

WAVE

WAVE EDITION

WAVE ULT608

OPERATING MANUAL



LOCALIZED OPERATOR GUIDE

Original technical manual (English)

LOCALIZED OPERATOR GUIDE

DOCUMENT STATUS

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This WAVE edition provides a clear operating overview and preserves the complete original manufacturer manual as an unchanged technical appendix. The appendix remains authoritative for detailed controls, diagrams, maintenance and fault codes.

SAFETY FIRST

Installation, operation and maintenance are restricted to trained and authorized personnel. Read this guide and the complete technical appendix before first use. Follow the nameplate, local law and site procedures. Stop the machine and contact WAVE if information conflicts or the unit behaves unexpectedly.

SCOPE AND KEY DATA

Ultra-low-temperature storage for approved medical, biological and laboratory materials. Validate product suitability and maintain an independent sample-protection plan.

608 L**-40 to -86 deg C****1000 x 1147 x 1996 mm****220 V / 50 Hz****308 kg net****1660 VA rated**

INSTALLATION AND COMMISSIONING

Before first use

- Inspect transport damage and accessories before acceptance.
- Install indoors at 10 to 32 deg C and relative humidity up to 83%.
- Level and secure the cabinet; keep the air intake grille unobstructed.
- Use a dedicated, correctly rated and grounded outlet. Verify nameplate voltage.

WAVE CHECK

Installation, operation and maintenance are restricted to trained and authorized personnel. Read this guide and the complete technical appendix before first use. Follow the nameplate, local law and site procedures. Stop the machine and contact WAVE if information conflicts or the unit behaves unexpectedly.

OPERATION AT A GLANCE

Routine operation

- Start empty, silence the initial alarm and set the required temperature.
- Confirm the chamber has reached the set point before loading.
- Load pre-cooled items in small batches, at least two hours apart.
- Minimize door openings and never block internal air circulation.

Stop and escalate

- Move samples to validated backup storage after a power or cooling failure.
- Do not store flammable, explosive or highly corrosive materials.
- Do not dismantle the refrigeration, electrical or battery systems.
- Escalate persistent temperature, compressor, fan or alarm faults to qualified service.

CARE, RECORDS AND RESPONSE

Maintenance rhythm

- Daily: clean outer surfaces and review alarms.
- Weekly: clean chamber, shelves and door seal.
- Monthly: remove dust from the equipment compartment.
- As needed: defrost only with the supplied scraper; never use sharp tools.
- Annually: full service by qualified personnel.

Required records

- Temperature and alarm history
- Door openings and loading events
- Cleaning, defrosting and maintenance
- Sample transfer and contingency actions

Support

wave.cc | mike@wave.cc

TECHNICAL APPENDIX FOLLOWS

Original technical manual (English)

The following pages reproduce the original manufacturer manual without alteration. Screen names, diagrams, part references, maintenance procedures and alarm tables must be read there in full.

Source revision: BDF-86V608BD - Version 2025.05

BIOBASE

-86°C Freezer
BDF-86V608BD
User Manual

Jinan Biobase Biotech Co., Ltd.

Version 2025.05

Preface

Dear customers:

Thanks for choosing Jinan Biobase Biotech Co., Ltd. Products!

In order to let you know more about this product and use it safely and reasonably, please read the instruction manual carefully before use. The content of this manual is very important for you to use this machine safely and correctly!

Please keep this manual in a safe place for reference at any time.

In all cases marked with , the instructions should be consulted in order to confirm the nature of the potential hazard and any countermeasures that must be taken.

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1. Scope of Application

This product is used to provide a $-40^{\circ}\text{C} \sim -86^{\circ}\text{C}$ storage environment for medical institutions to store viruses, germs, red blood cells, white blood cells, skin, bones, bacteria, semen, biological products, ocean products, electronic devices, and low-temperature tests of special materials.

2. Working Environment

- a) Only applicable for indoor use;
- b) Ambient temperature: $10^{\circ}\text{C} \sim 32^{\circ}\text{C}$;
- c) Relative humidity: not more than 83%;
- d) Power supply: single-phase voltage: $(220 \pm 22)\text{V}$; frequency: $50\text{Hz} \pm 1\text{Hz}$.
- e) No strong vibration and corrosive gas exists around;
- f) No direct sunlight exposure and other cold and heat sources.

3. Technical Parameters

Model	BDF-86V608BD
Volume (L)	608
Setting temperature range ($^{\circ}\text{C}$)	$-40 \sim -86^{\circ}\text{C}$
Net weight (kg)	308
Climate type	SN/N
Rated power (VA)	1660
Dimensions (W×L×H) (mm)	1000×1147×1996
Software release version	V1.0.101

4. Performance

4.1 Characteristic point temperature

The characteristic point temperature of the freezer shall not be greater than -86°C.

4.2 Temperature display

A) The freezer shall have a device displaying the temperature in the chamber. The minimum separation value of the temperature display shall be 1°C or better, and the difference between the display temperature and the set temperature shall be less than 3°C.

B) The temperature in the freezer is above or below the set temperature shall have the alarm function, and the alarm temperature can be set manually. The alarm displayed with sound beep and flashing flashing. The alarm temperature is generally set to be 10°C above or below the set operating temperature.

4.3 Cooling time

The time required for the temperature to drop to the temperature specified in the table shall meet the requirements in the table.

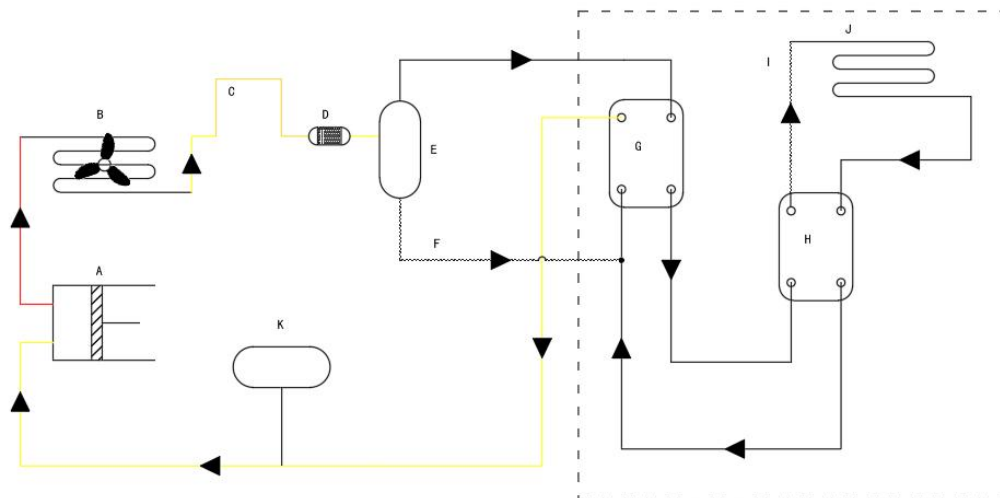
No.	Freezer type	Temperature at the characteristic point(°C)	Cooling time / h (upright type)
1	-86°C freezer	- 81	≤8

4.4 Power consumption

The measured power consumption value of the freezer shall not be greater than 115% of the rated value.

5. Working Principle and Product Structure

5.1 Working Principle

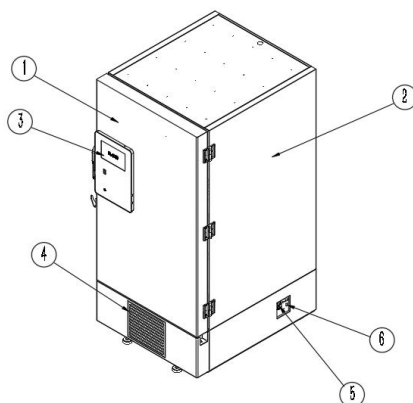


A: Compressor
 B: Condenser
 C: Anti-dew tube
 D: Drying filter
 E: Gas-liquid separator
 F: Capillary tube1

G: Plate heat exchanger1
 H: Plate heat exchanger2
 I: Capillary tube2
 J: Light tube evaporator
 K: Pressure relief tank

5.2 Product Structure

The product is mainly composed of cabinet body, door body, refrigeration system, control system and accessories.



