

PAC SERIES AIR CLEANERS

PAC HF/LF

Installation, Operation, and
Maintenance Manual



PAC HF/LF AIR CLEANER

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

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SECTION ONE - INTRODUCTION

Krueger's PAC HF/LF UV is a portable, self-contained high efficiency particulate air (HEPA) filtration system with an ultraviolet lamp that helps to disinfect the filter face. The PAC HF/LF with UV is designed to easily and economically create a negative pressure isolation room that will meet OSHA and CDC TB guidelines. The PAC HF/LF with UV can be used as a positive pressure clean air recirculating system in clinics, waiting rooms, hospital emergency rooms and other confined areas or as a partial or complete exhausting system to create a negative pressure isolation room for possible use with patients known or suspected of having TB, SARS, or other infectious diseases. As a recirculating unit, the PAC HF/LF with UV powerful motor/blower can deliver up to 800 cubic feet per minute (CFM) or 1360 m³/hr to provide a large number of room air changes per hour to minimize the spread of airborne diseases to patients and health care workers. As a negative pressure unit, the air passing through the HEPA filter is cleansed of 99.99% of particles as small as 0.3 micron and may be exhausted directly to the exterior through a window, or through a wall, simply by connecting flexible ducting to the 6" (152 mm) collar located on the top of the PAC HF/LF with UV. The PAC HF/LF with UV filter contains 220 square feet (20.4 square meters) of media to extend its usable lifetime before filter loading occurs, resulting in decreased cost and fewer filter changes.

FEATURES

- **Low Cost Isolation Room:** The PAC HF/LF with UV is an easy and economical solution for creating a negative pressure, isolation room. Simply roll the PAC HF/LF with UV into a standard room, connect flexible ducting to the 6" (152 mm) collar on the top of the unit for partial exhaust or to the optional 8" (204 mm) flanged collar for total exhaust and vent the purified air to the exterior through a window or wall.
- **Flexible Applications:** The versatile PAC HF/LF with UV can be used as a clean air recirculating unit, a negative pressure unit or as a split system to create both negative pressure and clean air recirculation by simultaneously exhausting some of the air out while recirculating the remainder back into the room.
- **Small and Portable:** The PAC HF/LF with UV can be rolled from one room to another and easily fits into areas with limited floor space.
- **Simple Maintenance:** Both HEPA filter and prefilter are easily accessible for replacement by authorized personnel.
- **3-Speed Adjustable Airflow:** With speeds ranging from 560 to 800 CFM (951 to 1360 m³/hr), the PAC HF/LF with UV provides effective air filtration for a wide variety of room sizes.
- **Room Air Changes Per Hour:** Provides up to 27 room air changes per hour (ACH) in a typical 18 x 12 x 8 ft (5.5 x 3.7 x 2.4 m) patient room or up to 12 ACH for rooms up to 4,000 cubic feet (113 cubic meters).
- **Low-High Clean Air Circulation Pattern:** Room air, along with airborne contaminants, is drawn into the intake grille at the bottom while the purified air is discharged at a high velocity from the exhaust grille located at the top of the PAC HF/LF with UV to generate a sweeping, low-to-high air circulation pattern with adequate "reach" to optimize the clean breathing zone for patient and staff.
- **Quiet Operation:** 52 dBA on low, 56 dBA on medium, and 60 dBA on high speed measured 30" (762mm) from face of the unit.

OPTIONS

- PAC HF/LF with ULPA filter upgrade
- 220 V, 50/60 Hz unit available
- Carbon prefilter
- 8" (203 mm) 100% exhaust collar kit

APPLICATIONS

- Negative Pressure Rooms
- Emergency Rooms
- Waiting Rooms
- Sputum Induction
- Aerosol Pentamidine Treatment
- Intensive Care Units
- Bronchoscopy Rooms
- Renal Dialysis Rooms
- Clinics
- Physician Offices
- Correctional Facilities
- Nursing Homes
- Homeless Shelters
- Addiction Recovery Center

SECTION TWO - INSTALLATION

SAFETY WARNING & PROCEDURES



WARNING: To reduce the risk of fire, electrical shock, or injury to persons, observe the following.

1. Installation work and electrical wiring must be done by a qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
2. When cutting or drilling into a wall or ceiling, do not damage electrical wiring or other hidden utilities.
3. Service to and decontamination of this equipment should be performed by an authorized technician trained and experienced in performance evaluation and maintenance of clean air equipment. However, certain procedures are outlined in this manual that can be performed by the owner.
4. Before servicing the unit, switch power off at service panel and lock service panel to prevent power from being switched on accidentally, and follow proper procedures as necessary.
5. Use this unit only in the manner intended by the manufacturer.

UNPACKING INSTRUCTIONS

1. The PAC HF/LF is shipped in an open-framed crate. The module should be inspected for exterior shipping damage immediately upon arrival. If any damage is observed, a claims report should be completed and promptly filed with the responsible carrier.
2. Uncrate and remove all packing material. Examine the unit for internal damage. If damage is discovered inside the crating, file a claim with the responsible carrier immediately. The shipping components list and actual material received should be compared and any shortages reported to Krueger immediately.

ASSEMBLY

1. The PAC HF/LF is shipped completely assembled from the factory and requires no assembly. Every unit is tested prior to shipment to verify airflow, noise level, and that the unit is leak-free.
2. Place the unit in its final operating position (see Figure 1 for recommended positioning).
3. Lock the wheel locks on the casters to keep the unit from accidental repositioning.

NOTE: The CDC requires that quantitative leakage and filter performance tests be performed at the initial installation and every time the filter is changed or moved. Tests should be repeated every six months. The factory tests should not be substituted for the initial test.

SECTION THREE - OPERATION

INITIAL START-UP

1. Connect the power cord to a standard 115 V, 1-phase, 60 Hz, or 220 V, 50 Hz, grounded power source. Assure that the circuit is sized to provide sufficient amperage as noted on the data plate.
2. Locate the "ON/OFF" switch on the right side of the unit. The switch is a maintain contact rocker type.
3. Turn the PAC HF/LF unit on by pressing downward on the raised portion of the rocker switch. A light whirring sound will be heard as the motor starts. Within 5 to 10 seconds, the module will start to provide clean air into the environment.

