



Laboratory Equipment Manufacturer
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Operation Manual

Vertical Pressure Steam Sterilizer

(Please read the manual carefully before operating this machine)

UTKBS-150LV



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MRC.2.19

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Chapter 1: Overview

The vertical pressure steam sterilizer (Hereinafter referred to as sterilizer) applies pressurized saturated steam. By using the principle of gravity displacement, it makes the steam move from top to bottom inside the sterilizer, and it discharges the cold air from the lower discharge hole. The cold air discharged will be replaced by the saturated steam, and the latent heat released by the steam can be used to sterilize the articles.

The sterilizer can be used by medical institutions for sterilization purposes of medical apparatus and instruments which can resist pressure and high temperature steam.

The sterilizer is produced according to the relevant regulations of Safety Requirements of Electrical Equipment for Measurement, Control and Laboratory - Part 1: General Requirements (GB 4793.1-2007), Safety Requirements of Electrical Equipment for Measurement, Control and Laboratory - Particular Requirements of Autoclaves for the Treatment of Medical Materials (GB 4793.4-2001), Vertical Steam Sterilizer (YY 1007-2010), Safety Technical Supervision rules for Fixed Pressure Vessels (TSG 21-2016), Pressure Vessel (GB150.1~GB150.4) and other technical specifications.

The production process of the sterilizer meets the Hygienic Standard for Production Enterprises of Disinfectant Products.

The sterilizer meets the technical requirements of Vertical Pressure Steam Sterilizer.

Chapter 2: Technical Characters

2.1 The working temperature should range from 5°C to 40°C, the relative humidity should be no higher than 85%, and the atmosphere pressure should be between 70Kpa and 106Kpa. The altitude is less than 2000 meters.

2.2 This equipment is a fixed installation permanently connected to the power in the Lab and the external power should be of three-Phase, five-Wire.

2.3 The basic parameters for pattern and dimension of the sterilizer meet the requirements of Regulations on the Supervision of Safety technology for Pressure Vessels.

2.4 This fast-open sterilizer is equipped with safety interlocking device and caution light.

2.5 The pressure indicator of this equipment ranges from 0MPa to 0.4MPa.

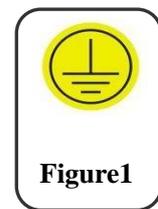
2.6 The control system of the sterilizer is controlled by microcomputer, the version of software released is V1, and the model specification is *SWJ-8003-ZD-1*.

Software functions:

- a. Temperature sampling function
- b. Door switch detection function
- c. Water level detection function
- d. Sterilization control function
- e. 485 communication function

2.7 Warning tags are attached in appropriate positions of the sterilizer to alert the user. The user is supposed to read through the accompanying documents to master the operation of the equipment.

2.8 The rated working pressure of the sterilizer is 0.217MPa, the highest working temperature is 134°C, and the noise is less than 65dB under normal working condition (A weight).



2.9 The equipment is equipped with reliable protective earthing connection with a clear grounding tag(see **Figure1**) .

2.10 The sterilizer is equipped with a lower steam (water) discharge valve. When the sterilization is completed, the lower steam (water) discharge valve can be manually opened to quickly discharge the steam (water).

The steam makes it cool rapidly (See the equipment structure diagram).

2.11 The sterilizer is equipped with a solenoid valve. It can discharge steam or water automatically. If the steam or water discharge function key is selected, when the sterilization is completed, the solenoid valve will be booted to conduct steam or water discharge.

2.12 Protection Class: 1, Pollution Degree: 2, Over voltage Category: II, Operating Conditions: Continuous Operation.

2.13 Goods are sterilized in this equipment by utilizing the pressurized saturated steam generated from a solution with a boiling point of 100°C.

Chapter 3: Technical Parameters

3.1 The inner diameter, volume and dimensions of this series of Sterilizer are shown in the table below (Table 1): Table 1

Volume	Power	Power supply voltage	Booting way	Interlocking device	Work pressure	Work temperature	Net weight
100L	2Kw×3	380V 50Hz	Fast booting	Yes	0.217MPa	134°C	144Kg
150L	2Kw×3	380V 50Hz	Fast booting	Yes	0.217MPa	134°C	162Kg
200L	2Kw×3	380V 50Hz	Fast booting	Yes	0.217MPa	134°C	180Kg

3.2 The sterilizer is provided with a safety valve, the set pressure is 0.24Mpa, and the reseating pressure is ≥ 0.217 MPa. The pressure difference between opening and closing is not more than 0.023MPa.

