systemair

# ERV RT-EC SERIES
## Outdoor Energy Recovery Ventilator

# Installation Manual

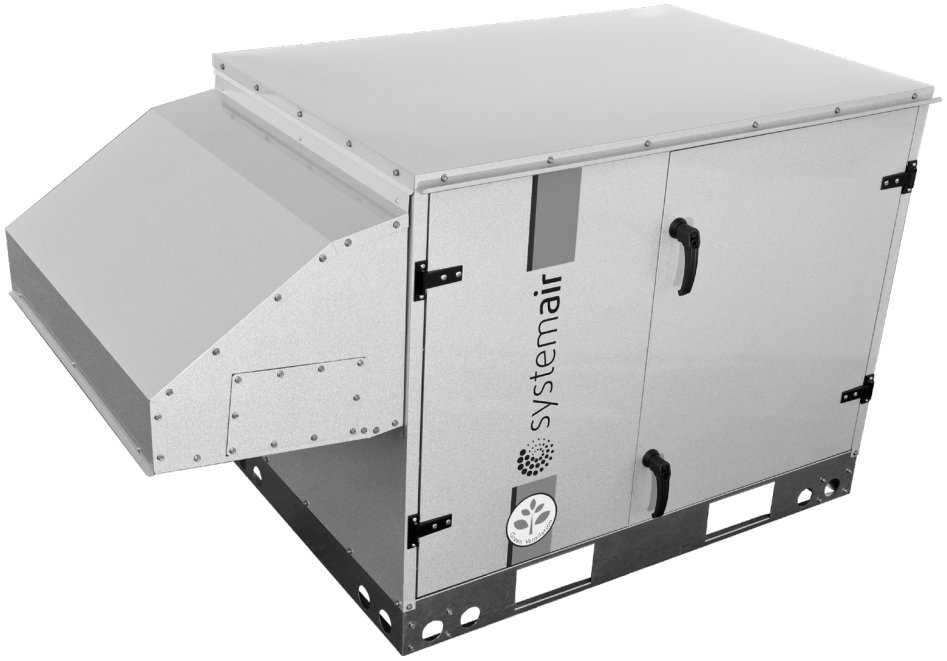
## IMPORTANT - PLEASE READ THIS MANUAL BEFORE INSTALLING UNIT

CAUTION - Before installation, careful consideration must be given to how this system will operate if connected to any other piece of mechanical equipment, i.e. air handler, operating at a higher static. After installation, the compatibility of the two pieces of equipment should be confirmed by measuring the airflow of the Energy Recovery Ventilator.
It is always important to assess how the operation of any ERV may interact with vented combustion equipment (i.e. Gas Furnaces, Oil Furnaces, Wood Stoves, etc.).
NEVER - install a ventilator in a situation where its normal operation, lack of operation or partial failure may result in the backdrafting or improper functioning of vented combustion equipment!!!

AHRI CERTIFIED™ www.ahridirectory.org
Air-to-Air ERV
AHRI Standard 1060
Energy Recovery COMPONENT is certified. Actual performance in packaged equipment may vary.

Green Ventilation

c UL US




Your ventilation system should be installed in conformance with the appropriate provincial or state requirements or in the absence of such requirements with the current edition of the National Building Code, and / or ASHRAE's " Good Engineering Practices".

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

## Warranty

- The motors found in all Systemair ERV's require no lubrication, and are factory balanced to prevent vibration and promote silent operation.
- The limited warranty covers normal use. It does not apply to any defects, malfunctions or failures resulting from improper installation, abuse, mishandling, misapplication, fortuitous occurrence or any other circumstances outside Systemair's control.
- Inappropriate installation or maintenance may result in the cancellation of the warranty.
- Any unauthorized work will result in the cancellation of the warranty.
- Systemair is not responsible for any incidental or consequential damages incurred in the use of the ventilation system.
- Systemair is not responsible for providing an authorized service center near the purchaser or in the general area.
- Systemair reserves the right to supply refurbished parts as replacements.
- Transportation, removal and installation fees are the responsibility of the purchaser.

