

Instruction Manual

Autoclave/Pressure Steam Sterilizer

LFSS12BA

LFSS18BA

LFSS23BA



Manufacturer:

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Customer Record

Overview

Description:	Pressure Steam Sterilizer / Autoclave
Model number:	
SN:	

Attentions:

- Please read the manual carefully before operating the steam sterilizer.
- Please operate the steam sterilizer strictly according to this manual.
- Please keep this manual for reference.
- Please contact your local distributor or us if there are any problems with the steam sterilizer.
- The person who operates and maintains the steam sterilizer shall be specified and well trained.

This instruction manual covers the following models:

LFSS12BA, LFSS18BA, LFSS23BA.



Please do not operate the device without reading this manual in advance.



Please use distilled water only. If tap water is used, the steam sterilizer might be damaged and the warranty will be invalid.

Symbols

	Symbol for "Caution!"
	Symbol for "PROTECTIVE CONDUCTOR TERMINAL"
	Symbol for "HOT SURFACE, KEEP AWAY"
	Symbol for "ENVIRONMENTAL PROTECTION – Electrical wastes should not be disposed together with household wastes. If possible, please contact local distributor or government to recycle it."
	Symbol for "MANUFACTURER"
	Symbol for "COMPILES WITH MDD93/42/EEC REQUIREMENTS"
	Symbol for "DATE OF PRODUCTION"
	Symbol for "SERIAL NUMBER"
	Symbol for "EUROPEAN REPRESENTATIVE"
	Symbol for "THIS SIDE UP"
	Symbol for "KEEP AWAY FROM RAIN"
	Symbol for "DO NOT ROLL"
	Symbol for "STACKING LIMITED 3"
	Symbol for "Room Temperature: 5°C~40°C"
	Symbol for "Relative humidity: ≤80% "

Important Safety Information

Please read below carefully.



Electric shock, fire or equipment damage might happen if you ignore below warnings.

- ❖ Please use a 3-pin socket, and ensure the socket has been earthed. Do not put the steam sterilizer in a place where the power source is hard to reach or has unreliable electricity connectivity.
- ❖ Do not use power with a different voltage than that stated in this manual.
- ❖ Do not touch the plug or socket with wet hands.
- ❖ Do not pull, change, over-bend or twist the wires, and do not put heavy things on the wires.
- ❖ Do not put the steam sterilizer on an unstable surface.
- ❖ Do not block the door of the steam sterilizer, or cover the ventilation holes or radiation holes.
- ❖ Do not put anything on top of the steam sterilizer.
- ❖ If you experience any abnormal smell or sound during operation, please disconnect the power immediately and contact your local distributor or us.
- ❖ If you do not intend to use the steam sterilizer for a long period of time, please disconnect the power and store the steam sterilizer in a dry, cool place.

Recommended Safety Information

- Every 150 cycles, the germ-tight filter needs to be replaced.
- Solid/unwrapped programs can only sterilize solid instruments without wrapping, such as pliers, forceps etc.
- Check the instrument's maximum temperature resistance and choose a proper temperature. Don't sterilize any instruments where temperature resistance is below 121°C.
- Failure to adjust atmospheric pressure may stop the sterilizer from being operated.
- The user must turn the door handle to the max. position. Otherwise the sterilizer will not start, and there will be an "E6" alarm.
- If the signal for clean water is showing on the sterilizer, please fill up with clean water prior to using.
- The plastic tray-hand-holder should be used to remove the trays after sterilization.
- Do not open the door until the chamber pressure has decreased to "-05-05".
- Please carry out a leak test check after adjusting the door. If there is any leakage, the door must be adjusted again.
- If the door is too loose, the door seal might burst.
- Do not drag the machine.
- Pressure units: 1 bar= 0.1 MPA= 1.0 X 10⁵ PA = 1 barometric pressure

1. Brief introduction

This steam sterilizer is an automatic type steam sterilizer, which is very easy to operate. The parameters and conditions of the program will be displayed automatically on the digital screen during the sterilization. If a problem occurs, the steam sterilizer will alarm automatically. Should the unit over heat or exceed the recommended pressure, the steam sterilizer will automatically stop working to ensure the safety of the operator. Inside the steam sterilizer, there is a separate waste water tank to collect waste water and vapor to ensure the clean inner pipes are not polluted with dirty water.

