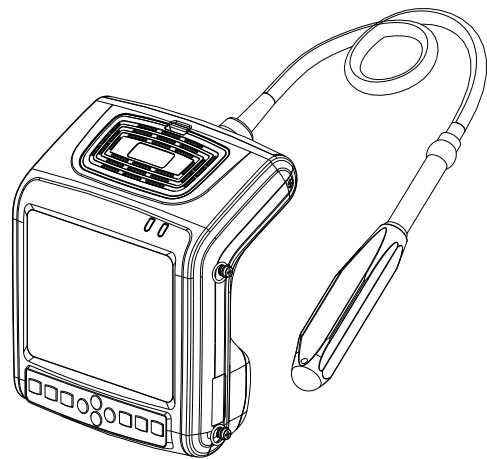


KAIXIN

KX5200

**Full Digital Ultrasonic Diagnostic
Instruments (Vet)**

User's Manual



Xuzhou Kaixin Electronic Instrument Co., Ltd.

Introduction

Thank you for purchasing KX5200 full digital ultrasonic diagnostic instruments.

Users shall carefully read through this manual and fully understand the text before operating the equipment.

Please keep this manual after reading so that you can access at any time when needed.

The user's manual issue date: July 16, 2025, Version: V3.19

For the changes of appearance, this manual is subject to change without further notice!

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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.

Manufacturer's Information



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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.

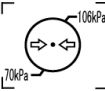
Safety Cautions

1. Warning Symbols and Definitions

The following warning symbols are used in this 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.
	Indicates that make sure refer to relevant contents in this manual.

2. Safety Symbols

Symbols	Meaning	Symbols	Meaning
	Type B applied part		Up
	Power supply indication		Keep dry
	Battery charge indicator		Fragile
	Direct current		Stacking limit by number
	Follow instructions for use		Temperature limits
	Marking for the separate collection of electrical and electronic equipment		Humidity limitation
			Atmospheric pressure limitation
	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.		

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Chapter One Technical Specifications

1.1 Technical Data

1. Gray scale: 256
2. Monitor: 5.7" LED
3. Main Unit Size: approx. 155 * 180 * 80mm³ (L * W * H)
4. Weight of main unit: approx. 1.1kg (excluding accessories)

1.2 Primary Functions

1. Mode conversion function.
2. Magnification conversion function.
3. Frequency conversion function.
4. Frame correlation function.
5. Image post-process function.
6. Edge enhancement function.
7. Image freeze/unfreeze.
8. Depth range selection function.
9. Depth heighten function.
10. Color display function.
11. Local zooming.
12. Angle/width change.
13. Image filter function.
14. Automatic backfat measure function.
15. Adjustment and display of near field, far field, total gain and dynamic range.
16. Single-point, multi-point focusing.
17. Image storage.
18. Vertical, horizontal reverse and B/W conversion.
19. Case information, image annotation and auto time display.
20. Body marks.
21. Measurement of distance, fat thickness, circumference, area, volume, slope, heart rate and cycle.
22. OB software package including 25 tables about 8 kinds of animals, automatic calculation of GA and EDC.
23. Puncture guide.
24. Cine loop.
25. PAL-NTSC Conversion.
26. Energy saving.
27. Obstetric report.

Chapter Two System Outline and Structure

2.1 Structure composition of the instrument

KX5200 full digital ultrasonic diagnostic instruments (Vet) are composed of main unit and probe, etc.

2.2 Components name

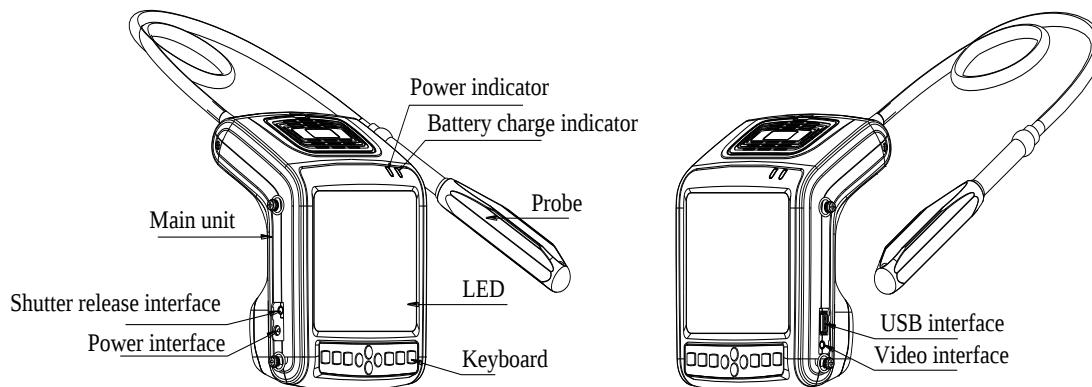


Fig. KX5200 main unit sketch map

2.3 Parts of the probe (Take 6.5MHz animal transrectal linear array probe for example)

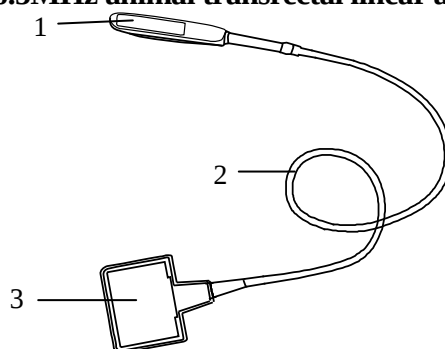


Fig. Parts name of 6.5MHz animal transrectal linear array probe

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 system.

2.4 Function keys description

SN.	Function keys	Real-time mode function	Freeze mode function
1		Mode Selection	Text Input, dump image, select local/U disk
2		Enter Confirm menu	
3		Main-menu / Cine loop	
4		Freeze/Unfreeze	
5		Direction Keys	
6		Quit	
7		Power switch	

Chapter Three System Configuration

3.1 Typical configuration

1. Main unit	1 unit
2. 6.5MHz animal transrectal linear array probe	1 PC
3. Power adapter	1 PC
4. Internal battery	2 PCS
5. Charger	1 PC
6. Support bracket	1 PC
7. Arm-band	1 PC
8. Strap	1PC
9. Socket screwdriver	1 PC
10. Plastic seal box	1 PC
11. Shutter release	1 PC
12. Hood	1 PC

3.2 Optional parts

1. 3.5 MHz convex array probe
2. 3.5 MHz linear array loin probe
3. 4.0 MHz convex array transrectal probe
4. 6.5 MHz micro-convex probe
5. 6.5 MHz intra-cavity probe
6. 7.5 MHz high frequency linear array probe
7. Video recorder
8. Video glasses
9. Probe holder
10. Leather bag
11. Probe telescopic frame

Chapter Four Operation Condition

4.1 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: DC12V 3.0A

4.2 Operation Environment

Ambient temperature: 10°C-40°C

Relative humidity: 30%-75% (without condensation)

Atmospheric pressure: 700hPa-1060hPa.

