

WAVE

WAVE AUSGABE

WAVE AUTO80

BETRIEBSANLEITUNG



LOKALISierter BEDIENTEITFADEN

Technisches Originalhandbuch (Englisch)

LOKALISierter BEDIENTEITFADEN

DOKUMENTSTATUS

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Diese WAVE-Ausgabe bietet einen klaren Bedienueberblick und erhaelt das vollstaendige Originalhandbuch des Herstellers als unveraenderte technische Anlage. Fuer Detailsteuerung, Schaltbilder, Wartung und Fehlercodes ist die Anlage massgeblich.

SICHERHEIT ZUERST

Installation, Betrieb und Wartung duerfen nur durch geschultes und autorisiertes Personal erfolgen. Vor der ersten Nutzung diesen Leitfaden und die vollstaendige technische Anlage lesen. Typenschild, lokale Vorschriften und Betriebsanweisungen beachten. Bei Widerspruechen oder ungewoehnlichem Verhalten Anlage stoppen und WAVE kontaktieren.

EINSATZ UND KERNDATEN

Klasse-B-Vakuum-Dampfsterilisator fuer validierte, feuchthitzebestaendige Beladungen. Nicht fuer verschlossene Fluessigkeitsbehaelter oder dampfunvertraegliche Materialien.

80 L**105 to 134 deg C****Chamber 386 x 692 mm****AC 220 V / 50 Hz****230 kg gross****6.2 kW**

INSTALLATION UND INBETRIEBNAHME

Vor der ersten Nutzung

- Stabil und belueftet bei 5 bis 40 deg C und bis 85 % Feuchte aufstellen.
- Typenschild, Schutzkontakt, Ablauf und Anschluesse fuer destilliertes Wasser pruefen.
- Tuerdichtung, Kammer, Tablets, Filter und Sicherheitseinrichtungen kontrollieren.
- Betrieb nur durch geschultes und lokal befugtes Druckgeraetepersonal.

WAVE CHECK

Installation, Betrieb und Wartung duerfen nur durch geschultes und autorisiertes Personal erfolgen. Vor der ersten Nutzung diesen Leitfaden und die vollstaendige technische Anlage lesen. Typenschild, lokale Vorschriften und Betriebsanweisungen beachten. Bei Widerspruechen oder ungewoehnlichem Verhalten Anlage stoppen und WAVE kontaktieren.

BETRIEB IM UEBERBLICK

Routinebetrieb

- Validiertes Programm passend zu Beladung und Verpackung waehlen.
- Nicht ueberladen; freie Dampfwege um jedes Teil sicherstellen.
- Tuerverriegelung pruefen und Druck, Temperatur sowie Alarme ueberwachen.
- Erst nach Zyklusende und 0 MPa oeffnen; vor heissem Dampf schuetzen.

Stoppen und eskalieren

- Nie verschlossene Fluessigkeitsbehaelter oder ungeeignete Werkstoffe sterilisieren.
- Tuerverriegelung, Druckregelung oder Sicherheitsventil nie umgehen.
- Bei Alarm sicheren Druck und sichere Temperatur abwarten.
- Fehlzyklus erst nach Ursachenanalyse und korrekter Aufbereitung wiederholen.

PFLEGE, NACHWEISE UND REAKTION

Wartungsrhythmus

- Je Zyklus/täglich: Kammer reinigen, Belag entfernen und Abwasser nach Vorgabe leeren.
- Wöchentlich: Gehäuse wischen; modellspezifischen Wasserwechsel beachten.
- Monatlich: Filter reinigen, Dichtungen und Ablauf prüfen.
- Jährlich: Sicherheitsventil, Manometer, Tür und Elektroanschluss fachlich prüfen.
- Lokale Druckgerätevorschriften und Originalanlage beachten.

Erforderliche Nachweise

- Programm, Beladung und Bediener
- Zyklusausdruck und USB-Datensatz
- Chemisches/biologisches Indikatorergebnis
- Alarm, Korrektur und Freigabeentscheidung

Support

wave.cc | mike@wave.cc

TECHNISCHE ANLAGE FOLGT

Technisches Originalhandbuch (Englisch)

Die folgenden Seiten geben das Originalhandbuch des Herstellers unverändert wieder.
Bildschirmbezeichnungen, Schaltbilder, Teileangaben, Wartungsverfahren und Alarmtabellen dort
vollständig lesen.

Quellrevision: BKM-Z60/80B - Version 2024.10

BIOBASE

Desktop Vacuum Autoclave BKM-Z60/80B User Manual

Please read this manual carefully before use

BIOBASE DISINFECTION(SHANDONG) Co., Ltd.

Preface

Respected user:

Welcome to buy Desktop Vacuum Autoclave, would like to thank you!

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

- The first time using this product, please read this manual carefully!
- Sterilizers should only be handled by trained and authorized personnel.
- Equipment maintenance can only be done by authorized BIOBASE or BIOBASE dealers.
- If the operator encounters problems that are not mentioned in this manual, contact the authorized BIOBASE or BIOBASE dealer and ask for correct handling.
- The Desktop Vacuum Autoclave must be inspected and maintained within the specified time.

After reading the manual, in order to facilitate access at any time, please put this manual in a convenient place.

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The scope of application

Pressure steam sterilizer for medical equipment, hygrometer sterilization and other health materials.

This device can be used normally under the following conditions:

Ambient temperature: 5 °C ~ 40 °C;

Relative humidity: not more than 85%;

Atmospheric pressure: 70 kPa ~ 106 kPa;

Note: The use of sterilizers by manufacturers and users should consider the effect of local atmospheric pressure on sterilizer parameter settings.

Avoid heavy dust, oil mist, containing conductive particles, corrosive gases, flammable gas environment.

Avoid easily shock or vibration of the occasion.

Avoid high temperature and humidity or easily wet place.

Avoid strong magnetic environment.

Technical parameters and contraindications

Model	BKM-Z60B	BKM-Z80B
Volume	60L	80L
Design pressure	-0.1/0.3MPa	
Sterilization temperature	105-134℃	
chamber material	S30408	
Rated voltage	AC220V/50Hz(Standard); AC220V/60Hz(Standard); AC110V/50Hz(Optional); AC110V/60Hz(Optional); Wiring Method: Air switch Note: The voltage of the equipment delivered to the customer shall be determined by the voltage marked on the nameplate affixed to the back cover of the equipment.	
Power	6.2kW	
Ambient temperature	5-40℃	
Chamber size (mm) (Φ×L)	Φ 386*520	Φ 386*692
External size (mm) (L×W×H)	940*805*700	1140*805*700
Gross weight (kg)	215	230
Design life	8 years (validity period of product obtained by accelerated aging test)	
Date of manufacture	See label for details	

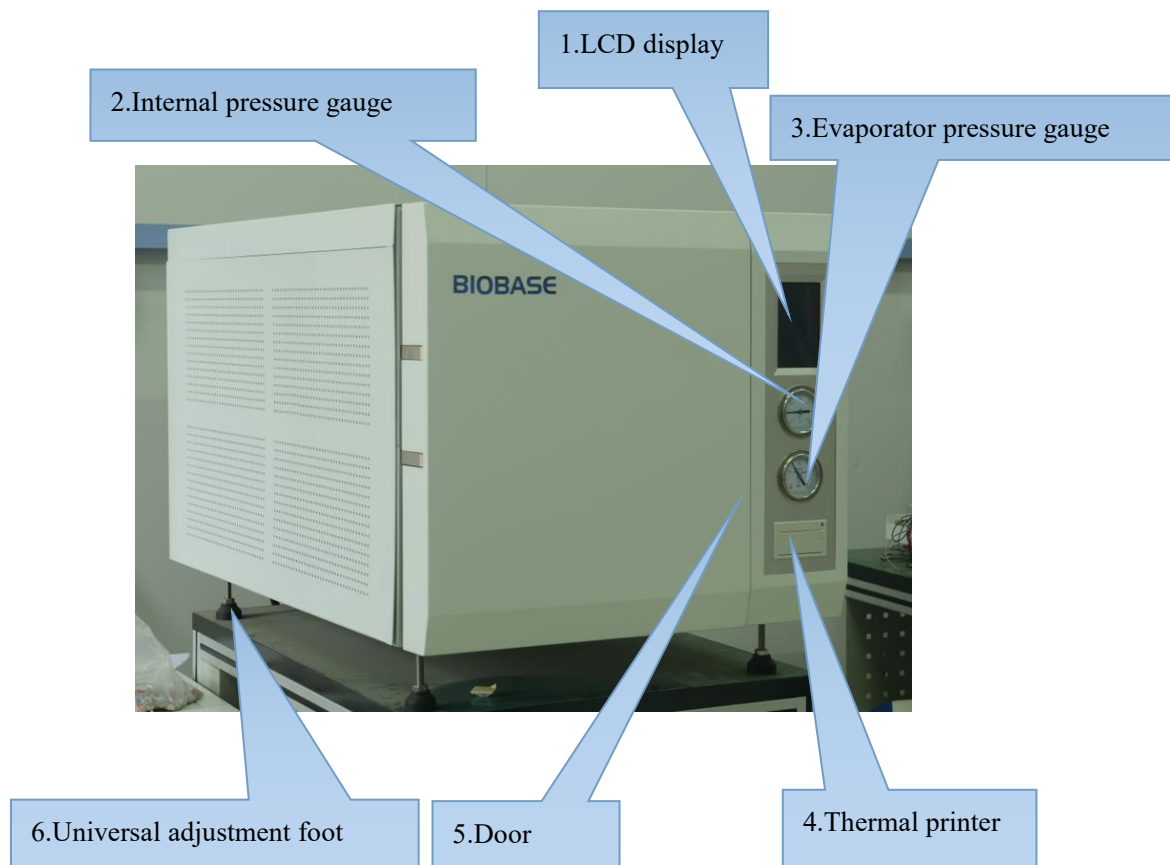
Product performance:

