Operation Manual

BAHZ-202

Horizontal Autoclave

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

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01 General

Saturated pressure steam is used to sterilize article, for it will liberate a great amount of heat when condensing. To make the articles (need to be sterilized) hot and wet for a certain time, most resistant bacterial spores will be killed, and then sterilization aim is reached. The method is reliable, economical, and easy to be controlled, so it has been used for more than one hundred years.

This unit is ideal equipment for clinics, scientific research institutes and other organizations to sterilize surgical instruments, fabric glassed, culture media etc.

02 Features

- Capacity : 0.20m3 (ф0.515m×1m)
- Max.work pressure : 0.22MPa
- Max.work temperature : 134℃±1℃
- Temp.range : 105~134℃
- Timer range : 1~60min
- Heat evenness : ≤±2℃
- Power consumption : 9KW/220V 50Hz.
- interlock device for safety:

■ the steam can't go through to chamber when the door haven't close, and the pilot off to inform. You can processing dry operat.

■ when the pressure inner over 0.027Mpa, the door be lock and not be open.

■ if you mistake open the door in the course of start, the jacket valve auto off and open the chamber valve.

■ if you not choose the sterile time and start the machine, buzzer sound.

■ lack water the pilot on, heating and sterile pilot off, the buzzer sound and auto release steam.

■ overload and leakage protection, when leakage or over current occur, it auto cut off the power.

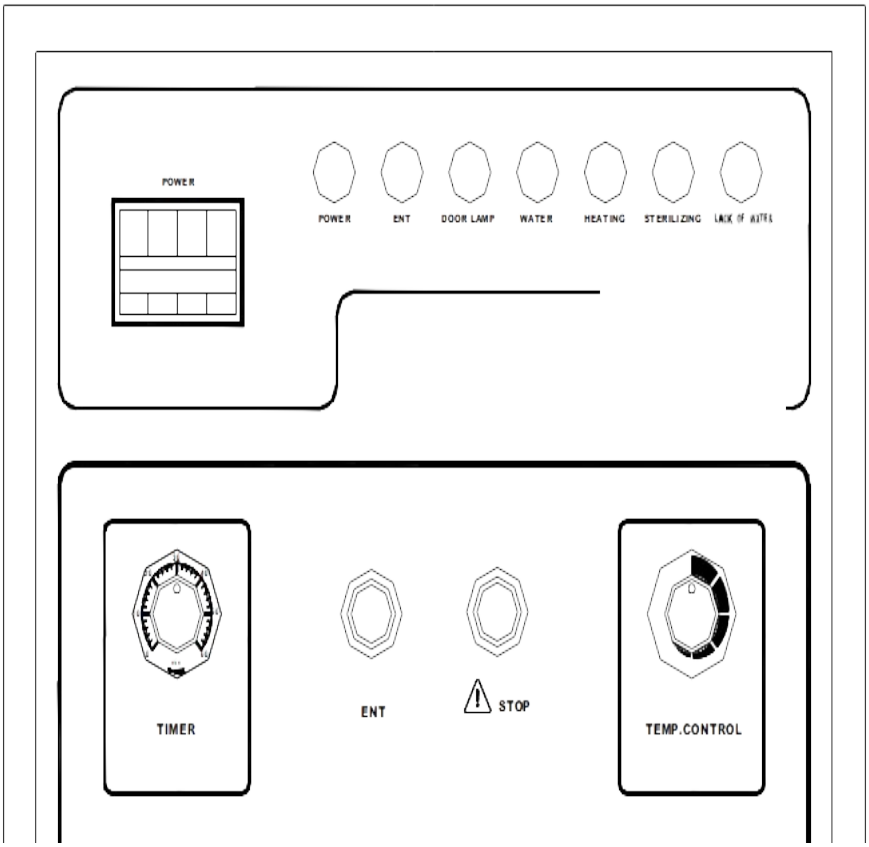
■ temperature controller not work and the inner pressure over 0.165 Mpa, the safety valve auto start open.

- Dimension : 67×140×165 cm
- Trans Dimension : 82×156×185 cm
- Weight: Net 260 (kg) / Gross 350 (kg)

03 Specifications

• The main body is composed of a chamber and steam-jacket with closed double jacket. The chamber wall will be pre-heated as steam enters and fills the jacket up. A main valve is connected between the chamber and the jacket, which is turned to “sterilize” position and admit steam from jacket to chamber to make articles moist and heated. The above-mentioned method ensures requirements for pre-heating, sterilizing, drying and following operations.