3.3: The RT14~RT18 fuse equipped on the sterilizer ($\phi 10 \times 38$, 380V 16A×3) can effectively cut off the overrun short-circuit current.

3.4 The sterilizer is equipped with a door (cover) interlocking device. When the door (cover) is closed, the door (cover) status lamp will show that the door (cover) is closed; when pressing the start key, the working lamp and the door (cover) interlocking lamp will be on, and the door (cover) will be locked and can't be opened; when the steam pressure is released, the door (cover) can't be opened, until the pressure gauge pointer has returned to zero and the interlock has been unlocked, (**Figure 2**)

3.5 The service life of the fast door opening interlock device for the sterilizer is 5,000 sterilization cycles.

3.6 In the sterilization cycle of 121°C, 126°C and 134°C, the maintenance time of the sterilizer shall not be less than 20min, 15min and 4min respectively.

3.7 The sterilizer is equipped with a temperature test connector TT (**Figure 3**), which is convenient for

the connection test instrument to calibrate all the instruments connected to the sterilizer. Special sealing joint is used (Need to be equipped additionally) to connect the test instrument, so as to calibrate all the instruments connected to the sterilizer and test the temperature of each point in the sterilization room.

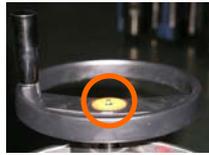


Figure2

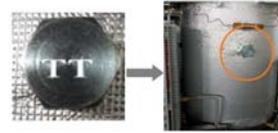


Figure3

Chapter 4: Installation Requirements

4.1 Before using the equipment, the operator should refer to the accompanying documents for the operation and safety items of the machine.

4.2 The equipment should be placed in a dry spacious room with good lighting and ventilation conditions as well as smooth floor.

4.3 The protective grounding wire should be reliably connected to the outside grounding.

4.4 The power for the sterilizer is three- phase, five-wire.

From the moment of leaving the factory, the five wires are respectively marked with L1, L2, L3, N and E. (. Among them, L1 , L2 and L3 are all live wires; N is zeroline; E is protective grounding wire.) The zero line and grounding wire can not be connected as one.

4.5 The sterilizer and grid power are permanently connected equipment. Users must be on a building which is more than 50cm away from the equipment.

At the height of 1.5m, there is a circuit breaker (And indicate "Only used for sterilizer"), and the load current of the circuit breaker must be greater than 16A. Before the power line of the sterilizer is connected to the circuit breaker, it must be fixed on the building, so as to prevent it from falling off the circuit breaker. The minimum off-ground distance for the exposed part of the power line must be greater than 150mm.

4.6 To emit waste water for cleaning the equipment, there should be a sewer beneath the position where the equipment is located.

4.7 Caster wheels are equipped at the bottom of the sterilizer to facilitate handling. When the equipment is moved to a specific location, it should be stopped with caster breakers or fixed with a space block to avoid further slipping.

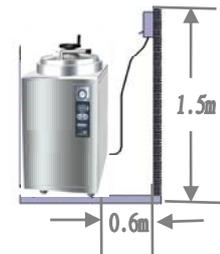


Figure4

Chapter 5: Entry Operation

5.1 Identification Instruction

5.1.1 Control Panel(See Figure5)

1) **Door interlock lamp** --- After pressing the start key for about 5 seconds (or after pressing the locking key for more than 5 seconds), the door interlock lamp will be on.

2) **Work lamp** --- After normal heating, the work lamp will be on.

3) **Door status lamp** --- Display the door opening and closing status. If the door is not opened or closed in place, it will

display the error code ER08, and the door status lamp will flicker.

4) **Digital display window** --- Display the temperature of sterilization room, and the timing status of sterilization.

5) **Add key** --- Also the locking key of door interlock. After pressing the confirmation key, the temperature or time will flicker, then the temperature or time can be added (According to the prescribed value, the temperature or time can only be added, but can't be reduced). After pressing more than 5 seconds, the door interlock will be locked (After pressing the start key for 5 seconds, it will be naturally locked).

6) **Confirmation key** --- After pressing the confirmation key, the temperature will flicker; after pressing it again, the time will flicker. Through the add key, add the temperature or time as well as choose the setting of waiting time after draining the solenoid valve.

