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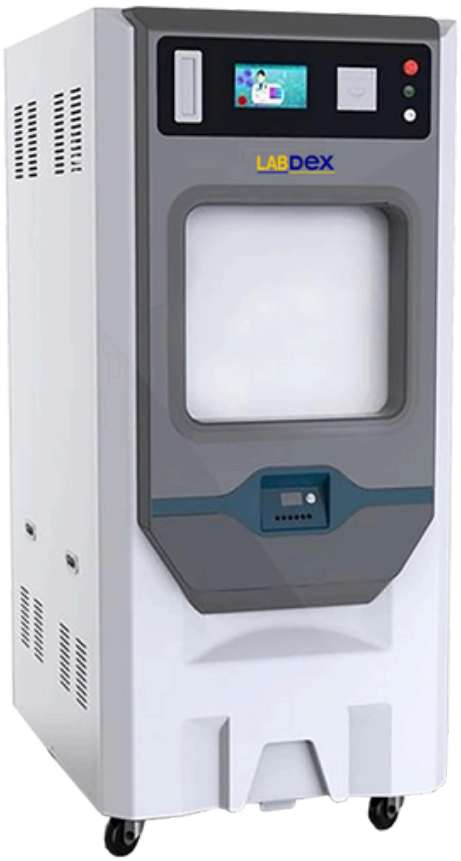

Plasma Autoclave

LX901LA

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Index

1. Safety Measures

1.1 Precautions

- The sterilized items should be cleaned and dried effectively and correctly before being loaded into the sterilization equipment.
- The packaging material should be made of materials that do not absorb and dissociate hydrogen peroxide and have been tested. For example: non-woven fabrics, special paper-plastic packaging bags, etc.
- The loading of sterilized items should be carried out strictly under the requirements of the sterilizer instructions to avoid improper loading that affects the sterilization effect.
- High concentrations of hydrogen peroxide can burn the skin, so operate the sterilization equipment correctly and take personal protective measures.
- The concentration and dosage of the sterilizing agent hydrogen peroxide are consistent with the requirements specified in the sterilizer instructions.
- Carry out equipment maintenance and maintenance in strict accordance with the requirements of the sterilizer instructions.

1.2 Installation precautions

Professional and strictly trained technicians should carry out the installation of the sterilizer. Installation by professional technicians is the best guarantee for the safety and quality of the user and the equipment.

Warning:

- The installation of this equipment must be carried out by trained and qualified professional installers. Unconventional installation by inexperienced, unqualified, and untrained personnel may cause personal injury or equipment damage.
- The plasma autoclave has passed the test and meets the electromagnetic radiation and immunity standards of IEC 61326-1:2013. Although this machine has no radiation effect, it may be affected by radiation from other equipment. It is recommended to install this machine away from potential sources of interference.

1.3 Operation precautions

1) When encountering the alarm of "vacuum timeout", check the dryness of the sterilized items, and re-sterilize after they are completely dry.
2) When encountering other alarms, exit the program, perform a self-check according to the "Troubleshooting" in the instruction manual, and restart the equipment.
3) Operate strictly under the relevant regulations of the instruction manual.

1.4 Warnings and cautions

When operating the equipment, the following safety precautions must be observed. These precautionary statements (part or all) will run through the entire instruction manual.
Read the following carefully before using or servicing the equipment. In the manual, the following symbols are used to indicate the operation content that should be paid attention to or highly valued.

Note: Indicates that it should be taken seriously.

Warning: Indicates that it should be observed, otherwise it will damage the equipment or equipment.

Danger: Indicates that it must be strictly observed, otherwise personal safety will be endangered.

Note: When you see a symbol in any position of the equipment, you need to consult the instruction manual and other related documents to clarify the nature of the potential hazard and the measures that must be taken.

Note: No one can tear off or take out any content in the instruction manual under any circumstances.

Note: The place where the instruction manual is kept should be ventilated and dry and avoid humidity and high temperature.

Danger: The sterilizer is a hydrogen peroxide low-temperature plasma sterilizer. The sterilizing agent hydrogen peroxide used has strong oxidizing properties and can easily penetrate the skin and cause temporary damage to the skin. Be sure to wear latex or vinyl gloves when contacting the solution, and dispose of empty bottles properly. If you accidentally touch the skin, immediately rinse the contact area with plenty of water for about 5 minutes. If the antiseptic is inhaled or swallowed, drink plenty of water immediately and seek medical attention.

Warning: All instruments must be operated in compliance with the disinfection technical specifications before being put into the sterilization room: thoroughly cleaned, completely dried, and sterilized items use professional packaging materials and containers.

Danger: Before servicing, disconnect the main power supply to the equipment. Do not perform any maintenance operations before the main power supply is cut off in the correct way.

Note: If the program is interrupted or the operation is canceled due to abnormal equipment during the operation, wear latex or vinyl gloves for handling, and be careful not to contact the face and eyes with the gloves. At this time, there may be residual hydrogen peroxide inside or on the surface of the incompletely sterilized items.

Warning: Failure to observe the above items may damage the sterilizer.

1.5 Logo Description

Logo	Description
	Warnings and cautions
	High voltage danger
	Ground wire
	Alternating current
	Beware of burns
	Direct current

2. Introduction

Plasma Autoclave LX901LA is a PLC-controlled system with a 120 L volume capacity. Features a sliding door, and rectangular chamber design. Adopted with low thermal conductivity fire performance, anti-aging ability and non-toxic environmental protection. Equipped with a high and low-temperature alarm system, pressure and temperature sensors, and an H_2O_2-resistant rotary vane vacuum pump for quality performance. The maximum storage space is obtained by loading items on the two layers of aluminum alloy punching plate.

