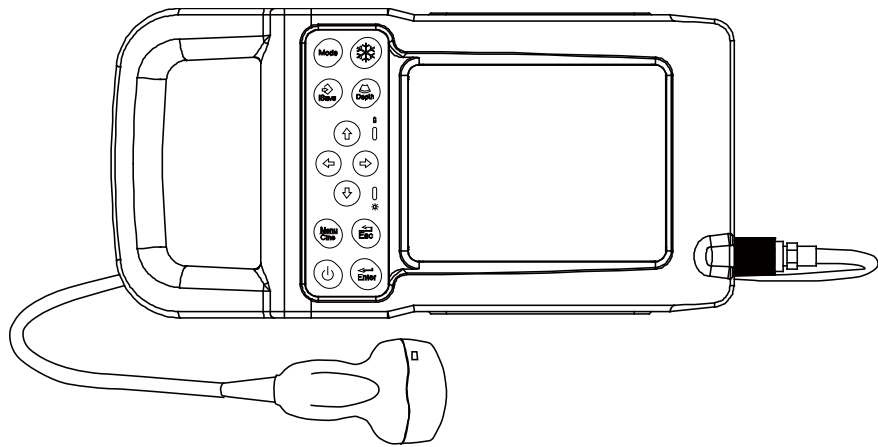


KAIXIN

KX5600L

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

User's Manual



Xuzhou Kaixin Electronic Instrument Co., Ltd.

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Introduction

Thank you for purchasing KX5600L 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: May 24, 2023, Version: V1.00

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

Statement

Kaixin was considered responsible for the safety, reliability and performance in case of meeting all the following requirements: all repairs are performed by professionals recognized by Kaixin; all replacement parts and accessories, consumables involved repairs are Kaixin Company.

Warranty and Repair Service

Purchased the product warranty, sees the company's service policies.

Manufacturer's Information



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Chapter 1 Product Specifications

1.1 Power Supply

Adapter ratings: 100-240V~, 50Hz/60Hz 1A max

Output of adapter: DC12.8V 3.5A

Main device rating: DC12.8V 3.5A

Internal supply voltage: DC10.89V-12.6V

1.2 Operating Environment

Ambient temperature: 10°C~40°C

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

Atmospheric pressure: 700hPa~1060hPa

1.3 Storage and Transportation

1.3.1 Storage and Transportation Conditions

Ambient temperature: -20°C~55°C

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

Atmospheric pressure: 700hPa~1060hPa

1.3.2 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°C — 55°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.

1.4 Dimensions and Weight

1. Main unit dimension: approx. 285 * 143 * 35mm³ (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.	3.5 MHz convex array probe	1 PC
3.	Power adapter	1 PC
4.	Power cable	1 PC
5.	Strap	1 PC
6.	Leather bag	1 PC
7.	Plastic sealed box	1 PC
8.	Shutter release	1 PC
9.	Hood	1 PC

2.2 Optional Parts

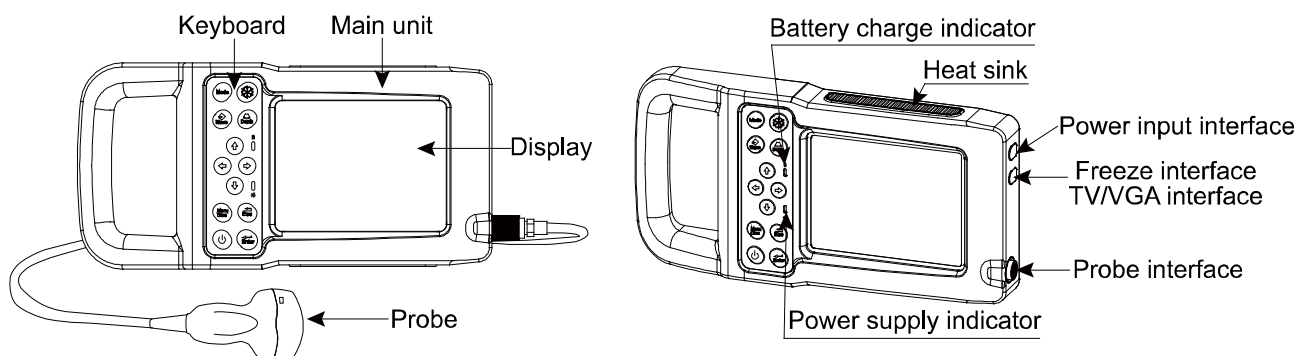
1. 4.0 MHz convex array transrectal probe
2. Video recorder
3. Leather case (including strap)
4. Probe holder

