RVE-40-36P-30H
CONSTRUCTION FEATURES AND ACCESSORIES

Unit Overview

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply (CFM)</th>
<th>Outside Air (CFM)</th>
<th>Recirc (CFM)</th>
<th>Exhaust (CFM)</th>
<th>Heating</th>
<th>Cooling</th>
<th>Electrical V/C/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-36P-30H-7.5</td>
<td>2,800</td>
<td>2,800</td>
<td>0</td>
<td>2,800</td>
<td>Hot Water</td>
<td>Packaged DX</td>
<td>208/60/3</td>
</tr>
</tbody>
</table>

Features

- Exterior housing constructed of galvanized steel
- Energy recovery cassette with a desiccant wheel
- Direct-drive backward inclined plenum blowers with factory mounted VFDs
- Ball bearing motors
- Corrosion resistant fasteners
- Internally lined with galvanized steel metal creating a double wall
- Insulated with 2 in. 2.4# R13 density foam insulation
- Internally mounted control center with motor starters, 24 VAC control transformer(s), control circuit fusing
- Energy Wheel Motor: 1/3 HP
- Stainless steel condensate drain pan and connection.
- Low Sound Condensate Fan Package

Options and Accessories

- UL\cUL1995
- Frost Control: Modulating Wheel
- Weatherhood: Downturned Hood
- ElectroFin Coil Coating: All
- Outdoor Air Filters - MERV 8, 4-20x25x2
- Exhaust Air Filters - MERV 8, 4-20x25x2
- Supply Filters - 2" Pleated MERV 8 and MERV 13, 8-20x20x2
- Roof Curbs - GKD-48/145-G14"
- Outdoor Air Dampers - Motorized Low Leakage
- Return Air Dampers - Motorized Low Leakage
- Damper End Switch - Outdoor Air & Return Air Damper
- Painted Exterior - Permatector Concrete Gray (RAL 7023)
- Microprocessor Controls
- Supply Fan VFD Control - Duct Static Pressure
- Economizer Mode - Temp./Dew Point Control
- Wheel Control - Modulating Wheel
- Network Protocol: To Be Selected
- Dirty Filter Sensor: Outdoor, Exhaust and Final
- Rotation Sensor
- Phase and Brown Out Protection
- 120v NEMA 3R Outlet (Factory mounted and wired)
- Expansion Board
  - RAI
  - Unit Disconnect - Mounted By Factory
  - Condensate Overflow Switch
  - Power Venting
  - Short-circuit current - 5kA
  - Exhaust Discharge Gravity Backdraft Damper
  - Lead ECM Condenser Fan

Note: Unit is provided with factory mounted and wired disconnect switch.

Note: Electrofin coil coating requires monthly and quarterly coil maintenance to maintain the coil coating. See unit IOM for detailed cleaning procedure and required documentation to maintain the coatings warranty. Failure to follow cleaning recommendations will void the coatings warranty.

Note: Verify that the correct Protocol has been selected before ordering.
# PERFORMANCE AND SPECIFICATIONS

## Description/Arrangement

<table>
<thead>
<tr>
<th>Model</th>
<th>Qty</th>
<th>Unit Weight (lb)</th>
<th>Outdoor Air Discharge</th>
<th>Outdoor Air Intake</th>
<th>Exhaust Air Discharge</th>
<th>Return Air Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-36P-30H-7.5</td>
<td>1</td>
<td>2,795</td>
<td>Bottom</td>
<td>End</td>
<td>Side</td>
<td>Bottom</td>
</tr>
</tbody>
</table>

## Design Conditions

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Summer DB (F)</th>
<th>Summer WB (F)</th>
<th>Winter DB (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>91</td>
<td>74</td>
<td>7</td>
</tr>
</tbody>
</table>

## Air Performance

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (CFM)</th>
<th>External SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Qty/Size (hp)</th>
<th>Size (in.)/Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>2,800</td>
<td>1.25</td>
<td>3.057</td>
<td>1797</td>
<td>2.17</td>
<td>Qty 1 (3)</td>
<td>18/Plenum</td>
</tr>
<tr>
<td>Exhaust Normal</td>
<td>2,800</td>
<td>1.25</td>
<td>2.535</td>
<td>1925</td>
<td>2.45</td>
<td>Qty 1 (3)</td>
<td>18/Plenum</td>
</tr>
</tbody>
</table>

## Electrical/Motor Specifications

<table>
<thead>
<tr>
<th>V/C/P</th>
<th>Unit MCA (amps)</th>
<th>Unit MOP (amps)</th>
<th>Exh. MCA (amps)</th>
<th>Exh. MOP (amps)</th>
<th>Enclosure</th>
<th>Supply Motor RPM</th>
<th>Supply Efficiency</th>
<th>Exhaust Motor RPM</th>
<th>Exhaust Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>208/60/3</td>
<td>54</td>
<td>70</td>
<td>N/A</td>
<td>N/A</td>
<td>ODP</td>
<td>1750</td>
<td>PE</td>
<td>3500</td>
<td>PE</td>
</tr>
</tbody>
</table>

## Heating/Cooling Specifications

<table>
<thead>
<tr>
<th>Heating Type</th>
<th>Entering Air Temp. (F)</th>
<th>Leaning Air Temp. (F)</th>
<th>Fluid Type</th>
<th>Face Velocity (ft/min)</th>
<th>Air Pressure Drop (in. wg)</th>
<th>Entering Fluid Temp. (F)</th>
<th>Leaving Fluid Temp. (F):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water</td>
<td>49.0</td>
<td>71.1</td>
<td>Propylene-35%</td>
<td>465</td>
<td>0.049</td>
<td>160.0</td>
<td>140.0</td>
</tr>
<tr>
<td>HW Coil Model</td>
<td>Total Energy (MBH)</td>
<td>Fins Per Inch</td>
<td>Rows Deep</td>
<td>1</td>
<td>1</td>
<td>7.2</td>
<td>0.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cooling Type</th>
<th>Total Capacity (MBH)</th>
<th>Sensible Capacity (MBH)</th>
<th>Compressor Quantity</th>
<th>Lead Compressor Type</th>
<th>Condensing Unit By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaged DX</td>
<td>106.9</td>
<td>77.9</td>
<td>1</td>
<td>Digital Scroll</td>
<td>Greenheck</td>
</tr>
</tbody>
</table>

## Sound Performance in Accordance with AMCA

<table>
<thead>
<tr>
<th>Fan</th>
<th>Sound Power by Octave Band</th>
<th>Lwa</th>
<th>dBA</th>
<th>Sones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>62.5</td>
<td>125</td>
<td>250</td>
<td>500</td>
</tr>
<tr>
<td>Supply</td>
<td>77</td>
<td>81</td>
<td>89</td>
<td>80</td>
</tr>
<tr>
<td>Exhaust Normal</td>
<td>74</td>
<td>80</td>
<td>82</td>
<td>77</td>
</tr>
</tbody>
</table>

## Unit Pressure Drop (in. wg)

<table>
<thead>
<tr>
<th>Air Stream</th>
<th>Weatherhood</th>
<th>Damper Section</th>
<th>Filter Section</th>
<th>Cooling Section</th>
<th>Heating Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>0.085</td>
<td>0.033</td>
<td>0.238</td>
<td>0.21</td>
<td>0.049</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.156</td>
<td>0.0</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: The unit base line performance incorporates the pressure drop of the energy wheel.

Note: Filter pressure drop is based off of clean filters.
FAN CURVES

Supply Fan Performance

<table>
<thead>
<tr>
<th>Volume (CFM)</th>
<th>Supply SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Size (hp)</th>
<th>Size (in.)/Type</th>
<th>Fan Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,800</td>
<td>1.25</td>
<td>3.057</td>
<td>1797</td>
<td>2.171</td>
<td>3</td>
<td>18/Plenum</td>
<td>1</td>
</tr>
</tbody>
</table>

Exhaust Fan Performance - Normal Operation

<table>
<thead>
<tr>
<th>Volume (CFM)</th>
<th>Exhaust SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Size (hp)</th>
<th>Size (in.)/Type</th>
<th>Fan Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,800</td>
<td>1.25</td>
<td>2.535</td>
<td>1925</td>
<td>2.45</td>
<td>3</td>
<td>18/Plenum</td>
<td>1</td>
</tr>
</tbody>
</table>
RVE-40: Supply Air Flow Nominal, Largest Tonnage Condensing Section Available, PDX units only

AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m².
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.
**COOLING PERFORMANCE**

### Packaged DX Cooling

<table>
<thead>
<tr>
<th>Nominal Tonnage</th>
<th>Total Capacity (MBH)</th>
<th>Sensible Capacity (MBH)</th>
<th>Refrigerant Type</th>
<th>Lead Compressor Type</th>
<th>Compressor Quantity</th>
<th>Condensing Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5</td>
<td>106.9</td>
<td>77.9</td>
<td>R-410A</td>
<td>Digital Scroll</td>
<td>1</td>
<td>By Greenheck</td>
</tr>
</tbody>
</table>

### Hot Gas Reheat

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity (MBH)</th>
<th>LAT (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulating</td>
<td>68.0</td>
<td>77.9</td>
</tr>
</tbody>
</table>

### Condensing Unit Details

The RVE will come equipped with the following components:
- Hermetic scroll type compressors
- Compressors mounted in a compartment to be serviceable without affecting airflow and on neoprene vibration isolation to minimize vibration transmission and noise
- Crankcase heater on compressor(s)
- Thermal expansion valve for refrigerant flow control
- Variable capacity scroll compressor
- Lead ECM condensing fan for active head pressure control
- Liquid-Line filter drier
- High pressure manual reset cutout
- Low-pressure auto-reset cutout
- Time delay relays for compressor protection
- Service/charging valves
- Moisture-indicating sight glass
- Direct drive condensing fans with external rotors and molded fan blades
- Condensing coils with 5/16" copper tubes mechanically bonded to aluminum fins

### Packaged DX Coil Details

- Face Area (ft²): 11.8
- Rows Deep (Evap Coil): 5
- Fins Per Inch: 12
- Face Velocity (ft/min): 237
- Entering Dry Bulb (F): 80.7
- Entering Wet Bulb (F): 67.3
- Leaving Dry Bulb (F): 55.4
- Leaving Wet Bulb (F): 55.0
- Cool Coil SP (in. wg): 0.21
- Refrigerant Velocity (ft/min): 1,248
- Suction Temp. (F): 51.7
- Refrigerant: R-410A
- Evaporator Cap. (MBH): 106.9
- AHRI 920 ISMRE: 6.3
- Ambient Condenser Temp. (F): 91.0

### Compressor and Condenser Details

- Compressor 1 RLA (amps): 24
- Compressor 1 LRA (amps): 187
- Condenser Fan QTY: 2
- Condenser Motor 1 HP: 1.68
- Condenser Motor 2 HP: 0.62
- Condenser Motor 1 FLA: 3.8
- Condenser Motor 2 FLA: 3.8

Note: Digital Scroll is on lead circuit only.
HEATING PERFORMANCE

Hot Water Heating

<table>
<thead>
<tr>
<th>Heating Type</th>
<th>Entering Air Temp. (F)</th>
<th>Leaving Air Temp. (F)</th>
<th>Fluid Type</th>
<th>Face Velocity (ft/min)</th>
<th>Air Pressure Drop (in. wg)</th>
<th>Entering Fluid Temp. (F)</th>
<th>Leaving Fluid Temp. (F):</th>
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</thead>
<tbody>
<tr>
<td>Hot Water</td>
<td>49.0</td>
<td>71.1</td>
<td>Propylene-35%</td>
<td>465</td>
<td>0.049</td>
<td>160.0</td>
<td>140.0</td>
</tr>
</tbody>
</table>

HW Coil Model | Total Energy (MBH) | Fins Per Inch | Rows Deep | Connection Size (in.) | Fluid Flow Rate (GPM) | Fluid Press. Drop (ft wg) |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HW38S01H10-40x21.7-RH</td>
<td>67.8</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>7.2</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Hot Water Unit Unit Details
The RVE will come equipped with the following:
• Aluminum fins
• Copper tubes
• Hand brazed construction
• Galvanized steel casing
• AHRI certified

Heating Coil Details
Heating Coil Model: HW12C01H10-40x21.7-RH
Rows Deep: 1
Fins Per Inch: 10
Face Velocity (ft/min): 465
Total Energy (MBH): 67.8
Entering Dry Bulb (F): 49.0
Leaving Air (F): 71.1
Heat Coil SP (in. wg): 0.049
Entering Fluid (F): 160.0
Leaving Fluid (F): 140.0
Fluid Type: Propylene
Glycol (%): 35
Fluid Flow (GPM): 7.2
Fluid PD (ft wg): 0.5
Connection Size (in.): 1
ENERGY RECOVERY SUMMER PERFORMANCE

### OUTDOOR AIR

<table>
<thead>
<tr>
<th>Entering Air</th>
<th>Leaving Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>91.0</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>74.0</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>100</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>37.5</td>
</tr>
</tbody>
</table>

| Dry Bulb (F) | 85.3        |
| Wet Bulb (F) | 69.9        |
| Specific Humidity (gr/lb) | 86        |
| Enthalpy (BTU/lb) | 34.1       |

### LEAVING AIR

<table>
<thead>
<tr>
<th>Entering Air</th>
<th>Leaving Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>80.7</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>67.3</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>79</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>31.6</td>
</tr>
</tbody>
</table>

| Dry Bulb (F) | 75.0        |
| Rel. Humidity (%) | 50        |
| Specific Humidity (gr/lb) | 65        |
| Enthalpy (BTU/lb) | 28.1       |

### EXHAUST AIR

#### Design Air Flow Conditions

<table>
<thead>
<tr>
<th>Model</th>
<th>Outdoor Air Volume (CFM)</th>
<th>OA Wheel Enthalpy Recovery Ratio</th>
<th>Exhaust Air Volume (CFM)</th>
<th>Exhaust Air Wheel Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-36P-30H</td>
<td>2,800</td>
<td>63.1</td>
<td>2,800</td>
<td>63.1</td>
</tr>
</tbody>
</table>

#### Outdoor Air Cooling Reduction

<table>
<thead>
<tr>
<th></th>
<th>(BTU/h)</th>
<th>(tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA Load w/o Energy Recovery</td>
<td>118,440.0</td>
<td>9.87</td>
</tr>
<tr>
<td>OA Load with Energy Recovery</td>
<td>44,100.0</td>
<td>3.68</td>
</tr>
</tbody>
</table>

| Equipment Reduction tons | 6.20 |

---

**Summer Conditions**

1 = Outdoor Air Design  
2 = Energy Wheel  
3 = DX Coil  
4 = Hot Gas Reheat  
5 = Exhaust Air Entering Wheel
ENERGY RECOVERY WINTER PERFORMANCE

OUTDOOR AIR

Entering Air

<table>
<thead>
<tr>
<th>Dry Bulb (F)</th>
<th>Wet Bulb (F)</th>
<th>Specific Humidity (gr/lb)</th>
<th>Enthalpy (BTU/lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td>4.9</td>
<td>4</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Leaving Air

<table>
<thead>
<tr>
<th>Dry Bulb (F)</th>
<th>Wet Bulb (F)</th>
<th>Specific Humidity (gr/lb)</th>
<th>Enthalpy (BTU/lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48.7</td>
<td>41.1</td>
<td>26</td>
<td>16.0</td>
</tr>
</tbody>
</table>

EXHAUST AIR

Leaving Air

<table>
<thead>
<tr>
<th>Dry Bulb (F)</th>
<th>Wet Bulb (F)</th>
<th>Specific Humidity (gr/lb)</th>
<th>Enthalpy (BTU/lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.3</td>
<td>28.1</td>
<td>19</td>
<td>9.9</td>
</tr>
</tbody>
</table>

Entering Air

<table>
<thead>
<tr>
<th>Dry Bulb (F)</th>
<th>Wet Bulb (F)</th>
<th>Specific Humidity (gr/lb)</th>
<th>Enthalpy (BTU/lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72.0</td>
<td>35</td>
<td>41</td>
<td>23.7</td>
</tr>
</tbody>
</table>

Design Air Flow Conditions

<table>
<thead>
<tr>
<th>Model</th>
<th>Outdoor Air Volume (CFM)</th>
<th>OA Wheel Enthalpy Recovery Ratio</th>
<th>Exhaust Air Volume (CFM)</th>
<th>Exhaust Air Wheel Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-36P-30H</td>
<td>2,800</td>
<td>64.3</td>
<td>2,800</td>
<td>64.3</td>
</tr>
</tbody>
</table>

Outdoor Air Heating Reduction

<table>
<thead>
<tr>
<th>OA Load w/o Energy Recovery</th>
<th>OA Load with Energy Recovery</th>
<th>BTU/h Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>196,560.0</td>
<td>70,459.0</td>
<td>126,101.0</td>
</tr>
</tbody>
</table>

Winter Conditions

1 = Outdoor Air Design
2 = Energy Wheel
3 = Hot Water Coil
4 = Exhaust Air Entering Wheel

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## AHRI PERFORMANCE DATA

<table>
<thead>
<tr>
<th>Type</th>
<th>Tilt Angle (Heating/Cooling)</th>
<th>Pressure Drop (in. wg)</th>
<th>Nominal Airflow (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEEL</td>
<td>N / A Deg</td>
<td>0.85</td>
<td>2,600</td>
</tr>
</tbody>
</table>

### Wheel Leakage Ratings

<table>
<thead>
<tr>
<th>Test</th>
<th>Pressure Differential</th>
<th>Exhaust Air Transfer Ratio</th>
<th>Outdoor Air Correction Factor</th>
<th>Purge Angle/Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>0.0</td>
<td>2.1</td>
<td>1.03</td>
<td>0</td>
</tr>
<tr>
<td>#2</td>
<td>0.5</td>
<td>0.9</td>
<td>1.05</td>
<td>1</td>
</tr>
<tr>
<td>#3</td>
<td>1.0</td>
<td>0.8</td>
<td>1.07</td>
<td>1</td>
</tr>
</tbody>
</table>

### Optional Additional Test(s):

#### Thermal Effectiveness Ratings at 0.0 in. Differential Pressure

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sensible</th>
<th>Latent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Airflow Heating</td>
<td>65</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td>75% Airflow Heating</td>
<td>72</td>
<td>66</td>
<td>70</td>
</tr>
<tr>
<td>100% Airflow Cooling</td>
<td>65</td>
<td>61</td>
<td>63</td>
</tr>
<tr>
<td>75% Airflow Cooling</td>
<td>72</td>
<td>66</td>
<td>69</td>
</tr>
</tbody>
</table>