• The vaporizer, gauge in front above easy watch, the thermometer on the side, all the pilots and display in front lower part control box for easy operating. (fig.1)



each letter mark for the role:

- pilot display
  - power------- power start, pilot on.
  - close door--- pilot on.
  - start-------pilot on
  - water in----auto fill the water, the pilot on to high level the pilot off.
  - heating-----pilot on to sterile temperature the pilot off.

◦ sterilizing-----pilot on to sterilize end the pilot off.

◦ lack of water----after heating water lack the pilot on, press emergency stop button or turn off dealing the error, restart the machine the pilot off.

• power switch

◦ turn on the breaker, the machine enter the state of standby.

• the knob for setting auto program select.

◦ sterilizing temperature (range 105℃~134℃)

◦ sterilizing time (range 1~60min.)

• key start

◦ press key start, the auto program sterilizing or dry begin, repeat press useless.

• key emergency stop

◦ press the key emergency stop recovered to connect power, vaporizer, and electric valve open all and release, pilot start, heat, sterilize off, repeat press useless.

• The jacket is coated with a cover, in which insulated liner of glass fabric is filled, for the sake of saving energy, as well as preventing ambient temperature from rising excessively

• The door opening mechanism adopts a dial of radial-bar with self-lock and two grade inter-lock safety devices, first move safety closing handle when you close the door, the angle 45°with the radial-bar connection center, the radial-bar enter the close position complete, then turn the handle again, the dial go in axle direction, the center dial be locked by pin. when the inner pressure over 0.027Mpa, the interlock auto enter to prevent mistake operation, until the inner pressure lower than 0.027Mpa, interlock device turn back but the dial keep lock by pin, the handle can be rotate counter clockwise, the center dial back out in axle way, the seal became useless, the spare steam be release to zero, that is release the pressure first then open the door, until the handle returned to outer can you move closing handle and returned radial-bar to open the door.

• With program function, it'll auto release the air and condense to balance the temperature in chamber.

• With the device to stabilizing the steam pressure in the course of heating, the range 0.05~0.15Mpa, related temperature 105~134℃,

• With timer device, the range 1~60min. the knob on the panel of the control box.

• With high water level device, you push the key start, the pilot water in on, the water auto enters to the high level of the tank (about 26L)and heating right way, meanwhile the pilot off.

• auto control problem

◦ the steam can't go through to chamber when the door haven't close, and the pilot off to inform. You can processing dry operate.

◦ if you mistake open the door in the course of start, the jacket valve auto off and open

the chamber valve. with mechanic interlock pressure ≥0.027MPa

◦ if you not choose the sterile time and start the machine, buzzer sound.

◦ with lower level protection device, when lack water the pilot on, auto cut off the power, heating and sterile pilot off, the buzzer sound and auto release steam.

◦ overload and leakage protection, when leakage or over current occur, it auto cut off the power. the pilot off on panel.

◦ An ordinary lift safety valve connected to the jacket is installed at the top of the sterilizer. It cannot open to release over pressure steam until the steam in jacket overpasses set pressure of safety valve. When steam pressure falls to the normal value, it automatically closes. The set pressure for safety valve is 0.165 MPa~0.17 MPa (See Fig2)

◦ manual emergency switch valve Fig2

◦ when the unit suddenly break the power and you need take the objects be sterilize urgent, you can manually turn on the bulb valve on the rear release the pressure, until the gauge back to zero you can take the objects.

• manual maintenance switch valve

◦ When you need clean the vaporizer, you can open the manual valve at the bottom and release the dirty water.

◦ magnetic valve function:

◦ water-in valve: press key start, it auto fill the water to high level then turn off.

◦ condensation valve: power connect and press key start auto release, heating and temperature ≤108℃ auto turn on, ≥108℃ auto turn off, press emergency key

◦ release valve: power connect and press key start auto release, after the auto water in to high level then turn off. Sterilize end, press emergency key auto release on.

◦ sterilize valve: power connect and press key start auto air-in, after the auto water in to high level, the door haven't closed turn off, otherwise turn on. sterilize end press emergency key auto release on.

