ABOUT RENEWAIRE

For over 30 years, RenewAire has been a pioneer in enhancing indoor air quality (IAQ) in commercial and residential buildings of all sizes. This is achieved while maximizing sustainability through fifth-generation, enthalpic-core, static-plate Energy Recovery Ventilators (ERVs) that improve energy efficiency, lower capital costs via load reduction and decrease operational expenses by minimizing equipment needs, resulting in significant energy savings. Our ERVs are competitively priced, simple to install, easy to use and maintain and have a quick payback. They also enjoy the industry’s lowest warranty claims due to long-term reliability derived from innovative design practices, expert workmanship and Quick Response Manufacturing (QRM).

As the first producer of static-plate core technology in North America, RenewAire presently has over 180,000 units in operation and is now one of the largest ERV companies in the world. We’re committed to sustainable manufacturing and lessening our environmental footprint, and to that end our Madison, WI plant is 100% powered by wind turbines. The facility is also one of the few buildings worldwide to be LEED- and Green Globes-certified, as well as having achieved ENERGY STAR Building status. In 2010, RenewAire joined the Soler & Palau (S&P) Ventilation Group in order to provide direct access to the latest in HVAC technologies. For more information, visit: www.renewaire.com.
**VENTILATION TYPE**

Static Plate, Heat and Humidity Transfer

**FEATURES**

**Ventilation Type:**
Static Plate, Heat and Humidity Transfer

**Typical Airflow Range:**
375-1,575 CFM

**AHRI 1060 Certified Core:**
One L62 and L125

**Standard Features:**
- Non-fused Disconnect
- 24 VAC Transformer/Relay Package

**Filters:**
Four total, MERV 8, 2" pleated,
14" x 20" (2) and 16" x 20" (2)

**Weight:**
395 lbs (unit), 455 lbs (shipping weight on pallet)

**Shipping Dimensions:**
70" L x 48" W x 63" H

**Options:**
- ECM Motor – Two, 115V or 208-230V
  - 1.0 hp (Single Phase)
- Factory supplied and mounted Variable Frequency Drives (VFDs) – one or both airstreams
- Fused Disconnect
- Double Wall Construction
- Motorized isolation dampers, OA, EA or both airstreams
- Factory mounted Filter Alarms (2)
- Independent Blower Control
- Exterior paint – white standard
- MERV 13 Filters

**Accessories:**
- Backdraft Dampers
- CURB1.5X - HE1.5XRT Rooftop Curb
- 1XHECC - HE1.5XRT Tie Down Clip Kit

**MOTORS : Two Direct drive motorized impeller packages**

<table>
<thead>
<tr>
<th>V</th>
<th>HZ</th>
<th>PHASE</th>
<th>FLA (per motor)</th>
<th>Min. Cir. Amps</th>
<th>Max. Overcurrent Protective Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>115</td>
<td>60</td>
<td>Single</td>
<td>6.5</td>
<td>14.6</td>
<td>20</td>
</tr>
<tr>
<td>208-230</td>
<td>60</td>
<td>Single</td>
<td>3.3-3.4</td>
<td>7.7</td>
<td>15</td>
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<tr>
<td>277</td>
<td>60</td>
<td>Single</td>
<td>2.7</td>
<td>6.1</td>
<td>15</td>
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<tr>
<td>208-230</td>
<td>60</td>
<td>Three</td>
<td>2.2-2.2</td>
<td>5.0</td>
<td>15</td>
</tr>
<tr>
<td>460</td>
<td>60</td>
<td>Three</td>
<td>1.1</td>
<td>2.5</td>
<td>15</td>
</tr>
</tbody>
</table>

**OPTIONAL FACTORY INSTALLED VFD ELECTRICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>V</th>
<th>HZ</th>
<th>PHASE</th>
<th>FLA (per motor)</th>
<th>Min. Cir. Amps</th>
<th>Max. Overcurrent Protective Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>208-230</td>
<td>60</td>
<td>Three</td>
<td>2.2 - 2.2</td>
<td>5.4</td>
<td>15</td>
</tr>
<tr>
<td>460</td>
<td>60</td>
<td>Three</td>
<td>1.1</td>
<td>2.8</td>
<td>15</td>
</tr>
</tbody>
</table>

**AIRFLOW PERFORMANCE**

<table>
<thead>
<tr>
<th>Motor HP Phase</th>
<th>External Static pressure (inches Water Column)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>1.0 Single Phase</td>
<td>1,535 CFM</td>
</tr>
<tr>
<td>1.0 Three Phase</td>
<td>1,630 CFM</td>
</tr>
</tbody>
</table>

*Performance Ratings assume standard-equipment 2” MERV-8 filters in clean condition.