Altitude: < 2000 m

Overvoltage: Overvoltage Category II

Pollution degree: 2

4.3 Storage and Transport

Ambient temperature: -20°C-55°C

Relative humidity: 30%-93% (without condensation)

Atmospheric pressure: 700hPa-1060hPa

⚠ Danger: Do not use this equipment 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: 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.

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

⚠ Attention: Using radio transmitting equipment nearby the system may interfere with the normal operation of the system. Prohibited carry or use of devices that can generate radio waves within the room installed this system, such as cell phones, radio transceivers and wireless remote control toys.

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

1. Moist	2. Rain	3. Thunderstorm weather
4. No ventilation	5. Close to heat source	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		

Chapter Five System Installation and Check

⚠Warning: To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

⚠Warning:

1. All plugs of instruments of this system shall be connected into the power socket with protectively earth on the wall and the socket must meet the requirement of power rating of instrument. Use of multiple portable socket-outlets may affect protective earth to make leakage currents exceed the safety requirements.
2. 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 bad grounding and danger of explosion.
3. This equipment is not waterproof, not use this equipment in place where liquid may into the interior of the equipment. Never pour any liquid on the equipment; otherwise there will be danger of electric shock or cause equipment damage. If accidentally spill liquid on the equipment, turn off the power immediately and contact your local representative.
4. 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.
5. Additional equipment connected to the medical electrical equipment must comply with the respective IEC or ISO standards (e.g. IEC60950 for data processing equipment). Furthermore all configurations shall comply with the requirements for medical electrical systems (see IEC 60601-1-1 or clause 16 of IEC60601-1 3rd, respectively). 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. When more than one device is connected to use, the accumulation of leakage current may cause the danger of security. If in doubt, consult your local representative or the technical service department.
6. If the integrity of the external protective conductor in the installation or its arrangement is in doubt, equipment shall be operated from its internal electrical power source.

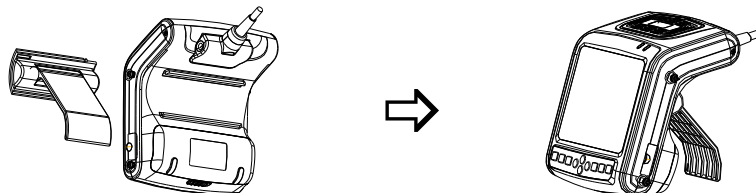
⚠Warning:

1. When instrument works abnormally, do stop working, turn off the power and check the reason, then contacts the KAIXIN Company about it.
2. Turn off power and pull out of the plug from socket after each ultrasonic diagnostic operation.
3. 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.
4. It is forbidden to load and unload the probe or move the instrument in galvanic to avoid danger of safety.
5. Pull out of the plug from socket after operation in thunderstorm weather to avoid the instrument being damaged by lightening.
6. If the temperature changes greatly in short time will cause vapor recovery inside of instrument, the case may damage the instrument.
7. The instrument is turned off completely only by disconnecting the power supply from the wall socket.

5.1 System installation

Please carefully read through and fully understand the use-method before installing the system, and check the goods for its completeness according to the packing list furnished. This system provides the following several usages, for the user to select:

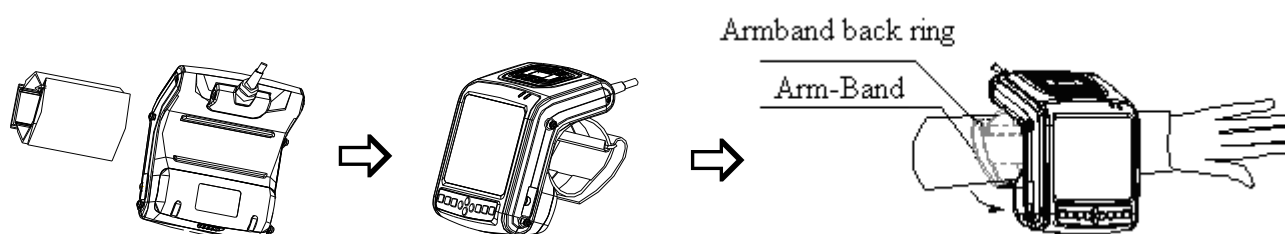
1. Place the instrument on a desktop to use



As shown in figure, insert the support bracket from the back of the instrument, place the instrument on a desktop; adjust the angle of the support bracket to adjust the screen visual angle.

2. Instrument fixed in the arm to use

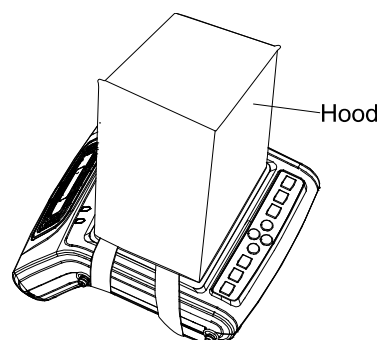
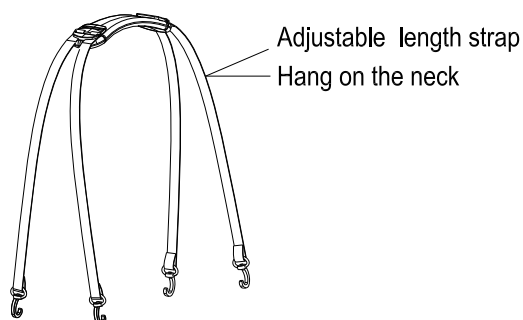
⚠Attention: when using the arm-band, if allergy, please consult a doctor immediately and increase protective measures (e.g. Wear gloves before use).



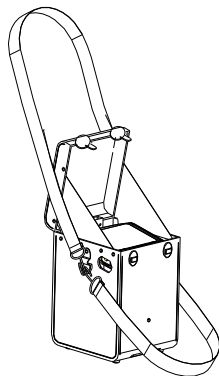
- a. Lock the arm-band as figures from the back of the instrument;
- b. Extend your arm into the arm-band according to arrow direction, or disconnect the arm-band to put on your arm, the long end through the back ring.
- c. Strain the arm-band and stick it firmly on the Velcro.
- d. When using outdoors, if the outdoor light is strong, install the hood on the main unit as shown in the figure below.

3. Instrument hanging on the chest to use

- a. Take out the attached strap; install the strap on the rings of main unit;
- b. Adjust the length of the strap and hang it on your neck so that the screen visual angle meets the requirements.
- c. When using outdoors, if the outdoor light is strong, install the hood on the main unit as shown in the figure below.



4. Instrument places on the leather lag and hangs on the chest to use



Installation:

- Take out the instrument and accessory, install the probe;
- The probe passes through the oval hole of the leather bag, and put the instrument into the leather lag;
- Install the straps on the rings of leather bag as fig shown;
- Adjust the strap length, the one hung on the neck, the other one fixed on the waist, you can also use a strap around your neck or diagonal used in your shoulder.

The benefits of using this method:

- Self-built darkroom for the strong-light environments.
- The protection of leather bag can avoid collisions and pollution in the use process.

