cardiac measurement menu, roll the trackball to highlight **RV**.

2. Measure RV by the method of distance.

3. The result will be displayed in the measurement result window.

9.2.3. PA (Pulmonary Artery)

1. In the B-cardiac measurement menu, roll the trackball to highlight **PA**, and press **Set** to display a "+" in the image area.

2. Measure **PA** by the method of distance measurement.

3. The result will be displayed in the measurement result window.

9.2.4. MVA (Mitral Valve Area)

1. In the B-cardiac measurement menu, roll the trackball to highlight **MVA**, select **Ellipse** or **Trace**, and then press **Set** to display a "+" in the image area.

2. Measure **MVA** by the Ellipse or Trace method of B-mode generic measurement.

3. The result will be displayed in the measurement result window.

9.2.5. AVA (Aortal Valve Area)

1. In the B-cardiac measurement menu, roll the trackball to highlight **AVA**, select **Ellipse** or **Trace**, and then press **Set** to display a "+" in the image area.

2. Measure **AVA** by the Ellipse or Trace method of B-mode generic measurement.

3. The result will be displayed in the measurement result window.

Other parameters:

If you want to perform other cardiac parameter measurements, please enter B+M mode or M mode cardiac measurement.

9.3. Cardiac Measurements in D Mode

Cardiac measurements in D mode include Velocity, PG, Time, Heart Rate, Slope, PHT and Trace (Manual).

Note: All these cardiac measurements in D mode will not be entered into the cardiac report.

For the steps of velocity measurement, please refer to Section 6.5.4 Generic Measurement in D mode.

For the steps of heart rate, time and slope measurement, please refer to Section 6.5.2 Generic Measurement in M mode.

PG

(Pressure gradient)

To measure PG of a point on the Doppler wave:

$PG[mmHg]=4*v^2$

(1mmHg=0.133kPa)

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **PG** and press **Set** and a "+" is displayed.

3. Roll the trackball and press **Set** to anchor the point, measuring velocity.

4. Roll the trackball and press **Set** to begin a new PG measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

5. Press **Caliper** to finish and exit.

PHT

(Pressure half time)

PHT is defined as the time needed for the peak transvalvular pressure gradient to fall to its half value. The system also calculates MVA (mitral valve area) automatically.

$MVA(cm^2)=220/PHT(ms)$

To measure PHT:

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **PHT** and press **Set**.

3. Roll the trackball and then press **Set** to anchor the start point.

4. Roll the trackball and then press **Set** to anchor the end point.

5. Roll the trackball and press **Set** to begin a new PHT measurement. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

6. Press **Caliper** to finish and exit.

NOTE: When performing the PHT measurement above the baseline, ensure that the end point is lower than the start point; otherwise, the end point cannot be fixed; and when performing the PHT measurement below the baseline, ensure that the end point is higher than the start point.

Trace

(Manual)

To trace spectrum:

1. Press **Caliper** to activate a measurement cursor "+".

2. Roll the trackball to highlight **Trace** and press **Set** and a "+" is displayed.

3. Roll the trackball and press **Set** to anchor the start point. Roll the trackball to trace along the Doppler wave forward, or press **Back** to erase the trace

backwards.

4. Press **Set** to anchor the end point, the system displays the results of Mean velocity, MeanPG, and VTI (Velocity Time Integral), etc. in measurement result window.

5. Roll the trackball and press **Set** to begin a new trace. You can measure a maximum of eight groups of data. The outcome will be displayed in the measurement result window.

6. Press **Caliper** to finish and exit.

9.4. Cardiac Report

After the cardiac examination, the system generates a cardiology examination and diagnosis worksheet.

1. Select the desired probe model and the exam mode **Adult Cardiac/ Pedia Cardiac**.

2. In M/B mode, after application measurements press **Report** to open **Cardiac worksheet**, as shown in *Figure 9-9*.

Figure 9-9 Cardiac Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

For specific operations of editing or printing the report, please refer to Section 6.7 Worksheet(Report).

Chapter 10 Gynecology Measurements & Calculations

The gynecology examination is usually performed in the B mode and PW mode.

10.1. Measurements and Calculations in B Mode

1. Press **Probe**, select the desired probe model and the exam mode **Gynecology/ Endovaginal**, and then press **OK**, or double click on the exam type.
2. Press **B** to enter the B mode.
3. Press **Measure** to activate the application measurement function. The system displays the measurement menu, as shown below.
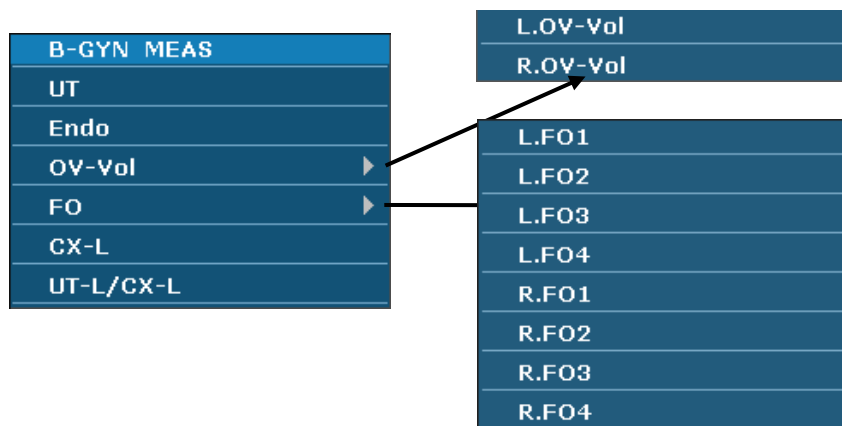
Figure 10-1 Gynecology Measurement and Calculation Menu in B Mode

To determine the volume of right ovary or left ovary, perform three measurements: length, width, and height. The system calculates the volume.

The gynecology measurement & calculation items of the B mode are as follows.

Label	Description	Method
UT	Uterus	UT (mm) = UT-L (mm)+UT-W (mm)+UT-H (mm)
UT-L	Uterus Length	
UT-W	Uterus width	Distance (mm)
UT-H	Uterus Height	
UT-V	Uterus Volume	UT-V(mm^3) =π/6×L(mm)×W(mm)×H(mm)
Endo	Uterus Endo- membrane Thickness	Distance (mm)
L. OV-Vol	Left Ovary Volume	L. OV-V (cm^3) = 0.523 x L. OV-L (mm) x L. OV-W (mm) x L. OV-H (mm)/1000
L. OV-L	Left Ovary Length	
L. OV-W	Left Ovary Width	Distance (mm)
L. OV-H	Left Ovary Height	
R. OV-Vol	Right Ovary Volume	R. OV-V (cm^3) = 0.523 x R. OV-L (mm) x R. OV-W (mm) x R. OV-H (mm)/1000

R. OV-L R. OV-W R. OV-H	Right Ovary Length Right Ovary Width Right Ovary Height	Distance (mm)
L.FO-Vol	Left Follicle Volume (Left Follicle 1-4)	$Vol(cm^3)=\pi/6 \times D1(mm) \times D2(mm) \times D3(mm)/1000$
L. FO-D1 L. FO-D2 L. FO-D3	Left Follicle Distance 1 Left Follicle Distance 2 Left Follicle Distance 3	Distance (mm)
R.FO-Vol	Right Follicle Volume (Right Follicle 1-4)	$Vol(cm^3)=\pi/6 \times D1(mm) \times D2(mm) \times D3(mm)/1000$
R. FO-D1 R. FO-D2 R. FO-D3	Right Follicle Distance 1 Right Follicle Distance 2 Right Follicle Distance 3	Distance (mm)
CX-L	Cervix Length	Distance (mm)
UT-L/CX-L	The ratio of Uterus Length and Cervix Length	Distance (mm)

Table 10-1 Gynecology Measurement and Calculation Items in B Mode

10.1.1. UT

To measure UT:

1. In the B-gynecology measurement menu, roll the trackball to highlight **UT** and press **Set**.

2. Perform three measurements, UT-L, UT-W and UT-H, by the method of distance measurement.

Reference　　Section *6.5.1 Generic Measurements in B Mode*.

3. After the three measurements are performed, the system calculates UT-V automatically, and the result of UT and UT-V will be displayed in the measurement result window. You can measure a maximum of one group of data.

10.1.2. Endo

To measure endometrium:

1. In the B-gynecology measurement menu, roll the trackball to highlight **Endo** and press **Set**.

2. Measure Endo by the method of distance measurement.

Reference　　Section *6.5.1 Generic Measurements in B Mode*.

3. The result of Endo will be displayed in the measurement result window. You can measure a maximum of one group of data.

10.1.3. OV-Vol

The measurement of OV-Vol includes L.OV-Vol and R.OV-Vol.

To measure L.OV-Vol:

1.   In the B-gynecology measurement menu, roll the trackball to highlight **OV-Vol**, and then highlight the submenu **L.OV-Vol**, press **Set**.
2.   Perform three measurements, L.OV-L, L.OV-W and L.OV-H, by the method of distance measurement.

 Reference   Section *6.5.1 Generic Measurements in B Mode*.

3.   After the three measurements are performed, the result of L.OV-Vol will be displayed in the measurement result window.

To measure R.OV-Vol:

1.   In the B-gynecology measurement menu, roll the trackball to highlight **OV-Vol**, and then highlight the submenu **R.OV-Vol**, press **Set**.
2.   Perform three measurements, R.OV-L, R.OV-W and R.OV-H, by the method of distance measurement.

 Reference   Section *6.5.1 Generic Measurements in B Mode*.

3.   After the three measurements are performed, the result of R.OV-Vol will be displayed in the measurement result window.

10.1.4. FO

The measurement of FO includes L. FO and R. FO.

To measure L. FO:

1. In the B-gynecology measurement menu, roll the trackball to highlight **FO**, select **L. FO1/ L. FO2/ L. FO3/ L. FO4** in the submenu, and then press **Set**.

2. Perform three measurements: Distance 1, Distance 2, and Distance 3, by the method of distance measurement.

 Reference   Section *6.5.1 Generic Measurements in B Mode*.

3. After the three measurements are performed, the result of **L. FO** will be displayed in the measurement result window.

To measure R. FO:

1. In the B-gynecology measurement menu, roll the trackball to highlight **FO**, select **R. FO1/ R. FO2/ R. FO3/ R. FO4** in the submenu, and then press **Set**.

2. Perform three measurements: Distance 1, Distance 2, and Distance 3, by the method of distance measurement.

 Reference   Section *6.5.1 Generic Measurements in B Mode*.

3. After the three measurements are performed, the result of **R. FO** will be displayed in the measurement result window.

10.1.5. CX-L

To measure CX-L:

1. In the B-gynecology measurement menu, roll the trackball to **CX-L**, and press **Set**.

2. Measure **CX-L** with distance method.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The result will be displayed in the measurement result window; if you have already measured UT-L, the UT-L/CX-L will also be displayed.

10.1.6. UT-L/CX-L

To measure UT-L/CX-L:

1. In the B-gynecology measurement menu, roll the trackball to highlight **UT-L/CX-L**, and press **Set**.

2. Measure UT-L and CX-L, by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. The results will be displayed in the measurement result window.

NOTE:

During measurement, if you have already measured any one of the items, UT-L or CX-L, when you finished the other one, the UT-L/CX-L will be displayed automatically.

10.2. Measurements and Calculations in PW Mode

1. Press **Probe**, select the desired probe model and the exam mode **Gynecology/ Endovaginal**, and then press **OK**, or double click on the exam type.

2. Press **PW** to display the sample line, and press this key again to enter the PW mode.

3. Press **Measure** to activate the application measurement function. The system displays the measurement menu , as shown below.

Items of Measurement and Calculation

L UT A, R UT A, L OV A, and R OV A.
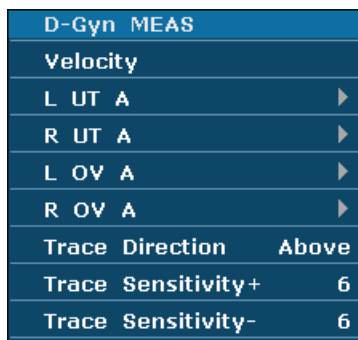
Submenu of the gynecology measurement items in the PW mode:

Figure 10-2 Gynecology Measurement and Calculation Menu in PW Mode

Label	Description	Channel	Method
L UT A	Left Uterus Aorta	1	
R UT A	Right Uterus Aorta	1	D trace
L OV A	Left Ovary Aorta	1	
R OV A	Right Ovary Aorta	1	

Table 10-2 Gynecology Measurement and Calculation Items in PW Mode

10.2.1. L UT A

1. In the PW-gynecology measurement menu, select **L UT A**.

2. Measure **L UT A** by the method of D trace measurement.

Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. You can measure a maximum of one group of data. To begin a new **L UT A** measurement, repeat steps 1 through 3.

10.2.2. R UT A

1. In the PW-gynecology measurement menu, select **R UT A**.

2. Measure **R UT A** by the method of D trace measurement.

 Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. You can measure a maximum of one group of data. To begin a new **R UT A** measurement, repeat steps 1 through 3.

10.2.3. L OV A

1. In the PW-gynecology measurement menu, select **L OV A**.

2. Measure **L OV A** by the method of D trace measurement.

 Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. You can measure a maximum of one group of data. To begin a new **L OV A** measurement, repeat steps 1 through 3.

10.2.4. R OV A

1. In the PW-gynecology measurement menu, select **R OV A**.

2. Measure **R OV A** by the method of D trace measurement.

 Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. You can measure a maximum of one group of data. To begin a new **R OV A** measurement, repeat steps 1 through 3.

10.3. Gynecologic Report

After the gynecologic examination, the system generates a gynecologic worksheet.

1. Select the desired probe model and the exam mode **Gynecology/ Endovaginal**.

2. In B/PW mode, after application measurements press **Report** to open **Gynecologic worksheet**.

Gynecologic worksheet has four tabs, uterus, ovary, follicle, and PW, as shown in *Figure 10-3*.

Figure 10-3 Gynecologic Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

For specific operations of editing or printing the report, please refer to Section 6.7 Worksheet(Report).

Chapter 11 Small Parts Measurements & Calculations

11.1.Measurements and Calculations

The small parts examination is usually performed in the B mode.

1. Press **Probe**, select the desired probe model and the exam mode **Thyroid**, and then press **OK**, or double click on the exam type.

2. Press **B** to enter the B mode.

3. Press **Measure** to activate the application measurement function. The measurement menu is displayed.
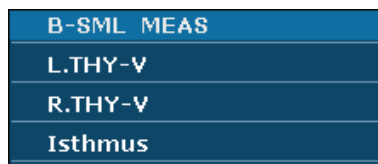
Figure 11-1 Small Parts Measurement and Calculation Menu

NOTE:

Small parts application measurements are available for thyroid exam only; other small parts exams such as Breast/MSK/Testicle/Superficial have generic measurements only.

To determine the right thyroid volume or left thyroid volume, perform three measurements: length, width, and height. The system calculates the volume.

The measurement & calculation items of small parts of B mode are as follows.

Label	Description	Method
THY	Thyroid	/
L. THY-V	Left Thyroid Volume	L. THY-V (mm^3) = 0.497 × L. THY-L (mm) × L. THY-W (mm) × L. THY-H (mm)
L. THY-L L. THY-W L. THY-H	Left Thyroid Length Left Thyroid Width Left Thyroid Height	Distance (mm)
R. THY-V	Right Thyroid Volume	R. THY-V (mm^3) = 0.497 x R. THY-L (mm) × R. THY-W (mm) × R. THY-H (mm)
R. THY-L R. THY-W R. THY-H	Right Thyroid Length Right Thyroid Width Right Thyroid Height	Distance (mm)
Isthmus	Thyroid Isthmus	Distance (mm)

Table 11-1 Small Parts Measurement and Calculation Items

The measurements of THY include L.THY-V, R.THY-V, and Isthmus.

To measure L.THY-V:

1. In the small parts measurement menu, roll the trackball to highlight **L.THY-V**, press **Set**.

2. Measure three pieces of data: L.THY-L, L.THY-W and L.THY-H, by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the three measurements, the result of L.THY-V will be displayed in the measurement result window.

To measure R. THY-V:

1. In the small parts measurement menu, roll the trackball to highlight **R.THY-V**, press **Set**.

2. Measure three pieces of data: R.THY-L, R.THY-W and R.THY-H, by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the three measurements, the result of R.THY-V will be displayed in the measurement result window.

To measure Isthmus:

1. In the small parts measurement menu, roll the trackball to highlight **Isthmus**, press **Set**.

2. Measure Isthmus by the method of distance measurement.

 Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the measurement, the result of Isthmus will be displayed in the measurement result window.

11.2. Small Parts Report

After the small parts examination, the system generates a worksheet.

1. Select the desired probe model and the exam mode **Breast/MSK/Testicle/Superficial/Thyroid**.

2. In B mode, after measurements press **Report** to open **Thyroid worksheet** in Thyroid exam, or to open **Small Parts worksheet** in other small parts exam (such as Breast/ MSK/ Testicle/ Superficial), as shown below:

Figure 11-2 Small Parts Worksheet

Figure 11-3 Thyroid Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

For specific operations of editing or printing the report, please refer to Section 6.7 Worksheet(Report).

Chapter 12 Urology Measurements and Calculations

12.1.Measurements and Calculations

The urology examination is usually performed in the B mode.

1. Press **Probe**, select the desired probe model and the exam mode **Urology/ Endorectal**, and then press **OK**, or double click on the exam type.

2. Press **B** to enter the B mode.

3. Press **Measure** to activate the application measurement function. The system displays the measurement menu, as shown below.
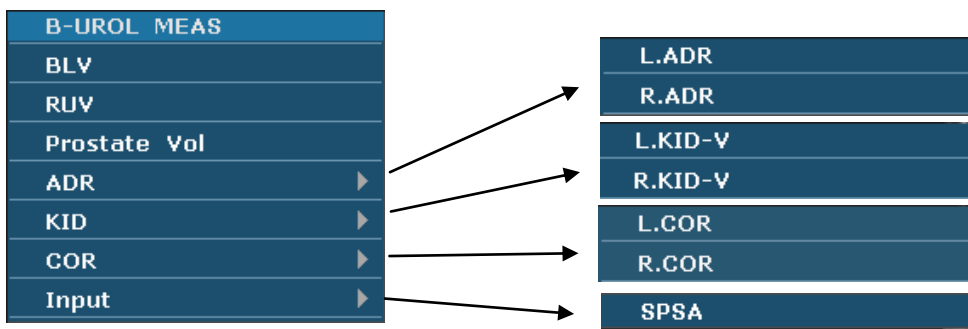
Figure 12-1 Urology Measurement and Calculation Menu

Label	Description	Method
RUV	Residual Urine Volume (ml or mm^3)	RUV(ml) = π/6 ×RUV-L (mm)×RUV-W (mm)× RUV-H(mm)/1000
RUV-L RUV-W RUV-H	Residual Urine Length Residual Urine Width Residual Urine Height	Distance (mm)
PV	Prostate Volume (mm^3, cm^3, or dm^3)	PV (mm^3) =π/6x PV-L (mm) × PV-W (mm) × PV-H (mm)
PV-L PV-W PV-H	Prostate Length Prostate Width Prostate Height	Distance (mm)
PPSA	Predicted Prostate Specific Antigen Density	PPSA (ng/mL) = 0.12 × PV
SPSA	Serum of Prostate Specific Antigen	Key in SPSA (ng)
PSAD	Prostate Specific Antigen Density	PSAD (ng/mL) = SPSA (ng)/ PV (mL), (0.01ng ≤SPSA≤100ng)
BLV	Bladder Volume	BLV(ml) = π/6×L(mm)×W(mm)×H(mm) /1000
BLV-L BLV-W BLV-H	Bladder Length Bladder Width Bladder Height	Distance (mm)
ADR(L/R)	Adrenal (Left/Right)	/

ADR-L ADR-W ADR-H	Adrenal Length Adrenal Width Adrenal Height	Distance (mm)
KID-V(L/R)	Kidney Volume (Left/Right)	KID-V(mm^3) = π/6×L(mm)×W(mm)×H(mm)
KID-L KID-W KID-H	Kidney Length Kidney Width Kidney Height	Distance (mm)
COR(L/R)	Cortex Thickness of Kidney(Left/Right)	Distance (mm)

Table 12-1 Urology Measurement and Calculation Items

To determine the residual urine volume or prostate volume, perform three measurements: length, width, and height. The system calculates the volume.

To measure BLV:

1. In the urology measurement menu, roll the trackball to highlight **BLV**, and then press **Set**.

2. Measure three pieces of data: BLV-L, BLV-W and BLV-H, by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the three measurements, the result of BLV will be displayed in the measurement result window.

To measure RUV:

1. In the urology measurement menu, roll the trackball to highlight **RUV**, and then press **Set**.

2. Measure three pieces of data: RUV-L, RUV-W and RUV-H, by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the three measurements, the result of RUV will be displayed in the measurement result window.

To measure Prostate Vol:

1. In the urology measurement menu, roll the trackball to highlight **Prostate Vol**, and then press **Set**.

2. Measure three pieces of data: PV-L, PV-W and PV-H, by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the three measurements, the results of Prostate Vol and PPSA will be displayed in the measurement result window.