1. External door: Hold the external door handle to open the external door. When closing, it should be completely locked with the external door handle hook.
2. Main cabinet: The whole cyclopentane foam insulation has good insulation effect.

3. Touch screen thermostat: Used to control and set the parameters of the entire electrical system.
4. Air intake grille: Do not block this port to maintain normal cooling performance.
5. Air power switch: Can turn the power of the device on or off to protect the safe operation of the entire device. On: " | " Off: "○".
6. Battery switch: Used to display the temperature in the box for a certain period of time after power failure.

Due to the improvement and different models, the actual product may be different from the diagram, please refer to the object!

6. Installation and Operation

6.1 Precautions for receiving the deep freezer

- a) After removing the packaging, carefully check whether the product information is consistent with the order requirements, and refer to the accessories list in the instruction manual, and check whether the accessories and data are complete.



Please keep the package box for unexpected use.

6.2 Handling and Movement

- a) Handling should be lifted from the bottom, the inclined surface should not be greater than 45 degrees, light move light put;
- b) When handling or moving by naked machine, do not grasp the door body and other non-load-bearing parts;
- c) Remove all packaging components, including the protective foam inside the cabinet.

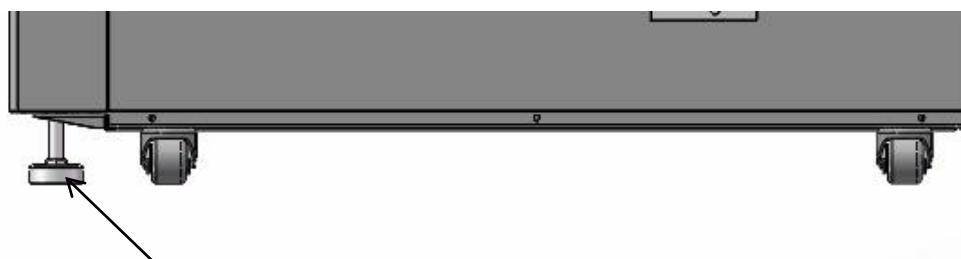
6.3 Installation and Debugging

- a) Remove the packaging material and the packaging tape

Remove all the packaging materials and packaging belts for transportation. Open the box door to ventilate the equipment. If the equipment housing is dirty, clean with a neutral detergent.(Undiluted detergent may damage the plastic parts. For dilution method, refer to the instructions of detergent.) After washing with diluted detergent, wipe with a clean soaked cloth and then with a dry cloth.

- b) Adjust the horizontal feet

Rotate the horizontal foot counterclockwise to extend the horizontal foot out to touch the ground. Ensure that the equipment is in a horizontal state.

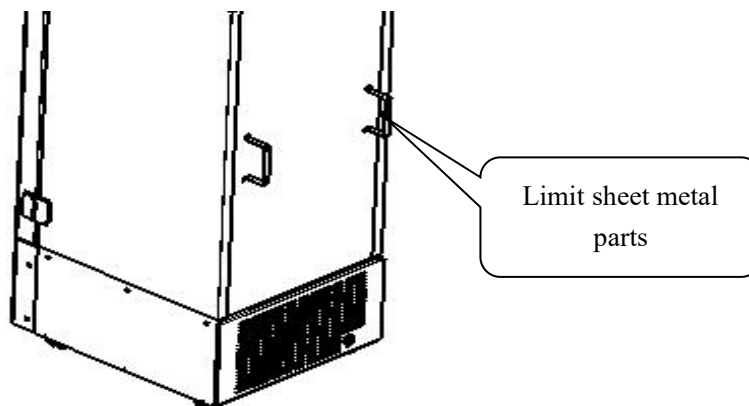


Horizontal floor foot

- c) fixed equipment

There are two limit sheet metal parts installed on the back of the freezer. Attach the freezer to the

wall with limit sheet metal parts and ropes or chains.



d) Grounding

Warning

A power socket with a ground wire shall be used to prevent electric shock. If the power socket is not grounded, it must be installed by qualified engineering personnel.

Do not ground the equipment through the gas pipe, water supply pipe, telephone line or lightning rod. The above grounding may cause electric shock in the case of incomplete pipe line.

e) Starting device

When starting commissioning or officially running equipment, follow the following steps.

1. In an empty cabinet, connect the power cord to a suitable special socket and turn on the power switch.
2. If you hear the alarm sound, press the mute button to stop sound.
3. Set the required temperature in the cabinet.
4. Check whether the temperature in the cabinet reaches the required temperature.
5. After confirming the above steps, a small amount of pre-cooled items can be put into the deep freezer in batches, with a time interval of at least two hours, to prevent the temperature from rising.

Temperature controller setting

The temperature controller has set the default parameters, please do not change.

 **Note:** The default temperature of the device at the factory is set at -80°C

Compressor delay start time changes

In order to reduce the power load after power failure, the equipment can change the delayed start time of the high temperature compressor.

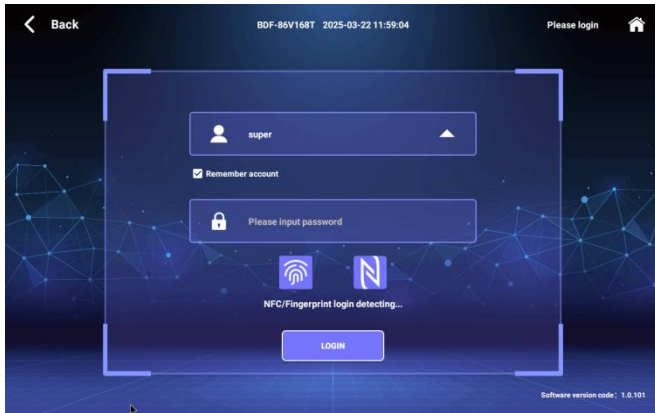
Notes:

- There is no need to change the delayed start time when the entire power supply capacity is sufficient.

6.4 Operation Instructions

a. Button function

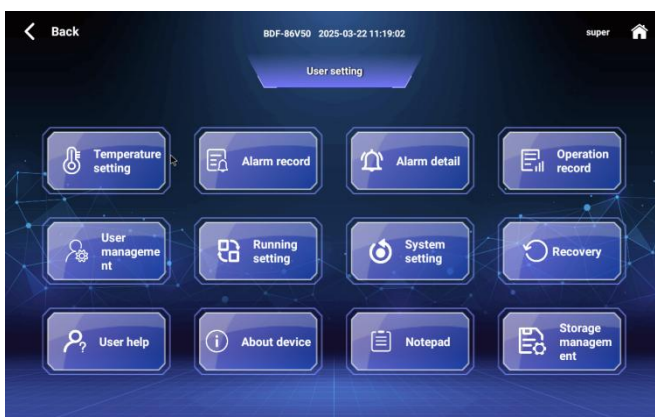
Setting button



Step 1: Click on the account login in the upper right corner of the screen, the login interface will appear, enter the account password or fingerprint recognition, NFC card swipe to log in.



Step 2: Click the "Settings" menu at the bottom of the Main interface to enter the user settings interface.



Step 3: The user setting interface appears, select the parameters to be set.

Temperature setting button



Click the "Temperature Setting" button to set the temperature, high temperature alarm value, and low temperature alarm value.

Alarm record button



Click the "Alarm Record" button, and the list will display the alarm records for the current day by default.

