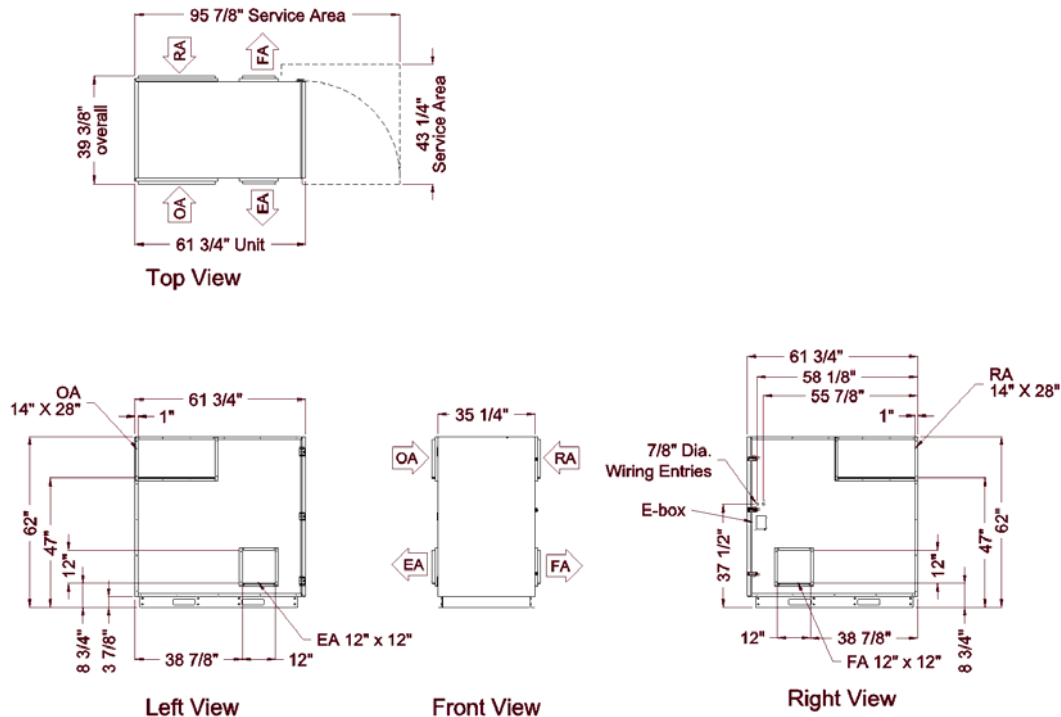


**INSTALLATION,
OPERATION,
& MAINTENANCE MANUAL**



WARNING

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

1. Use the unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
2. Before servicing or cleaning the unit, switch power off at service panel and lock service panel to prevent power from being switched on accidentally. **CAUTION: More than one disconnect switch may be required to de-energize the equipment for servicing.**
3. Do not use in cooking area.
4. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment that might be installed in the area affected by this equipment. **If this unit is exhausting air from a space in which chimney-vented fuel burning equipment is located, take steps to assure that combustion air supply is not affected.** Follow the heating equipment manufacturer's guidelines and safety standards such as those published by the National Fire Protection Association (NFPA), the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and local code authorities.
4. Do not connect this unit to fume hoods or collection systems for toxics.
5. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction codes and standards.
6. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
7. Ducted fans must always be vented to the outdoors.
8. NEVER place a switch where it can be reached from a tub or shower.
9. This unit must be grounded.

CAUTION

1. For general ventilating use only. Do not use to exhaust hazardous or explosive materials and vapors.
2. To avoid motor bearing damage and noisy and/or unbalanced impellers, keep drywall spray, construction dust, etc., off power unit.

Attention: This installation manual shows the suggested installation method. Any structural alterations necessary for installation must comply with all applicable building, health, and safety code requirements.

Units should be installed by properly licensed contractor(s) according to local code requirements.

Placement of the HE3XINV:

The HE3XINV is designed for installation in a sheltered location, out of the weather.

