# Operation Manual



# Vertical Steam Sterilizer

Version:A2/20240104



**Warning: To ensure the safe and correct use of the equipment, please read this manual carefully before use and follow the instructions. If the equipment is not used in the manner specified by the manufacturer, the protection provided by the equipment may be compromised.**

### 0.1 Introduction

Welcome to use our vertical steam sterilizer (referred to as sterilizer, machine, or equipment hereafter).This manual outlines the operation steps for the equipment. To ensure proper use, please carefully read this manual before operating.

Our company guarantees the quality of our products. In accordance with relevant state and industry regulations, we provide warranty for our products (excluding wear parts) and take direct responsibility for product quality. If you encounter any issues during use, please feel free to contact us. We are committed to providing warm and attentive service.

### 0.2 Safety instructions

(1) Please carefully read this manual before use and understand all warnings and attention requirements. The user must check the safety performance of the sterilizer to ensure it is in good working condition before use.

(2) The sterilizer should be used according to the applicable scope, usage methods, and precautions stipulated in this manual. Otherwise, it may damage the protective features provided by the sterilizer or result in sterilization failure.

(3) The equipment is equipped with safety protection devices to prevent operator injuries and equipment damage. Operators should understand the operating rules and conduct startup operations only after proper training.

(4) Requirements for the operator: Operators must undergo training on equipment performance characteristics, operating principles, field operations (usage), and have a certain understanding of the sterilization process. Before operating, they must carefully read and understand the contents of this manual and possess the necessary operational skills.

(5) This equipment belongs to Class A pressure vessels. During usage, it must comply with the relevant provisions of national pressure vessel regulations. To ensure safe and correct usage of the equipment, a responsible person should be designated.

(6) In the design and manufacturing process, we have fully considered the safety of product usage. However, operators should not be overlooked. During usage, it is important to frequently check and observe the equipment's operational status.

(7) The electrical power supply and connections used by the user must meet the relevant requirements of national electrical safety standards. If the voltage fluctuation of the grid exceeds 10%, the equipment may not function properly.

(8) This equipment complies with the requirements of GB/T 18268.1:2010. It is recommended that users evaluate the electromagnetic environment before usage to ensure the sterilizer's normal operation. (9)levies the equipment in line with the GB 4793.1 2007, the related safety requirements of GB 4793.4 2007.

(9) Pressure gauges, safety valves, and instruments should be inspected regularly in

accordance with relevant state regulations.

(10) Before installing fuses or conducting electrical maintenance, ensure that the equipment is powered off by cutting off the main power supply.

(11) To ensure safe usage and avoid damage from electric shock, it is essential to ensure good equipment grounding. Do not alter the internal or external grounding protection wires of the equipment or remove the grounding protection wiring. Doing so may disable the device's protective function and result in electric shock.

(12) When using the device, pay attention to and keep away from areas prone to scalding, exhaust ports, and drain ports to avoid burns.

(13) In case of equipment failure, immediately disconnect the total power supply to the equipment, wait for troubleshooting, and then reconnect the total power supply.

(14) Equipment and various accessories should be used within their service life. Overdue use may pose certain security risks. Therefore, ensure safety by checking the equipment before each use and replacing parts as necessary.

## BRIEF

The steam sterilizer is the sterilization equipment that can sterilize medical equipment, surgical dressing, medicine liquid, glassware, etc by saturated steam. They enjoy the following merits such as fashionable and attractive appearance, reasonable frame, multiple functions, fast heating, and complete disinfection.

Purpose: they are used to sterilize following goods by medical treatment and public health, scientific research organization: medical equipment, labware, culture medium and non-sealed liquid or preparations.

## Features

1. The vertical steam sterilizer mainly consists of a shell, sterilization chamber, steam generator, pipeline system, and control system. It is available in several models with sterilization chamber volumes of 35L, 50L, 75L, and 100L.
2. The sterilizer features a square and vertical structure. The shell, sterilization chamber, and sterilization net basket are constructed from stainless steel. The sterilization chamber (pressure vessel) and its safety accessories must comply with GB 150, special equipment safety supervision regulations, and national statutory pressure vessel regulations. They should bear a legal pressure vessel safety supervision organization registered product nameplate and possess a product quality certificate.
3. A safety valve is installed to automatically release excessive pressure when the pressure in the container exceeds 0.24 MPa, ensuring safety and reliability.
4. During the heating process, the air valve opens automatically to discharge cold air. When the temperature exceeds 102°C, the exhaust valve automatically closes, switching to automatic intermittent exhaust function. This improves vapor saturation in the container, enhancing sterilization effectiveness.
5. The operation panel is equipped with a pressure gauge with pressure reading indication for clear observation.
6. This sterilizer features automatic protection function. In case of water shortage in the container, the circuit is automatically cut off, and the heater stops working.

