



User Manual

Full Digital Veterinary B-Ultrasound Device (Model: BXL-V50)




Important Statement

1. After purchasing this product, the customer is fully responsible for the maintenance and management of this product.
2. Even during the quality assurance period, the quality assurance does not include the following
 - (1) Damage or loss caused by wrong or rough use.
 - (2) Damage or loss caused by force majeure such as fire, earthquake, flood or lightning.
 - (3) Failure to meet the operating conditions specified by this system, such as damage or loss caused by insufficient power supply, incorrect installation or environmental conditions that do not meet the requirements.
 - (4) There is no damage or loss caused by using the system in the region where it was originally purchased.
 - (5) Damage or loss of the system not purchased from our company or its authorized distributors or agents.
3. Only qualified medical personnel with professional qualification certificates can use this system.
4. It is forbidden to modify the software or hardware of this product without authorization.
5. Under any circumstance, the company will not be responsible for any problems, damages or losses caused by the re-installation, modification or maintenance of the system by non-designated personnel of the company.
6. This system aims to provide doctors with data needed for clinical diagnosis. The doctor is responsible for the diagnosis process. The company is not responsible for the diagnosis process.
7. Be sure to back up important data to an external storage medium, such as a notebook.
8. The company is not responsible for any loss of data stored in the system due to operator errors or abnormal conditions.
9. This instruction manual contains warnings about foreseeable potential risks. At all times, we must maintain a high level of vigilance against unexplained risks. The company is not responsible for any damage or loss caused by negligence or ignorance of the preventive measures specified in this manual.
10. Please keep this manual with the machine to ensure that management and operating personnel can refer to this manual at any time. Once the administrator of this system changes, this manual must be handed over.
11. Please dispose of the product in accordance with local laws and regulations. The internal maintenance and maintenance of the product must be completed by a professionally trained engineer or contact our company.


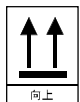






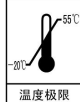

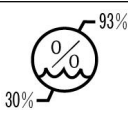

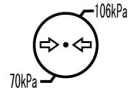

Safety Tips

1. Definition Of Warning Symbols

In the instruction manual, warning symbols are used to indicate safety and other important matters, and their specific meanings are as follows. Before reading this instruction manual, please carefully understand and remember the meaning of these words.

Symbols	Definition
 Danger	Indicates that there will be an imminent dangerous situation that, if not avoided, will cause death or serious injury to personnel.
 Warning	It means that there will be a potentially dangerous situation, if it is not avoided, it may cause personal injury.
 Attention	Indicates that there will be potential dangers or unexpected use. If not avoided, it may cause minor injuries to personnel or property damage or affect use.

2. Safety Symbol

Symbols	Meaning	Symbols	Meaning
	Type B Application Part		Upward
	DC (Direct Current)		Keep Dry
	Power Switch		Fragile
	Power indicator		Stacking Layers Limit
Chg	Battery Charging Indicator		Temp. Limit (storage & transportation)
	Adapter Connection Indicator		Humidity Limit (storage & transportation)
	Restricted Use Sign Of Hazardous Substances (electrical & electronic products)		Atmospheric Pressure Limit (storage & transportation)
	Recyclable		

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Chapter 1 Technical Specifications

1.1 Technical Parameters

- (1) The whole device is waterproof and dust-proof, with waterproof level of IP56; strong and durable.
- (2) Symmetry design for the left and right side buttons (convenient for left and right hand operation).
- (3) Work for more than 6.5 hours for a single charge.
- (4) Display: 8.0 inch high-resolution, high-definition LCD display.
- (5) Measurement of back-fat and eye muscle, automatic back fat thickness measurement, lean meat rate measurement function.
- (6) Probe upgrade, no appendages.
- (7) Professional customized sun visor, retractable adjustment, suitable for outdoor use, humanized design.
- (8) One-key screen protection function (optional).
- (9) Use embedded hardware control system.
- (10) Waterproof 30 cores probe interface, which can be adapted to replace various types of probes.
- (11) Image display mode: B, 2B, 4B, B/M, M and other display modes.
- (12) Dynamic adjustment: 0~135dB adjustable; frame correlation: 0~15 adjustable; post-processing: 0~7 adjustable; edge enhancement: 0~3 adjustable.
- (13) Focus: The rectal probe is adjustable in 4 sections, and the large convex probe is adjustable in 14 sections.
- (14) The maximum depth of rectal probe $\geq 173\text{mm}$, the maximum depth of large convex probe $\geq 270\text{mm}$.
- (15) Pseudo-color: a variety of pseudo-color processing.
- (16) The image has up and down, left and right flip functions.
- (17) Storage: One-key storage; and support U disk storage preview, etc., the left and right buttons have a one-key storage function.
- (18) A variety of fast measurement functions, including conventional measurement (distance, area, volume, etc.), obstetric measurement, heart measurement and other measurement functions.
- (19) Grid setting quick measurement function, 11 kinds of grid quick measurement display.
- (20) Position markings: beef cattle, dairy cows, buffaloes, goats, sheep, alpaca, pigs, cats, dogs, etc., no less than 45 kinds of animal position markings are optional.
- (21) Grayscale: 256.
- (22) Number of channels: 16.
- (23) One video charging interface, eight-core waterproof interface.
- (24) Host rated input: DC14V 3.0A; 15. Adapter output: DC14.0V 3.0A.
- (25) Power supply: 100-240V~1.2-0.6A Frequency: 50-60Hz.
- (26) Patented products, more than three patents.
- (27) Weight: the weight of the whole machine is 1.2KG.
- (28) Image frame rate: 60 frames/sec.
- (29) Image U disk/TF card storage and browsing function; host memory $\geq 8\text{G}$ (New update for 16GB).
- (30) Multiple system preset functions.

(31) Host size: about 206×120×35 mm (length×width×height).