SPEED ADJUSTMENT

NOTE: The PAC HF/LF unit is set on low at the factory.

1. To change speeds, remove the exhaust grille by pulling down and lifting out.
2. Turn the 3-speed switch to the desired setting.
3. Replace the exhaust grille.

AIRFLOW INDICATOR

1. Locate the airflow indicator on the right side of the unit above the "ON/OFF" switch. On high speed, the light will turn on when there is insufficient pressure, indicating the need for a filter change. The airflow indicator should not be used as the only guide for when a filter change is necessary. The unit should be checked at each use to insure recommended room air changes per hour are being met.
2. The air velocity generated by the unit may be checked using an airflow measurement device. The volume of air entering the lower intake grille should be approximately 560 CFM (951 m³/h) on low, 690 CFM (1172 m³/h) on medium and 800 CFM (1359 m³/h) on high with a new filter.

RECIRCULATION MODE

1. The PAC HF/LF unit is set at the factory on the 100% air recirculation mode.
2. The room air change rate of the unit will depend on both the speed setting and the size of the room. See table in the Appendix on page 14 for representative room air changes per hour (ACH).
3. For maximum recirculation efficiency, the unit should be placed between the entry door and the patient's bed or the activity area (see Figure 1 on next page). However, the unit will function effectively at other locations within the room.

SECTION THREE - OPERATION (CONTINUED)

PARTIAL EXHAUST/RECIRCULATION MODE

Note: The PAC HF/LF with or without UV units come with a removable exhaust cover plate and a removable 6" (152mm) duct collar for attachment to exhaust ducting (not included) to create a negative pressure room. If the exhaust cover plate is not removed, both the PAC HF/LF with or without UV units will operate in the 100% recirculation mode.

1. Remove the exhaust cover plate located on top of the unit by taking off the four (4) screws and plastic caps used to secure the cover to the exhaust port.
2. Remove the 6" (152mm) duct collar underneath the top cover and flip the collar over.
3. Attach exhaust ducting (not included) onto the collar and fasten tightly with a round hose clamp (not included).
4. Mount the duct collar with ducting onto the unit exhaust port using the four (4) screws that originally held the cover plate. **NOTE:** Keep the top plate and plastic washers for re-assembly when needed.
5. The HEPA filtered exhaust air can now be vented to the outside or returned to the main HVAC system. If the unit is ducted to an exhaust duct rather than directly to the outside, it must be verified that the exhaust duct is capable of handling the exhaust air expelled by the unit.
6. The PAC HF/LF is designed to exhaust 100-300 CFM (170-510 m³/h) at the 6" exhaust port. It is recommended that the unit be set on the high-speed setting when operating in this mode to achieve maximum exhaust and negative pressure. At this setting, the unit will exhaust approximately 300 CFM (510 m³/h) and recirculate 500 CFM (850 m³/h).

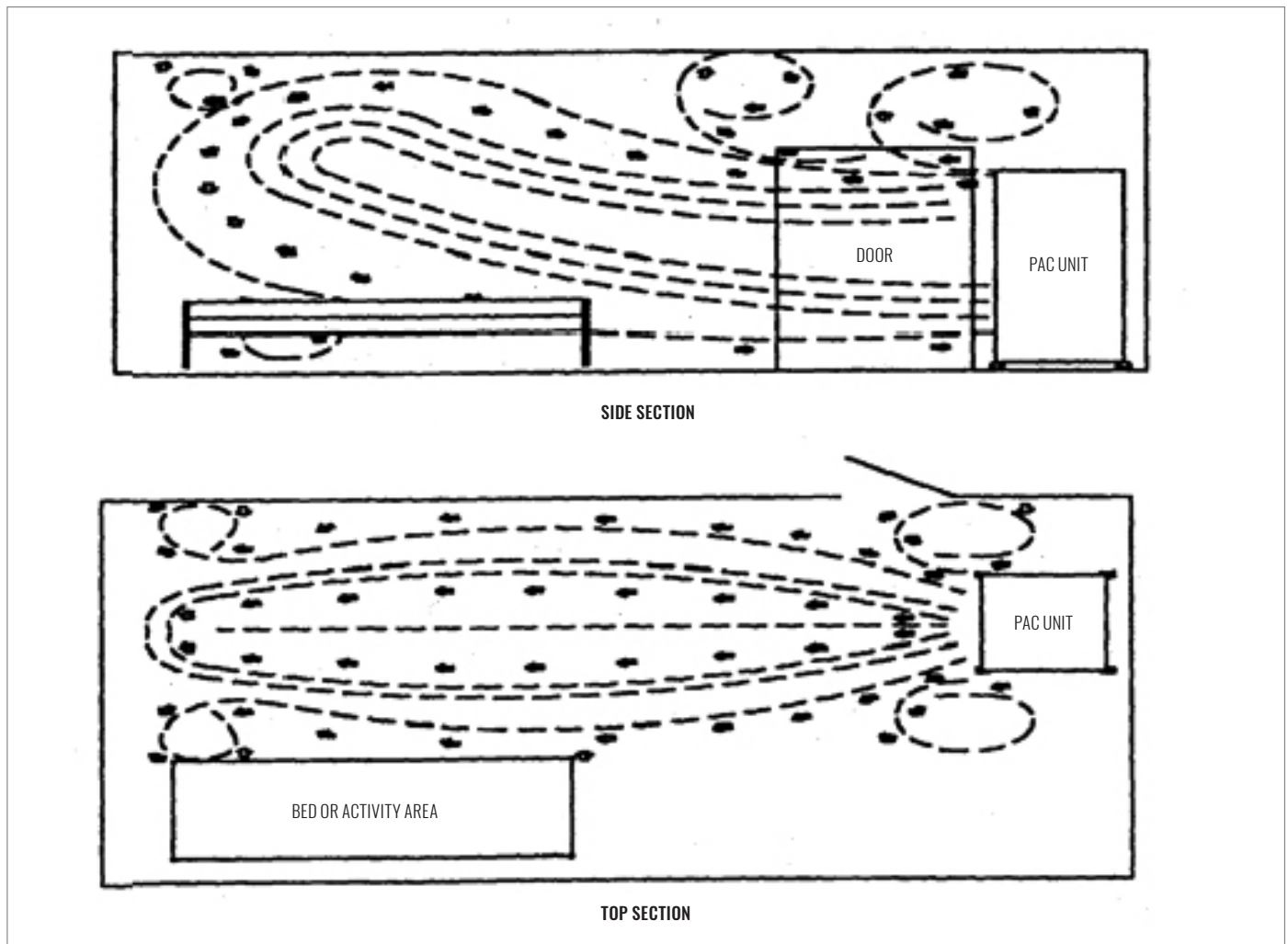


Figure 1: Recommended unit positioning within a patient room

SECTION THREE - OPERATION (CONTINUED)

TOTAL EXHAUST MODE (NEGATIVE PRESSURE)

NOTE: The cover plate must be securely attached to the top of the unit to run in the 100% exhaust mode.