**SUPPLEMENTAL MANUALS AVAILABLE FOR THE HE1.5XRT**

- ECM Option
- Factory Installed Optional Dampers
- Filter Alarms
- Controls
- Commercial Unit Start-Up
- VFD Option
The HE1.5XRT is available from the factory in four different configurations to meet different connection requirements:

### OPTION CODE

<table>
<thead>
<tr>
<th>OPTION CODE</th>
<th>DESCRIPTION OF DUCT CONNECTION CONFIGURATION</th>
<th>MOUNTING OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE1.5XRTV</td>
<td>Room Air [RA] enters bottom of unit. Fresh Air [FA] exits bottom of unit.</td>
<td>Roof Curb</td>
</tr>
<tr>
<td>HE1.5XRTR</td>
<td>Room Air [RA] enters bottom of unit. Fresh Air [FA] exits side of unit.</td>
<td>Roof Curb</td>
</tr>
<tr>
<td>HE1.5XRTF</td>
<td>Room Air [RA] enters side of unit. Fresh Air [FA] exits bottom of unit.</td>
<td>Roof Curb</td>
</tr>
<tr>
<td>HE1.5XRTH</td>
<td>Room Air [RA] enters side of unit. Fresh Air [FA] exits side of unit.</td>
<td>Equipment Rail</td>
</tr>
</tbody>
</table>

### STANDARD CONFIGURATION

- **RA** = Room Air into Unit
- **OA** = Outside Air into Unit
- **FA** = Fresh Air to Inside
- **EA** = Exhaust Air to Outside

---

- **HE1.5XRTV**
  - [Diagram]
- **HE1.5XRTR**
  - [Diagram]
- **HE1.5XRTF**
  - [Diagram]
- **HE1.5XRTH**
  - [Diagram]
PLACEMENT OF THE HE1.5XRT
The HE1.5XRT is designed for installation on a roof or other outside location. Select a location that is central to the inside duct runs, and close to any other air handler that might be part of the system.

CAUTION
It is the installer’s responsibility to make sure that the screws or bolts used for securing the units are properly selected for the loads and substrates involved. Secure the HE1.5XRT so that it cannot fall or tip in the event of accident, structural failure or earthquake. See Rigging Information for unit weight. RenewAire strongly recommends that you secure rooftop units properly to the building structure.

Provide service access to the unit to allow for cleaning the core and filter.

CAUTION
Provide Adequate Service Access for Maintenance. The HE1.5XRT will require regular filter and core inspections. Install the HE1.5XRT where you can open the doors for cleaning the core and replacing the filters, and where you can get at the wiring for installation and service. Observe all safety precautions when working on roofs, including locating the unit away from roof edges, provision of safety railings and use of fall protection equipment.
There are pairs of rigging holes at each upper corner of the unit. Use slings or shackles at all four corners. Spreader bars are recommended in order to avoid damage to the unit.

**HE1.5XRT UNIT CORNER WEIGHTS (LBS)**

<table>
<thead>
<tr>
<th>PHASE</th>
<th>UNIT</th>
<th>LF</th>
<th>LR</th>
<th>RR</th>
<th>RF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-PHASE &amp; 3-PHASE</td>
<td>395</td>
<td>94</td>
<td>81</td>
<td>102</td>
<td>117</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHASE</th>
<th>UNIT</th>
<th>LF</th>
<th>LR</th>
<th>RR</th>
<th>RF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-PHASE &amp; 3-PHASE</td>
<td>504</td>
<td>120</td>
<td>104</td>
<td>130</td>
<td>150</td>
</tr>
</tbody>
</table>

*Indicates locations at which corner weights are calculated along centers of curb rails.*

**CURB CROSS-SECTION A-A (TYP.)**

**SECTION A-A**

---

1. **ABBREVIATIONS**

- **RTH:** Rooftop Horizontal RA & FA
- **RTV:** Rooftop Vertical RA & FA
- **FA:** Fresh Air to inside
- **RA:** Room Air to be exhausted
- **OA:** Outside Air intake
- **EA:** Exhaust Air to outside

2. **SPECIFICATIONS MAY BE SUBJECT TO CHANGE WITHOUT NOTICE.**

- **NOTE:** Unit must be installed in orientation shown.