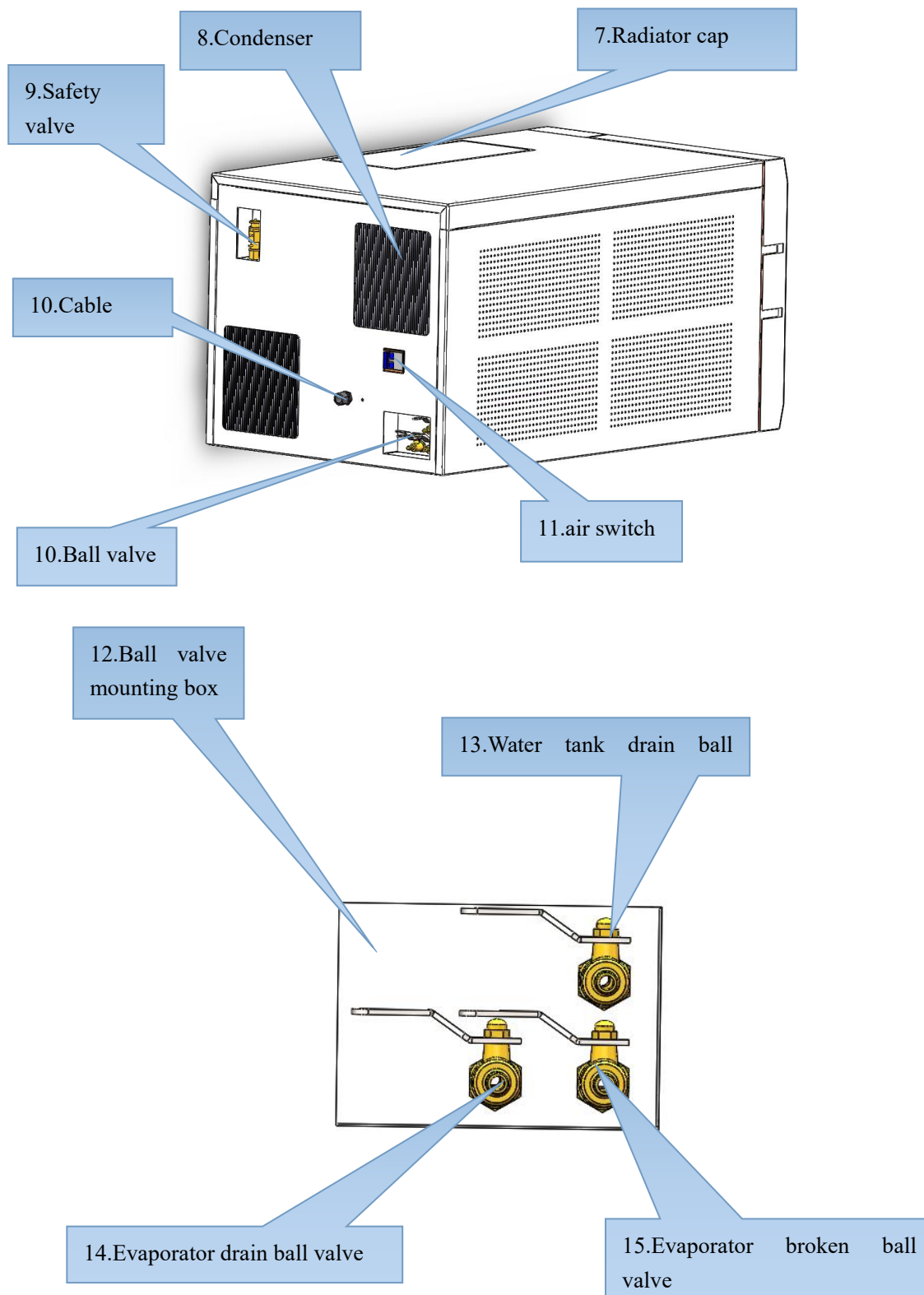
1. At the same time the difference between the points should not exceed 2 ℃
2. For the sterilization temperature of 121 ℃ and 134 ℃ sterilization cycle, the maintenance time should be not less than 15min and 3min
3. Control system should be sterilized room temperature control in the preset sterilization temperature 0 ℃ ~ 4 ℃ error range.

Contraindications: The product has no absolute contraindications, but can not sterilize items not suitable for moist heat sterilization.

Equipment principle and the main structure

The Desktop Vacuum Autoclave is the principle of using microorganisms to kill microorganisms. The equipment is designed to remove the cold air in the inner chamber according to the specified sterilization process, and the saturated hot and humid steam is used as the sterilization factor at high temperature and high pressure. In a high-humidity environment, sterilization of items that can be penetrated by steam is achieved according to a combination of pressure and time. The sterilizer consists of a sterilizer body, a sealing door, a pipe system, and a control system. The door opening direction is upward, and the inner chamber material is made of S30408 stainless steel plate.





The main function of each device is as follows:

NO.	Components	Features
1	LCD display	Macroscopic real-time monitoring of the entire sterilization process
2	Internal pressure gauge	Real-time display of internal chamber pressure
3	Evaporator pressure gauge	Real-time display of internal pressure of the evaporator
4	Thermal printer	Used to record data during the operation of the sterilizer
5	Door cover	Open the door and heat insulation to protect the operator
6	Universal adjustment foot	Open the door and heat insulation to protect the operator
7	Radiator cap	Prevent foreign matter from entering the tank and prevent water from splashing out of the tank
8	Condenser	Reduce the temperature of the water in the tank and increase the vacuum effect
9	Safety valve	Relieve pressure when pressure exceeds predetermined working pressure, ensuring safety
10	Cable	Power switch
11	Air switch	A switch that automatically disconnects when the current exceeds the rated current in the circuit
12	Ball valve mounting box	Fixed ball valve
13	Water tank drain ball	drain
14	Evaporator drain ball valve	Drainage (the evaporator pressure is greater than or equal to 1KPA or the ball valve cannot be opened during operation to avoid burns)
15	Evaporator broken ball valve	When the evaporator is under negative pressure, the evaporator drain ball valve can't drain, open the evaporator to break the ball valve, and let the air enter, which is good for the evaporator water to drain (the evaporator is greater than or equal to 1KPA or the equipment is running, the ball valve can not be opened to avoid burns)

Sterilizer main components of the role simply as follows:

	Component	Function
1	Sterilizer body	medical equipment, sanitary materials and other objects of sterilization
2	Door	closed container
3	Plumbing system	to connect all kinds of parts, conveying distilled water and steam.
4	Control system	control various types of solenoid valves and testing devices to ensure that the sterilization process can be successfully completed.

Precautions**Important tips**

1. The product units should be used in the process of regular maintenance and regular self-inspection.
2. The use of the product units should be used in products at least once a month to check and make a record. The use of units in the use of products for self-examination and routine maintenance found abnormalities, it should be promptly processed.
3. Change the product use unit shall be in use safety accessories (safety valves, pressure gauges, etc.), safety protection devices, measurement and control devices and related subsidiary instrumentation for regular inspection, overhaul, and make a record.
4. The operating personnel and related management personnel of the product shall, in accordance with the relevant provisions of the State, pass the examination and verification of the special equipment safety supervision and administration department and obtain the special operating personnel certificate of the unified national format before engaging in corresponding operations or management. The employing unit shall educate and train special equipment safety workers to ensure that special equipment operators possess the necessary special equipment safety knowledge. The product operators in the operation should be strictly enforced special equipment operating procedures and the relevant safety rules and regulations.



The equipment is Class I pressure vessels, in accordance with the "pressure vessel" design, manufacture,



Inspection and acceptance, and in line with "fixed pressure vessel safety technology supervision regulations" requirements.



This device is not suitable for the sterilization of closed liquid articles.