An optional 8" (203mm) exhaust collar with flange is available to convert the unit to the 100% exhaust mode.

1. Remove the front exhaust grille by pulling down and lifting out.
2. Place the optional 8" (203mm) exhaust collar over the opening where the grille was removed and attach with the screws included with the 8" collar.
3. Attach flexible exhaust duct (not included) over the 8" collar and fasten tightly with a round hose clamp (not included).
4. The HEPA filtered exhaust air can now be vented to the outside or returned to the main HVAC system. If the unit is ducted to an exhaust duct rather than directly to the outside, it must be verified that the exhaust duct is capable of handling the exhaust air expelled by the unit.

Note: CDC guidelines recommend that rooms used for negative pressure isolation should be single patient rooms with negative pressure relative to the corridor or other areas connected to the room. The minimum pressure difference necessary to achieve and maintain negative pressure that will result in airflow into the room is 0.01 Inch w.G. (2.5pa) (a higher pressure is preferred). To achieve this, the exhaust flow should be 10% or 50 CFM (85 m³/h) greater than the supply (whichever is greater).

ACHIEVING NEGATIVE PRESSURE

1. The PAC HF/LF unit is designed to exhaust 100-300 CFM (170-510 m³/h) when the 6" (152.4mm) exhaust collar is used. It is recommended that the unit be set on the high-speed setting when operating in this mode to achieve maximum exhaust and negative pressure. At this setting, the unit will exhaust approximately 300 CFM (510 m³/h) and recirculate 500 CFM (850 m³/h).
2. If an exhaust volume greater than 300 CFM (510 m³/h) is required to create a negative pressure room, the optional 8" (203.2mm) 100% exhaust collar should be used.
3. The attachment of ductwork to the exhaust port decreases the air volume exhausted through the port. The magnitude of the decrease varies depending on the length and type of duct as well as its configuration. For example, for a 10 ft (3.048m) run of standard flexible duct containing two 90° bends, the exhaust reduction will be approximately 100 CFM (170 m³/h).
4. CDC recommends that air from negative pressure rooms be exhausted to the outside in accordance with federal, state, local or country regulations. The air should not be recirculated into the general ventilation. In certain cases in existing facilities, recirculation of air into the general ventilation system is unavoidable and, in such cases, CDC guidelines state that HEPA filters should be installed in the exhaust duct leading from the room to the general ventilation system.

NOTE: It is the responsibility of the purchaser, and not Krueger, to ensure the room in which the unit is used is in compliance with CDC Guidelines* for a negative pressure isolation room and monitored to ensure its continuing performance.

DIFFICULTY ACHIEVING NEGATIVE PRESSURE

The equipment may not be able to achieve or maintain negative pressure in conformance with the CDC Guidelines* due to building ventilation of rooms or air leakage. The room should be inspected for air leakage through doors, windows, plumbing and wall penetrations. Appropriate corrective action should be taken to seal the leaks.

* CDC. Guidelines for Preventing the Transmission of Tuberculosis in Healthcare Facilities, 1994. MMWR, October 28, 1994; 43 (No. RR-13).

