Kalamed
Medical Systems

POLYMED GROUP SUISSE

OPERATION-MANUAL

KUT-500

COLOR-DOPPLER-SYSTEM

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All information contained in this manual is believed to be correct.However, Kalamed reserves all rights of future or further improvements or modifications.

Carefully read and understand the manual before using the system to ensure its safe and correct operation. User’s operation failing to comply with this manual may result in malfunction or accident for which Kalamed can not be held liable.

The contents of this manual are subject to change without prior notice.

Product information

Product name: color doppler ultrasound diagnostic system

Model: KUT-500/

Important information

1. After buying the product, the user takes full responsibility for the maintenance and management of the product.
2. The warranty does not include follow items, even during the warranty period:

► Damage or loss resulting from disoperation or improper use (any application beyond the application scope of this instrument).

► Damage or loss caused by natural disasters, such as fires, earthquakes,flood, lightning, and so on.

► Damage or loss due to the failure to follow regulations on power supply, installation and operating conditions.

- ► Damage or loss caused by use of this system in area that is not the initially buy region.
- ► Damage or loss caused by buying the system from distributors or agents without authorization from Kalamed.

3. This system shall be operated only by or under the guidance of a qualified person.
4. Damage or loss caused by the installation, modification and checkup or repair by an unauthorized service engineer.
5. While the system is designed to provide diagnostic information, it is the operator's responsibility to ensure that this information is properly interpreted. The manufacturer shall not assume any responsibility for the misinterpretation of ultrasound images.
6. We recommend back up any important data on the system to external media, such as USB drive and CD/DVD. The manufacturer shall not be responsible for any data loss(including but not limited to the patient data,clinical records) due to malfunction.
7. For system data loss caused by operator's error or exception,Kalamed shall not assume any responsibility.
8. This manual contains information about the foreseeable warnning of the potential danger, please also keep high vigilance of those that aren't listed danger .Damage or loss caused by negligence or ignore of specified instructions for the prevention measures, Kalamed shall not assume any responsibility.
9. Once the administrator of this system change, please handed over this manual.

Manufacturer's Responsibility

Kalamed holds the rights to modify, update, and ultimately interpret this manual.

Kalamed is responsible for safety, reliability and performance of this product, only if:

- ► All installation operations, expansions, changes, modifications and repairs of this product are authorized by Kalamed;
- ► The use of the product or accessories is approved by Kalamed;
- ► The electrical installation of the relevant room complies with national and local requirements;
- ► The product is used in accordance with the instructions for use.

User manual

- ► To operate the scanner safely and correctly, please read carefully to understand this manual before use.it is necessary to use the right methods described in this manual when using the system.
- ► Especially take caution of contents marked "warning", "caution", "note" .
- ► Kalamed doesn't take responsibility for any damage or loss caused by improper operation or

maintainance don't follow instruction from manufacturer or distributors.

► The following conventions are available throughout the manual to show special emphasised information.

Sign	Meaning
	Indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in malfunction or damage of the system.
	Indicates precautions or recommendations should be used when operating the system.
[ ]	Indicates on-screen objects such as menu items and prompt.
Boldfaced Word	Indicates keys on the control panel.

Manufacturer information

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Chapter 1 Safety

The operation safety is the most important concern of the designer . To ensure the safety and efficiency of the system, the operator should read carefully about this chapter before using the system.

1.1 Safety Instructions

Read and understand all precautions in this manual before using the system.

Keep this manual with the system at all times. Periodically review the procedures for operation and safety precautions.

To maintain the performance and safety of the system, electric and mechanical safety inspections for the system should be performed periodically by professional technicians in not less than 6 months.

Warning

- Do not use the system in the applications other than those listed in the intended use.Otherwise, it may result in system damage or serious injury.
- This equipment can only be used for diagnosis, cannot be used for treatment.

1.1.1 Electric Safety

Warning

- Only qualified physicians or sonographers can perform ultrasound scanning on human body for medical diagnosis.
- The system can only be maintained by the person authorized or trained by the manufacturer.
- The transducer is treated as the applied part.
- Do not operate this system in an atmosphere containing flammable gases or liquids such as anesthetic gases, hydrogen, and ethanol, because there is an danger of explosion.
- Do not use this system at the same time with other equipment such as electric knife, defibrillator, and other high-frequency therapy equipment. Otherwise, there is danger of electric shock.
- keep the system dry, avoid beding transported to the field with a great temperature change to prevent condensation or water droplets from resulting in short circuit
- Connect the earth conductor before powering on the system, Disconnect the grounding cable after powering off the system. Otherwise, there is a danger of electric shock.
- Please check and replace the battery periodly, please use batteries as power supply when there is any problem with protective earthing

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- The AC power connector plug for the ultrasound system is a three-pin plug and should never be adapted to any two-pin outlet. The AC power connector plug should be plugged into a hospital-grade power outlet.
- Do not place the multi-socket outlet on the floor.
- Do not connect other devices to multi-socket outlet; otherwise, the rated output power may be exceeded and failure may be resulted.
- The multi-socket outlet can only be used to provide power to the recommended peripheral devices of this system.
- Select the qualified multi-socket outlet with protective grounding, and ensure its maximum output power doesn't exceed the required one of this system.
- If the non-medical electric equipment connected to the system is powered by the movable multi-socket outlet with the isolation transformer, you should connect the plug of the system to the hospital-graded standard socket. Meanwhile, please consult the professional technician to ensure that the connection meets the safety requirements.
- The video printer should be connected to the printing command line provided by the manufacturer, otherwise, there is a danger of electric shock.
- It is recommended to connect this equipment to equipotential system. Use yellow and green equipotential grounding cables, one end is connected to position with symbol, and other end is connected to equipotential system. Use of potential equalization conductor together with a reference to requirements of IEC 60601-1 for Medical Electrical System.
- Do not pour any fluid onto the ultrasound system surfaces, as fluid seepage into the electrical circuitry may cause excessive leakage current or system failure. If carelessly pour any water onto the system, immediately stop using the ultrasound system and contact Service Representative immediately.
- Only use the probes provided by the manufacturer. Otherwise, the ultrasound system cannot be performed, and an accident such as a fire may result in the worst case.
- The machine that are not serviced or maintained while in use with the patient.
- Make sure the system is powered off and power cable is disconnected before cleaning the system. Otherwise, an electric shock may happen.

Caution

- Do not use this system in the strong electromagnetic field. Using the system in the improper environment may result in malfunction or damage.
- Only the peripherals and accessories (such as probes, peripherals or cables) provided or recommended by the manufacturer can be used. Using other devices or accessories may degrade the system performance and even cause an electrical shock.

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1.1.2 Mechanical Safety

Warning

- Please make sure that the system is powered off and the power cable and the relevant accessories are disconnected before moving or transporting the system.
- Place the system on a level floor.
- The plug is used as disconnect to the mains supply, do not to position the machine so that it is difficult to operate the disconnection device.
- Do not place the system on a tilted plane . Otherwise, the system will fall off to cause system damage or personal injury. To ensure safety, it needs two people to move the system when crossing the slope.
- Avoid external force is applied on the machine, otherwise it may damage the machine. Prohibit sitting on the machine.
- Avoid external force is applied on the keyboard operation panel, otherwise it may damage the machine. Prohibit sitting on the keyboard operation panel.
- Avoid someone's unconscious rely on the front end of the operation panel to cause damage to the machine and people.
- The rocker arm may pinch of finger when someone adjusts the display, please be careful.

1.1.3 Accessories Safety

Warning

- Use the probe carefully. If any part of the transducer surface is scratched, immediately stop using the probe. Otherwise, there is a danger of electric shock.
- After disinfecting the accessories, chemicals must be washed out from the accessories. Remaining residual chemicals or gases could not only result in damage to the accessories but also can be harmful to human bodies.
- You should use the legally marketed rubber latex (probe sheath)when performing trans-esophagus or intracavitary exam, or biopsy exam. Please check the ingredient of the rubber latex on the package before purchasing the rubber latex. Contact with natural rubber latex may cause a severe anaphylactic reaction in persons sensitive to the natural latex protein. Refer to package labeling to check latex content and FDA’s March 29,1991 Medical Alert on latex products
- Do not use the footswitch in the operating room.
- Only the trained physicians or sonographers can handle the biopsy needle guides under ultrasound guidance. During the operation, the operator must observe proper needle insertion sequencing with the needle guide in order to avoid undue discomforts, unnecessary risks or injuries to patient.
- You should use the legally marketed medical ultrasound couplants. Please check the user instruction carefully before using it,please manage and use the ultrasound couplants correctly to prevent it being polluted.

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Caution

- Disconnect the probe from the system after freezing an image or powering off the system. Otherwise, the system or the probe could be damaged.

1.2 Principles of Using Acoustic Power

Warning

- Perform ultrasound procedures prudently under the guidance of the ALARA (as low as reasonably achievable) principle. Expose the patient to the lowest practical transmit power levels in the shortest possible period to achieve a satisfactory diagnosis.
- The operator should notice the effect of the heat on the patient body when the exam is performed around the bones and the nearby soft tissues which can transform the ultrasound energy to heat energy. Take special care to the fetal whose bones are growing.

1.2.1 Biological Safety

Diagnostic ultrasound is recognized as being safe, but the risk of biological effects exists when using it in high exposure levels and long exposure times. Thus ultrasound should be used in a prudent manner to provide medical benefit to the patient.

1.2.2 Mechanical and Thermal Indices

The ultrasound system displays two parts: thermal Index (TI) and Mechanical Index (MI). The MI/TI value of the machine is real time displayed at the upper right corner, regarding how to change TI display type, please choose: **Preset** → [System Preset] → [TI].

■ Meaning of MI/TI

Mechanical bioeffects are threshold phenomena that occur when a certain level of output is exceeded. The threshold level varies with tissue type. The potential mechanical bioeffects varies with peak pressure and ultrasound frequency. The higher the MI value, the greater the likelihood of mechanical bioeffects occurring. There is no specific MI value theat means that a mechanical effect is actually occurring. The MI should be used as guide for implementing the ALARA principle.

The TI value informs the operator about the conditions that might lead to an increase in temperature at surface of the body, within the body tissue, or at the point of focus of the ultrasound beam on bone. That is, the TI value informs the operator about the potential temperature rise in body tissue. It is an estimate of temperature increase in body tissue with specific properties. The actual amount of an temperature rise is influenced by factor such as tissue type, vascularity, mode of operation and others. The TI value should be used as a guide for implementing the ALARA principle. Depending on the examination and type of tissue involved, TI could be one of three types.

Soft Tissue Thermal Index (TIS) is used when imaging soft tissue only, it provides an estimate of potential temperature rise in soft tissue.

- Bone Thermal Index (TIB) is used when bone is near the focus of the image as in the third

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cropester OB examination, it provides an estimate of potential temperature rise in the bone or adjacent soft tissue.

- Cranial Bone Thermal Index (TIC) is used when bone is near the skin surface as in transcranial examination, it provides an estimate of potential temperature rise in the bone or adjacent soft tissue.

■ Precision of MI/TI

TI and MI values are displayed in real time on the screen. The operator should observe these index values during examinations and ensure that exposure time and output values are maintained at minimum amounts needed for effective diagnosis. The MI and TI precision is 0.1.

1.2.3 Acoustic Output Statement

1.2.3.1 The Influencing Factors of Acoustic Uncertainty

When estimating accuracy of displayed numerical values,many factors are considered:

- The probe changeability
- The system changeability
- Changeability and accuracy of measurement
- Possible operating conditions and testing numbers needed to obtain displayed result accuracy of the diagnostic system
- Whether the display accuracy depends on specific system combination, mode combination , probe component and launch mode combination, or all of above
- Algorithm accuracy of the system software used to calculate the MI/TI
- Approximation engineering method used in real time computation

1.2.3.2 Differences between Actual and Displayed MI and TI

For many assumptions used in the process of measurement and calculation, actually they are conservative. For most organs measurement and calculaiton path, high estimate is made in the measurement and calculation process of tissue exposure intensity. For example, using attenuation coefficient 0.3dB cm^{-1} MHz^{-1} much lower than the actual human tissue attenuation coefficient, choosing conservative values of tissue characteristic. Therefore, displayed MI and TI values should be relative information for reference, they serve to indicate to the operator whether a particular setting of the system increases or decreases the possibility of Thermal or Mechanical effect, used to help the operator be careful to use ultrasonic diagnostic system and follow the ALARA principle, these values can not be equal to actual values.

1.2.3.3 Uncertainty of Measurement

Sound pressure is the most basic data of sound field measurement, and other sound field parameters can be deduced from sound pressure, so when analysing measurement uncertainty, only take sound pressure for analysis and uncertainty of other parameters can be deduced from the sound pressure.

Measurement uncertainty mainly include repeated measurement uncertainty and the system uncertainty, the system uncertainty is an order of magnitude higher than repeated measurement uncertainty, so the main analysis is the system uncertainty. Mainly decided by the following factors:

1. The sensitivity of hydrophone:According to hydrophone calibration report provided by ONDA

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company, the maximum allowable error of sound pressure for hydrophone is plus or minus 12%;

2. Scope: according to agilent DSO6502A specifications, its effect on the sound pressure is plus or minus 2%;
3. Temperature: effect of the thermocouple on sound pressure error is plus or minus 4%;

Above all uncertainty components are not related, synthetic standard uncertainty of sound pressure is :plus or minus 13%.

1.2.4 Operator Control Property

There are three types of operation control related to the generation of mechanical/thermal effect: direct control and indirect control, receiver control. Qualified operator should try to cut down the acoustic output in the premise of effective diagnostic images.

- Direct control

The direct control of the acoustic output of this system is adjusting voltage size. But its maximum acoustic output shouldn't be more than displayed acoustic output limit in any modes.

- Indirect control

The controls that indirectly affect output are many imaging parameters. These are operating modes, frequency, focal point number/position, image depth and pulse repetition frequency (PRF)(By adjusting the [Scale] of the toolbar).

The operating mode determines whether the ultrasound beam is scanning or non-scanning. Thermal effect is closely connected to M Mode, PW Doppler and Color Mode.

Acoustic attenuation of tissue is directly related to transducer frequency.

The focal point number and position is related to active aperture of transducer and beam width.

For the pulse repetition frequency(PRF)(By adjusting the [Scale] of the toolbar), the higher the PRF, the more acoustic output power increased over a period of time.

- The receiver control

The receiver control does not affect the acoustic output, including gain, dynamic range, and image processing, etc. Therefore, in the image optimization, should adjust the receiver control to optimize images firstly, the second are through direct control and indirect control.

When acquiring images, it is recommended to use the default (or as low as possible) acoustic output location, and use the gain control to compensate. The default setting is commonly 70% of maximum allowed acoustic output value, which will not cause harm to the operator, and for the probe is the most effective value

1.2.5 Acoustic Power Settings

The ultrasound system has been preset the parameters for each exam mode with different probes before shipment. When the ultrasound system is powered on, a new patient is created or the application mode is changed, the system will retrieve the default settings. You can also reset the parameters.

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1.2.6 ALARA

It is required to practice ALARA when using ultrasound energy. Practicing ALARA ensures that the total energy level is controlled below a low level at which bioeffects are not generated while diagnostic information is being accumulated. The total energy is controlled by output intensity and total radiation time. The output intensity necessary for examinations differs depending on the patient and clinical case.

Not all examinations can be performed with an extremely low level of acoustic energy. Controlling the acoustic level at an extremely low level leads to low-quality images or insufficient Doppler signals, adversely affecting the reliability of the diagnosis. However, increasing the acoustic power more than necessary does always contribute to an increase in quality of information required for diagnosis, rather increasing the risk of generating bioeffects.

The operator must take responsibility for the safety of patients.

1.3 Electromagnetic Compatibilities

Electromagnetic compatibilities are the abilities of the system or equipment to operate normally in the electromagnetic environment and not to radiate any electromagnetic interruptions to any other objects which are in the same environment.

This system is designed in accordance with the current EMC requirement. And the ultrasound image will degrade instantly if the system is used in the electromagnetic field environment. If the degradation of the image is found, it is recommended to inspect the operation environment to confirm the radiation source.

1.3.1 Electromagnetic Radiation

This system is applicable for the following environment. You should use this system under the suggested environment.

Emission Test	Compliance	Electromagnetic Environment and Guidance
RF emission CISPR 11	Group 1 Class A	The equipment use RF energy only for its internal function. Therefore, its RF emission is very low and not likely to cause any interference to nearby electronic equipment.
Harmonic emission IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

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1.3.2 Electromagnetic Immunity

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment and Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±8kV Contact ±15kV Air	±8kV Contact ±15kV Air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient burst IEC 61000-4-4	±2 kV for power supply lines, ±1 kV for input output lines	±2 kV for power supply lines, ±1 kV for input output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1kV line to line ±2kV line to earth	±1kV line to line ±2kV line to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips and Short interruptions IEC 61000-4-11	< 5%UT (>95% dip in UT) for 0.5 period; 40%UT (60% dip in UT) for 5 period; 70%UT (30% dip in UT) for 25 period) < 5%UT (>95% dip in UT) for 5 seconds	< 5%UT (>95% dip in UT) for 0.5 period; 40%UT (60% dip in UT) for 5 period; 70%UT (30% dip in UT) for 25 period) < 5%UT (>95% dip in UT) for 5 seconds	Mains power quality should be that of a typical commercial or hospital environment. If the user of the equipment requires contained operation during power mains interruptions, it is recommended for the equipment to be powered from an uninterruptible power supply.
Power frequency (50/60 Hz) IEC 61000-4-8	3 A/m	3 A/m	Power frequency of magnetic fields should be at leveled characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

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Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment and Guidance
Conducted RF IEC 61000-4-6	3Vrms 150kHz-80 MHz	1 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the EQUIPMENT, including cables, than the recommended separation distance calculated form the equation applicable to the frequency of the transmitter. Recommended separation distance: $d = 3.5\sqrt{p}$ $d = 1.2\sqrt{p}$ 80MHz-800 MHz $d = 2.3\sqrt{p}$ 80 MHz-2.5GHz 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, "should be less than the compliance level in each frequency range." Interference may occur in the vicinity of equipment marked with the following symbol:
Radiated RF IEC 61000-4-3	3V/m 80 MHz-2.5GHz	3 Vrms	
NOTE 1: At 80 MHz and 800MHz, 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.			
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 access the electromagnetic environment due to fixed RF transmitters, and electromagnetic site survey should be considered. If the measured filed strength in the location in which the EQUIPMENT is used exceeds the applicable RF compliance level above, the EQUIPMENT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocationing the EQUIPMENT. h Over the frequency range 150kHz to 80MHz, field strengths should be less than 3 V/m.			

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1.3.3 Recommended Minimum Distance Between and Mobile RF Equipment

The equipment is intended for use in an electromagnetic environment in which radiated RF disturbance are controlled. The customer or the user of the equipment can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the equipment 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 2.5 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.			

Note

If the system has generated the interference (confirmed by powering on and off the system), you or the qualified service personnel should solve the problem by following the steps as below:

- Reposition the affected system.
- Place this system further away from the affected system.
- Supply power to this system in other ways other than the way used currently.
- Contact the manufacturer as soon as possible.

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1.3.4 Signs and Meaning

Sign	Meaning
	Caution! Please consult the accompanying document.
	Warning, danger of electric shock!
	Type BF applied part
	Disconnect (the mains supply)
	Connect (the mains supply)
	Power on/standby button
	Footswitch
	Cable connecting the video printer
	Protective earth
IOIOI	Serial port
	Equipotentiality
	Alternating current
IPN$_1$N$_2$	Degree of IP protection
	Non-ionizing electromagnetic radiation

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Sign	Meaning
	Manufacturer
	Date of manufacturer
	Consult the user manual
	Network port
	USB port
	Video output
	Fragile
	Keep dry
	Keep this way upward
	Atmospheric pressure range of the transportation
	Relative humidity range of the transportation
	Ambient temperature rang of the transportation
	No object stacked on the package

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Sign	Meaning
	Do not roll.
	Keep in shade
	Indicates the presence of hazardous substance (s) above the maximum concentration value(s) as set in SJ/T11364-2006. "20" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in ay severe environmental pollution, bodily injury, or damage to any assets.
	Serial number
	Unrecyclable
	Authorized EU Representative

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Chapter 2 System Overview

You should familiar with the components, physical specification, operation of the keys and buttons, the general work flow before using this system.

2.1 Intended Use

The ultrasound system is intended for examining the adult, pregnant woman and children. The application parts are as follows: abdomen, obstetrics, gynecology, cardiac, smallparts, urology, vascular, pediatrics, thyroid, breast, carotid, kidney.

Contraindication: The ultrasound system is not intended for ophthalmic use or any use causing the acoustic beam to pass through the eye.

2.2 System Configuration

2.2.1 Standard Configuration

■ Main Unit

■ Accessories:

- Convex Array Transducer(3C6C)
- Operation Manual
- Gel
- Power Supply Cable
- Printing command line
- Potential-equalization lead wire
- Rechargeable lithium-ion battery

2.2.2 Options

2.2.2.1 Optional Probes

Probes Name	Probe Types	Applications
3C6C	Convex Array Transducer	Abdomen, Obstetrics, Gynecology
7L4C	Linear Array Transducer	Peripheral Vascular, Superficial organs
8L4C	High Frequency Linear Array Transducer	Peripheral Vascular, Superficial organs
6E1C	Trans-vaginal Transducer	Obstetrics, Gynecology
2P2F	Phased array probe	Abdomen,Cardiac

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Probes Name	Probe Types	Applications
6C15C	Micro-convex probe	Abdomen,Cardiac, Obstetrics
5L4C	Linear Array Transducer	Peripheral Vascular, Superficial organs
10L25C	Linear Array Transducer	Superficial organs
3C20C	Convex Array Transducer	Abdomen,Obstetrics Gynecology
6L7C	Linear Array Transducer	Peripheral Vascular, Superficial organs

2.2.2.2 Optional accessories

NO.	Accessories
1	Footswitch
2	Graphic printer
3	Blackwhite video printer
4	Color video printer
5	Biopsy bracket
6	USB flash disk
7	One-dimensional Scanner

2.3 Physical Specifications

Monitor: 18.5" LCD screen

Dimension: 815mm (L) x 550mm (H) x 1490 (D)

Weight: approximately 45kg

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2.4 Main Unit Overviews

Figure 2-1 Main Unit Overview

2.4.1 Side View

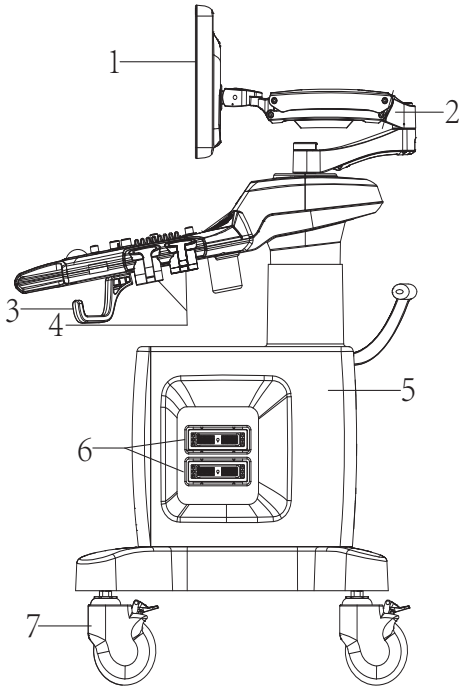

Figure 2-2 Side View

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Note

Adjustable angle range of monitor: -20° — +90°

Adjustable height of rocker arm: -30° — +65° ; adjustable range of rotation: -90° — +90°

Do not adjust monitor and the rocker arm vigorously, so as to avoid damage to the machine.

No	Name	Function
1	Monitor	Display images and parameters
2	Rocker arm	Support the monitor; adjust the height /position/tilted direction of the monitor
3	Hook drive	Hook for the probe and the power cable
4	Probe Holder	Place the probe
5	Ultrasound Host	/
6	Probe Port	Connect the probe
7	Truckle	Fix or move the system: Step the pedal ON to fix truckles; Step the pedal OFF to unfix the truckles

2.4.2 Rear View

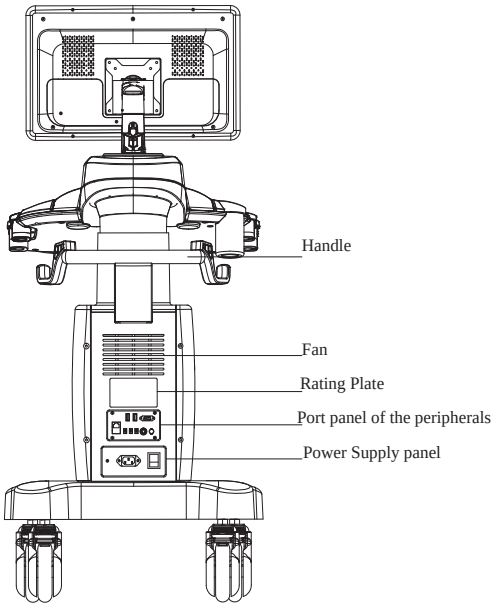

Figure 2-3 Rear View

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2.5 Peripherals Ports View

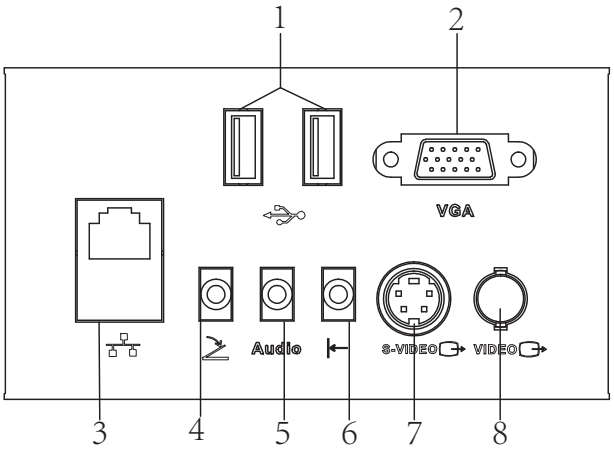

Figure 2-4 Peripherals Ports

No.	Name	Function
1	USB port	For external device connection and communication, such as U-disk, keyboard and Scanner, etc.
2	VGA port	For connecting analog signal video device, such as monitor or projector.
3	Network port	Used for connecting DICOM server or network.
4	Footswitch port	Used for connecting the footswitch.
5	Aduio output port	Used for connecting headphone or sound.
6	Printer port	Used for connecting the cable of video printer.
7	S-VIDEO output port	Used for connecting color video printer or TV.
8	VIDEO output port	Used for connecting the video equipment generating the composite signals, such as video printer.

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2.6 Power Supply Port

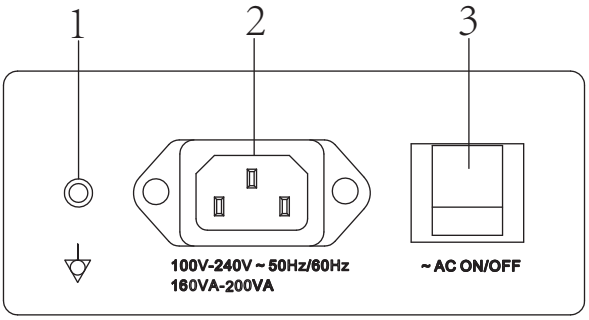

Figure 2-5 Power Supply Port

No.	Name	Function
1	Equipotentiality terminal	Used for balancing the protective earth potentials between this system and other electrical equipment.
2	AC power input port	Used for connecting the AC power supply.
3	ON/OFF switch	Used for powering on or off the system.

2.7 Control Panel

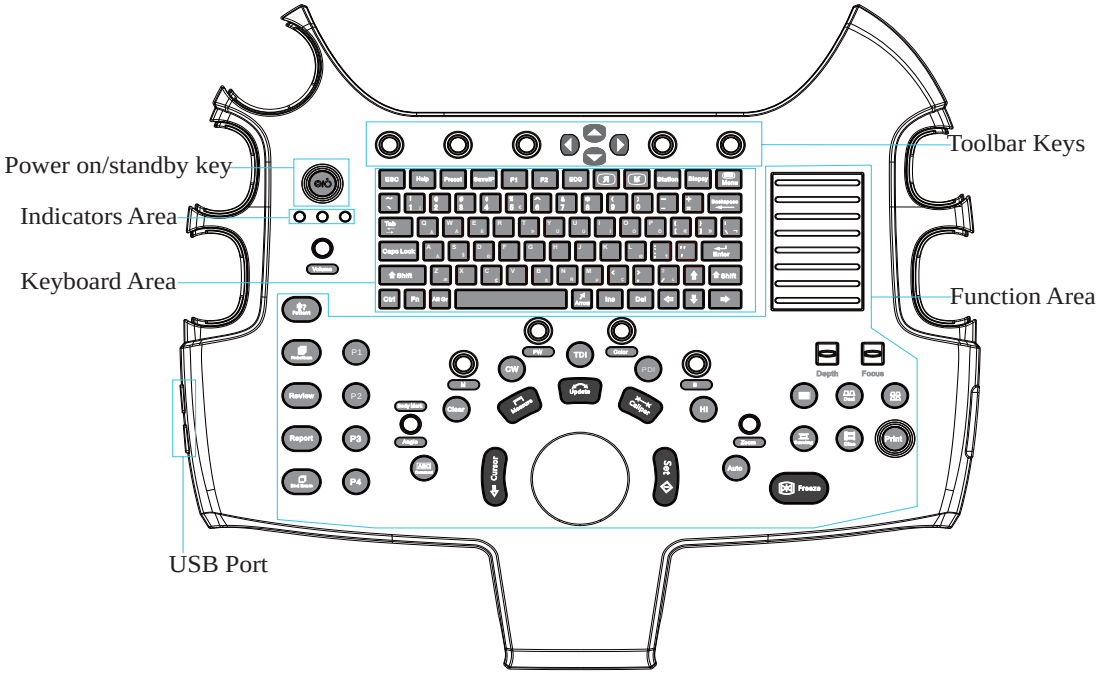

Figure 2-6 Control Panel

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Warning

Do not place other items on the control panel to protect it from suffering external force.

Sign	Name	Functions
Indicators Area		
	Power indicator	The indicator lights on when the system is powered by the alternative current.
	Battery capacity indicator	The indicator lights on when the system is powered by the battery. ● The indicator flashes when the battery capacity is lower than 30%. ● The indicator lights on when the battery is in full capacity.
	Battery charge indicator	The indicator lights on when the battery is charged and lights off when the battery is fully charged.
Keyboard Area		
Report	Report key	Press it to enter the report interface.
Review	Review key	Press it to enter the file review interface.
Station	Workstation key	Press it to enter the workstation interface.
Preset	Preset key	Press it to enter the system setting interface.
Save IP	Key for saving the image parameters	Press it to save the parameters setting of the current imaging mode.
Biopsy	Biopsy key	Press it to activate the biopsy function.
F1、F2	User-defined shortcut key	Press it to enter the self-defined shortcut function. For details, refer to Section 4.1 Presetting the System.

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Sign	Name	Functions
	Left/right invert key	Press it to invert the 2D image left to right.
	Up/down invert key	Press it to invert the 2D image up to down.
	Dual display key	Press it to enter the dual display.
	Quad display key	• If it is not in four images view, press this button to enter four images view. • If it is in four images view, press this button to switch real time display image.
Comment	Text annotation key	Press it to enter/exit the text annotation status.
Arrow	Arrow annotation key	Press it to enter/exit the arrow annotation status.
Clear	Clear key	Press it to remove all the annotations and measurements from the screen.
	Left/right key	• Press it to move the cursor left or right in the text annotation status. • Press it to adjust the brightness in other status.
	Up/down key	Press it to adjust the volume of the frequency spectrum in the real time PW mode.
-	Other keys	Achieve the functions similar with the keys on the keyboard of the computer.
Toolbar Keys		
	Adjustment key	Press it to adjust the corresponding menu items at the bottom of the screen.

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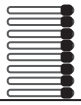
Sign	Name	Functions
	Navigation key	Up/down key is used to turn to the previous or next items. Left/right key varies with the status. ● Used for selecting the menu of the imaging mode in the image scan mode. ● Used for selecting the menu of the cine or imaging mode in the cine mode.
Function Keys		
	Power on/ standby key	Press it to power on or off the system or to enter standby mode.
	TGC slide	● There are 8 TGC slide. ● Move it to adjust the gain of the specified depth.
Patient	Patient key	Press it to enter the patient information screen to create or edit the patient information.
Probe/ Exam	Probe and exam mode selection key	Press it to enter the probe and exam selection mode to select the probe and the application part.
End Exam	Key to end the exam	Press it to end the exam of the current patient.
	B mode knob	Press it to enter the B mode.Rotate it to adjust the gain of the current mode.
	Color mode knob	Press it to enter/exit the color flow Doppler mode. Rotate it to adjust the gain of the current mode.
PDI	PDI mode key	Press it to enter the PDI mode.
	PW mode knob	Press it to enter/ exit the Pulsed Wave Doppler.Rotate it to adjust the gain of the current mode.
CW	CW mode key	Press it to enter/ exit the Continuous Wave Doppler

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Sign	Name	Functions
	M mode knob	Press it to enter/exit the M mode.Rotate it to adjust the gain of the current mode.
	Focus key	Slide it to adjust the focus of the current mode.
Cursor	Cursor key	Press it to display or hide the cursor.
Measure	Measurement key	Press it to activate or deactivate the measurement.
Update	Update key	When measuring, ● Press it to switch status between the ending point and the starting point in the distance measurement. ● Press it to switch status between the long axis and the short axis in the ellipse measurement. When scanning, ● Press it to switch the real time display and frozen mode in B mode and PW mode.
Caliper	General measurement key	Press it to enter/exit the general measurement.
Set	Confirmation key	Press it to confirm the current operation.
	Angle key/ **Body Mark**	● Press it to enter/exit the body mark status.Rotate it to adjust the direction mark of the probe in the body mark annotation status. ● Rotate it to adjust the direction of the arrow in the annotation status. ● Rotate it to adjust the calibrated angle in the PW mode. ● Rotate it to adjust the angle in the orthopaedic measurement. ● Rotate it to delete or restore the last trace in the trace measurement.

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Sign	Name	Functions
Depth	Depth key	Used for increasing or decreasing the depth of the image.
Zoom	Magnification key	Used for magnifying the interest area of the image.
Print	Print key	Used for printing images or patient report. For detailed settings, refer to Section 4.1 System Preset.
Cine	Play back key	Press it to inactivate/activate the manual review of the cine in the cine mode.
Save	Save key	Press it to save the current image in the frozen mode.
Freeze	Freeze key	Press it to freeze/unfreeze the image.

