

Operation Manual



BAMN-304

Medical Class N Autoclave

Thank you very much for Choosing Biolab products. Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation.

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Attentions:

1. Read this instruction carefully before start to use this Pressure Steam Sterilizer.
2. Follow the instruction seriously while using this Sterilizer.
3. Please keep this instruction for reference in future.
4. Contact the sellers or manufacturer if the Sterilizer has any problems.

User Guide:

Customer will get the instruction after buying the Sterilizer.

The symbols as below indicate important meanings.



Warning, Attention and other importance

Warning: Please pay attention on these "Warning", ignoring warning signs may cause death or serious injury.

Attention: Please pay attention on these "Attention", ignoring warning signs may cause death or serious injury.

Importance: Please pay attention on these "Importance", ignoring warning signs may cause death or serious injury.



Tip and explanation: Tip for user to operator.

Safety Attentions:

Please read it carefully.



If the user ignores these "Warning", may cause electronic shock, fire or equipment damage.

- Please use three holes socket (230±23VAC/10A/50Hz~60Hz), and be sure it is connected to the ground.
- Please don't use any other voltage powers.
- Never touch the plug or the socket by wet hands.
- Don't pull, change, over-bend or twist wire, or don't leave heavy things on wire.
- Don't put the sterilizer on an unstable shelf or counter.
- Don't block the sterilizer's ventilation and radiation.
- Don't keep anything on the sterilizer.
- If the user smells or hears abnormally during running (it doesn't include the noise of pumps), then cut off the power and contact sellers or manufacturer.
- Please cut off the power if machine is not in use for long time.

01 General Instruction

The Biolab Medical Class N Autoclave is operated by doctors or professionals and is designed especially for clinic, hospital, laboratory etc. The sterilizer uses microprocessor with intelligence control system, and humanistic interface, operate easily, safety and reliable. The parameters and conditions of the sterilizer will be displayed on the digital screen during the processing. For ensuring the reliability of sterilization, the machine will do trouble self-diagnose and self-protect automatically during overheat or overpressure situations.

02 Using Range

The sterilizer is highly penetrability for department of hospital, stomatology, ophthalmology, and biological research institute to sterilize the solid instruments without package.

03 Parameters and process of the sterilizer

3.1 Parameters:

The condition of using the sterilizer:

Temperature of environment: 5°C~40°C;

Relative humidity: ≤80%;

Atmospheric Pressure: >70kPa;

Frequency: 50Hz/60Hz, Voltage: one-phase 230V±23V.

3.2 Process of the sterilizer:

Process	sterilizing time	Sterilizing temperature	Sterilizing pressure	Dry time min
121°CProcess	4 min	121°C	110KPa	10
134°CProcess	20min	134°C	210KPa	10

The sterilization time can be adjusted.