### Net Thermal Effectiveness Ratings at 0.0 in. Differential Pressure

<table>
<thead>
<tr>
<th>Condition</th>
<th>Net Sensible</th>
<th>Net Latent</th>
<th>Net Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Airflow Heating</td>
<td>65</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td>75% Airflow Heating</td>
<td>72</td>
<td>66</td>
<td>70</td>
</tr>
<tr>
<td>100% Airflow Cooling</td>
<td>65</td>
<td>61</td>
<td>63</td>
</tr>
<tr>
<td>75% Airflow Cooling</td>
<td>72</td>
<td>66</td>
<td>69</td>
</tr>
</tbody>
</table>

Trademark: Greenheck  
Model Number: RVE-40-36P-30H

## Energy Recovery Schedule

<table>
<thead>
<tr>
<th>Mark Name</th>
<th>Qty</th>
<th>Model</th>
<th>ER Type</th>
<th>Mounting Location</th>
<th>Weight</th>
<th>Outdoor Air Volume</th>
<th>Supply ESP</th>
<th>Supply TSP</th>
<th>FRPM</th>
<th>Supply BHP</th>
<th>Supply Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTU-1</td>
<td>1</td>
<td>RVE-40-36P-30H-7.5</td>
<td>Wheel</td>
<td>Outdoor</td>
<td>2,795 lb</td>
<td>2,800 CFM</td>
<td>1.25 in wg</td>
<td>3.057 in wg</td>
<td>1797</td>
<td>2.171</td>
<td>3 hp</td>
</tr>
</tbody>
</table>

### Exhaust Fan

<table>
<thead>
<tr>
<th>Exhaust AIR Volume</th>
<th>Exhaust ESP</th>
<th>Exhaust TSP</th>
<th>FRPM</th>
<th>Exhaust Motor</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Phase</th>
<th>Unit MCA</th>
<th>Unit MOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,800 CFM</td>
<td></td>
<td>1.25 in wg</td>
<td>592</td>
<td>2.46</td>
<td>9 hp</td>
<td>108</td>
<td>6</td>
<td>54</td>
<td>70</td>
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</table>

### Supply Fan

<table>
<thead>
<tr>
<th>Supply AIR Volume</th>
<th>Supply ESP</th>
<th>Supply TSP</th>
<th>FRPM</th>
<th>Supply Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,800 CFM</td>
<td>1.25 in wg</td>
<td>3.057 in wg</td>
<td>1797</td>
<td>2.171</td>
</tr>
</tbody>
</table>

### Summer Energy Recovery Performance

<table>
<thead>
<tr>
<th>Outside Air DB</th>
<th>Outside Air WB</th>
<th>Supply AIR DB</th>
<th>Supply WB</th>
<th>Return AIR DB</th>
<th>Return WB</th>
<th>Exhaust AIR DB</th>
<th>Exhaust WB</th>
<th>ASHRAE 90.1 Enthalpy Recovery Ratio</th>
<th>Cooling Load Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>91.0 F</td>
<td>74.0 F</td>
<td>80.7 F</td>
<td>67.3 F</td>
<td>75.0 F</td>
<td>62.5 F</td>
<td>85.3 F</td>
<td>69.9 F</td>
<td>63.1</td>
<td>6.20 tons</td>
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### Winter Energy Recovery Performance

<table>
<thead>
<tr>
<th>Outside AIR DB</th>
<th>Outside AIR WB</th>
<th>Supply AIR DB</th>
<th>Supply WB</th>
<th>Return AIR DB</th>
<th>Return WB</th>
<th>Exhaust AIR DB</th>
<th>Exhaust WB</th>
<th>ASHRAE 90.1 Enthalpy Recovery Ratio</th>
<th>Heating Load Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0 F</td>
<td>4.9 F</td>
<td>48.7 F</td>
<td>41.1 F</td>
<td>72.0 F</td>
<td>55.8 F</td>
<td>30.3 F</td>
<td>28.1 F</td>
<td>63.1</td>
<td>126,101 BTU</td>
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## Cooling Section

### HVAC System

<table>
<thead>
<tr>
<th>Fluid Type</th>
<th>% Glycol</th>
<th>Coil Entering DB</th>
<th>Coil Leaving DB</th>
<th>Nominal Tonnage</th>
<th>Total Capacity</th>
<th>Sensible Capacity</th>
<th>Coil Face Velocity</th>
<th>Coil Pressure Drop</th>
<th>Rows Deep</th>
<th>Fins per Inch</th>
<th>Compressor Type</th>
<th>Compressor Qty</th>
<th>AHRI 920 ISMRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene</td>
<td>35%</td>
<td>49.0 F</td>
<td>55.4 F</td>
<td>55.0 F</td>
<td>7.5</td>
<td>106.9 MBH</td>
<td>77.9 MBH</td>
<td>237 ft/min</td>
<td>0.21 in wg</td>
<td>5</td>
<td>12</td>
<td>8</td>
<td>6.3</td>
</tr>
</tbody>
</table>

### Heating Section

<table>
<thead>
<tr>
<th>Fluid Type</th>
<th>% Glycol</th>
<th>Coil Entering DB</th>
<th>Coil Leaving DB</th>
<th>Nominal Tonnage</th>
<th>Total Capacity</th>
<th>Sensible Capacity</th>
<th>Coil Face Velocity</th>
<th>Coil Pressure Drop</th>
<th>Rows Deep</th>
<th>Fins per Inch</th>
<th>Compressor Type</th>
<th>Compressor Qty</th>
<th>AHRI 920 ISMRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene</td>
<td>35%</td>
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<td>5</td>
<td>12</td>
<td>8</td>
<td>6.3</td>
</tr>
</tbody>
</table>

## Options and Accessories

- **Frost Control**: Modulating Wheel
- **Weatherhood**: Downturned Hood
- **Electric Fan Coating**: All
- **Outdoor Air Filters**: MERV 8, 4-20x25x2
- **Exhaust Air Filters**: MERV 8, 4-20x25x2
- **Supply Filters**: 2" Pleated MERV 8 and MERV 13, 8-20x20x2
- **Roof Curbs**: GKD-48/145-34-14
- **Outdoor Air Dampers**: Motorized Low Leakage
- **Return Air Dampers**: Motorized Low Leakage
- **Dampair End Switch**: Outdoor Air & Return Air Damper
- **Painted Exterior**: Thermolite Concrete Gray (RAL 7023)
- **Microprocessor Controls**:
- **Supply Fan VFD Control**: Duct Static Pressure
- **Economizer Mode**: Temp/Dew Point Control
- **Wheel Control**: Modulating Wheel
- **Network Protocol**: To Be Selected
- **Dirty Filter Sensor**: Outdoor, Exhaust and Final
- **Rotation Sensor**: Phase and Brown Out Protection
- **120V NEMA 3R Outlet**: Factory mounted and wired
- **Expansion Board**: RAI
- **Unit Disconnect**: Mounted By Factory
- **Condensate Overflow Switch**:
- **Unit Warranty**: 1 Yr (Standard)
FOOTPRINT DRAWINGS

Top View of Curb

Cross-Section View of Unit on Curb

NOTES: All dimensions shown are in units of in.'s
If unit is selected with side or end discharge/return, there will not be bottom connections supplied with the curb.

Curb Weight: 218 lb
Unit Corner Weights

892 lb  781 lb

598 lb  524 lb

Note: Estimated corner weights are shown looking down on unit and the outside air intake will be on the right. Weights are applied at the base of the unit. Images not drawn to scale.
CAUTION
UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES
USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.
FIELD CONTROL, WIRING RESISTANCE SHOULD
NOT EXCEED 0.75 OHM.
FIELD WIRED — FACTORY SUPPLIED AND WIRED

LEGEND
G1000XXXX000000XY00
GREENHECK
BUILDING VALUE IN AIR.
WIRING DIAGRAM

WIRE COLOR CODE
BK — BLACK
BL — BLUE
BR — BROWN
GY — GRAY
LT — LIGHT BLUE
O — ORANGE
PK — PINK
PR — PURPLE
R — RED
W — WHITE
Y — YELLOW

Wiring Template: Y00

MONITORING POINTS WIRING DIAGRAM

Printed Date: 2/27/2018
Job: Cohasset Town Hall
Mark: RTU-1
Model: RVE-40-36P-30H-7.5

Generated by: dchisholm@buckleyonline.com
CAPS 4.25.1598
Page 16 of 92
R:\Salespersons\Denis Chisholm\MARKETING\GGD\Cohasset town Hall\Cohasset Town Hall.gfcj
## MONITORING POINTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Type</th>
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<tbody>
<tr>
<td>OAI</td>
<td>Outdoor Air Intake Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>OAD</td>
<td>Outdoor Air Discharge Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>ACC</td>
<td>After Cooling Coil Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>PS2</td>
<td>Supply Dirty Filter Pressure Switch</td>
<td>Contact</td>
</tr>
<tr>
<td>PS3</td>
<td>Exhaust Dirty Filter Pressure Switch</td>
<td>Contact</td>
</tr>
<tr>
<td>PS6</td>
<td>*Duct Pressure</td>
<td>0-10 VDC</td>
</tr>
<tr>
<td>S2</td>
<td>Wheel Rotation Sensor</td>
<td>Contact</td>
</tr>
<tr>
<td>RAI</td>
<td>Return Air Intake Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
</tbody>
</table>

*Shipped loose sensor.*
Microprocessor Controller Sequence of Operation

MICROPROCESSOR CONTROLLER: Controller shall be provided with required sensors and programming for rooftop unit. Controller shall be factory programmed, mounted and tested. Controller shall have a LCD readout for changing set points and monitoring unit operation.

UNIT START COMMAND (Unit will be enabled to start once a jumper is placed between R to G):
- Factory mounted and wired outdoor air damper actuator is powered
- Return air damper actuator is powered.
- Exhaust fan starts after a 10 second (adj.) delay.
- Supply fan starts 10 second delay.
- Tempering options and energy wheel option to function as described below.

UNIT STOP COMMAND (OR DE-ENERGIZED):
- Supply fan, exhaust fan, energy wheel and tempering options de-energized.
- Outdoor air damper actuator is spring return close.
- Return air damper is spring return close.

OCCUPIED/UNOCCUPIED MODES: Shall be based on a 7-day time clock internal to the controller. The schedule shall be set by the end user. When a user initiates an override input, the controller will switch from unoccupied to occupied mode. The controller will return to the scheduled occupied/unoccupied mode after the override time has expired (60 min, adj.). If internal time clock is disabled, a remote contact or a BMS can control the occupied/unoccupied mode.

Occupied Mode:
- Damper control per below.
- Energy wheel control per below.
- Exhaust fan ON.
- Supply fan ON.
- Heating per below.
- Cooling per below.

Unoccupied Mode (Unit Off): Unit remains off when in unoccupied mode.
- Supply fan OFF
- Exhaust fan OFF
- Tempering OFF
- Outdoor air damper closed.
- Return damper closed.

Morning Warm-up: One hour prior to occupancy, the controller will reference the temperature differential between the current room temperature and the occupied temperature set point. The controller will then look at the amount of time required from the previous days morning warm up sequence and determine how far in advance the unit has to be started to meet the desired occupied set point by the time of occupancy.

SUPPLY BLOWER SEQUENCE: The supply blower is provided with a factory mounted variable frequency drive. The supply blower speed will be controlled with the following sequence.

Duct Static Pressure Sensor: The supply blower is modulated based upon the signal from a duct static pressure sensor (factory provided and wired, field mounted and tubing by others). The controller will modulate the supply fan based upon a comparison of the duct static pressure set point (adj.) to the actual duct static pressure level reported from the sensor. (Mechanical high static protection cutoffs must be installed by others to protect the system and equipment from over-pressurization. The manufacturer does not assume responsibility for this.)
**BMS Control:** The supply blower is modulated based upon a command from the Building Management System. (This Sequence must be field configured.)

**EXHAUST BLOWER SEQUENCE:** The exhaust blower is provided with a factory mounted variable frequency drive. The exhaust blower speed will be controlled with the following sequence.

- **Supply Tracking:** The exhaust fan will modulate to track the speed of the supply fan.
- **BMS Control:** The exhaust blower is modulated based upon a command from the Building Management System. (This sequence must be field configured.)

**COOLING SEQUENCE:** The cooling is controlled to maintain the supply temperature set point. The mechanical cooling will be locked out when the outside air is < 55°F - 2°F hysteresis (adj.).

- **Packaged DX Cooling (Digital Scroll):** The controller will provide a modulating signal for cooling. From 10-100%, the digital scroll will be controlled to maintain discharge temperature.
- **Modulating Hot Gas Reheat Sequence:** During dehumidification the modulating HGRH is controlled to maintain the supply temperature set point.
- **Modulating Head Pressure Control:** Lead condenser fan will have a EC motor and will modulate to maintain a head pressure set point.

**DEHUMIDIFICATION SEQUENCE:** The cooling is controlled to maintain the cooling-coil set point. The dehumidification sequence will be locked out when the OA is <10°F above the cold-coil set point (adj.).

- **Cold Coil Setpoint Reset Function:** The controller will control the cooling to maintain an active set point. The active set point will set to local control (55°F, adj) from the factory and can be field adjusted to the following sequence:
  - **BMS Control:** The controller will adjust the cold coil leaving air temperature set point between the minimum (50°F, adj.) and the maximum (55°F, adj.) set points, to satisfy the desired BMS set point for dehumidification.

**REHEAT SEQUENCE:** While the unit is in dehumidification mode the outdoor air will be reheated via Modulating Hot Gas Reheat for space neutral applications.

- **Modulating Hot Gas Reheat:** The controller will modulate the hot gas reheat reheat valve with a 0-10 V signal to maintain the supply temperature set point (adj.).

**HEATING SEQUENCE:** The heating is controlled to maintain the supply temperature set point. The heating will be locked out when the outside air is > 70°F + 2°F hysteresis, (adj.).

- **Hot Water Coil:** The controller will modulate a hot water valve (field provided) to maintain the supply temperature set point (adj.). **Coil Freeze protection must be provided by others in the field!**

**SUPPLY SET POINT RESET FUNCTION.** The controller will modulate the heating and cooling to maintain an active set point. The active set point will be set to outdoor air reset from the factory and can be field adjusted to the following sequence:
**OA Reset (Default):** The controller will monitor the outdoor air temperature and adjusts the desired supply temperature set point accordingly. For example, when the outdoor air is below 55 °F, the controller will change the supply set point to 70 °F. If the outdoor air is above 65 °F, the controller will change the supply set point to 55°F. If the outdoor air temperature is between 55°F and 65°F, the supply set point changes according to the outdoor air reset function. A visual representation of this is shown below.

![Outdoor Air Reset Function](image)

**Local:** The supply set point will be a constant temperature set from the controller (adj.).

**BMS Control:** The controller will adjust the desired supply temp set point to satisfy the desired BMS set point.

**BUILDING FREEZE PROTECTION:** If the supply air temperature drops below 35°F (adj.) for 300s (adj.), the controller will de-energize the unit and activate the alarm output.

**TEMPERATURE PROTECTION:** The controller will enable the supply fan to modulate down to help the unit keep up with heating demand in the event of wheel failure or the unit operating outside design conditions. (This can be enabled under the manufacturer menu in the controller)

**FROST CONTROL:** Frost control for the energy wheel is enabled when frost is present on the wheel; based on the outside air temperature and the pressure drop across the wheel. If the outdoor air temperature is below 5°F – 2°F hysteresis, adj. and the differential pressure across the wheel is about 1.5", adj. frost control will enable.

**Modulate Wheel:** When frosting is occurring, the VFD modulates the wheel down to a slow rotational speed to defrost wheel. Once either the pressure drop decreases below the pressure switch set point, or the outdoor air temperature increases about the temperature set point, the unit will resume normal operation.

**ECONOMIZER SEQUENCE:** When the application requires cooling, and the outdoor air conditions are suitable for free cooling, the controller will modulate the energy wheel speed to maintain the discharge temperature set point. If the energy wheel modulates to the economizer set point and the discharge temperature is not met, the controller will increase the call for cooling to meet the discharge temperature and could engage mechanical cooling.

**Temp/Dew Point:** The economizer will be locked out when: the outdoor air is < 40° F DB (-2° F hysteresis, adj.) or > 75° F DB (-2° F hysteresis, adj.) or > 55° F dew point (-2° F hysteresis, adj.) ; the unit is operating in dehumidification mode; or there is a call for heating

**ENERGY WHEEL SEQUENCE**
Modulate Wheel (100% OA only): When economizer mode is enabled and there is a signal for cooling, the wheel VFD modulates wheel speed to maintain the discharge temperature set point.

ALARMS INDICATION: The controller will display alarms and have one digital output for remote indication of an alarm condition. Possible alarms include:

Building Management System: The controller will send all alarms to the BMS.

Dirty Filter Alarm: A digital signal is sent to the controller indicating an increased pressure drop across the outdoor, exhaust or supply air filters (Must be adjusted in field during start up). The controller will then provide a dirty filter alarm.

Dirty Wheel Alarm: The controller monitors pressure across the wheel and sends an alarm in the case of an increased pressure drop.

Wheel Rotation Alarm: The controller monitors wheel rotation, if the wheel does not rotate for 30s (adj.) an alarm will generate.

Supply and Exhaust Air Alarm: The controller monitors the proving switch on each blower and sends an alarm in the case of either blower proving switch not engaging for 30s (adj.).

DX Alarm: The controller monitors the refrigerant pressure. In the case of low refrigerant pressure the compressors will shut down until refrigerant pressure returns to normal values and the controller will send a alarm. In the case of high refrigerant pressure the compressors will shut down, requiring a manual reset and the controller will send a alarm.

Temperature Sensor Alarm: The controller sends an alarm in the case of a failed air temperature sensor.

Pressure Sensor Alarm: The controller sends an alarm in the case of a failed pressure sensor.

Humidity Sensor Alarm: The controller sends an alarm in the case of a failed humidity sensor.

Accessories: The following accessories will be included with the unit to expand the functionality or usability of the controller.

BMS Interfacing: A BMS serial card is provided with the controller for field interfacing with a building management system. Each card is sent out with the default parameters, and the controls contractor must change the appropriate addresses to match the BMS settings.

Phase and Brown Out Protection: Factory mounted and wired component which monitors the main power coming into the unit. If a phase drops out, or if the incoming voltage exceeds the acceptable range, the component will turn off the unit to help protect the electrical systems.

Condensate Overflow Switch: The condensate overflow switch is mounted in the drain pan within the unit. If the water level in the drain pan reaches a certain level, the switch will open a set of contacts connected to a terminal block in the control center.

Damper End Switch: Damper end switched will be provided to ensure the supply and exhaust fans do not enable until the dampers are proven open.
Unit Warranty

Limited Warranty
Greenheck warrants this equipment to be free from defects in material and workmanship for a period of 1 year(s) from the purchase date. The energy recovery wheel is warranted to be free from defects in material and workmanship for a period of five years from the purchase date. Any component which proves defective during the warranty period will be repaired, or replaced, at Greenheck's sole option when returned to our factory, transportation prepaid.

