

## Energy Recovery Ventilator (ERV)

\*ERVR100A9P00A

\*ERVR200A9P00A

\*ERVR300A9P00A

*\*First letter may be "A" or "T"*

### **⚠ WARNING: HAZARDOUS VOLTAGE - DISCONNECT POWER BEFORE SERVICING**

ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES

**IMPORTANT** — This Document is **customer property** and is to remain with this unit. Please return to service information pack upon completion of work.

#### A. GENERAL INFORMATION

##### **⚠ WARNING**

THIS INFORMATION IS FOR USE BY INDIVIDUALS HAVING ADEQUATE BACKGROUNDS OF ELECTRICAL AND MECHANICAL EXPERIENCE. ANY ATTEMPT TO REPAIR A CENTRAL AIR CONDITIONING PRODUCT INCLUDING AN ERV MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. THE MANUFACTURER OR SELLER CANNOT BE RESPONSIBLE FOR THE INTERPRETATION OF THIS INFORMATION, NOR CAN IT ASSUME ANY LIABILITY IN CONNECTION WITH ITS USE.

##### **⚠ CAUTION**

To prevent shortening its service life, the ERV should not be used during the finishing phases of construction. Compounds used in construction and construction dust may cause rapid deterioration of the cabinet and internal components. To avoid damage keep drywall spray, construction dust, etc from entering the air stream of the unit.

These instructions do not cover all variations in systems or provide for every possible contingency. Should further information be desired or particular problems arise which are not covered sufficiently by this manual, contact your local distributor or the manufacturer as listed on the ERV nameplate.

#### **BEFORE YOU BEGIN THE INSTALLATION**

Check carefully for any shipping damage. This must be reported to and claims made against the transportation company immediately. Open carton, remove packing material, loose parts and ship-with literature. Check to be sure all major components are in the unit. Any missing parts should be reported to your supplier at once, and replaced with authorized parts only.

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Figure 1

# Installer's Guide

## READ ALL INSTRUCTIONS BEFORE INSTALLING THE UNIT.

1. Use the unit in the manner intended by the manufacturer. If you have questions contact your local distributor.
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 before servicing

3. 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.
4. When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.
5. Never place a switch where it can be reached from a tub, shower or sink.
6. This unit is provided with a grounded power cord which must be plugged into a properly grounded outlet.

### **⚠ WARNING**

#### Carbon Monoxide Poisoning Hazard

Failure to provide sufficient air 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 may cause Personal Injury or Death.

The unit is intended for general building ventilation. Connection of the unit to ventilation exhaust, drier exhaust or ranger exhausts will damage the unit and could result in hazardous levels of toxic materials in the home. If this unit is exhausting air from a space in which chimney –vented fuel burning equipment is located, take steps to assure that the 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.

### **⚠ CAUTION**

This unit is intended for general ventilating use only. Do not use to exhaust hazardous or explosive materials and vapors.

### **⚠ CAUTION**

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.

## ERV LOCATION CONSIDERATIONS

- Select a location to install the ERV with the objective of keeping the fresh air supply ducts and exhaust ducts as short as possible. Short runs provide the best performance and help ensure system balance; the amount of air brought into the home equals the amount of air exhausted. Unbalanced air flow can cause poor performance and may result in frosting of the core during extremely cold weather. See ACCA Manual D for ducting guidelines.
- If the fresh air supply from the ERV is connected to the heating and cooling system return air duct, locate the ERV as close to the furnace or air handler as possible.
- If the ERV is to be installed independent from the forced air heating and cooling system locate the ERV to minimize the length of all duct runs.
- An electrical outlet must be located within reach of the ERV power cord. The power cord is 36 inches long.
- Provide at least 24" of clearance at the front of the ERV for service access to the blowers, filters and heat exchanger core.
- Provide access for maintenance so the front cover can be opened to allow cleaning the core and filters.
- ERV's may be installed in a basement, mechanical room, storage area, garage, accessible attic or crawl area. Conditioned spaces are preferred.

