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NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury or property damage. Consult a qualified installer, service agency or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings and cautions included in literature and attached to the unit. Consult local building codes and the current edition of the National Electrical Code (NEC) NFPA 70.

In Canada, refer to the current editions of the Canadian Electrical Code CSA C22.1.

Recognize safety information. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards, which will result in severe personal injury or death. WARNING signifies hazards, which could result in personal injury or death. CAUTION is used to identify unsafe practices, which may result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

INTRODUCTION

The ERVCCLHA Energy Recovery Ventilator is used to exchange indoor stale air with outside fresh air. The unit is equipped with a special energy recovery core which transfers both sensible and latent heat between the fresh incoming air. The cross-flow design core allows entering and leaving air streams to transfer heat energy without mixing. (See Fig. 2.)

The ERVCCLHA is available in 2 sizes with airflow ranges of 60-148 CFM (28 - 71 L/s), and 60-183 CFM (28 - 89 L/s). The design of this unit is horizontal. Special attention should be given to duct application, balancing the ERV, and locating unit for easy access and routine maintenance.

INSTALLATION CONSIDERATIONS

Inspect Equipment

Move carton to final installation location. Remove ERVCCLHA from carton taking care not to damage unit. Remove all packaging and inspect unit for damage. Remove parts bag from inside unit. File claim with shipping company if shipment is damaged or incomplete. Check to make sure ERV unit matches Fig.1.

Select Location

The ERV should be located in a conditioned space and in close proximity to a fused power source. It should be easily accessible for routine maintenance.

If ERV is installed independent of a forced-air system, unit should be located near the center of the air distribution system. If ERV is installed in conjunction with a forced-air system, unit should be located next to (or close to) the indoor equipment.

Fig. 1 - ERVCCLHA Energy Recovery Ventilator
**Component Description**

The following listed items are components of ERVCCLHA (see Fig. 3).

1. Stale air return from building connected to return-air duct system.
2. Fresh-air intake connected to outdoor air inlet hood.
3. Exhaust-air connected to outdoor air exhaust hood.
4. Mechanical filters trap dust contained in the air.
5. Energy recovery core is a cross-flow type. It transfers sensible and latent energy between the 2 air streams.
6. Blowers bring in fresh-air from outside and exhaust stale-air to outside.
7. Electronic control circuit ensures proper unit operation.
8. Fresh-air supply from ERV connected to return-air duct of forced air system.
9. Terminal connector block for wiring wall and timer controls.
10. Electrical cord connects to standard 115v outlet.

**UNIT INSTALLATION**

**UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage or improper operation.

Do not install ERV in a corrosive or contaminated atmosphere.

**Mount Unit**

The ERV can be suspended from floor joists using chains and 4 springs. Attach metal hanging bracket to all 4 sides of cabinet (see Fig. 4). The unit may be installed on a shelf if an isolation pad is provided to dampen vibration. Unit should always be installed as level as possible.

**Independent System Application**

In the absence of a forced-air system and a typical duct system layout, the ERV can be applied as an independent or stand alone unit. To ensure comfort, this type of application involves running both fresh-air and return-air registers (or stale-air pickup registers) throughout the home.

Fresh-air registers are normally located in bedrooms, dining rooms, living rooms, and basements. It is recommended that registers be placed 6 to 12” (152 to 305 mm) from the ceiling on an interior wall and airflow directed toward the ceiling. If registers are floor installed, airflow should be directed toward the wall.

**Forced-Air Application**

Most ERV applications will be installed in conjunction with new or existing forced-air systems. To operate properly, the fresh-air supply and stale-air return from ERV connect directly to return-air duct system. This is how the ERV distributes fresh air and removes stale air from inside of building (see Fig. 5). For these installations, furnace or fan coil blower must be interlocked and operate continuously whenever ERV is energized.

**NOTE:** The fresh air from ERV is introduced into return-air duct at a point no less than 6 ft (1.8 m) upstream of furnace or fan coil. This connection should be direct (see Fig. 5). This is to allow incoming fresh-air to mix before entering indoor equipment.

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**CARBON MONOXIDE POISONING HAZARD**

Failure to follow this warning could result in personal injury or death.

Do not install return-air registers (or stale-air pickup registers) in same room as gas furnace or water heater.

Return-air (or stale-air pickup registers) are normally located to draw from kitchens, bathrooms, basements, or other rooms where stale-air can exist.