3. Features

- 7-inch touch screen LCD display with communication rate of ≥19.2Kbps to show temperature, pressure, time, cycle mode, process stage and alarm information, and provide the actual interface photo
- Electric lift door open mode
- Fully automatic control system
- Built-in microcomputer-controlled biological indicator having special temperature for the monitoring of biological effects of biological indicators of the constant temperature culture process and the full range of temperature(≤ ± 0.3°C) control accuracy, user can set temperature
- Large storage capacity
- High-strength rotary vane vacuum pump
- Exhaust oil mist filtration system
- Door protection switch function
- Adapted with anti-explosion and fire resistance heating system
- Micro printer (data reviewing) attachment
- Manual setting for different sterilization programs
- User-friendly appearance

4. Specifications

Model No.	LX901LA
Chamber Volume	120 L
Chamber dimension (L x W x H)	750 × 450 × 400 mm
Sterilization temperature	50 ± 5°C
H_2O_2 solution	Cassette
Working pressure	-50 Pa
Sterilizing agent	60 % H_2O_2 hydrogen peroxide
Sterilizing time	45 to 50 min
Installation environment temperature	5 to 45°C
Vacuum speed	Absorb to – 50 Pa in five minutes
High anti-pressure valve	10 Pa
Door type	Rectangular type, vertical sliding door
Operation height (for chamber design)	≤ 160 cm
Chamber material	Anti-corrosion type 5052 aluminum
Chamber temperature	50°C ± 3°C
Chamber temperature heating power	2.75 kW, pre-heating time ≤30 mins
Electrode material	Anti-corrosion type 5052 aluminum
Sealing door material	Anti-corrosion type 5052 aluminum
Carton material	Carbon steel baking plastic powder and ABS
Storage U disk capacity	≥ 8 GB
Air filter accuracy	≤ 0.2 μm
Power	4.2 kW
Power supply	AC220V, 50 Hz
Net weight	310 kg
Packaging dimension (L x W x H)	1270 × 910 × 1880 mm
Gross weight	360 kg

5. Applications

Used in the hospital, pharmaceutical factory, lab, medical institutions for low temperature sterilization of heat sensitive materials.

6. Instrument Introduction

6.1 Structure and Composition

The plasma autoclave consists of a sterilization chamber, a sterilization article rack, a vacuum system, a hydrogen peroxide vaporization device, an electrode net, a high-frequency power supply, a hydrogen peroxide filling system, and an automatic control system.

6.2 Product Main Performance Indicators

- The outer surface should be smooth and flat, uniform in color, and free of burrs, sharp edges, and cracks. There must be no obvious scratches, bumps or other defects.
- The fasteners of the sterilizer should be installed firmly, and the switch key adjustment should be flexible and reliable.
- The materials selected for the sterilizer's sterilization chamber, sterilization chamber door, sealing strip, vaporization chamber, and other parts in contact with hydrogen peroxide should meet the following requirements: resistance to hydrogen peroxide corrosion; should not lead to hydrogen peroxide quality It should not release any substances known to be harmful to human health, sterilization load, and the environment.
- The seal of the sterilization chamber door should be replaceable. It should be possible to inspect and clean the seal and the surface in contact with the door without removing the structure of the door.
- The filtering efficiency of the air filter to filter out particles larger than 0.30μm in diameter should not be less than 99.5%.
- The temperature of the sterilization room should not be greater than 60°C.
- The injection volume of hydrogen peroxide solution should be within ±10% of the set value.
- The actual measurement error shall be within ± 2% in the timing display of each stage.
- If the filling system has a transmission pipeline, the sterilizer shall have a removal device to remove the residual hydrogen peroxide in the transmission pipeline. The residual hydrogen peroxide in the transmission pipeline shall not be greater than 60mg.
- The frequency of the plasma generator is 50kHz, the discharge power is 700VA, and the measured error shall be within ± 10%.
- When the pressure in the sterilization chamber reaches 50Pa, the rate of pressure rise should not exceed 15Pa/min within 10 minutes.
- The working noise of the sterilizer should not be greater than 65dB (A).
- The residual amount of hydrogen peroxide in the sterilization load should not exceed 30mg/kgH2O.

6.3 Working Principle

Plasma autoclave mainly uses the effect of hydrogen peroxide plasma active genes, the breakdown effect of high-speed particles, and the sterilization effect of ultraviolet rays to inactivate microorganisms and achieve sterilization effects.

7. Installation

7.1 Working Conditions

1) **Ambient temperature:** 10°C - 40°C
2) **Relative humidity:** Not more than 80%
3) **Atmospheric pressure:** 70kPa - 106kPa
4) **Power supply:** AC220V; 50Hz.

7.2 Installation requirements

7.2.1 Energy demand

1) 3-hole 16A socket with reliable grounding.
2) **Power supply:** 220V/50Hz, 20A (reliable grounding)

7.2.2 Environmental requirements

1) **Ambient temperature:** +10°C - 40°C
2) **Relative humidity:** Not more than 80%
3) **Atmospheric pressure:** 70kPa - 105kPa

7.2.3 Installation space

1) Should be placed in a well-ventilated sterilization room to ensure safe operation.
2) The distance between the left and right sides of the sterilizer and the front and rear ends of the wall or obstacles should not be less than 0.5m to facilitate the subsequent maintenance and use of the equipment to dissipate heat. The distance between the door of the sterilization chamber and the wall or obstacles should not be less than 1.5 times the total length of the equipment to facilitate the operation of the equipment by the operators.
3) **Installation foundation:** The surface should be solid and smooth, and the load-bearing should meet the requirements of the corresponding equipment. If installed on the second floor, if installed on the second floor and above. The user should consider whether the corresponding part of the floor slab needs to be reinforced according to the specific situation.

7.2.4 Room ventilation requirements

The room where the sterilizer is installed should be well-ventilated and equipped with a suitable exhaust fan and ventilation system to ensure 10 air exchanges per hour.

7.3 Instrument Installation

7.3.1 Unpacking

1) Before unpacking, check whether the outer packing box is intact and undamaged.
2) Open the outer packing box in a flat-open area.
3) Check whether the equipment, accessories, and accompanying documents are complete according to the packing list.
4) Remove the connection between the equipment and the base of the packing box.
5) Use a forklift or lifting equipment to move the equipment from the base of the box to level ground.

7.3.2 Fixed equipment

1) Move the equipment to the installation position, move the equipment to make the equipment stable, and the four casters of the equipment should be evenly struggling to land.
2) Lock the locking structure of the swivel casters at the front of the equipment.

