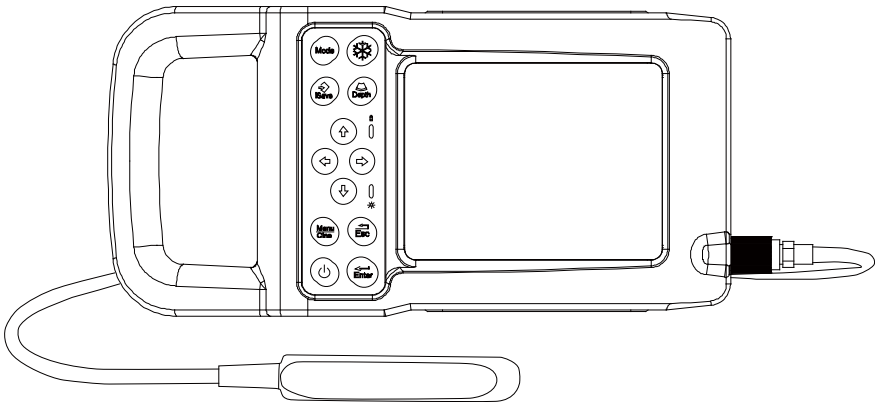
KAIXIN

KX5600F

Full Digital Ultrasonic Diagnostic Instruments (Vet)

User's Manual



Xuzhou Kaixin Electronic Instrument Co., Ltd.

Contents

Introduction

Thank you for purchasing KX5600F Full Digital Ultrasonic Diagnostic Instruments (Vet).
Users shall carefully read through this user's manual and fully understand the text before operating the product.
Please keep this user's manual after reading so that you can access at any time when needed.
The user’s manual issue date: March 8, 2022, Version: V1.00
For the changes of appearance, this user's manual is subject to change without further notice!

Intellectual Property Information

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Statement

Kaixin has the final explanation right of this user’s manual.
Kaixin was considered responsible for the safety, reliability and performance in case of meeting all the following requirements:

1. Assembly, expansion, readjustment, improve and repair are all performed by professionals recognized by Kaixin;
2. All replacement parts and accessories, consumables involved repairs are Kaixin company (original) or approved by Kaixin;
3. Related electrical equipment complies with national standards and the requirements of the user’s manual;
4. Operate the product in accordance with the user’s manual.

Warranty and Repair Service

Purchased the product warranty, sees the company's service policies.
The qualified service personnel who get Kaixin written authorization can repair the instrument out of warranty by themselves. But this should be agreed by Xuzhou Kaixin Electronic Instrument Co., Ltd. We will provide circuit diagrams, component part lists or other information to assist service personnel to repair those parts of our equipment that are designated by our company as repairable by service personnel.

Manufacturer’s Information

Xuzhou Kaixin Electronic Instrument Co., Ltd.
Kaixin Mansion, C-01, Economic Development Zone, Xuzhou, Jiangsu, China.
Post Code: 221004
Tel: +86-516-87732932 87733758
Fax: +86-516-87732932 87792848
Website: http://www.kxele.com
E-mail: info@kxele.com

Important Statement

1. User shall be fully responsible for the maintenance and management of this product after purchasing this product.
2. Even in the warranty period, warranty does not include the following:
   a) Damage or loss caused by error or rough using.
   b) Damage or loss caused by force majeure (such as fires, earthquakes, floods, or lightning etc.).
   c) Damage or loss caused by not meeting the conditions of use specified by the system, such as inadequate power supply, incorrect installation or environmental conditions do not meeting the requirements.
   d) Damage or loss caused by not used the system in the initial buy region.
   e) Damage or loss caused by the system purchased not by Kaixin or its authorized dealer or agents.
3. Medical personnel qualified with professional qualifications only to use this system.
4. Do not modify the software or hardware of the equipment without authorization of the manufacturer.
5. In any case, Kaixin shall not be liable for the problems, damages or losses due to re-installation, alteration or repair the system by non-Kaixin designated personnel.
6. This product is intended to provide clinical diagnostic data for the doctor.
   The doctor shall be responsible for the diagnostic process. Kaixin shall not be liable for any problems arising out of the process.
7. Be sure to back up important data to external storage media, such as notebooks.
8. Due to operator’s error or abnormal condition causing the data stored in the internal system is lost, Kaixin is not responsible.
9. This user’s manual contains warnings for predictable dangers. Users shall also exercise care at any time to be aware of the dangers unforeseen in this manual. Kaixin shall not be liable for the damages and losses arising out of neglecting to follow the operation instructions herein described.
10. This user’s manual shall be furnished with the machine so that managerial and operating personnel can refer to it any time as necessary. Once the managerial personnel of the system changes, it shall hand over this user’s manual.
11. Deal with the exhausted product according to the local statute.
12. The maintenance and servicing of product shall be performed by the trained engineer or by Kaixin Electronic Instrument Company Ltd.

Warning Symbols and Definitions

The following warning symbols are used in this user's manual to indicate safety level and other important items. Please remember these symbols and understand the meaning as you read this user's manual. These symbols convey specific meanings as detailed in the table below:

Symbols & Words	Connotation
⚠**Danger**	Indicates an imminent danger that may result in personal death or serious injury if not avoided.
⚠**Warning**	Indicates a potential danger that may result in personal injury if not avoided.
⚠**Attention**	Indicates a potential danger or unexpected use condition that may result in light injury or property loss or affecting the use if not avoided.

Safety Symbols

Symbols	Description
	Type B applied part
	Indicates the need for the user to consult the instructions for use for important cautionary information.

Labels

The labels are attached to this product in order to call your attention to potential hazards.

Labels	Description
	**Warning:** This is a heat plate to allow heat release from ultrasound. **Remove this label before using.**
	**Attention:** When connecting or disconnecting the probe, please note rotate this ring only!

	**Symbol for the marking of electrical and electronics devices according to Directive 2012/19/EU. The device, accessories and the packaging have to be disposed of waste correctly at the end of the usage. Please follow Local Ordinances or Regulations for disposal.**

Safety Precautions

Please observe the following precautions to ensure patient and operator safety when using this product.

⚠Danger: Do not use this equipment and probes where flammable gas (such as anesthetic gas, oxygen or hydrogen) or flammable liquid (such as alcohol) are present. Failure to do so may result in explosion.

⚠Warning:

1. **The power adapter plug of this equipment and the power plug of the peripherals connected to this equipment shall be connected into the power socket with protectively earth on the wall and the socket must meet the ratings indicated on the rating nameplate. Use of multiple portable socket-outlets may affect protective earth to make leakage currents exceed the safety requirements.**
   You must use the power adapter provided by Kaixin; otherwise electric shock may result.
   You must adopt the power supply method provided by Kaixin, other power supply modes may result in electric shock.
2. **To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.**
3. **Please follow the correct electrical connections method to connect the power supply and earth, otherwise there will be danger of electric shock. Do not connect the grounding wire to any gas pipe or water pipe, or it may cause improper grounding and danger of explosion.**
4. **Before cleaning the equipment, disconnect the power supply cord from the outlet. Failure to do so may result in equipment failure and electric shock.**
5. **The waterproof grade of the equipment is IPX4 (no adverse effect on splashing water in all directions). Splash any liquid on the equipment may damage it. If you accidentally splash liquid on the equipment, please immediately turn off the power and contact your service representative.**
6. **Do not use a probe that has a damaged or scratched surface. Immediately stop using the probe and contact your local representative. There is a risk of electric shock if using a damaged or scratched probe.**
7. **Prohibit the live parts of the equipment or other devices (such as various signal input and output ports, etc.) contact with the patient, if this equipment or other equipment has failure, the patient will have danger of electric shock.**
8. **Do not strike the probe; using the damaged probe may cause electric shock.**
9. **Do not open the covers or control panel of the equipment. Short circuit or electric shock may occur when the system hardware is exposed and powered on.**
10. **Avoid using this equipment with high-frequency electric knife, high-frequency therapy equipment or defibrillators and other electronic devices, or may an electric shock occur to the patient.**
11. **If the integrity of the external protective conductor in the installation or its arrangement is in doubt, the equipment shall be operated from its internal electrical power source.**
12. **Additional equipment connected to the medical electrical equipment must comply with the respective IEC or ISO standards (e.g. IEC60950 for data processing equipment, IEC 60601-1 for medical equipment). Furthermore all configurations shall comply with the requirements for medical electrical systems (see IEC 60601-1-1). Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible that the system complies with the requirements for medical electrical systems. Attention is drawn to the fact that local laws take priority over the above mentioned requirements. If in doubt, consult your local representative or the technical service department.**

