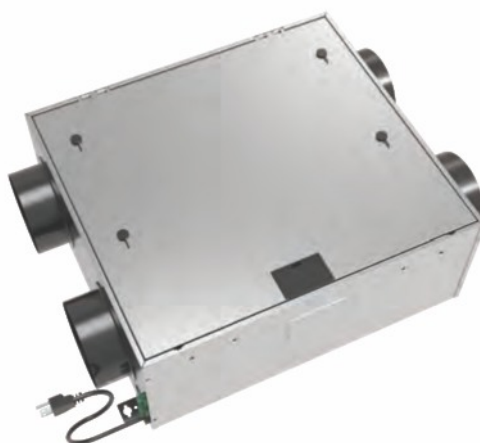




ERV120S

Total Recovery Low Profile Value ERV

Installation, Operation and Maintenance Manual



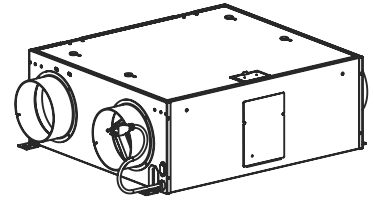
ENERGY RECOVERY VENTILATOR





ERV - ENERGY RECOVERY VENTILATOR

MODEL: ERV120S



WARNING

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

1. Before servicing or cleaning the unit, unplug the unit line cord or shut off power at service switch or circuit breaker. Make sure unit is not running before opening its door.
2. This installation manual shows the suggested installation method. Additional measures may be required by local codes and standards.
3. Installation work and electrical wiring must be done by qualified professional(s) in accordance with all applicable codes, standards and licensing requirements.
4. Any structural alterations necessary for installation must comply with all applicable building, health, and safety code requirements.
5. Connect this unit only to a 220VAC grounded circuit protected by a 15 amp circuit breaker.
6. Do not install unit or controls where they can be reached from a tub or shower.
7. This unit must be properly ducted to the outdoors.
8. Outside air inlet for this unit must be located away from sources of hazardous air such as car exhausts.
9. 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 requirements and the combustion air supply requirements of applicable codes and standards.
10. This unit is intended for general ventilating only. Do not use to exhaust hazardous or explosive materials and vapors. Do not connect this unit to range hoods, fume hoods or collection systems for toxics.
11. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
12. Use the unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

CAUTION

1. To avoid motor bearing damage and noisy and/or unbalanced impellers, keep drywall spray, construction dust, etc., out of the unit.
2. Do not connect power to the unit's external control terminals: this will damage the unit. The external terminals are for use only with un-powered controls designed for low-voltage operation.
3. When door springs are dis-engaged, the ERV door can be hinged open to access to internal components for routine maintenance and cleaning. Take precautions when dis-engaging the door springs to ensure the door does not cause any damage or injury. When the ERV is installed so that the door swings down (upside down) lower the door down slowly.

*This manual in electronic format can be downloaded on our company website, or obtained from our dealer.

CLEANING & MAINTENANCE

Keep your ERV performing at its best by maintaining it as described below:

⚠ WARNING

RISK OF ELECTRIC SHOCK OR INJURY.

- Before servicing or cleaning the unit, unplug the unit line cord.
- Make sure unit is not running before opening its door. Blower wheels are sharp and can cause injury.

Maintenance Requirements

Keep your ERV performing at its best by cleaning it as described below:

Service filters regularly Service filters every three months when the unit is in regular use or as needed to keep them reasonably clean.

1. Release door spring clips and carefully swing access door open. Remove the door (if necessary).
2. Remove filter clips and pull out the filters.
3. Vacuum core and filters with a hose (not included).
4. Re-install filters and filter clips.
5. Re-install door, and secure door spring clips.

NOTE: The filters should be replaced after they have been cleaned several times. The primary contact for replacement filters for your S&P unit is the installing contractor. As an alternative, you may wish to produce your own filters. Filters may be cut from a sheet or roll of 3/8" inch firm, spun polyester filter media or material, similar to the existing filter in the residential unit. The size of each filter (2 required per unit) is as follows: 9-1/2" x 7-1/4" x 3/8"

NOTE: Filters must be used or the face of the energy exchange core will become blocked by dust. The filters supplied in the unit are usually able to keep the energy exchange core clear for many months. Finer filters can be used but must be cleaned more often.

READ AND SAVE THESE INSTRUCTIONS
Installer: Leave this manual with the homeowner.