(32) Software version: Animal ultrasound B5.5.

1.2 Main Function

- (1) System setting function.
- (2) Mode conversion function.
- (3) Adjustable function of near field, far field, total gain and dynamic range.
- (4) Frequency conversion function.
- (5) Frame related functions.
- (6) Image post-processing function.
- (7) Image edge enhancement function.
- (8) Color function.
- (9) Brightness adjustment function.
- (10) Depth adjustment function.
- (11) Image freeze/unfreeze function.
- (12) Image rotation function.
- (13) Body mark marking function.
- (14) Distance, circumference, area, volume, heart rate, cycle measurement functions.
- (15) Back-fat thickness, eye muscle thickness, lean meat rate measurement function.
- (16) Automatic measurement of back-fat function.
- (17) Fast measurement of back-fat function.
- (18) Abundant obstetrics software package, including dozens of obstetric tables for 8 animals, can automatically calculate gestational week and expected date of delivery.
- (19) Routine heart measurement function.
- (20) Image U disk/TF card storage and browsing function.
- (21) Single-point and multi-point combination focusing function.
- (22) Energy-saving protection function.
- (23) Text annotation function.
- (24) Image movie playback function.
- (25) Standard conversion function.
- (26) TV/VGA output function.
- (27) Grid setting function.

Chapter 2 Product Appearance

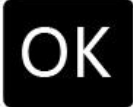
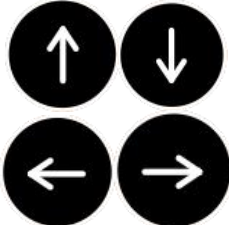





2.1 The Structure Of The Instrument

The veterinary B-type ultrasonic diagnostic apparatus BXL-V50 is composed of a host, a probe and other parts.

2.2 Host External Interface Description

No.	Interface ID	Interface Description
1	DC14V 3A	Power adapter interface
2	VIDEO	TV, VGA output interface
3	USB	USB 2.0 interface
4	TF Card	TF card slot interface
5	PROBE	Probe interface

2.3 Function key description

No.	Function Buttons	Function
1		Enter
2		Parameter selection and adjustment; depth adjustment, etc.
3		Freeze / Unfreeze
4		Power switch; Picture browsing
5		Fast grid measurement
6		Image storage
7		System measurement

2.4 Keyboard Indicator Description

No.	Indicator Lights	State Description
1	Power	Turn on light on, turn off light off
2	Battery	Charging status flashes; full status is always on

Chapter 3 System Configuration

3.1 Standard Configuration

- (1) 1*Host
- (2) 1*Probe
- (3) 1*Power adapter
- (4) 1*Dedicated sun visor
- (5) 1*Suitcase
- (6) 1*Manual/Warranty card/Using USB flash drive

3.2 Optional Probe

- (1) 6.5MHz Linear rectal probe for large animal
- (2) 3.5MHz Convex probe
- (3) 6.5MHz Linear rectal probe for sheep

Chapter 4 Use Conditions

4.1 Power Supply

Network power supply: 100-240V~ $\pm 10\%$ 1.2-0.6A
Frequency: 50-60Hz ± 1 Hz;
Rated input: DC14V 3.0A

4.2 Working Environment

Ambient temperature: 10~40°C;
Relative humidity: 30%~75%(no condensation);
Atmospheric pressure: 800hPa~1060hPa;
Altitude: less than 2000 meters;
Over voltage: Treat as over voltage level II;
Pollution degree: 2

4.3 Storage And Transportation

Ambient temperature: -20~55°C;
Relative humidity: 30%~93% (no condensation);
Atmospheric pressure: 700hPa~1060hPa

⚠ Danger: Do not use this system in an environment where flammable gas (such as anesthetic gas, oxygen, hydrogen) or flammable liquid (such as ethanol) exists. Otherwise, it may cause an explosion.

⚠ Warning: Do not use this equipment with electronic equipment such as high-frequency electric knife, high-frequency treatment equipment or defibrillator at the same time, otherwise it may cause electric shock to the patient.

⚠ Note: The voltage of the network power supply may be different in different countries and regions.

⚠ Note: The use of radio transmitting equipment near this system may interfere with the normal operation of the system. It is forbidden to bring or use equipment that can generate radio waves in the room where this system is installed, such as mobile phones, radio transceivers and wireless remote control toys.

⚠ Note: The system should be avoided in the following environments:

1. Water splashing
2. Humidity
3. Rain
4. Thunderstorm weather
5. No ventilation
6. Near heat source
7. Direct sunlight
8. Severe temperature changes
9. Toxic gas
10. Corrosive gas
11. Strong vibration
12. Strong magnetic field, strong electric field (such as MRI)
13. Radiation (such as X-ray, CT)
14. Use pacemaker or other short-wave medical equipment

Chapter 5 System Connection and Inspection

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

⚠ Warning:

1. The power plugs of this equipment and connected external equipment must be connected to a power socket with protective grounding on the wall, and the socket must meet the requirements on the rated power identification plate. The use of multi-function sockets may affect the protective grounding and cause the leakage current to exceed safety requirements.
2. Please follow the correct electrical connection method to connect the power supply and the earth, otherwise there is a danger of electric shock. Do not connect the ground wire to any gas pipeline or water pipe, otherwise there will be a risk of poor protective grounding or explosion.
3. The signal input and output parts of this instrument are only allowed to be connected with the optional accessories approved in this manual and equipment that meets the IEC standard (IEC 60950 is data processing equipment, and IEC 60601-1 is medical equipment). If in doubt, consult the technical department or local agent.
4. It is forbidden to contact the patient with the live parts of the equipment or other equipment (such as various signal input and output ports, etc.). If the equipment or other equipment fails, the patient will be in danger of electric shock.
5. If the external protective conductor is installed or the integrity of its wiring is in doubt, the equipment should be operated by the internal power supply.