⚠Warning:

13. **Adapter has no switch. APPLIANCE COUPLER or MAINS PLUG is used as the isolation means from the SUPPLY MAINS. Not to position the equipment so that it is difficult to operate the disconnection device.**
14. **Other additional multiple socket-outlets or extension cords should not be connected to the equipment.**
15. **When the equipment works abnormally, do stop working, turn off the power and check the reason, then contacts the Kaixin Company about it.**
16. **It is forbidden to load and unload the probe or move the equipment in galvanic to avoid danger of safety.**
17. **The equipment is switched completely only by disconnecting the power supply from the wall socket.**
18. **Turn off power and pull out of the plug from socket after the equipment is completed operation.**
19. **It is forbidden to drag and press the power and probe cables emphatically; regularly inspect whether there is pull-apart and bareness, if there is the phenomena like this, turn off power supply immediately, stop using it and change it for new one.**
20. **Pull out of the plug from socket after operation in thunderstorm weather to avoid the equipment being damaged by lightening.**
21. **Always keep the equipment dry. Avoid transporting this equipment quickly from a cold place to a warm place; otherwise condensation or water droplets may form allowing a short circuit and possible electric shock.**
22. **To avoid damaging power adapter or harming people by unexpected fallen, make sure the power adapter is placed on the leveled desk.**
23. **The operator must not touch signal input/ signal output and patient simultaneously.**

⚠Attention:

1. **Please keep the equipment in a frozen state when it is turned on and not in use to extend the service life of the probe.**
2. **Repeat available reboot time should be more than one minute to avoid turn on/off power supply in short time.**
3. **Using radio transmitting equipment nearby the equipment may interfere with the normal operation of the equipment. Prohibited carry or use of devices that can generate radio waves within the room installed this equipment, such as cell phones, radio transceivers and wireless remote control toys.**
4. **Do not apply external force to the equipment; otherwise, the equipment may be damaged.**
5. **If the equipment is used in a small room, the room temperature may rise. Please provide proper ventilation and free air exchange.**
6. **The images displayed in this equipment are only reference for diagnosis. Our company is not responsible for the correctness of diagnostic results. The doctor shall be responsible for the diagnostic process.**

Please read the following precautions carefully to ensure the safety of the patient and the operator when using the probes.

⚠Warning:

1. **Check the probe and connecting cable before and after diagnostic operation. Use of defective probe may cause electric shock.**
2. **Do not strike or hit the probe; using the damaged probe may cause electric shock to the patient.**
3. **Unauthorized disassembly of the probe shall be prohibited as it may cause electric shock.**
4. **For the depth of immersion during disinfection, please refer to disinfection figure in Chapter 7.1.1 "System cleaning and disinfection"; Failure to disinfect as required can cause internal short circuits and burnout of the board.**

⚠Attention:

1. **When using the probe, wear sterile gloves to prevent infection.**
2. **Care should be taken when using the probe normally and it should be handled gently to avoid mechanical damage to the transducer assembly.**
3. **Use a qualified coupling gel to keep the probe dry. If the unqualified coupling gel is used or the probe surface is not cleaned in time, the lens of the probe surface may be corroded and damaged. The surface of the probe may be cleaned with a soft cloth. Do not scrub with hard paper.**
4. **The normal ultrasound examination could not have a danger of burns. To avoid burns, please do not place the probe on the same part of the body for a long time. Under the premise of meeting diagnosis, try to shorten the inspection time.**
5. **Do not use the packing box for storing the probe. If the packing box is used for storage, it may become a source of infection.**
6. **It is required to practice ALARA when operating ultrasound examination. Minimize the acoustic power without compromising the quality of images.**
7. **Clean and disinfect the probe before and after each examination.**
8. **Thoroughly clean the coupling gel on the patient or probe surface each time after ultrasonic operation, or the coupling gel may become hardened on the acoustic lens of the probe, deteriorating quality of image or become sources of infection.**
9. **Repeated disinfection may damage the probe, please check the probe's performance periodically.**

Chapter 1 Product Specifications

1.1 Power Supply

Adapter ratings: 100-240V~, 1.2-0.6A, 50-60Hz
Adapter model: BJE01-40-001M
Output of adapter: DC12.8V 3.0A
Main device rating: DC12.8V 3.0A
Internal supply voltage: DC11.1V±10%

1.2 Environmental Conditions

- **Operating conditions**

  Ambient temperature: 10℃~40℃
  Relative humidity: 30%~75% (without condensation)
  Atmospheric pressure: 700hPa~1060hPa

- **Storage and transportation conditions**

  Ambient temperature: -20℃~55℃
  Relative humidity: 30%~93% (without condensation)
  Atmospheric pressure: 700hPa~1060hPa

⚠**Warning: Do not use or store the equipment in the conditions other than those specified.**

⚠**Attention: The main voltage is varies with different countries or regions.**

⚠**Attention: System should be avoided using in following environments:**

1. Moist **2. Rain**
3. Thunderstorm weather **4. No ventilation**
5. Close to heat source (e.g. heaters, microwave ovens, ovens, water heaters, etc.)
6. Direct sunlight **7. Dramatic temperature change**
8. Poisonous gas **9. Corrosive gas**
10. Strong shock **11. Strong electromagnetic field (e.g. MRI)**
12. Radiation (e.g. X-ray, CT) **13. Defibrillators or short wave therapy equipment**

1.3 Dimensions and Weight

1. Main unit dimension: approx. 285 * 143 * 35mm^3 (L * W * T)
2. Main unit net weight: 1.1kg (excluding accessories)

Chapter 2 System Configuration

2.1 Standard Configuration

1.	Main unit	1 unit
2.	6.5MHz animal transrectal linear array probe	1 PC
3.	Power adapter	1 PC
4.	Power cable	1 PC
5.	Shutter release	1 PC
6.	Probe holder	1 PC
7.	Strap	1 PC
8.	Leather bag	1 PC
9.	Plastic sealed box	1 PC

2.2 Optional Parts

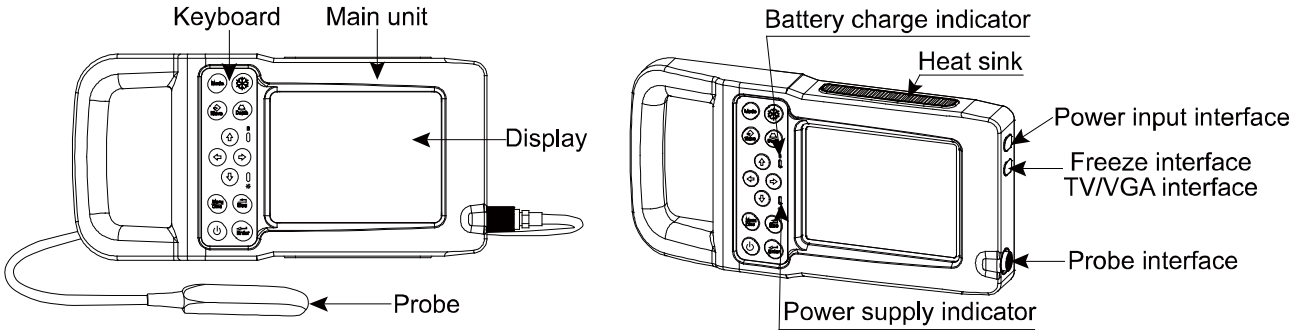
1. 3.5 MHz convex array probe
2. 3.5MHz linear array loin probe
3. 4.0 MHz convex array transrectal probe
3. 6.5 MHz micro-convex probe
4. 7.5 MHz high frequency linear array probe
5. Video recorder
6. Leather case (including strap)

Chapter 3 Product Introduction

3.1 Structure Composition of the Instrument

KX5600F Full Digital Ultrasonic Diagnostic Instruments (Vet) are composed of main unit, probe and power adapter etc.

