

# **BIOBASE**

**Autoclave  
BKQ-L100  
User Manual**

**BIOBASE GROUP**

## Preface

Dear users:

Thanks for purchasing BIOBASE Vertical Autoclave!

Sincerely hope that our products can bring you the greatest help in your work.

- Please read this manual carefully when using the pressure steam sterilizer for the first time!
- This product can only be operated by trained and authorized personnel.
- The repair of the equipment can only be done by BIOBASE or BIOBASE authorized dealers.
- If the operator encounters a problem not mentioned in this manual, please contact BIOBASE or BIOBASE authorized dealers to inquire about the correct handling method.
- The pressure steam sterilizer must be inspected and maintained within the specified time.

After reading the manual, please keep this manual in a convenient place for easy reference at any time.

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## 1. Application scope

The vertical pressure steam sterilizer is suitable for sterilizing moisture and heat resistant medical devices.

## 2. Working conditions

- 1) Environmental temperature: 5°C ~40°C;
- 2) Relative humidity: ≤85%;
- 3) Atmospheric pressure: 70 kPa ~ 106 kPa;

**Note:** Manufacturers and users should consider the influence of local atmospheric pressure on the parameter settings of the sterilizer when using the sterilizer.

- 4) Power supply: AC 220 V±22V, 50Hz±1Hz;
- 5) Avoid heavy dust, oil mist, conductive particles, corrosive gas, flammable gas environment.
- 6) Avoid occasions that are prone to electric shock or vibration.
- 7) Avoid places with high temperature, high humidity or rain and moisture.
- 8) Avoid strong magnetic field environment.

## 3. Technical parameters

Model	BKQ-L100
Volume	100L
Designed pressure	0.32MPa
Rated working pressure	0.23MPa
Rated working temperature	121°C/134°C
Rated voltage	220V±22V/50Hz±1Hz
Rated power	5.2kVA
Net weight	103±2kg
Internal cavity size (Φ * L) mm	386*877
Dimensions (L * D * H) mm	505×915×870
Noise	≤65dB
Service life	Five years (validity period obtained from aging test)
Production Date	See label for details
Container material	304 stainless steel

Software Release Version: MJQ-SLZ-LCD-BUZ-V1

## 4. Product performance

1. The lower limit of the sterilization temperature range is the sterilization temperature, and the upper limit should not exceed the sterilization temperature+3 °C.
2. During the maintenance time, the temperature measured at the reference measurement point in the sterilization chamber, the temperature at any test point in the standard test package, and the corresponding saturated steam temperature calculated based on the sterilization chamber pressure should meet the following requirements:
  - Should be within the sterilization temperature range;
  - The difference between points at the same time should not exceed 2 °C.
3. For sterilizers with sterilization temperatures of 121 °C and 134 °C, the maintenance time should not be less than 20 minutes and 4 minutes, respectively.

## 5. Prohibit

There are no absolute contraindications for vertical pressure steam sterilizers, but they cannot sterilize items that are not suitable for wet heat sterilization.

## 6. Working principle and structure

In a sealed steamer, using the principle of gravity displacement, hot steam is used to discharge the cold air inside the pot through the exhaust valve. The discharged cold air is replaced by saturated steam. When the exhaust valve is closed, heating continues. As the steam does not overflow during heating, the temperature inside the high-pressure cooker increases with the increase of steam pressure, reaching the sterilization cycle with sterilization temperatures of 121 °C and 134 °C, and the maintenance time should not be less than 20 minutes and 4 minutes respectively. Microbial tissue is destroyed and killed to achieve the purpose of sterilization.

The vertical pressure steam sterilizer consists of a sterilization chamber, a control system, and an overpressure protection device.

The main components include: a single-layer 304 stainless steel cavity, body and cover locking device, safety interlock device, handwheel, sealing ring, heating tube, solenoid valve, safety valve, pressure gauge, water level float, temperature sensor, pressure sensor display panel, control panel, safety protection device, pipeline system and circuit control system, stainless steel load-bearing device.