7) **Shift key** --- Also with start / stop key function. After putting well the material to be sterilized, cover the sterilizer, then the door (cover) status lamp will be on. After setting well the temperature and time, press the start key (shift key) for more than 5 seconds, then the work lamp and door interlock lamp will be on successively, and the sterilizer will enter the sterilization cycle.

8) **Reduce key** --- Also the unlocking key of door interlock. After pressing the confirmation key, the temperature or time will flicker, then the temperature or time which has been added can be reduced.

9) **Work water level lamp** ---When the water level is higher than the low water level but does not reach the normal operating water level, the working water level lamp is on (If the water level is abnormal, there will be an error code ER07 and the buzzer will alarm).

10) **High water level lamp** --- When the water level reaches the high water level, the high water level lamp will be on; when it is below the high water level, the high water level lamp will be off (When the high water level lamp is on, the sterilizer will not work; at this time, the water level needs to be reduced, until the high water level lamp, the work water level lamp and the low water level lamp are all off.).

11) **Low water level lamp** --- When the water level is above the low water level, the lamp will be on; when the water

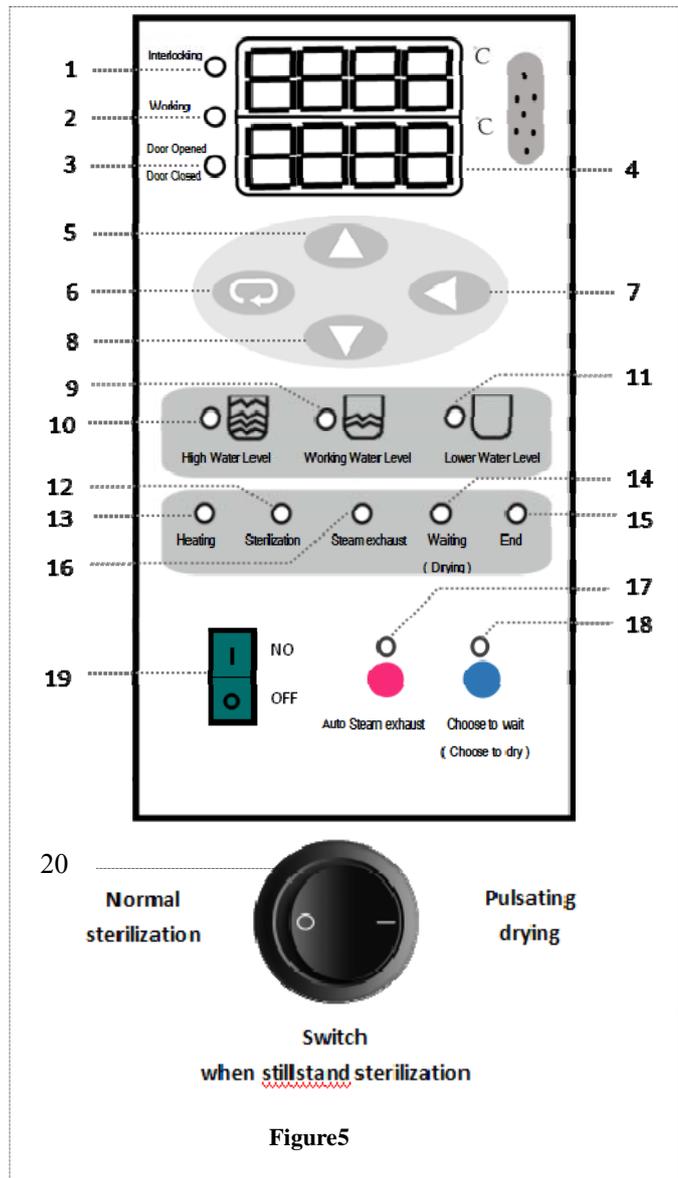


Figure5

level is below the lower water level, the lamp will be off.

12) **Sterilization status lamp** --- When the temperature in the sterilizer reaches the set temperature, the sterilization status lamp will be on.

13) **Heating status lamp** --- After pressing the start key, the sterilizer will start to work, and the heating status lamp will be on.

14) **Waiting function lamp** --- Choose the waiting function lamp and wait for the falling of temperature in the sterilizer to 95 °C then the lamp will be on.

15) **End lamp** --- When the whole process of sterilization is completed, the setting window will appear END, the end lamp will be on and there will be a buzzer prompt.

16) **Steam and water discharge function lamp** --- Choose the steam and water discharge function key, then the lamp will be on.

17) **Steam and water discharge function key** --- When the sterilization lamp is on, choose this key, then after the sterilization is completed, the gas and heating water in the sterilization room will be discharged automatically.