## UNIT INSTALLATION

### INSTALLATION ON A CONCRETE FOUNDATION WALL

Install hanging bracket to the wall with appropriate concrete anchors (supplied by installer). Remove backing from two 2" strips of foam tape and apply each piece of foam tape equally spaced along the unit's mounting flange that will be held by the hanging bracket. (See Figure 2)

The tape should be applied in a "U" shape to cushion both the front and back of the integral flanges. Apply the other two pieces of foam over the two holes that will be used for fastening the other unit flange.

Lift unit and slide unit flange into the hanging bracket. **Use caution and an assistant when installing unit overhead.** Using metal flat washers, fasten flange opposite the hanging bracket to structure.

Safety concrete anchors should similarly be installed passing through the hanging bracket and flange. Make sure the anchors, supplied by installer, are properly selected for the loads and substrate involved.

## ATTIC INSTALLATION

### INSTALLATION ON ROOF RAFTERS

The unit may be mounted directly to the roof rafters. (See Figure 3) Mount as described for installation on a concrete foundation wall except use appropriate fasteners for a roof rafter. Be sure fasteners are properly selected to support the load.

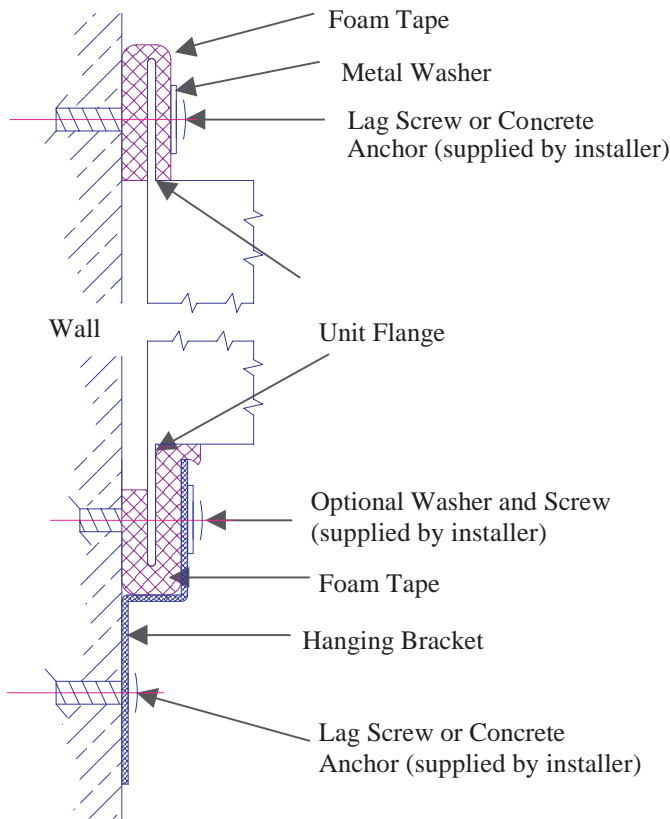


Figure 2

### INSTALLATION ON A STUD WALL

Mount the unit using the supplied hanging bracket kit as described for installation on a concrete foundation. Use appropriate fasteners for a stud wall (supplied by installer). Be sure the fasteners are properly selected to support the load. Note that the hole layout on the integral mounting flanges and the hanging bracket are spaced for 16" or 24" on center framing patterns.

### INSTALLATION ON OVERHEAD FLOOR JOISTS (Access Door Swings Open Down)

The unit may be fastened directly to floor joists using the hanging bracket and integral flange. Mount as described for installation on a concrete foundation wall except use appropriate fasteners for a floor joist supplied by installer. Be sure the fasteners are properly selected to support the load.

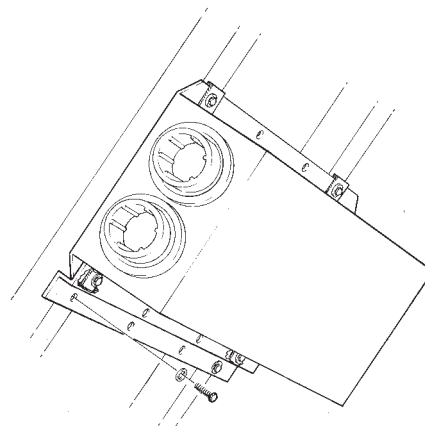


Figure 3

### SUSPENSION OF ERV FROM ROOF RAFTERS

Suspend unit from the roof rafters. The unit may be suspended from the roof rafters by chains and springs, supplied by the installer. See Figures 4, 4a, and 5.