3.2 Components Name



3.3 Parts of the Probe

Take 6.5MHz animal transrectal linear array probe for example:

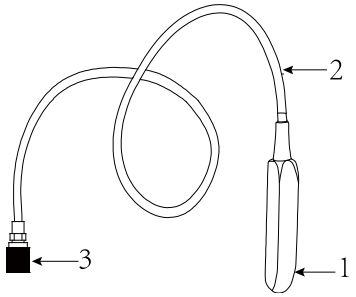


Figure: Parts name of 6.5MHz animal transrectal linear array probe

Name	Function
(1) Acoustic lens	To convert electric signal to ultrasonic signal based on principle of converse piezoelectric effect. The ultrasonic signal, after entering the human body, is reflected as echo wave and converted to electric signal again. The acoustic lens is on the probe surface. Supply ultrasonic coupling gel to the acoustic lens surface when performing ultrasonic diagnosis.
(2) Cable	To connect the probe to the probe connector.
(3) Probe connector	To connect the probe to ultrasonic diagnostic instrument.

3.4 Function Keys Description

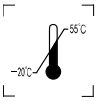
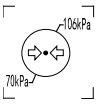
SN.	Function keys	Function
1	Mode	1. In real-time status, select mode; 2. In frozen status, text input, exchange the starting point and end point of the measurement, etc.

2		1. Main-menu; 2. In frozen status, save image/read image/cine loop.
3		Enter Confirm
4		Freeze/Unfreeze the image; Hold down freeze key for some time to achieve screen display up/down reverse.
5		One-key storage image
6		Adjust the imaging depth
7		Direction Keys
8		Quit various states
9		Power switch

3.5 Symbols Description

This instrument uses the symbols listed in the following table, and their descriptions are explained.

Symbols	Description
	Type B applied part
	Indicates the need for the user to consult the instructions for use for important cautionary information.
	Follow instructions for use
	Power switch
	Power supply indication
	Battery charge indication
	Direct current
	Polarity of direct current power connector
	Manufacturer
	Date of manufacture
	Serial number
	Up
	Keep dry

	Fragile
	Stacking limit by number
	Temperature limits (Storage and transport)
	Humidity limitation (Storage and transport)
	Atmospheric pressure limitation (Storage and transport)
	Marking for the separate collection of electrical and electronic equipment

Chapter 4 Installation and Check

> ⚠**Warning: Heat sinks on the upper and lower sides of main unit to allow heat release. Remove this label before using. When main unit is working, the temperature of heat sink may be high. If used, be careful not to touch the heat sink, so as not to burn!**

4.1 System Installation

Please carefully read through and fully understand the use-method before installing the equipment, and check the goods for its completeness.

You can hold the equipment handle to use or be hung on the chest to use.

The equipment is hung on the chest to use:

a. Take out the instrument and accessory, first put the equipment into the soft leather bag;
b. Stick the Velcro of leather bag to the handle of the main unit, and then install the strap on the rings of the leather bag;
c. Finally adjust the length of the strap, and hang it on the neck or shoulder for use.

4.2 Ultrasonic Probe Installation

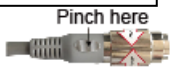
> ⚠**Danger: Use together with flammable anaesthetic, it may result in explosion.**

> ⚠**Warning: Do not use the probe not provided by our company, otherwise the equipment and the probe will cause damage, and may cause fire in extreme cases.**

> ⚠**Attention:**
>
> **1. Turn off the ultrasonic system before disconnecting the probe. Disconnecting the probe with system power on may damage the system or probe.**
> **2. Before disconnecting the probe, place the cable and probe on a stable and leveled position so that the probe may not be damaged or injury person by unexpected fall.**
> **3. Probe is highly sensitive to shake, be used with caution. About probe's use and cleaning, the details see the relevant sections.**

4.2.1 Ultrasonic Probe Connection

> ⚠**Warning: Before connecting or using the probe, make sure that the probe, connecting cable and connector are in normal condition (free of cracks or drop). Use of defective probe may cause electric shock.**

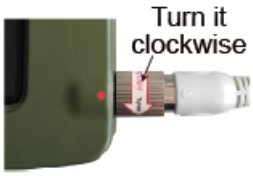
1. Turn off the system, pinch the oval position on both sides of the probe cable 

while keep the arrow above, as shown 

;
2. As shown below, insert the probe connector horizontally into the probe socket labeled "PROBE" of the main unit, when inserting the probe, the notch on the probe connector should be aligned with the position of the red dot mark on the main unit housing, and push the probe firmly into the probe socket of main unit;

3. After pushed in place, hold the machine with one hand and rotate the ring clockwise with one hand until the probe is locked.

Note: Lock the ring clockwise in the direction indicated on the label. Before turning the ring clockwise, be sure to push the probe connector into place and then rotate to prevent the ring from idling.



Probe connection schematic

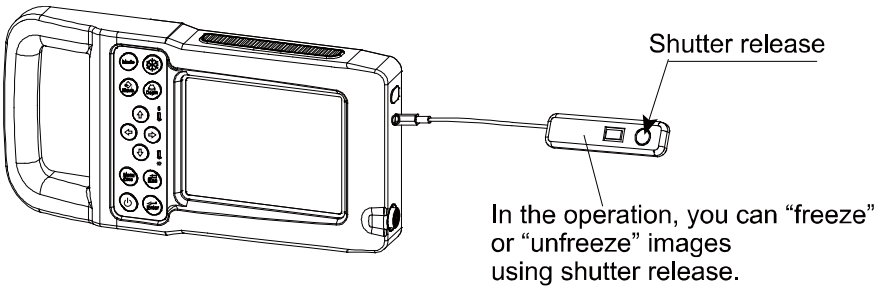
4.2.2 Ultrasonic Probe Disconnection

1. Turn off the system, pinch the oval position on both sides of the probe cable with one hand and rotate the probe ring counterclockwise with the other hand;
2. When rotating counterclockwise, pull out the ultrasonic probe connector vertically when the ring touches the probe cable.

Probe disconnection schematic

4.3 Shutter Release Installation

Install shutter release to Freeze interface (TV/VGA interface) as shown in the figure.



4.4 Video Recorder Installation

1. Turn off the system, connect the equipotential terminal (⏚) of the video recorder to the earthing;
2. Connect one end of the video connection line to the video recorder and the other end to the “TV/VGA interface” of the main unit;
3. Insert one end of power plug (jack) of the video recorder to the power input socket of the video recorder, the other end to the power supply socket.

   Note: When connecting the video recorder, the main unit needs to output the TV signal. Please contact Kaixin Company.

4.5 Working Power

The instrument can work when it is connected to the external power supply or the battery capacity is sufficient.

4.5.1 Connect to External Power Supply

1. Connect to the power adapter

Insert the output plug of adapter into power input interface of the main unit.

2. Connect to the main power supply

Insert the power plug (jack) furnished with the machine into power input socket of the power adapter, the other end to the mains socket-outlet. The instrument uses three-core power supply. It connects with the protective earth line when power plug inserts into its socket.

⚠Warning:

1. **Should be used the power adapter provided by Kaixin. If other adapters are used, it may cause electric shock.**
2. **Please use the power adapter in the environment specified in the user's manual.**

4.5.2 Powered by Battery

When connected to the external power supply, the instrument is powered by the external power supply. When disconnected from the external power supply, the instrument is powered by the battery.

4.6 Ultrasonic Probe Check Before and After Operation

Before and after ultrasonic diagnosis to check if there are any exceptionally on the surface of the probe or cable jacket, such as peeling, cracks, bulge, or if the acoustic lens is reliable, disinfected or cleaned.

4.7 Main Unit Check Before and After Operation

4.7.1 Inspection Before Start-up

Check the following items before starting the machine:

1. The temperature, humidity and atmospheric pressure shall meet the requirements of operation condition.
2. No condensation occurs.
3. No distortion, damage or contamination on system and peripheral. Clean the parts as specified in relevant sections, if the contaminant is present.
4. Check the control panel, display screen and enclosure to ensure they are in good working condition and free of abnormity (such as cracks and loosened screws).
5. No damage on power cable, and hard up on its connection.
6. Check probe and its connections to ensure they are free of abnormity (such as scuffing, drop-off or contamination). If the contaminant is present, clean, disinfect the contaminated objects as specified in relevant sections.
7. No barriers around the intake of equipment.
8. See to it that probe has been cleaned, disinfected; else dispose it as specified in relevant sections.
9. Check all the ports of the machine for possible damage or blockage.
10. Clean the field and environment.