The preferred mounting location is sitting on a concrete floor. Unit base may be bolted to floor. The concrete will isolate any blower vibration.

Select a location that is central to the inside duct runs, and close to both the exhaust duct (to the outside) and the fresh air duct (from the outside).

The **exhaust outlet and outside air inlet** on the outside of the building should be at least **ten feet apart** to avoid cross-contamination. The fresh air inlet should be at least 10' away from any exhaust, such as dryer vents, chimneys, furnace and water heater exhausts, or other sources of contamination or carbon monoxide. Never locate the outside air inlet inside a structure.

The exhaust outlet should not dump air into an enclosed space or any other structure. The inlets and outlets should be screened against insects and vermin and shielded from the weather to prevent the entry of rain or snow.

Install the ERV where you can open the door for cleaning the core and filter, and where you can get at the wiring for installation and service.

Exhaust & Fresh Air Ducts Between HE3XINV & Outside

Insulation

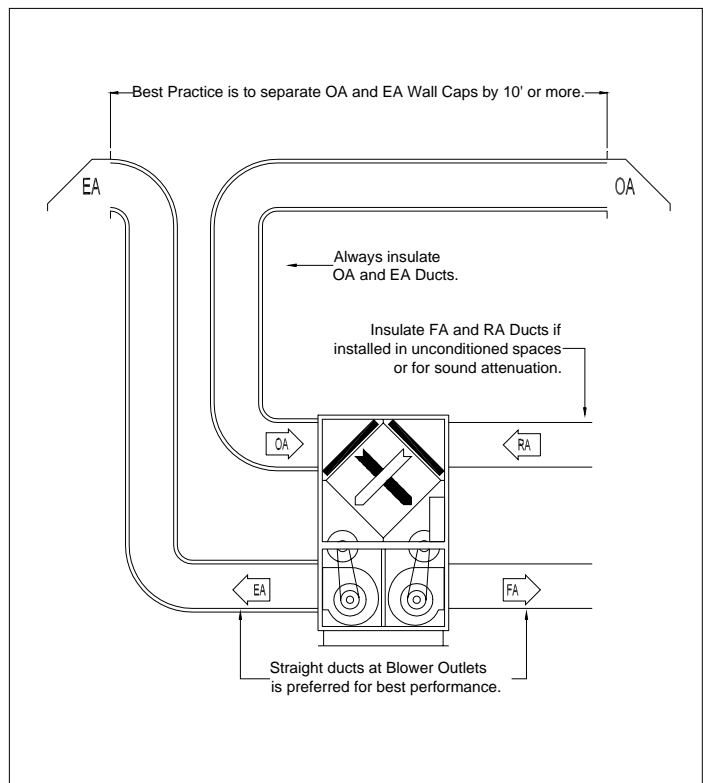
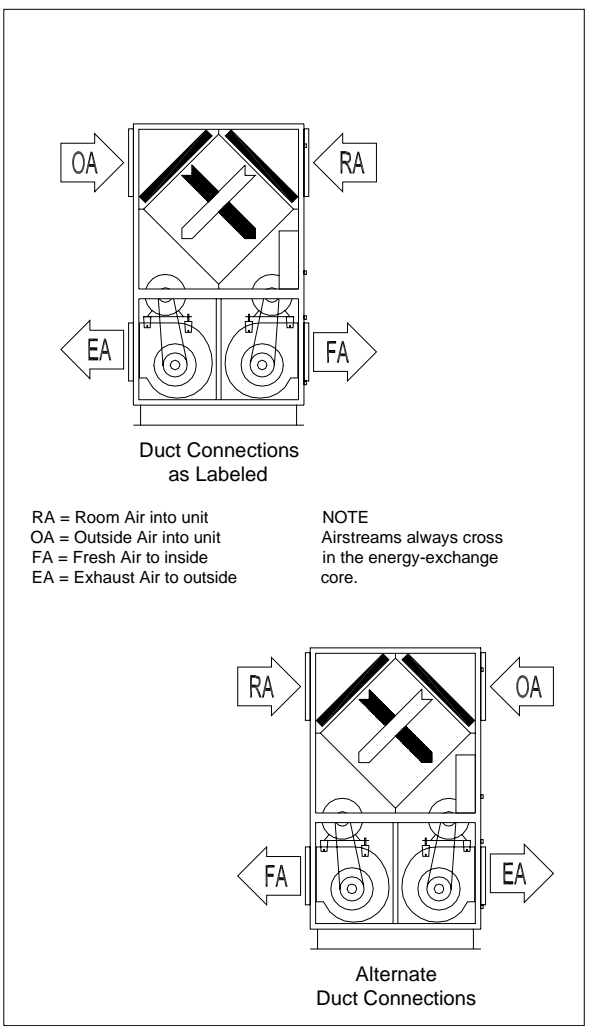
Ducts connecting the HE3XINV to the outside must be insulated, with sealed vapor barrier on both inside and outside of the insulation.