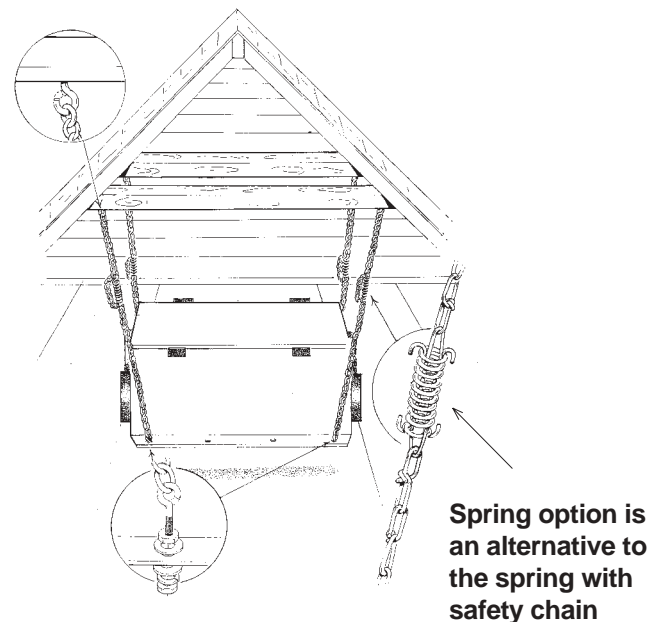
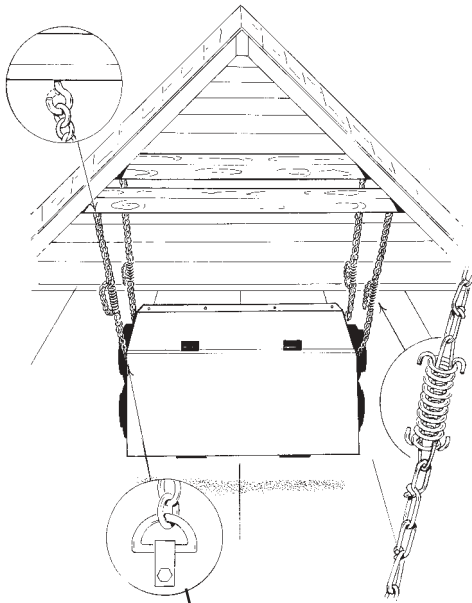


Figure 4

## UNIT MOUNTING POSITIONS

The unit may be installed in a variety of positions EXCEPT as noted in Figure 6d.

## APPROVED MOUNTING POSITIONS



**ALTERNATIVE MOUNTING  
OPTION TO "D" RING**

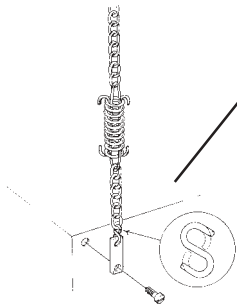


Figure 5

Be sure suspension hardware and fasteners are properly selected to support the load.

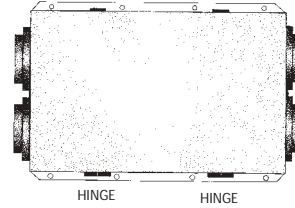


Figure 6a - Hinges on Bottom

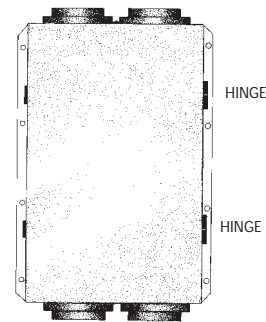


Figure 6b - Hinges on Right

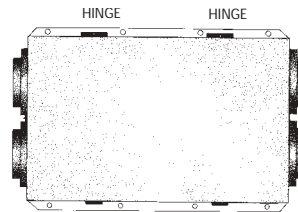


Figure 6c - Hinges on Top

## NOT AN APPROVED MOUNTING POSITION

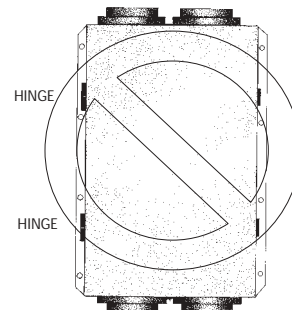


Figure 6d - Hinges on Left  
Do not install in this position, as door will fall off when opened

