

# MAGIC 500 PLUS ULTRASOUND UNIT

USER MANUAL



Item No. 303790

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# INTRODUCTION

Thank you for purchasing MAGIC 500 PLUS ultrasound unit.

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.

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

# INTELLECTUAL PROPERTY INFORMATION

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# STATEMENT

EICKEMEYER® has the final explanation right of this user manual. EICKEMEYER® was considered responsible for the safety, reliability and performance if all following requirements are met:

1. Assembly, expansion, readjustment, improve and repair are all performed by professionals recognised by EICKEMEYER®.
2. All replacement parts and accessories, consumables involved repairs are from EICKEMEYER® or approved by EICKEMEYER®.
3. Related electrical equipment complies with national standards and the requirements of the user manual.
4. Operate the product in accordance with the user manual.

# IMPORTANT STATEMENT

1. The user is fully responsible for the maintenance and management of this product after purchasing.
2. Even in the warranty period, warranty does not include the following:
  - Damage or loss caused by error or rough using.
  - Damage or loss caused by force majeure (such as fires, earthquakes, floods, or lightning etc.).
  - 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.
  - Damage or loss caused by using the system outside the initial buy region.
  - Damage or loss caused by the system being purchased not by EICKEMEYER® or its authorised dealer or agents.
3. Do not modify the software or hardware of the equipment without authorization of the manufacturer.
4. In any case, EICKEMEYER® shall not be liable for the problems, damages or losses due to re-installation, alteration or reparation of the system by non-EICKEMEYER® designated personnel.
5. This product is intended to provide clinical diagnostic data for the doctor.  
The doctor shall be responsible for the diagnostic process. EICKEMEYER® shall not be liable for any problems arising out of the process.
6. Be sure to back up important data to external storage media, such as notebooks.
7. If data stored in the internal system is lost due to operator's error or abnormal condition, EICKEMEYER® is not responsible.
8. This user manual contains warnings for predictable dangers. Users shall also exercise care at any time to be aware of the dangers unforeseen in this manual. EICKEMEYER® shall not be liable for the damages and losses arising out of neglecting to follow the operation instructions herein described.
9. This user manual shall be furnished with the machine so that managerial and operating personnel can refer to it any time necessary. Once the managerial personnel of the system changes, it shall hand over this user manual.
10. Deal with the exhausted product according to the local statute.
11. The maintenance and servicing of the product shall be performed by EICKEMEYER®.

## SAFETY CAUTIONS

### 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 manual. These symbols convey specific meanings as detailed in the table below:

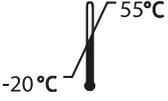
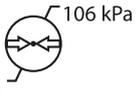
Symbols & Words	Connotation
 Danger	Indicates an imminent danger that may result in personal death or serious injury if not avoided.
 Warning	Indicates a potential danger that may result in personal injury if not avoided.
 Attention	Indicates a potential danger or unexpected use condition that may result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

### Safety Symbols

Symbols	Meaning
	Type B applied part
	Power switch
	Direct current
	Power supply indication
	Battery charge indicator
	Follow instructions for use
	Marking for the separate collection of electrical and electronic equipment
	Up
	Keep dry
	Fragile

## USER MANUAL MAGIC 500 PLUS ULTRASOUND UNIT

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Symbols	Meaning
	Stacking limit by number
	Temperature limits (Storage and transport)
	Humidity limitation (Storage and transport)
	Atmospheric pressure limitation (Storage and transport)
	Symbol for the marking of electrical and electronics devices according to Directive 2002/96/EC. 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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## 1. TECHNICAL SPECIFICATIONS

### 1.1 Technical Data

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- Gray scale: 256
- Monitor: 5,7" LED
- Adapter ratings: 100–240 V~, 1,2–0,6 A, 50–60 Hz
- Output of adapter: DC 12,8 V, 3,0 A
- Main device rating: DC 12 V, 3,0 A
- Main unit size: approx. L 158 x W 158 x H 65 mm
- Weight of main unit: approx. 1,1 kg (excluding accessories)

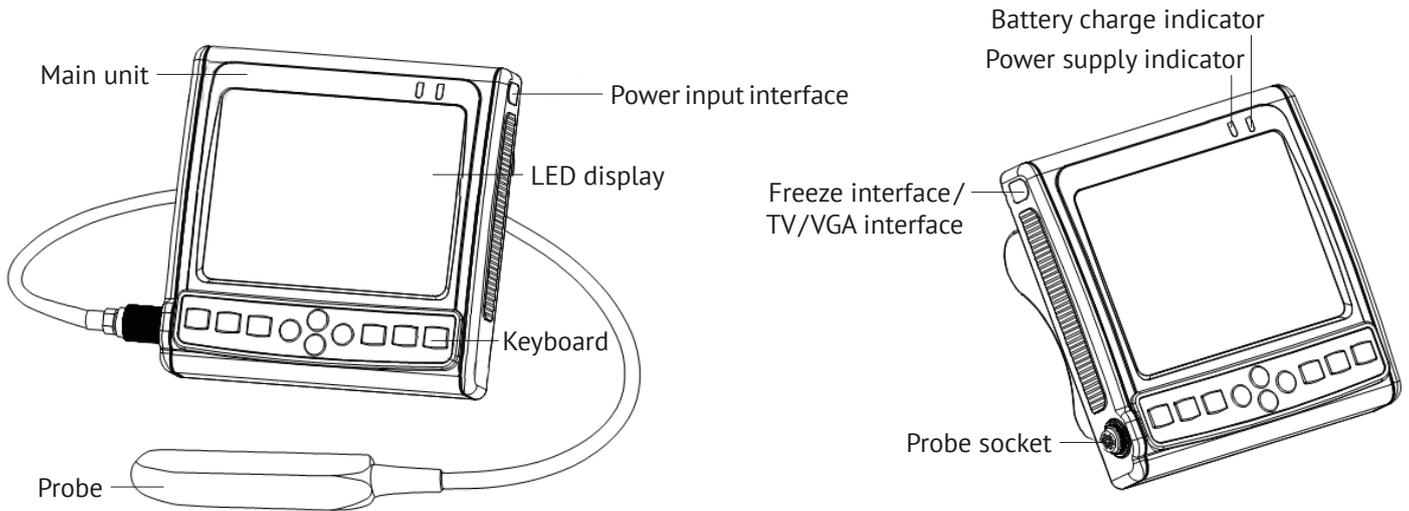
### 1.2 Primary Functions

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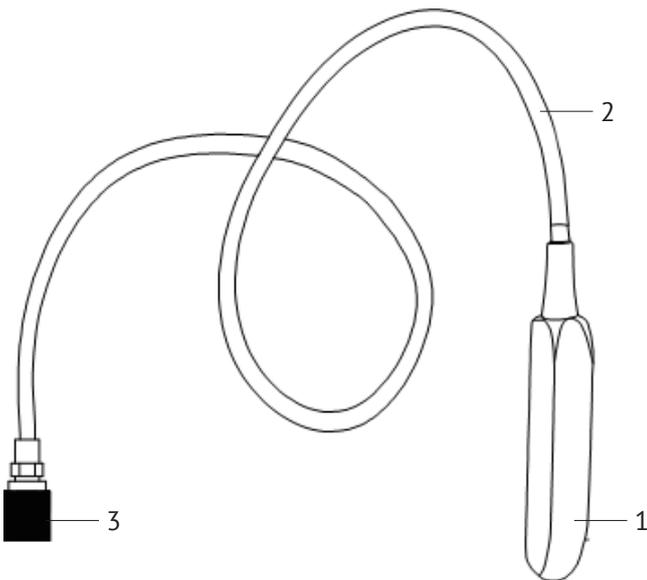
- Mode conversion function
- Adjustment and display of near field, far field, total gain and dynamic range
- Depth range selection function
- Frequency conversion function
- Frame correlation function
- Image post-process function
- Edge enhancement function
- Single-point, multi-point focusing function
- Local zooming function
- Image freeze/unfreeze
- Vertical, horizontal reverse
- Color display function
- Puncture guide
- Image filter function
- Save image by one-key
- Ultrasound workstation manages image and data
- Case information, image annotation and auto time display
- Body marks
- Measurement of distance, circumference, area, volume, slope, heart rate and cycle
- OB software package including 25 tables about 8 kinds of animals, automatic calculation of GA and EDC
- Measurement of backfat thickness, loin thickness and lean percentage
- Cine loop
- PAL-NTSC Conversion
- Energy saving
- English-German Switch

## 2. SYSTEM OUTLINE

### 2.1 Components



### 2.2 Parts of the 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 with the probe connector.
3. Probe connector	To connect the probe with the ultrasonic diagnostic instrument.

