LABDEX

Vertical Autoclave

LX482VA

Index

1. Safety Measures

- The product user is responsible for performing routine maintenance and conducting regular inspections throughout its use.
- The product must be inspected at least once a month, with findings documented. Any abnormalities found during inspections or routine maintenance should be addressed promptly.
- Safety accessories, such as safety valves and pressure gauges, as well as safety protection devices, measurement and control devices, and related instruments and meters, must be regularly checked, overhauled, and documented.
- Operators and relevant management personnel must obtain certification from the special equipment safety supervision and administration department, as required by national regulations, before undertaking operational or management tasks.
- Users must provide safety education and training to ensure operators have the necessary knowledge about special equipment safety. Operators must strictly adhere to operational guidelines and safety regulations.

 This equipment is not suitable for the sterilization of closed liquid items.

 When this equipment is used to sterilize the liquid items filled in glass bottles or glassware, kindly do not relieve pressure quickly, because the change of temperature and pressure during the operation may lead to the explosion of the liquid bottle, which endangers the safety of people and equipment.

 Chloride ion is an important factor causing the corrosion damage of stainless steel. If the sterilizer contains chloride ions, the inner wall of the sterilizer must be washed with clean water every day to avoid the corrosion of the deposited chloride ions on the internal stainless steel and prolong the service life of the equipment.

 This equipment is only suitable for sterilization of medical instruments and articles with high-temperature resistance and high-humidity resistance and cannot be used for sterilization of oil and powder, high volatile substances such as alcohol and gasoline, and articles with corrosion of copper and aluminium.

 This sterilizer shall not be used for cooking food.

 Kindly use the equipment according to the operation methods and precautions specified in this manual. If the equipment is not used according to the prescribed methods, it may damage the protection provided by the equipment and cause artificial unsafe factors and hidden dangers.

 The operating manual shall be kept completely during the service period of the equipment. To ensure that all the updated content received can be stored in the operating manual. When the equipment uses site or user unit changes, it must be ensured that the operating manual can be transferred or handed over as part of the whole equipment.

 The equipment is not allowed to be disassembled without permission.

 If the equipment has been stored in wet conditions, it may not meet all the safety requirements of this specification, so it should be ventilated and dry for some time and then stored under normal conditions.

 Do not put sterilized items into containers and bags that the steam is impermeable to, otherwise they cannot be sterilized.

 When the sterilizer door is opened, the high-temperature steam will spray from the sterilizer cavity. Kindly wait for all the steam to be discharged and then open the door completely. At the same time, do not bring your face close to the sterilizer.

 After the sterilization of the equipment, the sterilization cavity wall remains at a certain temperature. Kindly pay attention to heat insulation to avoid burns and burns, and the wound can be cooled to prevent damage to the deep tissue of the waste heat and relieve the pain. Meanwhile, kindly seek medical advice as soon as possible.

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

 The rear safety valve of the equipment shall avoid facing humans or other devices to avoid steam burns or interference.

 When the device opens the sterilization chamber gate, do not rotate the hand wheel again to avoid removing the guide column from the guide groove.

 When the equipment sterilizes the waste, place the waste disposal bag open in the sterilization basket, add about 500 ml of water, and place the mobile probe inside the liquid (must be inside the liquid not), select the liquid custom procedure, 121 degrees Celsius, and extend the sterilization time appropriately.

 Kindly do not approach the equipment in the house during the work period. When the light alarm is generated after the work is completed, turn on the equipment and remove the items.

Safety signs description

Label	Description
	Warning: Failure to comply may cause damage to the equipment.
	Danger: Personal safety will be endangered if not strictly observed.
	Notes at any location of the device
	A symbol indicating that the surrounding temperature is high and there is a risk of burns.

2. Introduction

Vertical Autoclave LX482VA is a pulsating vacuum autoclave made of a fully stainless structure with an electrical heater along with a temperature and pressure controller and smart design with a user-friendly hand wheel type door structure. It's equipped with a self-inflating seal for protection from leakage, a safety and releasing valve, 0.22µm bacteria filter, beep alarm indication after sterilization process and auto power cut off, microcomputer controlled, digital display for work stats and touch type screen for friendly operation. It's ideal equipment for the sterilization of glass wares, biological materials, fabrics and culture media in clinical laboratories, research centers, schools, colleges and universities, and the healthcare industry.

3. Features

- Microprocessor control with 4.3 inch LCD color touch screen display to show the working status: pressure, time, temperature, error code, and touch type key
- Having 2 sterilization baskets
- Automatic system for pulse vacuum, water inlet, heating, draining, sterilizing, exhausting air and drying
- Unique pulse vacuum drying procedure with vacuum rate of -0.096 Mpa, ensures the high extraction of inner air from dressing, A, B type hollowed appliance
- Preset program: 5 cycles. User-defined program: 4 cycles. Test programs (Bowie & Dick test, Vacuum leakage test)
- Digital display of temperature, pressure, time and vacuum with touch keypad
- Automatic system for pulse vacuum, water inlet, heating, draining, sterilizing, exhausting air and drying
- Three-time pulse vacuum with vacuum rate -0.081 Mpa, ensure the high extraction of inner air from dressing, A, B type hollowed appliance
- Equipped with 4 pre-set programs, 1 user-defined program, and test programs (Bowie & Dick test, Vacuum leakage test)
- PT/TT testing connector for easy testing
- Equipped with 0.22µm bacteria filter which ensures the sterile air enters the inner vacuum environment
- Equipped with an independent steam generator with high heating efficiency
- Advanced steam water inner circulation system
- Features like heat protection, Anti-dry heating, safety interlock door, Over-Temperature, pressure and current protection, Automatic release safety valve, Electric safety protection device and emergency exhaust switch for a safe and effective sterilizing process
- Features like heat protection, Anti-dry heating, safety interlock door, Over-Temperature, pressure and current protection, Automatic release safety valve, Electric safety protection device and emergency exhaust switch for a safe and effective sterilizing process
- Built-in printer, USB port

4. Specifications

Model No.	**LX482VA**
Volume	80 Liters
Control	Microprocessor
Display	LCD color touch screen
Chamber volume	Φ386 x 695 mm
Design pressure	-0.1/0.3 Mpa
Working pressure	0.23 Mpa
Max. temperature	138°C
Working temperature range	105 - 138°C
Vacuum rate	-0.096 Mpa
Time for sterilization	0 - 99 min
Time for drying	0 - 99 min
Temperature accuracy	0.1°C
Pressure display accuracy	0.1 KPa
Temperature uniformity	≤ 0.5°C
Power	4.5KW, 220-240V, 50/60Hz, Single-phase
Product dimension	546 x 688 x 1030 mm
Net weight	115 kg
Packing dimension	720 x 820 x 1250 mm
Gross weight	135 kg

5. Applications

Vertical Autoclave is used in Biotechnology, microbiology, the medical and healthcare industry, scientific research centers, schools, colleges, and universities for the sterilizing process.