## Technical parameters

| Seq. | Volume | Power | Sterilization Time Adjustment Range | Max. Working Pressure | Max. Working Temperature | Net Weight |
|---|---|---|---|---|---|---|
| 1 | 35L | 3.5kW | 4-120min | 0.22Mpa | 134℃ | 110 kg |
| 2 | 50L | 3.5kW | | | | 112 kg |
| 3 | 75L | 4.5kW | | | | 114 kg |
| 4 | 100L | 4.5kW | | | | 129 kg |

1. Power Supply: AC220V, 50Hz / 60Hz or 110V, 60Hz
2. Working pressure: 0.22MPa; Working temperature: 116℃ to 134℃.
3. During normal operation within the sterilization cycle, the noise should not exceed 65dB (A-weighted).
4. Set sterilization time range: 4 to 120 minutes; Set drying time range: 0 to 240 minutes.
5. Equipment safety class: Class I.
6. Operating environment temperature: +5℃ to +40℃; Relative humidity: not more than 85%; Atmospheric pressure 70kPa to 106kPa.
7. The water source used in the sterilizer should not affect the sterilization process or damage the sterilizer and its contents.

## Installation requirements

1. **Please read the manual carefully before use.**
2. According to protection against electric shock, it belongs to class Ⅰ. No flammable and explosive, anesthetics air or articles exist in installation place.
3. Connect the power source always during the procedure. The sterilizer must keep a 60cm distance from the wall and the height must exceed 1.2m, make sure to operate the equipment safely in（must conform to GB 14048.1 and GB 14048.3 standard）sterilizer's power source. It must have obvious disconnecting device ON-OFF mark（such as special for sterilizer）. The power line must be fixed when it is connected to disconnectiong device to prevent from falling off. The power line's diameter is 2.5mm²×3. L is the power line. N is the zero line. The yellow-green G is protective grounding. When the procedure is over, please press OFF to close and disconnecting device.
4. Place the equipment on the level and fast floor. Users can connect the power supply correctly according to its nameplate and manual. The equipment must be sure of safety and ground protection（ground resistance shouldn't be more than 2Ω）
5. Connect the drainage pipe to the drainage port, ensuring that the drainage end of the pipe is not submerged in water to prevent water from being drawn back into the sterilization chamber bucket.
6. For a machine with automatic water inlet function, prepare one bucket (5 gallons) of distilled water (tap water is not recommended, and the water quality should meet the requirements specified in GB 8599 Appendix C). Connect one end of the water inlet pipe to the device's water inlet, and insert the other end into the bottom of the water bucket.

## Use method

**All documents of the equipment must be supplied to the local inspection organization to register on record.**

**Sterilizer operators must accept professional training and be familiar with pressure vessel operation according to manul strictly.**

**Operator must look after the equipment and record the operation state during the sterilizing process, to prevent accidents.**

**Sterilizers must be checked one time per year at least by an inspection organization. The machine can be used after proving to be qualified.**

NOTES：
Please don't put inflammable goods into the sterilizer's barrel.
Please don't put following goods into the barrel: explosive goods, inflammable goods, oxidizing goods, incendive goods, or flammable goods. Otherwise, the equipment will explode, fire or breakdown.
Please don't put the following goods into the barrel such as culture medium that can corrode stainless steel. Otherwise, the equipment will explode, fire, or breakdown.

- Please don't touch the switch or circuit breaker with wet hands, to prevent electric shock or accident.
- Please don't touch the vessel's cover in the sterilizing state as it is high temperature.

"Please don't open the cover before releasing steam completely": after sterilization, please don't open the cover before the pressure gauge's pointer doesn't return to 0 place. Otherwise, high-temperature steam can burn the operator.

### （I）SYMBOLS AND THEIR MEANING

| Symbol | Meaning | Symbol | Meaning |
|---|---|---|---|
| ~ | Alternating current (AC) |  | notice ! check and review equipment's documents carefully |
|  | Caution Hot |  | Protective grounding |
|  | The test inter face | | |

## (II) Operating procedures

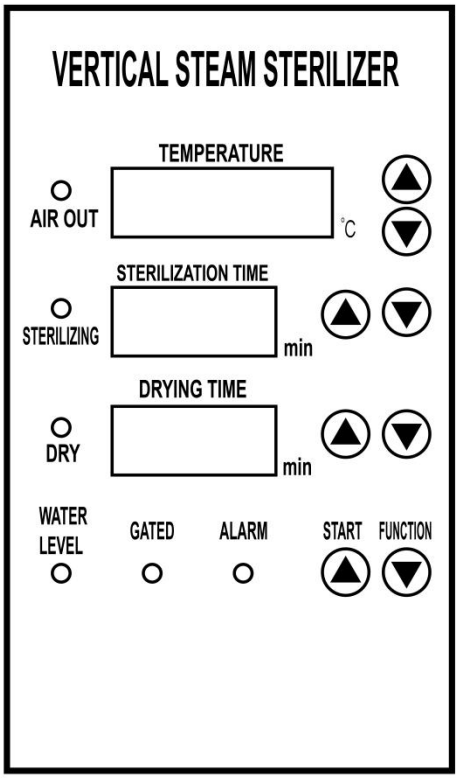
(1) **Function Key:** Press and hold this key to select a function. Press once to display the recent operating mode, such as mode "A" (sterilization function). Long press for 5 seconds to enter mode "C" (sterilization, air release, drying function). Press and hold for 5 seconds again to return to mode "A", and so on.

(2) △ **key:** Temperature Display Key: Press this key to increase the setting temperature within the range of 116 to 134.0°C. Additionally, use this key to increase the setting time within the sterilizing time (setting range: 4 to 120 minutes) and drying time (setting range: 0 to 240 minutes).