The **exhaust outlet and fresh air inlet** on the outside of the building should be at least **ten feet apart** to avoid cross-contamination.

CAUTION: The fresh air inlet should be at least 10' away from chimneys, furnace and water heater exhausts, and other sources of carbon monoxide, humidity or other contamination. Do not locate the fresh air inlet where vehicles may be serviced or left idling. Never locate the fresh air inlet inside a structure.

Outside Wall Caps

Wall caps should be designed to exclude animals and rain. Wall caps should be sized for minimum pressure loss. To keep rain from being drawn in, the outside air intake should be large enough to keep inlet velocity below 500 feet per minute, (or as dictated by local practice).



Inside Ductwork System

Follow Engineer's Ductwork Design

Ductwork should be designed by an engineer to allow the unit to provide the required airflow.

Design Tips

Air Flow Rates

Design the system to provide the lowest air exchange rate that will accomplish the ventilation goals. At lower air flow rates, energy recovery effectiveness improves. See Product Data Sheet.

Duct Transitions

Ducts should enter and exit the unit through smooth, gradual transitions.

Duct Insulation:

If the inside ducts run through un-conditioned spaces, they must be insulated, with a sealed vapor barrier on both inside and outside of insulation.

Picking up Stale Air in the Building

Locate the stale air pick-ups high in rooms where moisture, odor, or other contaminants are generated.

WARNING: DO NOT PLACE ANY PICK-UPS IN GARAGES, LOADING AREAS OR IN FUME HOODS!

Make the Ducts from the Stale Air Pick-ups to the HE3XINV as simple and direct as possible.

If some duct runs are much shorter than the others, install dampers so you can balance flows. Most rooms require only one stale air pick-up.

Duct Fresh Air from the HE3XINV into the heated space

Fresh Air from the HE3XINV often can be ducted into an existing HVAC air distribution system.

Sometimes, however, it is more practical to install a separate distribution system for the Fresh Air.

The Fresh Air supplied by the HE3XINV will be somewhat cooler or warmer than room air in very cold or hot weather. Consider this when deciding how to distribute the Fresh Air.

Connection of Fresh Air from HE3XINV to ducted heating and cooling system:

Avoid a situation in which operation of the main air-handling blower unbalances flow through the HE3XINV. (see **Balance the Air Flows**, below). This is a particular concern if the HE3XINV is to be operated on a different schedule from the main air-handler. Minimize the effect of the air-handler on the HE3XINV by connecting Fresh Air from unit at a point well upstream from the air handler.

Balance the Air Flows

The air flow rate for both the Fresh Air and the Exhaust Air should be roughly equal (or "balanced") for best performance of the HE3XINV. If the HE3XINV is connected to an existing air-handling system it may be necessary to check for balance with and without the main air-handling blower in operation.

In some facilities a slight positive or negative pressure in the building is desired. RenewAire heat recovery ventilators can generally operate with a flow imbalance of up to 20% without appreciable loss in heat recovery efficiency. However, very low exhaust air flow rates may result in frosting of the core during extremely cold weather.