6. Instrument Introduction

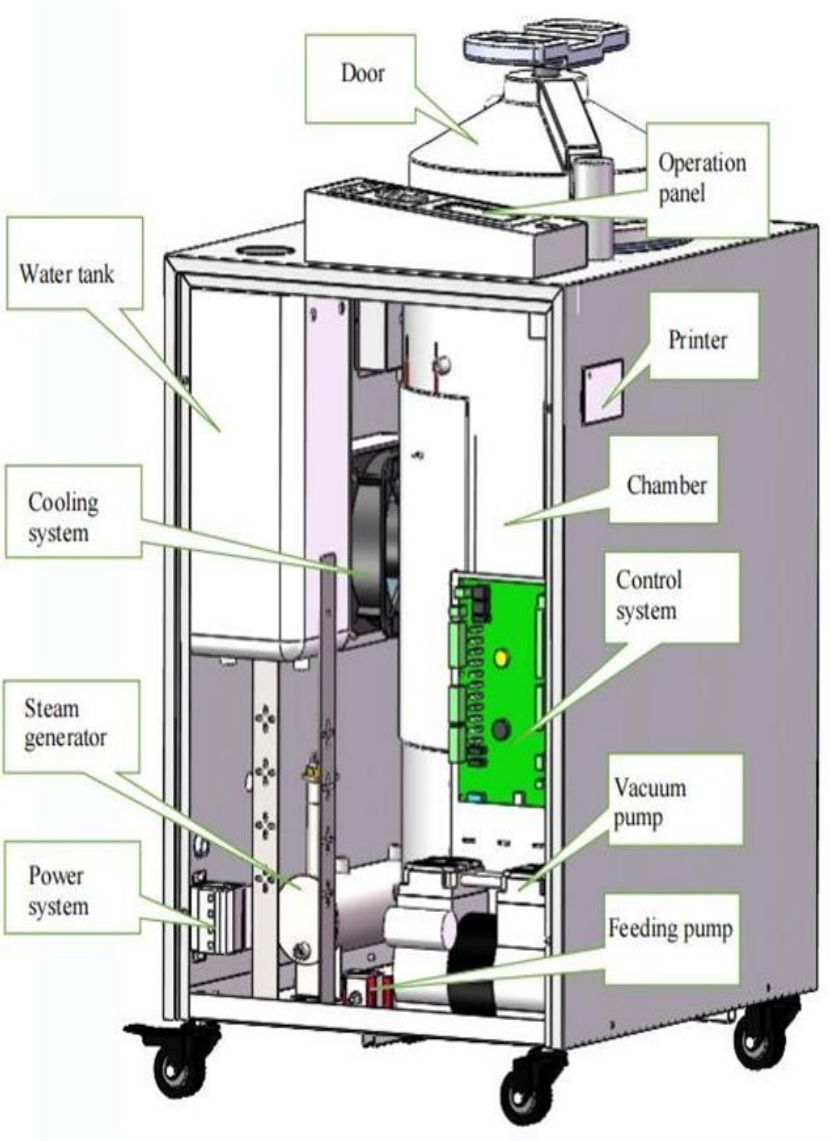


Figure-1 The main components and names of the equipment

6.1 The following is a brief description of the role of the main devices inside the sterilizer

S. No.	Part	Function
1	Vacuum pump	The chamber was evacuated for air and vacuum drying
2	Steam generator	Built-in electric heat pipe, electric heating to generate steam
3	Air-cooled condenser	Condensation of the inner chamber
4	Feeding pump	Inject the distilled water into the steam generator
5	Content gauge	Steam generator fluid level control
6	Evaporator pressure transmitter	Evaporator pressure detection control
7	Chamber pressure transmitter	Control of the sterilization chamber pressure detection
8	Internal compartment temperature sensor	Detection and control of the sterilization chamber temperature
9	Pot wall silica gel heating film	Sterilizer pot walls were preheated and dried
10	Pot wall temperature sensor	Pot wall heating temperature detection and control
11	Evaporator temperature controller	Prevent the dry burning of the evaporator electric heatingpipe
12	Intake solenoid valve	Inside the chamber into steam
13	Discharge solenoid valve	Extract internal chamber steam
14	Vacuum solenoid valve	The internal chamber is a vacuum
15	Return empty solenoid valve	The inner chamber enters the air to balance the atmosphericpressure
16	Evaporator safety valve	When the pressure reaches 0.26MPa, the relief valve opens, and the pressure is released to avoid the overpressure of the evaporator
17	Internal chamber safety valve	When the pressure reaches 0.26MPa, the relief valve opens, and the pressure is released to avoid the overpressure of the sterilizer
18	Air filter	Filter the air going into the sterilizer, 0.22um
19	Buzzer	Send out end-of-work signals and alarm signals

20	Filter	Filter impurities, improve the reliability of the solenoidvalve sealing
21	Door pressure safety interlock device	**Door safety interlock device:** Only the system can start the procedure; the pressure in the sterilizer makes the door not open.

6.2 Introduction to Safety Devices

The sterilizer is equipped with the following safety devices:

1) **Overtemperature automatic protection device:** If the sterilizer exceeds the design temperature, the system automatically cuts off the power supply and displays the alarm.
2) **Safety door interlock device:** Only when the door is closed in place, the sterilizer program can start, the steam heating and pressure, the chamber pressure, the door mechanism is locked, the door cannot be opened.
3) **Relief valve:** If the pressure exceeds the set pressure, the safety valve automatically opens and releases the pressure.
4) **Overpressure automatic alarm:** The main body pressure exceeds the set pressure, and the text display shows the alarm.
5) **Low water level automatic protection device:** When the steam generator water level reaches the specified water level, the heater will heat and cut off the heating below the specified water level.
6) **Electronic circuit safety device:** AC main circuit with short circuit protector, DC control circuit with over voltage overload protection.
7) **Overheating protection device:** High-temperature deviation in the chamber actuates the protective device and cuts off the heating source immediately.
8) **Vacuum pump overload:** The vacuum pump stops and alarms once its motor is overloaded or blocked when the vacuum pump is running.

7. Installation

7.1 Installation steps

7.1.1 Place of the sterilizer

Place the sterilizer on a smooth, clean and spacious ground, and adjust the feet of the equipment machine to be parallel to the ground to ensure its stability and stability. The distance between the back and side of the sterilizer and other objects is at least 25cm to ensure good ventilation.