The main functions of each device are as follows:

No.	Components	Functions
1	Handwheel	Used to open or close the sterilizer door
2	Door cover	The hood shaped door component serves as insulation to protect the operator. Opening safety lock at $P > 0$ .
3	Pressure gauge	When the equipment is working, it displays the pressure inside the main chamber
4	LCD touch screen	Operate equipment, view sterilization time, temperature and other information
5	Printer	Print records of sterilization process data
6	Access door	Quickly inspect and repair equipment
7	Safety valve	When the internal chamber pressure reaches 0.28MPa, open the pressure relief to ensure safety
8	Condenser	Water and steam discharged during condensation operation
9	Cable	Equipment powered on

The functions of the main components inside the sterilizer are briefly explained as follows:

No.	Components	Functions
1	Exhaust solenoid valve	Exhaust cold air during heating, exhaust steam during pulsating exhaust, and rapidly exhaust steam for pressure relief during cooling
2	Safety valve	When the pressure reaches 0.28MPa, the safety valve opens and the pressure is released
3	Sterilization temperature controller	Prevent sterilizer from dry burning $\leq 145 \pm 5 \text{ }^\circ\text{C}$
4	Heating plate temperature controller	Control the temperature of the heating plate to be $\leq 110 \pm 5 \text{ }^\circ\text{C}$
5	Buzzer	Send out work end signal and alarm signal
6	Filter	Filter impurities and improve the reliability of solenoid valves
7	Sterilization bucket	Carrying basket to prevent liquids, agar and other items from falling into the pot and causing blockage or corrosion
8	Basket	Loading sterilized items

## 7. Main bactericidal factors

Using saturated steam as a sterilization factor; Sterilization temperature is 121 °C/134 °C.

## 8. Sterilization principle

Using thermal factors to kill microorganisms.

## 9. Kill microbial categories

Kill bacteria and spores.

## 10. Precautions



The user should perform regular maintenance during use.



The user shall inspect the products in use once a month and keep records. If the user discovers an abnormal situation during the inspection and daily maintenance of the product in use, it shall be dealt with in a timely manner.



The user shall conduct regular inspections, maintenances, and keep records of the safety accessories (safety valves, pressure gauges, etc.), safety protection devices, measurement and control devices and related instruments and meters of the products in use.



Operators and related management personnel shall obtain special equipment operator certificates in the unified format of the country in accordance with relevant national regulations before they can engage in relevant work. The user shall conduct special equipment safety education and training for the operating personnel. The operating personnel shall have the necessary special equipment safety knowledge, and shall strictly abide by the relevant laws and regulations, operating procedures and related rules and regulations of special equipment during the operation.



This equipment belongs to Type I pressure vessel. It is designed, manufactured, inspected and accepted in accordance with "Pressure Vessels", and meets the requirements of "Stationary Pressure Vessel Safety Technical Supervision Regulations".



This device is not suitable for sterilization of sealed liquid items, nor for sterilization of tubular loads, and it does not have a drying function.



Chloride ions are an important factor in causing corrosion damage to stainless steel. When sterilizing items containing chloride ions, the inner wall of the sterilizer must be rinsed with clean water every day to avoid corrosion of stainless steel caused by chloride ions and prolong the service

life of the equipment. Otherwise, the additional damage and accelerated aging to the equipment will not be covered by our company.

If it is found that the sterilizer has come into contact with substances that have not been cleaned thoroughly or already contain chloride ions or chloride ions, please immediately rinse the inner wall of the chamber with clean water multiple times, drain the water in the chamber and water tank, which can reduce some damage to the equipment.



This equipment is only suitable for the sterilization of high-temperature, high-humidity medical equipment, sanitary materials and other items. It cannot be used for the sterilization of petroleum jelly and other oils, powders, high volatile substances such as alcohol and gasoline, and corrosive items to copper and aluminum.



This sterilizer must not be used for cooking food.



Please use the equipment in accordance with the operating methods and precautions in the manual. If you do not use the equipment in accordance with the operating methods, it may cause damage to the equipment, affect the protective function of the equipment, and cause man-made safety hazards.



Please keep the instruction manual completely. When the use site or unit of the equipment is changed, please ensure that the instruction manual is transferred or handed over as part of the equipment.



The equipment is not allowed to be disassembled without permission. If necessary, please contact our company or the company's authorized dealer to check or replace parts.



If the equipment has been stored under damp conditions, please ventilate and dry it for a period of time. After meeting all the safety requirements specified in this manual, store or use it under normal conditions.



Do not put sterilized items in containers and bags that are impermeable to steam, otherwise they cannot be sterilized.



When opening the sterilizer door, high-temperature steam will spray out of the sterilizer cavity. Please wait for the steam to be exhausted before fully opening the door. At the same time, do not put your face close to the sterilizer.