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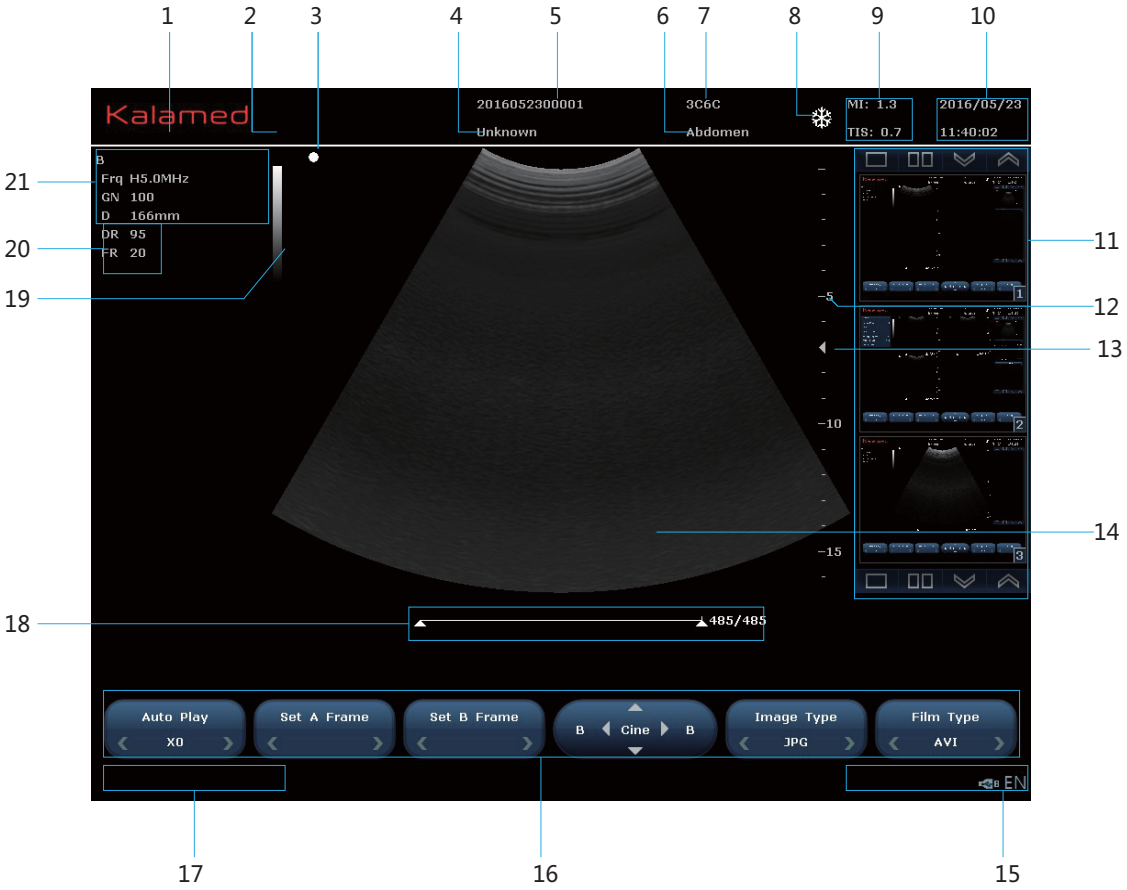
2.8 Main Screen



1. LOGO
2. Patient name
3. Direction mark of the probe
4. Gender
5. Patient ID
6. Exam type
7. Probe model
8. Freeze image
9. MI and TIS indices
10. Data and time
11. Imaging parameters
12. Thumbnails display area
13. Scale bar
14. Focus
15. Imaging area
16. Status
17. Toolbar
18. Prompt
19. Cine schedule bar
20. Gray map and color map (Color/PDI mode)
21. Menu

Thumbnails display area

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2.9 Regular Examination Workflow

The regular examination workflow is as shown in Figure 2-7. If you are not familiar with any of the operations, please consult the relevant chapter.

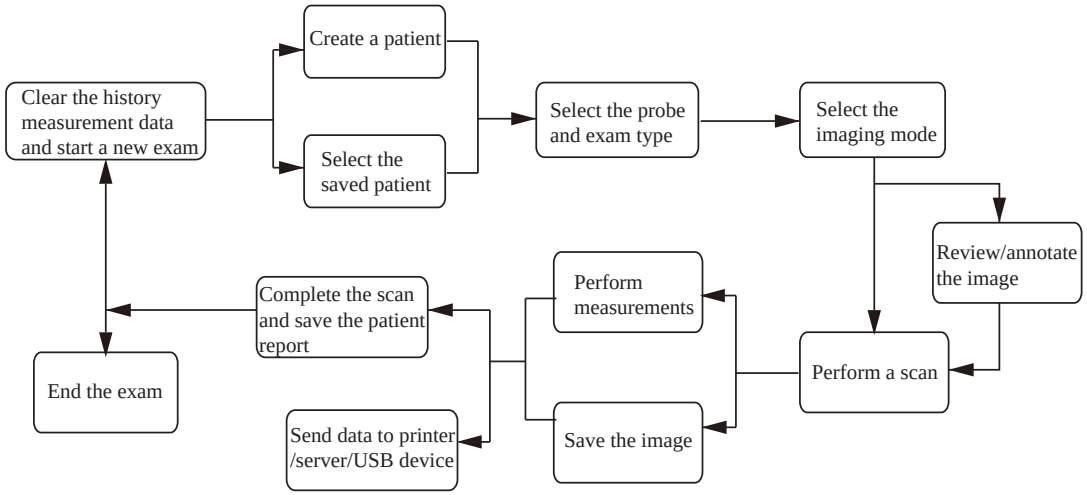

Figure 2-7 Regular Examination Workflow

- For creating a patient, refer to Section 5.1 Creating a Patient.
- For selecting the probe and exam type, refer to Section 5.2 Selecting the Probe and Exam Type.
- For selecting the imaging mode, refer to Chapter 6 Optimizing the Image.
- For reviewing/annotating the image, refer to Chapter 7 Working with the Images.
- For performing measurements, refer to Chapter 8 Measurements and Calculations.
- For saving the image, refer to Section 10.1 Saving the Image/Cine.
- For sending data to printer/server/USB storage device, refer to Section 10.4 Printing the Image and Section 10.5 Saving Data.
- For completing the scan and saving the patient report, refer to Chapter 9 Report.
- For ending the exam and clearing the history measurement and starting a new exam, refer to Section 5.3 Ending the Exam.

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Chapter 3 Preparing an Exam

You should complete the preparations before the exam, such as move, position and adjust the system, connect the power supply, probe or other peripherals. The battery can be disassembled or replaced during the exam.

3.1 Positioning the system

Caution

Keep the distance of 20cm from the left side and rear of the system to the walls during use. Otherwise, the temperature inside the system will increase and cause system malfunction.

Place the system on a level floor carefully.

3.2 Booting the system

Two methods can be used to supply power for the system: mains supply and battery.

When the adapter is connected to the mains supply, the battery is charged until full.

Note

The battery life will be affected if the battery is used frequently. Please use the AC Power as often as possible.

Connecting to the mains supply:

System Specifications: 100V-240V~50Hz/60Hz, 160VA-200VA

Warning

- The AC power plug for the ultrasound system is a three-pin grounded plug and should never be connected to any two-pin outlet or an AC Power. Otherwise, there is danger of electric shock.
- Ensure the potential-equalization lead wire is connected before inserting the equipment power plug. Otherwise, there is danger of electric shock.

Steps for connecting the mains supply are as follows:

Connect two ends of the power cable to the hospital-graded mains supply and the power input port at the rear panel of the system respectively, and ensure the connections are secure.

3.3 Using the Battery

3.3.1 Precautions

Warning

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- Prohibit assembling & disassembling the battery,in case of the explosion.
- Charge the battery through the diagnostic ultrasound system only. Otherwise, there is danger of explosion.
- Replace the battery provided by the manufacturer only.
- Do not short-circuit the battery by directly connecting the system with metal objects.
- If the battery emits an odor or heat, is deformed or discolored, or appears abnormal during use, charging or storage, remove it and stop using it immediately. If you have any questions about the battery, please contact the manufacturer.
- Do not use a battery if it leaks. If your skin or clothing is stained with the fluid from the battery, thoroughly wash the area immediately with clean water. If the fluid comes in contact with your eyes, immediately flush the eyes with water and seek the oculist for help.
- To avoid the battery damage causing the system damage, observe the following precautions:

  * Do not immerse the battery in water or allow it to get wet.

  * Do not discard the battery in a fire.

  * Do not expose the battery under the sunlight or leave it in the environment over 60°C.

  * Keep the battery away from fire and other heat sources during its usage and charge.

  * Do not pierce the battery with a sharp object, hit or step on it.

3.3.2 Charging the Battery

Caution

- If the battery has not been used for more than 3 months, it is recommended to store the battery in a temperature range from -20°C to 45°C with fully charged. If the battery has been used for more than 3 months, it is recommended to charge the battery once at least every 3 months to avoid of liquid leakage.
- Charge the battery in the temperature range from 0°C to 45°C and discharge it in a temperature range from 0°C to 60°C to maintain the lifespan of the battery.
- It is highly recommended to perform one full discharge/charge cycle before first time usage. A full discharge/charge cycle means the system works by using battery power until the battery loses its charge completely and the system shuts down. Thereafter, fully charge the battery
- When the battery capacity is low (battery status indicator flashes in gereen) and the battery cannot be charged in time, you need to save all unsaved data before the system automatically shuts down. Otherwise, you may lose useful information.
- If there is only a batterry inside, the battery can't be charged and supply power to the system.

When the system is connected to mains supply with the power cable, the battery is charged automatically.

A fully charged battery can work continuously for more than 1 hour. Exact time of endurance depends on image modes and screen brightness

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Battery Specifications:

Model: LI32IN001A

Rated voltage: 11.1V

Battery capacity: 5600mAh

Limited charging voltage: 12.6V

Please dispose the damaged, degraded battery or battery used for 3 years according to the local laws or regulations.

3.3.3 Assembling and Disassembling the Battery

Warning

Do not attempt to remove the battery.The battery is inside the diagnostic apparatus. Please connect manufacturer's service engineer or the technicians designated by the manufacturer when the battery needs disassembling.

3.4 Booting/Standby/Powering off

- Booting the system

  Press the Power on/Standby button on the system to boot the system.

- Standby

  In standby mode, screen is closed, system is in low power status, the Power on/Standby button led flickers in green back light.

  The system enters the standby mode automatically when it is not used for a certain time.

  You can also press the Power on/Standby button and select the [Standby] to enter the standby mode.

  You can set the standby by the **Preset** key -> [System Preset] -> [Standby and Wait Time].

- Powering off the system

Note

- Extra 20 seconds are needed for powering on the system if it is powered off in abnormal way last time.
- Do not power off the system during system upgrade or data transmission.
- Do not disconnect the power cable before the power off information disappears. Or, the files may be damaged and patient data may be lost.
- For safety and functionality of the system, regular maintenance should be performed as described in Chapter 12 System Maintenance.
- Long-click the Power on/Standby button can turn off the system forcely but may cause data lose, avoid turn off the system in this way unless it is necessary.

Press the Power on/Standby button on the system and select [Power off] to shut down the system.

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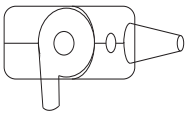
3.5 Connecting the Probe

Note

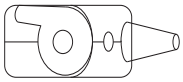
Disconnect the probe when the image is frozen or the system is shut down. Otherwise, probe and system damage may happen.

Steps for connection are as follows.

1. Place the probe cable upward and rotate the probe lock on the probe connector to vertical direction, as shown in picture below.



2. Insert the connector into the probe port until secure.
3. Rotate the probe lock on the probe connector to the horizontal direction position to make it fixed,as shown in picture below.



3.6 Connecting the Peripherals

3.6.1 Connecting the Footswitch

Note

Use the footswitch provided by the manufacturer only. Otherwise, system and footswitch may be damaged.

Connect the cable of the footswitch to the footswitch port of the system. Step on the footswitch to freeze/unfreeze the image.

3.6.2 Connecting the Video Printer

Use the type of the printer recommended by the manufacturer to connect to the system.

Connect the printer to the mains supply with power cable, With signal cable connect S - Video or Video output interface of the system to the printer Video input interface, use the command line to connect the command interface of the system to the printer command interface.

You can use the printer when the connection is completed.

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- By using printer factory default settings to print the image, we will get bad image quality. According to actual situation, please adjust the default parameters of graphic printer to get the best quality printed image.
- Please check user instruction to install the printer. If the printer don't work, please press **Preset** and choose [system preset] to check related preset.
- the system supports S-Video and Video port.In order to get the best printing result, when using color video printer, we recommend S-Video port, when using black and white video printer, we recommend Video port.

3.6.3 Connecting the Graphic Printer

Use the type of the printer recommended by the manufacturer to connect to the system.

Connect the printer to the mains supply with power cable, then connect the system and printer by USB signal cable.

You can use the printer when the connection is completed.

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Chapter 4 Presetting System

The Preset menu allows you to specify general system settings, printer, probe, scan, measurement method, text annotation and DICOM server. All your customized settings can be saved and can function even after you rebooting the system.

Press the **Preset** key on the control panel and see the manual shown in Figure 4-1.

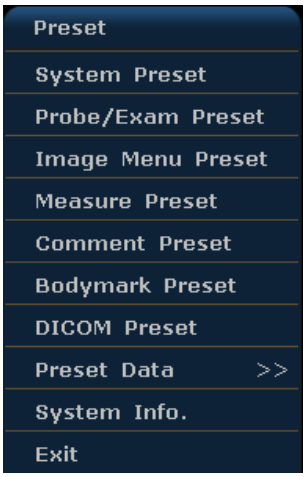

Figure 4-1 Presettings Menu

- Move the trackball to one of the menu items and press the **Set** key to enter the screen of this menu item.
- Move the trackball to ▼ at the right of one menu item and press the **Set** key, the submenu items are displayed. Move the trackball to one of the submenu items and press the **Set** key to confirm.
- To add one of the settings, move the trackball to the input box at the right of the desired menu item and press the **Set** key. A cursor displays in the input box, you can use the keyboard to type the characters.
- To exit the Presettings menu, move the trackball to [Exit] and press the **Set** key.

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4.1 Presetting the System

You can perform the general settings such as institution name, language or date format and the printer settings in the System Preset screen.

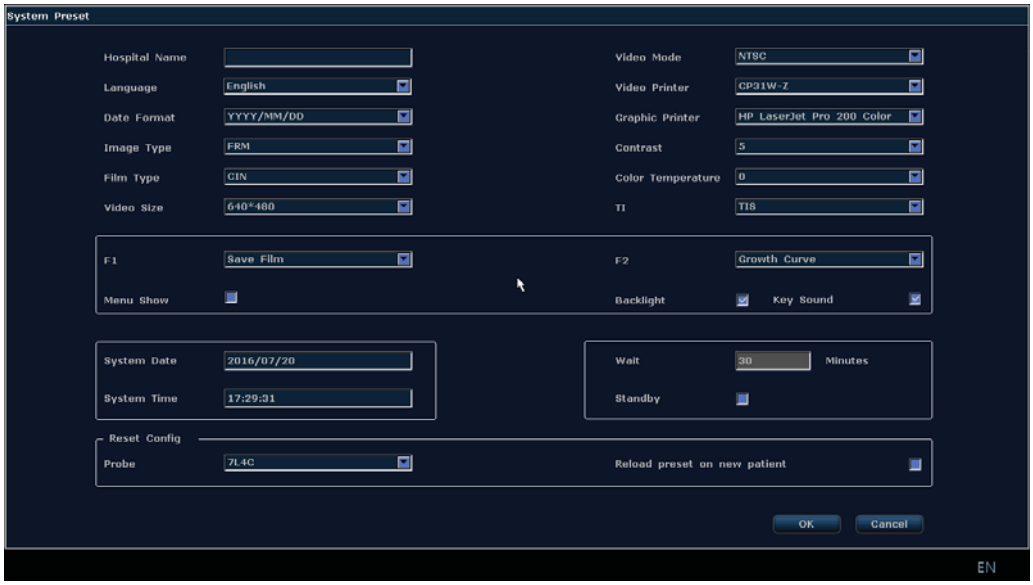

Figure 4-2 System Presettings Screen

Item	Descriptions
Hospital Name	Enter the hospital name.
Language	Choose a system language of the user interface.
Date Format	Set the date format of the system. Options: YYYY/MM/DD, MM/DD/YYYY or DD/MM/YYYY.
Image Type	Set the saving format of the image. Options: JPG, BMP or FRM Format
Film Type	Set the saving format of cine. Options: CIN or AVI Format
Video Size	Set the resolution of the printer. Options: 800*600, 640*480 or 1024*768.
Video Mode	Set the video output format. Options: NTSC or PAL.

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Item	Descriptions
Video Printer	Set the type of the video printer. Options: MITSUBISHI CP31W-Z or MITSUBISHI P93W-Z
Graphic Printer	Set the type of the graphic printer. Option: HP LaserJetPro 200 Color or HP LaserJet Pl606dn
Contrast	Set the contrast of the display screen. Options: 0-10.
Color Temperature	Set the color temperature of the display screen. Options: 0 or 1.
TI	Set the TI index. Options: TIS, TIB or TIC.
F1、F2	Set the functions of shortcut key **F1** and **F2**. Options: Save Film, Fetal growth curves, Colorize, Anatomical survey, Auto trace or Manual trace,Screen zoom,Lithotripsy.
Menu Show	Enable or disable the menu on the display
Key Sound	Enable or disable the sound when pressing the keys on the control panel.
Backlight	Enable or disable the background light on the control panel.
System Date, System Time	Set the system date and time. Move the cursor to change the date or time by using the trackball and input the desired date or time by using the keyboard.
Wait, standby	Enable or disable the standby mode and set the time to enable the standby mode.
Probe	Set the default probe to be used when the system is powered on.

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Item	Descriptions
Reload Preset on New Patient	Enable or disable the function of retrieving the saved imaging parameters for a new patient exam.

4.2 Presetting the Probe/Exam

As shown in Figure 4-3, you can select the probe for the specified exam and defined the exam type in the Probe/Exam Preset screen, and the presettings will display on the Probe/Exam screen.

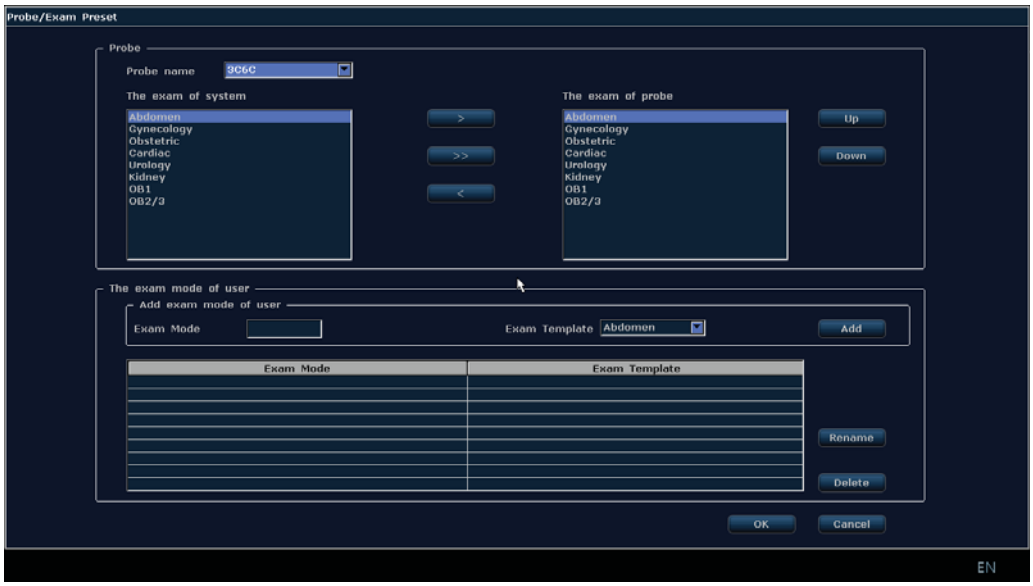

Figure 4-3 Probe/Exam Presettings Screen

Steps for editing the exam type are as follows.

1. Click the drop-down menu beside [Probe name] to select the desired probe.
2. Select the exam type in the list of [The exam of system] and click > to add the selected exam type to the list of [The exam of probe].
   - Click >> to add all the exam types.
   - Select one exam type the list of [The exam of probe] and click < to delete it.
   - Click [Up] or [Down] to move the selected exam type up or down.

Steps for defining an exam are as follows.

1. Click [Exam Template] to select one template.
2. Input the defined name for the selected exam template at [Exam Mode] and click [Add] to add it. The defined exam type displays in the list below.
   - Select exam type in the list and click [Rename], a prompt box pops up. Input the new name in this prompt box and click [OK] to rename an exam type.
   - Select the desired exam type in the list and click [Delete], a prompt box pops up. Click [OK] in the prompt box to delete an exam type.

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4.3 Presetting the Imaga Menu

As shown in 4-4, by image preset interface, you can adjust the image parameter and the sequence and number of function command on the menu and toolbar.

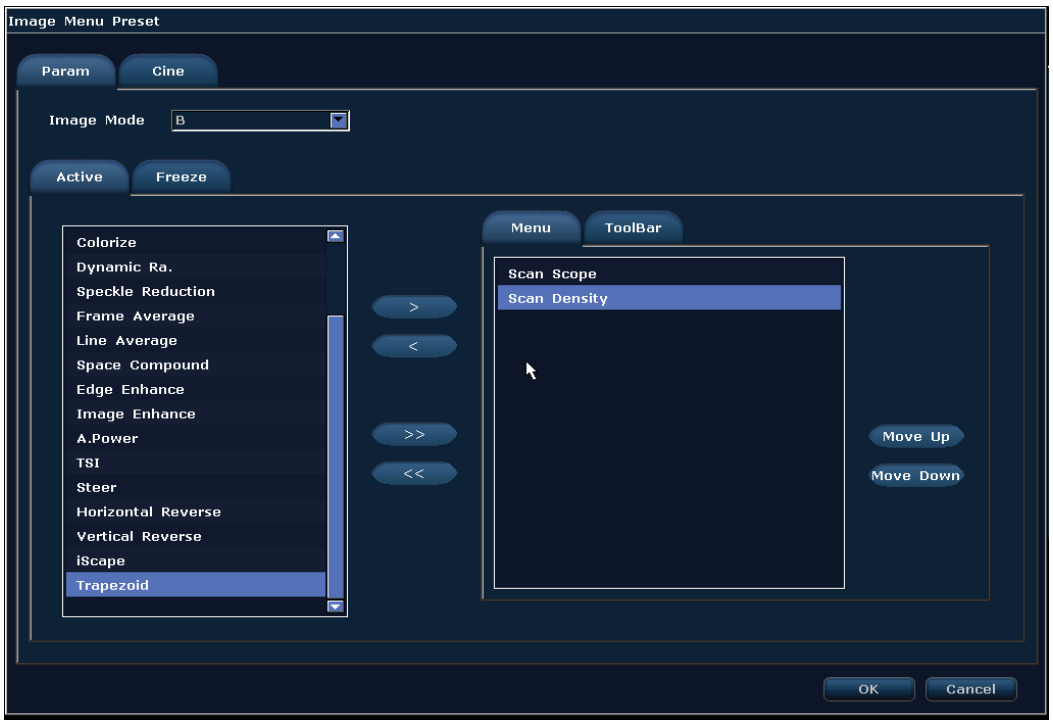

Figure 4-4 Image Menu Presettings Screen

Steps for editing the [Param] menu/toolbar are as follows:

1. Click to choose [Param].
2. Click the drop-down menu beside [Imaga Mode] to select the image mode.
3. Choose [Active]or [Freeze].
4. Choose [Menu] or [ToolBar], show the relevant image parameter and function command.
5. Click the image parameter or function command on left list, click >, it will be added to right list.
   - Click >> to add all the parameter and function command.
   - Select one parameter or function command in the list of Menu/ToolBar and click < to delete it.
   - Click << to delete all the parameter and function command.
   - Click [Move Up] or [Move Down] to move the selected exam type up or down.

Steps for editing the [Cine] menu/toolbar are as follows:

1.Choose[Menu]or [ToolBar], show the relevant image parameter and function command.

2. Click the image parameter or function command on left list, click >, it will be added to right list.
   - Click >> to add all the parameter and function command.

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- Select one parameter or function command in the list of Menu/ToolBar and click < to delete it.
- Click << to delete all the parameter and function command.
- Click [Move Up] or [Move Down] to move the selected exam type up or down.

4.4 Presetting the Measurements

■ You can preset the obstetric formulas, the heart rate and the distance between the measurement scales in the Measure Preset screen.

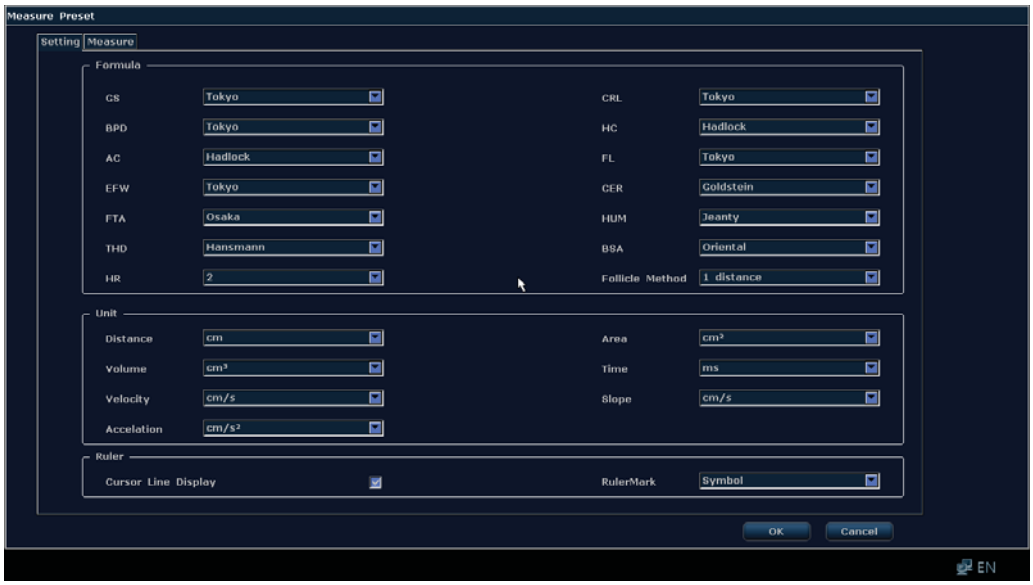

Figure 4-5 Measurement Presettings Screen

Item	Descriptions
GS	Set the GS formula. Options: Tokyo, Hellman, Rempen, Hansmann, China
BPD	Set the BPD formula. Options: Tokyo, Hadlock, Merz, Rempen, Osaka, China, Jeanty, Kurtz, Sabbagha, Hansmann
AC	Set the AC formula. Options: Hadlock, Merz, Jeanty
EFW	Set the EFW formula. Options: Tokyo, Hadlock1, Hadlock2, Hadlock3, Hadlock4, Shepard, Campbell, Merz1, Merz2, Hansmann, Osaka

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Item	Descriptions
FTA	Set the FTA formula. Option: Osaka.
THD	Set the THD formula. Option: Hansmann
HR	Set the heart rate. Options: 1-8.
CRL	Set the CRL formula. Options: Tokyo, Hadlock, Robinson, Hansmann, China, Jeanty, Nelson
HC	Set the HC formula. Options: Hadlock, Merz, Jeanty, Hansmann
FL	Set the FL formula. Options: Tokyo, Hadlock, Jeanty, Merz, Osaka, China, Hohler, Hansmann, OBrien
CER	Set the CER formula. Option: Goldstein
HUM	Set the HUM formula. Option: Jeanty
BSA	Set the BSA formula. Options: Oriental, Occidental.
Distance	Set the Distance unit. Options: cm、mm
Volume	Set the Volume unit. Options: cm^3、mm^3
Velocity	Set the Velocity unit. Options: cm/s、mm/s、m/s
Accelation	Set the Accelation unit. Options: cm/s^2、mm/s^2、m/s^2

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Item	Descriptions
Area	Set the Area unit. Options: cm^2、mm^2
Time	Set the Time unit. Options: ms、s
Slope	Set the Slope unit. Options: cm/s、mm/s、m/s
RulerMark(Only applies to 、)	Set the ruler mark type. Options: Number,Symbol.
Cursor Line Display	Enable or disable the dotted line between two markers.

■ In the Measure Preset interface you can remove unusual measurement items in the default menu or add needed items from measurement package to current measurement menu.

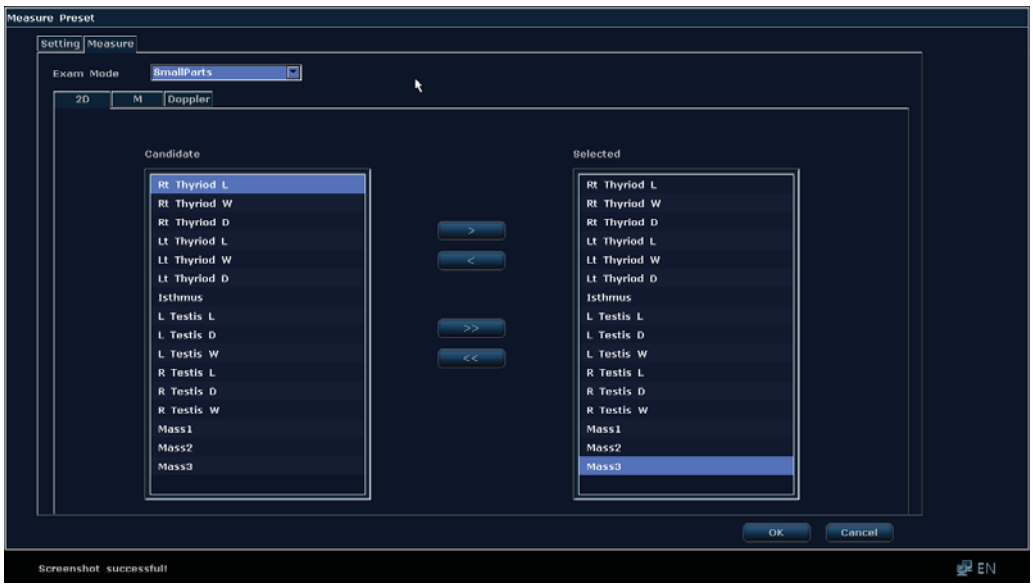

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Figure 4-6 Measurement Presettings Screen

Steps for removal of default items:

1. Click the [Exam Mode] to select the needed exam type.
2. Then click 2D/M/Doppler to select the needed imaging mode.
3. Click measurement items in the list of [Candidate] on the left, then click> and the measurement items will be added to the list of [Selected].
4. For removal click measurement items in the list of [Selected], then click <. Click << to remove all items in the list of [Selected].

4.5 Presetting the Annotations

Across the Comment Preset screen, you can change the sequence of texts on the default annotation menu, you can also remove the unused annotation or add some texts from the textbox to default annotation menu. Or reset, move, remove the customized annotation.

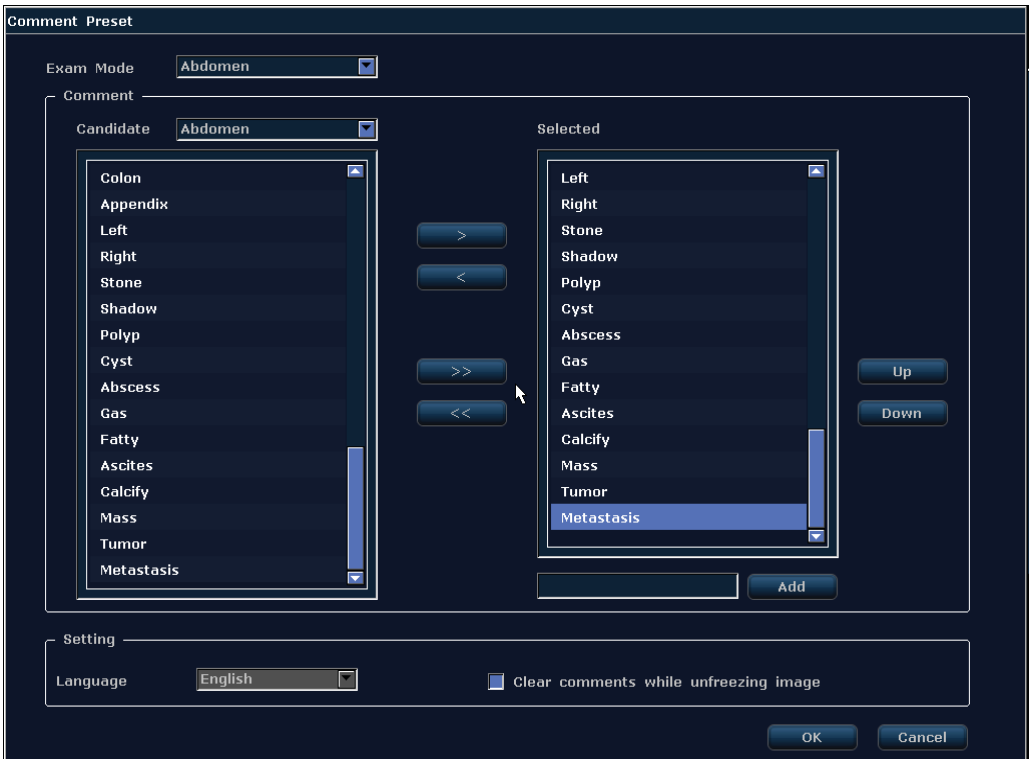

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Figure 4-7 Annotation Presettings Screen

■ To add an annotation

1. Click the [Exam Mode] to select one exam type.
2. Input the characters beside [Add] and click [Add] to add the defined annotation to the list of [The comment of user].

■ Add or remove default annotation.

1. Click the [Candidate] to select one exam type annotation.
2. Select the annotation in the left list and click > to add the annotation to the list of [Selected].

Click >> to add all the annotation.

3. Select one annotation the list of [Selected] and click< to delete it.

Click << to delete all .

■ To delete an annotation

Select one annotation in the list of [The comment of user] and click [Delete] to delete it.

■ To select the language of annotation

Click the [Language] and select the desired language of annotation. You can choose from Chinese or English.

■ To set the method for clearing the annotation

If enabled, the annotation will be cleared when the image is unfrozen.

If disabled, the annotation will be reserved.

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4.6 Presetting Bodymark

You can adjust the default sequence on BodyMark Menu or remove unused BobyMark,in the BodyMark Preset screen.