Chapter 3 Product Introduction

3.1 Structure Composition of the Instrument

KX5600L 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 3.5MHz convex array probe for example:

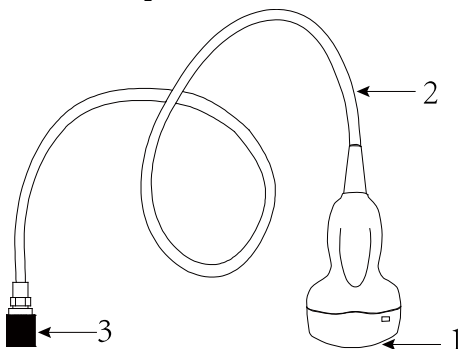


Figure: Parts name of 3.5MHz convex array probe

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.

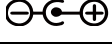
3.4 Function Keys Description

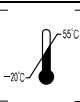
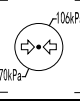
SN.	Function keys	Function
1		1. In real-time status, select mode;

		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. 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!

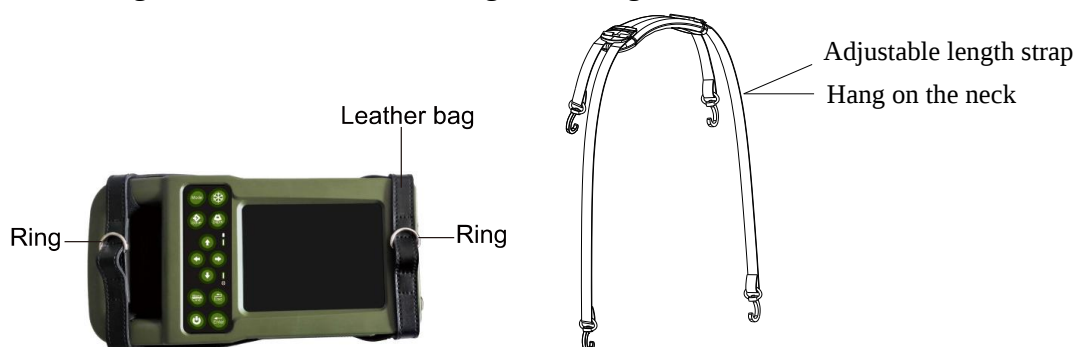
4.1 System Installation

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:

- Take out the instrument and accessory, first put the equipment into the leather bag;
- 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;
- Adjust the length of the strap, and hang it on the neck for use;
- When using outdoors, if the outdoor light is strong, install the hood on the main unit.



4.2 Ultrasonic Probe Installation

⚠ 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.

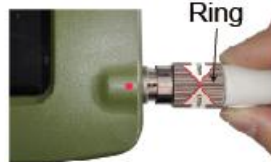
1. Turn off the system, pinch the oval position on both sides of the probe cable



while keep the arrow above, as shown

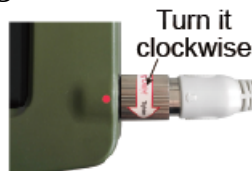


2. As shown below, insert the probe connector horizontally into the probe socket labeled "PROBE" of the main unit, when inserting the probe, the notch on the probe connector should be aligned with the position of the red dot mark on the main unit housing, and push the probe firmly into the probe socket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

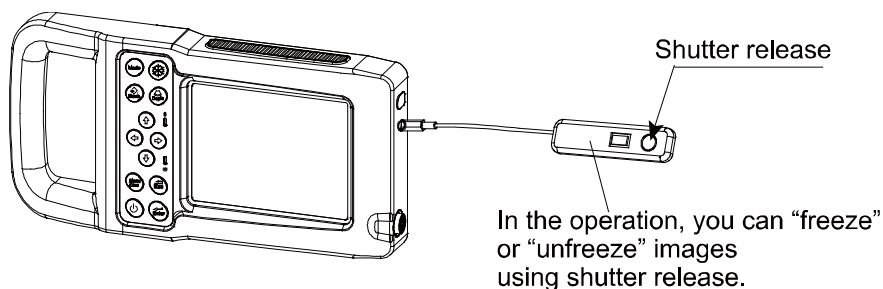
1. Turn off the system, pinch the oval position on both sides of the probe cable with one hand and rotate the probe ring counterclockwise with the other hand;
2. When rotating counterclockwise, pull out the ultrasonic probe connector vertically when the ring touches the probe cable.