⚠Warning:

1. If the instrument is abnormal, stop working immediately, turn off the power, and find out the cause and contact our company in time.
2. After using the instrument, turn off the power and unplug the power cord.
3. It is strictly forbidden to pull or squeeze the power cord, probe cord, etc. of the instrument. Regularly check whether there is any tearing or exposure. If found, cut off the power immediately, stop using it, and replace it before using it.
4. It is forbidden to load and unload the probe or move the instrument in the power-on state to avoid safety hazards.
5. After the thunderstorm is over, turn off the power and unplug the power cord, otherwise the instrument may be struck by lightning.
6. If the temperature changes too much in a short time, the water vapor inside the instrument may condense, which may cause damage to the instrument.
7. The device is completely closed only by unplugging the power cord directly from the socket.



Warning: The replacement of the power adapter, battery, and power cord described in this chapter should be done by service personnel authorized by our company or by qualified medical personnel (operators). Replacement in accordance with the operating methods in this chapter and the system maintenance chapter will not cause unacceptable risks.

5.1 Power Supply Connect

5.1.1 Power Adapter Connect

Insert the output plug of the power adapter into the DC power input port on the right side of the host.

5.1.2 Network Power Connect

Plug the other end of the power adapter that comes with the machine into the network power socket.

⚠Warning:

1. There is no switch on the adapter, and the system and network power supply are divided into sections, and the input plug of the adapter is pulled out as the sectioning device.
2. The power adapter provided by our company must be used.
3. The power adapter must be placed on a stable surface to prevent accidental fall and damage or injury.
4. The operator cannot touch the patient at the same time when touching the input and output interfaces.

5.2 Inspection before and after use of the ultrasound probe

Before and after each ultrasound inspection, check whether there are any abnormalities on the probe surface or cable sheath, such as peeling, cracks, protrusions, or whether the acoustic lens is firm, and whether it has been cleaned and disinfected.

5.3 Check before and after the host is used

5.3.1 Check before starting

Before starting up, check the following items:

- (1) The temperature, humidity and atmospheric pressure should meet the requirements of the conditions of use;
- (2) No condensation can occur;
- (3) The system and peripheral equipment must not be deformed, destroyed or stained. If there are stains, please clean them correctly according to the relevant chapters;


- (4) Check the keyboard, display and shell to ensure that there are no abnormal phenomena (such as cracks, loose screws);
- (5) The cable must not be damaged (power cable, etc.), and the connection of the connector must not be loose;
- (6) The probe and the probe cable part, make sure that there are no abnormal phenomena (such as scratches, falling off, stains). If there are stains, please clean them correctly according to the relevant chapters;
- (7) Whether the probe has been cleaned and disinfected, if not, please handle it correctly according to the relevant chapters;
- (8) Check whether all ports are damaged or blocked by foreign objects;
- (9) Clean the site and environment.

5.3.2 Check after boot

After starting the ultrasonic diagnostic system, perform the following checks:

- (1) There must be no abnormal sound, strange smell or overheating phenomenon;
- (2) Check whether the device starts normally: the power indicator is on, and the screen displays B mode;
- (3) Check whether the acoustic lens is abnormally heated when the probe is in use. You can feel its temperature by touching the probe with your hand;
- (4) Check the image to ensure that there are no abnormal phenomena (such as abnormal noise, flicker);
- (5) Check the keyboard to make sure it works normally;
- (6) Check the fuselage to ensure that there is no excessive temperature rise locally.

 **Note: If the operator places an abnormally hot acoustic lens on the surface of the patient's skin, it may burn the patient.**


 **Note: After each ultrasonic inspection, the ultrasonic couplant on the surface of the probe must be completely wiped. Otherwise, the ultrasonic couplant will freeze on the acoustic lens of the probe and affect the image quality.**


5.4 System Reset

When the screen display is abnormal, the system operation cannot be executed, etc., you can turn off/on the power of the host to restart the system through the power button.

Chapter 6 Function Operation

6.1 Power On & Off














In the shutdown state, press  key, the machine will turn on after the beep sound, and the power indicator light "Power" will be on.

In the power-on state, press and hold  key and the machine shuts down after a beep sound, and the power indicator light "Power" goes out.














Note: When the machine is turned off, the time for pressing the key is slightly longer than that of normal key-pressing.

6.2 System Function Settings














6.2.1 Time and date settings

- (1) Press “” Key to display the system setting menu;
- (2) Press the arrow   keys, move the cursor to "System Set" press “” key then press   keys to move the cursor to the "Normal" position;
- (3) Press “” Key to pop up the "Normal" dialog box;
- (4) Press the arrow   keys, to select "Year, month, day, hour, minute, second";
- (5) Press the arrow  key to increase the value; press the arrow  key to decrease the value;
- (6) Press “” key, confirm this setting and exit the setting interface.
- (7) Press “” key, cancel this setting and exit the setting interface.

6.2.2 Video Output Settings














- (1) Press “” key to display the system settings menu;
- (2) Press   keys to move the cursor to "System Set" press “” key then press   keys to move the cursor to the "Normal" position;
- (3) Press “” key, the "Normal" dialog box pops up;
- (4) Press   keys and select "Video Out";
- (5) Press   keys to realize the conversion of VGA and TV video output modes;
- (6) Press “” key, confirm this setting and exit the setting interface.
- (7) Press “” key, cancel this setting and exit the setting interface.

6.2.3 TV Mode Settings

- (1) Press “” key to display the system settings menu;
- (2) Press   keys to move the cursor to "System Set" press “” key then press   keys to move the cursor to the "Normal" position;
- (3) Press “” key, the "Normal" dialog box pops up;
- (4) Press   keys and select "TV Mode";
- (5) Press   keys to realize the standard conversion between PAL and NTSC;
- (6) Press “” key, confirm this setting and exit the setting interface;
- (7) Press “” key, cancel this setting and exit the setting interface.