After the equipment is sterilized, the wall of the sterilization chamber still has a certain temperature. Please pay attention to heat insulation to avoid burns. If you are burned or scalded, you can perform emergency cooling treatment on the wound to prevent the residual heat from damaging the deep tissues of the skin and relieve the pain. Please seek medical attention as soon as possible.



Monitoring method: The sterilizer can use methods such as temperature verification, sterilization test paper, and biological reagent culture to monitor the sterilization effect.



The safety valve at the rear of the equipment should not face people or other equipment to avoid steam scalding or interference.



After the liquid program is completed, please promptly open the ball valve on the back of the device and drain the sterilization water.



In the following situations, the door cannot be opened due to negative pressure: the door is not opened in time after use; the sterilization door is closed when there is residual temperature; the equipment is new to the customer. When this phenomenon occurs, please open the ball valve on the back of the equipment or pull up the safety valve of the equipment. After the pressure is balanced, the door can be opened.



According to relevant national regulations and local department requirements, safety valves should be inspected at least once a year, and pressure gauges should be inspected at least once every

six months.



Please stay away from the equipment during the work. After the light alarm is generated after the work is completed, enter the house, turn on the equipment, and take out the objects.



The user unit shall entrust the unit engaged in the installation, modification and maintenance of the pressure vessel to perform the installation, and the pressure vessel installation unit shall submit a written notice to the local pressure vessel registration authority.



The user shall, before or within 30 days after the equipment is put into use, go to the quality and technical supervision department of a municipality directly under the Central Government or a city divided into districts to register for use in accordance with the requirements of laws and regulations.



The door sealing ring is a consumable device. If the sterilizer is continuously used for 1.5 years or after 500 consecutive sterilization cycles, the door sealing ring needs to be replaced.



After the sterilizer fails during operation, do not perform rapid pressure relief to avoid harmful substances in the container from being harmful to the human body.

## 11. Installation and debugging

### 11.1 Preparation before equipment unpacking and installation

1.1 When the sterilizer arrives, please pay special attention to its packaging, carefully check whether the product name, specifications, and other information on the packaging box match, and keep the packaging box.

#### 1.2 Equipment inspection and quick unpacking

After opening the packaging box, please carefully check whether the equipment and all components are intact. If there is any damage or loss, please make a record and contact the transportation company and our company in a timely manner.

After unpacking the equipment, first check whether the product name, specifications, and model on the label in the upper left corner of the rear of the equipment match the purchase order.

Please refer to the packing list and carefully check whether the attachments and materials are complete.

Cut the packing tape with scissors, remove the top cover of the packaging, and move the packaging frame upwards, as shown in Figure 1.



Figure 1

### 11.2 Handling and moving

It should be installed by professionals.

2.1 Please do not hold the door handle and move the sterilizer.

During transportation, it is prohibited to place the equipment sideways or upside down.

2.3 Installation and handling should be carried out by multiple people, and should be handled with care. It is strictly prohibited to throw or collide violently.

During the transportation process, be careful not to damage or scratch the equipment.

## 11.3 Installation and commissioning

Installation steps

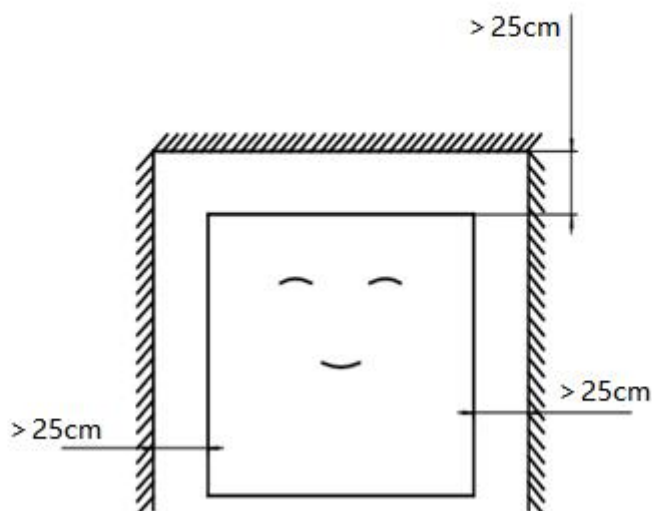
### 3.1 Placement of sterilizer:

Place the sterilizer on a stable, clean, and spacious ground, adjust the universal wheels of the equipment to be parallel to the ground, and ensure stability and reliability. The distance between the back and sides of the sterilizer and other objects should be at least 250mm. Ensure good ventilation (it is best to store the equipment separately).

