

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 working before opening its door, until the service or cleaning is completed.
2. This installation manual shows the suggested installation method. Additional measures may be required by local codes and standards.
3. Installation 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 120V grounded circuit.
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.
13. This unit must be grounded.
14. **WARNING:** To Reduce The Risk Of Fire Or Electric Shock, Do Not Use This unit With Any Solid-State Speed Control Device.
15. The unit must not be installed in a ceiling thermally insulated to a value greater than R40.

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 units external control terminals: this will damage the unit.
3. When door hasps 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 hasps 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.
4. Install the unit in the area where air temperature is above 50 °F (10 °C) to avoid condensation in unit.
5. Do not install the unit in the area where the air stream temperature may exceed 104 or (40 °C).

CLEANING & MAINTENANCE

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

⚠ WARNING

RISK OF ELECTRIC SHOCK OR INJURY.

- Before maintenance, unplug the unit line cord.

Maintenance Requirements

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

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

NOTE: The filters should be replaced after they have been cleaned several times. The primary contact for replacement filters for your unit is the installing contractor. Also, you may wish to produce your own filters, spun polyester filter media or material should be used, similar to the existing filter in the residential unit. The size of each filter (2 required per unit) is as follows: 11-1/4" x7-1/4" x 3/16"

NOTE: Filters must be used, otherwise the face of the energy exchange core will become blocked by dust. The filters existing 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.

Clean the face of the energy exchange core yearly:

1. Open the door and pull out the core.
2. Vacuum the exposed faces of the energy exchange core with a soft brush attachment.
3. After maintenance, re-install the core.
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.

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

CLEANING & MAINTENANCE

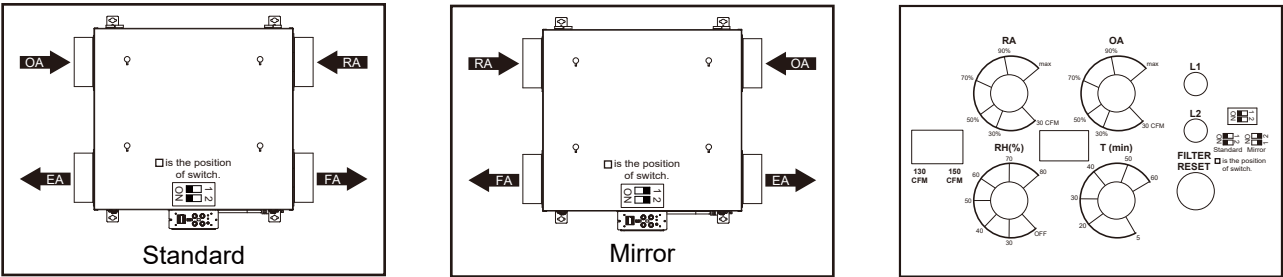
**CAUTION**

DO NOT WASH THE ENERGY EXCHANGE CORE.
The energy exchange core can be replaced but is expensive.

OPERATION

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

1. The toggle switch will adjust the upper fan speed setting from 130 to 150 CFM. (factory set to 150CFM).
2. The toggle switch will adjust the installation type between standard and mirror.
2. OA knob: Low airflow knob for OA, from 30CFM to air flow rate of the high fan speed determined by the toggle switch setting, factory set at max;
3. RA knob: Low airflow knob for RA, from 30CFM to air flow rate of the high fan speed determined by the toggle switch setting, factory set at max;
3. T knob: Timer knob for run time per hour (minutes / hour), stepless adjustable from 5 to 60 minutes, factory set at 60 minutes.
4. RH knob: Relative humidity limit knob from 30% - 80%. Factory set at 80%.
5. Filter reset button.
6. L1: Red indicator light.
7. L2: Orange indicator light.



OPERATING INSTRUCTIONS

- a. Inspect your installation to be sure all duct work is correctly installed and sealed and filters are in place.
- b. Shut and latch the door to the unit.
Plug the unit in to a 120V 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.
- c. The unit runs at low speed (30CFM-MAX) set by the OA/RA low airflow knobs for a period of time (5-60 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.
- d. **HUMIDITY SENSOR OPERATION**
When the outdoor relative humidity exceeds the user-set limit (30-80% RH), the unit will stop running and enter a check cycle. The red L1 led indicator light will illuminate continuously. The check cycle will run the unit for 5 minutes every 15 minutes (25% of every hour) in order to sample the outside air conditions and meet code requirements.