Note: The TV system setting can only be changed when the “Video Out” is in “TV” mode.

6.2.4 Energy Saving Settings














- (1) Press " " key to display the system settings menu;
- (8) Press " " " keys to move the cursor to "System Set" press " " key then press " " " keys to move the cursor to the "Normal" position;
- (2) Press " " key,the "Normal" dialog box pops up;
- (3) Press " " " keys and select "ES Set";
- (4) Press " " " keys,the energy saving time can be selected from 0 to 99 minutes, and 0 minutes means energy saving is off;
- (5) Press " " key, confirm this setting and exit the setting interface.
- (6) Press " " key, cancel this setting and exit the setting interface.

Note: When the energy saving time set by the system is exceeded and no button is pressed, the host will automatically shut down.

6.2.5 Key Sound Settings



- (1) Press " " key to display the system settings menu;
- (9) Press " " " keys to move the cursor to "System Set" press " " key then press " " " keys to move the cursor to the "Normal" position;
- (2) Press " "key,the "Normal" dialog box pops up;
- (3) Press " " " keys and select " KeySound Set";
- (4) Press " " " keys to choose between "on" and "off ";
- (5) Press " " key, confirm this setting and exit the setting interface.
- (6) Press " " key, cancel this setting and exit the setting interface.

6.2.6 Parameter Mode Setting














- (1) Press " " key to display the system settings menu;
- (10) Press " " " keys to move the cursor to "System Set" press " " key then press " " " keys to move the cursor to the "Normal" position;
- (2) Press " " key,the "Normal" dialog box pops up;
- (3) Press " " " keys and select " Param";
- (4) Press " " " keys to choose between "Custom / Mode A / Mode B / Mode C / Mode D";
- (5) Press " " key, confirm this setting and exit the setting interface.
- (6) Press " " key, cancel this setting and exit the setting interface.

Note: In custom mode, parameter changes will saved; in mode A/B/C/D, changes will not saved.















6.2.7 Grid mode settings

- (1) Press “” key to set the grid style;
- (2) Press “” key to set the grid style and spacing, long press to switch between multiple styles;


6.3 Obstetrics total gestational week setting

- (1) Press “” key to display the system settings menu;
- (11) Press “ ” keys to move the cursor to "System Set" press “” key then press “ ” keys to move the cursor to the "GWD Set" position;
- (2) Press “” key to pop up the obstetric total gestational week setting dialog box;
- (3) Press “ ” keys to choose an animal "total gestational week";
- (4) Press “ ” keys to adjust the total number of days of pregnancy;
- (5) Press “” key, confirm this setting and exit the setting interface.
- (6) Press “” key, cancel this setting and exit the setting interface.

6.4 Animal body mark setting

- (1) Press “” key to display the system settings menu;
- (12) Press “ ” keys to move the cursor to "System Set" press “” key then press “ ” keys to move the cursor to the "Body Mark" position;
- (2) Press “” key to pop up the body mark selection dialog box;
- (3) Press “   ” keys to choose one kind of animal body mark;
- (4) Press “” key, confirm this setting and exit the setting interface.
- (5) Press “” key, cancel this setting and exit the setting interface.
- (6) After the animal body mark is set successfully, the animal body mark will be displayed in the lower left corner of the image area. If you need to change the animal body mark display, follow the steps 1 to 4 to select the other "clear body mark" picture, press “” key to confirm and exit setting interface.





6.5 Mode selection

In the real-time state, repeatedly pressing “” key can realize the conversion of five modes: B, B/B, 4B, B/M, and M.





6.5.1 B Mode

After power on, the B mode is the basic mode, and the screen displays a single B mode image.




6.5.2 B/B Mode

- (1) In real time, press “OK” key to enter B/B mode;
- (2) B/B image switching: Press   keys to move the cursor to the "Active" menu item and then press   keys to switch the display of left and right images; One selected image is activated, and the other is frozen;
- (3) In real time, press “OK” key to exit B/B mode.





6.5.3 4B Mode

- (1) In real time, press “OK” key to enter 4B mode;
- (2) 4B image switching: Press   keys to move the cursor to the "Active" menu item and then press   keys to switch the display of four images; the selected one is activated, and the other three are frozen;
- (3) In real time, press “OK” key to exit 4B mode.

6.5.4 B/M Mode





- (1) In real time, press “OK” key to enter B/M mode;
- (2) Movement of the sampling line: Press “” key to exit the current state of use of the arrow keys, then press   keys to remove the sampling line;
- (3) In real time, press “OK” key to exit B/M mode.

6.5.5 M Mode


- (1) In real time, press “OK” key to enter M mode;
- (2) M speed change: Press the arrow   key to move the cursor to the "M Speed" menu item, then press   keys to select the eight scanning speeds required;
- (3) In real time, press “OK” key to exit M mode.





6.6 Adjust image quality

6.6.1 Total gain adjustment






- (1) In the real-time state, Press   keys to move the cursor to the "Gain" of the image menu, press  key to increase the total image gain, press  key to decrease the total image gain, and control the total image gain.

6.6.2 Near field gain adjustment





- (1) In the real-time state, if the menu on the right is the image menu, you can adjust the image quality according to the following steps; if it is not the image menu, press “” key several times to enter the image menu.

- (2) Press   keys to move the cursor to the "near field" of the image menu. Press  key to increase the near field gain of the image, and press  key to decrease the near field gain of the image to control the near field gain of the image.





6.6.3 Far field gain adjustment

- (1) In the real-time state, if the menu on the right is the image menu, you can adjust the image quality according to the following steps; if it is not the image menu, press "" key several times to enter the image menu.
- (2) Press   keys to move the cursor to the "far field" of the image menu. Press  key to increase the image far field gain; press  key to decrease the image far field gain to control the image's far field gain.