SECTION FOUR - MAINTENANCE & SERVICE

PARTS IDENTIFICATION

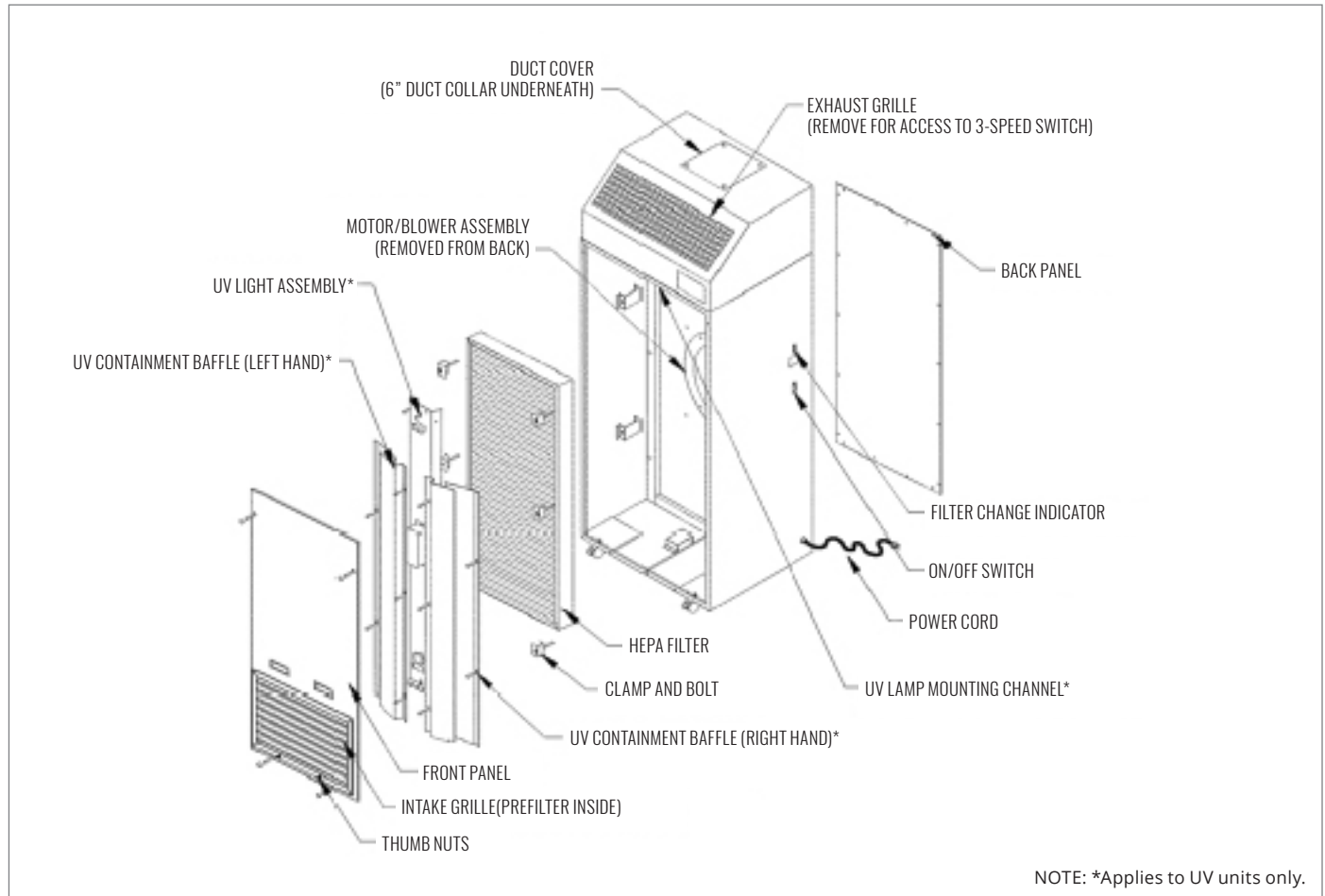


Figure 2: Parts location

CLEANING THE UNIT

1. Periodic cleaning of the unit may be done with a mild disinfecting soap and water solution. A 1% or 1/100 dilution of bleach is an optional disinfectant.**
2. Exterior cabinet cleaning must be performed with the unit running. Wipe the exterior of the unit with a damp sponge or cloth, paying particular attention to the prefilter intake grille.

**Rutala WA, APIC Guideline for Selection and Use of Disinfectants, Am J Infect Control 1996 Aug; 24(4): 313-42.

Caution: Proper protective equipment and measures must be used at all times during unit cleaning and maintenance. Check with your safety office to assure the cleaning solutions, protective equipment (disposable hospital gown, HEPA respirator, protective gloves) and protocols followed comply with your facility's and CDC Guidelines.

Caution: Disconnect the unit from the electrical power source before attempting service. Do not work inside the PAC HF/LF with UV unit with the UV light on. Proper replacement of UV containment baffles, after maintenance, is mandatory to maintain safe, short-term and long-term UV exposure levels.

SECTION FOUR - MAINTENANCE & SERVICE (CONTINUED)

PREFILTER REPLACEMENT

1. The prefilter should be replaced every 60 to 90 days. Regularly replacing the prefilter will maximize the life of the HEPA filter. The PAC HF/LF with UV comes standard with an anti-microbial pleated prefilter. It is recommended that a pleated prefilter is used.
2. Wipe the unit as described previously.

The following steps must be performed with the unit (fan) running:

3. Spray a mist of phenolic disinfectant such as "Amply" or "Lysol" into the air intake grille.
4. Remove the two (2) thumb nuts from the face of the intake grille and pull the grille out.
5. Insert gloved hand into a red plastic, medical waste disposal bag. Grasp the top portion of the prefilter with bagged hand and gently pull outward. The airflow of the unit will offer a resistance to pulling the prefilter out.
6. Turn the bag inside out over the prefilter then seal the bag for containment.
7. Install a new prefilter and secure the grille by following step these instructions in reverse order of removal.

Caution: Appropriate decontamination procedures must be followed prior to removal of the access panels to replace the HEPA filter or other parts. Contact your safety office to assure it conforms to your facility's protocol.

REMOVAL OF FRONT AND REAR PANELS

1. Remove the front access panel by taking off the screw covers and removing the four (4) screws. The front panel may now be lifted off.
2. Remove the 18 screws securing the rear access panel. The rear panel may now be lifted off.

HEPA FILTER REPLACEMENT

The CDC recommends that in any application, HEPA filters should be maintained meticulously and should be carefully installed by adequately trained personnel wearing an appropriate respirator. A regular maintenance program should include procedures for installation, removal and disposal of filter elements and a program to monitor the HEPA filter for possible leakage and for filter loading.

1. The expected HEPA filter life should range from 18 months to two (2) years depending on the environment and prefilter maintenance schedule. The filter indicator light will give a warning of filter loading by flickering on high speed. When the light stays on at high speed, the HEPA filter should be changed.
2. Remove the prefilter.
3. Remove the front access panel. Lift the panel out and set it aside.

REMOVAL OF THE UV LIGHT ASSEMBLY

1. Remove the five (5) screws on the left hand UV containment baffle and the five (5) screws on the right hand containment baffle and remove the baffle assemblies.
2. Disconnect the 3-pin connector located near the UV lamp ballast and remove the wires from the wire routing clamp.
3. Remove the four (4) screws, washers and nuts holding the UV lamp assembly in place (the mounting channel may be removed or left in place). Access through the exhaust grille is necessary to remove the mounting channel. Remove the exhaust grille by pushing down and lifting out. Carefully remove the UV lamp assembly taking care not to touch the glass tube. NOTE: Clean the UV light tube as necessary, using a cloth dampened with an 10% alcohol (or ammonia) and water solution, to avoid lamp degradation due to oil and dust residues. Gloves are required when handling UV Light.
4. Remove the six (6) bolts and clamps holding the HEPA filter. Slip a plastic biohazard bag over the filter from the top down. Tilt the top of the filter outward and wrap the bag over the bottom of the HEPA filter. Seal the bag to for containment. NOTE: It may be necessary to use two (2) biohazard bags to fully contain the filter.
5. Remove the new HEPA filter from its container and install it in the reverse order of removal. Care must be taken when handling the HEPA filter. Do not bump or squeeze the filter as this may damage the filter and render it non-effective.

