



# Aerosol Generator Model 3990-03 Operation Manual



Please carefully read and understand the warnings and precautions marked in this manual before using the product  
For the convenience of long-term use, please keep this manual properly



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# Users Must Know

1. Please read this manual carefully and be familiar with relevant terms before using the instrument.
2. Failure to operate in accordance with the requirements of this manual may cause instrument damage, fire, electric shock or other serious personal injury.

We define the types of warnings used in the manual as follows.

## [ Marking Instruction ]



Warnings

Prevent personal accident

There maybe a risk of personal accident for ignoring the contents of such warnings.



Precautions

Prevent damage to the instrument

The instrument may be damaged or its performance may be degraded for ignoring the contents of such warnings.

## [ Icon Instruction ]



△ indicates precautions (including hazards). The specific content needing attention is drawn in the triangle box.



Indicates prohibited items. The specific prohibited content is drawn in a circular frame.



Indicates mandatory behavior. The specific content is drawn near the icon.

## Warnings



Correct Use

- The aerosol outlet should not be completely blocked when the instrument is powered on.  
... Otherwise, it will cause serious damage to the instrument



Placement  
Prohibition

- It is forbidden to place the instrument inflammable, explosive, corrosive gas.  
... Otherwise, it may lead to fire or even explosion.



Disassembly  
Prohibition

- Do not disassemble or modify the instrument.  
... Otherwise, it may lead to electric shock or fire.



Correct Use

- Please use the instrument correctly according to the requirements of the manual.  
... Improper use may cause serious damage to the instrument



Correct Use

- Refuel according to the liquid level indication, and the oil shall not exceed the upper limit  
... Please refuel in time when the liquid level in the oil tank is lower than the lower limit



Correct Use

- Please unplug the power plug when not in use.  
... Otherwise, there maybe risks of electric shock, fire and damage to internal circuits.



Prohibition

- Do not drop or heavy press the instrument.  
... Otherwise, instrument malfunction or damage may result.



## Precautions

Do not use this product under freezing, humid or strong direct sunlight conditions.

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## I 、 Product Introduction

Model 3990-03 is a portable aerosol generator with a built-in compressor that does not require any other air supply. After the aerosol solution is injected, it can work when powered on. It has high and low concentration outputs, and can produce polydisperse aerosol particles that meets industry standards.

After the high-efficiency particulate air filter is put into operation, if there is any leakage point or leakage due to insufficient installation, the predetermined purification effect will not be achieved, and the high-efficiency particulate air filter must be tested for leakage. Due to the low concentration of air dust in the upstream of the tested high-efficiency particulate air filter, it is necessary to supplement the dust with an aerosol generator to meet the test conditions. Using aerosol concentration test instruments, such as aerosol photometer, to test the concentration of suspended particles in the upstream of the high-efficiency particulate air filter and conduct uniform scanning test in the downstream, so as to know the leakage rate of the tested high-efficiency particulate air filter, judge whether it leaks and determine the leakage point for repair reference.

Model 3990-03 aerosol generator is durable, portable and reliable, and is an excellent dust generator for biosafety cabinets, laminar flow hoods, negative pressure filter units, filter modules or movable cleaning units.

### 1.1 Product Features

- \* Built-in compressor, no need to provide compressed air supply, can work when powered on
- \* The aerosol concentration is controlled by 2 regulating valves to meet different test requirements.
- \* A variety of aerosol solutions are optional
- \* Stainless steel portable housing, pressure resistant design
- \* Large-capacity cavity to ensure long-term dust generation

### 1.2 Applications

- \* Test for high efficiency particulate air filter
- \* Nuclear energy and fuel
- \* Pharmaceutical industry, electronic industry

- \* Medical operating room, clean room
- \* Biosafety cabinet, clean operating table
- \* Food processing, scientific experiments

.....