(3) ▽ **key:** Temperature Display Key: Press this key to lower the setting temperature within the range of 116 to 134.0°C. Additionally, use this key to reduce the setting time within the sterilization time (setting range: 4 to 120 minutes) and drying time (setting range: 4 to 240 minutes).

(4) **Start:** Press this key to initiate the operation function.

(5) **Water Level Indicator Light:** When there is no water in the sterilizer or the water level is too low, the indicator light will be red. When the water level reaches the normal level, the indicator light will be green.




(6) **Door Control Indicator Light:** This light does not turn on when the sterilizer cover is opened.

(7) **Alarm Indicator Light:** When there is an over-temperature alarm or a work error, the alarm light will remain on continuously. When the waste water tank is full, the alarm light flashes.

(8) **Temperature Display Window:** In the setting state, the display shows the set temperature, while in the working state, it shows the current measured temperature inside the sterilizer.

(9) **Sterilization Time Display Window:** In the setting state, the display shows the set sterilization time, while in the working state, it shows the remaining sterilization time.

(10) **Drying Time Display Window:** In the setting state, the display shows the set drying time, while in the working state, it shows the remaining drying time.

◆ **Function setting method:**

After switching on the power supply and opening the power switch, the control panel will display the current temperature in the container and the last running program after self-inspection. Press the "function" button to select the running mode of the program, and then use the corresponding keys △▽ to set the temperature, sterilization time, and drying time respectively. Press the start button after completion, and the sterilization indicator light on the control panel will flash (indicating that the temperature is rising). When the temperature rises to the set value, the sterilization indicator light will stay on steadily, and the countdown for sterilization will begin. After sterilization is complete, the air is released automatically, and the indicator light turns on simultaneously. Following the completion of air venting, the drying indicator light will illuminate, and the drying time will be displayed on the window as it counts down (indicating the drying process). The display window will show "END," and a sound will indicate the end of the program, signaling that items can be removed.

**a. Set Sterilization Function:**

(1) Press "Function" to display the currently selected working procedure, sterilization

temperature, and sterilization time.

(2) Set the temperature using the key △▽ located below the temperature display window.

(3) Set the sterilization time using the button △▽ located below the sterilization time display window.

(4) Press the start button after setting.

**b. Set Sterilization, Air Venting, and Drying Functions:**

(1) Press the "Function" button to display the currently selected working procedure, sterilization temperature, sterilization time, and drying time.

(2) Set the temperature using the key △▽ located below the temperature display window.

(3) Set the sterilization time using the button △▽ located below the sterilization time display window.

(4) Press the key △▽ below the display window to set the drying time.

(5) Press the start button after setting.

**A. Adding water and Stacking**

✓ Rotate the handwheel counterclockwise for several turns (be cautious to avoid pinching hands and causing injuries) until it reaches the top, lifting the sterilizer cover sufficiently. Push the cover to the right to move the crossbeam and open the sterilizer cover. Remove the sterilization basket.

✓ Close the water drain valve and pour approximately 5 liters of clean water into the sterilization drum. The water level should reach the foot of the sterilization drum (below the shelf). For consecutive use, it is essential to replenish water after each sterilization cycle. If there is an automatic water addition function, after function is set, press the start button for automatic water addition. The automatic water addition will continue until the water level indicator light changes from red to a steady green, at which point it will automatically stop.

✓ Properly wrap and arrange the items to be disinfected in the sterilization basket in an orderly manner, leaving gaps between them. This facilitates steam penetration, improving the sterilization effect. When stacking sterilization packages, pay attention to leaving space for the safety valve vent. Otherwise, if the safety valve vent is blocked and cannot release pressure, it may result in the rupture of the sterilizer body.

**B. Power On**

Connect the power supply that corresponds to the sterilizer label. Set the switch on the control panel to the "On" position. The control panel should display a complete illumination, and a self-check status will be shown for 3 seconds.

**C. Sealing**

Push the crossbeam towards the left column. Rotate the handwheel clockwise to press the sterilizer cover tightly against the lower flange, exerting force to ensure a complete seal. (When the door control indicator light on the control panel is illuminated, continue rotating until fully sealed. At this point, the following operations can be carried out.)

**D. Function Setting**

Users should select the appropriate buttons to set the required sterilization temperature

and time based on the type of sterilized items.

<Refer to the operation panel instructions. Different items have specific sterilization temperature and time requirements according to the Ministry of Health's "Disinfection Technical Specifications.">

**E. Heating**

After pressing the start button, the equipment begins operation. The heating indicator on the control panel blinks, indicating the start of heating. The pressure relief valve automatically closes after the temperature reaches 102°C.

**F. Recycle and discharge cool air**

After automatically closing the solenoid valve, the temperature rises to 115°C. The valve will open to discharge the cool air until the temperature reaches 105°C. The cycle will repeat three times.

**G.Sterilization**

Once the temperature reaches the set level, the sterilization indicator on the control panel stops blinking (remains solid), indicating the start of sterilization.

**H. Exhaust (this method is strictly prohibited when sterilizing liquid)**

After sterilization is completed, automatic venting begins. (In the mode setting function, only Program A does not have the venting function and will not vent automatically)

**I. Manual Water Drainage**

After venting, if manual water drainage is needed, open the side drainage valve. Note: Be careful to avoid burns when draining water. If the water in the internal circulation kettle exceeds the maximum water level line, open the side door, remove the kettle, and pour out the excess water.