To measure ADR:

1. In the urology measurement menu, roll the trackball to highlight **ADR**, select **L.ADR** or **R.ADR** from the submenu, and then press **Set**.

2. Measure three pieces of data: ADR-L, ADR-W and ADR-H, by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the three measurements, the result of ADR will be displayed in the measurement result window.

To measure KID:

1. In the urology measurement menu, roll the trackball to highlight **KID**, select **L.KID-V** or **R. KID-V** from the submenu, and then press **Set**.

2. Measure three pieces of data: KID-L, KID-W and KID-H, by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the three measurements, the result of KID will be displayed in the measurement result window.

To measure COR:

1. In the urology measurement menu, roll the trackball to highlight **COR**, select **L.COR** or **R. COR** from the submenu, and then press **Set**.

2. Measure COR by the method of distance measurement.

Reference   Section *6.5.1Generic Measurements in B Mode*.

3. After the measurement, the result of COR will be displayed in the measurement result window.

To measure PSAD:

Measure PV and input SPSA. The **SPSA input** dialog box is as shown below. Input the SPSA with the keyboard.
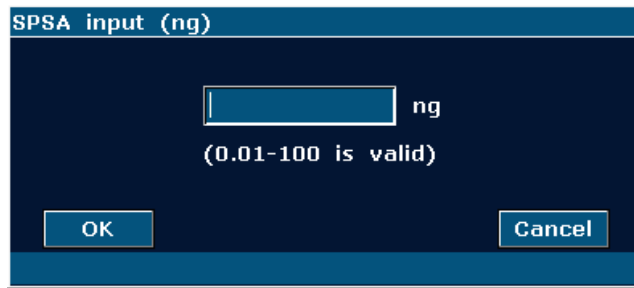
Figure 12-2 SPSA Input Dialog Box

12.2. Urologic Report

After the urologic examination, the system generates a urologic worksheet.

1. Select the desired probe model and the exam mode **Urology/ Endorectal**.

2. In B mode, after application measurements press **Report** to open **Urologic worksheet**, as shown below:
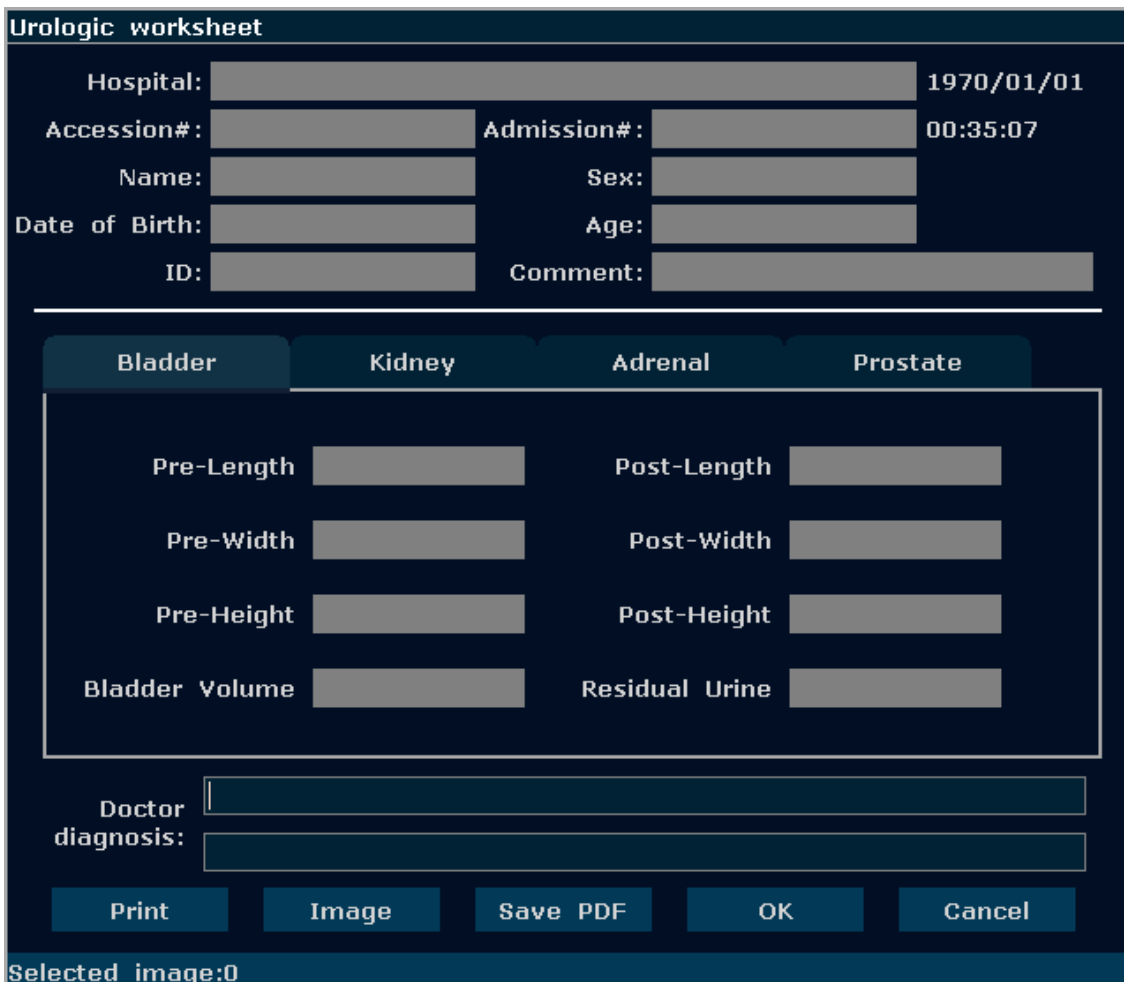
Figure 12-3 Urologic Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

For specific operations of editing or printing the report, please refer to Section 6.7 Worksheet(Report).

Chapter 13 Peripheral Vascular Measurements & Calculations

The vascular examination is usually performed in the PW mode.

13.1. Measurements and Calculations in PW Mode

1. Press **Probe**, select the desired probe model and the exam mode **Carotid / PV Artery/ PV Vein**, and then press **OK**，or double click on the exam type.

2. Press **PW** to display the sample line, and press this key again to enter the PW mode.

3. Press **Measure** to activate the application measurement function. The system displays the measurement menu, as shown below.

Items of Measurement and Calculation

Velocity, CCA, ICA, ECA, Vert A, Upper, and Lower.
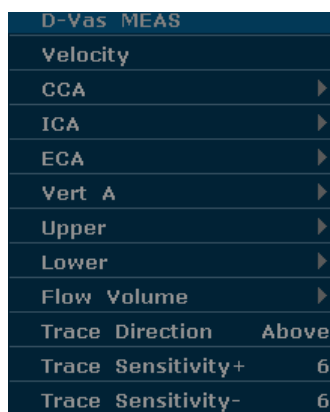
Submenu of the vascular measurement items in the PW mode:

Figure 13-1 Vascular Measurement and Calculation Menu in PW Mode

Label	Description	Channel	Method
CCA	Common Carotid Artery	1	D trace
ICA	Internal Carotid Artery	1	
ECA	External Carotid Artery	1	
Vert A	Vertebral Artery	1	
Upper	Upper Extremity Vascular	1	
Lower	Lower Extremity Vascular	1	

Table 13-1 Vascular Measurement and Calculation Items in PW Mode

13.1.1. CCA

To measure CCA:

1. In the PW-vascular measurement menu, select **CCA**.

2. Measure **CCA** by the method of D trace measurement.

 Reference　Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **CCA** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.2. ICA

To measure ICA:

1. In the PW-vascular measurement menu, select **ICA**.

2. Measure **ICA** by the method of D trace measurement.

 Reference　Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **ICA** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.3. ECA

To measure ECA:

1. In the PW-vascular measurement menu, select **ECA**.

2. Measure **ECA** by the method of D trace measurement.

 Reference　Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **ECA** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.4. Vert A

To measure Vert A:

1. In the PW-vascular measurement menu, select **Vert A**.

2. Measure **Vert A** by the method of D trace measurement.

Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **Vert A** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.5. UPPER

To measure UPPER:

1. In the PW-vascular measurement menu, select **UPPER**.

2. Measure **UPPER** by the method of D trace measurement.

Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **UPPER** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.6. LOWER

To measure LOWER:

1. In the PW-vascular measurement menu, select **LOWER**.

2. Measure **LOWER** by the method of D trace measurement.

Reference   Section *6.5.4 Generic Measurements in D Mode*.

3. The results are displayed in measurement result window.

4. To begin a new **LOWER** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.2. Vascular Report

After finishing the vascular examination, the system generates a vascular worksheet.

1. Select the desired probe model and the exam mode **Carotid / PV Artery/ PV Vein**.

2. In PW mode, after application measurements press **Report** to open **Vascular worksheet**, as shown below:

Figure 13-2 Vascular Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

For specific operations of editing or printing the report, please refer to Section 6.7 Worksheet(Report).

Chapter 14   Pediatrics Measurements & Calculations

The pediatrics examination is usually performed in the B mode. The pediatrics measurements include HIP.

1. Press **Probe**, select the desired probe model and the exam mode **Pedia Abd**, and then press **OK**,   or double click on the exam type.

2. Press **B** to enter the B mode.

3. Press **Measure** to activate the application measurement function. The system displays the measurement menu, as shown below.

Figure 14-1 Pediatrics Measurement and Calculation Menu

14.1. Measurements and Calculations

Label	Description	Method
HIP	The Angle of Hipbone (/)	
α	The Angle of BL and ARL (°)	Angle
β	The Angle of BL and IL (°)	

Table 14-1 Pediatrics Measurement and Calculation Items

To measure HIP:

1. In the B-gynecology measurement menu, roll the trackball to highlight **HIP** and press **Set**.

2. Perform two measurements, the angle α between BL and ARL, and the angle β between BL and IL, by the method of angle measurement.

Reference   Section *6.5.1 Generic Measurements in B Mode*.

3. After the two measurements, the results will be displayed in the measurement result window. You can measure a maximum of one group of data.

14.2. Pediatrics Report

After the Pediatrics examination, the system generates a HIP worksheet.

1. Select the desired probe model and the exam mode **Pedia Abd**.

2. In B mode, after application measurements press **Report** to open **HIP worksheet**, as shown below:

Figure 14-2 HIP Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

For specific operations of editing or printing the report, please refer to Section 6.7 Worksheet(Report).

Chapter 15 Inspection and Maintenance

15.1. Daily Checklist

Check before the system is switched on, if any system malfunction is experienced, eliminate the malfunction before use, or contact EDAN or authorized representatives for service if needed.

◆ Visually inspect all the probes. Do not use any damaged probe.

◆ Visually inspect all the probe assembly cables and associated connectors.

◆ Visually inspect all the power cords. Do not turn on the power if a cord is frayed or split, or shows signs of wear.

◆ Verify that the trackball and TGC slide controls are clean and free from gel or contaminants.

Check after the system is switched on:

◆ Visually check the on-screen display and lighting. Verify that the monitor displays the current date and time and there isn't any error message.

◆ Verify that the probe identification and indicated frequency on the screen are correct for the activated probe.

◆ Ensure that there isn't obvious abnormal noise, discontinuous image or dark area.

◆ Ensure that it isn't smelly or too hot.

◆ Ensure that the ultrasound window isn't too hot, checking with your hand.

◆ Verify that the buttons and knobs on the keyboard are good to operate.

◆ Ensure that there isn't obvious abnormal noise from the loudspeakers.

◆ Ensure that there isn't obvious abnormal noise from the air fan.

15.2. Cleaning and Disinfection

Use only the EDAN-approved substances and methods listed in this chapter to clean or disinfect your equipment. Warranty does not cover damage caused by using unapproved substances or methods.

Edan Instruments has validated the cleaning and disinfection instructions included in this User Manual. It is the responsibility of the healthcare professional to ensure that the instructions are followed so as to ensure adequate cleaning and disinfection.

General Points:

Keep your ultrasound system, cables and accessories free of dust and dirt. To prevent the device from damage, please follow the procedure:

● Use only recommended cleaning substances and disinfectants listed in this manual. Others may cause damage (not covered by warranty), reduce product lifetime or cause safety hazards.

● Always dilute according to the manufacturer's instructions.

● Unless otherwise specified, do not immerse any part of the equipment or any accessories in liquid.

● Do not pour liquid onto the system.

● Do not allow liquid to enter the case.

● Never use abrasive material (such as steel wool or silver polish).

● Inspect the monitor and reusable accessories after they are cleaned and disinfected.

CAUTION

If you spill liquid on the equipment, battery, or accessories, or they are accidentally immersed in liquid, contact your service personnel or EDAN service engineer.

15.2.1. Transducer Cleaning and Disinfection

Transducers should be cleaned and/or disinfected as necessary or between use with a recommended cleaner or disinfectant. Disconnect the transducer from the system prior to cleaning and disinfecting.

15.2.1.1. Cleaning

The validated cleaning agents for cleaning the transducer are:

- Ethanol (75%)

- Isopropanol (70%)

Cleaning agents should be applied and removed using a clean, soft, sterile, non-abrasive cloth or paper towel.

To clean the transducers:

1. Disconnect the transducer from the system.

2. Wear sterile protective gloves to prevent infection.

3. Remove all residual foreign matters from the transducer using sterile cloth or paper towel immediately after examination. For the situation where a protective sheath is used, the protective sheath should be removed first and discarded.

4. Wipe the surface of the transducer and cable with a sterile cloth dampened with the cleaning solution until no visible contaminants remain.

5. After cleaning, wipe off the cleaning solution with a new sterile cloth or towel dampened with tap water until no visible cleaning agent remains.

6. Wipe off with a dry sterile cloth to remove residual moisture.

7. Leave the transducer to air dry.

8. If the transducer is not visually clean at the end of the cleaning steps, please repeat the cleaning steps through step 4 to step 7.

9. Inspect the transducer to ensure that there is no damage. The transducer should be disposed of properly when any damage is found.

WARNING

1. Unplug the transducer from the system prior to cleaning or disinfecting.

2. To avoid infection, always use protective gloves when performing cleaning and disinfecting procedures.

3. Prohibit infiltration of any type of liquid into the device or the transducer.

15.2.1.2. Disinfection

Selecting a proper way to disinfect your transducers based on your transducer applied region:

Transducer Applied Region	Transducer Type	Disinfecting Intensity	Disinfecting Method
Contact intact body surface	Body surface	LLD	Spraying or wiping
Contact mucous membrane	Intra-cavity	HLD	Immersion
Note: LLD=Low-level Disinfection; HLD=High-level disinfection			

The validated disinfectants for transducer are:

Disinfectants	Disinfecting Intensity	Disinfecting Method
Ethanol (75%)	LLD	Spraying or wiping
Isopropanol (70%)	LLD	Spraying or wiping
Cidex OPA (0.55%)	HLD	Immersion
Cidex Glutaraldehyde(2.4%)	HLD	Immersion

WARNING

1. Unplug the transducer from the system prior to cleaning or disinfecting.

2. To avoid infection, always use protective gloves when performing cleaning and disinfecting procedures.

3. To avoid infection, ensure that the expiration date of the disinfecting solution has not passed.

4. Please clean the transducer first before disinfection.

Disinfecting by spraying or wiping:

1. Disconnect the transducer from the system.

2. Wear protective gloves to prevent infection.

3. Clean and dry the transducer according to the methods in section *15.2.1.1 Cleaning*.

4. Prepare the disinfectant solution (75% ethanol or 70% isopropanol).

5. Spray the solution to the transducer surface or wipe it with a sterile cloth dampened with the disinfectant solution. Follow the disinfectant manufacturer's recommended contact time and mode.

6. Rinse the transducer according to the disinfectant instructions. Wipe the transducer with a dry sterile cloth or leave the transducer to air dry.

7. Inspect the transducer to ensure that there is no damage.

Note:

If Ethanol or Isopropanol is used for both cleaning and disinfecting, then a new cloth is required for the disinfection step.

Disinfecting by Immersion:

1. Disconnect the transducer from the system.

2. Wear protective gloves to prevent infection.

3. Clean and dry the transducer according to the methods in section *15.2.1.1 Cleaning*.

4. Prepare the disinfectant solution (Cidex OPA 0.55% or Cidex Glutaraldehyde 2.4%). Refer to the instructions provided by the disinfectant manufacturer for the concentration of the disinfection solution, method of dilution, method of disinfection, temperature and cautions during use.

5. Place the cleaned and dried transducer in contact with the disinfectant (refers to figure 15-1 for the contacting area) for the time specified by the disinfectant manufacturer. For example, the contact time recommended by the manufacturer for soaking in Cidex Glutaraldehyde(2.4%) is at least 45 min.

6. Rinse the transducer thoroughly with sterile water to remove all chemical residues. For example, it is required to flush the transducer after soaking in Cidex Glutaraldehyde(2.4%) with plenty of sterile water (about 2 gallons) at least one time. Or, follow the complete rinsing instructions provided by the disinfectant manufacturer to rinse the transducer.

7. Wipe off the water on the transducer with a dry sterile cloth. Leave the transducer to air dry.

8. Inspect the transducer to ensure that there is no damage.
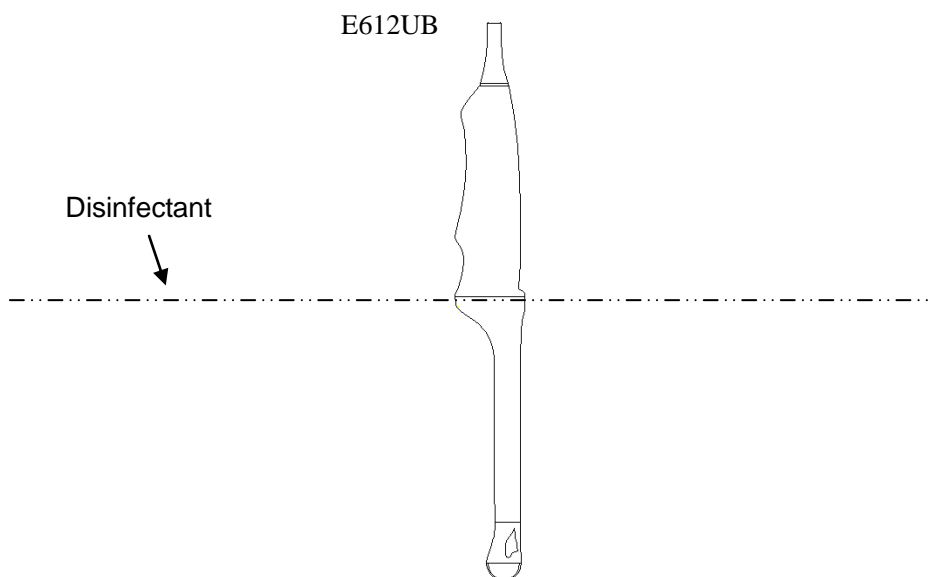
Figure 15-1 Depth of the Transducer Immerged into Disinfectant

WARNING

1. Do not immerse the transducer connector. If the cable connector is immersed, do not plug the connector into the system. Rinse the connector under running water and dry it thoroughly. If necessary, contact EDAN for service.

2. Prohibit infiltration of any type of liquid into the device or the transducer.

3. Do not immerse the cable and connector of the transducer into solutions. Transducers can be submerged to, but not including, the strain relief of the transducer array. Do not immerse or soak any part of a transducer in any cleaning material not listed in the recommended list of disinfectants.

4. Use the immersion method to disinfect the intra-cavitary transducer(E612UB).

5. Only non-immersion method can be used with solution of ethanol or isopropanol.

6. The immersion time should not exceed the time that is specified by the disinfectant manufacturer.

7. Patient contact area should be immersed into the solution while using the immersion method, but should not exceed the depth shown in figure 15-1.

8. Do not sterilize the transducer using techniques such as autoclave, ultraviolet, gamma radiation, gas, steam, or heat. Severe damage may result.

15.2.1.3. Using Transducers

Proper Use of Probes

In order to extend the service life and to obtain optimum performance of the probe, please operate as follows:

1. Inspect the cable, socket and acoustical window of the probe periodically.

2. Shut down the machine before connecting or disconnecting the probe.

3. Do not drop the probe onto the floor or collide with hard objects. Otherwise, it will be damaged easily.

4. When the probe is not used, put it in the probe holder.

5. Do not heat the probe.

6. Do not pull or bend the power cord of the probe.

7. Coupling gel can only be used on the head of the probe, and it should be wiped off after use.

8. Clean and disinfect the probe after every use.

9. The acoustical window and the shell of the probe should be examined frequently.

CAUTION

1. Do not disinfect or clean transducers under high temperatures. The temperature should be below 45°C.

2. To avoid damaging the device, the disinfection method is limited to the regular maintenance of devices in hospitals. Disinfecting instruments should be cleaned first.

3. The coupling gel adapted to the transducer is a medical ultrasound coupling gel. Use only ultrasound coupling gel that complies with local regulations.

Use of Transducer sheath

NOTE：

The single-use sheath should be used on E612UB transducer. Before cleaning the transducer, remove the sheath gently and discard it. Put on a new single-use sheath before using the transducer.

CAUTION

1. Always wear gloves to perform the following steps.
2. To minimize the disease transmission, legally marketed, sterile transducer sheath is required to used for intra-cavitary procedures.
3. DO NOT use an expired probe sheath. Check whether the term of validity has expired prior to using probe sheaths.
4. The single-use sheath should comply with the local regulations.