When using this equipment to sterilize liquid items such as glass bottles or glassware, do not quickly relieve the pressure because the changes in temperature and pressure during operation may cause the liquid bottles to explode, which may endanger people and equipment Security.



Chloride ion is an important factor that causes corrosion damage of stainless steel. If the sterilizer sterilizes articles containing chloride ions, the inner wall of the sterilizer must be rinsed daily with clean water to prevent the deposition of chloride ions from corroding the internal stainless steel and prolong the service life of the equipment, otherwise additional damage to the equipment and Accelerated aging is not covered by our company.



This equipment is only suitable for the sterilization of high temperature and high humidity medical equipment and articles. It can not be used for the oil and powder such as vaseline. It contains highly volatile substances such as alcohol and gasoline, and sterilizes the corroded copper and aluminum products.



This sterilizer shall not be used for cooking food.



Use the device according to the operation methods and precautions specified in this manual. If you do not use the device according to the specified method, the protection provided by the device may be damaged, resulting in artificial insecurity and hidden danger.



Keep the user's manual completely within the service life of the equipment, and ensure that all the updates received can be stored in the manual. When the equipment is used or the unit of use is changed, it is necessary to ensure that the manual is transferred or delivered as a part of the equipment.



Equipment does not allow unauthorized disassembly, if necessary, please contact our company authorized suppliers or agents of professionals to inspect or replace parts.



Equipment that has been stored under wet conditions may not meet all the safety requirements specified in this manual and must be air-dried for a period of time and then stored under normal conditions.



Don't pack sterilized items in containers and bags that can not be penetrated by steam, otherwise sterilization is not possible.



When opening the sterilizer door, high-temperature steam will be sprayed out of the sterilizer cavity. Please wait for the steam to completely drain and fully open the door. Also, do not put your face close to the sterilizer.



When equipment sterilization is completed, the sterilization chamber wall still a certain residual temperature, please pay attention to heat insulation, to avoid scalding, burns and burns, the injury can be cooled to prevent the heat caused by deep tissue damage to the skin, ease the pain, Please seek medical attention as soon as possible.

Monitoring method: sterilizer can be used to verify the temperature sterilization, sterilization test strips, biological reagents and other methods to monitor the sterilization effect.



Avoid rearward safety valve on the person or other equipment to avoid steam burns or interference.



After the device opens the door of the sterilization chamber, do not rotate the hand wheel again to prevent the guide post from escaping from the guide groove.



When sterilizing the waste, place the waste disposal bag in the sterilization basket, add about 500 ml of water, and place the moving probe inside the liquid (must be inside the liquid, not attached). Select the liquid custom program, 121 degrees Celsius, and extend the sterilization time as appropriate.



Safety valves and pressure gauges shall be calibrated annually to the testing agency in accordance with the national inspection standards. The inner cavity of the sterilizer shall be a type 1 pressure vessel with a testing period of 3 years.



Do not stay near the house during work, wait for the work to be completed when the light alarm into the house, open the device, remove the items.

Installation and Adjustment

1. Check whether the parts is complete

When the arrival of the autoclave, please pay special attention to the packing, carefully check whether the model, product name etc in product packaging box is consistent, and keep the packaging materials. Vertical autoclave packing list (see Appendix three).

2. Equipment unpacking Installation Preparation

2.1 Equipment unloading

Before unloading, please note:

Don't stand at the bottom of the hoisting equipment.

Please use the qualified hoisting equipment.

Adjust the hoisting equipment, find the center of gravity, so that making the equipment hoisting horizontally.

Pay attention to personnel safety.

2.2 Equipment inspection

After opening the packing box, please carefully check whether the equipment and parts are in good condition, if there are any damage or loss, please kindly make record and contact our company.

After unpacking the equipment, firstly check the model and product name on the product nameplate whether compliance with the order. (Product nameplate is at the rear cover of the equipment)

Whether the equipment has apparently collision trace, whether it is intact, if you have questions, please make record and contact the shipping company or our company.

2.3 Handling and moving

During the installation process, professional construction personnel should be responsible under the guidance of professionals.

Do not put the device on its side and reverse it during transport.

Installation and handling should be carried out by a special person. It should be lifted gently and gently.

Be careful not to damage or scratch the cover during handling.



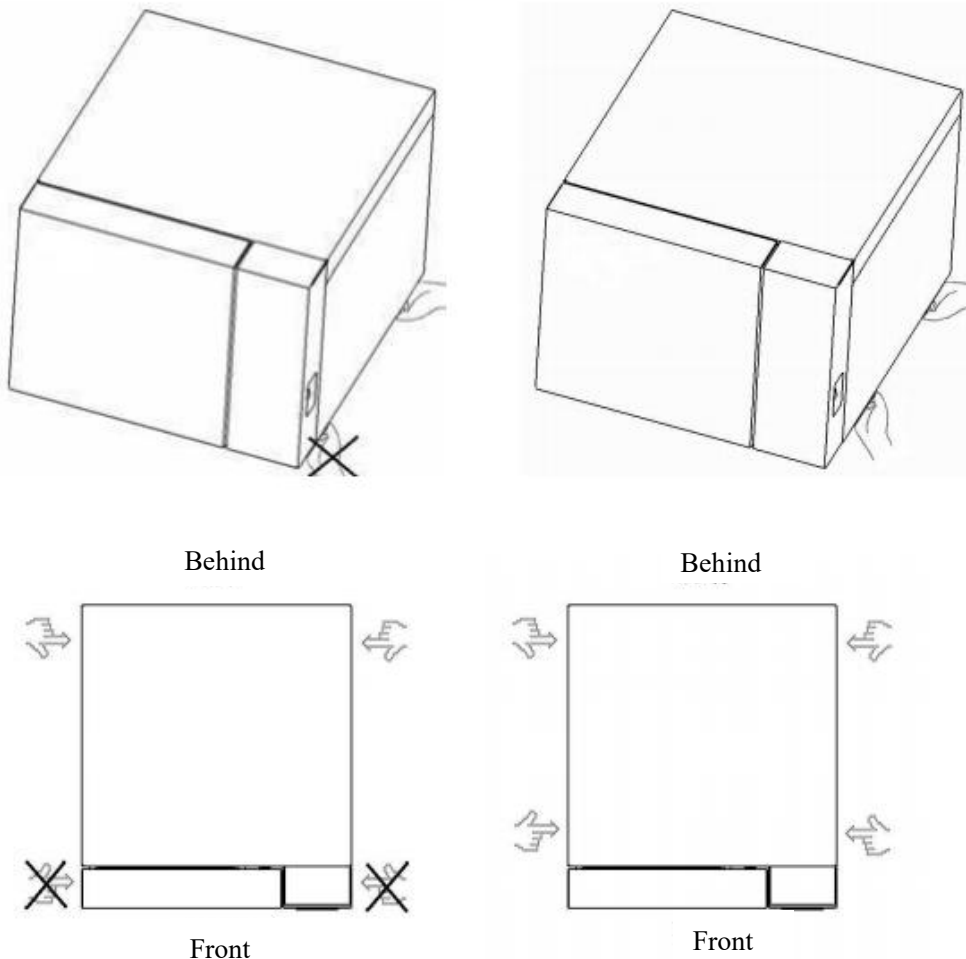
NOTICE Handling precautions!

Do not lift the door when handling equipment

Do not lift the feet of the device when handling the device.

Do not place or place the device on its side when handling the device.

The handling position when handling equipment is as follows



3.Installation and Debug

Installation steps:

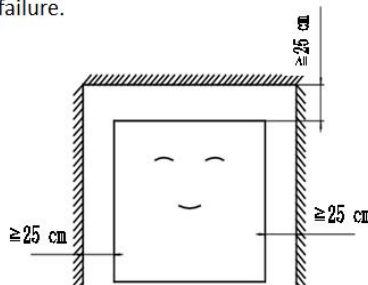
1).place of autoclave:

Put the autoclave on the ground of the smooth, clean and spacious, adjust the machine feet, make them parallel to the ground, to ensure stable reliable. The distance between back and sides of the sterilizer and other objects at least 250 mm.To ensure the ventilation is well.

In addition to keep a safe distance from other objects, the existence of other objects should not affect the equipment operation. When there is a failure in the equipment operation, you should be able to cut off the power quickly !

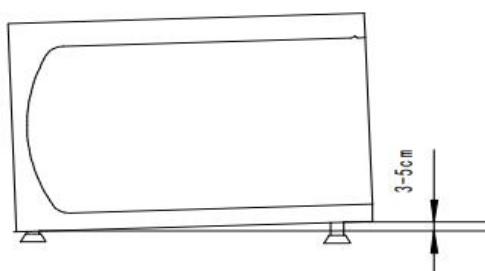


Attention: If the sterilizer is clingy wall, may cause internal heat agglomeration of sterilizer and cause failure.



After putting the equipment on the table, adjust the height of the equipment before and after according to the requirements of the following figure to prevent the equipment from storing too much water (equipment drainage, exhaust port at the back end).

