I - Shipping And Packing List
Package 1 of 1 contains:
1 - Energy Recovery Ventilator Assembly
1 - Pleated 2" Filter Assembly
   (Built into Filter Box Assembly)
2 - Standard 1" Filter Assembly
   (Built into Unit Assembly)
1 - Box Assembly
2 - 10" Round Isolation Adaptor
1 - 18" Round Isolation Adaptor
1 - Rectangle to Round Transition

II - Shipping Damage
Check unit for shipping damage. Receiving party should contact last carrier immediately if shipping damage is found.

III - General
These instructions are intended as a general guide and do not supersede local codes in any way. Authorities having jurisdiction should be consulted before installation.

IV - Requirements
When installed, the unit must be electrically wired and grounded in accordance with local codes or, in the absence of local codes, with the current National Electric Code, ANSI/NFPA No. 70.

V - Application
Unitary Energy Recovery Wheels (UERV) are used with split systems units. These wheels conserve energy by mixing warmer air with cooler air in the following manner:

Recovery Ventilator Mode
The Recovery Wheel mode is accomplished by two blowers providing continuous exhaust of stale indoor air and replacement by equal amount of outdoor air. Energy recovery is achieved by slowly rotating the energy recovery wheel within the cassette frame work. In winter, the UERV adsorbs heat and moisture from the exhaust air stream during one half of a complete rotation and gives them back to the cold, drier intake air supply during the other half rotation. In summer, the process is automatically reversed. Heat and moisture are absorbed from incoming fresh air supply and transferred to the exhaust air stream. This process allows outdoor air ventilation rates to be increased by factors of three or more without additional energy penalty or increase in size of heating or air conditioning systems.

VI - Rigging Unit For Lifting
1. Maximum weight of unit is — 380 Lbs. [Crated].
2. Remove crating.
3. All panels must be in place for rigging.
4. Lifting/mounting lugs are supplied with the unit.

VII - Installation
1. Lift unit into place with duct flange end in-line with blower cabinet opening.
2. Secure into place by attaching hangers to mounting lugs at the bottom (4) corners of the UERV.
3. After UERV is positioned, level the unit by adjusting the hangers.
4. Attached duct work (field provided) between blower cabinet and UERV unit at duct flange.
5. Determine if UERV unit requires a top or side fresh air inlet. If different then shipped arrangement, interchange inlet ring plate with motorized damper assembly and seal plate.
6. Attach fresh air isolation adapter to UERV fresh air opening and run fresh air duct work.
7. Position and secure rectangle to round transition at exhaust air opening.
8. Attach exhaust air isolation adapter to UERV transition (rectangle to round) and run exhaust air duct work.
9. Attach 18" round isolation adapter to bottom opening of UERV and connect return air duct work.
10. Determine if UERV unit requires a left or right side electrical control box position. If different then shipped arrangement, reposition to correct side by removing (4) screws at base of control box and rotating 180 degrees to opposite side. Secure into place at prepunched holes (4 filler screws removed) and fill holes with screws from where control box was removed.
11. Run high voltage conduct to control box. Refer to wiring diagram.
12. Connect line voltage wiring to the fuse block in control box as shown in wiring diagram from disconnect switch.
13. Ground unit with a suitable ground connection either through unit supply wiring or an earth ground.

CAUTION
Danger of sharp metallic edges. Can cause injury. Take care when servicing unit to avoid accidental contact with sharp edges.
14. Connect low voltage wiring (24 volt) from Energy Management / or parallel with furnace / blower coil thermostat to pigtales in control box. Refer to wiring diagram.
15. Restore power to unit.
16. Remove plastic plugs in divider post (4 total).
17. With a manometer measure pressure drop [inches of water column] across top half of UERV (top holes in divider post). Unit CFM is determined then by referring to Table #1. If CFM values are not per design, adjust damper (field provided) in fresh air duct and repeat measure method.
18. Repeat the same process for the bottom half of UERV. If CFM values are not per design, adjust internal slide damper inside the UERV. This is accomplished by removing door panel at the return air opening, loosing (2) screws in center of damper, then slide damper up or down in the return airstream and re tighten screws. Replace door panel and repeat measurement method.
19. Place plastic plugs back in to divider post.
20. Cleanup once UERV is operating properly. Caulk any open joints, holes or seams to make the units completely air and water tight.
21. Fill out installation checklist and start-up sheet in back of this instruction.
22. Leave this instruction manual with owner or in an envelope to be kept near the unit.