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.

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 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 the contaminated objects as specified in relevant sections.
7. Check all the ports of the machine for possible damage or blockage.

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.

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  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  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  key to confirm the time setting and quit setting interface.

5.3.2 TV Mode Setting

1. Press  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  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  key to confirm the setting and quit setting interface.

5.3.3 Energy Saving Setting

1. Press  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  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  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  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  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  key to confirm the setting and quit setting interface.

5.3.5 Hospital Name Setting

1. Press  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  key to enter setting interface;
3. Press direction keys   to move the 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, 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  key, move the cursor to the position need to deleted character, and then press direction keys to move cursor to character “←”, press  key, delete input content and retype.

7. Press  key to quit the character input status and save this setting.

5.3.6 Key Sound Setting

1. Press  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  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  key to confirm the setting and quit setting interface.

5.3.7 Grid Setting

1. Press  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  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  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  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  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  key to confirm the setting and quit setting interface.

Note: The WIFI function is to be upgraded.

5.3.9 Mode Setting

1. Press  key to enter main-menu, press direction keys   to move cursor to “Setup”;
2. Press  key to enter setting interface;
3. Press  key to enter mode selection menu;
4. Press direction keys   to move the symbol “<” to point to the checkbox for “Mode 4B”, “Mode BM” or “Mode M”;
5. Press  key to uncheck, press  key again to check;
6. Press  key to confirm the setting and quit setting interface.

Note: After the mode is unchecked, the image of the related mode is no longer displayed.

5.4 Mode Selection

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

Note: 4B, B/M, and M mode are checked by default in the checkbox.

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  key to exit B mode.

5.4.2 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, 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  key to exit B/B mode.

5.4.3 4B Mode

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

5.4.4 B/M Mode

1. In real-time mode, press  key to enter B/M mode.
2. Change M scan mode. Press  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  key to quit the current using status for direction keys. Press direction keys   to move sample line.
4. In real-time mode, press  key to exit B/M mode.

5.4.5 M Mode

1. In real-time mode, press  key to enter M mode.
2. Change M scan mode: Press  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  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  key to exit M mode.

5.4.6 A Mode

In real-time mode, press  key to enter or exit A 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  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  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  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  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  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  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  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  key to select eight kinds of depth.

5.5.7 Frequency Adjustment (Frequency conversion)

In real-time mode, press  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  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  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  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  key to enter main-menu, press direction keys  to move cursor to “LocalZoom” in the display area, press  key, a box appears. Press direction keys to move the box to the position to be enlarged, the selected image will 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.

5.5.12 Image Left/Right Reverse

In real-time B, B/B, 4B or B/M mode, press  key to enter main-menu, press direction keys  to move cursor to “L/R” 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  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  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  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  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 Gain adjustment in A mode

In real-time A mode, press  key to enter main-menu, press direction keys   to move cursor to “Gain” in the display area. Press direction key  to increase image gain, press direction key  to reduce it.

5.7 Auto Ruler (Automatic Backfat Measure)

1. In real-time B mode, press  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  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.

5.8 Restore Parameters

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

5.9 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  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;
4. Press  key to quit body mark and probe mark status;
5. Press  key to quit froze status.

5.10 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.

5.11 Image Management

5.11.1 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.

5.11.2 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 “*”.

5.11.3 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.

5.11.4 Review the Image

1. Press  key to freeze the image, continuously press  key twice to enter reading image status;
2. Press direction keys   to select the image code with “*”, press  key;
3. Press  key to review the images, the stored images will be automatically played by the fixed time interval;
4. Press  key to quit reading status;

5. Press  key to return to real-time status.

5.12 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.

Press  key to freeze the image, continuously press  key three times to enter the automatic playback status; in the automatic playback status, press  key to enter manual playback status; in the manual playback status, press direction keys   to view images frame by frame;

continuously press  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  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.