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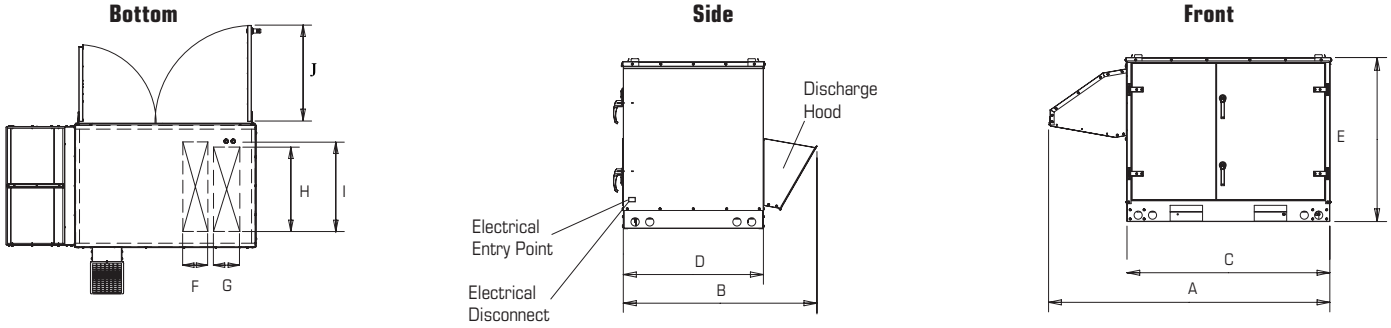
- The purchaser is responsible for ensuring that applicable local and national codes are observed.
- The warranty is limited to 3 years on parts including motors and 5 years on the energy recovery wheel from the date of purchase, including parts replaced during this time period. If there is no proof of purchase available, the date associated with the serial number will be used for the beginning of the warranty period.

* This warranty is the exclusive and only warranty in effect relative to the ventilation system and all other warranties either expressed or implied are invalid.

*****Illustrations & images in this manual may not be exactly like unit purchased, these illustrations & images are for examples only.*****

## Figure 1:

## Dimensions




| Model | A | B | C | D | E |
|---|---|---|---|---|---|
| ERV1300RT-EC | 69.4" (1763mm) | 46.8" (1189mm) | 50.0" (1271mm) | 33.8" (859mn) | 40.5" (1028mm) |
| ERV3200RT-EC | 95.15" (2417mm) | 66.72" (1695mm) | 67.98" (1727mm) | 53.61" (1336mm) | 60.0" (1526mm) |
| ERV4600RT-EC | 95.15" (2417mm) | 66.72" (1695mm) | 67.98" (1727mm) | 53.61" (1336mm) | 60.0" (1526mm) |
| Model | F | G | H | I | J |
| ERV1300RT-EC | 7.0" (178mm) | 7.25" (184mm) | 23.5" (597mm) | 24.75" (629mm) | 27.25" (692mm) |
| ERV3200RT-EC | 10.0" (254mm) | 10.0" (254mm) | 39.5" (1003mm) | 44.63" (1134mm) | 38.05" (967mm) |
| ERV4600RT-EC | 10.0" (254mm) | 10.0" (254mm) | 39.5" (1003mm) | 44.63" (1134mm) | 38.05" (967mm) |

## RECEIVING & INSPECTION OF UNITS

Upon receipt of the unit(s) to the job site, inspect the unit for shipping damage. Open all access panels and inspect the interior and exterior. If any damage exists, do not accept the shipment without written acknowledgement of the damages by the shipper. Report damage to the carrier and to Systemair Inc. immediately. Note type of damage on copy of Bill of Lading.

### PRACTICAL TIPS

- Do not operate unit while access doors are open. This may cause personal injury.
- Do not operate unit until all duct work is connected, unless you are familiar with the entire system and fully experienced in fan service and energy recovery ventilator service work.
- Clear the area of all unauthorized personnel if system must be operated with access panels off, or establish sufficient guards or warning signs keeping unwary bystanders out of danger.
- Whenever the system is being inspected internally, "lock-out" the power supply to the ERV, either at the disconnect located on the unit (optional), or the "main" disconnect located prior to the packaged system.

### CAUTION

Before installation, careful consideration must be given to how this system will operate if connected to any other piece of mechanical equipment, i.e. air handler, operating at a higher static. After installation, the compatibility of the two pieces of equipment must be confirmed by measuring the airflows of the Energy Recovery Ventilator. It is always important to assess how the operation of any ERV may interact with vented combustion equipment (i.e. Gas Furnaces, Oil Furnaces, Wood Stoves, etc.).

**NEVER** - install a ventilator in a situation where its normal operation, lack of operation or partial failure may result in the backdrafting or improper functioning of vented combustion equipment!!!

### CAUTION

- This product is to be installed only by a trained, experienced service technician or licensed electrician.
- Read and follow these instructions carefully as failure to follow them may cause an unsafe condition or damage the equipment.

### Pre-Installation Considerations

All Systemair units are provided with rigging holes. See LIFTING INSTRUCTIONS on the following pages before handling the units.

