

MODEL OD-ERV 150AC | OD-ERV 150-23



WARNING

WARNING — THE INSTALLATION MUST BE CARRIED OUT BY A QUALIFIED ELECTRICIAN.

1. For general ventilating use only. DO NOT use to exhaust hazardous or explosive materials and vapours
2. To avoid motor bearing damage and noisy and/or unbalanced impellers, keep drywall spray, construction dust, etc. out of the unit
3. Before maintenance, please unplug the unit line cord

Application Notice

1. Blower wheels are sharp and can cause injury. Make sure it is not running before opening the door
2. 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
3. This instruction manual shows the suggested installation method. Additional measures may be required by local codes and standards
4. Connect this unit only to a 120V AC grounded circuit protected by a 15 amps circuit breaker
5. DO NOT install unit or controls where they can be reached from a tub or shower
6. The Energy Recovery Ventilators MUST be properly ducted to the outdoors
7. Outside air inlet for this unit MUST be located away from sources of hazardous air such as auto exhausts
8. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of 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
9. When cutting or drilling into wall or ceiling, DO NOT damage electrical wiring and other hidden utilities
10. DO NOT connect power to the units external control terminals — this will damage the unit. The external terminals are for use only with un-powered controls designed for low-voltage operation
11. 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 Energy Recovery Ventilator is installed so that the door swings down (upside down), lower the door down slowly

CAUTION

PLEASE READ INSTRUCTION BEFORE COMMENCING INSTALLATION AND RETAIN FOR FUTURE REFERENCES.

Electrical products can cause death or injury, or damage to property.

If in any doubt about the installation or use of this product, consult a competent electrician.

CLEANING & MAINTENANCE

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 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

** The filters should be replaced after they have been cleaned several times. The primary contact for replacement filters for your unit is the installing contractors. You may also 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: 9-1/2" x 7-1/4" x 3/8"

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CLEANING & MAINTENANCE

Maintenance Requirements

- ** 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 annually:

1. Remove the filters
2. Remove the core latch and pull out the core
3. Vacuum the exposed faces of the energy exchange core with a soft brush attachment
4. After maintenance, re-install the core and filters
5. 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 covered with dust

CAUTION!

DO NOT WASH THE ENERGY EXCHANGE CORE:

The energy exchange core can be replaced but is expensive.

The core is secured to the unit by the core latch, when the unit is installed as installation B.

If the core latch is disengaged, the core can fall out, causing damage or injury if not prepared after the door swinging down.

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

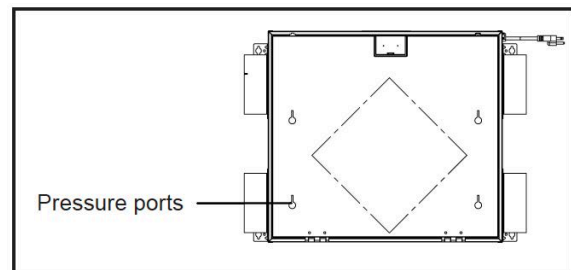
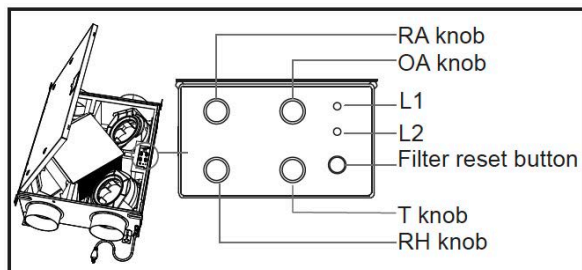
EA = Exhaust air

FA = Fresh Air

SA = Supply Air (furnace)

Features

1. OA knob — Low airflow knob for OA, from 20%~100% of full speed or OFF, factory set at 100%
2. RA knob — Low airflow knob 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



