

## Operation Manual



BAVT-103

## Vertical 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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# 01 Generation

This Vertical Autoclave is installed with an electrical heater, a timer, an automatically pressure-temperature controller, a safety valve, a releasing valve, a pressure-temperature indicator, an alarm bell for finished sterilization and an instrument to automatically cut off the power of heater. It has the advantages of effective sterilization, convenient operation, safe, less electricity consuming and cheap. It is ideal equipment for clinics, scientific research institutes and other organizations to sterilizer surgical instruments, fabrics, glasses, culture media etc.

## 02 Main Technical Data

Capacity	75L
Max.work pressure	0.22MPa
Max.work temperature	134°C
Heat evenness	$\leq \pm 1^\circ\text{C}$
Timer range	0~99min
Temp.range	0~134°C
Power consumption	220 (1±10%) V 50 (1±2%) Hz
Steri power / voltage	4500W
Dimension	560mm×560mm×1120mm (L×W×H)
Trans Dimension	630mm×650mm×1280mm (L×W×H)
G.W	100Kg
Characteristic	Cooling air release, sterilize, timing, air release, timing, alarm

Safety : Over pressure over temperature protection device auto pressure release lack water and overheat protection over current power cut off the door be locked when the pressure inner over 0.027MPa with the function of interlock

### Sketch diagram

- 1.Housing
- 2.Water release knob
- 3.Control panel
- 4.Inner barrel handle
- 5.Name board
- 6.Safety Valve
- 7.Lid
- 8.Horizontal bar
- 9.Handle
- 10.Screw rod
- 11.Gasket
- 12.Flanged base
- 13.Drum
- 14.Container
15. PT/TT testing opening
- 16.Low water level protection
- 17.Power cord
- 18.Power line

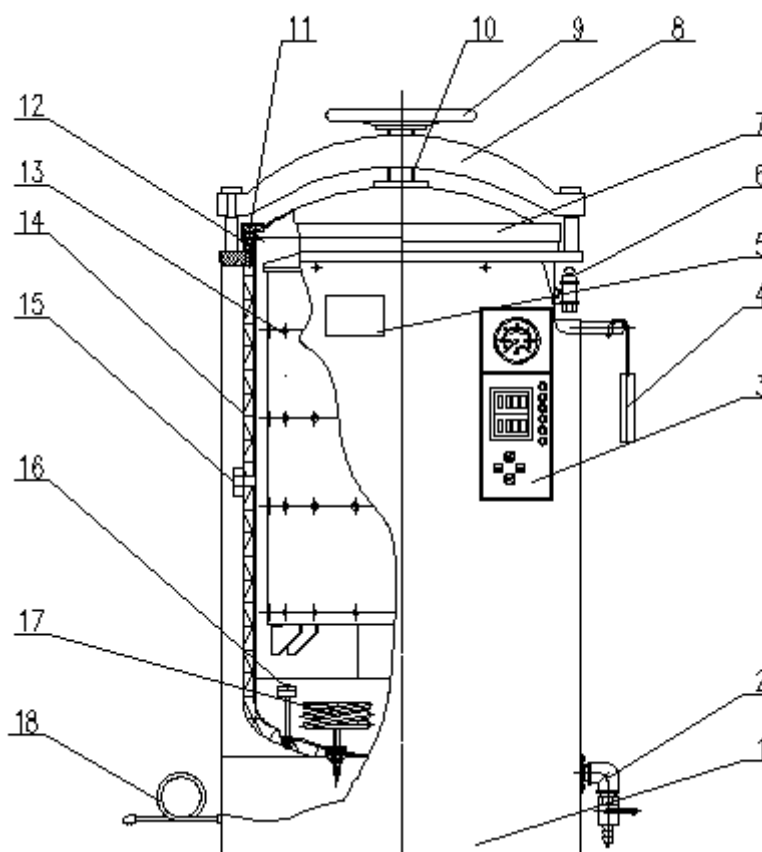


Figure: Sketch Diagram

## 03 Structure Characteristics

1. The autoclave structured by container, lid, pipe, control system, heating system and security system etc.
2. The structure of the unit is a single layer cylindrical body. Its design, manufacture and inspection are strictly operated in accordance with the State Standards of Utilization Safety of Pressure Vessel.
3. The lid be shaped by press one time, the lid is wheel type and quick open structure, Open the door fast and safety, the door can't be open when the pressure inside high than 0.027MPa.
4. The pipe component of electric valve and manual water release valve, the valves running reliable.
5. The outline of the unit is quadrate. The displays and the control switches are centered on the controller board screen in the front of the unit. It is convenient.