HE3XINV Airflow Performance

Motor HP	Blower RPM Nominal	Turns Open	External Static Pressure (Inches Water Column)													
			0.0		0.25		0.5		0.75		1.0		1.25		1.5	
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
2	1,095	4	1,900	1.3	1,600	1.2	1,250	1.2	850	1.1	-	-	-	-	-	-
	1,220	2	2,200	1.5	1,960	1.4	1,610	1.3	1,240	1.3	860	1.2	-	-	-	-
	1,340	0	2,300	1.7	2,160	1.6	1,950	1.5	1,580	1.4	1,150	1.3	800	1.2	-	-
3	1,345	4.5	2,400	2.2	2,250	2.2	1,970	2.1	1,570	2.0	1,170	1.9	900	1.8	-	-
	1,535	2	2,720	2.7	2,450	2.5	2,250	2.4	1,950	2.3	1,650	2.2	1,200	2.0	875	1.9
	1,685	0	-	-	2,870	3.0	2,740	2.9	2,540	2.8	2,340	2.7	2,090	2.5	1,800	2.4
5	1,495	6.5	2,850	2.7	2,610	2.6	2,380	2.5	2,090	2.4	1,710	2.2	1,330	2.1	950	2.0
	1,675	3.5	3,230	3.7	3,090	3.5	2,850	3.3	2,610	3.1	2,380	2.9	2,090	2.7	1,810	2.5
	1,855	0	3,520	4.5	3370	4.3	3,230	4.1	3,090	3.9	2,850	3.6	2,610	3.4	2,380	3.2

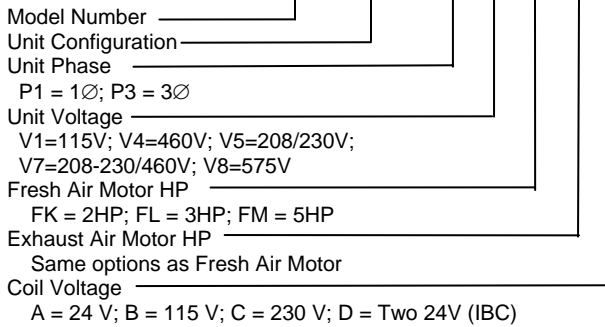
HE3XINV Electrical Specifications

NOTE: Proper Wiring Size Selection and Wiring Installation are the Responsibility of the Electrical Contractor.

Blower & contactor voltages are specified with order and set at factory. Brake Horsepower at various Blower RPM, Motor Rating, and ESP combinations are available on Spec Sheet or from factory.

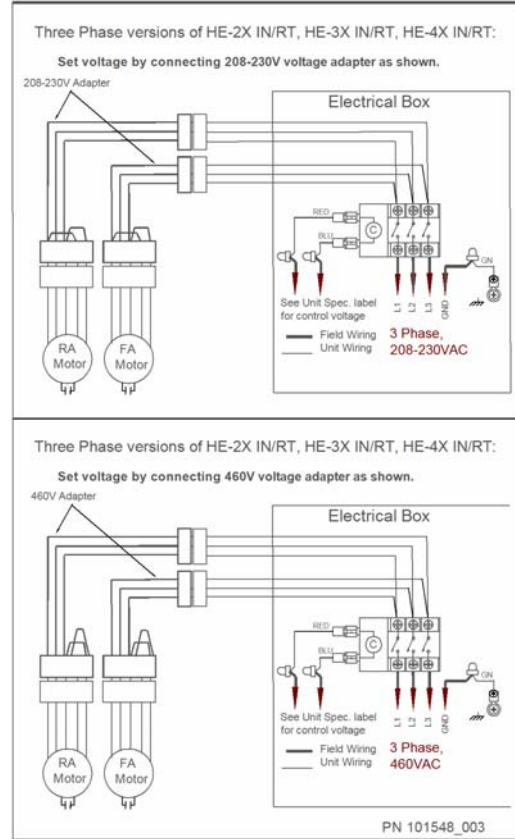
The Unit Model # contains the following codes that specify the blower and contactor voltages:

Standard Unit Example: **HE-3X K INV S B P3 V5 FK EK A** _ _ _ L



WARNING: Danger of Electrical Shock when servicing an installed unit. ALWAYS DISCONNECT POWER SOURCE BEFORE SERVICING. CAUTION: More than one disconnect switch may be required to de-energize the equipment for servicing.