2. Usage range

This steam sterilizer is designed to be used for medical purposes, e.g. In general medical practices, dentistry, veterinary and Chiropody/Podiatry practices, facilities for personal hygiene and beauty care. It is also used for materials and equipment which are likely to come into contact with blood or body fluids, e.g. Implements used by beauty therapists, tattooists, body piercers and hairdressers.

Type of this autoclave	
Type	Description of intended use
B	The sterilization of all wrapped or non-wrapped, solid, hollow load products type A and porous products as represented by the test loads in standard: EN13060:2004+A2:2010



Do not sterilize liquid!

3. Parameters and sterilization programs

3.1 Parameters:

The working condition of the steam sterilizer:

- ❖ Environmental temperature: 5°C~40°C
- ❖ Relative humidity: ≤80%
- ❖ Atmospheric pressure: >70KPA;
- ❖ Voltage: 220V/110V, 50Hz
- ❖ The max. working pressure: 0.21~0.23MPa
- ❖ The max. working temperature: 134~137°C
- ❖ Life span of the steam sterilizer: 5 years
- ❖ Vapor pressure: 0.3 – 0.6 MPA
- ❖ Water pressure: 0.15 – 0.3 MPA

The requirements of transportation and storage:

- ❖ Environmental temperature range: 5~40°C
- ❖ Relative humidity: ≤80%
- ❖ No corrosive gases

3.2 Sterilization programs

Sterilization Program	Sterilizing Time	Sterilizing Temperature	Sterilizing Pressure	Dry Time (Min.)
121°C solid	20min	121°C	110KPA	4
121°C universal	20min	121°C	110KPA	15
134°C solid	4min	134°C	210KPA	4
134°C universal	4min	134°C	210KPA	15
134°C cotton	4min	134°C	210KPA	20
B&D TEST (HELIX TEST)*	3.5min	134°C	210KPA	10
VACUUM TEST	15min			

* B&D test: you can use this program to carry out a Helix test.

4. Operation Panel

4.1 Pressure screen

Indicates relative pressure inside of the chamber.

Unit: KPA

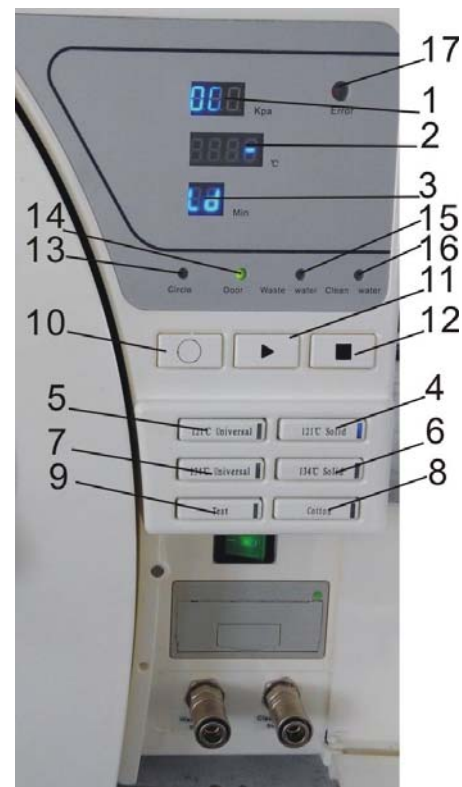
- ✓ “-80” means inside pressure “-80KPA”.
- ✓ “214” means inside pressure “214KPA”.

4.2 Temperature/Error Code screen

Indicates the temperature inside chamber.

Unit: °C

- ✓ “134.3” means inside temperature is “134.3 °C”.
 - ✓ Indicates the error code when an error occurs.
- Check the “Error Codes and Resolution” table to find a solution to cancel the alarm.
(See below “Error Codes and Resolution”)



Contact your local distributor or us for help if alarm appears.

4.3 Status Screen

Indicates the status of current program.

4.4 - 4.8 Sterilization Programs

Including:

- 121°C solid
- 134°C solid
- 121°C universal
- 134°C universal
- Cotton program



Solid program can only be used to sterilize solid items, such as pliers. Universal program can be used to sterilize solid, hollow, porous items, such as dental handpieces.