Note: select table placement equipment with bearing capacity of more than 150 kg.



2) . Power installation



Attention: Pls let the equipment grounding for your safety.

Please install a dedicated connection for wiring devices at the equipment nearby buildings. The height is about 1 meter. (such as circuit power supply and load capacity of the power line should be greater than the rated load of the equipment. Advice:

Please don't put equipment in a place which hard to disconnect the power supply, make sure that you can disconnect the power supply in case of an emergency. Please make sure that the fixed socket and power plug of power line with same specification.

Equipment use two phase three wire connection mode, please connect line according to equipment configuration connection way.

Please do not arbitrarily change the connection mode. If you need, please contact us.

Fire wire (L), brown or black, zero line (N) - blue, ground wire (PE) - green and yellow.

Please entrust a specialized electrical construction personnel to do construction work.

To ensure your personal safety, please be sure to lay a ground wire.

4. Water source required

Devices do not need to connect the water, you need to add water to sterilizer water tank or

sterilization chamber manually. You are advised to use soft water or pure water, Because if use water which is not suitable may shorten the service life of equipment, cause unnecessary trouble. Water quality must meet the following requirements:

Electrical conductivity is less than 15 μ S/cm

The content of bleach is less than 2mg/L.

PH value is 5~7.

Hardness is less than 0.02mmol/L.

5.Working conditions

The sterilizer should be placed in a clean, dry, dark, ventilated indoor environment with small temperature difference.

- 1) The indoor temperature is 5°C-40°C.
- 2) Relative humidity is not greater than 85%.
- 3) The atmospheric pressure is 70 kPa ~ 106 kPa.
- 4) The allowable voltage fluctuation range is $\pm 10\%$.
- 5) No dust and pollution in the room.

Equipment use instructions

1. Use instructions

In strict accordance with the instructions of equipment, installation and operation error would endanger the life and property safety of people, and make the generation of manufacturers of equipment performance guarantee is invalid;

In the equipment usage period kept complete instructions for use;

Ensure that all updates received can be preserved in the specification;

In the device using the site or the use of units of change, we must ensure that the instruction for use as part of the overall transfer or transfer equipment.

2 . Equipment marking instructions



Note

To show should pay great attention



The sign of ground connection



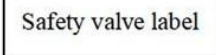
The sign of power



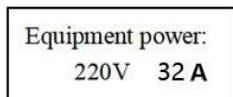
The sign of high temperature



The sign of draining off water



Safety valve label



Power grounding label

Instructions must be carefully preserved, in case of loss or damage, even a slight damage should be avoided.

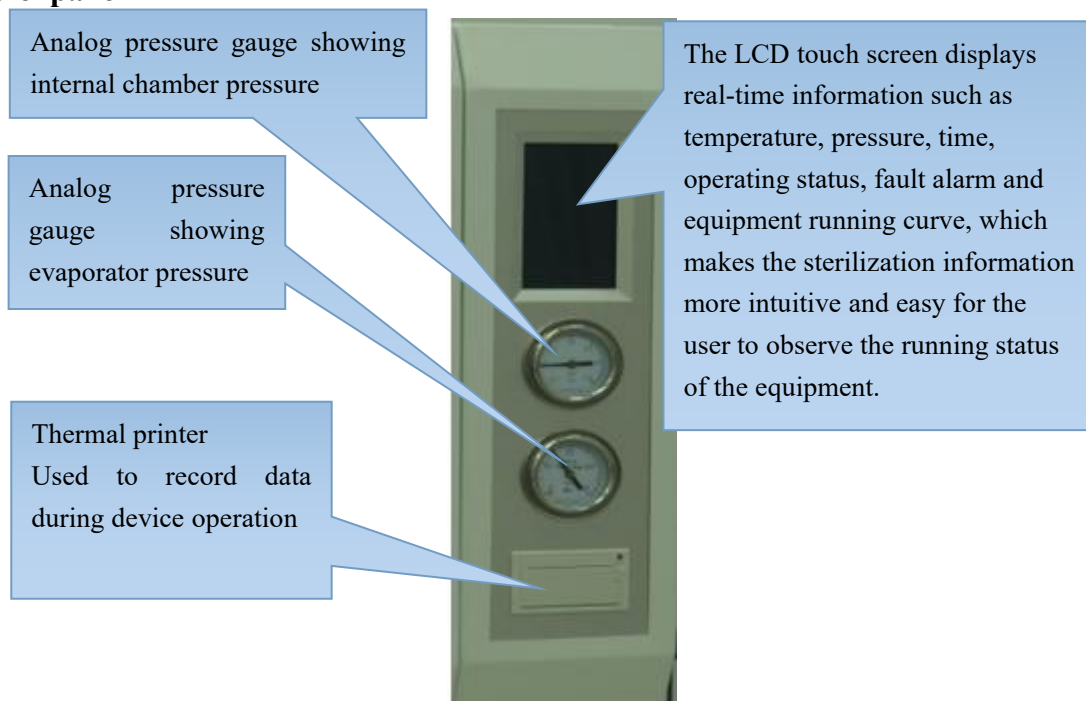
The operating personnel have the obligation to repair technology, complete specification, damaged or lost is not suitable, the part of the contents of directories and relevant section.

Any person, not under any circumstances will use any content of the specification are torn or out.

If the experience and instruction for use the instructions in the manual does not match or not relates to the situation, please timely contact with the manufacturers, to upgrade or update.

Manual save to keep ventilation drying, avoid high humidity and temperature.

3.Control panel



Program Description: The device is equipped with a total of 11 sets of default procedures, including bare equipment, packaging equipment, rubber procedures, dressing procedures, liquid procedures, solid DIY, liquid DIY, medium sterilization are sterile procedures, BD & Helix, The vacuum test belongs to the test program, medium dissolution belongs to the auxiliary class program.

Program Type	Sterilization Temperature /°C	sterilization time /min	drying time /min	holding temperature / °C	holding time /min	pulsation times	pulsation upper limit /kPa	pulsation lower limit /kPa	total time /min
Bare instruments	134	4	5	----	----	3	60	-80	45
Packaging equipment	134	6	10	----	----	3	60	-80	55
Dressing procedures	134	12	25	----	----	3	60	-80	90
Rubber procedure	121	25	5	----	----	3	60	-80	80
Liquid program	121	20	----	----	----	----	----	----	120
Solid DIY	134 (105-134)	20 (1-99)	10 (1-99)	----	----	3 (1-6)	60	-80	----
Liquid DIY	121 (105-134)	20 (1-99)	----	----	----	----	----	----	----

	)								
Medium sterilization	121 (105-134)	20 (1-99)	----	60-100	0-99	----	----	----	----
Media dissolved	80 (80-105)	10 (1-99)	----	60-100	0-99	----	----	----	----
BD&Helix	134	3.5	2	----	----	3	60	-80	50
Vacuum test	Vacuum: 300s Test: 600s								40
enhancement Sterilization	134	20	10	----	----	3	60	-80	90

Operating procedures:

Turn on the power of the device, turn on the air switch at the back, and then open the ship type switch on the right side of the control panel. The display panel lights up and the sterilizer is in standby state.

You can sterilize according to the sterilization item selection program by clicking the screen  program selection interface. For example, when selecting liquid sterilization, click the screen liquid icon to enter the liquid program  sterilization, and then click the liquid program startup  icon, and the liquid program starts running.

After the sterilization is completed, the buzzer will beep once every 3 seconds. After the sterilization is completed, confirm that the internal pressure gauge pointer and the display P1 return to 0, click the open door icon  to take out the item.
note:

If you want to stop sterilization during the sterilization process, you can press the exit icon .

When the confirmation icon  appears, click the confirmation icon  to terminate the sterilization process. When the exit icon  is clicked by mistake, click the return icon  and the program will continue to run.

4 .Operational operation

Sterilizer operation procedures include sterilization preparation, sterilization items loading, sterilization operations, sterile items unloading and other steps.

4.1 sterilization preparation

(1) Cleaning: The items should be thoroughly cleaned before sterilization to avoid the bloodstains and other impurities, as these residues will harm the sterilized items and the sterilizer. After items are

washed, they should be dried and packed in time.

(2) Packaging: Please use packaging materials that are conducive to the discharge of internal air and the penetration of steam into the packaging materials, strictly abide by the "Technical Specifications for Disinfection" and the relevant national standards. Follow these points may be conducive to your sterilization effect:

Dish, basin, bowl and other containers, as far as a single package, the lid should be opened when packaging.