NOTES:
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.

e. TEMPERATURE SENSOR OPERATION
The ERV defrosts automatically according to outdoor temperature, the defrost operation is "EXHAUST ONLY DEFROST".

	Outdoor Temperature					
	-5°C to -15°C		-15°C to -27°C		< -27°C	
CFM	Air exchange in minutes	Defrost in minutes	Air exchange in minutes	Defrost in minutes	Air exchange in minutes	Defrost in minutes
< 100	25	6	15	5	14	7
≥ 100	15	6	10	5	10	7

NOTE: There is a 10-minute additional defrost every 5 defrost cycles.

OPERATION

f. FILTER SERVICE INDICATOR

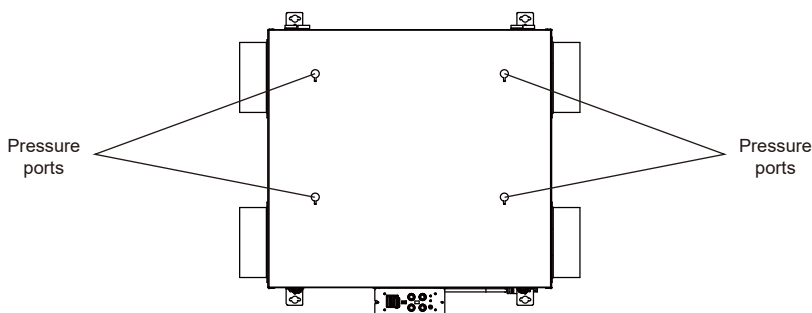
The filters should be cleaned/replaced at a minimum of every 6 months (depending on outdoor air conditions). The red L1 led indicator light will illuminate continuously and will buzz once a second in 15 seconds every 2 hours after 6 months of motor operation. This indicates that it is time to clean/replace 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.

BALANCING INSTRUCTIONS

Balancing the airflow is done by setting the OA fan speed and the RA fan speed to exhaust the same or similar airflow from and 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. Keep the MOS switch off, plug the unit in to a 120V power outlet, after two minutes, 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 0.6 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.
- 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 1. Adjust the OA fan speed control to obtain the desired CFM per the table in section 2. Enter the CFM information in the box in Section 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 or clean 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.

The unit provides 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. If needed, an HVAC professional will be able to advise balance settings that will best address the circumstances in each home.

1. MANOMETER READINGS AT COMMISSIONING

Return Air Pressure Port	In. w.g.:		Pressure Drop:	
Exhaust Air Pressure Port	In. w.g.:			
Outside Air Pressure Port	In. w.g.:		Pressure Drop:	
Supply Air Pressure Port	In. w.g.:			

2. PRESSURE DROP TO AIRFLOW CONVERSION TABLE

Outside Air

Core Pressure Drop (In. W.G.)	Airflow w/ Standard Filters (CFM)	Airflow w/ MERV 13 Filter (CFM)

Return Air

Core Pressure Drop (In. W.G.)	Airflow w/ Standard Filters (CFM)	Airflow w/ MERV 13 Filter (CFM)

Outside Air Flow: CFM

Return Air Flow: CFM

LOCATION OF THE UNIT

Select a location so that:

- The fresh air inlet 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 clean the core and filters conveniently. Provide clearance at front of unit for service access to the blowers, filters and energy exchange core (22" min. for full door swing)
- The exhaust outlet to the outside and fresh air inlet from 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 structure because a concrete structure 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 locate the unit in an attic or other unconditioned space, all of the unit's ductwork that is located in the attic must be insulated. Use at least R-6 insulation.