04 Control Panel

1. Pressure screen

Showing the pressure inside of the chamber

It is a relative pressure. unit:Kpa

Showing -80 means inside pressure is -80Kpa

Showing 214 means inside pressure is 214Kpa

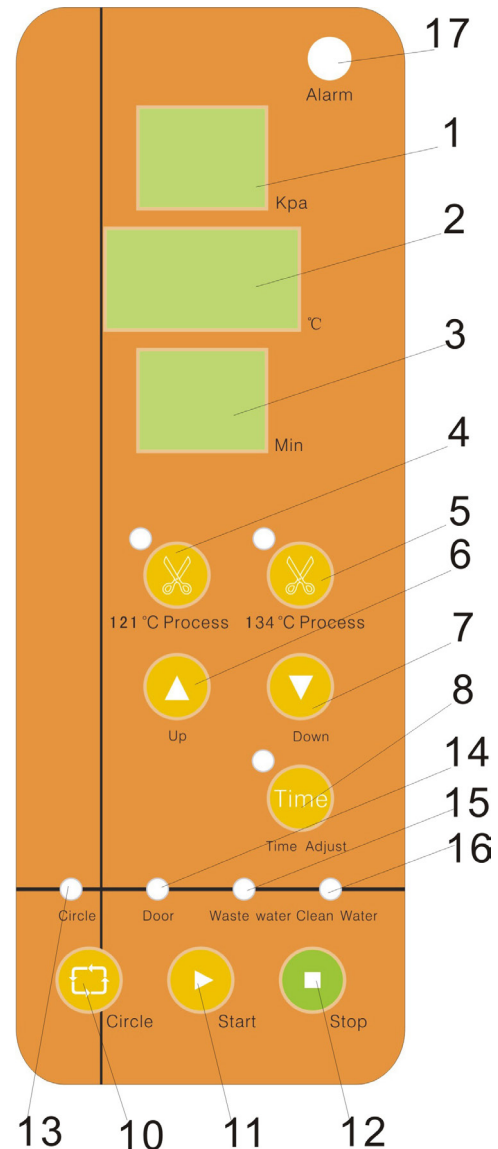
2. Temperature/Error Code screen

Showing the temperature inside of the chamber. unit:°C

Showing 131.3 means inside temperature is 131.3 °C

It shows the error code No. when error happens.

Checking with the "Error Codes and Resolution" table could find a solution to tackle the problems. (see below Page 14 "Error Codes and Resolution")



Warning : Contact the seller or manufacturer for solutions if there is any problem.


3. Status screen


Showing various Status of the process of sterilizer (see below page 19).


4~8. Keys for pre-setting program and adjusting sterilization time.

Two keys for pre-setting program: 121°C Process and 134°C Process, one button-push choice makes the operation convenient and easy.

Three keys for adjusting sterilization time: "Up", "Down" and "Adjust time".

 **Caution** : Solid Process can only sterilize solid instruments without wrapped, such as plier, forfex, forceps etc.

 **Tip** : Since 121°C program and 134°C-program has no difference in sterilization, please take 121°C program for the instruments temperature resistance below 134°C.

 **Caution** : Check the instruments maximum temperature resistance and choose a proper temperature. Don't sterilize any instrument with resistance temperature below 121°C.

10. "Circle" key

Using for successive sterilization process.

If cycle function is not selected, then the sterilizer will only do one sterilization cycle and then it will cool down automatically.

If cycle function is selected, then the sterilizer will do more than one sterilization cycle, after each cycle, the sterilizer will be warm until the door of sterilizer open, in this way, it can take shorter heating time for the next cycle.

11. "Start" key

To start sterilization process

12. "Stop" key

To stop the sterilization process, press this key for 5s when any abnormal situations of the machine happen.

13. "Circle" indicator light

The light will be on after press "Circle" key.

14. "Door" indicator light

The door of the sterilizer must be closed tightly before the sterilizer is started, otherwise the "Door" indicator light will be on and the sterilizer cannot be started.

15. "Waste Water Tank" indicator light

When this light is flashing, it indicates the level of waste water is too high and has to be drained.

When the waste water tank is full during operation, the light will keep flashing. The beeps is on for 10 times and then stops. After the cycle is completed, drain out the water.

16. "Water Storage Tank" indicator lamp

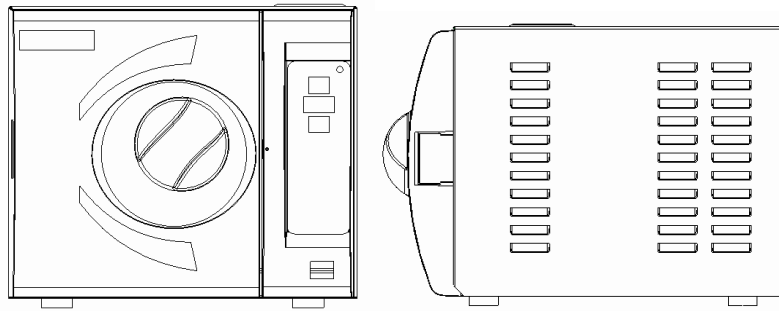
When this lamp is flashing indicates the level of water in storage tank is too low, and it may cause the sterilization process failed (E8 or E9), so the tank must be top up.