### 1.3 Main Specifications

Flow Range	50- 2000 cfm ( 85 ~ 3400m <sup>3</sup> /h )
Aerosol Concentration	100µg / L @ flow 200cfm 10µg / L @ flow 2000 cfm
Choice of Nozzle	L(low) / H(high)
Overall Dimension	38(L)×27(W)×26(H)cm
Weight (kgs)	18.5
Power Source	110±15V 60Hz 4A or 220±15V 50Hz 2.5A optional
Fuse	5×20mm · 10A
Generation Liquid	PAO 、 DOP 、 polydisperse (cold)
Work Cycle	Continuous operation for less than 1 hour, or intermittent operation
Ambient Temperature	5 ~ 40°C
Ambient Pressure	Standard atmospheric pressure
Ambient Humidity	5% ~ 85%RH
Instrument Storage Temperature	-25°C ~ 55°C

Note: frequently-used alternate units

$$1 \text{ psi} = 6.9 \times 10^{-3} \text{ MPa}$$

$$1 \text{ MPa} = 145 \text{ psi}$$

$$1 \text{ cfm} = 1.7 \text{ m}^3/\text{h}$$

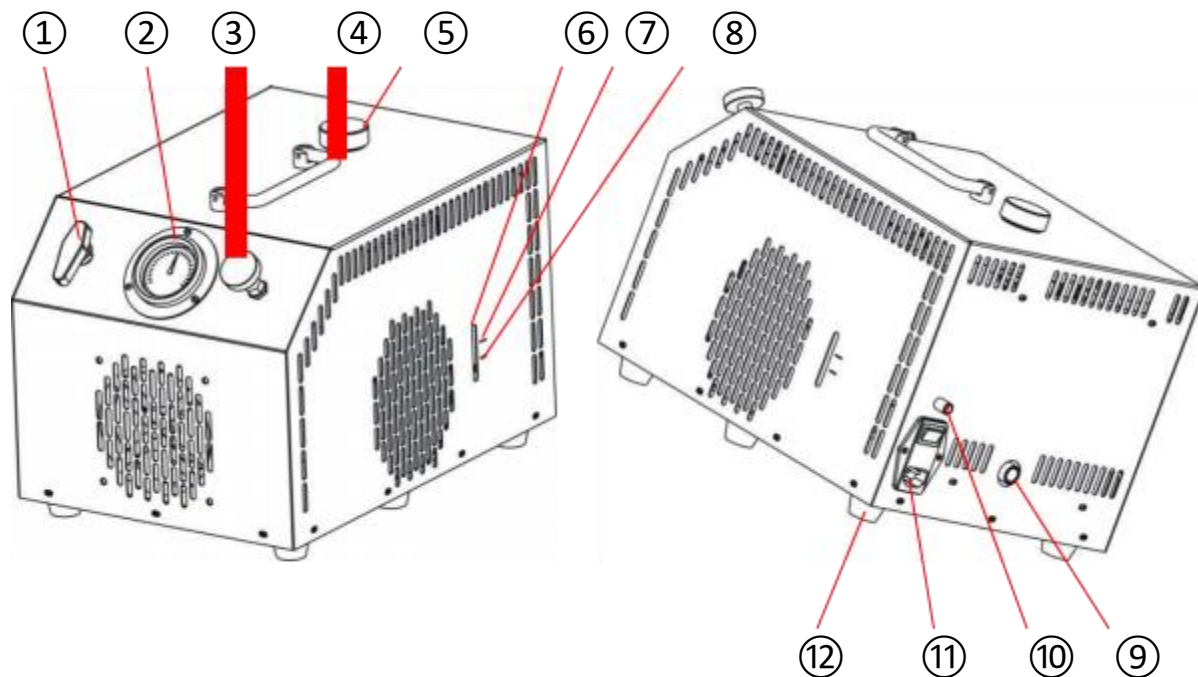
$$1 \text{ m}^3/\text{h} = 0.59 \text{ cfm}$$

$$1 \text{ µg} / \text{L} = 1 \text{ mg} / \text{m}^3$$

#### 1.4 Packing List

Name	Quantity
Main Engine (with portable handle)	1
Power Supply Cord	1
Manual	1
Collar	1
Silicone Pad	1
Upper Chuck	1
Lower Chuck	1
Hose Clamp	1
PTFE Tape	1