- **INSTALLATION ORIENTATION**
  - **RTH:** Rooftop Horizontal RA & FA
  - **RTV:** Rooftop Vertical RA & FA
  - **FA:** Fresh Air to inside
  - **RA:** Room Air to be exhausted
  - **OA:** Outside Air intake
  - **EA:** Exhaust Air to outside

- **NEAREST EIGHTH OF AN INCH.**

- **DIMENSIONS ARE ROUNDED TO THE**
  - **1:** UNLESS OTHERWISE SPECIFIED,
  - **NOTE:**
  - INSTALLATION ORIENTATION
  - **RTR:** Rooftop Vertical RA Only
  - **RTV:** Rooftop Vertical RA & FA
  - **FA:** Fresh Air to inside
  - **RA:** Room Air to be exhausted
  - **OA:** Outside Air intake
  - **EA:** Exhaust Air to outside

- **Duct Flange**
  - **FA (RTH, RTR)**
  - **RTV, RTR**

- **E-Box**
  - **wiring in bottom of**

- **Location**
  - **EA Damper**

- **Area**

- **TO CHANGE WITHOUT NOTICE.**

- **Taps (4) Typ.**

- **Pressure**

- **Switch**

- **Disconnect**

- **Wooden Nailer**

- **Neoprene Gasket**

- **3/4” X 3 1/2” Wooden Nailer**

- **SECTION A-A**

---

**ERGE1.5XRT**

**ERV**

**INSTALLATION**

**RIGGING**

**INFORMATION**
Take these simple steps to attenuate noise from the unit.

**Outside the building:**
The intake (OA) hood is the primary source of noise outside the building. When practical, orient the outtake air hood to point away from houses or public areas.

**At the Curb:**
Cut the holes in the roof deck to fit closely around the duct(s) passing through the roof deck. Seal all gaps around the duct(s) at the roof deck.

**Ducts:**
Make sure the ductwork at the unit outlets is stiff enough to resist the flexure and resulting booming associated with system start-up and shut-off.

In general, provide smooth transitions from the ERV’s outlets to the duct. The ducts connecting to the outlets should be straight for a sufficient distance, with gradual transitions to the final duct size.

These guidelines are consistent with SMACNA recommended duct layout practices for efficient and quiet air movement. Follow SMACNA guidelines.

**Radiated Noise**
The HE1.5XRT is insulated with high-density fiberglass. This provides significant attenuation of radiated sound from the unit itself.

The RA connector duct can be significant sources of radiated sound as well. The RA duct should be insulated for sound control. This insulation should start at the unit. At a minimum the first ten feet of duct should be insulated. All parts of the FA and RA ducts located in a mechanical space with noise-generating equipment also should be insulated for sound control, both to minimize sound radiation out of the FA duct, and also to control sound radiation into both ducts.
FIELD CONVERSION OF OPENINGS
The HE1.5-RT is designed to allow field conversion of the Return Air (RA) and Fresh Air (FA) unit openings. This means the RA motorized impeller subassembly can be moved to an adjacent side or base of the unit if that opening is preferred. The FA outlet opening can also be moved to an adjacent wall or base.

Before you start, plan the duct work layout.
Determine which openings are to be converted.
- Turn off the disconnect switch on the unit.
- Make sure electrical power is shut off to the unit and disconnect switch.
- Open the access doors to the unit.
- Remove the core strap, filters, and energy exchanger cores from the unit.

TO FIELD CONVERT INLET OPENING
1. Disconnect motor harness connector by the motor. Move the wire harness out of the way if necessary.
2. Support the impeller subassembly. Remove the eight ¼-20 bolts retaining the impeller subassembly plate to the side rails and front and back tabs.
3. Lift the entire impeller subassembly out of the unit and set aside. Leave the rails in the unit.
4. Remove the patch pan from the desired opening. Note: The RA patch pan may be on the underside of the base pan. Safely access the underside of the unit to remove the patch pan.
5. Using the exposed sheet metal cutout, cut the insulation from the desired opening.
6. Seal the edges of the cut insulation to prevent erosion of the insulation edges and having debris in the air stream.
7. Install the patch pan over the undesired opening. Note: The RA patch pan may be installed on the underside of the base pan. Safely access the underside of the unit to install the patch pan.
8. Install the insulation in the undesired opening. Seal the insulation.
9. At this point, if the Fresh Air (FA) outlet opening is to be converted, you will want to address it before proceeding with the RA inlet opening.
10. After converting the FA outlet opening proceed with the RA inlet opening.
11. Install the impeller subassembly into the new inlet opening and fasten with eight ¼-20 bolts to retain to the side rails and front and back tabs. Make sure the motor harness connector is towards the front of the unit.
12. Connect the motor harness.
13. Tidy up any wire harnesses that were moved making sure motor wires are taut and away from the impeller blades.