4.7.2 Inspection After Start-up

Check the following items after starting the machine:

1. No abnormal voice, strange smell and overheating appear.
2. Check the machine to ensure a normal start-up: The power supply indicator is on and startup picture is shown on the screen. Then the machine will be automatically set in B mode.
3. Check the acoustic lens for abnormal heat when the probe is in use. This can be done by hand touching the probe to feel the temperature of the lens.
4. Check the image to ensure trouble-free display (no excessive noise or flicker).
5. Check the control panel to ensure normal operation condition.
6. Check the instrument to ensure that the phenomenon of local high temperature will not appear.

⚠Attention: If the overheat acoustic lens is placed on the patient's skin, heat injury may occur.

⚠Attention: Thoroughly clean the coupling gel on the probe surface each time after ultrasonic operation, or the coupling gel may become hardened on the acoustic lens of the probe, deteriorating quality of image.

4.8 System Reset

In case of abnormal screen display or no-working for system operation, try to restart the system by turning on/off the main unit power.

Chapter 5 Functional Operation

5.1 Startup and Shutdown

In shutdown status, press key, machine starts up, power indicator lights.

In startup status, hold down key, machine shuts down, power indicator goes out. Please note that when shut down the machine, the time of pressing key is a rather long than normal pressing key.

5.2 Screen Display Reverse

Hold down freeze key for some time to achieve the screen display reverse, to meet left/right hand use.

5.3 System Functions Setting

5.3.1 Time Setting

1. Press Menu Cine key to enter main-menu, press direction keys to move cursor to “Setup”;
2. Press Enter key to enter setting interface;
3. Press direction keys to move the symbol “<” to point to “Year, Month, Day, Hour and Min”;
4. When setting year, month, day, hour and minute, press direction key to increase value or press direction key to decrease value;
5. Press Enter key to confirm the time setting and quit setting interface.

5.3.2 TV Mode Setting

1. Press Menu Cine key to enter main-menu, press direction keys to move cursor to “Setup”;
2. Press Enter key to enter setting interface;
3. Press direction keys to move the symbol “<” to point to “TV Mode”;
4. Press direction keys to achieve TV mode conversion between PAL and NTSC;
5. Press Enter key to confirm the setting and quit setting interface.

5.3.3 Energy Saving Setting

1. Press Menu Cine key to enter main-menu, press direction keys to move cursor to “Setup”;
2. Press Enter key to enter setting interface;
3. Press direction keys to move the symbol “<” to point to “Sleep”;
4. Press direction keys to select energy saving time among 01~99 minutes or select “Off”;
5. Press Enter key to confirm the setting and quit setting interface.

Note: Go beyond the system setting sleep time without pressing any key, the machine will automatically enter the energy saving status. Press any key, the system will return to normal operation status.

5.3.4 Characters Brightness Setting

1. Press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Setup";
2. Press Enter key to enter setting interface;
3. Press direction keys ↑↓ to move the symbol "<" to point to "Font Bright";
4. Press direction keys ←→ to select characters brightness among 160, 192, 224 and 255;
5. Press Enter key to confirm the setting and quit setting interface.

5.3.5 Hospital Name Setting

1. Press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Setup";
2. Press Enter key to enter setting interface;
3. Press direction keys ↑↓ to move the symbol "<" to point to "Hospital";
4. Press Enter key, the cursor is located above "ID"; at the same time characters input menu will be shown at the bottom of the screen:

   Caps 0 1 2 3 4 A B C D E F G H I J K L M
   Shift 5 6 7 8 9 N O P Q R S T U V W X Y Z

   Press direction keys to move cursor to point to Caps, and then press Enter key to achieve capital and small letter conversion; If the cursor point to Shift, press Enter key to achieve the conversion between the letter and punctuation;
5. Press direction keys to choose "numbers" or "characters" and press Enter key to confirm;
6. If need modify the content, in the characters input status press Shift key, the special characters input menu is shown at the bottom of the screen displays:

   Caps ← → ␣ ↑ ↓ ♀ ♂ ^ _ ♮ : ; < = > ? @ [
   Shift ! " # $ % & ` ( ) * + , - . /] { }

   Press direction keys to move cursor to point to character "←" or "→", press Enter key, move the cursor to the position need to deleted character, and then press direction keys to move cursor to character "␣", press Enter key, delete input content and retype.
7. Press Esc key to quit the character input status and save this setting.

5.3.6 Key Sound Setting

1. Press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Setup";
2. Press Enter key to enter setting interface;
3. Press direction keys ↑↓ to move the symbol "<" to point to "KeySound";
4. Press direction keys ←→ to select between "On" and "Off";
5. Press Enter key to confirm the setting and quit setting interface.

5.3.7 Grid Setting

1. Press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Setup";
2. Press Enter key to enter setting interface;
3. Press direction keys ↑↓ to move the symbol "<" to point to "Grid Set";
4. Press direction keys ←→ to select "00"-"08";
   "00" shows "no grid",
   "01" shows "line grid",
   "02" shows "dot grid",
   "03" shows 10mm spacing dot-like scale,
   "04" shows 2mm spacing dot-like scale,
   "05" show 10mm spacing and 2mm spacing dot-like scales,
   "06" shows longitudinal 1mm spacing grid (Depending on the probe, the grid is only displayed when the image depth is less than a certain value),
   "07" shows longitudinal 5mm spacing grid,
   "08" shows longitudinal 10mm spacing grid;
5. Press Enter key to confirm the setting and quit setting interface.

Note: Grid is displayed on B mode after has been set.

5.3.8 WIFI Switch Setting

1. Press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Setup";
2. Press Enter key to enter setting interface;
3. Press direction keys ↑↓ to move the symbol "<" to point to "WIFI SWITCH";
4. Press direction keys ←→ to select between "On" and "Off";
5. Press Enter key to confirm the setting and quit setting interface.

Note: The WIFI function is to be upgraded.

5.4 Mode Selection

In real-time mode, press Mode key repeatedly to switch modes among B, B/B, 4B, B/M and M.

5.4.1 B Mode

B mode is a basic operation mode after startup and a single-framed B mode image is displayed. Press ❄ key to freeze/unfreeze the image. In real-time mode, press Mode key to exit B mode.

5.4.2 B/B Mode

1. In real-time mode, press Mode key to enter B/B mode.
2. B/B image switch. Press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move the cursor to "BB Mode" and then press direction keys ←→ to switch image display; the selected image is activated and the other one is frozen.
3. In real-time mode, press Mode key to exit B/B mode.

5.4.3 4B Mode

1. In real-time mode, press Mode key to enter 4B mode.
2. 4B image switch. Press Menu Cine key to enter main-menu, press direction keys ↑↓ to move the cursor to "4B Mode", then press direction keys ←→ to switch display among four images; the selected image is activated and the other three are frozen.
3. In real-time mode, press Mode key to exit 4B mode.

5.4.4 B/M Mode

1. In real-time mode, press Mode key to enter B/M mode.
2. Change M scan mode. Press Menu Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "M Mode" and then press direction keys ←→ to change the M scan mode.
3. Move sample line. Press Esc key to quit the current using status for direction keys. Press direction keys ←→ to move sample line.
4. In real-time mode, press Mode key to exit B/M mode.

5.4.5 M Mode

1. In real-time mode, press Mode key to enter M mode.
2. Change M scan mode: Press Menu Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "M Mode" and then press direction keys ←→ to change the M scan mode.
3. Change M scan speed: Press Menu Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "M Speed" and then press direction keys ←→ to select the eight kinds of scan speed.
4. In real-time mode, press Mode key to exit M mode.

5.5 Image Adjustment and Control

5.5.1 Image Brightness and Contrast Adjustment

The user should adjust the brightness and contrast of the image according to the actual conditions of the environment.