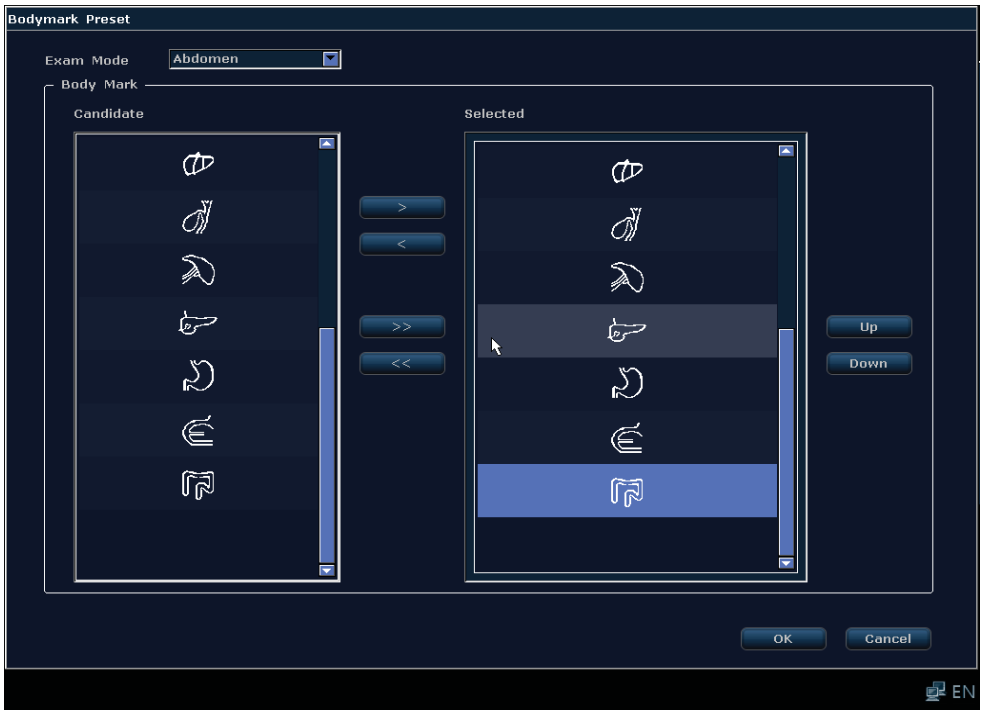

Figure 4-8 Bodymark Presettings Screen

Steps for editing the BobyMark are as follows.

1. Click the drop-down box beside [Exam Mode] to select the exam type.
2. Select the BobyMark in the list of [Candidate] and click > to add the selected BobyMark to the list of [Selected].
   - Click >> to add all the BobyMark.
   - Select one BobyMark in the list of [Selected] and click < to delete it.
   - Click [Up] or [Down] to move the selected BobyMark up or down.

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4.7 Presetting DICOM

You can preset the local network and the storage server network of this system in the DICOM Preset screen.

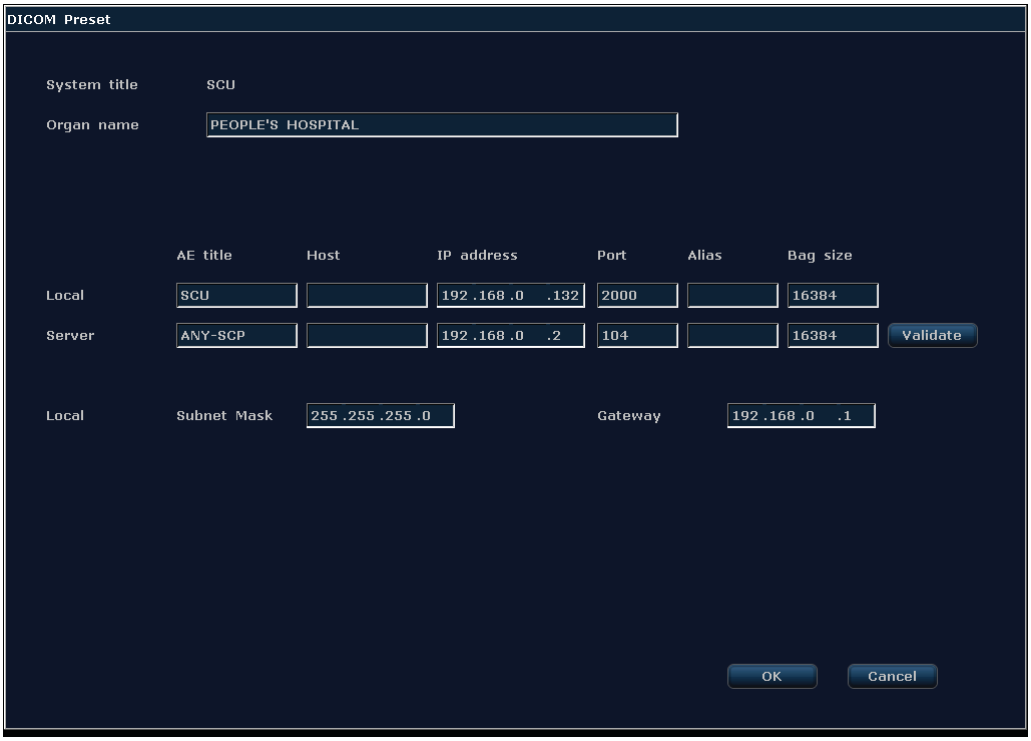

Figure 4-9 DICOM Presettings Screen

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Item		Descriptions
System title		The system title is the same as the local AE title by default.
Organ name		Enter the hospital's name.
Local	AE title	Enter the name of AE title and the system title changes with it.
	Host	Enter the host name of the system.
	IP address	Enter the IP address of the system.
	Port	Enter the port number of the system.
	Alias	Enter the alias of the system.
	Packet size	Enter the size of the PDU transmission pocket of the system.
	Subnet Mask	Enter the subnet mask of the system.
	Gateway	Enter the gateway of the system.
Server	AE title	Enter the name of AE title.
	Hose	Enter the hose name of the server.
	IP address	Enter the IP address of the server.
	Port	Enter the port number of the server.
	Alias	Enter the alias of the server.
	Packet size	Enter the size of the PDU transmission pocket of the server.
Validate		Click it to verify the connection between the system and the server after all information is provided.

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Steps for connecting DIOCM server are as follows.

1. Connect the system to the network of the server with a cable.
2. Set the network of the system and the server. Input AE title, host, IP address and the information in the table above.
3. Click [Validate] to verify the connection between the system and the sever.

   A prompt box will pop up to indicate the verification result.
4. If the connection is successful, you can save the patient information and cines to the server.

Note

Ensure that the system is successfully connected to the DICOM server before use. Otherwise, the information can't be saved to the DICOM server.

4.8 Import/Export Preset the Data

You can import or export the data in the system by the USB storage devices or restore the factory default setting in the Preset Data screen.

- After presetting the system, click [Export Preset Data] to export the data to the USB storage device.
- Click [Import Preset Data] to import the system settings data from the USB storage device.
- Click [Restore Factory] to restore the system settings data to the factory default settings.

Note

You can only import the system preset data to the ultrasound system with the same type provided by the manufacturer.

4.9 System Information

You can view the hardware version, software version, probe information and other information in the System Info. screen.

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Chapter 5 Preparing for an Exam

You should enter the relevant information about the patient, select the appropriate probe and exam type before examining. A complete patient information helps to define the exam.

5.1 Registering a Patient

Press the **Patient** key on the control panel to enter the Patient Info screen, as shown in Figure 5-1.

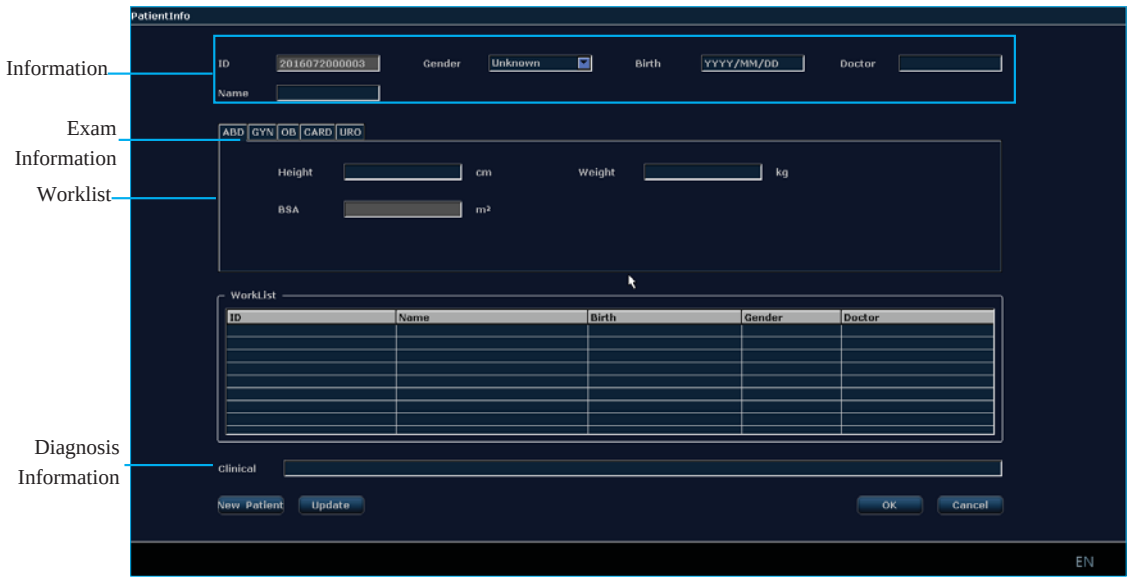

Figure 5-1 Patient Information Screen

Steps for adding a new patient are as follows.

1. Input the patient information, such as patient name, patient ID, gender and date of birth by the keyboard.You can also load patient information stored on the server Worklist.

Note

Patient ID is a very important identification. Once it is saved, you can't edit it.

2. Select the exam type and the exam information. For example, select [ABD] and input [Height] and [Weight].
   - You can input the patient's height and weight when selecting [ABD] and [CARD], BSA will

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be calculated by the formula preset in [Preset]-> [Measure Preset]-> [BSA] automatically.

- You can input the [LMP] when selecting [OB], the system will calculate the GA and EDD automatically.

3. Input the diagnostic information in the textbox beside [Clinical] as necessary.
4. Click [OK] to save the patient information and return to the main screen.

5.2 Selecting the Probe and Exam Type

Press the **Probe/Exam** key on the control panel to enter the exam selection interface, as shown in Figure 5-2. Click the exam type in the list below the probe or click the probe to select it.

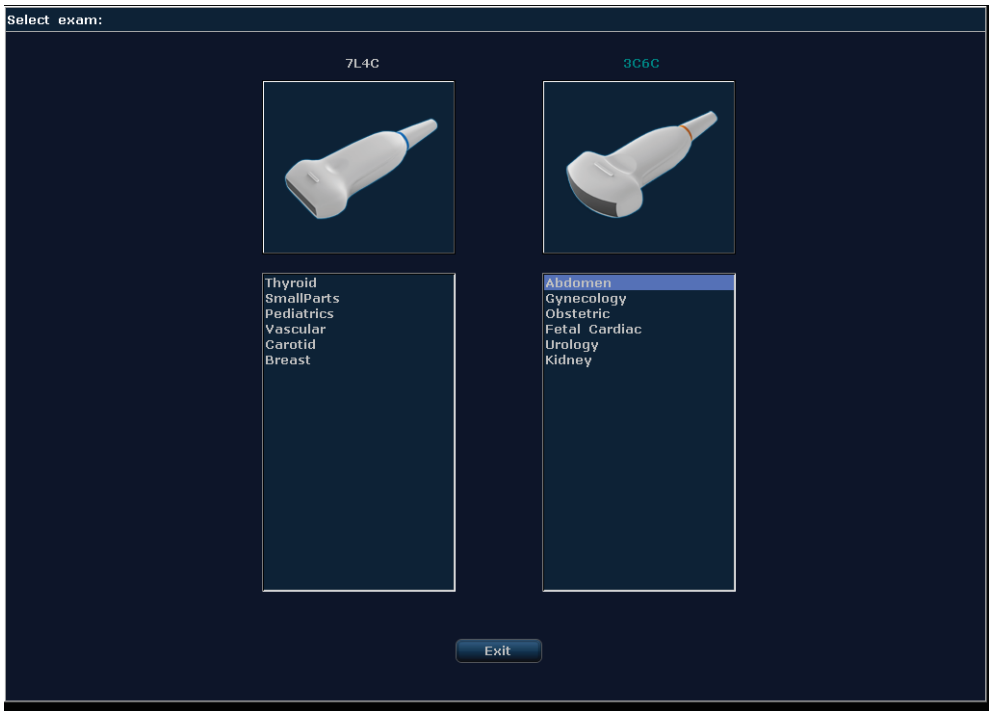

Figure 5-2 Probe and Exam Type Selection Screen

Note

Probe types and icons display on the LCD screen when the probe are connected. If the screen displays nothing, check the connections of the probe. If problem still exists, please stop using the ultrasound system immediately and contact the manufacturer or the authorized service engineer.

5.3 Ending the Exam

Press the **End Exam** key and a prompt box pops up. Select [OK] to end the current patient exam, and the system enters into Patient Info screen to start the next exam. Or, press the **Patient** key, select [New Patient] and [OK] to start the next exam.

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Chapter 6 Optimizing the Image

After patient information, probe and exam type are selected, you can select the imaging mode to optimize the image for exact diagnosis.

6.1 B Mode

B mode is the most frequently used two-dimension imaging mode. It is intended to provide information of anatomical structure of soft tissue and the image is in gray color in this mode.

6.1.1 Entering the B Mode

Steps for entering the B mode are as follows.

1. Select the appropriate probe and exam type, and the system automatically enters the B mode, as shown in Figure 6-1.

   Or, press the **B** knob on the control panel to enter the B mode from other modes.

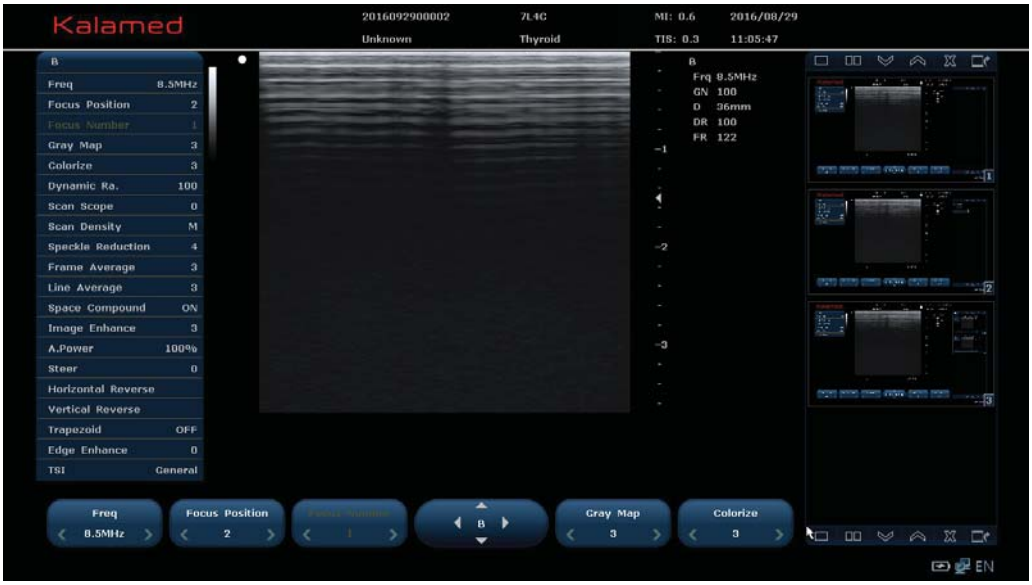

Figure 6-1 B Mode Image

   For details about the description of the main screen, refer to Section 2.8 Main Screen.

2. Optimize the image. For details, refer to Section 6.1.2 Optimizing the B Mode Image.

   To save the image parameter settings as the default setting, press the **Save IP** key on the control panel.

3. Select other image modes to exit the B mode.

6.1.2 Optimizing the B Mode Image

Methods of optimizing the B mode image are as follows.

■ Select the B mode parameter on the menu at the top left of the screen by using the trackball,

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press the **Set** key to adjust it. Press the **Menu** key to display/hide this menu.

- Select the B mode parameter in the toolbar at the bottom of the screen, as shown in Figure 6-2. This method is taken as example in this section to introduce steps of optimizing B mode image. The main steps are as follows.
  - Press or rotate the knob on the control panel corresponding to the parameter below the screen to adjust it.
  - Press or navigation key on the control panel to go to previous or next page.

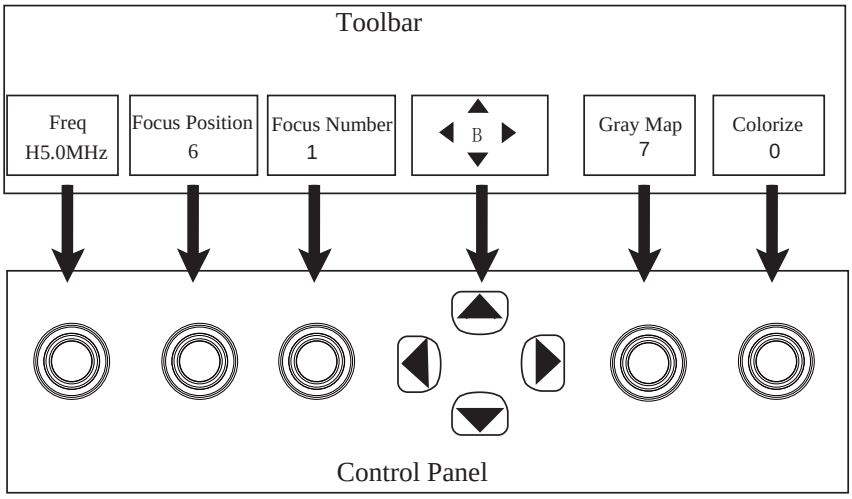

Figure 6-2 Parameters Adjustment in the B Mode

6.1.2.1 Adjusting the Gain

The B mode gain determines the amplifying factors of the received echoes and the brightness of the ultrasound image. The echoes are amplified with the same gain value regardless of depth.

Steps:

- Rotate the **B** knob clockwise to increase the value.
- Rotate the **B** knob anticlockwise to decrease the value.

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6.1.2.2 Adjusting the TGC

TGC (Time Gain Compensation) is used to adjust the gain that allows compensation for attenuation of the echoes over time (depth). It is adjustable during the real time scan regardless of the imaging mode and display format. TGC balances the image so that the density of echoes is the same throughout the image.

Steps:

- Slide the TGC left to dimmer the B mode image of the corresponding depth.
- Slide the TGC right to brighten the B mode image of the corresponding depth.

6.1.2.3 Adjusting the Focus Position/Number

It is used to adjust focus position and focus number. The focus is identified by a triangle displays in the right corner of the image.

Steps:

- Press or rotate the knob corresponding to [Focus Position] to adjust focus position.
- Press or rotate the knob corresponding to [Focus Number] to adjust focus number.

6.1.2.4 Adjusting the Frequency

The probe is capable of generating a broadband signal with a certain start frequency and a certain bandwidth.

Step:

Press or rotate the knob corresponding to [Freq] to adjust the frequency of the probe.

6.1.2.5 Adjusting the Depth

Depth is used to adjust the distance over which the B-Mode image is anatomized.

Step:

Slide the **Depth** key on the control panel to adjust the depth.

6.1.2.6 Adjusting the Grayscale

The image is optimized by adjusting the grayscale, but some parameters in the B mode will be affected.

Step:

Press or rotate the knob corresponding to [Gray Map] to adjust the grayscale.

Note

The gain and dynamic range vary with the grayscale.

6.1.2.7 Adjusting the Chroma

Chroma is used to colorize the gray scale image to enhance the discrimination capability.

Step:

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Press or rotate the knob corresponding to [Colorize] to choose the color.

6.1.2.8 Adjusting the Dynamic Range

Dynamic range increases the adjustable range of contrast by enhancing the intensities of parts of the grayscale.

Step:

Press navigation key on the control panel to go to next page and then press knob corresponding to [Dynamic Ra.] to adjust it.

6.1.2.9 Adjusting the Scan Range

Scan range is used to gain the maximum frame rate.

Step:

Press or rotate the knob corresponding to [Scan Scope] to adjust it.

6.1.2.10 Adjusting the Scan Density

Line density refers to the amount of ultrasound beam that makes up the image. Increasing the value of line density improves the resolution and decreases frame rate. Therefore, you have to balance the frame rate and the image quality when adjusting the line density.

Step:

Press or rotate the knob corresponding to [Scan Density] to adjust it.

6.1.2.11 Adjusting the Noise Repression

Noise repression is used to clear the noise caused by the low echo.

Step:

Press or rotate the knob corresponding to [Speckle Reduction] to adjust it.

6.1.2.12 Adjusting the Frame Persistence

Persistence is used to average consecutive frames to provide a smoother appearance with less noise.

Use lower persistence values for fast-moving organs or tissues and higher persistence values for smoother appearance.

Step:

Press or rotate the knob corresponding to [Frame Average] to adjust it.

6.1.2.13 Adjusting the Line Average

Line average is used to adjust smoothness of the image. A higher line average brings lower contrast and smoother image.

Step:

Press navigation key on the control panel to go to next page and then press or rotate the knob corresponding to [Line Average] to adjust it.

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6.1.2.14 Enabling/Disabling the Compound Imaging

Compound imaging is used to acquire a series of overlapping image frames from substantially differing spatial directions and combining these images to reduce speckle and improve contrast resolution.

Step:

Press or rotate the knob corresponding to [Space Compound] to enable or disable it.

6.1.2.15 Adjusting the Edge Enhance

Optimize the image by enhancing image contour to make image boundary clearer.

Step:

Press or rotate the knob corresponding to [Edge Enhance] to adjust it.

6.1.2.16 Adjusting the Image Enhance

Increase the image resoultion by reducing the speckle noise.

Step:

Press or rotate the knob corresponding to [Image Enhance] to adjust it.

6.1.2.17 Adjusting the Acoustic Power

Acoustic power is adjusted to increase or decrease the transmitting frequency of the probe.

Step:

Press or rotate the knob corresponding to [A. Power] to adjust it.

6.1.2.18 Adjusting the TSI(customization function)

Choose sonic speed according to tissue signature to get typical images, there are 3 ways to optimize: normal, muscle and liquidity.

Step:

Press or rotate the knob corresponding to [TSI] to adjust it.

6.1.2.19 Adjusting the Reverse

Adjust images through up & down,left & right and rotate to abtain the best observing point

Step:

Press or rotate the knob corresponding to [Horizontal Reverse] or [Vertical Reverse] to adjust it.

6.1.2.20 Enabling/Disabling the Trapezoid

Obtain more image info without moving probe or sample area. This function is only effective under liner probe

Step:

Press or rotate the knob corresponding to [Trapezoid] to enable or disable it.

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6.2 Color Doppler Flow Imaging (Color) Mode

Color is a color flow imaging technology which adds the color-coded qualitative information concerning the relative velocity and direction of fluid motion in the B-Mode image.

6.2.1 Entering the Color Mode

Steps for entering the Color mode are as follows.

1. Select the appropriate probe and exam type, and optimize the B mode image.
2. Press the **Color** knob on the control panel to enter the color mode, as shown in Figure 6-3.

Figure 6-3 Color Doppler Mode Image

3. Adjust the color ROI.

   Move the trackball to adjust the position of the color ROI. Press **Set** key and move the trackball to adjust the size of the ROI, or press **Set** key again to adjust the position of ROI.
4. Optimize the Color mode image. For details, refer to Section 6.2.2 Optimizing the Color Mode Image.

   Press the **Save IP** key to save the parameter settings in the Color mode as the default settings.
5. Press the **Color** knob again to exit the Color mode.

6.2.2 Optimizing the Color Mode Image

Methods for optimizing the Color mode image are as follows.

- Select the Color mode parameter on the menu at the top left of the screen by using the trackball, press **Set** key to adjust it. Press **Menu** key to display/hide this menu.
- Or, select the Color mode parameter in the toolbar at the bottom of the screen, as shown in Figure 6-4. This method is taken as example in this section to introduce the steps of optimizing the color mode image. The main steps are as follows.

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- Press or rotate the knob on the control panel corresponding to the parameter below the screen to adjust it.
- Press or navigation key on the control panel to go to previous or next page
- Press or navigation key to select B mode parameters.

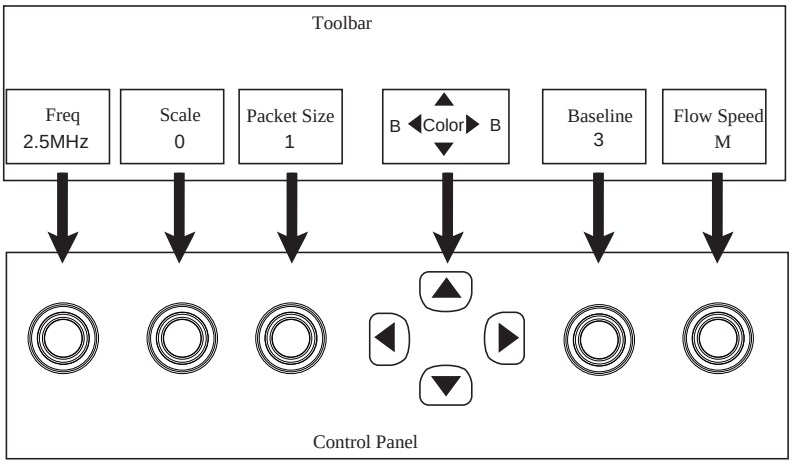

Figure 6-4 Parameters Adjustment in the Color Mode

6.2.2.1 Adjusting the Gain

Chrominance gain controls color signal strength.

Steps:

- Rotate the **Color** knob clockwise to increase the value.
- Rotate the **Color** knob anticlockwise to decrease the value.

6.2.2.2 Adjusting the Frequency

The working frequency of the probe can be adjusted.

Step:

Press or rotate the knob corresponding to [Freq] to adjust the frequency of the probe.

6.2.2.3 Adjusting the Scale

The value of scale on the color map can be adjusted.

Step:

Press or rotate the knob corresponding to [Scale] to adjust it.

6.2.2.4 Adjusting the Sensitivity

The higher the sensitivity is, the lower the frame rate.

Step:

Press or rotate the knob corresponding to [Sensitivity] to adjust it.

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6.2.2.5 Adjusting the Baseline

Baseline is used to unwraps the alias in the color flow imaging, and display higher velocities without reversal of colors. Baseline represents the position of zero velocity or frequency. The velocity range in one direction can be increased or decreased by adjusting the baseline. The maximum value and the minimum value of the flow speed display on the top and bottom of the color map respectively.

Step:

Press or rotate the knob corresponding to [Baseline] to adjust it.

6.2.2.6 Adjusting the Flow Speed

The flow speed that can be detected in the Color mode is adjusted.

Step:

Press or rotate the knob corresponding to [Flow Speed] to adjust it.

6.2.2.7 Adjusting the Wall Filter

Wall filter is used to filter the low frequency noise from the tissue activities of the patient and clear the aritifacts image.

Step:

Press or rotate the knob corresponding to [Wall Filter] to adjust it.

6.2.2.8 Enabling/Disabling the Color Invert

Flow invert is used to view blood flow from a different perspective.

Step:

Press or rotate the knob corresponding to [Reverse] to enable or disable it.

6.2.2.9 Adjusting the Color Persistence

Persistence is used to average consecutive frames to provide a smoother appearance with less noise.

Use lower persistence values for fast-moving organs or tissues and higher persistence values for smoother appearance.

Step:

Press or rotate the knob corresponding to [Correlation] to adjust it.

6.2.2.10 Adjusting the Scan Density

Line density refers to the amount of ultrasound beam that make up the image. Increasing the value of line density improves the resolution and decreases frame rate. Therefore, you have to balance the frame rate and the image quality when adjusting the line density.

Step:

Press or rotate the knob corresponding to [Scan Density] to adjust it.

6.2.2.11 Adjusting the Steer Angle

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Steer angle is used to adjust the angle of the color ROI.

Step:

Press or rotate the knob corresponding to [Steer] to adjust the angle of the ROI.

Note

The feature is only available with the linear probe.

6.2.2.12 Adjusting the Color Map

Color map is used to select the method for the color-coding of blood flows.

For the color flow image, the change of the color tone represents the change of the speed rate. Darker color tone represents the lower speed rate and vice versa. And the red and blue color represent the different flow direction respectively.

Step:

Press or rotate the knob corresponding to [Color Map] to change the color.

6.2.2.13 Adjusting the Post-Process

Post-process is used to optimize the quality of the image.

Step:

Press or rotate the knob corresponding to [Post Proc] to adjust it.

6.2.2.14 Adjusting the Acoustic Power

Acoustic power is adjusted to increase or decrease the transmitting frequency of the probe.

Step:

Press or rotate the knob corresponding to [A. Power] to adjust it.

6.2.2.15 Enabling/Disabling the Dual Real Time Mode

Dual real time mode can display the dual real time mode image simultaneously. The left part displays the B mode image and the right part is the Color mode image.

Step:

Press or rotate the knob corresponding to [Dual Live] to enable or disable it.

6.3 PDI Mode

PDI (Power Doppler Imaging) is a color flow imaging technology which adds the flow signal in the Color mode image. PDI uses the number and amplitude of red blood cell going through in the flow to create the color-coded imaging. The flow with slow velocity and small rate could be displayed in PDI. Therefore, the flow with a higher sensitivity can be detected without overlaying any flows with high velocity.

6.3.1 Entering the PDI Mode

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Steps for entering the PDI mode are as follows.

1. Select the appropriate probe and exam type, and optimize the B mode image.
2. Press the **PDI** key on the control panel to enter PDI mode, as shown in Figure 6-5.

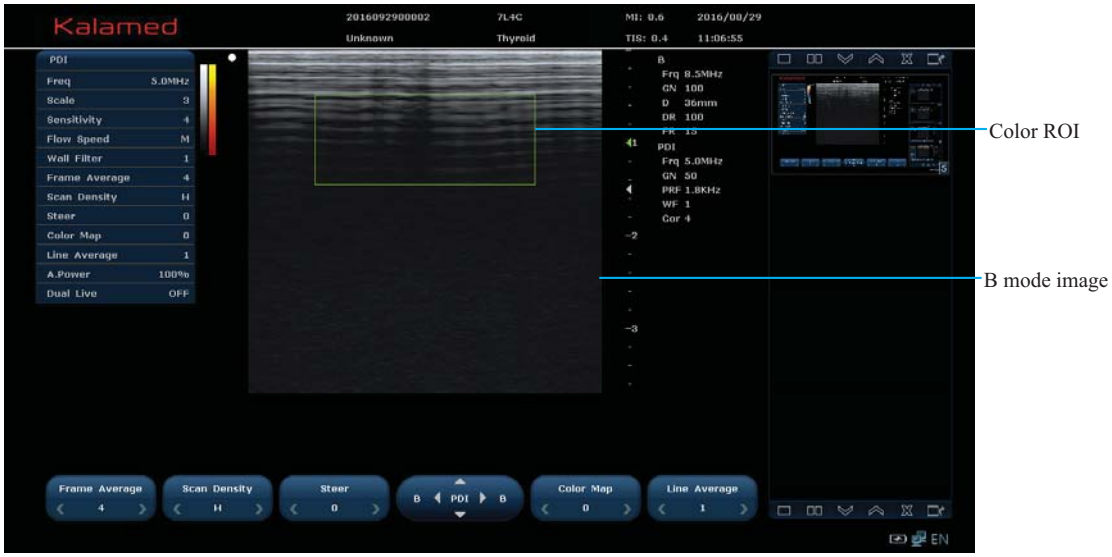

Figure 6-5 PDI Mode Image

3. Adjust the color ROI.

   Move the trackball to adjust the position of the color ROI.
   Press **Set** key and move the trackball to adjust the size of the ROI, or press **Set** key again to adjust the position of ROI.
4. Optimize the PDI mode image. For details, refer to Section 6.3.2 Optimizing the PDI Mode Image.

   Press the **Save IP** key to save the parameter settings in the PDI mode as the default settings.
5. Press the **PDI** key again to exit the PDI mode.

6.3.2 Optimizing the PDI Mode Image

Methods for optimizing the PDI mode image are as follows.

- Select the PDI mode parameter on the menu at the top left of the screen by using the trackball, press **Set** key to adjust it. Press the **Menu** key to display/hide this menu.
- Select the PDI mode parameter in the toolbar at the bottom of the screen, as shown in Figure 6-6. This method is taken as an example in this section to introduce the steps of optimizing the PDI mode image. The main steps are as follows.
  - Press or rotate the knob on the control panel corresponding to the parameter below the screen to adjust it.
  - Press or navigation key on the control panel to go to previous or next page.
  - Press the or navigation key to select the B mode parameters.

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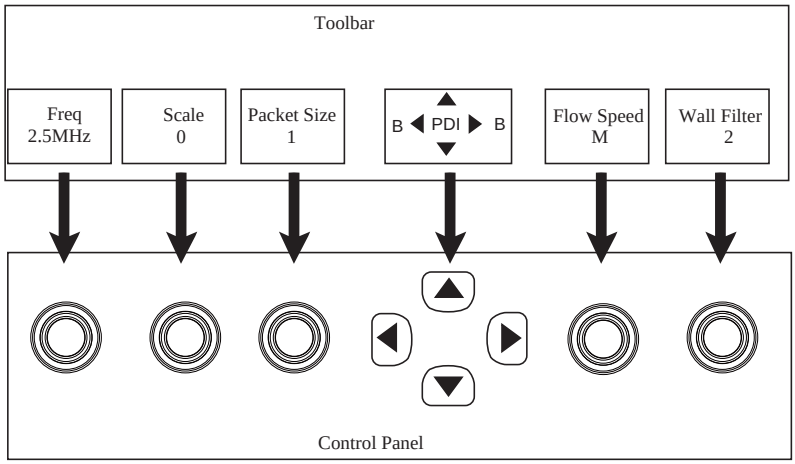

Figure 6-6 Parameters Adjustment in PDI Mode

Operations of adjusting PDI mode parameters are similar with those of in the Color mode. For details, refer to Section 6.2.2 Optimizing the Color Mode Image.

6.4 M Mode

M mode is generally used for cardiac applications. In M mode, you can position the M-line in the 2D image on the anatomy of interest, and then learn about the tissue motion along that line in an M-mode trace.

6.4.1 Entering the M Mode

Steps for entering the M mode are as follows.

1. Select the appropriate probe and exam type, and optimize the B mode image.
2. Press the **M** knob on the control panel to enter the M mode, as shown in Figure 6-7.

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Figure 6-7 M Mode Image

- M-line: Displays the position of the M-line.
- X-axis: Indicates the time.
- Y-axis: Indicates the position or depth of the tissue structure.

3. Adjust the position of the M-line.
4. Optimize the M mode image. For details, refer to Section 6.4.2 Optimzing the M Mode Image.
   Press the **Save IP** key to save the parameter settings in the M mode as the default settings.
5. Press the **M** knob again to exit the M mode.

6.4.2 Optimzing the M Mode Image

Methods for optimizing the M mode image are as follows.

- Select the M mode parameter on the menu at the top left of the screen by using the trackball, press **Set** key to adjust it. Press the **Menu** key to display/hide this menu.
- Select the M mode parameter in the toolbar at the bottom of the screen, as shown in Figure 6-8. This method is taken as an example in this section to introduce the steps of optimizing the M mode image. The main steps are as follows.
  - Press or rotate the knob on the control panel corresponding to the parameter below the screen to adjust it.
  - Press ▼ or ▲ key on the control panel to go to previous or next page.
  - Press the ◀ or ▶ key to select B mode parameters.

