



Air Shower NAS-204

Operation Manual

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1. Safety Measures

- Kindly read this introduction carefully before users use the air shower.
- To ensure the safe and reliable use of this product, kindly designate trained professionals as the operation managers of this product.
- Kindly ensure that the ground wire is connected to the power grid.
- Kindly do not place it near high-speed dust sources or earthquake sources.
- Kindly do not use corrosive solvents to wipe the box body, so as not to damage the paint layer and affect the appearance. Put the product in place first before wiring and the power supply to avoid personal injury.
- This product is not explosion-proof. Kindly do not use it in flammable and explosive environments.
- It is prohibited to operate the power switch repeatedly within one minute to avoid damage to electrical components due to frequent operation.
- The power supply should be cut off during maintenance to avoid safety accidents caused by electric shock or sudden start of the fan. Self-modification is strictly prohibited.

2. Introduction

Air Shower NAS-204, commonly known as "clean room air shower" or "product air shower" is a novel structure which bathes the object/person with filtered air that passes through it. Air shower is self-contained with low energy consumption and easy maintenance usually located between clean room and outside environment. Equipped with HEPA-filtered air jets enables decontamination by clearing off dust and dirt particles from the bodies of Cleanroom personnel. The adaptable nozzle angle effectively blows out dust attached on the person/object surface.

3. Features

- Air shower is partial purifying equipment of strong universality
- HEPA high efficiency air filter that filters about 0.3 micron dust particles up to 99.99
- An automatic interlocking barrier is placed between clean room and un-clean room
- LCD control screen with intelligent alarm, timing, air shower and lighting
- Stainless steel nozzle consists of corrosion resistance, cleaning resistance, cleaner blowing
- Floodlight is attached for easy use
- Designed with, low consumption, energy saving and convenient maintenance
- Blown dust enters into primary-efficiency air filter again, circulating so and reaching to the aim of air shower
- Air shower is often formed with stainless steel, powder coated mild steel or high grade thermoplastic

4. Specifications

Model	NAS-204
Number	Double person-Two sides air blow
Nozzle Number	18
Diameter of nozzle	Diameter 30 mm
Caliber of nozzle	15-20 m/s
Type of filter	HEPA
Efficiency of filter	Granularity is less than 0.5 μm , dust must be 99.99%. (sodium flame)
Size of air shower area	700×1200×1900 mm
Size of air shower	1300×1200×2050 mm
Power	AC 220 V 50 Hz
Max power	1100 W
Weight	450 kg

5. Applications

Air shower series are used in various fields such as colour packing, brewage, biological engineering, foodstuff, machinery, electronics, medicine, and other industries as well as scientific research fields.