Except for maintaining a safe distance from other objects, the presence of other objects should not affect the operation of this equipment. When the equipment malfunctions, the power should be quickly cut off!



Note: If the sterilizer is close to the wall, it may cause heat accumulation inside the sterilizer and malfunction



- 1) Open the sterilizer door, insert the sterilization indicator card or biological indicator, reset the door and close it properly;
- 2) When the power is turned on, the display screen will enter the program selection screen after the startup screen.
- 3) According to the altitude differences in different regions, the parameters involved will be modified by professionals.

### 3.2 Power supply installation



Note: For your safety, please ensure that the device casing is reliably grounded!

Please be sure to install a dedicated connection device suitable for wiring at a height of 1 meter on the building near the equipment (the load capacity of the disconnected power supply and power line should be greater than the rated load of the equipment). Suggestion:

Single phase AC 220V (50Hz) or above.

Please do not place the device in a location where it is difficult to disconnect the power supply, ensuring that it can be disconnected in case of emergency.

The equipment adopts a two-phase three wire direct wiring method. Please wire according to the wiring method configured for the equipment.

Please do not change the wiring method arbitrarily. If you need, please contact us.

Live wire (L) - brown, neutral wire (N) - blue, ground wire (PE) - yellow green.

Please connect the live, neutral, and ground wires of the device to the live, neutral, and ground wires of the local power supply during installation; Please be sure to entrust professional electrical construction personnel for installation. To ensure your personal safety, the equipment needs to be reliably grounded.

## **11.4 Electromagnetic compatibility**

The equipment is used for sterilization of medical devices that are resistant to moisture and heat. It is mainly used in hospitals, disease control centers, and other medical and health institutions, as well as factories, laboratories, and other places. It meets the emission and immunity requirements of Group A specified in GB/T 18268.1 and GB 4824.

## **11.5 Water source requirements**

The working medium of the sterilizer is medical distilled water, which has requirements for the water quality of the water source. Therefore, you need to manually add water to the sterilizer water tank. Please use soft water or pure water, as using inappropriate water quality may shorten the service life of the equipment and cause unnecessary malfunctions.

The water quality must meet the following requirements:

Conductivity below 15  $\mu$  S/cm

The content of bleach is less than 2mg/L

PH value 5-7

Hardness below 0.02mmol/L

Water volume: Add to the high water level of the water tank

Note: Connect the exhaust pipe to the exhaust port behind the equipment to avoid steam being discharged indoors.

## 11.6 Storage environment

Sterilizers are required to be placed in a clean, dry, dark, ventilated, and low temperature indoor environment.

- 1) Indoor temperature ranges from 5 °C to 40 °C.
- 2) The relative humidity should not exceed 85%.
- 3) Atmospheric pressure ranges from 70 kPa to 106 kPa.
- 4) There is no dust or pollution indoors.

## 12. Equipment instructions

### 12.1 Use method

**Note:**

- 1) Operate the equipment strictly in accordance with this instruction. Incorrect installation and operation will endanger human life and property safety, and invalidate the manufacturer's guarantee of equipment performance;
- 2) Keep the instructions for use completely within the service life of the equipment;
- 3) Ensure that all updates received can be stored in the manual;
- 4) When the equipment use site or the user unit is changed, it must be ensured that the instruction manual is transferred or handed over as an integral part of the equipment.

### 12.2 Equipment identification description



It means that it should be taken seriously. If there is a warning symbol, it is necessary to consult the instruction manual in order to clarify the potential hazards and the countermeasures that must be taken.



Door opening sign



Power sign



Grounding sign



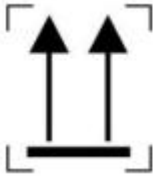
Drainage sign



High temperature sign



Safety valve sign



Upward



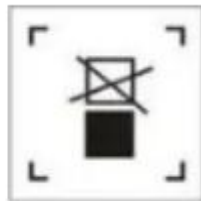
Fragile



afraid of rain



No dumping allowed



Prohibition of palletizing

**Note:** The user manual must be kept carefully to prevent loss or damage. It must be ventilated and dry to avoid humidity and high temperature. No one can tear off or take out any content in the instruction manual under any circumstances.

The operator is obliged to technically repair and complete the missing, damaged or no longer applicable part of the content, catalog and related chapters in the manual.

## 12.3 Operation

The operating procedure of a sterilizer includes steps such as sterilization preparation, loading of sterilized items, sterilization operation, and unloading of sterile items.

