

### General Description

The Series 1532 inflow module comes in a variety of sizes and styles. Some of the included information will depend on the style of unit purchased.

The Series 1532 units are constructed of stainless steel as standard. This finish is designed to be compatible with normal cleanroom environments. When cleaning is required, a mild soap and water solution is recommended with a distilled water rinse. The distilled water is recommended because it does not have any mineral hardness that may leave a "mineral film" that can be wiped off and cause particulate contamination.

Care should be used when cleaning the protective grill doors so the HEPA filters are not damaged during the cleaning process. NEVER attempt to clean the HEPA filter except by purging the filter. Rubbing or blowing the HEPA with high pressure air will damage the filter and cause leaks.

The system is designed to draw air into the wall mounted filters where it is filtered and then discharged back into the space. The system is not designed to work with flammable vapors, odors or corrosives. Protective garments and respirators should be worn by personal to prevent exposure to materials being used within the system.

A safety and use procedure should be developed by the purchaser taking in account the materials being used and airflow patterns after equipment being installed inside the hood. The operation should be monitored to ensure that all materials are being contained within the enclosure.

After installing the HEPA filters the discharge air should be monitored to ensure proper filtering efficiency

### HEPA Filters

**Sizes** — The HEPA filters used in the units are of standard industrial sizes. The size will be: 23-5/8 in. x 47-5/8 in. x 3 in. or 24 in. x 48 in. x 3 in. 24 in. x 72 in. x 3 in.

**Media pack** — 2.875 with aluminum separators.

**Filter Frames** — Extruded aluminum 3 in. or 3-1/2 in. thick

**Protective screen** on the upstream side of the filter.

**Gasket** — 1/4 in. x 3/4 in. closed cell, gasket on downstream side of the filter.

**Filter Efficiency** — 99.99% on 0.3 Micron (Standard) "HEPA"; 99.99% on 0.12 Micron "ULPA"; Other

### Shipments

Clean Air Products takes every reasonable precaution to ensure that your laminar air flow cabinet arrives without damage. However, damage can occur in any shipment, and it is important that you note visible damage immediately with a notation on the consignee's copy of the freight bill. Terms are F.O.B. factory, unless otherwise stated. Your inspection of either visible or concealed damage is the basis of your filing claim (which you must do at once) against carrier. An inspection then must be made to verify the claim against the carrier.

### Performance Specifications

All equipment is thoroughly inspected at the Clean Air Products' factory at the time of shipment. Quality control is maintained by constant surveillance over the product, beginning at receipt of purchased material and concluding with a final inspection which certifies performance to Class 100 conditions of Federal Standard 209D, as well as to the unique requirements of each project. In all instances where product quality cannot easily be assessed on the end item, the product is inspected during sub-assembly fabrication. All electrical components are UL approved; all mechanical components are fabricated or purchased and inspected to performance requirements before assembly into the final product.

All Clean Air Products' products have been certified to meet or better the following specifications:

### HEPA Filter System

The HEPA filter system consists of two basic members: the absolute HEPA filter and a flexible duct to form a modular component. All HEPA filters purchased by Clean Air Products have been Polystyrene bead tested to



## Series 1532



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**[www.cleanairproducts.com/1532](http://www.cleanairproducts.com/1532)**

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meet Mil Standard 282 and are tested for leakage for 99.99% removal of all particulate contaminants greater than 0.3 micron.

#### Prefilter

The Prefilter is made of 2-inch thick disposable, non-woven framed fiberglass media, a nominal efficiency of 40% by NBS Test Method using atmospheric dust or better. Higher efficiency filters can be used, but will increase the system pressure drop. This may require an increase of the blower RPM to increase the suction pressure across the filters.

#### Installation

1. Move unit into the general area where it is to be used. Keep all packing material in place while moving the cabinet; this will help reduce any moving damage.
2. Review drawing of complete cabinet assembly.
3. Lay unit on its back and remove the moving casters. Remove any packing materials on the cabinet's bottom. Raise the cabinet into its upright position. Care needs to be used when lifting the units. Never put anyone into a position where they could become injured should the equipment suddenly fall.  
NOTE: These cabinets are top heavy due to the blower and motor being in the top. Use caution and care so the unit does not tip get bumped over during installation. Ring eyes are provided on top to help lift the unit and should be used to hold the unit to your building.
4. Slide the cabinet into the place where it is to be used. Secure the

cabinet. Level the cabinet by slipping shims under the cabinet. Exact leveling is not mandatory for operation.

On double units — move second unit into place and level like the first. Install bolts between the two units (through the caster plates) and any additional front screws if necessary.