The warranty does not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck product.

This warranty is exclusive, and is in lieu of all other warranties, whether written, oral or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose.

Electrofin Coil Coating
Electrofin coil coating carries a standard 1 year warranty and is excluded from any extended unit warranty.
### Unit Overview

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply (CFM)</th>
<th>Outside Air (CFM)</th>
<th>Recirc (CFM)</th>
<th>Exhaust (CFM)</th>
<th>Heating</th>
<th>Cooling</th>
<th>Electrical V/C/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-30P-30H-5</td>
<td>1,500</td>
<td>1,500</td>
<td>0</td>
<td>1,500</td>
<td>Hot Water</td>
<td>Packaged DX</td>
<td>208/60/3</td>
</tr>
</tbody>
</table>

### Features
- Exterior housing constructed of galvanized steel
- Energy recovery cassette with a desiccant wheel
- Direct-drive backward inclined plenum blowers with factory mounted VFDs
- Ball bearing motors
- Corrosion resistant fasteners
- Internally lined with galvanized steel metal creating a double wall
- Insulated with 2 in. 2.4# R13 density foam insulation
- Internally mounted control center with motor starters, 24 VAC control transformer(s), control circuit fusing
- Energy Wheel Motor: 1/3 HP
- Stainless steel condensate drain pan and connection.
- Low Sound Condensate Fan Package

### Options and Accessories
- UL\cUL1995
- Frost Control: Modulating Wheel
- Weatherhood: Downturned Hood
- ElectroFin Coil Coating: All
- Outdoor Air Filters - MERV 8, 4-20x25x2
- Exhaust Air Filters - MERV 8, 4-20x25x2
- Supply Filters - 2" Pleated MERV 8 and MERV 13, 8-20x20x2
- Roof Curbs - GKD-48/145-G14"
- Outdoor Air Dampers - Motorized Low Leakage
- Return Air Dampers - Motorized Low Leakage
- Damper End Switch - Outdoor Air & Return Air Damper
- Painted Exterior - Permatector Concrete Gray (RAL 7023)
- Microprocessor Controls
- Supply Fan VFD Control - Duct Static Pressure
- Economizer Mode - Temp./Dew Point Control
- Wheel Control - Modulating Wheel
- Network Protocol: To Be Selected
- Dirty Filter Sensor: Outdoor, Exhaust and Final
- Rotation Sensor
- Phase and Brown Out Protection
- 120v NEMA 3R Outlet (Factory mounted and wired)
- Expansion Board
  - RAI
- Unit Disconnect - Mounted By Factory
- Condensate Overflow Switch
- Power Venting
- Exhaust Discharge Gravity Backdraft Damper
- Lead ECM Condenser Fan

Note: Unit is provided with factory mounted and wired disconnect switch.

Note: ElectroFin coil coating requires monthly and quarterly coil maintenance to maintain the coil coating. See unit IOM for detailed cleaning procedure and required documentation to maintain the coatings warranty. Failure to follow cleaning recommendations will void the coatings warranty.

Note: Verify that the correct Protocol has been selected before ordering.
## PERFORMANCE AND SPECIFICATIONS

### Description/Arrangement

<table>
<thead>
<tr>
<th>Model</th>
<th>Qty</th>
<th>Unit Weight (lb)</th>
<th>Outdoor Air Discharge</th>
<th>Outdoor Air Intake</th>
<th>Exhaust Air Discharge</th>
<th>Return Air Intake</th>
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</thead>
<tbody>
<tr>
<td>RVE-40-30P-30H-5</td>
<td>1</td>
<td>2,673</td>
<td>Bottom</td>
<td>End</td>
<td>Side</td>
<td>Bottom</td>
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### Design Conditions

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Summer DB (F)</th>
<th>Summer WB (F)</th>
<th>Winter DB (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>91</td>
<td>74</td>
<td>7</td>
</tr>
</tbody>
</table>

### Air Performance

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (CFM)</th>
<th>External SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Qty/Size (hp)</th>
<th>Size (in.)/Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>1,500</td>
<td>1.25</td>
<td>2.663</td>
<td>1549</td>
<td>1.18</td>
<td>Qty 1 (3)</td>
<td>18/Plenum</td>
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<tr>
<td>ExhaustNormal</td>
<td>1,500</td>
<td>1.25</td>
<td>2.05</td>
<td>1503</td>
<td>1.12</td>
<td>Qty 1 (3)</td>
<td>18/Plenum</td>
</tr>
</tbody>
</table>

### Electrical/Motor Specifications

<table>
<thead>
<tr>
<th>V/C/P</th>
<th>Unit MCA (amps)</th>
<th>Unit MOP (amps)</th>
<th>Exh. MCA (amps)</th>
<th>Exh. MOP (amps)</th>
<th>Enclosure</th>
<th>Supply Motor RPM</th>
<th>Supply Efficiency</th>
<th>Exhaust Motor RPM</th>
<th>Exhaust Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>208/60/3</td>
<td>45.9</td>
<td>60</td>
<td>N/A</td>
<td>N/A</td>
<td>ODP</td>
<td>1750</td>
<td>PE</td>
<td>1755</td>
<td>PE</td>
</tr>
</tbody>
</table>

### Heating/Cooling Specifications

<table>
<thead>
<tr>
<th>Heating Type</th>
<th>Entering Air Temp. (F)</th>
<th>Leaving Air Temp. (F)</th>
<th>Fluid Type</th>
<th>Face Velocity (ft/min)</th>
<th>Air Pressure Drop (in. wg)</th>
<th>Entering Fluid Temp. (F)</th>
<th>Leaving Fluid Temp. (F):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water</td>
<td>53.0</td>
<td>84.4</td>
<td>Propylene-35%</td>
<td>249</td>
<td>0.022</td>
<td>160.0</td>
<td>140.0</td>
</tr>
<tr>
<td>HW Coil Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HW38S01H10-40x21.7-RH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cooling Type</th>
<th>Total Capacity (MBH)</th>
<th>Sensible Capacity (MBH)</th>
<th>Compressor Quantity</th>
<th>Lead Compressor Type</th>
<th>Condensing Unit By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaged DX</td>
<td>67.0</td>
<td>45.7</td>
<td>1</td>
<td>Digital Scroll</td>
<td>Greenheck</td>
</tr>
</tbody>
</table>

### Sound Performance in Accordance with AMCA

<table>
<thead>
<tr>
<th>Fan</th>
<th>Sound Power by Octave Band</th>
<th>Lwa</th>
<th>dBA</th>
<th>Sones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>62.5 125 250 500 1000 2000 4000 8000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply</td>
<td>76 81 82 75 74 72 70 64 80 69 17.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust Normal</td>
<td>68 78 73 71 68 67 66 61 75 63 12.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Unit Pressure Drop (in. wg)

<table>
<thead>
<tr>
<th>Air Stream</th>
<th>Weatherhood</th>
<th>Damper Section</th>
<th>Filter Section</th>
<th>Cooling Section</th>
<th>Heating Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>0.025</td>
<td>0.009</td>
<td>0.068</td>
<td>0.055</td>
<td>0.022</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.045</td>
<td>0.000</td>
<td>0.000</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: The unit base line performance incorporates the pressure drop of the energy wheel.

Note: Filter pressure drop is based off of clean filters.
## FAN CURVES

### Supply Fan Performance

<table>
<thead>
<tr>
<th>Volume (CFM)</th>
<th>Supply SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Size (hp)</th>
<th>Size (in.)/Type</th>
<th>Fan Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500</td>
<td>1.25</td>
<td>2.663</td>
<td>1549</td>
<td>1.176</td>
<td>3</td>
<td>18/Plenum</td>
<td>1</td>
</tr>
</tbody>
</table>

![Supply Fan Performance Chart](chart1.png)

### Exhaust Fan Performance - Normal Operation

<table>
<thead>
<tr>
<th>Volume (CFM)</th>
<th>Exhaust SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Size (hp)</th>
<th>Size (in.)/Type</th>
<th>Fan Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500</td>
<td>1.25</td>
<td>2.05</td>
<td>1503</td>
<td>1.119</td>
<td>3</td>
<td>18/Plenum</td>
<td>1</td>
</tr>
</tbody>
</table>

![Exhaust Fan Performance Chart](chart2.png)
RVE-40: Supply Air Flow Nominal, Largest Tonnage Condensing Section Available, PDX units only

<table>
<thead>
<tr>
<th>Free Field Plane</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Lw</th>
<th>LwA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>73</td>
<td>86</td>
<td>81</td>
<td>79</td>
<td>77</td>
<td>73</td>
<td>69</td>
<td>63</td>
<td>89</td>
<td>82</td>
</tr>
<tr>
<td>B</td>
<td>71</td>
<td>79</td>
<td>77</td>
<td>71</td>
<td>69</td>
<td>64</td>
<td>63</td>
<td>55</td>
<td>82</td>
<td>75</td>
</tr>
<tr>
<td>C</td>
<td>79</td>
<td>76</td>
<td>69</td>
<td>66</td>
<td>64</td>
<td>59</td>
<td>53</td>
<td>46</td>
<td>81</td>
<td>69</td>
</tr>
<tr>
<td>D</td>
<td>74</td>
<td>77</td>
<td>72</td>
<td>72</td>
<td>69</td>
<td>62</td>
<td>58</td>
<td>51</td>
<td>81</td>
<td>74</td>
</tr>
<tr>
<td>E</td>
<td>77</td>
<td>84</td>
<td>80</td>
<td>76</td>
<td>76</td>
<td>70</td>
<td>66</td>
<td>60</td>
<td>87</td>
<td>80</td>
</tr>
<tr>
<td>Total</td>
<td>83</td>
<td>89</td>
<td>85</td>
<td>82</td>
<td>81</td>
<td>76</td>
<td>72</td>
<td>65</td>
<td>92</td>
<td>85</td>
</tr>
</tbody>
</table>

AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m².
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.
COOLING PERFORMANCE

Packaged DX Cooling

<table>
<thead>
<tr>
<th>Nominal Tonnage</th>
<th>Total Capacity (MBH)</th>
<th>Sensible Capacity (MBH)</th>
<th>Refrigerant Type</th>
<th>Lead Compressor Type</th>
<th>Compressor Quantity</th>
<th>Condensing Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>67.0</td>
<td>45.7</td>
<td>R-410A</td>
<td>Digital Scroll</td>
<td>1</td>
<td>By Greenheck</td>
</tr>
</tbody>
</table>

Hot Gas Reheat

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity (MBH)</th>
<th>LAT (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulating</td>
<td>41.1</td>
<td>77.5</td>
</tr>
</tbody>
</table>

Condensing Unit Details

The RVE will come equipped with the following components:
- Hermetic scroll type compressors
- Compressors mounted in a compartment to be serviceable without affecting airflow and on neoprene vibration isolation to minimize vibration transmission and noise
- Crankcase heater on compressor(s)
- Thermal expansion valve for refrigerant flow control
- Variable capacity scroll compressor
- Lead ECM condensing fan for active head pressure control
- Liquid-Line filter drier
- High pressure manual reset cutout
- Low-pressure auto-reset cutout
- Time delay relays for compressor protection
- Service/charging valves
- Moisture-indicating sight glass
- Direct drive condensing fans with external rotors and molded fan blades
- Condensing coils with 5/16” copper tubes mechanically bonded to aluminum fins

Packaged DX Coil Details

- Face Area (ft²): 11.8
- Rows Deep (Evap Coil): 4
- Fins Per Inch: 12
- Face Velocity (ft/min): 121
- Entering Dry Bulb (F): 79.8
- Entering Wet Bulb (F): 66.6
- Leaving Dry Bulb (F): 52.1
- Leaving Wet Bulb (F): 51.8
- Cool Coil SP (in. wg): 0.055
- Refrigerant Velocity (ft/min): 1,138
- Suction Temp. (F): 49.3
- Refrigerant: R-410A
- Evaporator Cap. (MBH): 67.0
- AHRI 920 ISMRE: 7.4
- Ambient Condenser Temp. (F): 91.0

Compressor and Condenser Details

- Compressor 1 RLA (amps): 17.9
- Compressor 1 LRA (amps): 110
- Condenser Fan QTY: 2
- Condenser Motor 1 HP: 1.68
- Condenser Motor 2 HP: 0.62
- Condenser Motor 1 FLA: 3.8
- Condenser Motor 2 FLA: 3.8

Note: Digital Scroll is on lead circuit only.
HEATING PERFORMANCE

Hot Water Heating

<table>
<thead>
<tr>
<th>Heating Type</th>
<th>Entering Air Temp. (F)</th>
<th>Leaving Air Temp. (F)</th>
<th>Fluid Type</th>
<th>Face Velocity (ft/min)</th>
<th>Air Pressure Drop (in. wg)</th>
<th>Entering Fluid Temp. (F)</th>
<th>Leaving Fluid Temp. (F):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water</td>
<td>53.0</td>
<td>84.4</td>
<td>Propylene-35%</td>
<td>249</td>
<td>0.022</td>
<td>160.0</td>
<td>140.0</td>
</tr>
<tr>
<td><strong>HW Coil Model</strong></td>
<td><strong>Total Energy (MBH)</strong></td>
<td><strong>Fins Per Inch</strong></td>
<td><strong>Rows Deep</strong></td>
<td><strong>Connection Size (in.)</strong></td>
<td><strong>Fluid Flow Rate (GPM)</strong></td>
<td><strong>Fluid Press. Drop (ft wg)</strong></td>
<td></td>
</tr>
<tr>
<td>HW38S01H10-40x21.7-RH</td>
<td>51.7</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>5.5</td>
<td>0.3</td>
<td></td>
</tr>
</tbody>
</table>

Hot Water Unit Unit Details

The RVE will come equipped with the following:
- Aluminum fins
- Copper tubes
- Hand brazed construction
- Galvanized steel casing
- AHRI certified

Heating Coil Details

<table>
<thead>
<tr>
<th>Heating Coil Model:</th>
<th>HW12C01H10-40x21.7-RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rows Deep:</td>
<td>1</td>
</tr>
<tr>
<td>Fins Per Inch:</td>
<td>10</td>
</tr>
<tr>
<td>Face Velocity (ft/min):</td>
<td>249</td>
</tr>
<tr>
<td>Total Energy (MBH):</td>
<td>51.7</td>
</tr>
<tr>
<td>Entering Dry Bulb (F):</td>
<td>53.0</td>
</tr>
<tr>
<td>Leaving Air (F):</td>
<td>84.4</td>
</tr>
<tr>
<td>Heat Coil SP (in. wg):</td>
<td>0.022</td>
</tr>
<tr>
<td>Entering Fluid (F):</td>
<td>160.0</td>
</tr>
<tr>
<td>Leaving Fluid (F):</td>
<td>140.0</td>
</tr>
<tr>
<td>Fluid Type:</td>
<td>Propylene</td>
</tr>
<tr>
<td>Glycol (%):</td>
<td>35</td>
</tr>
<tr>
<td>Fluid Flow (GPM):</td>
<td>5.5</td>
</tr>
<tr>
<td>Fluid PD (ft wg):</td>
<td>0.3</td>
</tr>
<tr>
<td>Connection Size (in.):</td>
<td>1</td>
</tr>
</tbody>
</table>
ENERGY RECOVERY SUMMER PERFORMANCE

**OUTDOOR AIR**

<table>
<thead>
<tr>
<th></th>
<th>Entering Air</th>
<th>Leaving Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>91.0</td>
<td>79.8</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>74.0</td>
<td>66.6</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>100</td>
<td>77</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>37.5</td>
<td>31.1</td>
</tr>
</tbody>
</table>

**EXHAUST AIR**

<table>
<thead>
<tr>
<th></th>
<th>Leaving Air</th>
<th>Entering Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>86.2</td>
<td>75.0</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>70.5</td>
<td>Rel. Humidity (%) 50</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>87</td>
<td>65</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>34.6</td>
<td>28.1</td>
</tr>
</tbody>
</table>

**Design Air Flow Conditions**

<table>
<thead>
<tr>
<th>Model</th>
<th>Outdoor Air Volume (CFM)</th>
<th>OA Wheel Enthalpy Recovery Ratio</th>
<th>Exhaust Air Volume (CFM)</th>
<th>Exhaust Air Wheel Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-30P-30H</td>
<td>1,500</td>
<td>68.5</td>
<td>1,500</td>
<td>68.5</td>
</tr>
</tbody>
</table>

**Outdoor Air Cooling Reduction**

<table>
<thead>
<tr>
<th></th>
<th>(BTU/h)</th>
<th>(tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA Load w/o Energy Recovery</td>
<td>63,450.0</td>
<td>5.29</td>
</tr>
<tr>
<td>OA Load with Energy Recovery</td>
<td>20,250.0</td>
<td>1.69</td>
</tr>
<tr>
<td>Equipment Reduction tons</td>
<td></td>
<td>3.60</td>
</tr>
</tbody>
</table>

**Summer Conditions**

1 = Outdoor Air Design
2 = Energy Wheel
3 = DX Coil
4 = Hot Gas Reheat
5 = Exhaust Air Entering Wheel

---

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ENERGY RECOVERY WINTER PERFORMANCE

### OUTDOOR AIR

<table>
<thead>
<tr>
<th>Entering Air</th>
<th>Leaving Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>7.0</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>4.9</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>4</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>2.3</td>
</tr>
<tr>
<td>Dry Bulb (F)</td>
<td>52.6</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>43.6</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>28</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>17.2</td>
</tr>
</tbody>
</table>

### EXHAUST AIR

<table>
<thead>
<tr>
<th>Entering Air</th>
<th>Leaving Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>26.4</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>25.0</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>17</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>8.7</td>
</tr>
</tbody>
</table>

### Outdoor Air Heating Reduction

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA Load w/o Energy Recovery</td>
<td>105,300.0</td>
</tr>
<tr>
<td>OA Load with Energy Recovery</td>
<td>31,428.0</td>
</tr>
<tr>
<td>BTU/h Reduction</td>
<td>73,872.0</td>
</tr>
</tbody>
</table>

---

Winter Conditions

1 = Outdoor Air Design
2 = Energy Wheel
3 = Hot Water Coil
4 = Exhaust Air Entering Wheel

---

Design Air Flow Conditions

<table>
<thead>
<tr>
<th>Model</th>
<th>Outdoor Air Volume (CFM)</th>
<th>OA Wheel Enthalpy Recovery Ratio</th>
<th>Exhaust Air Volume (CFM)</th>
<th>Exhaust Air Wheel Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-30P-30H</td>
<td>1,500</td>
<td>70</td>
<td>1,500</td>
<td>70</td>
</tr>
</tbody>
</table>
### AHRI PERFORMANCE DATA