- ① Surgical instruments should be placed in the basket or perforated tray supporting package.
- ② Items must be stacked when stacked, utensils should be used between the absorbent cloth, gauze or medical absorbent paper separated.
- ③ Should be exposed on all surfaces of items, in order to facilitate sterilization of all items exposed surface contact with a sieve container, the opening should be down or side.
- ④ Items bundled should not be too tight.
- ⑤ The weight of 60L instrument package should not exceed 8 kg, and the weight of fabric package should not exceed 6 kg. The volume of sterilization bag should not exceed 110 mm *150 mm, and the weight of liquid should not exceed 4 kg. The weight of 80L instrument package should not exceed 10 kg, and the weight of fabric package should not exceed 8 kg. The volume of sterilizing bag should not exceed 30 cm x 30 cm x 25 cm. The weight of liquid should not exceed 5 kg.



Note that packaging materials, including hard containers, disposable medical crepe paper, plastic bags, paper bags, textiles, non-woven fabrics, etc., should meet the requirements of GB / T 19633, textiles should meet the following requirements: In addition to the four sides should not have sutures, should not be stitched; the first use should be high temperature washing, degreasing to pulp, to color; should be used to record. Customers can use test kits and other testing tools to monitor the sterilization effect.

4.2 Article loading Sterilized items according to the following requirements for loading:

- ① items loaded, up and down about each other should be spaced at a distance, the items can not be against the door and the walls to prevent inhalation of more condensed water.
- ② the same type of equipment and appliances and equipment should be placed together sterilization; different materials, textile items placed in the upper, vertical release, metal equipment placed in the lower class.
- ③ the same type of equipment and appliances and equipment should be placed together sterilization; different materials, textile items placed in the upper, vertical release, metal equipment placed in the lower class.
- ④ It is recommended to use the special sterilization rack and basket equipped with sterilized items.
- ⑤ sterilization package should leave gaps between, conducive to sterilization factor penetration.
- ⑥ difficult to sterilize the large package should be placed in the upper package should be placed in the lower.
- ⑦ sterilizer loading capacity of not more than 80% of volume.
- ⑧ liquid only with heat-resistant glass bottles and test tube loading, loading capacity should not exceed 50% of the container volume

5. Display screen description

T1: chamber temperature

P1: chamber pressure

T2: wok wall temperature

P2: evaporator pressure

Tm: liquid temperature

T:(When the liquid program is run, it is the liquid temperature, and the running solid class is the inner chamber temperature)

5.1 Initial screen

Screen 1 initial screen



Icon:  Program selection

Icon:  open door icon

Icon:  Parameter setting icon

Icon:  System maintenance icon

5.2 Program selection and start screen

5.2.1 Program selection

Click the  button in the initial screen to enter screen 2 program type selection.



Icon	Program type	Meaning
	Bare instruments	Sterilization of metal and ceramic instruments such as scalpel, forceps, tweezers, etc.
	Packaging equipment	Sterilization of metal and ceramic instruments such as scalpel, forceps, tweezers, etc.
	Dressing procedures	Sterilization of surgical clothing, dressings, cotton cloth, masks, etc.
	Liquid program	It is mainly suitable for sterilizing articles such as culture medium, reagent and so on.
	Solid DIY	For sterilizing articles in solid state at high temperature, the sterilization temperature, sterilization time, drying time and custom sterilization, such as conventional instruments, glassware, rubber, etc., should be modified
	Liquid DIY	In order to sterilize objects in liquid state at high temperature, it is necessary to modify the sterilization temperature and time for self-defined sterilization such as culture medium, reagent and so on.
	Rubber procedure	Mainly suitable for sterilization of rubber products, heat-resistant plastics, such as petri dishes, etc.
	Medium sterilization	To sterilize the culture medium, increase the heat preservation procedure, the customer can set the heat preservation temperature and time according to their own demand
	Media dissolved	Dissolve the solidified medium and increase the heat preservation process. Customers can set the temperature and time according to their own needs.

	BD test	Check equipment steam penetration effect, cold air removal effect
	Vacuum test	Check equipment for leaks
	enhancement Sterilization	load containing bacteria that are more difficult to kill

5.2.2 Program launch screen

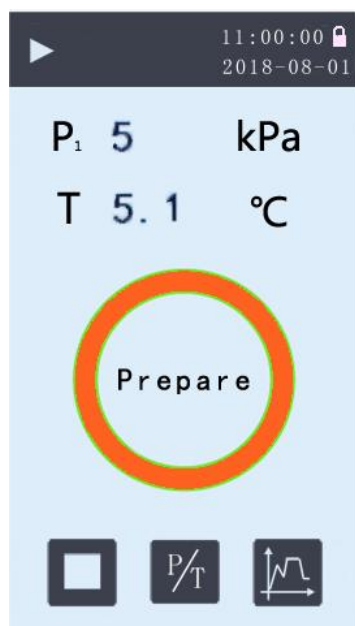
Press confirm key after selecting program screen 2, enter program start screen 3.



Icon:  start icon

Icon:  return icon

After clicking the start icon, enter the program run screen 4.



Icon:  exit icon

Icon:  temperature and pressure display icon

Icon:  Pressure and temperature curve

Click exit icon, enter exit screen 5, click confirm button, the customer can choose to exit halfway, or choose to return button, continue to run the program.



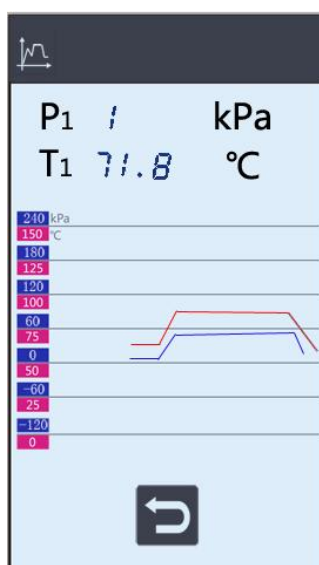
Icon:  Confirmation icon

Icon:  Return icon

Click the temperature and pressure display icon, enter the screen 6, you can check the evaporator pressure, chamber pressure and other parameters.



3 Click on the temperature and pressure curve icon, enter screen 7, you can see the inner room temperature pressure curve.



5.3 Setting screen

5.3.1 system parameter settings

Select system parameter setting icon  at initial screen 1, enter screen 8 system parameters



Icon:  confirm icon

Icon:  device Advanced Settings icon

Icon:  return icon

Preheating mode: on the preheating mode, the equipment starts to preheat, saving the program running time; off the preheating mode, the equipment only starts to preheat when it is running.

Print mode: select print or not print. If you select print “ON”, the printer will start to work when the autoclave is running a program and you can get printing result like above picture.

Language selection: select language types.

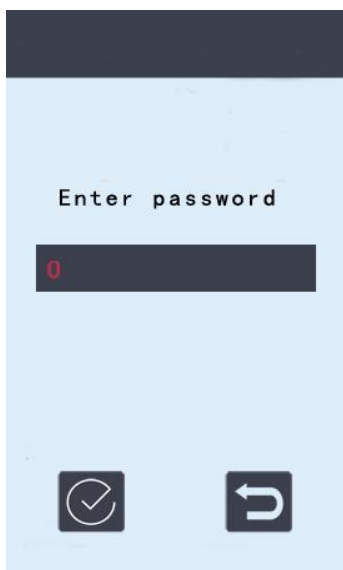
Time settings: direct screen 8 time display area, you can set the device's current time.

Atmospheric pressure: according to the actual use of regional atmospheric pressure regulation, boiling point temperature according to the corresponding relationship between water boiling point and pressure.

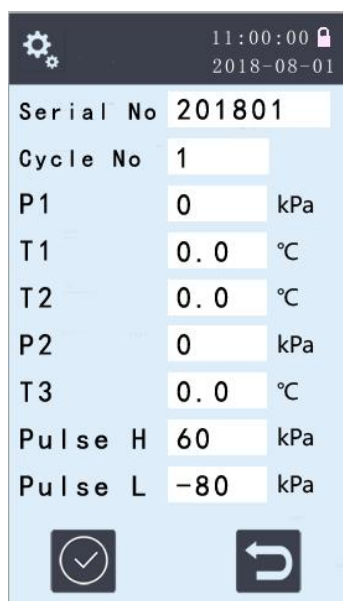
After the modification, press the confirm button  to save the modification data, then press the

return button  to return to the initial page.

Click the device deviation correction button to enter screen 9, enter the password.(PS: professionals with equipment operation and maintenance qualifications are required to have password permissions to set system maintenance parameters)



Enter the password, click the confirmation button, enter the device parameter repair screen 10, modify the device number, equipment running times, the upper and lower bound of the fixed program, and correct the deviation according to the comparison with the data measured by the instrument.



Click on the device information button  in the initial screen 1, enter screen 11, you can view the device number, model, volume, rated voltage, rated power information.