7.1.2 Power line

Wires and sockets shall be selected according to the power of the equipment. At the same time, comply with the local installation and safety rules and regulations. The fluctuation range of the equipment voltageis ± 10%.

7.1.3 Installation of power supply

Plug the power cord into the power socket, or directly connect it to the circuit breaker, must press it correctly and firmly.

7.1.4 Water Source Preparation

Water quality:

Conductivity must be less than 15 μs/cm

Bleach should be less than 2 mg/l and less than 0.02mmol/l PH 5-7

Water volume: The water level in the water tank should be between the high and low water levels.

7.2 Commissioning steps

7.2.1 Commissioning

Enter the manual operation interface according to the method of "Manual operation interface" in this manual.

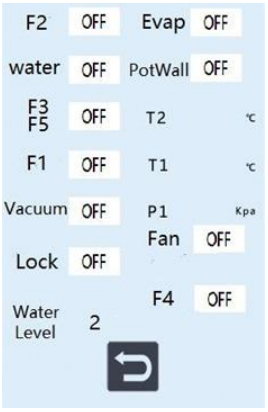


Figure-2

Click the status display area of the exhaust valve (ON or OFF) in the manual operation interface. When the status display area of the exhaust valve is displayed as **"ON"**, gently near the top of the solenoid valve, you should feel a strong magnetic attraction, if any, the valve is electrically open.
In the same way, check that all the solenoid valves and other equipment are open normally.

7.2.2 Test machine

Turn on the power supply. When the electronic lock mark in the interface of **Figure 3** is open "  ", open thesterilizer door, put the sterilization indicator card or biological indicator, reset and close the door.
The LCD screen display interface is as follows:

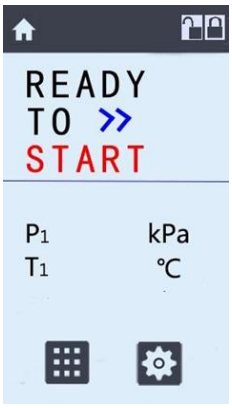


Figure-3

Click the **"Program Selection"** button "  ", and the program screen is as follows:

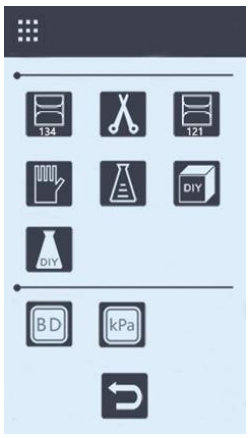


Figure-4

Select the corresponding program, click on the start icon "▶" to start the program, and wait for the LCD screen to complete the sterilization, the buzzer calls.

Ensure that the pressure representation number is zero. When the electronic lock in the **Figure 3** interface is open " 🔓 ", open the door and take out the indicator card or biological indicator, observe the sterilization effect or do the culture test.

Note: If the sterilizer has a fault alarm or other abnormal situation during debugging, kindly consult the fault analysis table in troubleshooting to find the cause and correct the fault.

7.3 Preparation before use

7.3.1 Preparation for sterilization of instrument vessel

Before placing the sterilization device into the sterilizer, kindly clean it to avoid causing harm to the residual substances on the sterilizer itself and the sterilization device. For example: blood stains and other impurities.

We have developed a specific cleaning plan for your reference:

1) For a sterilized device after use, you should immediately clean the residues attached to the sterilized device. Clean the sterilization device with a cleaner, purifier and distilled water.
2) After cleaning, it is recommended to rinse again with clean water to ensure that it is clean.
3) When you put the device in the sterilization basket, kindly place different types of devices in different baskets, such as stainless steel, carbon steel, etc., and leave appropriate gaps between the devices. If carbon steel equipment is placed in the basket, several layers of disinfectant paper should be placed on the basket before placing it to avoid direct contact between carbon steel and stainless steel.
4) The sterilization of test tubes, glass bottles, etc. shall place the opening vertically downward to facilitate the discharge of cold air and the entry of saturated steam.

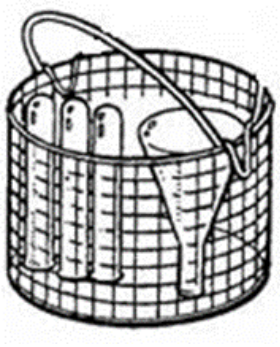


Figure-5

a. Place a sterilization indicator card in each basket.
b. Once a month, biospores detection indicators were placed in the load for sterilization effects.

Figure-6

a. The basket is not allowed to overload, otherwise it will cause inadequate sterilization and drying.
b. The instruments to be wrapped should be sterilized with packaging materials with good air permeability, such as sterilization bags, sterilization paper, gauze fabric, etc.
c. For the sterilization of test tube glass bottles, the opening should be placed vertically downwardto facilitate air discharge and steam entry.

7.3.2 Preparation before sterilization

Kindly clean the rubber tube with warm water first, and then place it on the clean sterilization tray and ensure that the pipe is a hollow pipe open at both ends, without any sharp turning, twist, kink, etc.

Place the dressing pack vertically on the tray to avoid contact with the inner wall of the sterilizer.

7.3.3 Preparation before sterilization of the culture medium

Only heat-resistant glass bottles, loading capacity does not exceed 2/3 volume, the bottle should be sealed to avoid culture medium overflow.

8. Operations

Note: Do not switch the sealed door of the inner chamber.
Only when the electronic lock "🔓" on the interface in Figure 3 is the open state.

8.1 Operation steps

The operation procedures of the sterilizer include sterilization preparation, sterilization articles loading, sterilization operation, and unloading of sterile articles.

8.1.1 Preparation for sterilization

Cleaning: The articles shall be cleaned thoroughly before sterilization to avoid the presence of blood and other impurities, as these residual substances will be harmful to the sterilized articles and the sterilizer. After washing, the items should be dried and packed in time.

Packaging: Choose the packaging materials conducive to the internal air discharge and steam penetration when packaging, and strictly comply with the "Disinfection Technical Specification and relevant national standards". Following the following may benefit your sterilization:

1) Plate, basin, bowl and other utensils, as far as possible single packaging, packaging should open the lid.
2) Surgical instruments should be placed in the basket or a porous plate for matching packaging.
3) When the items that must be exposed are stacked, the utensils should be separated by an absorbent cloth, gauze or medical absorbent paper.
4) The surfaces of the articles shall be exposed to help the sterilization factors contact the surfaces of all articles. containers with sieve holes shall be opened down or sideways.
5) The articles should not be tied too tightly.
6) The weight of the device package should not exceed 4 kg, and the weight of the fabric package should not exceed 4 kg. The size of the fabric bag should not exceed 110×150mm. The liquid weight should not exceed 2 kg.

