



Operation Manual



BAVT 500 series

Vertical Autoclave

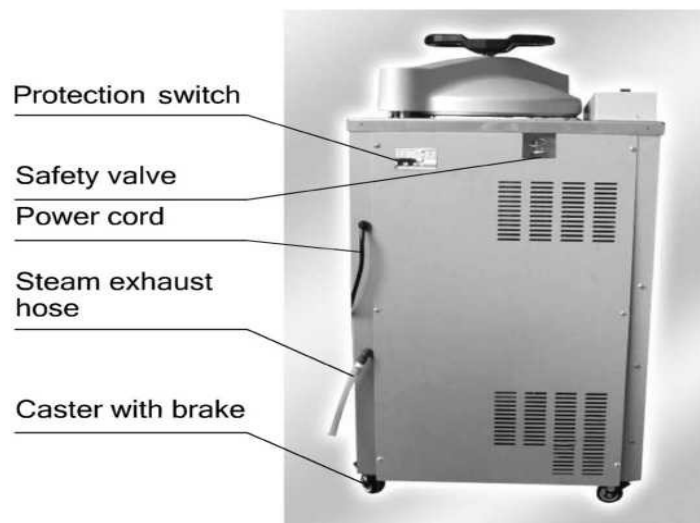
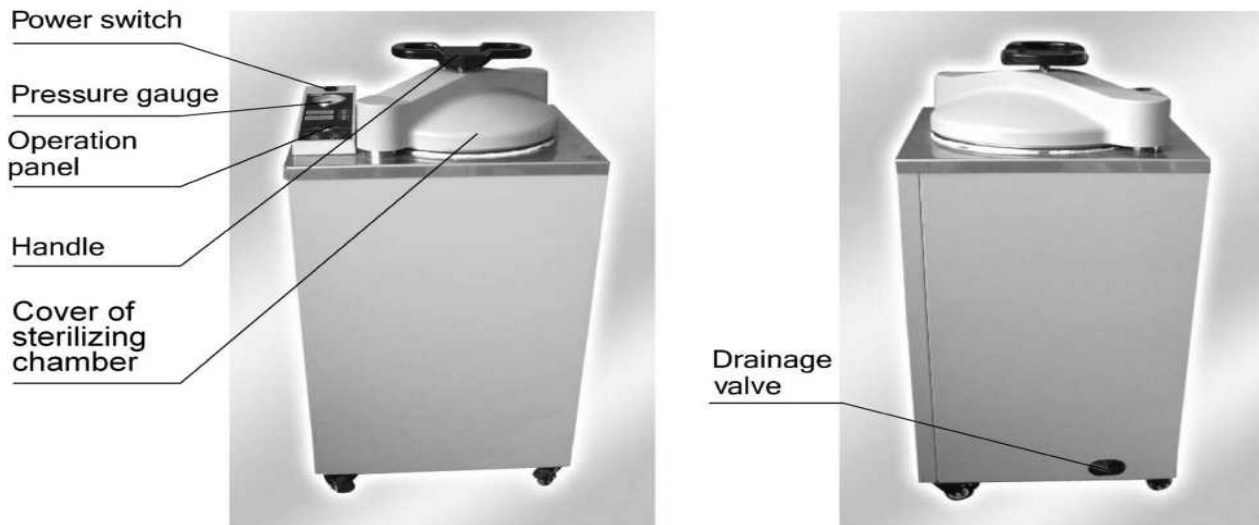
Thank you for Choosing Biolab products. Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation.

Index

1. External Features & Controller.....	03
2. Technical Specification.....	05
3. Installation of Instrument.....	06
4. Operation Instruction.....	07
5. Troubleshooting.....	13
6. Maintenance & Care.....	15
7. Setting of Administrator.....	16