5.4 Distillation procedure of medium sterilizing medium

5.4.1 Select medium sterilization program icon  in program screen 2, enter start screen 12.

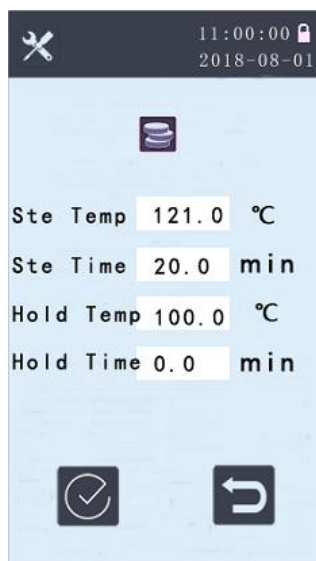


Icon:  start icon

Icon:  medium parameter adjustment icon

Icon:  return icon

Before clicking on the start icon , click on the medium parameters to adjust the icon , enter screen 13, the customer can according to their own needs, modify the sterilization temperature, sterilization time, insulation temperature, Heat preservation time (PS: medium sterilization temperature range 105-134, medium heat preservation temperature range 60-100), after setting up, click on the confirmation icon , return to continue to run the program.



5.4.2 choose medium dissolution program icon in program screen 2, enter start screen 14.

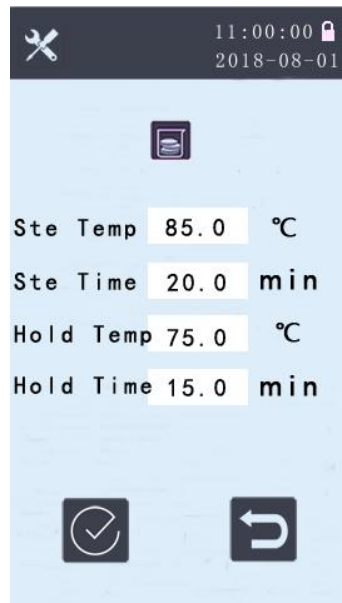


Icon:  start icon

Icon:  medium parameter adjustment icon

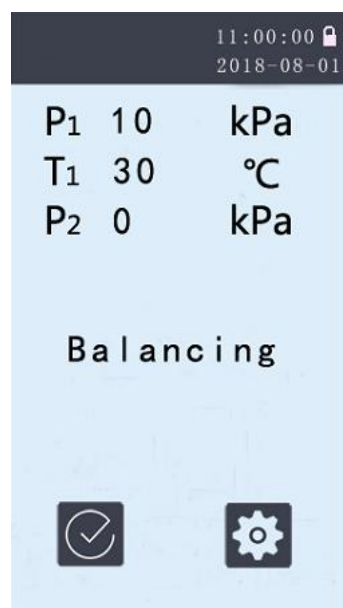
Icon:  return icon

Before clicking on the start icon , click on the medium parameters to adjust the icon , enter the screen 15, the customer can according to their own needs, modify sterilization temperature, sterilization time, insulation temperature, Heat preservation time (PS: medium solution temperature range 60-105, medium temperature range 60-100, medium temperature must be less than dissolved temperature), after setting up, click on the confirmation icon , go back to continue to run the program.



5.5 Operation steps of balance pressure and Error code

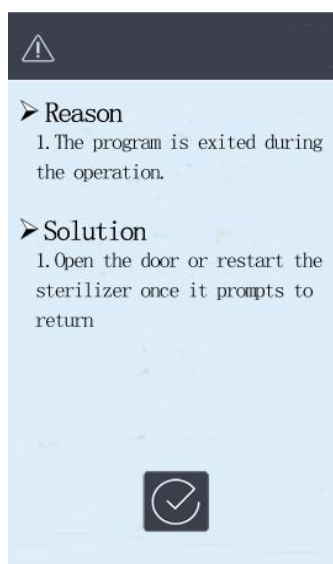
5.5.1 when there's negative and positive pressure in the inner chamber (PS:-5kpa < inner chamber pressure > 5kpa), door cannot be opened and show screen 16, click  to balance pressure.



5.5.2 when the machine fails, it will show screen 17, for example, if the device exits halfway, the failure code is E02



Click ok button, it will show screen 18, which contains error code and solution, customer can solve problem according to it.



5.6 Program Description

Program Description: The device is equipped with a total of 11 sets of programs by default, including bare equipment, packaging equipment, rubber procedures, dressing procedures, liquid procedures, solid DIY, liquid DIY, medium sterilization are sterile procedures, enhancement Sterilization, BD & Helix, vacuum test belongs to the test program, medium dissolution belongs to the auxiliary class program.

- The default process parameters of the equipment system are all under the standard load conditions specified in the product standard, is the default parameter set by the test, if the user changes the load or change the loading method, it needs to go through the related process verification before using, (The user must first confirm that the sterilization load can be run on the process flow corresponding to the specified program).

- Bare equipment, packaging equipment, rubber procedures, dressing procedures belong to the pulsating vacuum sterilization procedures, and the same process, only according to the characteristics

of different load adjustment of the value of the relevant parameters.

- ◆ Bare equipment is mainly applied to unpackaged high temperature bare metal sterilization, for example, the standard simulation load is a solid metal screw.

- ◆ Packaging equipment is mainly suitable for packaging with high temperature sterilization items, for example, standard analog loads are metal-coated metal screws with a cloth-covered fabric load.

- ◆ Rubber program is mainly applied to the relatively low temperature rubber load.

- BD & Helix program is mainly used to test the exclusion effect of cool air and steam infiltration effect with special equipment, such as the standard BD package, one-time BD package, this program parameter value is set according to the parameters required by the most commonly used BD test strip manufacturers (sterilization at 134 ° C. for 3.5 minutes), if the equipment used by the hospital or test strips are different, you should refer to the use of equipment or test strips to modify the specific parameters. Can also be used with a dedicated tube type PCD test a certain length of the lumen device cold air removal effect and steam penetration effect. The program parameter value is set according to the parameters required by the manufacturers of the most commonly used PCD devices (sterilization at 134 ° C for 3.5 minutes), if different from the hospital, you should refer to the requirements of the equipment to modify the specific parameters.

- The vacuum test procedure is mainly applicable to the sealing condition of some pipelines or devices connected with the internal chamber when the test equipment is under negative pressure. During commissioning or routine routine testing of equipment, especially after long-distance transport, there may be phenomena such as loose pipes (or when the B-D test fails), at this point, you can choose the program to test. It is mainly used to test the vacuum leak of sterilization equipment, in order to detect the sealing condition of the pipeline. This test is performed on the premise that the sterilizer chamber is empty. After the program is run to the test stage, the vacuum leak test is qualified when the pressure change does not exceed 1.3kPa within 600 seconds. If the test is not normal it must be overhauled. Check the door seal and piping systems connected to the internal part of the room and so on, find the leak, ruled out, re-test until the test is normal. This procedure is for testing purposes only and is not validated as a validated sterilization.

Maintenance



Before beginning maintenance, make sure that the equipment is powered off. At the same time, there is no pressure in the sterilization container.

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

Before beginning maintenance, make sure that the equipment is powered off. At the same time, there is no pressure in the sterilization container.

After the daily work with a soft cloth or a gauze to clean the door rubber ring.

Remove the basket.

Wipe the inner wall of the sterile container with gauze with detergent and water. Do not use steel wool or steel brush, so as not to damage the sterilization chamber wall.

Clean and remove scale from the chamber. Dump off the water in the tank.

Once a week, add molybdenum disulfide grease to the door pin. Once a week, to the door with molybdenum disulfide grease.

Once a week, wipe the sterilizer cover with a soft cloth.

Once a month, clean the filter spool.

Once a year, check the safety valve, pressure gauge and door hinge.

Once a year, fastening joints and testing off-state, should be completed by a professional electrician.

Once every 5 years, the door lock must be checked due to extreme wear and tear.

Usage notice: Maintenance instructions is for professionals. When the equipment fails, be sure to check the manual, and maintain with instructions required.

1.1 Change the water in water tank

- 1) Remove the transparent silicone tube to drain until the water in the tank is drained.
- 2) Put the distilled water into the tank, the water level should reach the mark of the water level.

1.2 Check the safety valve

It is located above the rear of the device.

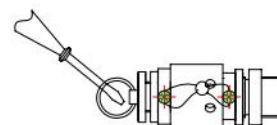
In order to prevent the safety valve is blocked. Under normal use, every two months, release the vapor pressure through it.

- 1) operate the autoclave according to the user manual
- 2) make the inner chamber to produce 0.21MPa pressure.
- 3) Push the relief valve handle with a screwdriver, leaving it open for about 2 seconds.
- 4) Turn off the main switch and terminate the operation. At meantime, discharge water vapour in sterilization vessel.
- 5) Wait until the pressure drops to 0MPa, open the door.

1.3 How to replace the safety valve

Usage notice:

These repairs may only be carried out by qualified personnel. Unless you are a professional talent, otherwise to avoid electric shock, equipment failure, be sure to check the manual, and maintenance instructions required, at the same time, the manual has provided the professional staff with maintenance methods as much as possible.