**J. Drying**

After the water drainage is complete, the automatic drying process will commence. (Note: Drying program is strictly prohibited for liquid sterilization.)

**K. End**

The panel display window shows END and a prompt sound indicates the END. Remove the cover (please wear protective gloves to remove. As the temperature will drop for some time, please be careful when taking out. At the end of operation, direct touch by hand may cause scald.

**Special note:**

**1. END is displayed at the end of the working process, and when the pressure indicates zero, open the cover to take out the goods.**

**2. With the drying function, in the abnormal operation, will occur in the barrel negative pressure phenomenon.If the inner bucket is under negative pressure, it may be inconvenient to open the lid. At this time, manually lift the relief valve bonnet up to open the lid later.**

During the program execution, if an alarm sounds, the alarm light is on, and the digital display shows a warning symbol. it indicates an error. The errors are as follows:

ERR—1: indicates that the door is not closed.

ERR—2: indicates that the water level is below the low water level.

ERR—3: indicates that the sterilization temperature is too high.

ERR—5: indicates overheat protection for heating element.

ERR—6: indicates excessive pressure.

ERR—7: indicates an unexpected interruption during the sterilization process.

ERR—8: indicates a manual interruption during the sterilization process.

ERR—9: indicates indoor temperature sensor malfunction.

ERR—10: indicates wall temperature sensor malfunction.

ERR—12: indicates heating film malfunction(for drying function).

ERR—20: indicates a timeout during the heating process.

ERR—21: indicates sterilization failure.

ERR—30: indicates automatic water inlet failure(if have).

If incorrect settings are noticed after running, press and hold any adjustment key (except "Function" and "Start") for 5 seconds to interrupt the program. Alternatively, turn the switch to the "Off" position, then back to the "On" position, and reselect the desired sterilization temperature and time settings.

**NOTE:**

**For the sterilization temperature correction/sterilization intermittent discharge time and cycle adjustment during the sterilization process: The parameters of this step are related to the equipment working performance. The user should not change the setting easily. If the user does need to adjust the parameters, please adjust as follows：**

**Temperature Correction Adjustment:** Press and hold the start button while turning on the switch. Press the start button once, and the temperature window will flash. Use the plus or minus keys below the temperature window to make corrections. Press the start button again, and the sterilization time window will flash. Use the plus or minus keys below the sterilization time window to adjust the upper limit of the emission gas temperature (105-120℃). Press the start button three or more times, turn off the switch, then turn it on again to complete the correction or adjustment.

**Emission Gas Frequency / Intermittent Emission Time and Cycle Adjustment:**

For Program A: Hold the function button and the temperature window plus or minus key. Press the start button once, and the temperature window digits will flash. Use the plus or minus keys below the flashing digits to adjust the emission frequency (1-3 times). Press the start button again to adjust the emission time (0-5s). Press the start button once more to adjust the emission cycle (1-60s). Press the start button again to adjust the emission time during gas release (0-10s). Press the start button once more to adjust the emission cycle during gas release (0-10s). Press the start button again to adjust the emission end temperature (110-120℃).

For Program B: Hold the function button and the temperature window plus or minus key. Press the start button once, and the temperature window digits will flash. Use the plus or minus keys below the flashing digits to adjust the emission frequency (1-3 times). Press the start button again to adjust the emission time (0-5s). Press the start button once more to adjust the emission cycle (1-60s).

# Attention and maintenance

**Notice:**
**1. Users should ensure an electromagnetic compatibility (EMC) environment before use to ensure the normal operation of the device.**
**2. It is recommended that users evaluate electromagnetic compatibility before using the device to ensure its normal operation.**
**3. Do not use this instrument near strong radiation sources, as this may interfere with its normal operation.**
**This product does not emit strong electromagnetic waves during operation. However, to ensure the normal use of other medical devices, avoid using it simultaneously with other highly sensitive equipment to prevent interference from electromagnetic sources.**

