

Vertical Autoclave FM-VA-B101



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

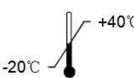







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1. Safety Measures

- Read this manual carefully and understand the requirements of all warnings and cautions before using. The users Must check the safety performance of the sterilizer and check if the sterilizer is in good working condition before using.
- The sterilizer should be used according to the scope of application, use method, and precautions specified in the manual. Otherwise, the unit might be damaged, or the sterilization may fail.
- The unit is equipped with several safety features to prevent operator injury and protect the equipment from damage. Operators should thoroughly understand each step of the operation before using the unit.
- **Instruction for the operator:** The operator must be trained and knowledgeable about the equipment's performance characteristics, working principles, and on-site operations. They should also have a basic understanding of the sterilization process. Before operating the unit, the operator must carefully read and fully understand this manual.
- **Requirements for the Maintenance Person:** the maintenance person should have corresponding qualifications, professional repair capabilities, and familiar experience.
- This equipment is classified as a type I pressure vessel. While using, the relevant provisions of the National Pressure Vessel Regulations should be observed. The responsible person should be identified to ensure the safe and correct use of the equipment.
- The connection between the user's network power supply and the power supply should meet the relevant requirements of the national electrical safety standards.
- If the voltage fluctuation exceeds 10%, the equipment cannot work properly.
- Electromagnetic Compatibility Requirements for Measurement and Control of Laboratory Electrical Equipment, Part 1: General Requirements." Please ensure an EMC environment for the proper operation of the equipment. Avoid using this sterilizer near strong radiation sources (e.g., unshielded RF), as this may affect its normal functioning. It is recommended that users assess the electromagnetic environment to ensure the sterilizer operates effectively.
- The replacement of the door gasket is determined according to the frequency of use, the rate of natural aging, and the conditions of cleaning, disinfection, and sterilization. If no damage occurs, the door seals can continue to be used, or they should be replaced in time.

- The equipment and accessories should be used within the specified service life, the overdue use may bring certain safety risks. Due to the aging of the equipment and accessories, there might be some safety risks and hidden dangers at the tail of the service life. Therefore, the equipment safety should be checked every time before use, and the broken spares should be replaced if necessary.
- The disposal of the accessories of this equipment and equipment itself after the service life shall be conducted following the relevant regulations of the national and regional environmental protection, and it shall be avoided to pollute the environment or create safety hazards.
- The Safety valves should be regularly tested according to the relevant national regulations.
- You must disconnect the device before installing a fuse or performing any electrical repairs. When replacing the fuse, ensure it has the appropriate current rating. The model, specifications, and current values must comply with the specifications outlined in this manual.
- Before operating the device, confirm the status of the circuit switch. If a malfunction occurs, the main power switch should be disconnected immediately.
- To ensure safety and avoid electric shock, make sure that the equipment is properly grounded. Do not modify the grounding protection wire, either inside or outside the equipment, or remove the wiring from the grounding protection terminal. Failing to do so may disable the equipment's protective functions and create a shock hazard.
- Must pay attention and stay away from the area with the hot proof mark, and exhaust port of the device to avoid burns.

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symbols	Instruction
	Fragile items (the transport, package contain innig fragile items, handling with care)
	Keep Up (the transport package should be straight up during transport)
	Avoid wet (the transport packages should be kept dry)
	Temperature limit (the temperature range during the transport packaging should be maintained)
	Alternating current
	Protective grounding/ (Protection conductor terminal)
	Disconnect (the main power supply) / (cut (power))
	Switch on (main power) / (connect (power))
	Caution, shock hazard / (electricity danger)
	Caution scalds
	Be careful, Dangerous / (NOTE! See random file)
PT/TT	Pressure/temperature test

2. Introduction

Vertical Autoclave FM-VA-B101 is a top loader sterility autoclave with a 50 L capacity, 134°C sterilization temperature and 0.22 MPa working sterilization pressure. Equipped with two stainless steel baskets and indicator light to indicate working status of the sterilization process. It gives auto protection against over temperature & over pressure. The chamber is constructed of long lasting 304 grade stainless steel with superior corrosion resistance property. It is CE certified vertical autoclave.