The textiles shall meet the following requirements: Non-bleached fabric; no stitching except for four sides; it shall be washed at high temperature, skimmed and coloured before initial use; service times shall be recorded. Customers can use test kits to monitor the sterilization effect.

8.1.2 Items sterilized articles should be loaded according to the following requirements

1) When the goods are placed, the upper and lower sides should be separated by a certain distance. The goods should not be attached to the door and the four walls to prevent the inhalation of more condensed water.
2) Instruments, appliances and articles of similar materials should be sterilized together; with different materials, textile articles are placed on the upper layer, vertical placement, and metal instruments are placed on the lower layer.
3) The surgical instrument bags and hard containers should be placed flat; the basins and bowls should be placed sideways, and the opening of the bag contents should be the same; the glass bottle beakers, flasks, test tubes and other vessels should be placed downward at the bottom.
4) It is recommended to load the sterilized items using the configured special sterilization rack and basket.
5) The space between them should be left in the sterilization package to facilitate the penetration of the sterilization factors.
6) Large bags that are difficult to sterilize should be placed in the upper layer, and small bags should be placed in the lower layer.
7) The sterilizer shall not exceed 80% of the volume.
8) The liquid shall only be loaded with heat-resistant glass bottles and tubes and shall not exceed 50% of the container volume.

8.2 Procedure description

Procedure description: Fabric, instruments, rubber procedure and liquid procedure all belong to the sterilization procedure, while BD & Helix and vacuum test belong to the test procedure.

- The default process parameters of the equipment system are all the default parameters set after testing under the standard load conditions specified in the product standard, if the load used by the user changes, they can be used before the relevant process verification (the user shall first determine that the sterilization load can run on the process flow corresponding to the specified procedure).
- Fabric, device, and rubber procedures belong to the same medical sterilization procedures, and the process flow is the same, only according to the characteristics of different loads, pulsation times, sterilization time, drying time and other parameters are different.
- The device is mainly suitable for the sterilization of high-temperature resistant surgical instrument items not packaged or packaged, such as the standard analog load is solid metal screws.
- Fabric is mainly suitable for the sterilization of high-temperature-resistant porous cloth articles with packaging, such as the standard analog load is the fabric load with a wrapped cloth.

- The rubber procedure is mainly suitable for rubber loads with relatively low-temperature resistance.
- BD & Helix program is mainly used to cooperate with special equipment to test the elimination effect of cold air and steam penetration effect, such as standard BD package, disposable BD package, etc., the program parameter value is set according to the most commonly used BD test paper manufacturer requirements (134℃ sterilization 3.5min), if different from the equipment or test paper used in hospitals, the specific parameters should be modified by reference to the requirements of equipment or test paper. It can also cooperate with the special cavity PCD to test the cold air elimination effect and steam penetration effect of the cavity device. The procedure parameter value is set according to the parameters required by the most common PCD device manufacturer (134℃ sterilization 3.5min). If different from the hospital, the specific parameters should be modified concerning the requirements of the equipment.
- The vacuum test procedure is mainly applicable to the sealing of the equipment connected to the inner chamber under negative pressure. During debugging or routine testing of the equipment, especially after long-distance transportation, loose pipes may occur (or if the B-D test is unqualified), at this time, you can choose this program for testing. It is mainly used to test the vacuum leakage situation of the sterilization equipment and to detect the sealing condition of the pipeline. This test was conducted in the absence of the sterilizer chamber. After running the program to the test stage, when the pressure changes within 600 seconds and does not exceed 1.3 kPa, the vacuum leak test is qualified. If the test is abnormal, it must be repaired. Check the door seal and the connecting part of the pipeline system and the inner room, find out the leakage point, remove, and re-test until the test is normal. This procedure is only for testing and is not used as a reliable validation of sterilization.

9. Software Operations

9.1 Display screen introduction

9.1.1 Initial picture

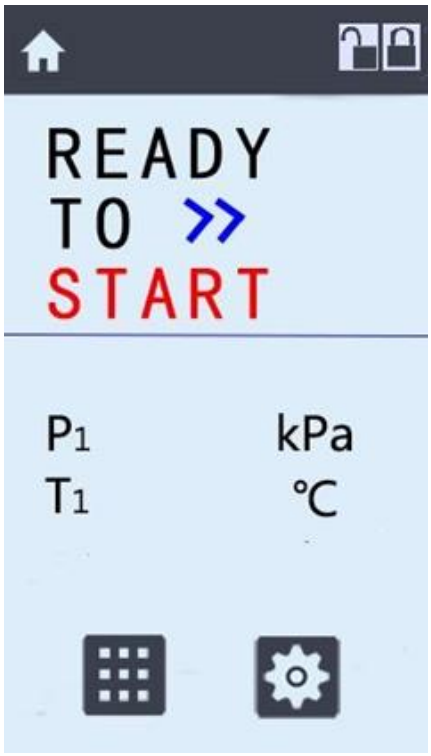


Figure-7

Electronic lock identification:
Door limit switch identification:
Program selection:
Parameter setting
T1: internal chamber temperature
P1: internal chamber pressure

Do not switch the sealed door of the inner chamber.
Only when the electronic lock on the interface in **Figure 7** is open state " ".

9.1.2 Program selection

Click the **"Program Selection"** button "  " **in Figure 7** to enter **Figure 8** for program type selection.

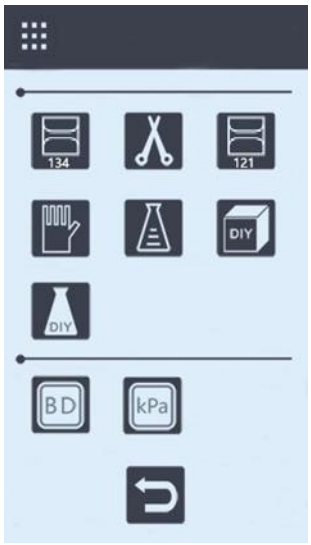


Figure-8

Icon	Program type	Meaning
	134℃ Instrument Program	Scalpels, surgical forceps, tweezers and other metal and ceramic instrumentsare sterilized
	134℃ TextileProgram	Surgical clothes, dressing packs, cotton cloth, masks and other items weresterilized
	121℃ TextileProgram	Surgical clothes, dressing packs, cotton cloth, masks and other items weresterilized
	121℃ LiquidProgram	It is mainly suitable for high temperature in the liquid state, such as culturemedium, culture medium, reagents and other items for sterilization
	121℃ RubberProgram	Mainly suitable for rubber products, heat-resistant plastics, such as Petridishes and other items sterilization
	User-defined Program (Solid)	User can create 5 solid programs according to their needs, glassware, HIV,HBV, etc.