<table>
<thead>
<tr>
<th>Type</th>
<th>Tilt Angle (Heating/Cooling):</th>
<th>Pressure Drop (in. wg)</th>
<th>Nominal Airflow (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEEL</td>
<td>N / A Deg</td>
<td>1</td>
<td>1,700</td>
</tr>
</tbody>
</table>

**Wheel Leakage Ratings**

<table>
<thead>
<tr>
<th>Test</th>
<th>Pressure Differential</th>
<th>Exhaust Air Transfer Ratio</th>
<th>Outdoor Air Correction Factor</th>
<th>Purge Angle/Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>0.0</td>
<td>2.0</td>
<td>1.03</td>
<td>0</td>
</tr>
<tr>
<td>#2</td>
<td>0.5</td>
<td>1.0</td>
<td>1.06</td>
<td>1</td>
</tr>
<tr>
<td>#3</td>
<td>1.0</td>
<td>0.8</td>
<td>1.08</td>
<td>1</td>
</tr>
</tbody>
</table>

Optional Additional Test(s):

### Thermal Effectiveness Ratings at 0.0 in. Differential Pressure

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sensible</th>
<th>Latent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Airflow Heating</td>
<td>67</td>
<td>62</td>
<td>65</td>
</tr>
<tr>
<td>75% Airflow Heating</td>
<td>72</td>
<td>67</td>
<td>70</td>
</tr>
<tr>
<td>100% Airflow Cooling</td>
<td>67</td>
<td>62</td>
<td>64</td>
</tr>
<tr>
<td>75% Airflow Cooling</td>
<td>72</td>
<td>67</td>
<td>69</td>
</tr>
</tbody>
</table>

### Net Thermal Effectiveness Ratings at 0.0 in. Differential Pressure

<table>
<thead>
<tr>
<th>Condition</th>
<th>Net Sensible</th>
<th>Net Latent</th>
<th>Net Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Airflow Heating</td>
<td>67</td>
<td>62</td>
<td>65</td>
</tr>
<tr>
<td>75% Airflow Heating</td>
<td>72</td>
<td>67</td>
<td>70</td>
</tr>
<tr>
<td>100% Airflow Cooling</td>
<td>67</td>
<td>62</td>
<td>64</td>
</tr>
<tr>
<td>75% Airflow Cooling</td>
<td>72</td>
<td>67</td>
<td>69</td>
</tr>
</tbody>
</table>

Trademark: Greenheck

Model Number: RVE-40-30P-30H

## EQUIPMENT SCHEDULE

### Energy Recovery

<table>
<thead>
<tr>
<th>Mark Name</th>
<th>Qty</th>
<th>Model</th>
<th>ER Type</th>
<th>Mounting Location</th>
<th>Weight</th>
<th>Outdoor Air Volume</th>
<th>Supply ESP</th>
<th>Supply Temp</th>
<th>Supply Fan</th>
<th>Supply Pressure</th>
<th>Supply Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTU-2</td>
<td>1</td>
<td>RVE-40-30P-30H-5</td>
<td>Wheel</td>
<td>Outdoor</td>
<td>2,673 lb</td>
<td>1,500 CFM</td>
<td>1.25 in. wg</td>
<td>1549</td>
<td>1.176</td>
<td>3 hp</td>
<td></td>
</tr>
</tbody>
</table>

### Exhaust Fan

<table>
<thead>
<tr>
<th>Exhaust ESP</th>
<th>Exhaust Pressure</th>
<th>Exhaust Motor</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Phase</th>
<th>Unit MCA</th>
<th>Unit MCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500 CFM</td>
<td>1.25 in. wg</td>
<td>1503</td>
<td>1119</td>
<td>39 hp</td>
<td>208</td>
<td>60</td>
<td>3</td>
</tr>
</tbody>
</table>

### Supply Fan

<table>
<thead>
<tr>
<th>Supply ESP</th>
<th>Supply Temp</th>
<th>Supply Pressure</th>
<th>Supply Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500 CFM</td>
<td>1.25 in. wg</td>
<td>1549</td>
<td>1.176</td>
</tr>
</tbody>
</table>

### SUMMER ENERGY RECOVERY PERFORMANCE

<table>
<thead>
<tr>
<th>Outside Air DB</th>
<th>Outside Air WB</th>
<th>Supply Air DB</th>
<th>Supply Air WB</th>
<th>Return Air DB</th>
<th>Return Air WB</th>
<th>Exhaust Air DB</th>
<th>Exhaust Air WB</th>
<th>ASHRAE 90.1 Enthalpy Recovery Ratio</th>
<th>Cooling Load Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>91.0 F</td>
<td>74.0 F</td>
<td>79.8 F</td>
<td>66.6 F</td>
<td>75.0 F</td>
<td>62.5 F</td>
<td>86.2 F</td>
<td>70.5 F</td>
<td>68.5</td>
<td>3.60 tons</td>
</tr>
</tbody>
</table>

### WINTER ENERGY RECOVERY PERFORMANCE

<table>
<thead>
<tr>
<th>Outside Air DB</th>
<th>Outside Air WB</th>
<th>Supply Air DB</th>
<th>Supply Air WB</th>
<th>Return Air DB</th>
<th>Return Air WB</th>
<th>Exhaust Air DB</th>
<th>Exhaust Air WB</th>
<th>ASHRAE 90.1 Enthalpy Recovery Ratio</th>
<th>Heating Load Reduciton</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0 F</td>
<td>4.9 F</td>
<td>52.6 F</td>
<td>43.6 F</td>
<td>72.0 F</td>
<td>55.8 F</td>
<td>26.4 F</td>
<td>26.0 F</td>
<td>68.5</td>
<td>73,872 BTU</td>
</tr>
</tbody>
</table>

### COOLING SECTION

<table>
<thead>
<tr>
<th>Coil Entering DB</th>
<th>Coil Entering WB</th>
<th>Coil Leaving DB</th>
<th>Total Capacity</th>
<th>Sensible Capacity</th>
<th>Coil Face Velocity</th>
<th>Coil Pressure Drop</th>
<th>Rows Deep</th>
<th>Fins per Inch</th>
<th>Entering Fluid Temp</th>
<th>Leasing Fluid Temp</th>
<th>Hot Gas Reheat Capacity</th>
<th>LAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>79.8 F</td>
<td>66.6 F</td>
<td>52.1 F</td>
<td>51.8 F</td>
<td>67.0 MBH</td>
<td>45.7 MBH</td>
<td>121</td>
<td>0.055 in. wg</td>
<td>4</td>
<td>12</td>
<td>140.0 F</td>
<td>41.1 MBH</td>
<td>77.5 F</td>
</tr>
</tbody>
</table>

### OPTIONS AND ACCESSORIES

- Condensate Overflow Switch
- Unit Warranty: 1 Yr (Standard)
- Frost Control: Modulating Wheel
- Weatherhood: Downturned Hood
- ElectroFin Coil Coating: All
- Outdoor Air Filters - MERV 8, 4-20x25x2
- Exhaust Air Filters - MERV 8, 4-20x25x2
- Supply Filters - 2" Pleated MERV 8 and MERV 13, 8-20x20x2
- Roof Curbs - G4K-48/145-G4-14-
- Outdoor Air Dampers - Motorized Low Leakage
- Return Air Dampers - Motorized Low Leakage
- Damper End Switch - Outdoor Air & Return Air Damper
- Painted Exterior - Permaselect Concrete Gray (RAL 7023)
- Microprocessor Controls
- Supply Fan VFD Control - Duct Static Pressure
- Economizer Mode - Temp/Dew Point Control
- Wheel Control - Modulating Wheel
- Network Protocol: To Be Selected
- Dirty Filter Sensor: Outdoor, Exhaust and Final
- Rotation Sensor
- Phase and Brownout Protection
- 120v NEMA 3R Outlet (Factory mounted and wired)
- Expansion Board
- RAI
- Unit Disconnect - Mounted By Factory
- Condensate Overflow Switch
- Unit Warranty: 1 Yr (Standard)
FOOTPRINT DRAWINGS

Top View of Curb

Cross-Section View of Unit on Curb

NOTES: All dimensions shown are in units of in.’s
If unit is selected with side or end discharge/return, there will not be bottom connections supplied with the curb.

Curb Weight: 218 lb
Unit Corner Weights

864 lb 748 lb

568 lb 492 lb

Note: Estimated corner weights are shown looking down on unit and the outside air intake will be on the right. Weights are applied at the base of the unit. Images not drawn to scale.
CAUTION
UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
PPOWER MUST BE OFF WHILE SERVICING.

NOTES
USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.
FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.
FIELD WIRED FACTORY SUPPLIED AND WIRED

Wiring Diagram Code:
BK BLACK
BL BLUE
BR BROWN
GY GRAY
LT BL LIGHT BLUE
O ORANGE
PK PINK
PR PURPLE
R RED
W WHITE
Y YELLOW

Wiring Template: Y00

RAI RETURN AIR INLET TEMPERATURE

BUILDING VALUE IN AIR.
### MONITORING POINTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAI</td>
<td>Outdoor Air Intake Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>OAD</td>
<td>Outdoor Air Discharge Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>ACC</td>
<td>After Cooling Coil Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>PS2</td>
<td>Supply Dirty Filter Pressure Switch</td>
<td>Contact</td>
</tr>
<tr>
<td>PS3</td>
<td>Exhaust Dirty Filter Pressure Switch</td>
<td>Contact</td>
</tr>
<tr>
<td>PS6</td>
<td>*Duct Pressure</td>
<td>0-10 VDC</td>
</tr>
<tr>
<td>S2</td>
<td>Wheel Rotation Sensor</td>
<td>Contact</td>
</tr>
<tr>
<td>RAI</td>
<td>Return Air Intake Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
</tbody>
</table>

*Shipped loose sensor.
Microprocessor Controller Sequence of Operation

MICROPROCESSOR CONTROLLER: Controller shall be provided with required sensors and programming for rooftop unit. Controller shall be factory programmed, mounted and tested. Controller shall have a LCD readout for changing set points and monitoring unit operation.

UNIT START COMMAND (Unit will be enabled to start once a jumper is placed between R to G):
- Factory mounted and wired outdoor air damper actuator is powered
- Return air damper actuator is powered.
- Exhaust fan starts after a 10 second (adj.) delay.
- Supply fan starts 10 second delay.
- Tempering options and energy wheel option to function as described below.

UNIT STOP COMMAND (OR DE-ENERGIZED):
- Supply fan, exhaust fan, energy wheel and tempering options de-energized.
- Outdoor air damper actuator is spring return close.
- Return air damper is spring return close.

OCCUPIED/UNOCCUPIED MODES: Shall be based on a 7-day time clock internal to the controller. The schedule shall be set by the end user. When a user initiates an override input, the controller will switch from unoccupied to occupied mode. The controller will return to the scheduled occupied/unoccupied mode after the override time has expired (60 min, adj.). If internal time clock is disabled, a remote contact or a BMS can control the occupied/unoccupied mode.

Occupied Mode:
- Damper control per below.
- Energy wheel control per below.
- Exhaust fan ON.
- Supply fan ON.
- Heating per below.
- Cooling per below.

Unoccupied Mode (Unit Off): Unit remains off when in unoccupied mode.
- Supply fan OFF
- Exhaust fan OFF
- Tempering OFF
- Outdoor air damper closed.
- Return damper closed.

Morning Warm-up: One hour prior to occupancy, the controller will reference the temperature differential between the current room temperature and the occupied temperature set point. The controller will then look at the amount of time required from the previous days morning warm up sequence and determine how far in advance the unit has to be started to meet the desired occupied set point by the time of occupancy.

SUPPLY BLOWER SEQUENCE: The supply blower is provided with a factory mounted variable frequency drive. The supply blower speed will be controlled with the following sequence.

Duct Static Pressure Sensor: The supply blower is modulated based upon the signal from a duct static pressure sensor (factory provided and wired, field mounted and tubing by others). The controller will modulate the supply fan based upon a comparison of the duct static pressure set point (adj.) to the actual duct static pressure level reported from the sensor. (Mechanical high static protection cutoffs must be installed by others to protect the system and equipment from over-pressurization. The manufacturer does not assume responsibility for this.)
**BMS Control:** The supply blower is modulated based upon a command from the Building Management System. (This Sequence must be field configured.)

**EXHAUST BLOWER SEQUENCE:** The exhaust blower is provided with a factory mounted variable frequency drive. The exhaust blower speed will be controlled with the following sequence.

- **Supply Tracking:** The exhaust fan will modulate to track the speed of the supply fan.
- **BMS Control:** The exhaust blower is modulated based upon a command from the Building Management System. (This sequence must be field configured.)

**COOLING SEQUENCE:** The cooling is controlled to maintain the supply temperature set point. The mechanical cooling will be locked out when the outside air is < 55°F - 2°F hysteresis (adj.).

- **Packaged DX Cooling (Digital Scroll):** The controller will provide a modulating signal for cooling. From 10-100%, the digital scroll will be controlled to maintain discharge temperature.
- **Modulating Hot Gas Reheat Sequence:** During dehumidification the modulating HGRH is controlled to maintain the supply temperature set point.
- **Modulating Head Pressure Control:** Lead condenser fan will have an EC motor and will modulate to maintain a head pressure set point.

**DEHUMIDIFICATION SEQUENCE:** The cooling is controlled to maintain the cooling-coil set point. The dehumidification sequence will be locked out when the OA is <10°F above the cold-coil set point (adj.).

- **Cold Coil Setpoint Reset Function:** The controller will control the cooling to maintain an active set point. The active set point will set to local control (55°F, adj) from the factory and can be field adjusted to the following sequence:
  - **BMS Control:** The controller will adjust the cold coil leaving air temperature set point between the minimum (50°F, adj) and the maximum (55°F, adj) set points, to satisfy the desired BMS set point for dehumidification.

**REHEAT SEQUENCE:** While the unit is in dehumidification mode the outdoor air will be reheated via Modulating Hot Gas Reheat for space neutral applications.

- **Modulating Hot Gas Reheat:** The controller will modulate the hot gas reheat reheat valve with a 0-10 V signal to maintain the supply temperature set point (adj.).

**HEATING SEQUENCE:** The heating is controlled to maintain the supply temperature set point. The heating will be locked out when the outside air is > 70°F + 2°F hysteresis, (adj.).

- **Hot Water Coil:** The controller will modulate a hot water valve (field provided) to maintain the supply temperature set point (adj.). **Coil Freeze protection must be provided by others in the field!**

**SUPPLY SET POINT RESET FUNCTION:** The controller will modulate the heating and cooling to maintain an active set point. The active set point will be set to outdoor air reset from the factory and can be field adjusted to the following sequence:
**OA Reset (Default):** The controller will monitor the outdoor air temperature and adjusts the desired supply temperature set point accordingly. For example, when the outdoor air is below 55 °F, the controller will change the supply set point to 70 °F. If the outdoor air is above 65 °F, the controller will change the supply set point to 55°F. If the outdoor air temperature is between 55°F and 65°F, the supply set point changes according to the outdoor air reset function. A visual representation of this is shown below.

![Diagram of Outdoor Air Reset Function](image)

**Local:** The supply set point will be a constant temperature set from the controller (adj.).

**BMS Control:** The controller will adjust the desired supply temp set point to satisfy the desired BMS set point.

**BUILDING FREEZE PROTECTION:** If the supply air temperature drops below 35°F (adj.) for 300s (adj.), the controller will de-energize the unit and activate the alarm output.

**TEMPERATURE PROTECTION:** The controller will enable the supply fan to modulate down to help the unit keep up with heating demand in the event of wheel failure or the unit operating outside design conditions. (This can be enabled under the manufacturer menu in the controller)

**FROST CONTROL:** Frost control for the energy wheel is enabled when frost is present on the wheel; based on the outside air temperature and the pressure drop across the wheel. If the outdoor air temperature is below 5°F – 2°F hysteresis, adj. and the differential pressure across the wheel is about 1.5", adj. frost control will enable.

**Modulate Wheel:** When frosting is occurring, the VFD modulates the wheel down to a slow rotational speed to defrost wheel. Once either the pressure drop decreases below the pressure switch set point, or the outdoor air temperature increases about the temperature set point, the unit will resume normal operation.

**ECONOMIZER SEQUENCE:** When the application requires cooling, and the outdoor air conditions are suitable for free cooling, the controller will modulate the energy wheel speed to maintain the discharge temperature set point. If the energy wheel modulates to the economizer set point and the discharge temperature is not met, the controller will increase the call for cooling to meet the discharge temperature and could engage mechanical cooling.

**Temp/Dew Point:** The economizer will be locked out when: the outdoor air is < 40° F DB (-2° F hysteresis, adj.) or > 75° F DB (-2° F hysteresis, adj.) or > 55° F dew point (-2° F hysteresis, adj.) ; the unit is operating in dehumidification mode; or there is a call for heating

**ENERGY WHEEL SEQUENCE**
Modulate Wheel (100% OA only): When economizer mode is enabled and there is a signal for cooling, the wheel VFD modulates wheel speed to maintain the discharge temperature set point.

ALARMS INDICATION: The controller will display alarms and have one digital output for remote indication of an alarm condition. Possible alarms include:

Building Management System: The controller will send all alarms to the BMS.

Dirty Filter Alarm: A digital signal is sent to the controller indicating an increased pressure drop across the outdoor, exhaust or supply air filters (Must be adjusted in field during start up). The controller will then provide a dirty filter alarm.

Dirty Wheel Alarm: The controller monitors pressure across the wheel and sends an alarm in the case of an increased pressure drop.

Wheel Rotation Alarm: The controller monitors wheel rotation, if the wheel does not rotate for 30s (adj.) an alarm will generate.

Supply and Exhaust Air Alarm: The controller monitors the proving switch on each blower and sends an alarm in the case of either blower proving switch not engaging for 30s (adj.).

DX Alarm: The controller monitors the refrigerant pressure. In the case of low refrigerant pressure the compressors will shut down until refrigerant pressure returns to normal values and the controller will send a alarm. In the case of high refrigerant pressure the compressors will shut down, requiring a manual reset and the controller will send a alarm.

Temperature Sensor Alarm: The controller sends an alarm in the case of a failed air temperature sensor.

Pressure Sensor Alarm: The controller sends an alarm in the case of a failed pressure sensor.

Humidity Sensor Alarm: The controller sends an alarm in the case of a failed humidity sensor.

Accessories: The following accessories will be included with the unit to expand the functionality or usability of the controller.

BMS Interfacing: A BMS serial card is provided with the controller for field interfacing with a building management system. Each card is sent out with the default parameters, and the controls contractor must change the appropriate addresses to match the BMS settings.