Proper size and type of registers must be used to minimize pressure drop. The velocity of airflow through register should not be above 400 ft per minute.

Maximum length of duct for the system should be designed according to the highest speed of the unit. Refer to specifications listed in unit Product Data Digest for ventilation capacities.
Connect Ducts to ERV

**PROPERTY DAMAGE HAZARD**

Failure to follow this caution may result in minor property damage from sweating duct or loss of unit efficiency and capacity.

ERV should be installed in a conditioned space with insulated flex duct for supply and exhaust air to the outdoor ambient.

**CAUTION**

Insulated flexible duct is required on both fresh-air inlet and exhaust-air outlet ducts connecting to exterior wall. When using insulated flexible duct, the vapor barrier of the flexible ducts must be taped very tightly to prevent condensation problems. To reduce pressure drop, stretch the flex duct and support it in a proper manner to avoid reduced airflow.

When connecting the ERV to a return-air duct system, insulated flexible duct can be used. When using metal duct from fresh-air supply to system duct work, the metal duct should be insulated (see Fig. 6). However, when metal or rigid ducts are applied use approximately 18” (457 mm) of flexible duct at ERV ports for fresh-air supply and stale-air return. This can act as a silencer when connecting ducts to return-air duct system. This should eliminate transmission of noise or vibration from unit to main duct system. In addition, there are four 30” (762 mm) duct ties provided to help fasten flexible duct to port on ERV.

**Locate and Install Exterior Hoods**

**IMPORTANT:** To prevent condensation problems, insulated flexible ducts are required on both fresh-air inlet and exhaust-air outlet ducts connecting between ERV and exterior wall.

Fresh-air intake and stale-air exhaust must be separated by at least 6 ft (1.8 m). Fresh-air intake must be positioned at least 10 ft (3 m) from nearest dryer vent, furnace exhaust, driveway, gas meter, or oil fill pipe. Fresh-air intake must be positioned as far as possible from garbage containers and potential chemical fumes. When possible, it is advised to locate the intake and exhaust hoods on same side of house or building. The intake and exhaust hoods should never be located on interior corners or in dead air pockets (see Fig. 5). Both intake and exhaust hoods must be 18” (457 mm) from ground and at least 12” (305 mm) above anticipated snow level.

After selecting proper hood locations, make appropriate size hole through exterior wall, pass flexible duct through hole and insert hood tube into duct. Tape duct vapor barrier tightly around hood tube and insert assembly back into wall and fasten securely.

**Wall Control**

**Location**

The ERV wall control is unique to this unit. The ERV will not operate without it. This control senses humidity not temperature. It must be located in an area where it will continually monitor fresh air circulating within the home. Install ERV wall control as close as possible to main system thermostat and follow same guidelines as installing a thermostat (locate approximately 5 ft (1.5 m) above floor, mount on an inside partitioning wall, etc.).

**Wiring**

Remove top cover assembly from wall control and pass thermostat wire through hole located on back of control before attaching to wall. Connect Y, R, G, and B (yellow, red, green, and black) between wall control and ERV connector following color code (see Fig. 7 and 8). Replace top cover assembly.

**NOTE:** ERV wall control and circuit board operate on 12 VDC.
The ERV wall control has 4 basic modes of operation, OFF, LOW, HIGH, and INTERMITTENT. Be sure that all modes of operation are fully functional. See Table 1 indicating standard control operation.

1. With switch OFF, ERV is inoperative and the LED is out.
2. With switch on LOW, ERV continuously exchanges air with outside. If control is satisfied, blower will run in low speed, otherwise, blower will run on HIGH speed. The LED is illuminated all the time.
3. INTERMITTENT-If relative humidity level inside of building is higher than setpoint, then no air exchange will occur and ERV shuts off. If relative humidity level inside building is lower than setpoint, then air exchange occurs at high speed, and shuts down ERV when humidity level reaches setpoint. This mode is ideal for maintaining proper humidity level when continuous mode cannot. To ensure highest degree of humidity control in cooling season, intermittent mode should be used.

Humidity Selection
The humidity selector is a built-in control designed to properly control the level of humidity in the house during the summer months. This acts like a limit switch. See Table 2 to select maximum humidity level. If the house becomes too dry in winter months, put wall control in INTERMITTENT mode and turn down humidity selector to provide ventilation less frequently.