- 1) Touching panel: operation program can be adjusted and with the memory function
- 2) With steam temperature control 0~134°C, for sterilizing different objects.
- 3) Sterilization time range is 0~99 min, once the chamber's temperature reached the setting value, the timing is automatically selected, after sterilizing, it cut off the power and alarm automatically.
- 4) With temperature control 0~110°C, With cool air release device automatically, to make sure the sterilize effect.
- 6) The electrical-heated elements of the unit are immersion tubes (AC220V) with high heating effect. It should be grounded reliably. Please connect with the ground when the machine using.
- 7) With over temperature & over pressure auto protection device:
  - 1) With open type safety valve, normally the valve close, when the pressure inside higher over the limited, the valve will open automatically and release the steam, and the pressure turn back to normal it auto close.
  - 2) With water lacking protection device, it'll auto cut-off the power when it water lacking, and alarm, and the press release valve auto open to release the steam.
  - 3) With over-loading protector, it'll cut-off the power when over load occur.
8. Whole machine Container and Drum made by high quality stainless steel (except special), anti corrode, easy keeping, firm coating and good look.
9. Whole machine Drum double boiler adoptive made by high quality stainless steel, anti corrode, easy keeping, firm coating and good look.
10. Whole machine Housing made by quality stainless steel drawbench except special, firm coating and good look.

## 04 Operation procedure

prepare and check

(I) Using conditions:

- 1) Check if the power supply is same as the machine, single phase AC220V, 50HZ.
- 2) environment temperature: 5~40°C
- 3) Relative humidity: ≤80%RH
- 4) Atmospheric pressure range: 0.07 MPa~0.106 MPa
- 5) The pressure of water source 0.15~0.3MPa

The preparation before use

- 1) Power supply data conform to product requirement.
- 2) please connecting to the ground.
- 3) The binding of dressing and textile should not be too tight
- 4) Sterilizing indicator
- 5) Turn on the manual valve of water source

II) Working course operation description

(I) Control panel

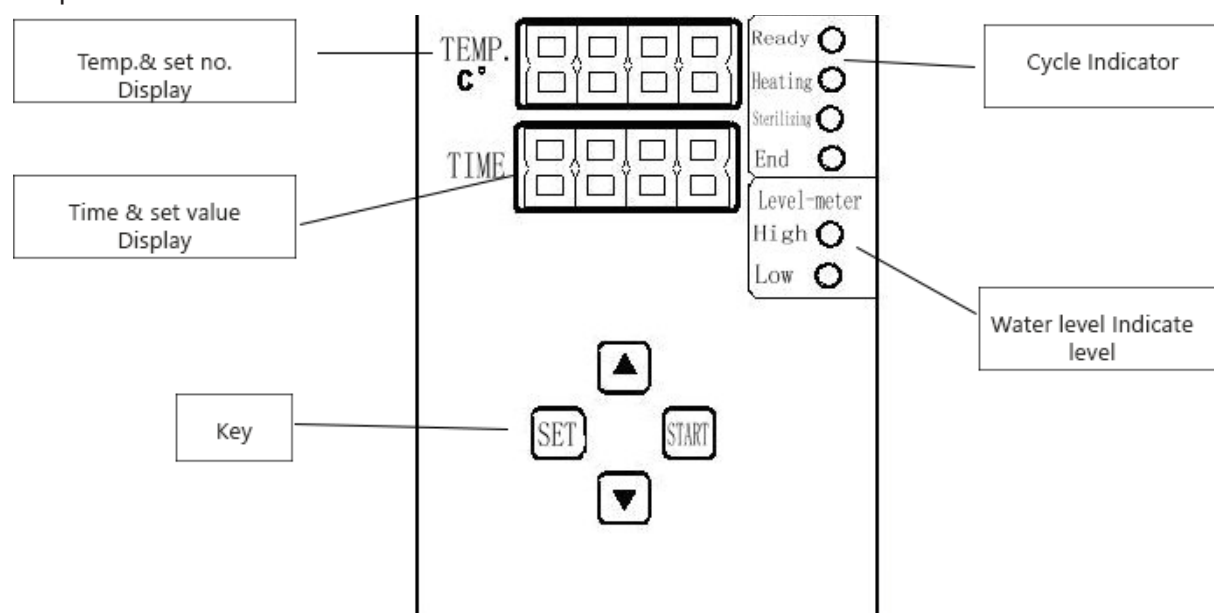


Fig.2: Control panel

Key operate and display:

1) Key

Set ----- set temperature, time, exchange temperature and check data in the course

Use for set exchange temperature (0~110) /sterilize temperature (0~134) and sterilize time (0~99min) / and check data in the course

▲ ----- Key for increase

Use for data increase setting and reset in the working.

▼ ----- Key for decrease

Use for data decrease setting and reset in the working.

Start ----- Key for start working

Start with sterilize program

Screen display



Fig.3 Screen display

2) Display

upper nixie tube-----for temperature and data setting

Display real chamber's temperature and setting code of data setting

Lower nixie tube ----- for time and data setting

Displays real sterilize time and setting value.

