RenewAire LLC offers some of the highest-efficiency energy recovery ventilators (ERVs) on the market. However, during winter conditions, supply air from the ERV may be less than optimal for space conditions. By providing an indoor and outdoor **INDIRECT GAS-FIRED DUCT FURNACE** as an accessory for our commercial ERVs, in addition to the Electric Duct Heater, RenewAire ERVs now have increased flexibility for controlling supply-air temperature during cooler months. This enhances indoor comfort, makes ERV installations easier and is possible via a single source for ERVs and furnaces.

**Key Benefits**

A **Single Source Reduces Time and Costs:**
A single information source, a single purchase point and a single approval package for ERVs and furnaces reduces design time and costs, as well as streamlines logistics for design engineers and contractors.

**Increased Capabilities and Flexibility:**
RenewAire offers design engineers the capacity to specify ERVs with a matching indoor or outdoor gas-fired furnace to increase ERV capabilities and flexibility for providing a single space or multiple spaces with tempered air conditions to equal wintertime loads.

**More and Easier Applications:**
The addition of the indoor and outdoor indirect gas-fired duct furnace as an accessory ensures that RenewAire ERVs can be easily specified on more applications that require gas heating of the recovered air.

**Expert Guidance:**
The RenewAire customer-support team will provide detailed and expert guidance for how best to install the indoor and outdoor gas-fired duct furnace with an ERV.

**Ultimate Reliability:**
RenewAire furnaces come with our two-year warranty and unmatched reliability. Single-source responsibility offers contractors and end users peace of mind and a single call location for technical, start-up and commissioning questions.

**Highly Certified:**
CSA certified, ANSI Z83.8, CSA 2.6, ETL and Gas Control Listed to ANSI Z21.85.

**Applications**
RenewAire ERV and indirect gas-fired duct furnace combinations are available for all of our commercial ERVs for indoor and outdoor projects that require gas heating of recovered air. VRF systems, hydronic panels and areas where non-ducted systems are applied offer an exclusive installation opportunity. RenewAire furnaces can suit many site restrictions in size, configuration or orientation, and can be designed for an array of preheat capabilities in certain extreme weather conditions.

Other applications include existing installations that require additional heat, increased heat or simply replacement furnaces. RenewAire furnaces can be designed for 75°F comfort conditions, or warmer, and since ERV supply air is ducted into the space, tempering outdoor air for space conditions or offering supplemental heat is easy and simple.

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**Models & Features**
RenewAire indoor and outdoor gas furnaces have been designed to match our existing product offering heat capacities that range from 50–400 MBH (input) and the ability to handle airflow from 620–11,000 CFM. Each indirect gas-fired duct furnace can be customized to address application specifics, and the furnace’s unique design allows air to flow freely for the lowest possible pressure drop.

**Gh Indoor Series**
- **Gh Indoor Series** (See submittal for working requirements)
- **Gh Indoor Series** (Top Exhaust Indoor)
- **Gh Indoor Series** (Top Exhaust Indoor)

**Gh Outdoor Series**
- **Gh Outdoor Series** (Top Exhaust Outdoor)
- **Gh Outdoor Series** (Top Exhaust Outdoor)

**Accessories**
**Modulation Control**
Duct-mounted thermostat accessory that provides 0-10 VDC signal for modulation control of gas furnace.

**1-Stage/2-Stage Control**
Duct-mounted thermostat accessory that provides “On/Off” signal for single-stage or two-stage control of gas furnace.

**Duct Curb For Outdoor Models**
24" x 16" duct curb for the easy installation of outdoor gas furnace and associated ductwork on the roof.

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**Typical Installations**

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**INDIRECT GAS-FIRED DUCT FURNACE**

**ROOFTOP**  
Indirect Gas-Fired Duct Furnace

**SPECIFICATIONS**

**Heater Type:**  
Indirect Gas-Fired Duct Furnace

**Typical Input Capacity (MBH):**  
50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400

**Standard Features:**
- Tubular heaters
- Indirect natural gas fired
- Outdoor installation
- 80% thermal efficiency
- Horizontal airflow
- Rated for elevations from 0 – 2,000 ft.
- 409 stainless steel heat exchanger
- Flue/combustion air – outdoor models
- Horizontal separated outdoor with hoods
- Vertical top exhaust with intake hood
- Direct spark ignition
- 2-stage gas controls
- Induced draft venting
- Terminal block for power and control wiring
- Automatic high limit safety shut-off
- Auxiliary manual high limit switch
- Combustion air pressure switch
- Air proving switch