3. Features

- Microprocessor-controlled advanced system
- Control panel structured with Digital Display i.e. LCD displays the pressure, temperature, and time setting
- Control panel also offers route display and indicating lamp, and operating buttons
- 304 Stainless steel body with corrosion resistance
- Manual / semiautomatic control
- Built in safety lid with hand fitted knobs
- Automatic steam discharge after sterilization
- Beep alarm for shutting off after sterilization
- Self-inflated seal type ring to prevent leakage
- Auto protection against over temperature and over pressure
- Automatic power off for heating element on reduction of a water level
- Heater protection sensor
- Safety features for pressure and water deficient
- Consists of two stainless steel sterilizing baskets
- Door lock safety system
- Safe, reliable and user friendly operation mode
- Comply with strict international directives and standard

4. Specifications

Model	FM-VA-B101
Capacity	50L
Working sterilization temperature	134°C
Working sterilization pressure	0.22 Mpa
Adjustment of Temperature	105°C to 134°C
Timer range	0 to 99 min / 0 to 99 hr 59 s
Control Precision: Temperature	≤ ± 1°C
Digital display	LCD Display
Maximum power consumption	3 kW
Power supply	AC 220 V 50 Hz
Chamber dimension (Φ × D)	340 × 550 mm
Dimension (L × W × H)	520 × 520 × 980 mm
Packaging dimension (L × W × H)	590 × 590 × 1110 mm
Net weight	50 kg
Gross weight	68 Kg

5. Applications

Especially designed for clinical disposal, biochemistry, pharmaceutical industry, health care industry, fertilizer plant, brewery industry, biotechnology, microbiology and scientific research.

6. Instrument Introduction

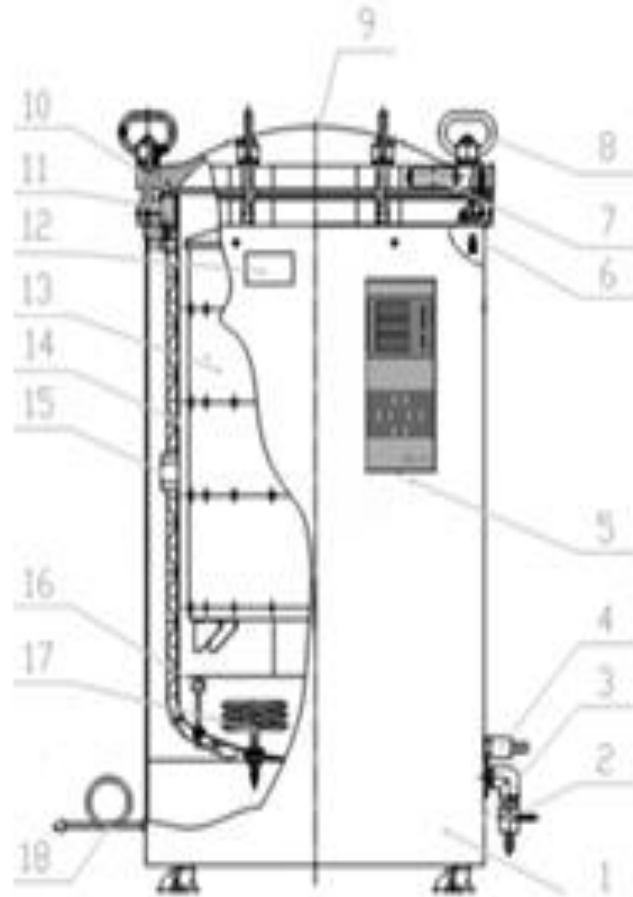


Figure 1

- | | |
|---------------------------|-------------------------|
| 1. Shell | 10. Gasket |
| 2. Water Drain Knob | 11. Flange |
| 3. Overload Power switch | 12. Name Plate |
| 4. Quick change connector | 13. Sterilizing Chamber |
| 5. Control board | 14. Container |
| 6. Safety valve | 15. PT/TT testing point |
| 7. Handle | 16. Low-level protector |
| 8. Tighten balls | 17. Heating tube |
| 9. Container Lid | 18. Power cord |

7. Installation

7.1 Equipment Placement

- The equipment should be placed on a flat surface.
- The equipment should be kept at a certain distance from the wall, 30 cm from the left wall, 20 cm from the back wall, and 80 cm from the right wall.
- Do Not place the steam vent of the safety valve too close to the power outlet, and Do Not be blocked by anything.