18) **Waiting function key** --- After discharging steam / water automatically, choose this key, then the sterilizer will enter the waiting time countdown.

19) **Control power switch** --- Power on and off of the control system.

20) **Transfer switch** --- When discharging steam automatically, choose to discharge steam or water.

5.1.2 Warnings and warning labels

Table 2

			
Warning	Caution, hot!	Be careful with electricity!	Protect the earthing terminal

5.1.2.1 Meanings of

5.1.2.1.1 Warning: It may cause serious damage to the human body. Where you not follow this Manual to use the sterilizer, its protective function may be impaired and it may cause injury.

5.1.2.1.2 Please carefully read this Manual and carry out operation, maintenance and repair in strict accordance with requirements herein.

5.1.2.1.3 Before opening the top cover, please confirm that the pressure in the sterilization chamber has dropped to “0Mpa”. If it is forced to open, it may emit high-temperature and high-pressure steam, leading to burns and other accidents.

5.1.2.2 Meanings of

5.1.2.2.1 Please avoid letting face and hands approach door of the sterilization chamber for there is large amount of hot steam emitting from the chamber in case the door is opened with high temperature within the chamber after completion of the sterilization cycle.

5.1.2.2.2 Prohibit approaching and obstructing steam exhaust port.

5.1.2.3 Meanings of

5.1.2.3.1 The live wire (L), natural wire (N) and earthing wire (E) must be connected to the grid according to their signs, and the natural wire and earthing wire shall not be connected in parallel.

5.1.2.3.2 The power line shall not be in contact with strong acid and alkali items. All pipes should be fixed.

5.1.2.3.3 After use, the circuit breaker should be disconnected.

5.1.2.4 Meanings of 

The sterilizer is equipped with protective grounding and must be firmly grounded. The natural wire and earthing wire shall not be connected together.

5.2 Instructions on the Placement of the Equipment

5.2.1 The equipment must be put alone in an independent spacious room with good ventilation and lighting conditions as well as smooth floor. No other equipment or caustic goods shall be put in the same space with the equipment.

5.2.2 The equipment must be put in the position where it can be conveniently operated and switched off.

5.2.3 The fuse, heating tube, solid state relay, pressure gauge, safety valve and sealing ring on the equipment are all consumables that the equipment should be placed in a position where these parts and components can be easily disassembled and installed. No other objects should be placed in the 50cm-diameter circle with the sterilizer as the center.

5.2.4 Incrustation and deposits will emerge after the equipment has been repeatedly used, so that the equipment should be placed in a position where it can be conveniently cleaned.

5.2.5 Under the back of the sterilizer, there is an outlet for lower steam / water drainage pipe, and it is best to connect it to the sewer, so as to prevent the high temperature gas and water discharged from scalding anybody.

5.3 Operation of the Equipment

Prior to use, the accompanying documents of the pressure vessel must be registered in the local auditing agency for filing. The operator must be well trained to familiarize with the operation of the pressure vessel. Each operation must be performed in accordance with the requirements of instruction book to prevent any misoperation or accidents. When the equipment is working, someone professional must be available to avoid any accident.

5.3.1 Open the lid

Note: Before opening the lid, it must be checked that the pointer of the pressure gauge has returned to zero and there is no pressure in the autoclave.

Rotate anticlockwise the hand wheel (see **Figure 7**) several turns until it can't be moved any more and the lid then gets completely separated from the hold down groove(see **Figure 8**). Heave up the handle (see **Figure 9**) and the lid can be opened.



Figure



Figure



Figure

5.3.2 Power on the equipment

Connect the power supply which is consistent with the nameplate of the



Figure10

device; turn the power supply control switch to ON position, then the power supply lamp will be on; (**Figure 10**) the work water level lamp and the low water level lamp on the control panel will all bright, accompanied by buzzing alarms, while the "high water level" lamp will not bright. (The sterilizer is in water cut-off status).

5.3.3 Add water

Open the lid, add 12L pure water into the evaporating pan (see **Figure 11**). While doing so, the operator should watch the water level indicator light on the control panel (see **Figure 12**): the "low water level" lamp and the "work water level" lamp will go out and the alarm will stop. When the "high water level" lamp comes on, it means too much water is added. At this time, the operator should adjust the manual drain valve to the drain position to drain water(see **Figure 13**) until the three water level lamps are all off. (Every time, the operator must add water until the three water level lamps are not lighted before using the equipment. Otherwise the heating pipe will not work properly).The drain valve should be opened at the end of each work to release the sewage from the sterilizer.