Alarm detail button



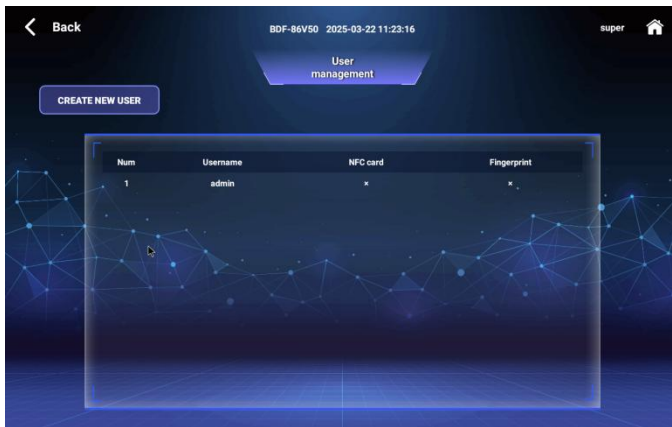
Click the "Alarm Details" button to display the current alarm information.

Operation record button



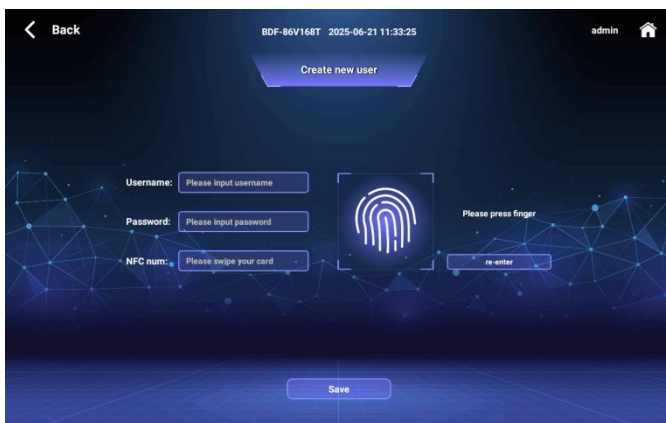
Click the "Operation record" button to query the setting records, door opening and closing records, sample records, and access record information.

User management button



Click the "User Management" button to view all user information and create new users.

User Management button



User column: Enter the user name, the length is limited to 10 characters.

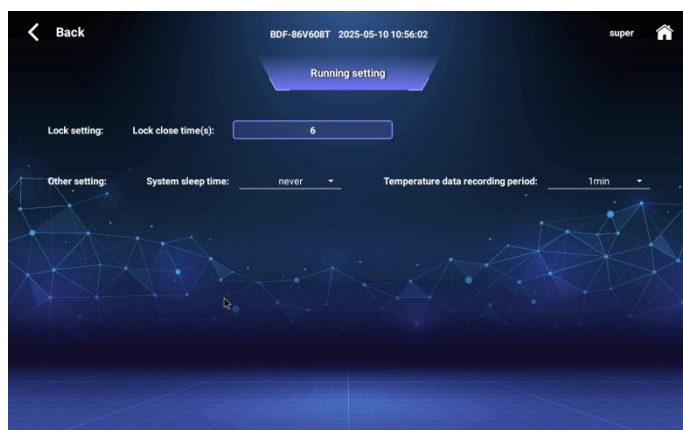
Password column: Enter the password, which will be automatically replaced by ".". The length is limited to 10 characters.

NFC card number column: Place the NFC card close to the NFC module. After successful identification and reading, the card number will be automatically filled into the NFC card number column.

Fingerprint entry: Press the fingerprint module with your finger. After the fingerprint module successfully identifies, it will display the fingerprint entry success, and the collected fingerprint image will be displayed on the left.

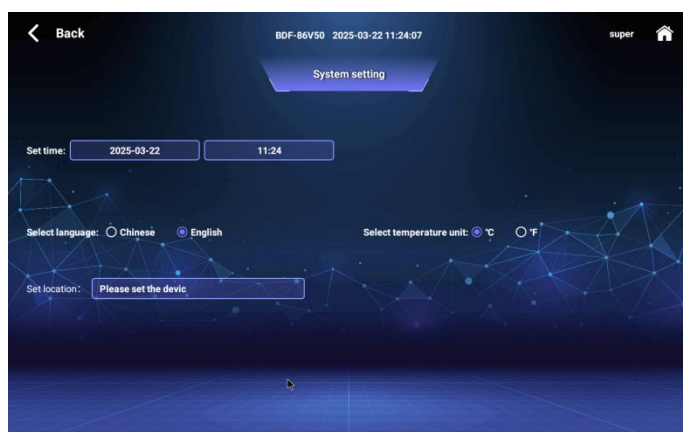
Click the OK button to save the currently entered user information. If there is no password or user name, it will prompt "Please check the user name or password"; if the user name is repeated, it will prompt "The user name has been used". After successful saving, exit the current interface, and the user list will automatically update the entered user information; click the Cancel or Return button to automatically clear the entered fingerprint information, and the user information will not be saved.

Running setting button



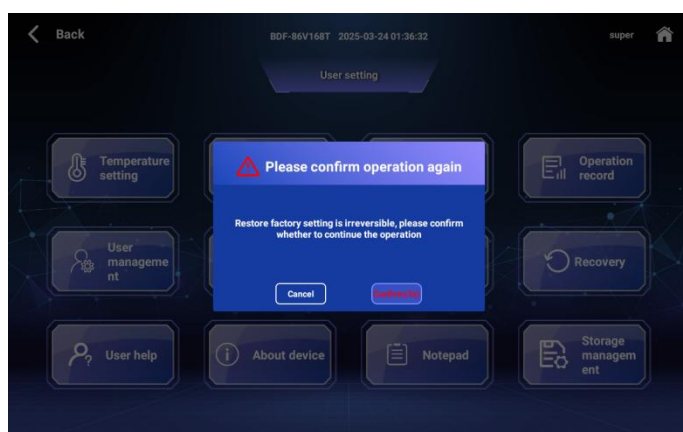
Click the "Running Settings" button to set the operation mode parameters, electromagnetic lock unlocking time parameters, system sleep time, and temperature data recording cycle parameters.

System setting button



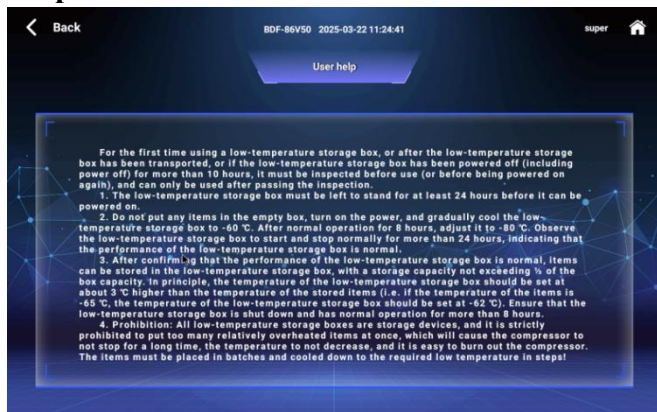
Click the "System Settings" button to set the time, system language, temperature unit, and device location.

Factory Reset button



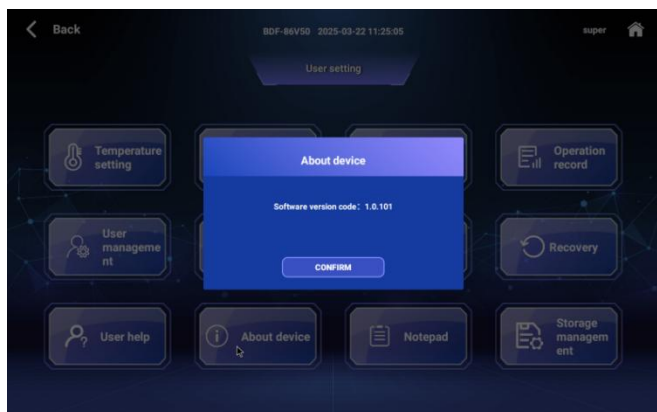
Click the "Restore Factory Settings" button to restore the device to factory settings and reset all user setting parameters.