## 2.3 Function Keys Description

SN.	Function keys	Real-time status function	Freeze status function
1		Mode Selection	Text input, transfer images / data to the ultrasound workstation, exchange measurement start-end points, etc.
2		Main menu	Save image / read image / cine loop
3		Confirm	
4		Freeze / Unfreeze	
5		Direction Keys	
6		Quit	
7		Power switch	

## 3. SYSTEM CONFIGURATION

- |  |        |
|--|--------|
| 1. Main unit                                     | 1 unit |
| 2. 6,5 MHz animal transrectal linear array probe | 1 PC   |
| 3. Power adapter                                 | 1 PC   |
| 4. Armband                                       | 1 PC   |
| 5. Shutter release                               | 1 PC   |
| 6. Plastic seal box                              | 1 PC   |
| 7. Soft leather bag                              | 1 PC   |
| 8. Straps  | 2 PCs  |
| 9. PC or mobile ultrasound workstation software  | 1 PC   |

## 4. OPERATION CONDITION

### 4.1 Power Supply

Adapter ratings: 100–240 V~, 1,2–0,6 A, 50–60 Hz  
 Output of adapter: DC 12,8 V, 3,0 A  
 Main device rating: DC 12 V, 3,0 A  
 Internal supply voltage: DC 11,1 V ± 10 %

### 4.2 Operation Environment

Ambient temperature: 10 °C–40 °C  
 Relative humidity: 30 %–75 % (without condensation)  
 Atmospheric pressure: 700 hPa–1.060 hPa  
 Altitude: < 2.000 m  
 Overvoltage: Overvoltage Category II  
 Pollution degree: 2

### 4.3 Storage and Transportation

Ambient temperature: -20 °C–55 °C  
 Relative humidity: 30 %–93 % (without condensation)  
 Atmospheric pressure: 700 hPa–1.060 hPa



#### **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 knives, high-frequency therapy equipment or defibrillators and other electronic devices, or an electric shock may occur to the patient.



#### **Attention!**

- The mains voltage varies with different countries or regions.
- Using radio transmitting equipment nearby the system may interfere with the normal operation of the system. It is prohibited to carry or use devices that can generate radio waves within the room this system is installed, such as cell phones, radio transceivers and wireless remote control toys.
- System should not be used in following environments:
  1. Moist
  2. Rain
  3. Thunderstorm weather
  4. No ventilation
  5. Close to heat source (e.g. heaters, microwave ovens, ovens, water heaters, etc.)
  6. Direct sunlight
  7. Dramatic temperature change
  8. Poisonous gas
  9. Corrosive gas
  10. Strong shock
  11. Strong electromagnetic field (e.g. MRI)

## 5. SYSTEM INSTALLATION AND CHECK



### Warning!

- The waterproof grade of the equipment is IPX4 (no adverse effect on splashing water in all directions). Splash any liquid on the equipment may damage it. If you accidentally splash liquid on the equipment, please immediately turn off the power and contact your service representative.
- To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.



### Warning!

1. All instrument plugs 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 connection 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. 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.
4. Additional equipment connected to the medical electrical equipment must comply with the respective IEC standards (e.g. IEC60950 for data processing equipment, IEC 60601-1 for medical electrical systems). 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.
5. 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 the device works abnormally, stop working, turn off the power and check the reason, then contact EICKEMEYER® 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 a phenomena like this, turn off power supply immediately, stop using it and replace it with a 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 lightning.
6. If the temperature changes greatly in short time, this 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.



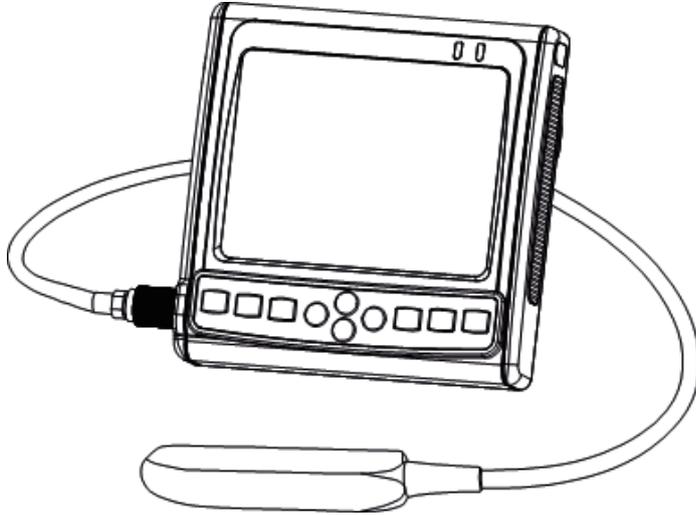
### Warning!

The power adapter, probe, shutter release and power supply cord as described in this section are replaced by the operator. But these parts must be provided by EICKEMEYER® or his authorized supplier.

## 5.1 System Installation

Please carefully read through and fully understand the method of use before installing the system, and check the components for their 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.

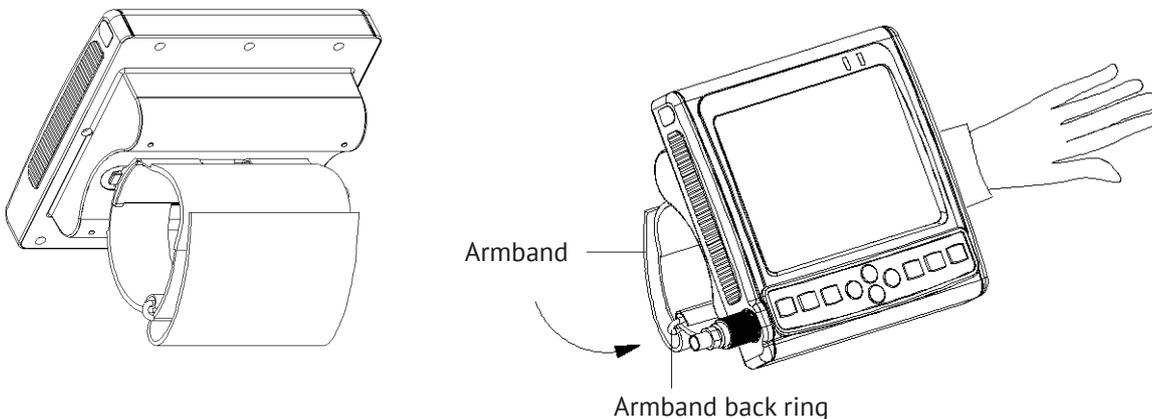


2. Instrument fixed in the arm to use.



### Attention!

When using the armband, if allergy, please consult a doctor immediately and increase protective measures (e.g. wear gloves before use).



- Extend your arm into the armband according to arrow direction, or disconnect the armband to put on your arm, the long end through the back ring.
  - Strain the armband and stick it firmly on the Velcro.
3. Instrument used with the soft leather bag and hanging on the chest to use.

### Installation

- Take out the instrument and accessory, put the instrument into the soft leather bag.
- The probe connector passes through the oval hole of the leather bag. Then install the probe.
- Install the straps on the rings of leather bag.
- 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 the soft leather bag can avoid collisions and pollution in the use process.

### 5.2 Ultrasonic Probe Installation

---



#### Danger!

Do not use together with flammable anaesthetic, it may result in an explosion.



#### Warning!

1. Do not use a probe not provided by EICKEMEYER®, otherwise the equipment and the probe will cause damage, and may cause fire in extreme cases.
2. Check the ultrasonic probe and connecting cable after diagnostic operation. Use of a defective probe may cause electric shock.
3. Do not strike the probe; using a damaged probe may cause electric shock to the patient.
4. Unauthorized disassembly of the probe is prohibited as it may cause electric shock.



