

OUDELONG[®] Air Shower

1400 SERIES



Air showers serve to protect your cleanroom environment from unwanted contamination.

Clean garments become contaminated during the gowning/ungowning process, general use, and because of high traffic in the gowning area. The contamination problem is amplified when the same garment is worn several times or is taken on and off numerous times during the day.

The OUDELONG air shower is a fast and effective method of removing this surface contamination, contamination that will otherwise be carried directly to your cleanroom and deposited on your product and critically clean areas by sloughing off from the surface of the garments.



The air shower is quality constructed using heavy stainless steel to minimize particle generation. The units provide air flow of approximately about 3200 m³/h , 20 m/s nozzle velocities.

It has a knock-down design that allows ease-of-installation and flexibility in use. The unit can be shipped knocked down or completely assembled. When shipped knocked down, all parts will fit through a standard door. All service to the blower, motor and filters is done from inside the air shower. The unit also offers an optional design that allows all the installation assembly to be done from inside the air shower.

Air showers are available in a variety of sizes and shapes to provide a cleaning system to meet your specific application.

General

- All metal construction
- Ships knocked down or fully assembled
- HEPA filtered with 40% pleated prefilters
- Variety of sizes, configurations and options
- Low maintenance and easily serviced.

Air showers can greatly enhance your cleanroom's performance by removing surface contamination from clothing and cleanroom garments. Gowning/changing room areas are the interface between a dirty "street clothes" environment and a clean room environment. Unfortunately, the changing or gowning process itself releases contaminants from street clothes that can settle onto the "clean" garments. Air showers blow off and remove much of this contamination preventing it from entering the clean space.

What Makes the OUDELONG Air Shower Perform Better

An air shower in many ways can be compared to vacuum cleaner. They are available in a variety of sizes, capacities and features; some work very well while others just seem to make noise. To be effective they need to have high cleaning force and power to do a good cleaning.

Cleaning Force. A good vacuum cleaner has high suction and airflow to pick up dirt. A small vacuum with low suction and airflow does little more than pick up a few crumbs. The same can be said for air showers.

Some air showers that have small blower/motor, low airflow and pressure fall into this category. These under-powered air showers give air showers a bad name. **The OUDELONG air shower has high velocity and large air volume for fast, efficient cleaning.** The OUDELONG air showers, as further described, offer the highest velocities combined with large airflow to provide an air shower that quickly and efficiently cleans particulates from the surface of clean room garments. The additional text describes why the OUDELONG air showers are the best.

In today's competitive market environment, the selection of quality raw materials is a key factor in ensuring superior performance and long product life. Our company proudly utilizes a range of high standard steel materials that not only exceed industry standards, but also demonstrate our relentless pursuit of product quality in a number of ways.



Most factories commonly use ordinary galvanized sheets in order to keep costs down. However, we understand that the quality of the material directly affects the final performance of the product. That's why we choose galvanized sheets with a zinc content well above the industry standard. Higher zinc content means better corrosion protection against oxidation and rust in harsh environments, which significantly extends the life of the product. This choice not only demonstrates our commitment to product quality, but also provides our customers with a more reliable and durable product.

In our pursuit of excellence, we don't settle for the norm. The 304 stainless steel we use is a high-quality alloy steel with a significantly higher nickel content than regular stainless steel. The high nickel content gives 304 stainless steel excellent corrosion resistance and high strength, making it ideal for use in a wide range of fields, including food processing, medical devices, and chemicals. The use of this material not only enhances the appearance and functionality of the product, but also brings higher safety and reliability to customers.

We understand that every step from production to delivery is crucial. Therefore, we choose wooden pallets or crates as packaging materials to ensure that the products are fully protected during transportation. This type of packaging not only prevents the products from being damaged during transportation, but also effectively isolates them from external environmental factors, ensuring they remain in their original condition. Our goal is to ensure that every customer receives their products in perfect condition and with the same performance as before.

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Construction Materials

The OUDONG® air shower is constructed of an all-metal, stainless steel shell. The all-metal shell design will stand up to the rigors of shipping, installation, use, and the occasional abuse of a high-malleable entry system. While we don't recommend it, you could hit the metal shell of the air shower with a hammer. You would not break the cabinet as you would laminated types of construction. The steel construction also reduces the chances of biological growth and contamination caused by systems using laminated particle board in the construction. Laminated particle board construction is fine for a simple table, but not for a piece of equipment that is being integrated into your cleanroom system.