5.2 Ultrasonic probe installation

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

⚠ Attention: Probe is highly sensitive to shake, be used with caution. About probe's use and cleaning, the details see the relevant sections.

⚠ 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.
- Check the ultrasonic probe and connecting cable after diagnostic operation. Use of defective probe may cause electric shock.
- Do not strike the probe; using the damaged probe may cause electric shock to the patient.
- Unauthorized disassembly of the probe shall be prohibited as it may cause electric shock.

⚠ Attention:

- Turn off the ultrasonic system before disconnecting the probe. Disconnecting the probe with system power on may damage the system or probe.
- 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.
- Freeze the instrument when instrument is start-up without operation to increase of service life of probe.
- Repeat available machine time should be more than 5 minutes to avoid turn on/off power supply in short time.

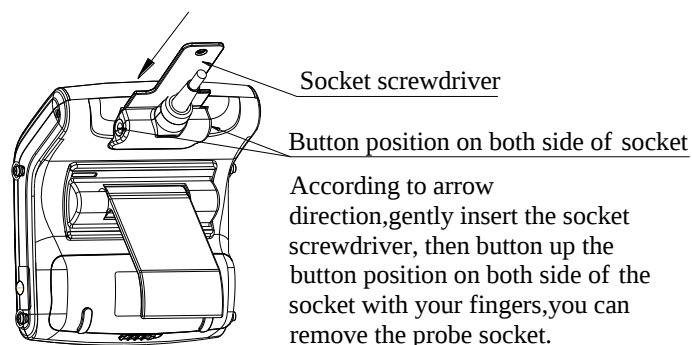
5.2.1 Ultrasonic probe connection

⚠ 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.

Insert the probe connector into the probe socket at the back of the main unit;

5.2.2 Ultrasonic probe disconnection

Turn off the system, and use socket screwdriver to remove the probe with figure's method and instructions.



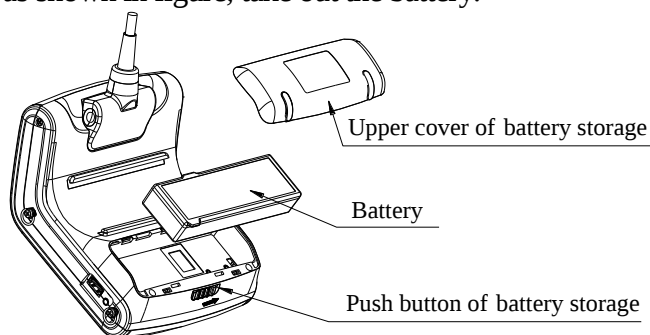
5.3 Install/Remove the battery

1. Install the battery

Put the battery into battery storage of main unit; cover the "Upper cover of battery storage" into the corresponding position, and then toggle the push button in the opposite direction, lock the "Upper cover of battery storage".

2. Remove the battery

According to the direction of the arrow, toggle "Push button of battery storage", removed "Upper cover of battery storage" as shown in figure, take out the battery.



5.4 Video glasses installation

Turn off the system; connect the video signal line of video glasses to the "Video output interface" of the main unit, and then connect the USB line of video glasses to the "USB interface" of the main unit.

5.5 Shutter release installation

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



In the operation, you can "freeze" or "unfreeze" images using shutter release.

5.6 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 video output interface on the right of 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.

5.7 Connect to power

1. Connect to the power adapter

Insert the output plug of adapter into DC power input interface, which is on the left of 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. Adapter has no switch. The isolation of the system with the MAINS used to unplug the adapter as the intended isolation means.**
- 2. The device should be used only with power adapter provided by Kaixin Company.**
- 3. To avoid damaging power adapter or harming people by unexpected fallen, make sure the power adapter is placed on the leveled desk.**
- 4. The operator must not touch signal input/ signal output and patient simultaneously.**

5.8 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.

5.9 Main unit check before and after operation

5.9.1 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, LED screen and enclosure to ensure they are in good working condition and free of abnormality (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 abnormality (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.

5.9.2 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 indication light 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.

5.10 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 Six Functional Operation

6.1 Startup and Shutdown

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

In startup status, press  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.

6.2 System Functions Setting

6.2.1 Time Setting

1. In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Preset";
2. Press direction keys   to enter setting interface;
3. Press direction keys   to select "Minutes, Hours, Day, Month and Year";
4. When setting minutes, hours, day, month and year, press direction key  to increase value or press direction key  to decrease value;
5. Press  key to confirm the time setting and quit setting interface.

6.2.2 TV Mode Setting

1. In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Preset";
2. Press direction keys   to enter setting interface;
3. Press direction keys   to move symbol "<" to point to "TV mode";
4. Press direction keys   to achieve TV mode conversion between PAL and NTSC;
5. Press  key to quit setting interface.

6.2.3 Energy Saving Setting

1. In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Preset";
2. Press direction keys   to enter setting interface;
3. Press direction keys   to move symbol "<" to point to "Sleep";
4. Press direction keys   to select energy saving time among 1~99 minutes or select "Off";
5. Press  key to quit setting interface.

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

6.2.4 Characters Brightness Setting

1. In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Preset";
2. Press direction keys   to enter setting interface;
3. Press direction keys   to move symbol "<" to point to "Font Bright";
4. Press direction keys   to select characters brightness among 160, 192, 224 and 255;
5. Press  key to quit setting interface.

6.2.5 Hospital Name Setting

1. In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Preset";

2. Press direction keys   to enter setting interface;
3. Press direction keys   to move symbol "<" to point to "Hospital";
4. Press  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  key to achieve capital and small letter conversion; If the cursor point to Shift, press  key to achieve the conversion between the letter and punctuation;

5. Press direction keys to choose "numbers" or "characters" and press  key to confirm;
6. If need modify the content, press  key to quit the character input menu, press direction keys   to delete input content; press  key again to retype;
7. Press  key to save this setting and quit setting interface.

6.2.6 Key Sound Setting

1. In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Preset";
2. Press direction keys   to enter setting interface;
3. Press direction keys   to move symbol "<" to point to "Key Sound";
4. Press direction keys   to select between "On" and "Off";
5. Press  key to quit setting interface.

6.2.7 Compression Curve Setting

1. In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Preset";
2. Press direction keys   to enter setting interface;
3. Press direction keys   to move symbol "<" to point to "Compression Curve";
4. Press direction keys   to select compression curve among "00" – "07";
5. Press  key to quit setting interface.

Note: If use 3.5MHz or 4.0MHz probe, it is recommended to choose 04; if use 6.5MHz or 7.5MHz probe, recommend choose 00.

6.2.8 Grid setting

1. In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Preset";
2. Press direction keys   to enter setting interface;
3. Press direction keys   to move symbol "<" to point to "Grid set";
4. Press direction keys   to select "00" – "05"; "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;
5. Press  key to quit setting interface.

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

6.3 Mode selection

In real-time mode, press  key repeatedly to achieve mode switching of B, B/B, 4B, B/M and M.