6. Instrument Introduction

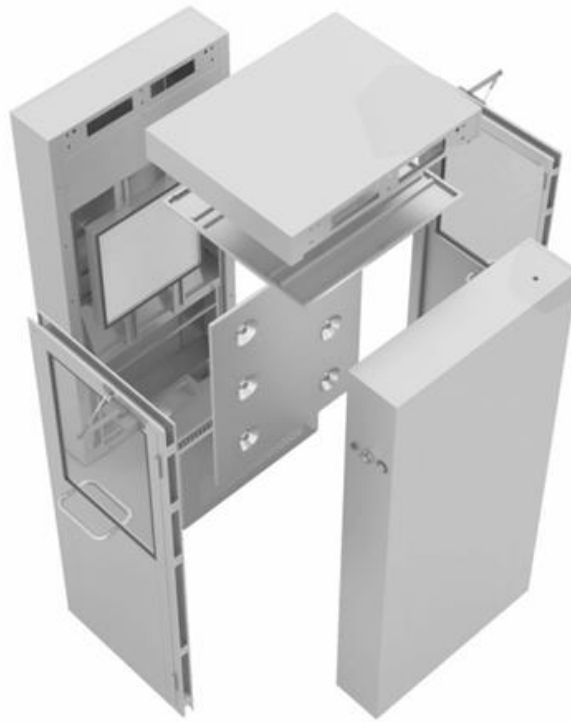


Figure-1

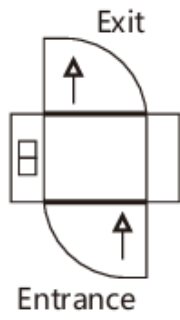


Figure-2

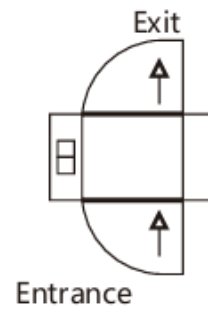


Figure-3

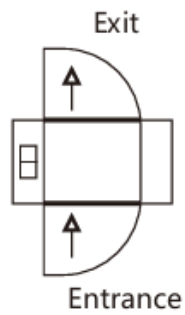


Figure-4

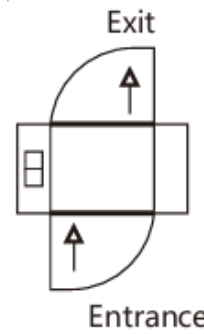


Figure-5

6.1 Control Panel Diagram



Figure-6

1) Emergency button description

Pressing the emergency stop button at any time will automatically disconnect all outputs except for lighting. Pressing it again will restore the system to its initial state. This button is mainly used when the inner and outer doors cannot unlock, the air shower does not close automatically, or for other maintenance needs. If the emergency stop button is pressed, it will revert to normal operation after one minute. If held for more than 3 seconds, the emergency stop will remain active until the button is pressed again.

2) Air shower button

After both doors are closed, pressing the manual button will initiate the air shower process. This button is primarily used when the door magnets or infrared sensors malfunction, or during fan maintenance.

3) Lighting Button

The "**Lighting**" button can be used to switch the lighting in the air shower on and off. This button is mainly used when the door magnets malfunction or for lighting repairs.

4) Up/Down Adjustment Buttons

Before the air shower starts or after it ends, the up and down buttons can be used to adjust the air shower delay time. They are also used for adjustments or selections during internal parameter settings.

7. Installation

7.1 Transportation Precautions

- Suitable for transportation by general means of transport on try to avoid transportation in high temperature, high humidity or rainy/snowy weather.
- When packing, use cushioning materials such as foam blocks to fill the inside of the cardboard box.
- During transportation on avoid impacts and friction on the cardboard box to prevent deformation of the box and damage to the packaging materials.
- Long-distance transport may require transshipment. Pay special attention to protecting the cardboard boxes during transshipment to prevent accidents during transport.
- If the transportation passes through humid areas, take measures to prevent moisture, such as placing moisture absorbers inside the cardboard box.
- When transporting to high-altitude areas, pay attention to altitude sickness and insufficient oxygen.
- After transportation on promptly inspect the packaging and goods to ensure that the goods are not damaged and take appropriate actions if any issues are found.

7.2 Storage Precautions

- Intact workbenches should be stored in well-ventilated warehouses with a relative humidity not exceeding 80%. The surrounding air should not contain acidic, alkaline, or other corrosive gases.
- The floor (pallet) should be flat, and the stacking height should not exceed 2 meters to prevent filter units from tipping over and getting damaged.
- The maximum storage period for filter units in their packaging should not exceed 180 days.

7.3 Unboxing and Inspection

- 1) When dismantling the wooden frame, prepare the necessary tools such as a hammer, pliers, screwdriver, gloves, etc
 - Firstly, locate the joints between the wooden bars.
 - Insert the flat end of the screwdriver into the seam of the wooden bar.
 - If the nails are tight, use a hammer to tap the screwdriver in.
 - Pry with a lever to loosen the nails in the wooden bar, then apply force to pry the wooden bar off.
 - Use the same method to remove all the wooden bars around.
 - Unboxing should be done in a civilized manner, without rough or brutal handling, to avoid damaging the purification unit inside the box or causing personal injury.