Figure 11

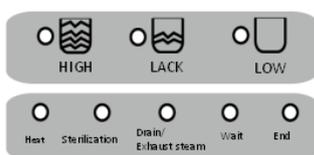


Figure 12

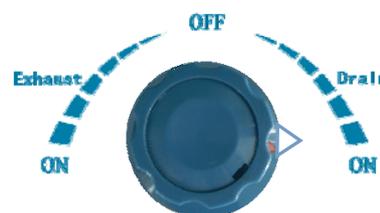


Figure 13

5.3.4 Pile up items

The packed items (preferably with a volume of not more than 200×200×100mm) are piled up in the sterilization basket (**Figure 14**) in turn. There should be some space between each two packs so that the steam can penetrate thoroughly to achieve better sterilization results. Remember that the packed items should not block the release holes of safety valve (**Figure 15**), or else the steam pressure can not be released easily that there might be an explosion in the pan.



Figure1



Figure 15



Figure 16

5.3.5 Seal up the lid

Put down the sterilizer cover, rotate the hand wheel clockwise until it is in place, then the door status lamp will be on (As shown in **Figure 16**).



Figure17



Figure18



Figure19

5.3.6 Temperature and Time Setting

Once powered on, the lights of digital display window on the control panel(**Figure 19**)will be on. The temperature effective adjustable range is 105°C~134°C (When the display temperature exceeds the set temperature by more than 2°C, the microcomputer will start over-temperature alarm and stop heating).The effective setting time is 60min, the time runs by the countdown form, and when the temperature in the sterilizer reaches the set value, the timer will begin to countdown (When the safety valve takes off and releases pressure, the timer will loose timing function). According to the sterilizer industry standard, the corresponding time of sterilization temperature must match, and the time can only be increased and cannot be reduced, such as: the time for 121°C cannot be less than 20min; the time for 126°C cannot be less than 15min; the time for 134°C cannot be less than 4min.

5.3.6.1 Operating Steps for Setting Temperature

□ Press the key for confirmation  (**Figure20**) to enter the setting procedure of the digital display; if the red digital display (**Figure21**) is flickering, it indicates that setting can be started now.



Figure20



Figure21

□ Press the key for increase  to increase the temperature and key for decrease  to reduce the temperature (see **Figure22**). The five choices of temperature are: 105°C, 115°C, 121°C, 126°C, 134°C.Having set the temperature, the operator needs to press the key of confirmation  again (**Figure23**) to confirm the newly set data. The procedure of setting temperature ends when the newly set data are confirmed.



Figure2



Figure2

5.3.6.2 Operating Steps for Setting Time

□Having finished setting the temperature, the operator needs to press the key for confirmation  once more to switch over to the procedure of setting time. When finding the green setting window (Figure21) flickering, it indicates that time setting can be started. The first two digits indicate the hour while the last two digits indicate the minute.

□ Press the key of increase  (Figure22) to increase time.(The time corresponding to temperature can only increase and cannot decrease.)

- ③ After adjusting the required heat preservation temperature, the confirmation key  must be pressed again to confirm the new setting time. After confirmation, the time setting program is completed.
- ④ After choosing the time of sterilization, press the confirmation key , then the waiting time can be set.

Tip:

■ When any setting failure or operation error occurs, and the data needs to be readjusted, then only need to press the confirmation key  (Figure 23), and choose temperature or time. When the data in the green setting window is flickering, it can be reset.

■ Shift key  (figure 24) can only shift the flickering data in the status of setting digital display, so as to adjust the data quickly.



Figure24

5.3.7 Sterilization

After the setting of temperature and time is completed, when pressing the start key, the sterilizer will enter the sterilization program. When the heating lamp on the control panel is on, it shows that temperature and pressure are rising normally in the sterilization room. As the temperature rises, when the temperature in the sterilization room reaches the set value, the heating lamp will be off, showing the status of heat preservation; at the same time, the automatic control system will begin to conduct sterilization countdown, and the time required for the sterilization will be shown in the setting window (Figure 26) on the control panel.



Figure2



Figure2

Tip:The sterilizer has the function of automatic discharge. Before 102°C, the lower gas discharge valve will discharge gas automatically; after 102°C, it will stop automatically. In order to achieve a better sterilization effect, after 102°C, please rotate the lower gas discharge valve manually, so as to maintain a trace of gas discharge.