	User-defined Program (Liquid)	User can create 5 liquid programs according to their needs, culture medium,fluid, etc.
	BD test	Check the penetration effect of the equipment steam and the cold air elimination effect
	Vacuum test	Check the equipment for leakage

9.1.3 Program startup screen

After program selection **Figure 8**, enter program startup **Figure 9**.

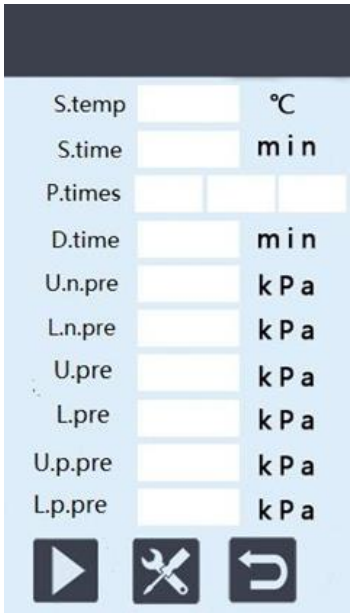


Figure-9

 Start

 Parameter setting

 Return

Explain:

Pulse number: Negative pressure pulse number (1st)
Cross pressure pulse number (2nd)
Positive pressure pulse number (3rd)

If necessary to modify the parameters, click the parameter setting icon "  "of **Figure 9** to enter **Figure 10**.

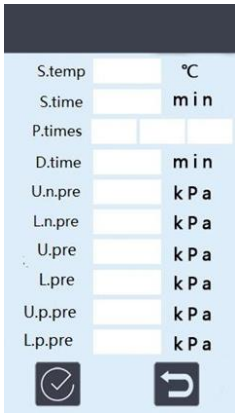


Figure-10

: Confirmation

: Return

You can click the display area of the parameters, pop up the keyboard and modify the corresponding parameters. After modification, kindly press the confirmation key " " to save.

9.1.4 Program running screen

Click the start icon " "in **Figure 9**, and enter the program run in **Figure 11**.

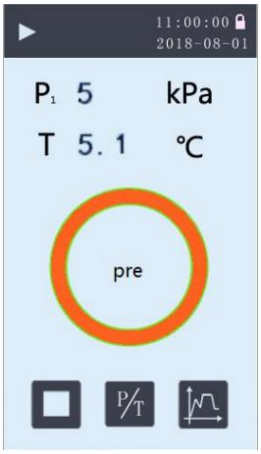


Figure-11

: Exit

: Temperature pressure display

: Pressure temperature curve

Click the exit icon " " to enter exit **Figure 11** and click the confirmation button. The customer can choose to exit midway or select the return button to continue running the program.

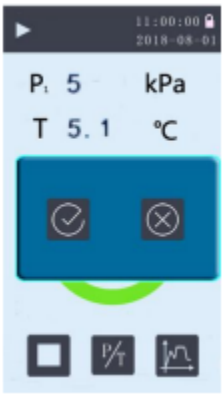


Figure-12

: Confirmation
: Return
Click the temperature and pressure display icon " " of **Figure 12** to enter **Figure 13** to view the evaporator pressure, inner chamber pressure and other parameters count.

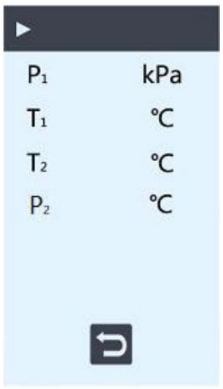


Figure-13

P1: Chamber pressure
T1: Chamber temperature
T2: Jacket temperature
P2: Evaporator pressure

Click the temperature and pressure curve icon " "of **Figure 12** to enter **Figure 14** to view the temperature and pressure curve of the inner chamber.

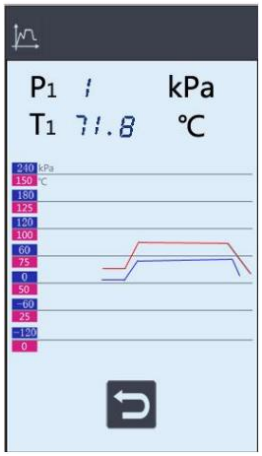


Figure-14

9.1.5 System settings

Select the system parameter setting icon " " in **Figure 7** and enter the system parameter in **Figure 15**.

Figure-15

: Confirm

: Equipment advanced settings

: Return

1) **Preheat mode:** Open the preheating mode, start the device for preheating, and save the program running time; close the preheating mode, and the equipment will only begin to preheat during operation.
2) **Print mode:** Select to print or not to print.
3) **Language selection:** Select the language type.
4) **Time setting:** Click the time display area directly to set the current time of the device.
5) **Atmospheric pressure:** According to the actual use area, the boiling point temperature value is automatically adjusted according to the correspondence between the water boiling point and pressure. (PS: When the door is open, the customer can directly click on the atmospheric pressure place and the equipment can obtain the local atmospheric pressure by itself and click to save it).
6) After the modification is completed, press the confirmation " " button to save the modification data, and then press the return button to return to the initial page.

9.1.6 Manual operation interface

Click the device advanced setting button to enter **Figure 16**.

Figure-16

After entering the password 123456, click the confirmation button to enter the manual operation screen.

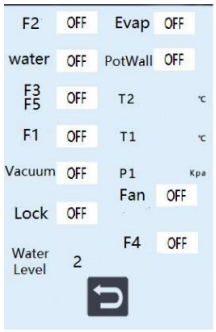


Figure-17

Click the display interface of "ON / OFF" to display the corresponding device of "on / off".

9.1.7 Operation steps of balancing pressure and fault code

When the inner chamber pressure appears as negative pressure or positive pressure (PS: Inner chamber pressure <-15 kpa, inner chamber pressure> 10 kpa), the door cannot be opened, and **Figure 18** will appear. Click the balance pressure confirmation icon to balance the pressure.

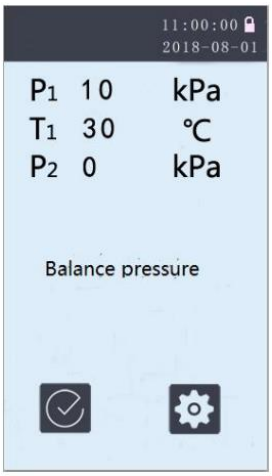


Figure-18

When the equipment fails, **Figure 19** will appear, for example, when the device exits midway, the fault code E02 will exit midway.