- 2) After unboxing, first confirm if the product is the one ordered, then carefully check the contents of the packing list for any missing parts or damage caused during transportation.
- Repeatedly operating the power switch within one minute is prohibited to prevent damage to electrical components due to frequent operations.
 - Do not touch the electrical components inside the product. If necessary, kindly disconnect the power supply first.
 - Modifying the equipment is strictly prohibited. Do not place heavy objects on the power cord or clamp the power cord to prevent damage to the power cord, which could result in electric shock, fire, or other accidents.
 - When the equipment is not in use for an extended period, unplug the power plug from the socket.
 - Do not insert or unplug the power plug with wet hands to avoid an electric shock.
 - Check if there is any dust on the conductor part of the plug before inserting it into the socket, as dust can cause a fire easily.

7.4 Environmental Conditions

- **Power:** 220V; 60Hz
- **Temperature:** 5°C~40°C
- **Humidity:** ≤80%RH
- **Atmospheric pressure:** 86Kpa~106Kpa

8. Operations

8.1 Work Process

8.1.1 Enter Clean Area

- When a person entering the clean area opens the outer door, the voice prompts: "Hello, kindly stand in the induction area." The electric lock of the inner door automatically locks to prevent unfiltered air in the air shower room from seeping into the clean area, and the air shower room lights light up. The work indicator light outside the door is on.
- After entering the air shower room, the system's infrared probe begins to detect whether there is someone. If someone is detected, the system will enter the air shower process. Before the air shower, the inner and outer doors are locked, the fan starts to start the air shower, and at the same time, the air shower countdown starts.
- **Voice prompt** : "Working, kindly turn your body 360".
- If the system cannot detect anyone in the air shower room within the specified time after the outer door is closed, it will return to the standby state.
- During the air shower, if someone presses the emergency stop switch, the air shower will end. Press the emergency stop button again to cancel the emergency stop state.
- After the air shower is completed, the inner door is unlocked, and the voice prompts. "The air shower is completed. Kindly exit through the back door".
- After the personnel walk out of the air shower and close the inner door, the system returns to the initial state and waits for the next use.
- If the air shower is completed, the inner door will be unlocked. If the person inside does not leave the air shower room within the specified time, the system assumes that the person has left and automatically returns to the standby state.
- After the light is turned on. it will automatically go out if it is not triggered again within the specified time.
- If a door has not been closed for more than 1 minute, the voice prompts "Kindly close the door."
- If the door is not closed or closed for more than 3 minutes, the voice prompt will end.

8.1.2 Exit Clean Area

- Open the inner door; the electric lock of the outer door will lock itself; the air shower room light will light up; and the work indicator light will light up.
- When a person walks into the air shower and closes the inner door, the system starts to detect whether there is anyone in the air shower.
- If no one is detected within the specified time, the inner and outer doors will be unlocked.
- If someone is detected, the system will lock the inner door when the person opens the outer door.
- When the outer door is closed, the system returns to the initial state.
- In case of special circumstances, personnel can choose to return to the clean area.
- The system waits for the personnel to open the inner door.
- The outer door is powered on and self-locks.

- When the inner door is closed, the system returns to the initial state.
- After the outer door is opened, if no one is detected within the specified time; if the outer door is opened first at this time, the system will transfer to the process of entering the clean area; if the inner door is opened first at this time, the system will transfer to the process of leaving the clean area.
- After the light is turned on, it will automatically go out if it is not triggered again within the set time.

Warning:

- After the air shower room is powered on, only one door can be opened at the same time; it is strictly forbidden to leave the doors on both sides open.
- When the inner shower room is showering, it is strictly prohibited to open the door (until the showering stops); if people entering or exiting forcefully open the front or rear doors, causing damage to the circuit, they will be responsible for the consequences.

8.2 Operation Instructions

8.2.1 Shower Time setting

Before the air shower starts or after the end, the air shower delay time can be changed directly through the up and down adjustment buttons. The adjustment range is 2-99 seconds, and it is displayed by a two-digit digital tube or LCD. 5 seconds after the adjustment is completed, the system automatically saves the parameter value.