7.3.3 Line

1) Install a power switch box on the wall behind or both sides of the device. A main air switch circuit breaker must be installed in the power switch box, and an over-current protection device must be installed to realize the on-off and over-current protection of the power supply of the device. The installation location of the power switch box should be close to the equipment and a place that the operator can easily reach. This switch power box should be dedicated to the hydrogen peroxide low-temperature plasma sterilizer. To ensure the safety of personnel and equipment, the equipment ground wire must be reliably connected to the ground wire in the power switch box.
2) Plug the power cord of the device into a 220V/50Hz 16A socket. After the connection is completed, the reliability of the power cord should be carefully checked.

7.3.4 Debugging

The debugging of the equipment should be carried out by professional personnel.

7.3.5 Equipment Operator Training

After the plasma autoclave is installed and debugged, the user's operation and maintenance personnel must be trained on the equipment's performance, operation, sterilant characteristics, and safety. Only qualified, trained personnel are permitted to operate and maintain the equipment.

7.4 Item handling before sterilization

7.4.1 Cleaning of sterilized items

Cleaning is the key to successful sterilization, especially for some medical devices with complex structures and difficult to clean. Foreign studies have found that cleaning can reduce the number of bacteria by 3 to 4 logs and can greatly reduce the content of organic matter. If the organic matter and other contaminants cannot be effectively removed, the activity of the sterilant will be greatly reduced, and the bacteria hiding in the organic matter will not be easily killed by the sterilant. Therefore, if the cleaning is not thorough, it will increase the difficulty of sterilization.

Warning:

- If the items are not properly cleaned, sterilization will not be guaranteed. **Cleaning:** Purified water should be used to clean the sterilized items. It should be cleaned under the cleaning method provided by the device manufacturer. When necessary, a suitable detergent or cleaning agent should be used to remove all blood, tissue, and contaminants on the instrument. After the contaminants on the instruments are removed, the instruments should be rinsed with clean water, and the detergent or cleaning residues on the surface of the articles should be removed to ensure that the sterilized articles are thoroughly cleaned.
- Without effective removal of all organic matter or cleaning agents, residues may be formed on the equipment.

7.4.2 Drying of sterilized items

Sterilized items should be fully dried, otherwise, the sterilization cycle time will be prolonged or the sterilization cycle will be interrupted and the sterilization effect will be affected.

Drying method: Use a non-woven cotton cloth to wipe the cleaned sterilized items with water on the surface of the items, and then put them in a special drying cabinet for drying or use dry and clean air to dry. For luminal instruments, dry-filtered compressed air should be blown into the lumen to drain the internal water.

Note: It should be ensured that any method used to dry the device is confirmed in accordance with the device manufacturer's instructions.

7.4.3 Packaging of sterilized items

Single-layer packaging or special non-woven double-layer packaging should be used in plasma autoclave special packaging bags.

Warning: Never use packaging materials that are completely sealed or contain cellulose.

7.4.4 Loading of sterilized items

Note:

- Sterilized items should be free from backlog, and stacked naturally, with a maximum of 2 layers. There should be gaps between packages, and they should not be placed too tightly.
- The packaged sterilized items should not exceed 80% of the volume of the container, and the weight should not exceed 20kg/layer.

8. Operations

8.1 Sterilization process and parameters

8.1.1 Sterilization flow chart

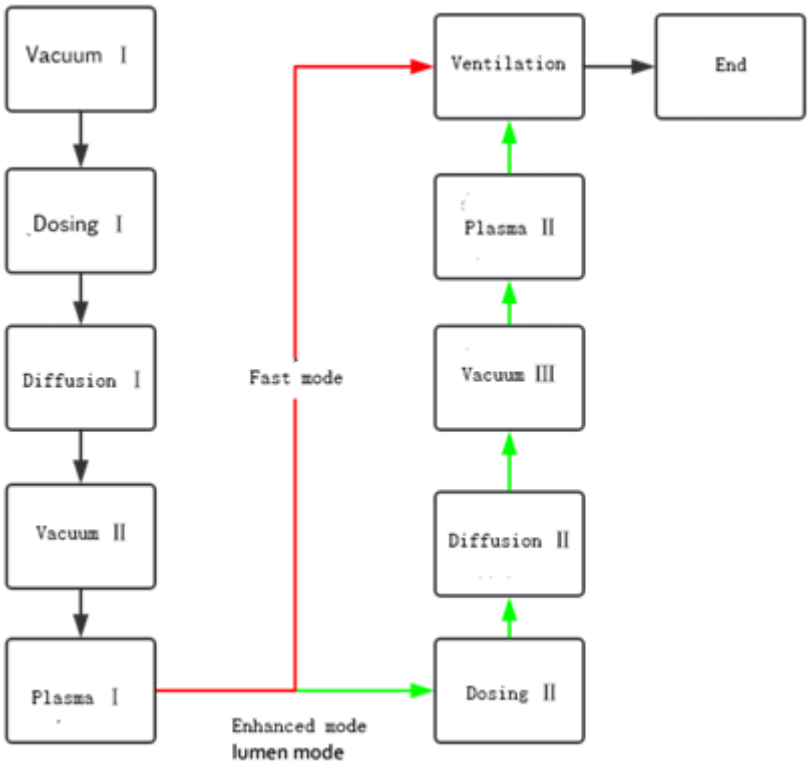

Figure-1

8.1.2 Sterilization parameters

1) The temperature of the sterilization chamber: 50℃±5℃
2) Minimum vacuum degree: 50Pa
3) Sterilization time: About 30 minutes in fast mode, about 50 minutes in enhanced mode, and about 60 minutes in lumen mode.
4) Hydrogen peroxide concentration: 58% - 60%
5) Upper and lower pressure limits of diffusion stage: 2450Pa - 2550Pa
6) Discharge power of plasma generator: 700VA
7) Plasma generator discharge time: 6 minutes.

8.2 Operating Procedures

The items to be sterilized should meet the "sterilization range" in the instruction manual, and the operation must be carried out in strict accordance with the provisions of "Items before sterilization" in the instruction manual.