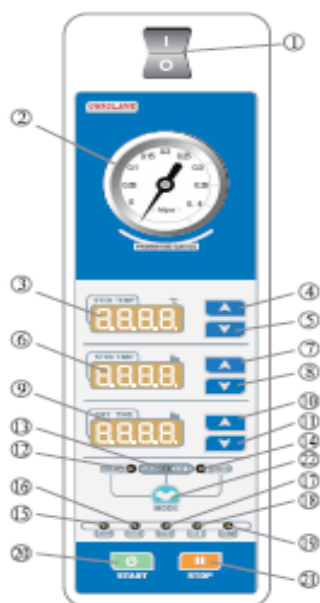
01 External Features & Controller

I. External Features



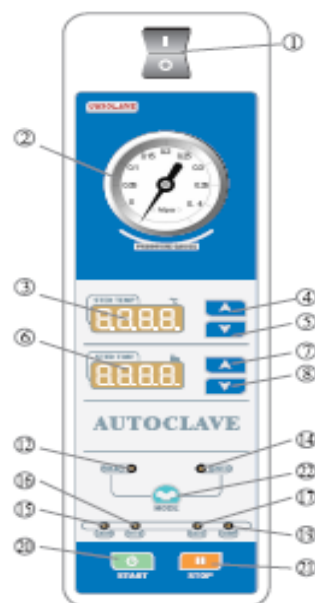
II Introduction of Controller

FD36R/FD50R/FD65R/FE80R/FD100R
operation panel(R series)



- 1.power switch :press " 1" to turn on the power ,press " 0" to turn off the power
- 2.pressure gauge
- 3.sterilizing temperature screen:℃
- 4.sterilizing temperature up button
- 5.sterilizing temperature down button
- 6.sterilizing time screen:min
- 7.sterilizing time up button
- 8.sterilizing time down button
- 9.drying time screen: min
- 10.drying time up button
- 11.drying time down button

FD36A/FD50A/FD65A/FD80A/FD100A
operation panel(A series)



- 12.solid mode indicator
- 13.solid&drying mode indicator
- 14.liquid mode indicator
- 15.interlocking indicator:on means cover is secured
- 16.sterilizing indicator
- 17.exhausting indicator
- 18.drying indicator
- 19.complete indicator: on means work finished
- 20.button:press to start sterilizing
- 21.button:press to stop sterilizing
- 22.button:press to choose sterilizing mode

02 Technical Specification

I. Technical Specification

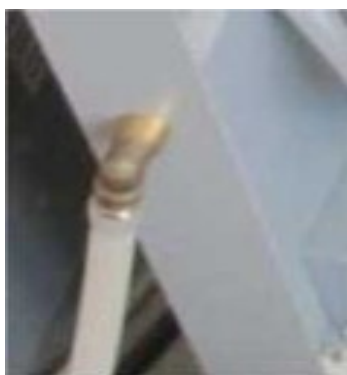
Model	BAVT-502-A/BAVT-502-B	BAVT-503-A/BAVT-503-B	BAVT-504-A/BAVT-504-B
Capacity	50(L)	80(L)	100(L)
External dimension(mm)	580x490x1080	730x625x1100	730x625x1200
Size of sterilizer chamber mm	φ325x670	φ400x709	φ400x809
Power supply	220V 50/60HZ		
Rated power	2600W	4600W	4600W
Range of pressure gauge	-0.1-0.5Mpa		
Working environment	5-40°C relative humidity 10-85%		
Rated working pressure	0.25Mpa		
Designed pressure	0.3Mpa		
Sterilization temperature	105-135°C		
Sterilization timer	1-300min		
Drying timer	1-300min ①		
Operation mode	Solid Mode、Solid& Drying Mode ② 、Liquid Mode		
safety equipment	Safety valve, over temperature and temperature abnormal protection system, over pressure protection system, electric leakage protection equipment, chamber cover checking system, self- induction interlocking device		
Accessories	Stainless steel baskets, water plate, waste water tank		

①② R series have drying mode for solid, drying time can be pre-set

03 Installation of Instrument

I. Placement of Instrument

1. Place the instrument on the level ground with the brakes of four casters pressed down before installation. Do not place any objects within 10cm around for ventilation.
2. Connect the drainage pipe between machine and wastewater receiving bottle or pipe.
3. Take out the water plate, remove the packaging, place it in the bottom of the chamber in a horizontal position.