To install transducer sheath:

1. Place an adequate amount of sterile coupling gel on the acoustic window of the probe;

2. Insert the probe into the sheath;

3. Pull the sheath over the probe and cable until the sheath is fully extended;

4. Secure the sheath using the bands or clips supplied with the sheath;

5. Check and eliminate bubbles between the face of the probe and the sheath. Bubbles between the face of probe and the sheath may affect the ultrasound imaging.

6. Inspect the sheath to ensure that there are no damages (i.e. holes or tears).

15.2.1.4. Storage

WARNING

1. Dry the transducer after high-level disinfection or sterilization and store it in sterile environment.

2. Do not use the carrying case for storing the transducer, because the carrying case may become a source of infection.

1. Ensure the transducer is cleaned, disinfected, sterilized and completely dried before storage.

2. Store the transducer in a sterile environment or in a disposable sterile package.

3. Store the transducer under the following conditions:

   a) Atmospheric Temp.: -20℃～+55℃

   b) Relative Humidity: 15%~95% (Non-condensing)

   c) Atmospheric Pressure: 70kPa ~ 106kPa.

15.2.2. Needle Guide Bracket Cleaning and Sterilization

NOTE:

1. Use proper sterilization technique at all times when performing a biopsy.

2. Ensure that protective gloves are worn.

WARNING

1. The needle guide bracket kits are not disinfected or sterilized before delivery. The operators must clean and sterilize the needle guide bracket kits before the first use and after each subsequent use.

2. Inspect the bracket for damage such as cracks or breakage. If damage is evident, discontinue use of bracket and contact your Edan representative for disposal guidance.

3. Sterilize the bracket before disposal or sending back to manufacturer for repair.

15.2.2.1 Cleaning

1. Wear sterile protective gloves to prevent infection.

2. Disconnect the needle guide bracket from the transducer after each use, and remove all visible residues from the needle guide bracket using a small and soft-bristled brush or other similar devices. Do the cleaning quickly before the needle guide bracket dries out.

3. Soak the needle guide bracket in the cleaning solution (Ethanol 75% or Isopropanol 70%) for

at least five minutes. Use a soft-bristled brush to clean the needle guide bracket during the soaking.

4. Take out the needle guide bracket from the cleanser and wipe all residues with a sterile cloth.

5. Let the bracket air dry, or dry the bracket with a sterile cloth.

6. If the bracket is not visually clean at the end of the cleaning steps, please repeat the cleaning steps through step 3 to step 5.

7. Inspect the bracket to ensure that there is no damage. The bracket should be disposed of properly when any damage is found.

15.2.2.2 Sterilization

1. Wear sterile protective gloves to prevent infection.

2. Disconnect the bracket from the transducer, and remove all visible residues from the bracket using sterile cloth.

3. Clean and dry the bracket according to the methods in *section 15.2.2.1 Cleaning*.

4. Sterilize the bracket assembly by dynamic air removal steam sterilizer for at least four minutes at 132℃. Dry the bracket for at least 30 min after sterilization.

5. Inspect the bracket to ensure that there is no damage.

15.2.2.3 Storage

WARNING
1.   Dry the bracket after sterilization and store it in sterile environment.
2.   Do not use the carrying case for storing the bracket, because the carrying case may become a source of infection.

1. Ensure the bracket is cleaned, sterilized and completely dried before storage.

2. Store the bracket in a sterile environment or in a disposable sterile package.

3. Store the bracket under the following conditions:

     a)   Atmospheric Temp.: -20℃～+55℃

     b)   Relative Humidity: 15%~95% (Non-condensing)

     c)   Atmospheric Pressure: 70kPa ~ 106kPa.

15.2.3. System Cleaning and Disinfection

System Surface Cleaning

The validated disinfecting agents for cleaning the system are:

● Ethanol (75%)

● Isopropanol (70%)

To clean the system surface:

1. Switch off the system and unplug it.

2. Wear sterile protective gloves to prevent infection.

3. Remove all residual foreign matters from the system surface using sterile cloth or paper towel immediately after examination.

4. Use a sterile cloth dampened with cleaning agent to gently wipe the entire exterior surface, including the screen, of the equipment thoroughly until no visible contaminants remain.

5. After cleaning, wipe off the cleaning agent with a sterile cloth dampened with tap water until no visible cleaning agent remains.

6. Wipe off with a dry sterile cloth to remove residual moisture.

7. Leave the system to air dry.

8. If the system is not visually clean at the end of the cleaning steps, please repeat the cleaning steps through step 4 to step 7.

9. Inspect the system to ensure that there is no damage.

NOTE:

1. Make sure the system is free of gel and any other visible residue.

2. Use a soft dry cloth without chemicals for cleaning. The monitor surface is easily scratched.

To clean the trackball:

1. Remove the front panel bezel.

2. Remove the trackball as shown in.*Figure 15-2*.

3. Wipe the trackball, X and Y rollers, and the auxiliary idler wheel with a soft cloth dampened with the disinfecting agent until no visible contaminants remain.

4. Wipe off the disinfecting agent with a fresh cloth or towel, dampened with tap water after cleaning until no visible disinfecting agent remains.

5. Wipe off with a dry cloth to remove residual moisture.

6. Leave the trackball, X and Y rollers, and the auxiliary idler wheel to air dry.

7. Assemble the trackball and front panel bezel after the assembly parts completely dry.

Rotate clockwise to remove the fixing ring

Rotate counterclockwise to mount the fixiing ring
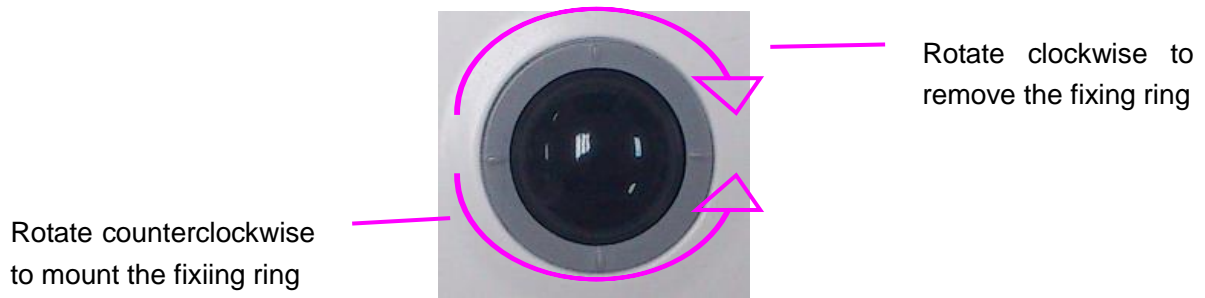
Figure 15-2 Assembling and Disassembling Trackball

Auxiliary idler wheel
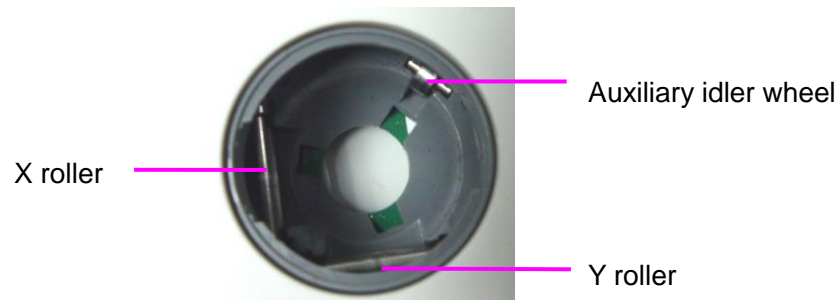
X roller

Y roller

Figure 15-3 X and Y Rollers and the Auxiliary Idler Wheel

CAUTION

Do not drop or place foreign objects inside the trackball assembly or it may affect the trackball operation and damage the system.

NOTE:

Be sure to clean the X and Y rollers and the auxiliary idler wheel.

System Surface Disinfection

The validated disinfecting agents for disinfecting the system are:

● Ethanol (75%)

● Isopropanol (70%)

To disinfect the system surface:

1. Switch off the system and unplug it.

2. Wear protective gloves to prevent infection.

3. Clean the system prior to disinfection.

4. Prepare the disinfectant solution.

5. Wipe the entire exterior surface of the equipment thoroughly with a soft sterile cloth dampened with the disinfectant solution. Follow the disinfectant manufacturer's recommended contact time and mode.

6. After disinfection, wipe off the disinfecting agent with a new sterile cloth dampened with sterile water.

7. Wipe the system with a dry sterile cloth or leave the system to air dry.

8. Inspect the system to ensure that there is no damage.

NOTE:

After cleaning or disinfecting, check if the device, transducer, cable and accessories function well. If any problem is detected, please contact the manufacturer for service before reusing them.

Check Item	Check Method
Visual	Inspect the device, probe, cable and accessories etc. for any damage.
Power On	Power on the system, check if the system boots up successfully without errors and enters the main display.
Functionality Test	After power up, check if the AC power indicator and battery status indicator in lower right of the screen are as described in *Section 5.3*. Check the control panel for any damage.
Performance	Inspect probes for cracks, openings, or other damage that could allow liquid entry.
System	Connect probes to the system, and check if the main display is as described in *Section 5.3*.

15.3. Replacing Fuses

You can replace the fuses if necessary.

Step 1. Pull out the fuse-box using tweezers;

Step 2. Use the tweezers to pull the fuses out through the small hole on the bottom of the box;

Step 3. Put new fuses (φ5×20, T3.15AH250V) provided by EDAN in position, and reposition the fuse-box.

Step 1

Step 2

Step 3

Figure 15-4 Replacing Fuses

WARNING

Ruptured fuse must only be replaced with those of the same type and rating as the original.

15.4. Maintenance

CAUTION

Besides the maintenance requirements recommended in this manual, comply with local regulations on maintenance and measurement.

WARNING

Failure on the part of the responsible individual hospital or institution employing this equipment to implement a satisfactory maintenance schedule may cause undue equipment failures and possible health hazards.

Maintenance must be performed every 12 months, including the safety and functionality of the system.

The following safety checks should be performed at least every 12 months by a qualified person who has adequate training, knowledge, and practical experience to perform these tests.

◆ Inspect the safety-related labels for legibility.

◆ Inspect the fuse to verify compliance with rated current and breaking characteristics.

◆ Verify that the device function properly as described in the instructions for use.

◆ Test the protection earth resistance according to IEC/EN 60601-1 and IEC/EN 60601-2-37: Limit: 0 - 0.1 Ω.

◆ Test the earth leakage current according to IEC/EN 60601-1 and IEC/EN 60601-2-37: Limit: NC 500 μA, SFC 1000 μA.

◆ Test the patient leakage current according to IEC/EN 60601-1 and IEC/EN 60601-2-37: Limit: AC NC 100 μA, SFC 500 μA, DC NC 10 μA, SFC 50 μA.

◆ Test the enclosure leakage current according to IEC/EN 60601-1 and IEC/EN 60601-2-37: Limit: NC100 μA, SFC 500 μA.

◆ The leakage current should never exceed the limit.

The data should be recorded in an equipment log. If the device is not functioning properly or any of the above tests fail, please contact the maintenance personnel of EDAN.

Chapter 16 Transportation and Storage

16.1. Moving the System

The system is designed to be portable and easily transported. Power off the system and secure all accessories before moving it to another location.

CAUTION

1 Switch off the ultrasound system. Unplug the power cord from the power source and secure the power cable.

2 Put the probes in the probe holder, or remove them and place them in the protective carrying cases.

3 Disconnect and secure the footswitch and the connecting cable.

4 Raise the brakes away from the front and back caster wheels of the mobile trolley (optional).

5 Push the handle to roll the system forward and maneuver it to its new location and lock the wheel caster brakes of the mobile trolley (optional).

6 Connect optional system accessories, such as the single-pedal footswitch.

7 Secure the system and complete the system setup, and then perform all the daily checking before using it.

16.2. Storage

◆ Do not place the device near the ground, walls or the roof.

◆ Keep good indoor ventilation. Avoid strong and direct sunlight, and erosive gas.

16.3. Transportation

To prepare the system for shipment over long distances or rough terrain, repack the system in the factory packing

To prepare the system for transport over distances: load the system into a vehicle using a lift gate.

To prevent lateral movement of the system, secure the system with cargo straps. To prevent sudden jarring of the system during transport, provide anti-shock cushions beneath the system.

It is suitable for transportation by air, railway, highway and ship. Protect the system from inversion, collision, and splashing with rain and snow.

Chapter 17 Troubleshooting

17.1. Checkup

◆ Check whether the power supply works properly and the power cord is well connected and plugged into the power socket.

◆ Check whether the probe is properly connected to the main unit.

17.2. Troubleshooting

◆ Changing the cartridge fuse (You can replace the fuses if necessary).

◆ Troubleshooting (see *Table 17-1*)

Item	Problem	Solution
1	When the power switch is on, there isn't any image displayed.	1. Check power supply. 2. Check wires and plugs. 3. Check whether the cartridge fuse is melted. 4. Check the brightness control knob.
2	Strip-shape or snowflake-shape disturbance occurs on the display screen.	1. Inspect the power supply. 2. Check whether it is disturbed by the ignition action of any other device. 3. Check the disturbance of electric or magnetic field in the surrounding environment. 4. Check whether the plug and socket of power supply and probe are properly connected.
3	Image is not displayed clearly on the screen.	1. Adjust overall gain (Gain). 2. Adjust eight TGC slide controls. 3. Adjust the brightness. 4. Adjust focus (the number and the position).
4	Near-field image is not clear.	Adjust the key total gain and the upper TGC
5	Far-field image is not clear.	Adjust the key total gain and the lower TGC
6	Image window is dark.	Adjust the brightness and slide the TGC controls to the right most.

Table 17-1 Troubleshooting Examples

Chapter 18 Warranty and Service

18.1. Warranty

EDAN warrants that EDAN's products meet the labeled specifications of the products and will be free from defects in materials and workmanship that occur within the warranty period.

The warranty is void in cases of:

   a) Damage caused by mishandling during shipping.

   b) Subsequent damage caused by improper use or maintenance.

   c) Damage caused by alteration or repair by anyone not authorized by EDAN.

   d) Damage caused by accidents.

   e) Replacement or removal of serial number label and manufacture label.

If a product covered by this warranty is determined to be defective because of defective materials, components, or workmanship, and the warranty claim is made within the warranty period, EDAN will, at its discretion, repair or replace the defective part(s) free of charge. EDAN will not provide a substitute product for use when the defective product is being repaired.

18.2. Contact information

If you have any questions about maintenance, technical specifications or malfunctions of devices, contact your local distributor.

Alternatively, you can send an email to EDAN service department at: support@edan.com.cn.

Appendix I: Specifications

A1.1: Electrical Safety Classifications

According to the type of protection against electric shock	Internally powered equipment, Class I equipment
According to the degree of protection against electric shock	Type BF
According to the degree of protection against harmful ingress of liquid	Whole device: Ordinary equipment (Sealed equipment without liquid proof); Probe (not including the probe connector): IPX7; Footswitch (optional): IP68.
According to the degree of safety of application in the presence of a flammable gas	Equipment not suitable for use in the presence of a flammable gas
According to the mode of operation	Continuous operation
According to the grade of EMC	CISPR 11 Group 1, Class A
Standards Compliance	EN 60601-1:2006/A1:2013 idt IEC 60601-1: 2005/A1:2012 EN 60601-1-2: 2015 idt IEC 60601-1-2: 2014 EN 60601-2-37:2008/A1:2015 idt IEC 60601-2-37:2007/A1:2015

A1.2: Power Supply

Operating Voltage	100 V-240 V~
Operating Frequency	50 Hz/60 Hz
Input Current	1.8A-0.8A
Lithium battery	
Capacity	5000 mAh
Voltage	14.8 VDC
Average working time	1 h
Maximum charging time	8 h
Cycle life	300 times

A1.3: Machine Specifications

Main unit dimensions	33cm（L）x22cm（W）x32cm（H）
Net weight	7.8kg (not including probes and Lithium battery)

A1.4: Display Specifications

Display	TFT-LCD
Diagonal Size	12.1-inch
View Angle	140º
Pixel Number	1024*768
White Luminance	Typ.: 500 cd/m^2
Contrast Ratio	Typ.: 700

A1.5: General Technical Specifications

Display Modes	B Mode:Single, Dual, Quad C Mode: B/C (Single, Dual); 　　　　　B+B/C (Simultaneous dual mode); 　　　　　B/C/PW (Triplex mode or not) PDI/DPDI Mode: 　　　　　B/PDI(DPDI) (Single, Dual); 　　　　　B+B/PDI(DPDI) (Simultaneous dual mode); 　　　　　B/PDI(DPDI)/PW (Triplex mode or not) PW Mode: 　　　　　B/PW (Duplex mode or not); 　　　　　B+C/PW, B+PDI(DPDI)/PW (Duplex mode or not); 　　　　　B/C/PW, B/PDI(DPDI)/PW (Triplex mode or not); CW Mode: 　　　　　B/CW; 　　　　　B+C/CW, B+PDI(DPDI)/CW; 　　　　　B/C/CW, B/PDI(DPDI)/CW M Mode: B/M (Display layout:Up/down, Left/right,1:1)
Image Gray Scale	256 levels
Image Magnification	In area Real time:×1.2, ×1.4, ×1.6, ×2.0, ×2.4, ×3.0, ×4.0； Frozen: ×1.14, ×1.33, ×1.6, ×2.0, ×2.67, ×3.2, ×4.0
Storage	Local disk: 504 MB Internal hard disk: 500G (optional)
Cine Review	409 frames(Color)/1227frames（Black & White）
Depth Adjustment	Adjustable in real time in all modes

Image Conversion	Up/Down flip, Left/Right flip, 90°rotate, B/W invert
Language Conversion	Chinese, English, etc. (The language options varies with language software installed.)
Focus Number	Max. 4
Software Packages	Abdomen, obstetric, small parts, gynecology, cardiology, urology, vascular and pediatrics.
B mode generic measurement	Distance, area, volume, ratio, angle, and histogram.
M mode generic measurement	Distance, time, slope, and heart rate
D mode generic measurement	Velocity, Heart Rate, Time, Acceleration, Resistance Index (RI), Pulsatility Index (PI) and Auto Trace (auto trace is available only for PW mode)
Annotations	Patient name, age, sex, time, date, hospital name, doctor name, comment (full-screen character editing)
Body Mark	150 types

A1.6: Probe Specifications

This device can detect the probe automatically.

Model	Application
C352UB/ C5-2b	Abdomen, obstetrics, gynecology, urology
E612UB	Endovaginal, obstetrics
L742UB/L1042UB/ L15-7b	Small parts, musculo-skeletal (both conventional and superficial), peripheral vascular
C612UB/C6152UB	Pediatrics, pediatrics cardiac
C422UB	Abdomen, adult cardiac
L552UB	Small parts, musculo-skeletal (both conventional and superficial), peripheral vascular, pediatrics
P5-1b	Adult cardiac
NOTE: Maximum endocavity transducer temperature rise during simulated operation: Less than 6 °C. Maximum temperature rise for other transducers during simulated operation: Less than 10 °C.	

Probe Index Table-1:

Index \ Probe	C352UB	L742UB	L1042UB	E612UB
Probe type	Convex array probe（R50）	Linear array probe	Linear array probe	Micro Convex array probe（R10）
Central frequency, MHz	3.5	7.5	9.5	6.5

Probe Index Table-2:

Index \ Probe	C612UB	C6152UB	C422UB	L552UB
Probe type	Micro Convex array probe（R10）	Micro Convex array probe （R15）	Micro Convex array probe （R20）	Linear array probe(L50)
Central frequency, MHz	6.5	6.5	4.0	5.5

Probe Index Table-3:

Index \ Probe	C5-2b	P5-1b	L15-7b
Probe type	Convex array probe (R60)	Phased array probe	Linear array probe
Central frequency, MHz	3.5	2.5	12

A1.7: Operating, Storage and Transportation Environment

A1.7.1.Operating Environment

Temperature	+5 °C ~ +40 °C(+41ºF ~ +104ºF)
Relative humidity range	25% RH ~ 80% RH (non-condensing)
Atmospheric pressure range	860 hPa ~ 1060 hPa

A1.7.2.Storage and Transportation Environment

Temperature	-20 °C ~ +55 °C(-4ºF ~ +131ºF)
Relative humidity range	25% RH ~ 93% RH (non-condensing)
Atmospheric pressure range	700 hPa ~ 1060 hPa

Appendix II: Ultrasound Intensity and Safety

A2.1: Ultrasound in Medicine

The use of diagnostic ultrasound has proved to be a valuable tool in medical practice. Given its known benefits for non-invasive investigations and medical diagnosis, including investigation of the human fetus, the question of clinical safety with regards to ultrasound intensity arises.

There is no easy answer to the question of safety surrounding the use of diagnostic ultrasound equipment. Application of the ALARA (As Low As Reasonably Achievable) principle serves as a rule-of-thumb that will help you to get reasonable results with the lowest possible ultrasonic output.

The American Institute of Ultrasound in Medicine (AIUM) states that given its track record of over 25 years of use and no confirmed biological effects on patients or instrument operators, the benefits of the prudent use of diagnostic ultrasound clearly outweigh any risks.