SECTION FOUR - MAINTENANCE & SERVICE (CONTINUED)

POWER CORD

1. With the back panel removed, unplug the white connector on the power cord.
2. Remove nut on ground wire.
3. Remove strain relief on the side of the unit.
4. Remove the old cord and replace with the new one, following the steps above in reverse order.

ON/OFF SWITCH

1. With the back panel removed, unplug the white connector on the switch and squeeze the retainer strips on switch bezel.
2. Remove retaining nut that holds the switch to the baffle panel.
3. Unplug a connecting wires and replace the new switch, following the steps above in reverse order.

SPEED CONTROL SWITCH

1. Remove the exhaust grille by pushing down and lifting out.
2. Remove the retaining nut that holds the switch to the baffle panel.
3. Unplug a connecting wires and replace with the new switch, following the steps above in reverse order.

CAPACITOR

1. With the back panel removed, remove one screw from capacitor strap.
2. Slide capacitor out.
3. Remove the rubber boot and disconnect wires.
4. Replace with the new capacitor, following the steps above in reverse order.

AIR PRESSURE SWITCH

1. With the back panel removed, disconnect the two (2) air supply tubes and two (2) electric terminals.
2. Remove the two (2) sheet metal screws and replace with the new switch, making sure to reconnect everything correctly by reversing operation of removal.

FILTER CHANGE INDICATOR LIGHT

1. With the back panel removed, unplug the two (2) wires and push out the filter indicator light from the inside of the unit.
2. Replace the filter indicator light by following the step above in reverse order.

MOTOR/BLOWER LUBRICATION

The PAC HF/LF unit is equipped with permanently sealed bearings and requires no lubrication.

MOTOR ASSEMBLY REMOVAL

1. With the back panel removed, disconnect all wire connections between the motor and other components.
2. Loosen the Allen Head set screws on the blower wheel hub and remove the wheel.
3. Loosen the screw on the motor belly band until the motor can slide out.
4. Replace with the new motor, following the steps above in reverse order, ensuring there is an ¼-inch gap between the blower wheel and the inlet ring.

Caution: When reinstalling the motor ensure that it does not touch or puncture the HEPA filter.

RELOCATING A CONTAMINATED UNIT

NOTE: Use proper protocol, gowning, and protective measures.

1. If an existing unit is to be placed into storage for an extended period of time, remove and replace the prefilter.
2. Turn the unit off and disconnect from power source.
3. Clean the exterior surfaces of the unit.
4. Unlock caster wheel locks and move unit to its new location.

UNIT DECONTAMINATION

NOTE: Use proper protocol, gowning, and protective measures during unit decontamination.

Should decontamination of the unit be required, the following (on the next page) is an adaptation by Annex G. of the Recommended Microbiological Decontamination Procedure from NSF 49, June 2008. Confirm with appropriate Biosafety and Industrial Safety Professionals that the procedures meet your facility's guidelines.

SECTION FOUR - MAINTENANCE & SERVICE (CONTINUED)

Paraformaldehyde Decontamination

1. As described previously, relocate the unit to a controlled access, non-public area with a non-porous floor, good ventilation, and a dedicated exhaust directly outside the building. A new prefilter is not required. Attach and seal a flexible hose to the dedicated exhaust. Place the other end of the exhaust hose near the unit.
2. Calculate the total volume of the unit by multiplying the height, width, and depth. The total unit volume is 13 cubic feet (61" x 24" x 15.5") or (1.55m x 0.61m x 0.39m).
3. Multiply the total volume of the unit by 0.3g/ft³ to determine the gram weight of Paraformaldehyde required. Decontamination of the unit requires 3.9 grams (12 ft³ x 0.3g/ft³) of Paraformaldehyde.
4. Remove the intake grille and wipe it down with an appropriate surface decontaminant.
5. Place an unplugged heating device, such as a commercially available electric frying pan with the thermostat set at 232.2° to 246.1°C (450° to 475°F) inside the unit through the removed prefilter access panel. Spread the Paraformaldehyde evenly over the heating surface of the electric frying pan. **Caution:** The auto-ignition temperature of paraformaldehyde is 300°C (572°F). Place a hot plate, beaker of water, and temperature and humidity indicators in the unit next to the pan that will contain the paraformaldehyde.
6. Enclose all sides of the unit with heavy gauge plastic film and tape in place while leaving the film that will close the space formerly occupied by the intake grille free. The power cord should be coiled and taped to the unit and sealed under the plastic film. Seal the film to the floor on which the unit stands.
7. Determine the temperature and humidity inside the unit.
8. The temperature should be 21.1°C (70°F) or higher with a humidity level between 60% to 85%. Use the hot plate to heat the beaker of water until the desired temperature and humidity are achieved. Disconnect the hot plate.
9. Seal the film over the remaining opening of the intake grille space. Carefully seal around the power cord extending from the electric frying pan so that formaldehyde gas will not leak out.
10. Plug the cord of the electric frying pan into an outlet.
11. After the Paraformaldehyde has depolymerized, disconnect the frying pan from the electrical outlet.
12. Allow the unit to stand for a minimum of two hours or overnight.
13. Attach the flexible hose to the unit and allow it to draw from inside the unit.
14. After 15 minutes of visible exhaust activity, small openings may be made in the film over the unit's air supply grille to improve ventilation.
15. Allow the unit to ventilate overnight.

16. Remove the unit from exhaust ventilation when the formaldehyde gas has been exhausted. **Caution:** During unit decontamination, respiratory protection for service personnel is highly recommended. Only national institute for occupational safety and health (NIOSH) approved respirators should be used.

17. Remove the HEPA filter as described previously. The filter can now be disposed of as general waste.

Phenolic Decontamination

In facilities where Paraformaldehyde gas decontamination is prohibited or not feasible, the unit can be disinfected by the following procedure.

1. Remove the prefilter.
2. After the intake grille and prefilter are removed, turn the unit on, and with the unit running, spray a mist of phenolic disinfectant such as Amphyl or Lysol into the air intake opening. Approximately two (2) to five (5) ounces is adequate.
3. Remove the HEPA filter as described previously. Since the filter has not been decontaminated by the formaldehyde procedure, it must be placed in a red medical waste bag and disposed of properly.