8.2.1 Operation flow chart

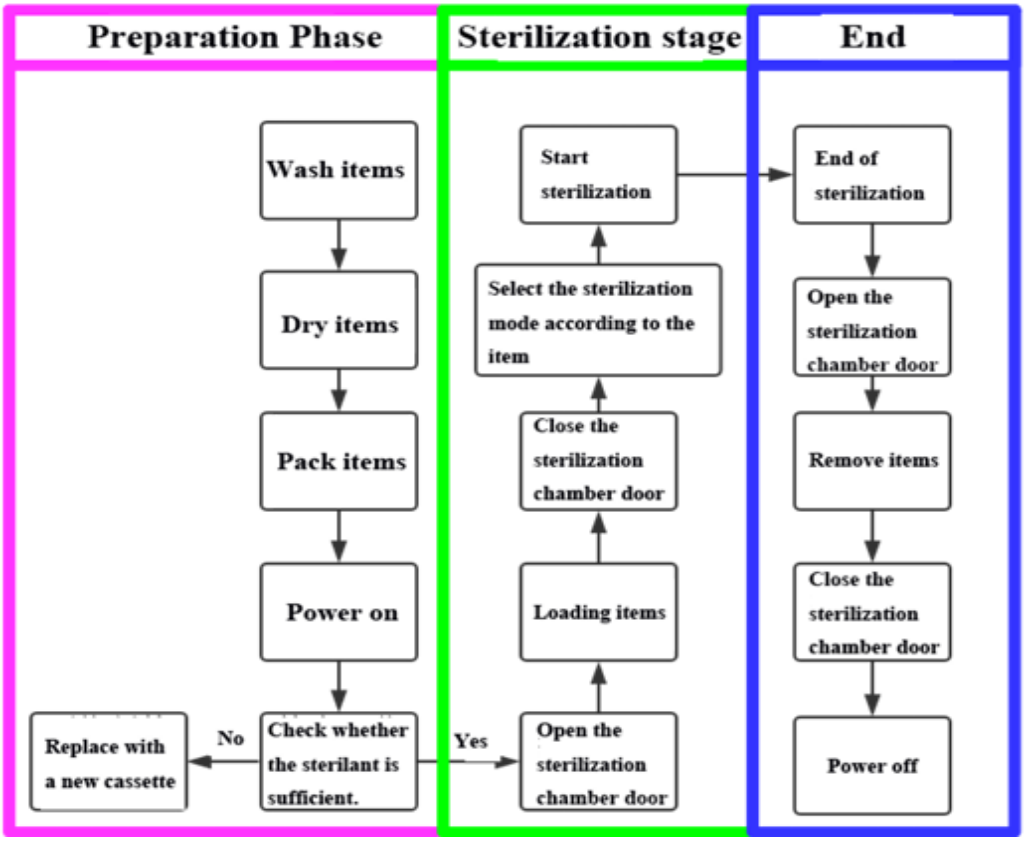

Figure-2

Note: Clean the sterilization room and the loading basket with a clean dry every day.

8.2.2 Sterilizer addition and removal

Danger: When contacting the sterilant, be sure to wear latex or vinyl gloves, and do not allow the gloves to touch the face and eyes.

When the hydrogen peroxide in the hydrogen peroxide cassette is used up or cannot be used for a sterilization cycle, replace the hydrogen peroxide cassette in time.

The method of replacing the cassette is as follows:

1) Click the "**Parameter Setting**" button on the main screen to enter the parameter setting screen.
2) Click the "**Parameter Monitoring**" button on the left to select its function list.
3) Click the button under "**Eject Cartridge**" to start the cartridge system and eject the cardholder.
4) After the hydrogen peroxide cassette is completely ejected, pull out the hydrogen peroxide cassette, put the new hydrogen peroxide cassette into the cassette system according to the arrow on the cassette, and fill in the remaining hydrogen peroxide cassette according to the actual situation of the hydrogen peroxide cassette. The number of medicines (the new one is 12).
5) Click the button under "**Cartridge back to origin**", the cassette system will start and retract the cassette until it returns to the origin.

8.3 Sterilization effect monitoring

8.3.1 Physical monitoring method

This equipment is equipped with a thermal printer, which can print out sterilization data recording paper for archiving for future reference. The recording paper can record the pressure, temperature, time, and other related parameters of each sterilization stage in the sterilization process. By observing these values and whether the requirements comply can be preliminarily judged whether the sterilization effect is good or bad. Physical monitoring cannot truly reflect the sterilization process and microbial killing of each package in the sterilizer. It is necessary to combine chemical monitoring and biological monitoring to comprehensively reflect the quality of sterilization.

8.3.2 Chemical detection method

Chemical monitoring mainly uses the naked eye to observe the substance (state) change or chemical (color) change to test the parameters of the sterilization process. Chemical monitoring is fast, simple, and low-cost, and can be used to detect possible sterilization failures, such as incorrect. The packaging or loading sterilizer function fails, etc.

8.3.3 Bioassay

Plasma sterilization biological indicators cannot be replaced by steam sterilization biological indicators.

9. Software Operations

9.1 Power on

After the device is connected to the power source, press the power-on button on the front control panel of the device to turn it on, and the touch screen is turned on at the same time. After about 2 seconds, enter the main screen. When placing the medicine cassette, put the metal piece end of the cassette into the inner bottom of the import and export cassette (1).

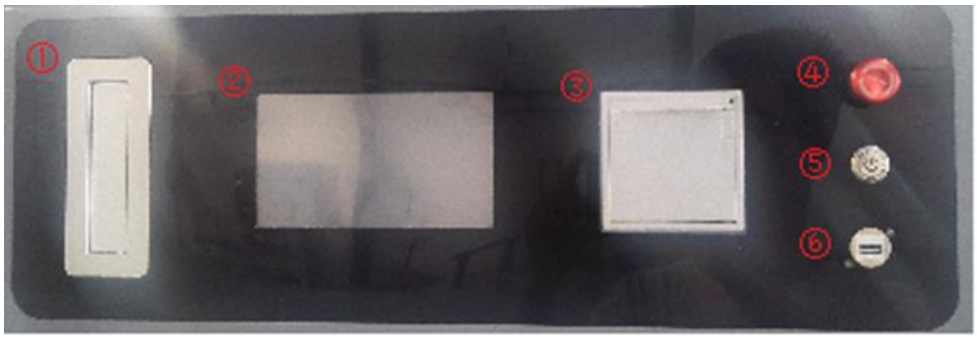

Figure-3 Control Panel

1) Import and export of cassette
2) Touch screen
3) Printer
4) Emergency stop button
5) ON/OFF button
6) USB interface

9.2 Main Screen

The function of each button in the screen of **Figure 4**:
"Historical data" - Enter the historical data screen.
"Parameter setting" - Enter the parameter setting screen.
"Mode switch" - Switch and select the sterilization program, namely "quick mode", "enhanced mode" and "lumen mode".
"Process monitoring" - Enter the selected mode to run the monitoring screen, where the user can start or stop the sterilization process.
"Open door", "Close door" and "Stop" - Stop operation during opening and closing of sterilization chamber door and door opening and closing.
The real-time temperature value, pressure value and system time of the current sterilization chamber are displayed in the middle.