## INSTALLATION GUIDELINES

### GENERAL GUIDELINES

- 1) Do operate the ERV independent of the indoor central heating and cooling blower system (furnace / air handler). Independent operation of the ERV allows the ERV to introduce the minimum required fresh air at all times of the year.
- 2) Do Not set up a control system that requires the indoor (furnace / air handler) blower for the heating and cooling system to operate (when in the cooling mode) when the ERV operates. Fan operation during the cooling mode without cooling occurring is not recommended under most circumstances and applications. Fan operation evaporates the condensed moisture (water) on the cooling coil and results in increased Relative Humidity inside the home. For exceptions and additional details, see the ERV Application Bulletin.
- 3) Humidifiers and ERV/HRV's. When the "fresh air" is ducted into the return duct and the system is to have a humidifier, install a "fan power humidifier." Do not install a by-pass humidifier, as it can freeze based on the installation, outdoor temperature and homeowner thermostat setback requirements.

### APPROVED INSTALLATIONS

- I) Separate Room Exhaust Air Pick-Up / Fresh Exchanged outside air to central system return air

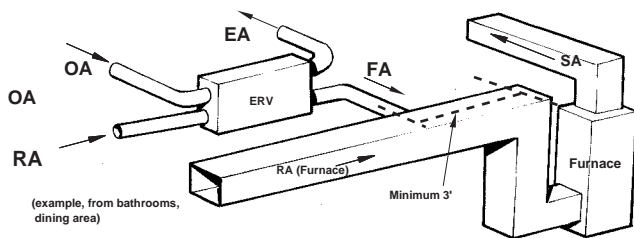


Figure 7

#### Legend

- RA - Room Air
- OA - Outside Air
- FA - Fresh Air
- EA - Exhaust Air
- SA - Supply Air

**Note:** Entering mixed air temperature to furnace (furnace heating air) must be above 50°F (18°C) to prevent condensation in furnace heat exchanger.

### II) Separate Return Air and Fresh Air Supply

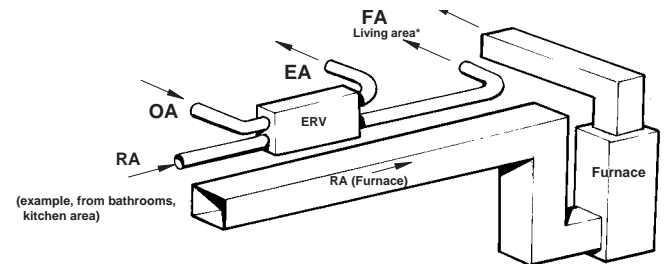


Figure 8

**Note:** Introduce fresh air where good mixing will occur to minimize discomfort to occupants.

### NON APPROVED / NOT RECOMMENDED INSTALLATIONS

- I) Exhaust Air and Fresh Air Ducted To System Return Air Duct

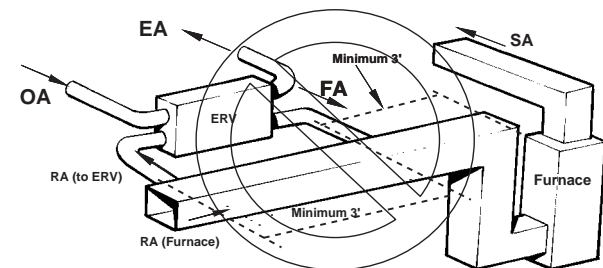


Figure 9

**Note:** Application requires indoor blower to be running when ERV runs. This is in violation of General Guideline #2 on page 3.