NOTE: A typical laminated particle board air shower has the plastic laminate on the outside but often has interior concealed air ducts just painted over the raw particle board leaving a rough surface finish that harbors



air and biological contamination. As the particle board ages and deteriorates, joints will take off, becoming a source of contamination. Almond, painted steel or stainless steel air showers are the best type of air shower to purchase.

Option: Stainless Steel Air Shower

With the stainless steel shell option, the shell of the exterior and interior air shower is stainless steel. Parts located in the shower compartment behind the interior access panels, i.e., blower motor, filter support, straps, etc., are standard painted or plated materials and not stainless steel. Consult the factory for further details.

Option: Explosion-proof Main Electrical Control Box

The explosion-proof main electrical control panel mounted above one door or side on the exterior of the cabinet. The control panel contains the microprocessor controller, motor, thermal overloads, fuses, relays, power shut off, and other electrical components.

Option: Laboratory Applications

The OUDELONG has a special set of options for laboratory and other applications where microbial contamination is a concern. Please

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In order to cope with the fact that some workshops have already been constructed and complete air showers are not easy to pass through the installed doors, air showers can also be shipped from the factory in its sections: the bottom, the top, the two side sections, and the two doors.

Service Access

Service to the mechanical equipment, blower, motor, HEPA filter and profile is easily done from the inside of the air shower through a access panel located in the inner side of the air shower. This is desirable because you don't have to penetrate the clean room ceiling surrounding the air shower for maintenance. Also, the area around the air shower is not accessible because of ceiling fans, lights, ducts, pipes, walls or other equipment that would make service from the exterior difficult or impossible with exterior-mounted access panels. The main electrical control panel is conveniently mounted on the inside of the air shower one of the side panel (for drawing details), and is accessed from outside the air shower.

Option: The control panel can be located in other upper side positions on a lower exterior cabinet.



Doors

The doors are a heavy-duty stainless steel framed, glass style with a full-view safety glass viewing panel. Each door is furnished with heavy-duty door hinges and a door closer.

Options:

- Door options include double doors, power entry, stainless steel frame, power sliding and painted steel with sliding window.

Air showers can be furnished without a door(s) on one end so the unit can butt against an existing door. A door interlock magnet can be shipped loose for field mounting. When interfacing with an existing or sliding door, the air shower can be furnished with a dry contact to automatically open the door at the end of the cleaning/wash cycle.

- Vertical and horizontal sliding doors are often used when the air shower is used for parts cleaning. These door configurations can have a variety of options and an shower size depending on the application. The air shower is typically shorter when used with a conveyor to bring workpiece/parts to through and away from the air shower.

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Electrical Control Panel

The control panel includes the power thermal switches and microprocessor controller (PLC) used for timing the cleaning cycle and controlling the interlock of the doors, along with the starting of the air shower.

The frame of the control panel is made of plastic by default, and can be upgraded to stainless steel optional.

Microprocessor Controller and Door Start Switch

A microprocessor controls the starting of the air shower so that the unit will only start when people are going through it one direction. On applications where there is bi-directional flow through the air shower (people using the shower to both enter and exit the cleanroom), the air shower only starts when people are going into the cleanroom, not when they are leaving.

The cleaning time sequence is field adjustable by tapping the button of the controller. There is one button for adjusting the cleaning time, 0-99 seconds.

Note: Only units with magnetic door interlocks have the door start switch; other units have a wall start switch.



Standard Program Sequence with Door Interlock Magnet:

Traveling from green room into the clean room.

- Green Room Door A opens, cleanroom Door B locks (magnetic interlock).
- Door A shuts, both Door A & B lock and cleaning cycle starts.
- At the end of wash time, Door B unlocks (people can leave air shower) but Door A stays locked until people have left the air shower and Door B shuts. When Door B shuts, both Door A and B are unlocked and people can enter the air shower from either direction.
- Traveling from the Cleanroom to the Green Room.
- Door B opens, Door A locks.
- Door B shuts, Door A unlocks.
- Door A opens, Door B locks.
- People exit the shower.
- Door A shuts, both Door A and B are unlocked.

Note: It is very easy to make the door open from either the air showers, as well as from Door A entering the cleanroom. Door B can start the air shower.

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the indicator panel. When either door opens, the interior fluorescent light turns on. The light will stay on through the cleaning cycle time and purge/wash time. At the end of the wash time the interior light will flash off then back on to indicate it is a time okay to exit the shower. The light will remain on while people are in the air shower, but turns off when exit door has shut, indicating it is okay to enter the air shower.