8.2.2 Delay Setting for Exterior door unlocking after air shower

- Continuously press the emergency stop button for 10 seconds; the system will enter the internal parameter setting, and the digital tube will display TI. then press the up or down button to view the delay time for unlocking the outer door after the air shower. The unit is seconds. Press the up or down button to view the delay time, adjustable within 0–60 seconds.
- Press the air shower key to confirm and enter the next option; if no key is pressed within five seconds, the system will save the parameters and exit the settings.

Note: The outer door unlocking delay must be greater than or equal to the inner door unlocking delay; that is, the TI parameter must be greater than or equal to TO.

8.2.3 Delay setting for inner door unlocking after air shower (TO)

- After completing the outer door settings, press the air shower key again within five seconds to enter the inner door unlocking delay setting (TO) after the air shower is completed; you can view and adjust the time within 0–60 seconds through the up and down adjustment keys.
- Press the air shower key to confirm and enter the next option; if no key is pressed within five seconds, the system will save the parameters and exit the settings.

Note: The inner door unlocking delay must be less than or equal to the outer door unlocking delay; that is, the TO parameter must be less than or equal to TI.

8.2.4 Internal and external door interlock opening delay setting

- After completing the inner door settings, press the air shower key again within five seconds to enter the internal and external door interlocking and opening delay settings (TC) User can view and adjust the internal and external door interlocking and opening delay settings from 0 to 60 seconds through the up and down adjustment keys; delay time.
- Press the air shower key to confirm and enter the next option. If no key is pressed within five seconds, the system will save the parameters and exit the settings.

8.2.5 Lighting delay setting

- After completing the internal and external door interlock setting, press the air shower key again within five seconds to enter the lighting delay setting (TL), The User can view and adjust the lighting delay extinguishing time from 0 to 60 minutes through the up and down adjustment keys.
- Press the air shower key to confirm and enter the next option; if no key is pressed within five seconds, the system will save the parameters and exit the settings.

8.2.6 Program Selection Settings

- After completing the lighting settings, press the air shower key again within five seconds to enter the program selection setting (TD); you can view and select the program from 00 to 02 through the up and down adjustment keys.
00: Normal air shower program
01: Program with the door but no sensor
02: Program with a sensor but no door
- Press the air shower key to confirm and enter the next option; if no key is pressed within five seconds, the system will save the parameters and exit the settings.

8.2.7 Interchangeable settings for inner and outer doors (TN)

- After completing the program selection and setting, press the air shower key again within five seconds to enter the inner and outer door interchange settings (TN), The User can view and select the program in 00–01 through the up and down adjustment keys.
00: Normal,
01: Swap.
- Press the air shower key to confirm and enter the next option. if no key is pressed within five seconds, the system will save the parameters and exit the settings.

8.2.8 Voice Selection (OC)

Press and hold for 5 seconds to display OC; press the up and down keys to modify parameters.