Help button



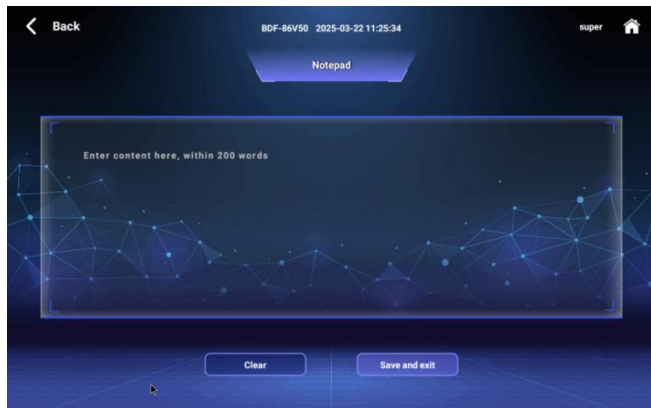
Click the "User Help" button to get a text-based introduction to usage precautions and instructions.

About device button



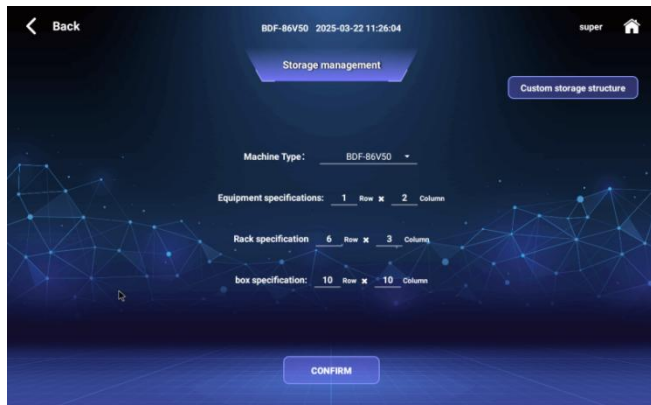
Click the "About Device" button to pop up the current device information dialog box, displaying the software version number

Notepad button



Click the "Notepad" button to enter the electronic whiteboard for recording matters and prompting information, etc.

Storage management button



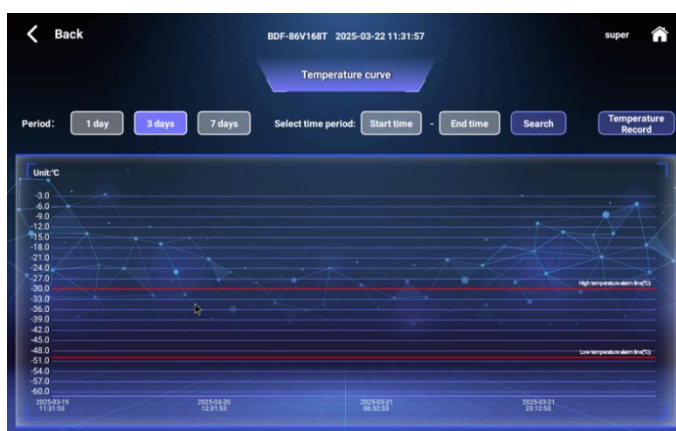
Click the "Storage Management" button to enter the equipment specifications, cryorack specifications, cryobox specifications, number of rows and columns according to actual usage, and set a custom storage structure.

1) "Customize storage structure" button



Click "Customize Storage Structure" under the "Storage Management" button to adjust the specifications of a single cryorack or cryobox.

Temperature curve button



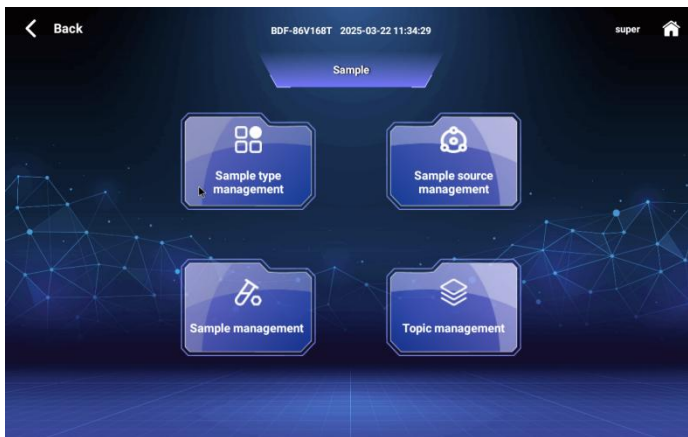
Click the "Temperature Curve" button to display the temperature record curve and high and low temperature alarm values within the time period of the day by default. Click the three-day and seven-day buttons to view the temperature curves corresponding to three natural days and seven natural days. You can click the custom time period to select the start time and end time. It supports viewing the temperature record curve within 7 days.

Running status button



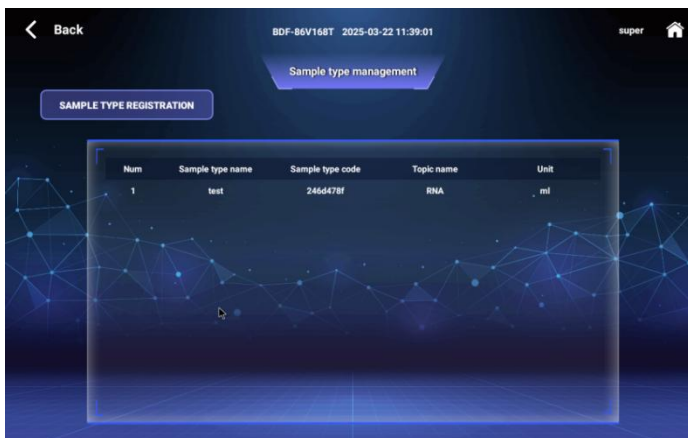
Click the "Running Status" button to dynamically update and display the temperature inside the box, 1# condenser temperature, 2# condenser temperature, set temperature, ambient temperature, and battery voltage in real time. Dynamically update and display the high temperature alarm value, low temperature alarm value, operation mode, current, and power supply voltage value in real time. Dynamically update and display the start and stop status of the high temperature fan, low temperature fan, high temperature compressor, low temperature compressor, and battery charge and discharge status in real time. The white icon indicates the stopped operation status, and the blue icon indicates the operation status.

Sample button



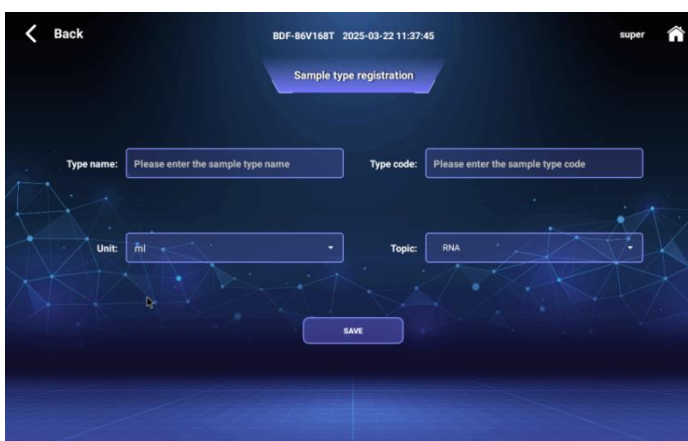
Click the "Sample" button to enter the sample interface, which displays the "Sample Type Management", "Sample Source Management", "Sample Management" and "Topic Management" options.

Sample type management button



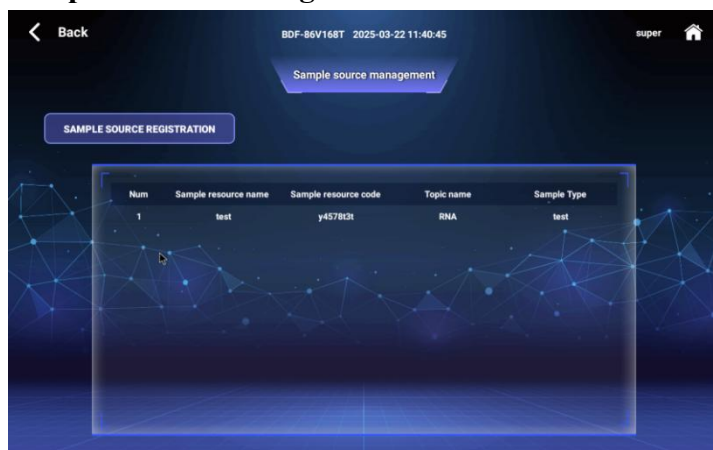
Click the "Sample Type Management" button to display the sample type name, sample type number, subject name, measurement unit, etc., and you can perform "Sample Type Registration".