In most applications, the people using the air shower are trained on governing cleanroom protocol and how to use the air shower. With the same people using the air shower every day, the automatic turning on and off of the interior light works extremely well as a reminder when to enter and when to exit the air shower.

By default, there is a small emergency stop button on the indicator panel, which is more beautiful, and it can also be upgraded to a large mushroom head emergency stop button.

Optional Door Interlocks

A low-voltage magnetic door interlock prevents both doors from being opened at the same time. When one door is opened, the other door's magnet is energized which prevents the door from opening. During the cleaning cycle both door magnets are energized locked to prevent anyone from entering or leaving before the cycle is completed.



When door interlocks are installed, total three "emergency power off" (EPO) panic buttons are provided on the interior and both exterior ends of the of the shower. When the EPO button is pressed, the interlock magnets deactivate and both doors can be opened, because pressing the EPO button deactivates the interlock system and unlocks the doors.

When the EPO button is pressed, interlocks are deactivated and an audible alarm sounds alerting individuals to the emergency condition. A dry contact for a remote alarm or alarm is available to indicate that the EPO system has been activated. The alarm is turned off by a key switch on the inside wall of the air shower.

Now with the door interlock magnets, a door start switch is used and the wall start switch is eliminated.

Blower/Motor

The blower wheel is an energy-efficient backward-curved aluminum wheel. It is blower drive mounted to an efficient 3 HP, three-phase motor with sealed ball bearings for low maintenance and long life. The complete assembly is vibration isolated from the rest of the air shower.

The blower assembly is mounted on top of the unit with the (D425) (D42) and is vented through an access panel on the interior of the air shower.

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Filters

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Large perforated grill to allow easy access. Prefilters with the coarsest filter option are located in the upper blower compartment or under the floor grille depending on the options ordered.

Air Nozzles

There are 12 adjustable air nozzles in each standard air shower section, 6 per side. This provides a uniform concentration of nozzles for fast, effective cleaning.

The nozzles are stainless steel. They have a direct back-spray with a direct nozzle air velocity. That velocity is the highest velocity measured at the outlet of the nozzles. This high nozzle velocity provides more cleaning force to effectively dislodge particles and other contaminants.

Air Flow Capacity

The (D425) (D42) provides approximately 1000 CFM (about 300 m³/min) with the high air flow volume (power), and the high nozzle velocity forces the people inside the air shower are cleaned faster and more effectively.

When the ceiling purge filter is used in conjunction with the optional water breaks, the interior of the air shower is purged of contamination prior to the chamber door being opened. The length of the purged time is adjustable from 1 to 15 seconds. The interior light filter option is used to indicate when the purge time is complete and the person can enter the clean room.



Optional Variable Frequency Drive, Nozzle Air Purge

The air shower can be equipped with a variable frequency drive that allows the blower to run at a low speed when not in the high-velocity clearing cycle. This low constant air moving volume keeps the interior of the air shower clean by sweeping and clearing the interior.

Optional Point Ionization

DC, pulse-type point ionization can be mounted in the sidewalls of the air shower to help reduce static charges.

Optional Magnahelic Pressure Gages

The unit can be furnished with Magnahelic pressure gages to monitor the differential pressure across the HEPA filter and/or gaskets to indicate when the filter or gasket needs to be replaced.

A gage can also be used to measure the air pressure entering the facility. The pressure supplied to the facility can be monitored to ensure that the air pressure is maintained at a level that is sufficient to prevent contamination from entering the facility.

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temperature rise. The typical time spent inside the air shower is approximately 10 to 15 seconds. People get in and out of the shower before it would become a problem. When supplying air conditioning to the air shower it is recommended to use a self-contained air handler that recirculates air within the air shower. Optional self-contained A/C units can be installed on the air shower. Please contact the factory for further details on cooling.

Optional Air Shower Styles and Configurations

90-Degree Air Showers

The air shower can be provided with the doors in a 90-degree configuration for those applications that require a 90-degree turn.

Three-Door Air Showers

This air shower has three doors. The typical configuration is one entrance door and two doors exiting to two different cleanrooms.

Multiple Units Tuned



Two or more air showers can be combined to form a longer unit. By adding complete sections, an efficient arrangement for the modules will be maintained.

These tunnels can be used for 'large batch' clearing if a large number of people will enter and exit as a group, or for 'continuous flow' clearing where the showering time is too long to allow to walk the length of the tunnel.