CLEANING & MAINTENANCE

Clean the face of the energy exchange core yearly:

1. Remove the filters (see above).
2. Vacuum the exposed faces of the energy exchange core with a soft brush attachment.
3. After servicing the filters, re-install them (see above).
4. Vacuum out dust from the rest of the unit case. Dust collects only on the entering faces of the energy exchange core. The interior of the energy exchange core stays clean even if the core faces are dust covered.

⚠ CAUTION

DO NOT WASH THE ENERGY EXCHANGE CORE. Clean only as described above.

When the ERV is installed so that the door swings down (upside down), the core is secured to the ERV by the core latch. If the core latch is dis-engaged, the core can fall out causing damage or injury if not prepared. Ensure the core latch is secured until you are ready to remove the core for maintenance. Re-engage the core latch after maintenance to secure the core in place.

OPERATION

RA: Return Air OA: Outside Air EA: Exhaust Air FA: Fresh Air SA: Supply Air (furnace)

FEATURES

1. OA knob: Speed Control for OA, from 20%-100% of full speed or OFF, factory set at 100%
2. RA knob: Speed Control for RA, from 20%-100% of full speed or OFF, factory set at 100%
3. T knob: Timer knob for run time per hour (minutes / hour), stepless adjustable from 0 to 60 minutes, factory set at 60 minutes.
4. RH knob: Relative humidity limit knob from 50% - 100% or OFF. Factory set at 90% approximately.
5. Filter reset button.
6. L1: Red indicator light.
7. L2: Orange indicator light.

BALANCING INSTRUCTIONS

- a. Balancing the airflow is done by setting the OA fan speed and then adjusting the RA fan speed to exhaust the same or similar airflow to the outdoors. Inspect your installation to be sure all duct work is correctly installed, sealed, and clean filters are in place. The entire air delivery duct system needs to be in place and all vents should be in their normal operating position.
- b. Shut and latch the door to the unit.
- c. Plug the unit in to a 220VAC power outlet. It will start immediately and run a one minute system check. The L1 and L2 indicator lights will illuminate continuously. After one minute, L1 and L2 turn off, and the unit runs per the user settings.

Equipment required for testing airflows:

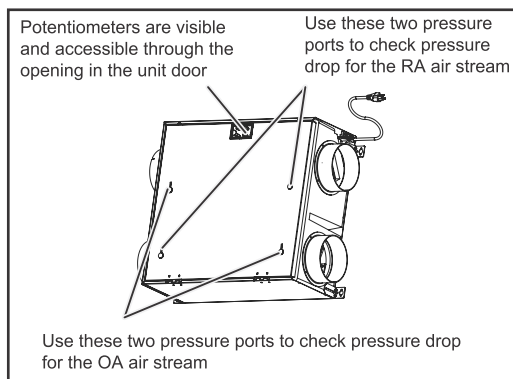
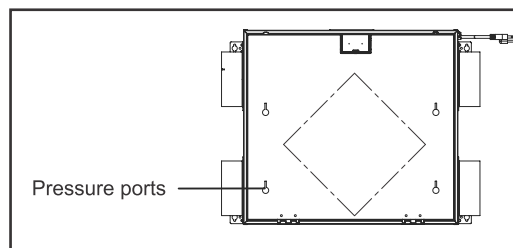
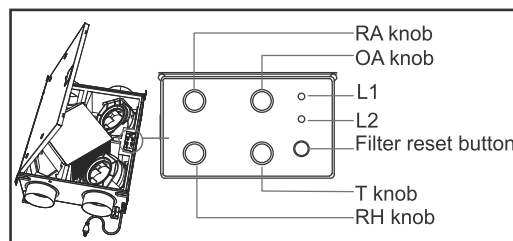
- A magnehelic gauge (or manometer) or other device capable of measuring 0 to 1.0 inches water gauge of differential pressure
 - 2 pieces of tubing, 1/8" I.D., 1/16" wall thickness works best. Individual differential static pressures (DP) are measured ACROSS the core, using the installed pressure ports located on the removable door
- d. Keep the MOS off so the unit will run at low speed. Open the pressure port caps for the OA air stream and insert the tubing into the ports about 1". Take a DP reading and record it in section d.1. Adjust the OA fan speed control to obtain the desired CFM per the table in section d.2. Enter the CFM information in the box in Section d.2. Remove the tubing, close the pressure port caps, and then repeat the process for the RA air stream.

NOTES:

After 30 days of unit operation, check / tighten all mounting and support hardware. Inspect filters for cleanliness. If filters appear dirty, replace them.