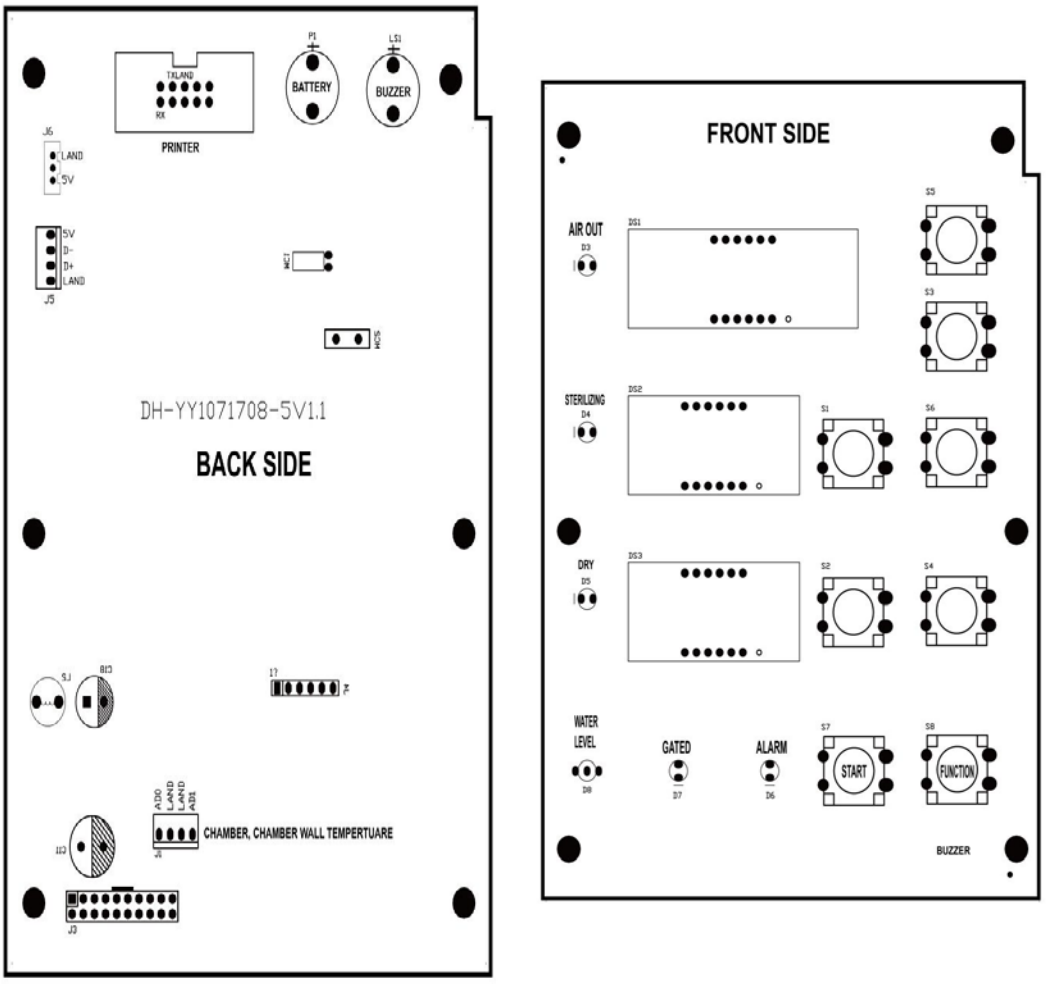
1. When stacking sterilized items (with the upper cover completely open), the mesh basket should be placed at the center of the barrel (the mesh baskets should be concentric and stacked up and down). It is strictly prohibited to block the vent holes of the safety valve. Sufficient space must be left to ensure smooth ventilation of the equipment. Otherwise, if the vent holes of the safety valve are blocked, it cannot function, leading to accidents.
2. Before each use, check whether the water level in the sterilization barrel is maintained at the specified level.
3. When the sterilizer is in continuous operation and a new sterilization operation is to be performed, allow a 5-minute interval and open the upper cover to give the equipment time to cool down.
4. When sterilizing liquids (only for program A), the liquid container should be placed in a heat-resistant glass bottle, not exceeding 3/4 of its volume. Use a cotton plug for the bottle mouth, and avoid using rubber or cork plugs without holes.
   **Special note: Do not release steam immediately after the sterilization of liquids. The residual air can only be discharged after the pressure gauge pointer returns to zero.**
5. When sterilizing containers such as beakers, flasks, and test tubes, the opening must face downward or be placed horizontally. Placing the opening upward not only makes it difficult to vent but also hinders steam from penetrating the interior, resulting in poor sterilization effectiveness.
6. For items with different types and sterilization requirements, such as dressings and liquids, do not sterilize them together to avoid damage.
7. Confirm sterilization performance: Sterilization performance varies depending on the type of items, quantity, loading method, and container type. Therefore, use sterilization indicators such as an OK card to confirm. Failure to do so may result in accidents or poor sterilization effectiveness.
8. Do not leave sterilized items in the product: This product does not have a storage function for sterilized items. To prevent recontamination, after sterilizing items such as culture media and instruments, promptly remove them and store them in a dedicated safe box.
9. At the end of sterilization (or in case of malfunctions), the pressure gauge pointer must