OPERATION

Operating Instructions

- Inspect your installation to be sure that all duct work is correctly installed and sealed and filters are in place
- Shut and latch the door to the unit. Plug the unit into a 120V AC power outlet. It will start immediately and run a one minute system check. The Red indicator light (L1) and Orange indicator light (L2) will illuminate continuously. After one minute, Red indicator light and Orange indicator light turn off, and the unit runs per the user setting
- The unit runs at low speed (20-100% of full speed) set by the Outside Air (OA) / Return Air (RA) low airflow knobs for a period of time (0-60minutes/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

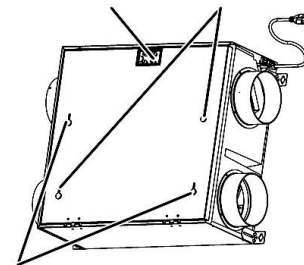
d) Humidity Sensor Operation

When the outdoor relative humidity exceeds the user-set limit (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 requirement.

** 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

Potentiometers are visible and accessible through the opening in the unit door

Use these two pressure ports to check pressure drop for the RA air stream



Use these two pressure ports to check pressure drop for the OA air stream

e) 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

** 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.

f) Filter Service Indicator

The filters should be cleaned/replaced at a minimum of every 3 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 3 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 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 into a 120V AC power outlet. After one minute, L1 and L2 turn off, and the unit runs per the user setting.

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OPERATION

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 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.

Important Reminder

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 re-calibrated for optimum performance. If the residence undergoes significant structural changes, such as an addition to the home, the unit should also be re-calibrated. If optional MERV 13 filters are installed, recalibration is also required

The unit 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 (Outside Air) airflow and RA (Return Air) air flow. Many owners will prefer to have a slight imbalance, providing a slight excess of OA to reduce air infiltration into a house. Some homes may require 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 house.

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

CFM

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LOCATION OF THE UNIT

Select a location so that:

- The fresh air inlet from the outside is placed a minimum of 10 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 (minimum 20-1/8" for full door swing, 14-1/4" for door removal from hinges)
- 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 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.

** 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 GUIDE

CAUTION!

RISK OF INJURY WHEN LIFTING AND INSTALLING UNIT OVERHEAD:

Get a helper and wear eye protection and gloves.

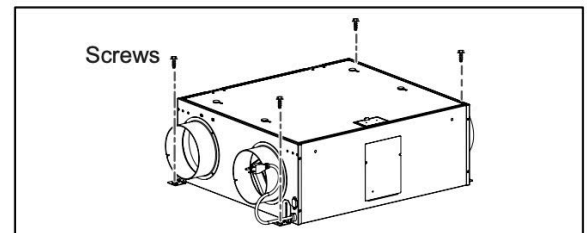
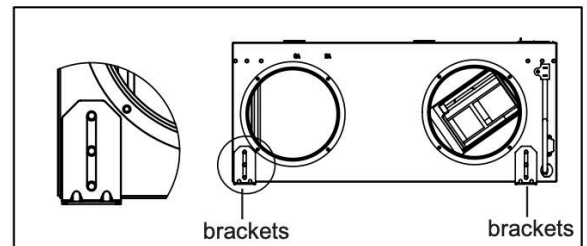
Locate the unit for the simplest duct layout and connections. Note that the door is equipped with hinges. For the homeowner's convenience, it is helpful to locate the unit so that the door does not drop off when it is unlatched.

Unit Installation

Installation A

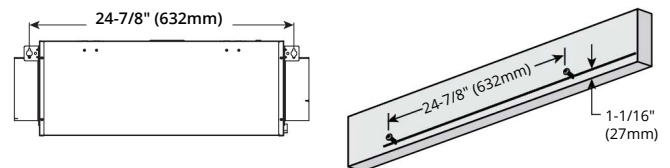
a1) Mount the 4 brackets to the unit as illustrated at right, using two screws provided for each bracket through 2 appropriate holes. Unit may be installed in any orientation. Be careful as condensation could be present when outdoor temperature is low

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

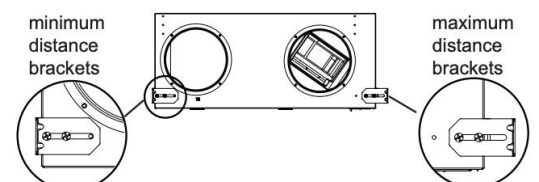


Installation B

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 on the right, using 2 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)