#### 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. Freeze the instrument when instrument is start-up without operation to increase of service life of probe.
4. 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

1. Turn off the system, pinch the oval position on both sides of the probe cable while keeping the arrow above, as shown.



2. As shown below, insert the probe connector horizontally into the probe socket labeled "PROBE" on the left side of the main unit. When inserting the probe, the notch on the probe connector should be aligned with the position of the protruding mark on the probe interface, 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 knob clockwise with the other hand until the probe is locked.

**Note:** Before turning the knob clockwise, be sure to push the probe connector into place and then rotate to prevent the knob from idling.



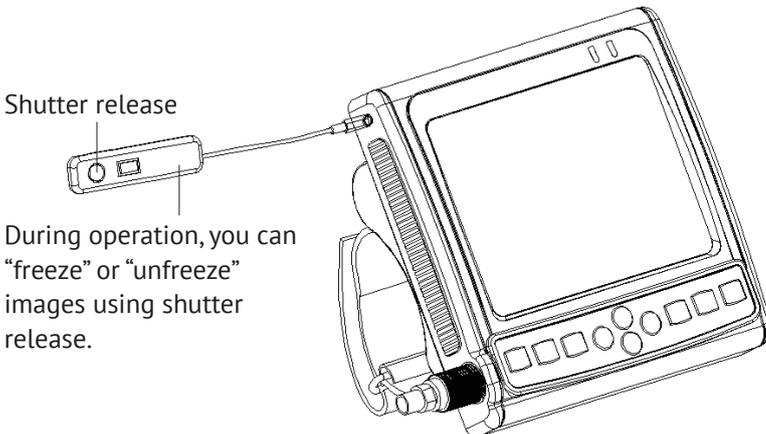
### 5.2.2 Ultrasonic Probe Disconnection

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



### 5.3 Shutter Release Installation

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



### 5.4 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" on the left 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.

**Note:** When connecting the video recorder, the main unit needs to output the TV signal. Please contact EICKEMEYER®.

### 5.5 Use of Wireless Monitor

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1. Set the RF according to the section 6.2.8 and select the RF channel, such as “RF: 1”.
2. Turn on the wireless monitor’s power switch.
3. To set the wireless monitor. First select the source “RF”, then search the RF channel.
4. Wireless monitor starts automatic search, after completed search, the wireless monitor automatically synchronizes the display of the main unit screen content.

**Note: When selecting the wireless monitor, you need a wireless monitor of receiving a 5,8 GHz signal.**

### 5.6 Connect to Power

---

1. Connect to the power adapter  
Insert the output plug of adapter into DC power input interface, on the upper right of main unit.
2. Connect to the main power supply  
Insert the power plug (jack) furnished with the machine into the 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 EICKEMEYER®.
3. To avoid damaging the 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.

### 5.7 Ultrasonic Probe Check Before and After Operation

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

### 5.8 Main Unit Check Before and After Operation

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#### 5.8.1 Inspection Before Start-up

Check the following items before starting the machine:

1. The temperature, humidity and atmospheric pressure shall meet the requirements of the 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 a contamination 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 cables (power cable, etc.), and hard up on its connection.
6. Check the probe and its connections to ensure they are free of abnormality (such as scuffing, drop-off or contamination). If a contamination is present, clean, disinfect the contaminated objects as specified in relevant sections.
7. No barriers around the intake of equipment.
8. Check the 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.

### 5.8.2 Inspection After Start-up

Check the following items after starting the machine:

1. No abnormal sound, strange smell and overheating appear.
2. Check the machine to ensure a normal start-up: The power indication light is on and the 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.
- 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 image quality.

### 5.9 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.

## 6. FUNCTIONAL OPERATION

### 6.1 Startup and Shutdown

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

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

### 6.2 System Functions Setting

In B, B/B, B/M, M mode and in real-time status can be set as follows.

#### 6.2.1 Time Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "YY, MM, DD, hr, min".
4. When setting year, month, day, hour and minute, press direction key  to increase the value or press direction key  to decrease the 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 the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "Mode".
4. Press direction keys   to achieve TV mode conversion between PAL and NTSC.
5. Press  key to confirm this setting and quit setting interface.

#### 6.2.3 Key Sound Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "Key Sound".
4. Press direction keys   to select between "On" and "Off".
5. Press  key to confirm this setting and quit setting interface.

#### 6.2.4 Screensaver Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "Screen saver".
4. Press direction keys   to adjust the screensaver time; screensaver time are "00–99" minutes, "00" stands for turn off the screensaver.
5. Press  key to confirm this setting and quit setting interface.

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

#### 6.2.5 Image Filter Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "Filter".
4. Press direction keys   to select two kinds of filters.
5. Press  key to confirm this setting and quit setting interface.

### 6.2.6 Grid Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "Grid".
4. Press direction keys   to select "00-09".  
 "00" shows "no grid"  
 "01" shows backfat ruler, vertical spacing of ruler is 5 mm  
 "02" shows "line grid"  
 "03" shows "dot grid"  
 "04" shows 10 mm-spacing dot-like scale  
 "05" shows 2 mm-spacing dot-like scale  
 "06" show 10 mm-spacing and 2 mm-spacing dot-like scales  
 "07" shows longitudinal 1 mm-spacing grid (when the image depth is less than 10 cm)  
 "08" shows longitudinal 5 mm-spacing grid  
 "09" shows longitudinal 10 mm-spacing grid
5. Press  key to confirm this setting and quit setting interface.

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

### 6.2.7 WiFi Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "WiFi".
4. Press direction keys   to select between "On" and "Off".
5. Press  key to confirm this setting and quit setting interface.

### 6.2.8 RF Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "RF".
4. Press direction keys   to select RF channels among "1-8" or select RF "Off".
5. Press  key to confirm this setting and quit setting interface.

**Note: When setting RF, it costs more time to select the channels.**

### 6.2.9 Background Color Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "BackColor".
4. Press direction keys   to select six kinds of background colors.
5. Press  key to confirm this setting and quit setting interface.

### 6.2.10 User Name Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select "Preset".
2. Press  key to enter setting interface.
3. Press direction keys   to select "User Name".
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 the cursor to point to Caps, and then press  key to achieve capital and small letter conversion; if the cursor points 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 you need to modify the content, in the characters input status press Shift key, the special characters input menu is then shown at the bottom of the screen displays:

Caps                  
Shift ! " # \$ % & ^ \_ ` { \* + , - . / ] { }

Press direction keys to move the cursor to point to character “←” or “→”, press  key, move the cursor to the position need to deleted character, and then press directions keys to move the cursor to character “←”, press  key, delete input content and retype.

7. Press  key to quit the character input menu, press  key again to quit the cursor status, press  key to return the frozen status.

### 6.2.11 English-German Language Setting

1. In real-time mode, press  key to enter the main menu, press direction keys   to select “Preset”.
2. Press  key to enter setting interface.
3. Press  key to switch between English and German.
4. Press  key to confirm this setting and quit setting interface.

## 6.3 Mode Selection

---

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

### 6.3.1 B Mode

B mode is the 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.

### 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 the main menu, press direction keys   to move the cursor to “B/B Mode” and then press direction keys   to switch left/right 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 B/M Mode

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

### 6.3.4 M Mode

1. In real-time mode, press  key to enter M mode.
2. Change M speed: Press  key to enter the main menu, press direction keys   to move the cursor to “M Speed” and then press direction keys   to select the eight kinds of scan speed.
3. In real-time mode, press  key to exit M mode.

### 6.3.5 A Mode

In real-time mode, press  key to enter or exit A mode.

## 6.4 Image Adjustment and Control in B, B/B, B/M and M

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In real-time mode, you can adjust the total gain, near field gain, far field gain, dynamic range, depth range, frequency, frame correlation, image post-process, edge enhancement, focus quantity, local zoom, left/right reverse, up/down reverse, color, backlight, brightness and contrast, etc.

### 6.4.1 Image Brightness and Contrast Adjustment

The brightness and contrast level of the screen is one of the most important factors for the image quality. The brightness and contrast adjustment should be done in relation to the ambient brightness. Therefore the actual brightness and contrast level shall be adjusted according to the specific environmental condition.