Sample Type Registration button



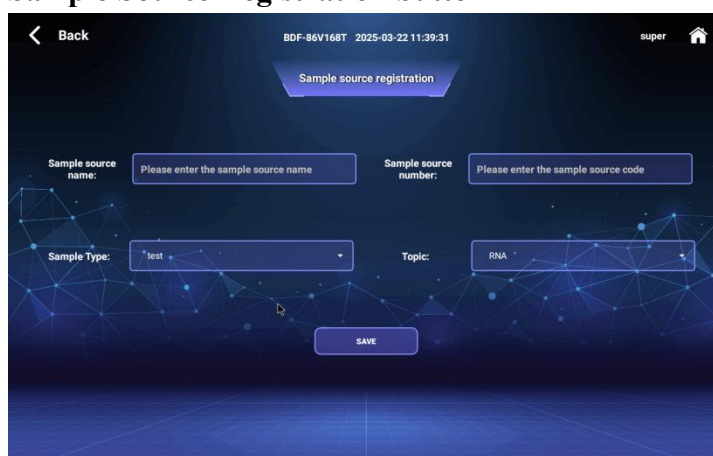
Click the "Sample Type Registration" button, enter the sample type name, type number, select the unit of measurement, and the subject to which it belongs.

Sample Source Management button



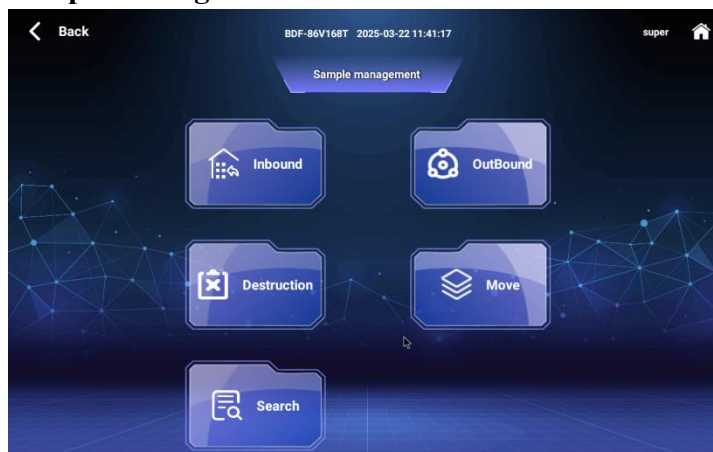
Click the "Sample Source Management" button to display the sample source name, sample source number, subject name, sample type, etc., and you can perform "Sample Source Registration".

Sample Source Registration button



Click the "Sample Source Registration" button and enter the sample source name, sample source number, sample type, and subject.

Sample management button



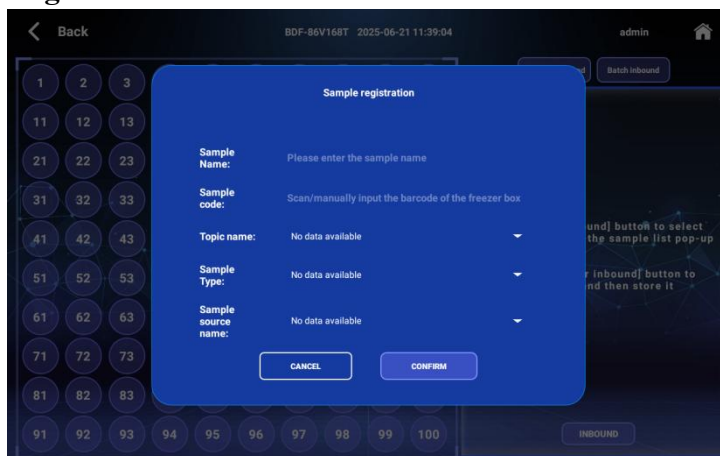
Click the "Sample Management" button to perform operations such as sample storage, sample out of storage, movement, destruction, and viewing.

Enter Warehouse button



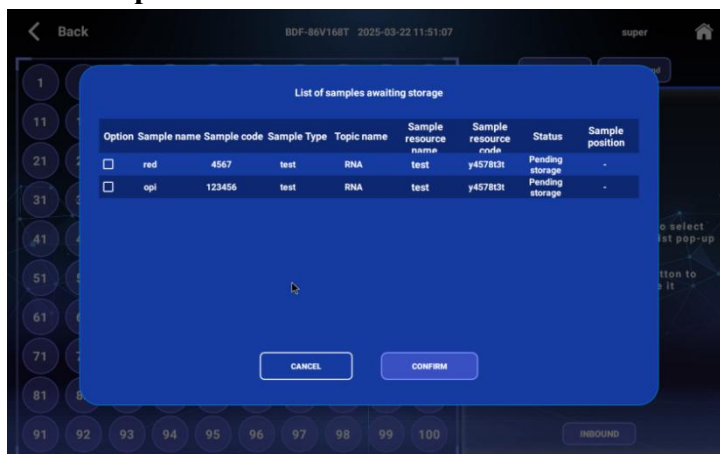
Click the "Enter Warehouse" button to enter the cryostock rack view. Select the target cryostock rack in the rack view. The system will automatically display the corresponding box view, cryostock rack position, and available capacity of the cryostock rack. You can register for warehousing and batch warehousing operations.

Register Enter Warehouse button



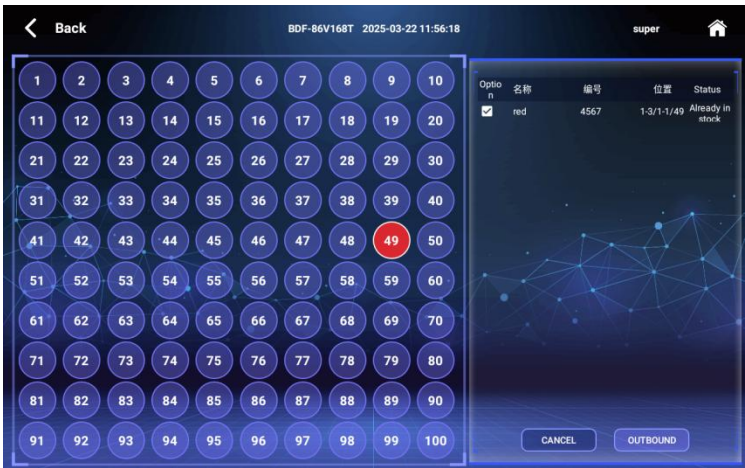
Click the "Register" button to enter the sample name and sample number, and select the subject name, sample type, and sample source name.

Batch Import button



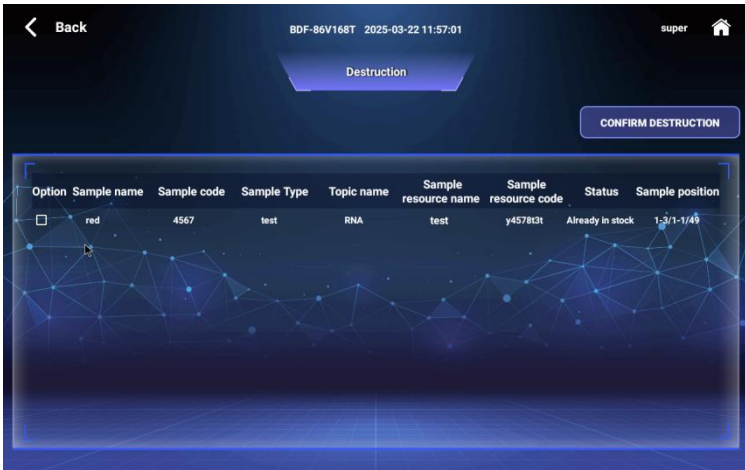
Click the "Batch Storage" button, and the system will automatically pop up a list of samples waiting to be stored. After selecting the samples to be stored, click the OK button, and the system will automatically synchronize the selected sample list to the list on the right.