After completion of the field conversion,
- Clean out the interior of the unit to remove any debris.
- Install energy exchanger cores, filters, and core strap.
### INSTALLATION

#### PLANNING YOUR INSTALLATION

**CONNECTING HORIZONTAL DUCTS TO UNIT**

Flanged duct connections are provided on the horizontal duct connections of the HE1.5XRTR, RTF, and RTH units. These allow for connection of ducts

- Duct flange size: 18” x 18”

---

#### WARNING

The unit’s fresh air inlet should be at least 10’ away from any exhaust, such as dryer vents, chimneys, furnace and water heater exhausts, or other sources of contamination or carbon monoxide. Do not locate the fresh air inlet where vehicles may be serviced or left idling. Never locate the unit inside a structure.

Danger of damage or severe injury if high winds move this unit. Secure unit to structure. Observe local code requirements at a minimum.

---

**INSIDE DUCTWORK SYSTEM**

**Follow Engineer's Ductwork Design**

Ductwork should be designed by an engineer to allow the unit to provide the required airflow.

**Duct Insulation**

If the inside ducts run through un-conditioned spaces, they must be insulated, with a sealed vapor barrier on both inside and outside of insulation.

**APPLICATIONS**

See figure F4 for examples of some common installation approaches.

---

**Use Dampers to Set and Balance Airflow Rates**

In most applications, the airflow rate for both the Fresh Air and the Exhaust Air should be roughly equal (or “balanced”) for best performance of the HE1.5XRT Unit. See unit specification sheet for CFM/ESP curves for available horsepower motors.

---

**F4  Common Installation Approaches**
BASIC REQUIREMENTS
Always connect an RA and an FA duct to each Rooftop unit.

- With Rooftop units, the RA and FA ducts cannot be interchanged.
- With RTV units, both ducts are inside the building. In other units, such as the RTR/RTF and RTH, at least one of the ducts is outside and must be weatherized.
- Any weatherized duct must be thermally insulated to prevent condensation on the inside or outside of the duct. The duct lining must be vapor-sealed, and the duct exterior must be rain tight. Duct(s) connected to the bottom of the HE1.5XRT are generally installed at this time.

Install (2) ducts with HE1.5XRTV, (1) duct with HE1.5XRTR or RTF.

Ducts should be insulated on the inside or the outside:
- If insulation is applied to outside of duct, duct should be 14” x 14”, with 2” or 3” lips turned out at the top.
- If insulation is applied to inside of duct, duct should be 16” x 16”, with 1” or 2” lips turned out at the top.

Drop duct(s) into openings in top of roof curb.
Install appropriate gasket on top of Roof Curb and edges of ducts.

CAUTION
Tape both inner and outer vapor barriers of insulated duct to collars on duct adapters. This is critical to prevent migration of moisture into insulation. Build-up of moisture can result in failure of the duct system and/or frost in the insulation. Make sure any tears in the inner and outer vapor barriers are sealed.

MOUNTING THE UNIT - ON ROOF CURBS
The base of the HE1.5XRT is designed for installation on typical Roof Curbs that come with 1½” wide wood nailers on the top edge. See figure 3 in Planning Your Installation for appropriate curb size.

Set HE1.5XRT in place. We recommend bolting through sides of unit base into the Roof Curb to secure the unit against high winds.

ON EQUIPMENT RAILS (HE1.5XRT only)
Review drawing of Roof Curb and specify Equipment Rail to fit. 

Before installing HE1.5XRT, 

apply roofing and counterflashing to Equipment Rails as per standard practice.

Set HE1.5XRT in place. We recommend bolting through sides of unit base into the Equipment Rails to secure the unit against high winds.

OPTIONAL CURB CLIPS
If the optional curb clip kit is supplied, the clips must be installed on the curb before installing the unit. Refer to instructions supplied with the Curb Clip Kit.

ELECTRICAL SPECIFICATIONS
NOTE: If your unit is equipped with ECM Motors, please refer to “ECM Motor Manual Supplement” for more detail.

Electrical Options and Ratings are identified on the Unit Label (located near electrical box). Find the complete Unit Model Number in the lower left corner of the Unit Label.

CAUTION
Before bringing power to the unit check unit nameplate to confirm it matches the voltage and phase of the power you are supplying. Remember that your field connections need to be accessible for inspection.
HE1.5XRT P1  WIRING SCHEMATICS - STANDARD

DO NOT interconnect this unit’s Class 2 Power Supply with an External Power Supply.