UV LIGHT TUBE REPLACEMENT

1. The expected life of the UV light tube is nine (9) months to one (1) year, depending on the environment and prefilter maintenance schedule.
2. Remove the five (5) screws on the left hand UV containment baffle or the five (5) screws on the right hand containment baffle and remove the baffle assembly.
3. Reach around the UV light assembly, taking care not to touch the face of the HEPA filter, and grasp the "old" light tube gently. Rotate the light tube 90° in either direction to enable removal (you should feel tension on the tube release). To remove the light tube, carefully pull away from the UV lamp assembly, towards the HEPA filter. Dispose of the light tube (or recycle) following local guidelines. **Caution:** Touching the face of the filter could cause damage to the filter media resulting in the need of professional repair or replacement.
4. Use clean latex gloves to ensure that the new light tube remains clean. Clean the new light tube using a cloth dampened with a 10% alcohol (or ammonia) and water solution. To replace, reverse the order of removal.

SECTION FIVE - TROUBLESHOOTING

Before attempting to service and repair the unit, use proper protocol and follow appropriate decontamination procedures described in the following sections:

- Cleaning the Unit
- Prefilter Replacement
- Relocating a Contaminated Unit
- Unit Decontamination

INOPERATIVE AIRFLOW

1. Confirm that the power cord is plugged into the building receptacle and power is present.
2. Confirm that the unit power switch is turned "ON".
3. Check switch and internal wiring per Wiring Diagram (next page). Replace or repair faulty component(s).
4. Check the motor and replace if necessary.
5. Check the motor capacitor and replace if necessary.

LOW AIRFLOW

1. Check prefilter for obstruction and remove obstruction as necessary.
2. Replace dirty prefilter media.
3. Switch the speed control to the next higher airflow setting.
4. Check power supply for proper voltage, amperage, and distribution frequency.
5. Check for down-stream obstructions or erratic isolation room ventilation balance.
6. Replace HEPA filter if the air velocity remains low.

HIGH AIRFLOW

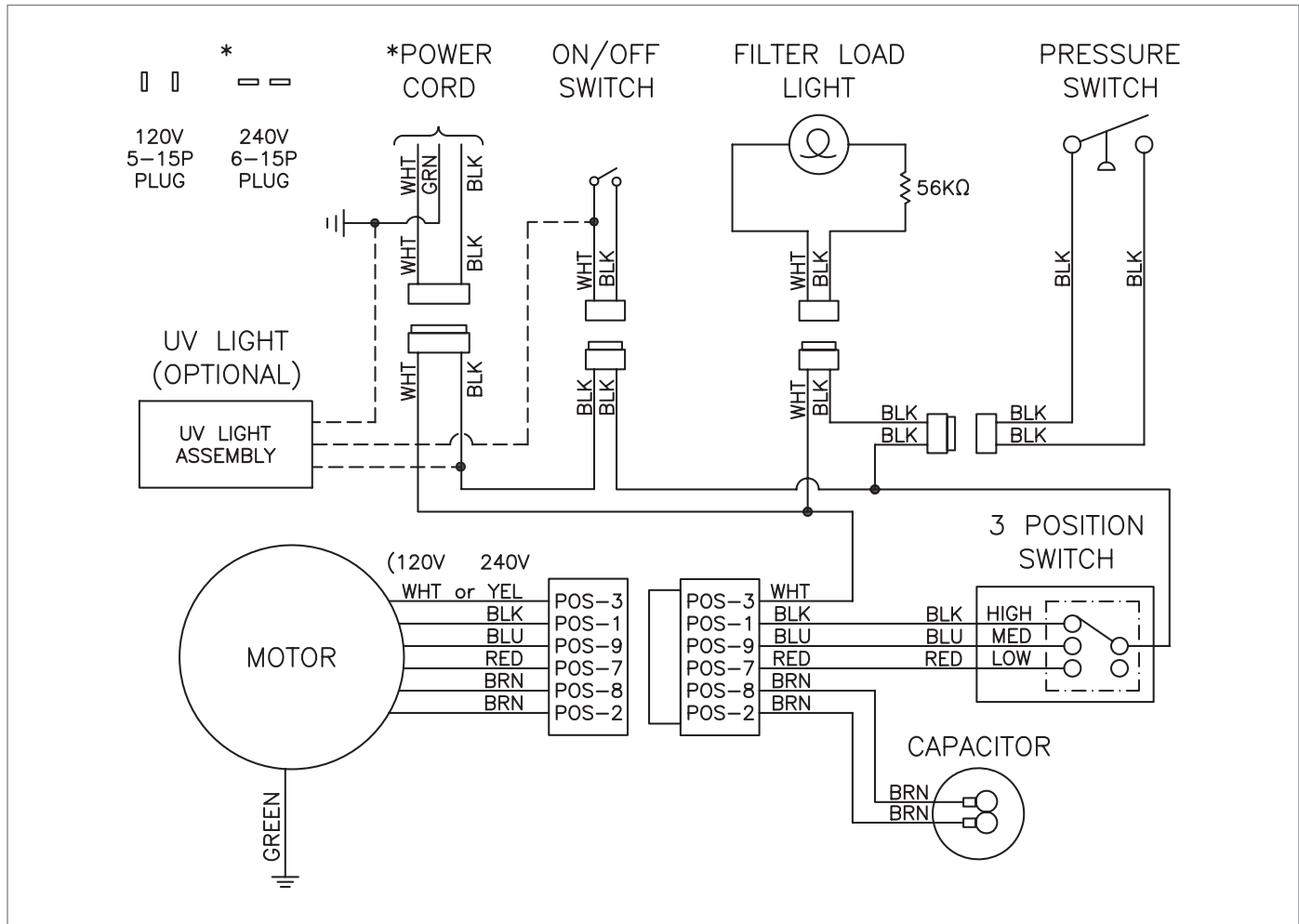
1. Adjust the speed control down to the next lowest setting.
2. Assure all filters are properly in place.