1. In the startup default status, press freeze key to unfreeze, press  key to quit the current using status of direction keys.
2. Press direction keys  , the “BackLight, Bright, Contrast” adjustment bars appear on the screen.
3. Press direction keys  , choose “BackLight, Bright, Contrast” adjustment bar.
4. Press direction keys  , change the brightness of backlight, brightness and contrast of the image.
5. Finish the settings, press  key or automatically later exit the adjustment status.

**Note:**

1. In A mode, the brightness and contrast cannot be adjusted.
2. If not adjust the brightness and contrast using direction keys  , you must exit current use status of direction keys.

### 6.4.2 Total Gain Adjustment

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

### 6.4.3 Near Field Gain Adjustment

In real-time mode, press  key to enter the main menu, press direction keys   to move the cursor to “Near” in the display area. Press direction key  to increase near field gain and direction key  to reduce near field gain to control the gain in near field region.

### 6.4.4 Far Field Gain Adjustment

In real-time mode, press  key to enter the main menu, press direction keys   to move the cursor to “Far” in the display area. Press direction key  to increase far field gain and direction key  to reduce far field gain to control the gain in far field region.

### 6.4.5 Dynamic Range Adjustment

In real-time mode, press  key to enter the main menu, press direction keys   to move the 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 to control the dynamic range of the entire image.

### 6.4.6 Depth Range Selection

In real-time mode, press  key to enter the main menu, press direction keys   to move the cursor to “Depth” in the display area. Press direction keys to select   eight kinds of depths, press  key to quit depth range selection.

### 6.4.7 Frequency Adjustment (Frequency Conversion)

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

### 6.4.8 Frame Correlation Adjustment

In real-time B, B/B mode, press  key to enter the main menu, press direction keys   to move the 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 the main menu, press direction keys   to move the cursor to “IP” in the display area. Press direction keys   to obtain four levels of corrected images.

### 6.4.10 Edge Enhancement Adjustment

In real-time mode, press  key to enter the main menu, press direction keys   to move the cursor to “IE” in the display area. Press direction keys   to obtain four levels of sharpened images.

### 6.4.11 Focus Adjustment and Control

In real-time B, B/B mode, press  key to enter the main menu, press direction keys   to move the cursor to “Focus Qty” in the display area. Press direction keys   to choose four kinds of focus modes: stage 1 (Full process dynamic focus), 2, 3 and 4.

In real-time B, B/B 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, choosing only one single focus mode is allowed. Press direction keys   to move the focus position.**

### 6.4.12 Local Zoom and Local Additive Color

In real time mode, press  key to enter the main menu, press direction keys   to move the cursor to “Local Zoom” 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 be enlarged; Press  key to quit local zoom status.

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

### 6.4.13 Image Left/Right Reverse

In real-time B, B/B, B/M mode, press  key to enter the main menu, press direction keys   to move the cursor to “L/R” in the display area, and then press direction keys   to achieve image horizontal reverse. The image left/right 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.

### 6.4.14 Image Up/Down Reverse

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

### 6.4.15 Color Selection

In real-time mode, press  key to enter the main menu, press direction keys   to move the cursor to “Color” in the display area. Press direction keys   to achieve the conversion of eight kinds of colors (including one kind of black and white).

### 6.4.16 Image Freeze/Unfreeze

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

## 6.5 Gain Adjustment in A Mode

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

## 6.6 Puncture Guide Line

---

In real-time B mode, press  key to enter the main menu, press direction keys   to move the 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, the cursor is located on the “Puncture”. 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.

## 6.7 Body Mark and Probe Mark

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This product contains 27 body marks that are divided into two pages. The operation steps are as follows:

1. In frozen status, press direction keys   to move the cursor to “BodyMark”, press  key, body marks will be shown 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 and body mark status.

## 6.8 One-key Storage Image

1. In B, B/B, B/M, M mode, freeze the image.
2. Press  key, the image code such as "036" is displayed on the lower right corner of the screen. After the code disappears, the current frozen image is stored in the frame "036".

### Explanation:

1. One-key storage can save the current frozen image into the internal memory of the main unit; it can store 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 internal memory of the main unit to prevent invalid storage. After 420 images have been saved, delete it manually.

## 6.9 Image Management

### 6.9.1 Save the Image

1. In B, B/B, B/M, M mode, freeze the image.
2. Press  key, a "Save" prompt appears on 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 coded "003". The saved image code is preceded with an asterisk "\*\*".
5. Press  key to quit saving status and press  key to return to real-time status.

**Explanation: Images can be saved into the internal memory of the main unit; it can store up to 420 images.**

### 6.9.2 Read the Image

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

**Explanation: When reading images, choose the image code with "\*\*".**

### 6.9.3 Delete the Image

1. In B, B/B, B/M, M mode, 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 image stored in the main unit will be deleted, "\*\*" will automatically disappear.
4. Repeat the steps 2 – 3 to delete other images.
5. Press  key to return to real-time mode.

### 6.9.4 Review the Image

1. In B, B/B, B/M, M mode, freeze the image, press  key to enter saving or reading image status.
2. Press  key to review the images, the stored 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.
5. Press  key to return to real-time mode.

### 6.9.5 Transfer a Single Image to Workstation

1. In B, B/B, B/M, M mode, freeze the image, press  key to enter saving or reading image status, such as "004\*\*".
2. Press  key, a symbol ">>>>" prompt appears on the lower right corner of the screen. After the prompt disappear, the image stored in frame "004\*\*" is transferred to ultrasound workstation.
3. Press  key to quit saving or reading image status.
4. Press  key to return to real-time mode.

**Note: The specific functions of ultrasound workstation, see Chapter Ten "Ultrasound Workstation Software Instructions".**

### 6.9.6 Batch Images Transfer to Workstation

1. In B, B/B, B/M, M mode, freeze the image, press  key to transfer all the stored images to the ultrasound workstation.
2. Press  key to quit frozen status.
3. Press  key to return to real-time mode.

#### Explanation:

1. In the transmission process, the lower right corner of the screen shows the number of frames being transmitted, long press  key to terminate the transmission at any time.
2. When transferring batch images, the system time displayed in the upper right corner of the main unit is at rest; when the transmission ends, the system time automatically returns to normal. All batch images transmission takes a long time, please be patient!
3. The specific functions of ultrasound workstation, see Chapter Ten “Ultrasound Workstation Software Instructions”.

### 6.10 Cine loop

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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, the lower right corner of the screen shows the relevant saved and played frames.

Press  key to return to frozen status.

Press  key unfreeze and quit playback status.

**Note: If the images appear abnormal, there was not enough storage time and the images have not been fully stored.**

### 6.11 Text Input

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Operation steps:

1. In real-time B, B/B, B/M, M mode, freeze image, the cursor is located on the “Comment”.
2. Press  key, the cursor is located behind “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 the cursor to point to Caps, and then press  key to achieve capital and small letter conversion. If the cursor points to Shift, press  key to achieve the conversion between letters and punctuation.

3. Press direction keys to choose “numbers” or “characters” and press  key to confirm.
4. After putting in the 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.
5. Press direction keys   to select the result, press  key to confirm and exit.
6. If you need to note something in the image area, in the comment status, press  key to exit characters input menu, the cursor is located behind ID, press direction keys to move the cursor to image area, continuously press  key twice, and then input the content according to Step 3.
7. If you need to modify the content, press direction keys   to select “Clear”, at last press  key to clear all noted marks and retype.
8. Press  key to quit.

## 6.12 Check List Management

### 6.12.1 Save and View Check List

1. In the B, B/B mode, freeze the desired image.
2. Record the "ID" and "Result" according to the text input method, press  key to confirm and save to check list.
3. Press direction keys   to move the cursor to "Checklist", 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.

#### Explanation:

1. In the check list, the contents of each column respectively: SN, ID, Result and Time.
2. The main unit stores up to 200 check lists.

### 6.12.2 Delete Check Lists

1. In the B, B/B frozen status, press direction keys   to move the cursor to "Checklist", press  key to enter check list interface.
2. Press direction keys   to clear all the check lists.
3. Press  key to exit check list interface and press  key to return to real-time status.