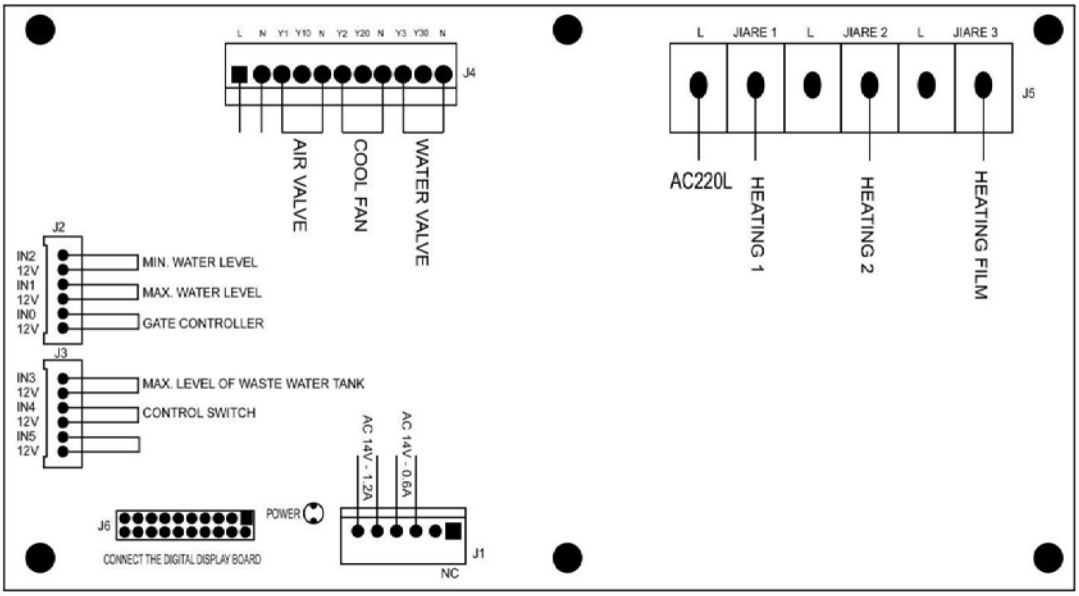
return to zero. Open the manual vent valve (or place the vent valve lever in the vent position) to allow outside air into the sterilizer. Once the vacuum is eliminated, the container lid can be opened (do not approach the lid with your face). When fully opening the lid and removing the mesh basket, be cautious of burns and pinching fingers. (Be sure to wear protective gloves when removing items. Due to the time required for the liquid temperature to decrease, extra care is needed during removal. Direct contact with hands after the operation may cause burns.)

10. After prolonged use, if the pressure gauge shows inaccuracies or cannot return to zero, it should be promptly inspected. Regular checks are recommended (ideally every 6 months) by comparing it with a standard pressure gauge. If abnormalities are found, a new gauge should be replaced. Every six months, apply an appropriate amount of high-temperature grease to the horizontal beam screw.
11. Keep the equipment clean and dry at all times. The rubber sealing gasket may age over time and should be replaced regularly (recommended every 12 months).
12. During operation, if the pressure gauge indicates over 0.24 MPa and the safety valve does not activate, immediately cut off the power, open the manual vent valve, wait for the pressure gauge to indicate 0 MPa for 1-2 minutes, then open the container lid and promptly replace the safety valve.
13. When troubleshooting requires the replacement of components, it must be done by qualified personnel with professional training or authorized personnel from the manufacturer. Disconnect the power circuit breaker, release the residual air in the container, zero the pressure gauge pointer, and send the safety valve for inspection at least once a year. Lift and lower the handle on the safety valve core several times each week to prevent valve core scaling and air leakage.
14. Do not modify for use: Unauthorized disassembly or repair is strictly prohibited, except for maintenance technicians. Otherwise, injuries may occur due to fire or abnormal operation. If screws or nuts are found to be loose during routine use, tighten them promptly to ensure normal operation.
15. Cleaning (recommended monthly): Empty the water from the container and disconnect the power circuit breaker. After the container has cooled, remove the shelves and mesh basket from the container. Use a brush to remove scale deposits on the inner walls, heating elements, and water level probes. Then, use a towel dipped in alcohol or distilled water to wipe the inner surfaces. After drying, place the shelves and mesh basket back into the container. Store the equipment in a well-ventilated room with non-corrosive gases.
16. The interlock device of the door is composed of a self-locking mechanism and a door control switch. During regular use, ensure the flexible extension and retraction of the self-locking mechanism (recommended quarterly inspection). Do not forcefully open the container lid before the pressure inside the container has been released to zero, as it may damage the self-locking mechanism. The door control switch should maintain flexible contact points. If contact points are stuck or indicator lights are not working properly, prompt maintenance is required.
17. Do not allow children to use or play with the equipment: Otherwise, it may result in burns, electric shock, or injuries.
18. Do not open the drainage valve while the equipment is in operation: When draining the

heated water, wait for at least 2 hours after sterilization is complete and ensure that the lid is open before starting the drainage operation. Failure to do so may result in burns or accidents due to the release of high-temperature hot water.

19. Fuse replacement: If the power indicator light does not illuminate after connecting the sterilizer power cord to the power source, disconnect the circuit breaker. Using a Phillips screwdriver, open the back cover of the sterilizer to inspect the fuse (specifications: R015, 10×38, 32A). If the fuse is damaged, replace it immediately.
20. Before moving, transporting, or storing, drain the water from the container, seal the sterilizer lid, disconnect the circuit breaker, and remove the power cord. When moving (release the caster locks first), push the sterilizer on a flat surface. During transportation and storage (secure the sterilizer in the packaging box), prevent loosening and abrasion. Avoid tipping to prevent injuries or accidents.
21. Transportation and storage environmental conditions:
    Ambient temperature: -40°C to +55°C
    Relative humidity range: 10% to 80%
    Atmospheric pressure range: 500 hPa to 1060 hPa
22. At the end of its service life (8 years from the production date indicated on the product label), this product and its accessories should be voluntarily handed over to qualified entities or individuals for recycling and disposal.
23. Wiring diagram:






If necessary, you can provide the circuit diagram and the necessary data for the repair. If you have any trouble in the maintenance of the electrical circuit, you can contact our company.