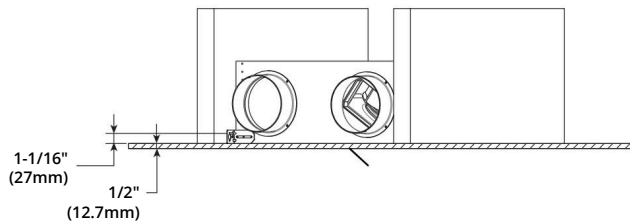
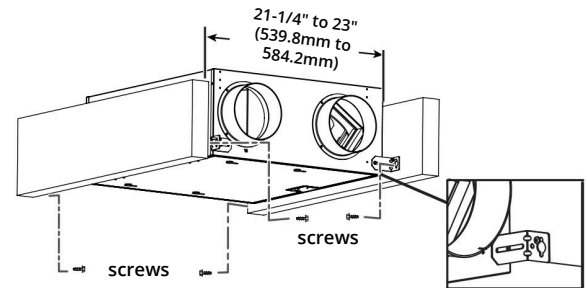
OPERATION

Unit Installation

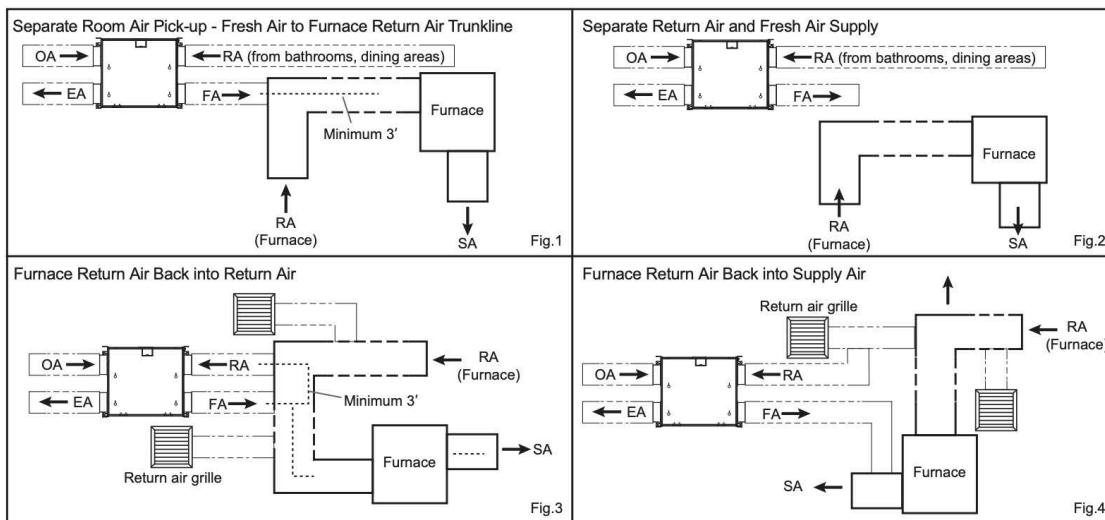
Installation B

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 in contact with the bottom of the ceiling.



DUCTWORK



Stale Air Return Grille Sizes	
Bathroom	4' x 10' or 6' x 10' — 40-60 sq.in.
Kitchen	6' x 10' or 60 sq.in.

For Houses WITHOUT Ducted Heating or Cooling Systems (see 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 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 (see Fig.1, Fig.3, and Fig4)

Most units are installed with the fresh air duct connected directly to a return duct for the main heating and cooling system. Make sure to connect the fresh air duct at least 3 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 (see Fig.1 and Fig.2)

Locate stale air return grilles (RA) in rooms where moisture and odors are generated: bathrooms, kitchens, 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 would not 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.

EXHAUST & OUTSIDE AIR DUCTS

Duct Minimum Size and Types	
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.	

The exhaust air (EA) duct and the outside air (OA) duct connect the unit to the outside. Flexible insulated duct is usually used.

WARNING!

DO NOT PLACE ANY STALE AIR RETURNS IN GARAGES.