Figure-4

Note: When closing the door, ensure that the sterilization tray or basket is completely placed in place, and there are no objects or other obstacles on the running line up and down the door, so as not to be unable to close the door or damage the equipment and the sterilizer.

9.3 Parameter settings

9.3.1 Parameter monitoring screen

The user can view the temperature, pressure, and remaining amount of sterilant of the sterilizer on this interface. **(Figure 5)**

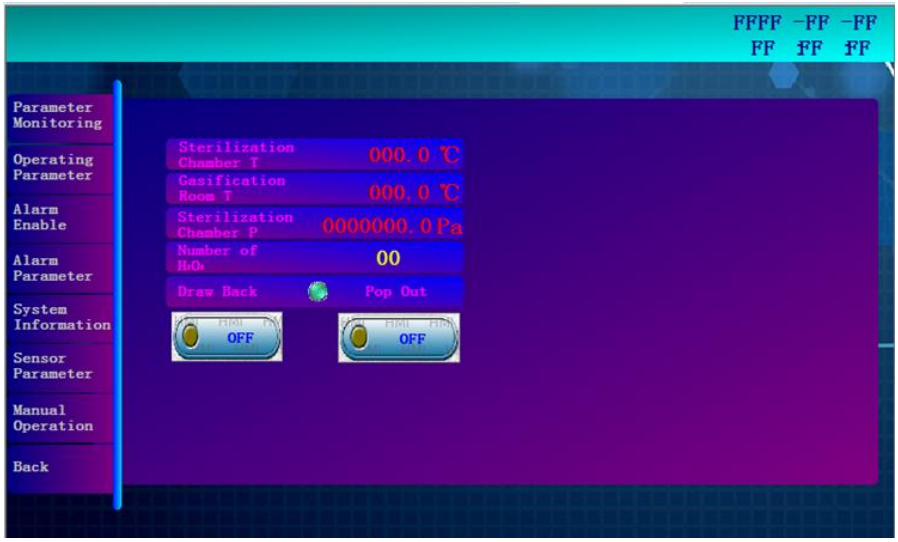

Figure-5

Note: Click the button under "**Card Cartridge Back to Origin**" and "**Eject Cartridge**" to replace the cassette. If you need to stop the current operation, click the corresponding button again.

9.3.2 Operating parameter screen

Standard parameters when the program is running normally. **(Figure 6)**

Figure-6

9.3.3 The monitoring of sterilization room temperature, vaporization room temperature, door temperature, sterilization room pressure and concentration, and plasma power can also be corrected. **(Figure 7)**

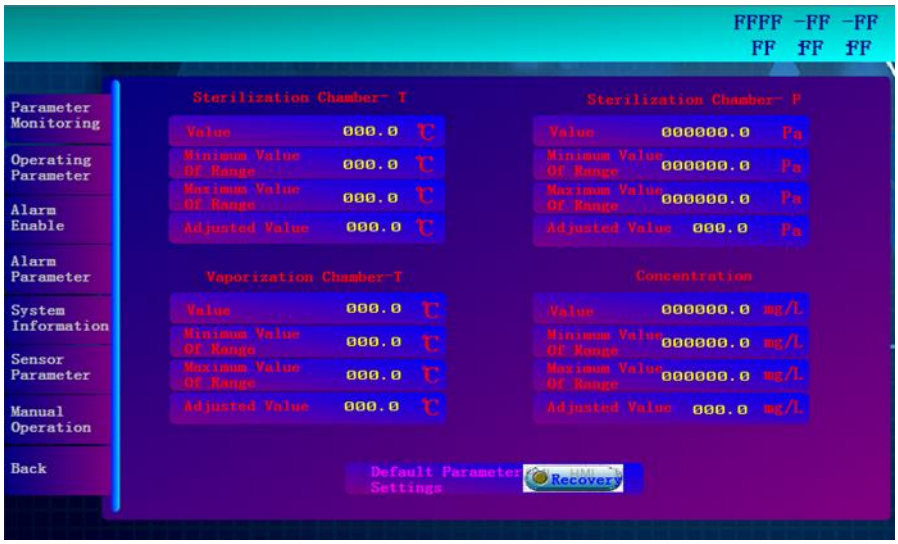

Figure-7

9.3.4 Alarm parameter setting screen

Real-time monitoring of temperature, pressure, and time during the sterilization process. If a parameter is found to exceed the set value during the sterilization process, it will immediately alarm the user and terminate the sterilization process.