### 3.1 Preparation before sterilization of instruments

Before placing the sterilization equipment into the sterilizer, please clean it thoroughly to avoid any residual substances on the sterilization equipment from causing harm to the sterilizer itself and the

sterilization equipment. For example, bloodstains and other impurities. We have developed a specific cleaning plan for your reference:

- 1) For instruments that require sterilization after use, you should immediately clean any residue attached to the sterilized instruments. We recommend using cleaning agents, purifying agents, and distilled water to clean and sterilize equipment.
- 2) After cleaning, it is recommended to rinse with clean water again to ensure its cleanliness.
- 3) When placing the instruments into the sterilization bucket, please place different types of instruments in different buckets, such as stainless steel, carbon steel, etc., and leave appropriate gaps between the instruments. If carbon steel equipment is placed in a bucket, several layers of disinfectant or cotton paper should be placed on the basket before placement to avoid direct contact between carbon steel and stainless steel.
- 4) The sterilization of test tubes, glass bottles, etc. should be placed vertically with the opening facing downwards to facilitate the exchange of cold air and saturated steam.
- 5) Place a sterilization indicator card in each basket.
- 6) Once a month, place biological indicators in the load to test the sterilization effect.
- 7) Plate, basin, bowl and other utensils should be packaged individually as much as possible, and the lid should be opened when packaging. Surgical instruments should be placed in baskets or perforated trays for matching packaging. The items should not be too tightly tied, the weight of the equipment bag should not exceed 5 kilograms, the fabric bag should not exceed 3 kilograms, and the volume of the sterilization bag should not exceed the volume of the sterilization basket. Otherwise, it will cause insufficient sterilization.
- 8) The instruments that need to be wrapped during sterilization should use packaging materials with good breathability, such as sterilization bags, sterilization paper, gauze fabrics, etc.
- 9) The sterilization of test tube glass bottles and other materials should be placed vertically with the opening facing downwards to facilitate the discharge of air and the entry of steam.

### 3.2 Preparation before rubber sterilization

Please clean the rubber tube with warm water first, then place it on a clean sterilization tray, while ensuring that the tube is a hollow pipe with two open ends, without any sharp bends, twists, knots, etc.

### 3.3 Preparation work before sterilization of dressing package

Place the dressing package vertically on the tray, avoiding contact with the inner wall of the sterilizer.

### 3.4 Preparation before sterilization of culture medium

Only use the culture medium basket, with a loading capacity not exceeding 2/3 of the volume, to avoid overflow of the culture medium.



Packaging materials include hard containers, disposable medical wrinkle paper, paper plastic bags, paper bags, textiles, non-woven fabrics, etc., which should comply with the requirements of GB/T 19633. Textiles should also meet the following requirements: non bleached fabrics; There should be no stitching or patching on the fabric except for the four sides; Before initial use, it should be washed at high temperature to remove fat, pulp, and color; There should be a record of usage times. Customers can use testing tools such as test kits to monitor the sterilization effect.

## 13. Software Usage Instructions

### 13.1 Initialization

Connect the cable to the air circuit breaker, turn on the machine's own air circuit breaker, and then turn on the boat shaped switch on the right side of the top cover to power on the system. After power on, the LCD screen will display information such as water level, door status, date, time, printer switch, USB switch, etc. When communication is normal, the LCD screen buzzer will sound once.

### 13.2 Select sterilization program

#### 13.2.1 Main interface



This page contains 9 sterilization program selection menu icons and appointment start icons. Click to

enter the current selected program parameter viewing or modification page; Press the return icon to return to the previous menu.

### 13.2.2 Program parameter viewing or modification page



This page displays the sterilization parameters of the sterilization program. Fixed program parameters are not adjustable, while custom program parameters are adjustable. Click the start button to start the program and enter the sterilization process page, then click back to return to the previous menu.