5.3.8 End of sterilization countdown

5.3.8.1 Manual steam and water discharge

Rotate the steam and water master discharge valve clockwise to the “open” position (Figure 13), so that the water and steam in the sterilizer can be discharged rapidly, and residual water vapor on the articles can be vaporized quickly.

5.3.8.2 Automatic steam and water discharge

In the timing process of sterilization, if the automatic steam and water discharge key is chosen, after the sterilization is completed, the solenoid valve will open, and steam or water discharge can be chosen by the transfer switch under the operation control panel.

5.3.8.3 Waiting function

① In the timing process of sterilization, first press the “Automatic steam and water discharge function key”; after the steam discharge is completed, press the “Waiting key”, then it will begin to enter the set program of waiting time countdown.

Tip: After the sterilization countdown comes to an end, if the temperature shown by the digital display window, the buzzer rings for several times, the digital display window shows End, the door interlock lamp is off and the pressure gauge pointer returns to zero, then the upper cover can be opened.

5.3.9 Cover opening

Rotate the hand wheel anticlockwise (Figure 27), until it cannot be rotated, so that the pot cover is completely separated with the fixed slot (Figure 28), then manually lift the handle up, and then the pot cover can be opened (Figure 29). At this time, the power supply can be turned off.



Figure2



Figure2



Figure2

Chapter 6: Care and Maintenance of the Equipment

If any parts or components need to be replaced, the operation must be performed by the qualified person that has received professional trainings or the one from the manufacturer. Prior to the replacement, the professional must first disconnect the breaker to let go the residual steam and wait until the pointer of the pressure gauge returns to zero.

Fault Analysis and Troubleshooting

Table 3

No.	Fault Phenomenon	Cause Analysis	Troubleshooting
1	The actual temperature of the pressure gauge doesn't agree with the digit displayed.	There is cold air in autoclave.	Open the master vent and drain valve appropriately.
2	The water level exceeds the	The inner bore of water level	

	high water level, but the indicator light (green light) is off.	regulator gets blocked.	The professional dredges the pipe.
3	The high water level indicator light (green light) is on without having the temperature displayed increased.	a. Holding time has not been set. b. The solid state relay is broken. c. The tubular electric heating element is broken.	Set holding time. The professional replaces the broken solid state relay or/and the broken tubular electric heating element.
4	The red digital display window shows- - - -	a. The temperature transmitter is broken. b. The control panel is broken.	The professional replaces the broken parts.
5	The digital display window shows- O O O	The computer control panel is broken.	The professional replaces the broken part.
6	There is no water in autoclave and the heating light (green) is on.	The water-level needle gauge is in contact with the copper shell.	a. Cut off the electricity immediately. b. Revise the water-level needle gauge.
7	There is water vapor in the pressure gauge.	Vapor leaking is found at the joints.	The professional tightens up the joints.
8	When pressing the shift key, there is no flicker.	The control panel is broken.	The professional replaces the control panel.
9	The interlocking light is off or there is no beep.	a. The lid is not tightly closed; the interlocking pin is not in place. b. The interlocking light is broken. c. The water level is lower than the low water level sensor.	a. Open the lid and reclose it tightly. b. The professional replaces the interlocking light. c. Open the lid and refill water to the level higher than the low water level sensor.
10	Water leakage is found on the seal ring.	The seal ring is broken.	The professional replaces the broken seal ring.
11	Start to heat the yielding water of the gas discharge pipe	The transfer switch under the control panel is not shifted to "Gas discharge status"	Shift the transfer switch to "Gas discharge status"
12	Abnormal display of temperature in the digital display window	Dry burning and damage of the electric heating pipe	Replace the electric heating pipe by professionals

List of Major Components

Table 4

No.	Name	Specification	Quantity	
1	Pressure temperature switch	P0.5-2.5	1	
2	solid state relay	440V 40A	3	
3	rocker switch	250V 15A	1	
4	fuse	RT18-32 380V 16A	3	
5	Circuit fuse	5F 250V 5A	1	
6	tubular electric heating element	2000W	3	
7	spring-loaded safety valve	0.217-0.24Mpa	1	
8	steam relieve valve	0.25Mpa	1	
9	pressure gauge	1.6 级	1	
10	silica gel seal ring		1	

Packing List

Table 5

No.	Items	Quantity	Remarks
1	Vertical Pressure Steam Sterilizer	1	
2	Instruction for Use	1	
3	Product Certification and Warranty Card	1	
4	Quality Tracking Card	1	
5	Inspection Certificate for Pressure Vessels	1	
6	sterilization baskets	Based on actual items	
7	Water tray	1	

6.1 The equipment is equipped with over-voltage safety device - safety valve. At ordinary times, pliers should often be used to pull the safety valve suriko upwards for several times, so as to maintain the

sensitivity of the safety valve. When the sensitivity of the safety valve fails, it should be replaced in time.