1. Make sure the unit is level to eliminate water accumulating in undesired areas.
2. Thermally insulate duct work to and from unit to prevent unnecessary heat losses.
3. Provide adequate straight inlet and outlet transitions to the unit. Use turning vanes when abrupt turns are unavoidable.
4. Duct work must be supported independently.
5. Rough-in for electrical wires

### Safety Precautions

Testing, adjusting, start-up, and maintenance of Energy Recovery Equipment exposes personnel to potential safety hazards. Only experienced mechanical personnel who are aware of these safety hazards created by moving or rotating components internal to the packaged units should be authorized to work on the Energy Recovery packaged system. It is assumed that these personnel will take the proper precautions to prevent injury from moving parts. Many systems are of the low pressure, low velocity type that appear relatively harmless. However, some systems have an added danger of high velocity and relatively high pressure air movement which can blow or suck people off balance or blow dust or dirt in their eyes.

# INSTALLATION

The unit may be secured to a metal or wooden curb fastened to the roof. If securing the unit to the curb is required, fasteners and isolators may be used at the mounting points on the frame protruding from the unit (all mounting hardware is field supplied and specified).

## Roofcurb

Care must be exercised in locating the roof opening and in all cases a structural engineer should confirm location of the unit on the roof. The HVAC system should cross enough roof supports to safely distribute the weight of the system over the roof. The ERV RT-EC Series air duct sizes can be found in Figures 3 & 4. Roofcurb may be supplied by others. Assemble and install accessory roofcurb in accordance with instructions shipped with the curb. See Figures 3 & 4 for curb dimensions.

The gasketing of the unit to the roofcurb is critical for a watertight seal. Gasket is factory installed to the bottom of the unit. Ensure gasket has not been disturbed during shipping. An improperly applied gasket can result in water leaks and poor unit performance.

Ductwork must be attached to the roofcurb, or self supported. They are not to be attached to the unit.

The roofcurb for the ERV RT-EC series should be level. Consult with local authorities or your local building code for minimal intake hood height from the roof. This code will determine the height of the roofcurb. See Figures 3 & 4 for typical unit dimensions.

**Figure 2: Roofcurb assembly**

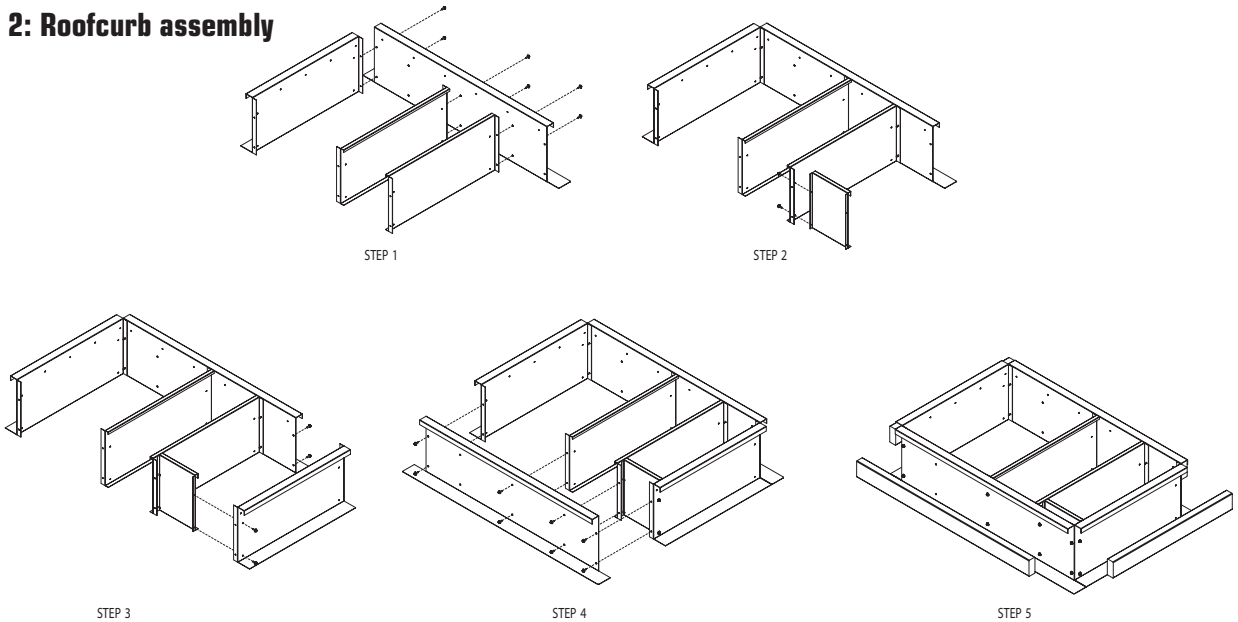
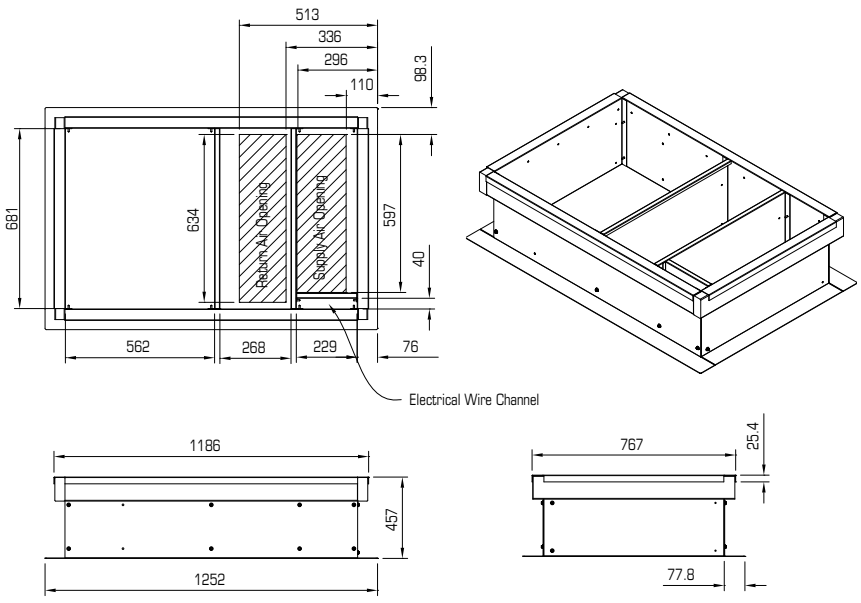