04 Installation

• for installation. More floor space around the sterilizer is set aside for operating and repairing. The Min. Installation size for single door 200×93×182cm, for double doors 200×93×182cm.(see fig.3)

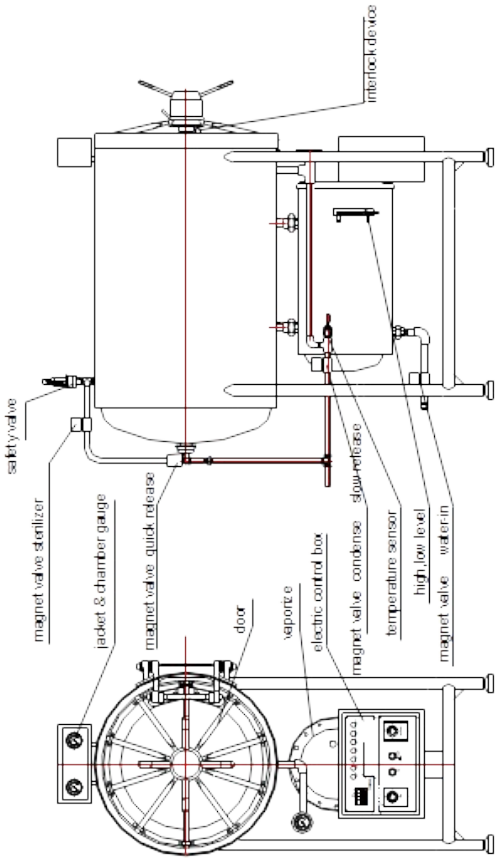
• Connect inlet with tap water supply and outlet with drain pipelines so as to make daily operation simpler.

• Extend exhaust pipe outside to avoid vapor throughout inside, so as to affect operation inside.

• During sterilizing, condense will be discharged through the condense ejector. It is suggested that a cone-shaped funnel is supplied to join the exhaust pipe and drain pipe. Thus the drainage of condense may be easily observed, as well as prevent drain flowing back, in case of drain line clogged.

• The unit has been fully inspected before leaving the factory, but after installation by users, training should be performed according to manual instructions. In case that anything abnormal occurs, it should be resolved until the unit is in operation.

electric type single door installation



05 Operation

- Operation procedures:
- manual operation
  - connection water----- trun on the water source
  - connection the power-----pilot display
  - Pile --------The articles (to sterilize) should be well packed and separated certain distance from each other in chamber, so as to leave free passage for steam. Dressing package cannot be close to chamber door, otherwise condense drops along door into dressing and prolongs drying time. In general dressing package should be no more than 20×20×10cm, otherwise the period of sterilizing time would be prolonged. If sterilize solution, pour it into a rigid heat-resistant flask, do not exceed 3/4 containment of the flask. Stuff mouth with cotton and gauze, and bind it with yarn. Be sure not to use a non-perforated rubber stopper or cork, or the flask will be broken. Put the flask onto a larger enamelware or metal tray, in case the explosion of the bottle occurs, the liquid won't flow away to pollute and damage the inside of the sterilizer.
  - Close the door, turn the safety handle clockwise to the center position, to make radial arms into the door ring, then turn the octagonal hand wheel clockwise along axis, till the door is steam-tight (Avoid over-tightening or it will shorten the life of the door gasket). Then the door close indicator lights. Solenoid valve is closed so that steam pipelines admit the steam into chamber. For the double-doors unit, till both the front and the back doors are all closed, then the door close indicator lights.

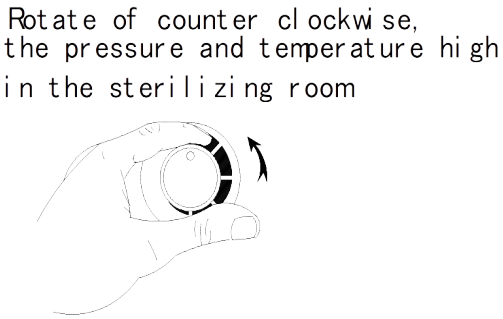
Preset Sterilizing Time:

The customer can preset the required sterilizing time (see form 1) according to following table. Turn the timer knob on the time line you wanted clockwise. When it reached the preset temperature, the pilot of time light, the timer start to count automatically.

Reference table to sterilization time and temperature (form I)

Objects	Required heat preservation time (min)	Steam Pressure Mpa	Relative steam Temperature ℃
Rubber goods	15	0.1 – 0.11	121
Surgical dressings	15 - 20	0.1 – 0.22	121– 134
Utensils	8	0.1 – 0.22	121– 134
Instruments	10	0.1 – 0.22	121– 134
Solution in flasks	20 - 40	0.1 – 0.145	121– 126

1) Sterling temperature (115℃~134℃)
2) Sterling time (1~60min)