### Program Introduction Catalog

Program name	sterilization temperature	sterilization time	Cooling time	Pulse frequency	Type explanation
Bare equipment	134°C	4min	5min	2 times	Sterilization of exposed items such as conventional metals and glassware
Encapsulation equipment	134°C	8min	10min	3 times	Sterilization of conventional metals, glassware, and other items
Dressing Procedure	134°C	12min	18min	4 times	Sterilization of dressing materials such as cotton cloth and masks
Rubber program	121°C	25min	10min	4 times	Sterilization of rubber products, heat-resistant plastic items, such as culture dishes, etc
Solid Custom Program	100°C-138°C	0-999min	0-999min	0-9 times	Sterilization of solid objects at high temperatures requires modifying the sterilization temperature and time to customize sterilization, such as conventional instruments, glassware, rubber, etc

Liquid program	121°C	20min	/	/	Sterilize reagents and other substances that are in liquid state at high temperatures
Liquid customization program	100°C-138°C	0-999min	/	/	Customize sterilization for reagents that are in liquid state at high temperatures and require modification of sterilization temperature and time
Sterilization of culture medium	105°C-136°C	0-999min	/	/	Sterilize the liquid state of the culture medium at high temperatures
Cultivation medium melting program	40°C-100°C	0-999min	/	/	Dissolve the liquid state of the culture medium at high temperatures

**Note: When using solid custom programs and liquid custom programs, customers need to place biological indicators themselves to identify whether the sterilization effect is qualified.**

### 13.2.3 Sterilization Process Page



This page displays the indoor temperature during the sterilization process, the temperature of the moving probe, the accumulated time, the countdown to key stages, the current stage, and the F0 value (only applicable to liquid programs); After clicking the stop icon, a confirmation message box will pop up. Click "Yes" to abort the sterilization process, and click "No" to return to the sterilization process; Click the curve button to enter the real-time curve display interface; Click on the process information icon to enter the process information display page.

#### 13.2.3.1 Real time curve display interface



This page displays the current temperature value and its corresponding curve. Click the back button to return to the sterilization page.

### 13.2.3.2 Sterilization Process Information



This interface displays the highest and lowest temperatures during the sterilization stage. Click to return to the sterilization page.

### 13.2.4 Appointment activation

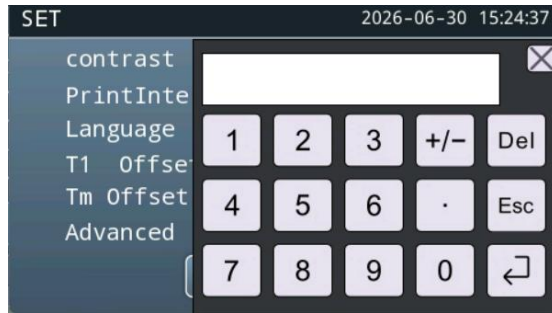
The Timing Sta interface shows the following table:

PROGRAMS	Hour	Minute
Melt	23	59
Instrument	0	0
Package	1	1
Pressing	2	2

At the bottom, there is a 'RUN' button and a back button.

Select the type of scheduled startup program, set the startup time for the program (e.g. start at 1pm or set 13:00), click execute to start the program at the set time.

### 13.2.5 Date and Time Settings



Long press the date display control on each page, and a date and time modification keyboard will pop up. Simply enter the numbers on the keyboard to modify, press the enter icon to save and exit, and press ESC to exit without saving.

### 13.2.6 Manual Operation

This page allows you to click a button to control the opening and closing of the corresponding solenoid valve or other output components. It can only be operated by professionals or trained by professionals.

### 13.2.6 System Settings



This interface can adjust the contrast of the display screen within the range of 0-255. Dragging the slider can adjust the contrast value.

You can click the increase or decrease button to set the printing interval, which is 10 seconds. The maximum value is 250 seconds and the minimum value is 30 seconds.

You can click the dropdown icon to select the system language, and currently two languages can be set.

You can click on the deviation correction text box control and set the deviation correction value by popping up the keyboard. The correction range is  $\pm 5.0$  degrees Celsius, and the value is a floating point number.

You can click on the advanced settings to pop up the password input interface. After entering the correct password, you will enter the advanced settings page.

Click on the next page to display device volume, replacement temperature, and drainage time.

## 14. Maintenance



Before starting maintenance, ensure that the equipment is powered off and there is no pressure inside the container.

In order to ensure that the sterilizer is in good working condition and minimize the number of failures, the operations described in this chapter must be followed.

### 1. Sealing ring

Clean the door gasket with a soft cloth or gauze after work every day.

### 2. Sterilization basket

Take out the disinfection basket and use gauze with cleaning agent and water to wipe the inner wall of the sterilization container clean. Do not use steel slag wool or steel brushes to avoid damaging the walls of the sterilization chamber.

### 3. Sterilization room

Clean and remove scale from the sterilization container room, and drain the water from the sterilizer.