II. Connection

1. The instrument must be grounded reliably, if the power socket does not have the ground terminal, it is required to connect the instrument with independent ground wire before powered on.
2. Power supply: single-phase AC 200-240V, (50/60) Hz.
3. Requirement for current intensity:

BAVT-A	≥ 14A
BAVT-502-B/BAVT-502-A	≥ 14A
BAVT-503-A	≥ 25A
BAVT-504-B/BAVT-504-A	≥ 25A

III. Setting

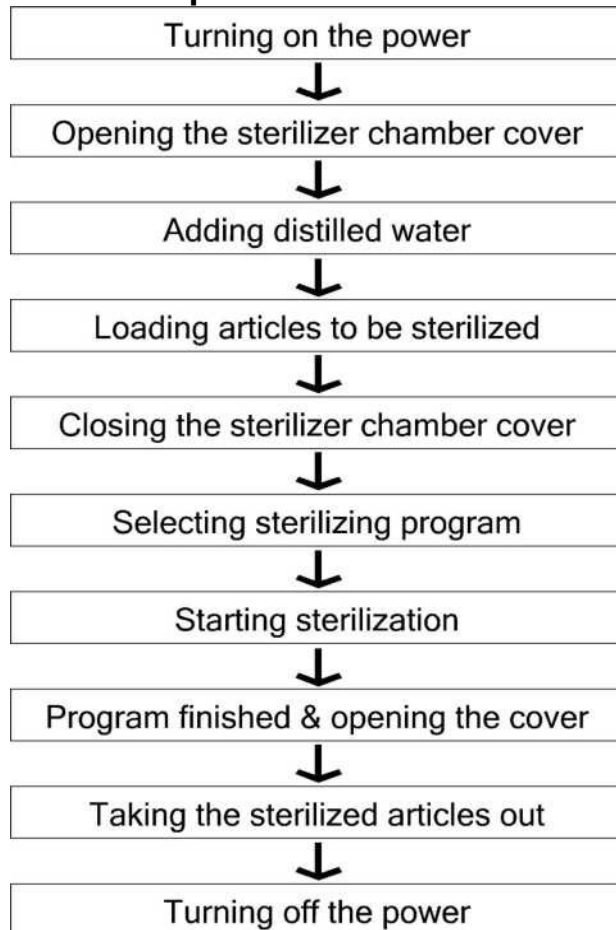
When shipped from the factory, the unit is set for an elevation of between 0 and 300m. If the elevation of the installation location is higher than 300m, please ask your dealer to change the setting to avoid affecting normal work of sterilization.

★Caution :

If the elevation is not set properly, machine can not work normally.

04 Operation Instruction

I. Basic Sterilization Illustration & Operation Instruction



1. Turning on the power

Turn on the leakage protection switch and the power switch on the control panel

2. Opening the sterilizer chamber cover

- 1) Turn the handle counter-clockwise until the chamber cover is loosened
- 2) Push the handle rightward slightly to move the cover to one side

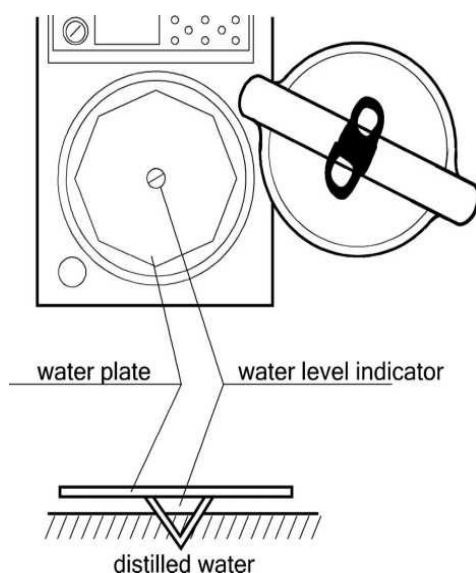
★Note:

- The indicator "locked" is off at this time, and the sterilizer will not be able to work until the chamber cover is closed and secured.
- Do not open the chamber cover too fiercely, so that it will not be extruded and broken.

3. Adding water

4. Loading articles to be sterilized

Adding distilled water into the sterilizer chamber until the water flows into the observation hole in the middle of the water plate.



- 1) Put the articles to be sterilized into the baskets and close the cover
- 2) Make sure the water plate is placed well, in case baskets place on the heater directly.
- 3) Put the baskets lightly into the chamber

★Note:

- Verify whether the water plate is in place or not before putting the baskets back into the sterilizer chamber, so that they will not be put on the heater directly.
- When plastic bag is used for sterilizing, please put some water into the bag and keep the bag open, and make sure the bags do not contact with the inner wall of the sterilizer. Sealed

bags will result in inefficient sterilization. If the sterilization chamber is over crowded, steam can not reach every corner, will result in incomplete sterilization.