6.6.4 Dynamic range adjustment

- (1) In the real-time state, press   keys to move the cursor to the "Dyn" of the image menu. Press  key to increase the value of the dynamic range; press  key to decrease the value of the dynamic range, and control the dynamic range of the entire image.






6.6.5 Frequency adjustment (frequency conversion function)

- (1) In the real-time state, press   keys to move the cursor to the "Freq" of the image menu, and then press   keys to achieve frequency conversion.






6.6.6 Frame related adjustment

- (1) In the real-time state, if the menu on the right is the image menu, you can adjust the image quality according to the following steps; if it is not the image menu, press "" key several times to enter the image menu.
- (2) Press   keys to move the cursor to the "Frame Correlation" of the image menu, and then press   keys to achieve 16 frame correlation conversions.







6.6.7 Image post-processing adjustment

- (1) In the real-time state, if the menu on the right is the image menu, you can adjust the image quality according to the following steps; if it is not the image menu, press "" key several times to enter the image menu.
- (2) Press   keys to move the cursor to the "post-processing" of the image menu, and then press   keys to get eight corrected images. The system defaults to 2.

6.6.8 Edge enhancement adjustment



- (1) In the real-time state, if the menu on the right is the image menu, you can adjust the image quality according to the following steps; if it is not the image menu, press “” key several times to enter the image menu.
- (2) Press   keys to move the cursor to the "edge" of the image menu, and then press   keys to get four processed images.

6.6.9 Screen brightness adjustment





- (1) In the real-time state, if the menu on the right is the image menu, you can adjust the image quality according to the following steps; if it is not the image menu, press “” key several times to enter the image menu.
- (2) Press   keys to move the cursor to the "" of the image menu, and then press   keys to achieve 5 to 31 levels of screen brightness.

6.7 Image control

6.7.1 Image focus position adjustment



In the real-time state, exit all menu item selections, press   keys to select the focus position, and there is an arrow on the left side of the image area.

6.7.2 Image focus number adjustment





- (1) In the real-time status B, B/B, 4B mode, press   keys to move the cursor to the "FocPos" in the image menu. Press   keys to select 4 different focus modes: 1 segment (full dynamic focus) / 2 segments / 3 segments / 4 segments.

Note: When working in B/M or M mode, only one focus mode is allowed to be selected.


6.7.3 Magnification / depth selection

In the real-time state, press   keys to adjust the image magnification, and 16 image depths can be realized to meet various detection requirements.





6.7.4 Image left / right flip

- (1) In the real-time state, B, B/B and 4B modes, press   keys to move the cursor to the "H Rev" of the image menu, and then press   keys to change the scanning direction of the probe, which is indicated by the arrow on the upper left of the image.





6.7.5 Image rotation

- (1) In the real-time state, if the menu on the right is the image menu, you can adjust the image quality according to the following steps; if it is not the image menu, press “” key several times to



enter the image menu.

- (2) In B mode, press   keys to move the cursor to the "H Rev" of the image menu, and then press   keys to rotate the image display direction.

6.7.6 Color selection

- (1) In the real-time state, if the menu on the right is the image menu, you can adjust the image quality according to the following steps; if it is not the image menu, press " key several times to enter the image menu.
- (2) Press   keys to move the cursor to the "Color" of the image menu, Press  key can realize the conversion of 8 color images (including a black and white image).

6.7.7 Image freeze / unfreeze

In the real-time state, press " key to "freeze" the image; press " key again to "unfreeze" the image.



6.8 Image storage and browsing

Note: The TF card should be plugged and unplugged in the off state, it may damage the TF card or even the host system.

6.8.1 Store image



Insert a TF card or a U disk, and insert the default storage to the U disk at the same time. If it is not inserted, the storage function will not be realized.

- **Save to TF card**

- (1) Confirm that the TF card has been inserted before booting;
- (2) Freeze the image;
- (3) Press " key, the storage progress prompt will be displayed at the bottom of the screen until storage is completed;
- (4) Press " key to exit the storage state and return to the real-time state.

Note: The name of the stored image is named according to the current "hours, minutes, and seconds" of the storage.

- **Save to U disk**

- (1) Insert the USB flash drive, the USB flash drive icon is displayed at the bottom right, indicating that the USB flash drive is recognized;
- (2) Freeze the image;
- (3) Press " key, the storage progress prompt will be displayed at the bottom of the screen until storage is completed;
- (4) Press " key to exit the storage state and return to the real-time state.





6.8.2 Browse images




Insert a TF card or U disk, and insert the default U disk image for browsing at the same time. If it is not inserted, the image browsing function will not be realized.

- **Browse TF card images**

Confirm that the TF card has been inserted before booting;

Freeze the image;

- (1) Short Press  key the screen will display the name of the image folder stored in the TF card;
- (2) Press   keys to select the folder, and press "


- (3) Press   keys to select the image file name, and press "




- (4) Press "




- **Browse U disk image**

Insert the USB flash drive, the USB flash drive icon is displayed at the bottom right, indicating that the USB flash drive is recognized;

Freeze the image;

- (1) Short Press  key the screen will display the name of the image folder stored in the U disk;



- (2) Press   keys to select the folder, and press "



- (3) Press   keys to select the image file name, and press "


- (4) Press "

Note: You can only browse the images stored in the machine, browsing the images not stored in the machine may destroy the storage medium or even the host system.