## II 、 Instrument introduction



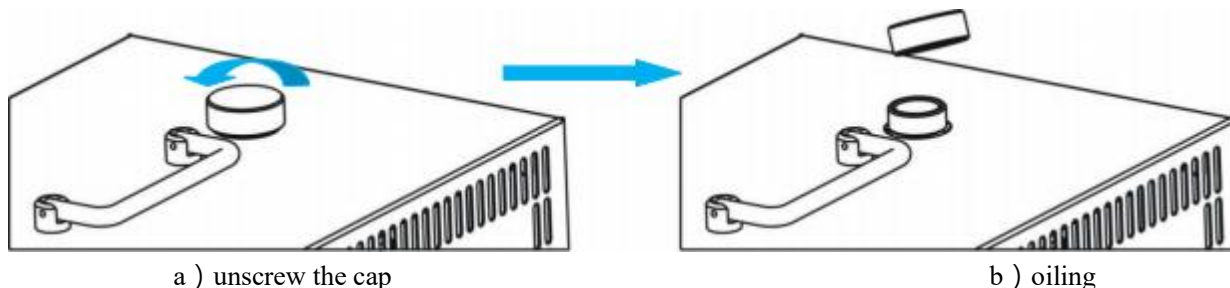
### Instruction:

- ① Concentration change-over valve: controls the two states of high (H) and low (L) concentration of the output aerosol.
- ② Pressure gauge: shows the working pressure value of aerosol generation.
- ③ Pressure regulating valve: regulates the working pressure to generate aerosol, and the maximum pressure value is 23psi (0.16 mPa).
- ④ Foldable handle.
- ⑤ Filling cap (with sealing ring embedded): unscrew this cap to fill aerosol solution.
- ⑥ Liquid level display window: observe the liquid level of the internal aerosol liquid.
- ⑦ The highest point of the liquid level (MAX): the maximum height of the internal aerosol liquid level.
- ⑧ The lowest point of the liquid level (Min): the minimum height of the internal aerosol liquid level.
- ⑨ Liquid outlet: discharges the residual aerosol solution inside the instrument.
- ⑩ Grounding stud: When the power supply is not grounded, connect the grounding stud to the grounding wire to ensure reliable grounding of the instrument.
- ⑪ Power outlet + power switch + fuse: controls the internal compressed air supply.
- ⑫ Foundation.