5. Remove any remaining packing material.
6. Make sure cabinet is secure and cannot tip over. Floor anchors can be added by drilling through the cabinet bottom near the back edge or wall anchor holes can be drilled into back of the cabinet.
7. Make necessary electrical connections. Remove front service panel to gain access to the blower and motor. Connect per local codes.
8. Attach the hood to the cabinet. The hood is made of a 2x2 tube support frame and acrylic panels. Assemble the hood support and attach to the cabinet.  
The side plex is screwed to the cabinet side and held by a clamp to the support leg. A floor angle is provided to close the gap between the acrylic bottom and the floor.
9. Install the filters. The filter assembly consists of the HEPA or ULPA filter, 2 in. prefilters and frame, and 1 in. media and frame assembly.  
**USE CARE** in handling the HEPA filters. **DO NOT** cut open the cardboard containers. **DO NOT "RACK"** (twist from corner to corner) or drop the filter. **DO NOT** push or pull on the filter pleats. **USE CAUTION** in laying the filter down and, during installation,

watch out for the long threaded rods. Any of these things can damage the pleats and cause the filter to leak.

Set the HEPA filter on the threaded rods with the gasket in toward the unit. Hold in place while adding the prefilter frame. This frame works as a clamp to hold the HEPA into place and to hold the prefilters.

Install springs, washers and hex nuts loosely. Position the HEPA filter evenly over the opening and tighten the nuts to hold the filter in place. A long socket is provided for these nuts.

The filter gasket should compress about 1/16 to 1/8 inch. **DO NOT OVERTIGHTEN**; filters can be damaged.

Insert prefilters into their frame. Note air flow direction arrows.

Install media frame over prefilters and clamp with spring, washers and nuts. Do not crush the prefilters while tightening the frame.

Install the media filter - tacky side out. Add media holders to rods and put on cap nuts.

Close and latch front perforated doors.

10. Clean and wipe down the entire unit.
11. Start cabinet and let run approximately one day to purge the filters.
12. Have the safety group review the installation, develop operational procedure, train personal and develop maintenance time table for checking and replacing the various filters and mechanical parts.
13. The cabinet is now ready for use.

## Daily Operation

The factory recommends that the unit during use and changing of the PREFILTERS. (not when changing the HEPA filters). The life of the HEPA filter life will depend on the material being filtered, quantity of material being filtered and the number of shifts worked.

The inflow velocity of the air should be monitored at the beginning of each shift to ensure proper airflow. This data can be used to develop a schedule for changing the various filters

1. The clear plastic hood will only require occasional cleaning on the inside with alcohol. The hood outside is to be cleaned with a plastic cleaner and soft material. Alcohol will make the clear plastic turn a milky color over a long period of time. Use sparingly and only when needed.
2. Stainless may be cleaned with detergents or alcohol. Abrasive materials will scratch the surface. The top of the clear plastic hood may easily be cleaned by removing the panels.
3. When the cabinet is shut off for a short period of time and is turned on, the hood interior is to be wiped clean. The hood should run for few minutes before use.
4. Avoid fanning papers, books, arms, coats and fast walking in front of the hood. Air currents will cause contaminate to exit the interior. A line should be drawn on the floor to show the safe working zone. All work is performed inside of this line.
5. The air is being drawn into the enclosure. Turbulence will develop

on the downstream side of the operator or objects. This will cause duct and other contamination to be "held" close the operator on the downstream side in the turbulent pocket. By positioning the operator 90 degrees to the airflow (the air flows horizontally past the operators face, turbulence will be reduced and more effectively drawn away from the operator.

7. Spills should be cleaned up immediately. Sponge the liquid near the HEPA filter first to keep the liquid away from the filter. Should liquid splash onto the HEPA filter, DO NOT attempt to wipe the filter. Wiping the filter will cause filter leaks. The liquid will dry, discolor and plug a small area of the filter in front. The filter is nearly 4 inches deep, and a small plugged area will have little or no affect on the air flow.
8. Do not use the hood for storage of large objects. Large objects will disrupt the smooth laminar air flow, causing turbulent air flow behind them. A good practice is to place materials on platforms to allow air movement under, as well as around, the object. All work should be performed with the operator's hands downstream of the critical process points.

## Service

To change the pre filters:

- ❖ Wear respirator, safety glasses and other required safety equipment
- ❖ Turn ON the cabinet. (This will contain any duct created while changing the prefilters. When changing the HEPA filters keep the

cabinet running until the prefilters are removed then turn the cabinet off)

- ❖ Open the front doors; this exposes the filter media, prefilters and final filters.
- ❖ Remove cap nuts and media keepers.
- ❖ Undo the hex nuts and springs to release the media frame and expose the prefilters.
- ❖ Undo the next set of nuts and springs to release the prefilter frame. Hold the final filter while removing the prefilter frame. Lift out the final filter and replace with new filter.
- ❖ Reverse this procedure to reinstall all the parts — see drawing A41873.0102.06.