**Figure 3: Roofcurb detail for ERV 1300 RT-EC**

**Bottom View**

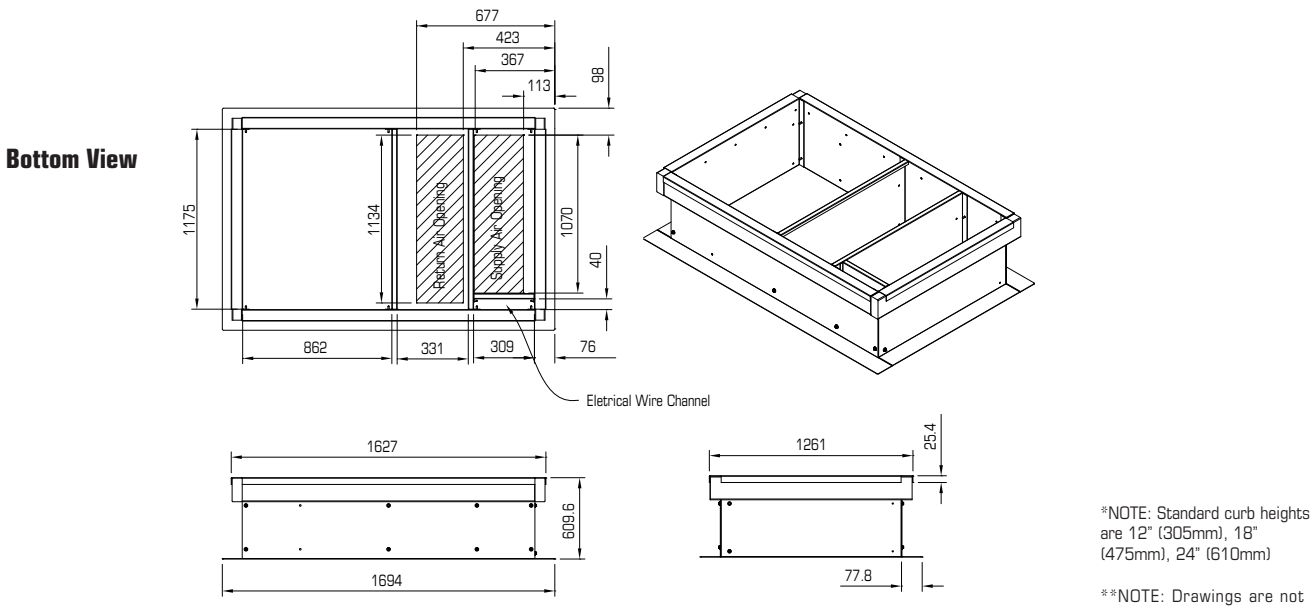



*NOTE: Standard curb heights are 12" (305mm), 18" (475mm), 24" (610mm)