"UNIT CONTROL USING CLASS II 24VAC POWER PROVIDED BY THIS UNIT" 24VAC POWER AVAILABLE AT TERMINALS 1 & 2  INSTALL PROVIDED JUMPER BETWEEN TERMINALS 2 & 3

"UNIT CONTROL USING CLASS II 24VAC POWER FROM ANOTHER POWER SOURCE" 24VAC POWER AVAILABLE AT TERMINALS 1 & 2  DO NOT INSTALL JUMPER BETWEEN TERMINALS 2 & 3

KEY:
- "FA" = Fresh Outside Air Blower
- "EA" = Exhaust Air Blower

FACTORY WIRING HIGH-VOLTAGE
FACTORY WIRING 24VAC
FIELD WIRING HIGH-VOLTAGE
FIELD WIRING 24VAC

HE1.5XRT P3  WIRING SCHEMATICS - STANDARD

DO NOT interconnect this unit’s Class 2 Power Supply with an External Power Supply.

"UNIT CONTROL USING CLASS II 24VAC POWER PROVIDED BY THIS UNIT" 24VAC POWER AVAILABLE AT TERMINALS 1 & 2  INSTALL PROVIDED JUMPER BETWEEN TERMINALS 2 & 3

"UNIT CONTROL USING CLASS II 24VAC POWER FROM ANOTHER POWER SOURCE" 24VAC POWER AVAILABLE AT TERMINALS 1 & 2  DO NOT INSTALL JUMPER BETWEEN TERMINALS 2 & 3

KEY:
- "FA" = Fresh Outside Air Blower
- "EA" = Exhaust Air Blower

FACTORY WIRING HIGH-VOLTAGE
FACTORY WIRING 24VAC
FIELD WIRING HIGH-VOLTAGE
FIELD WIRING 24VAC
HE1.5XRT P1 IBC  SINGLE PHASE UNIT WITH INDEPENDENT BLOWER CONTROL

POWER SUPPLY - 60 Hz
SEE UNIT RATING LABEL
FOR PHASE, VOLTAGE, MCA AND MOPD.
DO NOT INSTALL PROVIDED JUMPER BETWEEN TERMINALS 2 & 3.

UNIT DISCONNECT
This wire printed with single phase power supply.

DO NOT interconnect this unit's Class 2 Power Supply with an External Power Supply.

KEY:
"FA" = Fresh Outside Air Blower
"EA" = Exhaust Air Blower
FACTORY WIRING HIGH-VOLTAGE
FACTORY WIRING 24VAC
FIELD WIRING HIGH-VOLTAGE
FIELD WIRING 24VAC

HE1.5XRT P3 IBC  SINGLE PHASE UNIT WITH INDEPENDENT BLOWER CONTROL

POWER SUPPLY - 60 Hz
SEE UNIT RATING LABEL
FOR PHASE, VOLTAGE, MCA AND MOPD.

UNIT DISCONNECT
This wire printed with single phase power supply.

DO NOT interconnect this unit's Class 2 Power Supply with an External Power Supply.

KEY:
"FA" = Fresh Outside Air Blower
"EA" = Exhaust Air Blower
FACTORY WIRING HIGH-VOLTAGE
FACTORY WIRING 24VAC
FIELD WIRING HIGH-VOLTAGE
FIELD WIRING 24VAC
**INSTALLATION**

**INSTALLATION INSTRUCTION**

**LOW VOLTAGE CONTROL SYSTEM**

This ERV is provided with a Class II 24VAC power supply system that operates the unit’s contactor(s) for HE1.5XRT. The ERV’s 24VAC Power Supply can also be used to power the externally-installed controls system: up to 8VA of power is available.

The unit’s power supply system includes isolation relay(s) so you can use external controls whose contact ratings are as low as 50mA (1.2VA). Also, it is possible to operate the isolation relays with 24VAC power from an external source (with proper wiring connections).

A built-in circuit-breaker prevents damage to the transformer and other low-voltage components in the event of a short-circuit or overload. In extreme cases, the transformer itself is designed to fail safely.

**SPECIFICATIONS**

- Nominal Output Voltage under load: 24VAC
- Typical Output Voltage at no load: 29-31V
- Minimum contact rating for connected control device: (50mA (1.2VA)
- Circuit Breaker Trip Point: 3A

**CAUTION**

- If primary-side voltage is 230VAC, move black primary-side lead from transformer’s “208V” terminal to the transformer’s terminal marked “240V” (“230V” in some units). Do not move the black primary-side lead that is connected to the transformer’s “COM” terminal.