VIII - Operation

How It Works

The unit contains an Energy Recovery Wheel (ERW) that is a new concept in rotary air-to-air heat exchanger. Designed as a packaged unit for ease of installation and maintenance, only matching up to rooftop unit with an internal economizer and connection of electrical power is required to make the system operational. The concept consists of a unique rotary energy recovery wheel that rotates in and out of fresh air streams within a heavy duty, permanently installed blower cabinet that provides ready access to all internal components. The media is polymeric material that is coated and permanently bonded with a dry desiccant for total enthalpy recovery. The wheel is belt driven by PSC motor and drive belt.

When slowly rotating through counter flowing exhaust and fresh air streams the UERV adsorbs sensible heat and latent heat from the warmer air stream and transfer this total energy to the cooler air stream during the second half of its rotating cycle. Rotating at 60 revolutions per minute, the wheel provides constant flow of energy from warmer to cooler air stream. The large energy transfer surface and laminar flow through the wheel causes this constant flow of recovered energy to represent up to 85% of the difference in total energy contained within the two air streams.

Sensible and latent heat are the two components of total heat. Sensible heat is energy contained in dry air and latent heat is the energy contained within the moisture of the air. The latent heat load from the outdoor fresh air on an air conditioning system can often be two to three times that of the sensible heat load and in the winter it is a significant part of a humidification heat load.

During both the summer and winter, the UERV transfers moisture entirely in the vapor phase. This eliminates wet surfaces that retain dust and promote fungal growth as well as the need for a condensate pan and drain to carry water.

Because it is constantly rotating when in the air stream, the UERV is always being cleared by air, first in one direction then the other. Because it is always dry, dust or other particles impinging on the surface during one half cycle, are readily removed during the next half cycle.

Additional Information for Options are provided in Options Manual

Recovery Wheel Mode

On a thermostat call for blower operation in heating, cooling or continuous blower, the ERW will rotate between fresh air and exhaust air streams. Both the fresh air and exhaust air blowers will also be operating to overcome the air resistance of the UERV.

IX - System Check

1. Disconnect main power.
2. Remove control access panel.
3. Apply 24 volts to low voltage terminal strip at "TB37-1(+) and TB37-2(-)".
4. Restore power to unit. Observe UERV drive motor for speed and operation.
5. Verify that the UERV blower motors are set to high speed (black wire connected to relay) for correct speed and operation.
   a. Disconnect power.
   b. Change speed setting at each blower relay. Refer to wiring diagram.
   c. Reapply power.

A - Blower Speed Adjustment

Blower speed selection is accomplished by changing the speed taps at relays. Both fresh air and exhaust air blowers are direct dive multi-tap motors. Both blowers are factory set at "High" speed for maximum airflow. To determine air flow setting, external static pressure readings will need to be read across the UERV. Refer to blower performance Table #1 showing specific air volumes. The table is for balanced air flows (fresh air and exhaust air are equal), unbalanced airflow will effect UERV performance. Correction factors are applied for unbalanced flows and its effect on wheel and system performance.

1. Disconnect main power to unit before making adjustment to balancing dampers and/or UERV unit.
2. Replace UERV control access cover.
3. Set thermostat to normal operating position.
4. Restore power to unit.

B - Air Balancing Adjustment

1. Remove plastic plugs in divider post (4 total).
2. With a manometer measure pressure drop [inches of water column] across top half of UERV (top holes in divider post). Unit CFM is determined then by referring to Table #1. If CFM values are not per design, adjust...
damper (field provided) in fresh air duct and repeat measure method.