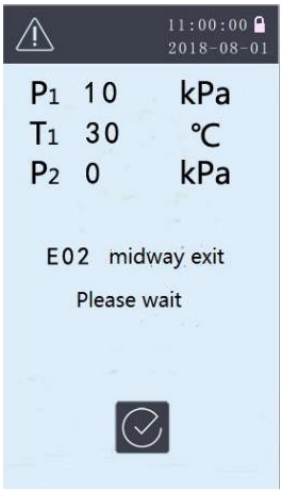


Figure-19

Click the confirmation icon and exit **Figure 19**.

9.2 Program run

1) Ensure that the water level in the tank is between the lowest and the highest water level.
2) Place the prepared sterilization items into the sterilization chamber, and then close the door.
3) Connect the power supply of the equipment, connect the air switch behind, and then open the ship-type switch on the lower side of the control panel. The LCD screen displays as follows:

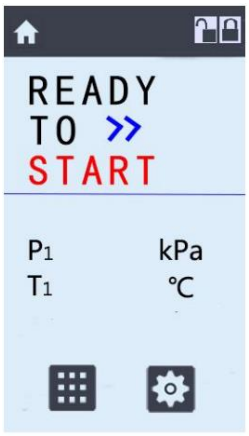


Figure-20

Program Description: By default, it is equipped with 7 sterilization programs and 10 user-defined programs. If necessary, we can create up to 32 sets of sterilization programs. BD and vacuum tests are test programs.

Program name	The number of pulsating vacuum	Sterilization temperature ℃	Sterilization time Min	Drying time Min
Textile	0 (negative pressure), 4 (cross pressure), 0 (positive pressure)	134	7	15
Instrument	0 (negative pressure), 4 (cross pressure), 0 (positive pressure)	134	5	10
Rubber	0 (negative pressure), 4 (cross pressure), 0 (positive pressure)	121	20	12
Liquid	Gravity displacement for 5 min	121	25	0

BD test	0 (negative pressure), 4 (cross pressure), 0 (positive pressure)	134	3.5	5
Vacuum leak test	-80 KPa pressure for 15min, the leakage rate is less than or equal to 0.13 KPa / min,the touch screen displays "vacuum test qualified", otherwise "vacuum test qualified"			

The sterilizer is in the standby state. Click the screen program to select the interface according to the sterilization item selection program. For example, when selecting the liquid sterilization, click the screen liquid icon , enter the liquid program sterilization, and then click the liquid program start icon , and the liquid program begins to run. After sterilization, the buzzer will beep once every 3 seconds. After the sterilization, confirm that the pressure gauge pointer of the inner chamber and the display screen P1 return to 0, and when the electronic lock in **Figure 7** is open , open the door and remove the items. Note: If you want to terminate the 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. If the exit icon is mistakenly clicked, click the return icon to allow the program to continue running.

10. Maintenance

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

1) Be sure that the equipment is powered off before starting maintenance. Meanwhile, there is no pressure in the sterilization vessel.
2) After the end of the daily work. Wipe the door ring with a soft cloth or gauze. Take out the basket. Wipe the inner walls of the sterilization container with gauze detergent and water.
3) Do not use steel wool or brush to damage the sterilization wall.
4) Clean and remove the scale from the sterilization container room.
5) Remove the water from the water tank. weekly Once a week, wipe the sterilizer cover with a soft cloth.
6) Once a week, clean the filter spool.
7) Once a week, check the escape steam valve.
8) Check the safety valve once.

10.1 Routine maintenance

Instructions for use: This kind of maintenance instructions are provided for professional use. Unless you are a professional, otherwise the equipment failure must consult the instructions, and repair according to the instructions. The instruction manual has provided the maintenance methods to the professionals whenever possible.

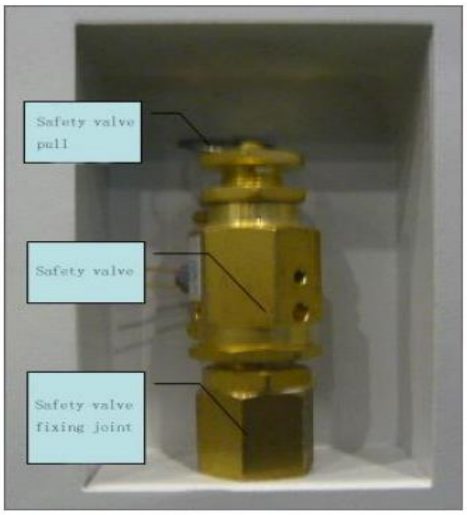
10.2 Elevation and handling

1) Cut off the power supply.
2) Before moving the sterilizer, ensure that it is disconnected from the power supply and there is no pressure in the sterilizer.
3) Put off the water in the sterilizer. The lifting and handling are carried out by multiple people.

10.3 Periodic inspection

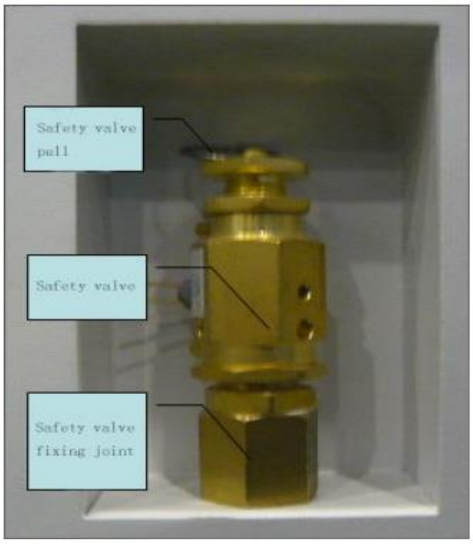
Once a year, fastening joints and detection status, should be completed by a professional electrician. Once every 5 years, due to extreme loss, the door lock device must be tested.

10.4 How to check the safety valve



Main relief valve (Open pressure 0.28M Pa)

Figure-21



Evaporator relief valve (Open pressure 0.30M Pa)

Figure-22

To prevent the safety valve from being blocked, the steam pressure is released through it once a month during normal use. According to the manual, perform the sterilization operation.

1) Create a pressure of 0.22 Mpa in the sterilization container.
2) Use a screwdriver to push the safety valve pull loop, causing it to be open for about 2 seconds.
3) Close the main switch and terminate the operation. At the same time, discharge the water steam in the sterilization container.
4) Open the door until the pressure drops to 0M Pa.

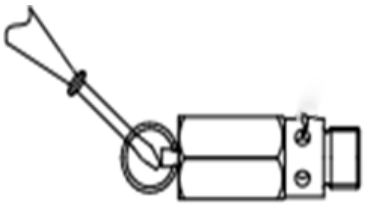


Figure-23

It is located just above behind the device. To prevent the safety valve from a blocking state, allow the steam pressure to be released through it every two months under normal use.