### 6.12.3 Transfer Check Lists to Workstation

1. In the B, B/B mode, freeze the desired image.
2. Press direction keys   to move the cursor to "Checklist", press  key to enter check list interface.
3. Press  key, a symbol ">>>" prompt appears at the top right of the screen, after the prompt disappear, all the check lists will be transferred to ultrasound workstation.
4. Press  key to exit check list interface and press  key to return to real-time status.

**Note:** The specific functions of ultrasound workstation, see Chapter Ten "Ultrasound Workstation Software Instructions".

## 6.13 Obstetric List Management

### 6.13.1 Save and View Obstetric List

1. In the B, B/B mode, freeze the desired image.
2. Obstetric results were obtained by obstetric measurement, the results were saved to the main unit.
3. Press direction keys   to move the cursor to "OB List", press  key to enter obstetric list interface.
4. Press direction keys   to view stored obstetric lists.
5. Press  key to exit obstetric list interface and press  key to return to real-time status.

#### Explanation:

1. In the obstetric list, the contents of each column respectively: SN, Time, ID, Animal, Formula, G.A and EDC.
2. The main unit stores up to 200 obstetric lists.

### 6.13.2 Delete Obstetric Lists

1. In the B, B/B frozen status, press direction keys   to move the cursor to "OB List", press  key to enter obstetric list interface.
2. Press direction keys   to clear all the obstetric lists.
3. Press  key to exit obstetric list interface and press  key to return to real-time status.

### 6.13.3 Transfer Obstetric Lists to Workstation

1. In the B, B/B mode, freeze the desired image.
2. Press direction keys   to move the cursor to "OB List", press  key to enter obstetric list interface.
3. Press  key, a symbol ">>>" prompt appears at the top right of the screen, after the prompt disappear, all the obstetric lists will be transferred to ultrasound workstation.
4. Press  key to exit obstetric list interface and press  key to return to real-time status.

**Note:** The specific functions of ultrasound workstation, see Chapter Ten "Ultrasound Workstation Software Instructions".

## 7. GENERAL MEASUREMENT

### 7.1 Distance Measurement

1. In B, B/B mode, freeze the desired image, press direction keys   to move the cursor to "Measure" position of display area.
2. Press  key, the measurement methods are shown in the lower left of the screen, press direction keys   to choose "1. 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 and end point of the measurement.
6. Press  key to finish the first measurement.
7. Press  key again, repeat the steps 3–6 to complete the multi-group data measurement.
8. Press  key to quit the measurement status.
9. Press direction keys   to choose "Clear" and press  key to clear all marks and data.
10. Press  key to return the real-time status.

### 7.2 Circumference / Area / Volume Measurement

#### Circumference / Area / Volume Measurement with Ellipse Method

1. In B, B/B mode, freeze the desired image, press direction keys   to move the cursor to "Measure" position of display area.
2. Press  key, the measurement methods are shown 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 on the lower right of the image. Hold down  or  key to change the minor axis of the ellipse to satisfy the test area. The measured values are displayed at the built-in characters "C: ----mm, A: ----mm<sup>2</sup>, V: ----cm<sup>3</sup>" on the right part of the screen automatically.
6. Press  key again to quit the minor axis status; Press  key to exchange the starting and end point.
7. Press  key to finish the first measurement.
8. Press  key again, repeat the steps 3–7 to complete the multi-group data measurement.
9. Press  key to quit the measurement status.
10. Press direction keys   to choose "Clear" and press  key to clear all marks and data.
11. Press  key to return the real-time status.

#### Circumference / Area Measurement with Trace Method

1. In B, B/B mode, freeze the desired image, press direction keys   to move the cursor to "Measure" position of display area.
2. Press  key, the measurement methods are shown in the lower left of the screen, press direction keys   to choose "3. 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: ----mm" on the right part of the screen. Press  key to display at the built-in mark "A: 0,0 mm<sup>2</sup>" the value of the measured area formed by measurement line enclosure.
5. Press  key again, repeat the steps 3–4 to complete the multi-group data measurement.

6. Press  key to quit the measurement status.
7. Press direction keys   to choose "Clear" and press  key to clear all marks and data.
8. Press  key to return the real-time status.

### Circumference/Area Measurement with Point Method

1. In B, B/B mode, freeze the desired image, press direction keys   to move the cursor to "Measure" position of display area.
2. Press  key, the measurement methods are shown in the lower left of the screen, press direction keys   to choose "4.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, a trace appears on the screen (trace is automatically drawn along the order of marking points until close the beginning point and end point). The measured circumference and area values are automatically displayed at the built-in mark "C: ----mm, A: 0.0 mm<sup>2</sup>" 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: ----mm, A: 0.0 mm<sup>2</sup>" on the right part of the screen.
5. Press  key again, the cursor will show "+", repeat steps 3, 4 to complete the multi-group data measurement.
6. Press  key to quit the measurement status.
7. Press direction keys   to choose "Clear" and press  key to clear all marks and data.
8. Press  key to return the real-time status.

### 7.3 Slope/Heart Rate/Cycle Measurement

In B/M, M frozen status, measure slope/heart rate/cycle. The method is identical with distance measurement.

**Note: T denotes cycle measured in ms (millisecond)**

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

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



#### Attention!

The accuracy of software measurement:

- Distance measurement  $\leq 0,1$  mm
- Area measurement  $\leq 0,1$  mm<sup>2</sup>
- Volume measurement  $\leq 0,01$  cm<sup>3</sup>
- Heart rate measurement  $\leq 1$  bpm
- Time measurement  $\leq 1$  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.

## 8. 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, B/B mode, freeze the desired image, press direction keys   to move the cursor to "OB" position of display area.
2. Press  key to display the obstetric measurement animals on the lower part of the screen, "Select Animal: 1. Bovine, 2. Equine, 3. Ovine, 4. Canine, 5. Feline, 6. Goat, 7. Llama, 8. Swine", press direction keys   to select the measured animal, press  key to confirm. Measured parameters of this animal are shown on the lower part of the screen, (if select goat, display the types of goat).
3. Press direction keys   to select the measured parameters (if 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 and end point.
7. Press  key to finish the first measurement.
8. Repeat the steps 3–7 to complete the multi-group data measurement.
9. Press  key to quit measurement status for this animal.
10. Press direction keys   to select other measured animal, press  key to confirm, repeat steps 3–7 to complete a variety of animal measurements.
11. Continuously press  key twice to quit obstetric measurement status.
12. Press direction keys   to choose "Clear" and press  key to clear all marks and data.
13. Press  key to return the real-time status.

### 8.3 Measurement of Swine's Lean Percentage

#### % Lean Calculation Formula Uses NSIF Formula

1. In B, B/B mode, freeze the desired image, press direction keys   to move the cursor to "OB" position of display area.
2. Press  key to display the obstetric measurement animals on the lower part of the screen, "Select Animal: 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 swine are shown 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 ~ 300 kg), press  key again to confirm.
5. Measure the backfat thickness with distance measurement method, the backfat 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 obstetric measurement status.
7. Press direction keys   to choose "Clear" and press  key to clear all marks and data.
8. Press  key to return the real-time status.