# 7. Analysis and elimination of common faults

| Seq | Fault Symptoms | Cause Analysis | Troubleshooting Methods |
|---|---|---|---|
| 1 | Water level light on, temperature not rising on display | a.The sterillization time is not set<br>b.Circuit board damaged<br>c.Heat tube damaged | Set the sterillization time<br>Be replaced by professional<br>Be replaced by professional |
| 2 | Operating status, shell electrified | a.Heat tube damaged<br>b.Power supply without grounding line. | Be replaced by professional<br>Grounding wires by professionals. |
| 3 | Temperature display shows - - - - | a.The temperature sensor damaged<br>b.Circuit board damaged | Be replaced by professional<br>Be replaced by professional |
| 4 | Digital display shows - O O O or garbled characters | Circuit board damaged | Be replaced by professional |
| 5 | Pressure gauge with water vapor inside | The pressure gauge spring tube leak | Be replaced by professional |
| 6 | Pressing the shift key, no blinking in the corresponding position | The control panel damaged | Be replaced by professional |
| 7 | Display ERR—1 or door control light not on | a.The cover is not closed in place<br>b.Light chain broken | a.Open the cover,and close the cover in place.<br>b.Change the light chain |
| 8 | Display ERR-2 | Water level below low water level | Add enough water |

| | | | |
|---|---|---|---|
| 9 | Display ERR 3 | Sterilization temperature too high | SCR failure and the temperature sensor failure |
| 10 | Display ERR 5 | Heating element overheating protection | Temperature control switch failure (Professional repair) |
| 11 | Display ERR 6 | Pressure too high | Pressure switch, safety valve failure (Professional repair) |
| 12 | Display ERR 7 | Power outage during sterilization process | Manually unlock by pressing the function key |
| 13 | Display ERR 8 | Manual reset during sterilization process | Manually unlock by pressing the function key |
| 14 | Display ERR 9 | Indoor temperature sensor malfunction | Replace the sensor (to be done by a professional). |
| 15 | Display ERR 10 | Wall temperature sensor malfunction. | Replace the sensor (to be done by a professional). |
| 16 | Display ERR 12 | Heating film malfunction(for drying function). | Replace the heating film (to be done by a professional). |
| 17 | Display ERR—20 | Timeout for heating | Replace heating element |
| 18 | Display ERR—21 | Sterilization temperature lower than set temperature, temperature sensor damaged; heating element damaged | a. Replace heating element (Professional replacement)<br>b. Replace temperature sensor (Professional repair) |
| 19 | Display ERR—30 | indicates Water inlet failure. | Check if the water source is sufficient, and ensure that the inlet pipe is unobstructed. The failure of the water pump or the inlet solenoid valve should be examined. |

**Packing list:**

| No | Name | Quantity | Note |
|---|---|---|---|
| 1 | Vertical steam sterilizer | 1 | |
| 2 | Product manual | 1 | |
| 3 | Pressure vessel quality certificate | 1 | |
| 4 | Basket | 2 | |
| 5 | Air releasing tube | 1 | 2 M length |

## VIII. Electromagnetic compatibility requirements:

Table 201

1 set of class B

| Guidelines and manufacturer's statement - electromagnetic emission | | |
|---|---|---|
| Vertical steam sterilizer is expected to be used in the following specified electromagnetic environment, and the purchaser or user shall guarantee its use in such electromagnetic environment: | | |
| Emission test | compliance | Electromagnetic environment - guide |
| Rf emission GB4824 | 1 set of | Vertical steam sterilizers use rf energy only for their internal functions. As a result, its rf emission is very low, and the possibility of interference to nearby electronic equipment is very small |
| Rf emission GB4824 | Class B | The vertical steam sterilizer is suitable for use in all facilities, including domestic facilities and directly connected to the public low-voltage supply grid of domestic homes |
| Harmonic emission GB17625.1 | Class A | |
| Voltage fluctuation, flicker emission GB17625.2 | Conform | |

Table 202

| Guidelines and manufacturer's statement - electromagnetic disturbance immunity | | | |
|---|---|---|---|
| Vertical steam sterilizer is expected to be used in the following specified electromagnetic environment, and the purchaser or user shall guarantee its use in such electromagnetic environment: | | | |
| Disturbance immunity test | IEC60601 test level | In line with the level | Electromagnetic environment - guide |
| Electrostatic discharge GB/T17626.2 | ±4kV contact discharge<br>±4kV air discharge | ±4kV contact discharge<br>±4kV air discharge | The floor should be wood, concrete or tile, and if the floor is covered with synthetic material, the relative humidity should be at least 30% |