6.3.1 B Mode

B mode is a basic operation mode after startup and a single-framed B mode image is displayed.

6.3.2 B/B Mode

1. In real-time mode, press  key to enter B/B mode.
2. B/B image switch. Press  key to enter main-menu and press direction keys  to move the cursor to "B/B 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  key to exit B/B mode.

6.3.3 4B Mode

1. In real-time mode, press  key to enter 4B mode.
2. 4B image switch. Press  key to enter main-menu and 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  key to exit 4B mode.

6.3.4 B/M Mode

1. In real-time mode, press  key to enter B/M mode.
2. Change of scan mode. Press  key to enter main-menu and press direction keys  to move cursor to "M Mode" and then press direction keys  to change the M ultra-scan mode.
3. Move sample line. Press  key to quit the current using status of direction keys. Press left/right direction keys to move sample line.
4. In real-time mode, press  key to exit B/M mode.

6.3.5 M Mode

1. In real-time mode, press  key to enter M mode.
2. Change of M-scan mode: Press  key to enter main-menu and press direction keys  to move cursor to "M Mode" and then press direction keys  to change the M ultra-scan mode.
3. Change of M speed: Press  key to enter main-menu and 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  key to exit M mode.

6.4 Image Quality Adjustment

6.4.1 Brightness and Contrast Adjustment

In the startup default status, press freeze key to unfreeze, press  key to quit the current using status of direction keys, the adjustment bars of brightness and contrast will be displayed on the screen by pressing direction keys , adjust them according to actual need. Press direction key  to increase brightness and contrast, direction key  to decrease them; press direction keys  to select brightness or contrast adjustment.

Note: In normal operation, it can adjust brightness and contrast; if not be adjusted with direction keys , you must exit current use status for direction keys.

6.4.2 Total Gain Adjustment

In real-time mode, press  key to enter main-menu and 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.

6.4.3 Near Field Gain Adjustment

In real-time mode, press  key to enter main-menu and 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.

6.4.4 Far Field Gain Adjustment

In real-time mode, press  key to enter main-menu and 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.

6.4.5 Dynamic Range Adjustment

In real-time mode, press  key to enter main-menu and 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.

6.4.6 Frequency Adjustment (Frequency conversion)

In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Freq." in the display area. Press direction keys   to achieve frequency conversion.

6.4.7 Focus Adjustment and Control

In real-time mode and in B, B/B or 4B mode, press  key to enter main-menu and move cursor to "F. Num" and then press direction keys   to choose from the four focus modes of stage 1(Full process dynamic focus), 2, 3 and 4.

In real-time mode and in B, B/B, 4B, B/M or M mode, press  key to quit menu mode, press direction keys   again to move the focus up and down.

Note: In B/M or M mode, only allowed choosing single focus mode.

6.4.8 Frame Correlation Adjustment

In real-time mode and in B, B/B, 4B or B/M mode, press  key to enter main-menu and press direction keys   to move cursor to "Frame Avg" in the display area. Press direction keys   to achieve four levels of frame correlation.

6.4.9 Image Post-process Adjustment

In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "IP" in the display area and then press direction keys   to obtain corrected image. System default is 2.

Note: After image post-process are adjusted, the parameter is retained after shutdown.

6.4.10 Edge Enhancement Adjustment

In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to "Edge" in the display area and then press direction keys   to gain four levels of sharpened images. System default is 0.

6.5 Image Control

6.5.1 Magnification Selection

In real-time mode, press  key to enter main-menu and move cursor to "Zoom" and then press direction keys   to choose eight kinds of magnification.

6.5.2 Depth Range Selection and Depth Enhancement

In real-time B, B/B mode, press  key to enter main-menu and press direction keys   to move cursor to "Depth" in the display area and then press direction keys   to select depth, press  key to quit depth range selection.

Note: There is no depth range selection function when main unit connecting the probe, which its nominal frequency greater than or equal to 6.5MHz.

In real-time B, B/B, B/M, M mode, press  key to enter main-menu and press direction keys   to move cursor to “Upgrade” in the display area and then press direction keys  , “” appears on the screen. Press direction keys to move image up/down or left/right so as to observe the images of different depth and width. Press  key to quit depth heighten status.

6.5.3 Local Zoom and Local Additive Color

In real time mode, press  key to enter main-menu and press direction keys   to move cursor to “Local Zoom” in the display area and then press direction keys  , a box appears. Press direction keys to move the box to the position to be enlarged, the selected image be enlarged; Press  key to quit local zoom status.

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

6.5.4 Image Left/right Reverse

In real-time mode and in B, B/B, 4B or B/M mode, press  key to enter main-menu and press direction keys   to move cursor to “HRev” and then press direction keys   to achieve image horizontal reverse. The image horizontal reverse is the change of probe scanning direction. The probe scanning direction is indicated by the arrow on the upper left area of the image.

6.5.5 Image Up/down Reverse

In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to “VRev” and then press direction keys   to achieve image vertical reverse.

6.5.6 Image Negative

In real-time mode and in B/B, 4B, B/M or M mode, press  key to enter main-menu and press direction keys   to move cursor to “Image POS” and then press direction keys   to achieve negative function.

6.5.7 Ruler (Automatic Backfat Measure)

1. In real-time B mode, press  key to enter main-menu and press direction keys   to move cursor to “Ruler” in the display area and then press direction keys   to turn on or turn off 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 horizontal dotted line of fat thickness measurement appears in the middle of screen, press direction keys   to adjust the position of the dotted line, the backfat measurement value is automatically displayed at the “+:---mm” on the right side of the screen.
3. Press  key, and then press direction keys   to choose “Clear” in display area and press  key to clear all marks and data;
4. Press  key to unfreeze, clear all marks and data and quit the measurement 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.

6.5.8 Color Selection

In real-time mode, press  key to enter main-menu and press direction keys   to move cursor to “Color:” in the display area and then press direction keys   to achieve the conversion of forty kinds of

colors (including one kind of black and white).

6.5.9 Scan Range (Angle/Width Change)

In real-time B mode, press  key to enter main-menu and press direction keys   to move cursor to “Angle” and then press direction keys   to choose angle/width.(convex array for scanning angle and linear array for scanning width).

6.5.10 Image Filter

In real-time B mode, press  key to enter main-menu and press direction keys   to move cursor to “Filter” and then press direction keys   to achieve the conversion of two kinds of filter.

6.5.11 Image Freeze/Unfreeze

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

6.6 Puncture guide line and lithotripsy positioning line

Puncture guide line: In real-time B mode, press  key to enter main-menu and press direction keys   to move cursor to “Puncture” and then press direction keys   to choose line 1, press  key to confirm, two puncture guide lines appear on the screen, press direction keys   to change the angle of the first puncture guide line, press direction keys   to change the start position of the first puncture guide line. Press  key again to enter main-menu and press direction keys   to move cursor to “Puncture” and then press direction keys   to choose line 2, press  key to confirm, press direction keys   to change the angle of the second puncture guide line, press direction keys   to change the start position of the second puncture guide line. Press  key to quit the puncture guide status.