**WARNING**

**DANGER OF INJURY OR DAMAGE.**

The motors in this unit must not be run at an amperage that exceeds the motor’s rated full load amps. It is the installer’s responsibility to measure the operating amperage of each motor. If the full load amp rating is exceeded, the amp draw must be reduced by reducing airflow with an external damper.

Failure to make this adjustment may result in unsafe motor winding temperatures or tripping of the motor thermal protection.

**CAUTION**

1. Connect only to components intended for use with 24VAC power.
2. Do not undersize the low-voltage wires connected to this device. Observe the wire length and gauge limits indicated in this manual.
3. Do not overload this unit’s 24VAC power supply system. Confirm that the power requirements of devices you connect to this power supply system do not exceed 8VA in total.
4. If an external source of 24VAC power is used to control the unit, consult the wiring schematics and connect the external power only to the specified terminals in order to avoid damaging the unit or external controls. Connect only CLASS II power to the control terminals of this unit.
5. Unit is not equipped to receive analog signals (such as 1-10vdc or 4-20mA).
6. Unit is not equipped to communicate directly with Building Management Systems (such as BACNET, LONWORKs, etc.). However, the unit can be controlled by powered or non-powered contacts operated by any kind of control system.

**HOW TO RESET THE 24VAC CIRCUIT BREAKER**

If the transformer is subjected to an excessive load or a short circuit, the circuit breaker will trip to prevent the failure of the transformer. When it trips the circuit breaker’s button pops up. Shut off the primary-side power to the unit, and remove the excessive load or the short. The circuit breaker can be reset about fifteen seconds after it trips by pressing in the button.

**Limits of Power Output**

If limits on wire gauge and length are observed, you may connect control devices that draw up to 8VA to the blue and red wires. More than one device can be connected as long as total steadystate load does not exceed 8VA.

**OBSERVE THESE LIMITS TO WIRE LENGTH AND GAUGE**

in order to ensure reliable operation of the control system.

<table>
<thead>
<tr>
<th>Wire Gauge</th>
<th>#22</th>
<th>#20</th>
<th>#18</th>
<th>#16</th>
<th>#14</th>
<th>#12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit Length</td>
<td>100’</td>
<td>150’</td>
<td>250’</td>
<td>400’</td>
<td>700’</td>
<td>1000’</td>
</tr>
</tbody>
</table>

“Circuit Length” is distance from ERV to Control Device.
NOTE: The simplified schematics below show only the relevant portions of the low-voltage control circuit in the ERV unit and representational external control approaches. See the complete unit schematics elsewhere in this manual.

CONTROL WIRING EXAMPLES BY TYPE OF APPLICATION

A. Single 2-wire Control: Use this schematic if the control requires no power to operate and acts like a simple on/off switch. The control must not supply any power to the ERV unit. Install jumper (provided) between terminals 2 & 3. Connect the control’s contacts to terminals 1 & 4 to operate the ERV’s isolation relay.

Control on separate Power Supply, no power present at Control Output:
Wire as shown for the Single 2-wire control.

B. Control Sending 24VAC “On” Signal (from an external power source) to ERV: Make sure jumper is NOT installed between Terminals 2 & 3. Now you can safely apply 24VAC to the Terminals 3 & 4 to operate the ERV’s isolation relay.

C. Control System with 2 Non-powered Relay Contacts: ERVs with Independent Blower Control Only: Use this schematic if the external control system provides no voltage or current at its output contacts. Install jumper (provided) between terminals 2 & 3. Connect one side of each of the output contacts to Terminal 1. Connect the other side of the output contacts to the appropriate yellow leads: Terminal 4 for the “FA Blower”, and Terminal 5 for the “EA Blower”.

CAUTION
Be careful if the external control system provides 24VAC power at its control output: make sure blue and red leads are separately capped and not connected to any other wires.

CAUTION
Make sure the control provides no voltage or current at its output terminals.

CAUTION
Supply only 24VAC (not VdC) from a Class II Power Source.
CONTROL WIRING SCHEMATICS

D. Control System Sending two 24VAC “On” Signals (from an external power source): ERVs with Independent Blower Control Only: Make sure the jumper is NOT installed between Terminals 2 & 3. Now you can safely apply one of the 24VAC signals to Terminals 3 & 4 to operate the ERV’s isolation relay for the Fresh Air Blower. Apply the second 24VAC signal to Terminals 3 & 5 to operate the ERV’s isolation relay for the Exhaust Blower (make sure the polarity of each wire connected to Terminal 3 is the same).