Whenever there is a reconfiguration of the HVAC system in a residence, the speed controls should be recalibrated for optimum performance. If the residence undergoes significant structural changes, such as an addition to the home, the unit should also be recalibrated. If optional MERV 13 filters are installed, recalibration is also required.

TRLPV units provide the ability to deliver completely balanced airflows, or to modify them as desired. In a perfect environment, airflows would be balanced so that there is no difference between OA airflow and RA airflow. Many owners will prefer to have a slight imbalance, providing a slight excess of OA to reduce air infiltration into a home. Some homes may require an imbalance because a furnace or water heater is not direct-vented. An HVAC professional will be able to advise balance settings that will best address the circumstances in each home.





OPERATION

d.1. MANOMETER READINGS AT COMMISSIONING

Return Air Pressure Port	In. w.g.:	<input type="text"/>	Pressure Drop:	<input type="text"/>
Exhaust Air Pressure Port	In. w.g.:	<input type="text"/>		
Outside Air Pressure Port	In. w.g.:	<input type="text"/>	Pressure Drop:	<input type="text"/>
Supply Air Pressure Port	In. w.g.:	<input type="text"/>		

d.2. PRESSURE DROP TO AIRFLOW CONVERSION TABLE

Core Pressure Drop (In. W.G.)	Airflow w/ Standard Filters (CFM)	Airflow w/ MERV 13 Filter (CFM)
0.1	56	17
0.2	111	35
0.3	167	52
0.4	-	69
0.5	-	87
0.6	-	104

Outside Air Flow: CFM Return Air Flow: CFM

OPERATION

A. Unit Operation

The unit runs at low speed (20-100% of full speed) set by the OA/RA low airflow knobs for a period of time (0-60 minutes/hour) set by the timer knob. The manual override switch (MOS) boosts the unit to high speed. The unit returns to low speed operation after the MOS is turned off.

B. HUMIDITY SENSOR OPERATION

When the outdoor relative humidity exceeds the user-set limit (50-100% RH), the unit will stop running and enter a check cycle. The orange L2 led indicator light will illuminate continuously. The check cycle will run the unit for 5 minutes at full speed every 15 minutes (25% of every hour) in order to sample the outside air conditions and meet code requirements. NOTE: the HVAC/AHU blower (if connected) will NOT run during this check cycle to prevent cycling. The MOS will still boost the unit to high speed during the check cycle and WILL activate the HVAC/AHU blower if connected.

C. TEMPERATURE SENSOR OPERATION

When the outdoor temperature falls below 14 degrees F, the unit will stop running and enter a check cycle. The orange L2 led indicator light will illuminate continuously. The check cycle will run the RA fan for 5 minutes at full speed every 15 minutes (25% of every hour) in order to minimize frost on the core and meet code requirements. The OA fan will not run during this check cycle. NOTE: the HVAC/AHU blower (if connected) will NOT run during this check cycle to prevent cycling. The MOS will still boost the RA fan to high speed during the check cycle and WILL NOT activate the HVAC/AHU blower if connected. Install an auxiliary duct heater upstream of the OA duct connection (minimum of 12" clearance) if necessary.

D. FILTER SERVICE INDICATOR

The filters should be cleaned/replaced at a minimum of every 3 months (depending on outdoor air conditions). After 3 months of motor operation, the red L1 led indicator light will illuminate continuously and will buzz once every 2 hours. This indicates that it is time to clean/replace the filters. After servicing the filters, press and hold the filter reset button for 5 seconds. Four quick beeps will indicate that the filter service indicator has successfully been reset. To deactivate the buzzer, press the filter reset button once. Two quick beeps will indicate that the buzzer has successfully been deactivated. Re-activate it by pressing the button once more.

LOCATION OF THE UNIT

Select a location so that:

- The fresh air intake vent from the outside is placed a minimum of ten feet from any other exhaust vent
- The two ducts to the outside are as short and straight as possible for the best system performance
- The door can be opened to allow cleaning the core and filters. Provide clearance at front of unit for service access to the blowers, filters and energy exchange core (20 1/8" min. for full door swing, 14 1/4" for door removal from hinges)
- The exhaust outlet and fresh air inlet on the outside of the building should be at least ten feet apart to avoid cross-contamination. The exhaust duct should be about the same length as the fresh air duct
- The exhaust outlet should not dump air into an enclosed space or into any other structure

The preferred mounting location for the unit is on a concrete foundation wall because the foundation wall isolates any blower vibration. If a basement area is not available or practical, use other mechanical room space such as a closet, garage, storage, or accessible attic or crawl space.