Phase and Brown Out Protection: Factory mounted and wired component which monitors the main power coming into the unit. If a phase drops out, or if the incoming voltage exceeds the acceptable range, the component will turn off the unit to help protect the electrical systems.

Condensate Overflow Switch: The condensate overflow switch is mounted in the drain pan within the unit. If the water level in the drain pan reaches a certain level, the switch will open a set of contacts connected to a terminal block in the control center.

Damper End Switch: Damper end switched will be provided to ensure the supply and exhaust fans do not enable until the dampers are proven open.
Unit Warranty

Limited Warranty
Greenheck warrants this equipment to be free from defects in material and workmanship for a period of 1 year(s) from the purchase date. The energy recovery wheel is warranted to be free from defects in material and workmanship for a period of five years from the purchase date. Any component which proves defective during the warranty period will be repaired, or replaced, at Greenheck's sole option when returned to our factory, transportation prepaid.

The warranty does not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck product.

This warranty is exclusive, and is in lieu of all other warranties, whether written, oral or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose.

Electrofin Coil Coating
Electrofin coil coating carries a standard 1 year warranty and is excluded from any extended unit warranty.
RVE-40-30P-30H
CONSTRUCTION FEATURES AND ACCESSORIES

Unit Overview

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>RVE-40-30P-30H-5-RC</td>
</tr>
<tr>
<td>Supply (CFM)</td>
<td>1,500</td>
</tr>
<tr>
<td>Outside Air (CFM)</td>
<td>1,500</td>
</tr>
<tr>
<td>Recirc (CFM)</td>
<td>0</td>
</tr>
<tr>
<td>Exhaust (CFM)</td>
<td>1,500</td>
</tr>
<tr>
<td>Heating</td>
<td>Hot Water</td>
</tr>
<tr>
<td>Cooling</td>
<td>Split System DX W/RC</td>
</tr>
<tr>
<td>Electrical V/C/P</td>
<td>208/60/3</td>
</tr>
</tbody>
</table>

Features
- Exterior housing constructed of galvanized steel
- Energy recovery cassette with a desiccant wheel
- Direct-drive backward inclined plenum blowers with factory mounted VFDs
- Ball bearing motors
- Corrosion resistant fasteners
- Internally lined with galvanized steel metal creating a double wall
- Insulated with 2 in. 2.4# R13 density foam insulation
- Internally mounted control center with motor starters, 24 VAC control transformer(s), control circuit fusing
- Energy Wheel Motor: 1/3 HP
- Stainless steel condensate drain pan and connection.
- Low Sound Condenser Fan Package

Options and Accessories
- UL/cUL1995
- Frost Control: Modulating Wheel
- Duct Flanges
- ElectroFin Coil Coating: Interior
- Outdoor Air Filters - MERV 8, 4-20x25x2
- Exhaust Air Filters - MERV 8, 4-20x25x2
- Supply Filters - 2" Pleated MERV 8 and MERV 13, 8-20x20x2
- Outdoor Air Dampers - Motorized Low Leakage
- Return Air Dampers - Motorized Low Leakage
- Damper End Switch - Outdoor Air & Return Air Damper
- Painted Exterior - Permatector Concrete Gray (RAL 7023)
- Microprocessor Controls
- Supply Fan VFD Control - Duct Static Pressure
- Economizer Mode - Temp./Dew Point Control
- Wheel Control - Modulating Wheel
- Network Protocol: To Be Selected
- Dirty Filter Sensor: Outdoor, Exhaust and Final
- Rotation Sensor
- Phase and Brown Out Protection
- 120v NEMA 3R Outlet (Factory mounted and wired)
- Expansion Board
  - RAI
  - Unit Disconnect - Mounted By Factory
  - Condensate Overflow Switch
  - Exhaust Discharge Gravity Backdraft Damper
  - Lead ECM Condenser Fan
  - Remote Condenser
  - Painted Exterior - Remote Condenser - Permatector - Concrete Gray (RAL7023)

Note: Unit is provided with factory mounted and wired disconnect switch.

Note: Electrofin coil coating requires monthly and quarterly coil maintenance to maintain the coil coating. See unit IOM for detailed cleaning procedure and required documentation to maintain the coatings warranty. Failure to follow cleaning recommendations will void the coatings warranty.

Note: Verify that the correct Protocol has been selected before ordering.
# PERFORMANCE AND SPECIFICATIONS

## Description/Arrangement

<table>
<thead>
<tr>
<th>Model</th>
<th>Qty</th>
<th>Unit Weight (lb)</th>
<th>Outdoor Air Discharge</th>
<th>Outdoor Air Intake</th>
<th>Exhaust Air Discharge</th>
<th>Return Air Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-30P-30H-5-RC</td>
<td>1</td>
<td>2,030</td>
<td>Bottom</td>
<td>End</td>
<td>Side</td>
<td>Bottom</td>
</tr>
</tbody>
</table>

## Design Conditions

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Summer DB (F)</th>
<th>Summer WB (F)</th>
<th>Winter DB (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>91</td>
<td>74</td>
<td>7</td>
</tr>
</tbody>
</table>

## Air Performance

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (CFM)</th>
<th>External SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Qty/Size (hp)</th>
<th>Size (in.)/Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>1,500</td>
<td>1.25</td>
<td>2.663</td>
<td>1549</td>
<td>1.18</td>
<td>Qty 1 (3)</td>
<td>18/Plenum</td>
</tr>
<tr>
<td>ExhaustNormal</td>
<td>1,500</td>
<td>1.25</td>
<td>2.005</td>
<td>1489</td>
<td>1.09</td>
<td>Qty 1 (3)</td>
<td>18/Plenum</td>
</tr>
</tbody>
</table>

## Electrical/Motor Specifications

<table>
<thead>
<tr>
<th>V/C/P</th>
<th>Unit MCA (amps)</th>
<th>Unit MOP (amps)</th>
<th>Exh. MCA (amps)</th>
<th>Exh. MOP (amps)</th>
<th>Enclosure</th>
<th>Supply Motor RPM</th>
<th>Supply Efficiency</th>
<th>Exhaust Motor RPM</th>
<th>Exhaust Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>208/60/3</td>
<td>40.3</td>
<td>50</td>
<td>N/A</td>
<td>N/A</td>
<td>ODP</td>
<td>1750</td>
<td>PE</td>
<td>1755</td>
<td>PE</td>
</tr>
</tbody>
</table>

## Heating/Cooling Specifications

### Heating Type

- **Hot Water**
  - Entering Air Temp. (F): 53.0
  - Leaving Air Temp. (F): 84.4
  - Fluid Type: Propylene-35%
  - Fluid Flow Rate (GPM): 5.5
  - Fluid Press. Drop (ft wg): 0.3

### HW Coil Model

- HW38S01H10-40x21.7-RH
  - Total Energy (MBH): 51.7
  - Fins Per Inch: 10
  - Rows Deep: 1

### Cooling Type

- Split System DX W/RC
  - Total Capacity (MBH): 67.0
  - Sensible Capacity (MBH): 45.7

### Compressor

- Compressor Quantity: 1
- Lead Compressor Type: Digital Scroll
- Condensing Unit By: Greenheck

## Sound Performance in Accordance with AMCA

<table>
<thead>
<tr>
<th>Fan</th>
<th>Sound Power by Octave Band</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>62.5</td>
</tr>
<tr>
<td>Supply</td>
<td>76</td>
</tr>
<tr>
<td>Exhaust</td>
<td>68</td>
</tr>
</tbody>
</table>

### Unit Pressure Drop (in. wg)

<table>
<thead>
<tr>
<th>Air Stream</th>
<th>Weatherhood</th>
<th>Damper Section</th>
<th>Filter Section</th>
<th>Cooling Section</th>
<th>Heating Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>N/A</td>
<td>0.009</td>
<td>0.068</td>
<td>0.055</td>
<td>0.022</td>
</tr>
<tr>
<td>Exhaust</td>
<td>N/A</td>
<td>0.000</td>
<td>0.000</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: The unit base line performance incorporates the pressure drop of the energy wheel.

Note: Filter pressure drop is based off of clean filters.
# FAN CURVES

## Supply Fan Performance

<table>
<thead>
<tr>
<th>Volume (CFM)</th>
<th>Supply SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Size (hp)</th>
<th>Size (in.)/ Type</th>
<th>Fan Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500</td>
<td>1.25</td>
<td>2.663</td>
<td>1549</td>
<td>1.176</td>
<td>3</td>
<td>18/Plenum</td>
<td>1</td>
</tr>
</tbody>
</table>

![Supply Fan Performance Graph](graph1.png)

## Exhaust Fan Performance - Normal Operation

<table>
<thead>
<tr>
<th>Volume (CFM)</th>
<th>Exhaust SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Size (hp)</th>
<th>Size (in.)/ Type</th>
<th>Fan Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500</td>
<td>1.25</td>
<td>2.005</td>
<td>1489</td>
<td>1.09</td>
<td>3</td>
<td>18/Plenum</td>
<td>1</td>
</tr>
</tbody>
</table>

![Exhaust Fan Performance Graph](graph2.png)
### COOLING PERFORMANCE

#### Split System DX W/RC Cooling

<table>
<thead>
<tr>
<th>Nominal Tonnage</th>
<th>Total Capacity (MBH)</th>
<th>Sensible Capacity (MBH)</th>
<th>Refrigerant Type</th>
<th>Lead Compressor Type</th>
<th>Compressor Quantity</th>
<th>Condensing Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>67.0</td>
<td>45.7</td>
<td>R-410A</td>
<td>Digital Scroll</td>
<td>1</td>
<td>By Greenheck</td>
</tr>
</tbody>
</table>

#### Hot Gas Reheat

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity (MBH)</th>
<th>LAT (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulating</td>
<td>41.1</td>
<td>77.5</td>
</tr>
</tbody>
</table>

#### Condensing Unit Details

The RVE will come equipped with the following components:
- Hermetic scroll type compressors
- Compressors mounted in a compartment to be serviceable without affecting airflow and on neoprene vibration isolation to minimize vibration transmission and noise
- Crankcase heater on compressor(s)
- Thermal expansion valve for refrigerant flow control
- Variable capacity scroll compressor
- Lead ECM condensing fan for active head pressure control
- Liquid-Line filter drier
- High pressure manual reset cutout
- Low-pressure auto-reset cutout
- Time delay relays for compressor protection
- Service/charging valves
- Moisture-indicating sight glass

#### Split System DX W/RC Details

- Face Area (ft²): 11.8
- Rows Deep (Evap Coil): 4
- Fins Per Inch: 12
- Face Velocity (ft/min): 121
- Entering Dry Bulb (F): 79.8
- Entering Wet Bulb (F): 66.6
- Leaving Dry Bulb (F): 52.1
- Leaving Wet Bulb (F): 51.8
- Cool Coil SP (in. wg): 0.055
- Refrigerant Velocity (ft/min): 1,138
- Suction Temp. (F): 49.3
- Refrigerant: R-410A
- Evaporator Cap. (MBH): 67.0
- AHRI 920 ISMRE: 7.4

#### Compressor and Condenser Details

- Compressor 1 RLA (amps): 17.9
- Compressor 1 LRA (amps): 110

Note: Digital Scroll is on lead circuit only.
REMOTE CONDENSER

Split System DX W/RC Cooling

<table>
<thead>
<tr>
<th>Weight</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Phase</th>
<th>RC MCA</th>
<th>RC MOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>815 lb</td>
<td>208 V</td>
<td>60 Hz</td>
<td>3</td>
<td>6.5 A</td>
<td>15.0 A</td>
</tr>
</tbody>
</table>

Condensing Unit Details

The RVE will come equipped with the following components:

- Direct drive condensing fans with external rotors and molded fan blades
- Condensing coils with 5/16" copper tubes mechanically bonded to aluminum fins
- Low sound condensing fans
- Lead EC condenser fan
- Remote condenser will have stand-alone control without requiring control wiring back to the unit it is paired with

Condenser Details

<table>
<thead>
<tr>
<th>Ambient Condenser Temp. (F):</th>
<th>91.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condenser Fan QTY:</td>
<td>2</td>
</tr>
<tr>
<td>Condenser Motor 1 HP:</td>
<td>1.68</td>
</tr>
<tr>
<td>Condenser Motor 2 HP:</td>
<td>0.62</td>
</tr>
<tr>
<td>Condenser Motor 1 FLA:</td>
<td>3.8</td>
</tr>
<tr>
<td>Condenser Motor 2 FLA:</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Piping Details

Equivalent Piping Length (ft): 100
Piping Rise (ft): 25

Requires field provided piping between the main unit and the remote condenser. Field provided piping shall include 1/2" liquid line and 5/8" discharge line.
## HEATING PERFORMANCE

### Hot Water Heating

<table>
<thead>
<tr>
<th>Heating Type</th>
<th>Entering Air Temp. (F)</th>
<th>Leaving Air Temp. (F)</th>
<th>Fluid Type</th>
<th>Face Velocity (ft/min)</th>
<th>Air Pressure Drop (in. wg)</th>
<th>Entering Fluid Temp. (F)</th>
<th>Leaving Fluid Temp. (F):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water</td>
<td>53.0</td>
<td>84.4</td>
<td>Propylene-35%</td>
<td>249</td>
<td>0.022</td>
<td>160.0</td>
<td>140.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HW Coil Model</th>
<th>Total Energy (MBH)</th>
<th>Fins Per Inch</th>
<th>Rows Deep</th>
<th>Connection Size (in.)</th>
<th>Fluid Flow Rate (GPM)</th>
<th>Fluid Press. Drop (ft wg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HW38S01H10-40x21.7-RH</td>
<td>51.7</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>5.5</td>
<td>0.3</td>
</tr>
</tbody>
</table>

### Hot Water Unit Unit Details

The RVE will come equipped with the following:
- Aluminum fins
- Copper tubes
- Hand brazed construction
- Galvanized steel casing
- AHRI certified

### Heating Coil Details

Heating Coil Model: HW12C01H10-40x21.7-RH

- Rows Deep: 1
- Fins Per Inch: 10
- Face Velocity (ft/min): 249
- Total Energy (MBH): 51.7
- Entering Dry Bulb (F): 53.0
- Leaving Air (F): 84.4
- Heat Coil SP (in. wg): 0.022
- Entering Fluid (F): 160.0
- Leaving Fluid (F): 140.0
- Fluid Type: Propylene
- Glycol (%): 35
- Fluid Flow (GPM): 5.5
- Fluid PD (ft wg): 0.3
- Connection Size (in.): 1
ENERGY RECOVERY SUMMER PERFORMANCE

**Design Air Flow Conditions**

<table>
<thead>
<tr>
<th>Model</th>
<th>Outdoor Air Volume (CFM)</th>
<th>OA Wheel Enthalpy Recovery Ratio</th>
<th>Exhaust Air Volume (CFM)</th>
<th>Exhaust Air Wheel Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-30P-30H</td>
<td>1,500</td>
<td>68.5</td>
<td>1,500</td>
<td>68.5</td>
</tr>
</tbody>
</table>

**Outdoor Air Cooling Reduction**

<table>
<thead>
<tr>
<th>OA Load w/o Energy Recovery</th>
<th>(BTU/h)</th>
<th>(tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA Load with Energy Recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment Reduction tons</td>
<td></td>
<td>3.60</td>
</tr>
</tbody>
</table>

**Summer Conditions**

1 = Outdoor Air Design
2 = Energy Wheel
3 = DX Coil
4 = Hot Gas Reheat
5 = Exhaust Air Entering Wheel
ENERGY RECOVERY WINTER PERFORMANCE

OUTDOOR AIR

<table>
<thead>
<tr>
<th>Entering Air</th>
<th>Leaving Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>7.0</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>4.9</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>4</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>2.3</td>
</tr>
<tr>
<td>Dry Bulb (F)</td>
<td>26.4</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>25.0</td>
</tr>
<tr>
<td>Specific Humidity (gr/lb)</td>
<td>17</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>8.7</td>
</tr>
</tbody>
</table>

Exhaust Air

<table>
<thead>
<tr>
<th>Outdoor Air Heating Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA Load w/o Energy Recovery</td>
</tr>
<tr>
<td>OA Load with Energy Recovery</td>
</tr>
<tr>
<td>BTU/h Reduction</td>
</tr>
</tbody>
</table>

Design Air Flow Conditions

<table>
<thead>
<tr>
<th>Model</th>
<th>Outdoor Air Volume (CFM)</th>
<th>OA Wheel Enthalpy Recovery Ratio</th>
<th>Exhaust Air Volume (CFM)</th>
<th>Exhaust Air Wheel Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-30P-30H</td>
<td>1,500</td>
<td>70</td>
<td>1,500</td>
<td>70</td>
</tr>
</tbody>
</table>

Winter Conditions

1 = Outdoor Air Design
2 = Energy Wheel
3 = Hot Water Coil
4 = Exhaust Air Entering Wheel
<table>
<thead>
<tr>
<th>Type</th>
<th>Tilt Angle (Heating/Cooling)</th>
<th>Pressure Drop (in. wg)</th>
<th>Nominal Airflow (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEEL</td>
<td>N/A Deg</td>
<td>1</td>
<td>1,700</td>
</tr>
</tbody>
</table>

**Wheel Leakage Ratings**

<table>
<thead>
<tr>
<th>Pressure Differential</th>
<th>Exhaust Air Transfer Ratio</th>
<th>Outdoor Air Correction Factor</th>
<th>Purge Angle/Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test #1</td>
<td>0.0</td>
<td>2.0</td>
<td>1.03</td>
</tr>
<tr>
<td>Test #2</td>
<td>0.5</td>
<td>1.0</td>
<td>1.06</td>
</tr>
<tr>
<td>Test #3</td>
<td>1.0</td>
<td>0.8</td>
<td>1.08</td>
</tr>
</tbody>
</table>

**Optional Additional Test(s):**

**Thermal Effectiveness Ratings at 0.0 in. Differential Pressure**

<table>
<thead>
<tr>
<th></th>
<th>Sensible</th>
<th>Latent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Airflow Heating Condition:</td>
<td>67</td>
<td>62</td>
<td>65</td>
</tr>
<tr>
<td>75% Airflow Heating Condition:</td>
<td>72</td>
<td>67</td>
<td>70</td>
</tr>
<tr>
<td>100% Airflow Cooling Condition:</td>
<td>67</td>
<td>62</td>
<td>64</td>
</tr>
<tr>
<td>75% Airflow Cooling Condition:</td>
<td>72</td>
<td>67</td>
<td>69</td>
</tr>
</tbody>
</table>