EXCESSIVE CONTAMINATION

1. Replace HEPA filter.
2. Assure the HEPA filter is installed properly.

SECTION SIX - MISCELLANEOUS

WIRING DIAGRAM



SPECIFICATIONS PAC LF/HF

- **Dimensions:** 62.25" H x 23.66" W x 15.75" D, 1581 H x 601 W x 400 D (mm)
- **Weight:** 250 lbs. (113 Kg) ship weight
- **Power Requirements:** 6.9 A at 115 V, 60 Hz, 1-phase; 3.5 A at 208-230 V, 60 Hz, 1-phase
- **Average Airflow:** 560 CFM (951 m³/hr) on low ±10%, 690 CFM (1172 m³/hr) on medium ±10, 800 CFM (1359 m³/hr) on high ±10
- **HEPA Filter Media:** 99.99% At 0.3 Micron minimum efficiency
- **Prefilter:** Woven polyester with frame
- **Motor:** 1/3 Hp (0.25 Kw, direct drive, 3-speed, continuous duty)
- **Exhaust Port:** 6" (152.4mm) duct collar

SPECIFICATIONS PAC HF/LF WITH UV

- **Dimensions:** 62.25" H x 23.66" W x 19.75" D, 1581 H x 601 W x 502 D (mm)
- **Weight:** 285 lbs. (129 kg) ship weight
- **Power Requirements:** 8.0 A at 115 V, 60 Hz, 1-phase; 4.0 A at 220 V, 60 Hz, 1-phase
- **Average Airflow:** 560 CFM (951 m³/hr) on low ±10, 690 CFM (1172 m³/hr) on medium ±10, 800 CFM (1359 m³/hr) on high ±10
- **HEPA Filter Media:** 99.99% at 0.3 Micron minimum efficiency
- **Prefilter:** Anti-microbial pleated prefilter with frame
- **Motor:** 1/3 HP (0.25 kW), direct drive, 3-speed, continuous duty
- **Exhaust Port:** 6" (152.4mm) duct collar

SECTION SIX - MISCELLANEOUS (CONTINUED)

REPLACEMENT PARTS

PAC HF/LF UNIT		
PART NO.	DESCRIPTION	QUANTITY
62954	MOTOR, 1/3 HP, 3-SPEED, 115V	1
63093	MOTOR, 1/3 HP, 3-SPEED, 208-230V	1
24000	MOTOR/BLOWER ASSEMBLY, 115V	1
24000-002	MOTOR/BLOWER ASSEMBLY, 208-230V	1
62964	AIR INLET RING	1
63270	BLOWER WHEEL	1
62944	3-SPEED SWITCH	1
63042-008	POWER CORD - MOLDED 115V	1
63042-004	POWER CORD - MOLDED 220V	1
61807	MOTOR CAPACITOR 15 mfd, 115V	1
60078	MOTOR CAPACITOR 5 mfd, 220V	1
66354	ON/OFF SWITCH	1
63027	AIR PRESSURE SWITCH	1
61400	FILTER PILOT LIGHT	1
90833	PREFILTER, 12" x 20" x 1 (304.8mm x 508mm x 25.4mm)	1
69391-001	HEPA FILTER, 21" x 45" x 3" (533.4mm x 1143mm x 76.2mm)	1
62973	CASTER	2
62974	CASTER WITH BRAKE	2
23877	6" (152.4mm) DUCT COLLAR FOR PAC HF/LF	1
37454	EXHAUST COVER PLATE FOR PAC HF/LF	1

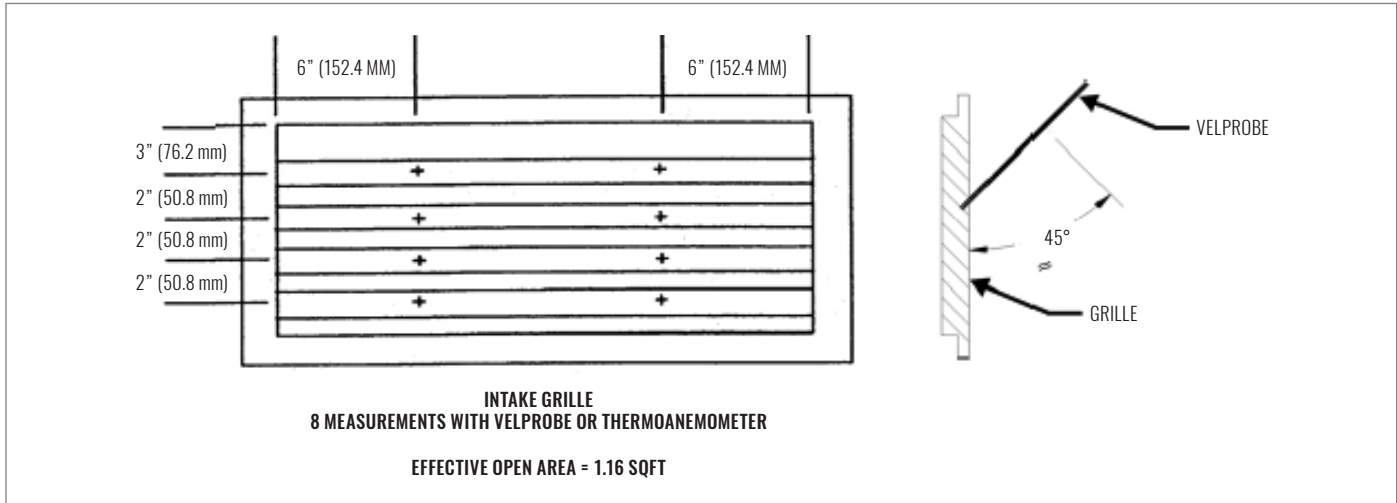
PAC HF/LF - OPTIONAL ACCESSORIES		
PART NO.	DESCRIPTION	QUANTITY
11055	8" (203.2mm) A/C COLLAR WITH FLANGE FOR 100%	1
63338	ANNUNCIATOR	1
63352	ANTIMICROBIAL FILTER	1
63349	CARBON PREFILTER	1
63337	ROOM PRESSURE MONITOR	1