6.9 Delete image or folder

- (1) After freezing the image, Press   keys to move the cursor to "Review";

- (2) Press   keys to select the image or folder to be deleted;




- (3) Press "



- (4) Repeat steps 2 to 3 to delete other images or folders;


- (5) Press "








6.10 Text annotation function

- (1) Press "

- (2) Press   keys to move the cursor to "System Set" press "

-   keys to move the cursor to the "Comment" position;







- (3) Frozen state, press "

- (4) Press  keys to select the position where you need to enter the comment;
- (5) Press "" key to adjust the soft keyboard;
- (6) Press  keys to select the character to be entered;
- (7) Press "" key to confirm the input character and input it to the blinking cursor in the image area;
- (8) Press "" key to exit this comment;
- (9) Press  keys to select the location where you need to enter the comment again;
- (10) Press "" key several times to exit the comment function.

6.11 Movie playback function


In the real-time state, the system has been storing the image being scanned, and the image played back is the image that was frozen for a period of time before.

Follow the steps below to realize the movie playback function:

- (1) After freezing the image, press  key to move the cursor to the "Cine" position then press "" key to enter the continuous playback state;
- (2) In the continuous playback state, press "" key again to enter the frame-by-frame playback state, and press  keys to scroll browse the images frame by frame;
- (3) In the frame-by-frame playback state, press "" key again to enter the pause playback state. The pause playback state can free the keyboard keys for other operations, such as pseudo-color, measurement, and image storage;
- (4) In the paused playback state, press "" key again to enter the continuous playback state, which can repeatedly realize 1~3 function operations;
- (5) Press the freeze button to unfreeze and exit the movie playback function.

Note: If the displayed image is abnormal, it means that the storage time is not enough and the image is not full.





















Chapter 7 Measurement Operation

Note: After freezing the image, press "" key to enter the measurement selection menu; B image mode for "General measurement" and "Obstetric measurement" ; M image mode for "Cardiac measurement".

7.1 General measurement






















7.1.1 Distance measurement





- (1) In B, B/B, B/M mode, freeze valuable images;

- (2) Press " key to display the measurement selection menu on the right side of the screen, press   keys to select "General", and then press " key to enter the general measurement menu;
- (3) Enter the distance measurement mode by default, or press   keys to select "Distance", and then press " key to enter the distance measurement mode; the cursor is displayed as "+" in the image area;
- (4) Press     keys to move the "+" mark to the desired position, and press " key to set the position of the "+" mark as the starting point of the measurement;
- (5) Press     keys to move the "+" mark to the end of the measurement. At the same time, the bright spots appearing between the two measurement marks form a dashed trace of distance measurement. The measurement result is automatically displayed at the "Dx:----mm" on the right side of the screen;
- (6) Press " key before (5) step to exchange the start point and end point;
- (7) Press " key to end the first measurement;
- (8) Repeat steps 4 to 7 to perform multiple data measurements;
- (9) Press " key 2 times to exit the measurement state;
- (10) Press " key to unfreeze, clear all marks and data and exit the measurement.

7.1.2 Circumference, area and volume measurement

Ellipse method to measure perimeter, area and volume

- (1) In B, B/B, B/M mode, freeze valuable images;
- (2) Press " key to display the measurement selection menu on the right side of the screen, press   keys to select "General", and then press " key to enter the general measurement menu;
- (3) Press  key to exit the default distance measurement mode, then press   keys to select "Cir | Area" or "Volume", and then press " key to enter the perimeter, area or volume measurement mode; the cursor is displayed as "+" in the image area;
- (4) Press     keys to move the "+" mark to the desired position, and press " key to set the position of the "+" mark as the starting point of the measurement;
- (5) Press     keys to change the short axis of the ellipse to meet the area to be tested, on the right side of the screen "Cx:00000mm, Ax:00000cm², Vx:00000cm³" Will automatically display the measurement result, then press     keys again to move the "+" cursor to the end of the measurement, and an elliptic curve will appear at the same time;

- (6) Press "" key before setting end of the measurement to swap the start point and end point;
- (7) Press "" key to end the first measurement;
- (8) Repeat 4~8 steps to make multiple sets of data measurement;
- (9) Press  key to exit the measurement state;
- (10) Press "" key to unfreeze to unfreeze, clear all marks and data and exit the measurement.

7.2 Cardiac measurement

Depth / Slope / Heart Rate / Time measurement

The operation method of Depth / Slope / Heart Rate / Time measurement is same with the distance measurement.

Note: When in B/M mode, the start and end points of the measurement mark are both in the B mode area; The unit of M mode measurement result is as follows:


Displaying "---" is an invalid value.

+: Indicates depth, unit: mm (millimeters)








EF: Represents the slope, unit: mm/s (millimeters per second)

HR: Indicates heart rate, unit: times/minute (times/minute)

T: represents the period, unit: ms (milliseconds)


 **Note: The accuracy of the software measurement is: distance measurement $\leq 1\text{mm}$; area measurement $\leq 1\text{mm}^2$; volume measurement $\leq 1\text{cm}^3$; heart rate measurement $\leq 1\text{bpm}$; period measurement $\leq 1\text{ms}$, but due to the difference between the images obtained each time due to user reasons, the actual object The measurement accuracy may be greater than the above-mentioned value.**













7.3 Obstetric measurement

- (1) In B, B/B, B/M mode, freeze valuable images. Press "" key, the right side of the screen displays the measurement selection menu, press   keys to select "OB" and then press "" key to enter the obstetric measurement menu;
- (2) The obstetric measurement menu has 8 types of animal obstetric measurement for selection (default animal obstetric measurement will according to the body marked you set before), press  key to exit default animal obstetric measurement then press   keys to select the desired animal type to enter the corresponding obstetric measurement option;
- (3) The obstetrics measurement operation method is the same as the distance measurement method;
- (4) When the measurement result shows "---", it is an invalid value.