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## IV) EXHAUST AIR FROM RETURN DUCT / FRESH AIR DUCTED TO SUPPLY AIR DUCT

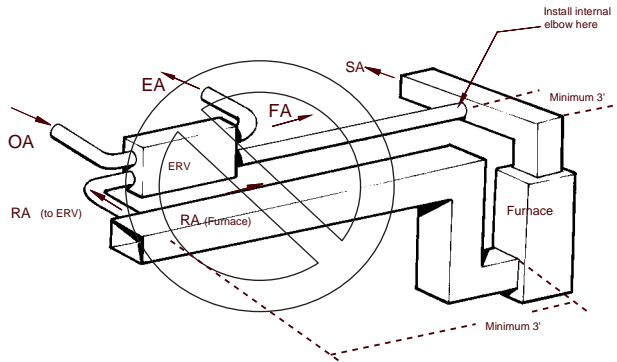


Figure 10

**Note:** Duct routing produces a negative pressure on Exhaust Air and Adds additional pressure on Fresh Air and can result in a greater than desired pressure difference and can make the house a negative pressure volume. If a vented gas appliance is within the home's envelope this duct application can cause flue gas backdrafting.

### INSTALL DUCT COLLARS

Attach one each of four duct collars to the fresh air inlet and outlet, exhaust air inlet and outlet with the screws provided in the plastic small parts bag. **Use duct mastic or equivalent approved caulk to form seal around duct collar.** (Optional) See figure 11.

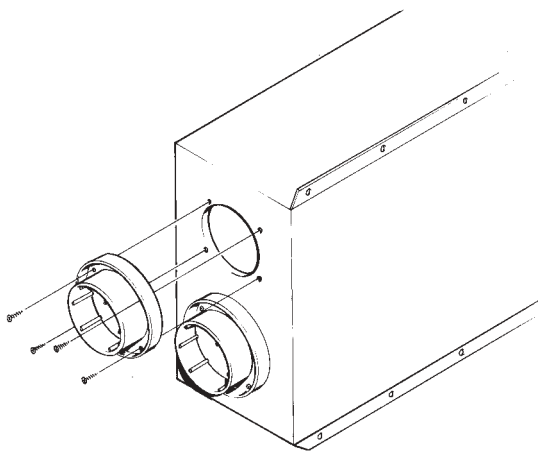


Figure 11

## DUCTWORK INSTALLATION - ERV TO EXTERIOR WALL OUTLETS

### ⚠ CAUTION

Failure to follow this installation instruction may result in property damage from sweating ductwork.

The fresh air duct and exhaust air duct connect the ERV to the exterior wall outlet. Flexible or metal duct may be used. The fresh air and exhaust air duct must be insulated.

Keep the fresh air supply and exhaust duct roughly equal in length and as short and straight as possible. Typically, six (6) inch insulated flexible duct is used for the \*ERVR100/200A9P00AA and eight inch for the \*ERVR300A9P00AA. If using flexible duct band or tape the inner duct liner to the inner flange of appropriate collar. Drive a sheet metal screw through the liner to secure the duct spiral wire to the collar. Straighten insulation, and slide the outer duct jacket onto the outer flange of the duct collar. Secure with band or tape. The outer flange of the duct collar can be used for both the inner and outer jacket of eight (8) inch flexible duct. Care must be taken to insure that the duct is securely fastened and sealed to the duct collar.

If duct runs are exceedingly long (over 25 feet of duct for the \*ERVR100 or 300 and over 15 feet for the \*ERVR200) see the Air Conditioning Contractors Association of America's (ACCA) duct sizing manual "Manual D" to design the appropriate sized ductwork.

## FRESH AND EXHAUST AIR INLET AND OUTLET INSTALLATION

### ⚠ WARNING

Failure to follow the installation instructions for location of the fresh air inlet and return air grilles could result in Carbon Monoxide Poisoning or Death.

The fresh air inlet should be at least ten feet away from any exhaust such as chimneys, furnace vents, water heater exhausts, dryer vents, driveways or other sources of carbon monoxide or contamination. Do not locate a fresh air inlet where vehicles may be serviced or left idling. Never locate the fresh air inlet inside a structure.

Do not install return air grilles (stale air return) in garages, or in the same room with any gas fired appliance; for example a gas fired furnace, gas fired water heater, gas dryer, etc.