**NOTE: Drawings are not to scale

## INSTALLATION – CONT.

**Figure 4: Roofcurb detail for ERV 3200/4600 RT-EC**




*NOTE: Standard curb heights are 12" (305mm), 18" (475mm), 24" (610mm)

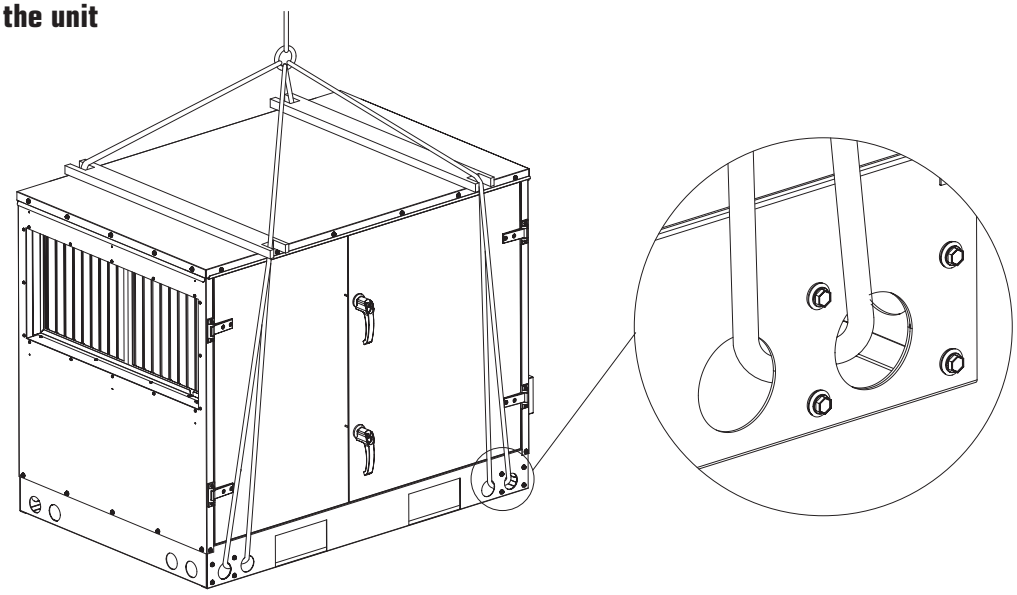
**NOTE: Drawings are not to scale

### LIFTING AND/OR SUPPORTING THE UNIT

The ERV RT-EC series units are factory equipped with rigging holes which should be used to hoist and install the unit.

A forklift may be used in the appropriate frame openings. A spreader must be used in instances where the upper casing of the unit could be damaged. See Table 1 for details on unit weight and dimensions or for the exact weight, see the bill of lading.

**Figure 5: Rigging the unit**



# INSTALLATION - CONT.

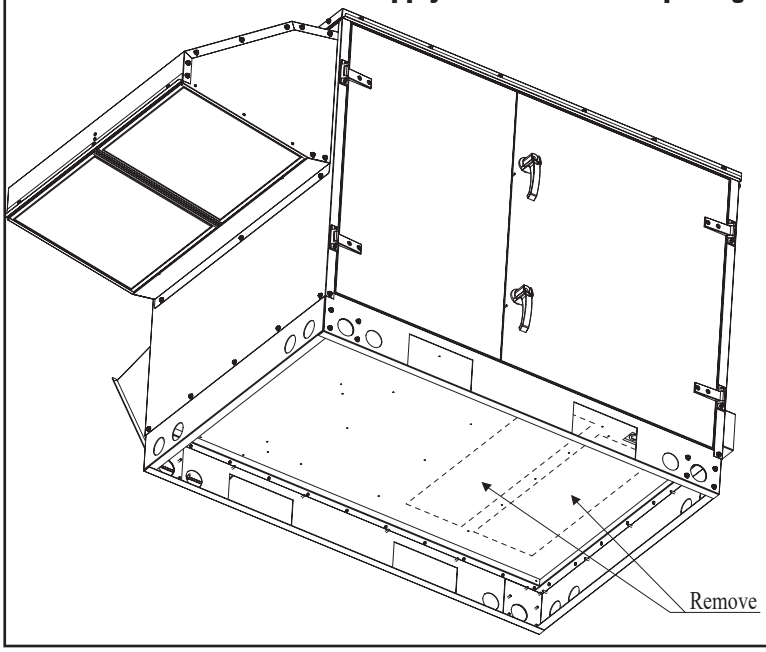
## PLACING THE UNIT

All ERV RT-EC series units are provided with integral rigging holes. Units must be lifted via these rigging provisions using a spreader system (provided by others) which protects the upper exterior of the Systemair Energy Recovery Unit during lifting.