INSTALLATION

⚠ CAUTION

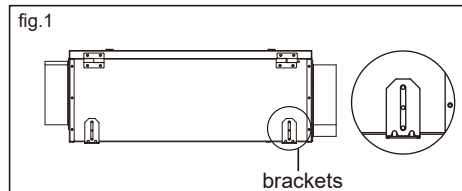
**RISK OF INJURY WHEN LIFTING AND INSTALLING UNIT OVERHEAD.
GET A HELPER AND WEAR EYE PROTECTION AND GLOVES.**

Install the unit for the simplest duct layout and connections. Note however that the door is equipped with hinges. For the homeowner's convenience it is helpful to install the unit so that the door does not fall off when it is unlatched.

PREPARATION

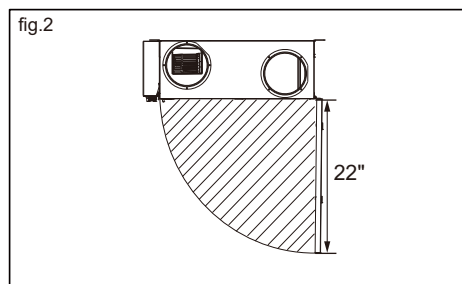
Mount the 4 brackets to the unit as illustrated in fig.1, using two screws provided for each bracket through the two appropriate holes.

NOTE: Unit may be installed in any orientation. Be careful as condensation could be present when outdoor temperature is low.



INSTALLATION - WALL MOUNT

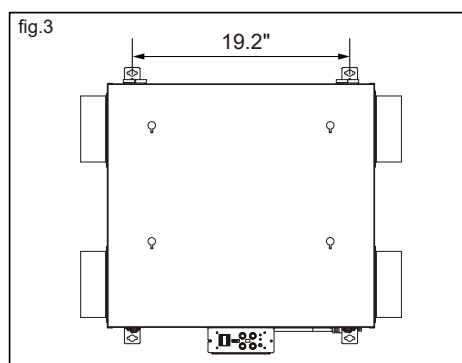
1. Make sure there is enough space in front of the machine when installing so that the door can be opened freely for maintenance. The minimum space is 22 inches.



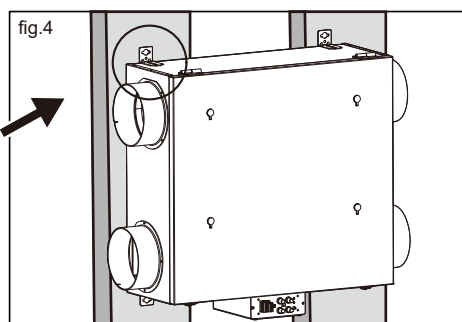
2. The distance between brackets is 19.2 inch. Choose the appropriate place to locate the unit

3. Screw half way two provided screws on the joist, the distance of two screws is 19.2 inch.

NOTE: The two screws should be horizontally aligned.



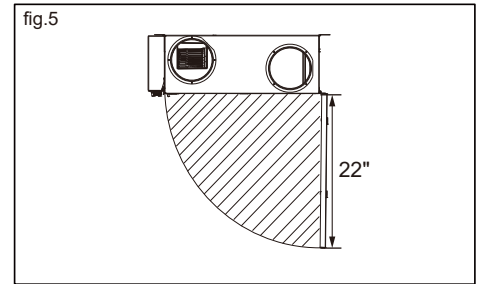
4. Hang the unit on the screws mounted on the joist using the larger holes of the brackets with control box facing down. Secure the unit to the joist by fixing one screw through the smaller hole in the each of the bottom brackets.



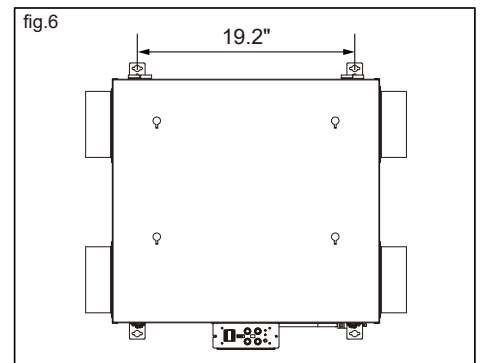
INSTALLATION

INSTALLATION - CEILING MOUNT

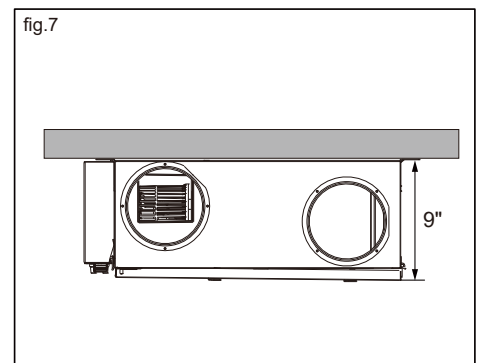
1. Before installation, make sure there is enough space below the unit so that the door can be opened freely for maintenance. The minimum space is 22 inches.