| | | | |
|---|---|---|---|
| Electrical fast transient pulse group GB/T17626.4 | ±2kV on the power line<br>±1kV on input/output line | ±2kV on the power line<br>Do not apply | The network power supply should be of the quality typical for use in commercial or hospital environments |
| surge GB/T17626.5 | ±0.5 kV line to line<br>Plus or minus 1 kv line to ground | ±0.5 kV line to line<br>Plus or minus 1 kv line to ground | The network power supply should be of the quality typical for use in commercial or hospital environments |
| Voltage drop, short interruption and voltage change on power input line GB/T17626.11 | Less than 5%$U_T$, lasts 0.5 weeks<br>(on $U_T$ 95% temporary drop)<br>40% $U_T$, 5 weeks<br>(on $U_T$, 60% drop)<br>70%$U_T$ for 25 weeks<br>(on $U_T$, 30% drop)<br>Less than 5% $U_T$, lasts 5s<br>(on $U_T$ 95% temporary drop) | Less than 5% $U_T$, lasts 0.5 weeks(on $U_T$ 95% temporary drop)<br>40% $U_T$, 5 weeks(on $U_T$, 60% drop)<br>70% $U_T$ for 25 weeks(on $U_T$, 30% drop)<br>Less than 5% $U_T$, lasts 5s<br>(on $U_T$ 95% temporary drop) | The network power supply should be of the quality typical for use in commercial or hospital environments. If the user of a vertical steam sterilizer needs continuous operation during a power outage, it is recommended that the vertical steam sterilizer be supplied with an uninterruptible power supply or battery power |
| Power frequency magnetic field 50 hz GB/T17626.8 | 3 A/m | 3 A/m | The industrial frequency magnetic field should have the horizontal characteristics of the industrial frequency magnetic field in the typical commercial or hospital environment |
| Note: $U_T$ means the ac grid voltage before the test voltage is applied | | | |

Table 204

| Guidelines and manufacturer's statement - electromagnetic disturbance immunity | | | |
|---|---|---|---|
| The vertical steam sterilizer is intended to be used in the electromagnetic environment specified below, and the purchaser or user shall guarantee its use in such electromagnetic environment. | | | |
| Disturbance immunity test | IEC60601 test level | In line with the level | Electromagnetic environment - guide |
| The radio frequency transmission GB / 17626.6<br><br>Radiofrequency radiation | 3V (effective value)<br>150 KHZ ~80 MHZ<br><br>3 V/m<br>80 MHZ ~ 2.5 GHz | 3V (effective value)<br><br>3 V/m | Portable and mobile radio frequency communication equipment shall not be closer to any part of the vertical steam sterilizer (including the cable) than the recommended isolation distance, which shall be calculated using a formula corresponding to the frequency of the transmitter.<br>Recommended isolation distance d = $1.2\sqrt{p}$<br>D = 1.2 80MHz ~ 800MHz$\sqrt{p}$ |

| | | | |
|---|---|---|---|
| GB / 17626.3 | | | D = 2.3 800MHz ~ 2.5ghz$\sqrt{P}$<br>Where: P -- the maximum output power of the transmitter provided by the transmitter manufacturer, in watts (W)<br>D -- -- recommended isolation distance in meters (m)<br>The field intensity of a stationary rf transmitter, determined by surveying the electromagnetic field *should be lower than the coincidence level in each frequency range *.<br>Interference may occur near devices marking the following symbols.<br> |
| Note 1 at 80MHz and 800MHz, a higher frequency formula should be used.<br>Note 2: these guidelines may not apply in all cases.Electromagnetic propagation is influenced by the absorption and reflection of buildings, objects and the human body. | | | |
| The field strength of stationary transmitters, such as radio telephone and ground mobile radio stations, ham radio, am and FM radio broadcasts, and television broadcasts, cannot be predicted theoretically.In order to evaluate the electromagnetic environment of the fixed radio frequency transmitter, the investigation of electromagnetic field should be considered. If the field intensity in the place where the vertical steam sterilizer is measured is higher than the above rf coincidence level, the vertical steam sterilizer should be observed to verify its normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorientation or position of the vertical steam sterilizer.<br>* in the whole frequency range of 150kH ~ 80MHz, the field intensity should be lower than 3V/m. | | | |

Table 206

| |
|---|
| Recommended isolation distance between portable and mobile radio frequency communication equipment and vertical steam sterilizer |

Vertical steam sterilizers are expected to be used in electromagnetic environments where rf radiation disturbance is controlled. According to the maximum output power of the communication equipment, the buyer or user of the vertical steam sterilizer can prevent electromagnetic interference by maintaining the minimum distance between the portable and mobile radio frequency communication equipment (transmitter) and the vertical steam sterilizer

| Maximum rated output power of transmitter W. | Interval distance /m corresponding to different frequency of transmitter | | |
|---|---|---|---|
| | 150 KHZ to 80 MHZ $D = 1.2\sqrt{P}$ | 80 MHZ to 800 MHZ $D = 1.2\sqrt{P}$ | 800 MHZ ~ 2.5 GHz $D = 2.3\sqrt{P}$ |
| 0.01 | 0.12 | 0.12 | 0.23 |
| 0.1 | 0.38 | 0.38 | 0.73 |
| 1 | 1.2 | 1.2 | 2.3 |
| 10 | 3.8 | 3.8 | 7.3 |
| 100 | 1.2 | 1.2 | 23 |

For the maximum rated output power of the transmitter not listed in the above table, it is recommended that the isolation distance d, in meters (m), can be determined by the formula in the corresponding frequency column of the transmitter. Here, P is the maximum rated output power of the transmitter provided by the transmitter manufacturer, in watts (W).

Note 1 at 80MHz and 800MHz frequency points, a higher frequency formula should be used.

Note 2: these guidelines may not apply in all cases.Electromagnetic propagation is influenced by the absorption and reflection of buildings, objects and the human body.

This product will not generate strong electromagnetic wave during operation, but to ensure the normal use of other medical devices, try to avoid using it at the same time with other highly sensitive instruments and equipment, so as to avoid the interference of electromagnetic source.