1: Pure English

9. Maintenance

- Kindly check the following items before starting work every day; if any abnormality is found, immediately cut off the power supply and take corrective measures.
- This equipment must be maintained and serviced daily by professionally trained personnel.
- Depending on the cleanliness of the environment, the primary filter can be removed, cleaned, or replaced regularly (usually 2-3 months).
- Conduct environmental testing regularly (usually once a week).
- Loosen and remove all fixing screws as shown in Figure 1; remove the primary effect panel, remove the primary effect filter, and check monthly. If dust is detected, the filter needs to be cleaned or replaced.
- Follow the instructions in Figure 2 and remove all the fixing screws; fold down the spray panel and remove the high-efficiency filter; when the high-speed fan can no longer make the wind speed in the operating area reach 18 m/s, or after 6-12 months of use, it is recommended to replace the high-efficiency air filter.
- When replacing the high-efficiency filter and primary filter, the machine should be shut down.
- The following should be noted when replacing the high-efficiency filter:
 - When replacing a high-efficiency filter, special attention should be paid to ensuring that the filter paper is intact when unpacking, transporting, and installing it. Do not touch the filter paper with your hands to avoid damage.
 - Before installation, point the new high-efficiency filter to a bright place and visually observe whether the high-efficiency filter is damaged due to transportation or other reasons. If the filter paper has holes, it cannot be used.
 - When replacing the high-efficiency filter, you should first remove the box cover, then remove the pressure strip, then take out the failed high-efficiency filter and replace it with a new high-efficiency filter (note that the airflow arrow mark of the high-efficiency filter should be in the same direction as the outlet airflow of the purification unit. Consistent), make sure the frame is sealed and return the box cover to its original position.
- When entering or exiting the door, do not forcefully open both doors at the same time to avoid damaging the door lock.
- Do not push the glass with your hands when entering or leaving the door to avoid hurting people if the glass breaks.
- When entering or exiting the door, you must pull and push the door handle gently, and do not open the door to the limit to avoid damage to the door, door lock, etc.
- When the air shower system is working, the door must not be opened forcefully.