NOTE: If you wish to install the unit in an attic or other unconditioned space, you must insulate all of the unit's ductwork that is located in the attic. Use at least R-6 insulation.

INSTALLATION

⚠ CAUTION

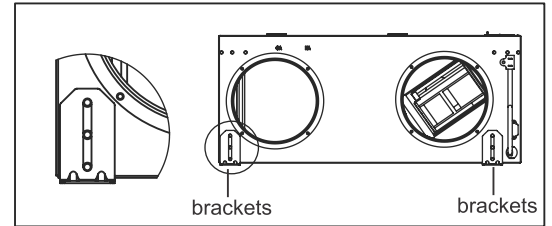
**RISK OF INJURY WHEN LIFTING AND INSTALLING UNIT OVERHEAD.
GET A HELPER AND WEAR EYE PROTECTION.**

Orient the unit for the simplest duct layout and connections. Note however that the door is equipped with slide-off hinges. For the homeowner's convenience it is helpful to orient the unit so that the door does not drop off when it is unlatched.

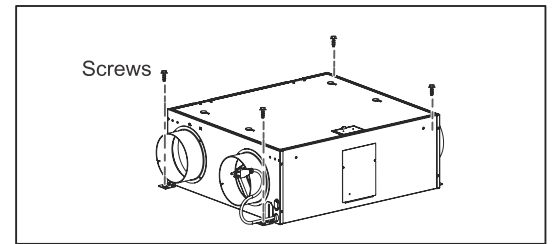
1. UNIT INSTALLATION

Installation A

a1. Mount the 4 brackets to the unit as illustrated at right, using two screws provided for each bracket through 2 appropriate holes. Unit may be installed in any orientation. Be careful as condensation could be present when outdoor temperature is low.



a2. Secure the unit to the truss by screws provided through the smaller hole of the brackets.



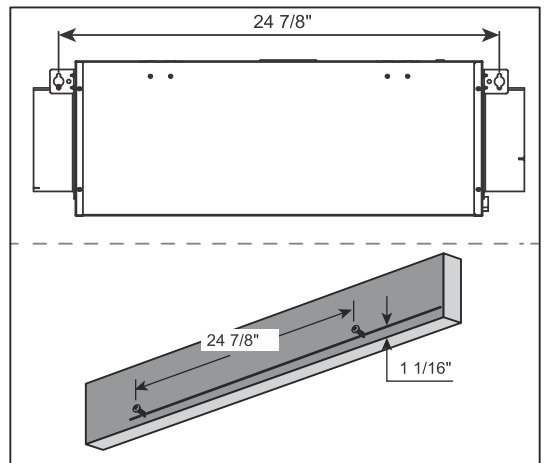
Installation B

b1. Trace a level line on both trusses, at 1-1/16" from the bottom (based on the ceiling sizes is 1/2", if not this size, needs to be adjusted properly), for the unit bracket location

On one truss, screw half way on level line two provided screws, leaving 24-7/8" between each other.

b2. Mount the 4 brackets to the unit as illustrated at right, using two screws provided for each bracket through 2 appropriate holes .

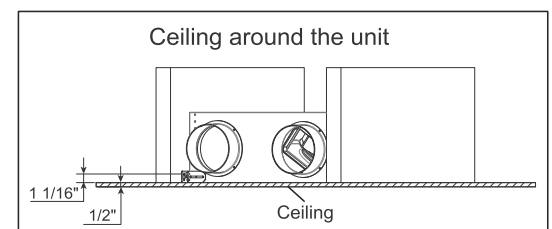
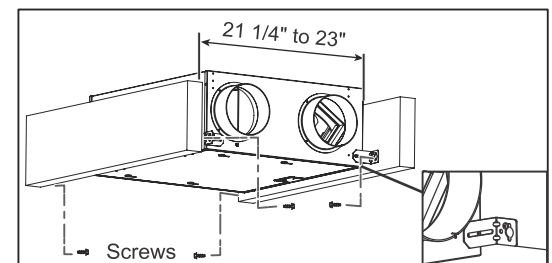
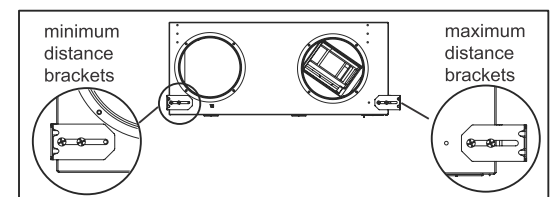
Screw half way the screws to allow adjustment between trusses within 23" and 21 1/4" (left shows the minimum distance and right the maximum distance).



b3. Hang the one side of the unit on the screws mounted on the truss Lift the other side of the unit and secure it to the other truss.