3. Repeat the same process for the bottom half of UERV. If CFM values are not per design, adjust internal slide damper inside the UERV. This is accomplished by removing door panel at the return air opening, loosing (2) screws in center of damper, then slide damper up or down in the return airstream and retighten screws. Replace door panel and repeat measurement method.

4. Place plastic plugs back in to divider post.

**X - Maintenance**

**Motor Maintenance**
All motors use prelubricated sealed bearings; no further lubrication is necessary.

**Mechanical Inspection**
Make visual inspection of dampers, linkage assemblies and UERV rotating bearings during routine maintenance. Filters should be checked periodically and cleaned when necessary. Filter is located in front of UERV unit and before blower cabinet. **DO NOT** replace throwaway type filters with permanent filters.

**Energy Wheel Maintenance**
Four pie-shaped ERW segments are seated on stops between the stainless steel spring retainers, secured to the hub and rim of wheel. Annual inspection of the self cleaning wheel is recommended. With power disconnected, remove UERV access panels (rear) and unplug (J150 & P150). Refer to wiring diagram in this instruction manual. Each segment is secured in place by a stainless steel spring retainer located on wheel rim. Remove one end of the stainless steel spring retainer from the slot in the wheel rim and remove. Do the same on the next retainer. Remove segment and wash with water and/or mild detergent. Replace segment by reversing the above procedure. **See Figure 1.** Discoloration and staining of UERV segment does not affect its performance. Only excessive buildup of foreign material need be removed. If the segment appears excessively dirty, it should be cleaned to ensure maximum operating efficiency. Thoroughly spray plastic surface with household cleaner such as Fantastic® or equivalent middle detergent and gently rinse with warm water using a soft brush to remove heavier accumulation. Shake excess water from segment and replace in reverse of removal instructions.
Notes:
1. Remove jumper to install optional low ambient switch.
2. Step-down transformer assembly for 460 volt units.
3. Selective voltage terminal for proper unit voltage.
4. Optional low ambient switch.
5. For energy management systems connect +24v to green and common 24v to black.
6. Unit may be wired for HI, MED, or LO speeds. Diagram shows the HI speed setup, to rewire for MED or LO speed, disconnect BK-101 from relays and connect BL-101 for MED, or RD-101 for LO. Also connect WH-101 to BK-101.
7. Optional stop, start and jog control.

H11A-01YDW
Notes:
1. Remove jumper to install field optional low ambient switch.
2. Step-down transformer assembly for 460 volt units.
3. Selective voltage terminal for proper unit voltage
4. Optional low ambient switch.
5. For energy management systems connect -24v to green and common 24v to black.
6. Unit may be wired for HI, MED, or LO speeds. Diagram shows the HI speed setup, to rewire for MED or LO speed, disconnect BK-101 from relays and connect BL-101 for MED, or RD-101 for LO. Also connect WH-101 to BK-101.
7. Optional stop, start and jog control.
Features
1. Fresh air intake can be field located on top or end of unit.
2. Electrical control box can be located to either side for access.
3. Access panels located on both sides of UERV for servicing.
4. Static test ports are provided for verification of CFM.
5. Filter rack accepts 1" or 2" filters and comes with flex connector to air handler.