When the light is still on, the tank is full.

17. Error lamp

If any problem happens during the sterilization process, the light will be flashing with beeps and stop running automatically, The pressure will also be released automatically.

05 Installation



5.1) At least 10 cm space should be left around the sterilizer, and the back space must be at least 20 cm.


Suggest putting sterilizer in well-ventilated location. Don't block the radiator of the sterilizer.

Put the sterilizer on the horizontal shelf or counter.

5.2) Adjust atmospheric pressure before the first time use since atmospheric pressure varies from place to place.

Steps:

1) Cut off the power 2) Open the door 3) Turn on the power, and 20's later, cut off the power, it is done automatically.

 **Warning:** If the user don't adjust atmospheric pressure, the sterilizer might not be able to run

5.3) Date & Time adjustment:

1. Press "stop" key for 20's, the pressure screen shows



2. Then release the key.

3. Press "stop" key for 20's, the pressure screen shows



On the temperature screen, it shows the year, e.g. "11" means year of 2011. Press "start" key for up and "circle" key for down.

4. Press "stop" key once to adjust month. (the same as above adjusting year). On the pressure screen, it shows:

5. d1: year d2: month d3: day

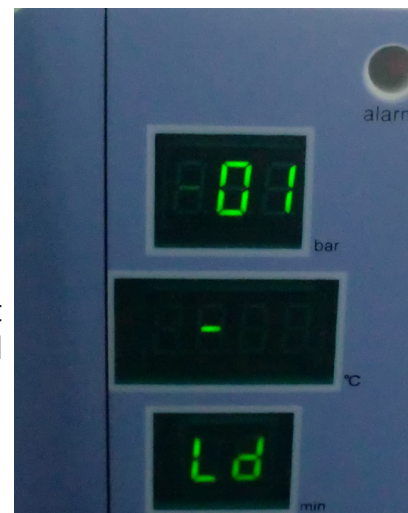
6. d4: hour d5: minute d6: second

5. Cut off the power and it's done.

06 Operation

Prepare before using:

Connect the power line correctly before starting the sterilizer. Press the power switch that is on the right front side, the lamp will be on which indicates the sterilizer has been connected to the power and it is on the initial condition without heating. The working condition will display as "LD". After press the start key, the sterilizer will go to run.



Warning : Please ensure to be well grounded.

6.1 Top up water

If the level of water in the storage tank is too low, the water storage tank indicator lamp will keep flashing with beeps, and the start key will become invalid, user must fill water in. There is a hole on the top of the sterilizer, as the picture shows, when the user top up the water the light will be off with beeps, which indicates the tank has enough water to run a cycle, the user can continue filling water until it is full. The storage tank light keeps on and beeps 10 times and then stops.



Attention: Please use distilled water to avoid clogging of the steam generator and the valves. Users should be responsible for the consequences it caused.



Tip:

- 1 Before top up water, the power must be connected.
- 2 Please do not put the sterilizer upside down when tank is full.
- 3 Suggest: Drain the waste storage tank also when the water in the storage water tank used out.
- 4 Pressing the stop key can stop the beeps when the waste water tank is full. The light won't be off until the waste water tank is empty.

6.2 Working

When storage tank indicator lamp and waste water tank indicator lamp don't flash, it is ready for working.

6.2.1 Put the loads into the chamber



Tip:

1. No more than 70% of the volume of the sterilizer or no more than 6kg for once.
2. The instruments should not stick to the inside-wall, especially should not block the outlet of the chamber. It should leave at least 10 mm from the inside-wall.
3. Put the test paper into the center of the sterilization package if the user wants to test and judge the sterilization effect.
4. When putting the loads into the sterilizer, we suggest using the tray-hand-holder to prevent from scalded.