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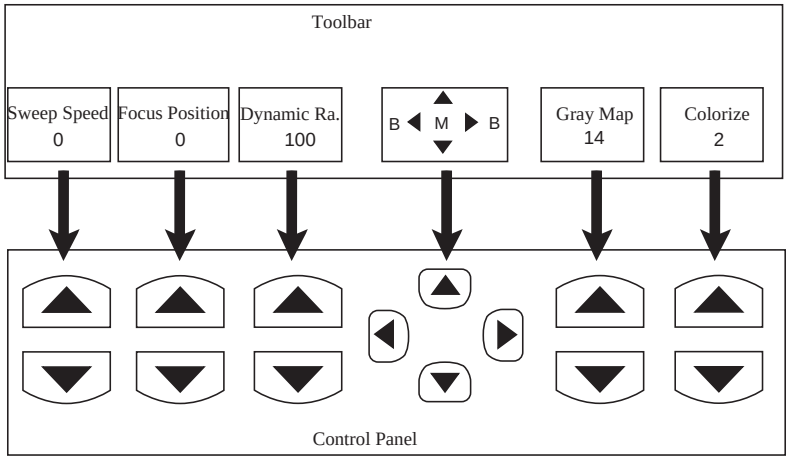

Figure 6-8 Parameters Adjustment in the M Mode

6.4.2.1 Adjusting the Gain

M gain controls the overall brightness of the M trace.

Steps:

- Rotate the **M** knob clockwise to increase the value.
- Rotate the **M** knob anticlockwise to decrease the value.

6.4.2.2 Adjusting the Depth

Depth is used to adjust the distance over which the M mode image is anatomized.

Step:

Slide the **Depth** key on the control panel to adjust the depth.

6.4.2.3 Adjusting the Sweep Speed

Sweep speed is used to set the sweep speed of the M trace. Faster speed is suitable to view the motion.

Step:

Press or rotate the knob corresponding to [Sweep Speed] to adjust it.

6.4.2.4 Adjusting the Focus Position

Focal position is used to adjust the position of the ultrasound beam. The focus displays as a triangle on the scale.

Step:

Press or rotate the knob corresponding to [Focus Position] to adjust it.

6.4.2.5 Adjusting the Dynamic Range

Dynamic Range increases the adjustable range of contrast by enhancing the intensities of parts of the grayscale.

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Step:

Press or rotate the knob corresponding to [Dynamic Ra.] to adjust contrast.

6.4.2.6 Adjusting the Grayscale

Grayscale is adjusted with different gray level to correct the image, but the display of information in the M mode may be affected.

Step:

Press or rotate the knob corresponding to [Gray Map] to adjust it.

6.4.2.7 Adjusting the Chroma

Chroma is used to colorize the grayscale image.

Step:

Press or rotate the knob corresponding to [Colorize] to select the color.

6.4.2.8 Adjusting the Speckle Reduction

Speckle reduction is used to clear the low frequency echo caused by noise.

Step:

Press or rotate the knob corresponding to [Speckle Reduction] to adjust it.

6.4.2.9 Adjusting the Line Average

To adjust smooth parameter between linear in M mode to reduce the noise in the image of M mode.

Step:

Press or rotate the knob corresponding to [Line Average] to adjust it.

6.4.2.10 Adjusting the Edge Enhance

Edge enhance is used to distinguish the image outline and optimize the smoothness of the image edge.

Step:

Press or rotate the knob corresponding to [Edge Enhance] to adjust it.

6.4.2.11 Enabling/Disabling the Full-Screen Display

When image of M mode in full screen displayed, you can see the details.

Step:

Press or rotate the knob corresponding to [Full Screen] to enable or disable it.

6.4.2.12 Adjusting the Acoustic Power

Acoustic power is adjusted to increase or decrease the transmitting frequency of the probe.

Step:

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Press or rotate the knob corresponding to [A. Power] to adjust it.

6.4.2.13 Enabling/Disabling the Anatomic M

Get comprehensive information by making straight line analysis on anywhere and directions of image.

Step:

Press or rotate the knob corresponding to [Anatomical M] to enable Anatomical M Mode.

- Press or rotate the knob corresponding to [Scan Speed] to adjust scan speed.
- When sample line is active, move the trackball left/right to adjust the position. The arrow at the endpoint of sample line indicates the sampling direction.
- When sample line is active, move the trackball up/down to adjust the position of fulcrum, and adjust the angle via the multifunctional knob, the adjusting angle range is 0-360 degree.
- Press or rotate the knob corresponding to [Anatomical M] to disable Anatomical M Mode.

6.5 PW/CW Mode

PW (Pulsed Wave Doppler) mode or CW (Continuous Wave Doppler) mode is used to provide blood flow velocity、direction、 type(e.g., artery、vein) and property, which is superior to color flow imaging on quantitative evaluation for blood flow. CW mode is used to display high velocity flow, which is only supported by phased array probe.

6.5.1 Entering the PW/CW Mode

Steps for entering the PW mode are as follows.

1. Select the appropriate probe and exam type, and optimize the B mode image.
2. Press the **PW** knob on the control panel to enter the PW mode, the interface will display two asymmetric parts as shown in Figure 6-9.

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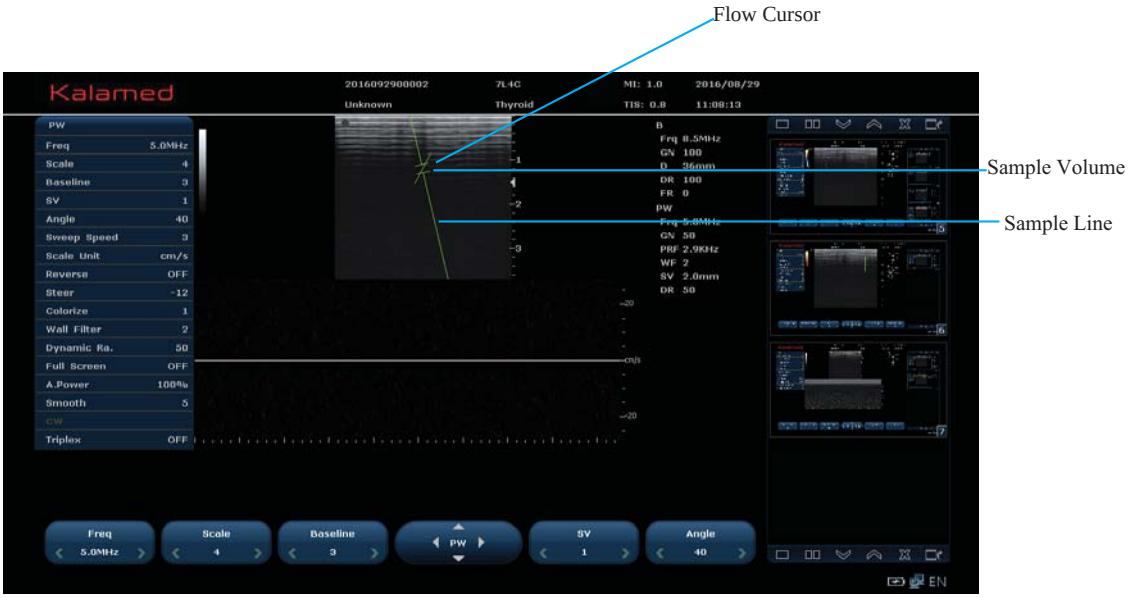

Figure 6-9 PW Mode Image

3. When exam mode of phased array probe is active, press CW key switch to CW mode;

- The Spectral Doppler line and the sample volume it explains where are the acoustic wave measuring the spectral analysis.
- Cursor of blood flow:The flow cursor needs to be adjusted parallel to the blood flow when measuring the velocity.
- X-axis: Indicates the time.
- Y-axis: Indicates Doppler frequency scale, Stands for velocity of positive or negative direction after calibrated.

4. Adjust the position and angle of the spectral Doppler line.

- Move the trackball to adjust the position of the spectral Doppler line.
- Press or rotate the knob corresponding to [Steer] to adjust the angle of the spectral Doppler line.

5. Adjust the sample volume and flow cursor.

- Press or rotate the knob corresponding to [SV] to adjust the sample volume(unavailabe in CW mode).
- Rotate the multi-functional knob on the control panel to adjust the direction of the flow cursor.

6. Optimize the PW/CW mode image. For details, refer to Section 6.5.2 Optimizing the PW/CW Mode Image.

   Press the **Save IP** key to save the parameter settings in the PW mode as the default settings.
   Press ↑ or ↓ key on the keyboard to adjust the Doppler sound.

7. Press the **PW** knob again to exit the PW mode.
8. Press the **CW** key again to exit the PW mode.

6.5.2 Optimizing the PW/CW Mode Image

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The imaging parameters of CW/PW mode are almost the same, so here we introduce together. Thereinto, SV,Triplex parameter are unavailabe in CW mode

Methods for optimizing the PW/CW mode image are as follows.

- Select the PW/CW mode parameter on the menu at the top left of the screen by using the trackball, press the **Set** key to adjust it. Press the **Menu** key to display/hide this menu.
- Or, select the PW/CW mode parameter in the toolbar at the bottom of the screen, as shown in Figure 6-10. This method is taken as example in this section to introduce the steps of optimizing the PW/CW mode image. The main steps are as follows.
  - Press or rotate the knob on the control panel corresponding to the parameter below the screen to adjust it.
  - Press or key on the control panel to go to the previous or next page.
  - Press the or key to select the B mode parameters.

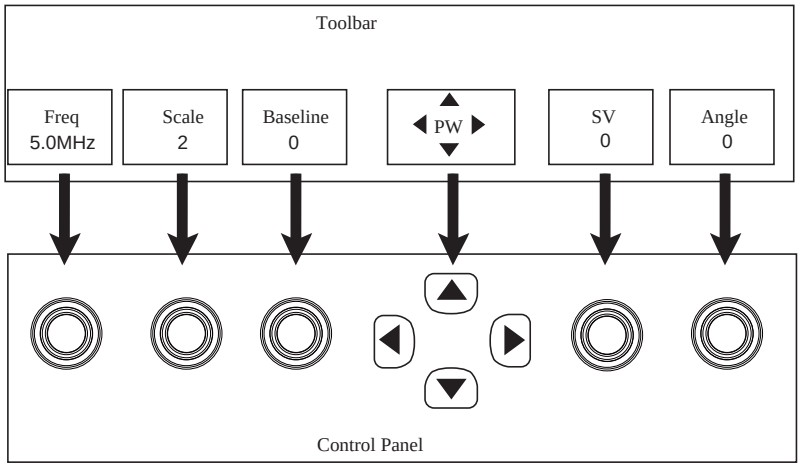

Figure 6-10 Parameters Adjustment in the PW Mode

6.5.2.1 Adjusting the Gain

Adjust PW/CW gain can increase or decrease received signals, the brightness will be changed accordingly.

Steps:

- Rotate the gain knob clockwise to increase the value.
- Rotate the gain knob anticlockwise to decrease the value.

6.5.2.2 Adjusting the Scale

Scale is adjusted to change the range of the speed displayed.

Step:

Press or rotate the knob corresponding to [Scale] to adjust it.

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6.5.2.3 Adjusting the Baseline

Baseline represents the position of zero velocity or frequency. The velocity range in one direction can be increased or decreased by adjusting the baseline.

Step:

Press or rotate the knob corresponding to [Baseline] to adjust it.

6.5.2.4 Adjusting the Sample Volume

Used to adjust the position and width of the sample volume gate,current SV value is displayed the image parameter's area on the right side. Small sample volume gate can help to get more accurate result,larger sample volume gate expand the detection range.

Step:

Press or rotate the knob corresponding to [SV] to adjust it.

6.5.2.5 Adjusting the Angle

Angle is used to adjust the angle of the flow cursor.

Step:

Press or rotate the knob corresponding to [Angle] to adjust it.

6.5.2.6 Adjusting the Scan Speed

Time scale and the refresh speed of the spectrum vary with the scan speed.

Step:

Press navigation key to the next page and press or rotate the knob corresponding to [Sweep Speed] to adjust it.

6.5.2.7 Adjusting the Unit Speed

It is used to select the unit of the flow speed.

Step:

Press or rotate the knob corresponding to [Scale Unit] to select it.

6.5.2.8 Enabling/Disabling the Spectrum Invert

Spectrum invert is used to view the flow velocity from a different perspective. The spectrum image above the baseline represents the flow movement to the probe and the spectrum image below the baseline represents the flow movement against the probe. If the spectrum invert is On, the spectrum image above and below the baseline are inverted.

Step:

Press or rotate the knob corresponding to [Reverse] to enable or disable it.

6.5.2.9 Adjusting the Steer

Steer angle is used to adjust the angle of the spectral Doppler line.

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Step:

Press or rotate the knob corresponding to [Steer] to adjust the angle of the spectral Doppler line.

Note

The feature is only available with the linear probe.

6.5.2.10 Adjusting the Chroma

Chroma is used to colorize the grayscale image.

Step:

Press or rotate the knob corresponding to [Colorize] to select the color.

6.5.2.11 Adjusting the Wall Filter

Wall filter is used to filter the low frequency noise from the tissue activities of the patient and clear the fake image.

Step:

Press navigation key on the control panel to go to the next page and press or rotate the knob corresponding to [Wall Filter] to adjust it.

6.5.2.12 Adjusting the Dynamic Range

Dynamic range increases the adjustable range of contrast by enhancing the intensities of parts of the grayscale.

Step:

Press or rotate the knob corresponding to [Dynamic Ra.] to adjust it.

6.5.2.13 Enabling/Disabling the Full-Screen Display

Full-screen display is used to display the image in full screen.

Step:

Press or rotate the knob corresponding to [Full Screen] to enable or disable it.

6.5.2.14 Adjusting the Acoustic Power

Acoustic power is adjusted to increase or decrease the transmitting frequency of the probe.

Step:

Press or rotate the knob corresponding to [A. Power] to adjust it.

6.5.2.15 Adjusting the Spectrum Smoothness

Spectrum smoothness is used to decrease the spectrum noise and make the image display smoother.

Step:

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Press or rotate the knob corresponding to [Smooth] to adjust it.

6.5.2.16 Enabling/Disabling the Duplex/Triplex

Enable/Disable PW mode works synchronously with B mode or B+Color(Power) mode.

Step:

Press or rotate the knob corresponding to [Triplex] to enable/disable Triplex imaging.

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Chapter 7 Processing the Images

You can work with the acquired images by using the features provided by the ultrasound system, such as reviewing, magnifying and freezing the image, cropping the cine, and making annotations on the image.

7.1 Displaying the image

7.1.1 Reversing the Image

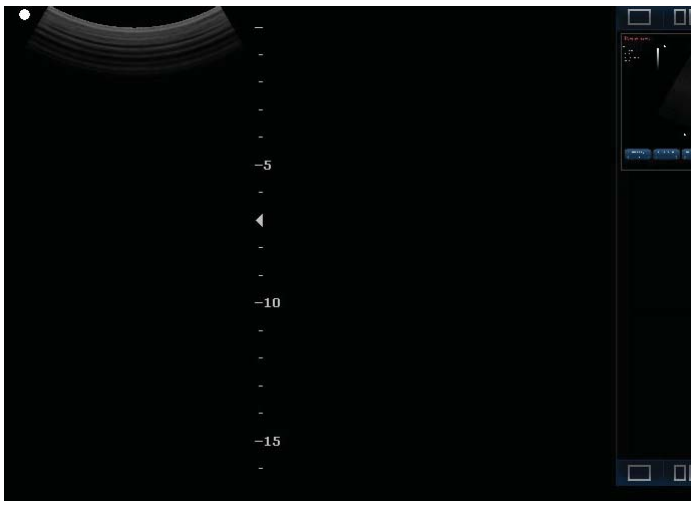
- Press Я on the control panel to reverse the 2D image left or right.
- Press Ƃ on the control panel to reverse the 2D image up or down.

7.1.2 Dual-splitting Display

You can position two images side by side on the screen to compare the images acquired at different times.

Steps are as follows.

1. Press **B**, **Color** or **PDI** on the control panel to enter the real time scan.
2. Press Dual to enter the dual-splitting display.
   The image is spitted by two parts with a real time scan on the left and no image on the right.



3. Press Dual again to freeze the real time scan and unfreeze the frozen image.
   The probe direction mark is highlighted in the a real time scan and becomes gray in the frozen mode.
4. Press other imaging mode keys to exit the dual-splitting display.

7.1.3 Quad-splitting Display

You can position four images side by side on the screen to compare the images acquired at different times.

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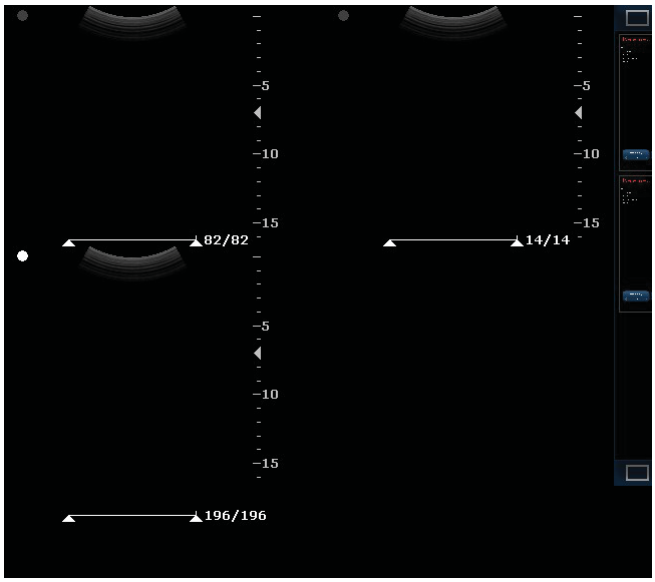
Steps are as follows.

1. Press **B**, **Color** or **PDI** on the control panel to enter the real time scan.
2. Press to enter the quad-splitting display.
   The image is spitted by four parts with a real time scan on the top-left and no image on the rest parts.



3. Repeatedly press to freeze the real time scan and unfreeze other images.
   The probe direction mark is highlighted in the a real time scan and becomes gray in the frozen mode.
4. Press other imaging mode keys to exit the quad-splitting display.

7.2 Magnifying the Image

You can magnify an interest region on the imaging area.

7.2.1 Real time Zooming

Step are as follows.

1. Press **B** to enter the real time B mode.
2. Press the **Zoom** knob on the control panel to activate the magnification feature.
3. A ROI displays on the imaging area. Adjust the size of ROI by moving the trackball and press the **Set** key to confirm.
   Adjust the position of ROI by moving the trackball.
4. Press the **Set** key again to adjust the size of ROI.
5. Press the **Zoom** knob to magnify the interest region.
   You can adjust the interest region, make annotation on the region or perform measurement.
6. Press the **Zoom** knob again to exit the magnification feature.
   You can press the **Zoom** to directly magnify the image in the Color/PDI mode, and press **Zoom** again to exit it.

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7.2.2 Freeze Zooming

Step are as follows.

1. Press Freeze key in B mode.
2. Press Zoom key on the control panel to enter into magnification status.
3. The lower-left corner of the screen dispalys Thumbnail with sample volume box, imaging area displays the magnified image selected by sample volume box, rotate the multifuctional knob to adjust sample volume box.
4. Move the trackball to adjust the position of sample volume box.
5. Image adjustment、annotation、 image saving、etc. are available on magnified image.
   Press **Zoom** knob again to return to the normal dispaly status.

7.2.3 Full-screen Zooming

Step are as follows.

1. Setup shortcut key is required, enter into [Preset] → [System Preset], define F1 key as [Screen zoom], click[OK] to finish the setup.
2. Open the image or current scanning image, press F1 key, the imaging area close to the left side of the screen is magnified; press F1 key again to enable Full-screen Zooming.
3. Image adjustment、annotation、measurement, etc. are available on magnified image.
   Press F1 key again to return to the normal dispaly status.

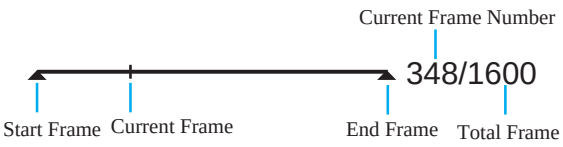
7.3 Freezing the Image

Press the **Freeze** key on the control panel, ❄ displays on the screen and the current real time scan is frozen. You can perform measurement, make annotation or enter the cine mode in the frozen mode.

Press the **Freeze** key again to restore to the real time scan.

7.4 Viewing and Cropping the Cine

The cine review is available by pressing the **Freeze** key in the real time scan, and schedule bar appears on the screen.



You can review or crop the cine.

7.4.1 Reviewing the Cine

- Reviewing it manually

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You can review the cine frame by using the trackball.

- Reviewing it automatically

  Press or rotate the knob corresponding to [Auto Play] to playback the cine automatically and you can adjust the review speed during playback.

  To stop playback, set the value of auto play as X0.

7.4.2 Cropping the Cine

Steps are as follows.

1. Move the trackball to select the starting point, press or rotate the knob corresponding to [Set A Frame] to confirm.
2. Move the trackball to select the end point, and press or rotate the knob corresponding to [Set B Frame] to confirm.
3. Press or rotate the knob corresponding to [Auto Play] to review the cropped cine.

7.5 Annotating the Image

The annotation feature provides you to type or add an annotation from the predefined annotation library. Arrows and body marks are also provided to annotate the image. You can make annotations, arrows or bodymark on the image in the frozen or real time scan.

7.5.1 Text Annotation

Steps are as follows.

1. Press the **Comment** key on the control panel to activate the annotation. Annotation library appears on the left of the screen.
2. Select the desired annotation by using the trackball and press the **Set** key to add the annotation on the image.

   You can also type an annotation into the annotation library.
3. Press the **Set** key, and move the annotation to the desired position by using the trackball and then press the **Set** key again to confirm.
4. If necessary, repeat step 2 - 3 to add more annotations.
5. Press the **Comment** key again to exit the annotation status.

   You can define the annotation in the Preset screen. For details, refer to Section 4.4 Presetting the Annotations.

7.5.2 Arrow Annotation

Steps are as follows.

1. Press the **Arrow** key on the control panel to activate the annotation.
2. An arrow appears on the screen. Adjust the position of the arrow by using the trackball and press the Set key to confirm.

   You can also adjust the direction of the arrow by rotating the multi-functional knob.
3. If necessary, repeat step 2 to add more annotations.

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4. Press the **Arrow** key again to exit the annotation status.

7.5.3 Bodymark Annotation

Steps are as follows.

1. Press the **Body Mark** knob on the control panel to activate the annotation and a body mark appears on the screen.
2. Select one body mark by using the trackball and press the **Set** key to confirm. The selected body mark displays on the bottom left of the screen.

   You can also adjust the direction of the probe by rotating the multi-functional knob.
3. Press **Set** or **Body Mark** knob again to exit the annotation status.

7.5.4 Deleting the Annotation

- Deleting the text annotation

  When you are adding a text annotation, move the trackball to the desired text annotation and press **Backspace** on the keyboard to delete one annotation or press **Clear** on the keyboard to delete all annotations.

  When you have added the text annotation, press **Backspace** to delete the annotations from the last one to the first one, or press **Clear** to delete all the annotations.

  Delete all the annotations: when it is not in dialog interface, press **Clear** on the keyboard to clear all the annotation, including text, arrow, body scale, measuring scale and results. Please operate carefully!

  If you want to delete all the annotations after freezing the image, make a setting in Preset screen -> [Comment Preset] -> [clear comments while unfreeze image].

- Deleting the body mark annotation

  Refer to Deleting the text annotation.

- Deleting the arrow annotation

  Refer to Deleting the text annotation.

Note

when it is not in dialog interface, press Clear on the keyboard to clear all the annotation, including text, arrow, body scale, measuring scale and results. Please operate carefully!

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Chapter 8 Measurements and Calculations

You can perform measurements on ultrasound images, and the system automatically calculates the measurement results. You can use the results to conclude the precise diagnostic information.

General measurements and specific measurements are provided.

Before measuring, you should be familiar with the measurement screen, measurement keys and menus and preset the necessary parameters used in measurements.

8.1 Measurement Screen and Keys

■ Measurement Screen

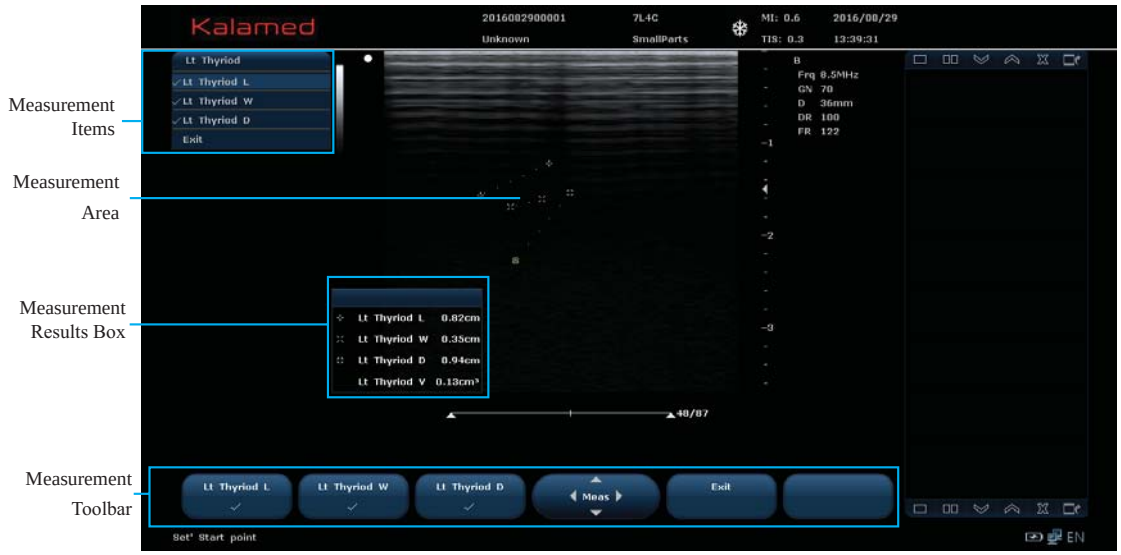

Figure 8-1 Measurement Screen

Measurement Menu: Display the measurement items and sub-items. For details, refer to Section 8.2 Measurement Menu.

Measurement Toolbar: Press the button corresponding to the toolbar to select the measurement item.

Measurement Area: It means the area of which the measurement is performed.

Measurement Result Box: The measurement results are displayed in this box after you complete the measurement. Press the **Clear** key to delete the measurement results and measurement rulers.

■ Keys

The following keys are used to perform measurements and calculations.

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Name	Functions
Caliper	Used to activate the general measurement and calculation.
Measure	Used to activate the specific measurement and calculation.
Trackball	Used to select the measurement item. Or, used to move the measurement marker during the measurement.
Set	Used to confirm the operation. Or, used to fix the position of the measurement marker during the measurement.
Update	Used to move to the next measurement point.
Clear	Used to remove all the measurement and calculation results on the screen.
Report	Used to view the measurement report.

8.2 Measurement Menu

Press the **Caliper** key in the real time or frozen mode to display the general measurement menu, and press the **Measure** key to display the specific measurement menu. The following specific measurement menu is taken Gynecology measurement menu as an example.

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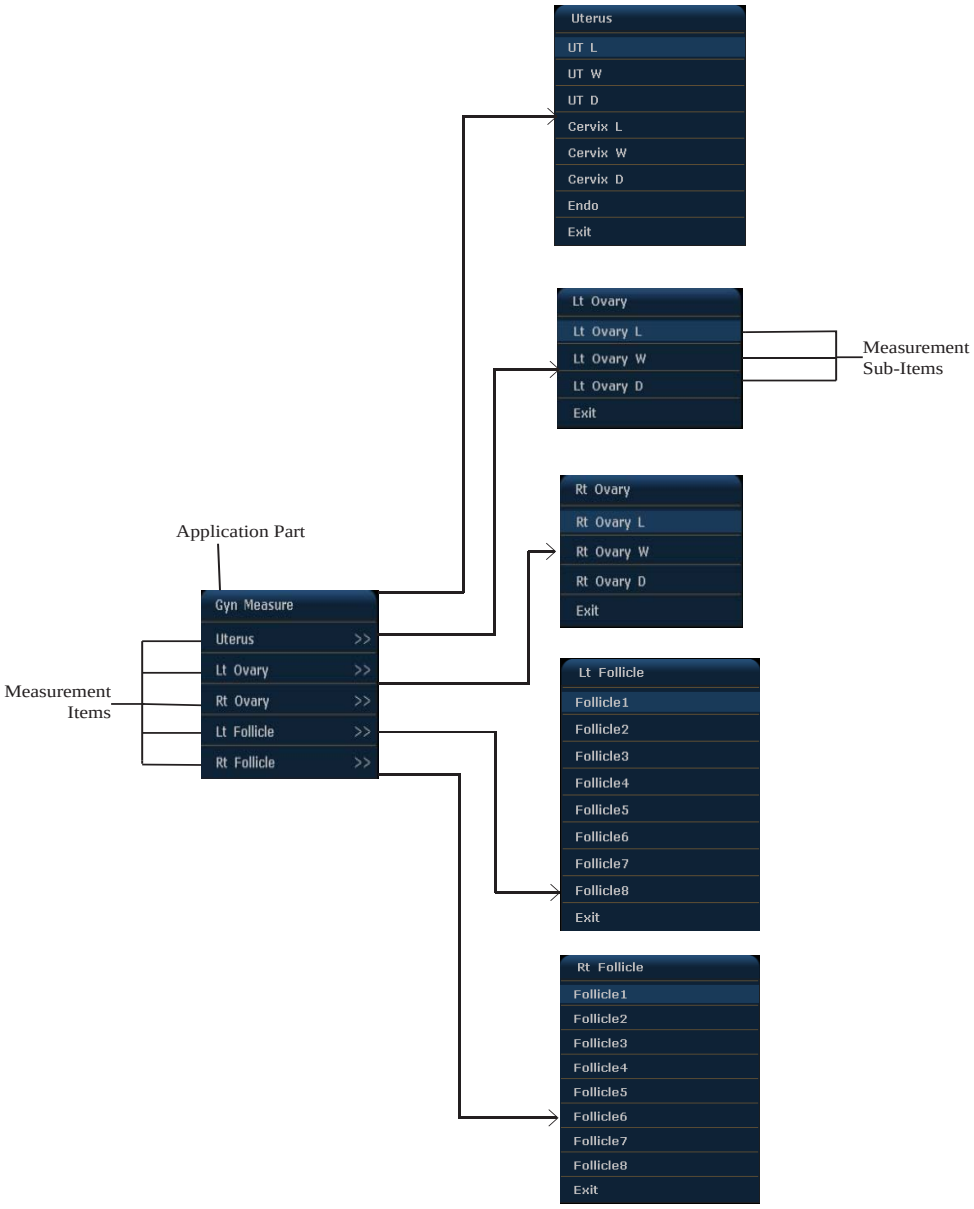

Figure 8-2 Measurement Menu

The measurement menu consists of exam type, measurement items and measurement sub-items.

- Exam Type

  The name of the exam type is displayed. You can select it on the Probe and Exam Type screen. The measurement items vary with the exam type.

- Measurement Items and Sub-items

  Measurement items display under the exam type. >> after a measurement item indicates you can select it to display the sub-items. Move the trackball on this measurement item and press the **Set** key to display them.

  Measurement items and sub-items also display in the toolbar. You can press the corresponding buttons to activate it. The following sections are described according to the measurement menu.

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8.3 Measurement Preset

You can preset the obstetric measurement formula. For details, refer to Section 4.3 Presetting the Measurements.

8.4 Measurement Error

Ultrasound scan and measurements are highly precise, but measurement errors still exist due to the features of the ultrasound signal, the scanning structures and the features of the tissues and liquid. You can follow the methods below to decrease errors as little as possible.

- Select the probe in accordance with the depth range of the tissue to be measured.
- Adopt higher image magnification during measurement.
- Select an appropriate imaging mode and optimize the image quality.

The following measurement errors should be considered during measurements. Measurement accuracy is only valid in the range shown as below.

- Error of distance measurement: within ±5%
- Error of depth measurement: within ±5%
- Error of time measurement: within ±5%
- Error of sweep (slope) measurement: within ±15%
- Error of area measurement: within ±8%
- Error of circumference measurement: within ±4%

You should make a diagnosis with a clinical analysis and the measurement results together.

8.5 General Measurements

Measurement results of general measurements are not recorded in the measurement report, but all specific measurements are based on general measurements.

General measurements can be performed in the B mode, M mode, Color/PDI mode and PW mode. And operations of the Color/PDI mode and the B mode measurements are similar. These two modes are called 2D mode hereafter.

8.5.1 2D Mode Measurements

8.5.1.1 Distance

It is used to measure the distance between two points on a image.

Steps:

1. Press the **Caliper** key on the control panel to activate the measurement, and the measurement menu displays on the top left of the screen.

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2. Select [Distance] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.

   You can also press **Update** on the control panel and move the trackball to adjust the starting point.
4. Move the second marker to the end point by using the trackball and press **Set**. A line connects the two points, and the measurement result displays in the result box.
5. If necessary, you can repeat step 2-4 to perform the next distance measurement.

8.5.1.2 Area and Circumference

If the target object is similar with an ellipse, ellipse measurement can be performed to measure the area and circumference. If the target object is irregular, trace measurement can be performed to measure the area and circumference.

- Ellipse

  It is used to measure the circumference and area of a blocked area on the image.

  Steps:

  1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
  2. Select [Circle/Area] on the menu by moving the trackball and press **Set** to confirm. Select [Ellipse] on the pop-up menu. A marker displays on the image.
  3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
  4. Move the second marker to the end point by using the trackball and press **Set**. An ellipse displays on the image.

     You can also press **Update** on the control panel, move the trackball to the axes to adjust their lengths. Then press **Set** to confirm.
  5. The system automatically calculates the area and circumference, and the measurement result displays in the result box.
  6. If necessary, you can repeat step 2-5 to perform the next area and circumference measurement.

- Trace

  It is used to measure the circumference and area by operating the trackball along the target object.

  Steps:

  1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
  2. Select [Circle/Area] on the menu by moving the trackball and press **Set** to confirm. Select [Trace] on the pop-up menu. A marker displays on the image.

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3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
4. Move the second marker along the target object by using the trackball.
5. Press **Set** to confirm and the system automatically calculates the area and circumference, and the measurement result displays in the result box.
6. If necessary, you can repeat step 2-5 to perform the next area and circumference measurement.

8.5.1.3 Volume

■ Three-distance

It is used to measure the volume of a cuboid shaped object by measuring the length, the width and the depth.

Steps:

1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
2. Select [Volume] on the menu by moving the trackball and press **Set** to confirm. Select [3 Dist] on the pop-up menu. A marker displays on the image.
3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
4. Move the second marker to the end point by using the trackball and press **Set** to confirm. A line connects these two points.
5. Repeat step 3-4 to perform a distance measurement for the width.
6. Rescan an image which is perpendicular to the previous image and repeat step 3-4 to perform a distance measurement for the depth. The system automatically calculates the volume, and the measurement result displays in the result box.

■ Ellipse distance

Steps:

1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.