2. Refer to distance between brackets in fig. 6. Choose the appropriate place to locate the unit



3. Secure unit to the ceiling using two screws provided for each bracket, making sure not to secure it into drywall alone.



DUCTWORK

Separate Room Air Pick-up - Fresh Air to Furnace Return Air Duct.

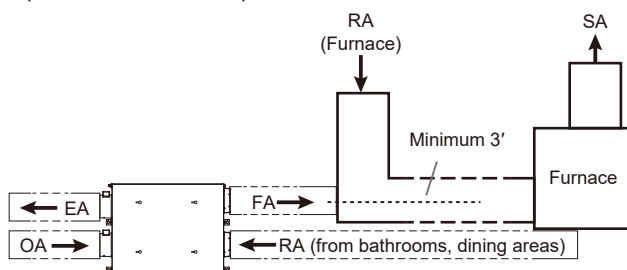


Fig. 1

Separate Return Air and Fresh Air Supply

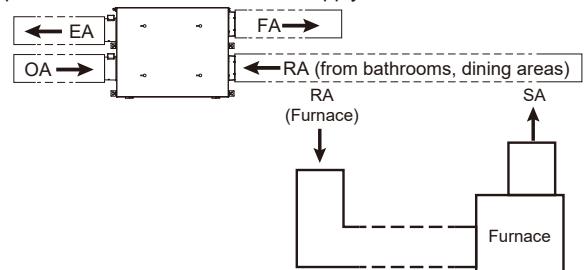


Fig. 2

Furnace Return Air Back into Return Air

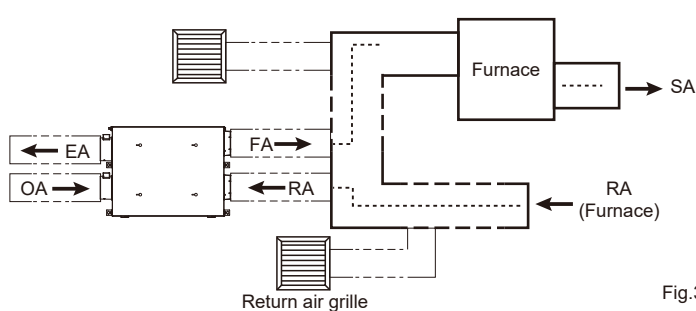


Fig. 3

ERV supply air into Furnace supply air

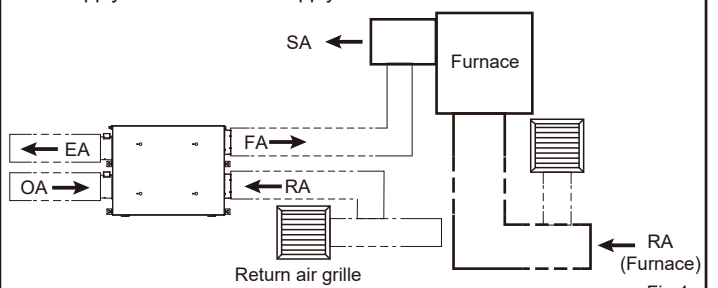


Fig. 4

DUCTWORK

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 indoor air, the fresh air supply grilles should be located in a high traffic area like a hallway or stairway rather than in a sitting area. If you want to get fresh air into specific room 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 or other associated problems.