Table 1 – Basic Control

<table>
<thead>
<tr>
<th>MODE</th>
<th>OPERATION</th>
<th>DAMPER POSITION</th>
<th>FAN SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Off</td>
<td>Closed to outside</td>
<td>Off</td>
</tr>
<tr>
<td>Low</td>
<td>Air exchange with outside</td>
<td>Open to outside</td>
<td>Low</td>
</tr>
<tr>
<td>Intermittent</td>
<td>Air exchange with outside</td>
<td>Open to outside</td>
<td>Low</td>
</tr>
<tr>
<td>High</td>
<td>Air exchange with outside</td>
<td>Open to outside</td>
<td>High</td>
</tr>
</tbody>
</table>

Table 2 – Recommended Humidity Levels

<table>
<thead>
<tr>
<th>OUTSIDE TEMPERATURE</th>
<th>DOUBLE-PANE WINDOWS</th>
<th>TRIPLE-PANE WINDOWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>50°F / 10°C</td>
<td>55%</td>
<td>65%</td>
</tr>
<tr>
<td>32°F / 0°C</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>14°F / -10°C</td>
<td>35%</td>
<td>45%</td>
</tr>
<tr>
<td>-4°F / -20°C</td>
<td>30%</td>
<td>45%</td>
</tr>
<tr>
<td>-22°F / -30°C</td>
<td>25%</td>
<td>35%</td>
</tr>
</tbody>
</table>

NOTE: The ERV may be controlled using the Infinity system control. The ERV may be connected using either a NIM or a 4-Zone Damper Module. See the appropriate instructions if using the NIM of a 4-Zone Damper Module for connection instructions.

### OneTouch Control

The OneTouch control may be used as the primary wall control for the ERV. This control will step through the modes of operation with consecutive presses of the button. The LED indicates which mode is currently selected; Off, Intermittent, Low, or High. There is no humidity sensor on the OneTouch, and it will not provide direct humidity control.

### Latent Control

NOTE: To ensure highest degree of humidity control in cooling season, the INTERMITTENT mode should be used.

Blower interlock relay is not needed for use with the Infinity system control. The Infinity system control will simultaneously control the ERV and the indoor blower.

Push Button Timers may be used and are connected to the ERV as shown in Figure 9. However, the Infinity system should be set to continuous fan to ensure that the fresh air is circulated in the home. In a Zoned System, at least one zone should be set to continuous fan.

### OPERATING THE ERV WITH THE INFINITY CONTROL

The ventilator has four settings in heating mode and three settings in cooling mode.

**Heating:**
- AUTO - the ventilator selects the speed based on indoor humidity and outdoor temperature. It may cycle on/off every 30 minutes depending on humidity and outside temperature.
- LOW - low speed all of the time.
- HIGH - high speed all of the time.
ERV - will only turn on if humidity is 3% over setpoint. The speed is determined by indoor humidity and outdoor temperature.

**Cooling:**
- AUTO - the ventilator selects the speed based on indoor humidity and outdoor temperature. It may cycle on/off every 30 minutes depending on humidity and outside temperature.
- LOW - low speed all of the time.
- HIGH - high speed all of the time.

If the fan speed is set to Auto and the ventilator wants to run, the fan speed will run at High continuous speed. Otherwise, the fan will stay at the chosen continuous fan speed.

**ELECTRICAL CONNECTIONS**

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELECTRICAL SHOCK HAZARD</strong></td>
</tr>
<tr>
<td>Failure to follow this warning could result in personal injury or death.</td>
</tr>
</tbody>
</table>

Before installing or servicing system, always turn off main power to system. There may be more than 1 disconnect switch.

**115 VAC Wiring**
The ERV operates on 115 VAC. It comes with a power cord attached to unit and ready to plug into a fused outlet. Unit must be grounded for proper operation.

All electrical connections must comply with National and Local Electrical Codes, or other ordinances that might apply.

**12 VDC Wiring**
The ERV circuit board, wall control, and accessories operate on 12 VDC. See Wall Control section, item Wiring and Fig. 7 and 8 for more information.

The ERV comes with an integrated interlock. The interlock can be wired to the system blower to ensure that the blower is running when there is a call for ventilation. See the wiring diagram for proper wiring of the interlock circuit.

**ACCESSORIES**

**20 Minute Timer**
A push button timer can be used to override the wall control and put the ERV into high speed for 20 minutes. Connect switches in parallel and connect leads to ERV terminals I, OC, and OL (see Fig. 9). Push button locations are ideal in special activity areas, such as bathrooms or kitchens, where high-speed exhaust operation is needed for a short period of time.