Lithotripsy positioning line: In real-time B mode, press  key to enter main-menu and press direction keys   to move cursor to “Puncture.” and then press direction keys   to choose line 3, press  key to confirm, lithotripsy positioning line appears on the screen; At the same time, the measurement depth of lithotripsy positioning line “+: 0.0mm” is shown at the top right corner, operate the up/down keys to positioning the depth. Press  key to quit.

6.7 Body Mark and Probe Mark

This product contains 27 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”, press  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  key to confirm the selected body mark;
3. Press direction keys to change the probe mark position; press  key to change probe mark direction, press  key to confirm;
4. Press  key to quit body mark and probe mark status;
5. Press  key to quit froze status.

6.8 Image storage and recall

6.8.1 Save image

● Storage to main unit

1. Freeze the image;
2. Press  key, a “Save” prompt appears on lower right corner of the screen;
3. Press direction keys   to select the image code need to be saved in the “LOCAL”, such as choose “003”;

4. Press  key to appear “Wait” prompt. After the prompt disappear, 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.

● Storage to U disk

1. Plug U disk;
2. Freeze the image;
3. Press  key, a “Save” prompt appears on lower right corner of the screen;
4. Press direction keys   to select the image code need to be saved in the U disk, such as choose “004”;
5. Press  key to appear “Wait” prompt. After the prompt disappear, the current image is saved in the frame for coded “004”. The saved image code is preceded with asterisk “*”. The current image is saved in the “USER” folder in the U disk, and file name is the selected image code;
6. Press  key to quit saving status and press  key to return to real-time mode.

Explanation:

1. Main unit and the “USER” folder of the U disk are all stored up to 256 images.

2. Press  key, can select “LOCAL” or “U Disk”.

6.8.2 Open image

● Open image in the main unit

1. Freeze the image;
2. Continuously press  key twice, a “Read” prompt appears on lower right corner of the screen;
3. Press direction keys   to select the image code need to be read out in the “LOCAL”, such as choose “003*”;
4. Press  key to appear “Wait” prompt. After the prompt disappear, the image stored in frame “003*” is read out;
5. Press  key to quit reading status and press  key to return to real-time status.

● Open image in the U disk

1. Plug U disk;
2. Freeze the image;
3. Continuously press  key twice, a “Read” prompt appears on lower right corner of the screen;
4. Press direction keys   to select the image code need to be read out in the U disk, such as choose “004*”;
5. Press  key to appear “Wait” prompt. After the prompt disappear, the image stored in frame “004*” is read out;
6. Press  key to quit reading status and press  key to return to real-time status.

Explanation:

1. When reading images, it must choose the image code with “*”.

2. If has read out the images in the U disk, also would like to re-read the local image, must press  key to exit this reading status, then press  key to choose “LOCAL”, and vice versa.

6.9 Single dump and mass dump

6.9.1 Single dump

● From main unit to U disk

1. Plug U disk;
2. Read out the image in the main unit, “Img” with highlight status is displayed on lower right corner of the screen;

3. Press  key, a "Dump" prompt appears on lower right corner of the screen;
4. Press direction keys   to select the image saving code in the U disk, such as choose "005";
5. Press  key, "Dump" prompt disappears, until the "Dump" re-appears, the current image can be dumped in the frame for coded "005". The dumped image code is preceded with asterisk "*";
6. Press  key to quit dumping status and press  key to return to real-time status.

● From U disk to main unit

1. Plug U disk, read out the image in the U disk, "Img" with highlight status is displayed on lower right corner of the screen;
2. Press  key, a "Dump" prompt appears on lower right corner of the screen;
3. Press direction keys   to select the image saving code in the "LOCAL", such as choose "006";
4. Press  key, "Dump" prompt disappears, until the "Dump" re-appears, the current image can be dumped in the frame for coded "006". The dumped image code is preceded with asterisk "*";
5. Press  key to quit dumping status and press  key to return to real-time status.

6.9.2 Mass dump

● From main unit to U disk

1. Plug U disk;
2. Freeze the image, continuously press cine loop key  until enter "PAUSE" status;
3. Press  key, "LOCAL -> U Disk Mass Dump?" prompt display at the bottom of the screen;
4. Press  key, "Mass Dumping" prompt appears, images are mass dumped under the "DUMP" folder in the U disk, and the number behind "PAUSE" character is the number of files name of mass dumping. After finishing mass dumping, return to "PAUSE" status;
5. Press  key to quit mass dumping status and press  key to return to real-time status.

● From U disk to main unit

1. Plug U disk;
2. Freeze the image, continuously press cine loop key  until enter "PAUSE" status;
3. Press  key twice, "U Disk -> LOCAL Mass Dump?" prompt display at the bottom of the screen;
4. Press  key, "Mass Dumping" prompt appears, the number behind "PAUSE" character is the number of files name of mass dumping. After finishing mass dumping, return to "PAUSE" status;
5. Press  key to quit mass dumping status and press  key to return to real-time status.

Explanation:

1. Mass dump, which is dump images from main unit to "DUMP" folder in the U disk; can also dump the images under the "DUMP" folder in the U disk to main unit.
2. If U disk does not have "DUMP" folder, or "DUMP" folder does not have images, or the images within the "DUMP" folder are not named by digital 1-100, press  key, although the screen prompt "Dumping", the image number is not appeared on the right corner of the screen.

6.10 Delete the image

1. Freeze the image, press  key to enter reading or saving image status;
2. Press  key to switch "LOCAL" and "U disk", identify the location "LOCAL" or "U disk" for file need to be deleted;
3. Press direction key   to select the image code to be deleted, such as "002*";

4. Press  key, the image will be deleted, “*” will automatically disappear;
5. Repeat the 2-3 steps, delete other images;
6. Press  key to return to real-time mode.

6.11 Image review

1. Freeze the image, press  key to enter reading or saving image status;
2. Press  key to enter the function of “LOCAL” image review, images will be automatically played by the fixed time interval;
3. Press direction keys   to select the previous or the next image to review;
4. Press  key to return to frozen status.

6.12 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.

Freeze the image, continuously press  key three times to enter the automatic playback status; Press  key to enter pause status when playing back; Press direction keys   to view images frame by frame in pause status; Continuously press  key three times again to return to automatic playback status. In the process of saving and playback, relevant data of image frames saved and played are shown on the lower right corner of the screen.

Press  key to return to frozen status.

Press  key unfreeze and quit playback status.

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

6.13 Text Input

Operation steps:

1. In B mode, freeze image;
2. Press  key, the cursor is located behind ID;
3. Press  key again, 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  key to achieve capital and small letter conversion; If the cursor point to Shift, press  key to achieve the conversion between the letter and punctuation;

4. Press direction keys to choose “numbers” or “characters” and press  key to confirm;
5. After inputting ID, press  key, the screen below shows “Pregnancy, Unpregnancy, Suspected, Disease” four kinds of results; at the same time the date and time of inspection automatically shown behind the result;
6. Press direction keys   to select the result, press  key to confirm and exit;
7. Press  key, the cursor is located behind ID, press direction keys to move cursor to image area and press  key again to input according to Step 4;
8. If need modify the content, continuously press  key twice to quit annotation status, press direction keys   to select “Clear”, at last press  key to clear all noted marks and retype;
9. Press  key to quit.