There's no difference between 121°C programs and 134°C programs. If the loads cannot be sterilized under 134°C, please choose 121°C programs.



Please check and confirm the loads can bear at least 121°C. If not, please don't use this autoclave.

4.9 B&D / Helix, Vacuum

This is used to carry out a B&D / Helix and vacuum test.

- ✓ Press "test" key directly. The status screen will indicate: **Ur**, and then press "START" key to run vacuum test.
- ✓ To run B&D test, please press this key for 5 seconds, The status screen will indicate: **bd** and then press "START" key.



Please carry out a B&D or Helix test before starting sterilization programs to ensure this autoclave sterilizes well.

4.10 Circle

This is used to keep temperature to save time of next sterilization program.

- ✓ If you press this, the steam sterilizer will keep temperature for the next program.
- ✓ If you do not press it, the steam sterilizer will not keep temperature for the next program.
- ✓ If the door is opened, this function will be stopped.

4.11 Start

This is used to start the sterilization program which has been selected.

4.12 Stop

This is used to stop the current sterilization program urgently when any abnormal situations happen.
To stop, please press this key for 5 seconds.

4.13 Circle indicator

The indicator will be on if “Circle” key is pressed.

4.14 “Door” indicator

This indicator will be on if the door is not closed properly. The sterilization program will not run whilst the door indicator is showing even after pressing “ START “. Only after the door is closed properly, will the sterilization program be allowed to run.

4.15 “Waste Water ” indicator

This is used to indicate that there is too much waste water inside.

- ✓ If this indicator is showing, please drain out the waste water.
- ✓ If the indicator comes on during a sterilization program, you can drain the waste water after the current sterilization program is finished.

4.16 “Clean Water ” indicator

This is used to indicate that there is not enough clean water inside.

- ✓ If this indicator is showing, please fill the clean water tank.
- ✓ When the indicator changes from a flashing light to a solid light, this means the clean water tank is now full and you should stop filling.

4.17 Error Indicator

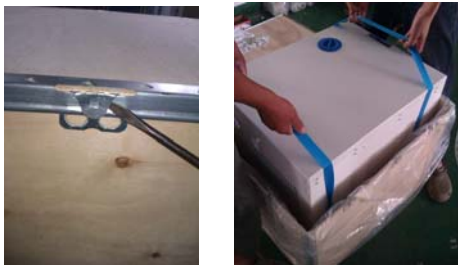
This will show when there is a problem with the steam sterilizer. In the event of a problem, the steam sterilizer will automatically stop working and release the air inside.

4.18 Dry setting

“press “cotton” for about 10s , the status Screen will show “dy”. The temperature screen will show the grade of dry. User can adjust the dry grade by press the “circle” key and “start” key. The sterilizers have 3 grades for dry:0,1,2. If you find that: after a cycle, loads are wet , you can choose 1 or 2. the dry's temperature of grade 1 and 2 are higher than 0 grade, using grade 1or 2may short down the device's life.

5. Installation

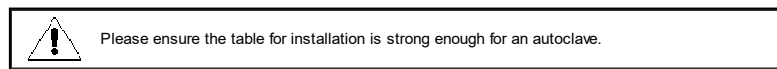
The steam sterilizer is packed inside a wooden carton. To open the carton, you need a flat screwdriver to open the cover. Then, the steam sterilizer can be lifted out by 2 persons.



5.1 Installation

When installing the steam sterilizer onto the table or work surface, please keep the steam sterilizer at least 10 cm away from surrounding objects/walls etc. Also, ensure that the rear side of the steam sterilizer is at least 20cm away from any surrounding objects/walls etc.

It is recommended the steam sterilizer ins installed in a well-ventilated location. Don't block the radiator of the sterilizer. Keep the table/surface stable & horizontal.

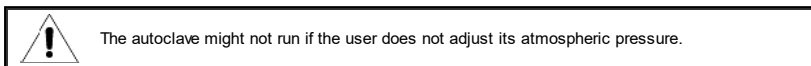


5.2 Adjust atmospheric pressure

Because different countries have different atmospheric pressure, the user should adjust the atmospheric pressure before first use.