Cycle indicator ----- Indicating each working step of sterilize cycle.

Include prepare pilot, heating pilot, sterilize pilot and end pilot.

Water level indicates----- indicate instant water level

Include high level and low level pilot.

On Low level, the low pilot light; high level the high pilot light, medium, the light flash, when it is

between the high and low.

Source power break switch

On the lower part of the unit, use for standby when the power is on.

release tap

On the lower part of the unit, use for release the water in chamber.

(II) data setting and checking

1) Data setting

You can setting: exchange temperature, sterilize temperature, sterilize time.

Last time setting is the default value.

How to set data:

1.1) Press setting key, first line nixie tube display 1111, it means enter cool air release setting, second line nixie tube display the temperature of last time release cool air.

Press key ↑ the data increase, press key ↓ decrease. ( range 0-110°C)

Keep press key ↑ the data fast increase, keep press key ↓, the data fast decrease.

We suggest exchange temperature is 102°C.

1.2) Press setting key again, first line nixie tube display 2222, means enter sterilize setting. Second line nixie tube display sterilize temperature of last time.

Press key ↑ the data increase, press key ↓ decrease. ( range 0-126°C)

Keep press key ↑ the data fast increase, keep press key ↓, the data fast decrease.

1.3) Press setting key third time, first line nixie tube display 3333, means setting sterilize time. Second line nixie tube fore two bit display the sterilize time last time.

Press key ↑ the data increase, press key ↓ decrease. ( range 0-99min)

Hold press key ↑ for the fast increase of data , Hold press key ↓, for the fast decrease of the data.

1.4) Press setting key fourth time, restore the setting data, first line nixie tube is chamber's temperature, the second nixie tube display 0.

2) data checking in the course of sterilize

After setting parameters you can check data anytime.

First press setting key, first line nixie tube display 1111, means the release cool temperature be setting, the second line nixie tube display last time release cool temperature.

Press setting key again, first line nixie tube display 2222, means sterilize temperature be setting. Second line nixie tube display sterilize temperature last time.

Press setting key third time, first line nixie tube display 3333, means sterilize time be setting. Second line nixie tube display the sterilize time last time.



Press setting key fourth time, first line nixie tube display real temperature, second line nixie tube display the data before check.

If you do not turn back to the state before check in the checking course, it will recover to the state before check after 30 sec. automatically.

### (III) The course of sterilizing

#### 1. Prepare, set parameters

1.1) Open the lid, take out the sterilizing baskets, then fill in water to the high water level by hand. (pure water or distill water)

1.2) Insert the power plug on the socket, open the break switch.

1.3) Prepare pilot on

1.4) Put the objects to be sterilized into the baskets. The objects should be wrapped then settle on the sieve plate, keep space between each objects, dressing size better in 20 cm×20 cm×10 cm, please put sterilize indicator.

1.5) Put the baskets into the unit and close the lid, tighten the bend as clockwise to seal the lid and the body, not too tight to avoid damage the rubber seal.(or you can check that water is up to the high level then close the lid.)

1.6) Upper line nixie tube display real chamber temperature, the low line nixie tube display 0.

1.7) 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	10-15	0.1 – 0.22	134
Utensils	10	0.1 – 0.22	134
Instruments	10-20	0.1 – 0.22	126

#### 2. heating

Push the key ENT, it auto enters heating course.

##### 2.1) Pilot of heating

2.2) If the chamber's temperature lower than 100°C ,and the water not reached high level, water –in valve open and electric release valve open, the tank's water move to chamber, if this time in lower level, the low level pilot on, if between the high and low, the low pilot flash, upper nixie tube shows chamber's temperature, lower nixie tube shows exchange temperature.

2.3) If the chamber's temperature higher than 100°C, electric release valve open up to lower than 100°C, going on item 2.2.

2.4) When water reached high level, the high level pilot on, the water-in valve off, the heating element get the power and chamber start to heat, meanwhile cool air be exchange through release valve and air suction pump.

If the high level pilot not on for a long time, need add proper pure water or distill water to the tank up to high level pilot on.

2.5) When the chamber's temperature reached exchange temperature be set, release valve off, the heating element heat go on. Upper nixie tube display chamber temperature, low line nixie tube display sterilize time, front 2 bit is minute, and rear 2 bit is second.

### 3) sterilizing

#### 3.1) Pilot of sterilizing

3.2) When the chamber's temperature reached the setting value, the timing begin to decrease second by second.

Adjust sterilize temperature in the course to make the temperature be controlled in the range of setting value 0-1°C.

3.3) When the time ends, please open the tap water and prepare cooling for the steam be released.

#### (IV) Trouble in sterilize program

1) it may have problems as below in program:

(1) You can check working data in the cycle (detail see above)

(2) If you want reset the machine, you can press key ▲ or key ▼, it'll recover to state of preparation.