Mount the unit to the truss using 2 screws per bracket.

b4. After installation, the bottom of the unit is flush with the bottom of the ceiling



DUCTWORK

Separate Room Air Pick-up - Fresh Air to Furnace Return Air Trunkline

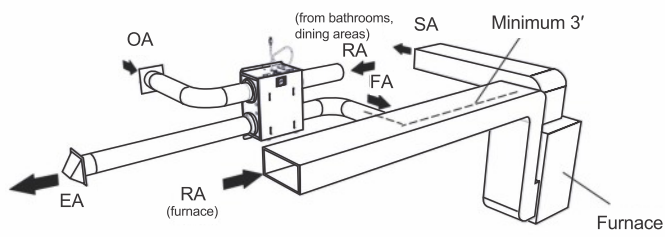


Fig.1

Separate Return Air and Fresh Air Supply

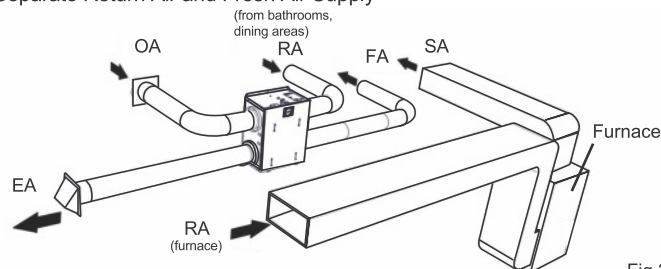


Fig.2

Furnace Return Air Back into Return Air

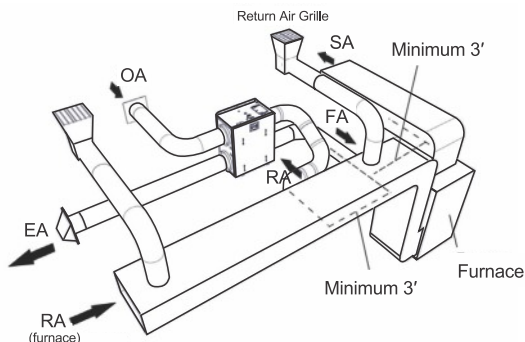


Fig.3

Furnace Return Air Back into Supply Air

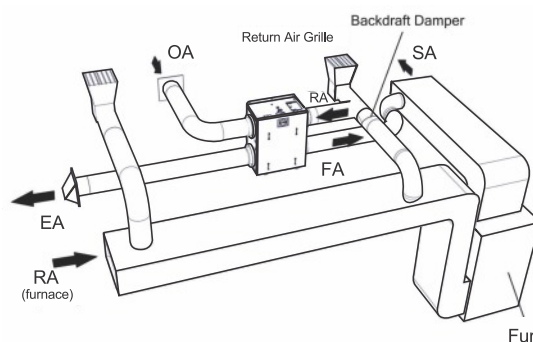


Fig.4

For houses without ducted heating or cooling systems (Fig.2):

In most houses one or two fresh air grilles in a central part of the house provide effective distribution of the fresh air into the home, particularly when the stale exhaust air is picked up at several points. Because the fresh air is usually somewhat cooler than the household air, the fresh air supply grilles should be located in a traffic area like a hallway or stairway rather than in a sitting area. If you want to get fresh air into specific rooms with high occupancy, you can split up the fresh air supply.

For houses with forced-air heating and cooling systems (Fig.1 Fig.3 Fig.4):

Most units are installed with the fresh air duct connected directly to a return duct for the main heating and cooling system. Be careful to connect the fresh air duct at least three feet from the return plenum to minimize suction from the furnace blower. A connection closer to the furnace may result in unbalanced flow and associated problems.

For installations that collect stale air from specific rooms in the home (Fig.1 Fig.2):

Locate stale air return grilles (RA) in rooms where moisture and odors are generated: bathrooms, the kitchen, and perhaps other areas where contaminants are generated such as in the home workshop. Return grilles in these other areas may be dampered so that they can be shut off when not in use. A central location such as a hallway is also acceptable but won't clear humidity and odors from baths and kitchens as rapidly. Locate stale air return grilles (RA) near the ceiling on inside walls. Stale air returns are usually easiest to install in interior partitions.