6.2.2. After the user put the loads into the sterilizer and close the door tightly(turn the handle to the maximize position) and the door indicator light will be off.



Warning : The user must turn the handle to the maximize position otherwise the sterilization won't start, and even the user presses the start key, the user will get "E6" alarm.



Tip: If the user feels the door is too hard to close, may be steam still in the sterilizer, we suggest that closing door quickly or waiting for a few seconds to close door.

6.2.3. Choosing program

After the door is closed, choose the relative sterilization program according to the loads in the chamber. Press the program key, the relative program indicator light will be on. It won't be off until the sterilization cycle is finished and another program is chosen.

6.2.4. Choosing cycle

For successive sterilization process, press "circle" key after the program is chosen. Therefore the sterilizer will keep warm after each cycle. It can take shorter preheating time for the next cycle.



Tip: Whenever the door is opened, the function if "cycle" will be stopped.


Without choosing cycle, it will cool down after a cycle is finished.

6.2.5. Having made the choice, the user can press the start key to start the program. The sterilizer will run pre-heating, 4-times thermodynamic initial vacuum, sterilization and drying automatically. The time of the whole cycle is decided by the initial temperature, the loads and the program.


6.2.6 When the sterilization process is finished, "Ed" will be displayed on the panel with three beeps. Then the user can open the door and take the sterilized loads out.

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

6.2.7 When it is not in use, please turn off the power switch (be sure the power lamp is off). If the user won't use the sterilizer for a long time, please disconnect the power.

 **Warning:** We strongly suggest using the tray-hand-holder to take the tray out of the sterilizer for preventing scald.

Don't open the door until the pressure within "-05~05".

 **Tip:** To ensure the effectiveness of sterilization, we suggest putting test paper or pouches with indicators together with the loads into the sterilization chamber every time.

07 Abnormal Situations

The sterilizer will give alarm, release pressure and stop heating automatically if it has any abnormal situations during working. It will absolutely keep the user safe and display the error code(See the below page 13).

Write down the error code No. and cut off the power, don't open the door and then turn on the power again to wait the pressure turn back to "-0.5~0.5".



Tip: We suggest running one more time to see if the error happens again.

If the user cannot find the resolution from the table, contact with seller or our service department, telling us the error code No., we will help the user to solve it as soon as possible.

Error Codes and Resolutions:

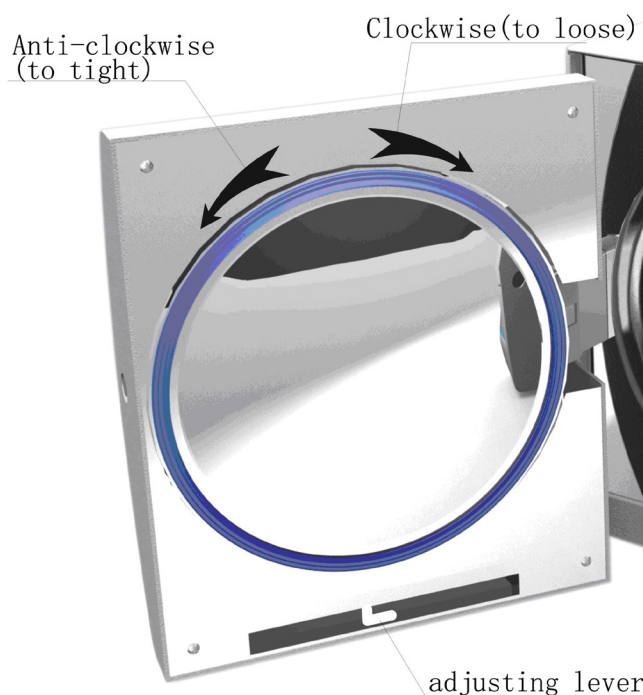
E1	"Du"long beep	The temperature sensor has problems.	Check the temperature sensors.
E2	"Du"long beep	Over pressure	Check temperature sensor in the chamber
E3	"Du"long beep	Inner temperature or steam generator over heat	Check steam generator, the temperature sensor of steam generator and heating ring.
E4	"Du"long beep	Pre-heating failed.	Check steam generator and heating ring have been heated or not
E5	"Du"long beep	The pressure cannot be released.	Check the drain water valve
E6	"Du"long beep	The door sensor is open	Check the sensor of the door.
E7	"Du"long beep	The local air pressure value too low	Turn off the power ,open the door and turn on the power, waiting for 25S. (refer to page 10)
E8	"Du"long beep	Rising pressure failed.	Check the water tank Check water pump, steam generator, pips and heating stick.
E9	"Du"long beep	Keeping pressure failed	Check if it is out of water in the water tank

