



Vertical Autoclave

LMVT-A203

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1. Safety Measures

1.1 Important Safety Instructions

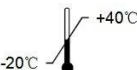
- Carefully read this manual and fully understand all warnings and precautions before using the sterilizer. Users must check the safety performance of the sterilizer and ensure it is in proper working condition before operation.
- Use the sterilizer strictly by its intended scope, specified methods, and outlined precautions. Failure to do so may result in damage to the unit or ineffective sterilization.
- The sterilizer is equipped with safety protection features to prevent injury to operators and damage to the equipment. Operators should familiarize themselves with every operational step before use.
- **Operator requirements:** Operators must be properly trained, understand the equipment's performance characteristics and working principles, and know the sterilization process. Before operating the sterilizer, this manual should be thoroughly read and understood.
- **Maintenance personnel requirements:** Maintenance personnel should possess the necessary qualifications, professional repair skills, and relevant experience to effectively maintain the sterilizer.
- This equipment is classified as a Type I pressure vessel. During use, comply with the relevant provisions of the National Pressure Vessel Regulations. A responsible person should be designated to ensure the safe and proper operation of the equipment.
- Although safety has been thoroughly considered during the design and manufacturing process, operators must continuously monitor and observe the equipment's working status while it is in operation.
- The connection between the user's network power supply and the equipment's power supply must meet the requirements outlined in national electrical safety standards.
- The equipment may not function properly if the voltage fluctuation exceeds $\pm 10\%$.
- The sterilizer complies with GB/T18268.1-2010: Electromagnetic Compatibility Requirements for Laboratory Use Measurement and Control Electrical Equipment, Part 1: General Requirements. Ensure an appropriate electromagnetic compatibility (EMC) environment for the proper operation of the equipment. This sterilizer meets the design and testing standards of Class A equipment under GB4824-2013. Avoid using the sterilizer near strong radiation sources (e.g., unshielded RF), as they may interfere with its normal operation.
- This equipment is designed and manufactured in compliance with the relevant provisions of national and industry laws and regulations, including the safety requirements outlined in GB4793.1-2007.
- Replacement of the door gasket depends on usage frequency, natural aging rate, and the conditions under which cleaning, disinfection, and sterilization are performed. If no damage is observed, the door seals may continue to be used; however, they should be replaced promptly if necessary.

- The equipment and its accessories must be used within the specified service life. Extended use beyond this period may pose safety risks due to aging components. Before each use, the safety of the equipment should be thoroughly inspected, and any defective parts should be replaced as needed.
- The disposal of equipment and accessories after the end of their service life must comply with national and regional environmental protection regulations. Measures should be taken to avoid environmental pollution or the creation of safety hazards.
- The quality of the water source used with this equipment must meet the standards specified in Appendix A of YY 1007-2010.
- Safety valves must be regularly tested by relevant national regulations to ensure proper functionality.
- The device must be disconnected from the power supply before installing a fuse or performing any electrical repairs. Replacement fuses should match the specified current values and comply with the model and specifications detailed in this manual.
- Before operating the device, ensure that the circuit switch is in the correct status. If a malfunction occurs, the device's main power switch must be immediately disconnected to prevent further issues.
- To ensure safety and prevent electric shock, the equipment must be properly grounded. Do not modify or disconnect the grounding protection wire inside or outside the equipment, as this will compromise the equipment's protection function and create a shock hazard.
- Pay close attention to areas marked with hot surface warnings and the exhaust port of the device to avoid burns. Stay clear of these areas during operation.

1.2 Explanation of Symbols

Certain symbols and codes are used on the sterilizer's shell, in this manual, or on the outer packaging in place of text descriptions.

Their explanations are as follows:

Symbols	Instruction
	Fragile items (the transport package containing 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 package should be maintained).

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	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.

This sterilizer has the following safety features:

1) Water Shortage Overheat Protection

If there is a water shortage or no water in the container, the heating tube may overheat. To prevent damage, the sterilizer will automatically cut off the power supply. At this point, turn off the power manually. Do not open the cover until the pressure inside the chamber has returned to zero. Once the pressure is zero, open the cover, add water to the container, close the cover securely, and tighten the handwheel. Turn on the power switch, and once the water level indicator is displayed, the sterilization process can resume.