### III 、 How to Use

#### 3.1 Unscrew the filling cap and inject aerosol

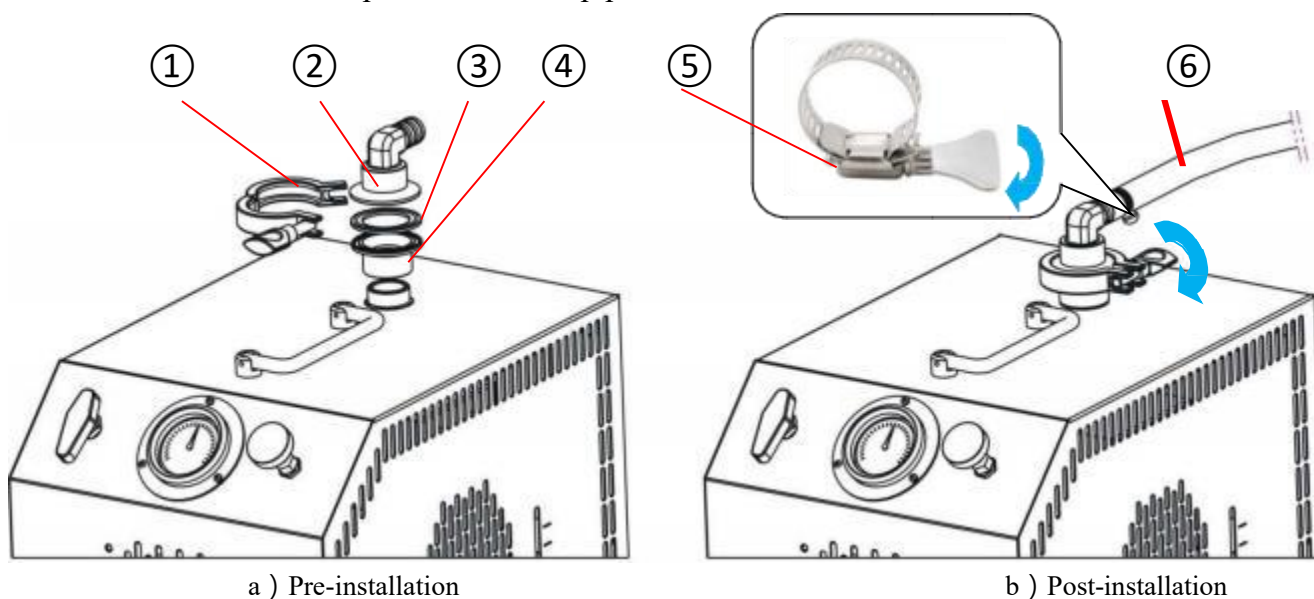


a ) unscrew the cap

b ) oiling

Note: The oil filling level is between the Min and Max scales of the display window

#### 3.2 Connect aerosol outlet parts and water pipes



a ) Pre-installation

b ) Post-installation

①—Collar ②—Upper Chuck ③—Silicone Pad ④—Lower Chuck ⑤—Hose Clamp ⑥—Water pipe

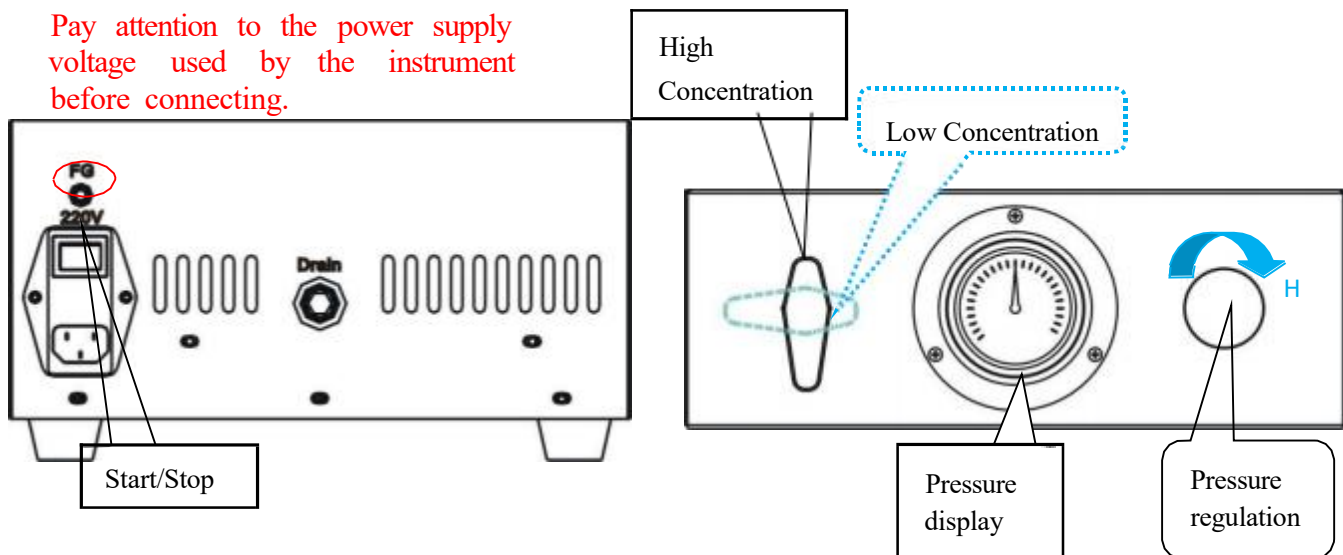
Note: 1. the inner diameter of the water pipe is 19mm. The user can purchase it according to the actual length for use, with moderate hardness, which is convenient for clamping and ensures a smooth aerosol channel.