08 Maintenance

8.1 Door Tightness Adjustment

Door Adjustment:

Push down the lever while turning the door to adjust tightness. As show in below picture, anticlockwise turning will tighten the door, i.e, the door will be closer to the chamber. Therefore, it needs more strength to turn the handle. Clockwise turning the door will loosen it.



Steps:

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

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

! Warning: 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 Change printer paper and paper feed .

Change printer paper:



press "open" button of the printer to open the door,
change the paper, cover the door sheet as the figure 2;



(2)

Checking whether the paper change is correct through paper feed.

Printer paper feed check:

when press "LF" button once to see if the paper feed is in gear; if the paper feed out of gear, the paper is jammed, then change paper and feed again;

If the printer paper feed correct, but there's no data on the paper, please anti to install the printer paper.



Tip: The printer paper has direction and only one side can be printed on.

8.3. Use disinfectant to clean the tank every week.

8.4 Use ethyl alcohol disinfect and clean the inner surface of the sterilizer every month.

8.5 After every 150 cycles, we recommend to replace the germ-tight filter.

8.6 Replace the fuse

(1) Disconnect power

(2) Push screwdriver and turn the screws in anti-clockwise, and then take the fuse out.

(3) Replace the old fuse by a new one , then turn the screws in clockwise.



Tip: Check the parameter of new fuse if it is correct before replacement.

8.7 Clean seal ring regularly

For keeping a good ability of seal, the user should clean the seal ring regularly. Cleaning the seal ring by distilled water. If leakage still happens after cleaning, then user may have to replace the seal ring.

8.8 Replace the seal ring

Tool: The user needs a screwdriver without sharp.

- A. Hold the seal ring by a hand and use another one to hold a screwdriver carefully to separate the door and the seal ring. Then take the seal ring out slowly.
- B. After the user takes the seal ring out, clean and check it, if it is damaged. The user must replace it, if it is damage.
- C. After the seal ring is cleaned, put it back.
- D. Attention: if the user finds it hard to put the seal ring back, use screwdriver press it carefully until it is done.



8.9 Never repair the sterilizer until the power is disconnected and it is getting cool down for preventing scald. Repairing the sterilizer must be done by the well trained professionals.

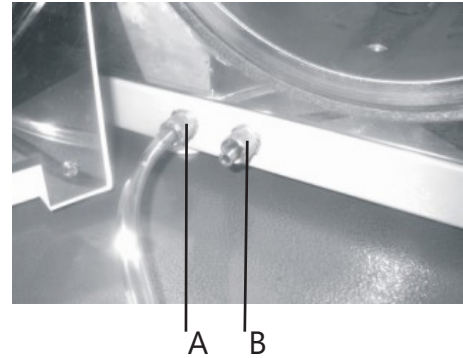
09 Transport and Storage

9.1 Preparation

Cool down the sterilizer and disconnect the power.

11.2 Drainage

Empty all tanks: Insert the side of pipe without joint into bleeder valve, A is waste water tank bleeder valve, B is water storage tank bleeder valve. Then turn the drainage switch anti-clockwise.