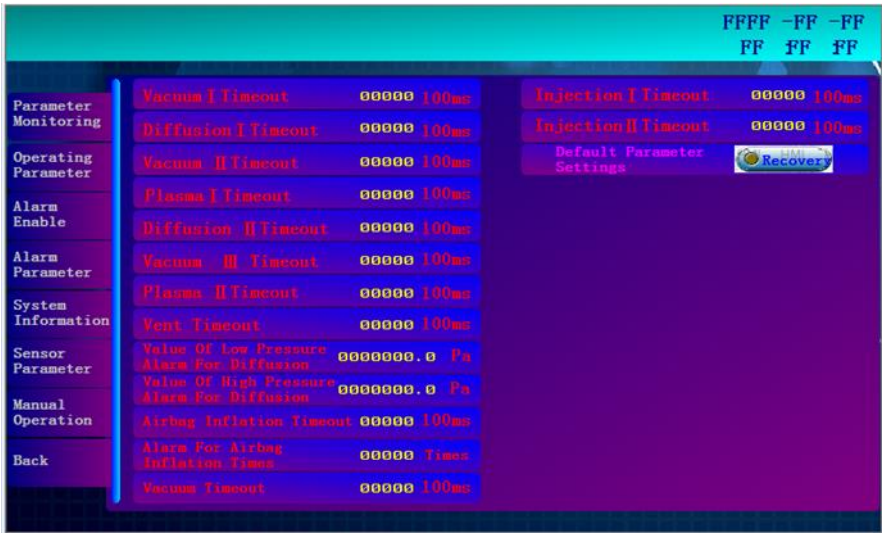

Figure-8

9.4 Process monitoring screen

9.4.1 Under the condition that the sterilization conditions are met, the sterilization mode is determined according to the duty cycle of the items to be sterilized in the sterilization chamber.

Table – Sterilization mode

Sterilization mode	Type of sterilized articles
Fast mode	Sterilized articles are solid instruments, without lumen, occupying less than 30% of the space in the sterilization room
Enhanced mode	Occupy 30%-80% of sterilization room space
Lumen mode	Lumen instrument

9.4.2 In the main screen **(Figure 4)**, click "**Mode switching**" to switch the sterilization mode; click "Enhanced Monitoring", "Lumen Monitoring" or "Quick Monitoring", and the system enters the process monitoring screen. **(Figure 8)**

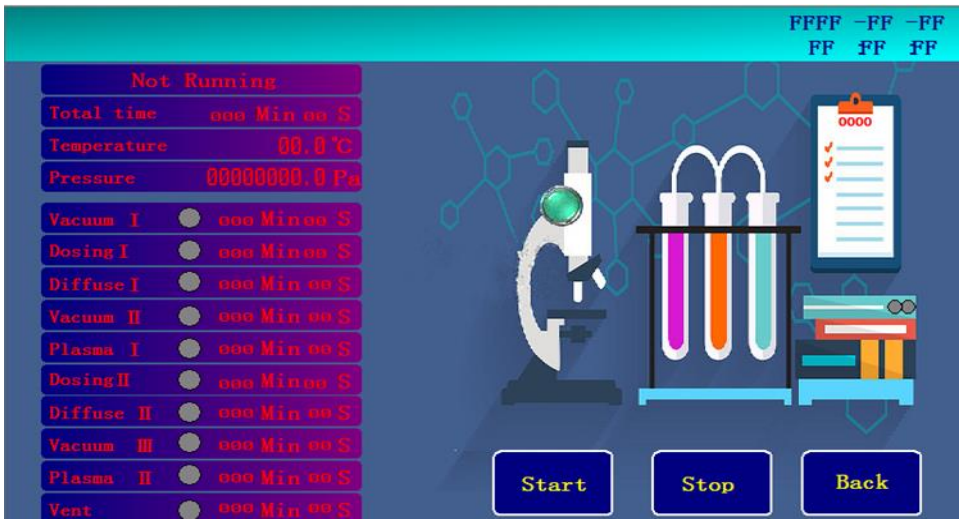

Figure-8

In the current sterilization mode, click the **"Start"** button to execute the sterilization process. When the sterilization condition parameter (temperature) reaches the set value, enter the sterilization process.

When the program is running, the corresponding program running indicator flashes and the timer starts to count. When the stage program ends, the corresponding indicator turns off and the timer shows that the stage is time-consuming. Sterilization time shows the running time of the entire sterilization process. Click the **"Return"** button in the process monitoring screen to return to the main screen.

When the sterilization program needs to be terminated in an emergency during program operation, click the **"Stop"** button to pop up a prompt screen; select **"OK"** in the prompt screen to terminate the sterilization program, and select **"Cancel"** to return to the process monitoring screen. After selecting to terminate the sterilization program, the process of the sterilization program being executed will stop immediately, and the program will automatically jump back to the empty state. After the sterilization chamber returns to atmospheric pressure, the program ends. At this time, click **"Return"** on the screen to return to the main screen for proceeding. Other operations.

When an unexpected situation occurs in the system, an alarm screen will be displayed automatically, accompanied by an intermittent beeping sound for 5 seconds.

Note: If a timeout alarm occurs during the sterilization process, it is recommended that the user click the **"OK"** button to exit the program, and start the sterilization after finding the cause of the failure and handling it properly.

9.5 Footswitch

In the middle of the lower part of the machine, there is a photoelectric sensor foot switch, as shown in the box marked in **Figure 9**. If the sterilizer is in the standby state with the door closed and it is inconvenient to open and close the door through the touch screen, you can touch the photoelectric switch with the back of your foot, and the sterilizer will automatically open the door at this time.

Note:

- It is forbidden to place sundries in the area under the foot switch, otherwise it will affect the normal operation of the sterilizer.
- When the sterilizer enters the sterilization state, the corresponding function of the photoelectric switch is invalid.

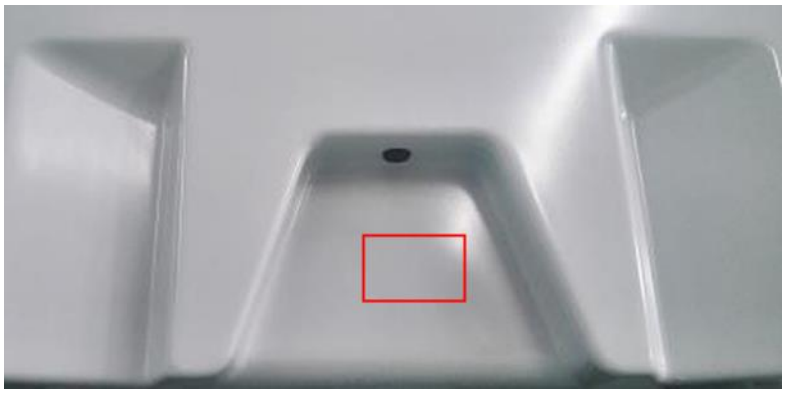

Figure-9

9.6 Power OFF

Before shutting down, make sure that there are no objects in the sterilization room, and then close the door of the sterilization room to prevent contamination of the sterilization room. When shutting down, press the power button on the operation panel to shut down.