**NOTE:** The 20 minute timer will not function properly unless ERV wall control is applied and working correctly. Timing function is internal to electronic circuit board, it is activated by a momentary contact between OC and OL. The I connection is to illuminate the push button. The maximum number of push button timers that can be applied is 5.

**60 Minute Adjustable Timer**
A 60 minute adjustable timer can also be used to override wall control and put ERV into high-speed operation for a select amount of time. Connect timer in parallel with push button timers, or to ERV terminals OC and OL (see Fig. 9).

**BALANCING ERV**
Balancing intake and exhaust airflow is very important for proper system operation and optimum performance when applying an ERV. Unit balancing prevents a positive and/or negative pressure within the home. Balancing the ERV is done by using balancing dampers in the fresh air intake and stale air exhaust ducts.

Airflow is determined by temporarily connecting a magnehelic gauge to the pressure taps on ERV. (See Fig. 10.) Balancing chart is located on unit door.

If supply-air from outside is greater than exhaust-air from the house, an imbalance can result over pressurizing the home. If exhaust-air is greater than supply-air, combustion appliances may backdraft, bringing exhaust fumes into the house. A balanced condition will ensure optimum performance, provide satisfied customers, and avoid expensive callbacks.

Before proceeding with balancing, all windows, doors, and fireplace flues should be tightly closed. No exhaust systems such as range top exhausts, dryer exhaust, fume hoods, bath or roof fans should be in operation. The forced-air furnace (if used for circulation) should be operating in continuous fan mode for normal operating speed.

**Balancing Procedure**

**Step 1 — Set the unit to high speed.**
Make sure that the furnace/air handler blower is ON if the installation is in any way connected to the ductwork of the cold air return. If not, leave furnace/air handler blower OFF. If the outside temperature is below 32°F (0°C), make sure the unit is not running in defrost while balancing. (By waiting 10 minutes after plugging the unit in, you are assured that the unit is not in a defrost cycle.)

**Step 2 — Magnehelic gauge placement.**
Place the magnehelic gauge on a level surface and adjust it to zero.

**Step 3 — Connect tubing from gauge to EXHAUST air flow pressure taps.**
Be sure to connect the tubes to their appropriate high/low fittings. (See Fig. 11.) If the gauge drops below zero, reverse the tubing connections.

**NOTE:** It is suggested to start with the exhaust air flow reading because the exhaust has typically more restriction than the fresh air, especially in cases of fully ducted installations or source point ventilation. Place the magnehelic gauge upright and level. Record equivalent AIR FLOW of the reading according to the balancing chart.

**Step 4 — Move tubing to FRESH air flow pressure taps.**
Adjust the fresh air balancing damper until the fresh air flow is approximately the same as the EXHAUST air flow. If fresh air flow is less than exhaust air flow, then go back and adjust the exhaust balancing damper to equal the fresh air flow. (See Fig. 11.)

**Step 5 — Secure both dampers thumb screw in place with tape.**

**Step 6 — Record air flow information.**
Write the required air flow information on a label and stick it near the unit for future reference (date, maximum speed air flows, your name, phone number and business address).
NOTE: The unit is considered balanced even if there is a difference of ±10 CFM (or ±5 l/s or 17 m³/h) between the two air flows.

Balancing Dampers

Balancing dampers (sometimes called butterfly dampers) are located in fresh-air intake and stale-air exhaust of the ERV. (See Fig. 11.) Some field modification may be required to ensure proper adjustment of balancing dampers while located in flexible duct. Insulating over these dampers is strongly recommended after balancing is complete to prevent condensation problems.

NOTE: Temporary flow collars are not needed with the new ERVCCLHA models since the air flow pressure taps are incorporated in the access door. (See Fig. 11.)

VENTILATION EVALUATION

CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in reduced unit efficiency, capacity or unit life.

DO NOT use ERV during construction of a house or when sanding drywall. This type of dust may damage system.

Ventilator Sizing

Tables 3 and 4 should be used to determine the required airflow for a home. These guidelines are taken from ANSI/ASHRAE 62.2–2007.