Note: Applications with extensive duct on intake and exhaust may require booster fans for airflow.
<table>
<thead>
<tr>
<th>Horizontal</th>
<th>Matching York Furnace Models</th>
<th>Cabinet Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>VH011Z03H</td>
<td>P<em>HU / P</em>DU / P<em>DU-V / P</em>HU-L / P*DU-L 12-032,048,060</td>
<td>A</td>
</tr>
<tr>
<td>VH011Z04H</td>
<td>P<em>HU / P</em>DU / P<em>DU-V / P</em>HU-L / P<em>DU-L 12-080 or 16-064,080 P</em>UR / P<em>XU / P</em>XU-V 10-055 or 12-075</td>
<td>B</td>
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<tr>
<td>VH011Z05H</td>
<td>P<em>HU / P</em>DU / P<em>DU-V / P</em>HU-L / P*DU-L 16-092 or 20-064,080,092</td>
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<tr>
<td>VH011Y05H</td>
<td>P<em>HU / P</em>DU / P<em>DU-V / P</em>HU-L / P*DU-L 20-104</td>
<td>D</td>
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<tr>
<td>VH011Z02H</td>
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<td>E</td>
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<tr>
<td>VH011Y03H</td>
<td>P<em>DH / P</em>XD-V 12-055,075</td>
<td>F</td>
</tr>
<tr>
<td>VH011X05H</td>
<td>P<em>DH / P</em>XD-V 16-075 or 20-075</td>
<td>G</td>
</tr>
<tr>
<td>VH011W05H</td>
<td>P<em>DH / P</em>XD-V 20-112</td>
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<td>VH011W03H</td>
<td>G*C 12-050,075</td>
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<tr>
<td>VH011X04H</td>
<td>G*C 16-075,100</td>
<td>M</td>
</tr>
<tr>
<td>VH011U05H</td>
<td>G*C 20-100,125,150</td>
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<table>
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<th>Matching York Blower Coil Models</th>
<th>Cabinet Size</th>
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<tbody>
<tr>
<td>VH011X03H</td>
<td>N<em>AH / N</em>VS B--G2FD 16-024S,030S,036S</td>
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<tr>
<td>VH011Y04H</td>
<td>N<em>AH / N</em>VS C--G2FD 16-036S,042S,048S</td>
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<tr>
<td>VH011V05H</td>
<td>N<em>AH / N</em>VS D--G2FD 14/20-048S,060S,061H</td>
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# START UP INFORMATION SHEET

## VOLTAGE - UERV UNIT

<table>
<thead>
<tr>
<th>Description</th>
<th>L1-L2</th>
<th>L1-L3</th>
<th>L2-L3</th>
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<tbody>
<tr>
<td>Incoming Voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Running Voltage</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Voltage</td>
<td></td>
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</tr>
</tbody>
</table>

*With thermostat calling.*

## AMPERAGE - UERV MOTORS

<table>
<thead>
<tr>
<th>Description</th>
<th>Intake Motor</th>
<th>Exhaust Motor</th>
<th>Wheel Motor</th>
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<tbody>
<tr>
<td>Nominal HP</td>
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<td></td>
</tr>
<tr>
<td>Rated Amps</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Running Amps</td>
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</table>

## AIRFLOW

<table>
<thead>
<tr>
<th>Description</th>
<th>Intake Design CFM</th>
<th>Exhaust Design CFM</th>
<th>Calculated CFM</th>
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</thead>
<tbody>
<tr>
<td>Pressure Drop</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Amb. db Temp</th>
<th>Return Air db Temp</th>
<th>Temperd Air db Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return Air wb Temp*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tempered Air wb Temp*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Measure after 15 minutes of run time

## INSTALLATION CHECK LIST

**UERV Model #**

**Serial #**

**Owner**

**Owner Address**

**Installing Contractor**

**Start Up Mechanic**

- Inspect the unit for transit damage and report any damage on the carrier’s freight bill.
- Check model number to insure it matches the job requirements.
- Install field accessories and unit adapter panels as required. Follow accessory and unit installation manuals.
- Verify field wiring, including the wiring to any accessories.
- Check all multi-tap transformers, to insure they are set to the proper incoming voltage.
- Verify correct belt tension, as well as the belt/pulley alignment. Tighten if needed.
- Prior to energizing the unit, inspect all the electrical connections.
- Power the unit. Bump the motor contactor to check rotation. Three phase motors are synchronized at the factory. If blower motor fans are running backwards, de-energize power to the unit, then swap two of the three incoming electrical lines to obtain proper phasing. Re-check.
- Perform all start up procedures outlined in the installation manual shipped with the unit.
- Fill in the Start Up Information as outlined on the opposite side of this sheet.
- Provide owner with information packet. Explain the thermostat and unit operation.