1. In the startup default real-time status, press Esc key to quit the current using status of direction keys;
2. Press direction keys ←→, the "SBRIGH, SCONTR" adjustment bars appear on the screen;
3. Press direction keys ↑↓, move the cursor to "SBRIGH, SCONTR";
4. Press direction key → to increase brightness and contrast, press direction key ← to decrease them;
5. Finish the adjustment, press Esc key or automatically later exit the adjustment status.

Note: When adjusting the brightness and contrast, if you cannot adjust by pressing the direction keys ←→, you must exit the current use state of the direction keys.

5.5.2 Total Gain Adjustment

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Gain" in the display area. Press direction key → to increase image total gain and direction key ← to reduce total gain so as to control the total gain of the entire image.

5.5.3 Near Field Gain Adjustment

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Near" in the display area. Press direction key → to increase near field gain and direction key ← to reduce near field gain so as to control the gain in near field region.

5.5.4 Far Field Gain Adjustment

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Far" in the display area. Press direction key → to increase far field gain and direction key ← to reduce far field gain so as to control the gain in far field region.

5.5.5 Dynamic Range Adjustment

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Dyn" in the display area. Press direction key → to increase the value of dynamic range and direction key ← to decrease the value of dynamic range so as to control the dynamic range of the entire image.

5.5.6 Depth Range Selection

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Depth" in the display area and then press direction keys ←→ to select eight kinds of depth.

Or, in real-time mode, repeatedly press Depth key to select eight kinds of depth.

5.5.7 Frequency Adjustment (Frequency conversion)

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Freq" in the display area. Press direction keys ←→ to achieve frequency conversion.

5.5.8 Frame Correlation Adjustment

In real-time B, B/B, 4B or B/M mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "FrameAvg" in the display area. Press direction keys ←→ to achieve four levels of frame correlation.

5.5.9 Image Post-process Adjustment

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "IP" in the display area and then press direction keys ←→ to obtain four levels of corrected images.

5.5.10 Edge Enhancement Adjustment

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "IE" in the display area and then press direction keys ←→ to gain four levels of sharpened images.

5.5.11 Local Zoom and Local Additive Color

In real time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "LocalZoom" in the display area, press Enter key, a box appears. Press direction keys to move the box to the position to be enlarged, the selected image will be enlarged; Press Esc key to quit local zoom status.

In the color display, the selected image which by above mentioned operation will be enlarged and added color.

5.5.12 Image Left/Right Reverse

In real-time B, B/B, 4B or B/M mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "RL" in the display area and then press direction keys ←→ to select "L" or "R" to achieve image left/right reverse. The image is flipped left/right, that is, the probe scanning direction is changed. The probe scanning direction is indicated by the arrow on the upper left area of the image.

5.5.13 Image Up/Down Reverse

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "UPDOWN" in the display area and then press direction keys ←→ to select "U" or "D" to achieve image up/down reverse.

5.5.14 Color Selection

In real-time mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Color" in the display area and then press direction keys ←→ to achieve the conversion of eight kinds of colors (including one kind of black and white).

5.5.15 Image Filter

In real-time B mode, press Menu/Cine key to enter main-menu, press direction keys ↑↓ to move cursor to "Filter" in the display area and then press direction keys ←→ to achieve the conversion of two kinds of filter.

5.5.16 Focus Position Adjustment

In real-time mode, press Esc key to quit main-menu status, press direction keys ↑↓ to move the focus up and down.

5.5.17 Image Freeze/Unfreeze

In real-time mode, press key to freeze the image; in frozen status, press key to unfreeze the image.

5.6 Auto Ruler (Automatic Backfat Measure)

1. In real-time B mode, press Menu Cine key to enter main-menu, press direction keys to move cursor to “AutoRuler” in the display area and then press direction keys to select “0” or “1” to turn off or turn on the automatic backfat measure. “0” means: turn off the automatic backfat measure; “1” means: turn on the automatic backfat measure.
2. Press key, freeze the desired image, a vertical dotted line of fat thickness measurement appears in the middle of screen, the backfat measurement value is automatically displayed at the “+:----mm” on the right side of the screen.
3. Press direction keys to select “Clear” in display area and press Enter key to clear all marks and data.
4. Press key to return to real-time status.

Note: As the swine increases weight and age, and if the measurement site is accurate, two or three layers of backfat thickness can be measured, the backfat measurement values for two or three layers are automatically displayed at the “+:----mm” on the right side of the screen.

5.7 Restore Parameters

In real-time B mode, press Menu Cine key to enter main-menu, press direction keys to move cursor to “RecallParam” in the display area and then press key Enter to restore the image parameters.

5.8 Body Mark and Probe Mark

This product contains 31 body marks that are divided into two pages when display. The operation steps are as follows:

1. In frozen status, press direction keys to move cursor to “BodyMark” in display area, press Enter key, body marks will be showed in the image area, press direction keys to change pages;
2. Press direction keys to move to the position of desired body mark, press Enter key to confirm the selected body mark;
3. Press direction keys to change the probe mark position; press Mode key to change probe mark direction;
4. Press Esc key to quit body mark and probe mark status;

5. Press key to quit froze status.

5.9 One-key Storage Image

Press key to freeze the image, press key, the system emits a beep, and then the current frozen image is stored in the main unit.

Note:

1. **One-key storage can saved the current frozen image into the inter memory of main unit; it can stored up to 420 images.**
2. **For the stored image, its file name is automatically named by the image code.**
3. **When storing images with one-key, you should always pay attention to the remaining frames within the inter memory of main unit to prevent invalid storage. After 420 images have been saved, delete it manually.**

5.10 Image Management

5.10.1 Save the Image

1. Press key to freeze the image;
2. Press key, a "Save" prompt appears in the lower right corner of the screen;
3. Press direction keys to select the image code need to be saved, such as choose "003";
4. Press key, the current image is saved in the frame for coded "003". The saved image code is preceded with asterisk "*";
5. Press key to quit saving status and press key to return to real-time status.

Note: Images can be saved into the inter memory of main unit; it can stored up to 420 images.

5.10.2 Read the Image

1. Press key to freeze the image;
2. Continuously press key twice, a "Read" prompt appears in the lower right corner of the screen;
3. Press direction keys to select the image code need to be read out, such as choose "003*";
4. Press key to read out the image stored in the frame "003*", "Img" character showed in the lower right corner of the screen;
5. Press key to quit reading status and press key to return to real-time status.

Note: When reading images, it must choose the image code with "*".

5.10.3 Delete the image

1. Press key to freeze the image, press key to enter saving or reading image status;
2. Press direction keys to select the image code to be deleted, such as "002*";

3. Press key, the stored image will be deleted, "*" will automatically disappear;
4. Repeat the 2-3 steps, delete other images;
5. Press key to return to real-time status.

5.10.4 Review the Image

1. Press key to freeze the image, continuously press Menu/Cine key twice to enter reading image status;
2. Press direction keys to select the image code with "*", press Enter key;
3. Press key to review the images, the stored images will be automatically played by the fixed time interval;
4. Press Esc key to quit reading status;
5. Press key to return to real-time status.

5.11 Cine Loop

In real-time mode, the system is always saving the scanned image. The playback images are for a period time images before freeze.

Press key to freeze the image, continuously press Menu/Cine key three times to enter the automatic playback status; in the automatic playback status, press Menu/Cine key to enter manual playback status; in the manual playback status, press direction keys to view images frame by frame; continuously press Menu/Cine key three times again to return to automatic playback status. In the process of saving and playback, the relevant saved and played frames are shown in the lower right corner of the screen.

Press Esc key to return to frozen status.

Press key unfreeze and return to real-time status.

Note: If the images appear abnormal, that is without enough storage time and the images have not been stored full.

5.12 Text Input

Operation steps:

1. Press key to freeze the image, press direction keys to move cursor to "Note" in the display area;
2. Press Enter key, the cursor is located behind "ID";
3. Press Mode key, the characters input menu will be shown at the bottom of the screen:

   Caps 0 1 2 3 4 A B C D E F G H I J K L M
   Shift 5 6 7 8 9 N O P Q R S T U V W X Y Z

   Press direction keys to move cursor to point to Caps, and then press Enter key to achieve capital and small letter conversion; If the cursor point to Shift, press Enter key to achieve the

conversion between the letter and punctuation;

4. Press direction keys to choose “numbers” or “characters” and press Enter key to confirm;
5. After inputting ID, repeatedly press Menu Cine key to choose “Pregnancy, Unpregnancy, Suspected, Disease” four kinds of check results;
6. Press Esc key to confirm and exit;
7. If need to input the note in the image area, in the note status (exit the character input menu and the cursor is located behind the “ID”), press direction keys to move cursor to image area and input the content according to Step 3-4, press Esc key to confirm and quit the input status.
8. If need to modify the input content, press direction keys ⬆⬇ to select “Clear”, press Enter key to clear all noted marks and retype.