1. Select [Volume] on the menu by moving the trackball and press **Set** to confirm. Select [EDist] on the pop-up menu. A marker displays on the image.
2. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
3. Move the second marker to the end point by using the trackball and press **Set**. An ellipse displays on the image.

   You can also press **Update** on the control panel, move the trackball to the axes to adjust their lengths. Then press **Set** to confirm.
4. Rescan an image which is perpendicular to the previous image.

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5. Perform a distance measurement. The system automatically calculates the volume, and the measurement result displays in the result box.

- Ellipse

  Steps:

  1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
  2. Select [Volume] on the menu by moving the trackball and press **Set** to confirm. Select [Ellipse] on the pop-up menu. A marker displays on the image.
  3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
  4. Move the second marker to the end point by using the trackball and press **Set**. An ellipse displays on the image.

     You can also press **Update** on the control panel, move the trackball to the axes to adjust their lengths. Then press **Set** to confirm.
  5. The system automatically calculates the volume, and the measurement result displays in the result box.

8.5.1.4 Area Ratio

The value of area ratio between two ellipses and trace areas can be measured.

- Ellipse ratio

  It is used to measure the value of area ratio between two ellipses.

  Steps:

  1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
  2. Select [Ratio(A)] on the menu by moving the trackball and press Set to confirm. Select [Ellipse] on the pop-up menu. A marker displays on the image.
  3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
  4. Move the second marker to the end point by using the trackball and press **Set**. An ellipse displays on the image.

     You can also press **Update** on the control panel, move the trackball to the axes to adjust their lengths. Then press **Set** to confirm.
  5. Repeat step 3-5 to draw the second ellipse. The system automatically calculates the area ratio, and the measurement result displays in the result box.

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■ Trace ratio

It is used to measure the value of area ratio between two trace areas.

Steps:

1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
2. Select [Ratio(A)] on the menu by moving the trackball and press **Set** to confirm. Select [Trace] on the pop-up menu. A marker displays on the image.
3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
4. Move the second marker along the target object by using the trackball.
5. Press **Set** to confirm.
6. Repeat step 2-5 to perform a second trace measurement. The system automatically calculates the trace ratio, and the measurement result displays in the result box.

8.5.1.5 Distance Ratio

It is used to measure the value of distance ratio between two lines.

Steps:

1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
2. Select [Ratio(D)] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.

   You can also press **Update** on the control panel, move the trackball to adjust the starting point.
4. Move the second marker to the end point by using the trackball and press **Set**. A line connects these two points.
5. Repeat step 3-5 to perform a second distance measurement. The system automatically calculates the distance ratio, and the measurement result displays in the result box.

8.5.1.6 Angle

It is used to measure the value of angle between two intersection planes.

Steps:

1. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
2. Select [Angle] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
3. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.

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You can also press **Update** on the control panel, move the trackball to adjust the starting point.

4. Move the second marker to the end point by using the trackball and press **Set**. A line connects these two points.
5. Repeat step 3-5 to draw a second line to create an angle. The system automatically calculates the angle, and the measurement result displays in the result box.

8.5.2 M Mode Measurements

Distance, time, heart rate and slope measurements can be performed in the M mode. You can also press [BC Caliper] to enter the general measurements in the 2D mode. For details, please refer to Section 8.5.1 2D Mode Measurements.

8.5.2.1 Distance

It is used to measure the vertical distance between two points on the M mode image.

Steps:

1. Press the **M** key on the control panel to enter the M mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [Distance] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.

   You can also press **Update** on the control panel, move the trackball to adjust the starting point.
5. Move the second marker to the end point by using the trackball and press **Set**. A line connects these two points. The measurement result displays in the result box.
6. Repeat step 3-5 to perform the next distance measurement.

8.5.2.2 Time

It is used to measure the time interval between two points on the M mode image.

1. Press the **M** key on the control panel to enter the M mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [Time] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
5. Move the second marker to the end point by using the trackball and press **Set**. The measurement result displays in the result box.

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8.5.2.3 Heart Rate

It is used to measure the time interval between heart cycles based on the number of heartbeats per minute on the M mode image.

You can preset the heart cycle in [Preset] -> [Measure Preset] -> [HR].

Steps:

1. Press the **M** key on the control panel to enter the M mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [HR] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
5. Move the second marker to the end point by using the trackball and press **Set**. The measurement result displays in the result box.

8.5.2.4 Slope Rate

It is used to measure the change in distance over time on the M mode image.

Steps:

1. Press the **M** key on the control panel to enter the M mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [Slope] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
5. Move the second marker to the end point by using the trackball and press **Set**. The measurement result displays in the result box.

8.5.3 PW Mode Measurements

Flow speed ratio, speed, time, heart rate, acceleration and spectrum trace measurements can be performed in the PW mode. You can also press [BC General Measurements] to enter the general measurements in the 2D mode. For details, please refer to Section 8.5.1 2D Mode Measurements.

8.5.3.1 Flow Speed Ratio

It is used to calculate the flow speed ratio and Pressure Gradient (PG) on the Doppler-mode image by measuring the flow speed of peak systole and end diastole.

Step:

1. Press the **PW** key on the control panel to enter the PW mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.

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3. Select [S/D] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the flow speed of peak systole by using the trackball, press **Set** to fix the marker and the second marker displays.
5. Move the second marker to the flow speed of end diastole by using the trackball and press **Set**. The measurement result displays in the result box.

8.5.3.2 Speed

It is used to measure the speed of one point on the spectral Doppler waveform.

1. Press the **PW** key on the control panel to enter the PW mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [Velocity] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the desired point by using the trackball and press **Set**. The measurement result displays in the result box.

8.5.3.3 Time

It is used to measure the time interval between two points on the spectral Doppler image.

Steps:

1. Press the **PW** key on the control panel to enter the PW mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [Time] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
5. Move the second marker to the end point by using the trackball and press **Set**. The measurement result displays in the result box.

8.5.3.4 Heart Rate

It is used to measure the time interval between heart cycles based on the number of heartbeats per minute on the PW mode image.

Steps:

1. Press the **PW** key on the control panel to enter the PW mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [HR] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.

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5. Move the second marker to the end point by using the trackball and press **Set**. The measurement result displays in the result box.

8.5.3.5 Acceleration

It is used to calculate the flow speed difference in the time interval from two measured flow speeds on the PW mode image.

Steps:

1. Press the **PW** key on the control panel to enter the PW mode.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [Acceleration] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
4. Move the marker to the starting point by using the trackball, press **Set** to fix the marker and the second marker displays.
5. Move the second marker to the end point by using the trackball and press **Set**. The measurement result displays in the result box.

8.5.3.6 Spectrum Trace

It used to measure the velocity or other indexes for clinical diagnosis purposes by tracing one or more Doppler waveforms. Manual trace and auto trace are available.

Note

- To ensure the measurement accuracy, you should position the first marker on peak systole and position the second marker on end diastole during the trace measurements.
- Spectrum trace can only be performed in frozen PW mode.

■ Manual trace

Steps:

1. Press the **PW** key on the control panel enter the PW mode, then press **Freeze** key.
2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
3. Select [D Trace] on the menu by moving the trackball and press **Set** to confirm. Select [Manual] on the pop-up menu. A marker displays on the image.
4. Move the marker to the starting point of peak waveform of the end systole by using the trackball, press **Set** to fix the marker and the second marker displays.
5. Trace the waveform and move the second marker to the end diastole which is one cardiac cycle adjacent to the first marker by using the trackball and press **Set**. The measurement result displays in the result box.

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- Auto trace

  Steps:

  1. Press the **PW** key on the control panel to enter the PW mode, then press **Freeze** key.
  2. Press the **Caliper** key to activate the measurement, and the measurement menu displays on the top left of the screen.
  3. Select [Spectrum Trace] on the menu by moving the trackball and press **Set** to confirm. Select [Auto] on the pop-up menu. A marker displays on the image.
  4. Move the marker to the starting point of peak waveform of the end systole by using the trackball, press **Set** to fix the marker and the second marker displays.
  5. Move the second marker to the end diastole which is one cardiac cycle adjacent to the first marker by using the trackball and press Set. The system automatically traces the waveform and the measurement result displays in the result box.

8.6 Specific Measurements and Calculations

Specific measurement and calculations corresponds to the measurement and calculation of each exam type. The measurement results are recorded in the report.

You should confirm the following items before measurement.

- Confirm that the current probe is applicable for the current application part.
- Confirm that the current date is correct.
- Confirm that the patient information is input.
- Confirm that the exam type is selected.

8.6.1 Abdomen Measurements

Abdominal measurements can be performed in 2D (B/Color/PDI) mode and PW mode.

8.6.1.1 Abdomen Measurements in 2D mode

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menudisplays on the top left of the screen.
2. Select a measurement item, such as [Liver], on the menu by moving the trackball and press **Set** to confirm.
3. Select the measurement sub-item, such as [R Liver Max], on the pop-up sub-menu and a marker displays on the image.
4. Follow the methods in the following table to perform the measurement, and the measurement result displays in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Liver	R Liver Max	Right Liver Maximum	Refer to Section 8.5.1.1 Distance.
	R Liver W	Right Liver Width	
	R Liver D	Right Liver Depth	
	L Liver L	Right Liver Length	
	L Liver D	Right Liver Depth	
Kidney	LK L	Left kidney Length	Refer to Section 8.5.1.1 Distance.
	LK W	Left kidney Width	
	LK D	Left kidney Depth	
	LK Cortex	Left Renal Cortex	
	RK L	Right kidney Length	
	RK W	Right kidney Width	
	RK D	Right kidney Depth	
	RK Cortex	Right Renal Cortex	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Adrenal	L Adrenal L	Left Adrenal Length	Refer to Section 8.5.1.1 Distance.
	L Adrenal W	Left Adrenal Width	
	L Adrenal D	Left Adrenal Depth	
	R Adrenal L	Right Adrenal Length	
	R Adrenal W	Right Adrenal Width	
	R Adrenal D	Right Adrenal Depth	
Gall bladder	CBD	Common Bile Duct	Refer to Section 8.5.1.1 Distance.
	CHD	ductuli hepaticus communis	
	GB L	Gall Bladder Length	
	GB W	Gall Bladder Width	
	GB Wall D	Gall Bladder Wall Depth	
Pancreas	Pancr. Duct	Pancreas Ductus	Refer to Section 8.5.1.1 Distance.
	Pancr. Head	Pancreas Head	
	Pancr. Corus	Pancreas Corus	
	Pancr. Tail	Pancreas Tail	
Spleen	SP L	Spleen Length	Refer to Section 8.5.1.1 Distance.
	SP W	Spleen Width	
	SP D	Spleen Depth	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Bladder	Pre_BL L	Preceding Bladder Length	Refer to Section 8.5.1.1 Distance.
	Pre_BL W	Preceding Bladder Width	
	Pre_BL D	Preceding Bladder Depth	
	Post_BL L	posterity Bladder Length	
	Post_BL W	posterity Bladder Width	
	Post_BL D	posterity Bladder Depth	
	Mictur.Vol	Mictur.Vol	
	Residual Urine	Residual Urine	
Aorta	Aorta Diam	Aorta Diam	Refer to Section 8.5.1.1 Distance.
	Aorta Bif	Aorta Bif	
Iliac	L Iliac Diam	Left Lliac Diam	
	R Iliac Diam	Right Lliac Diam	
Protal V Diam	/	/	

■ **Kidney measurement**

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select [Left kidney] or [Right kidney] on the menu by moving the trackball and press **Set** to confirm.
3. Perform the three distance measurements for the length, width and depth of the kidney. The system automatically calculates the volume of the kidney by the following formula, and the

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measurement results displays in the result box.

$$\text{Kidney volume} = 0.49 \times \text{length} \times \text{width} \times \text{depth}$$

■ **Bladder measurement**

Steps:

1. Press the **Measure** key in the real time or frozen 2D (B/Color/PDI) mode, and the measurement menu displays on the top left of the screen.
2. Select [Bladder] on the menu by moving the trackball and press **Set** to confirm.
3. Perform three distance measurements like the length, width and depth of the bladder. The system automatically calculates the bladder volume, urinary output and residual urine according to the following formula, respectively. The measurement results displays in the result box.

$$\text{Bladder volume} = 0.523 \times \text{length} \times \text{width} \times \text{depth}$$

$$\text{Mictur volume} = \text{bladder volume before micturating} - \text{bladder volume after micturating}$$

$$\text{Residual urine} = 0.7 \times \text{length} \times \text{width} \times \text{depth}$$

8.6.1.2 Abdominal measurement in PW mode

Steps:

1. Press the **Measure** key in the frozen PW mode, and the measurement menu displays on the top left of the screen.
2. Select a measurement item, such as [Renal Artery], on the menu by moving the trackball and press **Set** to confirm.
3. In the sub-menu that pops out use the track ball to select wanted measurement sub-item, such as [M Renal A], and move the track ball to press **Set** to confirm.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Renal Artery	M Renal A	Major Renal Artery	Refer to Section 8.5.3.6 spectrum tracing
	Segment A	Segment Artery	
	Interlobar A	Interlobar Artery	
	Arcuate A	Arcuate Artery	
	Renal V	Renal Vena	Refer to Section 8.5.3.2 Speed.
	Renal A	Renal Artery	Refer to Section8.5.3.6 spectrum tracing
Kidney	LK L	Left kidney Length	
	LK Cortex	Left Renal Cortex	
	RK L	Right kidney Length	
	RK W	Right kidney Width	
	RK D	Right kidney Depth	
	RK Cortex	Right Renal Cortex	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Abdominal Aorta	Aorta	Aorta	Refer to Section 8.5.3.6 spectrum tracing
	Celiac Axis	Celiac Axis	
	SMA	Serve Mesentery Artery	
	C Hepatic A	Chief Hepatic Artery	
	Hepatic A	Hepatic Artery	
	Splenic A	Splenic Artery	
Abdominal Vein	IVC	Inferior Vena Cava	Refer to Section 8.5.3.2 Speed.
	Portal V	Portal Vena	
	M Portal V	Major Portal Vena	
	Hepatic V	Hepatic Vena	
	Rt Hepatic V	Right Hepatic Vena	
	M Hepatic V	Middle Hepatic Vena	
	Lt Hepatic V	Left Hepatic Vena	
	Splenic V	Splenic Vena	
	SMV	Serve Mesentery Vena	Refer to Section 8.5.3.6 spectrum tracing

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Pancreas	Vas Area	Vascular Area	Refer to Section 8.5.1.1 Distance.
	TAMEAN	/	Refer to Section 8.5.3.6 spectrum tracing
	TAMAX	/	
Ren A Org	/	Renal artery origin	

8.6.2 Gynecology Measurements

Gynecology measurement and calculations can be performed in the 2D (B/Color/PDI) mode. Uterus, ovary and follicle can be measured.

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select a measurement item, such as [Uterus], on the menu by moving the trackball and press **Set** to confirm.
3. In the sub-menu that pops out use the track ball to select wanted measurement sub-item, such as [U T L], and move the track ball to press **Set** to confirm.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Renal Artery	UT L	Uterus Length	Refer to Section 8.5.1.1 Distance.
	UT W	Uterus Width	
	UT D	Uterus Depth	
	Cervix L	Cervix Length	
	Cervix W	Cervix Width	
	Cervix D	Cervix Depth	
	Endo	Endometrium Thickness	
Lt Ovary	Lt Ovary L	Left Ovary Length	Refer to Section 8.5.1.1 Distance.
	Lt Ovary W	Left Ovary Width	
	Lt Ovary D	Left Ovary Depth	
Rt Ovary	Rt Ovary L	Right Ovary Length	Refer to Section 8.5.1.1 Distance.
	Rt Ovary W	Right Ovary Width	
	Rt Ovary D	Right Ovary Depth	
Lt Follicle	Lt Follicle L	Left Follicle Length	Refer to Section 8.5.1.1 Distance.
	Lt Follicle W	Left Follicle Width	
	Lt Follicle D	Left Follicle Depth	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Rt Follicle	Rt Follicle L	Right Follicle Length	Refer to Section 8.5.1.1 Distance.
	Rt Follicle W	Right Follicle Width	
	Rt Follicle D	Right Follicle Depth	

■ **Uterus measurement**

Perform uterus length, uterus width, uterus Depth measurement and the system automatically do calculations by the following formula.

Uterus volume=0.523 ×uterus length × uterus width ×uterus Depth

Cervix=Cervix length+ cervix width+ cervix Depth

Uterus/cervix=uterus length/cervix length

■ **Ovary measurement**

Perform three distance measurements for the length, width and depth of the ovary. The system automatically calculates the volume of the ovary by the following formula, and the measurement results displays in the result box.

Ovary volume = 0.523 × length × width × depth

8.6.3 Obstetrics Measurements

Obstetrics measurements and calculations can be performed in the 2D (B/Color/PDI) mode, PW mode and M mode.

8.6.3.1 Obstetrics Measurements in the 2D Mode

Steps:

1. Press the Measure key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select a measurement item, such as [Length measurement], on the menu by moving the trackball and press Set to confirm.
3. In the sub-menu that pops out use the track ball to select wanted measurement sub-item, such as [Ulna length], and move the track ball to press Set to confirm.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Length measurement	Ulna	Ulna Length	Refer to Section 8.5.1.1 Distance.
	Radius	Radius Length	
	Tibia	Tibia Length	
	Fibula	Fibula Length	
	vertebra	vertebra Length	
	MP	Middle Phalanx	
	Ft	Foot Length	
	Ear	Ear Length	
	VL	Vertebra Length	
	TAD	Transverse Abdominal Diameter	
	APAD	Anterior-Posterior Abdominal Diameter!	
	Umb VD	Umbilical Vein Diameter	
	Cervix L	Cervical length	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Atrium and ventricle measurement	LVIDd	Left Ventricle short-axis Distance diastole	Refer to Section 8.5.1.1 Distance.
	LVIDs	Left Ventricle short-axis Distance systole	
	LV Diam	Left ventricular diameter	
	RVIDd	Right Ventricle short-axis Distance diastole	
	RVIDs	Right Ventricle short-axis Distance systole	
	RV Diam	Right ventricular diameter	
	IVSd	Inter ventricular septal thickness diastole	
	IVSs	Inter ventricular septal thickness systole	
	IVS	Inter ventricular septal thickness	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Atrium and ventricle measurement	LV Area	Left ventricular area	Refer to Section 8.5.1.2 area
	RV Area	Right ventricular area	
	LVOT Diam	Left ventricular outflow tract diameter	Refer to Section 8.5.1.1 Distance.
	RVOT Diam	Right ventricular outflow tract diameter	
	HrtC	Heart cycle	Refer to Section 8.5.1.2 area
	TC	Thoracic Circumference	
	LA Diam	Left atrial diameter	Refer to Section 8.5.1.1 Distance.
	RA Diam	Right atrial diameter	
	LA Area	Left atrial area	Refer to Section 8.5.1.2 area
	RA Area	Right atrial area	
cephalometry	CM	Cisterna Magna	Refer to Section 8.5.1.1 distance
	LV	Lateral Ventricle	
	CH	Cerebral Hemisphere	
	EED	External eye distance	
	IED	Inner eye distance	
	CF	Cervical Fold	
	OOD	Orbital Outer Diameter	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Kidney measurement	FK	Fetal Kidney	Refer to Section 8.5.1.1 distance
	MK	Matrix Kidney	
Amniotic fluid measurement	AFI	Amniotic Fluid Index	Refer to Section 8.6.3.4 amniotic measurement
	AFD	Amniotic Fluid depth	
BPD	/	Biparietal Diameter	Refer to Section 8.5.1.1 distance
CRL	/	Crown-Rump Length	
HC	/	Head Circumference	
AC		Abdominal Circumference	Refer to Section 8.5.1.1 distance
FL	/	Femoral Length	
Humeros	/	Humeros Length	
Clavicle	/	Clavicle Length	
CER	/	Cerebella	
FTA	/	/	Refer to Section 8.5.1.2 area
TTD	/	Transverse Thunk Diameter	Refer to Section 8.5.1.1 distance
APTD	/	Anterio-Posterial Trunk Diameter	
OFD	/	Occipito-Frontal Diameter	
THD	/	Thoracic Diameter	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
EFW	/	Estimated fetal weight	Refer to Section 8.6.3.3EFW

For some measurement sub-items there are measurement methods on the right. Use track ball to move cursor and choose the needed measurement method and press Set to confirm. Measurement methods can be switched between each other.

8.6.3.2 Gestational age and expected date of confinement

Two methods are available for the measurement of gestational age and expected date of confinement. One is calculated based on last menstrual period and the other is based on ovulation date.

Besides, they can also be calculated by measuring foetal sac, crown-rump length, head circumference, abdominal circumference, cerebella. The formula for these calculation can be preset following the path: [Preset] -> [Measure Preset].

8.6.3.3 EFW

EFW can be calculated by more than one of formulas. Calculation with different formulas adopts different measurement items and measurement sequences. The EFW formula can be preset in [Preset] -> [Measure Preset] -> [EFW].

Method	Formula	Unit	Unit of Measurement Item
Hadlock1	EFW=10^(1.304+(0.05281×AC)+(0.1938×FL)-(0.004×AC×FL))	g	cm
Hadlock2	EFW=10^(1.335-(0.0034×AC×FL)+(0.0316×BPD)+(0.0457×AC)+(0.1623×FL))	g	cm
Hadlock3	EFW=10^(1.326-(0.00326×AC×FL)+(0.0107×HC)+(0.0438×AC)+(0.158×FL))	g	cm
Hadlock4	EFW=10^(1.3596-(0.00386×AC×FL)+(0.0064×HC)+(0.00061×BPD×AC)+(0.0424×AC)+(0.174×FL))	g	cm
Shepard	EFW=10^(-1.7492+(0.166×BPD)+(0.046×AC)-(2.646×AC×BPD/1000))	kg	cm

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Method	Formula	Unit	Unit of Measurement Item
Merz1	EFW=-3200.40479+(157.07186×AC)+(15.90391×(BPD^2))	g	cm
Merz2	EFW=0.1×(AC^3)	g	cm
Hansmann	EFW=(-1.05775×BPD)+(0.0930707×(BPD^2))+(0.649145×THD)-(0.020562×(THD^2))+0.515263	kg	cm
Tokyo	EFW=(1.07×(BPD^3))+(3.42×APTD*TTD×FL)	g	cm
Osaka	EFW=(1.25674×(BPD^3))+(3.50665×FTA×FL)+6.3	g	cm
Campbell	EFW=EXP (-4.564+(0.282×AC)-(0.00331×(AC^2)))	kg	cm

The EFW automatically displays when all the measurement items of EFW are measured. If only parts of the measurement items are measured, EFW result will be updated according to the latest measurement results.

8.6.3.4 AFI

Amniotic Fluid Index (AFI) requires four measurements in the four quadrants of the uterine cavity.

The ultrasound system adds these four measurements together to calculate AFI.

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select [AFI] on the menu by moving the trackball and press **Set** to confirm.
3. Perform four distance measurements for the depth of four quadrants (AF1, AF2, AF3 and AF4) of the uterine cavity. The measurement results displays in the result box.

$$AFI = AF1 + AF2 + AF3 + AF4$$

8.6.3.5 Measurement and Calculation of 2D Related Measurement Items

Abbreviation	Description	Measurement Methods
FL/BPD	Femoral Length/Biparietal Diameter	FL/BPD *100

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Abbreviation	Description	Measurement Methods
CI	Cephalic Index	BPD / OFD *100
HC(c)	/	2.325*(BPD ^2/ OFD ^2)^1/2
LAD/AoD	LA Diam/AO Diam	LAD/AoD
FL/AC	Femoral Length/Abdominal Circumference	FL/AC *100
FL/HC	Femoral Length/Head Circumference	FL/HC *100
CTAR	Cardio-Thoracic Area Ratio	FL/HC
TCD/AC	Cerebella/Abdominal Circumference	TCD/AC
AoD/MPAD	Ao Diam/MPA Diam	AoD/MPAD
LVD/RVD	LV Diam/RV Diam	LVD/RVD
LAD/RAD	LA Diam/RA Diam	LAD/RAD
HC/AC	Head Circumference/Abdominal Circumference	HC/AC
LVW/HW	Lateral Ventricle/Cerebral Hemisphere	LVW/HW *100%
AXT	/	AXT

8.6.3.6 Obstetric Measurement in PW Mode

Steps:

1. Press the **Measure** key in frozen PW mode, the measurement menu displays on the top left side of the screen.
2. Move the trackball to, choose one item,such as BPD,press **Set** to confirm.
3. Measurement cursor displayed in the image and follow the methods in the following table measurement results will be displayed in the result box.

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Measurement Item	Description	Measurement Method
FHR	Fetal Heart Rate	Refer to Section 8.5.3.4 Heart Rate
Umb A	Umbilical Artery	Refer to Section 8.5.3.6 Spectrum Trace
Ductus V	Ductal Vena	
Placent A	Placent Aartery	
MCA	Media Cerebri Artery	
FetalAO	Fetal Aorta	
Desc.AO	Descending Aorta	
Uterus A	Uterin Artery	
Ovary A	Ovary Artery	

8.6.3.7 Obstetric Measurement in M Mode

Steps:

1. Press the **Measure** key in frozen M mode, the measure menu displays on the top left side of the screen.
2. Move the trackball to the measurement item, choose one itme,such as FHR,press **Set** to confirm. Measurement cursor displays in the image.
3. Follow the methods in the following table, measurement results will be displayed in the result box.

Measurement Item	Description	Measurement Method
FHR	Fetal Heart Rate	Refer to Section 8.5.2.3 Heart Rate

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Measurement Item	Description	Measurement Method
RVIDd	Right Ventricle short-axis Distance diastole	Refer to Section 8.5.2.1 distance
RVIDs	Right Ventricle short-axis Distance diastole	
LVIDd	Left Ventricle short-axis Distance diastole	
LVIDs	Left Ventricle short-axis Distance systole	
IVSd	Inter ventricular septal thickness diastole	
IVSs	Inter ventricular septal thickness systole	

8.6.3.8 Early Pregnancy Measurement

Early pregnancy measurement and calculation can be carried out under 2D mode B/Color/DPI.

Steps:

1. Press the **Measure** key in real time or frozen B/Color/PDI mode, the measure menu displays on the top left side of the screen.
2. Move the trackball to the measurement item, choose one item, such as BPD,press **Set** to confirm. Measurement cursor displayed in the image.
3. Follow the methods in the following table, measurement results will be displayed in the result box.

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Measurement Item	Description	Measurement Method
BPD	Biparietal diameter	Refer to Section 8.5.1.1 distance
GS	Gestationalsac diameter	
PT	Placenta thickness	
YS	Yolk Sac	
CRL	Crown-Rump Length	
FL	Femur Length	
AFD	Amniotic fluid depth	
NT	Nuchal Translucency	
GSD1	Gestation Sac Diameter1	
GSD2	Gestation Sac Diameter 2	
GSD3	Gestation Sac Diameter 3	

8.6.3.9 Middle&Late Pregnency Measurement

The Middle&Late Pregnency Measurement is the same as the obstetric measurement.For detailed measurement method please refer to 8.6.3 Obstetric Measurement

8.6.4 Cardiac Measurement

The cardiac measurement and calculations are carried out in 2D（B/Color/DPI）mode, M mode or PW mode.

8.6.4.1 Cardiac Measurement in 2D Mode

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select [LV] on the menu by moving the trackball and press [Set] to confirm.
3. Select [LV Major] on the pop-up menu and a marker displays on the image.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
LV	LV Major	Left ventricular Major	Refer to Section 8.5.1.1 Distance.
	LV Minor	Left ventricular Minor	
	LV Area(d)	left ventricular area at end diastole	Refer to Section 8.5.1.2 Area and Circumference.
	LV Area(s)	Left ventricular area at end systole	
	LVIDd	Left Ventricle internal dimension at end diastole	Refer to Section 8.5.1.1 Distance.
	LVIDs	Left Ventricle internal dimension at end systole	
	LVPWd	Left Ventricular Posterior Wall at end diastole	
	LVPWs	Left Ventricular Posterior Wall at end systole	
	Single Plane	Single plane ellipse method	See instruction below
	Bi Plane	Double plane ellipse method	
	Bullet	Bullet volume method	
LV	Mod. Simpson	Modified Simpson method	See instruction below
	LVM	left ventricular mass	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
RV	RV Major	Right ventricular Major	Refer to Section 8.5.1.1 Distance.
	RV Minor	Right ventricular Minor	
	RV Area(d)	right ventricular area at end diastole	Refer to Section 8.5.1.2 Area and Circumference.
	RV Area(s)	Right ventricular area at end systole	
	RVDd	Right ventricular dimension at end diastole	Refer to Section 8.5.1.1 Distance.
	RVDs	Right ventricular dimension at end systole	
	RVAWd	right ventricular anterior wall at end diastole	
	RVAWs	right ventricular anterior wall at end systole	
	RVOT Diam	right ventricular outflow tract Diam	
IVSd	/	Inter ventricular septal thickness diastole	Refer to Section 8.5.1.1 Distance.
IVSs	/	Inter ventricular septal thickness systole	Refer to Section 8.5.1.1 Distance.
VSD Diam	/	Ventricular septal defect diameter	Refer to Section 8.5.1.1 Distance.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Atrium	LA Diam	Left atrial diameter	Refer to Section 8.5.1.1 Distance.
	LA Major	Left atrial Major	
	LA Minor	Left atrial Minor	
	RA Major	Right atrial Major	
	RA Minor	Right atrial Minor	
	LA Area	Left atrial area	Refer to Section 8.5.1.2 Area and Circumference.
	RA Area	Right atrial area	
	ASD Diam	atrial septal defect diameter	Refer to Section 8.5.1.1 Distance.
MV/TV	MV Diam	Mitral valve diameter	Refer to Section 8.5.1.1 Distance.
	MVA	Mitral valve area	Refer to Section 8.5.1.2 Area and Circumference.
	MCS	Maximum open mitral valve	Refer to Section 8.5.1.1 Distance.
	EPSS	E-point of septal Separation	
	TV Diam	Tricuspid valve diameter	
	TVA	Tricuspid valve Area	Refer to Section 8.5.1.2 Area and Circumference.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
MPA	Ao Diam	Aortic root diameter	Refer to Section 8.5.1.1 Distance.
	Ao Arch Diam	Aortic arch diameter	
	Ao Asc Diam	Ascending aorta diameter	
	Ao Desc Diam	Descending aorta diameter	
	Ao Isthmus	Aortic isthmus	
	Ao st junct	Aortic st juncture	
	Ao Sinus Diam	Inner diameter of aortic sinus	
MPA	ACS	Maximum open scope of aortic valve	Refer to Section 8.5.1.1 Distance.
	AV Diam	Aortic valve diameter	
	AVA	Aortic valve orifice area	Refer to Section 8.5.1.2 Area and Circumference.
	MPA Diam	Main pulmonary artery diameter	Refer to Section 8.5.1.1 Distance.
	PV Diam	Pulmonary valve diameter	
	LPA Diam	Left pulmonary artery diameter	
	RPA Diam	Right pulmonary artery diameter	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Art C	LVOT Diam	Left ventricular outflow tract diameter	Refer to Section 8.5.1.1 Distance.
	RVOT Diam	Right ventricular outflow tract diameter	
	Duct Art Diam	Diameter of arterial ductal	
	PDA Diam	patent ductus arteriosus	
	Pre Ductal	Premature Ductal	
	Post Ductal	Posterior Ductal	
Vena	IVC Diam(insp)	Inner diameter of inferior vena cava	Refer to Section 8.5.1.1 Distance.
	IVC Diam(Expir)	Inner diameter of inferior vena cava	
	SVC Diam(insp)	Internal diameter of superior vena cava	
	SVC Diam (Expir)	Internal diameter of superior vena cava	
CA	LCA	Left coronary artery	Refer to Section 8.5.1.1 Distance.
	RCA	Right coronary artery	
PFO Diam	/	Patent Foramen Ovale	Refer to Section 8.5.1.1 Distance.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
PE	PEd	Diastole Pericardial effusion	Refer to Section 8.5.1.1 Distance.
	PEs	Systolic pericardial effusion	
LA/Ao	/	/	Refer to Section 8.5.1.5 Distance Ratio.
Ao/LA	/	/	

Switch measurement sub-items by moving the trackball to the measurement menu, and press [Set] to confirm.

■ **Single plane**

This measurement method calculates the LV volume by measuring the ellipse covering the long axis of the left ventricle.

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select [LV] on the menu by moving the trackball and press **Set** to confirm.
3. Select [Single Plane] on the pop-up menu and a marker displays on the image.
4. Perform the LVLd -> LVALd -> LVLs -> LVALs measurements one by one and the measurement results displays in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Left Ventricle/ Single Plane Method	LVLd	Left Ventricle Diastolic Major Axis	Refer to Section 8.5.1.1 Distance.
	LVALd	LV long axis area at end-diastole	Refer to Section 8.5.1.2 Area and Circumference.
	LVLs	Left Ventricle Systolic Major Axis	Refer to Section 8.5.1.1 Distance.
	LVALs	Left Ventricle Systolic Area	Refer to Section 8.5.1.2 Area and Circumference.

The system automatically calculates the following items according to the measurement results.

Calculation Item	Description	Formula
EDV	End-diastolic Left Ventricular Volume (ml)	EDV(mL)=(8/3/π)×LVALd(cm^2)/LVLd(cm)
ESV	End-systolic Left Ventricular Volume (ml)	ESV(mL)=(8/3/π)×LVALs(cm^2)/LVLs(cm)
SV	Stroke Volume	SV = EDV(ml) - ESV(ml)
EF	Ejection Fraction	EF=100%×SV(ml)/EDV(ml)
SI	Stroke Volume Index	SI=SV(ml)/BSA(m^2)
CO	Cardiac Output	CO(l/min)=SV(ml)× HR(bpm)/1000
CI	Cardiac Index	CI=CO(l/min)/BSA(m^2)

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Note

You should input the height, weight and heart rate before performing the cardiac measurement. Otherwise, CO, CI and SI cannot be calculated.

■ Bi plane

This measurement method calculates the LV volume by measuring the images covering the long axis and the short axis of the left ventricle.

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select [LV] on the menu by moving the trackball and press **Set** to confirm.
3. Select [Bi Plane] on the pop-up menu and a marker displays on the image.
4. Perform the LVIDd -> LVIDs -> LVAMd -> LVAMs -> LVALd -> LVALs measurements one by one and the measurement results displays in the result box.

Measurement Item	Measurement Sub-item	Description	Measurement Method
Left Ventricle/ Bi Plane Method	LVIDd	LV internal dimension at end diastole	Refer to Section 8.5.1.1 Distance.
	LVIDs	LV short axis diameter at end systole	Refer to Section 8.5.1.1 Distance.
	LVAMd	LV short axis area at mitral valve at end diastole	Refer to Section 8.5.1.2 Area and Circumference.
	LVAMs	LV short axis area at mitral valve at end systole	
	LVALd	LV long axis area at end diastole	
	LVALs	LV long axis area at end-systole	

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The system automatically calculates the following items according to the measurement results.