Adjustment method:

- ✧ Turn off power
- ✧ Open the door of steam sterilizer
- ✧ Turn on the power, and keep it on for 20 seconds. Then turn it off.
- ✧ The Atmospheric pressure for the steam sterilizer will now be successfully adjusted.



5.3 Adjust time and date

- ❖ 1. Press "STOP" key for 20 seconds. The screen shows . Then, release the key.
- ❖ 2. Press "STOP" key again for 20 seconds. The screen shows . Now you can adjust the year. e.g. "11" means year of 2011. Press "start" key for up and "circle" key for down.
- ❖ Press "STOP" key again to adjust month. The screen will show:
D1: Year D2: Month D3: Day D4: Hour D5: Minutes D6: Seconds
- ❖ After adjustment, please turn off power.

6. Operation

Preparation before using

Connect the power before using this steam sterilizer. Then press the power switch to I position.

The steam sterilizer is now ready and the screen will show "LD".



Please ensure this autoclave is well grounded.

6.1 Fill water

If the clean water indicator is on and the autoclave is making a beeping sound, it means there is not enough clean water inside. You need to fill the clean water tank before starting sterilization programs.



The water can be filled from the top of the steam sterilizer. Please see pic. above.

When filling the water, two alarms will sound:

- ❖ The first alarm/beep means there is now enough water inside to start a new sterilization cycle. You can stop at this point or continue filling with water.
- ❖ The second alarm/beep means that the clean water tank is now full. Please stop filling at this point.



Attention:

Please pay special attention to the use of the "Attention" information, failure to comply with these may result in damage to the machine and serious injury or death. **Please only use Distilled, RO, or De-ionised water. Please check with supplier of your water, that it complies with HTM01-05. If tap water is used it will damage this machine and the warranty will be void.**



Before filling water, please turn on the autoclave and ensure the autoclave is horizontal. After filling water, if possible, please drain the waste water.

6.2 Working

When the clean water tank has enough water and the waste water tank is not full, it is ready for use.



6.2.1 Put the loads (instruments etc.) into the chamber

Warning:

- Ensure the total CBM of the loads is less than 70% of the CBM of the chamber.
- Keep the loads away from the surface, air outlet of chamber. Keep the loads at least 10mm away from the inner side of the chamber.
- If you carry out a B&D test, you need to put the test paper at the center of the sterilization package to ensure a reliable test result.
- When inserting or removing loads, please use the tool provided to prevent your hands from touching the hot surface.

6.2.2 Close the steam sterilizer's door

If the door is not locked an alarm will sound.

Please turn the handle right to Max position to lock the door.



If the temperature and pressure inside the chamber are high, the door will be difficult to be closed. We suggest to close the door quickly, or, you can wait 30 seconds, then close the door.

6.2.3 Choose sterilization program, then start

After the door is closed, choose the relevant sterilization program according to the type of load in the chamber.

Then, press "START" button to start the program.

6.2.4 Cycle

If you want to sterilize more than twice consecutively, please press the cycle button. This will keep the temperature when the first program is finished and reduce the cycle time of second sterilization program.

Notice: when the door is opened, this function will be invalid automatically for user protection.

6.2.5 After selecting the required program, please press "START" to run the program. The steam sterilizer will complete the program automatically. The sterilization time is affected by the initial room temperature, water temperature, load, and the program you selected.

6.3.6 After the program is finished, the screen will show “ED” and an alarm will sound three times. You can open the door and take out the loads. If you do not intend to use the autoclave for a long period of time, please disconnect the power supply.



The user shall fill in water promptly if there is a low-water alert. Otherwise it will show “E08 or E9” error alarm.



You shall use a tray-holder tool when taking out loads to prevent scald.
Don't open the door until the pressure is within “-05~05”.

7. Abnormal Situations

The sterilizer will sound an alarm, release pressure and stop heating automatically if it experiences any abnormal situations during working. It is designed to keep the user safe and display the error code (See page 14).

If alarm appears, please write down the error code and turn off the power. Do not open the door. Turn the power back on and wait for the pressure to return to “-0.5~0.5”.



We suggest running program once more to see if the error happens again.

Below is a list of alarms/error codes. If the user cannot solve the problem according to the chart below, please contact your local distributor or MDS Medical Ltd (www.mdsmedical.co.uk), so that we can help rectify any problems.