Before placing the unit into position, ensure the supply and exhaust duct openings are free from obstruction. The neoprene insulation might have been left intact at the factory to kept these openings closed to prevent any unwanted items to enter the unit (see Figure 6). It will be easy to clear this obstruction from the exhaust air duct opening even after the unit is placed into position, however it will be more difficult to do so for the supply air.

After placing the unit atop the mounting supports or roof curb, check to insure that the unit is level.

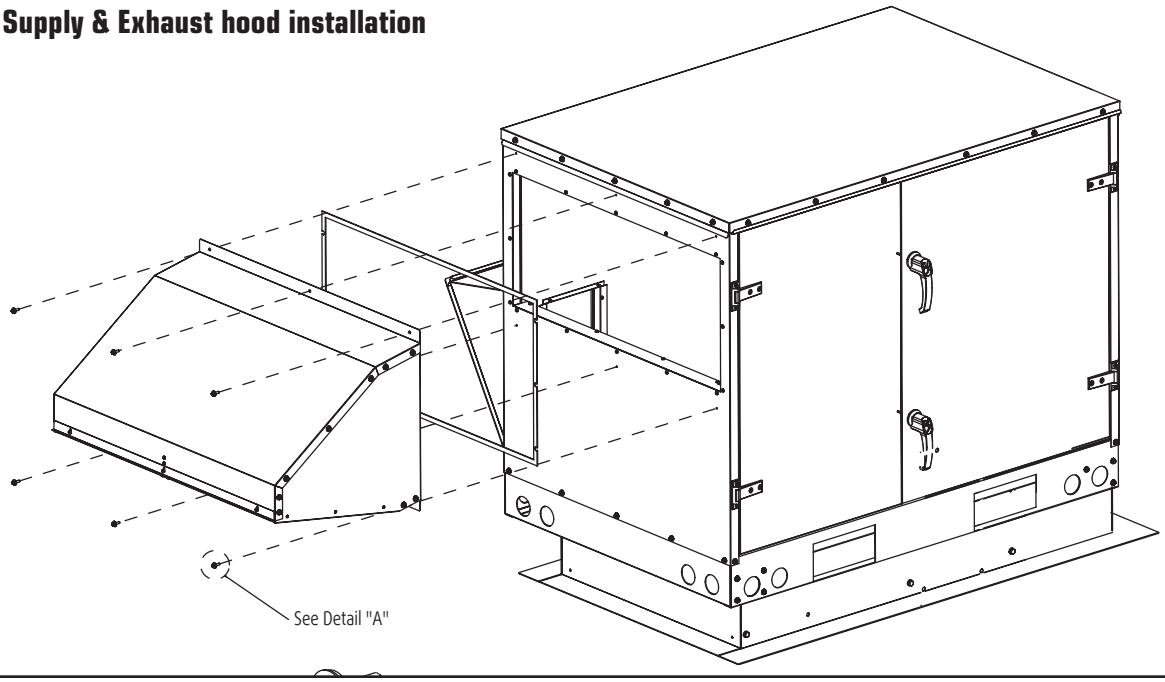
**Figure 6:**
**Remove obstructions from supply and exhaust air openings**




## INSTALL HOODS

Intake and exhaust hoods for these models are shipped separately from the unit. To install hoods, see Figure 7. A quick connect for the damper motor is provided to connect to the main body of the unit for hoods equipped with motorized dampers. Make sure that all the screws are secured to maintain proper support and to keep the seals watertight.

**Figure 7: Supply & Exhaust hood installation**



# INSTALLATION - CONT.

## ELECTRICAL WIRING

These units may, or may not, have a factory supplied disconnect switch. If disconnect is field supplied, provide a disconnect per the NEC. Use copper conductors only. All field wiring must comply with NEC and local requirements. In Canada, electrical connections must be in accordance with CSA C22.1 Canadian Electrical Code Part One. Ensure the power supply (voltage, frequency, and current carrying capacity of wires) is in accordance with unit nameplate. **Lock off all power sources before unit is wired to power source.**

An optional location to install the disconnect switch box directly on the ERV unit is identified by the label "Input Power" located on the right hand side of the unit. To install, you first need to remove the screw located in the middle of the label. The screw hole should now be used as the reference hole to drill a 3/4" opening to gain access to the electrical box. Care should be followed so that components inside the electrical box are not damaged by the drill bit. Alternatively, units may have knockouts to make this task easier to the installer. Once the hole has been drilled, or the knockouts removed, a water tight seal or washer must be installed in between the disconnect switch and the ERV to prevent water from entering either the switch box, electrical box, or between the ERV double wall and wetting the insulation. We recommend using a Thomas & Betts Cat# 5263 3/4" sealing ring or equivalent UL Listed Type 4 (NEMA 4) rated sealing washer. This sealing washer shall be used in conjunction with a 3/4" X 1-1/2" conduit fitting. See Figure 8.