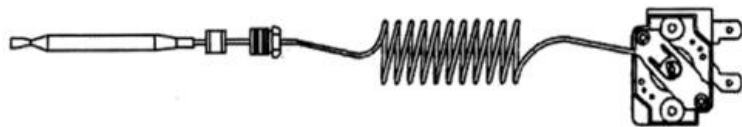
- 1) Located above the rear of the unit.
- 2) First remove the equipment cover, then remove the safety valve retainer screw and remove the safety valve from the safety valve seat.
- 3) Replace it with a qualified safety valve. Test the sterilization process.

1.4 Thermostat

The sterilizer is equipped with two thermostats, one inside the evaporator and one above the pot wall. It can maintain a constant temperature by turning the power on and off during the heating and sterilization phases. Usually used as a temperature alarm device.

If the temperature exceeds the allowable value, the thermostat automatically turns off the heater.

The thermostat switches on automatically when the temperature drops below the permissible value.



1.5 How to improve the working temperature of thermostat

This operation is limited to professionals using a screwdriver to slightly rotate the center screw clockwise to raise the temperature.

1.6 Replace the flange heating tube steps.

Before this operation, turn off the power and ensure that there is no pressure in the steam generator.

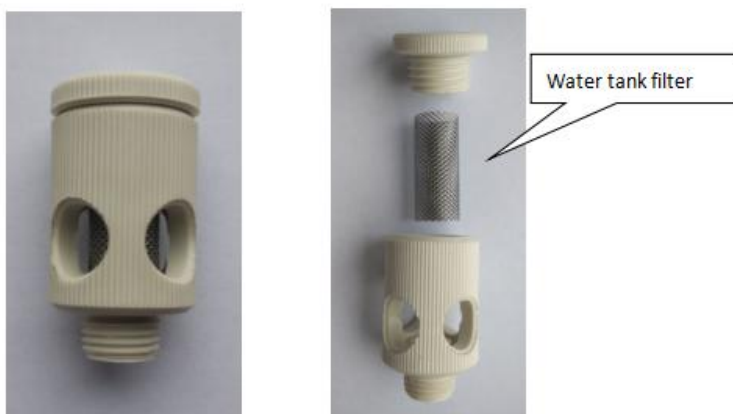
- 1) Remove the sterilizer housing.
- 2) Remove the wiring on the flanged heating tube.
- 3) Loosen the captive screws on the heater.
- 4) Replace the damaged heater with a new flanged heating tube. The position of the new flanged heating tube should match the position of the flange to be replaced and be connected.
- 5) Install the sterilizer housing.
- 6) Test all the work process.

1.7 Door safety interlocks

Safety devices that prevent the door from opening when the sterilization container is under pressure. This system is built on the basis of the pressure inside the sterilizer. The pressure inside the sterilizer will push the movable clutch up and the fixed clutch into close contact. It will prevent the operator from opening the door by mistake. When the water vapor is released, the unit returns to its original position so that the door can be opened.

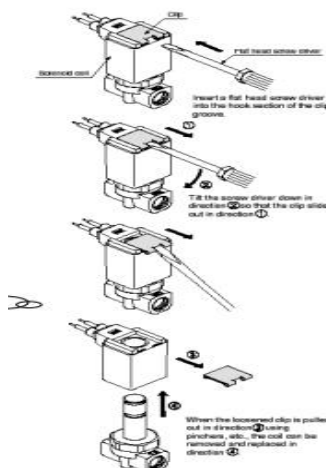
1.8 Filter cleaning.

The filter is located in the bottom of the device, it is used to filter impurities, to ensure smooth piping and solenoid valve sealing. Unscrew the filter nut from the chassis of the device, remove the filter cartridge, clean the filter cartridge, and clean it once a month.

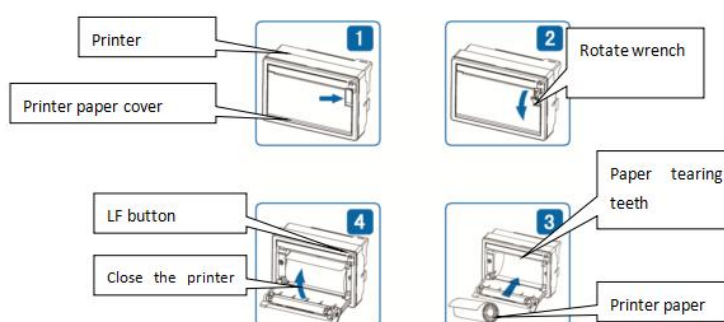


1.9 Solenoid valve cleaning steps

- 1) Disassemble the sterilizer housing.
- 2) Use a screwdriver to dial the solenoid valve stainless steel tablet.
- 3) Lift solenoid valve coil.
- 4) Open the valve body with a wrench.
- 5) Flush valve with debris on debris.
- 6) Reinstall the solenoid valve.



1.10 Replace printer paper



NOTICE When you see the red print on the printing paper roll, please replace the roll with a new one.

- Unsheathe the circumrotated wrench from the position the arrow point to as shown in Fig.1 and circum-rotate it until the paper cover opened as shown in Fig.2.
- Undrawn the paper cover, and insert the paper into the printer, then pull out a small amount of paper. Notice the direction of the paper according to Fig.4.
- Close the paper cover. Press the platen roller back to the printer head, then push the circumrotated wrench to the original position.
- Power the printer on, then press LF button, make the print head to run, and the paper will come out. Turn off the power.

1.11 U disk record

- 1) The USB disk must be inserted into the USB port above the ship type switch before the program is run. If the U disk is inserted during the program operation, the data will not be read.
 - 2) After the sterilization is completed, the display will be completed.
- At the same time, the data is also transmitted.



NOTICE The U disk format must be FAT32. The mobile hard disk is not supported here.

Common faults and solutions

1.This manual explains how to provide you with the repair method of the known fault as possible. The following is some common fault information.

Phenomenon	Possible Causes	Correction method
The power switch is on, the power light is off	1.The circuit breaker is not closed 2. The main power switch is damaged	1. Close the circuit breaker 2. According to the specific circumstances to replace the power switch
Door detection light is off	1.Do not switch the door in place 2. Door micro switch loose, dislocation	1. Close the door and try again 2. Adjust the door position switch
Heating state, pressure, temperature does not rise or rise slowly	The heater's control circuit is short-circuited or burned 2. Pipe joints or safety valve leaks serious	1. Check for damaged parts 2. Check, tighten the pipe joints, safety valves and other places
Drainage conditions, pressure, temperature does not decline or slow down	Drain filter blocked	Remove filter debris on the filter
Can not reach the sterilization temperature	Whether the boiling point of the altitude where the decision? Please check and confirm the setting temperature of boiling point	Non-altitude reasons, please contact us or agents
Safety valve open	Is the pressure too high? 2. Safety valve is fault?	1. Adjust the temperature deviation 2. Correction, replacement safety valve
Door leaks	Door rubber ring is hardened? 2.Does the door strip crack? 3.Door rubber ring off?	1.Door gasket must be replaced 2.Door gasket must be replaced 3.Reinstall the door apron

2.Alarm code:

In use, when an error occurs, an error code is displayed and the buzzer sounds a warning, and the sterilizer stops automatically. Find the following conditions and handle them. Please wait for the device to step down before touching the device if something goes wrong.

Alarm information CRT table

NO	Alarm Code	Reason	Solution
1	E02 quit midway	Select stop and return during program operation	Wait for the device prompt to return for confirmation before