A2.2: Ultrasound Safety and the ALARA Principle

Ultrasound waves dissipate energy in the form of heat and can, therefore, cause tissue warming. Although this effect is extremely low with Transcranial Doppler, it is important to know how to control and limit patient exposure. Major governing bodies in ultrasound have issued statements to the effect that there are no known adverse effects from the use of diagnostic ultrasound; however, exposure levels should always be limited to As Low As Reasonably Achievable (the ALARA principle).

Imaging Functions Affecting Acoustic Output

In addition to the level of voltage transmitted, adjustment of the following imaging functions and /or controls may affect the acoustic output.

Item	Affection
Probe	Acoustic output will be changed with the change of probe.
Imaging mode	There are different parameters applied in B mode, Color mode, M mode, and PW mode, so acoustic output will be changed with the change of among B mode, Color mode, M mode, and PW mode.
Field of view (scan angle or scan width)	Frame rate may be changed with the change of the scan angle of the scan width, and the acoustic output will also be changed.
Image depth	Pulse repeated frequency will be changed with the change of the image depth, and the acoustic output will be changed.
Focus number	Frame rate and focus position will be changed with the change of the focus number, and acoustic output will also be changed.

Focus position	Acoustic output will be changed with the change of the focus position even the beam power level and the beam aperture have not been changed. Generally, the acoustic output will be higher with it gets nearer to the probe.
Freeze	When freezing the system, it will stop transmitting ultrasonic wave.
Multi-frequency	The character of the wave focus will be changed with the change of the frequency, and acoustic output will be changed.
Line density	The acoustic output will be changed with the change of the number of the scanning line (line density).
PRF	The acoustic power will be changed with the change of PRF.
Sample volume	The pulsed wave and the power will be changed with the change of the sample volume, and acoustic output will be changed.
Presets	Presets contain all the parameters above, so any change of the presetting will change acoustic output.
Restart, or power on/off	System will return to the default setting when restarting, or powering on/off the system, and acoustic output will be changed.

A2.3: Explanation of MI/TI

A2.3.1. MI (Mechanical Index)

Cavitations will be generated when an ultrasound wave passes through and contacts tissues, resulting in instantaneous local overheating. This phenomenon is determined by acoustic pressure, spectrum, focus, transmission mode, and factors such as states and properties of the tissue and boundary. This mechanical bioeffect is a threshold phenomenon that occurs when a certain level of ultrasound output is exceeded. The threshold is related to the type of tissue. Although no confirmed adverse mechanical effects on patients or mammals caused by exposure at intensities typical of present diagnostic ultrasound instruments have ever been reported, the threshold for cavitation is still undetermined. Generally speaking, the higher the acoustic pressure, the greater the potential for mechanical bioeffects; the lower the acoustic frequency, the greater the potential for mechanical bioeffects.

The AIUM and NEMA formulate mechanical index (MI) in order to indicate the potential for mechanical effects. The MI is defined as the ratio of the peak-rare factional acoustic pressure (should be calculated by tissue acoustic attenuation coefficient 0.3dB/cm-MHz) to the square root of acoustic frequency.

$$MI = \frac{Pr, \alpha}{\sqrt{faw} \times C_{MI}}$$

$C_{MI} = 1$ (MPa / MHz)

A2.3.2. TI (Thermal Index)

Heating of tissues is caused by absorption of ultrasound when the ultrasound energy is applied. The temperature rise is determined by the acoustic intensity, exposed area and thermophysical properties of the tissue.

In order to indicate the potential for temperature rise caused by thermal effects, the AIUM and NEMA formulate thermal index (TI). It is defined as the ratio of the total acoustic power to the acoustic power required to raise the tissue temperature by 1 ℃.

According to different thermophysical properties of the tissue, TI is divided into three kinds: TIS, TIB and TIC.

TIS (Soft Tissue Thermal Index): It provides an estimate of potential temperature rise in soft or similar tissues.

TIB (Bone Thermal Index): It provides an estimate of potential temperature rise when the ultrasound beam passes through soft tissue and a focal region is in the immediate vicinity of bone.

TIC (Cranial Bone Thermal Index): It provides an estimate of potential temperature rise in the cranial bones or superficial bones.

A2.3.3. Display of MI/TI

The system provides real-time display of MI/TI values in the upper right part of the screen. The start point of MI/TI value is 0.0. You can preset which TI item is to be displayed through **Preset**>**System Preset**.

The operator should monitor these values during examinations and keep the exposure time and output level at the minimum amounts needed for effective diagnosis.

The display precision is 0.1.

MI display error:

When tested MI ≤0.6, the absolute display error ＜ 0.39;

When tested MI > 0.6, the relative display error ＜±65%.

TI display error:

When tested TI ≤1.2, the absolute display error ＜ 0.78;

When tested TI > 1.2, the relative display error ＜±65%.

A2.4: Acoustic Output

A2.4.1. Factors that Contribute to Uncertainty in the Output Display

A number of factors should be considered in display accuracy determination methods, such as:
- Transducer variability
- System variability

- Measurement variability and accuracy
- The number of operating conditions of which the system is capable and the number tested in obtaining display accuracy results
- Whether display accuracy will be determined by specific combinations of system, mode, transducer assembly and transmit patterns, or all allowed combinations of them
- Accuracy of system software MI and TI calculation algorithms.
- Engineering approximations for real-time calculations

A2.4.2. Differences between Actual and Displayed MI/TI

Actually, many assumptions adopted in the process of measurement and calculations are relatively conservative. Over-estimation of actual in situ intensity exposure, for the majority of tissue paths, is made to the measurement and calculation process. For example, attenuation coefficient of 0.3 dB/cm-MHz, which is much lower than the actual value for most tissues of the body, is adopted. And conservative values of tissue characteristics are selected for use in TI models. Therefore, the display of MI and TI should be used as relative information to assist operator in prudent use of ultrasound system and implementation of ALARA principle, and the values should not be interpreted as the actual physical values in tissues or organs examined.

A2.4.3. Measurement Uncertainty

The uncertainties in the measurements were predominantly systematic in origin; the random uncertainties were negligible in comparison. So the intensity and pressure measurement uncertainties were showed in table 1 and table 2. The power, the center frequency and MI measurement uncertainties were showed in table 3.

Table 1 The intensity and pressure measurement uncertainties table

Transducer	Total Error		Hydrophone Sensitivity		Digitizer	
	Intensity	Pressure	Intensity	Pressure	Intensity	Pressure
C5-2b	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
L15-7b	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
P5-1b	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
C352UB	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
L742UB	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
L1042UB	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
E612UB	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
C422UB	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
C612UB	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
C6152UB	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
L552UB	±22.91%	±11.46%	±14%	±7%	±0.80%	±0.40%
Notes	The RMS combination of		Uncertainties based on		Uncertainties based on	

	all sources of measurement uncertainty, based on all sources being independent.	the hydrophone calibration certificate.	oscilloscope calibration certificate.

Table 2 The intensity and pressure measurement uncertainties table

Transducer	Temp		Spatial Ave.		Distortion	
	Intensity	**Pressure**	**Intensity**	**Pressure**	**Intensity**	**Pressure**
C5-2b	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
L15-7b	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
P5-1b	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
C352UB	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
L742UB	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
L1042UB	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
E612UB	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
C422UB	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
C612UB	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
C6152UB	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
L552UB	±2.40%	±1.20%	±17.5%	±8.75%	±4%	±2%
Notes	Uncertainties based on temperature variation of the water bath and difference in the mean temperature between the hydrophone calibration lab and our facility.		Uncertainties based on part 7 of A2.7 and discussions with industry consultants.		Non-linear distortion estimates are based on part 7 of A2.7 and discussions with industry consultants.	

Table 3 The power, center frequency and MI measurement uncertainties table

Transducer	Total uncertainties		
	Power	**Center frequency**	**MI**
C5-2b	±22.91%	±0.2%	±11.68%
L15-7b	±22.91%	±0.2%	±11.68%
P5-1b	±22.91%	±0.2%	±11.68%
C352UB	±22.91%	±0.2%	±11.68%
L742UB	±22.91%	±0.2%	±11.68%
L1042UB	±22.91%	±0.2%	±11.68%
E612UB	±22.91%	±0.2%	±11.68%
C422UB	±22.91%	±0.2%	±11.68%
C612UB	±22.91%	±0.2%	±11.68%

C6152UB	±22.91%	±0.2%	±11.68%
L552UB	±22.91%	±0.2%	±11.68%
Notes	Uncertainties based on the intensity uncertainties.	Uncertainties based on the oscilloscope.	Uncertainties based on the pressure and center frequency.

A2.5: Operator Control Features

The possibility of producing mechanical/thermal biological effects can be influenced by three kinds of controls: Direct Controls, Indirect Controls, and Receiver Controls. The qualified operator may use the system controls to minimize the ultrasound output while acquiring necessary clinical information.

◆ Direct Controls

The acoustic output of the system can be controlled directly through the level of voltage transmitted. In this case, the maximum acoustic output never exceeds the limits in any mode of operation.

◆ Indirect Controls

The acoustic output of the system can be controlled indirectly through many imaging parameters, including imaging modes, probe frequency, focus number/position, depth and pulse repetition frequency (PRF).

The imaging mode determines whether the ultrasound beam is scanning or non-scanning. Thermal bioeffect is closely associated with M, PW and Color mode.

Acoustic attenuation of tissue is directly connected to probe frequency.

The focus number/position is related to active aperture of probe and beam width.

The higher PRF (pulse repetition frequency), the more output pulses occur over a period of time.

◆ Receiver Controls

The receiver controls (such as gain, TGC, dynamic range and image processing), which are used to improve image quality, have no effect on acoustic output. Thus these controls should be optimized before increasing acoustic output.

A2.6: Prudent Use Statement

Although no confirmed bioeffects on patients caused by exposure from present diagnostic ultrasound equipment have ever been reported, the potential exists that such bioeffects may be identified in the future. Therefore, the ultrasound should be used prudently. High levels of acoustic output and long exposure time should be avoided while acquiring necessary clinical information.

A2.7: References for Acoustic Output and Safety

1. "Bioeffects and Safety of Diagnostic Ultrasound" issued by AIUM in 1993

2. "Medical Ultrasound Safety" issued by AIUM in 1994

3. "Acoustic Output Measurement Standard for Diagnostic Ultrasound Equipment, Revision 3" issued by AIUM/NEMA in 2004

4. "Information for Manufacturers Seeking Marketing Clearance of Diagnostic Ultrasound Systems and Transducers" issued in 2008.

5. IEC60601-2-37, Medical electrical equipment - Part 2-37:2007+AMD1:2015 Particular requirements for the basic safety and essential performance of ultrasonic medical diagnostic and monitoring equipment, International Electro technical Commission.

6. Roy C. Preston, David R. Bacon, and Robert A. Smith, Calibration of Medical Ultrasonic Equipment - Procedures and Accuracy Assessment, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, Vol. 35, No. 2, page110, March 1988.

A2.8: Probe Acoustic Output Parameters List

A2.8.1. Test of Probe C5-2b

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: C5-2b (P/N: 02.01.211004)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.03	0.98		0.98		N/A
Index Component Value				0.98	0.98	0.98	0.98	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	(MPa)	1.10					
	P	(mW)		117.25		117.25		N/A
	P_{1x1}	(mW)		90.19		90.19		
	z_s	(cm)			3.41			
	z_b	(cm)					3.41	
	z_{MI}	(cm)	4.50					
	$z_{PII,a}$	(cm)	4.50					
	f_{awf}	(MHz)	2.48	2.29	2.29	2.29	2.29	N/A
Other Information	prr	(Hz)	-					
	S_{rr}	(Hz)	64.14					
	n_{pps}		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	128.57					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	9.24					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	20.04					
	pr at z_{PII}	(MPa)	1.62					
Operating control conditions	Focus Depth(mm)		60	30	30	30	30	N/A
	Display Depth(mm)		68	39	39	39	39	N/A
	Frequency Index		H6.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:　　　　M mode

Transducer:　　C5-2b(P/N: 02.01.211004)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.20	0.03		0.12		N/A
Index Component Value				0.03	0.02	0.03	0.12	
Associated acoustic parameters	$p_{r,\,a}$ at z_{MI}	*(MPa)*	1.77					
	P	*(mW)*		3.71		3.71		N/A
	P_{IXI}	*(mW)*		2.86		2.86		
	z_s	*(cm)*			3.24			
	z_b	*(cm)*					0.02	
	z_{MI}	*(cm)*	4.26					
	$z_{PII,a}$	*(cm)*	4.26					
	f_{awf}	*(MHz)*	2.33	2.29	2.29	2.29	2.29	N/A
Other Information	prr	*(Hz)*	148.44					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,\,a}$ at $z_{PII,a}$	*(W/cm^2)*	179.70					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	26.41					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	53.10					
	pr at z_{PII}	*(MPa)*	2.51					
Operating control conditions	Focus Depth(mm)		60	40	40	50	50	N/A
	Display Depth(mm)		68	49	49	58	58	N/A
	Frequency Index		H5.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: C5-2b(P/N: 02.01.211004)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.20	1.01		1.10		N/A
Index Component Value				1.01	1.00	1.01	1.10	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.77					
	P	*(mW)*		120.96		120.96		N/A
	P_{IXI}	*(mW)*		93.05		93.05		
	zs	*(cm)*			3.41			
	zb	*(cm)*					3.41	
	zMI	*(cm)*	4.26					
	$z_{PII,a}$	*(cm)*	4.26					
	f_{awf}	*(MHz)*	2.33	2.29	2.29	2.29	2.29	N/A
Other Information	prr	*(Hz)*	148.44					
	Srr	*(Hz)*	64.14					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	179.70					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	26.41					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	53.10					
	pr at z_{PII}	*(MPa)*	2.51					
Operating control conditions	Focus Depth(mm)		60	40	40	50	50	N/A
	Display Depth(mm)		68	49	49	58	58	N/A
	Frequency Index		H5.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: C5-2b(P/N: 02.01.211004)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.23	0.93		0.93		N/A
Index Component Value				0.93	0.45	0.93	0.46	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.95					
	P	*(mW)*		83.51		83.51		N/A
	P_{IXI}	*(mW)*		64.24		64.24		
	zs	*(cm)*			3.24			
	zb	*(cm)*					3.66	
	zMI	*(cm)*	4.72					
	$z_{PII,a}$	*(cm)*	4.72					
	$fawf$	*(MHz)*	2.51	3.02	3.02	3.02	3.02	N/A
Other Information	prr	*(Hz)*	914.99					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	166.79					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	224.34					
	$Ispta$ at z_{PII} or z_{SII}	*(mW/cm^2)*	509.95					
	pr at z_{PII}	*(MPa)*	2.94					
Operating control conditions	Focus Depth(mm)		60	30	30	40	40	N/A
	Display Depth(mm)		68	39	39	49	49	N/A
	Frequency Index		2.5	3	3	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: C5-2b(P/N: 02.01.211004)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.23	1.51		1.91		N/A
Index Component Value				1.51	1.16	1.91	1.44	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	(MPa)	1.95					
	P	(mW)		174.97		200.76		N/A
	P_{1X1}	(mW)		134.60		154.43		
	z_s	(cm)			3.41			
	z_b	(cm)					3.41	
	z_{MI}	(cm)	4.72					
	$z_{PII,a}$	(cm)	4.72					
	f_{awf}	(MHz)	2.51	2.50	2.29	2.29	2.29	N/A
Other Information	prr	(Hz)	914.99					
	Srr	(Hz)	64.14					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	166.79					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	224.34					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	509.95					
	pr at z_{PII}	(MPa)	2.94					
Operating control conditions	Focus Depth(mm)		60	30	30	40	40	N/A
	Display Depth(mm)		68	39	39	49	49	N/A
	Frequency Index		2.5	3	3	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:B+C/B+PDI/B+DPDI mode

Transducer: C5-2b(P/N: 02.01.211004)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.34	0.15		0.15		N/A
Index Component Value				0.15	0.15	0.15	0.15	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	2.11					
	P	(mW)		12.72		12.72		N/A
	P_{IXI}	(mW)		9.78		9.78		
	zs	(cm)			5.01			
	zb	(cm)					4.39	
	zMI	(cm)	4.52					
	$z_{PII,a}$	(cm)	4.52					
	$fawf$	(MHz)	2.50	3.04	3.39	3.39	3.04	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	5.74					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	152.90					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	45.10					
	$Ispta$ at z_{PII} or z_{SII}	(mW/cm^2)	98.61					
	pr at z_{PII}	(MPa)	3.12					
Operating control conditions	Focus Depth(mm)		60	40	40	40	40	N/A
	Display Depth(mm)		78	49	49	49	49	N/A
	Frequency Index		2.5	3	3	3	3	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: C5-2b(P/N: 02.01.211004)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.23	1.08		1.08		N/A
Index Component Value				1.08	0.60	1.08	0.61	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.95					
	P	*(mW)*		96.23		96.23		N/A
	P_{1X1}	*(mW)*		74.02		74.02		
	z_s	*(cm)*			32.38			
	z_b	*(cm)*					3.66	
	z_{MI}	*(cm)*	4.72					
	$z_{PII,a}$	*(cm)*	4.72					
	f_{awf}	*(MHz)*	2.51	3.02	3.02	3.02	3.02	N/A
Other Information	prr	*(Hz)*	914.99					
	Srr	*(Hz)*	-					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	166.79					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	224.34					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	509.95					
	pr at z_{PII}	*(MPa)*	2.94					
Operating control conditions	Focus Depth(mm)		60	30	30	40	40	N/A
	Display Depth(mm)		68	39	39	49	49	N/A
	Frequency Index		2.5	3	3	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: C5-2b (P/N: 02.01.214387)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.84	1.01		1.01		N/A
Index Component Value				1.01	1.01	1.01	1.01	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.34					
	P	(mW)		116.39		116.39		N/A
	P_{IX1}	(mW)		89.53		89.53		
	zs	(cm)			3.76			
	zb	(cm)					3.76	
	zMI	(cm)	5.40					
	$z_{PII,a}$	(cm)	5.40					
	$fawf$	(MHz)	2.53	2.37	2.37	2.37	2.37	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	64.14					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	57.02					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	27.54					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	70.90					
	pr at z_{PII}	(MPa)	2.15					
Operating control conditions	Focus Depth(mm)		60	30	30	30	30	N/A
	Display Depth(mm)		68	39	39	39	39	N/A
	Frequency Index		H6.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		0 level	0 level	0 level	0 level	0 level	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer:　　C5-2b (P/N: 02.01.214387)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.69	0.04		0.11		N/A
Index Component Value				0.04	0.02	0.03	0.11	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.06					
	P	(mW)		4.01		3.56		N/A
	P_{1X1}	(mW)		3.08		2.74		
	z_s	(cm)			3.31			
	z_b	(cm)					3.64	
	z_{MI}	(cm)	4.74					
	$z_{PII,a}$	(cm)	4.74					
	f_{awf}	(MHz)	2.39	2.39	2.39	2.38	2.38	N/A
Other Information	prr	(Hz)	148.44					
	Srr	(Hz)	-					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	57.94					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	7.05					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	15.47					
	pr at z_{PII}	(MPa)	1.57					
Operating control conditions	Focus Depth(mm)		60	40	40	50	50	N/A
	Display Depth(mm)		68	49	49	58	58	N/A
	Frequency Index		H5.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: C5-2b (P/N: 02.01.214387)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.69	1.05		1.12		N/A
Index Component Value				1.05	1.03	1.04	1.12	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.06					
	P	(mW)		120.40		119.95		N/A
	P_{IXI}	(mW)		92.61		92.27		
	z_s	(cm)			3.76			
	z_b	(cm)					3.76	
	z_{MI}	(cm)	4.74					
	$z_{PII,a}$	(cm)	4.74					
	f_{awf}	(MHz)	2.39	2.37	2.37	2.37	2.37	N/A
Other Information	prr	(Hz)	148.44					
	Srr	(Hz)	64.14					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	57.94					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	7.05					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	15.47					
	pr at z_{PII}	(MPa)	1.57					
Operating control conditions	Focus Depth(mm)		60	40	40	50	50	N/A
	Display Depth(mm)		68	49	49	58	58	N/A
	Frequency Index		H5.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: C5-2b (P/N: 02.01.214387)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.28	1.07		1.07		N/A
Index Component Value				1.07	0.74	1.07	0.64	
Associated acoustic parameters	$p_{r.a}$ at zMI	*(MPa)*	2.03					
	P	*(mW)*		96.28		96.28		N/A
	P_{IXI}	*(mW)*		74.06		74.06		
	z_s	*(cm)*			1.74			
	z_b	*(cm)*					1.79	
	z_{MI}	*(cm)*	4.90					
	$z_{PII,a}$	*(cm)*	4.90					
	f_{awf}	*(MHz)*	2.50	3.03	3.03	3.03	3.03	N/A
Other Information	prr	*(Hz)*	900.00					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm^2)*	205.20					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	275.17					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	637.57					
	pr at z_{PII}	*(MPa)*	3.09					
Operating control conditions	Focus Depth(mm)		60	30	30	30	30	N/A
	Display Depth(mm)		68	39	39	39	39	N/A
	Frequency Index		2.5	3	3	3	3	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: C5-2b(P/N: 02.01.214387)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.28	2.08		2.08		N/A
Index Component Value				2.08	1.75	2.08	1.65	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	(MPa)	2.03					
	P	(mW)		212.67		212.67		N/A
	P_{IX1}	(mW)		163.59		163.59		
	z_s	(cm)			3.76			
	z_b	(cm)					1.79	
	z_{MI}	(cm)	4.90					
	$z_{PII,a}$	(cm)	4.90					
	f_{awf}	(MHz)	2.50	3.03	2.37	2.37	3.03	N/A
Other Information	prr	(Hz)	900.00					
	Srr	(Hz)	64.14					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	205.20					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	275.17					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	637.57					
	pr at z_{PII}	(MPa)	3.09					
Operating control conditions	Focus Depth(mm)		60	30	30	30	30	N/A
	Display Depth(mm)		68	39	39	39	39	N/A
	Frequency Index		2.5	3	3	3	3	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:B+C/B+PDI/B+DPDI mode