According to the manual, perform the sterilization operation.

1) Create a pressure of 0.22 Mpa in the sterilization container.
2) Drive the safety handle and cause it to open for about 2 seconds.
3) Close the main switch and terminate the operation. At the same time, discharge the water steam in the sterilization container.
4) Open the door until the pressure drops to 0M Pa.

10.5 Temperature controller

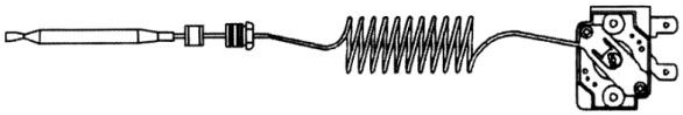


Figure-24

Located inside of the device. The sterilizer is equipped with a temperature controller: used to prevent dry burning in the sterilization chamber. The operating principle is provided as follows:

1) If the detection temperature exceeds the allowable value, the temperature controller contact automatically closes and the system alarm.
2) If the detection temperature drops below the allowable value, the temperature controller contact will automatically break, and the system will remove the alarm.

How to improve the operating temperature of the temperature controller

Careful: This operation is limited to professionals only. Using a screwdriver, rotate the center screw in a clockwise direction to increase the temperature.

10.6 Door safety linkage device

It is a safety device to prevents doors from opening when the sterilization container is under pressure. This system was built based on the pressure generated in the inner compartment of the sterilizer. The pressure generated by the sterilizer chamber will push the moving clutch up and engage the fixed clutch. It prevents the operator from opening the door by mistake. When the water vapour is released, the device returns to its initial position so that the door can be opened.

10.7 Cleaning of the filter

The filter is located at the bottom of the equipment and is used to filter impurities, ensure a smooth pipeline and the sealing of the solenoid valve. Unscrew the filter nut from the chassis of the equipment, remove the filter element, and clean the filter core only, about once a week.

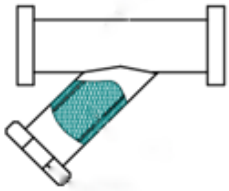


Figure-25

10.8 Cleaning step of the solenoid valve

Disassemble the sterilizer's outer cover. Remove the solenoid valve with a screwdriver. Lift the solenoid valve coil. Open the valve body with a wrench. Wash the debris on the valve cell with clean water. Reinstall the electromagnetic system.

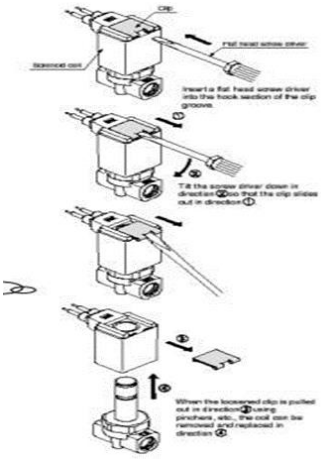


Figure-26

11. Troubleshooting

Phenomenon	Possible cause	Inspection method
The power switch is on, but thepower indicator light is not on.	1. The circuit breaker is not closed 2. The main power supply switch is damaged	1. Close the short-circuit device. 2. Replace the power switch accordingto the specific situation.
Video display: The E03 door is unlocked	1. The door is not in place. 2. The door position switch isloose and misplaced.	1. Close the door and try again. 2. Adjust the door position switch.
Video display: E04 pot wall temperature failure	1. Damage to the pot wall heating plate. 2. Pot wall temperature sensor fault.	1. Check whether the heating plate ofthe pot wall is damaged. 2. Check whether the pot walltemperature sensor fails.
Video display: E05 extraction vacuum timeout	1. Air leakage at the pipe and door seals. 2. The vacuum pump is not working properly.	1. Check the pipe and door for airleakage. 2. Check whether the vacuum pump is working properly.
Video display: E07 sterilization at lowtemperature	1. Cavity temperature sensor fault 2. Evaporator failure	1. Check whether the cavitytemperature sensor is faulty 2. Check whether the evaporator is faulty.
Video display: E08 sterilization over temperature	1. Cavity temperature sensor fault 2. Evaporator failure	1. Check whether the cavitytemperature sensor is faulty 2. Check whether the evaporator is faulty.
Video display: E09-lumen pressure failure	Pressure sensor fault	Kindly replace the accessories

Video display: E10 water level failure	1. Water shortage in the water tank 2. Water injection valve failure. 3. Water level sensor fault	1. Check whether the water tank is shortof water. 2. Open the water injection valve manually and determine whether thewater injection valve is connected. 3. Check whether the water level sensoris faulty.
Video display: The E11 evaporator is protectedagainst dry burning	1. Short circuit of the heating controller 2. Anti-dry burning temperature controller failure 3. Water level sensor fault	Kindly have a professional electrician checkthe circuit and replace the corresponding accessories
Video display: E13 lumen temperature failure	Short circuit of the heating controller	Kindly have a professional electrician check the circuit and replace the controller.
The heating state, the pressure, and the temperature do not rise or riseslowly	1. The control circuit of theheater is an open circuit or burned out. 2. Serious leakage at the pipe joint or safety valve.	1. Check and replace the damaged devices. 2. Check and tighten the pipe joints,safety valves, etc
Drainage state, the pressure, and temperature do not drop or drop slowly	The drainage filter valve is blocked	Remove the debris from the filtervalve core

12. Replacement

12.1 How to replace the safety valve

Instructions for use: These maintenance methods are only available to professional personnel. Unless you are a professional talent, otherwise to avoid electric shock or equipment failure, be sure to consult the manual, and according to the requirements of the manual maintenance, while the manual has been as far as possible to provide professional maintenance methods.

1) It is located just above the device.
2) Remove the safety valve fixing screw and remove the safety valve from the safety valve base.
3) Replace it with a qualified safety valve. Test for the sterilization process.

12.2 Steps for replacing the heater

Warning: Before starting this operation, cut the power off and ensure the pressure is pressure-free in the sterilizer chamber.

1) Remove the sterilizer hood Remove the wiring on the heater Release the retaining screws on the heater.
2) Replace the damaged heater with a new heater, and the position of the new heater matches the position of the replaced heater and connect the heater in line.
3) Install the sterilizer cover and test all working processes.