### 4. Regular inspections

Once every three months, the fastening of joints and the inspection of continuity should be carried out by professional electricians. Once a year, due to extreme wear and tear, the door lock device must be inspected.

Instructions for use: This type of maintenance manual is provided for professionals to use. Unless you are a professional, when the equipment malfunctions, be sure to consult the manual and repair it according to the instructions. The manual has provided repair methods to professionals as much as possible.

### 5. Safety valve



How to safely remove the load after equipment failure:

- ① Use a tool to pull the pull tab on the safety valve to release pressure. Only after the pressure gauge indicates zero, can the door be opened and the load be removed.

## 5.1. Check the safety valve

It is located above the left front of the device. To prevent the safety valve from being in a blocked state, steam pressure should be released through it every two months under normal use.

- 1) Perform sterilization operation according to the instructions.
- 2) Generate a pressure of 0.165MPa inside the sterilization container.
- 3) Use a screwdriver to push the safety valve handle open for about 2 seconds.
- 4) Turn off the main switch and terminate the operation. At the same time, discharge the water vapor inside the sterilization container.
- 5) Wait until the pressure drops to 0MPa before opening the door.

## 5.2. How to replace the safety valve

Instructions for use: These repair methods can only be used by professionals. To avoid electric shock and equipment malfunction, it is necessary to consult the instruction manual and repair it according to the instructions. At the same time, the manual has provided repair methods to professionals as much as possible.

- 1) The safety valve is located above the front left side of the equipment.
- 2) Remove the safety valve fixing screws and detach the safety valve from the safety valve base.
- 3) Replace it with a qualified safety valve. Test the sterilization process.

## 6. Temperature controller

Located inside the equipment, the sterilizer is equipped with a temperature controller that can maintain a constant temperature during the heating and sterilization stages by turning on and off the power supply. Usually used as a temperature alarm device. If the temperature of the pot exceeds the allowable value, the thermostat will automatically disconnect the power supply of the heater. When the temperature of the pot drops below the allowable value, the thermostat automatically turns on.

### 6.1. How to increase the working temperature of the thermostat

The thermostat is a liquid expansion thermostat, which increases the temperature control range by rotating clockwise. (Note: The equipment has been adjusted before leaving the factory, and customers do not need to adjust it).

## 7. Steps for replacing the heater

Before this operation, the power should be cut off and ensure that there is no pressure in the sterilizer chamber.

- 1) Remove the outer cover of the sterilizer.
- 2) Remove the wiring from the heater.
- 3) Loosen the fixing screws on the heater.
- 4) Replace the damaged heater with a new one, the position of the new heater should match the position of the replaced heater, and connect the wires.
- 5) Install the sterilizer cover.
- 6) Test all work processes.

## 8. Door safety interlock device

A safety device that prevents the door from opening when the sterilization container is under pressure. This system is built on the basis of pressure generated in the sterilizer chamber. The pressure generated inside the sterilizer will push the movable clutch up and the fixed clutch into close engagement. It will prevent the operator from accidentally opening the door. After the release of water vapor, the device returns to its initial position, allowing the door to be opened.

## 9. Cleaning steps for solenoid valve

- 1) Remove the outer cover of the sterilizer.
- 2) Use a screwdriver to open the stainless steel pressure plate of the solenoid valve.
- 3) Lift the solenoid valve coil.
- 4) Use a wrench to open the valve body.
- 5) Rinse the debris on the valve core with clean water.
- 6) Reinstall the solenoid valve.
- 7) Every 6 months or when the solenoid valve leaks, seal it

When not using soda water, clean it. After cleaning, follow the instructions

If the above phenomenon occurs, it is necessary to consider replacing the solenoid valve.

The disassembly steps of the valve body are shown in the following figure



① Remove the top compression nut



② Remove each component one by one



③ Disassemble the valve core nut



④ Clean each component one by one

10. Steps for replacing the fuse

First, turn off all the devices. The fuse is located at the bottom right corner of the device circuit board. Use a flat screwdriver to gently pry it open to remove it. After removing it, replace it with a new fuse. Simply press it lightly with your finger to complete the replacement. Maintenance work should be carried out by professionals, and non professionals should not replace it themselves.