○ When sterilizing the glassware like beaker, conical flask and test tube, the vessel must be put up side down or across. If the vessel can only be in vertical direction, put a little water in the vessel before sterilizing.

○ When sterilizing the liquids like chemical reagent or menstruum, care must be taken to the volume of liquid inside the container ($3/4$ of total volume of flask, and $1/2$ of total volume of test tube), so that the liquid will not overflow from the container during sterilizing.

○ The cover of container to be sterilized should be loosened for air exhaust to prevent container broken.

○ When melting the agar, each container should be less than 2 L, otherwise the melting may not be completed thoroughly.

○ The DURHAM TEST TUBE with over 6mm calibre should be used, otherwise air bubble may stay in the tube.

○ Please put article temperature sensor properly if the instrument is attached article thermometer.

5. Closing the sterilizer chamber cover

1) Push the handle leftward slightly until the arm leans against the arm stopped.

2) Turn the handle until it is secured and the cover closed indicator " Locked" is on. The cover closed indicator may change repeatedly in course of tightening. When it is nearly secured, turn the handle slowly while observing whether the cover closed indicator is on or not.

6. Selecting sterilizing program

Select the sterilization mode, set up the Sterilization time and drying time according to your needs.

Model	Sterilization Parameter	S Setting Way
BAVT-B	1.Sterilizing mode 1) Solid mode 2) Liquid mode	Pr Pess " MODE " button to switch between solid mode and liquid mode
	2、Main Parameter 1) Sterilizing temperature 105-135°C 2) Sterilizing time 1-300min	PPrees sterilizing temperature up or down button to set PrPress Sterilizing time up or down button to set
BAVT-A	1.Sterilizing mode 1) Solid mode 2) Solid&drying mode 3) Liquid mode	PrPress"MODE"button to switch between solid mode, solid&drying mode and liquid mode
	2、Main Parameter 1) Sterilizing temperature: 105-135°C 2) Sterilizing time : 1-300min 3) Drying time:1-300min	PrPress sterilizing temperature up or down button to set PrPress Sterilizing time up or down button to set Press drying time up or down button to set

★Note:

○ For sterilization of liquids, set a sterilization time longer than desired, taking a delay time into account: For example, if the volume of water in the flask is 3L , when the internal temperature of the sterilizer chamber reaches the set value, another 33 minutes shall be required for the water in the flask to reach this temperature, therefore, the sterilizing time must be set to 53 minutes.

Actual required sterilizing time (53min)=Delay time(33min) + Normal sterilizing time(20min)

BAVT-502-B Sterilizing Delay Time Reference Value (Every Flask)	
Liquid Volume	Delay Time
3L	30min
2L	25min
1L	20min
500cc	15min

○ Never press the "STOP" button casually to stop the running program during sterilizing of liquids to avoid the liquid overflowing into the sterilizer chamber and even blocking the valve and pipe lines.

7. Starting sterilization

After setting the sterilization parameter, press "START" button to start work, "STER" indicator will start to blink, when reaching the setting sterilization time, the sterilizing time on the screen start to count down.

★Note:

○ In order to prevent misuse, "START" and "STOP" button have a delayed response function. Keep the button for 2 seconds to start work.

8. Opening the cover & Program finished

- 1) When the set sterilizing time is up, the system will send out a sound alarm, and the steam will be exhausted to release automatically "EXHT" indicator starts to blink.
- 2) Under solid mode with drying, when the temperature is lower than the boiling point, the system will send out a sound alarm, and the screen will show "OPEN" to indicate the opening of the cover. After opening the cover, system will start drying function, "DRY" indicator starts to blink, drying time on the screen starts to count down.
- 3) When program finished and the temperature is below 97 °C (Solid mode or solid+drying mode) or below 80°C (liquid mode), the "COMP" indicator will blink, which means the sterilization is finished.

9. Taking the sterilized articles out

- 1) Always wear the heat insulation gloves when taking articles after sterilizing out of the sterilizer chamber, and wait until the steam disperses before reaching into the sterilizer chamber.
- 2) When sterilizing the liquids, verify the temperature is low enough before taking it out to avoid scald due to low cooling speed of liquid.