12.3 Replace the print paper

1) When the printing paper installed in the printer is about to run out, a red mark will appear on the printing paper to prompt the user to replace the printing paper.
2) The rotary wrench is gently pulled at the arrow position.
3) Continue to spin the wrench, then the print head paper shaft separates from the print head and open the paper bin cover.
4) Put the printing paper in and pull out a piece (beyond a point to tear the paper teeth), pay attention to put the paper neatly, the direction of the paper is a liquid side (smooth surface) upward (if the reverse will not be completed printing).
5) Close the cover of the paper bin, press the printing head, press the printing paper, then slightly press the printing head back to the printing head, and push the rotary wrench into the reset.
6) Turn on the power supply of the printer, turn the nose, and see if the paper goes crooked. If it goes crooked, you need to adjust the printing paper until the printing paper is perpendicular to the paper.

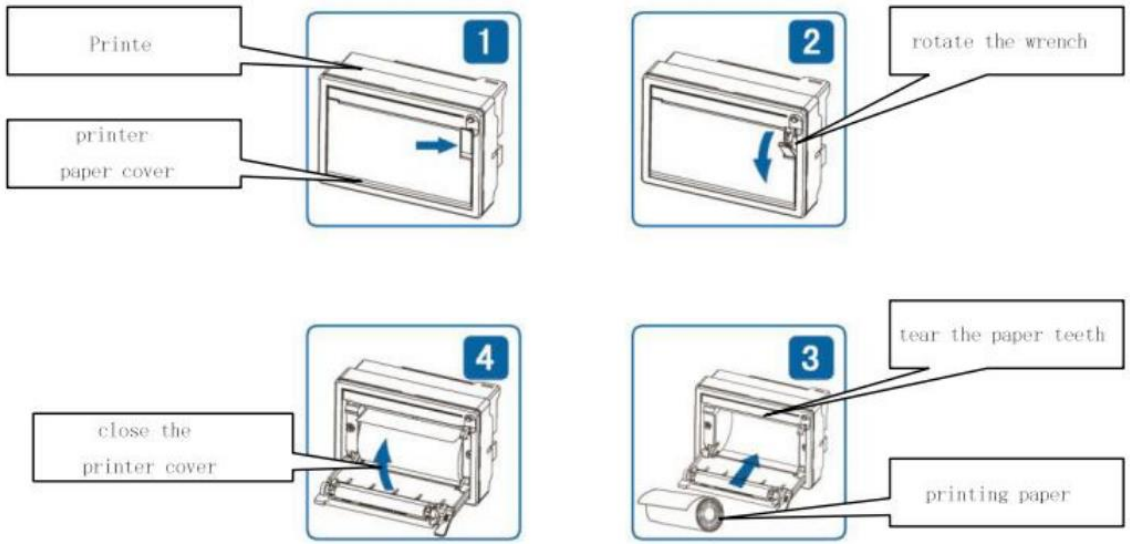
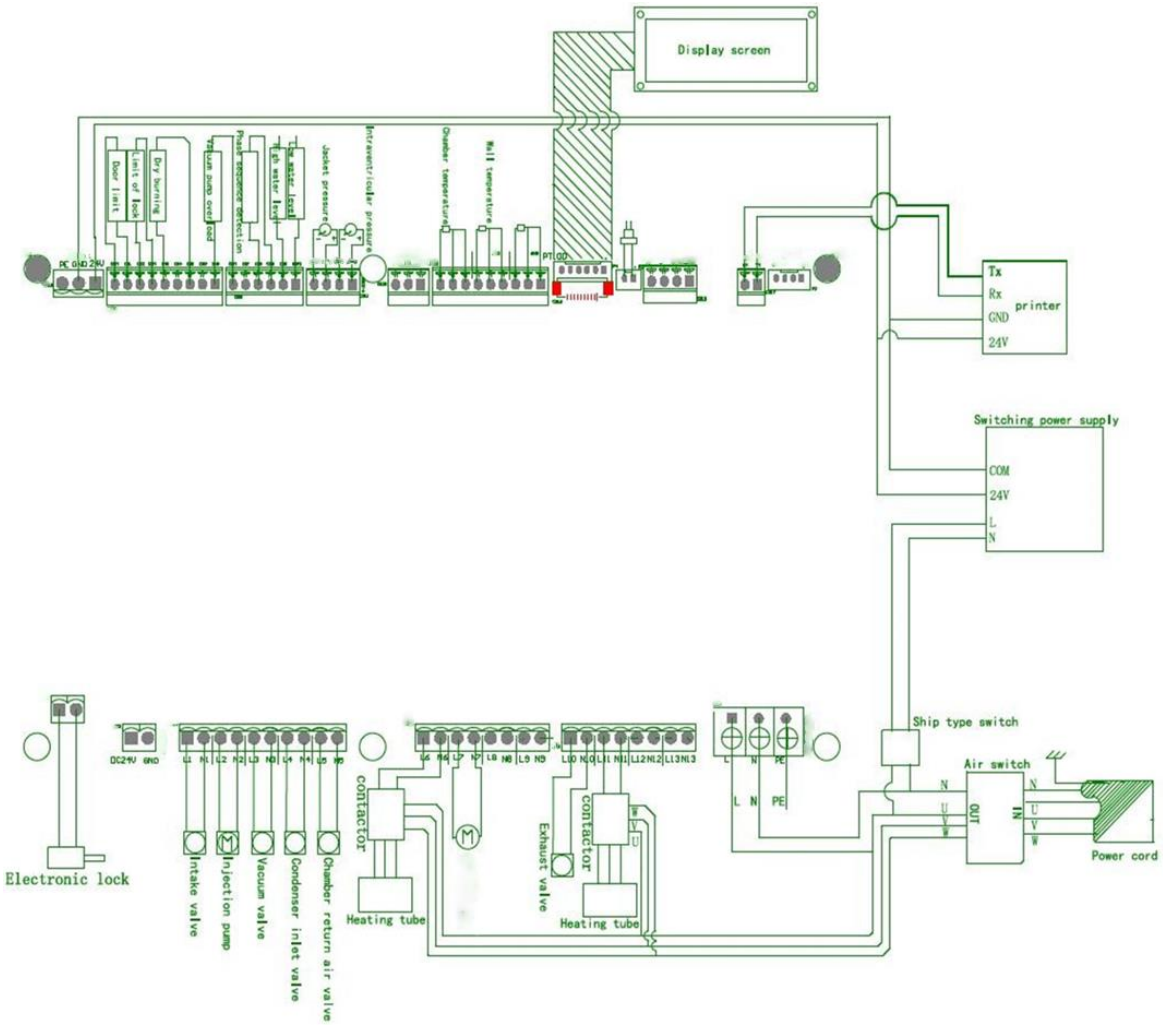

Printe
printer
paper cover
1
2
rotate the wrench
4
close the
printer cover
3
tear the paper teeth
printing paper

Figure-27

13. Circuit Diagram



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