<table>
<thead>
<tr>
<th>FLOOR AREA (ft²)</th>
<th>BEDROOMS</th>
<th>0–1</th>
<th>2–3</th>
<th>4–5</th>
<th>6–7</th>
<th>&gt;7</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1500</td>
<td></td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>1501–3000</td>
<td></td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
</tr>
<tr>
<td>3001–4500</td>
<td></td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
</tr>
<tr>
<td>4501–6000</td>
<td></td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
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<td>6001–7500</td>
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<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
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<tr>
<td>&gt;7500</td>
<td></td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
<td>165</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FLOOR AREA (m²)</th>
<th>BEDROOMS</th>
<th>0–1</th>
<th>2–3</th>
<th>4–5</th>
<th>6–7</th>
<th>&gt;7</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;139</td>
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<td>14</td>
<td>21</td>
<td>28</td>
<td>35</td>
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<td>139.1–279</td>
<td></td>
<td>21</td>
<td>28</td>
<td>35</td>
<td>42</td>
<td>50</td>
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<tr>
<td>279.1–418</td>
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<td>42</td>
<td>50</td>
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<td>57</td>
<td>64</td>
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<td>557.1–697</td>
<td></td>
<td>42</td>
<td>50</td>
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<td>64</td>
<td>71</td>
</tr>
<tr>
<td>&gt;697</td>
<td></td>
<td>50</td>
<td>57</td>
<td>64</td>
<td>71</td>
<td>78</td>
</tr>
</tbody>
</table>

CONTROL BOARD OPERATION

Board Function

To ensure proper operation of ERV, configuration jumpers are located on electronic control board and must match configuration setup shown in Fig. 12 under Jumper Table. Jumpers are factory set and do not require any changes unless control board is replaced. If control board is replaced, or unusual start-up operation is encountered, check jumpers to make sure they are located properly.

NOTE: Power disconnect for 30 seconds is required to reset the CPU when changing jumpers.

Outdoor Ambient Below 23° F (−5° C)

The ERV continually monitors outside air temperature. If outside air is at or below 23° F (−5° C), ERV will cycle between air exchange and defrost.

The ERV measure the incoming air temperature and will cycle unit in and out of defrost, depending on outdoor ambient. The intake damper will close and circulate indoor air through the core for 6 to 10 minutes. This time depends on jumper location. Refer to Table 5 for defrost cycle.

<table>
<thead>
<tr>
<th>OUTSIDE TEMP</th>
<th>STANDARD DEFROST (AS SHIPPED)</th>
<th>EXTENDED DEFROST (JUMPER JU1−F REMOVED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 23°F / −5°C</td>
<td>No Defrost</td>
<td>No Defrost</td>
</tr>
<tr>
<td>23 to 5°F / −5 to −15°C</td>
<td>10 Minute Defrost / 60 Minute Exchange</td>
<td>10 Minute Defrost / 30 Minute Exchange</td>
</tr>
<tr>
<td>4 to −17°F / −16 to −27°C</td>
<td>10 Minute Defrost / 30 Minute Exchange</td>
<td>10 Minute Defrost / 20 Minute Exchange</td>
</tr>
<tr>
<td>Below −18°F / −28°C</td>
<td>10 Minute Defrost / 20 Minute Exchange</td>
<td>10 Minute Defrost / 15 Minute Exchange</td>
</tr>
</tbody>
</table>

OFF and INTERMITTENT/OFF Mode

When ERV is Off, K1 relay is open (see Fig. 12).

High-Speed Air Exchange

When high-speed air exchange occurs, K1 relay closes and K2 (12 VDC relay) is energized. This opens low-speed contacts, and closes high-speed contacts. Then, 115 VAC is applied between orange and gray wires on Molex® plug (pins 1 and 6) and blower motor runs in high-speed operation. Also, 115 VAC is applied across pins 5 and 7, this energizes interlock relay (see Fig. 12).

Low-Speed Air Exchange

When low-speed air exchange occurs, K1 relay closes and K2 (12 VDC relay) is de-energized. This keeps low-speed contacts closed and high-speed contacts open. Then, 115 VAC is applied between
red and gray wires on Molex plug (pins 1 and 4) and blower motor runs in low-speed operation. Also, 115 VAC is applied across pins 5 and 7, energizing interlock relay (see Fig. 12).

**CAUTION**

**ELECTRICAL SHOCK HAZARD**
Failure to follow this warning could result in personal injury or death.
Before installing or servicing system, always turn off main power to system. There may be more than 1 disconnect switch.