6.14 Obstetric list management

6.14.1 Save and view obstetric list

● Storage to main unit

1. Freeze the desired image of B-mode; record the “ID” and “Result” according to the text input method;
2. Press  key to confirm and exit;
3. Press direction keys   to move cursor to “LIST”, press direction keys   to enter obstetric list interface;
4. Press direction keys   to view stored obstetric lists;
5. Press direction keys   to exit obstetric list interface and press  key to return to real-time status.

● Storage to U disk

1. Freeze the desired image of B-mode; record the “ID” and “Result” according to the text input method;
2. Press  key to confirm and exit;
3. Press direction keys   to move cursor to “LIST”, press direction keys   to enter obstetric list interface;
4. Insert U disk, the lower right corner of the screen appears “U DISK” prompt;
5. Press  key, the system issued a “tick” tone, namely the obstetric list stored in the EXCEL spreadsheet on the folder of the U disk; the folder is automatically named by the system current date; the EXCEL spreadsheet is automatically named by the system current time;
6. Press direction keys   to view stored obstetric lists;
7. Press direction keys   to exit obstetric list interface and press  key to return to real-time status.

Such as:

U:\161110\1547.csv

It represents that on November 10, 2016, on the storage path U:\161110, save a “1547.csv” EXCEL spreadsheet.

Note 1: The EXCEL spreadsheet records the results for each inspection in the order. In the EXCEL spreadsheet, the contents of each column respectively: ID, Result, Time and Remark.

Note 2: The main unit stores up to 200 obstetric lists.

6.14.2 Delete obstetric lists

1. Freeze B-mode image, press direction keys   to move cursor to “LIST”;
2. Press direction keys   to enter obstetric list interface;
3. Press  key, clear all the obstetric lists;
4. Press direction keys   to exit obstetric list interface and press  key to return to real-time status.

Chapter Seven General Measurement

7.1 Distance Measurement

1. In B mode, freeze desired image, press direction keys   to move cursor to "Measure"; or in the B/B or B/M mode, freeze desired image, the cursor is located in the "Measure" position of display area;
2. Press  key, the measurement methods are showed in the lower left of the screen, press direction keys   to choose "Distance", press  key again, the cursor will show "+";
3. Press direction keys to move the "+" mark to desired position, press  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 side of the screen;
5. Press  key to exchange the starting point and end point of the measurement;
6. Press  key to finish the first measurement;
7. Repeat the steps 3~6 to complete the multi-group data measurement;
8. Continuously press  key twice to quit the measurement status;
9. Press direction keys   to choose "Clear" in display area and press  key to clear all marks and data;
10. Press  key to unfreeze, clear all marks and data and quit the measurement status.

7.2 Fat thickness Measurement

1. In B mode, freeze desired image, press direction keys   to move cursor to "Measure"; or in the B/B, B/M or M mode, freeze desired image, the cursor is located in the "Measure" position of display area;
2. Press  key, the measurement methods are showed in the lower left of the screen, press direction keys   to choose "Distance", press  key again, the cursor will show "+";
3. Press  key, a dotted line of fat thickness measurement appears in the middle of screen, press direction keys   to move the dotted line to desired position, press direction keys   to move the "+" mark to the end point of the measurement, the measured value of fat thickness is automatically displayed at the built-in mark "+: ----mm" on the right side of the screen;
4. Press  key to complete the multi-group fat thickness measurement;
5. Press  key to return to the status of distance measurement;
6. Continuously press  key twice to quit the measurement status;
7. Press direction keys   to choose "Clear" in display area and press  key to clear all marks and data;
8. Press  key to unfreeze, clear all marks and data and quit the measurement status.

Note: Direction keys   cannot work in the fat thickness measurement when connecting convex array probe.

7.3 Circumference/Area/Volume Measurement

● Circumference/area measurement with trace method

1. In B mode, freeze desired image, press direction keys   to move cursor to "Measure"; or in the B/B mode, freeze desired image, the cursor is located in the "Measure" position of display area;

2. Press  key, the measurement methods are showed in the lower left of the screen, press direction keys   to choose "Trace", press  key again, the cursor will show "+";
3. Press direction keys to move the "+" mark to desired position, press  key to set the "+" mark position as the start of the measurement;
4. Press direction keys to move the "+" mark to the end point of the measurement. At the same time, a locus appears in the direction of operation between the two measurement marks. The measured circumference value is displayed automatically at the built-in mark "C: 00000mm" on the right part of the screen. Press  key to display at the built-in mark "A: 00000mm²" the value of the measured area formed by measurement line enclosure;
5. Press  key, the measurement methods are showed in the lower left of the screen, continue to choose "Trace" to measure;
6. Repeat steps 3, 4 to complete the multi-group data measurement;
7. Continuously press  key twice to quit the measurement status;
8. Press direction keys   to choose "Clear" in display area and press  key to clear all marks and data;
9. Press  key to unfreeze, clear all marks and data and quit the measurement status.

● Circumference/area measurement with multi-point method

1. In B mode, freeze desired image, press direction keys   to move cursor to "Measure"; or in the B/B mode, freeze desired image, the cursor is located in the "Measure" position of display area;
2. Press  key, the measurement methods are showed in the lower left of the screen, press direction keys   to choose "Multi-point", press  key again, the cursor will show "+";
3. Press direction keys to move the "+" mark to desired position, press  key to mark the first point, continue to press direction keys, move the "+" mark to next desired position, press  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  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: 00000mm²" 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: 00000mm²" on the right part of the screen;
5. Repeat steps 3, 4 to complete the multi-group data measurement;
6. Continuously press  key twice to quit the measurement status;
7. Press direction keys   to choose "Clear" in display area and press  key to clear all marks and data;
8. Press  key to unfreeze, clear all marks and data and quit the measurement status.

● Circumference/area/volume measurement with ellipse method

1. In B mode, freeze desired image, press direction keys   to move cursor to "Measure"; or in the B/B mode, freeze desired image, the cursor is located in the "Measure" position of display area;
2. Press  key, the measurement methods are showed in the lower left of the screen, press direction keys   to choose "Ellipse", press  key again, the cursor will show "+";
3. Press direction keys to move the "+" mark to desired position, press  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  key, the “←▷+” mark appears on the screen. Hold down  or  key to change the minor axis of the ellipse so as to satisfy the test area. The measured values are displayed at the built-in characters “C: 00000mm, A: 00000mm², V: 00000 cm³” on the right part of the screen automatically;
6. Press  key again to quit the minor axis status; Press  key to exchange the starting point and end point;
7. Press  key to finish the first measurement;
8. Repeat the steps from 3 to 7 to complete the multi-group data measurement;
9. Continuously press  key twice to quit the measurement status;
10. Press direction keys   to choose “Clear” in display area and press  key to clear all marks and data;
11. Press  key to unfreeze, clear all marks and data and quit the measurement status.