2) Overvoltage Protection

If the input line voltage exceeds AC280V, the sterilizer will automatically cut off the heating power. In this case, turn off the power and check the power supply. Ensure the voltage is stable and within the normal range (AC220V) before restarting the sterilizer.

2. Introduction

Vertical Autoclave LMVT-A203 is a compact and spacious-free autoclave that offers outstanding performance during sterilization of laboratory applications. It features a capacity of 100 L that stimulates a temperature range between 105 °C to 134 °C. All parameters displayed on the LED screen allow intuitive operation for quick recognition. Improved with handle door lock system to ensure sample safety with advanced protocol.

3. Features

- User-friendly easy to view LED display offers clear observation of working temperature
- Structured with robust and spark-free stainless steel ensures long-term usability
- Equipped with a corrosion-resistant chamber enables tool-free cleaning
- Effortless handling with minimal maintenance
- Easily adjustable with high reliability and safety
- Employed with alarm alert indication during automatic shut-off
- Configured with a safety control system to prevent protection against overloading and temperature deviation Improved with auto discharge of cool air and steam to ensure worry-free operation

4. Specifications

Model No.	LMVT-A203
Capacity	100 L
Temperature Range	134 °C
Maximum Pressure	0.23 MPa
Time Range	0 - 99 min or 0 - 99 hours 59 min
Chamber Size	φ 440 × 650 mm
Working Pressure	0.22 MPa
Sterilizing Temperature	105 °C - 134 °C
Power	4.5 kW
Voltage	220 V
Heat Average	≤ ± 1 °C
Dimension	540 × 560 × 1250 mm
Net Weight	85 Kg
Gross Weight	110 Kg

5. Applications

It is extensively used to sterilize surgical equipment, laboratory instruments, pharmaceutical items, and other materials.