Transducer: C5-2b (P/N: 02.01.214387)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.04	0.13		0.13		N/A
Index Component Value				0.13	0.13	0.13	0.13	
Associated acoustic parameters	$p_{r.a}$ at zMI	*(MPa)*	1.65					
	P	*(mW)*		11.17		11.17		N/A
	P_{IXI}	*(mW)*		8.59		8.59		
	zs	*(cm)*			4.96			
	zb	*(cm)*					3.89	
	zMI	*(cm)*	5.00					
	$z_{PII,a}$	*(cm)*	5.00					
	f_{awf}	*(MHz)*	2.51	3.04	3.43	3.43	3.04	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	64.14					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm^2)*	141.40					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	56.20					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	133.18					
	pr at z_{PII}	*(MPa)*	2.54					
Operating control conditions	Focus Depth(mm)		60	40	40	40	40	N/A
	Display Depth(mm)		78	49	49	49	49	N/A
	Frequency Index		2.5	3	3	3	3	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: C5-2b (P/N: 02.01.214387)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.28	1.20		1.20		N/A
Index Component Value				1.20	0.87	1.20	0.77	
Associated acoustic parameters	$p_{r.a}$ at zMI	*(MPa)*	2.03					
	P	*(mW)*		107.45		107.45		N/A
	P_{IXI}	*(mW)*		82.65		82.65		
	z_s	*(cm)*			1.74			
	z_b	*(cm)*					1.79	
	z_{MI}	*(cm)*	4.90					
	$z_{PII,a}$	*(cm)*	4.90					
	f_{awf}	*(MHz)*	2.50	3.03	3.03	3.03	3.03	N/A
Other Information	prr	*(Hz)*	900.00					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm²)*	205.20					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	275.17					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm²)*	637.57					
	pr at z_{PII}	*(MPa)*	3.09					
Operating control conditions	Focus Depth(mm)		60	30	30	30	30	N/A
	Display Depth(mm)		68	39	39	39	39	N/A
	Frequency Index		2.5	3	3	3	3	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.2. Test of Probe P5-1b

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: P5-1b(P/N: 02.01.211291)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.00	0.59		0.59		N/A
Index Component Value				0.59	0.59	0.59	0.59	
Associated acoustic parameters	$p_{r.\,a}$ at z_{MI}	*(MPa)*	1.49					
	P	*(mW)*		108.80		108.80		N/A
	P_{IXI}	*(mW)*		63.74		63.74		
	z_s	*(cm)*			4.03			
	z_b	*(cm)*					4.03	
	z_{MI}	*(cm)*	3.60					
	$z_{PII,a}$	*(cm)*	3.60					
	f_{awf}	*(MHz)*	2.24	1.95	1.95	1.95	1.95	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	61.34					
	n_{pps}		1.00					
	$I_{pi.\,a}$ at $z_{PII,a}$	*(W/cm^2)*	143.49					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	15.20					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	26.84					
	pr at z_{PII}	*(MPa)*	1.98					
Operating control conditions	Focus Depth(mm)		60	50	50	50	50	N/A
	Display Depth(mm)		68	58	58	58	58	N/A
	Frequency Index		2	3	3	3	3	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer: P5-1b (P/N: 02.01.211291)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.31	0.03		0.14		N/A
Index Component Value				0.03	0.02	0.06	0.14	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.82					
	P	(mW)		3.29		5.29		N/A
	P_{1X1}	(mW)		2.70		4.41		
	z_s	(cm)			2.49			
	z_b	(cm)					2.63	
	z_{MI}	(cm)	3.78					
	$z_{PII,a}$	(cm)	3.78					
	f_{awf}	(MHz)	1.94	1.96	1.96	2.62	2.62	N/A
Other Information	prr	(Hz)	148.44					
	Srr	(Hz)	-					
	npps		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm²)	126.99					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm²)	20.55					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm²)	34.26					
	pr at z_{PII}	(MPa)	2.35					
Operating control conditions	Focus Depth(mm)		60	40	40	50	50	N/A
	Display Depth(mm)		68	49	49	58	58	N/A
	Frequency Index		H4.0	3	3	H4.0	H4.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: P5-1b (P/N: 02.01.211291)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.31	0.62		0.73		N/A
Index Component Value				0.62	0.61	0.65	0.73	
Associated acoustic parameters	$p_{r,\,a}$ at z_{MI}	*(MPa)*	1.82					
	P	*(mW)*		112.09		114.09		N/A
	P_{1X1}	*(mW)*		66.44		68.15		
	z_s	*(cm)*			4.03			
	z_b	*(cm)*					4.03	
	z_{MI}	*(cm)*	3.78					
	$z_{PII,a}$	*(cm)*	3.78					
	f_{awf}	*(MHz)*	1.94	1.95	1.95	1.95	1.95	N/A
Other Information	prr	*(Hz)*	148.44					
	Srr	*(Hz)*	61.34					
	n_{pps}		1.00					
	$I_{pi.\,a}$ at $z_{PII,a}$	*(W/cm^2)*	126.99					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	20.55					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	34.26					
	pr at z_{PII}	*(MPa)*	2.35					
Operating control conditions	Focus Depth(mm)		60	40	40	50	50	N/A
	Display Depth(mm)		68	49	49	58	58	N/A
	Frequency Index		H4.0	3	3	H4.0	H4.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: P5-1b(P/N: 02.01.211291)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.07	0.47		0.77		N/A
Index Component Value				0.47	0.17	0.77	0.43	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.57					
	P	(mW)		46.93		127.16		N/A
	P_{IXI}	(mW)		39.11		65.19		
	zs	(cm)			1.32			
	zb	(cm)					2.99	
	zMI	(cm)	3.35					
	$z_{PII,a}$	(cm)	3.35					
	$fawf$	(MHz)	2.17	2.50	2.50	2.49	2.49	N/A
Other Information	prr	(Hz)	914.99					
	Srr	(Hz)	61.34					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	86.20					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	133.29					
	$Ispta$ at z_{PII} or z_{SII}	(mW/cm^2)	220.65					
	pr at z_{PII}	(MPa)	2.02					
Operating control conditions	Focus Depth(mm)		160	150	150	20	20	N/A
	Display Depth(mm)		167	157	157	29	29	N/A
	Frequency Index		2	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: P5-1b (P/N: 02.01.211291)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.07	1.06		1.37		N/A
Index Component Value				1.06	0.76	1.37	1.02	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.57					
	P	(mW)		155.73		235.96		N/A
	P_{IXI}	(mW)		102.85		128.93		
	zs	(cm)			4.03			
	zb	(cm)					2.99	
	zMI	(cm)	3.35					
	$z_{PII,a}$	(cm)	3.35					
	$fawf$	(MHz)	2.17	2.5	1.95	1.95	2.49	N/A
Other Information	prr	(Hz)	914.99					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	86.20					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	133.29					
	$Ispta$ at z_{PII} or z_{SII}	(mW/cm^2)	220.65					
	pr at z_{PII}	(MPa)	2.02					
Operating control conditions	Focus Depth(mm)		160	30	30	30	30	N/A
	Display Depth(mm)		167	39	39	39	39	N/A
	Frequency Index		2	3	3	3	3	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer:　P5-1b (P/N: 02.01.211291)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.63	0.09		0.09		N/A
Index Component Value				0.09	0.09	0.09	0.09	
Associated acoustic parameters	$p_{r, a}$ at zMI	(MPa)	2.39					
	P	(mW)		11.54		11.54		N/A
	P_{IXI}	(mW)		7.21		7.21		
	z_s	(cm)			4.32			
	z_b	(cm)					4.79	
	z_{MI}	(cm)	0.80					
	$z_{PII,a}$	(cm)	0.80					
	f_{awf}	(MHz)	2.16	2.51	2.86	2.86	2.51	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	8.28					
	n_{pps}		1.00					
	$I_{pi. a}$ at $z_{PII,a}$	(W/cm^2)	127.59					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	35.24					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	39.80					
	pr at z_{PII}	(MPa)	2.54					
Operating control conditions	Focus Depth(mm)		10	60	60	60	60	N/A
	Display Depth(mm)		19	68	68	68	68	N/A
	Frequency Index		2	2.5	2.5	2.5	2.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: P5-1b (P/N: 02.01.211291)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.07	0.56		0.86		N/A
Index Component Value				0.56	0.26	0.86	0.52	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.57					
	P	(mW)		58.47		138.70		N/A
	P_{IXI}	(mW)		46.32		72.40		
	z_s	(cm)			1.32			
	z_b	(cm)					2.99	
	z_{MI}	(cm)	3.35					
	$z_{PII,a}$	(cm)	3.35					
	f_{awf}	(MHz)	2.17	2.50	2.50	2.49	2.49	N/A
Other Information	prr	(Hz)	914.99					
	Srr	(Hz)	61.34					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	86.20					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	133.29					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	220.65					
	pr at z_{PII}	(MPa)	2.02					
Operating control conditions	Focus Depth(mm)		160	150	150	20	20	N/A
	Display Depth(mm)		167	157	157	29	29	N/A
	Frequency Index		2	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: CW mode

Transducer: P5-1b(P/N: 02.01.211291)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.04	0.11		0.27		N/A
Index Component Value				0.11	0.003	0.11	0.27	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	(MPa)	0.05					
	P	(mW)		14.22		14.22		N/A
	$P_{I X I}$	(mW)		11.85		11.85		
	z_s	(cm)			2.24			
	z_b	(cm)					2.24	
	z_{MI}	(cm)	2.26					
	$z_{PII,a}$	(cm)	2.26					
	f_{awf}	(MHz)	2.00	2.00	2.00	2.00	2.00	N/A
Other Information	prr	(Hz)	200000.00					
	Srr	(Hz)	-					
	n_{pps}		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	0.02					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	0.42					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	0.56					
	pr at z_{PII}	(MPa)	0.06					
Operating control conditions	Focus Depth(mm)		50	50	50	50	50	N/A
	Display Depth(mm)		58	58	58	58	58	N/A
	Frequency Index		2	2	2	2	2	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: P5-1b(P/N: 02.01.214389)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.12	0.52		0.52		N/A
Index Component Value				0.52	0.52	0.52	0.52	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	(MPa)	1.65					
	P	(mW)		71.95		71.95		N/A
	P_{1X1}	(mW)		49.18		49.18		
	z_s	(cm)			4.06			
	z_b	(cm)					4.06	
	z_{MI}	(cm)	4.39					
	$z_{PII,a}$	(cm)	4.39					
	f_{awf}	(MHz)	2.17	2.21	2.21	2.21	2.21	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	64.14					
	n_{pps}		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	118.40					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	15.30					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	29.47					
	pr at z_{PII}	(MPa)	2.29					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		68	68	68	68	68	N/A
	Frequency Index		H5.0	2.5	2.5	2.5	2.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer:　P5-1b(P/N: 02.01.214389)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.12	0.02		0.09		N/A
Index Component Value				0.02	0.02	0.02	0.09	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.65					
	P	*(mW)*		2.29		2.29		N/A
	P_{IXI}	*(mW)*		1.88		1.88		
	zs	*(cm)*			3.09			
	zb	*(cm)*					3.39	
	zMI	*(cm)*	4.39					
	$z_{PII,a}$	*(cm)*	4.39					
	f_{awf}	*(MHz)*	2.17	2.40	2.40	2.40	2.40	N/A
Other Information	prr	*(Hz)*	183.76					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	118.40					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	12.62					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	24.31					
	pr at z_{PII}	*(MPa)*	2.29					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		68	68	68	68	68	N/A
	Frequency Index		H5.0	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: P5-1b(P/N: 02.01.214389)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.12	0.54		0.54		N/A
Index Component Value				0.54	0.02	0.54	0.09	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.65					
	P	*(mW)*		74.24		74.24		N/A
	P_{1X1}	*(mW)*		51.06		51.06		
	z_s	*(cm)*			4.06			
	z_b	*(cm)*					4.06	
	z_{MI}	*(cm)*	4.39					
	$z_{PII,a}$	*(cm)*	4.39					
	f_{awf}	*(MHz)*	2.17	2.21	2.21	2.21	2.21	N/A
Other Information	prr	*(Hz)*	183.76					
	Srr	*(Hz)*	64.14					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	118.40					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	12.62					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	24.31					
	pr at z_{PII}	*(MPa)*	2.29					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		68	68	68	68	68	N/A
	Frequency Index		H5.0	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: P5-1b(P/N: 02.01.214389)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.14	0.74		0.74		N/A
Index Component Value				0.74	0.32	0.74	0.66	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.79					
	P	(mW)		76.25		76.25		N/A
	P_{IXI}	(mW)		63.54		63.54		
	z_s	(cm)			1.32			
	z_b	(cm)					1.39	
	z_{MI}	(cm)	1.50					
	$z_{PII,a}$	(cm)	1.50					
	f_{awf}	(MHz)	2.45	2.45	2.45	2.45	2.45	N/A
Other Information	prr	(Hz)	900.00					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	109.70					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	148.10					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	190.47					
	pr at z_{PII}	(MPa)	2.03					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		2.5	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: P5-1b(P/N: 02.01.214389)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.14	1.26		1.26		N/A
Index Component Value				1.26	0.84	1.26	1.17	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.79					
	P	*(mW)*		148.20		148.20		N/A
	P_{1X1}	*(mW)*		112.72		112.72		
	z_s	*(cm)*			4.06			
	z_b	*(cm)*					1.39	
	z_{MI}	*(cm)*	1.50					
	$z_{PII,a}$	*(cm)*	1.50					
	f_{awf}	*(MHz)*	2.45	2.45	2.21	2.21	2.45	N/A
Other Information	prr	*(Hz)*	900.00					
	Srr	*(Hz)*	64.14					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	109.70					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	148.10					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	190.47					
	pr at z_{PII}	*(MPa)*	2.03					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		2.5	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: P5-1b(P/N: 02.01.214389)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.77	0.05		0.05		N/A
Index Component Value				0.05	0.05	0.05	0.05	
Associated acoustic parameters	$p_{r, a}$ at z_{MI}	*(MPa)*	1.12					
	P	*(mW)*		5.81		5.81		N/A
	P_{IXI}	*(mW)*		4.84		4.84		
	z_s	*(cm)*			1.34			
	z_b	*(cm)*					1.62	
	z_{MI}	*(cm)*	1.62					
	$z_{PII,a}$	*(cm)*	1.62					
	f_{awf}	*(MHz)*	2.15	2.15	2.27	2.27	2.15	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	18.82					
	n_{pps}		1.00					
	$I_{pi. a}$ at $z_{PII,a}$	*(W/cm^2)*	42.16					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	71.25					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	91.61					
	pr at z_{PII}	*(MPa)*	1.27					
Operating control conditions	Focus Depth(mm)		30	30	30	30	30	N/A
	Display Depth(mm)		39	39	39	39	39	N/A
	Frequency Index		2	2	2	2	2	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: P5-1b(P/N: 02.01.214389)

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.14	0.79		0.79		N/A
Index Component Value				0.79	0.37	0.79	0.71	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.79					
	P	(mW)		82.06		82.06		N/A
	P_{1X1}	(mW)		68.38		68.38		
	z_s	(cm)			1.32			
	z_b	(cm)					1.39	
	z_{MI}	(cm)	1.50					
	$z_{PII,a}$	(cm)	1.50					
	f_{awf}	(MHz)	2.45	2.45	2.45	2.45	2.45	N/A
Other Information	prr	(Hz)	900.00					
	Srr	(Hz)	-					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm²)	109.70					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm²)	148.10					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm²)	190.47					
	pr at z_{PII}	(MPa)	2.03					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		2.5	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: CW mode

Transducer: P5-1b(P/N: 02.01.214389)

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.04	0.24		1.24		N/A
Index Component Value				0.24	0.01	0.24	1.24	
Associated acoustic parameters	$p_{r.\alpha}$ at z_{MI}	(MPa)	0.06					
	P	(mW)		30.39		30.39		N/A
	P_{1X1}	(mW)		25.32		25.32		
	z_s	(cm)			1.56			
	z_b	(cm)					1.56	
	z_{MI}	(cm)	1.61					
	$z_{PII,a}$	(cm)	1.61					
	f_{awf}	(MHz)	2.00	2.00	2.00	2.00	2.00	N/A
Other Information	prr	(Hz)	200000.00					
	Srr	(Hz)	-					
	n_{pps}		1.00					
	$I_{pi.\alpha}$ at $z_{PII,a}$	(W/cm^2)	0.02					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	0.55					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	0.69					
	pr at z_{PII}	(MPa)	0.07					
Operating control conditions	Focus Depth(mm)		50	50	50	50	50	N/A
	Display Depth(mm)		58	58	58	58	58	N/A
	Frequency Index		2	2	2	2	2	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.3. Test of Probe L15-7b

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: L15-7b

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.88	0.22		0.22		N/A
Index Component Value				0.22	0.22	0.22	0.22	
Associated acoustic parameters	$p_{r.a}$ at zMI	(MPa)	2.42					
	P	(mW)		4.98		4.98		N/A
	P_{1X1}	(mW)		4.98		4.98		
	zs	(cm)			1.00			
	zb	(cm)					1.00	
	z_{MI}	(cm)	1.34					
	$z_{PII,a}$	(cm)	1.34					
	f_{awf}	(MHz)	7.54	9.30	9.30	9.30	9.30	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	59.27					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	230.10					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	24.53					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	49.28					
	pr at z_{PII}	(MPa)	3.43					
Operating control conditions	Focus Depth(mm)		15	15	15	15	15	N/A
	Display Depth(mm)		19	19	19	19	19	N/A
	Frequency Index		H14.4	10	10	10	10	N/A
	ScanAngle		level 3	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer: L15-7b

Index label		MI	TIS		TIB		TIC
			At surface	Below surface	At surface	Below surface	
Maximum index value		0.88	0.003		0.01		N/A
Index Component Value			0.003	0.001	0.003	0.01	
Associated acoustic parameters	$p_{r,a}$ at zMI *(MPa)*	2.42					
	P *(mW)*		0.07		0.07		N/A
	P_{IXI} *(mW)*		0.07		0.07		
	z_s *(cm)*			0.86			
	z_b *(cm)*					1.01	
	z_{MI} *(cm)*	1.34					
	$z_{PII,a}$ *(cm)*	1.34					
	f_{awf} *(MHz)*	7.54	9.30	9.30	9.30	9.30	N/A
Other Information	prr *(Hz)*	292.59					
	Srr *(Hz)*	-					
	$npps$	1.00					
	$I_{pi,a}$ at $z_{PII,a}$ *(W/cm^2)*	230.10					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$ *(mW/cm^2)*	14.81					
	I_{spta} at z_{PII} or z_{SII} *(mW/cm^2)*	29.75					
	pr at z_{PII} *(MPa)*	3.43					
Operating control conditions	Focus Depth(mm)	15	15	15	15	15	N/A
	Display Depth(mm)	19	19	19	19	19	N/A
	Frequency Index	H14.4	10	10	10	10	N/A
	ScanAngle	/	/	/	/	/	N/A
	Speed	level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: L15-7b

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.88	0.22		0.23		N/A
Index Component Value				0.22	0.22	0.22	0.23	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	2.42					
	P	(mW)		5.05		5.05		N/A
	P_{IXI}	(mW)		5.05		5.05		
	zs	(cm)			1.00			
	zb	(cm)					1.00	
	zMI	(cm)	1.34					
	$z_{PII,a}$	(cm)	1.34					
	$fawf$	(MHz)	7.54	9.30	9.30	9.30	9.30	N/A
Other Information	prr	(Hz)	292.59					
	Srr	(Hz)	59.27					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	230.10					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	14.81					
	$Ispta$ at z_{PII} or z_{SII}	(mW/cm^2)	29.75					
	pr at z_{PII}	(MPa)	3.43					
Operating control conditions	Focus Depth(mm)		15	15	15	15	15	N/A
	Display Depth(mm)		19	19	19	19	19	N/A
	Frequency Index		H14.4	10	10	10	10	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: L15-7b

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.16	0.31		0.55		N/A
Index Component Value				0.31	0.08	0.55	0.28	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	3.3					
	P	*(mW)*		7.94		18.69		N/A
	P_{1X1}	*(mW)*		7.94		14.16		
	z_s	*(cm)*			0.81			
	z_b	*(cm)*					1.38	
	z_{MI}	*(cm)*	0.77					
	$z_{PII,a}$	*(cm)*	0.77					
	f_{awf}	*(MHz)*	8.11	8.13	8.13	8.12	8.12	N/A
Other Information	prr	*(Hz)*	900					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	412.80					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	174.61					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	268.22					
	pr at z_{PII}	*(MPa)*	4.09					
Operating control conditions	Focus Depth(mm)		10	60	60	15	15	N/A
	Display Depth(mm)		19	68	68	19	19	N/A
	Frequency Index		8	8	8	8	8	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: L15-7b