2. The clamp and hose clamp shall be manually tightened clockwise to ensure no aerosol leakage.

#### 3.3 Connect the power supply cord and turn on the instrument

The built-in compressed air supply of the instrument is activated, and the appropriate working pressure is adjusted according to the selected aerosol solution. In the default state of power-on, the concentration change-over valve is in the vertical state H position (high concentration state), and rotates 90° clockwise to the horizontal state L position, which can be switched to the low concentration state.

Pay attention to the power supply voltage used by the instrument before connecting.



### Precaution



The concentration change-over valve can only be adjusted to two positions, which are used to control the high concentration and low concentration states of the output aerosol.

- a. High Concentration: The valve handle is in vertical state (default state);
- b. Low Concentration: Turn the valve handle left to horizontal state.

### Warning



In any case, keep the outlet and pipeline unblocked, otherwise the instrument will be deformed and leaked, and in severe cases, the housing will explode, threatening personal safety.

### Prohibition



The built-in compressed air supply will generate heat during operation. It is forbidden to cover the surface of the instrument with anything, and it is forbidden to block the ventilation holes of each fan.

### Precaution

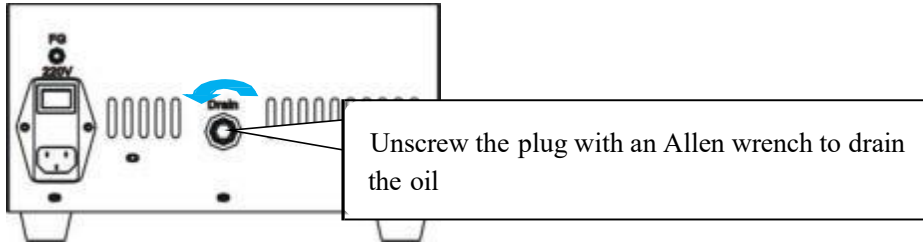


After use, turn off the power in time. If the instrument is not used for a longtime, please empty the aerosol solution inside the instrument.

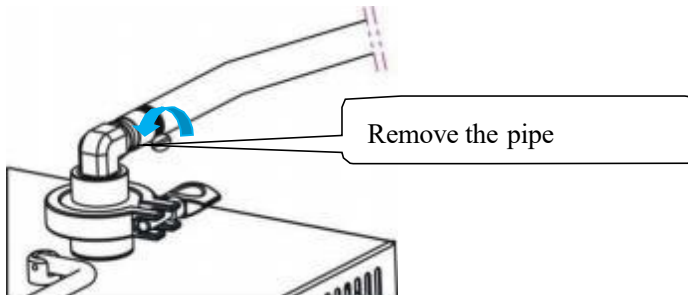
In case of disassembly of the plugged connector of the liquid outlet, wrap 7-9 turns of PTFE tape on the external thread of the plug before reinstallation, and then screw it back to the original position to prevent oil leakage.

## IV 、 Preparation before Transportation

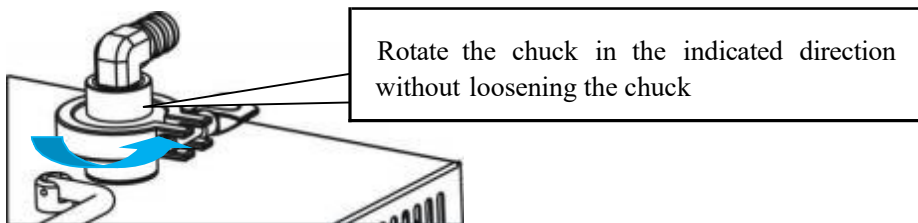
1. Drain the liquid from the reservoir.