7.4 Slope/Heart rate/Cycle Measurement

The method to measure slope/heart rate/cycle 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 area, the value of the “+: ” refers to distance; if starting point and end point of the measurement mark fall into the M-mode 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.

+: denotes depth measured in mm (millimeter)

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

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

T: denotes cycle measured in ms (millisecond)

 **Attention:** The accuracy of software measurement: distance measurement $\leq 1\text{mm}$; area measurement $\leq 1\text{mm}^2$; volume measurement $\leq 1\text{cm}^3$; heart rate measurement $\leq 1\text{bpm}$; time measurement $\leq 1\text{ms}$. 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.

Chapter Eight Obstetric Measurement

8.1 Measurement and Calculation items

Obstetric tables of the system including: 1.BOVINE, 2.EQUINE, 3.OVINE, 4.CANINE, 5.FELINE, 6.GOAT, 7.LLAMA, 8. SWINE, which is reference for doctor.

8.2 Measurement of Gestational Age (GA) and Estimated Date of Confinement (EDC)

Follow the steps below:

1. In B mode, freeze desired image, press direction keys   to choose "OB Measure" in the display area; or in the B/B mode, freeze desired image, press direction keys   to choose "OB" in the display area;
2. Press  key to display the obstetric measurement animals on the lower part of the screen, "VETERI Select: 1.BOVINE, 2.EQUINE, 3.OVINE, 4.CANINE, 5.FELINE, 6.GOAT, 7.LLAMA, 8. SWINE", press direction keys   to select the measurement animal, press  key to confirm, measured parameters of this animal are showed on the lower part of the screen, (for example, select goat that is, display the types of goat);
3. Press direction keys   to select the measured parameters (for example select goat, this step is to select the type of goat, press  key again to display the measured parameters of goat), press  key, the cursor will show "+";
4. Press direction keys to move the "+" mark to desired position, press  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 start and the end as the dashed locus of the measurement. The measured value is automatically displayed at the built-in mark "+: ----mm" on the right side of the screen; G.A and EDC value to be displayed in real time in the right area of the screen;
6. Press  key to exchange the starting point and end point;
7. Press  key to finish the first measurement;
8. Repeat the steps from 3 to 7 to complete the multi-group data measurement;
9. Press  key to quit measurement status for this animal;
10. Repeat steps 2 to 9 to complete a variety of animals measurements;
11. Press  key to quit measurement status, press direction keys   to choose "Clear" in display area and press  key to clear all marks and data;
12. Press  key to unfreeze, clear all marks and data and quit the measurement status.

8.3 Measurement of Swine's lean percentage

% Lean calculation formula uses NSIF formula.

1. In B mode, freeze desired image, press direction keys   to choose "OB Measure" in the display area; or in the B/B mode, freeze desired image, press direction keys   to choose "OB" in the display area;
2. Press  key to display the obstetric measurement animals on the lower part of the screen, "VETERI Select: 1.BOVINE, 2.EQUINE, 3.OVINE, 4.CANINE, 5.FELINE, 6.GOAT, 7.LLAMA, 8. SWINE", press direction keys   to select "8.SWINE", press  key to confirm, measured parameters of this animal are showed on the lower part of the screen;

3. Press direction keys   to select “2. %Lean”, press  key again to confirm, the cursor will show “+”;
4. Press direction keys     to select “Weight” (range 1.0~300.0kg), press  key again to confirm;
5. Measure the fat thickness with distance measurement method, the fat thickness is displayed in real time in the right area of the screen; measure loin with distance measurement method, the loin is displayed in real time in the right area of the screen; press  key to finish the loin measurement, the %Lean will be displayed in the right area of the screen;
6. Continuously press  key twice to quit the measurement status;
7. Press direction keys   to choose “Clear” in display area and press  key to clear all marks and data;
8. Press  key to unfreeze, clear all marks and data and quit the measurement status.

8.4 Obstetric report

In frozen status, press direction keys   to move the cursor to the position “Report”. Press direction keys   to display obstetric report. Press  key to exit obstetric report status.

8.5 Measurement items

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

Chapter Nine System Maintenance

The system maintenance should be performed by the user and service engineer. Users shall be in full charge of maintenance and operation of the system after purchasing the product.

9.1 Maintenance by users

9.1.1 System cleaning and disinfection

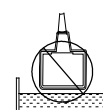
⚠Warning: Turn off the instrument and pull out the power supply wire before cleaning the instrument. It may cause electric shock if clean the system under power is on.

⚠Warning: The device is not waterproof. Do not splash any water or liquor into the system when cleaning or maintaining; otherwise it will cause malfunction or electric shock.

⚠Attention:

1. Probe without cleaning, disinfection may become the source of contamination, so cleaning or disinfection to the probe is very necessary after every ultrasonic diagnosis.
2. To prevent possible infection, it is advisable to wear sterilized gloves when cleaning, disinfecting the ultrasonic probe.
3. In the process of cleaning and disinfection, avoid probe overheating (exceeding 55°C) as it may be deformed or damaged under excessive heat.
4. To prevent the infection or the cross infection, the intra-cavity probe surface should be covered with a condom every time before examination.
5. Do not use the probe packing box to store the probe as the box may become the source of contamination.
6. The waterproof grade of intra-cavity probe is IPX7, immersion depth from probe's acoustic head to the sheath of probe handle; others are IPX4.
7. In the operation of disinfection, please refer to medical institutions disinfection technical specifications.

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



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.
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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 choose 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:

1. Clean the probe with sterile water to remove the residual chemicals after disinfection, because the residual chemicals may be harmful for humans.
2. Kaixin Company will not make any guarantee for the efficacy of disinfectant. Please contact the appropriate manufacturer for details.

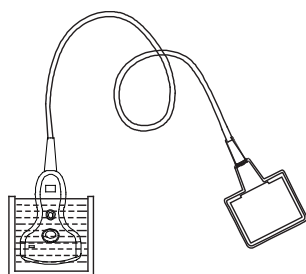


Fig. Immersion disinfection of probe (except intra-cavity probe)

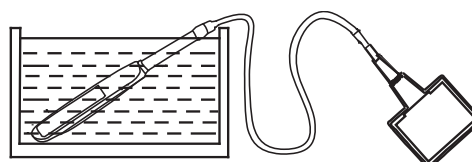


Fig. Immersion disinfection of intra-cavity probe (sketch map)

⚠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. To prevent the infection or the cross infection, such cleaning and disinfection for puncture bracket and probe is very necessary before and after every puncture operation.
3. The regular disinfection times should be minimized as it may lead to degrade of the probe safety and performance.