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.16	0.53		0.77		N/A
Index Component Value				0.53	0.30	0.77	0.50	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	(MPa)	3.30					
	P	(mW)		12.92		23.67		N/A
	P_{IX1}	(mW)		12.92		19.14		
	z_s	(cm)			1.00			
	z_b	(cm)					1.38	
	z_{MI}	(cm)	0.77					
	$z_{PII,a}$	(cm)	0.77					
	f_{awf}	(MHz)	8.11	8.13	9.30	9.30	8.12	N/A
Other Information	prr	(Hz)	900.00					
	Srr	(Hz)	59.27					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	412.80					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	174.61					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	268.22					
	pr at z_{PII}	(MPa)	4.09					
Operating control conditions	Focus Depth(mm)		10	60	60	15	15	N/A
	Display Depth(mm)		19	68	68	19	19	N/A
	Frequency Index		8	8	8	8	8	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: L15-7b

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.11	0.06		0.06		N/A
Index Component Value				0.06	0.06	0.06	0.06	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	3.17					
	P	*(mW)*		1.79		1.79		N/A
	P_{1X1}	*(mW)*		1.46		1.46		
	z_s	*(cm)*			1.57			
	z_b	*(cm)*					1.35	
	z_{MI}	*(cm)*	0.92					
	$z_{PII,a}$	*(cm)*	0.92					
	f_{awf}	*(MHz)*	8.07	8.07	10.91	10.91	8.07	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	6.02					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	364.90					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	34.25					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	57.01					
	pr at z_{PII}	*(MPa)*	4.09					
Operating control conditions	Focus Depth(mm)		10	80	80	80	80	N/A
	Display Depth(mm)		19	88	88	88	88	N/A
	Frequency Index		8	8	8	8	8	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: L15-7b

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			1.16	0.37		0.61		N/A
Index Component Value				0.37	0.14	0.61	0.34	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	3.30					
	P	*(mW)*		9.73		20.48		N/A
	P_{IXI}	*(mW)*		9.40		15.62		
	zs	*(cm)*			0.81			
	zb	*(cm)*					1.38	
	zMI	*(cm)*	0.77					
	$z_{PII,a}$	*(cm)*	0.77					
	$fawf$	*(MHz)*	8.11	8.13	8.13	8.12	8.12	N/A
Other Information	prr	*(Hz)*	900.00					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	412.80					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	174.61					
	$Ispta$ at z_{PII} or z_{SII}	*(mW/cm^2)*	268.22					
	pr at z_{PII}	*(MPa)*	4.09					
Operating control conditions	Focus Depth(mm)		10	60	60	15	15	N/A
	Display Depth(mm)		19	68	68	19	19	N/A
	Frequency Index		8	8	8	8	8	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.4. Test of Probe C352UB

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: C352UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.53	0.36		0.36		N/A
Index Component Value				0.36	0.36	0.36	0.36	
Associated acoustic parameters	$p_{r.a}$ at zMI	(MPa)	0.90					
	P	(mW)		66.67		66.67		N/A
	P_{1X1}	(mW)		27.10		27.10		
	z_s	(cm)			6.35			
	z_b	(cm)					5.65	
	z_{MI}	(cm)	5.78					
	$z_{PII,a}$	(cm)	5.78					
	f_{awf}	(MHz)	2.84	2.80	2.86	2.86	2.80	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	58.40					
	n_{pps}		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	81.10					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	15.20					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	47.44					
	pr at z_{PII}	(MPa)	1.59					
Operating control conditions	Focus Depth(mm)		70	70	70	70	70	N/A
	Display Depth(mm)		78	78	78	78	78	N/A
	Frequency Index		H5.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer: C352UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.54	0.01		0.10		N/A
Index Component Value				0.01	0.01	0.01	0.10	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	0.92					
	P	*(mW)*		2.39		2.39		N/A
	P_{1X1}	*(mW)*		0.97		0.97		
	z_s	*(cm)*			5.15			
	z_b	*(cm)*					5.35	
	z_{MI}	*(cm)*	5.88					
	$z_{PII,a}$	*(cm)*	5.88					
	f_{awf}	*(MHz)*	2.86	2.80	2.86	2.86	2.86	N/A
Other Information	prr	*(Hz)*	125.47					
	Srr	*(Hz)*	-					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm²)*	82.87					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	5.51					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm²)*	15.64					
	pr at z_{PII}	*(MPa)*	1.55					
Operating control conditions	Focus Depth(mm)		70	70	70	70	70	N/A
	Display Depth(mm)		78	78	78	78	78	N/A
	Frequency Index		H5.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: C352UB

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.54	0.37		0.46		N/A
Index Component Value				0.37	0.37	0.37	0.46	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	0.92					
	P	*(mW)*		69.06		69.06		N/A
	P_{1X1}	*(mW)*		28.07		28.07		
	z_s	*(cm)*			6.35			
	z_b	*(cm)*					5.65	
	z_{MI}	*(cm)*	5.88					
	$z_{PII,a}$	*(cm)*	5.88					
	f_{awf}	*(MHz)*	2.86	2.80	2.86	2.86	2.80	N/A
Other Information	prr	*(Hz)*	125.47					
	Srr	*(Hz)*	58.40					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	82.87					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	5.51					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	15.64					
	pr at z_{PII}	*(MPa)*	1.55					
Operating control conditions	Focus Depth(mm)		700	70	70	70	70	N/A
	Display Depth(mm)		78	78	78	78	78	N/A
	Frequency Index		H5.0	H5.0	H5.0	H5.0	H5.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: C352UB

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.54	0.45		0.45		N/A
Index Component Value				0.45	0.23	0.45	0.38	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	(MPa)	0.88					
	P	(mW)		76.76		76.76		N/A
	P_{1X1}	(mW)		34.87		34.87		
	z_s	(cm)			5.01			
	z_b	(cm)					5.33	
	z_{MI}	(cm)	5.60					
	$z_{PII,a}$	(cm)	5.60					
	f_{awf}	(MHz)	2.71	2.71	2.71	2.71	2.71	N/A
Other Information	prr	(Hz)	4885.20					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	62.53					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	418.50					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	1265.05					
	pr at z_{PII}	(MPa)	1.53					
Operating control conditions	Focus Depth(mm)		70	70	70	70	70	N/A
	Display Depth(mm)		78	78	78	78	78	N/A
	Frequency Index		2.5	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: C352UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.54	0.81		0.81		N/A
Index Component Value				0.81	0.59	0.81	0.74	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	(MPa)	0.88					
	P	(mW)		143.43		143.43		N/A
	P_{1X1}	(mW)		61.97		61.97		
	z_s	(cm)			6.35			
	z_b	(cm)					5.33	
	z_{MI}	(cm)	5.60					
	$z_{PII,a}$	(cm)	5.60					
	f_{awf}	(MHz)	2.71	2.71	2.86	2.86	2.71	N/A
Other Information	prr	(Hz)	4885.20					
	Srr	(Hz)	58.40					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	62.53					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	418.50					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	1265.05					
	pr at z_{PII}	(MPa)	1.53					
Operating control conditions	Focus Depth(mm)		70	70	70	70	70	N/A
	Display Depth(mm)		78	78	78	78	78	N/A
	Frequency Index		2.5	2.5	2.5	2.5	2.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: C352UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.67	0.04		0.04		N/A
Index Component Value				0.04	0.04	0.04	0.04	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.10					
	P	*(mW)*		7.78		7.78		N/A
	P_{IXI}	*(mW)*		2.74		2.74		
	z_s	*(cm)*			4.88			
	z_b	*(cm)*					5.79	
	z_{MI}	*(cm)*	6.68					
	$z_{PII,a}$	*(cm)*	6.68					
	f_{awf}	*(MHz)*	2.71	2.71	3.59	3.59	2.71	N/A
Other Information	prr	*(Hz)*	3205.10					
	Srr	*(Hz)*	7.79					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	114.67					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	63.21					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	202.74					
	pr at z_{PII}	*(MPa)*	1.97					
Operating control conditions	Focus Depth(mm)		70	70	70	70	70	N/A
	Display Depth(mm)		88	88	88	88	88	N/A
	Frequency Index		2.5	2.5	2.5	2.5	2.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: C352UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.54	0.49		0.49		N/A
Index Component Value				0.49	0.27	0.49	0.42	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	0.88					
	P	(mW)		84.54		84.54		N/A
	P_{IXI}	(mW)		37.61		37.61		
	zs	(cm)			5.01			
	zb	(cm)					5.33	
	zMI	(cm)	5.60					
	$z_{PII,a}$	(cm)	5.60					
	$fawf$	(MHz)	2.71	2.71	2.71	2.71	2.71	N/A
Other Information	prr	(Hz)	4885.20					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	62.53					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	418.50					
	$Ispta$ at z_{PII} or z_{SII}	(mW/cm^2)	1265.05					
	pr at z_{PII}	(MPa)	1.53					
Operating control conditions	Focus Depth(mm)		70	70	70	70	70	N/A
	Display Depth(mm)		78	78	78	78	78	N/A
	Frequency Index		2.5	2.5	2.5	2.5	2.5	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.5. Test of Probe L742UB

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:　　B mode

Transducer:　L742UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.46	0.23		0.23		N/A
Index Component Value				0.23	0.23	0.23	0.23	
Associated acoustic parameters	$p_{r, a}$ at z_{MI}	(MPa)	1.03					
	P	(mW)		9.81		9.81		N/A
	P_{1X1}	(mW)		9.81		9.81		
	z_s	(cm)			1.81			
	z_b	(cm)					1.81	
	z_{MI}	(cm)	1.78					
	$z_{PII,a}$	(cm)	1.78					
	f_{awf}	(MHz)	4.99	5.00	5.00	5.00	5.00	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	79.33					
	n_{pps}		1.00					
	$I_{pi, a}$ at $z_{PII,a}$	(W/cm^2)	107.89					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	28.05					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	55.59					
	pr at z_{PII}	(MPa)	1.45					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.0	H9.0	H9.0	H9.0	H9.0	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer: L742UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.51	0.01		0.05		N/A
Index Component Value				0.01	0.002	0.01	0.05	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.16					
	P	(mW)		0.35		0.35		N/A
	P_{IXI}	(mW)		0.35		0.35		
	zs	(cm)			1.41			
	zb	(cm)					1.57	
	zMI	(cm)	1.70					
	$z_{PII,a}$	(cm)	1.70					
	$fawf$	(MHz)	5.00	5.00	5.00	5.00	5.00	N/A
Other Information	prr	(Hz)	227.48					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	129.38					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	7.65					
	$Ispta$ at z_{PII} or z_{SII}	(mW/cm^2)	14.56					
	pr at z_{PII}	(MPa)	1.60					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.0	H9.0	H9.0	H9.0	H9.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: L742UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.51	0.24		0.28		N/A
Index Component Value				0.24	0.23	0.24	0.28	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.16					
	P	*(mW)*		10.16		10.16		N/A
	P_{IXI}	*(mW)*		10.16		10.16		
	zs	*(cm)*			1.81			
	zb	*(cm)*					1.81	
	z_{MI}	*(cm)*	1.70					
	$z_{PII,a}$	*(cm)*	1.70					
	f_{awf}	*(MHz)*	5.00	5.00	5.00	5.00	5.00	N/A
Other Information	prr	*(Hz)*	227.48					
	Srr	*(Hz)*	79.33					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	129.38					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	7.65					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	14.56					
	pr at z_{PII}	*(MPa)*	1.60					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.0	H9.0	H9.0	H9.0	H9.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: L742UB

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.55	0.35		0.49		N/A
Index Component Value				0.35	0.06	0.35	0.49	
Associated acoustic parameters	$p_{r.\,a}$ at zMI	(MPa)	1.32					
	P	(mW)		13.16		13.16		N/A
	P_{IXI}	(mW)		13.16		13.16		
	zs	(cm)			1.57			
	zb	(cm)					1.69	
	zMI	(cm)	1.80					
	$z_{PII,a}$	(cm)	1.80					
	f_{awf}	(MHz)	5.63	5.63	5.63	5.63	5.63	N/A
Other Information	prr	(Hz)	9789.30					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi.\,a}$ at $z_{PII,a}$	(W/cm^2)	99.76					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	634.78					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	1329.05					
	pr at z_{PII}	(MPa)	1.91					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5.5	5.5	5.5	5.5	5.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer:　L742UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.55	0.58		0.72		N/A
Index Component Value				0.58	0.29	0.58	0.72	
Associated acoustic parameters	$p_{r.a}$ at zMI	(MPa)	1.32					
	P	(mW)		22.97		22.97		N/A
	P_{1X1}	(mW)		22.97		22.97		
	zs	(cm)			1.81			
	zb	(cm)					1.69	
	zMI	(cm)	1.80					
	$z_{PII,a}$	(cm)	1.80					
	f_{awf}	(MHz)	5.63	5.63	5.00	5.00	5.63	N/A
Other Information	prr	(Hz)	9789.30					
	Srr	(Hz)	79.33					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	99.76					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	634.78					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	1329.05					
	pr at z_{PII}	(MPa)	1.91					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5.5	5.5	5.5	5.5	5.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: L742UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.68	0.05		0.05		N/A
Index Component Value				0.05	0.05	0.05	0.05	
Associated acoustic parameters	$p_{r.a}$ at zMI	(MPa)	1.59					
	P	(mW)		1.79		1.79		N/A
	P_{1X1}	(mW)		1.79		1.79		
	zs	(cm)			2.00			
	zb	(cm)					2.00	
	zMI	(cm)	2.05					
	$z_{PII,a}$	(cm)	2.05					
	f_{awf}	(MHz)	5.60	5.60	5.60	5.60	5.60	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	15.76					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	153.30					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	24.35					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	53.19					
	pr at z_{PII}	(MPa)	2.35					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5.5	5.5	5.5	5.5	5.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer:　L742UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.55	0.40		0.54		N/A
Index Component Value				0.40	0.11	0.40	0.54	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.32					
	P	(mW)		14.95		14.95		N/A
	P_{IXI}	(mW)		14.95		14.95		
	zs	(cm)			1.57			
	zb	(cm)					1.69	
	zMI	(cm)	1.80					
	$z_{PII,a}$	(cm)	1.80					
	fawf	(MHz)	5.63	5.63	5.63	5.63	5.63	N/A
Other Information	prr	(Hz)	9789.30					
	Srr	(Hz)	-					
	npps		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm²)	99.76					
	Ispta,a at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm²)	634.78					
	Ispta at z_{PII} or z_{SII}	(mW/cm²)	1329.05					
	pr at z_{PII}	(MPa)	1.91					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5.5	5.5	5.5	5.5	5.5	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.6. Test of Probe L1042UB

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: L1042UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.48	0.25		0.25		N/A
Index Component Value				0.25	0.25	0.25	0.25	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.22					
	P	*(mW)*		8.28		8.28		N/A
	P_{1X1}	*(mW)*		8.28		8.28		
	zs	*(cm)*			1.73			
	zb	*(cm)*					2.00	
	zMI	*(cm)*	1.83					
	$z_{PII,a}$	*(cm)*	1.83					
	$fawf$	*(MHz)*	6.47	6.39	6.55	6.55	6.39	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	79.33					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm²)*	116.77					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	22.19					
	$Ispta$ at z_{PII} or z_{SII}	*(mW/cm²)*	62.64					
	pr at z_{PII}	*(MPa)*	2.05					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H13.0	H13.0	H13.0	H13.0	H13.0	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer:　L1042UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.51	0.01		0.03		N/A
Index Component Value				0.01	0.002	0.01	0.03	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.30					
	P	(mW)		0.30		0.30		N/A
	P_{IXI}	(mW)		0.30		0.30		
	zs	(cm)			1.33			
	zb	(cm)					1.59	
	zMI	(cm)	1.80					
	$z_{PII,a}$	(cm)	1.80					
	$fawf$	(MHz)	6.48	6.39	6.55	6.55	6.39	N/A
Other Information	prr	(Hz)	227.48					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	122.65					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	5.30					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	13.18					
	pr at z_{PII}	(MPa)	2.05					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H13.0	H13.0	H13.0	H13.0	H13.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: L1042UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.51	0.26		0.28		N/A
Index Component Value				0.26	0.252	0.26	0.28	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.30					
	P	*(mW)*		8.58		8.58		N/A
	P_{1X1}	*(mW)*		8.58		8.58		
	z_s	*(cm)*			1.73			
	z_b	*(cm)*					2.00	
	z_{MI}	*(cm)*	1.80					
	$z_{PII,a}$	*(cm)*	1.80					
	f_{awf}	*(MHz)*	6.48	6.39	6.55	6.55	6.39	N/A
Other Information	prr	*(Hz)*	227.48					
	Srr	*(Hz)*	79.33					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	122.65					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	5.30					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	13.18					
	pr at z_{PII}	*(MPa)*	2.05					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H13.0	H13.0	H13.0	H13.0	H13.0	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: L1042UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.46	0.31		0.47		N/A
Index Component Value				0.31	0.04	0.31	0.47	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	(MPa)	1.12					
	P	(mW)		11.03		11.03		N/A
	P_{1X1}	(mW)		11.03		11.03		
	z_s	(cm)			1.63			
	z_b	(cm)					1.75	
	z_{MI}	(cm)	2.05					
	$z_{PII,a}$	(cm)	2.05					
	f_{awf}	(MHz)	5.84	5.87	5.87	5.87	5.87	N/A
Other Information	prr	(Hz)	9789.3					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	58.19					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	370.27					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	793.90					
	pr at z_{PII}	(MPa)	1.64					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5.5	5.5	5.5	5.5	5.5	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: L1042UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.46	0.56		0.73		N/A
Index Component Value				0.56	0.30	0.56	0.73	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.12					
	P	*(mW)*		19.31		19.31		N/A
	P_{IXI}	*(mW)*		19.31		19.31		
	z_s	*(cm)*			1.73			
	z_b	*(cm)*					1.75	
	z_{MI}	*(cm)*	2.05					
	$z_{PII,a}$	*(cm)*	2.05					
	f_{awf}	*(MHz)*	5.84	5.87	6.55	6.55	5.87	N/A
Other Information	prr	*(Hz)*	9789.30					
	Srr	*(Hz)*	79.33					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	58.19					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	370.27					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	793.90					
	pr at z_{PII}	*(MPa)*	1.64					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5.5	5.5	5.5	5.5	5.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: L1042UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.58	0.04		0.04		N/A
Index Component Value				0.04	0.04	0.04	0.04	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.42					
	P	*(mW)*		1.25		1.25		N/A
	P_{IXI}	*(mW)*		1.25		1.25		
	z_s	*(cm)*			2.00			
	z_b	*(cm)*					2.00	
	z_{MI}	*(cm)*	2.20					
	$z_{PII,a}$	*(cm)*	2.20					
	f_{awf}	*(MHz)*	5.83	5.86	6.43	6.43	5.86	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	17.38					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm²)*	101.56					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	66.01					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm²)*	148.53					
	pr at z_{PII}	*(MPa)*	2.13					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5.5	5.5	5.5	5.5	5.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: L1042UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.46	0.35		0.51		N/A
Index Component Value				0.35	0.08	0.35	0.51	
Associated acoustic parameters	$p_{r, a}$ at z_{MI}	*(MPa)*	1.12					
	P	*(mW)*		12.28		12.28		N/A
	P_{IXI}	*(mW)*		12.28		12.28		
	z_s	*(cm)*			1.63			
	z_b	*(cm)*					1.75	
	z_{MI}	*(cm)*	2.05					
	$z_{PII,a}$	*(cm)*	2.05					
	f_{awf}	*(MHz)*	5.84	5.87	5.87	5.87	5.87	N/A
Other Information	prr	*(Hz)*	9789.3					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi. a}$ at $z_{PII,a}$	*(W/cm^2)*	58.19					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	370.27					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	793.90					
	pr at z_{PII}	*(MPa)*	1.64					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5.5	5.5	5.5	5.5	5.5	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.7. Test of Probe E612UB