Out of Stock button



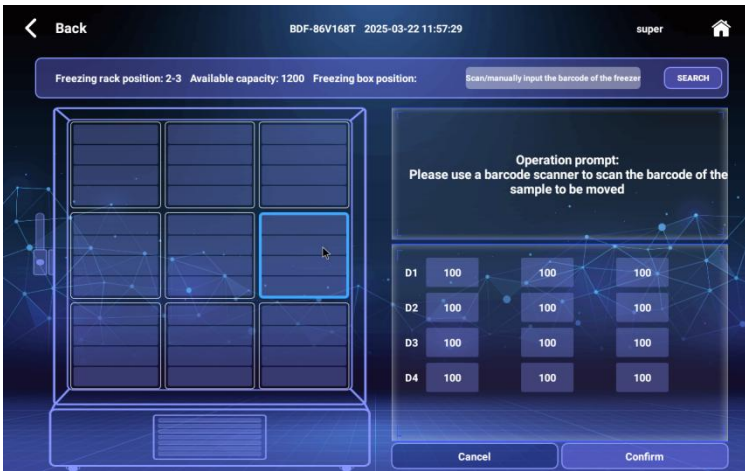
Click the "Out of stock" button to carry out the sample outbound operation.

Destroy button



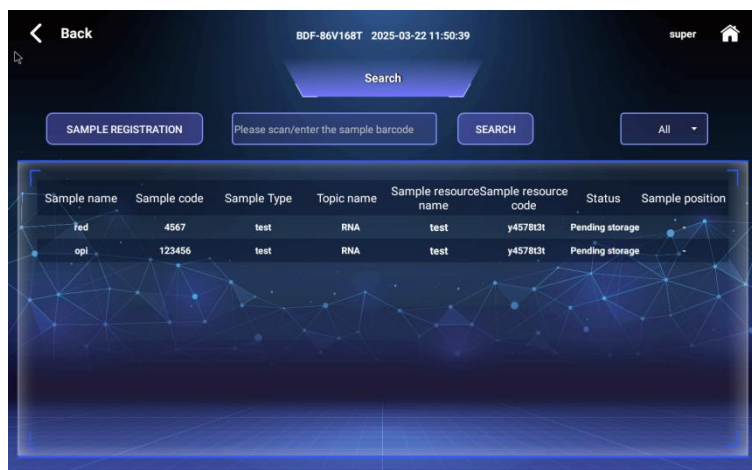
Click the "Destroy" button, select the samples you want to destroy, and click the Confirm Destruction button. The system will automatically destroy the selected samples and remove them from the sample list.

Move button



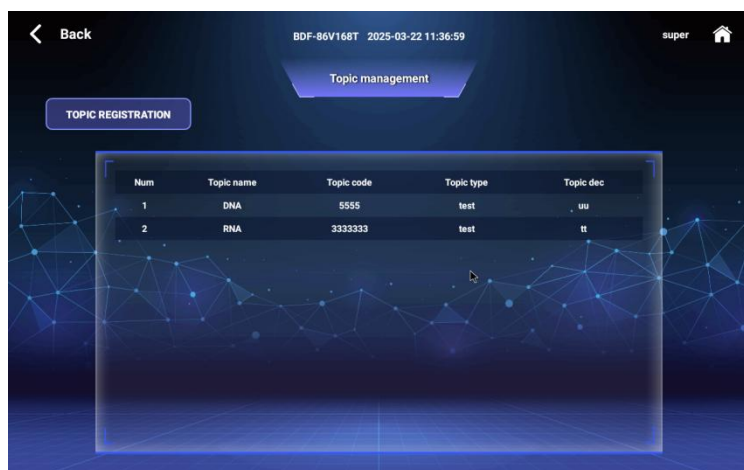
Click the "Move" button to move the cryopreservation rack, cryopreservation box, and cryopreservation tube in the sample library management.

Search button



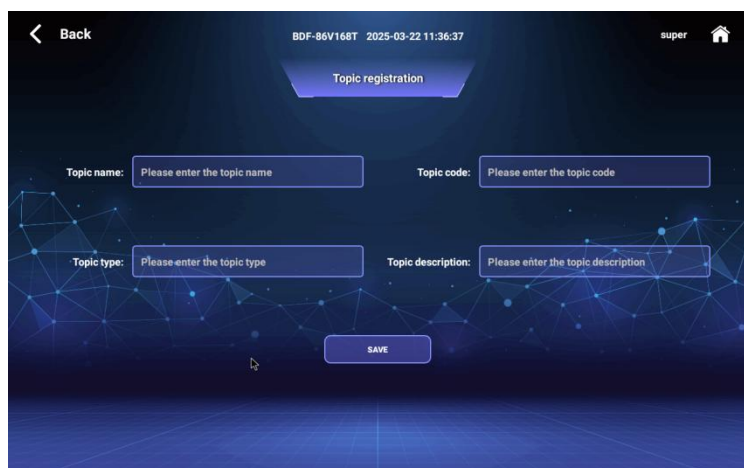
Click the "Search" button to view the sample list display, sample search, and sample registration functions including all statuses.

Topic management button



Click the "Topic Management" button to view project name, project number, project type, project description and other information, and perform project registration operations.

Topic Registration button



Click the "Subject Registration" button to enter information such as subject name, subject number, subject type, and subject description.

Alarm information



The alarm information is displayed in the lower right corner of the home page. When a system failure occurs, the alarm information and code will flash and the buzzer will sound.

⚠️ Note: Users should not set parameters at will. If there is a need to change parameters, please contact the after-sales department and distributors of BIOBASE for setting.

b. Fault code

This device has the alarm and safety functions shown in the table below and has a self-diagnosis function.

Alarm and safety functions

Alarm and safety function	Status	Indicator	Buzzer
High temperature alarm	When the temperature inside the box is higher than the high temperature alarm setting temperature for a certain period of time	The alarm icon flashes and the alarm text prompts	Make a staccato sound
Low temperature alarm	When the temperature inside the box is lower than the low temperature alarm setting temperature for a certain period of time	The alarm icon flashes and the alarm text prompts	
Power failure alarm	When the device is powered off	The power supply voltage on the main interface is displayed as 0V	Make a staccato sound
Door open alarm	When the door is opened for more than the set time value	The alarm icon flashes and the alarm text prompts, and the door status icon displays the "open" status	Make a staccato sound

Condenser dirty blockage alarm	The condenser sensor temperature exceeds the ambient temperature sensor set temperature value for 5 minutes	The alarm icon flashes and the alarm text prompts	Make a staccato sound
Ambient temperature too high alarm	When the ambient temperature exceeds the set temperature value	The alarm icon flashes and the alarm text prompts	Make a staccato sound
Sensor abnormality	When the temperature control sensor fails	The alarm icon flashes and the alarm text prompts	Make a staccato sound
	When the ambient temperature sensor fails	The alarm icon flashes and the alarm text prompts	
	When the 1# condenser sensor fails	The alarm icon flashes and the alarm text prompts	
	When the 2# condenser sensor fails	The alarm icon flashes and the alarm text prompts	



When the controller displays the above alarm code, please check the corresponding equipment or parts according to the corresponding code, or check whether the parameter settings of the controller are appropriate.

If the freezer stops working due to power outage or other faults, the temperature inside the freezer will rise. If the power cannot be restored in a short time, you should consider taking out the stored items and putting them in other normal freezers for storage to avoid damage to the stored items and causing losses.

Before storing the items in the freezer, you should confirm in advance whether it is suitable for storage under the temperature conditions you set, so as to avoid damage and losses caused by the items not being suitable for the temperature of the equipment.