6. Instrument Introduction

6.1 Construction

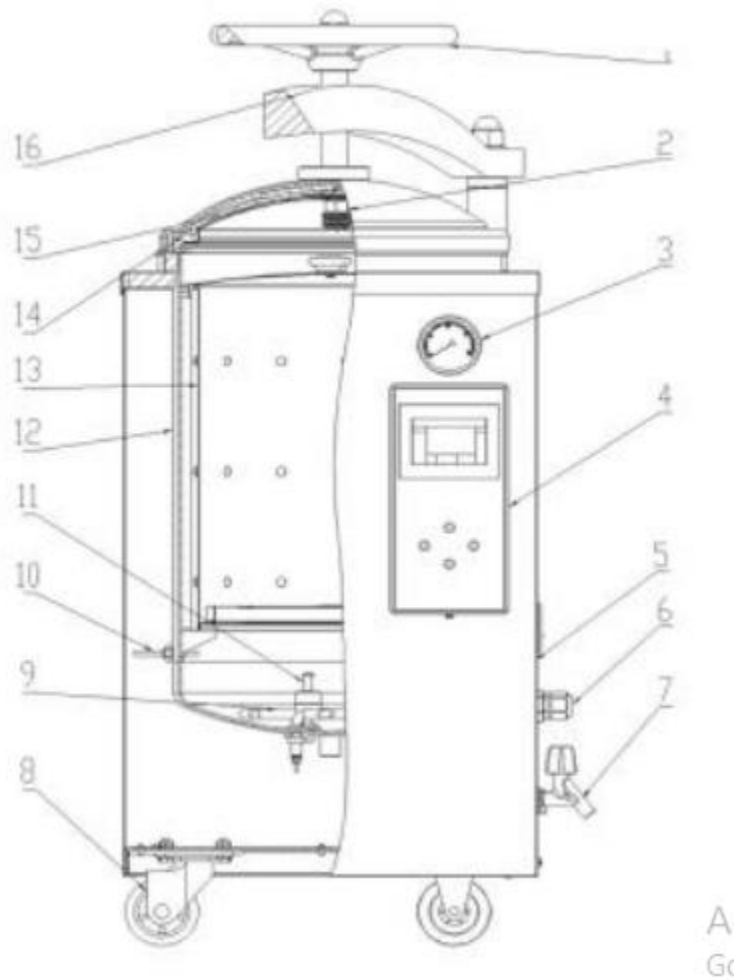


Figure 1 Outline Structure

- | | |
|------------------------|-------------------------------|
| 1. Handwheel | 9. Heater |
| 2. Self-locking device | 10. Probe |
| 3. Pressure gauge | 11. Low water level protector |
| 4. Control board | 12. Container |
| 5. Circuit breaker | 13. Inner pot |
| 6. Power cord | 14. Gasket |
| 7. Water tap | 15. Screw rod |
| 8. Pulley | 16. Cross arm |

7. Installation

7.1 The Preparation

Equipment Placement

1. The equipment must be placed on a flat, stable surface.
2. Maintain specific clearances from the walls: 30 cm from the left wall, 20 cm from the back wall, and 80 cm from the right wall.
3. Ensure the steam vent of the safety valve is not positioned too close to a power outlet and always remains unobstructed.

Power connection

1. **Power requirements:** single-phase AC 220V $\pm$ 10%, 50Hz
2. 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

1. The power cord must be connected to the power switch for only use. Do not twist or pull the power cord, which might cause damage and looseness to the wires, and bring fire hazard or electric shock.
2. The equipment must be grounded reliably. Do not connect the ground wire to plastic pipes, gas pipes, water pipes, etc.

7.2 The Preparation Before Using

1. Verify that the power supply parameters align with the product's specified requirements.
2. Arrange the items on a sieve plate in sequence, leaving appropriate gaps between the packages. It is recommended to keep the package dimensions at approximately 20 cm x 20 cm x 10 cm. Ensure that dressings and textiles are not tightly packed.
3. Prepare a sterilization indicator, such as a chemical indicator card or a biological indicator.

7.3 Normal Working Conditions

- 1) Ambient temperature +5°C ~ +40°C
- 2) Relative humidity $\leq$ 85%RH
- 3) Atmospheric pressure 70kPa ~ 106 kPa

Note: By using the sterilizer, the operator should consider the impact of the local atmospheric pressure on the parameter settings.

- 4) Power supply AC 220V $\pm$ 22V, 50Hz $\pm$ 1

8. Operations

8.1 The Operation Instructions

The operation panel is shown in Figure 2.

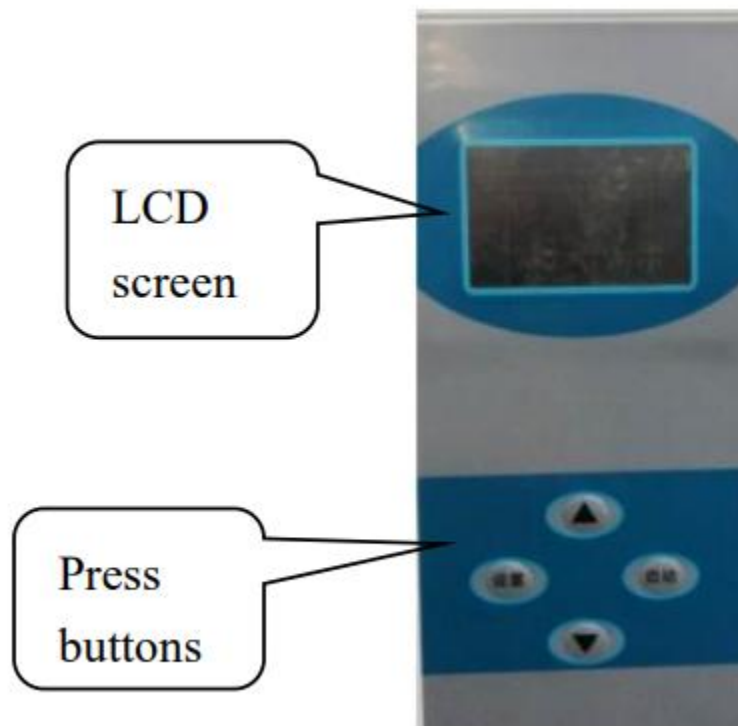


Figure 2 Control Board

Other Instructions

1) Break Switch

Located at the lower side of the sterilizer, this switch is used when the equipment is in standby mode.