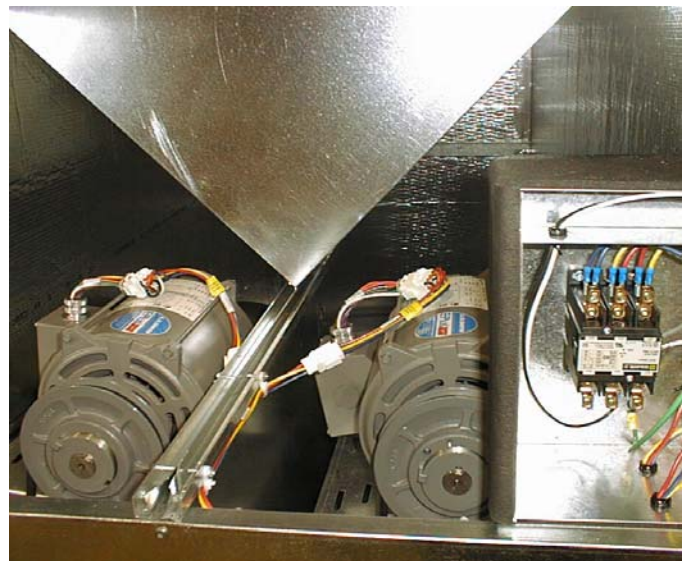
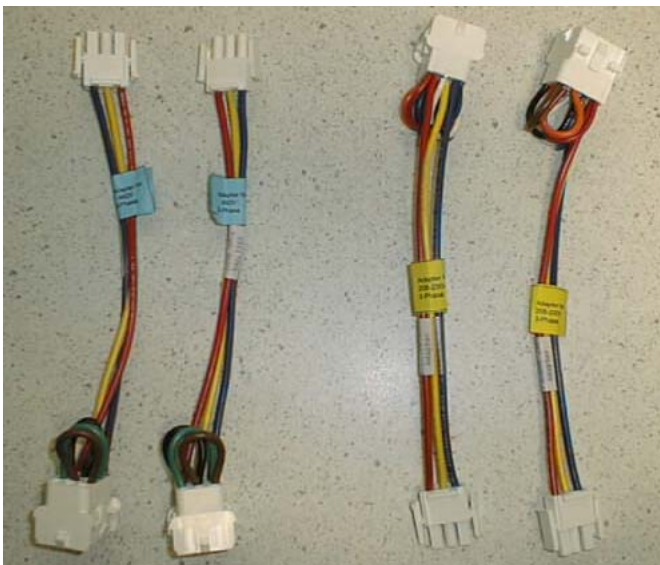
Connect the control signal to the pigtails in the control voltage compartment of the unit's electrical box. Make sure you are connecting the correct voltage to the control pigtails.



Setting HE3XINV Blower Voltage

If Unit Electrical Rating Label shows two operating voltages, you must install voltage adapters (supplied). Follow these steps:

1. Determine voltage of the power supply for the unit.
2. Open the unit's electrical box and find the four loose wiring harnesses. These are the "voltage adapters" (see picture below). Select the two adapters labeled for the unit's power supply. Set the other two aside – they will be discarded.
3. Open the unit door to get access to each motor.
4. Install the two voltage adapters. Each adapter connects one motor to the main wiring harness (see picture below).



Operation

Principal of Operation

The HE3XINV has one basic purpose: to exhaust air from a structure and bring in fresh air from outside, while transferring heating or cooling energy from the exhaust air to the fresh air.

The HE3XINV is a very simple device, and will accomplish this purpose as long as the blowers for both air streams are able to move air through the energy-exchange core.