Do not connect ERV ductwork to kitchen vent hoods  
Do not connect a dryer directly to an ERV

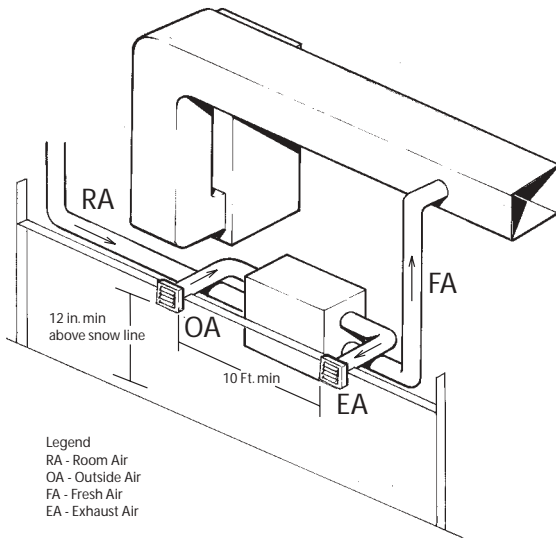


Figure 12

The exhaust outlet and fresh air inlet on the outside of the building **should be at least ten (10) feet apart** to avoid cross contamination.

*The Outdoor fresh air inlet must be located a minimum of 10 feet from any other exhaust vent, gas meter, outdoor grill, or source of open flame.*

Fresh air inlets must also be located a minimum of ten (10) feet from oil tank fill tubes, garbage cans and any other source of contamination. Fresh air inlet and outlets should not be installed in areas of stagnant air. Fresh air inlet and outlet hoods should be located a minimum of twelve (12) inches above the normal snow level.

## ⚠ CAUTION

Failure to follow installation instructions may lead to premature failure of the heat transfer core.

The ERV fresh air inlet and return air grilles must not be located in the same room as an indoor swimming or exercise "lap" pool.

Determine outlet locations. Cut correct size hole. Cut a short piece of 6" round duct to connect to the fresh air inlet and exhaust air outlet hoods. For Model \*ERVR100 or \*ERVR200. Use 8" round duct for Model \*ERVR300. Secure duct to inlet and outlet hood duct collars with installer supplied fasteners. Install hood and ductwork through penetration. See figure 13 for sealing duct penetration and duct collar.

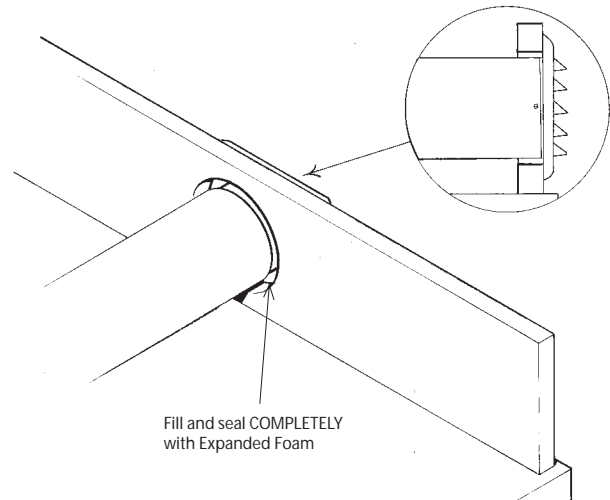


Figure 13

## DUCTWORK CONNECTING ERV TO INDOOR TERMINATION POINTS

### ⚠ CAUTION

Failure to follow this installation instruction may result in property damage from sweating ductwork.

Insulate all connecting ductwork from the ERV to any indoor termination point that will be subject to forming condensation. Flexible or metal duct may be used.

An ERV can be applied either with an independent free standing fresh and return air duct system or the fresh air supply can be connected to the cooling and heating system return air duct. The following guidelines should be considered when applying and installing either duct system.

### FRESH AIR DUCT CONNECTION TO THE COOLING AND HEATING SYSTEM RETURN AIR DUCT

The Fresh Air Supply duct from the ERV should be connected a minimum of three (3) feet up stream of the indoor unit return plenum. (See Figure 7)

A connection closer than three 3 foot may result in unbalanced airflow. Use a minimum of 5 foot section insulated flexible duct to connect the ERV port labeled "Fresh Air To Inside" to the return air duct.

### FREE STANDING DUCT SYSTEM

For free standing ERV duct systems one or two fresh air grilles located in a central part of the house will provide effective distribution of the fresh air into the home particularly when the air to be exhausted from the home is returned from several points. Use a minimum of 5 foot

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insulated flexible duct from the ERV port labeled "Fresh Air To Inside" to the point of termination.