Calculation Item	Description	Formula
EDV	End-diastolic Left Ventricular Volume	EDV(mL)=(8/3/π)×LVAMd(cm^2)×LVALd(cm^2)/LVIDd(cm)
ESV	End-systolic Left Ventricular Volume	ESV(mL)=(8/3/π)×LVAMs(cm^2)×LVALs(cm^2)/LVIDs(cm)
SV	Stroke Volume	SV = EDV(ml) - ESV(ml)
EF	Ejection Fraction	EF=100%×SV(ml)/EDV(ml)
SI	Stroke Volume Index	SI=SV(ml)/BSA(m^2)
CO	Cardiac Output	CO(l/min)=SV(ml)× HR(bpm)/1000
CI	Cardiac Index	CI=CO(l/min)/BSA(m^2)

■ Bullet

This measurement method calculates the LV volume by measuring the image covering the long axis and the short axis of the left ventricle at level of the mitral valve.

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select [LV] on the menu by moving the trackball and press **Set** to confirm.
3. Select [Bullet] on the pop-up menu and a marker displays on the image.
4. Perform the LVLd -> LVLs -> LVAMd -> LVAMs measurements one by one and the measurement results displays in the result box.

Measurement Item	Measurement Sub-item	Description	Measurement Method
Left Ventricle/ Bullet Method	LVLd	LV long axis length at end-diastole	Refer to Section 8.5.1.1 Distance.
	LVLs	LV long axis length at end-systole	Refer to Section 8.5.1.1 Distance.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Left Ventricle/ Bullet Method	LVAMd	LV short axis area at mitral valve at end diastole	Refer to Section 8.5.1.2 Area and Circumference.
	LVAMs	LV short axis area at mitral valve at end systole	

The system automatically calculates the following items according to the measurement results.

Calculation Item	Description	Formula
EDV	End-diastolic Left Ventricular Volume	EDV(mL)=(5/6/ π)×LVLd(cm^2)×LVAMd(cm^2)
ESV	End-systolic Left Ventricular Volume	EDV(mL)=(5/6/ π)×LVLs(cm^2)×LVAMs(cm^2)
SV	Stroke Volume	SV = EDV(ml) - ESV(ml)
EF	Ejection Fraction	EF=100%×SV(ml)/EDV(ml)
SI	Stroke Volume Index	SI=SV(ml)/BSA(m^2)
CO	Cardiac Output	CO(l/min)=SV(ml)× HR(bpm)/1000
CI	Cardiac Index	CI=CO(l/min)/BSA(m^2)

■ Mod. Simpson

This measurement method calculates the LV volume by using the LV long axis view, the LV short axis at the level of the mitral valve and the LV short axis view at level of the papillary muscles.

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select [LV] on the menu by moving the trackball and press **Set** to confirm.
3. Select [Mod. Simpson] on the pop-up menu and a marker displays on the image.
4. Perform the LVLd -> LVLs -> LVAMd -> LVAMs -> LVAPd -> LVAPs measurements one

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by one and the measurement results displays in the result box.

Measurement Item	Measurement Sub-item	Description	Measurement Method
Left Ventricle/ Mod. Simpson Method	LVLd	LV long axis length at end-diastole	Refer to Section 8.5.1.1 Distance.
	LVLs	LV long axis length at end-systole	Refer to Section 8.5.1.1 Distance.
	LVAMd	LV short axis area at mitral valve at end diastole	Refer to Section 8.5.1.2 Area and Circumference.
	LVAMs	LV short axis area at mitral valve at end systole	
	LVAPd	Area of LV short axis view at the level of papillary muscles at end diastole.	
	LVAPs	Area of LV short axis view at the level of papillary muscles at end systole	

The system automatically calculates the following items according to the measurement results.

Calculation Item	Description	Formula
EDV	End-diastolic Left Ventricular Volume	$EDV(mL) = LVLd(cm) / 9 \times \{4 \times LVAMd(cm^2) + 2 \times LVAPd(cm^2) + \sqrt{LVAMd(cm^2) \times LVAPd(cm^2)}\}$

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Calculation Item	Description	Formula
ESV	End-systolic Left Ventricular Volume	$ESV(mL) = LVLs(cm) / 9 \times \left\{4 \times LVAMs(cm^2) + 2 \times LVAPs(cm^2) + \sqrt{LVAMs(cm^2) \times LVAPs(cm^2)}\right\}$
SV	Stroke Volume	SV = EDV(ml) - ESV(ml)
EF	Ejection Fraction	EF=100%×SV(ml)/EDV(ml)
SI	Stroke Volume Index	SI=SV(ml)/BSA(m^2)
CO	Cardiac Output	CO(l/min)=SV(ml)× HR(bpm)/1000
CI	Cardiac Index	CI=CO(l/min)/BSA(m^2)

■ Left Ventricle Mass Weight

LV mass weight can be calculated by measuring LVPWd, IVSTd and LVIDd.

Steps:

1. Press the **Measure** key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select [LVMW] on the menu by moving the trackball and press **Set** to confirm. A marker displays on the image.
3. Perform the LVPWd -> IVSTd -> LVIDd measurements one by one and the measurement results displays in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Left Ventricle Mass Weight	LVPWd	LV posterior wall thickness at end diastole	Refer to Section 8.5.1.1 Distance.
	LVSTd	Interventricular septal thickness at end diastole	
	LVIDd	LV internal dimension at end diastole	Refer to Section 8.5.1.1 Distance.

The system automatically calculates the following items according to the measurement results.

Calculation Item	Description	Formula
LVMW	Left Ventricle Mass Weight	LVMW(g) = $1.04\times((LVPWd(cm)+IVSTd(cm)+LVIDd(cm))^3-(LVIDd(cm))^3)-13.6$
LVMWI	Left Ventricle Mass Weight Index	LVMWI = LVMW(g) / BSA（m^2）

Note

You should input the height and weight on the PatientInfo screen before performing the LVMW measurement. Otherwise, LVMWI cannot be calculated.

8.6.4.2 Cardiac Measurement in M Mode

Steps:

1. Press the **Measure** key in the real time or frozen M mode, and the measurement menu displays on the top left of the screen.
2. Select [RV] on the menu by moving the trackball and press [Set] to confirm.
3. Select [RVDd] on the pop-up menu and a marker displays on the image.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
RV	RVDd	Right ventricular dimension at end diastole	Refer to Section 8.5.2.1 Distance.
	RVDs	Right ventricular dimension at end systole	
	RVAWd	right ventricular anterior wall at end diastole	
	RVAWs	right ventricular anterior wall at end systole	
	RVPEP	Right ventricular Pre-ejection period	Refer to Section 8.5.2.2 time.
	RVET	Right ventricular Ejection time	
	RVOT Diam	right ventricular outflow tract Diam	Refer to Section 8.5.2.1 Distance.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
LV	LVIDd/LVIDs (Cube)	Left Ventricle internal dimension at end diastole/at end systole	Refer to Section 8.5.2.1 Distance.
	LVIDd/LVIDs (Teichholz)	Left Ventricle internal dimension at end diastole/at end systole	
	LVPWd	Left Ventricular Posterior Wall at end diastole	
	LVPWs	Left Ventricular Posterior Wall at end systole	Refer to Section 8.5.2.1 Distance.
	LVPEP	Left ventricular Pre-ejection period	Refer to Section 8.5.2.2 time.
	LVET	Left ventricular Ejection time	
	LVOT Diam	Left ventricular outflow tract diameter	Refer to Section 8.5.2.1 Distance.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Ao	Ao Diam	Aortic root diameter	Refer to Section 8.5.2.1 Distance.
	Ao Arch Diam	Aortic arch diameter	
	Ao Asc Diam	Ascending aorta diameter	
	Ao Desc Diam	Descending aorta diameter	
	Ao Isthmus	Aortic isthmus	
	Ao st junct	Aortic st juncture	
	Ao Sinus Diam	Inner diameter of aortic sinus	
	ACS	Maximum open scope of aortic valve	
	AVSV	Aortic Valve Stroke Volume	
PA	LPA Diam	Left pulmonary artery diameter	Refer to Section 8.5.2.1 Distance.
	RPA Diam	Right pulmonary artery diameter	
	MPA Diam	Main pulmonary artery diameter	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
MV	MV E Amp	Mitral Valve E Amplitude	Refer to Section 8.5.2.1 Distance.
	MV A Amp	Mitral Valve A Amplitude	
	MV E-F Slope	Mitral Valve E-F Slope	Refer to Section 8.5.2.4 slope rate
	MV D-E Slope	Mitral Valve D-E Slope	
	MV DE	Mitral Valve Deceleration Time	Refer to Section 8.5.2.1 Distance.
	MCS	Maximum open mitral valve	
	EPSS	E-point of septal Separation	
	QMV	Mitral Valve flow	
LA Diam	/	Left atrial diameter	Refer to Section 8.5.2.1 Distance.
IVSd	/	Inter ventricular septal thickness diastole	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
IVSs	/	Inter ventricular septal thickness systole	Refer to Section 8.5.2.1 Distance.
Ped	/	Diastole Pericardial effusion	
Pes	/	Systolic pericardial effusion	
HR	/	Heart rate	Refer to Section 8.5.2.3. heart rate

Note

You should input the height, weight and heart rate before performing the LVIDd/LVIDs measurement.Otherwise, CO, CI and SI cannot be calculated. You should measure the ET, otherwise MVCF cannot be calculated.

■ LVIDd/LVIDs(Cube)

This measurement method approximates the LV volume by measuring a cube.

Steps:

1. Press the **Measure** key in the real time or frozen M mode, and the measurement menu displays on the top left of the screen.
2. Select [LV] on the menu by moving the trackball and press **Set** to confirm.
3. Select [LVIDd/LVIDs (Cube)] on the pop-up menu and a marker displays on the image.
4. Perform the LVIDd -> LVIDs measurements one by one and the measurement results displays in the result box.

Measurement Item	Measurement Sub-item	Description	Measurement Method
LVIDd/LVIDs (Cube)	LVIDd	LV internal dimension at end diastole	Refer to Section 8.5.2.1 Distance.
	LVIDs	LV internal dimension at end systole	

The system automatically calculates the following items according to the measurement results.

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Calculation Item	Description	Formula
EDV	End-diastolic Left Ventricular Volume	EDV (ml)=(7×LVIDd(cm)^3)/(2.4 + LVIDd(cm))
FS	Fractional Shortening	FS = 100%×(LVIDd(cm)- LVIDs(cm))/ LVIDd(cm)
ESV	End-systolic Left Ventricular Volume	ESV(ml)=(7×LVIDs(cm)^3)/(2.4 +LVIDs(cm))
SV	Stroke Volume	SV = EDV(ml) - ESV(ml)
EF	Ejection Fraction	EF=100%×SV(ml)/EDV(ml)
SI	Stroke Volume Index	SI=SV(ml)/BSA(m^2)
CO	Cardiac Output	CO(l/min)=SV(ml)× HR(bpm)/1000
CI	Cardiac Index	CI=CO(l/min)/BSA(m^2)
MVCF	Mean Velocity of Circumferential Fiber Shortening	MVCF(circ/s)=(LVIDd(cm)–LVIDs(cm))/ ((LVIDd(cm)×ET(s))

■ LVIDd/LVIDs(Teichholz)

This measurement method approximates to the LV volume by measuring a cube.

Steps:

1. Press the **Measure** key in the real time or frozen M mode, and the measurement menu displays on the top left of the screen.
2. Select [LV] on the menu by moving the trackball and press **Set** to confirm.
3. Select [LVIDd/LVIDs (Teichholz)] on the pop-up menu and a marker displays on the image.
4. Perform the LVIDd -> LVIDs measurements one by one and the measurement results displays in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
LVIDd/LVIDs (Teichholz)	LVIDd	LV internal dimension at end diastole	Refer to Section 8.5.2.1 Distance.
	LVIDs	LV internal dimension at end systole	

The system automatically calculates the following items according to the measurement results.

Calculation Item	Description	Formula
EDV	End-diastolic Left Ventricular Volume	EDV（ml)=LVIDd(cm)^3)
FS	Fractional Shortening	FS = 100%×(LVIDd(cm)- LVIDs(cm))/ LVIDd(cm)
ESV	End-systolic Left Ventricular Volume	ESV(ml)=LVIDs(cm)^3)
SV	Stroke Volume	SV = EDV(ml) - ESV(ml)
EF	Ejection Fraction	EF=100%×SV(ml)/EDV(ml)
SI	Stroke Volume Index	SI=SV(ml)/BSA(m^2)
CO	Cardiac Output	CO(l/min)=SV(ml)× HR(bpm)/1000
CI	Cardiac Index	CI=CO(l/min)/BSA(m^2)
MVCF	Mean Velocity of Circumferential Fiber Shortening	MVCF(circ/s)=(LVIDd(cm)–LVIDs(cm))/ ((LVIDd(cm)×ET(s))

■ AVSV

Note

ET must be measured before measuring AVSV, otherwise AVSV can not be calculated by the system.

Steps:

1. Press the **Measure** key in the real time or frozen M mode, and the measurement menu

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displays on the top left of the screen.

2. Select [Ao] on the menu by moving the trackball and press **Set** to confirm.
3. Select [AVSV] on the pop-up menu and a marker displays on the image.
4. Perform the measurement according to the following table and the measurement results displays in the result box.

Measurement Item	Description	Measurement Method
MAVO1	Aortic Valve Volume Opened, beginning	Refer to Section 8.5.2.1 Distance.
MAVO2	Aortic Valve Volume Opened, ending	
AA	Aortic Amplitude	

AVSV(ml) =(MAVO1+MAVO2)*ET*50+AA

■ QMV

Steps:

1. Press the **Measure** key in the real time or frozen M mode, and the measurement menu displays on the top left of the screen.
2. Select [MV] on the menu by moving the trackball and press **Set** to confirm.
3. Select [QMV] on the pop-up menu and a marker displays on the image.
4. Perform the measurement according to the following table and the measurement results displays in the result box.

Measurement Item	Description	Measurement Method
DEV	Minimum flow of end diastole	Refer to Section 8.5.2.4Slope Rate.
DCT	Descending Time	Refer to Section 8.5.2.2Time.

QMV(ml) = 4 * DEV(cm/s) * DCT(s)

8.6.4.3 Cardiac Measurment in PW Mode

Steps:

1. Press the **Measure** key in the real time or frozen PW mode, and the measurement menu displays on the top left of the screen.

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2. Select [MV] on the menu by moving the trackball and press [Set] to confirm.
3. Select [MV Vmax] on the pop-up menu and a marker displays on the image.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

Measurement Item	Measurement Sub-item	Description	Measurement Method
MV	MV Vmax	Mitral Valve Maximum velocity	Refer to section 8.5.3.2 speed
	MV E Vel	Mitral Valve E peak Velocity	
	MV A Vel	Mitral Valve A peak Velocity	
	MV E VTI	Mitral Valve E peak velocity time integral	Refer to section 8.5.3.6 spectrum trace
	MV A VTI	Mitral Valve A peak velocity time integral	
	MV VTI	Mitral Valve velocity time integral	
	MV AccT	Mitral Valve Acceleration Time	Refer to section 8.5.3.5 acceleration
	MV Dect	Mitral Valve Deceleration Time	
	MV E Dur	Mitral Valve E wave Duration	Refer to section 8.5.3.3 time
	MV A Dur	Mitral Valve A wave Duration	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
MV	MR Vmax	Mitral regurgitation Maximum velocity	Refer to section 8.5.3.2 speed
	MR VTI	Mitral regurgitation velocity time integral	Refer to section 8.5.3.6 spectrum trace
	MS Vmax	Mitral Stenosis maximum velocity	Refer to section 8.5.3.2 speed
	MVA(PHT)	Mitral Valve Area(PHT)	Refer to section 8.5.3.3 time

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Measurement Item	Measurement Sub-item	Description	Measurement Method
AV	LVOT Vmax	Left ventricular outflow tract Maximum velocity	Refer to section 8.5.3.2 speed
	LVOT VTI	Left ventricular outflow tract velocity time integral	Refer to section 8.5.3.6 spectrum trace
	LVOT AccT	Left ventricular outflow Acceleration Time	Refer to section 8.5.3.3 time
	LVPEP	Left ventricular Pre-ejection period	
	LVET	Left ventricular Ejection time	
	RVOT Vmax	Left Ventricular outflow tract Maximum velocity	Refer to section 8.5.3.2 speed
	RVOT VTI	Left Ventricular outflow tract velocity time integral	Refer to section 8.5.3.6 spectrum trace
	RVET	Right ventricular Ejection time	Refer to section 8.5.3.3 time
	RVPEP	Right ventricular Pre-ejection period	Refer to section 8.5.3.3 time
	VSD Vmax	Ventriaular septal defect Maximum velocity	Refer to section 8.5.3.2 speed
	ASD Vmax	Atrial septal defect Maximum velocity	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
TV	TV Vmax	Tricuspid Valve Maximum velocity	Refer to section 8.5.3.2 speed
	TV E Vel	Tricuspid Valve E peak Velocity	
	TV A Vel	Tricuspid Valve A peak Velocity	
	TV VTI	Tricuspid Valve velocity time integral	Refer to section 8.5.3.6 spectrum trace
	TV AccT	Tricuspid Valve Acceleration Time	Refer to section 8.5.3.5 acceleration
	TV DecT	Tricuspid Valve Deceleration Time	
	TV A Dur	Tricuspid Valve A peak Duration	Refer to section 8.5.3.3 time
	TR Vmax	Tricuspid regurgitation Maximum velocity	Refer to section 8.5.3.2 speed
	TR VTI	Tricuspid regurgitation velocity time integral	Refer to section 8.5.3.6 spectrum trace

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Measurement Item	Measurement Sub-item	Description	Measurement Method
PA	PV Vmax	Pulmonary valve Maximum velocity	Refer to section 8.5.3.2 speed
	PV VTI	Pulmonary valve velocity time integral	Refer to section 8.5.3.6 spectrum trace
	PV AccT	Pulmonary valve Acceleration Time	Refer to section 8.5.3.5 acceleration
	MPA Vmax	Main pulmonary artery Maximum velocity	Refer to section 8.5.3.2 speed
	RPA Vmax	Right pulmonary artery Maximum velocity	
	LPA Vmax	Left pulmonary artery Maximum velocity	
	PR Vmax	Pulmonary regurgitation Maximum velocity	
	PR VTI	Pulmonary regurgitation velocity time integral	Refer to section 8.5.3.6 spectrum trace
	PR PHT	Pulmonary regurgitation pressure half time	Time of halving pressure
	PR Ved	Pulmonary regurgitation velocity end diastolic	Refer to section 8.5.3.2 speed

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Vein	PVein S Vel	Pulmonary Vein S peak Velocity	Refer to section 8.5.3.2 speed
	PVein D Vel	Pulmonary Vein D peak Velocity	
	PVein A Vel	Pulmonary Vein A peak Velocity	
	PVein A Dur	Pulmonary Vein A peak Duration	Refer to section 8.5.3.3 time
	PVein S VTI	Pulmonary Vein S peak velocity time integral	Refer to section 8.5.3.6 spectrum trace
	PVein D VTI	Pulmonary Vein D peak velocity time integral	
	PVein DecT	Pulmonary Vein Deceleration Time	Refer to section 8.5.3.3 time
	IVC Vel(Insp)	Inferior vena cava maximum velocity (inspiratory)	Refer to section 8.5.3.2 speed
	IVC Vel(Expir)	Inferior vena cava maximum velocity (Expir)	
	SVC Vel(Insp)	Superior vena cava maximum velocity (inspiratory)	
	SVC Vel(Expir)	Superior vena cava maximum velocity (Expir)	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Ao	AR Vmax	Aortic regurgitation Maximum velocity	Refer to section 8.5.3.2 speed
	AR VTI	Aortic regurgitation velocity time integral	Refer to section 8.5.3.6 spectrum trace
	AR DecT	Aortic regurgitation Deceleration Time	Refer to section 8.5.3.5 acceleration
	AR PHT	Aortic regurgitation pressure half time	Time of halving pressure
	AR Ved	Aortic regurgitation velocity end diastolic	Refer to section 8.5.3.2 speed
	AAo Vmax	Aorta ascendens Maximum velocity	
	DAo Vmax	Descending aorta Maximum velocity	
	AV Vmax	Aortic valve Maximum velocity	
	AV VTI	Aortic valve velocity time integral	Refer to section 8.5.3.6 spectrum trace
	AV AccT	Aortic valve Acceleration Time	Refer to section 8.5.3.3 time
	AV DecT	Aortic valve Deceleration Time	
PDA Vel(d)	/	Patent ductus arteriosus Velocity at end diastole	Refer to section 8.5.3.2 speed

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Measurement Item	Measurement Sub-item	Description	Measurement Method
PDA Vel(s)	/	Patent ductus arteriosus Velocity at end systole	Refer to section 8.5.3.2 speed
Coarc Pre-Duct	/	Aorta Proximal Coarctation	Refer to section 8.5.3.2 speed
Coarc post-Duct	/	Aorta Distal Coarctation	Refer to section 8.5.3.2 speed
HR	/	Heart rate	Refer to section 8.5.3.4 heart rate
IVRT	/	Isovolumic relaxation time	Refer to section 8.5.3.3 time
IVCT	/	Isovolumic contraction time	Refer to section 8.5.3.3 time
LV TEI	MV C_O dur	Time interval between the close and open of mitral valve	Refer to section 8.5.3.3 time
	LVET	Left ventricular Ejection time	Refer to section 8.5.3.3 time
RV TEI	TV C_O dur	Time interval between the close and open of tricuspid valve	Refer to section 8.5.3.3 time
	RVET	Right ventricular Ejection time	Refer to section 8.5.3.3 time

■ Velocity measurement item

In PW mode after measuring velocity, the system will automatically calculate the corresponded PG value with following formula and then displayed the results.

$$PG(mmHg)=4\times(V(cm/s))^{2}\times10^{-4}$$

■ Velocity time integration measure item

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In heart PW mode apply velocity time of integration, after measuring velocity by tracing method, the system automatically calculates the corresponded PGmax, PGmean & VTI. Values will display in result box.

$$\mathrm{PGmax(mmHg)} = 4 \times (Vmax(\mathrm{cm/s}))^2 \times 10^{-4}$$

$$\mathrm{PGmean(mmHg)} = \frac{\sum_{n=1}^{N} 4 \times (\mathrm{V(n)(cm/s)})^2 \times 10^{-4}}{N}$$

$$\mathrm{VTI(cm)} = \sum_{n=1}^{N} (V(n)(\mathrm{cm/s})) \times (t(n)(s))$$

Herein, N stands for data points which are included in trace profile; V stands for velocity value（cm/s）of each data point.

■ MVA（PHT）

MVA（PHT）is calculated by half pressure and time method. After measuring half pressure and time, the system will automatically calculate MVA（PHT）value and display the results.

$$\mathrm{MVA(PHT)(cm)^2}=220/\mathrm{MV\ PHT(ms)}$$

MV PHT is half pressure time. It means the time it takes for pressure to decrease to half.

■ Ratio

Measure MV E Vel and MV A Vel、TV E Vel and TV A Vel、PVein S Vel and PVein D Vel，the system will automatically calculate above values and display them in the result box.

■ LV TEI

LV TEI reflects the function of ventricle contraction and relaxation. After measuring values of MV C_O dur and LVET the system can automatically calculate LV TEI value by the following fomula and show results in the result box.

$$\mathrm{LV\ TEI}=(\mathrm{MV\ C_O\ dur(ms)}-\mathrm{LVET(ms)})/\mathrm{LVET(ms)}$$

■ RV TEI

Measurement of RV TEI is similar to that of LV TEI. By measuring values of TV C_O dur and LVET the system can automatically calculate RV TEI value by the following fomula and show results in the result box.

$$\mathrm{RV\ TEI}=(\mathrm{TV\ C_O\ dur(ms)}-\mathrm{RVET(ms)})/\mathrm{RVET(ms)}$$

8.6.5 Vascular Measurements

Vascular measurements and calculations should be performed the 2D (B/Color/PDI) mode or in the PW mode.

8.6.5.1 Vascular measurement in 2D mode

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Steps:

1. Press the **Measure** key in the real time or frozen 2D (B/Color/PDI) mode, and the measurement menu displays on the top left of the screen.
2. Select a measurement item, such as [Normal D] on the menu by moving the trackball and press **Set** to confirm.
3. A marker displays on the image. Perform the measurement according to the following table and the measurement results displays in the result box.

Measurement Item	Description	Measurement Method
Normal(D)	Normal diameter	Refer to Section 8.5.2.1 Distance.
Resid(D)	Strait diameter	
Normal(A)	Normal area	Refer to Section 8.5.1.2 Area and Circumference.
Resid(A)	Strait area	

Take measurement for above two items by moving trace ball to the right side of area measurement on menu, press set key, you can switch the methods of ellipse and trace method.

■ Straitness ratio

After measuring normal & strait diameter or normal area & strait area, the system will automatically calculate Resid(D)/ Normal(D) (Straitness ratio of inner diameter) or Resid(A)/ Normal(A)(Straitness ratio of area) by following formula and display the results.

$$\text{Resid(D)/ Normal(D)} = 1 - (\text{Resid(D)/ Normal(D)})\%$$

$$\text{Resid(A)/ Normal(A)} = 1 - (\text{Resid(A)/ Normal(A)})\%$$

8.6.5.2 Vascular measurement in PW mode

Steps:

1. Press the **Measure** key in the real time or frozen PW mode, and the measurement menu displays on the top left of the screen.
2. Select [Carotid Artery] on the menu by moving the trackball and press [Set] to confirm.
3. Select [ICA] on the pop-up menu and a marker displays on the image.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Carotid Artery	CCA	Common Carotid Artery	Refer to section 8.5.3.6 spectrum trace
	ICA	Internal Carotid Artery	
	ECA	External Carotid Artery	
Iliac Artery	Com lliac A	Common iliac artery	Refer to section 8.5.3.6 spectrum trace
	IIA	Internal iliac artery	
	Ext lliac A	External iliac artery	
FA	CFA	Common femoral artery	Refer to section 8.5.3.6 spectrum trace
	PFA	Femoral profound artery	
	SFA	Superficial femoral artery	
Tib A	P.Tib A	Posterior tibial artery	Refer to section 8.5.3.6 spectrum trace
	A.Tib A	Anterior tibial artery	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
CA	ACA	Arteria cerebri anterior	Refer to section 8.5.3.6 spectrum trace
	MCA	Middle cerebral artery	
	PCA	Posterior cerebral artery	
ComA	PComA	Posterior communicating artery	Refer to section 8.5.3.6 spectrum trace
	AComA	Anterior communicating artery	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Artery	SCA	Subclavian Artery	Refer to section 8.5.3.6 spectrum trace
	AXA	Axillary Artery	
	Brachial A	Brachial Artery	
	UA	Ulnar Artery	
	RA	Radial Artery	
	Pop A	Popliteal artery	
	TP Trunk A	Tibial artery trunk	
	PA	Arteria peronea	
	Dors.Ped A	Dorsalis pedis artery	
	VA	Vertebral Artery	
	BA	BasilarArtery	
Bulb	/	Bulb	Refer to section 8.5.3.6 spectrum trace

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Measurement Item	Measurement Sub-item	Description	Measurement Method
IV	C.lliac V	Common iliac vein	Refer to section 8.5.3.2 velocity
	IlV	Internal iliac vein	
	Ex.lliac V	External iliac vein	
TV	P.Tib V	Posterior tibial vein	Refer to section 8.5.3.2 velocity
	A.Tib V	Anterior tibial vein	
	TP Trunk V	Tibial vein trunk	
Vein	Ceph V	Cephalic vein	Refer to section 8.5.3.2 velocity
	SCV	Subclavian Vein	
	AXV	Axillary Vein	
	Basilic V	Basilic vein	
	UV	Ulnar Vein	
	RV	Radial Vein	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Vein	FV	Femoral vein	Refer to section 8.5.3.2 velocity
	CFV	Common femoral veins	
	SFV	Superficial femoral vein	
	PFV	Deep femoral vein	
	PV	Philip iv	
	Sural V	Gastrocnemius vein	
	SV	Great saphenous vein	
	Pop V	Popliteal vein	
	Soleal V	Vein of the flounder	
	Ba V	Basal vein	
	BV	Brachial Vein	
	SSV	Small saphenous vein	
Volume Flow	Vas Area	/	Refer to section 8.5.1.1distance
	TAMEAN	/	Refer to section 8.5.3.6 spectrum trace
	TAMAX	/	

■ Volume flow

Vascular area is calculated based on the diameter which the system use for calculation automatically

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according to the following equation.

$$\text{Vas area(cm)}^2 = \pi(D)^2/4, \text{ whereby D is vascular diameter. unit is cm.}$$

Volume flow: after measuring Vas area, TAMEAN or TAMAX, System automatically do calculation and show results in result box.

$$\text{TAMEAN (ml/min)} = \text{vascular area (cm)}^2 \times \text{TAMEAN(cm/s)} \times 60$$

$$\text{TAMAX(ml/min)} = \text{vascular area (cm)}^2 \times \text{TAMEAN(cm/s)} \times 60$$

8.6.6 Small Parts Measurements

Small parts measurements and calculations should be performed in the 2D (B/Color/PDI) mode and PW mode.

8.6.6.1 Small parts measurements in 2D mode

Steps:

1. Press the Measure key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select a measurement item, such as [Lt Thyroid], on the menu by moving the trackball and press Set to confirm.
3. In the sub-menu that pops out use the track ball to select wanted measurement sub-item, such as [Lt Thyroid L], and move the track ball to press Set to confirm.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

Measurement Item	Measurement Sub-item	Description	Measurement Method
Lt Thyroid	Lt Thyroid L	Left Thyroid Length	Refer to section 8.5.1.1 distance
	Lt Thyroid W	Left Thyroid Width	
	Lt Thyroid D	Left Thyroid Depth	
Rt Thyroid	Rt Thyroid L	Right Thyroid Length	Refer to section 8.5.1.1 distance
	Rt Thyroid W	Right Thyroid Width	
	Rt Thyroid D	Right Thyroid Depth	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Isthmus D	/	Isthmus Distance	Refer to section 8.5.1.1 distance
Testiscle	L Testis L	Left Testiscle Length	Refer to section 8.5.1.1 distance
	L Testis W	Left Testiscle Width	
	L Testis D	Left Testiscle Depth	
	R Testis L	Right Testiscle Length	
	R Testis W	Right Testiscle Width	
	R Testis D	Right Testiscle Depth	
Mass1	Mass1 D1	Mass1 Distance1	Refer to section 8.5.1.1 distance
	Mass1 D2	Mass1 Distance2	
	Mass1 D3	Mass1 Distance3	
Mass2	Mass2 D1	Mass2 Distance1	Refer to section 8.5.1.1 distance
	Mass2 D2	Mass2 Distance2	
	Mass2 D3	Mass2 Distance3	
Mass2	Mass3 D1	Mass3 Distance1	Refer to section 8.5.1.1 distance
	Mass3 D2	Mass3 Distance2	
	Mass3 D3	Mass3 Distance3	

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■ Thyroid

Measure distance of L/D/W of left or right thyroid and the system automatically calculates the volume of thyroid by following formula and display the results.

$$\text{Thyroid } V=0.479 \times \text{Length} \times \text{Width} \times \text{Depth}$$

■ Testis

Measure the length,width & depth of testis and system automatically calculates the volume of testis and displays the result.

$$\text{Testis } V=0.65 \times \text{length} \times \text{width} \times \text{depth}$$

8.6.6.2 Small parts measurement in PW mode

Steps:

1. Press the **Measure** key in the real time or frozen PW mode, and the measurement menu displays on the top left of the screen.
2. Select a measurement item, such as [LTh] on the menu by moving the trackball and press Set to confirm.Switching between auto and manual tracing is available.
3. Follow the methods in the following table to perform measurement, and the measurement results display in the result box.

Measurement Item	Description	Measurement Method
STA	Serve Thyroid Artery	Refer to section 8.5.3.6 spectrum trace
ITA	Inferior Thyroid Artery	

8.6.7 Urology Measurements

Urology measurements and calculations should be performed in the 2D (B/Color/PDI) mode. This is mainly for the measurement of bladder & prostate.

Steps:

1. Press the Measure key in the real time or frozen B/Color/PDI mode, and the measurement menu displays on the top left of the screen.
2. Select a measurement item, such as [Bladder], on the menu by moving the trackball and press Set to confirm.
3. In the sub-menu that pops out use the track ball to select wanted measurement sub-item, such as [Pre_BL L], and move the track ball to press Set to confirm.
4. Follow the methods in the following table to perform the measurement, and the measurement results display in the result box.

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Bladder	Pre_BL L	Preceding Bladder Length	Refer to section 8.5.1.1 distance
	Pre_BL W	Preceding Bladder Width	
	Pre_BL D	Preceding Bladder Depth	
	Post_BL L	posterity Bladder Length	
	Post_BL W	posterity Bladder Width	
	Post_BL D	posterity Bladder Depth	
Prostate	Prostate L	Prostate Length	Refer to section 8.5.1.1 distance
	Prostate W	Prostate Width	
	Prostate D	Prostate Depth	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
kidney	LK L	Left kidney Length	Refer to section 8.5.1.1 distance
	LK W	Left kidney Width	
	LK D	Left kidney Depth	
	L Renal Cortex	Left Renal Cortex	
	RK L	Right kidney Length	
	RK W	Right kidney Width	
	RK D	Right kidney Depth	
	R Renal Cortex	Right Renal Cortex	
Adrenal	L Adrenal L	Left Adrenal Length	Refer to section 8.5.1.1 distance
	L Adrenal W	Left Adrenal Width	
	L Adrenal D	Left Adrenal Depth	
	R Adrenal L	Right Adrenal Length	
	R Adrenal W	Right Adrenal Width	
	R Adrenal D	Right Adrenal Depth	

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Measurement Item	Measurement Sub-item	Description	Measurement Method
Seminal Vesicle	seminal vesicle L	Spermatophore Length	Refer to section 8.5.1.1 distance
	seminal vesicle W	Spermatophore Width	
	seminal vesicle D	Spermatophore Depth	
Testiscle	L Testis L	Left Testiscle Length	Refer to section 8.5.1.1 distance
	L Testis W	Left Testiscle Width	
	L Testis D	Left Testiscle Depth	
	R Testis L	Right Testiscle Length	
	R Testis W	Right Testiscle Width	
	R Testis D	Right Testiscle Depth	
Ureter Diam	/	/	

■ Bladder

Perform three distance measurements like the length, width and depth of the bladder. The system automatically calculates the bladder volume, urinary output and residual urine according to the following formula, respectively. The measurement results displays in the result box.

$$BL\ V=0.523 \times length \times width \times depth$$

$$Mictur.Vol=Pre\ BL\ V-Post_BL\ V$$

$$Residual\ Urine=0.7 \times Post_BL\ L \times Post_BL\ W \times Post_BL\ D$$

■ Prostate Glands measurement

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Note

You should input the SPSA before performing the prostate measurement. Otherwise, PSAD cannot be calculated.