- ✓ Setting fulfill---- press key SET. Pilot door, start, water-in on. Auto water-in to high level and the pilot off, and heating pilot on, this time you press start the buzzer sound to inform you setting temperature and time.
- ✓ Press key start----- sterilizing begin.
- ✓ End---- buzzer sound, when the inner gauge show zero, open the door the buzzer stop.
- ✓ At the end of the sterilization period, in case of rapid decrease in pressure of chamber, solution or culture media in flasks would boil over or be spoiled. Therefore, turn the main valve knob to “slow exhaust” position to release the steam in the chamber slowly. Also cut off steam supply, let pressure and temperature in chamber drop naturally. Another way is provided to turn pressure adjustment switch to “close ”position till chamber pressure gauge is reduced to “0”. Wait a few minutes after main valve is turned to “slow exhaust”, door can be opened.
- ✓ By reaching the rating pressure, the sterilizing lamp will be on, and the timer would start to count down.After counting to the zero,the buzzer would go off to remind the end of the sterilizing.The unit would automatically exhaust the air, and pay attention that don’t open the doo till the needle of the pressure gauge point to zero. Open the door a little for about 5~10 cm, and the objects can be fetched in 20~30 mins.(the power could be shut off when the door is open)

- **auto program control**
  - ✧ auto water-in,(from tap to main tank)-----heating (auto release the condense)-----sterilizing(timing)------exhaust steam-----end
- **auto display pilot indicator in sterilizing processing**
  - ✧ power pilot on----door pilot on----start pilot on----water in pilot on(high level off)----heating pilot on----sterilizing pilot on (heating pilot flash)----heating, sterilizing pilot off, buzzer sound---- open the door the pilot off, buzzer stop.
- **dry fully auto program**
  - ✧ after sterilize time, according different demand, be drying by the jacket, and meanwhile open the door around 40~50mm for cooling.
  - ✧ manual operation (setting program select)

1) Sterilizing temperature 134℃
2) Sterilizing time 1~60min.

- **dry auto program control**

✧ heating(auto release the condense)----drying(timing)----end

- **auto display pilot indicator in drying processing**

power pilot on---- start pilot on---- heating pilot on---- sterilizing pilot on (heating pilot flash)---- heating, sterilizing pilot off

Notice

• Do not sterilize different articles at the same time, such as dressing and solution or the same article but has different sterilization requirements

• Check the water level indicator before using the unit, see whether it has sufficient water in tank, if not, add more water when the water level below water line, adding water must in no pressure state.

• if alarm pilot for the water level on, it'll auto exhaust the steam, press emergency key or turn off the power then restart the power, the adding water going on, this time the pilot off, then press key start to going on the heating.

• If you want adding water in the standby, press emergency key, the machine recover to the state of connect power, vaporize & magnet valve open to release, pilot start, heating and sterilize off, press repeat useless. Thus it auto adding the water and going on heating.

• The handle of safety valve draw up 1-2times per week, make it smoothly.

• Electric connector should tighten often to prevent loose and overheat.

• Keep the sterilizer clean and dry, particularly if not used for a certain period of time, please clean up for the purpose of no rust. And lubricate the active parts regularly.

• The unit should be operated in normal conditions, as well as periodically checked and maintained by professional personnel.

• Operating regulations should be set up beside the unit, for the convenience of reference and conformance.

• Protective earth should be provide to ensure safety.

• In the course of sterilizing, if the safety gauge release, means the jacket pressure over the working pressure, you should inspect the pressure controller gauge and safety valve.

06 Maintenance

• Gasket:

The door gasket of rubber should be replaced timely, if steam leakage occurs.

• Pressure gauge:

If pressure gauge pointer doesn't return to "0" or reading isn't accurate, repairs should be made and then see if it up to standard pressure gauge. If not, replace it with new one.

• Thermometer:

There are one thermometer, equipped in condenser outlet at the bottom of chamber, for test the temperature between condensate and chamber, If temperature difference of them is large and the mercurial thermometer is in good order, the dial one should be repaired and checked.

• Pressure controller:

It is equipped with temperature pressure controller preset: 0.05MPa,~0.15Mpa, after be using for a period and large difference please replace.

Breakdown	Possible cause	Removes method
Required temperature in the chamber can't be reached	Dirt accumulated between the seats of the valve	Unscrew the cover, clean the ejecto
	The front part to the elector blocked	Dredge it
The temperature in chamber rises too slowly, A great quantity of steam leaks out	Distance between top and seat of the valve is wide	Fine adjust the temperature controller on the bottom of control box

Electric-thermal tube

There are three U-shape electric-thermal tubes at the bottom of water tank. each 3KW for AC380V three phase /AC220V(single phases).The unit input of power supply should conform to nameplate.

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