2) Drain Knob

Positioned at the lower part of the sterilizer, the drain knob is used to discharge water from the container (refer to Figure 1).

8.2 Number setting and query operation

- Press the setting button “” to flash, press the “▲” and “▼” buttons to select the required mode. The self-define mode is for the free set.
- Press the “SET” button again: modify the sterilization temperature and the temperature display flashes. If you select the fixed mode, the temperature cannot be set.
- Press the "Set" button again to modify the sterilization time.
- Press the "Set" button again to modify the drying time.
- Press the “SET” button again, to choose to print or not. At the TIME area, the HOUR position shows 05, if the MINUTE position shows 00 means no print, or 01 means print.
- Press the “SET” button again, to choose whether to drain the water or not after sterilizing. At the TIME area, the Hour position shows 05, if the MINUTE position shows 00 means no draining, or 01 means draining.
- Press the “SET” button again to save the parameter, and exit.
- Set the clock: Press the “▲” 5 times to set the YEAR, MONTH, DATE AND TIME.
- Long time press the “SET” button for 5 seconds by the unit is on standby, and the exhausting valve can be open, long time press the “ENT” button, which is for emergency use to pause the unit.

8.3 Sterilization Work Process Description

8.3.1 Preparation

1. Turn on the power and activate the power break switch.
2. Open the container lid, remove the drums, and manually add distilled water until it reaches the high-water level.
3. The standby indicator light will turn on, and the high-water level indicator will light up.
4. After stacking the items, place them on the sieve plate sequentially, leaving appropriate gaps between the packages. We recommend making the packages 20 cm x 20 cm x 10 cm. Ensure that the dressing and textiles are not tightly packed. Don't forget to place the sterilizing indicator.
5. After placing the drum into the container, close the lid by turning the handwheel clockwise until it is securely closed. Avoid tightening it too much, as this could damage the rubber gasket.
6. Set the sterilization parameters (refer to the parameter settings for details).

The sterilizing time can be set according to Table 2 below. Kindly set the sterilizing time and temperature based on the specific requirements for different items.

Table 2 Sterilizing time setting

Items	Sterilizing Time (min)	Pressure (MPa)	Temperature (°C)
Rubber	15	0.1~0.11	121
Textile	15~50	0.1~0.22	121~134
Instrument	8~40	0.1~0.22	121~134
Glass ware	10~40	0.1~0.22	121~134
Bottled fluid	20 ~ 40	0.145	121 ~ 126

Attention: The instrument, textile, and fluid modes are fixed, while the self-defined mode allows you to set the parameters freely.

8.3.2 Heating

Press the START key to begin heating the equipment.

8.3.3 Sterilizing

When the temperature reaches the set value, the timing will start automatically.

8.3.4 Drying

After sterilization, when the temperature drops below 100°C and the pressure gauge pointer returns to zero, the machine begins drying with the door open.

8.3.5 End

After drying, the sterilized items can be removed after 20–30 minutes.

Note: When sterilizing fluids or fluids in glass containers, do not exhaust the steam immediately after sterilization is complete. Rapid steam exhaustion may cause the liquid to boil and overflow, or even cause the glass to burst.

8.4 Characteristics

- Equipped with a pressure/temperature controller, the pressure setting range is 0.07 to 0.22 MPa (corresponding to a saturated steam temperature of 115 to 134°C).
- Equipped with a timer to automatically control the sterilization time.
- Equipped with a safety valve and pressure gauge; the relief valve automatically releases pressure when the sterilization pressure exceeds the maximum allowable value.
- The immersed-type electric heating tube has an anti-dry function. When the water level falls below the specified minimum level, the sterilizer automatically cuts off the heating power and triggers an alarm.

9. Maintenance

Precautions and Maintenance

Alarm: The operator should follow the relevant provisions of the Regulation on Safety Inspection of Special Equipment and the Inspection Procedure for Pressure Vessels in Use.