10. Turning off the power

- 1) Power must be switched off after the completion of daily operations or the instrument will not be used for a long period of time.
- 2) When sterilization is completed of a day, it is recommended to drain out all water in sterilization chamber.

11.Clock Setting(BAVT-A)

1.Under standby condition, press the STOP+▽ (beside STER TIME) , enter into clock setting and calibration mode, the screen will show below content:

Screen 1

STER TEMP
①

STER TIME MIN
yEAr

Screen 2

STER TEMP °C
②

STER TIME MIN
non

Screen 3

STER TEMP °C
③

STER TIME MIN
day

Screen 4

STER TEMP °C
④

STER TIME MIN
hour

Screen 5

STER TEMP °C
⑤

STER TIME MIN
nin

○F05 default specification and the adjustable range

Name	No.	Default setting	Adjustable range
yEAr (year)	①	2011	2000--2099
Non (month)	②	1	1-12
Day (day)	③	1	1-31
Hour (hour)	④	1	0-23
Nin (minute)	⑤	1	0-59

1) If you set the time correctly, press STOP to exit

2) If you didn't set the time correctly, press MODE to enter into data changing screen: screen 1 will blink 2011 or the current year setting, screen 2 will show yearr, means you can change the year, press the ▲or ▼ to change the setting. Press the MODE to save the change, if you do not want to save the change, you can press STOP to exit to standby condition. You can change the month, day, hour and minute in this way.

05 Troubleshooting

1. The automatic control system of the sterilizer monitors the real time operation of the instrument. Whenever any failure occurs, the system may send out alarm and display the error code, then, please press the STOP button to return to standby status, and turn off the power, check the error code and handle on time.
2. To insure the safety, the chamber cover can be open under the circumstance that no pressure in the chamber and the temperature is below 80°C at the same time
3. Under liquid mode, do not press STOP button before the temperature is lower than the boiling point, so as to avoid the liquid loads overflowing.

Error code	Possible causes	Suggested solution
E01	Lid lock error	Check the handle is placed well (either horizontally or vertically)
E02	Local altitude is not set correctly	Reset the local altitude (P009)
	The temp. sensor is blocked by articles	Read the articles loading part of manual
	Heating system problem	Check the heater, wires
E03	Water level sensor is dirty	Clean the water level sensor
	Pressure gauge display doesn't match temperature	1. Check if solenoid valve and pipe is blocked 2. Check temp. sensor and wires 3. Check pressure switch and its wires
	Temperature control switch is abnormal	Change the temperature control switch
E04	Temp. floating due to abnormal power floating	Check the power voltage, must be 198V-242V
	Cold air is not purged out completely	Check if the pipe is blocked, or the articles put in a right way
E06	The temp. sensor is not connected well to the electronic board	Re-plug the temp. sensor to the board
	Chamber temp. sensor is having problem	Change the temp. sensor
E07	Short circuit on chamber temp. sensor	Change the chamber temp. sensor

E10	Sudden power off during sterilization	Start the cycle again
E14	Drying system or temp. control problem	Contact local dealer
E18	Solenoid valve and piping blocked	Clean the solenoid valve and piping
	Temp. /pressure sensor is abnormal	Re-plug the temp./pressure sensor
E20	Safety valve testing wires problem	Contact local dealer
E26	The pressure sensor is not connected well to the electronic board	Re-plug the pressure sensor
	Chamber pressure sensor is having problem	Change pressure sensor
E27	Short circuit on chamber pressure sensor	Contact local dealer or change pressure sensor
E36	Open circuit or short circuit for heating prevention sensor	Re-plug the temp. sensor
E37	No enough water in chamber	Add water to chamber
	Water level sensor is dirty	Clean the water level sensor
	Water level sensor is having problem	Contact local dealer

Below is the note code, you can press STOP very shortly(just touch and go) to go back to standby condition:

Note code	Display content	Suggested solution
N02	The temp. is over boiling point when start	Re-start when temp. is lower
N06	Chamber lid is not locked when start	Re-lock the chamber lid
N05	Safety valve test reminder	Test the safety valve

The above chart covers the simple problems, if you can not handle them by yourselves, please contact the local dealer and provide the following information :

- 1)Model and Number of Machine
- 2)Broken part and symptom of failure (or Error code)
- 3)Purchasing date of machine
- 4)Operational information (including sterilizing articles)
- 5)Better to provide vedio or pictures when error

06 Maintenance & Care

1 .Daily care:

Sterilization chamber and chamber cover should be cleaned with soft cloth every day.