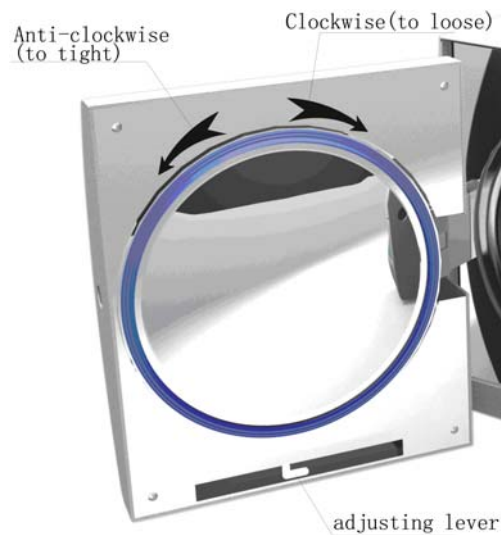
E1	The sound will be a long beep	The temperature sensor has problems.	Check the temperature sensors.
E2	long beep	Over pressure	Do a vacuum test. If the result is fail, check the vacuum pump .
E3	long beep	Inner temperature or steam generator over heating	Check steam generator ,the temperature sensor of steam generator and heating ring.
E4	long beep	Pre-heating failed.	Check steam generator and heating ring have been heated or not
E5	long beep	The pressure cannot be released.	Check the drain water valve
E6	long beep	The door sensor is open	Check the sensor of the door.
E7	long beep	The local air pressure value too low	Turn off the power ,open the door and turn on the power, waiting for 25S.
E8	long beep	Rising pressure failed.	Check the water tank Check water pump, steam generator, pipes and heating rod.
E9	long beep	Holding pressure failed	Check if it is out of water in the water tank

8. Maintenance

8.1 Door Tightness Adjustment

Door Adjustment

Push down the lever and rotate the door to adjust tightness. As shown in the picture below, turning anticlockwise will tighten the door, i.e., the door will be closer to the chamber and turning clockwise will loosen the door.



Detailed steps:

- 1) Push down the lever a little
- 2) Rotate the door to a specific angle
- 3) Release the lever
- 4) Keep turning the door to a place where the door cannot move anymore.



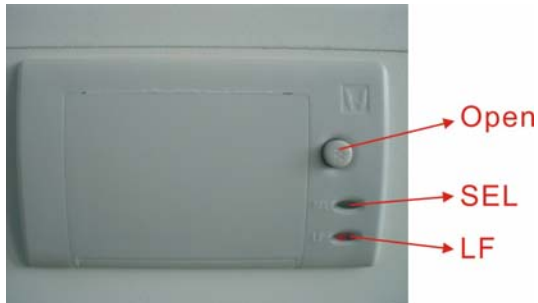
After the door adjustment, it is necessary to do a vacuum test. If there is a leakage, the user shall adjust it again.



If the door is too loose, the sealing ring might be exploded out with a big "bang". So, please be careful to use this function!

8.2 Replace printer paper and paper feeding

Replace printer paper



Press "open" button of the printer to open the door,
Change the paper as the pic 6. Cover the door sheet as the pic 7.



(Pic6)



(pic7)

Printer paper feeding

Press "LF" button once to feed the paper. If there's something wrong, please replace the paper once more.

If the printer is working correctly, but no print is showing on the paper the printer roll may be upside down - please ensure the paper is loaded correctly.



Only one side of the paper can be printed on.

8.3 Use thimerosal to sterilize water tanks every week.

8.4 To use ethyl alcohol to clean the inner surface of the steam sterilizer every month.

8.5 Every 150 cycles, we recommend to replace the germ filter.

8.6 Replace the fuse

(1) Disconnect power

-
- (2) Push screwdriver and turn the screws in anti-clockwise direction, and then take the fuse out.
 - (3) Replace the old fuse with a new one , then turn the screws in clockwise direction.



Check the new fuse if it is suitable for this autoclave before replacement.