3. Check probe after cleaning and disinfection

- (1) Check the probe enclosure and its cable to ensure they are free of abnormality (such as scuffing, cracks or drop-off);
- (2) The sound window of probe is thin; ensure that there are no any abnormality 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 LED screen

Use a soft cloth dipped in glass cleaner to clean the LED screen, and then air-dried.

⚠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 LED screen, and prohibit pressing or squeezing against the LED 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

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

9.1.2 Use and maintenance for the rechargeable battery

1. Only use charger and battery (model CNLB-01) provided by KaiXin Company.
2. The output port of adapter plugs into the input port of charger to charge; the minimum charging time is 3 hours and up to 4 hours. Over-charging or discharging will shorten the battery life; the full charged battery can be used for 2 ~ 3 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: Battery charger shall meet the requirements of the IEC60601-1 standard.

⚠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: A power indicator will appear “X” and glitter continually when the electric quantity is too low. Connect the main unit to external power supply and recharge the battery, or turn off the machine to recharge.

⚠Attention: If long-term use external power or do not intend to use the equipment within such a period of time, please remove the battery, to avoid over-charging or discharging the battery which will curtail battery life, or to reduce other risk.

⚠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.

⚠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.

9.2 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 abnormality 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.

Trouble	Correction
Power light is off and no screen display is present when starting the machine.	1. Check power supply. 2. Check power cable and plug. 3. Check power adapter.
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.
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.
Image display is not clear.	1. Adjust the total gain, near field, far field. 2. Adjust the brightness and contrast level.
Control panel malfunction	Restart the system by turning off the main unit power.

9.3 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.

- The following safety checks should be performed at least every 12 months by a qualified person who has adequate training, knowledge, and practical experience to perform these tests.
 - Inspect the equipment and accessories for mechanical and functional damage.
 - Inspect the safety relevant labels for legibility.
 - Inspect the fuse to verify compliance with rated current and breaking characteristics.
 - Verify that the device functions properly as described in the instructions for use.
 - Test the protection earth resistance according to IEC 60601-1: Limit: 0.1Ω.
 - Test the earth leakage current according to IEC 60601-1: Limit: NC300μA, 300uA (for UL) SFC: 1000μA.
 - Test the touch current according to IEC 60601-1: Limit: NC 100μA, SFC: 500μA.
 - Test the patient leakage current according to IEC 60601-1: Limit: for a.c.: 100μA (B), for d.c.: 10μA (B).
 - Test the patient leakage current under single fault condition with mains voltage on the applied part according to IEC 60601-1: Limit: for a.c.: 500μA (B), for d.c.: 50μA (B).

The leakage current should never exceed the limit. The data should be recorded in an equipment log. If the device is not functioning properly or fails any of the above tests, the device has to be repaired.

- Please clean the plug of power cord at least once a year. Too much dust on plug may cause the fire.

Chapter Ten Storage and Transportation

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: $-20^{\circ}\text{C} - 55^{\circ}\text{C}$; 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 Eleven Safety Classification

1. Classified according to electric shock protection type:
Class I, internally powered equipment
2. Classified according to electric shock protection degree:
Type B applied part
3. Classified according to the degree of protection against ingress of liquid:
Main unit belong to IPX0 equipment
4. Classified according to operation safety in condition of existence of flammable anesthetic mixture with air or oxygen or nitrous oxide:
It is neither of category AP equipment nor of category APG equipment
5. Classified according to mode of operation:
Continuous operation equipment
6. Classified according to the protection of radio services:
Group I Class A equipment

Chapter Twelve Guidance and Manufacturer's Declaration

This product complies with EMC test standard IEC 60601-1-2.

⚠Warning: The use of inappropriate accessory will reduce the performance of the product.

⚠Attention:

1. The use of the accessory, transducer or cable other than those specified may result in increased emissions or decreased immunity of the system.
2. The system should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, the system should be observed to verify normal operation in the configuration in which it will be used.
3. The system needs to be specifically for EMC protection, and need to be installed and maintenance in the environment meeting the following provided EMC information.
4. The system may be interfered with by other equipment, even if that other equipment complies with CISPR emission requirements.
5. Prevent electromagnetic interference (Conducted Immunity). Due to technical limitations, conducted immunity level is limited to 1 Vrms, conducted immunity level higher than 1 Vrms may cause the image display of the system interference and affecting the diagnosis and measurement. We recommend the system away from the conduction noise source.
6. Operation of the system below minimum amplitude or value of patient physiological signal may cause inaccurate results.
7. Portable and mobile communications equipment can affect the performance of the system. See the following tables 1, 2, 3, 4.

**Table 1 - Guidance and manufacturer's declaration — electromagnetic emissions-
for all EQUIPMENT and SYSTEMS**

Guidance and manufacturer's declaration — electromagnetic emission		
The KX5200 is intended for use in the electromagnetic environment specified below. The customer or the user of the KX5200 should assure that it is used in such and environment.		
Emission test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The KX5200 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emission CISPR 11	Class A	The KX5200 is suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

**Table 2 - Guidance and manufacturer's declaration — electromagnetic immunity-
for all EQUIPMENT and SYSTEMS**

Guidance and manufacturer's declaration — electromagnetic immunity			
The KX5200 is intended for use in the electromagnetic environment specified below. The customer or the user of KX5200 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV 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 power supply lines	The RESPONSIBLE ORGANIZATION or OPERATOR must take actions (like installing filter on power supply for KX5200) to reduce environmental levels of the ELECTROMAGNETIC DISTURBANCE so that they are less than or equal to the COMPLIANCE LEVEL listed in column 3.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. The KX5200 can continue the operation during power mains interruptions due to the usage of battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Mains power quality should be that of a typical commercial or hospital environment.
Note U_T is the a.c. mains voltage prior to application of the test level.			

**Table 3 - Guidance and manufacturer's declaration — electromagnetic immunity-
for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING**

Guidance and manufacturer’s declaration — electromagnetic immunity			
The KX5200 is intended for use in the electromagnetic environment specified below. The customer or the user of KX5200 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 V _{rms} 150 kHz to 80 MHz outside ISM bands	3 V _{rms}	Portable and mobile RF communications equipment should be used no closer to any part of the KX5200, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=[1.167]\sqrt{P}$ $d=[1.167]\sqrt{P} \quad 80 \text{ MHz to } 800\text{MHz}$ $d=[2.33]\sqrt{P} \quad 800 \text{ MHz to } 2.5 \text{ GHz}$ Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,^a should be less than the compliance level in each frequency range.^b Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3V/m	
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the KX5200 is used exceeds the applicable RF compliance level above, the KX5200 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the KX5200.			
^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

Table 4 - Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM – for EQUIPMENT or SYSTEM that are not LIFE-SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and the KX5200			
The KX5200 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the KX5200 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the KX5200 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 $d=[1.167]\sqrt{P}$	80 MHz to 800 MHz $d=[1.167]\sqrt{P}$	800 MHz to 2.5 GHz $d=[2.33]\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.73
1	1.2	1.2	2.3
10	3.7	3.7	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.			

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