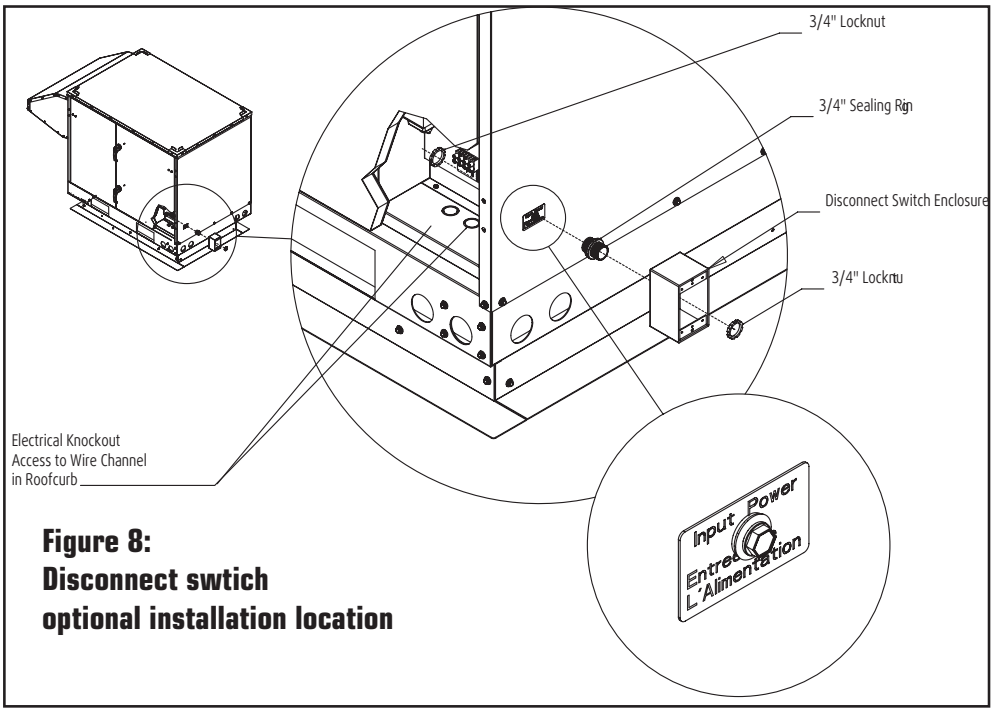



**Figure 8:**
**Disconnect swtich optional installation location**

Follow the wiring diagram inside the electrical enclosure (also found further in the manual). Correctly label the circuit on the main power box and always identify a closed switch to promote safety (i.e., red tape over a closed switch).

# OPERATIONS AND MAINTENANCE

## COMMISSIONING THE ENERGY RECOVERY UNIT PACKAGE SYSTEM

Make sure that all packing materials and hold down straps are removed and isolators are in the operating position prior to start up.

Packaged systems can normally be operated from various starting devices, from start-stop switches, remote panels, time clock devices, and/or other interlocks. Prior to starting the unit, check to see that all circuit interlocks are in the "**on**" position. This includes all safety switches and/or miscellaneous controls included in the packaged system. Check control schematics and related circuit diagrams furnished with each unit. The following pages are pre-start-up guidelines which should be followed carefully. If any problems exist, startup of the unit should not take place without consulting the Systemair representative or the factory.

****WARNING****

**DO NOT OPERATE ENERGY RECOVERY VENTILATOR WITHOUT THE FILTERS AND BIRDSCREENS INSTALLED. THEY PREVENT THE ENTRY OF FOREIGN OBJECTS SUCH AS LEAVES, BIRDS, ETC. DO NOT REMOVE UNIT COMPONENTS WHILE STANDING ON A LADDER OR OTHER UNSTEADY BASE. UNIT COMPONENTS ARE HEAVY AND SERIOUS INJURY MAY OCCUR.**

### START UP CHECKS

#### Pre-Start Check List

- Disconnect and lock-out all power switches to unit.

#### General

- Check all fasteners for tightness.
- Check dampers that they open and close without binding.

#### Fan Wheel Rotation

- Hand rotate the fan impeller to ensure there's no rubbing against the inlet ring.
- Check fan rotation by opening the access doors and running each fan momentarily to determine the rotation.