**Net Thermal Effectiveness Ratings at 0.0 in. Differential Pressure**

<table>
<thead>
<tr>
<th></th>
<th>Net Sensible</th>
<th>Net Latent</th>
<th>Net Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Airflow Heating Condition:</td>
<td>67</td>
<td>62</td>
<td>65</td>
</tr>
<tr>
<td>75% Airflow Heating Condition:</td>
<td>72</td>
<td>67</td>
<td>70</td>
</tr>
<tr>
<td>100% Airflow Cooling Condition:</td>
<td>67</td>
<td>62</td>
<td>64</td>
</tr>
<tr>
<td>75% Airflow Cooling Condition:</td>
<td>72</td>
<td>67</td>
<td>69</td>
</tr>
</tbody>
</table>

Trademark: Greenheck
Model Number: RVE-40-30P-30H

OVERVIEW DRAWINGS

Plan

Left End

Elevation

Right End
RC OVERVIEW DRAWINGS

CONDENSING FANS

PIPING CONNECTIONS

ELECTRICAL ACCESS PANEL

CONDENSING COIL

RECEIVER

Dimensions:
- CONDENSING FANS: 8.1
- 46.0
- 108.5
- 6.5
- 58.1
- 8.2
- 33.0
- 24.0

Printed Date: 2/27/2018
Job: Cohasset Town Hall
Mark: AHU-1
Model: RVE-40-30P-30H-5-RC

Generated by: dchisholm@buckleyonline.com
R:\Salespersons\Denis Chisholm\MARKETING\GGD\Cohasset town Hall\Cohasset Town Hall.gfcj
### EQUIPMENT SCHEDULE

#### Supply Fan

<table>
<thead>
<tr>
<th>Mark Name</th>
<th>Qty</th>
<th>Model</th>
<th>ER Type</th>
<th>Mounting Location</th>
<th>Weight</th>
<th>Outdoor Air Volume</th>
<th>Supply ESP</th>
<th>Supply TSP</th>
<th>FRPM</th>
<th>Supply BHP</th>
<th>Supply Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHU-1</td>
<td>1</td>
<td>RVE-40-30P-30H-5-RC</td>
<td>Wheel</td>
<td>Outdoor</td>
<td>1,250 lb</td>
<td>1,448 CFM</td>
<td>1,360 lb</td>
<td>1,175 lb</td>
<td>3 HP</td>
<td>1.175</td>
<td>3 HP</td>
</tr>
</tbody>
</table>

#### Exhaust Fan

<table>
<thead>
<tr>
<th>Exhaust Air Volume</th>
<th>Exhaust ESP</th>
<th>Exhaust TSP</th>
<th>FRPM</th>
<th>Exhaust Motor</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Phase</th>
<th>Unit MCA</th>
<th>Unit MOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500 CFM</td>
<td>1,480 lb</td>
<td>1,480 lb</td>
<td>1,500</td>
<td>1,500</td>
<td>148</td>
<td>3 hp</td>
<td>208</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

#### Energy Recovery

**Summer Energy Recovery Performance**

- Outside Air DB: 91.0°F
- Outside Air WB: 74.0°F
- Supply Air DB: 79.8°F
- Supply Air WB: 66.6°F
- Return Air DB: 52.1°F
- Return Air WB: 51.8°F
- Exhaust Air DB: 86.2°F
- Exhaust Air WB: 70.5°F

**Winter Energy Recovery Performance**

- Outside Air DB: 7.0°F
- Outside Air WB: 4.9°F
- Supply Air DB: 53.0°F
- Supply Air WB: 51.8°F
- Return Air DB: 9.8°F
- Return Air WB: 9.7°F
- Exhaust Air DB: 84.4°F
- Exhaust Air WB: 77.5°F

**Cooling Section**

- Coil Entering DB: 79.8°F
- Coil Entering WB: 66.6°F
- Nominal Tonnage: 3.60 tons
- Sensible Capacity: 75.0°F
- Latent Capacity: 26.4°F
- Coolant Type: R-410A

**Heating Section**

- Fluid Type: Propylene
- Supply Fluid Temp: 160.0°F
- Leaving Fluid Temp: 140.0°F
- Total Capacity: 51.7 MBH
- Hot Gas Reheat Capacity: 41.1 MBH

### OPTIONS AND ACCESSORIES

- 120v NEMA 3R Outlet (Factory mounted and wired)
- Expansion Board
- RAI
- Unit Disconnect - Mounted By Factory
- Condensate Overflow Switch
- Unit Warranty: 1 Yr (Standard)

**Painted Exterior - Remote Condenser - Permatect Concrete Gray (RAL7023)**

**ElectroFin Coil Coating: Exterior**

**Duct Flanges**

**ElectroFin Coil Coating: Interior**

**Outdoor Air Filters - MERV 8, 4-20x25x2**

**Exhaust Air Filters - MERV 6, 4-20x25x2**

**Supply Filters - 2" Pleated MERV 13, 8-20x25x2**

**Outdoor Air Dampers - Motorized Low Leakage**

**Return Air Dampers - Motorized Low Leakage**

**Perimeter Air End Switch - Outdoor Air & Return Air Dampers**

**Painted Exterior - Permatect Concrete Gray (RAL 7023)**

**Microprocessor Controls**

- Controls: VFD Controls - Duct Static Pressure
- Controls: ECM Mode - Temp./Dew Point Control
- Controls: Modulating Wheel
- Controls: Network - To Be Selected
- Controls: Only Filter Sensor - Outdoor, Exhaust and Final
- Controls: Phase and Brown Out Protection
- Controls: 120v NEMA 3R Outlet (Factory mounted and wired)
- Controls: Expansion Board
- Controls: RAI
- Controls: Unit Disconnect - Mounted By Factory
- Controls: Condensate Overflow Switch
- Controls: Unit Warranty: 1 Yr (Standard)

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**Page 58 of 92**
Unit Corner Weights

514 lb  496 lb

520 lb  501 lb

Note: Estimated corner weights are shown looking down on unit and the outside air intake will be on the right. Weights are applied at the base of the unit. Images not drawn to scale.
Remote Condenser Wiring Diagram

Diagram showing wiring connections and components such as condenser fans, transformers, and control systems. Notes on the diagram include:

- **CAUTION**: UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C. POWER MUST BE OFF WHILE SERVICING.

- **NOTES**: USE COPPER CONDUCTORS ONLY
  - 60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
  - 75° C FOR TERMINALS RATED 100 AMPS OR MORE.
  - FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

- ** legend**: Wiring Diagram Code:
  - 1 STAGE 1 AC
  - 2 STAGE 1 AC
  - 3 STAGE 1 AC

- **optional components**:
  - C# - CONDENSING FAN MOTOR
  - CF# - CONDENSING FAN CONTACTOR
  - CF# OL - CONDENSING FAN OVERLOAD (INTERNAL TO FAN MOTOR)

- **Symbols**:
  - D1 - DISCONNECT
  - DS1 - DISCONNECT
  - P1 - PRESSURE TRANSDUCER (STAGE 1 COOLING)
  - TR1 - CONTROL TRANSFORMER
  - TR2 - CONTROL TRANSFORMER
  - U1 - GREEN HECK
  - U10 - GREEN HECK
  - Y1 - GREEN HECK
  - J9 - J9
  - J10 - J10

- **Legend**: DDC Code: Version - RC v1.00

- **Connections**:
  - 2CBL-EC RED
  - 2CBL-EC BLACK
  - GND

- ** notes**: REMOVE FACTORY JUMPER IF USING EXTERNAL START/STOP

- **Notes on the diagram**: Building Value in Air.

- **Printed Date**: 2/27/2018
- **Generated by**: dchisholm@buckleyonline.com
- **Model**: RVE-40-30P-30H-5-RC
- **Job**: Cohasset Town Hall
- **Mark**: AHU-1
CAUTION
UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES
USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.
FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.
FIELD WIRED FACTORY SUPPLIED AND WIRED

LEGEND
G10000000000000XY00
GREENHECK
WIRE COLOR CODE
Building Value in Air.
Wiring Diagram Code:
BK BLACK
BL BLUE
BR BROWN
GY GRAY
LT BL LIGHT BLUE
O ORANGE
PK PINK
PR PURPLE
R RED
W WHITE
Y YELLOW

Wiring Template: Y00

ON MAIN UNIT CONTROLLER ( JS TERMINALS )
TO GND, +, -
RETURN AIR INLET TEMPERATURE
(RAJ)
## MONITORING POINTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAI</td>
<td>Outdoor Air Intake Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>OAD</td>
<td>Outdoor Air Discharge Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>ACC</td>
<td>After Cooling Coil Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>PS2</td>
<td>Supply Dirty Filter Pressure Switch</td>
<td>Contact</td>
</tr>
<tr>
<td>PS3</td>
<td>Exhaust Dirty Filter Pressure Switch</td>
<td>Contact</td>
</tr>
<tr>
<td>PS6</td>
<td>*Duct Pressure</td>
<td>0-10 VDC</td>
</tr>
<tr>
<td>S2</td>
<td>Wheel Rotation Sensor</td>
<td>Contact</td>
</tr>
<tr>
<td>RAI</td>
<td>Return Air Intake Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
</tbody>
</table>

*Shipped loose sensor.
Microprocessor Controller Sequence of Operation

MICROPROCESSOR CONTROLLER: Controller shall be provided with required sensors and programming for rooftop unit. Controller shall be factory programmed, mounted and tested. Controller shall have a LCD readout for changing set points and monitoring unit operation.

UNIT START COMMAND (Unit will be enabled to start once a jumper is placed between R to G):
- Factory mounted and wired outdoor air damper actuator is powered
- Return air damper actuator is powered.
- Exhaust fan starts after a 10 second (adj.) delay.
- Supply fan starts 10 second delay.
- Tempering options and energy wheel option to function as described below.

UNIT STOP COMMAND (OR DE-ENERGIZED):
- Supply fan, exhaust fan, energy wheel and tempering options de-energized.
- Outdoor air damper actuator is spring return close.
- Return air damper is spring return close.

OCCUPIED/UNOCCUPIED MODES: Shall be based on a 7-day time clock internal to the controller. The schedule shall be set by the end user. When a user initiates an override input, the controller will switch from unoccupied to occupied mode. The controller will return to the scheduled occupied/unoccupied mode after the override time has expired (60 min, adj.). If internal time clock is disabled, a remote contact or a BMS can control the occupied/unoccupied mode.

Occupied Mode:
- Damper control per below.
- Energy wheel control per below.
- Exhaust fan ON.
- Supply fan ON.
- Heating per below.
- Cooling per below.

Unoccupied Mode (Unit Off): Unit remains off when in unoccupied mode.
- Supply fan OFF
- Exhaust fan OFF
- Tempering OFF
- Outdoor air damper closed.
- Return damper closed.

Morning Warm-up: One hour prior to occupancy, the controller will reference the temperature differential between the current room temperature and the occupied temperature set point. The controller will then look at the amount of time required from the previous days morning warm up sequence and determine how far in advance the unit has to be started to meet the desired occupied set point by the time of occupancy.

SUPPLY BLOWER SEQUENCE: The supply blower is provided with a factory mounted variable frequency drive. The supply blower speed will be controlled with the following sequence.

Duct Static Pressure Sensor: The supply blower is modulated based upon the signal from a duct static pressure sensor (factory provided and wired, field mounted and tubing by others). The controller will modulate the supply fan based upon a comparison of the duct static pressure set point (adj.) to the actual duct static pressure level reported from the sensor. (Mechanical high static protection cutoffs must be installed by others to protect the system and equipment from over-pressurization. The manufacturer does not assume responsibility for this.)
**BMS Control:** The supply blower is modulated based upon a command from the Building Management System. (This Sequence must be field configured.)

**EXHAUST BLOWER SEQUENCE:** The exhaust blower is provided with a factory mounted variable frequency drive. The exhaust blower speed will be controlled with the following sequence.

Supply Tracking: The exhaust fan will modulate to track the speed of the supply fan.

**BMS Control:** The exhaust blower is modulated based upon a command from the Building Management System. (This sequence must be field configured.)

**COOLING SEQUENCE:** The cooling is controlled to maintain the supply temperature set point. The mechanical cooling will be locked out when the outside air is < 55°F - 2°F hysteresis (adj.).

Split System DX W/RC Cooling (Digital Scroll): The controller will provide a modulating signal for cooling. From 10-100%, the digital scroll will be controlled to maintain discharge temperature.

Modulating Hot Gas Reheat Sequence: During dehumidification the modulating HGRH is controlled to maintain the supply temperature set point.

Modulating Head Pressure Control: Lead condenser fan will have a EC motor and will modulate to maintain a head pressure set point.

**DEHUMIDIFICATION SEQUENCE:** The cooling is controlled to maintain the cooling-coil set point. The dehumidification sequence will be locked out when the OA is < 10°F above the cold-coil set point (adj.).

Cold Coil Setpoint Reset Function: The controller will control the cooling to maintain an active set point. The active set point will set to local control (55°F, adj) from the factory and can be field adjusted to the following sequence:

BMS Control: The controller will adjust the cold coil leaving air temperature set point between the minimum (50°F, adj.) and the maximum (55°F, adj.) set points, to satisfy the desired BMS set point for dehumidification.

**REHEAT SEQUENCE:** While the unit is in dehumidification mode the outdoor air will be reheated via Modulating Hot Gas Reheat for space neutral applications.

Modulating Hot Gas Reheat: The controller will modulate the hot gas reheat reheat valve with a 0-10 V signal to maintain the supply temperature set point (adj.).

**HEATING SEQUENCE:** The heating is controlled to maintain the supply temperature set point. The heating will be locked out when the outside air is > 70°F + 2°F hysteresis, (adj.).

Hot Water Coil: The controller will modulate a hot water valve (field provided) to maintain the supply temperature set point (adj.). **Coil Freeze protection must be provided by others in the field!**

**SUPPLY SET POINT RESET FUNCTION.** The controller will modulate the heating and cooling to maintain an active set point. The active set point will be set to outdoor air reset from the factory and can be field adjusted to the following sequence:
OA Reset (Default): The controller will monitor the outdoor air temperature and adjusts the desired supply temperature set point accordingly. For example, when the outdoor air is below 55 °F, the controller will change the supply set point to 70 °F. If the outdoor air is above 65 °F, the controller will change the supply set point to 55°F. If the outdoor air temperature is between 55°F and 65°F, the supply set point changes according to the outdoor air reset function. A visual representation of this is shown below.

![Outdoor Air Reset Function](image)

**Local:** The supply set point will be a constant temperature set from the controller (adj.).

**BMS Control:** The controller will adjust the desired supply temp set point to satisfy the desired BMS set point.

**BUILDING FREEZE PROTECTION:** If the supply air temperature drops below 35°F (adj.) for 300s (adj.), the controller will de-energize the unit and activate the alarm output.

**TEMPERATURE PROTECTION:** The controller will enable the supply fan to modulate down to help the unit keep up with heating demand in the event of wheel failure or the unit operating outside design conditions. (This can be enabled under the manufacturer menu in the controller)

**FROST CONTROL:** Frost control for the energy wheel is enabled when frost is present on the wheel; based on the outside air temperature and the pressure drop across the wheel. If the outdoor air temperature is below 5°F – 2°F hysteresis, adj. and the differential pressure across the wheel is about 1.5", adj. frost control will enable.

**Modulate Wheel:** When frosting is occurring, the VFD modulates the wheel down to a slow rotational speed to defrost wheel. Once either the pressure drop decreases below the pressure switch set point, or the outdoor air temperature increases about the temperature set point, the unit will resume normal operation.

**ECONOMIZER SEQUENCE:** When the application requires cooling, and the outdoor air conditions are suitable for free cooling, the controller will modulate the energy wheel speed to maintain the discharge temperature set point. If the energy wheel modulates to the economizer set point and the discharge temperature is not met, the controller will increase the call for cooling to meet the discharge temperature and could engage mechanical cooling.

**Temp/Dew Point:** The economizer will be locked out when: the outdoor air is < 40° F DB (-2° F hysteresis, adj.) or > 75° F DB (-2° F hysteresis, adj.) or > 55° F dew point (-2° F hysteresis, adj.) ; the unit is operating in dehumidification mode; or there is a call for heating

**ENERGY WHEEL SEQUENCE**
Modulate Wheel (100% OA only): When economizer mode is enabled and there is a signal for cooling, the wheel VFD modulates wheel speed to maintain the discharge temperature set point.

ALARMS INDICATION: The controller will display alarms and have one digital output for remote indication of an alarm condition. Possible alarms include:

- **Building Management System**: The controller will send all alarms to the BMS.

- **Dirty Filter Alarm**: A digital signal is sent to the controller indicating an increased pressure drop across the outdoor, exhaust or supply air filters (Must be adjusted in field during start up). The controller will then provide a dirty filter alarm.

- **Dirty Wheel Alarm**: The controller monitors pressure across the wheel and sends an alarm in the case of an increased pressure drop.

- **Wheel Rotation Alarm**: The controller monitors wheel rotation, if the wheel does not rotate for 30s (adj.) an alarm will generate.

- **Supply and Exhaust Air Alarm**: The controller monitors the proving switch on each blower and sends an alarm in the case of either blower proving switch not engaging for 30s (adj.).

- **DX Alarm**: The controller monitors the refrigerant pressure. In the case of low refrigerant pressure the compressors will shut down until refrigerant pressure returns to normal values and the controller will send a alarm. In the case of high refrigerant pressure the compressors will shut down, requiring a manual reset and the controller will send a alarm.

- **Temperature Sensor Alarm**: The controller sends an alarm in the case of a failed air temperature sensor.

- **Pressure Sensor Alarm**: The controller sends an alarm in the case of a failed pressure sensor.

- **Humidity Sensor Alarm**: The controller sends an alarm in the case of a failed humidity sensor.

**Accessories**: The following accessories will be included with the unit to expand the functionality or usability of the controller.

- **BMS Interfacing**: A BMS serial card is provided with the controller for field interfacing with a building management system. Each card is sent out with the default parameters, and the controls contractor must change the appropriate addresses to match the BMS settings.

- **Phase and Brown Out Protection**: Factory mounted and wired component which monitors the main power coming into the unit. If a phase drops out, or if the incoming voltage exceeds the acceptable range, the component will turn off the unit to help protect the electrical systems.

- **Condensate Overflow Switch**: The condensate overflow switch is mounted in the drain pan within the unit. If the water level in the drain pan reaches a certain level, the switch will open a set of contacts connected to a terminal block in the control center.

- **Damper End Switch**: Damper end switched will be provided to ensure the supply and exhaust fans do not enable until the dampers are proven open.
Unit Warranty

Limited Warranty
Greenheck warrants this equipment to be free from defects in material and workmanship for a period of 1 year(s) from the purchase date. The energy recovery wheel is warranted to be free from defects in material and workmanship for a period of five years from the purchase date. Any component which proves defective during the warranty period will be repaired, or replaced, at Greenheck's sole option when returned to our factory, transportation prepaid.

The warranty does not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck product.