7.4 Lean meat percentage measurement in swine

7.4.1 Measurement procedure

- (1) In B, B/B, B/M mode, freeze valuable images. Press "" key, the right side of the screen

- displays the measurement selection menu, press   keys to select "OB" and then press  key to enter the obstetric measurement menu;
- (2) In the obstetric measurement menu, press   keys to select "Swine" to enter the swine obstetric measurement menu;
- (3) In the swine obstetric measurement menu, press   keys to select "%Lean" then press  key to enter the swine lean meat percentage measurement, and then press  key to pop up the swine weight input dialog box;
- (4) Press   keys to select the weight of the swine, and then press  key to confirm and exit the dialog box;
- (5) After exit the dialog box, it will enter the distance measurement mode, the first measurement is back-fat thickness measurement;
- (6) The second measurement is the eye muscle thickness measurement, and the lean meat rate is displayed at the same time.



7.4.2 Measurement considerations



- (1) When measuring older animals, if necessary, cut off the hair of the measuring site, moisten the skin with hot water, and then moisten the skin with oil for 1 to 2 minutes before measuring. Make sure that the probe is always perpendicular to the pig's back when measuring, if it is tilted, it may cause measurement errors. When the selected measurement position is not accurate, such as selecting the animal's shoulder and arm, the measurement result is not accurate.
- (2) Whenever the probe leaves the measuring point, the ultrasonic couplant needs to be re-applied evenly before continuing the measurement.
- (3) If the contact is not good, first remove any possible feces, straws and other dressings and excessive hair on the scanned part, which may lead to poor contact between the acoustic window part and the skin, leading to inaccurate measurement results.
- (4) It is recommended to use a special ultrasonic coupling agent, or use vegetable oil.

7.5 Swine back-fat measurement





Preparation before measurement: In order to ensure accuracy, it is recommended to keep the pigs in a fixed position and keep them in a natural standing state. You can feed them; if the pig's hair is thick, it needs to be trimmed; if the pig's back is too dirty, please simply clean it before measuring; For precautions, please refer to 7.4.2 Summary, "Precautions for Lean Meat Ratio Measurement" for detailed instructions.

7.5.1 Automatic back-fat measurement

- (1) In the frozen state of B mode, Press  key, the measurement selection menu will be displayed on the right side of the screen, press  key to automatically measure the back-fat depth and display the back-fat thickness;

- (2) Press “” key to unfreeze the image and then measure again according to steps 1~2;
- (3) Press “” key to exit the automatic back-fat measurement.

7.5.2 Fast back-fat measurement

- (1) In the real-time state of B mode, Press “” key, and the measurement selection menu will be displayed on the right side of the screen. press  key to automatically measure the back-fat depth and display the back-fat thickness;
- (2) Adjust the probe direction and measurement angle to make the best back-fat image effect, and then press the "freeze" key to freeze the image, and press  key to enter the fast back-fat measurement state, and the image area will display three reference lines;
- (3) Press “” key to exit the automatic back-fat measurement.


Chapter 8 System Maintenance

The maintenance of the system is done jointly by the customer and the service engineer. After purchasing this product, the user is fully responsible for the maintenance and operation of the product.

8.1 Maintenance by the customer

8.1.1 System cleaning and disinfection

 **Warning:** Before cleaning each piece of equipment in the system, the machine must be turned off and the power cord must be unplugged. Cleaning when the machine is turned on may cause electric shock.

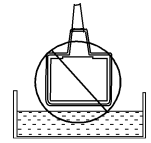
 **Warning:** The equipment in the system does not have any waterproof device. Do not spill water or liquid into the system during cleaning and maintenance, otherwise it may cause malfunction or electric shock.

 **Note:**

1. Probes that have not been cleaned or disinfected may become a source of bacterial infection. Therefore, the probes must be cleaned and disinfected after each ultrasound examination.
2. When cleaning and disinfecting the probe, you must wear sterile gloves to prevent infection.
3. During the cleaning and disinfection process, avoid overheating the probe (over 60°C), because high temperature can cause deformation or damage to the probe.
4. To prevent infection/cross-infection, a condom must be put on the probe before using the cavity probe.
5. Do not use the packaging box to store the probe, otherwise, the packaging box will become a source of pollution.
6. The waterproof grade of the cavity probe is IPX7, the immersion depth is from the sound head part of the probe to the sheath of the probe handle, and the waterproof grade of other probes is IPX4.
7. After disinfection, the probe must be rinsed with sterile water to remove residual chemicals. Because the remaining chemicals may be harmful to the human body.
8. The company does not make any guarantee for the efficacy of the disinfectant solution. Please contact the corresponding manufacturer for details of this type of product.
9. In the implementation of disinfection operations, please refer to the disinfection technical specifications of medical and health institutions for implementation.

 **Warning:**

It is forbidden to immerse the ultrasonic probe plug in water or disinfectant, otherwise it may cause electric shock or probe failure.



(1) Clean the probe

- 1) Sterile gloves must be worn to prevent infection;
- 2) Rinse the probe with clean water or soapy water to remove all foreign objects, or use a soft urethane sponge to wipe the probe. It is forbidden to use brushes, as the probe may be damaged.
- 3) After rinsing, use a sterile cloth or gauze to wipe off the water on the probe. It is forbidden to dry the probe by heating.

(2) High-level disinfection

In the disinfection process, please follow the disinfection method provided in this instruction manual for disinfection.

- 1) Before disinfection, please wear sterile gloves to avoid infection;
- 2) The probe must be cleaned before disinfection. It is recommended to use the solutions in the table below to disinfect the probe.

Disinfectants based on glutaraldehyde :

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

Non-glutaraldehyde-based disinfectant :

Chemical Name	Reagent name	Step
O-phthalaldehyde solution (0.55%)	Cidex OPA	Please refer to the instructions for use of the solution for details.