(3) If the nixie tube shows Err2 and with the sound buzzer in the heating and sterilizing program, it means water level is low, you need fill water

(4) If the nixie tube shows Err2 and with the sound buzzer in the course of heating, it means the heating time is too long, usually the heating elements can be destroyed.

(5) If you just hearing the sound of buzzer, it means chamber's temperature higher 3°C than setting, meanwhile chamber release until it reaches to the normal temperature.

(6) Over current protection:

The cut off switch should auto cut off the power when the over current occur. Once you solve the problem, turn on the switch and set the temperature and time as mentioned above.

## 1. trouble and the solving ways

The trouble	reason	Solving way
Buzzer alarm, display flash. And overheating bulb light	Lack of water or water level protector is broken	Add water or replace the protector
	Heat tube broken	Replace the heat tube
Circuit breaker cut off	Over current attack	Check power net
	Short circuit	Check the line, or replace some burned spare part.

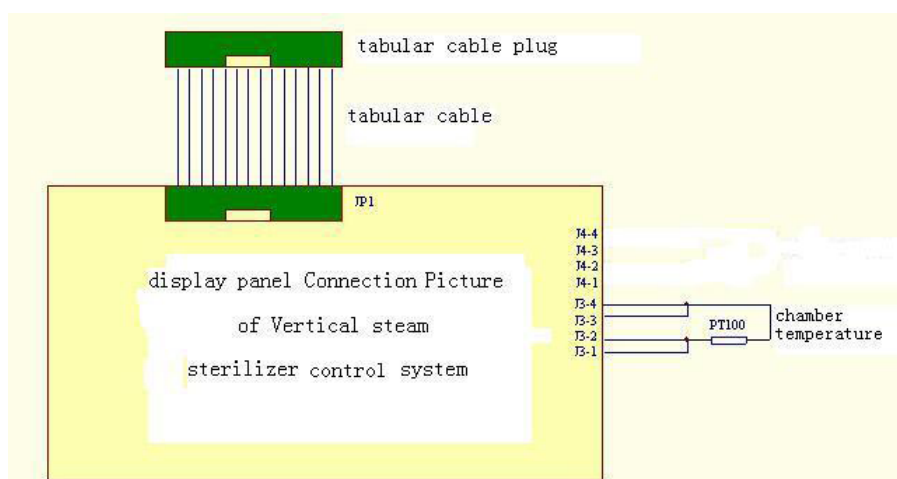
**Electric circuit:**

Fig.4 control panel

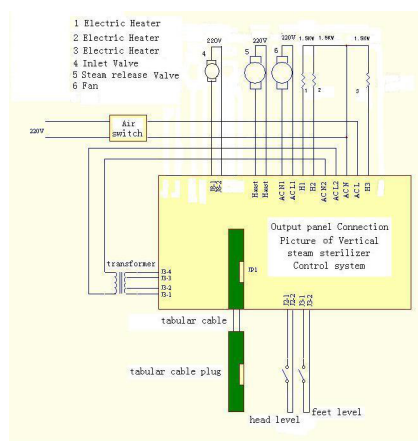


Fig.5 Electricity controller

Electric board with high voltage, when you repair please cut off the power first

## 05 Attention and maintenance

The operator of the sterilizer should have the operation knowledge and responsibility to regularly maintain the unit to prevent any accident.

1. Please don't sterilizing different kinds of objects at the same time, such as surgical dressings and solution, rubber goods and instruments, otherwise, it will not be result in effective sterilization. You should put together of the chemical sterilize trip or biological indicator, after sterilizing you can inspect the result, you can often use thermometer, sterile trip or indicator to know the temperature and the time, so as to make the sterilizing reliable.

2. If some accident occur in the sterilizing course, please solve it and wait for 5 seconds and then re-start the machine, any pre-set will be useless.

3. Every day after sterilization, drain the water from the sterilizer by opening the draining valve on the right bottom of the unit, dry the sterilizer and scrub the water stain, to improve the quality of sterilization, save energy and prolong the service life, if there is much water stain that cannot be clean, the solution made up of 10kg of water, 1 kg of caustic soda and 0.25kg of kerosene can be used. Put the solution into the container and let it soak for 10-12hours, then clean the water stain and finally rinse with clean water.

4. Replace the sealing washer in time as it will age a long time of use and affect the sealing effect.

5. You must test the safety valve every year, if it fails then please replace it. If some problems occur in the program and the pressure is going high then you must cut off the power in time, make sure the safety.

## 06 Warning

1. If the safety valve failed on the course, and the pressure is over 0.23 MPa but the valve not release steam, you must cut off the power in time, the warning mark labeled on the near of the power switch.
2. Power supply earth wire must be connected to the ground.
3. Use distill water only !



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