**Standard Features (continued):**
- Combination gas valve with shutoff
- Flame rollout switch
- Manual shut off valve
- 3/8” condensate drain connection

**Voltages & Phase:**
- Single phase - 120V, 208V, 230V

**Control Voltage:**
- 24 VAC

**Dimensions:**
- See table 1

**Shipping:**
- Shipped loose with base unit and installed in the field

**Options:**
- Indirect propane fired fuel
- Elevation correction for elevation > 2,000 ft.
- 304 stainless steel heat exchanger
- 5:1 continuous electronic modulation for all furnaces
- 10:1 continuous electronic modulation for furnaces
- 200 MBH and larger
- Duct thermostat for modulation control
- Disconnect switch
- Power fusing

**Accessory:**
- Duct thermostat for 2-stage control
- Duct thermostat for modulation control
- Duct curb

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**FLUE AND COMBUSTION AIR CONFIGURATION**

**Caution:** All indirect gas-fired duct furnaces to be installed downstream of the ERV and on the positive side of the supply fan.

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**TEMPERATURE RISE AND PRESSURE DROP**

**FIGURE 1** GAS FURNACE 50-200 MBH  
**FIGURE 2** GAS FURNACE 250-400 MBH

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Specifications may be subject to change without notice.
TABLE 1

<table>
<thead>
<tr>
<th>MBH</th>
<th>Qty.</th>
<th>Btuh</th>
<th>Output</th>
<th>Input Rate</th>
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</tr>
</tbody>
</table>

**Temp Rise and Pressure Drop**

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<tr>
<th>Temperature Rise (°F)</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>55</th>
<th>60</th>
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</thead>
<tbody>
<tr>
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<td>0.04</td>
<td>0.08</td>
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<td>0.24</td>
<td>0.32</td>
<td>0.48</td>
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<td>0.72</td>
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**Vent Locations**

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>&quot;W&quot;</td>
<td>&quot;L&quot;</td>
</tr>
</tbody>
</table>

**Indirect Gas-Fired Duct Furnace Dimensions**

**Notes:**
1. Unless otherwise specified, dimensions are rounded to the nearest eighth of an inch.
2. Specifications subject to change without notice.
Indirect Gas-Fired Duct Furnace

**Specifications**

**Heater Type:**
Indirect Gas-Fired Duct Furnace

**Typical Input Capacity (MBH):**
50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400

**Standard Features:**
- Tubular heaters
- Indirect natural gas fired
- Indoor installation
- 80% thermal efficiency
- Horizontal airflow
- Rated for elevations from 0 – 2,000 ft.
- 409 stainless steel heat exchanger
- 409 stainless steel burners
- Flue/combustion air – indoor models
  - Vertical (separated indoor)
  - Vertical top exhaust with louvered intake
- Direct spark ignition
- 1-stage/2-stage gas controls
- Induced draft venting
- Terminal block for power and control wiring
- Automatic high limit safety shut-off
- Auxiliary manual high limit switch
- Combustion air pressure switch
- Air proving switch
- Combination gas valve with shutoff

**Standard Features (continued):**
- Flame rollout switch
- Manual shut off valve
- 3/8” condensate drain connection

**Voltages & Phase:**
- Single phase - 120V, 208V, 230V

**Control Voltage:**
- 24 VAC

**Dimensions:**
- See table 2

**Shipping:**
- Shipped loose with base unit and installed in the field

**Options:**
- Indirect propane fired fuel
- Elevation correction for elevation > 2,000 ft.
- 304 stainless steel heat exchanger
- 5:1 continuous electronic modulation for all furnaces
- 10:1 continuous electronic modulation for furnaces 200 MBH and larger
- Duct thermostat for modulation control
- Disconnect switch
- Power fusing

**Accessory:**
- Duct thermostat for 1-stage/2-stage control
- Duct thermostat for modulation control

**Flue and Combustion Air Configuration**

**Note:** The total equivalent length of vent pipe must not exceed 50 feet. If equivalent length exceeds 50 feet refer to IOM for recommendations.

**Caution:** All indirect gas-fired duct furnaces to be installed downstream of the ERV and on the positive side of the supply fan.