6.2 The equipment door (cover) has a mechanical linkage device, and it is coated with lubricants. The operator shall check the mechanical linkage locking device of the door (cover) in every six months, and shall apply medical vaseline, so as to ensure lubrication and reduce wear and tear. When found that there is serious wear and tear, the supplier shall be contacted for replacement. The replacement shall be conducted by trained professionals.

6.3 After the linkage device of the equipment has worked for 5,000 sterilization cycles, the manufacturer or supplier shall be contacted for replacement.

6.4 The service life of the sterilizer is 10 years, and the production date can be seen in the product nameplate.

Chapter 7: Structure Chart and Electrical Diagram



1. hand wheel

2. lid

3. pan

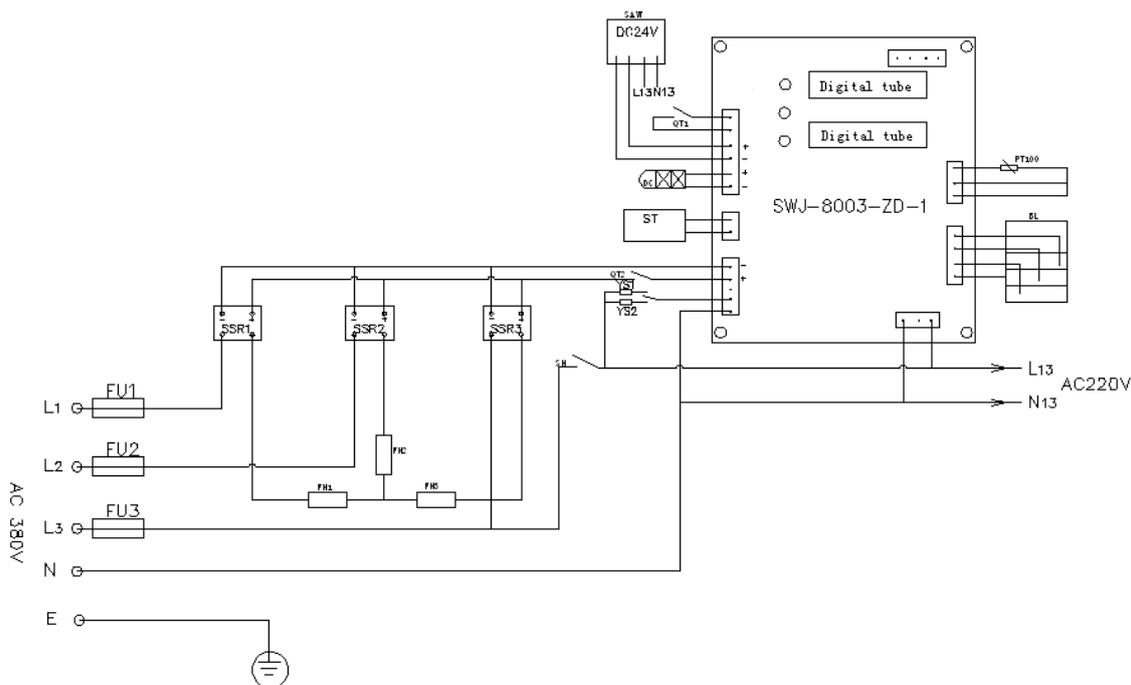
4. safety valve, steam release valve

5. master vent and drain valve (manually operated)

6. pressure gauge

7. control panel

8. castor wheel



Chapter 8: Precautions

8.1 When stacking the articles to be sterilized, it is strictly forbidden to block the gas discharge hole of safety valve and gas discharge valve, and the vacancy must be left out to ensure that the air is unblocked; otherwise, the safety valve and gas discharge valve cannot work due to blocking of the gas discharge hole, and result in accident.

8.2 It is strictly prohibited to put liquids, strong acidity and alkalinity materials, bulk particles, thermal expansion materials, inflammables and explosives, sealed containers (Especially glassware), materials which are not resistant to high temperature, materials which are volatile, toxic, polluted or not suitable for steam sterilization etc into the sterilizer for sterilization.