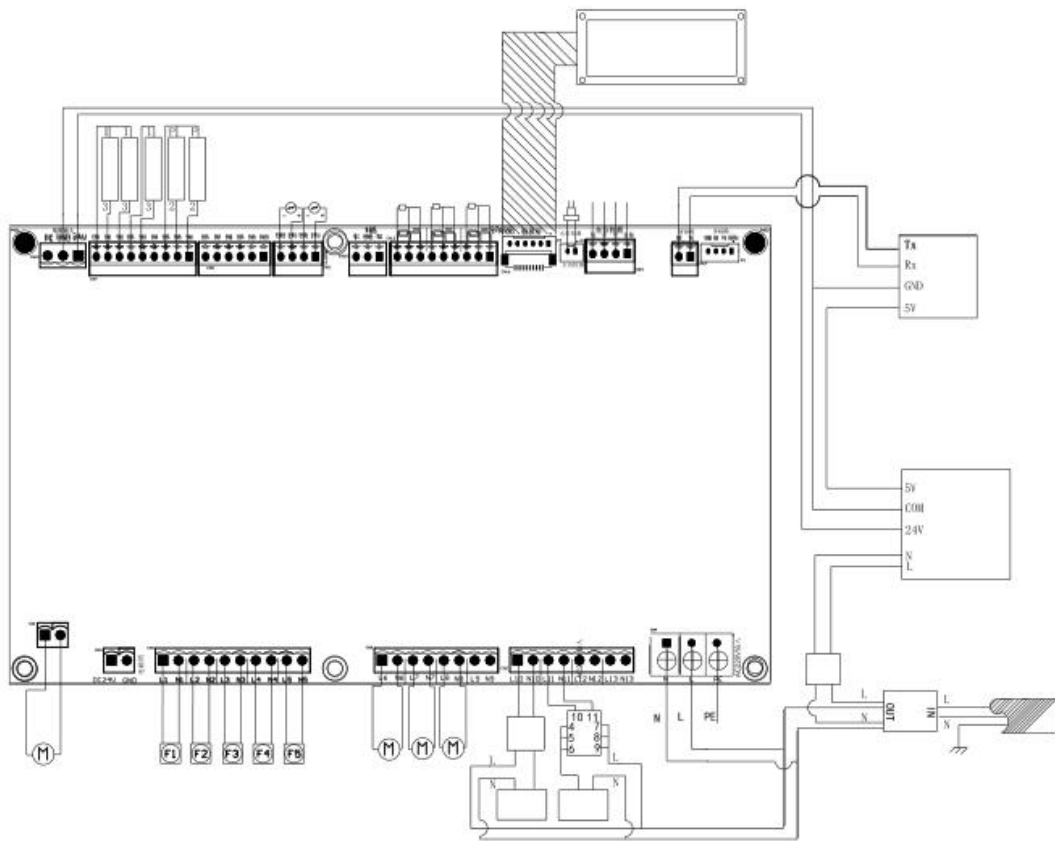
		Out of the program	opening the door or reselecting the program
2	E03 door is not clocked	The door is closed while running the program None detected	Check the door lock shut switch wiring
3	E04 motor fault	The door locks shut and open during operation None detected	Check the door lock shut switch wiring
4	E06 heat up timeout	The heating period exceeds the preset time	1.Check the equipment for obvious steam leakage 2.Check the vent solenoid valve for loose sealing and continue cleaning 3.Check if the evaporator is normal
5	E07 Sterilization temperature is too low	The temperature of the inner chamber is lower than sterilization temperature	1.Check the exhaust solenoid valve and clean it 2.Check equipment temperature test components or contact our technical staff
6	E08 sterilization temperature is high	In the process of sterilization chamber temperature is higher than the sterilization temperature + 4 ° C	1.Check the air intake solenoid valve and clean it 2.Check equipment temperature test components or contact our technical staff
7	E09pot wall temperature failure	The cavity wall temperature was not in the normal range	Check the temperature test components or contact our technical staff
8	E10 vacuum timeout	The vacuum did not arrive within the specified time to the predetermined lower limit	1.Check the inner body filter and tank filter for clogging and cleaning

			2.Check whether the door gasket is dirty and clean it 3.Check whether the water content of the water tank is too large to flood the drain connection on the inner wall of the water tank
9	E11 motor working timeout	In the opening and closing process, the motor working time over time	1.Check the motor for damage 2.The internal wiring of the equipment is loose or broken
10	E12chamber pressure failure	Internal chamber pressure is not within the normal range	Check the pressure sensor
11	E13 water level failure	Low water level of evaporator detected but not refilled	1.Check the inlet electromagnetic valve and motor are normal 2.Check the inlet pipe for leaks 3.Check the evaporator water level probe connection line
12	E14 evaporator pressure failure	The evaporator is always heated or always filled with water or sensor failure	1.Check control panel and heating control device 2.Check the water level line and probe 3.Check if the inlet electromagnetic valve is normal
13	E15 communication failure	Abnormal communication between display and control panel	Check the display and motherboard
14	E16 evaporator working without	Output signal of heating tube protection part	Check heating protection, heating control and water level

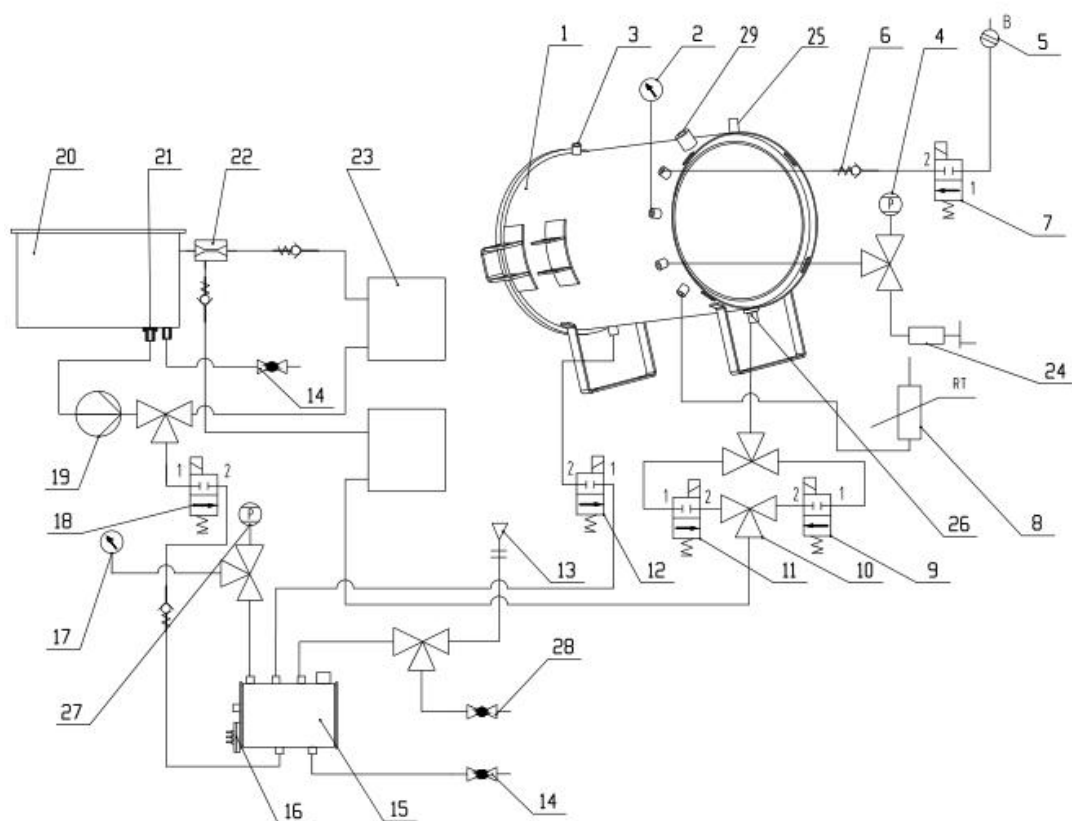
	water		
15	E17 lack water	Low water level was detected during operation	1.Check the tank for water 2.Check if inlet valve and pump are working normally
16	E18 Temperature fault in cavity	The temperature in the cavity was not in the normal range	Check the temperature test components or contact our technical staff
17	E19 Moving temperature fault	The moving temperature sensor was detected out of the normal range	Check the temperature test components or contact our technical staff

Circuit and Pipeline Schematics

Circuit Schematics



Piping Schematic



28	Inlet ball valve of evaporator	1	14	Drain ball valve	2
27	Evaporator pressure transmitter	1	13	Safety valve	1
26	Interior filter	1	12	Inner chamber intake solenoid valve	1
25	Mobile temperature sensor	1	11	Internal compartment hydrophobic solenoid valve	1
24	Safety interlock	1	10	Three links	7
23	Condenser	2	9	Internal exhaust solenoid valve	1
22	Vacuum generator	1	8	Fixed temperature sensor	1
21	water tank filter	1	7	Intake solenoid valve	1
20	water tank	1	6	Check valve	4
19	High pressure pumps	1	5	Air filter	1
18	Evaporator inlet valve	1	4	Internal pressure transmitter	1
17	Evaporator pressure gauge	1	3	Moving temperature sensor	1
16	Flanged heating tube	1	2	Internal pressure gauge	1
15	Evaporator	1	1	Sterilizer body	1
			No	Name	No

Warranty

Dear Customer: Any product has the possibility of failure, please use the process of real-time monitoring of equipment health, if there is any abnormality, please check the manual first, if still can not solve it, we should promptly notify our service center so as not to cause any loss to you.

After-sales service

1. The date of sale of equipment (subject to the invoice) machine free warranty for one year and enjoy life-long service.

2. Warranty card: When you need normal consultation or maintenance, please hold the warranty card and purchase invoice with our local service center and the warranty certificate properly kept.

The following parts can only be purchased by the manufacturer.

Flanged heating tube

Silicon film

Solenoid valve

Circuit board

LCD touch-screen

Packing list

No.	Name	Quantity	Remarks
1	Equipment	One set	
2	User's Manual	One set	
3	Conformity certificate	One set	
4	tray	Three set	
5	tray rack	One set	
6	tank lid	One set	
7	seal ring	One set	
8	Factory inspection report	One set	
9	accessories package	One set	Printing paper(Five volume), tray clamp, drain pipe, sealing ring, 2 fuses (Φ 5*20(10A))

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