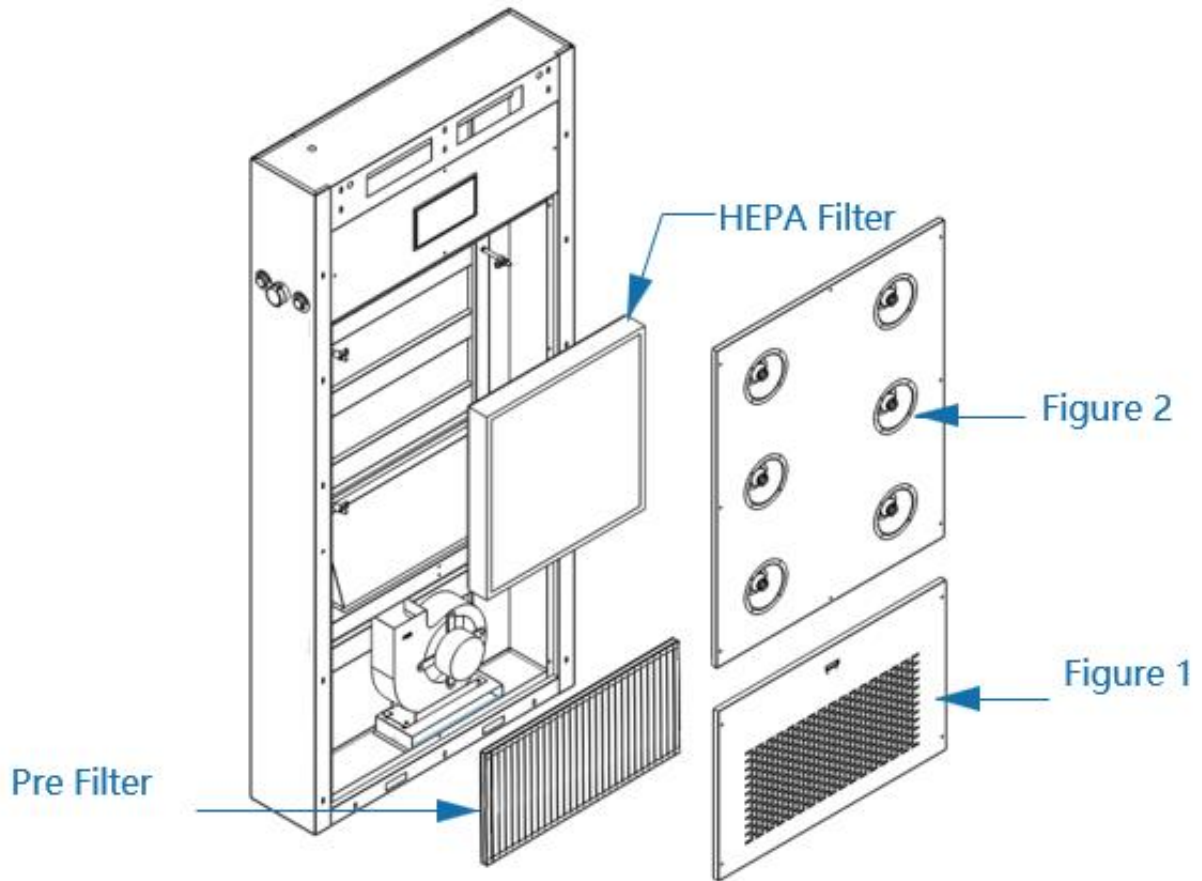


Figure-7

Routine Maintenance Task

After using the FFU for some time, due to differences in usage environment and conditions, to prevent accidents and ensure the normal operation of the fan filter unit, it is necessary to perform the following regular inspections.

- Kindly refer to the provided table for the scheduled maintenance tasks. Perform regular inspections on the fan filter unit according to the table. When the component's lifespan has been reached, replace the component immediately. (Component lifespan refers to the general lifespan under normal usage conditions and may vary depending on the usage environment and conditions).
- When unexpected events occur due to force majeure (such as earthquakes, electric shocks, etc.) or chemical leaks (corrosive gases, etc.), after shutting down and restarting, it is essential to perform the same inspections.

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Component	Indication and possible causes	Evaluation Criteria and Checkpoint	Frequency	Service life
Motor	<ul style="list-style-type: none"> Bearing damage causing motor operation to be rough or locked. Poor insulation is causing overheating and coil burnout due to overload. Poor insulation in power connections or terminals causes abnormal heating, grounding errors, and interlayer short circuits. 	<ul style="list-style-type: none"> Confirm whether the motor has any abnormal noise, vibration, or odor, and use your ears to check for any unusual sounds from the bearings. The insulation impedance must be greater than 5MΩ. Inspect the cables and terminals for any damage or corrosion and replace faulty components. 	Once/Year	≥3 years
Centrifugal Fan	Damaged due to uneven operation caused by the accumulation or damage of dust.	Check the centrifugal fan for any abnormal noise, vibration, or damage, and replace faulty components	Once/Year	≥3 years
Other electrical components and wiring material	<ul style="list-style-type: none"> Poor insulation, loose terminal screws causing overheating, short circuits, or burnout. Damage to the wiring insulation can cause short circuits, electrical leakage, or damage. 	<ul style="list-style-type: none"> Check for overheating, corrosion, exposed conductors, and damaged wiring insulation. Insulation impedance must be greater than 5MΩ. Tighten terminal screws (once every two years) and replace faulty components. 	Once/Year	≥3 years
Filter	<ul style="list-style-type: none"> Decreased airflow velocity due to blockage. Dust leakage caused by chemical substances damaging the filter material, gaskets, or sealing materials. 	<ul style="list-style-type: none"> Visually inspect the filter material, gaskets, and sealing materials for scratches, fading, or deformation. Inspect for leaks and replace faulty components. 	Twice/Year	Depends on the specific requirements of different usage scenarios

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	<ul style="list-style-type: none"> Poor filter material caused by external heat sources. 			
Housing and another component	Dust is generated due to corrosion or rusting of components caused by chemical substances.	Visually inspect the components for any defects, fading, etc.	Once/Year	5 Years

10. Troubleshooting

Symptom	Cause	Troubleshooting
Centrifugal Fan not operating	<ol style="list-style-type: none"> 1) Power not turned on 2) Fan Imbalanced 3) Electrical component damage 4) Faulty fan 	<ol style="list-style-type: none"> 1) Turn the power on 2) Remove foreign objects from the exterior 3) Replace electrical components 4) Replace fan
Abnormal Operation of Centrifugal Fan (During Operation)	<ol style="list-style-type: none"> 1) Fan housing in contact with the centrifugal fan 2) The centrifugal fan is damaged 3) FFU has abnormal noise 	<p>Cut off the power immediately, and the dealer should be contacted to take appropriate measures. Do not dismantle it privately.</p>



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