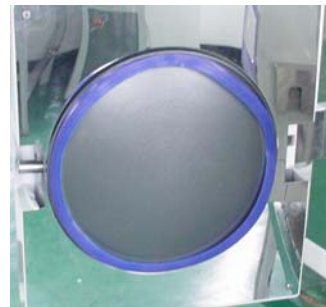
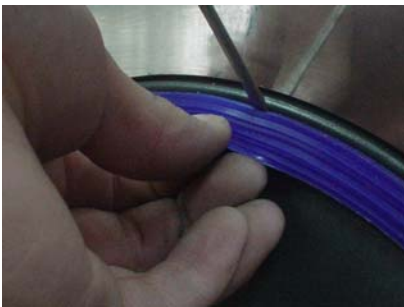
8.7 Clean seal ring regularly

The user needs to clean the seal ring regularly using distilled water. If leakage still occurs after cleaning, the user may have to replace the seal ring.

8.8 Replace the seal ring

Tool: The user needs a flat screwdriver.

- A. Hold the seal ring with one hand and use other hand to hold a screwdriver to carefully separate the door and the seal ring. Then take the seal ring out slowly.
- B. After removing the seal ring, clean and check it. If it is damaged, replace with new seal.
- C. After the seal ring is cleaned, replace it in the same position it was removed from.
- D. Attention: if the user finds it hard to put the seal ring back, use the screwdriver to carefully press it into place.



8.9 Regularly check the safety valve.

If the safety valve is invalid, it must be replaced

Replace the safety valve:



(pic8)

1. Remove part 1 in pic 8, then remove the pipe which connects the safety valve.
2. Remove the screw (part 2 in pic 8);
3. Replace the new safety valve.



The new safety valve shall be same model. If you need any help, please contact your local distributor or us.



Only maintain the autoclave when it cools down by well trained person.

9. Transportation and storage

9.1 Preparation

Cool down the sterilizer and disconnect power.

9.2 Drain water

Empty all tanks: Assemble the pipe without joint into bleeder valve. A is the outlet valve for waste water, while B is the outlet valve for clean water (If you do not intend to use this steam sterilizer for a long period of time, you should drain the clean water from here). Turn anti-clockwise to drain water.



A B

9.3 Terms of transportation:

Please refer to sales contract.

9.4 Terms of storage

The steam sterilizer should be stored in a clean warehouse where the room temperature is 5°C~40°C, the relative humidity should not exceed 80%, no corrosive gases are present and the area is well-ventilated.



Don't drag during transportation.

10. Warranty

1. Warranty: 2 year.

2. The warranty will become invalid in any of the following instances:

- (1)The damage is caused by incorrect installation by user
- (2)The damage is caused from the autoclave being dropped or impact from carelessness
- (3)The damage is caused by the customer's installation or repairs
- (4) Without invoice and guarantee card
- (5)The damage is caused by force majeure such as abnormal voltage, fire etc.

11. Accessories

No.	Accessories	Q'ty (PC)
1	Drainage pipe	1
2	Tray	3
3	Cable with plug	1
4	Tray shelf	1
5	Tray-hand-holder	1
6	Fuse	2
7	Instruction Manual	1



Appendixes

Appendix 1: Code and Explanation

Item	Code	Status	Status Explanation
1	Ld	Prepare	Loading loads, drain out waste water
2	HE	Preheating	Heating the ring and steam generator.
3	Ur	Vacuum	Vacuuming
4	rE	Raising Temperature	Temperature raising and pressure raising in the chamber
5	dn	Water drain and steam releasing	Water drain and steam releasing inside of a cycle
6	Show working time	Sterilization	Countdown of sterilization
7	Show drying time	Drying	Countdown of drying
8	LE	Pressure balance	Balance of inside pressure and barometric pressure
9	Ed	Ending work	Program finished, you can open the door to get loads out

Appendix 2: Adjust time of sterilization

1. Press "Cycle" button for 5 seconds to start adjustment.
2. Press the sterilization program button to select the sterilization program that you want to adjust.
3. Adjust sterilization time: Press "start" button once to add 1min; Press "stop" button once to reduce 1 min. Time scale: 4-60 min.
4. Press "Cycle" button to save and exit.
5. Default: If you want to re-set sterilization time to the default, please press "start" button for 5 seconds. When it shows "55", press "start" button again. The sterilization time of all programs will now be set at default.