7.2 Power connection

- Power requirements: single-phase AC 220V \pm 10%, 50Hz b)
- The equipment Must be reliably grounded. If the outlet does not have a ground end, the equipment must be grounded with a separate grounding conductor before connecting the power.

Warning

- While using only the power cord should be connected. Do not twist or pull the power cord, which might cause damage and looseness to the wires, and bring fire hazard or electric shock.
- Do not connect the ground wire to plastic pipes, gas pipes, water pipes, etc.

7.3 The preparation before using

- Check if the power supply parameters are consistent with product requirements.
- After piling the items, place them on a sieve plate sequentially, and leave some appropriate gaps between the packages. We suggest making the packages into 20cm x 20cm x 10cm. The dressing and the textile should not be tightly packed.
- Prepare a sterilizing indicator (chemical indicator card or biological indicator).

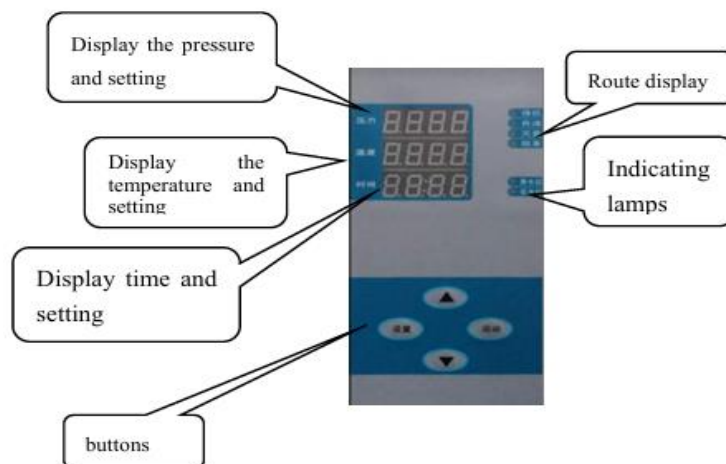


Figure 2

7.4 Working Environment

- a) Ambient temperature $+5^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- b) Relative humidity $\leq 85\% \text{RH}$
- c) Atmospheric pressure $70 \text{kPa} \sim 106 \text{kPa}$
- d) Power supply AC $220\text{V} \pm 22\text{V}$, $50\text{Hz} \pm 1\text{Hz}$

8. Operations

8.1 The control board instruction

The operation panel is shown in Figure 2

Display instruction

- Nixie tube (upper row) ----pressure display screen (Kpa)
- Nixie tube (middle row) ----temperature display screen (°C)
- Nixie tube (lower row) ----time display screen(min)
- Cycle indicates ---- This Indicates the working cycle of the sterilization cycle Including "standby", "heating", "sterilizing", and "end" four indicators.
- Water level----Indicates the water level status. Including the "high water" and "low water" indicators. If it is at a low water level, the "low water level" indicator flashes. The "high water level" indicator lights up if it is at a high level. If it is between the high and low water levels, the "low water level" light flashes.

Other Basic Information

- Overload protection power switch at the lower side of the sterilizer, which is used during the equipment is under standby status (Refer Fig 1).
- Drain knob at the lower part of the sterilizer, which is used for the discharge of water from the container (Refer Figure 1).

8.2 Parameter setting and the operation

Setting

- When the unit is in standby mode (indicated by the standby light being on), press the **SET** button.
- The second display will flash, indicating the sterilization temperature setting.
- Adjust the temperature value by using the "▲" and "▼" buttons.
- Press the **SET** button again, and the third display will flash, indicating the sterilization time setting.
- Again, use the "▲" and "▼" buttons to modify the sterilization time.
- Press the **SET** button again, and the first display will flash, allowing you to set whether to exhaust air after sterilization.
- Use the "▲" and "▼" buttons to make this adjustment. Finally, press the SET button again to save all parameters.

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Parameter	Minimum Value	Maximum Value	Defaults	Remarks
Sterilizing temperature	105°C	134°C	132°C	
Sterilizing time	0	599mins	30mins	
Exhaust	0	1	1	0-no exhaust, 1-exhaust

Parameter maintenance setting method

While the unit is on standby, press the "▼" key five times to set the parameters, the below words with color are invalidated, the pressure screen displays the serial number, the temperature window displays the setting value, the start button, and the serial number scrolls.