PAC HF/LF UNIT WITH UV-C		
PART NO.	DESCRIPTION	QUANTITY
62954	MOTOR, 1/3 HP, 3-SPEED, 115V	1
63093	MOTOR, 1/3 HP, 3-SPEED, 208-230V	1
24000	MOTOR/BLOWER ASSEMBLY, 115V	1
24000-002	MOTOR/BLOWER ASSEMBLY, 208-230V	1
62964	AIR INLET RING	1
63278	BLOWER WHEEL	1
62944	3-SPEED SWITCH	1
63042-008	POWER CORD - MOLDED 115V	1
63093-008	POWER CORD - MOLDED 220V	1
61807	MOTOR CAPACITOR 15 mfd, 115V	1
60078	MOTOR CAPACITOR 5 mfd, 220V	1
66354	ON/OFF SWITCH	1
63027	AIR PRESSURE SWITCH	1
61400	FILTER PILOT LIGHT	1
63352	PREFILTER, 12" x 20" x 1 (304.8mm x 508mm x 25.4mm)	1
69391-001	HEPA FILTER, 21" x 45" x 3" (533.4mm x 1143mm x 76.2mm)	1
62973	CASTER	2
62974	CASTER WITH BRAKE	2
23877-003	6" (152.4mm) DUCT COLLAR FOR PAC HF/LF WITH UV	1
37454-002	EXHAUST COVER PLATE FOR PAC HF/LF WITH UV	1
60265	GERMICIDAL LAMP FOR PAC HF/LF WITH UV	1
24392-001	UV CONTAINMENT BAFFLE FOR PAC HF/LF WITH UV	1

PAC HF/LF WITH UV-C - OPTIONAL ACCESSORIES		
PART NO.	DESCRIPTION	QUANTITY
23877-002P	8" (203.2mm) DUCT COLLAR KIT FOR PAC HF/LF WITH UV	1
63338	ANNUNCIATOR	1
63349	CARBON PREFILTER	1
63337	ROOM PRESSURE MONITOR	1

SECTION SIX - MISCELLANEOUS (CONTINUED)

AIRFLOW MEASUREMENT & TESTING



SECTION SEVEN - APPENDIX

FAN SPEED	ROOM SIZE (ROOM AIR VOLUME) IN FEET						
	10 x 10 x 8	12 x 12 x 8 (1150 ft ³)	12 x 15 x 8 (1440 ft ³)	12 x 15 x 9 (1620 ft ³)	15 x 15 x 8 (1800 ft ³)	15 x 20 x 8 (2400 ft ³)	20 x 20 x 8 (3200 ft ³)
LOW 560 CFM (951 m ³ /hr)	41 ACH	28 ACH	23 ACH	20 ACH	18 ACH	13 ACH	10 ACH
MEDIUM 690 CFM (951 m ³ /hr)	51 ACH	36 ACH	28 ACH	25 ACH	23 ACH	17 ACH	12 ACH
HIGH 800 CFM (1359 m ³ /hr)	60 ACH	41 ACH	33 ACH	29 ACH	26 ACH	20 ACH	15 ACH

SECTION EIGHT - LIMITED WARRANTY

A. Unless otherwise set forth in the Sales Confirmation, Seller warrants to Buyer, for a period of twelve (12) months following the date of delivery to the Delivery Location (the "Warranty Period"), that the Goods will be free from defects in material and workmanship. Notwithstanding the foregoing, the Warranty Period for consumable Goods shall in no event exceed recommended replacement intervals set forth in the Instructions (hereinafter defined). If, prior to the expiration of the Warranty Period, Buyer informs Seller in writing of any breach of this limited warranty, then Seller may repair or replace the Goods that gave rise to such breach or, in Seller's sole and exclusive discretion, refund the amounts that Buyer paid for such Goods. The foregoing limited warranties do not apply to (i) any defect in Goods not manufactured by Seller; and (ii) any Goods manufactured according to Buyer's specifications.

B. Buyer shall bear the costs of access, de-installation, re-installation and transportation of the Goods to Seller and back to Buyer. Any repair or replacement pursuant to this limited warranty shall not extend the Warranty Period. Seller does not warrant the Goods, or any repaired or replacement parts, against normal wear and tear. This limited warranty and remedy are expressly conditioned upon:

- i. Buyer's payment of the purchase price in full,
- ii. Buyer giving written notice of the defect, reasonably described, to Seller within ten (10) days of the time when Buyer discovers or ought to have discovered the defect,
- iii. the storage, installation, operation, use, and maintenance of the Goods in compliance with the published specifications and instructions provided by Seller or its suppliers or subcontractors (the "Instructions"),
- iv. the existence of proper records of Buyer's operation and maintenance of the Goods during the Warranty Period,
- v. Buyer providing Seller with a reasonable opportunity to examine the Goods and the aforementioned records, and
- vi. the absence of any unauthorized modification or repair of the Goods.

C. Before any test may be used to evaluate the Goods, Buyer shall:

- iv. provide Seller with reasonable written notification of such test,
- v. allow Seller to be present during such test, and
- vi. receive Seller's consent to the conditions of such test, which consent will not be unreasonably withheld. If a test is performed on the Goods, and Seller has not consented to the conditions of such test, then this limited warranty shall be void.

D. The remedies set forth in this section 8 are buyer's sole and exclusive remedies for any failure of seller to comply with its obligations under this agreement, including any breach of the limited warranty set forth in this section 8. Correcting any defect in the manner set forth in this Section 8 shall constitute complete fulfillment of Seller's obligations and liabilities under the Agreement following the delivery of the goods, regardless of whether a claim is based in contract law, tort law (including negligence, strict liability or otherwise), or other legal theory.

The limited warranty set forth in this section 8 is exclusive and in lieu of all other warranties, whether statutory, express, or implied. Except as set forth in this section 8, seller makes no express or implied warranties, including, but not limited to any warranties of merchantability, non-infringement, or fitness for a particular purpose, or any warranties arising from course of dealing or usage of trade. Any other oral or written statements, whether contained in general advertising or other printed material, do not constitute warranties, and Buyer agrees that it is not entering into the Agreement in reliance upon any such statements.

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Vertical / Stack

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Louvered
Perforated
Modular Core
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Plenum Slot
Round
Air Nozzles

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Return
Linear Bar
Security
Industrial
Duct Mounted
Transfer
Stainless Steel



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