**WARNING**

**CAUTION**

**CUT HAZARD**
Failure to follow this caution may result in personal injury.
Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.

**CARE AND MAINTENANCE**

**Door**
ERV door can be removed by unlatching brief case style latches, then lifting door up and sliding it sideways. Door must be in place and secured shut for proper operation.

**Filter**
Filters in ERV are washable and should be cleaned every 3 months. Use a vacuum cleaner to remove heaviest portion of accumulated dust, then wash in lukewarm water. Allow filter to completely dry before reinstalling. A dirty air filter will cause excessive strain on blower motor. Never operate unit without a filter.
In addition, regularly check and clean screens on exterior intake and exhaust hoods when necessary.

**Blower Motor and Wheel**
ERV blower motors are factory lubricated for life. Lubricating bearings is not recommended. However, inspect and clean any accumulated dirt and grease from blower motor and wheel annually.

**Cleaning the Core**
ERV is equipped with a special energy recovery core which is made out of paper and allows transfer of sensible and latent energy. The core should always be only vacuumed every 3 months to remove dust and dirt that could prevent transfer of energy.

**NOTE**: The core should only be serviced when outdoor temperature is between 60°F and 75°F (16°C and 24°C) and it is dry.

**UNIT COMPONENT DAMAGE HAZARD**
Failure to follow this caution may result in unit component damage.
DO NOT clean filters in a dishwasher and DO NOT dry them with a heating appliance or permanent damage will result.

**TROUBLESHOOTING**

**WARNING**

**ELECTRICAL SHOCK HAZARD**
Failure to follow this warning could result in personal injury or death.
Before installing or servicing system, always turn off main power to system. There may be more than 1 disconnect switch.

**CAUTION**

**CUT HAZARD**
Failure to follow this caution may result in personal injury.
Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.

**NOTE**: Reference Table 6 Troubleshooting Chart
This can be a quick guide in resolving unit problems. It is also recommended to review and understand Wall Control Board Operation and Care and Maintenance sections before continuing. There are 3 main parts to focus on when troubleshooting ERV unit:
1. Wall Control
2. Electronic control board
3. Blower motor

**Wall Control**
Use Table 1 to determine if wall control is operating correctly. Use Fig. 7 and Table 5 to check control wire connections.

**NOTE**: The electronic control board and wall control operate on 12 VDC.

**Control Board**
Electronic control board must have wall control attached before unit will function properly. Also, configuration jumpers located on control board must match configuration setup show in Fig. 12 under Jumper Table. In addition, outside air thermistor must be connected to control board for it to operate properly. See Table 8, Temperature - vs - Ohm Chart, for valid temperature range.

**Blower Motor**
The ERV blower motor operates on 115 VAC, with 2-speed operation.
The easiest way to check blower speed operation is to use the wall control and initiate a low-speed blower and high-speed blower operation using intermittent mode (see Table 1).
NOTE: If, after using the following test, you still hear relays clicking upon charge, carefully check wiring, blower capacitor, and blowers.

Alternate procedure to check blower speed:

**Blower Speed Test**

**HIGH SPEED**
1. Disconnect ERV from 115 V AC.
2. Unplug wall control wires at control module terminal block inside ERV.
3. Plug ERV back to 115 V AC.
4. Attach a wire across J3-8 and J3-9 (B and G) on control module terminal block.
5. Push in door switch, this will initiate a high-speed exchange.

**LOW SPEED**
1. Unplug ERV from 115 V AC.
2. Disconnect wall control wires at control module terminal block inside ERV.
3. Plug ERV back to 115 V AC.
4. Connect a 3.0 K ohm resistor between B and G on control module terminal block.
5. Push in door switch, this will initiate a low-speed exchange.

**Blower Speed Selection**

Three-speed blowers are factory connected to electronic control board on HIGH- and LOW-speed taps of blowers. Installer can easily change low-speed tap to medium-speed tap so electronic control will select between high and medium speed. Connections can be changed at motor location (see Table 9 and 10).

To change low speed to medium speed, proceed as follows:
1. Unplug unit from 115 V AC.
2. Remove filters and core from ERV.
3. Slide blower assembly to the right until wire connections are visible.
4. Locate red wire and blue wire coming from blower assembly.
5. Unplug red wire from quick connect.
6. Unplug protecting cap quick connection from blue wire and put on red wire coming from blower. The cap is a safety insulator.
7. Connect red wire of main harness to blue wire.
8. Replace wires, blower assembly, filters, and core.