2. Remove the pipe. (Please ignore this step, if no water pipe is connected to the instrument)



3. Remove the upper chuck and the lower chuck. (Please ignore this step, if no such components are installed on the instrument)



4. Tighten the filling cap.

5. Confirm whether the power supply cord and connector are equipped

## V 、 Common Causes of Failures and Solutions

Common Failures	Possible Causes	Solutions
No aerosol oil mist output	The power switch is not turned on	Turn on the test pressure source
	The aerosol in the tank is below the nozzle outlet	Inject the aerosol to the level of the use position
	Clogging of the outlet filter	Remove the outlet filter assembly to remove the blockage
Output pressure fails	Low output pressure	Adjust the pressure regulating

to reach the working pressure		valve to increase the pressure
	Pressure gauge damaged	Replace the pressure gauge
	Gas leak inside the instrument	Contact the manufacturer
	The air filter at the compressor inlet is blocked	Contact the manufacturer
Aerosol oil mist leakage	Parts joint sealing problem	Contact the manufacturer
	Oil tank weld joint leakage	Contact the manufacturer
Low aerosol output concentration	Low output gas pressure	Adjust the pressure regulating valve to increase the pressure
	Concentration change-over valve at "low concentration" position	Adjust the concentration change-over valve to "high concentration" position
	There is leakage in aerosol output	Contact the manufacturer
Compressor fails to operate	Incorrect power supply voltage	Connect the correct power supply
	Internal circuit problems of the instrument	Contact the manufacturer
The noise of the instrument increased and sounds abnormal	Clogging of the aerosol outlet	Turnoff the power and open the aerosol outlet
	The pressure gauge shows that the pressure is significantly higher than the working pressure	Adjust the pressure regulating valve to decrease the pressure

## VI 、 Warranty and After- Sale Service

### 6.1 Warranty

From the date of product purchase (except consumables), if there is any quality problem, we will provide a one-year warranty.

During the warranty period, the following conditions shall not be included in the warranty.

- 1 ) Use the instrument under inappropriate conditions and environments specified in this manual, or malfunctions caused by improper operation.
- 2 ) Unauthorized modification, disassembly and repair.
- 3 ) The instrument itself does not cause the malfunctions.
- 4 ) Improper use of the instrument.
- 5 ) Instrument damage caused by natural disasters and other factors.

## 6.2 After- Sale Service

In case of any abnormality, please check it first by referring to "Maintenance and Troubleshooting".  
If the problem cannot be solved, please contact us.

Due to quality problems, we will provide free instrument repair during the warranty period.

After the warranty period expires, we will offer paid maintenance according to the needs of users.

If the product is discontinued, the repaired parts shall be kept for at least 5 years. For details, please contact us.

### Annex: Aerosol Concentration Calculation Description and Formula

The following formula can be used to calculate the aerosol concentration produced and output by the nozzle when the solution is DOP and the pressure gauge shows that the output air supply pressure is 20psi, or the solution is PAO-4 and the pressure gauge shows that the output air supply pressure is 23psi:

$$\text{Aerosol output concentration ( } \mu\text{g/L )} = \frac{3375 \times K}{\text{Total flow ( cfm )}}$$

When concentration change-over valve at H position, K=6;

When concentration change-over valve at L position, K=2;

For different aerosol liquids to generate aerosol of the same concentration, the required pressure of output air supply is different. Refer to the following table for specific pressure:

Aerosol Liquid	Air Supply Pressure Generated (psi)
DOP/DEHP	20
PAO-4	23
DOS/DEHE	24.4
White Mineral Oil	22
Polyethylene Glycol	26.6
Liquid Paraffin	24.2
Corn Oil	23.4



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