This warranty is exclusive, and is in lieu of all other warranties, whether written, oral or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose.

Electrofin Coil Coating
Electrofin coil coating carries a standard 1 year warranty and is excluded from any extended unit warranty.
RVE-40-36P-30H
CONSTRUCTION FEATURES AND ACCESSORIES

Unit Overview

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply (CFM)</th>
<th>Outside Air (CFM)</th>
<th>Recirc (CFM)</th>
<th>Exhaust (CFM)</th>
<th>Heating</th>
<th>Cooling</th>
<th>Electrical V/C/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-36P-30H-12.5-RC</td>
<td>3,500</td>
<td>3,500</td>
<td>0</td>
<td>3,500</td>
<td>Hot Water</td>
<td>Split System DX W/RC</td>
<td>208/60/3</td>
</tr>
</tbody>
</table>

Features
- Exterior housing constructed of galvanized steel
- Energy recovery cassette with a desiccant wheel
- Direct-drive backward inclined plenum blowers with factory mounted VFDs
- Ball bearing motors
- Corrosion resistant fasteners
- Internally lined with galvanized steel metal creating a double wall
- Insulated with 2 in. 2.4# R13 density foam insulation
- Internally mounted control center with motor starters, 24 VAC control transformer(s), control circuit fusing
- Energy Wheel Motor: 1/3 HP
- Stainless steel condensate drain pan and connection.
- Low Sound Condenser Fan Package

Options and Accessories
- UL\cUL1995
- Frost Control: Modulating Wheel
- Duct Flanges
- ElectroFin Coil Coating: Interior
- Outdoor Air Filters - MERV 8, 4-20x25x2
- Exhaust Air Filters - MERV 8, 4-20x25x2
- Supply Filters - 2" Pleated MERV 8 and MERV 13, 8-20x20x2
- Outdoor Air Dampers - Motorized Low Leakage
- Return Air Dampers - Motorized Low Leakage
- Damper End Switch - Outdoor Air & Return Air Damper
- Painted Exterior - Permatector Concrete Gray (RAL 7023)
- Microprocessor Controls
- Supply Fan VFD Control - Duct Static Pressure
- Economizer Mode - Temp./Dew Point Control
- Wheel Control - Modulating Wheel
- Network Protocol: To Be Selected
- Dirty Filter Sensor: Outdoor, Exhaust and Final
- Rotation Sensor
- Phase and Brown Out Protection
- Branch Circuit Fusing
- 120v NEMA 3R Outlet (Factory mounted and wired)
- Expansion Board
  - RAI
- Unit Disconnect - Mounted By Factory
- Condensate Overflow Switch
- Short-circuit current - 5kA
- Exhaust Discharge Gravity Backdraft Damper
- Lead ECM Condenser Fan
- Remote Condenser
- Painted Exterior - Remote Condenser - Permatector - Concrete Gray (RAL7023)

Note: Unit is provided with factory mounted and wired disconnect switch.

Note: Electrofin coil coating requires monthly and quarterly coil maintenance to maintain the coil coating. See unit IOM for detailed cleaning procedure and required documentation to maintain the coatings warranty. Failure to follow cleaning recommendations will void the coatings warranty.

Note: Verify that the correct Protocol has been selected before ordering.
## PERFORMANCE AND SPECIFICATIONS

### Description/Arrangement

<table>
<thead>
<tr>
<th>Model</th>
<th>Qty</th>
<th>Unit Weight (lb)</th>
<th>Outdoor Air Discharge</th>
<th>Outdoor Air Intake</th>
<th>Exhaust Air Discharge</th>
<th>Return Air Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-36P-30H-12.5-RC</td>
<td>1</td>
<td>2,119</td>
<td>Bottom</td>
<td>End</td>
<td>Side</td>
<td>Bottom</td>
</tr>
</tbody>
</table>

### Design Conditions

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Summer DB (F)</th>
<th>Summer WB (F)</th>
<th>Winter DB (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>91</td>
<td>74</td>
<td>7</td>
</tr>
</tbody>
</table>

### Air Performance

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (CFM)</th>
<th>External SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Qty/Size (hp)</th>
<th>Size (in., Type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>3,500</td>
<td>1.25</td>
<td>3.603</td>
<td>2029</td>
<td>3.2</td>
<td>Qty 1 (5)</td>
<td>18/Plenum</td>
</tr>
<tr>
<td>Exhaust Normal</td>
<td>3,500</td>
<td>1.25</td>
<td>2.697</td>
<td>2160</td>
<td>3.4</td>
<td>Qty 1 (5)</td>
<td>18/Plenum</td>
</tr>
</tbody>
</table>

### Electrical/Motor Specifications

<table>
<thead>
<tr>
<th>V/C/P</th>
<th>Unit MCA (amps)</th>
<th>Unit MOP (amps)</th>
<th>Exh. MCA (amps)</th>
<th>Exh. MOP (amps)</th>
<th>Enclosure</th>
<th>Supply Motor RPM</th>
<th>Supply Efficiency</th>
<th>Exhaust Motor RPM</th>
<th>Exhaust Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>208/60/3</td>
<td>74.5</td>
<td>90</td>
<td>N/A</td>
<td>N/A</td>
<td>ODP</td>
<td>1750</td>
<td>PE</td>
<td>1750</td>
<td>PE</td>
</tr>
</tbody>
</table>

### Heating/Cooling Specifications

<table>
<thead>
<tr>
<th>Heating Type</th>
<th>Entering Air Temp. (F)</th>
<th>Leaving Air Temp. (F)</th>
<th>Fluid Type</th>
<th>Fluid Press. Drop (ft wg)</th>
<th>Fluid Flow Rate (GPM)</th>
<th>Fluid Press. Drop (ft wg)</th>
<th>Fluid Press. Drop (ft wg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water</td>
<td>44.0</td>
<td>81.9</td>
<td>Propylene-35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HW Coil Model</td>
<td>Total Energy (MBH)</td>
<td>Fins Per Inch</td>
<td>Rows Deep</td>
<td>Connection Size (in,)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>143.0</td>
<td>10</td>
<td>2</td>
<td>1.5</td>
<td></td>
<td>15.2</td>
<td>0.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cooling Type</th>
<th>Total Capacity (MBH)</th>
<th>Sensible Capacity (MBH)</th>
<th>Compressor Quantity</th>
<th>Lead Compressor Type</th>
<th>Condensing Unit By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split System DX W/RC</td>
<td>155.8</td>
<td>107.3</td>
<td>2</td>
<td>Digital Scroll</td>
<td>Greenheck</td>
</tr>
</tbody>
</table>

### Sound Performance in Accordance with AMCA

<table>
<thead>
<tr>
<th>Fan</th>
<th>Sound Power by Octave Band</th>
<th>Lwa</th>
<th>dBA</th>
<th>Sones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>62.5 125 250 500 1000 2000 4000 8000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply</td>
<td>80 81 92 83 82 78 78 72 88 77 26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust Normal</td>
<td>75 81 84 78 75 74 73 69 82 71 19.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Unit Pressure Drop (in. wg)

<table>
<thead>
<tr>
<th>Air Stream</th>
<th>Weatherhood</th>
<th>Damper Section</th>
<th>Filter Section</th>
<th>Cooling Section</th>
<th>Heating Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>0</td>
<td>0.052</td>
<td>0.372</td>
<td>0.337</td>
<td>0.148</td>
</tr>
<tr>
<td>Exhaust</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: The unit base line performance incorporates the pressure drop of the energy wheel.
Note: Filter pressure drop is based off of clean filters.
### Supply Fan Performance

<table>
<thead>
<tr>
<th>Volume (CFM)</th>
<th>Supply SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Size (hp)</th>
<th>Size (in.)/Type</th>
<th>Fan Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,500</td>
<td>1.25</td>
<td>3.603</td>
<td>2029</td>
<td>3.197</td>
<td>5</td>
<td>18/Plenum</td>
<td>1</td>
</tr>
</tbody>
</table>

### Exhaust Fan Performance - Normal Operation

<table>
<thead>
<tr>
<th>Volume (CFM)</th>
<th>Exhaust SP (in. wg)</th>
<th>Total SP (in. wg)</th>
<th>RPM</th>
<th>Operating Power (hp)</th>
<th>Motor Size (hp)</th>
<th>Size (in.)/Type</th>
<th>Fan Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,500</td>
<td>1.25</td>
<td>2.697</td>
<td>2160</td>
<td>3.395</td>
<td>5</td>
<td>18/Plenum</td>
<td>1</td>
</tr>
</tbody>
</table>
COOLING PERFORMANCE

Split System DX W/RC Cooling

<table>
<thead>
<tr>
<th>Nominal Tonnage</th>
<th>Total Capacity (MBH)</th>
<th>Sensible Capacity (MBH)</th>
<th>Refrigerant Type</th>
<th>Lead Compressor Type</th>
<th>Compressor Quantity</th>
<th>Condensing Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.5</td>
<td>155.8</td>
<td>107.3</td>
<td>R-410A</td>
<td>Digital Scroll</td>
<td>2</td>
<td>By Greenheck</td>
</tr>
</tbody>
</table>

Hot Gas Reheat

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity (MBH)</th>
<th>LAT (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulating</td>
<td>75.3</td>
<td>73.9</td>
</tr>
</tbody>
</table>

Condensing Unit Details

The RVE will come equipped with the following components:

- Hermetic scroll type compressors
- Compressors mounted in a compartment to be serviceable without affecting airflow and on neoprene vibration isolation to minimize vibration transmission and noise
- Crankcase heater on compressor(s)
- Thermal expansion valve for refrigerant flow control
- Variable capacity scroll compressor
- Lead ECM condensing fan for active head pressure control
- Liquid-Line filter drier
- High pressure manual reset cutout
- Low-pressure auto-reset cutout
- Time delay relays for compressor protection
- Service/charging valves
- Moisture-indicating sight glass

Split System DX W/RC Details

- Face Area (ft²): 12.4
- Rows Deep (Evap Coil): 6
- Fins Per Inch: 12
- Face Velocity (ft/min): 282
- Entering Dry Bulb (F): 81.8
- Entering Wet Bulb (F): 68.0
- Leaving Dry Bulb (F): 54.0
- Leaving Wet Bulb (F): 53.7
- Cool Coil SP (in. wg): 0.337
- Refrigerant Velocity (ft/min): 1,351
- Suction Temp. (F): 50.3
- Refrigerant: R-410A
- Evaporator Cap. (MBH): 155.8
- AHRI 920 ISMRE: 5.9

Compressor and Condenser Details

- Compressor 1 RLA (amps): 20.4
- Compressor 1 LRA (amps): 156
- Compressor 2 RLA (amps): 19.6
- Compressor 2 LRA (amps): 136

Note: Digital Scroll is on lead circuit only.
REMOTE CONDENSER

Split System DX W/RC Cooling

<table>
<thead>
<tr>
<th>Weight</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Phase</th>
<th>RC MCA</th>
<th>RC MOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>815 lb</td>
<td>208 V</td>
<td>60 Hz</td>
<td>3</td>
<td>8.0 A</td>
<td>15.0 A</td>
</tr>
</tbody>
</table>

Condensing Unit Details
The RVE will come equipped with the following components:
• Direct drive condensing fans with external rotors and molded fan blades
• Condensing coils with 5/16” copper tubes mechanically bonded to aluminum fins
• Low sound condensing fans
• Lead EC condenser fan
• Remote condenser will have stand-alone control without requiring control wiring back to the unit it is paired with

Condenser Details

<table>
<thead>
<tr>
<th>Ambient Condenser Temp. (F):</th>
<th>91.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condenser Fan QTY:</td>
<td>2</td>
</tr>
<tr>
<td>Condenser Motor 1 HP:</td>
<td>1.68</td>
</tr>
<tr>
<td>Condenser Motor 2 HP:</td>
<td>1.34</td>
</tr>
<tr>
<td>Condenser Motor 1 FLA:</td>
<td>3.8</td>
</tr>
<tr>
<td>Condenser Motor 2 FLA:</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Piping Details
Equivalent Piping Length (ft): 100
Piping Rise (ft): 25

Requires field provided piping between the main unit and the remote condenser. Field provided piping shall include 1/2” liquid line and 3/4” discharge line.
HEATING PERFORMANCE

Hot Water Heating

<table>
<thead>
<tr>
<th>Heating Type</th>
<th>Entering Air Temp. (F)</th>
<th>Leaving Air Temp. (F)</th>
<th>Fluid Type</th>
<th>Face Velocity (ft/min)</th>
<th>Air Pressure Drop (in. wg)</th>
<th>Entering Fluid Temp. (F)</th>
<th>Leaving Fluid Temp. (F):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water</td>
<td>44.0</td>
<td>81.9</td>
<td>Propylene-35%</td>
<td>581</td>
<td>0.148</td>
<td>160.0</td>
<td>140.0</td>
</tr>
</tbody>
</table>

HW Coil Model | Total Energy (MBH) | Fins Per Inch | Rows Deep | Connection Size (in.) | Fluid Flow Rate (GPM) | Fluid Press. Drop (ft wg) |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HW38S02H10-40x21.7-RH</td>
<td>143.0</td>
<td>10</td>
<td>2</td>
<td>1.5</td>
<td>15.2</td>
<td>0.9</td>
</tr>
</tbody>
</table>

Hot Water Unit Unit Details
The RVE will come equipped with the following:

- Aluminum fins
- Copper tubes
- Hand brazed construction
- Galvanized steel casing
- AHRI certified

Heating Coil Details

Heating Coil Model: HW12C02H10-40x21.7-RH
Rows Deep: 2
Fins Per Inch: 10
Face Velocity (ft/min): 581
Total Energy (MBH): 143.0
Entering Dry Bulb (F): 44.0
Leaving Air (F): 81.9
Heat Coil SP (in. wg): 0.148
Entering Fluid (F): 160.0
Leaving Fluid (F): 140.0
Fluid Type: Propylene
Glycol (%): 35
Fluid Flow (GPM): 15.2
Fluid PD (ft wg): 0.9
Connection Size (in.): 1.5
ENERGY RECOVERY SUMMER PERFORMANCE

OUTDOOR AIR

Entering Air

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>91.0</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>74.0</td>
</tr>
<tr>
<td>Specific Humidity</td>
<td>100</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>37.5</td>
</tr>
</tbody>
</table>

Leaving Air

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>84.2</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>69.2</td>
</tr>
<tr>
<td>Specific Humidity</td>
<td>84</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>33.5</td>
</tr>
</tbody>
</table>

EXHAUST AIR

Entering Air

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>84.2</td>
</tr>
<tr>
<td>Wet Bulb (F)</td>
<td>69.2</td>
</tr>
<tr>
<td>Specific Humidity</td>
<td>84</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>33.5</td>
</tr>
</tbody>
</table>

Leaving Air

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulb (F)</td>
<td>75.0</td>
</tr>
<tr>
<td>Rel. Humidity (%)</td>
<td>50</td>
</tr>
<tr>
<td>Specific Humidity</td>
<td>65</td>
</tr>
<tr>
<td>Enthalpy (BTU/lb)</td>
<td>28.1</td>
</tr>
</tbody>
</table>

Design Air Flow Conditions

<table>
<thead>
<tr>
<th>Model</th>
<th>Outdoor Air Volume (CFM)</th>
<th>OA Wheel Enthalpy Recovery Ratio</th>
<th>Exhaust Air Volume (CFM)</th>
<th>Exhaust Air Wheel Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-36P-30H</td>
<td>3,500</td>
<td>56.9</td>
<td>3,500</td>
<td>56.9</td>
</tr>
</tbody>
</table>

Outdoor Air Cooling Reduction

<table>
<thead>
<tr>
<th>Description</th>
<th>(BTU/h)</th>
<th>(tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA Load w/o Energy Recovery</td>
<td>148,050.0</td>
<td>12.34</td>
</tr>
<tr>
<td>OA Load with Energy Recovery</td>
<td>64,575.0</td>
<td>5.38</td>
</tr>
<tr>
<td>Equipment Reduction tons</td>
<td>6.96</td>
<td></td>
</tr>
</tbody>
</table>

Summer Conditions

1 = Outdoor Air Design
2 = Energy Wheel
3 = DX Coil
4 = Hot Gas Reheat
5 = Exhaust Air Entering Wheel
ENERGY RECOVERY WINTER PERFORMANCE

### Design Air Flow Conditions

<table>
<thead>
<tr>
<th>Model</th>
<th>Outdoor Air Volume (CFM)</th>
<th>OA Wheel Enthalpy Recovery Ratio</th>
<th>Exhaust Air Volume (CFM)</th>
<th>Exhaust Air Wheel Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE-40-36P-30H</td>
<td>3,500</td>
<td>57.6</td>
<td>3,500</td>
<td>57.6</td>
</tr>
</tbody>
</table>

### Outdoor Air Heating Reduction

<table>
<thead>
<tr>
<th>Description</th>
<th>(BTU/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA Load w/o Energy Recovery</td>
<td>245,700.0</td>
</tr>
<tr>
<td>OA Load with Energy Recovery</td>
<td>105,084.0</td>
</tr>
<tr>
<td>BTU/h Reduction</td>
<td>140,616.0</td>
</tr>
</tbody>
</table>

---

**Winter Conditions**

1 = Outdoor Air Design  
2 = Energy Wheel  
3 = Hot Water Coil  
4 = Exhaust Air Entering Wheel

---

Diagram with temperature and specific humidity values.
### AHRI PERFORMANCE DATA

<table>
<thead>
<tr>
<th>Type</th>
<th>Tilt Angle (Heating/Cooling)</th>
<th>Pressure Drop (in. wg)</th>
<th>Nominal Airflow (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEEL</td>
<td>N / A Deg</td>
<td>0.85</td>
<td>2,600</td>
</tr>
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</table>

#### Wheel Leakage Ratings

<table>
<thead>
<tr>
<th></th>
<th>Pressure Differential</th>
<th>Exhaust Air Transfer Ratio</th>
<th>Outdoor Air Correction Factor</th>
<th>Purge Angle/ Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test #1</td>
<td>0.0</td>
<td>2.1</td>
<td>1.03</td>
<td>0</td>
</tr>
<tr>
<td>Test #2</td>
<td>0.5</td>
<td>0.9</td>
<td>1.05</td>
<td>1</td>
</tr>
<tr>
<td>Test #3</td>
<td>1.0</td>
<td>0.8</td>
<td>1.07</td>
<td>1</td>
</tr>
</tbody>
</table>

Optional Additional Test(s):