During winter, since fresh air is unconditioned, the fresh air supply grilles should be located in a traffic area like a hallway or stairway rather than in a sitting area. Locate fresh air supply register within 12 inches of the ceiling on an inside wall pointing the register louvers toward the ceiling. If fresh air is desired in specific rooms with high occupancy the fresh supply air can be split among the additional rooms.

## RETURN AIR FROM HOUSE

Locate return air grilles in rooms where moisture and odors are generated. Preferred locations for returns are bath rooms, kitchens and hallways. Return grilles should be installed within 12 inches from the ceiling on an inside wall. Do not use returns to vent cooking areas. Do not connect returns to a vent hood.

## ELECTRICAL CONTROLS

### **⚠ WARNING**

**Hazardous Voltage – Disconnect Power Before Servicing**

*Note: Proper Wiring Size Selection and Wiring Installation Is The Responsibility of the Electrical Contractor.*

## Controls

A percent timer (PT) control is included in the box with the ERV. This is the primary control for operation of the ERV. After startup, the PT control will operate the ERV automatically. The PT control should be set by the installing dealer.

To assist the dealer in determining the PT control setting a ventilation calculator is available from your local distributor. MicroSoft Excel is required to run this program. The calculator input can accept a minimum

ventilation airflow requirement per local code or calculate the minimum airflow required per ASHRAE 62.2-2004.

In addition to the PT control some installations may include Push Button (PB) or point of use control(s). The PB controls are typically located in bathrooms or areas where exhaust ventilation is required for short periods of time. PB controls are wired in parallel to the PT controls and energize the ERV whenever there is a manual call for ventilation.

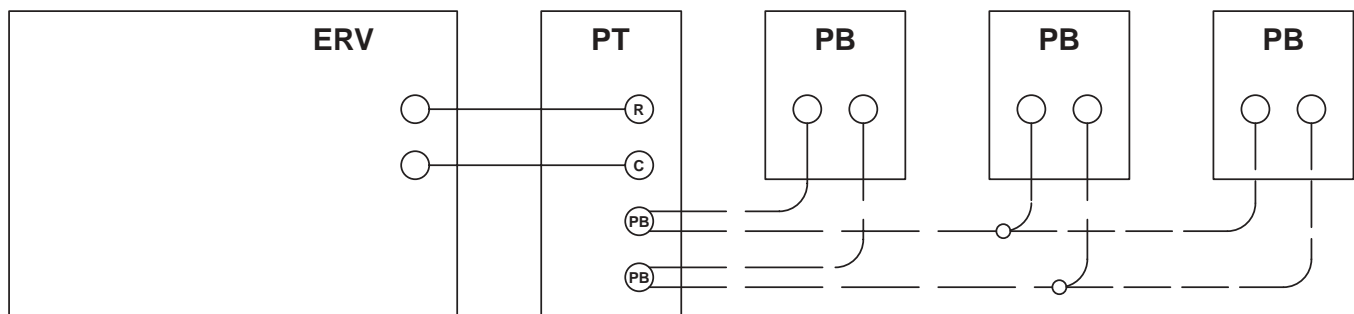
## PERCENT TIMER CONTROL (PT)

The Percent Timer Control automatically energizes and de-energizes the energy recovery ventilator every hour, ensuring ventilation for the home around-the-clock. The PT control has two status lights. One is the power light located in the upper left hand corner of the control. The other is the Runtime % light. The power light is on whenever the PT control is calling for the ERV to run. The Runtime % light is located on the right side of the control. The Runtime % light indicates the amount of time per hour the ERV will operate. Set the control per your local code or ASHRAE Std 62.2 and your ventilator will run once every hour.

**FOR CONSTANT OPERATION:** Press the fan icon until the 100% light is on. The "Runtime %" light turns on. The ERV unit will run continuously.

**FOR MINIMUM VENTILATION REQUIREMENT OPERATION:** Set the control at the percentage that meets local code or ASHRAE 62.2. Press the fan icon until the light for the percent desired is on.