Checking that Unit is Operating

Air Flow

Air flow should be occurring in both air streams. Sometimes the easiest place to confirm that air is moving is at the external wall caps.

If exact air flow is critical, it may be desirable to permanently install flow measuring stations and manometers. These also can be used to determine when filters should be cleaned or changed.

Energy Exchange

Precise determination of installed sensible energy exchange effectiveness requires careful measurement of temperatures and air flows in all four air streams, and in practice is somewhat difficult.

It is possible to confirm that energy is being exchanged simply by feeling the ducts. If the Fresh Air duct from the unit into the room is closer to room temperature than to the outside temperature, energy is being recovered.

Operating Controls

Service Disconnect

Unit comes from factory with contactor suitable for switching with externally-supplied power (24VAC or 115 VAC — **set at factory**). Electrical contractor should install near-by service switch to disconnect all power from unit for inspection, filter changes, etc.

Operating Controls

A wide variety of control schemes may be selected by the engineer, installer, or owner to meet the ventilation needs of the facility. These may include timer clocks, occupancy sensors, dehumidistats (for cool-weather operation), carbon dioxide sensors, and others. DDC systems may also control the unit. Most control schemes will operate the unit only when needed.

Continuous Operation

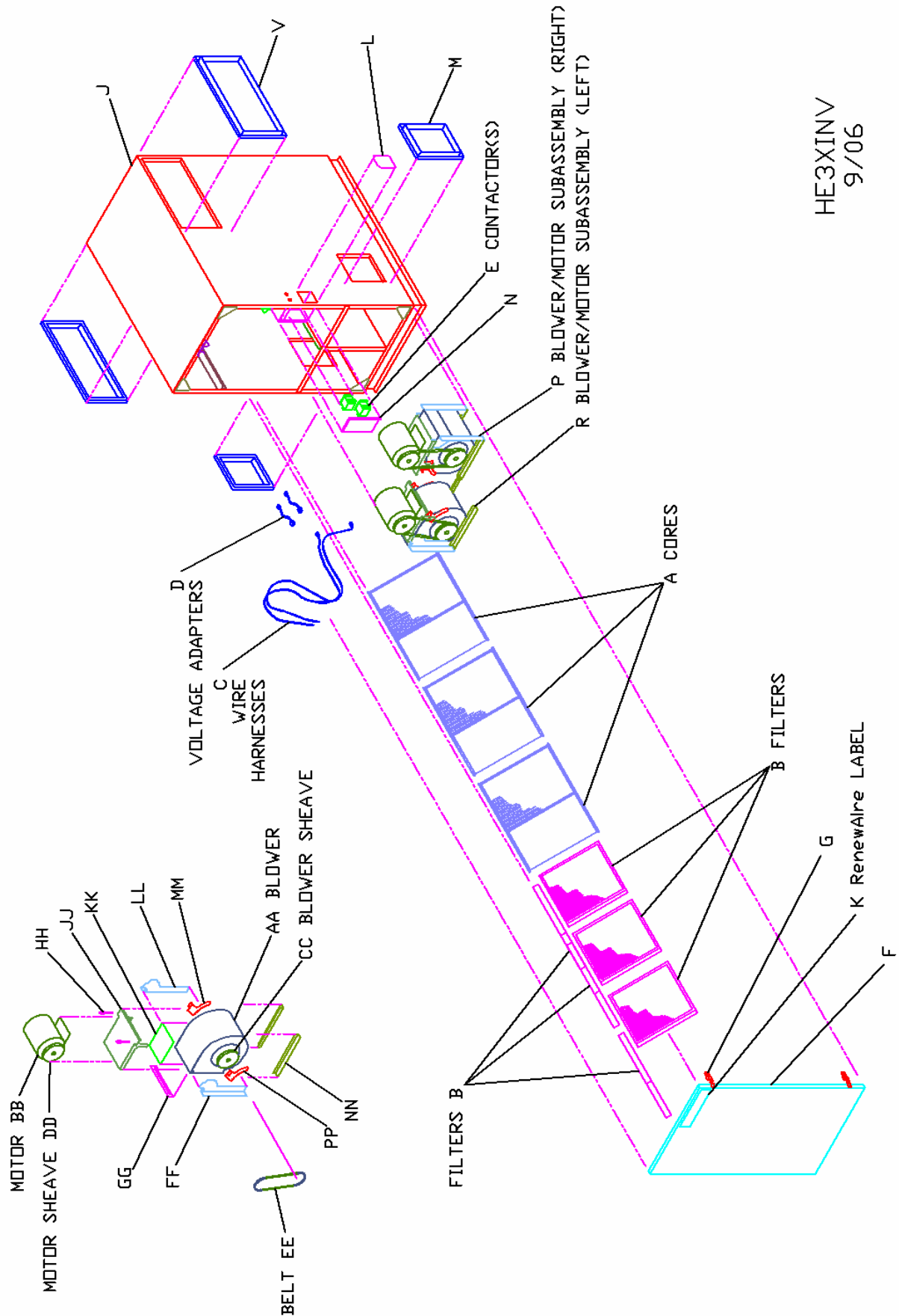
Continuous operation is acceptable in virtually all conditions. Unit will not be damaged by continuous operation as long as air flow occurs. Blower motors may overheat if filters become completely blocked due to lack of maintenance. With continuous operation, some external frosting on case may occur in very cold weather (see below).