5.13 Check List Management

5.13.1 Save and View Check List

1. Freeze the desired image;
2. Record the “ID” and “Result” according to the method in section 5.11 Text Input, press Esc key to confirm and save to the check list;
3. Press direction keys ⬆⬇ to move cursor to “LIST”, press Enter key to enter check list interface;
4. Press direction keys ⬆⬇ to view stored check lists;
5. Press Esc key to exit check list interface and press ❄ key to return to real-time status.

Note:

1. The check list interface records the pregnancy status of each examination. The list contents are as follows: ID, result, examination time.

2. The main unit stores up to 200 check lists.

5.13.2 Delete Check Lists

1. In the frozen status, press direction keys ⬆⬇ to move cursor to “LIST”, press Enter key to enter check list interface;
2. Press Mode key, clear all the check lists;
3. Press Esc key to exit check list interface and press ❄ key to return to real-time status.

Chapter 6 Measurement

6.1 General Measurement

6.1.1 Distance Measurement

1. In B, B/B or B/M mode, freeze the desired image, the cursor is located in the "Meas" position of display area;
2. Press Enter key, the measurement methods are showed in the lower left of the screen, press direction keys ◄► to choose "1. Distance", press Enter key again, the cursor will show "+"; **(Note: In B/M, M mode, measured method is fixed to the distance measurement)**
3. Press direction keys to move the "+" mark to desired position, press Enter key to set the "+" mark position as the starting point of the measurement;
4. Press direction keys to move the "+" mark to the end point of the measurement. A lighted dotted line appears between the starting point and the end point as the dashed locus of the measurement. The measured value is automatically displayed at the built-in mark "+: ----mm" on the right part of the screen;
5. Press Mode key to exchange the starting point and end point of the measurement;
6. Press Enter key to finish the first measurement;
7. Repeat the steps 3~6 to complete the multi-group data measurement;
8. Continuously press Esc key twice to quit the measurement status;
9. Press direction keys ▲▼ to choose "Clear" in display area and press Enter key to clear all marks and data;
10. Press ❄ key to unfreeze and return to real-time status.

6.1.2 Circumference/Area/Volume Measurement

- **Circumference/area/volume measurement with ellipse method**

1. In B, B/B mode, freeze the desired image, the cursor is located in the "Meas" position of display area;
2. Press Enter key, the measurement methods are showed in the lower left of the screen, press direction keys ◄► to choose "2. Ellipse", press Enter key again, the cursor will show "+";
3. Press direction keys to move the "+" mark to desired position, press Enter key to set the "+" mark position as the starting point of the measurement;
4. Press direction keys to move the "+" mark to the end point of the measurement, at the same time the elliptic curve appears;
5. Press Menu Cine key, the "− +" mark appears in the lower right of the image. Hold down ► or ◄ key to change the minor axis of the ellipse so as to satisfy the test area. The measured circumference, area and volume values are displayed at the built-in characters "C: 00000mm, A: 00000mm^2, V: 00000 mm^3" on the right part of the screen automatically;

6. Press Menu/Cine key again to quit the minor axis status; Press Mode key to exchange the starting point and end point;
7. Press Enter key to finish the first measurement;
8. Repeat the steps from 3 to 7 to complete the multi-group data measurement;
9. Continuously press Esc key twice to quit the measurement status;
10. Press direction keys ⇧⇩ to choose "Clear" in display area and press Enter key to clear all marks and data;
11. Press freeze key to unfreeze and return to real-time status.

- **Circumference/area measurement with multi-point method**

1. In B, B/B mode, freeze the desired image, the cursor is located in the "Meas" position of display area;
2. Press Enter key, the measurement methods are showed in the lower left of the screen, press direction keys ⇦⇨ to choose "3. Multi-point", press Enter key again, the cursor will show "+";
3. Press direction keys to move the "+" mark to desired position, press Enter key to mark the first point, continue to press direction keys, move the "+" mark to next desired position, press Enter key to mark the second point; By analogy, to mark all desired points;
   Note: The number of points must be within 8 to 32.
4. When completed the marking of desired points, press Mode key, it appears trace on the screen (trace is automatically drawn along the order of marking point until close the beginning point and end point), the measured circumference and area values are automatically displayed at the built-in mark "C: 00000mm, A: 00000mm^2" on the right part of the screen; If continuously marks the thirty-two point, it directly appears trace on the screen, the measured circumference and area values are automatically displayed at the built-in mark "C: 00000mm, A: 00000mm^2" on the right part of the screen;
5. Repeat steps 3, 4 to complete the multi-group data measurement;
6. Continuously press Esc key twice to quit the measurement status;
7. Press direction keys ⇧⇩ to choose "Clear" in display area and press Enter key to clear all marks and data;
8. Press freeze key to unfreeze and return to real-time status.

6.1.3 Time/Heart Rate/Slope Measurement

In the B/M or M frozen mode, measure time, heart rate and slope. The time/heart rate/slope operation method is identical with distance measurement.

Note: In B/M mode, if both starting point and end point of the measurement mark fall into the B-mode image area, the value of the "+: " refers to distance; if starting point and end point of the measurement mark fall into the M-mode image area, the value of the "+: " refers to depth; if the starting point and end point are in separate areas, the "+: "will display "----"sign or invalid value.

Time: denotes cycle measured in ms (millisecond)

HR: denotes heart rate measured in times/minute (times per minute)

EF: denotes slope measured in mm/s (millimeter per second)

> ⚠**Attention: The accuracy of software measurement: distance measurement ≤ 0.1mm; area measurement ≤ 1mm^2; volume measurement ≤ 1mm^3; heart rate measurement ≤ 1bpm; time measurement ≤ 1ms. Due to differences in images obtained by each user in different times, the actual object for the accuracy of the measurement may be greater than the above-mentioned values.**

6.2 Obstetric Measurement

6.2.1 Measurement and Calculation Items

Obstetric tables of the system including: 1. Bovine, 2. Equine, 3. Ovine, 4. Canine, 5. Feline, 6. Llama, 7. Swine, which is reference for doctor.

6.2.2 Measurement of GA and EDC

Follow the steps below:

1. In B, B/B mode, freeze desired image, press direction keys ⓤⓓ to choose "OB" in the display area;
2. Press Enter key to display the obstetric measurement animals in the lower part of the screen, "Animal: 1. Bovine, 2. Equine, 3. Ovine, 4. Canine, 5. Feline, 6. Llama, 7. Swine", press direction keys ⓛⓡ to select the measured animal, press Enter key to confirm, measured parameters of this animal are showed in the lower left of the screen;
3. Press direction keys ⓛⓡ to select the measured parameters, press Enter key, the cursor will show "+";
4. Press direction keys to move the "+" mark to desired position, press Enter key to set the "+" mark position as the starting point of the measurement;
5. Press direction keys to move the "+" mark to the end point of the measurement, at the same time, a lighted dotted line appears between the starting point and the end point as the dashed locus of the measurement. The measured value is automatically displayed at the built-in mark "+: ----mm" on the right part of the screen; the (Gestational Age) "G.A: " and (Estimated Date of Confinement) "EDC: " value to be displayed in real time on the right part of the screen;
6. Press Mode key to exchange the starting point and end point;
7. Press Enter key to finish the measurement;
8. Repeat the steps from 3 to 7 to complete the multi-group data measurement;
9. Press Esc key to quit measurement status for this animal;
10. Press direction keys ⓛⓡ to select the other animal, press Enter key to confirm, repeat steps 3 to 7 to complete a variety of animals measurements;
11. Continuously press Esc key twice to quit the obstetric measurement status;

12. Press direction keys ⓤⓓ to choose “Clear” in display area and press Enter key to clear all marks and data;
13. Press ❄ key to unfreeze and return to real-time status.