If the impeller is rotating in the wrong direction "Clockwise when facing the inlet of the motor" turn the power off and use the following procedure:
– For single phase units, rewire the motor per the instructions on the motor.
– For three phase units, interchange any two power leads.

#### Energy Recovery Wheel

- Turn the energy recovery wheel by hand to verify free operation.
- Check if the belt and pulley are align properly and run smoothly.
- Check that the air seals, located around the outside of the wheel and across the center (both sides of wheel), are secure and in good condition.
- Observe that the wheel rotates freely at about 20 RPM.

If wheel does not rotate or rotates too slowly, remove the cassette (following the instruction on page 7). Air seals, which are too tight, will prevent proper rotation of the energy recovery wheel. Recheck the air seals for tightness. Air seal clearance may be checked by placing a sheet of paper, to act as a feeler gauge, against the wheel face. To adjust the air seals, loosen all seal retaining screws.

## SYSTEMAIR ENERGY RECOVERY SYSTEM MAINTENANCE

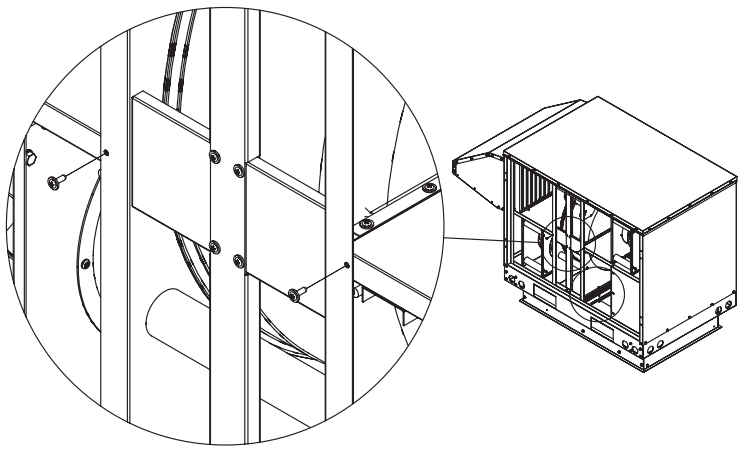
### Maintenance record

A record of regular maintenance is required to maintain any letters of guarantee issued by Systemair Inc. Date of service, actions taken, and the name of the service person are required. Frequency of maintenance required should be determined by inspection. The Systemair Energy Recovery Unit requires minimal maintenance in clean airstreams.

### Maintenance procedure

Access to the Systemair Energy Recovery Unit is gained via access panels located on the front of the unit. Disconnect and lockout all power supply to the ERV. Small amounts of dust present in either side of the energy recovery wheel will not affect the performance of the unit. If appreciable amounts of dirt has accumulated, the energy recovery unit may be cleaned with a vacuum cleaner or the dirt may be blown out with compressed air. For accumulations proving more difficult to clean, Systemair recommends using hot water (180ºF) and/ or a mild detergent (Oakite or Liqualin). This will not damage the wheel media but care must be taken not to wet the electrical motor. Cover the motor with a plastic bag before applying water to the energy wheel. Disconnect wheel motor power supply and slide wheel cartridge out of the main enclosure. Six (6) retaining screws hold the wheel assembly in place. See Figure 9 for screw locations. These must be removed to allow easy removal of the energy wheel. Spray mild detergent evenly across the transfer surface. Water pressure of 20 to 55 PSI is recommended. Take care not to force sharp objects against the energy transfer surface, as this could damage the energy transfer media.

**Figure 9: Bottom and front wheel hold down screws (one located on each side of the wheel)**



### MAINTENANCE OF DRIVE UNIT

The round belt is self tensioned and should not require any adjustment.

### MAINTENANCE OF BRUSH SEALANTS

Tightness between brush sealants and casing needs to be checked during inspection. The brush sealants are easily adjusted by loosening the screws and repositioning the brush sealant into the correct location. Round belt and brush sealants will be subject to wear and tear. Replacement parts can be obtained from Systemair or any of its authorized dealers.

### Options

### Frost Prevention

This shall be accomplished by a preheater factory installed in the fresh air supply. Alternately, this may also be accomplished by a fan shut down strategy.

### Dampers

All dampers shall be constructed of 16 gauge galvanized steel blades and hat channel frame with gasketed ends and edge seals unless noted differently. The fresh air inlet hood may be equipped with a motorized damper. Exhaust air hood may be equipped with a motorized damper or with a gravity backdraft.

## NOTES

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Systemair Inc. reserves the right to make changes and improvements to the contents of this manual without prior notice.

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