1. The operator should carefully read this manual before use. They should possess the necessary operational knowledge and strengthen their sense of responsibility. The unit should be operated strictly according to the steps outlined in the manual. The following maintenance procedures are required to ensure the unit remains in good condition, operates smoothly, and prevents accidents.
2. Ensure that there is enough water in the container, keeping the water level high and ensuring the corresponding lamp is always on. Note: Excess water may affect the drying process of textiles.
3. Before heating, strictly follow the instructions to eliminate cold air from the container. Failure to do so may affect the sterilization results.
4. Do not sterilize different types of items simultaneously, such as textiles and solutions, or rubber and instruments. This could affect the sterilization results.
5. When sterilizing solutions, they should be placed in a glass bottle (or vessel) that is resistant to high temperatures. Caution: Do not overfill the container. It is recommended to fill the glass bottle (or vessel) to 1/2 to 3/4 of its capacity. The bottle mouth should be tightly sealed with gauze. Do not use a stopper (such as a rubber stopper or cork stopper) that lacks a hole. The glass bottle (or vessel) should be placed in a protective container and placed in the sterilization chamber to prevent the glass from bursting or being damaged.
6. After each sterilization, drain the water from the container, dry the sterilizer, and frequently wipe off any water stains to ensure effective sterilization and prolong the service life of the unit.
7. If there is significant water incrustation that cannot be cleaned, the following solution is recommended: Add 0.75 kg of caustic soda and 0.25 kg of kerosene to 10L of clean water and mix. Pour the solution into the container and let it soak for 10-12 hours. The incrustation should then be cleared. Finally, rinse thoroughly with clean water.
8. Test the sterilization temperature, sterilization time, and sterilization results using a stationary-point thermometer, sterilization indicator, or other biological methods to ensure reliable and optimal sterilization results.
9. The equipment is a pressure vessel and must be protected from impact during operation. Overpressure is strictly prohibited. If the displayed pressure exceeds the maximum allowable value and the safety valve does not open to release pressure, stop using the unit immediately. The safety valve may have failed check and replace it as needed. Do not use the unit again until the safety valve is verified as functional. The safety valve and pressure gauge should be inspected annually by the local Technical Supervision Bureau.
10. The gasket is a worn part and should be checked regularly. If it becomes deformed, hardens, or shows signs of aging, it should be replaced immediately.

11. The replacement fuse should comply with the specifications outlined in the manual. The model and specifications should match the original.
12. Ensure the unit is properly grounded and verify that the power socket is grounded correctly.
13. Keep the unit clean.
14. There are no special requirements for transportation and storage. However, if the unit is not used for an extended period, store it in a cool, dry, and well-ventilated place, and take necessary dust-proof measures.