## 9. BACKFAT THICKNESS AND LEAN PERCENTAGE MEASUREMENT

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

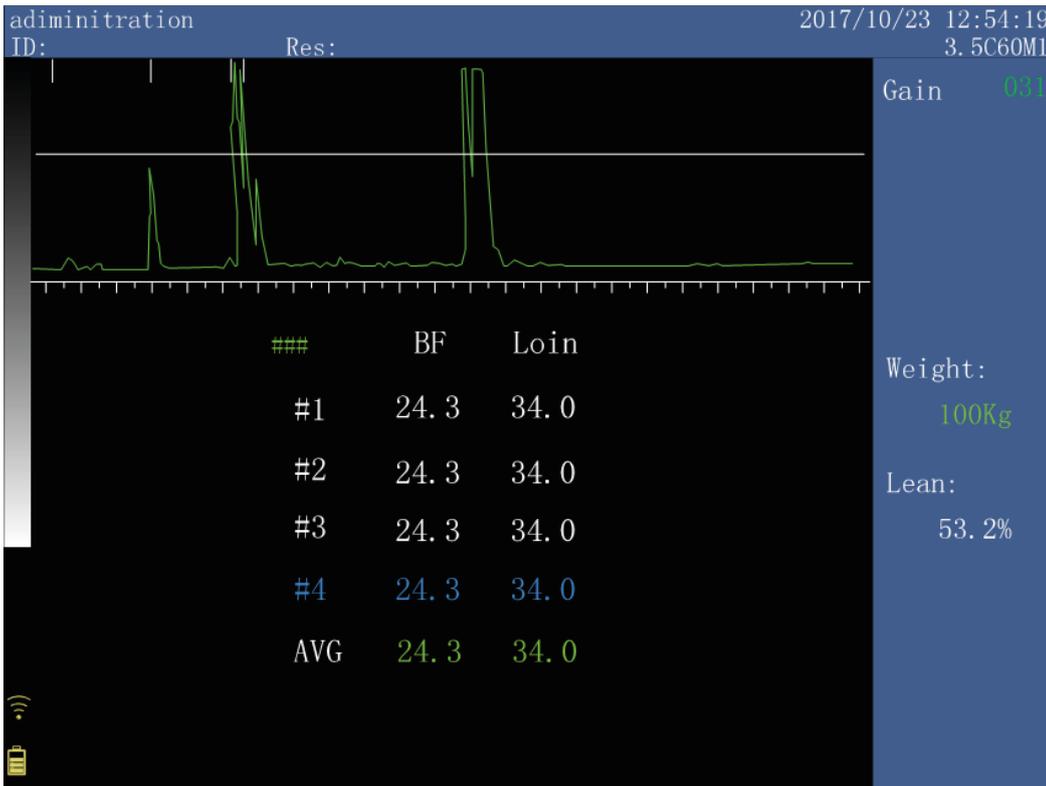


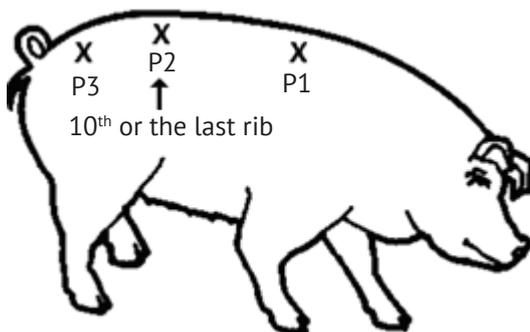
Figure: A mode interface

### 9.1 Measurement Items

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

### 9.2 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 the swine skin and the 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 there are 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 a 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 layer due to the muscle tissue.**

### 9.3 Measurement of Swine's Lean Percentage

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1. In real-time A mode, press  key to enter the main menu, press direction keys   to move the cursor to "Weight" in the display area. Press direction keys   to adjust the "Weight" (range: 37~300 kg).
2. Put ultrasonic coupling gel to the appropriate site of swine's back, in order to make good contact between the swine skin and the 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 there are 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.

**Explanation: 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.**

### 9.4 Measurement Considerations

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1. When measuring older animals, it might be necessary 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 the probe is at an angle. If you choose 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. If you 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, leading to inaccurate measured results.
4. Recommend using dedicated ultrasonic coupling gel.

## 10. ULTRASOUND WORKSTATION SOFTWARE INSTRUCTIONS

The images and data stored on the MAGIC 500 PLUS machine are wirelessly transmitted to the ultimate consumer via WiFi, and the user only needs to install the ultrasonic workstation software provided by EICKEMEYER® at the terminal. The machine provides two kinds of ultrasonic workstation software, Android mobile and PC-side ultrasonic workstation software.

### 10.1 Ultrasound Workstation Software Introduce

Before using the ultrasound workstation software, you need to install “EICKEMEYER® Ultrasound workstation software” on your pad, Smart Phone or PC. Mobile ultrasound workstation software is suitable for Android phones or pad (only supports the mobile phone/pad with Android OS 5.0 or above version; not support for mobile phone/iPad with IOS); PC-side ultrasound workstation software for Windows operating system computer (supports Windows XP, Windows 7/8/10).

### 10.2 Get Ultrasound Workstation Software

#### Get mobile ultrasound workstation software

1. According to the information provided in the card in the package, get “EICKEMEYER® ultrasound workstation software”, and install it.
2. After finish the installation, set up the phone.
  1. Go to Settings, tap Display, tap Font size to adjust text size on screen. In order to display the complete text, you should select “Normal”.
  2. Go to Settings, tap Permissions to enter permission interface, tap “kx\_station\_v”, and open the permission.
3. After finishing the operation, you can use it.



#### Attention!

- If you cannot install “EICKEMEYER® ultrasound workstation software”, it may be caused by 360 software block, please check whether the phone has been installed 360 software, if installed, please uninstall.
- After the equipment is connected to the phone, if “No Internet access” appears, please choose “No” will leave you on the same network.

#### Get PC-side ultrasound workstation software

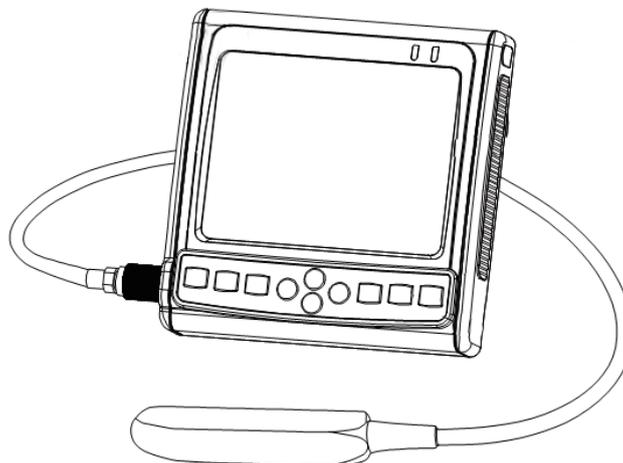
According to the information provided in the card in the package, get “EICKEMEYER® ultrasound workstation software”, copy to the computer, open the workstation software folder, double-click the icon , you can use.

### 10.3 Mobile Ultrasound Workstation Software

All icons on the mobile ultrasound workstation software may be different due to the display screen of the phone or pad; the display interface may be slightly different, the actual products shall govern. The usage for the phone and pad is similar, this article only take phone as an example to introduce.



WiFi



### 10.3.1 Preparation Before Use

1. In the MAGIC 500 PLUS preset interface, WiFi is set to “On”.
2. Connect to WLAN. Go to Settings of phone, tap WLAN, open WLAN, the phone will search and list the available WLAN.
3. In the available WLAN list, select MAGIC 500 PLUS network ID, such as “1712250”, connect to it.
4. After the connection is successful, tap the icon “ kx\_station\_v” to enter ultrasound workstation interface, the wireless signal icon “” appears on the lower left corner of the MAGIC 500 PLUS screen. Then you can use the mobile ultrasound workstation software.

#### Note:

1. You first turn on the WiFi of MAGIC 500 PLUS and then set up the phone’s WLAN. After WLAN connection is successful, open the ultrasound workstation software.
2. The WiFi network ID of MAGIC 500 PLUS is the default number displayed on the nameplate of MAGIC 500 PLUS, such as “1712250”.
3. When the network is disconnected, the wireless signal icon  on the MAGIC 500 PLUS screen disappears.

### 10.3.2 Start using mobile ultrasound workstation software

Mobile ultrasound workstation software kx\_station\_v includes image view, check list management, obstetric list management. kx\_station\_v software consists of four function keys: Image View , Check List , OB  and quit .

#### 10.3.2.1 Image View

1. After the connection between MAGIC 500 PLUS and kx\_station\_v is successful, the lower left corner of MAGIC 500 PLUS screen shows the wireless signal icon .
2. The images stored inside of MAGIC 500 PLUS will be transferred to the ultrasound workstation:
  - Transfer a single image: Freeze the image, press  key to enter saving or reading image status, such as choose “004\*”. Press  key, a symbol “>>>>” prompt appears on lower right corner of the screen, after the prompt disappear, the image stored in frame “004\*” is transferred to ultrasound workstation.
  - Batch images transfer: Freeze the image, press  key to transfer all the stored images to the ultrasound workstation.  
**Note: When transferring single or multiple images to the ultrasound workstation with WiFi, if the image cannot be transferred, the screen prompts “Poor network environment, please try again later!”. Wait until the network is good, and press  key to continue transferring the image.**
  - Press  key to quit, then press  key to return to real-time mode.
3. Tap Image View  to browse received images.
4. Tap the icon  in the lower right corner of the Image View interface, open the mobile album, find the “image”, you can browse the received images.