- **Please follow the instructions provided by the manufacturer on the concentration of the disinfectant and the method of disinfection, and pay attention to the precautions for the use of the disinfectant. But do not flush the cable close to the probe plug.**

- **Limit the time that the probe is immersed in the disinfectant to the shortest time recommended by the disinfectant manufacturer (for example, the manufacturer of Cidex OPA recommends a minimum of 12 minutes).**
 - **When choosing a disinfectant, please follow local regulations.**
- 3) After disinfection, rinse the probe with a large amount of sterile water (approximately 2 gallons) for at least 1 minute to remove residual chemicals on the probe. Or follow the flushing method recommended by the disinfectant manufacturer.
 - 4) After rinsing the probe, use a sterile cloth or gauze to wipe off the moisture on the surface of the probe. It is forbidden to dry the probe by heating.

 **Note: The waterproof rating of the probe is IPX7, and the immersion depth is from the sound head part of the probe to the probe housing part.**

 **Note:**

1. **The acoustic lens may change color, and the text on the probe label may fade. However, these are normal phenomena.**
2. **Repeated regular disinfection will cause the safety and performance of the probe to decrease, so the number of regular disinfection should be minimized.**

(3) Inspection after probe cleaning and disinfection

- 1) Ensure that there are no abnormal phenomena (such as scratches, cracks, falling off) in the probe shell and probe cable part;
- 2) The sound window of the probe is very thin to ensure that there are no abnormal phenomena such as scratches, cracks, peeling, bulging, falling off, etc.

(4) Cleaning the probe cable

- 1) Use a soft dry cloth to wipe the stains on the probe cable;
- 2) If it is still difficult to remove the stain, use a soft cloth soaked in a mild detergent to wipe the stain, and then air dry.

(5) LCD screen cleaning

Wipe the LCD screen with a soft cloth soaked in glass cleaner, and then air dry.

 **Note: It is forbidden to use hydrocarbon cleaners such as alcohol or OA equipment cleaners to clean the LCD screen.**

 **Note: Do not touch the LCD screen with sharp objects; do not press or squeeze the LCD screen forcefully.**

(6) Cleaning of control panel and housing

Use a soft dry cloth to clean the surface of the instrument, or use a soft cloth dampened with neutral water cleaner to wipe off the stains, and then use a dry soft cloth to dry the instrument or air dry.

8.2 Replacement of the host charger

Before replacing the host charger, please contact our company and replace the charger under our guidance. Please use the host charger provided by our company.

8.3 Fault check

In order to ensure the normal operation of the product, it is recommended that the user formulate a maintenance and regular inspection plan, and regularly check the product safety performance. If you find an abnormality, please contact our company's customer service department in time.

If you encounter the following situations after starting up, please refer to the troubleshooting methods in the table below to check. If the fault still cannot be eliminated, please contact the customer service department of our company.

Failure phenomenon	Elimination method
Power on, Power indicator not light, Screen not display	<ol style="list-style-type: none"> 1. Check the power supply. 2. Check the power cord and plug. 3. Check the power adapter.
Intermittent fringe interference, Snowflake interference or Image far-field interference Appear on the display	<ol style="list-style-type: none"> 1. Check the power supply of the product (whether the power is interfered by the ignition of other equipment) 2. Check the environment. There are electric motors, ultrasonic atomizers, cars, computers or other sources of interference (electromagnetic field interference in the space around the instrument) nearby. 3. Check the power supply of the product is in good connecting.
Image display is not clear	Adjust the product's gain, near field and far field, etc.
Operation panel fails	It should be turned off and then turned on again.

8.4 Maintenance by maintenance personnel

In order to ensure the performance and safety of the system, the following inspections must be carried out after the instrument is used for one year. When inspecting, please consult our company's agent, because these inspections require engineers with professional skills.

Check category	Check item
Cleaning	Inside the system Peripherals

Electrical Safety	Ground impedance Leakage current to ground Patient leakage current contact current Dielectric strength
Machinery safety	Check the control panel Peripheral equipment installation mechanism Other mechanical parts Probe appearance
Image recording	Images in each mode Images recorded using standard probes

Chapter 9 Storage and Transportation

Storage and transportation

- (1) When the storage period of the instrument exceeds 3 months, the instrument should be taken out of the packaging box. After 4 hours of power-on, the instrument should be placed in the box according to the direction shown on the packaging box and placed in the warehouse. Do not stack the instrument, do not close to the ground, four walls and roof.
- (2) The environment should meet: temperature should meet $-20\sim 55^{\circ}\text{C}$; relative humidity should meet 30~93% (non-condensing); atmospheric pressure should meet 800hPa~1060hPa. Indoor ventilation should be good, avoid strong sunlight and corrosive gas erosion.
- (3) The instrument packing box is equipped with simple anti-vibration facilities, which is suitable for aviation, railway, road and ship transportation. However, avoid rain and snow splashing, upside-down, collision and excessive stacking.

Chapter 10 Security Classification

- (1) Classified according to the type of electric shock prevention :
Class I, internal power supply equipment
- (2) According to the degree of protection against electric shock :
Type B application part
- (3) Classified according to the degree of protection against ingress of liquid :
The host belongs to the IPX0 equipment; the probe belongs to the IPX7 which prevents short-term immersion in water.
- (4) According to the safety degree of the use of flammable anesthetic gas mixed with air or flammable anesthetic gas mixed with oxygen or nitrous oxide :

Does not belong to AP type equipment, nor does it belong to APG type equipment

- (5) Classified by work system :
Continuous operation equipment
- (6) Classified according to the protection of radio services :
Group A equipment

Description

- (1) Thank you for purchasing an all-digital B-mode ultrasonic diagnostic apparatus (for veterinary use).
- (2) The functions described in this manual series are not applicable to all models, please refer to the actual model purchased.
- (3) Before using the product, please read the contents of the instruction manual carefully in order to use the product correctly.
- (4) After reading, please keep this manual properly so that you can refer to it at any time when you need it.

Instruction Manual Issue Date: 2021-11-3, Version: BXL-V50 V2.0

The user manual will be changed due to changes in appearance without notice !