Both 30-degree and straight-through air showers can be combined to form the tunnel configuration.

NOTE: The cost for additional sections is lower than for the batch unit, because the cost of the doors and electrical control is covered by the first unit and additional units don't need these items.

Low-Profile Air Shower

The OUDELONG low-profile model has an overall maximum height of 2000mm. The unit has the blower assembly, HEPA filter, and electrical components mounted on the side to permit the lower height. It can be mounted in a space 2000mm high, making it ideal for modules or areas where preserving the ceiling is undesirable. The unit is shipped disassembled to the point that all parts will fit through a standard doorway.

Service access to the blower assembly, filter, and electrical components is through two doors on each end of the unit. This is standard.

Note: When installing the low-profile model, be sure that the end access doors are available to service the blower and filter. Consult the factory for additional details.

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Order to the participating list number and module of the filter. Consult the factory for details.

Air Showers for Decontamination of Individuals When Leaving a Controlled Space

These air showers are similar to the standard air shower but have a few common options:

1. They typically do not have door interlocks.
2. They have wall start switches.
3. They often are not walk through but only have one door and the end without the door is just against an existing wall so you enter and exit through the same door.

4. Lower side-wall profiles unless gated floor option is chosen.

5. A respirator should be used for the task materials being cleared off. **RESPIRATOR IS NOT REQUIRED FOR DECONTAMINATION OF THE WORKERS.**

6. Optional compressed air fitting can also be installed to allow additional blow-off during clearing or to blow air into the water covered to 'blow it up' and make it easier to clean. The garments. Consult the factory for details.



Custom Features

Many other customized sizes and features can be provided. Contact the factory for more information.

Garment Type and Cleaning Effectiveness

The cleaning effectiveness of the air shower is affected by the type of garments, the size, shape and type of contamination. Large light particles such as lint, hair, dander and skin flakes are the easiest to remove.

Particulate contamination adheres to garments in two basic ways, either by mechanical entrapment or by an electrical attraction.

Mechanical bonds between the garment and particulate contamination are reduced when smooth surface garments are utilized. These include "cleanroom-designed" garments and those made from synthetic materials such as Tyvek, Gortex, polypropylene and nylon, to name a few. These materials are low-shedding and minimize the mechanical bond, making it easier to blow the surface contamination off the garments. Natural fibers, such as cotton, tend to shed particles and their surface friction tend to have a higher mechanical bond with particles, making them harder to clean.

Synthetic garments can develop a "static charge" which attracts a particle to a surface of a garment.

To help reduce this charge, garments can be treated with an "anti-static" agent in the final wash. This will help reduce the static charge and make it easier to blow the particles off the garments. Synthetic garments are also designed to shed particles less easily than natural fibers.

Without using an air shower, individuals are often cleaner when they leave the clean space because a large portion of the contamination they had on their garments will have fallen off within the clean space. Using an air shower is an effective way to remove much of the contamination that would otherwise come off within the clean space.

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Mounting Against Wall

The air shower can be installed so the entire air shower sticks through the wall, with space around the air shower. This space is filled with an optional trim angle. The shower can also butt up against a wall with an opening large enough for door and end-mounted hardware. (approximately 1000 mm x 2400 mm, contact factory for different sizes of other models) Please request a quote with a specific job number before planning cabinets. Different configurations and sizes may require different cutouts. When the unit is butting against the wall, the contact point between the air shower and the framed opening is typically sealed or small trim molding is applied. The exterior of the air shower would have a trim angle.

Receiving Air Shower

The total weight for a single standard air shower is approximately 210 kg.

Please use a forklift to move the air shower to the designated position during installation.

NOTE: The loaded down air shower needs room on the sides of the unit during the assembly process to install the floor mounting bolts. Once the unit is assembled, no space is required on the sides of the unit.

After the unit is assembled, moved into place and the mounting complete:

A) An electrician needs to connect power to the air shower, start the unit, and check blower rotation.

B) A sprayer contractor needs to install the sprayers.

C) The installer touches up the joints, adjusts doors, door closer and magnetic door interlocks, and confirms that high-velocity air is blowing out the nozzles at approximately 20 m/s. If the blower is running backwards, air will come out of nozzles but only at about 3 m/s. Blower rotation can also be confirmed by looking at the blower.

D) The inside of the air shower and floor must be cleaned.

E) Caulk and floor anchors are furnished by the installing contractor as required.

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