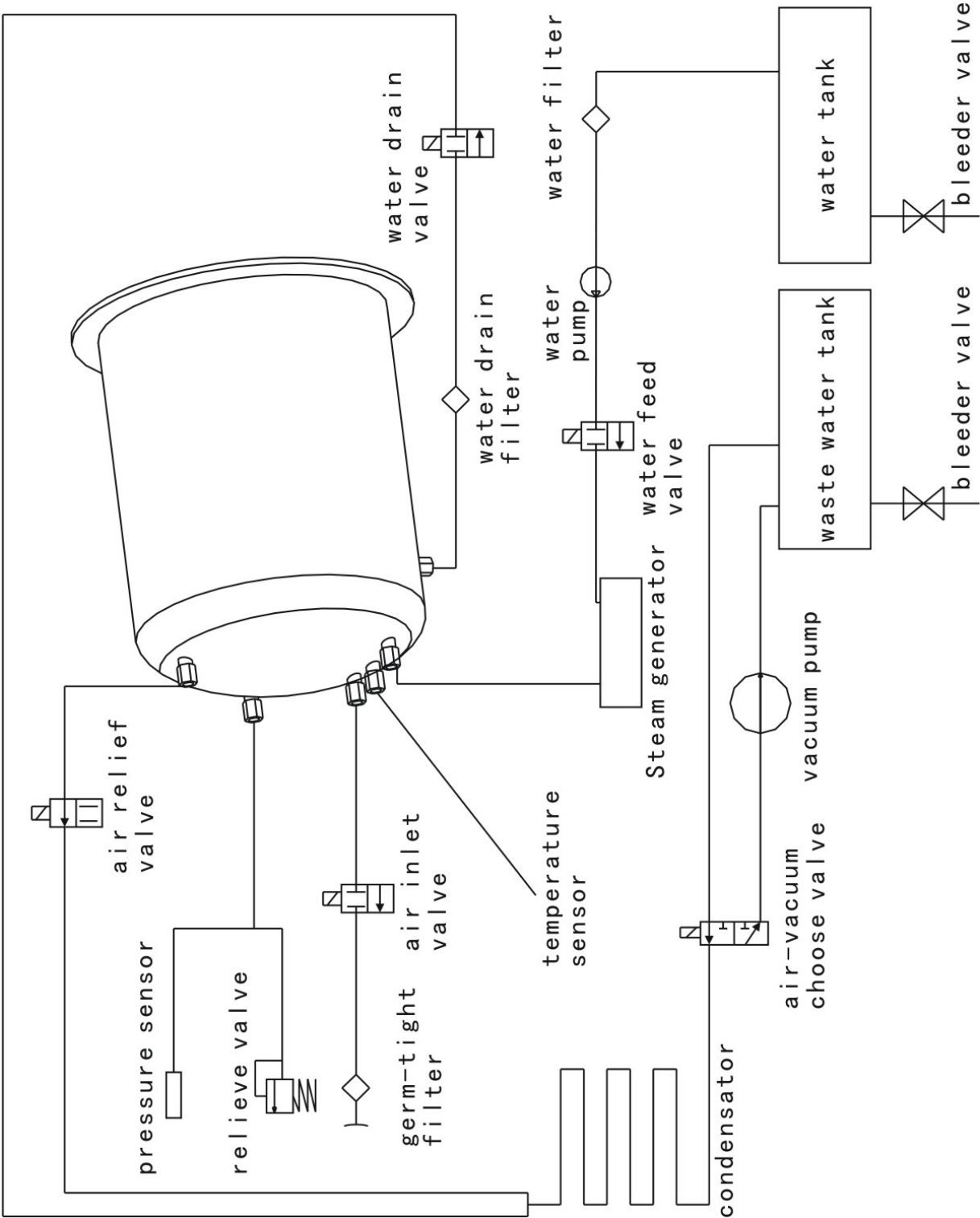


After you have adjusted sterilization time, you must do a verification test to verify the sterilization performance of this autoclave.