Due to refrigeration inertia, this freezer cannot maintain a constant temperature. The temperature inside the cabinet has a certain deviation from the set temperature, which varies with the use environment and the set temperature. This is normal.

6.5 Product contraindications

There are no absolute contraindications to this product.

6.6 Potential safety hazards and restrictions of use

Hazard types	potential hazard	Hazard impact	analysis of causes	service restrictions
Performance hazards	Transport goods damage	Cause machine damage	1. Improper transportation or handling operation	Sign for it carefully, and the low-temperature box is verified by professional personnel before use
	Error in using the settings operation	Lead to the low-temperature box operation failure, performance imbalance	1. Untrained personnel; 2. Misoperation	This cryobox is used by personnel trained in usage methods
	Mechanical hazard of the operators	Personal safety accident	1.The door body squeezed and hurts the finger; 2.Cabinet body dumping	Personnel with safety knowledge of mechanical operation
Electrical hazards	Harm of electric shock	Personal safety accident	1.The wires are damaged; 2.bad earth; 3.Water and gas are wet	Personnel with electricity safety experience
	fire hazard	Personal safety accident	1.Excessive socket load in the operation area; 2.Power line aging short circuit	Personnel with electricity safety experience to use, and have a certain fire knowledge

6.7 Accidents in use and countermeasures

Accident analysis	Hazard may	countermeasures
Sudden power-off during use	Rising temperature in the cabinet causes damage to the stored items	Immediately transfer the cabinet items to other suitable storage environments
Emergency situation of the working environment, such as fire, earthquake, etc	Operator is injured and the freezer is damaged	Evacuate the personnel immediately. If the time allows to cut off the power



If the equipment is not used in the prescribed way, the protection provided by the equipment

may be damaged.



Users should not replace the battery at will. Wearing the wrong model of the battery may cause the danger of explosion or fire. If there is a replacement need, please contact the after-sales service and distributor of BIOBASE.

7. Maintenance

Since the statistics of the use time will directly affect the judgment of maintenance needs, we suggest that when using the ultra-low temperature freezer, a record form of use time should be prepared for inquiry and reference.

In daily maintenance, in order to prevent electric shock or personal injury, be sure to cut off the power supply of the ultra-low temperature freezer before any repair or maintenance on the ultra-low temperature freezer, so as to ensure that the medicine or suspended particles around the ultra-low temperature freezer will not be inhaled when maintaining the ultra-low temperature freezer. Otherwise it will endanger your health. Be sure to wear dry gloves and a mask during maintenance to protect yourself.

7.1 Cleaning and disinfection

Refer to Part 2 of WS 310.2-2016 Hospital Disinfection Supply Center:

Cleaning and Disinfection and Sterilization Technical Operation Specifications and Technical Disinfection Specifications for Medical Institutions 6.2 Cleaning and Cleaning Methods and C.10 Chlorine-containing Disinfectants and C.11 Alcohol Disinfectants in Appendix C, determine the cleaning and disinfection methods of this product as follows :

a) Clean the working chamber and sealing strip

Clean the entire inner cavity and sealing strip with a cotton cloth or towel soaked in distilled water before use, and wipe the contaminated inner cavity and sealing strip surface with a cotton cloth soaked in medical alcohol (alcohol concentration: 75%), Wipe off all foreign matter, then use a clean dry cotton cloth or towel to wipe off the water on the inner cavity and the sealing strip, and let it stand for half an hour before it can be used normally;



Use protective gear (clothes, gloves, goggles, etc.) when cleaning with alcohol;

Please use designated reagents for cleaning, and do not use cleaning agents or disinfectants that may cause danger due to chemical reactions with equipment components or materials contained in the equipment. If in doubt about the compatibility of disinfectants or cleaning agents with equipment components or materials contained in equipment, please contact a technical engineer or agent dealer; If dangerous substances leak on the surface of the device or enter the interior of the device, use medical alcohol to clean it thoroughly, and then use a clean dry cotton cloth or towel to absorb the residual moisture before continuing to use it.

b) Cleaning of exterior surfaces and glass doors

After cleaning the contaminated surface with rubbing alcohol, wipe it with a soft cotton cloth or towel.

If there is dirt that is not easy to remove, first wipe it with a cotton cloth soaked in neutral soap, then wipe off the soap foam with another piece of cotton cloth soaked in warm water, and then dry it with a dry cloth;

In the case of high ambient humidity in summer, there may be condensation on the mouth frame of the ultra-low temperature storage box. This is a normal phenomenon, and it can be wiped dry with a dry cotton cloth in time.



Do not wash the inside and outside of the ultra-low temperature storage box directly with water or detergent, so as not to cause the insulation performance of electrical components to decrease and the material to rust.



Never use hot water or aggressive organic cleaning solvents to clean the ULT freezer.



Do not clean surfaces with scrub brushes, wire brushes, etc. to avoid scratches, paint peeling, etc.

7.2 Defrost

Frost is usually on the upper part of the box and on the inner door. Frost may create a gap between the cabinet and the door seal, and then cause a poor cooling effect. Defrost the internal door with a defrosting shovel attached with the equipment. The following procedure is to defrost by removing the empty cabinet.



Note: Please do not use knives or screwdrivers with sharp corner tools to defrost.

1. If there is an auxiliary cooling device, please turn it off.
2. Remove the contents of the cabinet and transfer to another freezer, or into a container with frozen liquid carbon dioxide or dry ice.
3. Turn off the power switch.
4. Let the outer door of the freezer be opened naturally for a period of time to defrost.
5. Use a dry cloth to wipe off the accumulated water at the bottom of the cabinet.
6. Put the item back into the fully cooled box.
7. If there is an auxiliary cooling unit, turn the unit back on.

7.3 Maintenance advice

- a) It is recommended to clean the outer surface of the ultra-low temperature freezer every day;
- b) It is recommended to clean the inner wall of the ultra-low temperature storage box and the surface of the shelf in the box every week;
- c) It is recommended to remove dust and clean the cabin of the ultra-low temperature storage box every month;
- d) It is recommended that professionals maintain the complete machine and core components of the ultra-low temperature freezer every year;
- e) It is recommended to establish a maintenance file for the ultra-low temperature freezer, and record each maintenance.

7.4 Storage and transportation conditions

- a) The well-packed low-temperature box should be stored in an environment where the relative humidity does not exceed 80%, the temperature is lower than 40°C, the environment is well ventilated, and there is no acid, alkali and other corrosive gases. Once the freezer is used, it is best to

use it continuously;

b) The storage period of the freezer is six months, and the freezer beyond the storage period must be inspected and verified again, and can only be used after passing the test;

c) During the transportation of the freezer, corresponding measures should be taken in full accordance with the requirements of the outer surface of the box. Please carefully check the integrity of the box when receiving the product with the box sent by the logistics company. If the packing box is damaged or squeezed, please refuse to sign for it, or unpack it for inspection on the spot;

8. Notes

a) The cryogenic freezer can only be operated by trained and authorized personnel;

b) Before connecting the AC power supply, ensure that the voltage of the power supply is consistent with the input voltage of the equipment and the voltage is stable, and ensure that the rated load of the power socket is not less than the requirements of the ultra-low temperature freezer;

c) The ultra-low temperature freezer uses a grounding plug with a third pin, which can only be used with a grounding power socket, which is a safety device. If the plug does not fit into the outlet, have an electrician install a grounded outlet;

d) The power cord cannot be bundled, cannot be pressed under heavy objects, and cannot be placed close to heat sources;

e) Ensure that the power supply can be disconnected in time in case of emergency;

f) Do not place heavy objects on the door or top cover of the ultra-low temperature freezer, so as to avoid deformation of the door body or top cover under pressure;

g) The maximum weight of a single layer of shelves inside the freezer to accommodate items should not exceed 25kg;

h) It is strictly forbidden to put flammable and explosive dangerous goods and highly corrosive acids and alkalis into the ultra-low temperature freezer;

i) It is strictly forbidden to store live animals in this ultra-low temperature freezer;

j) Before storing the item in the ultra-low temperature freezer, you should first confirm whether it is suitable for storage under the temperature conditions you set, so as to avoid damage to the item and cause loss because the item is not suitable for the temperature of the ultra-low temperature freezer;

k) When the ultra-low temperature freezer stops running in case of power failure or other failures, the temperature inside the ultra-low temperature freezer will rise, and the temperature inside the box may rise to above 15°C in about 30 minutes. If the power supply cannot be restored within a short period of time, the items should be taken out and stored in other suitable environments to avoid damage caused by items;

l) Please keep the key of this ultra-low temperature freezer properly to avoid accidents when children get it and open the door to play;

m) Please keep the instruction manual in its entirety, and ensure that the instruction manual is transferred or handed over as part of the ultra-low temperature freezer when the site or unit of use of the ultra-low temperature freezer is changed;

n) When the freezer is not used for a long time, please turn off the power switch and battery switch to avoid damage to the battery and other components;

o) When the ultra-low temperature freezer is repaired or scrapped, the whole machine or parts should not be discarded at will, and please dispose of it according to local regulations.