When the sterilizer is in standby mode, the door should be kept closed to equalize the temperature of the sterilization chamber, to prevent the sterilization effect from being affected by the imbalance of the sterilization chamber temperature.

10. Maintenance

10.1 Sterilizer cleaning

1) Disconnect the power supply of the sterilizer before cleaning.
2) Use a clean, dry cloth to wipe the surface of the equipment, and do not use strengthening agents or detergents.
3) Do not allow water or cleaning solution to penetrate the sterilization room and touch screen.

10.2 Maintenance of vacuum pump

Check the transparency of the oil every week before starting the machine. If you find that the oil is dark or turbid, change the oil. Check the oil level every week before starting the machine to ensure that the oil level is in the middle of the oil-level observation window during operation, and the oil level is at the 4/5 position of the oil-level observation window when the pump is turned on. During normal use, the vacuum pump needs to change the oil during 100 hours of operation, and then at least once every 300 hours when the clean gas is pumped out. After the oil change time of the sterilizer is up, the oil change prompt will be displayed on the touch screen. Please deal with it in time.

The oil change method is as follows:

1) **Brief introduction of vacuum pump interfaces**

Figure-10

2) **Correct oil change method**
For the application process of low-temperature plasma sterilizers, industries with certain corrosive gases, it is recommended to change the oil every 2-3 months, the method is as follows:
- Turn off the power, first unscrew the oil plug, drain the oil in the oil tank, drain it naturally, tighten the drain plug, and then fill the pump with 300-500ML of new oil from the oil filling hole, and let the vacuum pump run for 10-15s. Then release.
- Repeat step 1 several times until the oil released is relatively clean.
- **Add new oil**
- The oil consumption of the 16 pump is about 1.5 liters. When the pump is running normally, the oil level is located at the upper 2/3 position of the oil window as the appropriate oil level; because the pump cavity needs to be flushed with oil, change it the total oil consumption of secondary oil is about 2-3L.

Strictly follow the maintenance process of the vacuum pump to avoid unnecessary losses.
- Check and clean the dust filter of the air inlet every three months, and replace it if necessary.
- Clean the built-in oil filter every six months, and replace it if necessary.

10.3 Maintenance of oil filter

1) The oil mist absorption filter element is replaced every 500 runs.
2) If it is observed that the filter element of the oil mist absorption filter is damaged or the room smells of oil mist, the filter element can be replaced in advance.

10.4 Maintenance of hydrogen peroxide filter

1) Replace the hydrogen peroxide filter element every 500 runs.
2) If the hydrogen peroxide smell in the room is strong, the hydrogen peroxide filter element can be replaced in advance.

10.5 Sterilization

10.5.1 Hydrogen peroxide solution properties

The sterilant used in this equipment is a hydrogen peroxide solution with a concentration of 58% to 60%. Hydrogen peroxide solution is an explosive and strong oxidant. Hydrogen peroxide is non-flammable by itself but can react with combustibles to release a large amount of heat and cause fire and explosion.

10.5.2 Storage of hydrogen peroxide cartridge

The boxed hydrogen peroxide should be stored in a well-ventilated, dry and cool environment with a temperature below 25°C. Keep away from combustible materials, heavy metals, catalytic metal compounds, heat sources, fire sources, etc. during storage. Use it within the validity period of the product to avoid unqualified sterilization.

10.5.3 Emergency treatment

Skin contact: Take off contaminated clothing and rinse with plenty of running water.

Eye contact: Immediately lift the eyelids and rinse them thoroughly with a large amount of running water or normal saline for at least 15 minutes, and seek medical attention.

Inhalation: Leave the scene quickly to a place with fresh air; keep the respiratory tract unobstructed; if breathing is difficult, give oxygen; if breathing stops, give artificial respiration immediately; seek medical attention.

Ingestion: Drink enough warm water to induce vomiting and then seek medical treatment.

Note:

- If the program is interrupted or the operation is cancelled due to equipment abnormality during the operation, hydrogen peroxide may remain on the surface or inside of the sterilized items that have not been sterilized, and latex or vinyl gloves should be worn for handling.
- The hydrogen peroxide used in this sterilizer is corrosive evaluation of instruments made of carbon steel, copper, aluminum, and stainless steel under the "Technical Specifications for Disinfection". The result is non-corrosive and does not affect the expected clinical service life.

11. Troubleshooting

11.1 Faults and Troubleshooting Methods

Failure phenomenon	Cause	Elimination method
The touch screen does not light up after turning on the power	The touchscreen power is not turned on	Check the touchscreen power supply, the connection is reliable
	No 24V power supply	Check and turn on the 24V power supply
	The AC power supply part of the system is not connected properly	Check whether the connecting wires of the AC power supply are normal and whether the connectors are loose
No response when clicking on the touchscreen	The connection between the touch screen and the PLC communication line is abnormal	Check the communication line
	PLC failure	
	Touch screen failure	
The printer does not print	No printing paper	Install a new roll of printing paper
	The printing paper is loaded upside down	Install the printing paper correctly
	The printer power is not turned on	Check and turn on the printer's power
	Printer communication line failure	Check the printer communication line, the connection is reliable
	Printer failure	Replace the printer
Print overlap	The printing paper is not installed in place	Take out the printing paper and reinstall the printing paper
	The printer cover is not fastened in place	Re-fasten the printer cover
	No standard printing paper is installed	Replace standard printing paper
	The printer paper roll is not installed correctly	Reinstall the printing paper
	Printer failure	Replace the printer
The vacuum pump does not start	The vacuum pump power cord is not connected	Check whether the power cord is firmly connected
	The contactor is not closed	Check the status of the pump circuit breaker and the contactor circuit
	The vacuum pump burns out or bites to death	Replace the vacuum pump
	The vacuum pump power switch is not turned on	Turn on the power switch of the vacuum pump