E. Control operating on Unit’s 24VAC Power Supply: 24VAC power is available at the Terminals 1 & 2. CAUTION: external control system should not draw more than 8VA. Install jumper (provided) between terminals 2 & 3. Connect the switched output of the Control to Terminal 4 to operate the ERV’s isolation relay.

F. Control on separate Power Supply: Use this schematic only if no power is present at the controls output terminals. Install jumper at terminals 2 & 3. Connect the Control’s Normally Open (N.O.) contacts to terminals 1 & 4. NOTE: See Wiring Schematics.

G. Control System on separate Power Supply; Independent Blower Control: Use this schematic only if no power is present at the controls output terminals. Install jumper at terminals 2 & 3. Connect one of the Control’s (N.O.) contacts to terminals 1 & 4 to operate the ERV’s isolation relay for the Outside Air (OA) Blower. Connect another of the Control’s (N.O.) contacts to terminals 1 & 5 to operate the isolation relay for the Exhaust Air (EA) Blower. NOTE: See Wiring Schematics.

H. Control System Operating Isolation Dampers with End Switches: Use Isolation Dampers with electrically separate end switches. The end switches are used to separately control the ERV unit’s Isolation Relays. Also, specify the ERV with Independent Blower Control. This ensures that each damper is open before the respective blower starts up. NOTE: Because the ERV’s contact will only be operating once the Dampers are open, the power draw of the Damper Actuators is allowed to be as much as 35VA while opening (including power draw of the external control system, if any). However, the power draw of the fully-opened (stalled) Actuators (and external control system if any) must be less than 8VA.
PRINCIPAL OF OPERATION
The HE1.5XRT has one basic purpose: to exhaust air from a structure and bring in fresh air from outside, while transferring heating or cooling energy from the exhaust air to the fresh air.

CHECKING THAT UNIT IS OPERATING
Air Flow
Airflow should be occurring in both airstreams. Sometimes the easiest place to confirm that air is moving is at the weatherhoods.
If exact airflow is critical, it may be desirable to permanently install flow measuring stations and manometers in the ductwork connected to the unit. These also can be used to determine when filters should be cleaned or changed.

Use Static Taps in Doors to Measure Airflow Rates
See “Cross-Core Static Drop” in MEASURING AIRFLOW table. These may be used to directly measure airflow in the unit.

Energy Exchange
Precise determination of installed sensible energy exchange effectiveness requires careful measurement of temperatures and air flows in all four air streams, and in practice is somewhat difficult.

CONTINUOUS OPERATION
Continuous operation is acceptable in virtually all conditions. Unit will not be damaged by continuous operation as long as air flow occurs. Blower motors may overheat if filters become completely blocked due to lack of maintenance. Motors are thermally protected. With continuous operation, some external frosting may occur in very cold weather.

OPERATION IN EXTREME COLD WEATHER
Unit is capable of operating at outside temperatures down to -10°F, with indoor humidities below 40%, without any internal frosting. Unit can operate at more severe conditions occasionally with little or no impact on its performance. At lower humidities, it can operate at lower outside temperatures without freezing the energy-exchange core.

WARNING
Standard HE1.5XRT with single phase original equipment motors are NOT suitable for use with solid state speed control.
Three phase motors are NOT suitable for use with solid state speed control. If speed control is desired use the VFD option.
Single phase ECM motors are NOT suitable for use with solid state speed control. They already have speed control built into the motor electronics.

The HE1.5XRT is a very simple device, and will accomplish this purpose as long as the blowers for both airstreams are able to move air through the energy-exchange core.
It is possible to confirm that energy is being exchanged simply by feeling the ducts. If the Fresh Air duct from the unit into the room is closer to room temperature than to the outside temperature, energy is being recovered.

Operating Controls
A wide variety of control schemes may be selected by the engineer, installer, or owner to meet the ventilation needs of the facility. These may include timer clocks, occupancy sensors, dehumidistats (for cool-weather operation), carbon dioxide sensors, and others. DDC systems may also control the unit. Most control schemes will operate the unit only when needed.
START-UP

EQUIPMENT REQUIRED

- A maneghelic gauge or other device capable of measuring 0 to 1.5 in. water of differential pressure.
- 2 pieces of natural rubber latex tubing, 1/8” ID, 1/16” Wall works the best.

NOTE: Be sure to remove cap from pressure port before inserting tubing. Insure tubing is well seated in pressure ports.
NOTE: The tubing should extend in the pressure port approx. 1 inch.

CROSS CORE STATIC PRESSURE MEASUREMENT INSTRUCTIONS

The individual differential static pressures (DSP) can be measured using the installed pressure ports located in the front of the units core access doors.

