



## OWNER'S MANUAL

R02A-2ERV  
MAY 14, 2009  
SUPERSEDES 09-09-08

## ENERGY RECOVERY WHEEL

### INSTALLATION INSTRUCTIONS FOR RESIDENTIAL AIR VENTILATION EQUIPMENT (RAVE) AGENCY CERTIFIED PRODUCT LABELS



Energy recovery COMPONENT certified to the ARI Air-to-Air Energy Recovery Ventilation Equipment Certification Program in accordance with ARI Standard 1060-2000 . Actual performance in packaged equipment may vary.



ETL Certified per UL 1812 and CAN/CSE C349.00

#### INTRODUCTION

The **RAVE** (Residential Air Ventilation Equipment) is designed as an Energy Recover Ventilator (ERV). It will bring in outside air through an enthalpy wheel and exhaust the buildings stale air simultaneously. The enthalpy wheel is a device incorporating a rotating wheel for the purpose of transferring energy (both sensible and latent) from exhaust air to intake air.

Additionally the **RAVE** works effectively in summer conditions including high humidity as well as with low ambient temperatures in the winter. This **RAVE** unit as the definition implies, has "very enthusiastic communication" by the features and benefits listed below.

- ❖ Individually controlled variable speed fan motors
- ❖ Toolless entry to control access and filter service
- ❖ Fully insulated with foil face R4 insulation
- ❖ Lifting/Mounting hanger rings
- ❖ Intake and return air filter - 1" Pleated (MERV 7)
- ❖ Built in temperature sensors
- ❖ Adjustable frost protection set point
- ❖ Economizer mode as a standard feature with override capability
- ❖ Dirty filter and wheel rotation indicator
- ❖ Remote Equipment Stat (Optional)
- ❖ Furnace interlock and/or dry contact activation
- ❖ 110 V power cord
- ❖ Slide in and out filters and energy recovery wheel
- ❖ Door safety interlock
- ❖ Service override switches
- ❖ Computer port for troubleshooting
- ❖ 6" Duct collars provided on one end
- ❖ Universal mounting positions

#### SPECIFICATIONS

##### **Model**

The **Rave** unit includes motorized impeller backward curved centrifugal fans, ARI certified air-to-air energy recovery component (enthalpy wheel), 1" pleated pre-filters, pool safety switch and a base microprocessor controller.

##### **Airflow**

50 to 240 CFM

##### **Heat Exchanger Type**

Enthalpy wheel made of polymeric material with silicagel impregnated into the material.

##### **Electrical Rating**

120VAC, 60Hz, 6.0 AMP

##### **Fuse (High Voltage)**

6.0 AMP, 250V, AGA Slow Blow Fuse

##### **Effectiveness**

70% (Enthalpy) - 34 wraps/in - 1" thick

##### **Dimensions**

24 <sup>5</sup>/<sub>8</sub>" long x 25 <sup>1</sup>/<sub>4</sub>" tall x 19 <sup>3</sup>/<sub>4</sub>" wide

##### **Unit Weight**

90 lbs.

##### **Shipping Weight**

100 lbs.

##### **Mounting**

May be mounted horizontally or vertically by using the provided hanger rings to suspend from attic rafters or floor joists. Also may be placed on shelf or floor in condition spaces (indoor application only). Unit is provided with four duct collars that are six inches in diameter to be field installed.

##### **Maintenance**

Check or replace filters every 6 months if necessary. The enthalpy wheel is cleanable with mild detergent and water.

##### **Certification**

ARI certified component, ETL tested to UL 1812 standard.

## GENERAL INFORMATION

### Application

The **RAVE** is designed as an ERV to bring in outside air through a pre-filter and enthalpy wheel and into the conditioned space of a home or business, while removing stale air of that condition space through a pre-filter and enthalpy wheel then exhausting out of the building all at the same time. During this process the enthalpy wheel captures energy (temperature and moisture) from the stale air and transfers it to the incoming outside air.

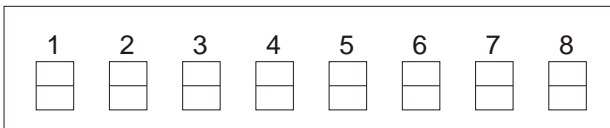
### Controls

The RAVE comes with a solid state microprocessor control base. This control has a power indication light and replaceable power fuse. The base microprocessor has a "heart beat" indicator that flashes every second when system is functioning properly. Fault code flashes, this LED is 4 times faster, if system has problems. All inputs will display a amber LED when input signal is indicated such as contact closer - like timer, off/on switch, Humidistat, dehumidistat or external energy management dry contact closure. Also a furnace interlock is provided if system is tied into HVAC system controls with signal from "G" on green, "C" on black and "W" on white from parallel connector with thermostat. Another switch can also override (lockout) the economizer function if necessary. This control base allows you to adjust the airflow individually for intake and exhaust to the desired airflow. An adjustable set point dial is on the control base to indicate the starting temperature of defrost cycle to start when in the low ambient mode.