#### Thermal Effectiveness Ratings at 0.0 in. Differential Pressure

<table>
<thead>
<tr>
<th></th>
<th>Sensible</th>
<th>Latent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Airflow Heating Condition:</td>
<td>65</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td>75% Airflow Heating Condition:</td>
<td>72</td>
<td>66</td>
<td>70</td>
</tr>
<tr>
<td>100% Airflow Cooling Condition:</td>
<td>65</td>
<td>61</td>
<td>63</td>
</tr>
<tr>
<td>75% Airflow Cooling Condition:</td>
<td>72</td>
<td>66</td>
<td>69</td>
</tr>
</tbody>
</table>

#### Net Thermal Effectiveness Ratings at 0.0 in. Differential Pressure

<table>
<thead>
<tr>
<th></th>
<th>Net Sensible</th>
<th>Net Latent</th>
<th>Net Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Airflow Heating Condition:</td>
<td>65</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td>75% Airflow Heating Condition:</td>
<td>72</td>
<td>66</td>
<td>70</td>
</tr>
<tr>
<td>100% Airflow Cooling Condition:</td>
<td>65</td>
<td>61</td>
<td>63</td>
</tr>
<tr>
<td>75% Airflow Cooling Condition:</td>
<td>72</td>
<td>66</td>
<td>69</td>
</tr>
</tbody>
</table>

Trademark: Greenheck

Model Number: RVE-40-36P-30H

RC OVERVIEW DRAWINGS

CONDENSING FANS

PIPING CONNECTIONS

ELECTRICAL ACCESS PANEL

46.0

108.5

6.5

8.1

8.2

58.1

24.0

33.0

CONDENSING COIL

RECEIVER

Printed Date: 2/27/2018
Job: Cohasset Town Hall
Mark: AHU-2
Model: RVE-40-36P-30H-12.5-RC
### EQUIPMENT SCHEDULE

#### Energy Recovery

<table>
<thead>
<tr>
<th>Mark Name</th>
<th>Qty</th>
<th>Model</th>
<th>ER Type</th>
<th>Mounting Location</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHU-2</td>
<td>1</td>
<td>RVE-40-36P-30H-12.5-RC</td>
<td>Wheel Outdoor</td>
<td>3,218 lb</td>
<td></td>
</tr>
</tbody>
</table>

#### Exhaust Fan

<table>
<thead>
<tr>
<th>Exhaust Air Volume</th>
<th>Exhaust ESP</th>
<th>Exhaust TSP</th>
<th>FRPM</th>
<th>Exhaust Motor</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Phase</th>
<th>Unit MCA</th>
<th>Unit MOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,500 CFM</td>
<td>1.25 in. wg</td>
<td>2,607 lb</td>
<td>2100</td>
<td>3,095</td>
<td>6 hp</td>
<td>3</td>
<td>74.5</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

#### Supply Fan

<table>
<thead>
<tr>
<th>Supply Air Volume</th>
<th>Supply ESP</th>
<th>Supply TSP</th>
<th>FRPM</th>
<th>Supply Motor</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Phase</th>
<th>Unit MCA</th>
<th>Unit MOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,500 CFM</td>
<td>1.25 in. wg</td>
<td>2,607 lb</td>
<td>2100</td>
<td>3,095</td>
<td>6 hp</td>
<td>3</td>
<td>74.5</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

#### Electrical

- **Supply ESP**: 1.25 in. wg
- **Supply TSP**: 2,607 lb
- **FRPM**: 2100
- **Supply Motor**: 3,095 | 6 hp | 3 | 74.5  | 90

#### Energy Recovery Performance

**Summer Energy Recovery Performance**

<table>
<thead>
<tr>
<th>Outside Air DB</th>
<th>Outside Air WB</th>
<th>Supply Air DB</th>
<th>Supply Air WB</th>
<th>Return Air DB</th>
<th>Return Air WB</th>
<th>Exhaust Air DB</th>
<th>Exhaust Air WB</th>
<th>ASHRAE 90.1</th>
<th>Enthalpy Recovery Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>91.0 F</td>
<td>74.0 F</td>
<td>81.8 F</td>
<td>68.0 F</td>
<td>54.0 F</td>
<td>53.7 F</td>
<td>84.2 F</td>
<td>69.2 F</td>
<td>6.96 tons</td>
<td>56.9</td>
</tr>
</tbody>
</table>

**Winter Energy Recovery Performance**

<table>
<thead>
<tr>
<th>Outside Air DB</th>
<th>Outside Air WB</th>
<th>Supply Air DB</th>
<th>Supply Air WB</th>
<th>Return Air DB</th>
<th>Return Air WB</th>
<th>Exhaust Air DB</th>
<th>Exhaust Air WB</th>
<th>Heating Load Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0 F</td>
<td>4.9 F</td>
<td>6.0 F</td>
<td>2.6 F</td>
<td>5.6 F</td>
<td>5.5 F</td>
<td>3.6 F</td>
<td>3.1 F</td>
<td>140,616 BTU</td>
</tr>
</tbody>
</table>

### Remote Condenser Section

- **Paired With Mark**: AHU-2
- **Qty**: 1
- **Weight**: 815 lb
- **Voltage**: 208 V
- **Frequency**: 60 Hz
- **Phase**: 3

#### OPTIONS AND ACCESSORIES

- **Painted Exterior**: Remote Condenser - Permatractor Concrete Gray (RAL 7023)
- **ElectroFin Coil Coating**: Exterior
- **Condenser Fan**: Eco condenser fan

#### Heating Section

**Heating Section**

- **Upflow**: 50%
- **Downflow**: 50%
- **Total Capacity**: 142.0 MBH
- **Coil Face Velocity**: 581 ft/min
- **Coil Pressure Drop**: 0.148 in. wg
- **Rows Deep**: 6
- **Fins per Inch**: 12
- **Entering Fluid Temp**: 140.0 F
- **Leaving Fluid Temp**: 81.9 F
- **Hot Gas Reheat Capacity**: 75.3 MBH
- **LAT**: 73.9 F

**OPTIONS AND ACCESSORIES**

- **Painted Exterior**: Remote Condenser - Permatractor Concrete Gray (RAL 7023)
- **ElectroFin Coil Coating**: Exterior
- **Condenser Fan**: Eco condenser fan

**Accessories**

- **UL**:
- **Frost Control**: Modulating Wheel
- **Duct Flanges**:
- **ElectroFin Coil Coating**: Interior
- **Outdoor Air Filters - MERV 6**: 0.25x20x2
- **Exhaust Air Filters - MERV 9**: 0.37x20x2
- **Supply Filters**: 2” Pleated MERV 8 and MERV 13, 0.37x20x2
- **Outdoor Air Dampers**: Motored Low Leakage
- **Return Air Dampers**: Motored Low Leakage
- **Damp End Switch**: Outdoor Air & Return Air Damper
- **Painted Exterior**: Permatractor Concrete Gray (RAL 7023)
- **Microprocessor Controls**:
- **Supply Air VFD Control - Duct Static Pressure**
- **Economizer Mode - Temp./Dew Point Control**
- **Mv Control - Modulating Wheel**
- **Network Protocol**: To Be Selected
- **Dirty Filter Sensor**: Outdoor, Exhaust and Final
- **Rotation Sensor**: Phase and Neutral Out Protection
- **Branch Circuit Breakers**:
- **208-240V 20A MCB (Factory mounted and wired)**
- **Expansion Board**:
- **NAC**:
- **Unit Disconnect - Mounted By Factory**
- **Coordinate Overflow Switch**
- **Unit Warranty**: 1 Yr (Standard)
Unit Corner Weights

527 lb       518 lb

541 lb       533 lb

Note: Estimated corner weights are shown looking down on unit and the outside air intake will be on the right. Weights are applied at the base of the unit. Images not drawn to scale.
Remote Condenser Wiring Diagram
MONITORING POINTS WIRING DIAGRAM

CAUTION
UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES
USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.
FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.
FIELD WIRED FACTORY SUPPLIED AND WIRED

BUILDING VALUE IN AIR.

Wiring Template: Y00

RAI RETURN AIR INLET TEMPERATURE
### Monitoring Points

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAI</td>
<td>Outdoor Air Intake Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>OAD</td>
<td>Outdoor Air Discharge Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>ACC</td>
<td>After Cooling Coil Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
<tr>
<td>PS2</td>
<td>Supply Dirty Filter Pressure Switch</td>
<td>Contact</td>
</tr>
<tr>
<td>PS3</td>
<td>Exhaust Dirty Filter Pressure Switch</td>
<td>Contact</td>
</tr>
<tr>
<td>PS6</td>
<td>*Duct Pressure</td>
<td>0-10 VDC</td>
</tr>
<tr>
<td>S2</td>
<td>Wheel Rotation Sensor</td>
<td>Contact</td>
</tr>
<tr>
<td>RAI</td>
<td>Return Air Intake Temperature Sensor</td>
<td>10K Ohm NTC (Carel)</td>
</tr>
</tbody>
</table>

*Shipped loose sensor.*
Microprocessor Controller Sequence of Operation

MICROPROCESSOR CONTROLLER: Controller shall be provided with required sensors and programming for rooftop unit. Controller shall be factory programmed, mounted and tested. Controller shall have a LCD readout for changing set points and monitoring unit operation.

UNIT START COMMAND (Unit will be enabled to start once a jumper is placed between R to G):
- Factory mounted and wired outdoor air damper actuator is powered.
- Return air damper actuator is powered.
- Exhaust fan starts after a 10 second (adj.) delay.
- Supply fan starts 10 second delay.
- Tempering options and energy wheel option to function as described below.

UNIT STOP COMMAND (OR DE-ENERGIZED):
- Supply fan, exhaust fan, energy wheel and tempering options de-energized.
- Outdoor air damper actuator is spring return close.
- Return air damper is spring return close.

OCCUPIED/UNOCCUPIED MODES: Shall be based on a 7-day time clock internal to the controller. The schedule shall be set by the end user. When a user initiates an override input, the controller will switch from unoccupied to occupied mode. The controller will return to the scheduled occupied/unoccupied mode after the override time has expired (60 min, adj.). If internal time clock is disabled, a remote contact or a BMS can control the occupied/unoccupied mode.

Occupied Mode:
- Damper control per below.
- Energy wheel control per below.
- Exhaust fan ON.
- Supply fan ON.
- Heating per below.
- Cooling per below.

Unoccupied Mode (Unit Off): Unit remains off when in unoccupied mode.
- Supply fan OFF
- Exhaust fan OFF
- Tempering OFF
- Outdoor air damper closed.
- Return damper closed.

Morning Warm-up: One hour prior to occupancy, the controller will reference the temperature differential between the current room temperature and the occupied temperature set point. The controller will then look at the amount of time required from the previous days morning warm up sequence and determine how far in advance the unit has to be started to meet the desired occupied set point by the time of occupancy.

SUPPLY BLOWER SEQUENCE: The supply blower is provided with a factory mounted variable frequency drive. The supply blower speed will be controlled with the following sequence.

Duct Static Pressure Sensor: The supply blower is modulated based upon the signal from a duct static pressure sensor (factory provided and wired, field mounted and tubing by others). The controller will modulate the supply fan based upon a comparison of the duct static pressure set point (adj.) to the actual duct static pressure level reported from the sensor. (Mechanical high static protection cutoffs must be installed by others to protect the system and equipment from over-pressurization. The manufacturer does not assume responsibility for this.)
**BMS Control:** The supply blower is modulated based upon a command from the Building Management System. (This Sequence must be field configured.)

**EXHAUST BLOWER SEQUENCE:** The exhaust blower is provided with a factory mounted variable frequency drive. The exhaust blower speed will be controlled with the following sequence.

- **Supply Tracking:** The exhaust fan will modulate to track the speed of the supply fan.
- **BMS Control:** The exhaust blower is modulated based upon a command from the Building Management System. (This sequence must be field configured.)

**COOLING SEQUENCE:** The cooling is controlled to maintain the supply temperature set point. The mechanical cooling will be locked out when the outside air is < 55°F - 2°F hysteresis (adj.).

- **Split System DX W/RC Cooling (Digital Scroll):** The controller will provide a modulating signal for cooling. From 10-50%, the digital scroll will be controlled to maintain discharge temperature. From 50-100% the second stage will be on in combination with the digital scroll compressor to maintain the discharge temperature.

- **Modulating Hot Gas Reheat Sequence:** During dehumidification the modulating HGRH is controlled to maintain the supply temperature set point.

- **Modulating Head Pressure Control:** Lead condenser fan will have an EC motor and will modulate to maintain a head pressure set point.

**DEHUMIDIFICATION SEQUENCE:** The cooling is controlled to maintain the cooling-coil set point. The dehumidification sequence will be locked out when the OA is <10°F above the cold-coil set point (adj.).

- **Cold Coil Setpoint Reset Function:** The controller will control the cooling to maintain an active set point. The active set point will set to local control (55°F, adj) from the factory and can be field adjusted to the following sequence:

  - **BMS Control:** The controller will adjust the cold coil leaving air temperature set point between the minimum (50°F, adj.) and the maximum (55°F, adj.) set points, to satisfy the desired BMS set point for dehumidification.

**REHEAT SEQUENCE:** While the unit is in dehumidification mode the outdoor air will be reheated via Modulating Hot Gas Reheat for space neutral applications.

- **Modulating Hot Gas Reheat:** The controller will modulate the hot gas reheat reheat valve with a 0-10 V signal to maintain the supply temperature set point (adj.).

**HEATING SEQUENCE:** The heating is controlled to maintain the supply temperature set point. The heating will be locked out when the outside air is > 70°F + 2°F hysteresis, (adj.).

- **Hot Water Coil:** The controller will modulate a hot water valve (field provided) to maintain the supply temperature set point (adj.). **Coil Freeze protection must be provided by others in the field!**

**SUPPLY SET POINT RESET FUNCTION.** The controller will modulate the heating and cooling to maintain an active set point. The active set point will be set to outdoor air reset from the factory and can be field adjusted to the following sequence:
**OA Reset (Default):** The controller will monitor the outdoor air temperature and adjusts the desired supply temperature set point accordingly. For example, when the outdoor air is below 55°F, the controller will change the supply set point to 70°F. If the outdoor air is above 65°F, the controller will change the supply set point to 55°F. If the outdoor air temperature is between 55°F and 65°F, the supply set point changes according to the outdoor air reset function. A visual representation of this is shown below.

![Outdoor Air Reset Function](image)

**Local:** The supply set point will be a constant temperature set from the controller (adj.).

**BMS Control:** The controller will adjust the desired supply temp set point to satisfy the desired BMS set point.

**BUILDING FREEZE PROTECTION:** If the supply air temperature drops below 35°F (adj.) for 300s (adj.), the controller will de-energize the unit and activate the alarm output.

**TEMPERATURE PROTECTION:** The controller will enable the supply fan to modulate down to help the unit keep up with heating demand in the event of wheel failure or the unit operating outside design conditions. (This can be enabled under the manufacturer menu in the controller)

**FROST CONTROL:** Frost control for the energy wheel is enabled when frost is present on the wheel; based on the outside air temperature and the pressure drop across the wheel. If the outdoor air temperature is below 5°F – 2°F hysteresis, adj. and the differential pressure across the wheel is about 1.5", adj. frost control will enable.

**Modulate Wheel:** When frosting is occurring, the VFD modulates the wheel down to a slow rotational speed to defrost wheel. Once either the pressure drop decreases below the pressure switch set point, or the outdoor air temperature increases about the temperature set point, the unit will resume normal operation.

**ECONOMIZER SEQUENCE:** When the application requires cooling, and the outdoor air conditions are suitable for free cooling, the controller will modulate the energy wheel speed to maintain the discharge temperature set point. If the energy wheel modulates to the economizer set point and the discharge temperature is not met, the controller will increase the call for cooling to meet the discharge temperature and could engage mechanical cooling.

**Temp/Dew Point:** The economizer will be locked out when: the outdoor air is < 40° F DB (−2° F hysteresis, adj.) or > 75° F DB (−2° F hysteresis, adj.) or > 55° F dew point (−2° F hysteresis, adj.) ; the unit is operating in dehumidification mode; or there is a call for heating

**ENERGY WHEEL SEQUENCE**
Modulate Wheel (100% OA only): When economizer mode is enabled and there is a signal for cooling, the wheel VFD modulates wheel speed to maintain the discharge temperature set point.

ALARMS INDICATION: The controller will display alarms and have one digital output for remote indication of an alarm condition. Possible alarms include:

Building Management System: The controller will send all alarms to the BMS.

Dirty Filter Alarm: A digital signal is sent to the controller indicating an increased pressure drop across the outdoor, exhaust or supply air filters (Must be adjusted in field during start up). The controller will then provide a dirty filter alarm.

Dirty Wheel Alarm: The controller monitors pressure across the wheel and sends an alarm in the case of an increased pressure drop.

Wheel Rotation Alarm: The controller monitors wheel rotation, if the wheel does not rotate for 30s (adj.) an alarm will generate.

Supply and Exhaust Air Alarm: The controller monitors the proving switch on each blower and sends an alarm in the case of either blower proving switch not engaging for 30s (adj.).

DX Alarm: The controller monitors the refrigerant pressure. In the case of low refrigerant pressure the compressors will shut down until refrigerant pressure returns to normal values and the controller will send a alarm. In the case of high refrigerant pressure the compressors will shut down, requiring a manual reset and the controller will send a alarm.

Temperature Sensor Alarm: The controller sends an alarm in the case of a failed air temperature sensor.

Pressure Sensor Alarm: The controller sends an alarm in the case of a failed pressure sensor.

Humidity Sensor Alarm: The controller sends an alarm in the case of a failed humidity sensor.

Accessories: The following accessories will be included with the unit to expand the functionality or usability of the controller.

BMS Interfacing: A BMS serial card is provided with the controller for field interfacing with a building management system. Each card is sent out with the default parameters, and the controls contractor must change the appropriate addresses to match the BMS settings.

Phase and Brown Out Protection: Factory mounted and wired component which monitors the main power coming into the unit. If a phase drops out, or if the incoming voltage exceeds the acceptable range, the component will turn off the unit to help protect the electrical systems.

Condensate Overflow Switch: The condensate overflow switch is mounted in the drain pan within the unit. If the water level in the drain pan reaches a certain level, the switch will open a set of contacts connected to a terminal block in the control center.

Damper End Switch: Damper end switched will be provided to ensure the supply and exhaust fans do not enable until the dampers are proven open.
Unit Warranty

Limited Warranty
Greenheck warrants this equipment to be free from defects in material and workmanship for a period of 1 year(s) from the purchase date. The energy recovery wheel is warranted to be free from defects in material and workmanship for a period of five years from the purchase date. Any component which proves defective during the warranty period will be repaired, or replaced, at Greenheck's sole option when returned to our factory, transportation prepaid.

The warranty does not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck product.

This warranty is exclusive, and is in lieu of all other warranties, whether written, oral or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose.

Electrofin Coil Coating
Electrofin coil coating carries a standard 1 year warranty and is excluded from any extended unit warranty.