Installing Outside Air (OA) & Exhaust Air (EA) Ducts

Ducts connecting the unit to the outside MUST be well-insulated. Vapour 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!

- The vapour 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.
- INSTALL FRESH AIR INLET AWAY FROM SOURCES OF CONTAMINANTS**
 - DO NOT locate the fresh air inlet where vehicles may be serviced or left idle
 - The fresh air inlet should be at least 10 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. 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**
- **SEAL ALL DUCT COLLARS AT UNIT TO MINIMIZE AIR LEAKAGE**

WARNING!

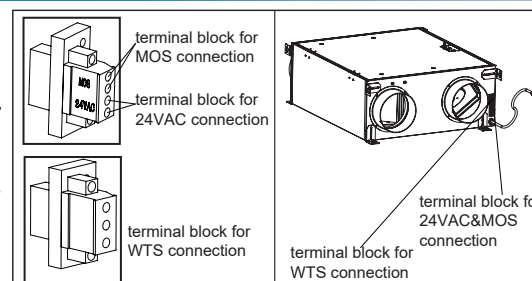
DANGER OF ELECTRIC SHOCK WHEN SERVICING THE UNIT: ALWAYS unplug unit before connecting or servicing controls.

ELECTRICAL CONNECTIONS

WARNING!

UNPLUG THE LINE CORD BEFORE WORKING ON UNIT.

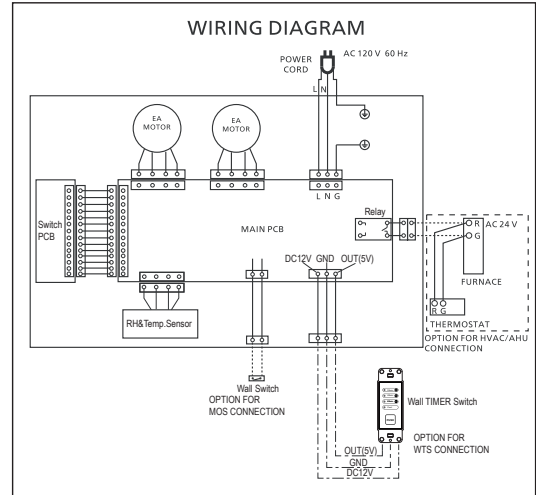
Run 120V AC house wiring to the location of the fan. The unit comes with a grounded 3 prong power cord for connection to an electrical outlet.



OPTIONAL CONNECTIONS

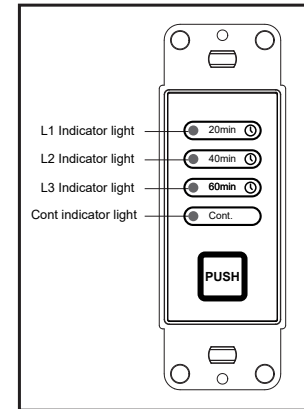
1. The unit has an optional terminal block for 24VAC HVAC/AHU blower integration. The user can connect the HVAC/AHU 24VAC dry contact relay to the terminal block so that when the ERV is operating, the HVAC/AHU blower operates to help distribute the fresh air through the existing ductwork if needed.
2. The unit has an optional terminal block for a MANUAL OVERRIDE SWITCH (MOS) connection. Connect an on/off switch to the terminal block 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.
3. 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 high speed mode and runs for the set time.

**The optional terminal block are not required for the unit



WALL TIMER SWITCH (OPTIONAL) 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.

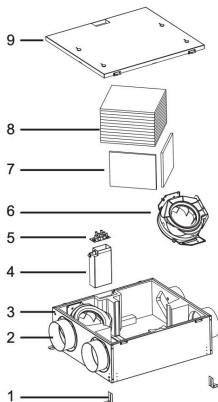


LED INDICATOR LIGHT FAULT DESCRIPTION

L1 INDICATOR	DESCRIPTION
Red Flashing	Humidity /Temperature Sensor problem

L2 INDICATOR	DESCRIPTION
Orange flashing	Motor problem

SERVICE PARTS



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