6.2.3 Measurement of Swine’s Lean percentage

Lean percentage calculation formula uses NSIF formula.

1. In B, B/B mode, freeze desired image, press direction keys ⓤⓓ to choose “OB” in the display area;
2. Press Enter key to display the obstetric measurement animals in the lower part of the screen, “Animal: 1. Bovine, 2. Equine, 3. Ovine, 4. Canine, 5. Feline, 6. Llama, 7. Swine”, press direction keys ⓛⓡ to select “7. Swine”, press Enter key to confirm, measured parameters of swine are showed in the lower left of the screen;
3. Press direction keys ⓛⓡ to select “2. LEAN”, press Enter key again to confirm, the cursor will show “+”;
4. Press direction keys ⓛⓡ to select “Weight” (range 50~300kg), press Enter key again to confirm;
5. Move the cursor to the measuring position of fat thickness, measure the fat thickness with distance measurement method, the fat thickness is displayed in real time on the right part of the screen; measure loin with distance measurement method, the loin is displayed in real time on the right part of the screen; press Enter key to finish the loin measurement, the Lean percentage will be displayed on the right part of the screen;
6. Continuously press Esc key twice to quit the measurement status;
7. Press direction keys ⓤⓓ to choose “Clear” in display area and press Enter key to clear all marks and data;
8. Press ❄ key to unfreeze and return to real-time status.

6.2.4 Obstetric Report

In frozen status, press direction keys ⓤⓓ to move the cursor to the “Report”, press Enter key to display current measurement obstetric report. Press Esc key to exit obstetric report status.

6.3 Measurement Items

1. Items measurable in B mode: distance, circumference, area, volume, gestational age (GA) and estimated date of confinement (EDC).
2. Items measurable in B/B mode: distance, circumference, area, volume, gestational age (GA) and estimated date of confinement (EDC).
3. Items measurable in B/M mode: distance or depth, time, slope and heart rate.
4. Items measurable in M mode: depth, time, slope and heart rate.
5. If the display becomes “----”, it indicates an invalid measurement value.

Chapter 7 System Maintenance

The system maintenance should be performed by the user. Users shall be in full charge of maintenance and operation of the system after purchasing the product. Please check the status of the machine regularly and perform a preventive check for the system.

⚠Warning:

1. Maintenance not specified in the user's manual should be performed by professional trained engineer or contact the Kaixin Company.

2. For the system performance and safety, you should perform periodical checks for the system.

3. The following maintenance should not be performed while inspecting the patient.

7.1 Daily Maintenance

Daily maintenance should be performed by the user.

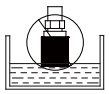
7.1.1 System Cleaning and Disinfection

⚠Warning: Turn off the equipment and pull out the power supply wire before cleaning equipment. It may cause electric shock if clean the system under power is on.

⚠Warning: The waterproof grade of the equipment is IPX4 (no adverse effect on splashing water in all directions). Do not spill water or liquid into the equipment during cleaning or maintenance. Failure to do so may cause malfunction.

⚠Warning:

Do not place the ultrasonic probe connector into water or disinfection, as it may cause electric shock or the malfunction of probe.



⚠Attention:

1. To prevent possible infection, it is advisable to wear sterilized gloves when cleaning, disinfecting the ultrasonic probe.

2. Clean the probe with sterile water to remove the residual chemicals after disinfection, because the residual chemicals may be harmful for humans.

3. Kaixin Company will not make any guarantee for the efficacy of disinfector. Please contact the appropriate manufacturer for details.

⚠Attention:

1. In the process of cleaning and disinfection, avoid probe overheat (exceeding 60℃) as it may be damaged or deformed under excessive heat.

2. In the operation of disinfection, please refer to medical institutions disinfection technical specifications.

1. Clean the probe

(1) Must wear sterilized gloves to prevent possible infection.

(2) Rinse the probe with water or soapy water to remove all contaminants, or use a soft urethane sponge to wipe the probe. Do not use brushes as it may damage the probe.

(3) After finishing the rinsing, use a sterilized cloth or gauze to wipe the water on the surface of probe. Do not dry the probe by heating it.

2. High-level disinfection

Please follow the disinfection method provided in this user's manual for disinfection.

(1) Before disinfection, wear sterilized gloves to prevent possible infection;

(2) You must clean the probe before disinfection. Recommend the solution to disinfect in the following table.

Glutaraldehyde-based disinfectant:

Chemical Name	Reagent Name	Step
Glutaraldehyde (2.4%)	Cidex Glutaraldehyde disinfectant	Please refer to the instructions of the solution for details.

Non-glutaraldehyde-based disinfectant:

Chemical Name	Reagent Name	Step
Phthalaldehyde solution (0.55%)	Cidex OPA	Please refer to the instructions of the solution for details.

- **Please follow the instructions about disinfectant concentration and disinfection method, as well as the precautions about disinfectants provided by disinfectant provider. But do not rinse or soak the probe connector or close to connector cable.**
- **The soaking time of probe in the disinfectant is limited to the minimum time recommended by disinfectant manufacturer (e.g., Cidex OPA manufacturer recommended minimum 12 minutes).**
- **Please follow local laws and regulations to choice the disinfectants.**

(3) After disinfection, rinse the probe with a large number of sterile water (about 2 gallons) for at least one minute to remove the residual chemicals. You may follow the recommended method by the disinfectant manufacturer to rinse.

(4) After finishing the rinsing, use a sterilized cloth or gauze to wipe the water on the surface of probe. Do not dry the probe by heating it.

⚠**Attention**: **The waterproof grade of transrectal probe is IPX7, immersion depth from probe's acoustic head to the sheath of probe handle; the waterproof grade for other probes is IPX4.**

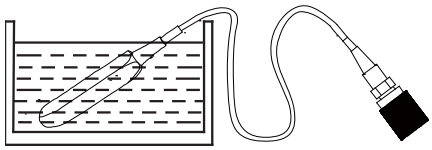


Fig. Immersion disinfection of transrectal probe (sketch map)

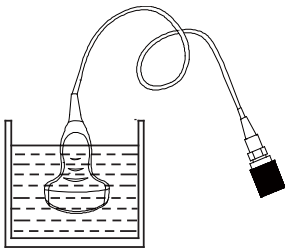


Fig. Immersion disinfection of probe (except transrectal probe)

⚠**Attention**:

1. **It is a normal phenomenon that color of the acoustic lens may change and color of the probe label may fade away.**
2. **Repeated disinfection may damage the probe, please check the probe's performance periodically.**

3. Check probe after cleaning and disinfection

(1) Check the probe enclosure and its cable to ensure they are free of abnormity (such as scuffing, cracks or drop-off);

(2) The sound window of probe is thin; ensure that there are no any abnormity on the sound window, such as scuffing, cracks, peeling, bulge and drop-off.

4. Clean the probe cable and its connector

(1) Clean the probe cable and its connector with soft, dry cloth.

(2) In case of die-hard blots, clean with soft cloth dipped in moderate detergent and then air-dry it.

5. Clean the display screen

(1) Use a soft cloth to clean the display screen;

(2) In case of die-hard blots, clean with soft cloth dipped in glass cleaner and then air-dry it.

> ⚠**Attention: Do not clean the screen with hydrocarbon detergent for example alcohol etc or OA equipment cleaning media.**

> ⚠**Attention: Prohibit using sharp objects to touch the display screen, and prohibit pressing or squeezing against the display screen.**

6. Clean the control panel, shell

Clean the instrument surface with soft, dry cloth or with soft cloth dipped in moderate water cleaning media to remove the blots, and then dry the instrument with soft, dry cloth or with air.

7. Clean the video recorder, shutter release

(1) Use the soft dry cloth to wipe the video recorder, shutter release.

(2) If it is difficult to wipe away the blemish, clean with soft cloth dipped in moderate detergent and then air-dry it.

7.1.2 Checking the Power Cable

1. Visually check the power adapter cable for no wrinkles, cracks or aging, and check the surface of the power adapter free from cracks and expansion.
2. Manual operation, check the power plug connection is reliable, no loose or broken.

7.1.3 Checking the Appearance

Check the appearance free from cracks and breakage, including the device shell and the probe shell.