11.2 Alarm and Troubleshooting Method

Information	Reason explanation	Elimination method
Sterilization room temperature is too high	Contact adhesion of relay KA3 or H1	Replace the corresponding relay
	The temperature transmitter is damaged	Replace the temperature transmitter
	The temperature probe is damaged	Replace the temperature probe
The sterilization room temperature is too low	The parameter setting is wrong	Reset parameters
	Failure of the heating plate in the sterilization chamber	Replace the corresponding heating plate
	The relay KA3 or H1 is damaged	Replace the relay
The vaporization room temperature is too high	Contact adhesion of relay KA4	Replace the corresponding relay
	The temperature transmitter is damaged	Replace the temperature transmitter
	The temperature probe is damaged	Replace the temperature probe
The vaporization room temperature is too low	Unreasonable thermostat adjustment	Adjust the thermostat
	Damaged heating plate	Replace the heating plate
Vacuum period I overtime Vacuum period II time out Vacuum period III overtime	Sterilized items are not completely dry	Re-dry the sterilized items
	Failure of the flapper valve and vacuum pump	
	Leakage in the sterilization room	
	The sterilization room is damp or there are foreign objects	Clean and dry the sterilization room
	Excessive loading of sterilized items	Reduce sterilization load
	Sterilized items exceed the effective range of the equipment	Confirm whether the sterilized items are within the sterilization range of this equipment
Expiration period timeout	The amount of hydrogen peroxide added is too large	Confirm the specifications of the medicine box
	Failure of the injection valve	Replace the injection valve
Diffusion phase pressure is too low	Improper parameter setting	Reset the corresponding parameters
	Failure of the injection valve	Replace the injection valve
	Failure of the puncture mechanism	
	Improper parameter setting	Reset the corresponding parameters

Excessive pressure during diffusion	Failure of the injection valve	Replace the injection valve
	The amount of hydrogen peroxide added is too large	Confirm the specifications of the medicine box
	Pipeline failure of the filling system	Check whether the corresponding pipeline is in good condition
The door is not closed	Failure of the door mechanism	
	Failure of door travel switch	Replace the travel switch
The cartridge system failed to start	The cardholder stops unexpectedly during the startup	Manually restore the card clamping system to the original point

11.3 Fault code

Fault Name	Fault Code
Vacuum phase I timeout	E3.5.1-0001
Diffusion phase I timeout	E3.5.1-0002
Vacuum phase II timeout	E3.5.1-0003
Plasma phase I timeout	E3.5.1-0004
Diffusion phase II timeout	E3.5.1-0005
Vacuum phase III timeout	E3.5.1-0006
Plasma phase II timeout	E3.5.1-0007
Return timeout	E3.5.1-0008
Radiofrequency power alarm	E3.5.1-0009
The tank temperature sensor is abnormal	E3.5.1-0010
Abnormal gasification chamber temperature	E3.5.1-0011
The door is not closed properly	E3.5.1-0012
Vacuum pump heat overload	E3.5.1-0013
The gasification room temperature is too low	E3.5.1-0015
The gasification room temperature is too high	E3.5.1-0016
The sterilization room temperature is too low	E3.5.1-0017
Sterilization room temperature is too high	E3.5.1-0018
The diffusion pressure in phase I is too low	E3.5.1-0019
The diffusion pressure in phase I is too high	E3.5.1-0020
Diffusion phase II diffusion pressure is too low	E3.5.1-0021
Diffusion phase II diffusion pressure is too high	E3.5.1-0022
Door airbag inflation timeout	E3.5.1-0023
Inflation times of door airbags exceed the limit	E3.5.1-0024
The cartridge system failed to start	E3.5.1-0029
No medicine box is detected	E3.5.1-0030
Vacuum pumping timeout	E3.5.1-0033
Tank temperature rise fault	E3.5.1-0035
Temperature rise fault of the gasification chamber	E3.5.1-0036
Residual drug handling timeout	E3.5.1-0037
Humidity alarm	E3.5.1-0040
Replace filter element	E3.5.1-0041

12. Accessories

Standard Accessories

S. No	Accessory Name	Quantity
1	Tray	2 pcs
2	Footswitch	

13. Replacement

13.1 Replace the printing paper

This sterilizer adopts thermal printing paper specifications: 55mm×30mm (width × diameter).

1) First open the printer cover and take out the used printing paper.
2) Replace with new printing paper. The printing paper sticks out of the paper slot from above. Press the printer cover tightly to ensure that the printing paper is exposed about 10mm. Close the printer cover.
3) Press and hold the detection button, and the printing paper feeds normally, then the installation is complete.

13.2 How to replace the fuse

Replace the fuse according to the following method:

1) Cut off the power supply of the sterilizer.
2) Use a Phillips screwdriver to remove the fixing screws of the left side cover of the equipment, and remove the cover to see the equipment distribution box.
3) Find the fuse holder on the upper part of the distribution box, as shown in the figure below.

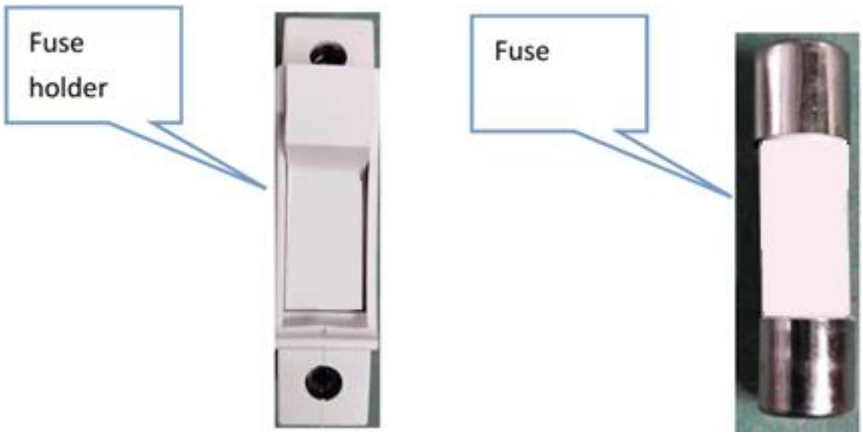

Figure-11

4) Use a small letter to pry open the upper part of the fuse holder.
5) Take out the fuse that needs to be replaced, and replace the fuse of the same specification Φ10×38 32A.
6) Reattach the fuse cover, and install and reset the side cover of the device according to the original position.

14. Circuit Diagram