P1	Parameter	Minimum value	Maximum Value	Default	Remarks
2.	Cold air releasing temperature	100	110	103°C	
3.	Cold air-releasing time	0	5	1 Second	
4.	Cold air releasing cycle	0	180	60 Seconds	
5.	The second time to release the cold air	0	500	120Seconds	
6.	The interval time between two times releasing the cold air	0	600	120Seconds	
13.	The temperature for open the exhausting valve	90	105	102°C	
16	The time limit of the pressure release	1	20	10Minutes	
21	pressure compensation	-20.0	20.0	0Kpa	
22	Temperature compensation	-20/2	20.0	0°C	
23	If the pressure sensor	0	1	1	0- no,1- yes
24	Model selection	0	5	0	0-vertical electro-mechanical

8.3 Sterilization Work Process Description

8.3.1 Preparation

- Open the lid of the container, take out the drums, and add water manually till it reaches a high level. (Use distilled water)
- Turn on the power and turn on the power brake switch.
- The standby indicator light is on. The high-water level indicator lights up.
- After piling the items, place them on a sieve plate sequentially, and leave some appropriate gaps between the packages. We suggest making the packages into 20cm x 20cm x 10cm. The dressing and the textile should not be tightly packed. And don't forget to place the sterilizing indicator.
- After placing the drum in the container, close the clock wisely and tighten the hand wheel till the lid is closed. Don't close too tight as it might bring damage to the rubber gasket.
- Set sterilization parameters (see parameter settings for details).

The Sterilizing time can be set by the following table please set the sterilizing time and temperature according to the different items required.

Items	Sterilizing time (min)	Pressure (MPa)	Temperature (°C)
Rubber	15	0.1to0.11	121
Textile	15 to 50	0.1to0.22	121 to 134
Instrument	8 to 40	0.1to0.22	121 to 134
Glassware	10 to 40	0.1to 0.22	121 to 134
Bottled Fluid	20 to 40	0.145	121 to 126

8.3.2 Heating

Press the **START** key, the equipment starts to heat. The Heat indicates the lamp would be on.

8.3.3 Sterilizing

- The lamp on indicates the sterilizing
- When the temperature of the inner chamber reaches the set value, it starts to time and is decremented by "seconds".
- By the value of the temperature reaches the setting parameter, it starts to clock wisely timing.

8.3.4 End

When the sterilization time reaches zero, the transfer is complete, and the internal chamber will begin to exhaust. As the temperature drops, the buzzer will sound when it reaches 102 °C, indicating that the sterilization process is finished. Wait for one minute before opening the lid. Allow the sterilized items to cool for 20-30 minutes before removing them. After opening the lid, remember to turn off the power.

8.3.5 Problems in the Sterilization Cycle

- During the sterilization cycle, the operating parameters can be queried.
- During the process of sterilization, press the “▲” or “▼” key to reset the program and return the “**Standby**” status.
- When the current is overloaded, the overload protection power switch will automatically cut off the power, eliminate the fault first, and then turn on the overload protection power switch again to perform the sterilization operation.