Stale Air Return Grille Sizes	
Bathroom	4" X 10" or 6" X 10" - 40 to 60 sq. in.
Kitchen	6" X 10" or 60 sq. in.

EXHAUST & OUTSIDE AIR DUCTS

The Exhaust Air Duct and the Outside Air Duct connect the unit to the outside. Flexible insulated duct is typically used.

Duct Minimum Sizes and Type	
Exhaust Air & Outside Air (EA & OA)	6" round insulated duct
Fresh Air & Stale Air (FA & RA)	6" round un-insulated duct
All ducts from unit to house in unconditioned spaces like attics and crawl spaces MUST BE INSULATED.	

⚠ WARNING

DO NOT PLACE ANY STALE AIR RETURNS IN GARAGES.



INSTALLING OUTSIDE AIR & EXHAUST AIR DUCTS

Ducts connecting the unit to the outside must be well- insulated. Vapor barrier is required on both inside and outside of the insulation. The inlets and outlets should be screened against insects and vermin and shielded from the weather to prevent the entry of rain or snow.

⚠ CAUTION

- a1. The vapor barrier should be continuous and sealed against air and moisture leakage! If not, condensation or ice may form in cold weather on the duct surface or in its insulation!
- a2. INSTALL FRESH AIR INLET AWAY FROM SOURCES OF CONTAMINANTS
 - Do not locate the fresh air inlet where vehicles may be serviced or left idling.
 - The fresh air inlet should be at least ten feet 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 fresh air inlet inside a structure

INSTALLING RETURN AIR (RA) DUCTS

All the stale air returns are connected by ducts to the unit. Generally, empty stud cavities are used for returns as is often done with cold air returns for the furnace, using standard duct boots to connect to six inch pipe at the bottom or top of the wall cavity. Always be sure to seal all joints with duct sealant or tape. Some local codes may require metal ducting all the way from the boots to the stale air grilles. Use rigid ducts to allow the air to move freely and easily through the ducts.

Do not use more flex duct than necessary!

Flex duct is much more resistant to airflow than rigid duct; longer runs of flex duct will reduce the ventilation performance of your system. Stretch flex duct and avoid sharp bends.

⚠ CAUTION

- Do not connect Dryers directly to the unit.
 - Do not connect Range Hoods to the unit.
- NOTE: Seal all duct collars at unit to minimize air leakage.

⚠ WARNING

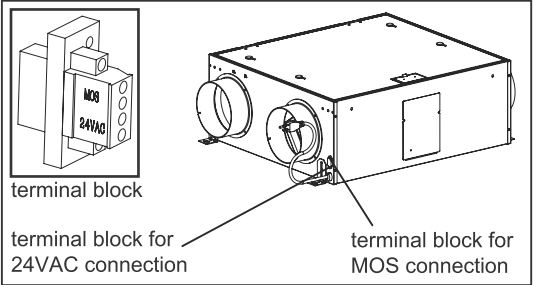
DANGER OF ELECTRICAL SHOCK WHEN SERVICING AN INSTALLED UNIT.
ALWAYS UNPLUG UNIT BEFORE CONNECTING OR SERVICING CONTROLS.

ELECTRICAL CONNECTIONS

⚠ WARNING

DISCONNECT POWER BEFORE WORKING ON UNIT.

Run 220 VAC house wiring to the location of the fan.
The unit comes with a grounded 3 prong power cord for connection to an electrical outlet.



Optional Connections:

The unit has an optional terminal block for 24VAC HVAC/AHU blower integration. If necessary, the user can connect the HVAC/AHU 24VAC dry contact relay to the terminal block so that anytime the ERV is operating, the HVAC/AHU blower operates to help distribute the fresh air through the existing ductwork (not required).

The unit has an optional terminal block for a MANUAL OVERRIDE SWITCH (MOS) connection. Connect an on/off switch to the terminal block for MOS connection to manually switch the unit to high speed. When the switch is off, the unit returns to the low speed operation per the OA, RA, and T knobs (not required).

LED INDICATOR LIGHT FAULT DESCRIPTION

L1 INDICATOR	DESCRIPTION
Red Flashing	Humidity /Temperature Sensor problem

L2 INDICATOR	DESCRIPTION
Orange flashing	Motor problem



EXPLODED VIEW

PART	PART NAME	Qty.
1	Mounting Bracket	4
2	Duct Collar	4
3	Housing	1
4	Power Box	1
5	Control Board	1
6	Blower Assembly	2
7	Filters	2
8	Core	1
9	Door	1