Perform three distance measurements like the length, width and depth of the prostate gland. The system automatically calculates the volume and PSAD according to the following formula and the measurement results displays in the result box.

$$\text{Prostate V}=0.523 \times \text{Prostate L} \times \text{Prostate W} \times \text{Prostate D}$$

$$\text{PPSA} = 0.12 \times \text{Prostate V}$$

$$\text{PSAD} = \text{SPSA}/\text{Prostate V}$$

8.6.8 Pediatric Measurement

Pediatric measurements and calculations should be performed in the 2D (B/Color/PDI) mode. The measurement includes hip measurement.

Note

You should input the age before performing the hip measurement. Otherwise, dislocation type cannot be evaluated.

Steps:

1. Press the **Measure** key in the real time or frozen 2D (B/Color/PDI) mode, and the measurement menu displays on the top left of the screen.
2. Select [HipJoint] on the menu by moving the trackball and press **Set** to confirm. A line displays on the screen.
3. Position the line by using the trackball.

   You can also rotate the multifunctional knob to adjust the angle of the line.
4. Press **Set** to fix the first line of base line (BL). A second line displays.
5. Repeat step 3-4 to draw the ARL and IL. The system automatically calculates the angle α between BL and ARL and the angle β between BL and IL.

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Chapter 9 Report

The report will be generated after you perform the specific measurements but not the general measurements. It contains patient information, measurement results and doctor's diagnosis results.

Besides, the obstetric report also includes fetal evaluation and fetal growth curves. For details, refer to Section 9.3 Obstetric Report.

9.1 Reviewing the Report

Press the **Report** key on the control panel to enter the Report interface. You can view the patient information and measurements results. If the report has more than one page, you can click [Next] or [Prev] to turn to the next or previous page. Press the [Export PDF], the report can be saved as PDF format in USB flash disk directly. Click [Clear] to delete all data other than patient information in the report.

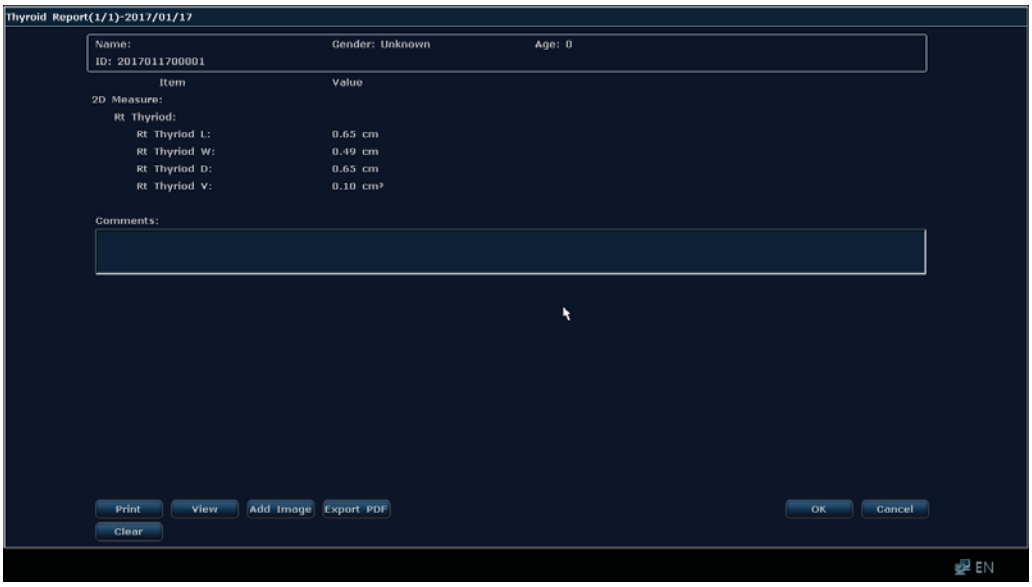

Figure 9-1 Report interface

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9.2 Editing the Report

1. After entering the Report interface, you can input the diagnosis information in the textbox beside [Comments] by moving the trackball and press the **Set** key to confirm.
2. If the clinical images are saved in current exam,it is available to add them into report. Click [Add Image] to enter into Add image interface, P.S. only single frame image is availabe to be added, multi- frame cine is unavailabe.

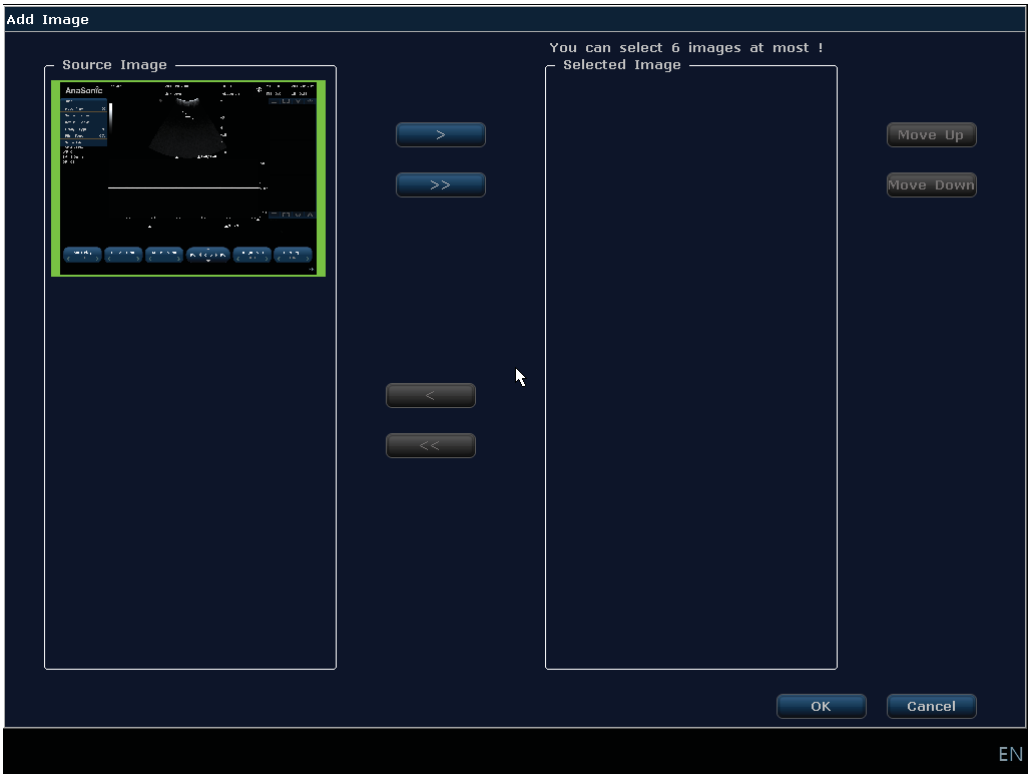

Figure 9-2 Add Image interface

Click image in the [Source Image] list, click [>] , this image will be added to [Selected Image] list.

- Click [》] to add all the images (6 images are available at Maximum)
- Select image in [Selected Image] list, click [<] to remove image.
- Click [《] to remove all the images.
- Click[Up] or[Down] to adjust the display sequence.

9.3 Obstetric Reports

9.3.1 Fetal Growth Curves

Fetal growth curves are used to assess the fetal growth compared to a normal growth curve. You can click [FetalGrowthCurve] in the Report screen to enter it.

Steps are as follows.

1. The measurement item and measurement method are displayed above the diagram. If you want

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to select measurement item and measurement formula, click ▼ at the right to select it and the relevant fetal growth curves display on the screen, as shown in Figure 9-3.

Figure 9-3 Fetal Growth Curves

- As shown in the above figure, x-axis indicates the gestation age, y-axis indicates measurement results.
- The intermediate curve indicates the normal curve for the fetus growth, and the range between two curves indicates the normal growth range for the fetus growth.

2. Click [1/4 Graph] to check the comparison of four fetal growth curves.
3. As the above figure shown, the intersection of the dotted line indicates the calculated gestation age after you enter the date in the LMP textbox of the Patient Information screen. The doctor can adjust the fetal growth condition according to intersection of the dotted line.

9.3.2 Fetal Evaluation

Press [Fetus Score] in the report screen, as show in Figure 9-4. The doctor can adjust the fetas growth condition according to the fetas image feedback and the fetus score.

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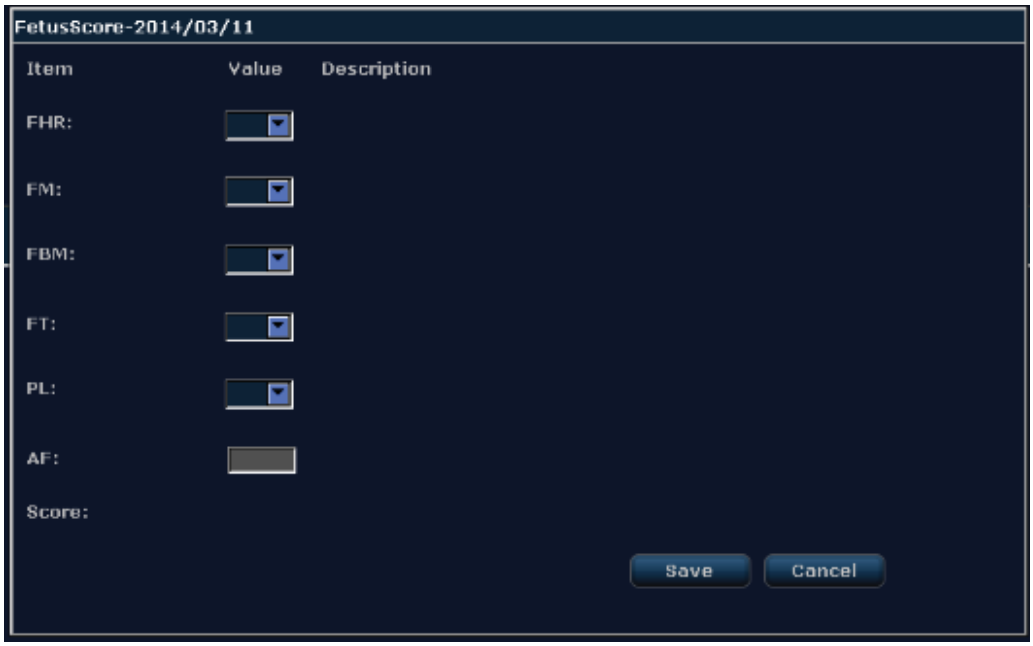

Figure 9-4 Fetal Score Screen

Click ▼ at the right of each item by using the trackball to score it, and then the descriptions display automatically. You can evaluate the fetal from the aspects of fetal heart rate, fetal movement, fetal breath movement, tension of the muscle, placenta level, and amniotic fluid. The total score is 12.

Note

You should perform the amniotic fluid measurement before evaluating the fetal evaluation.

9.4 Printing the Report

Ensure that the printer is connected well with the system before printing the report. For detailed description, refer to Section 3.6.3 Connecting the Graphic Printer.

Press the Report key on the control panel to enter the report interface, click [Print] to print the report, or click [Print Preview] to enter the print preview interface, click [Print] to print the report, this interface can also adjust the preview zoom of image.

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Chapter 10 Image Management & Data Management

The users can save patient images and vedios after scanning. The saved patient data can be backup to the USB storage devices for future use.

10.1 Saving the Image/Cine

Note

The data is saved to the built-in disk of the system by default. You can also export the data to the USB storage devices or DICOM server. For details, refer to Section 10.5 Saving Data.

Press the **Save** key on the control panel in the frozen mode to save the current screen as an image.

Press the **Cursor** or **Cine** key on the control panel in the frozen mode to activate the marker, move the marker to [Save Film] by using the trackball, and press the **Set** key to save the cine.

10.2 Reviewing the Image/Cine

- Current patient

  You can view the saved images or cines in the Review screen.

  Steps are as follows.

  1. Press the **Review** key on the control panel to enter the Review screen, as shown in Figure 10-1. The thumbnail images display in the [File List].

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Figure 10-1 Review Interface

2. Select the image or cine by using the trackball and double click the **Set** key or click [Open] at the right to view the image or cine.
3. Press the **Freeze** key to return to the main screen.

■ Saved patient

1. Press the **Station** key on the control panel to enter the Station screen.

Figure 10-2 Working Station

2. Select one patient in the [Exam List] by using the trackball and press the **Set** key, the thumbnail images display in the [File List]. Click [Review] to enter the Review screen and

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view the saved patient images or cines.

3. Select the desired image or cine by using the trackball, and double click the **Set** key or click [Open] at the right to view the image or cine.
4. Press the **Freeze** key to return to the main screen.

10.3 Deleting the Image/Cine

You can delete the saved image or cines in the Review screen.

1. Press the **Review** key on the control panel to enter the Review screen, the thumbnail images display in the [File List].
2. Select the desired image/cine and click [Delete] to delete it.

It also can delete the saved image or vedios directly on the main interface thumbnail area, choosing the images or vedios, then press [ ], the images or vedios can be deleted.

10.4 Printing the Image

Ensure that the printer is connecting well with the system before printing the report. For detailed connection description, refer to Section 3.6.2 Connecting the Video Printer.

Press the print Key on the printer or control panel can print out the image or report directly.

Note

Ensure that the printer is connected with the system before printing the image.

10.5 Saving Data

You can save the patient data, images or cines to the hard disk and send them to the USB storage devices and DICOM server.

10.5.1 Saving to USB Storage Devices

Steps are as follows.

Plug the USB flash into the USB port, there is a USB icon showed on the right bottom of screen, it means the USB flash has connected with the units successfully.

Save the images or cines as described in Section 10.1 Saving the Image/Cine.

Press **Review** to enter the Review screen and select the images/cines.

Or click [Select All] or enable [Mult Sel] at the right to select the images/cines.

Click ▼ beside the drop-down menu under the [Send to] to select [USB storage device] and click [Send to] to save the images/cines in the USB storage device.

Choose the images or vedios need to be backuped on the main interface thumbnail area, then press the [ ], images or vedios can be backuped copy in USB flash disk.

10.5.2 Saving to DICOM Server

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Note

Ensure that the DICOM server is connected with the system before sending the images/cines.

- Current patient images/cines

  Steps are as follows.

  1. Press **Review** to enter the Review screen and select the images/cines.

     Or, click [Select All] or enable [Mult Sel] at the right to select the images/cines.

  2. Click ▼ beside the drop-down menu under the [Send to] to select [DICOM] and click [Send to] to save the images/cines in the DICOM server.

- All patients data

  Steps are as follows.

  1. Press **Review** to enter the Review screen and click [Workstation] to enter the Workstation interface.
  2. Select patient in the [Exam List] by using the trackball and press the **Set** key to confirm.

     Or, click [Select All] or enable [Mult Sel] at the right to select the images/cines.

  3. Click ▼ beside the drop-down menu under the [Send to] to select [DICOM] and click [Send to] to save the images/cines in the DICOM server.

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Chapter 11 Probes and Biopsy

The user should be thoroughly familiar with the operations of the probe and the biopsy bracket before using them. The probe and biopsy bracket need to be cleaned, sterilized, maintained periodically to ensure the good performance and safety.

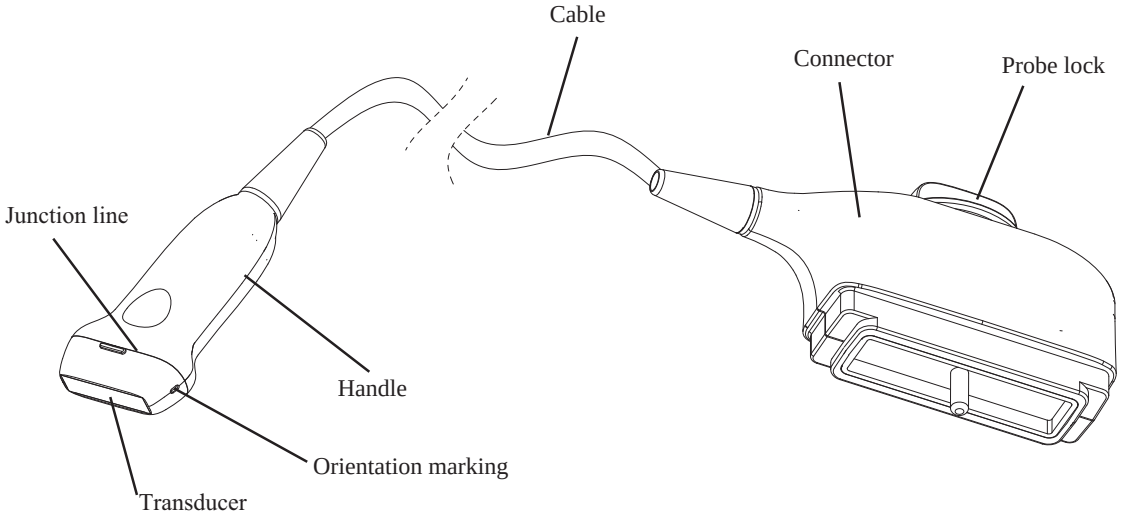
11.1 Probes

The probes that are applicable for this ultrasound system are all electronic scanning probes. It emits the pulsed wave into the patient body and receives the echo from the body to generate high resolution images.

In normal use or performance evaluation, only parts between acoustic window and integration of a shell and cable bushing can be under water or other liquid.

11.1.1 Appearance Overview

Body surface probes and intracavitary probes are available for this ultrasound system. The following picture takes body surface probes as an example to introduce the structure and composition of the probe.



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11.1.2 Using the Probe

Warning

- Do not use the broken or expired transducer sheath, especially for endo-vagional probe to prevent infection during examination.
- Use the probes provided by the manufacturer. Othewise, the system and the probe may be matched, and there is a danger of fire in worst case.
- If the transducer surface is scratched, it's better not to use the probe and try to repair it by manufacturer, or the user can use the scratched probe carefully to avoid some danger issue like electric shock, etc.
- Before using the probe, wait for 1 or 2 minutes and confirm that its surface temperature is not too high. Otherwise, you should stop using it immediately, especially the intracavitary probes.
- It has been tested maximum surface temperature can reach 42.8 degrees.

Caution

- Please use ultrasound coupling gel that comply with local regulations. Do not use mineral oil, oily coupling gel, any kind of lotions, gel or other unapproved material instead of the coupling gel provided or recommended by the manufacturer. Otherwise, the probe may be damaged.

■ To inspect the probe

Steps are as follows.

1. Inspect all parts of the probe carefully before using it.
2. Check that the surface of the transducer is not bulge, scratch or damaged.
3. Check that the front end, handle of the probe, and the cable is not scratched, damaged or cracked.
4. Check that the connector is not cracked and damaged and the pins inside the connector is not bent or damaged.

■ To use the probe

Steps are as follows.

1. Connect the probe, see Section “3.5 Connecting the Probe”.
2. Put on the protective gloves.
3. Put on the probe sheath.(The intracavitary probes must use with it.)
   a. Unpack the probe sheath, and take it out.
   b. Apply the appropriate coupling gel on the inside of the probe sheath.
   c. Hold the probe sheath and cover the probe with it.
   d. Pull the probe sheath tightly over the face of the probe to remove wrinkles.
   e. Secure the sheath to the probe with the adhesive tapes or elastic bands provided.

Take off the probe sheath when the exam is ended, and dispose it in accordance with the local

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laws and regulations.

4. Make sure the direction of the probe is ok.
5. Perform a scan.

11.1.3 Cleaning the Probe

Warning

- To avoid the electric shock, disconnect the probe from the ultrasound system before the cleaning.
- To avoid the potential disease transmission, you should wear medical sterile gloves and protective goggle during the cleaning.

Caution

- To avoid probe damages, do not bump the probe on hard surfaces during the cleaning.

You should clean the probe after each use. Steps are as follows.

1. Disconnect the probe from the system, take off the probe sheath and biopsy bracket.
2. Clean the probe with neutral soap or warm clean water.
3. Clean the surface of the probe with soft cotton ball or cloth. If the residues solidify on the surface, you can clean them with a soft dampened brush (such as toothbrush).
4. Clean the probe with enough drinking water.
5. Air drying the probe or clean it by soft cloth.

After cleaning the probe, functions of probe will not be affected, check approach is: connect the probe to main unit and switch on, check image, the image is ok.

11.1.4 Disinfecting the Probe

Caution

- Use the liquid disinfectant that meets local laws and regulations.
- If you use the recommended disinfectant, ensure its level and the probe soaking period meets the requirements. Otherwise, the probe may be damaged and your warranty might be void. If special application or requirements apply, ensure the level of the make-up disinfectant and the probe soaking period are suitable for the intended clinical application.
- Do not use the expired disinfectant.
- Do not disinfect the probe through autoclaving or contact with ethylene oxide.
- Do not use thermal disinfection. Temperatures higher than 66°C or 150°F will damage the probe.
- Do not air the probe with the disinfectant sticking on it.

11.1.4.1 Disinfecting the Body Surface Probe

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You should disinfect the body surface probe after each use.

Steps are as follows.

1. Clean the probe, see Section 11.1.3 Cleaning the Probe.
2. Perform the intermediate level disinfection to the surface of the probe in accordance with the recommended method in Table 11-1.

Note

- If you do not use the recommended disinfectant, make up it as to the manufacturer's instructions.
- Do not immerse the probe over the junction line.

3. Take out the probe from the disinfectant when the recommended soak period expires.
4. Rinse the probe with the fresh running water, and then dry it with a soft dry cloth.

Table 11-1 Recommended Method for Medium-level Disinfection

Disinfectant	Manufacturer	Active Ingredient	Level for Active Ingredient	Contact Type	Contact Period
Cidex	J&J	Glutaraldehyde	2.4%	Wipe/ Soak	<20min
ResertXLHLD	STERIS	Hydrogen peroxide	2.0%	Wipe/ Soak	<8min
T-spray	Pharm. Inc.	Quaternary ammonium salts	2.0-2.2%	Spray/ Wipe	<10min
T-spray	Pharm. Inc.	Quaternary ammonium salts	/	Spray/ Wipe	<10min

11.1.4.2 Disinfecting the Intracavitary Probe

You should disinfect the intracavitary probe after each use.

Steps are as follows.

1. Clean the probe, see Section 11.1.3 Cleaning the Probe.
2. Perform the high level disinfection to the surface reference to the table 11-2.

Note

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- If you do not use the recommended disinfectant, make up it as to the manufacturer's instructions.
- Do not immerse the probe over the junction line.

3. Take out the probe from the disinfectant when the recommended soak period expires.
4. Rinse the probe with the fresh running water, and then dry it with a soft dry cloth.

Table 11-2 Recommended Method for High-level Disinfection

Disinfectant	Manufacturer	Active Ingredient	Level for Active Ingredient	Contact Type	Contact Period
Cidex	J&J	Glutaraldehyde	2.4%	Soak	45-50min
ResertXLHLD	STERIS	Hydrogen peroxide	2.0%	Soak	<8min
T-spray	Pharm. Inc.	Quaternary ammonium salts	2.0-2.2%	Soak	45-50min

Note

- Disinfectants listed in this manual are recommended because of their chemical compatibility with product materials, not their biological effectiveness. For the biological effectiveness of a disinfectant, refer to the guidelines and recommendations of the disinfectant manufacturer, Association for Practitioners in Infection Control, U.S. Food and Drug Administration, and U.S. Centers for Disease Control.

After disinfecting tehe probe, functions of probe will not be affected, check approach is: connect the probe to main unit and switch on, check image, the image is ok.

11.1.5 Probe Transportation and Maintenance

The probe should be used, stored or transported under the conditions listed in Appendix A Specifications.

■ To transport the probe

To safely transport the probe, please perform the following steps.

1. Ensure that the probe is cleaned and disinfected before placing it in the carrying case.
2. Wrap the case with the plastic material (such as foam package) and place the wrapped case in the carton.
3. To protect the transducer, stick the soft adhesive plaster to the transducer before placing it in the carrying case.

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■ To store the probe

To safely store the probe, please be care of the following precautions.

- If the probe is not used, you should place it in the probe cup on the system or in the package.
- Avoid storing the probe at the extreme temperature or in the direct sunlight.
- Ensure that the probe cup is clean before placing the probe in it.
- Ensure that the probe is dry before storing it.
- Store the probes separately from other units or equipments to avoid some damage or broken issues.

11.2 Biopsy

Warning

- Only the trained physicians or sonographers with professional ultrasound biopsy guide or training can do the biopsy needle guide operation to avoid medical mistake. During the operation, the operator must observe proper needle insertion sequencing with the needle guide in order to avoid undue discomfort and unnecessary risk and injury to the patient.
- The biopsy guidelines that display on the monitor are intended as a reference. It is the operator's responsibility to verify correct positioning of the needle during a biopsy.
- Do not freeze an image when performing a biopsy.
- To avoid hurt to patient accidentally, the operator should be highly concentrated during a biopsy.
- The biopsy needle is disposable.
- To avoid the infection, disinfect the probe and wear it with the probe sheath before performing a biopsy.
- You should verify the biopsy bracket before performing a biopsy.

11.2.1 Preparing a Biopsy

Prepare the following items before the biopsy.

- New and straight biopsy needle
- Sterile container filled with sterilized and degassed water
- Properly assembled biopsy bracket
- Activated on-screen guidelines

11.2.2 Verifying the Biopsy Bracket

Note

Ensure that the biopsy bracket is properly assembled before verifying the biopsy bracket.

Steps are as follows.

1. Enter the real time B mode, and press **Biopsy**.

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2. Place the probe in the sterile container filled with sterilized and degassed water.
3. Insert the biopsy needle into the maximum depth of the water.
4. Verify that the path of the needle displays according to the guidelines shown on the image screen.

11.2.3 Calibrating a Biopsy

Note

Ensure that the biopsy bracket is properly assembled and verified before performing the biopsy.

Steps are as follows.

1. Enter the real time B mode, and press **Biopsy**.
2. Perform a scan and position and biopsy object.
3. Insert the biopsy needle and observe the ultrasound image to confirm the position of the needle.
4. Perform a biopsy and then take out the needle carefully. Remove the probe from the patient body.

11.2.4 Cleaning and Disinfecting the Biopsy Bracket

1. Remove the biopsy bracket from the probe.
2. Brush the biopsy bracket with the brush and water to remove the residues on it.
3. Wipe off the water drops on the biopsy bracket with a lint-free cloth.
4. After each use, perform the high-level disinfection in accordance with Table 11-2. For details, refer to Section 11.1.4 Disinfecting the Probe.

11.2.5 Storing the biopsy bracket

The probe must be stored in the sterile environment after disinfection.

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Chapter 12 Lithotripsy Guide

Lithotripsy line is to guide Lithotripsy devices to position the stone.

Steps are as follows.

1. Define shortcut key for Lithotripsy line, press [Preset] on the control panel, enter into [System Preset], define **F1** key as [Lithotripsy], click [OK] to finish the setup.
2. In the active imaging mode, press **F1** key to enable Lithotripsy guide line, which is displayed in the middle of imaging area, as shown in Figure 10-3.

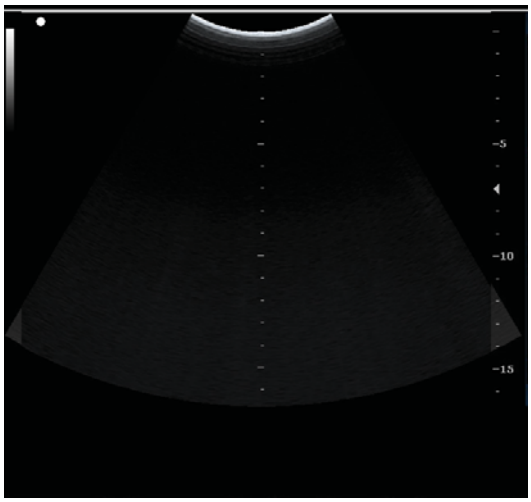

Figure 10-3 Lithotripsy guide line screen

3. Image adjustment、annotation、measurement, etc. are available when Lithotripsy guide line is enabled.
4. Press **F1** again to disable Lithotripsy guide line.

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Chapter 13 System Maintenance

To maintain the performance and reliability of the system, the operator should clean and maintain the system and the accessories periodically.

13.1 Cleaning the System

Warning

- The equipment needs to be maintained periodically at least six month one time to ensure the good performance and function. Besides, the unit must be well grounded properly to follow the safety requirements.
- The equipment needs to be power off and disconnect with the power support to avoid some damage or electronic shock.

Steps are as follows.

1. Clear the display screen, control panel and the unit body part by a clean soft cloth with 75% alcohol.
2. Wipe the solidified objects around the keys on the control panel with the cotton swab and ensure that the objects will not come into the inside of the system.
3. If the blood or contaminated objects adhere to the keys, wipe them with 70% isopropyl alcohol.

After cleaning the machine, functions of the machine will not be affected, check approach is: connect the probe to main unit and switch on, the machine can be booted up and image is ok.

13.2 Replacing the Fuse

The system doesn't include a replaceable fuse.

13.3 System Disposal

If the system, probes, biopsy brackets and other accessories have reached to validity period (The system's validity period is 5 years), you should dispose them in accordance with Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) or the requirements of the local laws.

For detailed information about disposing the electrical and electronic equipment, please consult the manufacture or the local distributor. The manufacturer is not responsible for any damages caused by improper disposal.

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13.4 Service Information

This system can only be maintained by the manufacturer or the professional service engineer authorized by the manufacturer. If you need to repair or adjust the system, please contact us by the following information.

Service Hotline:

Kalamed GmbH - Karl-Benz-Str. 8 - DE-72124 Pliezhausen

Tel. +49 7127 977 6340 - Fax +49 7127 977 6347W

ebsite: www.Kalamed.de

E-mail: info@Kalamed.de

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Chapter 14 Trouble shooting

14.1 Check

1. Check whether power input is in normal range, check whether power cable is connected well and connected to socket.
2. Check whether the probe is connected to main unit in right way.

14.2 Trouble shooting

Trouble shooting :

NO.	Problem	Solution
1	No responce after pressing power on switch	1. Check input power 2. Check power cable and related connectors
2	Interference like strips or snowflake display on screen	1. Check power 2. Check whetehr other electronic instruments are in use 3. Check electric field or magnetic field interference in the surrounding environment 4. Check power socket and probe whether they are connected well
3	Not clean image in near field	Adjust total gain and TGC slide near the bottom right edge
4	Not clean image in far field	Adjust total gain and TGC slide near the bottom right edge
5	Dark image	1. Check probe being used is connected to main unit well 2. Adjust brightness 3. Check whether the TGC slide are at the left side, if yes, please drag them to the right side

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Appendix A Specifications

Complied Standards	EN 60601-1 (IEC 60601-1), Medical electrical equipment Part 1: General requirements for basic safety and essential performance, Class I, BF, continuous operation EN 60601-2-37:2008 (IEC 60601-2-37:2007+A1:2015), Medical Electrical Equipment Part 2-37: Particular Requirements for the Basic Safety and Essential Performance of Ultrasonic Medical Diagnostic and Monitoring Equipment EN 60601-1-2(IEC 60601-1-2: 2014), Class A		
Safety Types	Type of protection against electric shock	Class I Equipment	
	Degree of protection against electric shock	Type-BF applied part	
	Operation mode	Continuous working	
	Installation and operation type	Mobile Equipment	
	Degrees of protection against harmful liquid	System is IPX0 Probe (from the acoustic window to the junction line) is IPX7 Footswitch is IPX4	
	Degree of safety of application	The equipment is not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.	
Environmental Requirement		Operations	Storage and Transportation
	Relative Humidity	25% to 80%, non-condensing	25% to 93%, non-condensing
	Ambient Temperature	5°C to +40°C	-20°C to +55°C
	Atmospheric Pressure	700hPa to 1060hPa	700hPa to 1060hPa
	Max. Altitude	3000m	3000m

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Appendix B Acoustic Output Data

System Model:

Transducer Model: 3C6C Operating Mode: M mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.97	0.23		0.72		0.44
indexcomponent value				0.23	0.72	0.44	0.72	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.51					
	P	(mW)		28		28		28
	$P_{1\times1}$	(mW)		20		20		
	Z_s	(cm)			2.7			
	Z_b	(cm)					4.85	
	Z_{MI}	(cm)	4.9					
	$Z_{pii,\alpha}$	(cm)	4.9					
	f_{awf}	(MHZ)	2.4	2.4		2.4		2.4
Other Information	prr	(Hz)	3731					
	srr	(Hz)	500					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	177.55					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	104.16					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	240.95					
	p_r at z_{pii}	(MPa)	2.1					
Operating control conditions	Freq	(MHz)	H6.0	H6.0		H6.0		H6.0
	Focus Position	(mm)	80	80		80		80
	Depth	(mm)	166	166		166		166
	A.Power	(%)	100	100		100		100
	Full Screen		On	On		On		On

(a) Intended use does not include cephalic so TIC is not computed

No data reported

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System Model:

Transducer Model: 3C6C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.9	0.23		1.26		1.26
indexcomponent value				0.23	0.23	1.26	0.23	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.4					
	P	(mW)		72		72		72
	$P_{1\times1}$	(mW)		20		20		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	4.8					
	$Z_{pii,\alpha}$	(cm)	4.4					
	f_{awf}	(MHZ)	2.41	2.41		2.41		2.41
Other Information	prr	(Hz)	3757					
	srr	(Hz)	49					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	126.47					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	34.46					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	73.02					
	p_r at z_{pii}	(MPa)	2.01					
Operating control conditions	Freq	(MHz)	H6.0	H6.0		H6.0		H6.0
	Focus Position	(mm)	80	80		80		80
	Depth	(mm)	166	166		166		166
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		L	L		L		L
	Space Compound		OFF	OFF		OFF		OFF

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 3C6C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.77	0.32		1.7		1.7
indexcomponent value				0.32	0.32	1.7	0.32	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.22					
	P	(mW)		92		92		92
	$P_{1\times1}$	(mW)		27		27		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	4.4					
	$Z_{pii,\alpha}$	(cm)	4.8					
	f_{awf}	(MHZ)	2.49	2.49		2.49		2.49
Other Information	prr	(Hz)	7148					
	srr	(Hz)	11					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	80.49					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	3.51					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	8.19					
	p_r at z_{pii}	(MPa)	1.69					
Operating control conditions	CFreq	(MHz)	2.5	2.5		2.5		2.5
	C Focus Position	(mm)	50	50		50		50
	Depth	(mm)	166	166		166		166
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		11	11		11		11
	Sensitivity		4	4		4		4
	Flow Speed		H	H		H		H
	Scan Density		L	L		L		L

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 6C15C Operating Mode: M mode

Index label		MI	TIS		TIB		TIC
			At surface	Below surface	At surface	Below surface	
Maximum index value		0.83	0.04		0.17		0.07
indexcomponent value			0.04	0.17	0.07	0.17	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI} (MPa)	1.81					
	P (mW)		2		2		2
	$P_{1\times1}$ (mW)		2		2		
	Z_s (cm)			1.05			
	Z_b (cm)					1.95	
	Z_{MI} (cm)	2.05					
	$Z_{pii,\alpha}$ (cm)	2.05					
	f_{awf} (MHZ)	4.72	4.72		4.72		4.72
Other Information	prr (Hz)	9965					
	srr (Hz)	500					
	n_{pps}	2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$ (W/cm^2)	160.15					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$ (mW/cm^2)	70.88					
	I_{spta} at z_{pii} or z_{sii} (mW/cm^2)	143.39					
	p_r at z_{pii} (MPa)	2.44					
Operating control conditions	Freq (MHz)	H9.0	H9.0		H9.0		H9.0
	Focus Position (mm)	40	40		40		40
	Depth (mm)	46	46		46		46
	A.Power (%)	100	100		100		100
	Full Screen	On	On		On		On