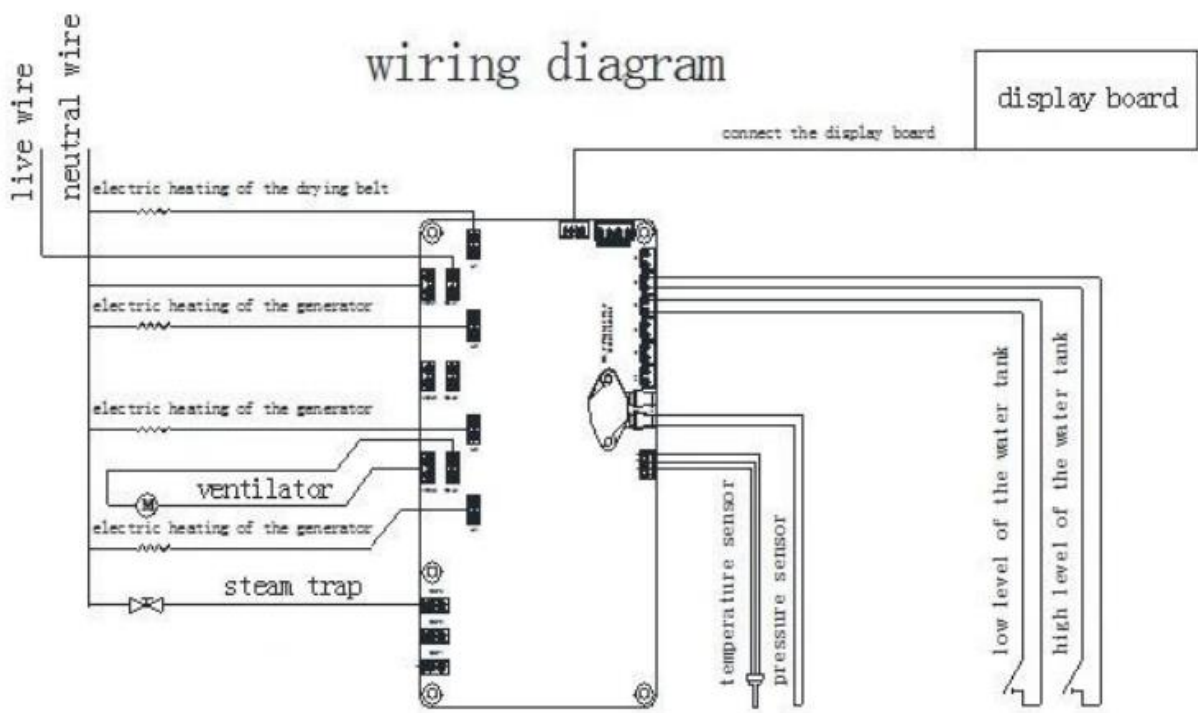
10. Troubleshooting

Common Faults and Troubleshooting

Faults	Troubleshooting
01	The sensor in the chamber is malfunctioning.
02	The pressure sensor in the chamber is broken.
03	The temperature sensor of the dry belt is broken.

11. Circuit Diagram

Electric Scheme



- * 35L: 1 pc of heating tube
- 50L: 2 pc of heating tube
- 75L、100L: 3 pc of heating tube

The breaker and the Fuse Capacity

- 1) Breaker rating current: 40A
- 2) Fuse specification : F2 250V/1A ϕ 5×20mm

12. Appendix

Brief Operation Steps

1. Insert the exhaust nozzle into the exhaust steam quick-change connector.
2. Connect the power (220V) and turn it on. Add water until the high-level indicator lamp is on. (The water float ball should be immersed in water.)
3. Press the “” button, which will flash. Then press the “▲” and “▼” buttons to choose the desired mode. The "Self-Define" mode allows you to set custom parameters, as outlined below:
 - Press the “SET” button again to adjust the sterilizing temperature. Note: This cannot be changed in fixed modes.
 - Press the “SET” button again to adjust the sterilizing time (132°C ~ 134°C).
 - Press the “SET” button again to adjust the drying time (0 ~ 30 minutes).
 - Press the “SET” button again to choose whether to print or not. In the TIME area, if the HOUR position shows "05" and the MINUTE position shows "00," it means no print. If it shows "01," it means print.
 - Press the “SET” button again to choose whether to drain the water after sterilization. In the TIME area, if the HOUR position shows "05" and the MINUTE position shows "00," it means no draining. If it shows "01," it means draining.
 - Press the “SET” button again to save the parameters and exit.

To set the clock: Press the “▲” button five times to set the YEAR, MONTH, DATE, and TIME.

Parameter	Minimum value	Maximum value	Default	Remark
MODE	0	3	0	0-instrument 1-textile 2-fluid 3-self define
Sterilizing temperature	105°C	134°C	134°C	
Sterilizing time	0	6000 mins	30 mins	
Drying time	0	6000mins	30mins	
05 Print	0	1	0	0-no print 1-print
06 Drain water	0	1	0	0-no drain 1-drain

Press and hold the “SET” button for 5 seconds while the unit is in standby mode to open the exhaust valve. Press and hold the “ENT” button for emergency use to pause the operation.

4. Press the “ENT” button to start. (The user can press the “ENT” button to start the cycle directly for the second use.)

5. After sterilization, the unit automatically exhausts the steam. DO NOT open the cover until the temperature shows 102°C. Then, remove the inner lid and replace the outer lid in its original position. There is no need to lock it; leave a small gap for drying. (The outer cover cannot be opened until the hand wheel is screwed to the top.) Turn off the power once drying is finished.
6. **Attention**
 - The exhaust tube should be securely fixed on both sides.
 - It is recommended to use distilled water and to change the tap water daily.
 - Read the manual carefully before use.



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