#### Explanation:

1. Tap the refresh icon  on the lower right corner of the ultrasound workstation software, the received images can be displayed correctly and be arranged according to the internal number of descending order stored in the MAGIC 500 PLUS.
2. Images are named according to system time. For example: DSC012\_20171026135127.  
Indicates the 12<sup>th</sup> image stored inside the MAGIC 500 PLUS at 13:51:27, Oct 26, 2017.
3. The stored bmp images are saved to your phone or pad folder.  
View or delete the path: open Files/Local/Internal storage/kxStation “image” folder on your phone or pad.  
For example: Local/Internal Storage/kxStation/image/DSC012\_20171026135127.bmp

#### 10.3.2.2 Check Lists Management

1. After the connection between MAGIC 500 PLUS and kx\_station\_v is successful, the lower left corner of MAGIC 500 PLUS screen shows the wireless signal icon .
2. The check lists stored inside of MAGIC 500 PLUS will be transferred to the ultrasound workstation:
  - In the B, B/B mode, freeze the desired image.
  - Press direction keys   to move the cursor to “Checklist”, press  key to enter check list interface.
  - Press  key, a symbol “>>>>” prompt appears at the upper right of the screen, after the prompt disappear, all the check lists will be transferred to ultrasound workstation.
  - Press  key to exit check list interface and press  key to return to real-time status.

3. Tap Check List  to browse received check lists.

- **Save check list**

In the check list interface, tap “note” column to enter remarks, tap “save”, prompt “Saved successfully” to save the check list to the database.

**Explanation:**

1. After saving the check list, you can't enter the “note” content.

2. The stored check lists are saved to your phone or pad folder.

View or delete the path: open Files/Local/Internal storage/kxStation “checklist” folder on your phone or pad.

For example: Local/Internal Storage/kxStation/checklist/2017-10-27 08: 34.db

3. The stored check lists files (suffix .db) need to be viewed using ultrasound workstation software.

- **Inquire check list**

1. The saved check list can be queried. Tap “inquire”, the query dialog box appears, according to the provide search field to query the required check list, the query method is as follows:

- In the query dialog, the search fields provided are: NO, Check Result, Check Time, note.

- Query according to the search field. For example, select the checkbox and enter the exact number:

NO. 123 \_\_\_\_\_.

- Query according to an established combined conditions. For example,  Check Time 2017-10-10  to 2017-10-30 , select the check date directly or manually enter the check date according to the date format; the check date is entered in the order from front to back.

- Fuzzy matching query, as long as the word can query. For example,  note normal result \_\_\_\_\_.

**Note: Whether which methods to inquire, you must select the checkbox  in front of the search field.**

2. After setting the search conditions, tap **inquire** to get the check list of queries; tap **Cancel** to give up the inquire.

3. According to the query conditions to get the desired result, then tap “inquire” to enter the query dialog box, the checkbox is not selected, click **inquire**, default display all lists.

- **Import check list**

In the check list interface, click “import”, click the database to import the saved database into the current check list.

- **Generate report**

In the check list interface, click “report”, the check list is generated as a report.

- **Empty the check list**

In the check list interface, click “empty” to delete all check lists.



**Attention!**

When the display screen is small, the check lists on the screen may not be displayed completely. In this case, you can slide left or right on the list to view.

### 10.3.2.3 Obstetric Lists Management

1. After the connection between MAGIC 500 PLUS and kx\_station\_v is successful, the lower left corner of MAGIC 500 PLUS screen shows the wireless signal icon .

2. The obstetric lists stored inside of MAGIC 500 PLUS will be transferred to the ultrasound workstation:

- In the B, B/B mode, freeze the desired image.

- Press direction keys   to move the cursor to “OB List”, press  key to enter obstetric list interface.

- Press  key, a symbol “>>>” prompt appears at the upper right of the screen, after the prompt disappear, all the obstetric lists will be transferred to ultrasound workstation.

- Press  key to exit obstetric list interface and press  key to return to real-time status.

3. Tap Check List  to browse received obstetric lists.

- **Save obstetric list**

In the obstetric list interface, tap “save”, prompt “Saved successfully” to save the obstetric list to the database.

### Explanation:

#### 1. The stored obstetric lists are saved to your phone or pad folder.

View or delete the path: open Files/Local/Internal storage/kxStation “ob” folder on your phone or pad.

For example: Local/Internal Storage/kxStation/ob/2017-10-28 15:46.db

#### 2. The stored obstetric lists files (suffix .db) need to be viewed using ultrasound workstation software.

#### • Inquire obstetric list

1. The saved obstetric list can be queried. Tap “inquire”, the query dialog box appears, according to the provide search field to query the required obstetric list, the query method is as follows:

- In the query dialog, the search fields provided are: Check Time, NO, animal, OB Formula, G.A and EDC.

- Query according to the search field. For example, select the checkbox and enter the exact number:

NO. 123 \_\_\_\_\_.

- Query according to an established combined conditions. Query the check time or gestational age (G.A), you can select the check date or G.A directly, you can also manually enter according to the date format; the check date is entered in the order from front to back. For example,  Check Time 2017-10-10  to 2017-10-30 .

- Fuzzy matching query, as long as the word can query. For example,  G.A 06 \_\_\_\_\_.

**Note: Whether which methods to inquire, you must select the checkbox  in front of the search field.**

2. After setting the search conditions, tap **inquire** to get the obstetric list of queries; tap **Cancel** to give up the inquire.

3. According to the query conditions to get the desired result, then tap “inquire” to enter the query dialog box, the checkbox is not selected, click **inquire**, default display all lists.

#### • Import obstetric list

In the obstetric list interface, click “import”, click the database to import the saved database into the current obstetric list.

#### • Generate report

In the obstetric list interface, click “report”, the obstetric list is generated as a report.

#### • Empty the obstetric list

In the obstetric list interface, click “empty” to delete all obstetric lists.

### 10.3.2.4 Images and Data on the Workstation Transfer to U Disk

1. Open the workstation software.

2. Insert the U disk into the USB port of the mobile phone, the mobile phone prompts “Allow the app kx\_station\_v to access the USB device?”, choose “OK”, the workstation software prompts “U disk has been identified!”.

3. Tap the icon  in the lower right corner of the Image View interface of workstation software, the workstation software prompts “U disk is storing data, please wait patiently ...”, after the prompt disappears, all images and data of the workstation will be transferred to U disk by one-key.

### Explanation:

**1. When transferring to U disk by one-key, you must first open the workstation software and then insert U disk, to ensure that the workstation can identify the U disk.**

**2. Tap the icon , all the images, the saved checklists and obstetric lists, the generated reports on the workstation software will transfer to U disk by one-key.**

**3. The images, checklists, obstetric lists and reports saved in the kxStation folder of U disk.**

**The image is stored in U: \ kxSation \ image; the checklist is stored in U: \ kxSation \ checklist; the obstetric record is stored in U: \ kxSation \ OB; the generated report is stored in U: \ kxSation \ report.**

### 10.3.2.5 Mobile album view images and reports of workstation

1. Open the workstation software.

2. Tap the icon  in the lower right corner of the Image View interface of workstation software, open the mobile album, find the “image” and “report”, you can view the saved images and the generated reports.

### 10.3.2.6 Quit workstation software

Tap quit  to quit mobile ultrasound workstation software.

## 10.4 PC-side Ultrasound Workstation Software

The usages for PC-side ultrasonic workstation software are similar to mobile workstation; it communicates with MAGIC 500 PLUS via WiFi.