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: E612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.51	0.15		0.15		N/A
Index Component Value				0.15	0.15	0.15	0.15	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.14					
	P	*(mW)*		6.45		6.45		N/A
	P_{IXI}	*(mW)*		6.45		6.45		
	z_s	*(cm)*			1.80			
	z_b	*(cm)*					1.50	
	z_{MI}	*(cm)*	1.68					
	$z_{PII,a}$	*(cm)*	1.68					
	f_{awf}	*(MHz)*	4.98	4.95	4.94	4.94	4.95	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	57.87					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	125.79					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	35.22					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	72.01					
	pr at z_{PII}	*(MPa)*	1.63					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.4	H9.4	H9.4	H9.4	H9.4	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer:　E612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.53	0.004		0.02		N/A
Index Component Value				0.004	0.001	0.004	0.02	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.20					
	P	(mW)		0.15		0.15		N/A
	P_{IX1}	(mW)		0.15		0.15		
	z_s	(cm)			1.28			
	z_b	(cm)					1.64	
	z_{MI}	(cm)	1.68					
	$z_{PII,a}$	(cm)	1.68					
	f_{awf}	(MHz)	5.01	4.95	4.94	4.94	4.95	N/A
Other Information	prr	(Hz)	110.49					
	Srr	(Hz)	-					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	126.74					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	3.92					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	7.50					
	pr at z_{PII}	(MPa)	1.66					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.4	H9.4	H9.4	H9.4	H9.4	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: E612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.53	0.15		0.17		N/A
Index Component Value				0.15	0.15	0.15	0.17	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	(MPa)	1.2					
	P	(mW)		6.60		6.60		N/A
	P_{1X1}	(mW)		6.60		6.60		
	z_s	(cm)			1.80			
	z_b	(cm)					1.50	
	z_{MI}	(cm)	1.68					
	$z_{PII,a}$	(cm)	1.68					
	f_{awf}	(MHz)	5.01	4.95	4.94	4.94	4.95	N/A
Other Information	prr	(Hz)	110.49					
	Srr	(Hz)	57.87					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	126.74					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	3.92					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	7.50					
	pr at z_{PII}	(MPa)	1.66					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.4	H9.4	H9.4	H9.4	H9.4	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: E612UB

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.60	0.28		0.44		N/A
Index Component Value				0.28	0.06	0.28	0.44	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.43					
	P	*(mW)*		10.34		10.34		N/A
	P_{IXI}	*(mW)*		10.34		10.34		
	zs	*(cm)*			1.46			
	zb	*(cm)*					1.62	
	zMI	*(cm)*	1.70					
	$zPII,a$	*(cm)*	1.70					
	$fawf$	*(MHz)*	5.66	5.65	5.65	5.65	5.65	N/A
Other Information	prr	*(Hz)*	4900.00					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $zPII,a$	*(W/cm^2)*	128.32					
	$Ispta,a$ at $zPII,a$ or $z_{SII,a}$	*(mW/cm^2)*	402.41					
	$Ispta$ at $zPII$ or z_{SII}	*(mW/cm^2)*	867.83					
	pr at $zPII$	*(MPa)*	2.10					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6	6	6	6	6	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: E612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.60	0.43		0.59		N/A
Index Component Value				0.43	0.21	0.43	0.59	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.43					
	P	*(mW)*		16.79		16.79		N/A
	P_{IXI}	*(mW)*		16.79		16.79		
	z_s	*(cm)*			1.80			
	z_b	*(cm)*					1.62	
	z_{MI}	*(cm)*	1.70					
	$z_{PII,a}$	*(cm)*	1.70					
	f_{awf}	*(MHz)*	5.66	5.65	4.94	4.94	5.65	N/A
Other Information	prr	*(Hz)*	4900.00					
	Srr	*(Hz)*	57.87					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	128.32					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	402.41					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	867.83					
	pr at z_{PII}	*(MPa)*	2.10					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6	6	6	6	6	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer:　E612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.65	0.03		0.03		N/A
Index Component Value				0.03	0.03	0.03	0.03	
Associated acoustic parameters	$p_{r, a}$ at zMI	*(MPa)*	1.55					
	P	*(mW)*		1.05		1.05		N/A
	P_{IXI}	*(mW)*		1.05		1.05		
	z_s	*(cm)*			2.00			
	z_b	*(cm)*					1.70	
	z_{MI}	*(cm)*	1.87					
	$z_{PII,a}$	*(cm)*	1.87					
	f_{awf}	*(MHz)*	5.67	5.64	6.37	6.37	5.64	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	15.46					
	$npps$		1.00					
	$I_{pi. a}$ at $z_{PII,a}$	*(W/cm^2)*	138.04					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	60.42					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	117.33					
	pr at z_{PII}	*(MPa)*	2.16					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6	6	6	6	6	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer:　E612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.60	0.31		0.47		N/A
Index Component Value				0.31	0.09	0.31	0.47	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.43					
	P	(mW)		11.39		11.39		N/A
	P_{IXI}	(mW)		11.39		11.39		
	zs	(cm)			1.46			
	zb	(cm)					1.62	
	zMI	(cm)	1.70					
	$z_{PII,a}$	(cm)	1.70					
	f_{awf}	(MHz)	5.66	5.65	5.65	5.65	5.65	N/A
Other Information	prr	(Hz)	4900.00					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	128.32					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	402.41					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	867.83					
	pr at z_{PII}	(MPa)	2.10					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6	6	6	6	6	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.8. Test of Probe C612UB

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:　　B mode

Transducer:　C612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.64	0.30		0.30		N/A
Index Component Value				0.30	0.30	0.30	0.30	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.60					
	P	(mW)		10.15		10.15		N/A
	P_{1X1}	(mW)		10.15		10.15		
	z_s	(cm)			1.50			
	z_b	(cm)					1.50	
	z_{MI}	(cm)	1.63					
	$z_{PII,a}$	(cm)	1.63					
	f_{awf}	(MHz)	6.25	6.19	6.19	6.19	6.19	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	138.22					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	164.90					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	32.98					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	72.97					
	pr at z_{PII}	(MPa)	2.38					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6.5	6.5	6.5	6.5	6.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer:　C612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.68	0.01		0.03		N/A
Index Component Value				0.01	0.001	0.01	0.03	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.69					
	P	*(mW)*		0.24		0.24		N/A
	P_{1X1}	*(mW)*		0.24		0.24		
	zs	*(cm)*			1.30			
	zb	*(cm)*					1.42	
	zMI	*(cm)*	1.58					
	$z_{PII,a}$	*(cm)*	1.58					
	f_{awf}	*(MHz)*	6.21	6.19	6.19	6.19	6.19	N/A
Other Information	prr	*(Hz)*	264.11					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	1.05					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	0.06					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	0.10					
	pr at z_{PII}	*(MPa)*	2.29					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6.5	6.5	6.5	6.5	6.5	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: C612UB

Index label			MI	*TIS*		*TIB*		*TIC*
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.68	0.31		0.33		N/A
Index Component Value				0.31	0.30	0.31	0.33	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.69					
	P	*(mW)*		10.39		10.39		N/A
	P_{IXI}	*(mW)*		10.39		10.39		
	zs	*(cm)*			1.50			
	zb	*(cm)*					1.50	
	zMI	*(cm)*	1.58					
	$z_{PII,a}$	*(cm)*	1.58					
	f_{awf}	*(MHz)*	6.21	6.19	6.19	6.19	6.19	N/A
Other Information	prr	*(Hz)*	264.11					
	Srr	*(Hz)*	138.22					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	1.05					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	0.06					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	0.10					
	pr at z_{PII}	*(MPa)*	2.29					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6.5	6.5	6.5	6.5	6.5	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: C612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.54	0.36		0.56		N/A
Index Component Value				0.36	0.07	0.36	0.56	
Associated acoustic parameters	$p_{r, a}$ at z_{MI}	*(MPa)*	1.30					
	P	*(mW)*		13.12		13.12		N/A
	P_{IX1}	*(mW)*		13.12		13.12		
	z_s	*(cm)*			1.30			
	z_b	*(cm)*					1.46	
	z_{MI}	*(cm)*	1.78					
	$z_{PII,a}$	*(cm)*	1.78					
	f_{awf}	*(MHz)*	5.68	5.69	5.69	5.69	5.69	N/A
Other Information	prr	*(Hz)*	9789.30					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi. a}$ at $z_{PII,a}$	*(W/cm²)*	106.79					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	669.06					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm²)*	1399.24					
	pr at z_{PII}	*(MPa)*	1.88					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6	6	6	6	6	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: C612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.54	0.65		0.86		N/A
Index Component Value				0.65	0.37	0.65	0.86	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	*(MPa)*	1.30					
	P	*(mW)*		23.27		23.27		N/A
	P_{1X1}	*(mW)*		23.27		23.27		
	z_s	*(cm)*			1.50			
	z_b	*(cm)*					1.46	
	z_{MI}	*(cm)*	1.78					
	$z_{PII,a}$	*(cm)*	1.78					
	f_{awf}	*(MHz)*	5.68	5.69	6.19	6.19	5.69	N/A
Other Information	prr	*(Hz)*	9789.30					
	Srr	*(Hz)*	138.44					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm^2)*	106.79					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	669.06					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	1399.24					
	pr at z_{PII}	*(MPa)*	1.88					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6	6	6	6	6	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: C612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.62	0.03		0.03		N/A
Index Component Value				0.03	0.03	0.03	0.03	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.48					
	P	*(mW)*		1.13		1.13		N/A
	P_{IXI}	*(mW)*		1.13		1.13		
	zs	*(cm)*			1.50			
	zb	*(cm)*					1.50	
	zMI	*(cm)*	1.63					
	$z_{PII,a}$	*(cm)*	1.63					
	$fawf$	*(MHz)*	5.69	5.69	6.53	6.53	5.69	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	18.29					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	142.35					
	$Ispta,a$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	31.00					
	$Ispta$ at z_{PII} or z_{SII}	*(mW/cm^2)*	64.21					
	pr at z_{PII}	*(MPa)*	2.13					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6	6	6	6	6	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: C612UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.54	0.39		0.59		N/A
Index Component Value				0.39	0.10	0.39	0.59	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	*(MPa)*	1.30					
	P	*(mW)*		14.25		14.25		N/A
	P_{1x1}	*(mW)*		14.25		14.25		
	z_s	*(cm)*			1.30			
	z_b	*(cm)*					1.46	
	z_{MI}	*(cm)*	1.78					
	$z_{PII,a}$	*(cm)*	1.78					
	f_{awf}	*(MHz)*	5.68	5.69	5.69	5.69	5.69	N/A
Other Information	prr	*(Hz)*	9789.30					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm^2)*	106.79					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	669.06					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	1399.24					
	pr at z_{PII}	*(MPa)*	1.88					
Operating control conditions	Focus Depth(mm)		20	20	20	20	20	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		6	6	6	6	6	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.9. Test of Probe C6152UB

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: C6152UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.62	0.46		0.46		N/A
Index Component Value				0.46	0.46	0.46	0.46	
Associated acoustic parameters	$p_{r.a}$ at zMI	*(MPa)*	1.33					
	P	*(mW)*		20.38		20.38		N/A
	P_{1X1}	*(mW)*		20.38		20.38		
	z_s	*(cm)*			2.00			
	z_b	*(cm)*					2.00	
	z_{MI}	*(cm)*	1.83					
	$z_{PII,a}$	*(cm)*	1.83					
	f_{awf}	*(MHz)*	4.71	4.72	4.72	4.72	4.72	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	79.33					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm^2)*	137.59					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	24.65					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	52.99					
	pr at z_{PII}	*(MPa)*	1.95					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.4	H9.4	H9.4	H9.4	H9.4	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer: C6152UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.63	0.01		0.06		N/A
Index Component Value				0.01	0.003	0.01	0.06	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.82					
	P	*(mW)*		0.49		0.49		N/A
	P_{1X1}	*(mW)*		0.49		0.49		
	z_s	*(cm)*			1.54			
	z_b	*(cm)*					1.72	
	z_{MI}	*(cm)*	1.90					
	$z_{PII,a}$	*(cm)*	1.90					
	f_{awf}	*(MHz)*	4.62	4.72	4.72	4.72	4.72	N/A
Other Information	prr	*(Hz)*	151.65					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm²)*	154.25					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	6.78					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm²)*	12.60					
	pr at z_{PII}	*(MPa)*	2.48					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.4	H9.4	H9.4	H9.4	H9.4	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: C6152UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.63	0.47		0.52		N/A
Index Component Value				0.47	0.46	0.47	0.52	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.82					
	P	*(mW)*		20.87		20.87		N/A
	P_{1X1}	*(mW)*		20.87		20.87		
	z_s	*(cm)*			2.00			
	z_b	*(cm)*					2.00	
	z_{MI}	*(cm)*	1.90					
	$z_{PII,a}$	*(cm)*	1.90					
	f_{awf}	*(MHz)*	4.62	4.72	4.72	4.72	4.72	N/A
Other Information	prr	*(Hz)*	151.65					
	Srr	*(Hz)*	79.33					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	154.25					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	6.78					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	12.60					
	pr at z_{PII}	*(MPa)*	2.48					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		H9.4	H9.4	H9.4	H9.4	H9.4	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer:　C6152UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.64	0.47		0.49		N/A
Index Component Value				0.47	0.10	0.47	0.49	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	*(MPa)*	1.41					
	P	*(mW)*		20.04		20.04		N/A
	P_{IXI}	*(mW)*		20.04		20.04		
	z_s	*(cm)*			1.93			
	z_b	*(cm)*					2.01	
	z_{MI}	*(cm)*	2.13					
	$z_{PII,a}$	*(cm)*	2.13					
	f_{awf}	*(MHz)*	4.98	4.98	4.98	4.98	4.98	N/A
Other Information	prr	*(Hz)*	7344.90					
	Srr	*(Hz)*	-					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm²)*	131.78					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	706.57					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm²)*	1627.60					
	pr at z_{PII}	*(MPa)*	2.14					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5	5	5	5	5	N/A
	ScanAngle		/	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: C6152UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.64	0.93		0.95		N/A
Index Component Value				0.93	0.56	0.93	0.95	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	*(MPa)*	1.41					
	P	*(mW)*		40.43		40.43		N/A
	P_{1X1}	*(mW)*		40.43		40.43		
	z_s	*(cm)*			2.00			
	z_b	*(cm)*					2.01	
	z_{MI}	*(cm)*	2.13					
	$z_{PII,a}$	*(cm)*	2.13					
	f_{awf}	*(MHz)*	4.98	4.98	4.72	4.72	4.98	N/A
Other Information	prr	*(Hz)*	7344.90					
	Srr	*(Hz)*	79.33					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm^2)*	131.78					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	706.57					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	1627.60					
	pr at z_{PII}	*(MPa)*	2.14					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5	5	5	5	5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: C6152UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.65	0.05		0.05		N/A
Index Component Value				0.05	0.05	0.05	0.05	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.44					
	P	(mW)		1.90		1.90		N/A
	P_{1X1}	(mW)		1.90		1.90		
	z_s	(cm)			2.00			
	z_b	(cm)					2.00	
	z_{MI}	(cm)	2.20					
	$z_{PII,a}$	(cm)	2.20					
	f_{awf}	(MHz)	4.98	4.99	6.07	6.07	4.99	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	15.89					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm²)	135.86					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm²)	25.96					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm²)	58.41					
	pr at z_{PII}	(MPa)	2.16					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5	5	5	5	5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer:　C6152UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.64	0.52		0.54		N/A
Index Component Value				0.52	0.15	0.52	0.54	
Associated acoustic parameters	$p_{r.\,a}$ at z_{MI}	*(MPa)*	1.41					
	P	*(mW)*		21.94		21.94		N/A
	P_{1X1}	*(mW)*		21.94		21.94		
	z_s	*(cm)*			1.93			
	z_b	*(cm)*					2.01	
	z_{MI}	*(cm)*	2.13					
	$z_{PII,a}$	*(cm)*	2.13					
	f_{awf}	*(MHz)*	4.98	4.98	4.98	4.98	4.98	N/A
Other Information	prr	*(Hz)*	7344.9					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi.\,a}$ at $z_{PII,a}$	*(W/cm^2)*	131.78					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	706.57					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	1627.60					
	pr at z_{PII}	*(MPa)*	2.14					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		5	5	5	5	5	N/A
	ScanAngle		/	level 0	level 0	level 0	level 0	N/A

A2.8.10. Test of Probe C422UB

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B mode

Transducer: C422UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.58	0.41		0.41		N/A
Index Component Value				0.41	0.41	0.41	0.41	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	*(MPa)*	1.08					
	P	*(mW)*		33.49		33.49		N/A
	P_{1X1}	*(mW)*		25.76		25.76		
	z_s	*(cm)*			4.00			
	z_b	*(cm)*					4.00	
	z_{MI}	*(cm)*	3.83					
	$z_{PII,a}$	*(cm)*	3.83					
	f_{awf}	*(MHz)*	3.34	3.34	3.34	3.34	3.34	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	84.06					
	n_{pps}		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm²)*	81.20					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	24.35					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm²)*	58.22					
	pr at z_{PII}	*(MPa)*	1.67					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		68	68	68	68	68	N/A
	Frequency Index		3	3	3	3	3	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer: C422UB

Index label		MI	TIS		TIB		TIC
			At surface	Below surface	At surface	Below surface	
Maximum index value		0.57	0.01		0.13		N/A
Index Component Value			0.01	0.004	0.01	0.13	
Associated acoustic parameters	$p_{r,a}$ at zMI (MPa)	1.03					
	P (mW)		1.20		1.20		N/A
	P_{IXI} (mW)		0.92		0.92		
	zs (cm)			2.97			
	zb (cm)					3.54	
	zMI (cm)	3.90					
	$z_{PII,a}$ (cm)	3.90					
	$fawf$ (MHz)	3.34	3.34	3.34	3.34	3.34	N/A
Other Information	prr (Hz)	240.62					
	Srr (Hz)	-					
	$npps$	1.00					
	$I_{pi,a}$ at $z_{PII,a}$ (W/cm^2)	91.27					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$ (mW/cm^2)	9.88					
	I_{spta} at z_{PII} or z_{SII} (mW/cm^2)	27.24					
	pr at z_{PII} (MPa)	1.71					
Operating control conditions	Focus Depth(mm)	60	60	60	60	60	N/A
	Display Depth(mm)	68	68	68	68	68	N/A
	Frequency Index	3	3	3	3	3	N/A
	ScanAngle	/	/	/	/	/	N/A
	Speed	level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: C422UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.57	0.42		0.54		N/A
Index Component Value				0.42	0.41	0.42	0.54	
Associated acoustic parameters	$p_{r, a}$ at z_{MI}	*(MPa)*	1.03					
	P	*(mW)*		34.69		34.69		N/A
	P_{1X1}	*(mW)*		26.68		26.68		
	z_s	*(cm)*			4.00			
	z_b	*(cm)*					4.00	
	z_{MI}	*(cm)*	3.90					
	$z_{PII,a}$	*(cm)*	3.90					
	f_{awf}	*(MHz)*	3.34	3.34	3.34	3.34	3.34	N/A
Other Information	prr	*(Hz)*	240.62					
	Srr	*(Hz)*	84.06					
	n_{pps}		1.00					
	$I_{pi, a}$ at $z_{PII,a}$	*(W/cm^2)*	91.27					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	9.88					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	27.24					
	pr at z_{PII}	*(MPa)*	1.71					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		68	68	68	68	68	N/A
	Frequency Index		3	3	3	3	3	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: C422UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.62	0.60		0.60		N/A
Index Component Value				0.60	0.28	0.60	0.47	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.09					
	P	*(mW)*		67.95		67.95		N/A
	P_{IXI}	*(mW)*		41.32		41.32		
	z_s	*(cm)*			3.67			
	z_b	*(cm)*					4.07	
	z_{MI}	*(cm)*	4.43					
	$z_{PII,a}$	*(cm)*	4.43					
	f_{awf}	*(MHz)*	3.08	3.07	3.07	3.07	3.07	N/A
Other Information	prr	*(Hz)*	4885.10					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	105.23					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	601.45					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	1556.32					
	pr at z_{PII}	*(MPa)*	1.75					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		68	68	68	68	68	N/A
	Frequency Index		3	3	3	3	3	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: C422UB

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.62	1.01		1.01		N/A
Index Component Value				1.01	0.69	1.01	0.88	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.09					
	P	*(mW)*		101.44		101.44		N/A
	P_{IXI}	*(mW)*		67.08		67.08		
	z_s	*(cm)*			4.00			
	z_b	*(cm)*					4.07	
	z_{MI}	*(cm)*	4.43					
	$z_{PII,a}$	*(cm)*	4.43					
	f_{awf}	*(MHz)*	3.08	3.07	3.34	3.34	3.07	N/A
Other Information	prr	*(Hz)*	4885.10					
	Srr	*(Hz)*	84.05					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	105.23					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	601.45					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	1556.32					
	pr at z_{PII}	*(MPa)*	1.75					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		68	68	68	68	68	N/A
	Frequency Index		3	3	3	3	3	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: C422UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.80	0.07		0.07		N/A
Index Component Value				0.07	0.07	0.07	0.07	
Associated acoustic parameters	$p_{r,a}$ at zMI	(MPa)	1.39					
	P	(mW)		7.31		7.31		N/A
	P_{IXI}	(mW)		4.74		4.74		
	z_s	(cm)			4.69			
	z_b	(cm)					4.67	
	z_{MI}	(cm)	4.23					
	$z_{PII,a}$	(cm)	4.23					
	f_{awf}	(MHz)	3.06	3.06	3.42	3.42	3.06	N/A
Other Information	prr	(Hz)	-					
	Srr	(Hz)	8.78					
	n_{pps}		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	168.11					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	65.34					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	160.72					
	pr at z_{PII}	(MPa)	2.18					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		78	78	78	78	78	N/A
	Frequency Index		3	3	3	3	3	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: C422UB