**Outdoor Air Thermistor**

When unit is not responding to wall control, check outdoor air thermistor.
1. Remove thermistor wire from control board.
2. Take ohm reading across thermistor.
3. Refer to Table 8 for temperature/ohm relationship.
Be sure to unplug and inspect the unit before proceeding with these steps. Start with problem 1, then problem 2 and so on.

**Table 6 – Troubleshooting**

<table>
<thead>
<tr>
<th>Problem:</th>
<th>Possible causes:</th>
<th>You should try this:</th>
</tr>
</thead>
</table>
| 1. Unit does not work. | - Erratic operation of the electronic circuit.  
- The breaker in the electrical panel may be tripped.  
- The door switch may be defective.  
- The circuit board may be defective.  
- The fan motor may be defective.  
- The 9-pin connector may have a loose connection. | - Unplug the unit. Wait for 30 seconds. Plug it back in.  
- Reset breaker. If it trips again, unplug the unit and call an electrician.  
- Using a multimeter, check for power across the switch (the door switch must be pushed in for this test). If there is no power, replace the switch.  
- Jump “B” and “G” (BLACK and GREEN). If unit switches to high speed, remove the wall control and test it right beside the unit using another shorter wire. If the wall control works there, change the wire. If it does not, change the wall control.  
- Unplug the unit and disconnect the fan motor (4 wires). Supply 120 V directly to the GREY and ORANGE wires of the fan motor. Replace the motor if not working.  
- Unplug the unit and check to make sure all the crimp connections are sound. Check the fan motor and the damper actuator connections as well. |
| 2. The damper actuator does not work. | - The 9-pin connector may have a loose connection.  
- The damper actuator may be defective.  
- The circuit board may be defective. | - Unplug the unit and check to make sure all the crimp connections are secured. Check the damper actuator connections as well.  
- Feed 120 V directly to the damper actuator. If the problem persists, replace the damper actuator.  
- Replace the circuit board if the problem is not solved by the above. |
| 3. The wall control will not work. | - The wire in the wall OR the wall control may be defective.  
- The wires may be in reverse position.  
- The wires may be broken.  
- There may be a short-circuit. | - Remove the wall control and test it right beside the unit using another shorter wire. If the wall control works there, change the wire. If it does not, change the wall control.  
- Ensure that the color coded wires have been connected to their appropriate places.  
- Inspect every wire and replace any that are damaged.  
- With the help of a multimeter, check for continuity. |
| 4. The 20-minute lighted push-button switch doesn’t work OR its indicator light doesn’t stay on. | - The switch may be defective.  
- The wires may be defective OR may not be connected properly. | - Jump the OL and OC terminals. If the unit switches to high speed, then the wires are not the problem. Replace the push-button.  
- Ensure that the color-coded wires have been connected to their appropriate places. |
| 5. The defrost cycle does not work (the fresh air duct is frozen OR the fresh air distributed is very cold.) | - Ice deposits may be hindering the damper operation.  
- The damper rod or the port damper itself may be broken.  
- The damper actuator may be defective.  
- The circuit board may be defective.  
- The thermistor may be defective. | - Remove the ice.  
- Inspect these parts and replace if necessary.  
- Plug in the unit and select “OFF”. Press the door switch and see if the port damper closes. If it does not close, feed 120V directly to the damper actuator. If the port damper still does not close, replace the damper actuator.  
- Unplug the unit. Unplug the defrost sensor wire (see J4 on electrical diagram). Plug the unit back in. Select “MIN” and make sure the unit is adjusted for low speed operation. Wait 3 minutes. The unit should switch to high speed and the damper at the fresh air intake port should close (defrost mode). If this does not happen, then replace the circuit board.  
- If the defrost mode works well after having disconnected the thermistor wire (above test), this means the thermistor is probably defective. It should be replaced. |
**Defrost cycles (minutes)**

<table>
<thead>
<tr>
<th>Model</th>
<th>ERVCCLHA1150</th>
<th>10/60</th>
<th>10/30</th>
<th>10/20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ERVCCLHA1200</strong></td>
<td>10/60</td>
<td>10/30</td>
<td>10/20</td>
<td></td>
</tr>
</tbody>
</table>

**Extended defrost all models**

- 10/30
- 10/20

**Revolutionary Technology**

- Fan Motor
- Damper Motor
- 120V, 60Hz
- NEMA-15P
- 5-15 Plug

**Function Table**

<table>
<thead>
<tr>
<th>RELAY</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
<th>K5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interval</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Exchange Low</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Exchange High</td>
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<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Circulation Low</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Circulation High</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Defrost Cycle</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>OFF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Notes**

1. Controls available in the instruction manual.
2. If any of the original wire supplied must be replaced, use the same or equivalent wire.
3. Factory setting for blower speed is high and low speed. medium speed can be selected instead of low speed, disconnected red wire from motor's red tap and connect to motor's brown tap.
4. Use specified UL Listed - CSA Certified Line Fuse.