The new filter should be inspected for damage. Prechecking the new filter for leaks is recommended prior to installing it into the unit. It is easier to repair a filter out of the unit if such repairs are required.

Check the gasket. Replace or repair as required.

With the new filter inspected, it can be installed into the unit. Set the filter into place resting on the threaded rods with the gasket toward the upper



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plenum of the unit. It should be centered on the opening of the supply plenum. Care should be taken when moving the filter into place that the gasketing is not folded or damaged when positioning the filter. Reattach the prefilter frame. The filter gasket should be compressed about 1/16 to 1/8 inch. This is about 1 to 2 turns of the nut with the gasketing just touching the frame. Over tightening the springs can damage the filter or the springs.

Insert prefilters into frame and reattach the media frame. This frame should not crush the prefilters when snugged down.

#### Blowers

The blowers can be direct drive or belt drive depending on what was ordered.

Direct Drive blowers have a fractional Horse Power, PSC (permanent split capacitor) motor that is attached directly to the blower wheel. The airflow of the unit is controlled by a voltage regulating solid state speed control located on the side of the blower. By turning the potentiometer on the cover of the electric box you change the speed of the blower.

Some units have 2 direct drive blowers feeding a single plenum. On this type of unit, both blowers should be set at about the same speed.

NOTE: On dual direct drive blowers the speed controls of both blowers need to be set very close to each other. If one is set too slow, it will not start properly. After the units speed is set, shut the units off. Let both blower wheels come to a complete stop. Turn the unit on. Both blowers should come up to speed at the same rate. If not, turn the speed up on the slightly slower blower.

#### Belt Drive Blowers

Belt drive blowers use a fixed speed 1725 RPM three phase motor that is connected to the blower by a belt and pulleys. The speed of the blowers and air velocity through the filters is changed by changing the diameter of the variable pitch pulley located on the motor. By increasing the diameter of the pulley (turning the pulley so the groove or space between the sides of the pulley becomes narrower) the blower will turn faster. Producing more air and a higher filter face velocity. By "opening up" this space or making the pulley smaller the blower is slowed down.

This adjustment is done by first shutting off the unit. Then loosen the belt by loosening the motor from the adjustable base and turning the base adjustment screw. Take the belt off the blower/motor. On the side of the motor pulley is set screw that locks a key. Loosen the set screw, remove the key and turn the pulley. Typically 1/2 to 1 turn of the pulley is enough to change the speed of the blower. Reattach the key and retighten the set screw. Reattach the belt and tighten. The unit can be turned on.

#### Frequency Modulator Speed Control (optional)

Three phase motors can have an optional electronic remote speed control used to change the RPM of the blowers. This electronic device changes the frequency of the electric power from 60 Hz to something less. As the frequency decreases, so does the speed of the blower. To change the face velocity of the filters simply change the setting on the frequency modulator.

The manual for the frequency modulating speed control is shipped with the devices in its boxes.

#### Acrylic Hoods

The side panels are attached to the cabinet and clamped to the hood leg in front. To remove the side panel, loosen the clamp from the leg and remove the screws from the cabinet and floor angle. To replace, mark hole locations and drill side panel. Reattach to cabinet and tighten front clamp. Reinstall floor angle. The top acrylic panels lay into the T-bar system and can be lifted out for replacement.

#### General Maintenance

The units require very little maintenance. The three phase motors have permanently sealed ball bearings and their typical life is over 10 years. The smaller fractional HP on the direct drive blowers have oil ports that the manufacturer recommends oiling every 6 months. This is very difficult to do with the motor mounted inside the blower, and most people do not attempt to oil the motor. The average life of this type of motor is about 5 to 7 years. We do have many that have been in continuous operation for over 10 years. They will typically develop a squeak prior to failing.

The direct drive blowers typically require no maintenance because there are no moving parts that have wear surfaces.

Belt drive blowers will require a possible belt adjustment after 6 months as they "seat" into the pulleys and will sometimes stretch slightly. We would recommend an annual check of the belts there after. Typically these belts will go many years with no maintenance.



The bearings on the belt drive blowers are sealed permanently lubricated ball bearings.

### Prefilter Media

The media is 1 inch thick with a "tacky" face to help catch and hold any particles. This media should be changed when it is dirty.

### Prefilters

The prefilters should be changed when they are dirty. They are of a standard industrial size.

### HEPA Filters

The HEPA filters should be changed when you are not able to maintain the proper face velocity out of the filter or when a filter becomes damaged. The life of the HEPA filter is dependent on the amount of dirt loading the unit is subject to.



Specifications subject to change. Please contact factory for details.

**Clean** **AIR**  
**PRODUCTS**

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