5.13 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  key, the cursor is located behind “ID”;
3. Press  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  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, repeatedly press  key to choose “Pregnancy, Unpregnancy, Suspected, Disease” four kinds of check results;
6. Press  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  key to confirm and quit the input status.
8. If need to modify the input content, press direction keys   to select “Clear”, press 

key to clear all noted marks and retype.

5.14 Check List Management

5.14.1 Save and View Check List

1. Freeze the desired image;
2. Record the “ID” and “Result” according to the method in section 5.13 Text Input, press  key to confirm and save to the check list;
3. Press direction keys   to move cursor to “LIST”, press  key to enter check list interface;
4. Press direction keys   to view stored check lists;
5. Press  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.

5.14.2 Delete Check Lists

1. In the frozen status, press direction keys   to move cursor to “LIST”, press  key to enter check list interface;
2. Press  key, clear all the check lists;
3. Press  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  key, the measurement methods are showed in the lower left of the screen, press direction keys   to choose “1. Distance”, press  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  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  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 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  key, the measurement methods are showed in the lower left of the screen, press direction keys   to choose “2. 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 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: 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 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  key, the measurement methods are showed in the lower left of the screen, press direction keys   to choose “3. 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 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.

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)

6.2 Obstetric Measurement

6.2.1 Measurement and Calculation Items

The following obstetric tables of the system for doctor's reference:

When the 3.5MHz convex array probe is configured, the obstetric table is: 1. Swine, 2. Ovine, 3. Canine, 4. Feline;

When the 4.0MHz convex array probe is configured, the obstetric table is: 1. Bovine, 2. Equine, 3. Llama.

6.2.2 Measurement of GA and EDC

Measurement steps, taking the 3.5MHz convex array probe as an example:

1. In B, 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 in the lower part of the screen, "Animal: 1.Swine, 2.Ovine, 3.Canine, 4.Feline", press direction keys   to select the measured animal, press  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  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 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  key to exchange the starting point and end point;
7. Press  key to finish the 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. Press direction keys   to select the other animal, press  key to confirm, repeat steps 3 to 7 to complete a variety of animals measurements;
11. Continuously press  key twice to quit the obstetric measurement status;
12. Press direction keys   to choose "Clear" in display area and press  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 IMF

1. In B, 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 in the lower part of the screen, “Animal: 1.Swine, 2.Ovine, 3.Canine, 4.Feline”, press direction keys   to select “1. Swine”, press  key to confirm, measured parameters of swine are showed in the lower left of the screen;
3. Press direction keys   to select “2.IMF”, press  key again to confirm, the cursor will show “+”;
4. Move the cursor to the measuring position, measure the SF (subcutaneous fat thickness) with distance measurement method, the “SF: ----mm” is displayed in real time on the right part of the screen; measure MT (muscle thickness) with distance measurement method, the “MT: ----mm” is displayed in real time on the right part of the screen, at the same time the IMF (intermuscular fat) is automatically displayed at the built-in mark “IMF: ----%” on the right part of the screen; press  key to finish the IMF measurement;
5. Continuously press  key twice to quit the measurement status;
6. Press direction keys   to choose “Clear” in display area and press  key to clear all marks and data;
7. 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  key to display current measurement obstetric report. Press  key to exit obstetric report status.

6.3 Backfat thickness and Lean percentage measurement

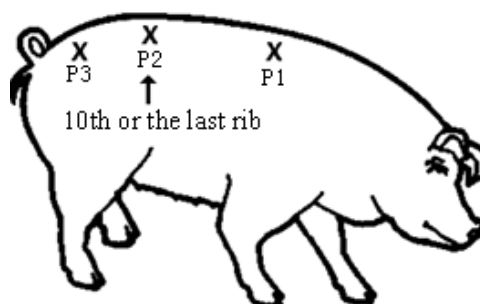
In A mode, you can measure the swine’s backfat thickness and lean percentage.

6.3.1 Measurement and Calculation Items

Name	Abbreviation	Unit
Backfat thickness	BF	mm
Loin thickness	Loin	mm
Average thickness	AVG	mm
Weight	Weight	Kg
Lean percentage	LEAN	%

6.3.2 Backfat measurement

1. Choose the desired measurement site: the trailing edge of shoulder (P1), the tenth rib (P2), the lumbosacral junction (P3);



2. Put ultrasonic coupling gel to the appropriate site of swine's back, in order to make good contact between swine skin and sound window. The probe is placed against the skin of the animal and is kept perpendicular to the back, move the probe gently, make sure no air bubbles between the skin and probe. Keep the swine quiet during the test (you can feed the swine during the test).
3. After the image is automatically frozen, the machine automatically displays four groups' measurement data and the corresponding waveform.