- p) Monitoring method: The ultra-low temperature preservation box can use the method of temperature verification to monitor the freezing effect.
- q) This product cannot be used beyond the scope of application of the product, not used in explosive environments, and not used to store flammable materials.
- r) The type and amount of refrigerant should be used according to the instructions on the product label.
- s) It is impossible for our company to cover all possible factors at the clinical level when verifying the freezing effect of the items included in the scope of application. Therefore, the freezing effect of the sample should be verified before the sample is stored, and its freezing effect should be monitored in real time.
- t) Equipment service life: 8 years;
- u) Production date: see product label

9. Label description

9.1 Company logo



9.2 Grounding mark



9.3 Anti-pinch mark



9.4 Anti-shock mark



9.5 Fire mark



9.6 Outer packaging identification (upward, fragile items, moisture-proof, anti-dumping, non-stackable)



10. The EMC

a) This freezer meets the emission and immunity requirements specified in GB / T 18268.1-2010.

b) This freezer is designed and tested according to Class A equipment in GB 4824.

In the home environment, the device may cause wireless interference and requires protective measures.

c) It is recommended to evaluate the electromagnetic environment before device use.

This incubator requires special precautions regarding electromagnetic compatibility (EMC) and must be installed and used according to the EMC information provided in this specification.



Portable and mobile RF communication equipment will affect the operation of this cold tank.



Except for converters and cables for replacement parts as internal parts permitted by the manufacturer, using accessories, converters and cables other than specified may cause the increased radiation increase or interference resistance of this cold box.



This cold box cannot be used near or stacked by other equipment.



Use the equipment near a strong radiation source (e. g. unshielded RF source), otherwise it may interfere with the normal operation of the equipment.

11. Common Fault Analysis

There are abnormalities in the ultra-low temperature freezer, some of which are caused by improper use. Before entrusting maintenance, please check and eliminate it by yourself according to the table below.

Fault	Analysis
The freezer does not work	Is the power plug live? Is the power plug plugged in or loose? Is the power fuse blown? Is the power supply voltage too low or too high? Is the switch on?
Compressor not running	Does it take less than 4 minutes to boot? Is the compressor hot?
The temperature continues to drop after reaching the expected value	Is the temperature setting correct? Is the compressor still on?
The temperature does not reach the set value	Is the evaporation fan stopped? Is the door left ajar or opened too many times? Are there too many items put in at one time, and is the air duct blocked? Is the ambient temperature higher than 32°C?
Big noise	Is the cabinet placed on a flat ground? Does the cabinet touch the wall? Does the noise cancel after opening the door?



The operation of the above electrical components must be carried out by an electrician under safe conditions (cut off the power supply). The other parts are not allowed to be disassembled, otherwise the consequences shall be borne by the user.



If you cannot determine the cause of the failure, or it is difficult to troubleshoot, please contact BIOBASE after-sales service, and professional engineers will serve you wholeheartedly.

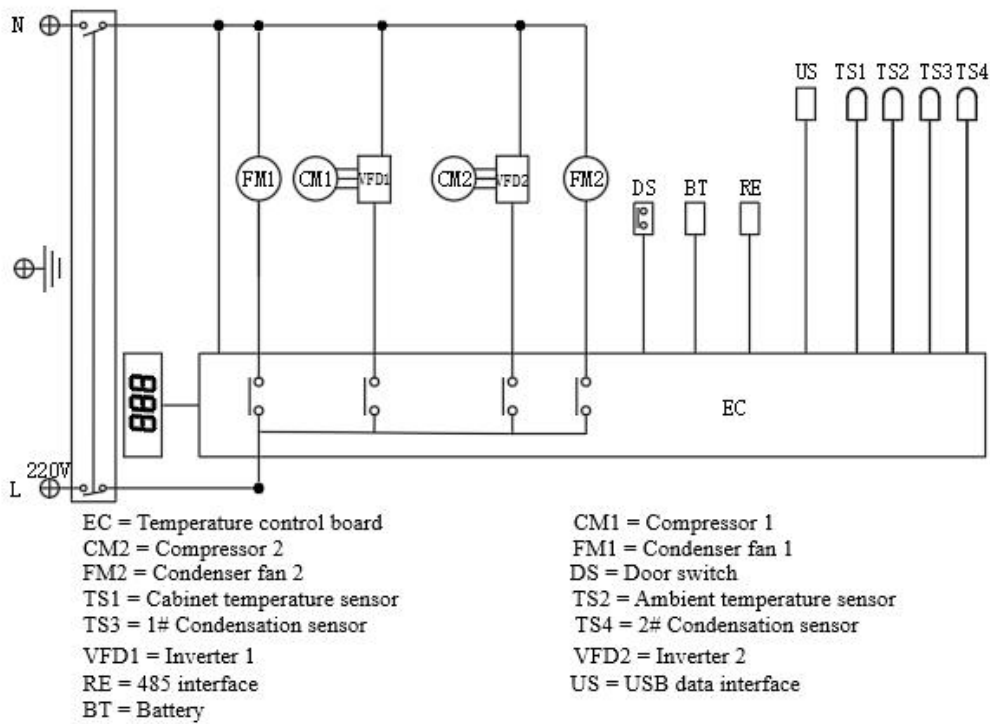


The maintenance work of this cryogenic freezer should only be undertaken by trained and approved technicians.



If you need to order parts, please contact the maintenance service department for confirmation, and please indicate the product model and product number you purchased.

Attachment A Circuit Schematic Diagram



Attachment B Accessories List

No.	Name	BDF-86V608BD
1	Stainless steel shelf	3
2	Key	2
3	Limiting sheet metal	2
4	Limiting sheet metal screws	4
5	Defrost shovel	1
6	IC card(optional)	2

Appendix C Warranty

- ◆ If the instrument and equipment during the warranty period fails or damages due to improper use by the user, our company shall not bear the warranty obligation.
 - ◆ After the warranty period, our company is also responsible for the maintenance, but the corresponding maintenance fee will be charged.
 - ◆ For the production date, please refer to the product label.
 - ◆ We can provide the drawings and some necessary technical data for the maintenance units and maintenance personnel trained and approved by our company.
1. From the date of purchase, the user can enjoy one-year free warranty for the whole machine and three-years warranty for the compressor (man-made damage is not within the scope of warranty), and the purchase time is subject to the valid purchase documents.
 2. The following situations are not within the scope of warranty, only maintenance services are provided, but corresponding cost are charged.
 - (1) All damages caused by human factors, including damages caused by using in abnormal working environment, not following the user manual and improper operation, etc.
 - (2) If the user disassembles, repairs or refits the machine without permission, or the device is not repaired by the authorized unit of our company, or there is no warranty card or valid document.
 - (3) Damage caused by improper transportation or other irresistible factors (such as flood, fire, lightning, earthquake, etc.) after purchase.

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