There are two types of low ambient modes that is selectable on control base. The service override switch table shows the position of dip switches for selecting the mode. Mode B - Disable intake air blower or Mode A - Reduce intake air 70% of motorized impeller set point. Both modes will activate at temperature set point and will stay in that mode until system exhaust temperature is 16 degrees F above that set point.

Service override switches are used when trouble shooting the system and are listed in the table. They will manually turn on individual motor and override inputs and have a 3 hour maximum operation time if left in override position.

**Service Override Switches (DIP Switches) Table**



\* "ON" is when the top is depressed.

Switch function when activated.

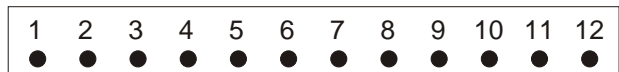
1. Exhaust Override
2. Intake Override
3. Wheel Override
4. Used for short time testing
5. Reset to default values and clear hour counters
6. ON Override
7. Defrost Mode "B"
8. Filter timer reset

Also the unit has a red LED indication flash when wheel rotation is detected every 5 seconds. If fault occurs, the LED will glow steady and wheel motor LED (green) will flash. All motor outputs have a green LED when powered. An amber LED will glow when system has reach 1000 hours of operation for dirty filter check and/or clean your enthalpy wheel. This is manually resettable by toggling #8 DIP switch (**See Table**).

### Options

A **Remote Equipment Stat (RES-1)** can be used as an independent controller or in conjunction with the above mentioned methods. The physical size of the **RES-1** is equivalent to an electronic thermostat and housed in a plastic housing. The housing has a snap on cover to have access to the circuit board and the wire termination connector which mounted on the back side of the circuit board. This connector is removable so wire can be connected to the terminal block and then insert back onto the pins of the circuit board. It has an Off/Auto/On slide switch that will activate the base control board of RAVE unit. A Dirty Filter/maintenance LED will be displayed after number of hours of operation and can only be reset at the base control board. Also a red LED will flash every 5 seconds when the **RAVE** enthalpy wheel is turning, however if this wheel stop turning due to a failure (broken/slipping belt, defective motor, worn-out bearing or debris with-in the media) this LED will flash 4 times faster. Another feature on the RES-1 is the fan speed control that allows the consumer to change blower speed by 2 steps of lower flow rates. It also allows the consumer to "Lockout" the base control board selected economizer mode for a fixed period of three hours with an indicator LED showing this function. The unit requires 12 conductors of solid copper wire (Class II-20 or 22 gauge) to communicate with the base control board. Refer to diagram below for detail wiring connections.

### "Optional" Remote Equipment Stat Connections



PIN POSITION	FUNCTION
1	Wheel Rotation LED
2	Dirty Filter LED
3	Economizer Lockout LED
4	Low Speed LED
5	Medium Speed LED
6	High Speed LED
7	Remote Switch "ON"
8	Remote Switch "OFF"
9	Economizer Push Button
10	Speed Up Push Button
11	Speed Down Push Button
12	Ground

A **Motorized Outdoor Air Damper (MOAD)** can be field install in the intake air duct run. This 24 VAC motorized damper is powered open and spring return with wiring connecting the base control board. With a

demand for operation the MOAD will power open and continue to be open until a low ambient signal is set into place if the system is in Mode B. At that point the power will be removed until system comes out defrost cycle.

**Flow Chart**

The attached flow chart on the back shows the logic that the system follows for the control sequence.

**WARRANTY**

**RSI Manufactured Parts**

In the event that defects in workmanship or materials originate in any part manufactured by RSI, FOB point of manufactured, we guarantee to repair or replace that part, within three (3) months of the shipment date.

**Other Supplied Parts**

Additionally, RSI guarantees to replace standard components purchased new from a RSI vendor, (motors, controls, etc.) that may be found defective, within twelve (12) months of the installation date. The components warranty, however, excludes service call charges and labor cost for replacing or adjusting the defective part.

**Limitation of Warranties**

Misapplication, destruction, negligence or alteration constitute the warranty and/or the components warranty of RSI products and/or parts, null and void. This warranty is provided in lieu of all other written, stated or implied warranties.