Operation in Extreme Cold Weather

Unit is capable of operating at outside temperatures down to -10°F, with indoor humidities below 40%, without any internal frosting. Unit can operate at more severe conditions occasionally with little or no impact on its performance. At lower humidities, it can operate at lower outside temperatures without freezing the energy-exchange core.

Some condensation or even frost may form on the **outside** or drip off of the case during very cold conditions, particularly if the unit runs continuously. Exterior condensation during extreme conditions can be reduced or prevented by periodically cycling the unit off for several minutes to allow the case to warm up.

REPLACEMENT PARTS



HE3XINV
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Maintenance

WARNING: Danger of Electrical Shock when servicing an installed unit. ALWAYS DISCONNECT POWER SOURCE BEFORE WIRING OR SERVICING.

CAUTION: More than one Disconnect Switch may be required to de-energize the equipment for servicing.

WARNING: . Danger of injury from un-guarded drive belts in unit! You may be injured if you open door while unit is running! Disconnect power to unit before opening door.

Inspect and change the filters regularly

Inspect and/or replace filters every two or three months when the HE3XINV is in regular use, or as needed.

NOTE: **Filters must be used** or the energy exchange core will become blocked by dust and the HE3XINV won't do its job. The filters supplied in the unit are usually able to keep the energy exchange core clear for several months. Finer filters can be used but must be cleaned more often. If using finer filters, their increased resistance to flow must be allowed for in the system design.

Vacuum the faces of the energy exchange core every 5000 operating hours.

Dust collects only on the faces of the energy exchange core. The interior of the energy exchange core stays clean even if the core faces are dust-covered.

TO CLEAN THE ENERGY EXCHANGE CORE:

- ❶ SHUT OFF UNIT and remove the filters;
- ❷ vacuum the exposed faces of the energy exchange core (do not scrub);
- ❸ vacuum out dust from the rest of the unit case;
- ❹ install new filters.

If necessary, it is possible to remove the cores. Reach in to grasp the back of each core, and pull it gently forward. If it is difficult to remove, you may want to lightly oil the four projecting lips of the core before replacing it in the unit. **IMPORTANT:** make sure all four lips of the core enter the receiver channels when re-inserting the core into the unit.

CAUTION: Do not wash the energy exchange core. Always handle the core carefully. Keep it away from water or fire to avoid damaging it. The energy exchange core can be replaced but is expensive.

Clean the blower wheels as necessary.

MOTOR AND BLOWER BEARINGS: Sealed, no further lubrication required; bearings are lubricated for the life of the bearing.