**TO TURN THE ERV OFF:** Press the fan icon until all lights are off. The control is off. The ERV motor is de-energized. (Power is still present inside the unit. Always unplug cord from outlet before servicing!)



(2) PB controls can be directly connected to the PT control  
Up to (6) PB controls, wired in parallel, may be used.

Figure 14



**NOTE for ERV systems with more than one control:**

Another control may be causing your ventilator to run - even if the runtime % light on this control is off. If you wish to keep your ventilator from running, check that none of your controls are calling for unit operation.

## INSTALLATION

1. Install control in a standard 2" x 4" electrical box, with a minimum depth of 1.5", with the two screws provided.
2. Wire Size: 18 gauge, no more than 500 feet. Wiring is non-polar.
3. The two wires from the ERV should be attached to the 'C' and 'R' positions on the terminal block on the back of the PT Control. See Figure 13.
4. Use Lutron Decora™ cover plate to complete the installation (supplied by installer).

## Push Button Point-of-use Control (Optional Accessory)

For use with all ERV models

### OPERATION

The Push Button (PB) Point-of-use Control lets you manually turn on your energy recovery ventilator for a short period of operation – for example, when you are using a bathroom. The PB Control must be connected to a PT control to operate.

### 20-40-60 MINUTE VENTILATION CONTROL:

Press the fan icon and your ventilator will run for 20 minutes. Press again and the unit will run 40 minutes. A third press provides for 60 minutes of operation. Percent Timer Control does not need to be on for the PB Control to operate the ERV unit.

You can cancel a cycle at anytime. Just press the logo and hold for about five seconds.

You can start another cycle by pressing the logo.

### NOTE FOR ERV SYSTEMS WITH MORE THAN ONE CONTROL:

Another control other than the push button may be causing your ventilator to run. If you wish to keep your ventilator from running, check that none of your controls are calling for unit operation.

## INSTALLATION

4. Install control in a standard 2" x 4" electrical box, with a minimum depth of 1.5", with the two screws provided.
5. Wire Size: 18 gauge, no more than 500 feet. Wiring is non-polar.
6. Two wires from the PB Control should be attached to the 'PB' positions on the terminal block on the back of the Percent Timer Control.
7. For two PB controls, one wire from each can be twisted together and inserted into a single position on the terminal block on the Percent Timer Control. The wires must be a 18 gage solid wire. If more than two PB controls are attached or 18 gage stranded wire is used then pigtailed must be inserted into the 'PB' positions on the Percent Timer Control and the leads attached to the pigtailed with wire nuts.
8. Use Lutron Decora™ cover plate to complete installation.

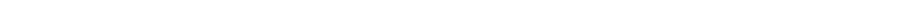
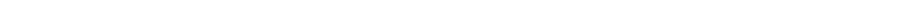
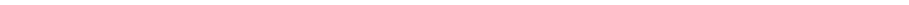
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## START-UP AND CHECK OUT PROCEDURE

1. Make sure power is disconnect by unplugging electrical cord.
2. Check field-supplied control wiring to insure proper installation and that all connection are tight.
3. Check field-supplied power supply for proper voltage
4. Make sure that unit is securely mounted or suspended and that there are no tools or loose debris in, around or on top of the unit
5. Check all duct connection to insure they are sealed
6. Check all duct outlets. All outlets must be open
7. Check unit filters.
8. Close unit door – plug in unit.
9. Turn all controls to off
10. Set timer to 10 %; unit should start and run for approximately six minutes.
11. Go to outside of building and check for airflow at inlet and outlet hoods. Check that weatherhood screens are in place and clean. Make sure that the intake hood is positioned away from any exhausts or other sources of pollutants. **The quality of the introduced fresh air is the most important function of this system!**
12. If the unit has a push-button timer installed press it one time after the unit has cycled off from the percentage timer's cycle. Unit should run twenty minutes and then cycle off.
13. Set percent timer to recommended percentage. (See application guide) Place peel & stick dot on the face of the percentage timer to indicate percentage proper setting.
14. Instruct end user on proper operation procedures and leave use and care manual with them.





**American Standard Inc.**  
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10/05

*For more information contact  
your local dealer (distributor)*

*Since the manufacturer has a policy of continuous product and product data improvement, it reserves the right to  
change design and specifications without notice.*