Specification and model of fuse: F5AL250V

**15. Troubleshooting**

1. Common fault information

Fault	Causes	Methods
The power switch is turned on, but the power indicator light is not on	1. Circuit breaker not closed 2. The main power switch is damaged	1. Close the circuit breaker 2. Replace the power switch according to the specific situation
The door detection indicator light is not on	1. The door is not properly opened and closed 2. Loose or misaligned door	1. Close the door tightly and try again 2. Adjust the position switch

	micro switch	of the door
Heating state, pressure and temperature do not rise or rise slowly	1. The control circuit of the heater is short circuited or burned out 2. Severe leakage at pipeline joints or safety valves Blockage of drainage filter	1. Check and replace damaged components 2. Check and tighten pipeline joints, safety valves, etc Remove debris from the filter spool
Drainage status, pressure and temperature do not decrease or decrease slowly	Blockage of drainage filter	Remove debris from the filter spool
Unable to reach sterilization temperature	Is it determined by the boiling point at the altitude? Please check and confirm the set temperature for boiling point	For non altitude reasons, please contact us or our agent
Safety valve opens	1. Is the pressure too high? 2. Is the safety valve malfunctioning?	1. Adjust the temperature deviation 2. Correct and replace the safety valve
The door is leaking air	1. Has the door gasket hardened and aged? 2. Is the door rubber strip cracked? 3. Has the door gasket fallen off?	1. The door gasket must be replaced 2. The door gasket must be replaced 3. Reinstall the door gasket

Note: This instruction aims to provide you with repair methods for known faults as much as possible.

The above are some common fault information.

## 2. Alarm code

During use, if an error occurs, an error code will be displayed and the buzzer will sound to prompt an alarm. The sterilizer will automatically stop running. Please investigate the following situations and take appropriate measures. When a malfunction occurs, please wait for the equipment to be depressurized before touching it.

Error code	Fault occurrence phenomenon	Causes	Methods
E01	Open the door during the sterilization process	Micro switch not tightened	Please exhaust and tighten the door cover again, and check if the installation position of the door detection switch is

			correct
E02	The temperature during the sterilization process is lower than the set temperature	Damaged or leaking heating tube	Please check for any air leaks or damaged heating components
E03	During the sterilization process, the temperature exceeds the set temperature by 3 °C	Program malfunction or circuit board loss of control	After exhaust, run the program again. If there is another malfunction, please contact after-sales service.
E04	Temperature sensor malfunction	The sensor connection wire is disconnected or the parameter settings are abnormal	Please check if the sensor connection wire is loose or if the calibration parameters in the advanced settings are correct
E05	Mobile temperature sensor malfunction	The sensor connection wire is disconnected or the parameter settings are abnormal	Please check if the sensor connection wire is loose or if the calibration parameters in the advanced settings are correct
E06	Water inflow timeout	Lack of water, damaged water level float, blocked inlet pipeline, electromagnetic valve malfunction	Please check the water volume inside the chamber, whether the water pump and float are working properly, or whether the filter is clogged
E07	Heating failure	Heating tube damaged or circuit detached	Please check if the status of the heating lamp is normal. If it is normal, please measure the resistance of the heating tube
E08	Heating up failure	Excessive pressure, lid displacement, lid detection failure	Please check if the equipment is leaking air
E09	Pressure relief failed	During the pulsating exhaust phase, the exhaust valve failed to open properly	Please check if the control circuit or exhaust valve is damaged
E10	Water shortage alarm	After the water inlet stage, if the duration of the low water level exceeds the set	Please check if the water level float or water inlet function is normal

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		value, the sterilization process is stopped to avoid dry burning	
E11	Dry burning alarm	Thermostat action, program termination	Check the set temperature of the thermostat and verify the status of the water level float ball

## 16. Warranty

Dear customer: Any product has the possibility of malfunction. Please monitor the operation status of the equipment in real time during use. If there are any abnormalities, please refer to the instruction manual for handling. If the problem cannot be solved, please notify our service center in a timely manner to avoid any losses to you.

After sales service matters

1. From the date of sale of the equipment (based on the invoice), the whole machine is free of charge for one year and enjoys lifelong service.
2. Warranty Certificate: When you need normal consultation or repair, please contact our local after-sales service center with the warranty certificate and purchase invoice and keep the warranty certificate properly.

The following components can only be purchased through the manufacturer

- Heating tube
- Silicone heating film
- Solenoid valve
- Circuit board

## 17. Packing List

No.	Name	Qty.
1	Main machine	1
2	User manual	1
3	Quality Certificate of Pressure Vessel	1
4	Warranty card	1
5	Certificate	1
6	Testing report	1
7	Key (to open the access door)	1
8	Dain pipe	1

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