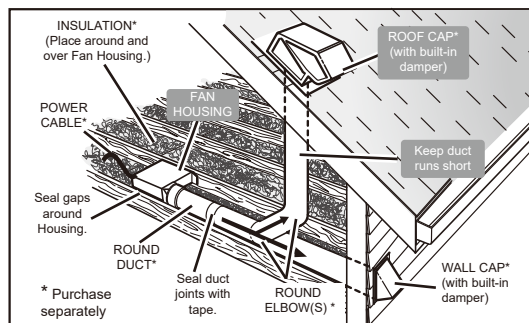
For installations that collect stale air from specific rooms in the home (Fig.1 Fig.2):

Locate stale air return grilles (RA) in rooms where moisture and odors are generated: bathrooms, the kitchen, and perhaps areas where contaminants may be generated such as the home workshop. Return grilles in these areas such as the home workshop 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 it won't clear humidity and odors from baths and kitchens quickly.

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.

Ducting has a strong effect on the air flow, noise, and energy use of the fan. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated air flow.



Using round duct wherever possible and duct size based on the inlet/outlet dimensions of unit are recommended for best performance. Ensure duct joints and exterior penetrations are sealed with caulk or other similar material to create an air-tight path and to minimize building heat loss and gain and reduce the potential for condensation.

Place/wrap insulation around duct and/or fan to in order to minimize possible condensation buildup within the duct, as well as minimize building heat loss and gain.

EXHAUST & OUTSIDE AIR DUCTS

The EA Duct and the OA Duct connect the unit to the outside. Flexible insulated duct is usually 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

EXHAUST & OUTSIDE AIR DUCTS

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. Rigid ducts will 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 THE UNIT.
ALWAYS UNPLUG UNIT BEFORE CONNECTING OR SERVICING CONTROLS.**

ELECTRICAL CONNECTIONS

⚠ WARNING

UNPLUG THE LINE CORD BEFORE WORKING ON UNIT.

Run 120V house wiring to the location of the fan. The unit comes with a grounded 3 prong power cord for connection to an electrical outlet.

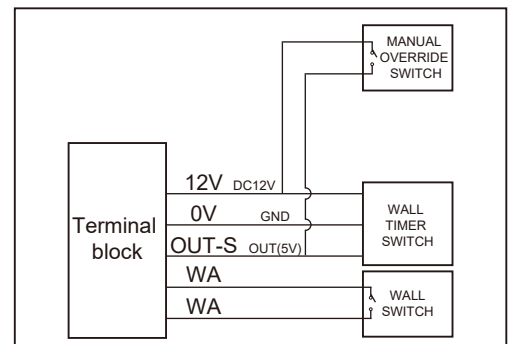
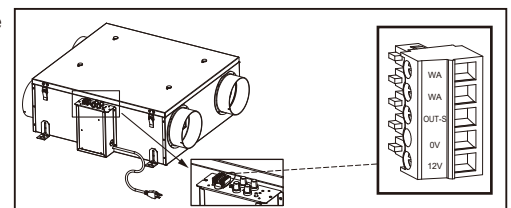
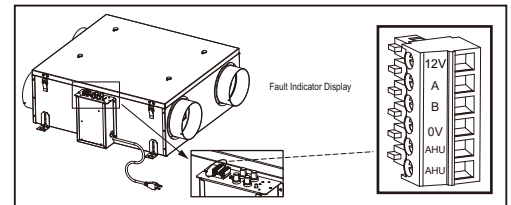
1. The unit has an optional terminal block for 24VAC HVAC/AHU blower integration. If necessary, the user can connect the HVAC/AHU 24VAC dry contact relay to the terminal block so that anytime the ERV is operating, the HVAC/AHU blower operates to help distribute the fresh air through the existing ductwork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

2. 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).

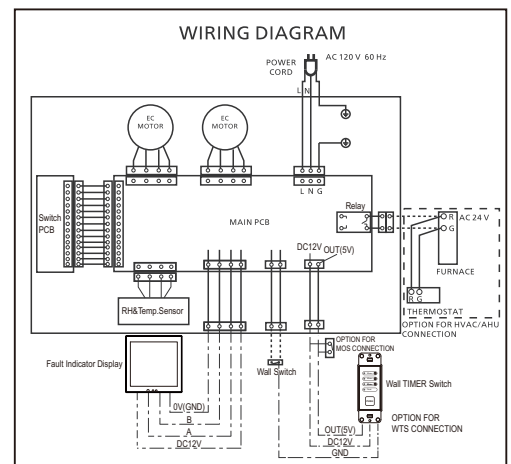
3. The unit has an optional terminal block for wall switch. If necessary, the user can connect the wall switch to control the unit on/off.