### 10.4.1 Preparation Before Use

1. Install the PC-side ultrasonic workstation software “kx\_station\_v” on the computer, “kx\_station\_v” is free to install, just copy the software to the computer.
2. In the MAGIC 500 PLUS preset interface, WiFi is set to “On”.
3. The computer needs to connect to the MAGIC 500 PLUS via Wireless network card or WiFi. Open the computer’s wireless network connection, in the available WLAN list, select MAGIC 500 PLUS network ID, such as “1712250”, connect to it.
4. After the connection is successful, double-click the icon “ kx\_station\_v” to enter ultrasound workstation interface, the wireless signal icon “” appears on the lower left corner of the MAGIC 500 PLUS screen, then you can use the PC-side ultrasound workstation software.

#### Note:

1. You first turn on the WiFi of MAGIC 500 PLUS and then set up the computer’s WLAN. After WLAN connection is successful, open the ultrasound workstation software.
2. The WiFi network ID of MAGIC 500 PLUS is the default number displayed on the nameplate of MAGIC 500 PLUS, such as “1712250”.
3. When the network is disconnected, the wireless signal icon on the MAGIC 500 PLUS screen disappears.

### 10.4.2 Start Using PC-side Ultrasound Workstation Software

The function for PC-side ultrasound workstation software kx\_station\_v is similar to the mobile workstation, including image view, check list management, obstetric list management. The following describes the differences.

1. In the check list interface, click “Preview”, the check list is displayed in the form of report, the user can preview its contents; click “Print” to print out the check list.
2. In the obstetric list interface, click on “Preview”, the obstetric list is displayed in the form of report, the users can preview its contents; click “Print” to print out the obstetric list.
3. The stored bmp images, check lists and obstetric lists are stored in the kxStation folder of computer’s D drive. The image is stored in D:\kxStation\image; the checklist is stored in D:\kxStation\checklist; the obstetric record is stored in D:\kxStation\OB.
4. The stored check lists files and obstetric lists files (suffix .db) need to be viewed using ultrasound workstation software.

## 10.5 Change the Language for Ultrasound Workstation Software

1. Go to Settings of the phone or pad, tap Language & input, tap Language and choose the used language.
2. After finish the settings, enter the ultrasound workstation again, the ultrasound workstation interface appears the changed language.

**Note:** EICKEMEYER® ultrasound workstation software supports English and German. Other languages are not support.

## 11. 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.



### Warning!

The following parts of the equipment are not serviced or maintained while in use.

### 11.1 Maintenance by Users

#### 11.1.1 System Cleaning and Disinfection



### Warning!

- Turn off the instrument and pull out the power supply wire before cleaning. It may cause electric shock when cleaning the system while the power is on.
- 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 device during cleaning or maintenance. Failure to do so may cause malfunction.
- Do not place the ultrasonic probe connector into water or disinfection, as it may cause electric shock or malfunction of probe.



### Attention!

1. To prevent possible infection, it is advisable to wear sterilized gloves when cleaning or disinfecting the ultrasonic probe.
2. In the process of cleaning and disinfection, avoid probe overheat (exceeding 60 °C) as it may be damaged or deformed under excessive heat.

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 this 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 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 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!**

The waterproof grade of intra-cavity probe is IPX7, immersion depth from probe's acoustic head to the sheath of probe handle; the waterproof grade for other probes is IPX4.



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

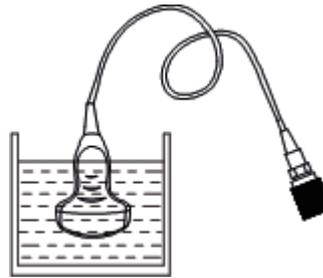


Fig. Immersion disinfection of probe (except intra-cavity probe)



**Attention!**

1. It is a normal phenomenon that the color of the acoustic lens may change and the text of the probe label may fade away.
2. The regular disinfection times should be minimized as it may lead to degrade of the probe safety and performance.

3. Check the 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.
- Do not use sharp objects to touch the LED screen, and do not press or squeeze against the LED screen.

6. Clean the control panel, shell  
Clean the instrument surface with a soft, dry cloth or with a soft cloth dipped in moderate water cleaning media to remove the blots, and then dry the instrument with a soft, dry cloth or with air.
7. Clean the video recorder, shutter release
  1. Use the soft dry cloth to wipe the video recorder, shutter release.
  2. If it is difficult to wipe away the blemish, clean with a soft cloth dipped in moderate detergent and then air-dry it.

**11.1.2 Use and Maintenance for the Rechargeable Battery**

1. Plug the output port of power adapter into the DC power input port on the right side of main unit to charge. When charging, the battery charge indicator flashes orange and green alternately; when fully charged, the indicator is in a orange no-flashing state.

2. The shutdown charging time is about more than 4 hours, boot charging about 7,5 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!

- A power indicator will appear “□” 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.
- 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.
- 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 battery leakage, explosion or fire.
2. Do not use or store the battery near a heat source, such as fire or heater, which will lead to battery leakage, explosion or fire.
3. Do not connect the anode and cathode reversely, which will lead to battery leakage, explosion or fire.
4. Do not heat up or throw the battery into fire, which will lead to 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 leakage, explosion or fire.
6. Do not hammerblow, throw or mechanically shake the battery, which will lead to 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 leakage, explosion or fire.
8. Do not weld the battery terminal directly, which will lead to leakage, explosion or fire.
9. Do not disassemble the battery in any way, which will lead to leakage, explosion or fire.
10. Do not charge the battery near a heat source or extra-hot environment, which will lead to leakage, explosion or fire.
11. Do not put the battery into the microwave oven or pressure vessel, which will lead to leakage, explosion or fire.
12. Do not mix a used battery together with an one-off battery (such as dry battery), or different capability or different model or different brand battery, which will lead to 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 leakage, explosion or fire.
14. Stop the charge and pull out the battery from the charger if any abnormal phenomenon happens to the battery, such as a particular smell or abnormal heat or distortion or turn colors. Otherwise, each of above will lead to leakage, explosion or fire.
15. Remove the battery from the near fire if any leakage or particular smell happens, which will lead to leakage, explosion or fire.
16. If any leakage splashes into the eye, do not wipe the eye, instead wash it and get help from the doctor as soon as possible. Otherwise, the eye will be injured.
17. Do not use the battery in an extremely hot environment, such as hot sunshine or in the car when it is too hot, because it will catch fire, even worsen its performance and shorten its life.
18. If you 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.

## 11.2 Replace the Fuse

Replace the fuse is to replace the power adapter.



### Attention!

1. The fuse is inside the power adapter. Fuse shall be replaced by qualified service personnel who is approved by EICKEMEYER®.
2. Before replacing the fuse, please contact EICKEMEYER®, replace the fuse under the guidance of EICKEMEYER®.
3. Before replacing the fuse, you must disconnect the mains supply.
4. Fuse Type: T3.15AH250VAC

## 11.3 Replacement of Power Supply Cord

Before replacing the power supply cord, please contact EICKEMEYER®; replace the power supply cord under the guidance of EICKEMEYER®. Please use the power supply cord provided by EICKEMEYER®.

## 11.4 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 occurs, contact EICKEMEYER® 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 EICKEMEYER® for support.

Trouble	Correction
Power supply indicator is off and no screen display is present when starting the machine.	<ol style="list-style-type: none"> <li>1. Check power supply.</li> <li>2. Check power cable and plug.</li> <li>3. Check power adapter.</li> </ol>
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.	<ol style="list-style-type: none"> <li>1. Check power supply (spark interference present).</li> <li>2. Check environment (source of interference around the machine, such as electric motor, ultrasonic atomizer, automobile, computer or other interference).</li> <li>3. Check power plug/socket of the instrument or probe connectors. They shall be properly contacted.</li> </ol>
Image display is not clear.	<ol style="list-style-type: none"> <li>1. Adjust the total gain, near field gain, far field gain.</li> <li>2. Adjust the backlight, brightness and contrast level.</li> </ol>
Control panel malfunction	Restart the system by turning off the main unit power.

### 11.5 Periodic Safety Checks

To ensure system performance and safety, it must be checked after using 1 year. When check the device, please consult the International Trade Dept of EICKEMEYER® or its dealers.

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

## 12. STORAGE AND TRANSPORTATION

### Storage and Transportation

1. If the device is stored over 3 months, take it out of 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 device 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: 700 hPa–1.060 hPa. 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.

## 13. 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 IPX4 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







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