9. Maintenance

- The operator should carefully read this manual before use and possess a thorough understanding of the operation. It is essential to cultivate a strong sense of responsibility and strictly follow the steps outlined in the manual. Additionally, regular maintenance is required to ensure the unit remains in good condition and operates normally, thereby preventing accidents.
- Ensure there is enough water in the container, keep the water at a high level and the corresponding lamp is always on. More water could affect the drying of the textile.
- Before the heating, must strictly follow the provision to eliminate the cold air from the container or the sterilizing result will be affected.
- Don't sterilize different kinds of items at the same time, such as textiles and solutions, rubber, and instruments. Otherwise, the sterilizing result would be affected.
- To sterilize the solution, it should be filled into a glass bottle or vessel that can withstand high temperatures. Take care not to overfill; it is generally advisable to fill the bottle to a volume between 1/2 and 3/4 full. The opening of the bottle should be tightly covered with gauze. Do not use a stopper, such as a rubber or cork stopper, that does not have a hole for ventilation. Place the glass bottle or vessel inside a protective container before putting it into the sterilization chamber. This step is crucial to prevent the glass from bursting or being damaged.
- Every day after sterilizing, drain the water from the container. Dry the sterilizer and scrub the water stain frequently to ensure the sterilizing result and prolong the service life.
- If there is much water incrustation that cannot be cleaned, the following solution is suggested: add 0.75 kg of caustic soda and 0.25kg of kerosene into 10L clean water and mix them. Pour the solution into the container and let it soak for 10-12 hours, then the water incrustation can be cleared and then 10 finally rinse with clean water.
- Test the sterilizing temperature, sterilizing time, and sterilizing result with the stationary point thermometer, sterilizing indicator, or other biological method, to ensure the reliable and best sterilizing result.
- The equipment is a type of pressure vessel. It is important to avoid any impacts while it is in operation and using it under excessive pressure is strictly prohibited. If the displayed pressure exceeds the maximum allowable value and the safety valve does not open to release it, cease use of the unit immediately. The safety valve may have malfunctioned, so it should be inspected and replaced if necessary. Do not resume the operation of the unit until the safety valve has been verified as functioning properly. Additionally, the safety valve must be inspected annually by the local Technical Supervision Bureau.
- The gasket is wearing part, which should be checked frequently. If the feature is changed or deformed or aging hardening, the spares should be changed immediately.

- The replaced fuse should comply with the provision as the manual said, the model and the specification should be the same as the old one.
- Ensure the safety grounding of the unit, and make sure the power socket is grounded well.
- Keep the Unit clean and neat.
- If not using it for a long time store it in, a shady, dry, and ventilated place, and make the necessary dustproof work.

10. Troubleshooting

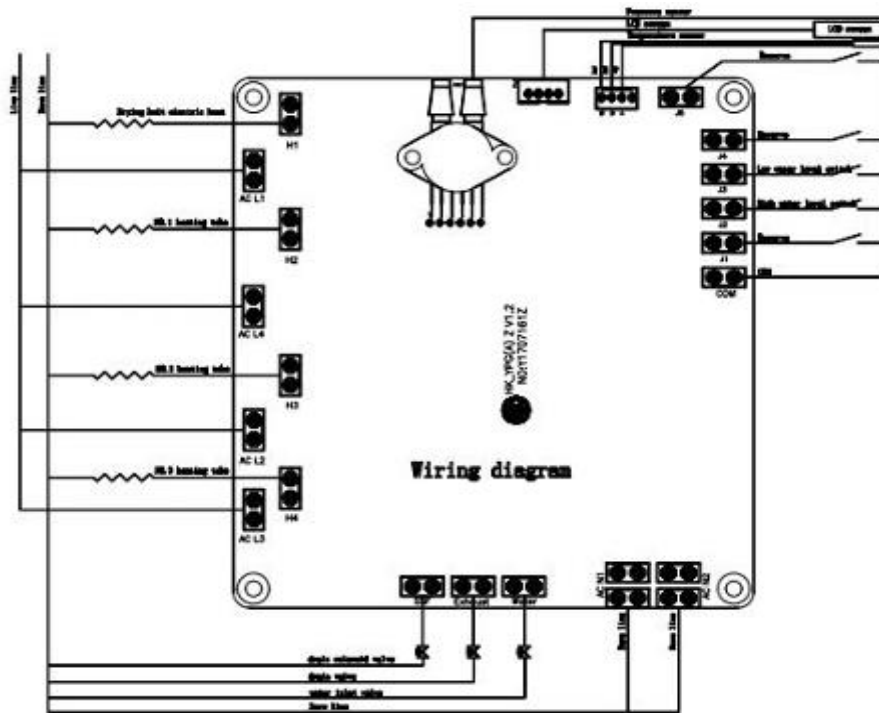
Faults	Cause
01	The sensor in the chamber is malfunctioning.
02	the pressure sensor in the chamber is broken.

11. Accessories

Accessories no.	Accessories name	Basket capacity	Basket dimension (W × H)	Units
1	Basket	50 L	315 × 250 mm	2

No	Name	Quantity	Marks
1	Main Body	1	
2	Sterilizing basket	2	
3	Sieve board	1	
4	Chamber handle	1	
5	Inner lid	1	
6	Exhausting tube	1	With one fix hoop
7	User's manual	1	

12. Circuit Diagram



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