9.2 Terms of transportation:

Terms of transportation should according to the order contract.

11.4 Terms of store:

After packing, the sterilizer should keep in the clean indoor, which the temperature is 5°C~40°C, the relative humidity is no more than 80%, no corroding gases and well-ventilated.

! Importance: Don't drag while machine is running.

10

Attentions

- 1) Please use three holes socket (230±23VAC/10A/50Hz~60HZ), and be sure it is connected to the ground.
- 2) Please don't use other voltage power.
- 3) Don't touch plug or socket by wet hands.
- 4) Don't pull, change, over bend or twist wire, and don't leave heavy things on wire.
- 5) Don't put sterilizer on unstable place.
- 6) Don't block sterilizer's ventilation, radiation.
- 7) Don't put anything on the sterilizer.
- 8) If the user smells or hears any abnormal (it doesn't include the noise of pump) then cut off power and contact sellers or manufacturer.
- 9) Please cut off power if the user won't use the sterilizer for a long time.
- 10) Contact the seller or manufacturer for solutions if there is any problem.
- 11) Solid Process can only sterilize solid instruments without wrapped, such as plier, forfex, forceps etc
- 12) Check the instruments maximum temperature resistance and choose a proper temperature. Don't sterilization any instruments temperature resistance below 121°C.
- 13) If the user don't adjust atmospheric pressure, the sterilizer might not be able to run
- 14) The user must turn the handle to the maximize position otherwise the sterilization won't start, and even the user presses the start key, the user will get "E6" alarm.
- 15) The user shall fill in water promptly if there is a low-water alert. Otherwise it will show "E08" error alarm.
- 16) We strongly suggest using the tray-hand-holder to take the tray out of the sterilizer for preventing scald.
- 17) Don't open the door until the pressure within "-05~05".
- 18) After the door adjustment, it needs an airproof check. If there is a leakage, the user shall adjust it again.
- 19) 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.
- 20) Don't drag during moving.

11 Accessories

- | | |
|---------------------|---|
| 1. Drainage pipe | 1 |
| 2. Equipment tray | 3 |
| 3. Wire | 1 |
| 4. Tray shelf | 1 |
| 5. Tray-hand-holder | 1 |
| 6. Fuse | 2 |



Appendix 1 Table of Working Status:

Item	Code	Status	Status Explanation
1	LD	Prepare	Loading loads, drain out waste water
2	HE	Preheating	Heating the ring and steam generator.
3	UF	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, and can open the door to get loads out

Appendix 2, Adjusting time of sterilization:

1) Press "Adjust time" key for 5 seconds to enter sterilization time adjustment.

2) Choosing the program which need to be adjusted:


Having to be choose, the light is on, and show the time of sterilization.

3) Adjusting the time:


Press the "Up" key, increase 1 min; press the "Down" key, reduce 1 min, the max range is 60 min.

4) Quit the process:

Press "Adjust time" key, and save the setting.

 **Caution** The time of installing processes is recommending time, it has been verified with the method which has prescript in standard ISO 14161:2009.

Once the time is adjusted, it must been verified with the method which has prescript in standard ISO 14161:2009; do not operate sterilizing until it has been verified, or the consequence should take by clients. Verifying can do by the clients who have the corresponding ability or the verifying-

 **Tip:** The relations between pressure units:

1bar = 0.1MPa = 1.0×10^5 Pa = 1 barometric pressure

Component parameters:

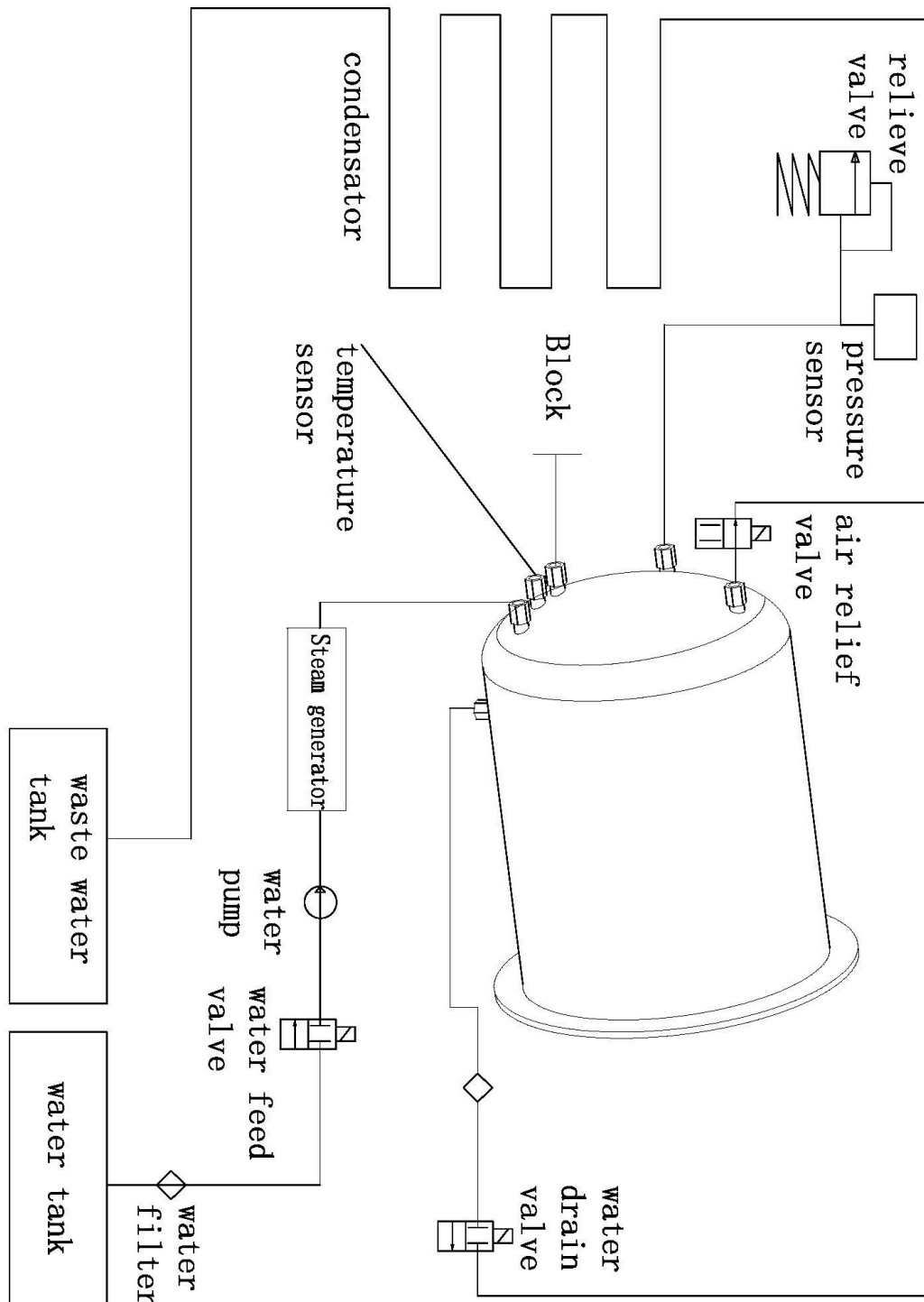
Water pump power: AC: 230V 50Hz 47W

Heating circle: AC: 230V 50Hz 1500W

Heating rod: AC: 230V 50Hz 500W

Electromagnetic valve: DC: 24V 17W

Appendix 3) Structure diagram:



Above Figure : AC220V input interface, 2 is FireWire, 3 is zero-line.

NOTES



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