Index label			MI	TIS At surface	TIS Below surface	TIB At surface	TIB Below surface	TIC
Maximum index value			0.62	0.67		0.67		N/A
Index Component Value				0.67	0.35	0.67	0.54	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	*(MPa)*	1.09					
	P	*(mW)*		75.26		75.26		N/A
	P_{1X1}	*(mW)*		46.06		46.06		
	z_s	*(cm)*			3.67			
	z_b	*(cm)*					4.07	
	z_{MI}	*(cm)*	4.43					
	$z_{PII,a}$	*(cm)*	4.43					
	f_{awf}	*(MHz)*	3.08	3.07	3.07	3.07	3.07	N/A
Other Information	prr	*(Hz)*	4885.10					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm^2)*	105.23					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	601.45					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	1556.32					
	pr at z_{PII}	*(MPa)*	1.75					
Operating control conditions	Focus Depth(mm)		60	60	60	60	60	N/A
	Display Depth(mm)		68	68	68	68	68	N/A
	Frequency Index		3	3	3	3	3	N/A
	ScanAngle		/	/	/	/	/	N/A

A2.8.11. Test of Probe L552UB

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode:　　B mode

Transducer:　L552UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.71	0.60		0.60		N/A
Index Component Value				0.60	0.60	0.60	0.60	
Associated acoustic parameters	$p_{r.\,a}$ at z_{MI}	*(MPa)*	1.53					
	P	*(mW)*		26.58		26.58		N/A
	P_{IXI}	*(mW)*		26.58		26.58		
	z_s	*(cm)*			2.00			
	z_b	*(cm)*					2.00	
	z_{MI}	*(cm)*	2.05					
	$z_{PII,a}$	*(cm)*	2.05					
	f_{awf}	*(MHz)*	4.71	4.74	4.74	4.74	4.74	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	110.98					
	n_{pps}		1.00					
	$I_{pi.\,a}$ at $z_{PII,a}$	*(W/cm²)*	157.30					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm²)*	20.45					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm²)*	44.23					
	pr at z_{PII}	*(MPa)*	2.25					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		4.5	4.5	4.5	4.5	4.5	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: M mode

Transducer: L552UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.76	0.02		0.13		N/A
Index Component Value				0.02	0.01	0.02	0.13	
Associated acoustic parameters	$p_{r,a}$ at zMI	*(MPa)*	1.64					
	P	*(mW)*		0.95		0.95		N/A
	P_{IXI}	*(mW)*		0.95		0.95		
	zs	*(cm)*			1.50			
	zb	*(cm)*					1.48	
	zMI	*(cm)*	1.93					
	$z_{PII,a}$	*(cm)*	1.93					
	$fawf$	*(MHz)*	4.71	4.74	4.74	4.74	4.74	N/A
Other Information	prr	*(Hz)*	317.88					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	*(W/cm^2)*	170.70					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	14.11					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	28.72					
	pr at z_{PII}	*(MPa)*	2.34					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		4.5	4.5	4.5	4.5	4.5	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+M mode

Transducer: L552UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.76	0.62		0.73		N/A
Index Component Value				0.62	0.61	0.62	0.73	
Associated acoustic parameters	$p_{r,a}$ at z_{MI}	(MPa)	1.64					
	P	(mW)		27.53		27.53		N/A
	P_{IXI}	(mW)		27.53		27.53		
	z_s	(cm)			2.00			
	z_b	(cm)					2.00	
	z_{MI}	(cm)	1.93					
	$z_{PII,a}$	(cm)	1.93					
	f_{awf}	(MHz)	4.71	4.74	4.74	4.74	4.74	N/A
Other Information	prr	(Hz)	317.88					
	Srr	(Hz)	110.98					
	$npps$		1.00					
	$I_{pi,a}$ at $z_{PII,a}$	(W/cm^2)	170.70					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	14.11					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	28.72					
	pr at z_{PII}	(MPa)	2.34					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		4.5	4.5	4.5	4.5	4.5	N/A
	ScanAngle		/	/	/	/	/	N/A
	Speed		level 3	level 3	level 3	level 3	level 3	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: PW mode

Transducer: L552UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.73	0.54		0.56		N/A
Index Component Value				0.54	0.16	0.54	0.56	
Associated acoustic parameters	$p_{r.\,a}$ at zMI	*(MPa)*	1.45					
	P	*(mW)*		28.32		28.32		N/A
	P_{1X1}	*(mW)*		28.32		28.32		
	zs	*(cm)*			1.71			
	zb	*(cm)*					1.95	
	z_{MI}	*(cm)*	2.23					
	$z_{PII,a}$	*(cm)*	2.23					
	f_{awf}	*(MHz)*	3.97	3.98	3.98	3.98	3.98	N/A
Other Information	prr	*(Hz)*	4885.10					
	Srr	*(Hz)*	-					
	$npps$		1.00					
	$I_{pi.\,a}$ at $z_{PII,a}$	*(W/cm^2)*	115.40					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	518.64					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	957.33					
	pr at z_{PII}	*(MPa)*	1.97					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		4	4	4	4	4	N/A
	ScanAngle		/	/	/	/	/	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+PW mode

Transducer: L552UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.73	1.14		1.16		N/A
Index Component Value				1.14	0.76	1.14	1.16	
Associated acoustic parameters	$p_{r.a}$ at z_{MI}	*(MPa)*	1.45					
	P	*(mW)*		54.89		54.89		N/A
	P_{1X1}	*(mW)*		54.89		54.89		
	z_s	*(cm)*			2.00			
	z_b	*(cm)*					2.00	
	z_{MI}	*(cm)*	2.23					
	$z_{PII,a}$	*(cm)*	2.23					
	f_{awf}	*(MHz)*	3.97	4.74	4.74	4.74	4.74	N/A
Other Information	prr	*(Hz)*	4885.10					
	Srr	*(Hz)*	102.77					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	*(W/cm^2)*	115.40					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	518.64					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	957.33					
	pr at z_{PII}	*(MPa)*	1.97					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		4	4	4	4	4	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C/B+PDI/B+DPDI mode

Transducer: L552UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.73	0.05		0.05		N/A
Index Component Value				0.05	0.05	0.05	0.05	
Associated acoustic parameters	$p_{r.\,a}$ at z_{MI}	*(MPa)*	1.47					
	P	*(mW)*		2.27		2.27		N/A
	P_{1X1}	*(mW)*		2.27		2.27		
	z_s	*(cm)*			2.00			
	z_b	*(cm)*					2.00	
	z_{MI}	*(cm)*	2.23					
	$z_{PII,a}$	*(cm)*	2.23					
	f_{awf}	*(MHz)*	3.97	3.97	4.92	4.92	3.97	N/A
Other Information	prr	*(Hz)*	-					
	Srr	*(Hz)*	11.00					
	$npps$		1.00					
	$I_{pi.\,a}$ at $z_{PII,a}$	*(W/cm^2)*	116.68					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	*(mW/cm^2)*	34.56					
	I_{spta} at z_{PII} or z_{SII}	*(mW/cm^2)*	60.19					
	pr at z_{PII}	*(MPa)*	1.94					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		4	4	4	4	4	N/A
	ScanAngle		level 0	level 0	level 0	level 0	level 0	N/A

Acoustic Output Reporting Table for IEC60601-2-37

Operating Mode: B+C+PW/B+PDI+PW/B+DPDI+PW mode

Transducer: L552UB

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.73	0.59		0.61		N/A
Index Component Value				0.59	0.21	0.59	0.61	
Associated acoustic parameters	$p_{r.a}$ at zMI	(MPa)	1.45					
	P	(mW)		30.59		30.59		N/A
	P_{IXI}	(mW)		30.59		30.59		
	zs	(cm)			1.71			
	zb	(cm)					1.95	
	zMI	(cm)	2.23					
	$z_{PII,a}$	(cm)	2.23					
	$fawf$	(MHz)	3.97	3.98	3.98	3.98	3.98	N/A
Other Information	prr	(Hz)	4885.10					
	Srr	(Hz)	-					
	$npps$		1.00					
	$I_{pi.a}$ at $z_{PII,a}$	(W/cm^2)	115.40					
	$I_{spta,a}$ at $z_{PII,a}$ or $z_{SII,a}$	(mW/cm^2)	518.64					
	I_{spta} at z_{PII} or z_{SII}	(mW/cm^2)	957.33					
	pr at z_{PII}	(MPa)	1.97					
Operating control conditions	Focus Depth(mm)		25	25	25	25	25	N/A
	Display Depth(mm)		29	29	29	29	29	N/A
	Frequency Index		4	4	4	4	4	N/A
	ScanAngle		/	/	/	/	/	N/A

WARNING

The device is not intended for ophthalmic use. Do not use it for examining ophthalmic vessels, or any other procedures which may cause the ultrasound beam to pass through the eye.

Appendix III: Measurement Accuracy

Parameter	Range	Accuracy
Two-dimension Measurement		
Distance/depth	Full Screen	< ±5%
Area (Trace)	Full Screen	< ±10%
Area (Ellipse)	Full Screen	< ±10%
Angle	Full Screen	< ±3%
Time Motion (TM) Measurement		
Depth	Full Screen	< ± 5%
Time	Timeline display	< ± 5%
Heart rate	Timeline display	< ± 5%
Volume Measurement		
Volume	Full Screen	< ±15%
PW measurement		
Velocity	10-200cm/s	When angle ≤60° , < ±10%
CW measurement		
Velocity	10-200cm/s	When angle ≤60° , < ±10%

Appendix IV: EMC Information-Guidance and Manufacture's Declaration

Electromagnetic Emissions

Guidance and manufacture's declaration – electromagnetic emission		
U50 is intended for use in the electromagnetic environment specified below. The customer or the user of U50 should assure that they are used in such an environment.		
Emission test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	U50 uses RF energy only for its internal function. Therefore, the RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emission CISPR 11	Class A	U50 is suitable for use in all establishments, other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC/EN 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC/EN 61000-3-3	Complies	

NOTE:

The EMISSIONS characteristics of U50 make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) U50 might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

Electromagnetic Immunity

Guidance and manufacture's declaration – electromagnetic immunity			
U50 is intended for use in the electromagnetic environment specified below. The customer or the user of U50 should assure that they are used in such an environment.			
Immunity test	**IEC/EN 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC/EN 61000-4-2	± 8 kV contact ± 15 kV air	± 8 kV contact ± 15 kV air	Floors should be wood, concrete or ceramic tile. If floor is covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC/EN 61000-4-4	±2 kV for power supply lines	±2kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC/EN 61000-4-5	±1 kV for line to line ±2 kV for line to ground	±1 kV for line to line ±2 kV for line to ground	Mains power quality should be that of a typical commercial or hospital environment.
Power frequency (50/60Hz) magnetic field IEC/EN 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC/EN 61000-4-11	0 % UT; 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0 % UT; 1 cycle and 70 % UT; 25/30 cycles) Single phase: at 0° 0 % UT; 250/300 cycle	0 % U_T; 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0 % U_T; 1 cycle and 70 % U_T; 25/30 cycles Single phase: at 0° 0 % U_T; 250/300 cycle	Mains power quality should be that of a typical commercial or hospital environment. If the user of U50 requires continued operation during power mains interruptions, it is recommended that U50 be powered from an uninterruptible power supply or a battery.

| NOTE | U_T is the a.c. mains voltage prior to application of the test level. |

Electromagnetic Immunity

Guidance and manufacture's declaration – electromagnetic immunity			
U50 is intended for use in the electromagnetic environment specified below. The customer or the user of U50 should assure that they are used in such an environment.			
Immunity test	**IEC/EN 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Conducted RF IEC/EN 61000-4-6 Radiated RF IEC/EN 61000-4-3	3 V_{rms} 150 kHz to 80 MHz 6Vrms[c] in ISM bands between 0.15 MHz and 80 MHz 3 V/m 80 MHz to 2.7 GHz See table 1	3 V_{rms} 150 kHz to 80 MHz 6Vrms[c] in ISM bands between 0.15 MHz and 80 MHz 3 V/m 80 MHz to 2.7 GHz Comply with table 1	Portable and mobile RF communications equipment should be used no closer to any part of U50, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1.2\sqrt{P}$ 150KHz to 80MHz $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.7 GHz $d = 6\sqrt{P}/E$ at RF wireless communications equipment bands (Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the U50, including cables specified by the manufacturer). Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended

			separation distance in meters (m).
			Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b]
			Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1   At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2   These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a]   Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which U50 is used exceeds the applicable RF compliance level above, U50 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating U50.

[b]   Over the frequency range 150kHz to 80MHz, field strengths should be less than 3V/m.

c   The ISM (industrial, scientific and medical) bands between 0.15 MHz and 80 MHz are 6.765 MHz to 6.795 MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz; and 40.66 MHz to 40.70 MHz. The amateur radio bands between 0.15 MHz and 80 MHz are 1.8 MHz to 2.0 MHz, 3.5 MHz to 4.0 MHz, 5.3 MHz to 5.4 MHz, 7 MHz to 7.3 MHz, 10.1 MHz to 10.15 MHz, 14 MHz to 14.2 MHz, 18.07 MHz to 18.17 MHz, 21.0 MHz to 21.4 MHz, 24.89 MHz to 24.99 MHz, 28.0 MHz to 29.7 MHz and 50.0 MHz to 54.0 MHz.

Table 1 Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communications equipment

Test frequency (MHz)	Band [a] (MHz)	Service [a]	Modulation [b]	Maximum power (W)	Distance (m)	Immunity test level (V/m)
385	380-390	TETRA 400	Pulse modulation [b] 18 Hz	1.8	0.3	27
450	430-470	GMRS 460, FRS 460	FM [c] ± 5 kHz deviation 1 kHz sine	2	0.3	28
710 745 780	704-787	LTE Band 13, 17	Pulse modulation [b] 217 Hz	0.2	0.3	9
810 870 930	800-960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation [b] 18 Hz	2	0.3	28
1720 1845 1970	1700-1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation [b] 217 Hz	2	0.3	28
2450	2400-2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation [b] 217 Hz	2	0.3	28
5240 5500 5785	5100-5800	WLAN 802.11 a/n	Pulse modulation [b] 217 Hz	0.2	0.3	9
NOTE If necessary to achieve the IMMUNITY TEST LEVEL, the distance between the transmitting antenna and the ME EQUIPMENT or ME SYSTEM may be reduced to 1 m. The 1 m test distance is permitted by IEC 61000-4-3.						

a) For some services, only the uplink frequencies are included.

b) The carrier shall be modulated using a 50 % duty cycle square wave signal.

c) As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

Recommended Separation Distances

Recommended separation distances between

portable and mobile RF communications equipment and U50

U50 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of U50 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and U50 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	Separation distance according to frequency of transmitter(m)		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.7 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Appendix V: Order List

The following accessories are recommended to be used on the U50.

WARNING

Only accessories supplied or recommended by EDAN can be used, the battery and probes of EDAN can be only used on EDAN's systems. Otherwise, the performance and electric shock protection can not be guaranteed. If electrical or mechanical equipment from other companies need to be connected to the device, please contact EDAN or authorized representatives before connection.

Part Name	Part Number
Probe C352UB	02.01.214369
Probe L1042UB	02.01.214382
Probe L742UB	02.01.214370
Probe E612UB	02.01.214381
Probe C612UB	02.01.214383
Probe C6152UB	02.01.214384
Probe C422UB	02.01.214385
Probe L552UB	02.01.214386
Probe C5-2b	02.01.214387
Probe P5-1b	02.01.214389
Probe L15-7b	02.01. 214388
BGK-R50UB Needle Guide Bracket Kit	02.01.210406
BGK-L40UB Needle Guide Bracket Kit	02.01.210407
BGK-CR10UA Needle Guide Bracket Kit	02.01.102963
BGK-R10UB Needle Guide Bracket Kit	02.01.210617
BGK-R15UB Needle Guide Bracket Kit	02.01.210618
BGK-R20UB Needle Guide Bracket Kit	02.01.210619
BGK-L50UB Needle Guide Bracket Kit	02.01.210620
BGK-C5-2 Needle Guide Bracket Kit	02.01.211006

Freeze footswitch	21.10.027169
MT-805 Mobile trolley	83.63.560347
Rechargeable Lithium-Ion battery	01.21.064356
Hand carried bag	01.56.465013
Dustproof cloth	01.57.471026
USB Disk	01.18.052245
Probe cable holder	01.52.113229

NOTE:

The part name may vary depending on the context, but the part number is constant.

Appendix VI: Glossary

Abbreviated	Description
Obstetrics	
EDC	Estimated Date of Confinement
MA	Menstrual Age
LMP	Last Menstrual Period
BBT	Basal Body Temperature
EFW	Estimated Fetal Weight
GS	Gestational Sac Diameter
CRL	Crown Rump Length
BPD	Biparietal Diameter
HC	Head Circumference
AC	Abdominal Circumference
FL	Femur Length
AFI	Amniotic Fluid Index
TAD	Transverse Abdominal Diameter/Transverse Trunk Diameter
APAD	Antero Posterior Abdominal Diameter
CER	Cerebellum Diameter
FTA	Fetus Trunk cross section Area
HUM	Humerus Length
OFD	Occipital Frontal Diameter
THD	Thorax Diameter
Umb A	Umbilical Artery
MCA	Middle Cerebral Artery
Fetal AO	Fetal Aorta
Desc.AO	Descending Aorta
Placent A	Placent Aorta
Ductus V	Ductus Venosus
FBP	Fetal Biophysical Profile
Cardiology	
LVIDd	Left Ventricle Internal Diameter (end diastolic)
LVIDs	Left Ventricle Internal Diameter (end systolic)
HR	Heart Rate
ESV	End Systolic Volume
SV	Stroke volume
CO	Cardiac Output
EF	Ejection fraction (M mode)
FS	Fractional Shortening
SI	Stroke Index
CI	Cardiac Index

MVCF	Mean Velocity Circumferential Fiber Shortening
BSA	Body Surface Area
AOD	Aortic root Diameter
LAD	Left Atrium Diameter
LAD/AOD	Left Atrium Diameter / Aortic root Diameter
CA	Cardiac cycle apex A
CE	Cardiac cycle apex E
CA/CE	The ratio of CA to CE
EF SLP	Ejection Fraction Slope
ACV	AC Decreasing Velocity
DEV	Deceleration Velocity
DCT	Deceleration Time
MAVO1	Aortic Valve Volume Opened, beginning
MAVO2	Aortic Valve Volume Opened, ending
AA	Aortic Amplitude
LVMW	Left Ventricular Muscle Weight
AVSV	Aortic Valve Stoma Valve flow
QMV	Mitral Valve Flow
LVLd	Left Ventricle Long-axle Diameter (end diastolic)
LVALd	Left Ventricle Area of Long-axle (end diastolic)
LVLs	Left Ventricle Long-axle Diameter (end systolic)
LVALs	Left Ventricle Area of Long-axle (end systolic)
LVET	Left Ventricular Ejection Time
Gynecology	
UT	Uterus
UT-L	Uterus Length
UT-W	Uterus width
UT-H	Uterus Height
Endo	Uterus Endo-membrane Thickness / Endometrium
L. OV-Vol	Left Ovary Volume
L. OV-L	Left Ovary Length
L. OV-W	Left Ovary Width
L. OV-H	Left Ovary Height
R. OV-Vol	Right Ovary Volume
R. OV-L	Right Ovary Length
R. OV-W	Right Ovary Width
R. OV-H	Right Ovary Height
L. FO-L	Left Follicle Length
L. FO-W	Left Follicle Width
R. FO-L	Right Follicle Length
R. FO-W	Right Follicle Width
CX-L	Cervix Length
UT-L/CX-L	Uterus Length / Cervix Length

L UT A	Left Uterus Aorta
R UT A	Right Uterus Aorta
L OV A	Left Ovary Aorta
R OV A	Right Ovary Aorta
Small Parts	
THY	Thyroid
L. THY-V	Left Thyroid Volume
L. THY-L	Left Thyroid Length
L. THY-W	Left Thyroid Width
L. THY-H	Left Thyroid Height
R. THY-V	Right Thyroid Volume
R. THY-L	Right Thyroid Length
R. THY-W	Right Thyroid Width
R. THY-H	Right Thyroid Height
Urology	
RUV	Residual Urine Volume (mL or L)
RUV-L	Residual Urine Length
RUV-W	Residual Urine Width
RUV-H	Residual Urine Height
PV	Prostate Volume (mm3, cm3, or dm3)
PV-L	Prostate Length
PV-W	Prostate Width
PV-H	Prostate Height
SPSA	Serum of Prostate Specific Antigen
PPSA	Predicted Prostate Specific Antigen Density
PSAD	Prostate Specific Antigen Density
Pediatrics	
HIP	Hip joint
Vascular	
CCA	Common Carotid Artery
ICA	Internal Carotid Artery
ECA	External Carotid Artery
Vert A	Vertebral Artery
Others	
TI	Thermal Index
MI	Mechanical Index
TIS	Soft-tissue thermal index
TIB	Bone thermal index
TIC	Cranial-bone thermal index
PW	Pulsed-wave Doppler
CW	Continuous-Wave Doppler
PDI	Power Doppler Imaging
DPDI	Directional Power Doppler Imaging

HPRF	High Pulse Repetition Frequency
PI	Pulsatility Index
RI	Resistance Index
PS	Peak Systolic Velocity
ED	End Diastolic Velocity
TAMAX	Time Averaged Maximum Velocity
PG	Pressure Gradient
PHT	Pressure Half Time
VTI	Velocity Time Integral
MVA	Mitral Valve Area

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