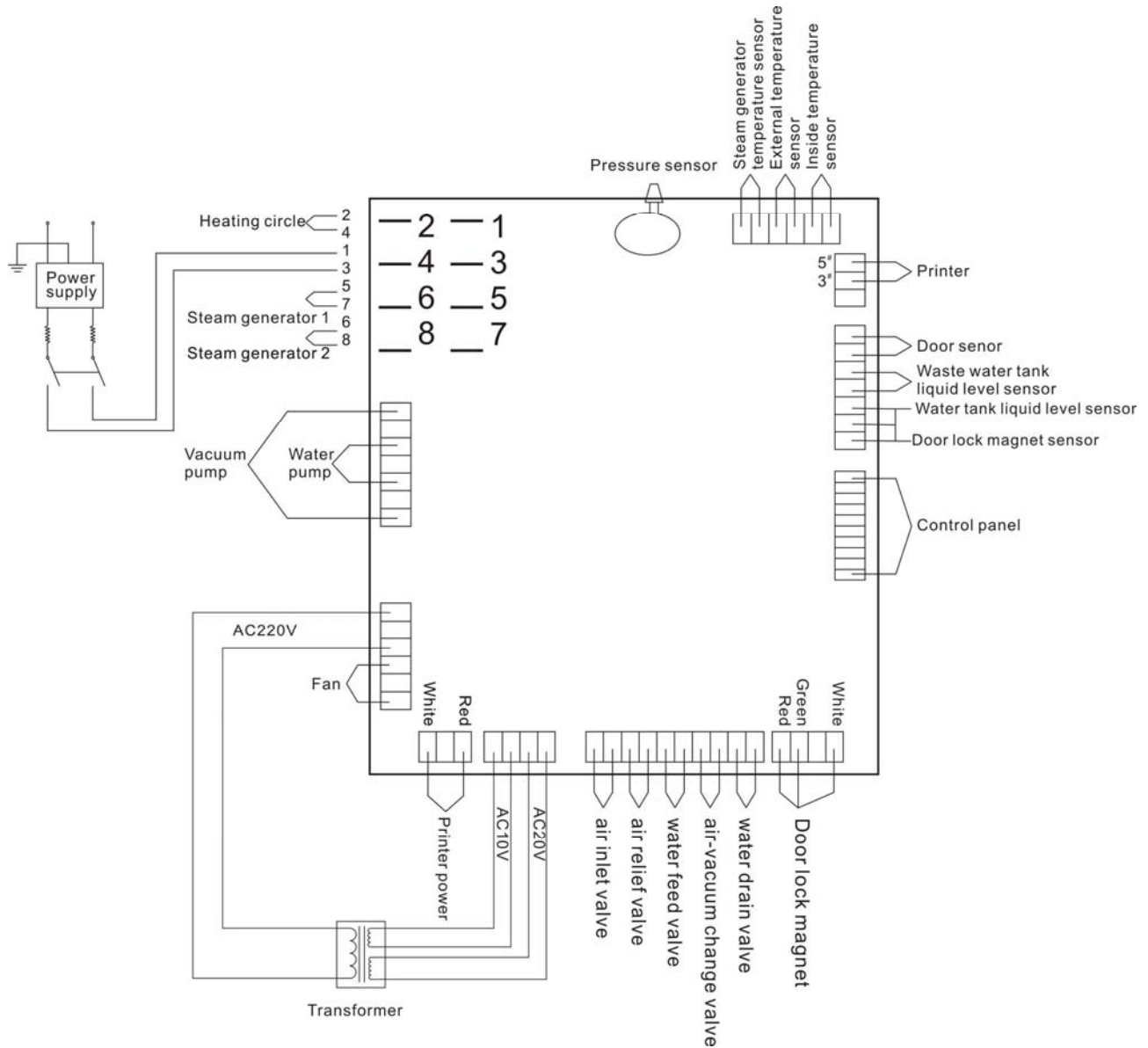


1 Bar = 0.1 MPA = 1 atmospheric pressure

Appendix 3: Structure diagram



Appendix 4: Circuit diagram



Above Figure : AC220V input interface, 2 is Fire Wire, and 3 is zero-line.

Component parameters

Vacuum pump power: AC: 230V 50Hz 75W

Water pump power: AC: 230V 50Hz 47W

Heating circle: AC: 230V 50Hz 1500W

Heating rod: AC: 230V 50Hz 750W

Electromagnetic valve: DC: 24V 5W