NOTE: These ports have been carefully located on the unit as to give you the most accurate airflow measurement. Do not relocate pressure ports.

- To read SCFM of Room Air (RA) install the “high” pressure side (+) of your measuring device to the Room Air (RA) port and the “low” pressure side (-) to the Exhaust Air (EA) port.
- To read SCFM of Fresh Air (FA) install the “high” pressure side (+) of your measuring device to the Outside Air (OA) port and the “low” pressure side (-) to the Fresh Air (FA) port.
- Use the reading displayed on your measurement device to cross reference the CFM output using the conversion chart.

NOTE: Be sure to replace cap into pressure port when air flow measuring is completed.

<table>
<thead>
<tr>
<th>DIFFERENTIAL STATIC ACROSS CORE DSP VS. CFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP</td>
</tr>
<tr>
<td>HE1.5XRT</td>
</tr>
<tr>
<td>Fresh Air (FA) CFM</td>
</tr>
<tr>
<td>Room Air (RA) CFM</td>
</tr>
</tbody>
</table>

NOTE: Pressure drop of clean 2” MERV-8 Filters is included in the Unit Performance Ratings Table.

CAUTION
The proper operating airflow range for this model is 375 - 1400 CFM.

F1 MEASURING AIRFLOW

Pressure Taps (4)

EA
OA
FA RTH, RTR ONLY
RA RTV, RTF ONLY
FA RTV, RTF ONLY
RA RTV, RTR ONLY
FILTER SPECIFICATIONS

- (2) 14” x 20” x 2” and (2) 16” x 20” x 2” (nominal) pleated filters. Actual size: 13.5” x 19.5” x 1.75” and 15.5” x 19.5” x 1.75”.
- Optionally (4) 15” x 20” x 2” (nominal) pleated filters can be used. Actual size: 14.5” x 19.5” x 1.75”
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6

NOTE: clean filter pressure drop is included in unit airflow performance tables.

NOTE: pressure drop of standard filter is included in unit airflow performance tables.
Keep your ERV performing at its best by cleaning it as described below:

**TO CLEAN THE ENERGY EXCHANGE ELEMENT**
Vacuum the face of the energy exchange element yearly. Dust collects only on the entering face of the energy exchange element, right where the filter sits. The interior of the energy exchange element stays clean even if the element faces are dust covered.

1. Remove the filters (see below)
2. Vacuum the exposed faces of the energy exchange element with a soft brush attachment
3. Vacuum out dust from the rest of the unit case
4. Install new filters

**INSPECT AND CHANGE THE FILTERS REGULARLY.**
Inspect and/or replace filters every two or three months when the HE1.5XRT is in regular use, or as needed. Filters must be used or the energy exchange core will become blocked by dust and the unit will not do its job. In extreme cases components may be damaged.

1. To access the filters unlatch the access door.
2. Pull the dirty filters out and replace with new filters.

**NOTE:** The filters supplied in the unit are usually able to keep the energy exchange core clear for several months. Finer filters can be used but must be cleaned more often. If using finer filters, their increased resistance to flow must be allowed for in the system design.

**MOTOR MAINTENANCE**
The motor needs no lubrication. If necessary vacuum clean the blower wheels at the same time you clean the face of the energy exchange element (annually).

**WARNING**
Danger of Electrical Shock when servicing an installed unit.

**ALWAYS DISCONNECT POWER SOURCE BEFORE SERVICING!** More than one disconnect switch may be required.

Proper Wiring Size Selection and Wiring Installation are the Responsibility of the Electrical Contractor.

**CAUTION**
**DO NOT WASH THE ENERGY EXCHANGE CORE.**
Keep it away from water or fire to avoid damaging it. Always handle the core carefully.

**WARNING**
**RISK OF INJURY OR DAMAGE.**
Motor has an automatic reset thermal protector. Disconnect power before servicing or resetting motor thermal protector. Use caution, motor may be hot. The motor must cool before it resets the thermal protector.

If the motor thermal protector tripped, correct the issue that caused the motor to overheat (e.g., over motor rated amperage or locked rotor).
UNMATCHED VENTILATION SUPPORT

As much as our unsurpassed quality and performance, our customers can also depend on our professional support staff for swift, professional assistance with all their technical, application, and service needs. Every time. Anywhere.

At RenewAire — unlike other ventilation suppliers — advanced ventilation solutions are all we do. Our sole passion. Which is why for all commercial projects, we are the “V” in HVAC... and the only name you need to know.