2.Weekly care:

- 1) The water in the sterilizer chamber must be changed every week, or change at any time within one week if the water is dirty.
- 2) When changing the water, connect one end of the drainage hose with the drain port of sterilizer chamber, and put the other end into a water collector, release the drainage valve to drain, and turn off the valve counter-clockwise after the drainage.

★ Note:

- Make sure that the water in the sterilizer chamber is at room temperature before changing the water.
- If the sterilizer will not be used for a long period of time, the water in the sterilizer chamber must be emptied to avoid blocking the pipeline.
- 3) Wipe the surface of the sealing ring and its contact parts with soft and clean cloth at least once a week.

3.Monthly care:

Take out the water plate to check the heating pipe. If dirt can be gently scrub with a soft brush and flush, and then discharge the dirty water.

4.Yearly care:

- 1)Check the wires damage and problem of fuse and connector.
- 2)Check the pipe for leaks.
- 3)Check if there is leaking of the solenoid valve or lose of coil.
- 4)Check the indicator and process indicators (check the security of cover)
- 5)Press the testing button of leakage protection switch, if the leakage protection switch trips means everything is normal, otherwise turn off the power switch and contact local dealer. Press the reset switch, make the position up right, the power will be on.

No.	Spare parts	No.	Spare parts	No.	Spare parts	No.	Spare parts
1	Mainboard	2	Control panel	3	Safety valve	4	Solenoid valve
5	Gasket ring	6	Heater	7	Temperature sensor	8	Temperature switch
9	Pressure gauge	10	Voltage transformer	11	Power switch	12	Leakage protector
13	Pressure switch	14	Beam micro switch	15	Chain switch	16	Solid state relay
17	Heating relay	18	Solenoid valve relay	19	Drying plant		

07 Setting of Administrator

1.Under standby condition, press and hold MODE and STOP buttons, then screen A will show "0000". Among these, the first "0" flashing means it is changeable. And press of ▲ or ▼ button may adjust the first digit to "6", and then press the ▼ button at the ster. time screen to save the first number. At this time, the second "0" flashing means it is changeable, you could input the password by analogy.

2.After entering into the parameter modification menu, press the ▲ or ▼ button to select the menu you want to modify.

3.Administrator menu:

P001 Printer enabled or not (Yes: enabled No: disabled)

P002 Button sound enabled or not (Yes: enabled No: disabled)

P003 Setting of pressure unit: 1: Kpa; 2: bar; 3: psi ; 4: No (Not available or no operation for pressure sensor, do not choose the pressure unit if the equipment is not added with pressure sensor, it will cause alarming)

P005: Printing language: 0: English 1: Chinese

P006: Safety valve test enabled or not (Yes: enabled No: disabled)

P007: Chamber temp sensor, temp compensation: the temp compensation scope is -5°C - +5°C

P008: Setting of max working temp: the temp range is 135°C-145°C

P009: Setting of local altitude: (0-3000m)

P010: Boiling point temp corresponding to altitude (according to P009)

P011: Version of system, unmodified

P012: Solid mode: exhaustion temperature setting (105°C-130°C)

P016: Does it need a password to create, modify or delete the program (Yes: enabled No: disabled, only for BAVT-A, same as P017 Admin password)

P017: Administrator menu password

P018: Total cycle number, each time you press START will adding one cycle number

P019: Pressure sensor compensation ,compensation scope is -5-5kPa.

P022: Drying temperature setting, scope: 80°C-160°C

P030: Pulse times setting, P+ numbers, range: 0-9 times

P031 : Exhaust temperature scope for liquid mode: 73°C-104°C

P032 : Water drainage scope for solid mode: 105-135°C, or OFF. (Only for R)

P033: YES: open lid drying, NO: closed lid drying (Only for R, closed lid drying require extra setting by manufacturer)



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