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 6C15C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.81	0.76		1.43		1.43
indexcomponent value				0.76	0.76	0.76	0.76	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.75					
	P	(mW)		36		36		36
	$P_{1\times1}$	(mW)		34		34		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	2.05					
	$Z_{pii,\alpha}$	(cm)	1.5					
	f_{awf}	(MHZ)	4.7	4.7		4.7		4.7
Other Information	prr	(Hz)	9960					
	srr	(Hz)	131					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	163.86					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	69.2					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	46.66					
	p_r at z_{pii}	(MPa)	2.35					
Operating control conditions	Freq	(MHz)	H9.0	H9.0		H9.0		H9.0
	Focus Position	(mm)	40	40		40		40
	Depth	(mm)	46	46		46		46
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		L	L		L		L
	Space Compound		OFF	OFF		OFF		OFF

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 6C15C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.49	0.5		0.86		0.86
indexcomponent value				0.5	0.5	0.86	0.5	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.09					
	P	(mW)		22		22		22
	$P_{1\times1}$	(mW)		21		21		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	2.1					
	$Z_{pii,\alpha}$	(cm)	1.5					
	f_{awf}	(MHZ)	5.01	5.01		5.01		5.01
Other Information	prr	(Hz)	8191					
	srr	(Hz)	14					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	52.57					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	31.95					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	60.15					
	p_r at z_{pii}	(MPa)	1.5					
Operating control conditions	CFreq	(MHz)	5.0	5.0		5.0		5.0
	C Focus Position	(mm)	40	40		40		40
	Depth	(mm)	46	46		46		46
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		5	5		5		5
	Sensitivity		4	4		4		4
	Flow Speed		H	H		H		H
	Scan Density		H	H		H		H

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 6C15C Operating Mode: PW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.49	0.65		1.86		0.99
indexcomponent value				0.65	1.86	0.99	1.86	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.18					
	P	(mW)		26		26		26
	$P_{1\times1}$	(mW)		24		24		
	Z_s	(cm)			1			
	Z_b	(cm)					1.9	
	Z_{MI}	(cm)	2.1					
	$Z_{pii,\alpha}$	(cm)	2.1					
	f_{awf}	(MHZ)	5.7	5.7		5.7		5.7
Other Information	prr	(Hz)	6006					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	92.1					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	721.51					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	1654.4					
	p_r at z_{pii}	(MPa)	1.75					
Operating control conditions	PW Freq	(MHz)	5.0	5.0		5.0		5.0
	PW Focus Position	(mm)	40	40		40		40
	Depth	(mm)	46	46		46		46
	A.Power	(%)	100	100		100		100
	SV	(mm)	0	0		0		0
	Scale		6	6		6		6

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 6E1C Operating Mode: M mode

Index label		MI	TIS		TIB		TIC
			At surface	Below surface	At surface	Below surface	
Maximum index value		0.65	0.05		0.1		0.08
indexcomponent value			0.05	0.1	0.08	0.1	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI} (MPa)	1.44					
	P (mW)		2		2		2
	$P_{1\times1}$ (mW)		2		2		
	Z_s (cm)			0.95			
	Z_b (cm)					1.5	
	Z_{MI} (cm)	1.7					
	$Z_{pii,\alpha}$ (cm)	1.7					
	f_{awf} (MHZ)	4.86	4.86		4.86		4.86
Other Information	prr (Hz)	3566					
	srr (Hz)	500					
	n_{pps}	2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$ (W/cm^2)	73.54					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$ (mW/cm^2)	20.5					
	I_{spta} at z_{pii} or z_{sii} (mW/cm^2)	39.54					
	p_r at z_{pii} (MPa)	1.83					
Operating control conditions	Freq (MHz)	H9.0	H9.0		H9.0		H9.0
	Focus Position (mm)	25	25		25		25
	Depth (mm)	184	184		184		184
	A.Power (%)	100	100		100		100
	Full Screen	On	On		On		On
(a) Intended use does not include cephalic so TIC is not computed # No data reported							

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System Model:

Transducer Model: 6E1C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.65	0.09		0.19		0.19
indexcomponent value				0.09	0.09	0.09	0.09	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.44					
	P	(mW)		4		4		4
	$P_{1\times1}$	(mW)		4		4		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	1.85					
	$Z_{pii,\alpha}$	(cm)	1.5					
	f_{awf}	(MHZ)	4.85	4.85		4.85		4.85
Other Information	prr	(Hz)	3565					
	srr	(Hz)	47					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	88.68					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	5.62					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	9.76					
	p_r at z_{pii}	(MPa)	1.96					
Operating control conditions	Freq	(MHz)	H9.0	H9.0		H9.0		H9.0
	Focus Position	(mm)	25	25		25		25
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		L	L		L		L
	Space Compound		OFF	OFF		OFF		OFF

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 6E1C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.58	0.45		1.07		1.07
indexcomponent value				0.45	0.45	1.07	0.45	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.3					
	P	(mW)		20		20		20
	$P_{1\times1}$	(mW)		19		19		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	1.6					
	$Z_{pii,\alpha}$	(cm)	1.5					
	f_{awf}	(MHZ)	5.02	5.02		5.02		5.02
Other Information	prr	(Hz)	10526					
	srr	(Hz)	14					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	82.24					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	28.05					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	50.25					
	p_r at z_{pii}	(MPa)	1.63					
Operating control conditions	CFreq	(MHz)	6.0	6.0		6.0		6.0
	C Focus Position	(mm)	25	25		25		25
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		2	2		2		2
	Sensitivity		4	4		4		4
	Flow Speed		L	L		L		L
	Scan Density		H	H		H		H

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 7L4C Operating Mode: M mode

Index label		MI	TIS		TIB		TIC
			At surface	Below surface	At surface	Below surface	
Maximum index value		0.76	0.05		0.15		0.06
indexcomponent value			0.05	0.15	0.06	0.15	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI} (MPa)	1.74					
	P (mW)		2		2		2
	$P_{1\times1}$ (mW)		2		2		
	Z_s (cm)			1.25			
	Z_b (cm)					1.4	
	Z_{MI} (cm)	1.4					
	$Z_{pii,\alpha}$ (cm)	1.4					
	f_{awf} (MHZ)	5.18	5.18		5.18		5.18
Other Information	prr (Hz)	3565					
	srr (Hz)	500					
	n_{pps}	2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$ (W/cm^2)	122.58					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$ (mW/cm^2)	47.18					
	I_{spta} at z_{pii} or z_{sii} (mW/cm^2)	106.21					
	p_r at z_{pii} (MPa)	2.07					
Operating control conditions	Freq (MHz)	H10.0	H10.0		H10.0		H10.0
	Focus Position (mm)	20	20		20		20
	Depth (mm)	184	184		184		184
	A.Power (%)	100	100		100		100
	Full Screen	On	On		On		On

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 7L4C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			1.03	0.25		1.34		1.34
indexcomponent value				0.25	0.25	1.34	0.25	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	2.37					
	P	(mW)		22		22		22
	$P_{1\times1}$	(mW)		10		10		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	1.25					
	$Z_{pii,\alpha}$	(cm)	1.3					
	f_{awf}	(MHZ)	5.24	5.24		5.24		5.24
Other Informa-tion	prr	(Hz)	3565					
	srr	(Hz)	47					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	253.53					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	39.84					
	I_{spta} at z_{pii} or z_{sii}	(mW/ cm^2)	64.16					
	p_r at z_{pii}	(MPa)	2.79					
Operating control conditions	Freq	(MHz)	H10.0	H10.0		H10.0		H10.0
	Focus Position	(mm)	20	40		40		40
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		L	L		L		L
	Space Compound		OFF	OFF		OFF		OFF

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System Model:

Transducer Model: 7L4C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.78	0.36		1.09		1.09
indexcomponent value				0.36	0.36	0.36	0.36	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.86					
	P	(mW)		40		40		40
	$P_{1\times1}$	(mW)		13.16		13.16		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	2.1					
	$Z_{pii,\alpha}$	(cm)	1.3					
	f_{awf}	(MHZ)	5.71	5.71		5.71		5.71
Other Information	prr	(Hz)	9331					
	srr	(Hz)	13					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	185.53					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	125.1					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	209.7					
	p_r at z_{pii}	(MPa)	2.74					
Operating control conditions	CFreq	(MHz)	5.7	5.7		5.7		5.7
	C Focus Position	(mm)	30	80		80		80
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		5	0		0		0
	Sensitivity		4	4		4		4
	Flow Speed		H	H		H		H
	Scan Density		H	L		L		L

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No data reported

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System Model:

Transducer Model: 7L4C Operating Mode: PW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.49	0.44		1.57		1.46
indexcomponent value				0.44	1.57	1.46	1.57	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.18					
	P	(mW)		19		19		19
	$P_{1\times1}$	(mW)		16		16		
	Z_s	(cm)			0.5			
	Z_b	(cm)					1	
	Z_{MI}	(cm)	1.15					
	$Z_{pii,\alpha}$	(cm)	1.15					
	f_{awf}	(MHZ)	5.72	5.72		5.72		5.72
Other Information	prr	(Hz)	5699					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	66.5					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	488.58					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	769.6					
	p_r at z_{pii}	(MPa)	1.48					
Operating control conditions	PW Freq	(MHz)	5.7	5.7		5.7		5.7
	PW Focus Position	(mm)	10	10		10		10
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	SV	(mm)	0	3		3		3
	Scale		7	5		5		5

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System Model:

Transducer Model: 8L4C Operating Mode: M mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.03	0.08		0.34		0.22
indexcomponent value				0.08	0.34	0.22	0.34	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	2.35					
	P	(mW)		4		4		4
	$P_{1\times1}$	(mW)		3		3		
	Z_s	(cm)			0.7			
	Z_b	(cm)					1	
	Z_{MI}	(cm)	1.15					
	$Z_{pii,\alpha}$	(cm)	1.15					
	f_{awf}	(MHZ)	5.25	5.25		5.25		5.25
Other Information	prr	(Hz)	13073					
	srr	(Hz)	500					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	276.18					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	106.22					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	161.22					
	p_r at z_{pii}	(MPa)	2.9					
Operating control conditions	Freq	(MHz)	H12	H12		H12		H12
	Focus Position	(mm)	15	15		15		15
	Depth	(mm)	27	27		27		27
	A.Power	(%)	100	100		100		100
	Full Screen		On	On		On		On

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System Model:

Transducer Model: 8L4C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			1.0	0.67		2.26		2.26
indexcomponent value				0.67	0.67	2.26	0.67	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	2.29					
	P	(mW)		33		33		33
	$P_{1\times1}$	(mW)		27		27		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	1.15					
	$Z_{pii,\alpha}$	(cm)	1.3					
	f_{awf}	(MHZ)	5.24	5.24		5.24		5.24
Other Informa-tion	prr	(Hz)	13089					
	srr	(Hz)	113					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	277.46					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	82.34					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	127.2					
	p_r at z_{pii}	(MPa)	2.82					
Operating control conditions	Freq	(MHz)	H12	H12		H12		H12
	Focus Position	(mm)	15	15		15		15
	Depth	(mm)	27	27		27		27
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		H	H		H		H
	Space Compound		OFF	OFF		OFF		OFF

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System Model:

Transducer Model: 8L4C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.2	0.89		1.9		1.9
indexcomponent value				0.89	0.89	1.9	0.89	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	2.86					
	P	(mW)		37		37		37
	$P_{1\times1}$	(mW)		33		33		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	1.25					
	$Z_{pii,\alpha}$	(cm)	1.3					
	f_{awf}	(MHZ)	5.69	5.69		5.69		5.69
Other Information	prr	(Hz)	10767					
	srr	(Hz)	22					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	441.22					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	317.4					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	530.85					
	p_r at z_{pii}	(MPa)	3.65					
Operating control conditions	CFreq	(MHz)	5.7	5.7		5.7		5.7
	C Focus Position	(mm)	20	20		20		20
	Depth	(mm)	36	36		36		36
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		11	3		3		3
	Sensitivity		4	4		4		4
	Flow Speed		H	H		H		H
	Scan Density		L	L		L		L

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No data reported

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System Model:

Transducer Model: 8L4C Operating Mode: PW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.79	0.49		1.69		0.81
indexcomponent value				0.49	1.69	0.81	1.69	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.89					
	P	(mW)		18		18		18
	$P_{1\times1}$	(mW)		18		18		
	Z_s	(cm)			0.85			
	Z_b	(cm)					1.4	
	Z_{MI}	(cm)	1.45					
	$Z_{pii,\alpha}$	(cm)	1.45					
	f_{awf}	(MHZ)	5.71	5.71		5.71		5.71
Other Information	prr	(Hz)	2581					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	209.55					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	702.04					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	1277.83					
	p_r at z_{pii}	(MPa)	2.42					
Operating control conditions	PW Freq	(MHz)	5.7	5.7		5.7		5.7
	PW Focus Position	(mm)	20	20		20		20
	Depth	(mm)	36	36		36		36
	A.Power	(%)	100	100		100		100
	SV	(mm)	0	4		4		4
	Scale		2	3		3		3

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No data reported

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System Model:

Transducer Model: 2P2F Operating Mode: M mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.39	0.06		0.73		0.73
indexcomponent value				0.06	0.17	0.73	0.17	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	0.53					
	P	(mW)		9		9		9
	$P_{1\times1}$	(mW)		7		7		
	Z_s	(cm)			2.4			
	Z_b	(cm)					3.45	
	Z_{MI}	(cm)	3.75					
	$Z_{pii,\alpha}$	(cm)	3.75					
	f_{awf}	(MHZ)	1.83	1.83		1.83		1.83
Other Information	prr	(Hz)	1985					
	srr	(Hz)	500					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	10.27					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	13.2					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	21.77					
	p_r at z_{pii}	(MPa)	0.66					
Operating control conditions	Freq	(MHz)	H3.5	H3.5		H3.5		H3.5
	Focus Position	(mm)	80	80		80		80
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100
	Full Screen		On	On		On		On

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No data reported

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System Model:

Transducer Model: 2P2F Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.39	0.06		0.26		0.26
indexcomponent value				0.06	0.06	0.06	0.06	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	0.53					
	P	(mW)		10		10		10
	$P_{1\times1}$	(mW)		7		7		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	3.65					
	$Z_{pii,\alpha}$	(cm)	3.6					
	f_{awf}	(MHZ)	1.83	1.83		1.83		1.83
Other Information	prr	(Hz)	1984					
	srr	(Hz)	29					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	10.32					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	4.3					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	6.76					
	p_r at z_{pii}	(MPa)	0.66					
Operating control conditions	Freq	(MHz)	H3.5	H3.5		H3.5		H3.5
	Focus Position	(mm)	80	80		80		80
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		L	L		L		L
	Space Compound		OFF	OFF		OFF		OFF

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No data reported

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System Model:

Transducer Model: 2P2F Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.32	0.09		0.43		0.43
indexcomponent value				0.09	0.09	0.09	0.09	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	0.45					
	P	(mW)		15		15		15
	$P_{1\times1}$	(mW)		10		10		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	3.9					
	$Z_{pii,\alpha}$	(cm)	3.6					
	f_{awf}	(MHZ)	1.99	1.99		1.99		1.99
Other Information	prr	(Hz)	3774					
	srr	(Hz)	7					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	8					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	168.58					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	299.93					
	p_r at z_{pii}	(MPa)	0.58					
Operating control conditions	CFreq	(MHz)	2.5	2.5		2.5		2.5
	C Focus Position	(mm)	60	60		60		60
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		11	11		11		11
	Sensitivity		4	4		4		4
	Flow Speed		H	H		H		H
	Scan Density		L	L		L		L

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 2P2F Operating Mode: PW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			0.11	0.19		0.42		0.42
indexcomponent value				0.19	0.36	0.42	0.36	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	0.16					
	P	(mW)		21		21		21
	$P_{1\times1}$	(mW)		20		20		
	Z_s	(cm)			2.75			
	Z_b	(cm)					3.8	
	Z_{MI}	(cm)	4.1					
	$Z_{pii,\alpha}$	(cm)	4.1					
	f_{awf}	(MHZ)	2	2		2		2
Other Informa-tion	prr	(Hz)	4341					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	0.86					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/ cm^2)	26.62					
	I_{spta} at z_{pii} or z_{sii}	(mW/ cm^2)	47.07					
	p_r at z_{pii}	(MPa)	0.21					
Operating control conditions	PW Freq	(MHz)	2.0	2.0		2.0		2.0
	PW Focus Position	(mm)	90	90		90		90
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100
	SV	(mm)	7	7		7		7
	Scale		7	7		7		7

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 2P2F Operating Mode: CW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			0.02	0.12		2.34		0.3
indexcomponent value				0.12	2.34	0.3	2.34	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	0.03					
	P	(mW)		13		13		13
	$P_{1\times1}$	(mW)		13		13		
	Z_s	(cm)			1.7			
	Z_b	(cm)					1.7	
	Z_{MI}	(cm)	1.45					
	$Z_{pii,\alpha}$	(cm)	1.45					
	f_{awf}	(MHZ)	2	2		2		2
Other Informa-tion	prr	(Hz)	#					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	0.02					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/ cm^2)	30.38					
	I_{spta} at z_{pii} or z_{sii}	(mW/ cm^2)	24.86					
	p_r at z_{pii}	(MPa)	0.04					
Operating control conditions	CW Freq	(MHz)	2.0	2.0		2.0		2.0
	CW Focus Position	(mm)	90	90		90		90
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model:5L4C Operating Mode: M mode

Index label		MI	TIS		TIB		TIC
			At surface	Below surface	At sur-face	Below surface	
Maximum index value		1.69	0.22		0.87		0.39
indexcomponent value			0.22	0.87	0.39	0.87	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI} (MPa)	3.33					
	P (mW)		12		12		12
	$P_{1\times1}$ (mW)		12		12		
	Z_s (cm)			1.15			
	Z_b (cm)					1.65	
	Z_{MI} (cm)	1.65					
	$Z_{pii,\alpha}$ (cm)	1.65					
	f_{awf} (MHZ)	3.9	3.9		3.9		3.9
Other Informa-tion	prr (Hz)	3565					
	srr (Hz)	500					
	n_{pps}	2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$ (W/cm^2)	654.6					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$ (mW/cm^2)	246.08					
	I_{spta} at z_{pii} or z_{sii} (mW/cm^2)	387.29					
	p_r at z_{pii} (MPa)	3.98					
Operating control conditions	Freq (MHz)	H8.0	H8.0		H8.0		H8.0
	Focus Position (mm)	25	25		25		25
	Depth (mm)	184	184		184		184
	A.Power (%)	100	100		100		100
	Full Screen	On	On		On		On

(a) Intended use does not include cephalic so TIC is not computed

No data reported

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System Model:

Transducer Model: 5L4C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.64	0.71		1.38		1.38
indexcomponent value				0.71	0.71	1.38	0.71	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	3.27					
	P	(mW)		41		41		41
	$P_{1\times1}$	(mW)		38		38		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	1.75					
	$Z_{pii,\alpha}$	(cm)	1.7					
	f_{awf}	(MHZ)	3.95	3.95		3.95		3.95
Other Information	prr	(Hz)	3565					
	srr	(Hz)	46					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	779.25					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	132.66					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	210.2					
	p_r at z_{pii}	(MPa)	3.91					
Operating control conditions	Freq	(MHz)	H8.0	H8.0		H8.0		H8.0
	Focus Position	(mm)	25	25		25		25
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		L	L		L		L
	Space Compound		OFF	OFF		OFF		OFF

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 5L4C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.11	1.19		1.93		1.93
indexcomponent value				1.19	1.19	1.19	1.19	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	2.33					
	P	(mW)		58		58		58
	$P_{1\times1}$	(mW)		56		56		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	1.8					
	$Z_{pii,\alpha}$	(cm)	1.7					
	f_{awf}	(MHZ)	4.45	4.45		4.45		4.45
Other Information	prr	(Hz)	9104					
	srr	(Hz)	17					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	295.22					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	216.15					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	364.2					
	p_r at z_{pii}	(MPa)	3.08					
Operating control conditions	CFreq	(MHz)	4.5	4.5		4.5		4.5
	C Focus Position	(mm)	30	30		30		30
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		6	5		5		5
	Sensitivity		4	4		4		4
	Flow Speed		H	L		L		L
	Scan Density		H	L		L		L

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System Model:

Transducer Model: 5L4C Operating Mode: PW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.9	0.47		1.63		0.74
indexcomponent value				0.47	1.63	0.74	1.63	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	1.89					
	P	(mW)		23		23		23
	$P_{1\times1}$	(mW)		22		22		
	Z_s	(cm)			1.2			
	Z_b	(cm)					1.85	
	Z_{MI}	(cm)	2					
	$Z_{pii,\alpha}$	(cm)	2					
	f_{awf}	(MHZ)	4.46	4.46		4.46		4.46
Other Information	prr	(Hz)	2053					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	186.64					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	524.13					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	970.99					
	p_r at z_{pii}	(MPa)	2.58					
Operating control conditions	PW Freq	(MHz)	4.5	4.5		4.5		4.5
	PW Focus Position	(mm)	30	30		30		30
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	SV	(mm)	2	3		3		3
	Scale		2	6		6		6

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System Model:

Transducer Model: 6L7C Operating Mode: M mode

Index label		MI	TIS		TIB		TIC
			At surface	Below surface	At surface	Below surface	
Maximum index value		1.44	0.19		0.79		0.37
indexcomponent value			0.19	0.79	0.37	0.79	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI} (MPa)	2.89					
	P (mW)		12		12		12
	$P_{1\times1}$ (mW)		10		10		
	Z_s (cm)			1.25			
	Z_b (cm)					2.3	
	Z_{MI} (cm)	2.3					
	$Z_{pii,\alpha}$ (cm)	2.3					
	f_{awf} (MHZ)	4.02	4.02		4.02		4.02
Other Information	prr (Hz)	3565					
	srr (Hz)	500					
	n_{pps}	2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$ (W/cm^2)	493.06					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$ (mW/cm^2)	243.65					
	I_{spta} at z_{pii} or z_{sii} (mW/cm^2)	467.3					
	p_r at z_{pii} (MPa)	3.81					
Operating control conditions	Freq (MHz)	H8.0	H8.0		H8.0		H8.0
	Focus Position (mm)	25	25		25		25
	Depth (mm)	184	184		184		184
	A.Power (%)	100	100		100		100
	Full Screen	On	On		On		On

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No data reported

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System Model:

Transducer Model: 6L7C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			1.48	0.61		1.37		1.37
indexcomponent value				0.61	0.61	1.37	0.61	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	2.96					
	P	(mW)		44		44		44
	$P_{1\times1}$	(mW)		32		32		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	2.3					
	$Z_{pii,\alpha}$	(cm)	2.3					
	f_{awf}	(MHZ)	4.02	4.02		4.02		4.02
Other Information	prr	(Hz)	3565					
	srr	(Hz)	47					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	517.7					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	97.94					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	175.78					
	p_r at z_{pii}	(MPa)	3.92					
Operating control conditions	Freq	(MHz)	H8.0	H8.0		H8.0		H8.0
	Focus Position	(mm)	25	25		25		25
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		L	L		L		L
	Space Compound		OFF	OFF		OFF		OFF

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System Model:

Transducer Model: 6L7C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			0.98	1.13		2.26		2.26
indexcomponent value				1.13	1.13	2.26	1.13	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	2.05					
	P	(mW)		72		72		72
	$P_{1\times1}$	(mW)		54		54		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	2.5					
	$Z_{pii,\alpha}$	(cm)	2.5					
	f_{awf}	(MHZ)	4.39	4.39		4.39		4.39
Other Informa-tion	prr	(Hz)	8499					
	srr	(Hz)	15					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	247.04					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	167.1					
	I_{spta} at z_{pii} or z_{sii}	(mW/ cm^2)	355.95					
	p_r at z_{pii}	(MPa)	3					
Operating control conditions	CFreq	(MHz)	4.5	4.5		4.5		4.5
	C Focus Position	(mm)	80	80		80		80
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		11	4		4		4
	Sensitivity		4	4		4		4
	Flow Speed		M	L		L		L
	Scan Density		L	L		L		L

(a) Intended use does not include cephalic so TIC is not computed
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System Model:

Transducer Model: 6L7C Operating Mode: PW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			0.8	0.59		1.3		1.06
indexcomponent value				0.59	1.3	1.06	1.3	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	1.68					
	P	(mW)		34		34		34
	$P_{1\times1}$	(mW)		28		28		
	Z_s	(cm)			1.25			
	Z_b	(cm)					2.4	
	Z_{MI}	(cm)	2.4					
	$Z_{pii,\alpha}$	(cm)	2.4					
	f_{awf}	(MHZ)	4.41	4.41		4.41		4.41
Other Informa-tion	prr	(Hz)	1262					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	164.34					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	259.26					
	I_{spta} at z_{pii} or z_{sii}	(mW/ cm^2)	552.47					
	p_r at z_{pii}	(MPa)	2.43					
Operating control conditions	PW Freq	(MHz)	4.5	4.5		4.5		4.5
	PW Focus Position	(mm)	80	80		80		80
	Depth	(mm)	184	184		184		184
	A.Power	(%)	100	100		100		100
	SV	(mm)	0	3		3		3
	Scale		0	5		5		5

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No data reported

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System Model:

Transducer Model: 10L25C Operating Mode: M mode

Index label		MI	TIS		TIB		TIC
			At surface	Below surface	At surface	Below surface	
Maximum index value		0.77	0.04		0.07		0.07
indexcomponent value			0.04	0.06	0.07	0.06	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI} (MPa)	2.14					
	P (mW)		1		1		1
	$P_{1\times1}$ (mW)		1		1		
	Z_s (cm)			0.55			
	Z_b (cm)					0.9	
	Z_{MI} (cm)	1.1					
	$Z_{pii,\alpha}$ (cm)	1.1					
	f_{awf} (MHZ)	7.78	7.78		7.78		7.78
Other Information	prr (Hz)	500					
	srr (Hz)	#					
	n_{pps}	1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$ (W/cm^2)	146.14					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$ (mW/cm^2)	17.1					
	I_{spta} at z_{pii} or z_{sii} (mW/cm^2)	31.76					
	p_r at z_{pii} (MPa)	2.75					
Operating control conditions	Freq (MHz)	9.0	9.0		9.0		9.0
	Focus Position (mm)	15	15		15		15
	Depth (mm)	36	36		36		36
	A.Power (%)	100	100		100		100
	Full Screen	On	On		On		On

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 10L25C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.81	0.59		1.47		1.47
indexcomponent value				0.59	0.59	1.47	0.59	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	2.25					
	P	(mW)		18		18		18
	$P_{1\times1}$	(mW)		16		16		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	0.95					
	$Z_{pii,\alpha}$	(cm)	1.3					
	f_{awf}	(MHZ)	7.76	7.76		7.76		7.76
Other Information	prr	(Hz)	11312					
	srr	(Hz)	192					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	171.16					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	35.45					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	58.95					
	p_r at z_{pii}	(MPa)	2.7					
Operating control conditions	Freq	(MHz)	9.0	H13		H13		H13
	Focus Position	(mm)	15	20		20		20
	Depth	(mm)	36	46		46		46
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		H	H		H		H
	Space Compound		OFF	OFF		OFF		OFF

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 10L25C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.68	0.19		0.8		0.8
indexcomponent value				0.19	0.19	0.8	0.19	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)						
	P	(mW)		9		9		9
	$P_{1\times1}$	(mW)		7		7		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	0.9					
	$Z_{pii,\alpha}$	(cm)	1.1					
	f_{awf}	(MHZ)	5.73	5.73		5.73		5.73
Other Information	prr	(Hz)	11330					
	srr	(Hz)	17					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	108.37					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	85.2					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	125.4					
	p_r at z_{pii}	(MPa)	1.95					
Operating control conditions	CFreq	(MHz)	6.0	6.0		6.0		6.0
	C Focus Position	(mm)	15	20		20		20
	Depth	(mm)	36	46		46		46
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		5	5		5		5
	Sensitivity		4	4		4		4
	Flow Speed		H	H		H		H
	Scan Density		H	L		L		L

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 10L25C Operating Mode: PW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			0.38	0.16		0.96		0.39
indexcomponent value				0.16	0.96	0.39	0.96	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	0.9					
	P	(mW)		6		6		6
	$P_{1\times1}$	(mW)		6		6		
	Z_s	(cm)			0.6			
	Z_b	(cm)					0.9	
	Z_{MI}	(cm)	1.05					
	$Z_{pii,\alpha}$	(cm)	1.05					
	f_{awf}	(MHZ)	5.72	5.72		5.72		5.72
Other Informa-tion	prr	(Hz)	10532					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	34.79					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	917.81					
	I_{spta} at z_{pii} or z_{sii}	(mW/ cm^2)	1418.3					
	p_r at z_{pii}	(MPa)	1.11					
Operating control conditions	PW Freq	(MHz)	6.0	6.0		6.0		6.0
	PW Focus Position	(mm)	15	20		20		20
	Depth	(mm)	36	46		46		46
	A.Power	(%)	100	100		100		100
	SV	(mm)	0	6		6		6
	Scale		6	2		2		2

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 3C20C Operating Mode: M mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			0.83	0.21		0.57		0.46
indexcomponent value				0.21	0.57	0.46	0.57	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	1.29					
	P	(mW)		26		26		26
	$P_{1\times1}$	(mW)		18		18		
	Z_s	(cm)			2.15			
	Z_b	(cm)					4.3	
	Z_{MI}	(cm)	4.6					
	$Z_{pii,\alpha}$	(cm)	4.6					
	f_{awf}	(MHZ)	2.43	2.43		2.43		2.43
Other Informa-tion	prr	(Hz)	2009					
	srr	(Hz)	500					
	n_{pps}		2					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	118.31					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	67.33					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	152.16					
	p_r at z_{pii}	(MPa)	1.81					
Operating control conditions	Freq	(MHz)	H6.0	H6.0		H6.0		H6.0
	Focus Position	(mm)	60	60		60		60
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100
	Full Screen		On	On		On		On

(a) Intended use does not include cephalic so TIC is not computed

No data reported

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System Model:

Transducer Model: 3C20C Operating Mode: B mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			0.76	0.5		1.42		1.42
indexcomponent value				0.5	0.5	1.42	0.5	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	1.45					
	P	(mW)		35		35		35
	$P_{1\times1}$	(mW)		29		29		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	2.3					
	$Z_{pii,\alpha}$	(cm)	2.4					
	f_{awf}	(MHZ)	3.63	3.63		3.63		3.63
Other Informa-tion	prr	(Hz)	2008					
	srr	(Hz)	52					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	89.89					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	8.22					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	14.45					
	p_r at z_{pii}	(MPa)	1.85					
Operating control conditions	Freq	(MHz)	3.5	H6.0		H6.0		H6.0
	Focus Position	(mm)	60	60		60		60
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scan Density		L	L		L		L
	Space Compound		OFF	OFF		OFF		OFF

(a) Intended use does not include cephalic so TIC is not computed
No data reported

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System Model:

Transducer Model: 3C20C Operating Mode: C mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At sur-face	Below surface	
Maximum index value			0.57	0.9		1.39		1.39
indexcomponent value				0.9	0.9	1.39	0.9	
Associat-ed Acoustic Parame-ters	$P_{r,a}$ at z_{MI}	(MPa)	1					
	P	(mW)		64		64		64
	$P_{1\times1}$	(mW)		61		61		
	Z_s	(cm)			#			
	Z_b	(cm)					#	
	Z_{MI}	(cm)	4.85					
	$Z_{pii,\alpha}$	(cm)	2.4					
	f_{awf}	(MHZ)	3.09	3.09		3.09		3.09
Other Informa-tion	prr	(Hz)	3759					
	srr	(Hz)	7					
	n_{pps}		15					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	67.34					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	123.3					
	I_{spta} at z_{pii} or z_{sii}	(mW/ cm^2)	216.75					
	p_r at z_{pii}	(MPa)	1.65					
Operating control conditions	CFreq	(MHz)	3.0	3.0		3.0		3.0
	C Focus Position	(mm)	60	60		60		60
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100
	Scan Scope		3	3		3		3
	Scale		9	9		9		9
	Sensitivity		4	4		4		4
	Flow Speed		H	H		H		H
	Scan Density		H	H		H		H

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No data reported

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System Model:

Transducer Model: 3C20C Operating Mode: PW mode

Index label			MI	TIS		TIB		TIC
				At surface	Below surface	At surface	Below surface	
Maximum index value			0.4	0.66		1.16		1.07
indexcomponent value				0.66	1.16	1.07	1.16	
Associated Acoustic Parameters	$P_{r,a}$ at z_{MI}	(MPa)	0.7					
	P	(mW)		56		56		56
	$P_{1\times1}$	(mW)		45		45		
	Z_s	(cm)			2			
	Z_b	(cm)					4.6	
	Z_{MI}	(cm)	5.25					
	$Z_{pii,\alpha}$	(cm)	5.25					
	f_{awf}	(MHZ)	3.09	3.09		3.09		3.09
Other Information	prr	(Hz)	2299					
	srr	(Hz)	#					
	n_{pps}		1					
	$I_{pa,\alpha}$ at $z_{pii,\alpha}$	(W/cm^2)	31.14					
	$I_{spta,\alpha}$ at $z_{pii,\alpha}$ or $z_{sii,\alpha}$	(mW/cm^2)	174.75					
	I_{spta} at z_{pii} or z_{sii}	(mW/cm^2)	564.56					
	p_r at z_{pii}	(MPa)	1.15					
Operating control conditions	PW Freq	(MHz)	3.0	3.0		3.0		3.0
	PW Focus Position	(mm)	60	60		60		60
	Depth	(mm)	351	351		351		351
	A.Power	(%)	100	100		100		100
	SV	(mm)	1	1		1		1
	Scale		3	3		3		3

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Manual Version-No.: V-2017-01		

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POLYMED GROUP SUISSE

WEITERE QUALITÄTS-PRODUKTE

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HERZ-KREISLAUF DIAGNOSTIK
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KES-601T **DIGITALES 6-KANAL EKG-GERÄT**
KES-121T **DIGITALES 12-KANAL EKG-GERÄT**
KES-121L **DIGITALES 12-KANAL EKG-GERÄT**
KMO-100 **PATIENTENMONITOR**

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MIT USB ODER WIFI VERBINDUNG ZUM PC ODER ANDROID GERÄT

SPIROMETER

KSP-1000 **PC-SPIROMETER**
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ULTRASCHALLGERÄTE

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KUT-301 **VOLLDIGITALES FARBDOPPLER ULTRASCHALLSYSTEM**

KLC-101

ÄSTHETISCHE MEDIZIN
LASERGERÄTE

KLC-101 **DER CO_2-LASER** MIT SUPERPULS

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