7.2 Use and Maintenance for the Rechargeable Lithium Ion Battery Pack

1. Plug the output port of power adapter into the power input interface of the main unit to charge. When charging, the battery charge indicator is in orange flash and green light state; when fully charged, the indicator is in an orange and green light state.
2. The shutdown charging time is about 5 hours; over-charging or discharging will shorten the battery life. The full charged battery can be used about 5 hours.
3. Battery is consumable; the battery cycle-life is based on the times of charge and discharge as unit. When the use time reduced significantly compared with normal conditions, the battery should be promptly replaced.
4. The excess high or low temperature will affect the charging and discharging performance, and short the battery life and capacity.

⚠Attention: When the battery power is too low, the battery power indicator "⌧" icon appears in the lower left corner of the screen and flashed continuously. Connect the main unit to external power supply and recharge the battery, or turn off the machine to recharge.

⚠Attention:

1. **Do not throw the battery into water or be wet, which will lead to the battery leakage, explosion or fire;**
2. **Do not use or store the battery near the heat source, such as fire or heater, which will lead to the battery leakage, explosion or fire;**
3. **Do not connect the anode and cathode reversely, which will lead to the battery leakage, explosion or fire;**
4. **Do not heat up or throw the battery into fire, which will lead to the leakage, explosion or fire;**
5. **Do not connect the anode and cathode with any metal or conductor; do not transport or store the battery together with necklaces, hairpins or other metal objects, which will lead to the leakage, explosion or fire;**
6. **Do not hammerblow, throw or mechanically shake the battery, which will lead to the leakage, explosion or fire;**
7. **Do not insert the battery with nail or other spiculate objects; do not hammerblow or trample the battery, which will lead to the leakage, explosion or fire;**
8. **Do not weld the battery terminal directly, which will lead to the leakage, explosion or fire;**
9. **Do not disassemble the battery in any way, which will lead to the leakage, explosion or fire;**
10. **Do not charge the battery near the heat source or extra-hot environment, which will lead to the leakage, explosion or fire;**
11. **Do not put the battery into the microwave oven or pressure vessel, which will lead to the leakage, explosion or fire;**
12. **Do not mixed use the battery together with one-off battery (such as dry battery), or different capability or different model or different brand battery, which will lead to the leakage, explosion or fire;**
13. **Do not use the abnormal battery with particular smell or abnormal heat or distortion or turn colors or abnormal phenomena, which will lead to the leakage, explosion or fire;**
14. **Do stop the charge and pull out the battery from the charger at once if any abnormal phenomenon happens to the battery, such as particular smell or abnormal heat or distortion or turn colors. Otherwise, each of above will lead to the leakage, explosion or fire;**
15. **Do remove the battery from the near fire if any leakage or particular smell happens, which will lead to the leakage, explosion or fire;**
16. **If any leakage splash into eye, do not wipe the eye, instead of washing it and get help from the doctor as soon as possible. Otherwise, the eye will be injured;**
17. **Do not use the battery in the extremely hot environment, such as hot sunshine or in the car when it is too hot, because these will catch fire, even worsen its performance and shorten its life;**
18. **If use the battery beyond the listed environment on the manual, it will worsen its performance or shorten its life, even lead to extreme heat or explosion or fire.**

⚠Attention: Battery is consumable; the battery cycle-life is based on the times of charge and discharge as unit. When the use time reduced significantly compared with normal conditions, the battery should be promptly replaced.

⚠Attention: When the equipment is unlikely to be used for a period of time, and leakage from a battery would result in an unacceptable risk, please remove the battery.

⚠Attention: Don't throw away the exhausted battery anywhere; especially throw it in the fire. Please deal with it according to local statutes. Use pollution degree II to deal with.

7.3 Replaceable Parts

Before replacing the replaceable parts, please contact us; replace the parts under the guidance of our company. Please use the probe, power adapter and power supply cord provided by Kaixin.

⚠Warning: The probe, power adapter and power supply cord as described in this section may be replaced by qualified medical personnel (operator). But these parts must be provided by KAIXIN or his authorized supplier.

7.4 Backup Data

To conduct the data management regularly, data backup to external storage medium to protect data security. For the data, which had been backed up successfully, please timely deleted unnecessary data within the instrument so as to avoid impacting the system performance for long-term using.

⚠Warning: Can not restore the data after delete, please cautions!

7.5 Troubleshooting

To ensure normal operation, users are recommended to prepare a proper maintenance and regular examination plan to regularly check on product safety performance. If any abnormity occur, timely contact International Trade Dept of Kaixin for support.

If the following problems occur on starting up the machine, try to make corrections following the method in the table. If the problem remains unsolved, contact International Trade Dept of Kaixin for support.

SN	Trouble	Correction
1	Power supply indicator does not light and the screen does not display when starting the machine.	1. Check power supply. 2. Check power supply cord and plug. 3. Check power adapter.
2	Character and gray scale are displayed, but no ultrasonic image on the screen.	Probe is not properly connected. Turn off the power and reconnect the probe.
3	Intermittent stripe, snow, or far-field interference appears on screen.	1. Check power supply.(spark interference present) 2. Check environment.(source of interference around the machine, such as electric motor, ultrasonic atomizer, automobile, computer or other interference) 3. Check power plug/socket of the instrument or probe connectors. They shall be properly contacted.

4	Image display is not clear.	1. Adjust the total gain, near field gain, far field gain. 2. Adjust the brightness and contrast level.
5	Control panel malfunction.	Restart the machine by turning off the main unit power.

7.6 Periodic Safety Checks

To ensure the system performance and safety, it must be checked after using 1 year. When check the instrument, please consult the International Trade Dept of Kaixin or its dealers, as they need to have professional technology engineers.

Inspect sorts	**Inspect items**
Cleaning	System inside Peripheral equipment
Electrical safety	Earth leakage current Touch current Patient leakage current Dielectric strength
Mechanical safety	Check the control panel Peripheral equipment installation agencies Other mechanical parts Probe appearance
Image recording	Images in each mode Images recorded using a standard probe

Chapter 8 Storage and Transportation

1. If the instrument is stored over 3 months, take out the instrument from the packing case, connect it to power supply for 4 hours, and then disconnect the power and place it in the case again following the direction indicated by arrows on the package. Store the case in the warehouse. Do not pile the case. The instrument case should have adequate space from ground, walls and ceiling of the warehouse.
2. Environment requirement

   Ambient temperature: -20℃－55℃; Relative humidity: 30%－93% (without condensation);

   Atmospheric pressure: 700hPa-1060hPa. The warehouse should be well ventilated and free of direct sunlight and corrosive gas.
3. Shockproof measures have been taken inside the packing case to allow for transport by air, railway, land and sea. The goods shall not be exposed to poor weather conditions like rain and snow, nor shall the goods be placed upside down, bumped, knocked or over-stacked.

Chapter 9 Safety Classification

1. Classified according to the type of protection against electric shock:
   Class I EQUIPMENT + internally power EQUIPMENT
2. Classified according to the degree of protection against electric shock:
   Type B applied part
3. Classified according to the degree of protection against harmful ingress of water:
   The main unit belongs to IPX4
4. Classified according to the degree of safety of operation in the presence of a flammable anesthetic mixture with air or oxygen or nitrous oxide:
   Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or oxygen or nitrous oxide
5. Classified according to whether the device has an applied part that protection against defibrillation discharge effects:
   Without defibrillation-proof applied part
6. Classified according to the permanent installation or non-permanent installation:
   Non-permanently installed equipment
7. Classified according to mode of operation:
   Continuous operation equipment
8. Classified according to the product structure:
   Portable equipment

KAIXIN ELECTRONIC

XUZHOU KAIXIN ELECTRONIC INSTRUMENT CO., LTD.

Kaixin Mansion, C-01, Economic Development Zone,
Xuzhou, Jiangsu, China

Post Code: 221004

Tel: +86-516-87732932/87733758

Fax: +86-516-87732932/87792848

Website: http://www.kxele.com

E-mail: info@kxele.com

AISON
INTERNATIONAL

Authorized Distributor
AISON INTERNATIOANL
Stigs Center 2B, 42246, Hisings Backa,Sweden
Tel:0046-73-5543108
Email: info@autoclave.se
www.autoclave.se

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