**Temperature Rise and Pressure Drop**

**Figure 1** Gas Furnace 50-200 MBH

**Figure 2** Gas Furnace 250-400 MBH

Specifications may be subject to change without notice.
### DUCT FURNACE DIMENSIONS

**FIGURE 3 IN-KI (TOP EXHAUST INDOOR)**

**FIGURE 4 IN-SI (SEPARATE INLET EXHAUST INDOOR)**

### TABLE 2

<table>
<thead>
<tr>
<th>Size</th>
<th>Tubes</th>
<th>Input Rate</th>
<th>Output</th>
<th>Min/Max Temperature Rise through Furnace (°F)</th>
<th>Vent Locations</th>
<th>Unit Weight</th>
<th>Shipping Weight</th>
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</thead>
<tbody>
<tr>
<td>MBH</td>
<td>Qty.</td>
<td>Btuh</td>
<td>Btuh</td>
<td>Nom. Duct Opening Airflow (CFM)</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3</td>
<td>50,000</td>
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<td></td>
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<tr>
<td>75</td>
<td>3</td>
<td>75,000</td>
<td>60,000</td>
<td>2778 2222 1852 1587 1389 1235 1111 1010 926</td>
<td></td>
<td>15.7</td>
<td>127 207</td>
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<tr>
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<td>12</td>
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<td>240,000</td>
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<td>40.4</td>
<td>279 384</td>
</tr>
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<td>280,000</td>
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<td>45.9</td>
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<tr>
<td>400</td>
<td>15</td>
<td>400,000</td>
<td>320,000</td>
<td>14815 11852 9877 8466 7407 6584 5926 5387 4938</td>
<td></td>
<td>48.7</td>
<td>394 499</td>
</tr>
</tbody>
</table>

**Note:** For a single furnace, 20°F minimum temperature rise, 60°F maximum temperature rise.

### INDIRECT GAS-FIRED DUCT FURNACE DIMENSIONS

---

**LEFT VIEW**

- 14 7/8" Opening
- 6 1/8" Opening
- 24" Opening

**FRONT VIEW**

- 3/8" Condensate Drain Tube
- 3/4" Gas Connection

**TOP VIEW**

- 36" Service Area

---

**RIGHT VIEW**

- 14 7/8" Opening
- 6 1/8" Opening
- 24" Opening

**NOTES**

1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE ROUNDED TO THE NEAREST EIGHTH OF AN INCH.
2. SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.
SIZE AND SELECT AN INDIRECT GAS-FIRED DUCT FURNACE

Two of the following data points are required to size and select a furnace:

1. Required heat output (Btu/Hr)
2. Airflow rate (CFM)
3. Required temperature rise $\Delta T$ (°F)

Then use the following formula(s) to select the furnace.

**STEP 1:**
Calculate output capacity (Btu/Hr):
Output capacity (Btu/Hr) = 1.08 x airflow (CFM) x temperature rise (°F)

**STEP 2:**
Calculate output capacity (MBH) using the results from step 1:
Output capacity (MBH) = output capacity (Btu/Hr) / 1,000

**STEP 3:**
Then, calculate the furnace input capacity (MBH):
Furnace input capacity (MBH) = output capacity (MBH) / furnace efficiency (80%)

**STEP 4:**
Select the furnace that is the next size up that will meet the input requirements.

**MINIMUM AND MAXIMUM AIRFLOWS**

The minimum and maximum airflows for the selected furnace can be calculated using:

Minimum airflow (CFM) = furnace size (MBH) x 1,000 x furnace efficiency (80%) / 1.08 x 60 (°F)
Maximum airflow (CFM) = furnace size (MBH) x 1,000 x furnace efficiency (80%) / 1.08 x 20 (°F)

**DETERMINING DUCT FURNACE PRESSURE DROP**

To determine the duct furnace pressure drop, use the following procedure:

1. Find airflow (CFM) on horizontal axis.
2. Follow the airflow line vertically up the graph until it intersects the curve for the furnace size selected. The lighter curves are for pressure drop. The darker curves are for temperature rise.
3. At the intersection point on the lighter curve, read the value on the right vertical axis for the pressure drop across the furnace.
4. At the intersection point on the darker curve, read the value on the left vertical axis for the temperature rise across the furnace.

In the example, airflow is 3,000 CFM. The furnace size is 125 MBH. Pressure drop is .036 inch WC and temperature rise is 31°F.

EXAMPLE:
The airflow rate:
3,000 CFM
Required temperature rise $\Delta T$:
30 °F
Output capacity:
1.08 x 3,000 x 30 = 91,200 Btu/Hr
Output capacity:
91,200/1,000 = 91.2 MBH
Furnace input capacity:
91.2/0.8 = 121.5 MBH
Furnace input capacity of 121.5 MBH would require a 125 MBH indirect gas-fired furnace.

TO SELECT AND SPECIFY YOUR FURNACE
visit renewaire.com/products/commercial-products/indirect-gas-fired-duct-furnace