8.3 The equipment should use pure water as far as possible, so as to prevent scale, and for the quality index of supply water, see the appendix.

8.4 For different types of materials with different sterilization requirements, do not put them together for sterilization, so as not to cause any loss.

8.5 At the end of sterilization, if the pressure gauge pointer has returned to zero, while the cover is not easy to be opened, then the plug of the steam discharge valve can be placed in the steam discharge position, so that the external air can enter the sterilizer. After the vacuum is eliminated, then the cover can be opened.

8.6 After the pressure gauge is used for a long time, if the pressure indicator is incorrect or cannot return to zero position, then it should be repaired timely. At ordinary times, it should be compared with the standard pressure gauge regularly; if it is abnormal, then it should be replaced with a new gauge. The pressure gauge shall be calibrated at least once in half a year.

8.7 At ordinary times, the equipment should be kept clean and dry, so as to extend the service life. The equipment should be cleaned once a week. At first, cut off the power supply, take down the inner tank, then brush away the scale attached to the inner wall, and then dry it with dry cloth.

8.8 The sealing ring should be cleaned regularly. Take out the sealing ring in the lower seal of the sterilizer, then use fresh water to clean up the whole sealing ring and the edge groove. After wiping and drying, fit the sealing ring back to the groove of the lower seal. After being used for a long time, the rubber seal will be worn out, so it should be changed regularly.

8.9 Replacement instructions of fuse and other components:

When the power line of the equipment is connected to the power supply, if found that the power lamp is not on, then the connection of the circuit breaker should be checked to confirm whether it is intact; if it is intact, then the fuse should be checked to confirm whether it is intact; if it is damaged, then it should be changed immediately, so that the equipment can run normally.

8.10 The reliability of the safety valve should be checked regularly and annually, otherwise it cannot release pressure and may result in excessive pressure in the pot, which will cause a burst accident of the pressure vessel. It should be calibrated at least once in a year.

8.11 Within 12 months since the product is purchased, if the user has fully complied with the use rules stipulated in the user manual, and the user has not made unauthorized change on the internal structure of the product, when found that the product cannot work normally, the manufacturer shall be responsible for replacement or repair freely.

8.12 The external power supply of the equipment shall be equipped with a electricity leakage protection air switch, which must be larger than 16A.

8.13 The input power voltage of the equipment is 380V, and the fuse is RT18-32 380V 16A.

8.14 If electrical fittings need to be used, they should be purchased from our factory or the qualified products with safety certification marks should be purchased in the market.

8.15 In the list of main components, if any component is damaged and needs to be replaced, then the manufacturer should be contacted timely, so as to draw up a replacement plan.

Chapter 9: Information Appendix

13.1 Please refer to Table 6 for quality indexes of water supply.

Quality Indexes of Water Supply

Table 6

Items	Indexes
Evaporation residue	≤10 mg/L
Silicon chloride (SiO ₂)	≤1 mg/L
Iron	≤0.2 mg/L
Cadmium	≤0.005 mg/L
Lead	≤0.05 mg/L
Other heavy metals except iron, cadmium and lead	≤0.1 mg/L
Chloride ion (Cl ⁻)	≤2 mg/L
Phosphate (P ₂ O ₅ ⁻⁵)	≤0.5 mg/L
Conductivity (25℃)	≤5 μS/L
pH value	5~7.5
Appearance	Colorless and clean without sediment
Hardness (total amount of alkaline metal ions)	≤0.02 mmol/L

Note: The consistency test results shall comply with the known analytical methods.

13.2 See Table 7 for quality indexes of steam condensate.

Quality Indexes of Steam Condensate

Table 7

Items	Indexes
Silicon chloride (SiO ₂)	≤0.1 mg/L
Iron	≤0.1 mg/L
Cadmium	≤0.005 mg/L
Lead	≤0.05 mg/L
Other heavy metals except iron, cadmium and lead	≤0.1 mg/L
Chloride ion (Cl ⁻)	≤0.1 mg/L
Phosphate (P ₂ O ₅ ⁻⁵)	≤0.1 mg/L
Conductivity (25℃)	≤3 μS/L
pH value	5~7
Appearance	Colorless and clean without sediment
Hardness (total amount of alkaline metal ions)	≤0.02 mmol/L

Note: Please refer to Chapter 22 of EN-285:2006 for test method of steam quality.