**Connection Diagram**

- Junction box
- Door interlock switch

**Logic Diagram**

- Fan motor
- Damper motor
- 120V, 60Hz
- NEMA-15P
- 5-15 Plug

**Function Table**

<table>
<thead>
<tr>
<th>RELAY</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
<th>K5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interval</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Exchange Low</td>
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<td>0</td>
</tr>
<tr>
<td>Exchange High</td>
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<tr>
<td>Circulation Low</td>
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<tr>
<td>Circulation High</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Defrost Cycle</td>
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<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>OFF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Notes**

1. Controls available in the instruction manual.
2. If any of the original wire supplied must be replaced, use the same or equivalent wire.
3. Factory setting for blower speed is high and low speed. medium speed can be selected instead of low speed, disconnected red wire from motor's red tap and connect to motor's brown tap.
4. Use specified UL Listed - CSA Certified Line Fuse.

**Warning**

- Electrical Shock Hazard
- Disconnect power before servicing/maintenance or field wiring. Replace all panels before operating. Failure to do so can result in death or electrical shock.

**Fig. 12 - ERV Wiring Diagram**

- ERVCCLHA1150
- ERVCCLHA1200

**Additional Information**

- 120V, 60Hz
- NEMA-15P
- 5-15 Plug

**AVERTISSEMENT**

- Risque de choc électrique
- Débranchez la source d'alimentation avant l'entretien, la réparation ou le câblage en place.

**ADVERTENCIA**

- Peligro de choque eléctrico
- Desconecte el suministro de energía antes de reparar, de mantener o de cablear in situ.
### Table 7 – System Wiring Colors and Connections

<table>
<thead>
<tr>
<th>Term. Block No.</th>
<th>Term. Block ID</th>
<th>Color</th>
<th>Term. No.</th>
<th>Term. ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>J3–9</td>
<td></td>
<td>B</td>
<td>J1–4</td>
<td>B</td>
</tr>
<tr>
<td>J3–8</td>
<td>G</td>
<td>Green</td>
<td>J1–3</td>
<td>G</td>
</tr>
<tr>
<td>J3–7</td>
<td>R</td>
<td>Red</td>
<td>J1–2</td>
<td>R</td>
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<tr>
<td>J3–6</td>
<td>Y</td>
<td>Yellow</td>
<td>J1–4</td>
<td>Y</td>
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</tbody>
</table>

### Table 8 – Temperature/Ohm Relationship

<table>
<thead>
<tr>
<th>Temp. (°F / °C)</th>
<th>Ohms</th>
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<tbody>
<tr>
<td>30 / -1</td>
<td>34,480</td>
</tr>
<tr>
<td>32 / 0</td>
<td>32,680</td>
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<tr>
<td>34 / 1</td>
<td>30,760</td>
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<td>38 / 3</td>
<td>27,470</td>
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<td>40 / 4</td>
<td>26,020</td>
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<td>24,680</td>
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<td>44 / 7</td>
<td>23,320</td>
</tr>
<tr>
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<tr>
<td>120 / 49</td>
<td>3,750</td>
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</tbody>
</table>

### Table 9 – Factory Set Blower Connection

<table>
<thead>
<tr>
<th>HIGH or LOW Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Module</strong></td>
</tr>
<tr>
<td>J1–6</td>
</tr>
<tr>
<td>No Connection</td>
</tr>
<tr>
<td>J1–4</td>
</tr>
</tbody>
</table>

### Table 10 – Modify Blower Connection

<table>
<thead>
<tr>
<th>HIGH or MEDIUM Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Module</strong></td>
</tr>
<tr>
<td>J1–6</td>
</tr>
<tr>
<td>J1–4</td>
</tr>
<tr>
<td>No Connection</td>
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</tbody>
</table>