Note: You can get accurate values of the three layers of backfat at the P2 site (the last rib). Many hogs have the thin third layer of backfat. As they increase in weight and age, the third layer becomes thicker and wider spread over the body. Measurement at P1 site (the trailing edge of shoulder: about 4-5 rib) is more difficult and inconsistent. P3 site (the lumbosacral junction) will get accurate measurement for two layers of backfat but may not give an accurate measurement for the third layers due to the muscle tissue.

6.3.3 Measurement of Swine's lean percentage

1. In real-time A mode, press  key to enter main-menu, press direction keys   to move cursor to "Weight" in the display area. Press direction keys   to adjust the "Weight" (range: 37~300kg);
2. Put ultrasonic coupling gel to the appropriate site of swine's back, in order to make good contact between swine skin and sound window. The probe is placed against the skin of the animal and is kept perpendicular to the back, move the probe gently, make sure no air bubbles between the skin and probe. Keep the swine quiet during the test (you can feed the swine during the test);
3. After the image is automatically frozen, the backfat thickness and loin thickness are measured, and the lean percentage is automatically displayed in the right area of the screen;
4. Press  key to return the real-time status.

Note: Before measuring the swine's lean percentage, you must enter the weight of the swine (weight range 37 to 300 kg); otherwise, the default weight is 100 kg.

6.3.4 Measurement considerations

1. When measuring the older animal, if necessary, it needs to remove the hair at the site and wet the skin with hot water, then apply light oil to wet the skin one minute or two before measuring. Always keep the probe perpendicular to the swine's back; measurement errors may result if probe is at an angle. If chooses the inaccurate site, such as animal shoulder or arm, the measured result is not accurate.
2. When the probe leaves the measuring site, it needs to reapply ultrasonic coupling gel evenly to continue measurement.
3. Have a bad contact, first remove any possible manure, straw and excess hair, etc., which may cause a poor contact between the sound window and skin and leading to inaccurate measured results.
4. Recommend using dedicated ultrasonic coupling gel, also can use vegetable oil.

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.

7.1 Daily Maintenance

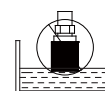
Daily maintenance should be performed by the user.

7.1.1 System Cleaning and Disinfection

⚠ Warning: Turn off the equipment and pull out the power cable 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.



1. Clean the probe

- (1) 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.
- (2) 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.

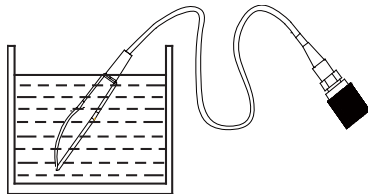


Figure. Immersion disinfection of transrectal probe
(sketch map)

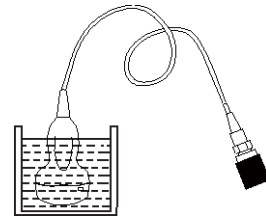


Figure. Immersion disinfection of probe
(except transrectal probe)

⚠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 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 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.

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.

7.2 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. 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: 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: If long-term use external power or do not intend to use the instrument 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.

⚠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 heat up or throw the battery into fire, which will lead to the leakage, explosion or fire;
4. Do not hammerblow, throw or mechanically shake the battery, which will lead to the leakage, explosion or fire;
5. 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;
6. Do not disassemble the battery in any way, which will lead to the leakage, explosion or fire;
7. Do not charge the battery near the heat source or extra-hot environment, which will lead to the leakage, explosion or fire;
8. Do not put the battery into the microwave oven or pressure vessel, which will lead to the leakage, explosion or fire;
9. 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;
10. Do stop the charge and pull out the battery 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;
11. Do remove the battery from the near fire if any leakage or particular smell happens, which will lead to the explosion or fire;
12. 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;
13. 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.

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.

7.4 Troubleshooting

To ensure normal operation, users are recommended to prepare a proper maintenance plan.

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.

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Information contained in this manual is subject to change without further notice.