4. The unit has an optional terminal block for a WALL TIMER SWITCH(WTS) connection. In case of the timer activation, the unit goes to the highspeed mode and runs for the set time.

5. The unit has an optional terminal block for Fault Indicator Display connection (connect 12V, A, B and 0V). When Fault Indicator Display is connected, you can control the unit and monitor the air volume and the temperature and humidity of OA.

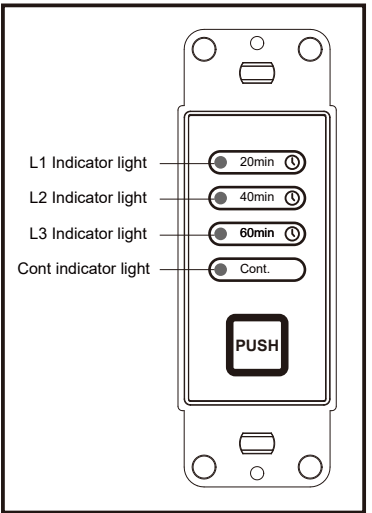


**NOTES:
FAULT INDICATOR DISPLAY OPERATION PLEASE
REFER TO THE FID USER MANUAL**



WALL TIMER SWITCH (WTS) OPERATION

- 1. Press button, L1 Indicator light up, timer setting for 20 mins, ERV run at high-speed, after timer delay of 20 mins, ERV get back to low speed operation per the OA, RA, and T knobs and indicator go out.
- 2. Press button twice quickly, the L2 indicator light up, timer setting for 40 minutes, the ERV run at high-speed; and the L1 and L2 indicator light up after 20 minutes; ERV get back to low speed operation per the OA, RA, and T knobs after 40 mins and indicator go out.
- 3. Press button 3 times quickly, the L3 indicator light up, timer setting for 60 minutes, the ERV run at high-speed, and the L2 and L3 indicator light up after 20 minutes; the L1 and L3 indicator light up after 40 mins; ERV get back to low speed operation per the OA, RA, and T knobs after 60 mins and indicator go out.
- 4. Press switch 4 times, Cont indicator light up and ERV go into high speed running, press switch again, Cont indicator put out, ERV runs at the speeds and timer delay per knobs adjusted



CAUTION

IF THERE IS NO WALL SWITCH, IT NEEDS TO BE SHORT-CIRCUITED THE OPTIONAL TERMINAL BLOCK FOR WALL SWITCH, OTHERWISE THE MACHINE HAS NO POWER.

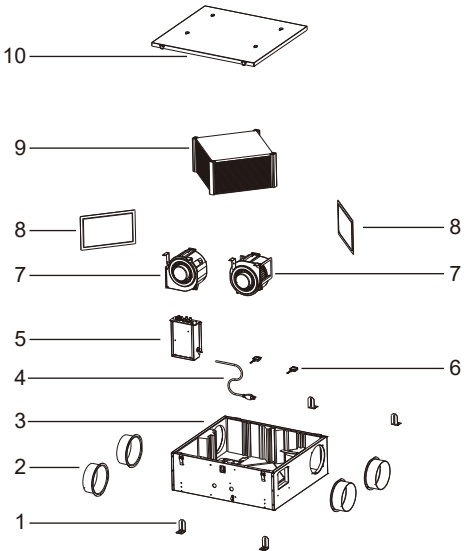
LED INDICATOR LIGHT FAULT DESCRIPTION

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 Cord	1
5	Power Box	1
6	T&RH Sensor	2
7	Blower Assembly	2
8	Filters	2
9	Core	1
10	Door	1



WARRANTY

FIVE YEARS LIMITED WARRANTY from the original date of purchase against defects in material and workmanship. This warranty is limited up to the amount of the original purchase price of the product, excluding any labor cost. For inquiries please visit www.ortechindustries.ca or call 1-888-543-6473.