ERV GUIDE
FOR ENHANCED INDOOR AIR QUALITY & ENERGY EFFICIENCY

BENEFITS OF INCREASED VENTILATION
- BETTER HEALTH
- REDUCED VIRAL SPREAD
- IMPROVED COGNITIVE FUNCTION
- INCREASED PRODUCTIVITY

RENEWAIRE EVERYWHERE
EVERY GEOGRAPHY, EVERY CLIMATE, EVERY HOME, EVERY BUILDING AND EVERY APPLICATION
Deficient Indoor Air Quality Is a Threat

As buildings get tighter to seal weather out, they seal in contaminants, causing deficient indoor air quality (IAQ). Typical contaminants include off-gassing from carpeting, furniture and building materials, excess humidity and mold, odors, cooking and cleaning fumes, CO2, hair and fibers, to name a few.

Deficient IAQ is a threat since it can harm occupant health and cognitive function, damage structures and hurt the bottom line. It’s especially concerning since people spend about 90% of their time indoors, and indoor air can be two to five times—and up to 100 times—more polluted than outdoor air. The EPA ranks indoor air pollution as a top-five health risk. 1

Deficient IAQ can cause allergies, headaches, coughs, asthma, skin irritations and breathing difficulties, as well as cancer, liver disease, kidney damage and nervous-system failure.

Ventilation with outdoor air is vital to diluting airborne contaminants and decreasing disease transmission rates.

Health Effects of Deficient IAQ

Harvard and Berkeley Lab found that CO2—a constituent of exhaled breath—negatively impacts thinking and decision-making at levels commonly found indoors. 2

Ventilation can enhance IAQ and decrease the transmission of airborne infectious diseases, including COVID-19: bit.ly/COVID19WP_22

Cognitive Impairment

Deficient IAQ can cause allergies, headaches, coughs, asthma, skin irritations and breathing difficulties, as well as cancer, liver disease, kidney damage and nervous-system failure.

Disease Transmission

Ventilation with outdoor air is vital to diluting airborne contaminants and decreasing disease transmission rates.

Reduced Productivity

Berkeley Lab found that deficient IAQ can cost $200 billion in debilitated worker performance and $58 billion in lost sick time. 3

Adverse Effects of Deficient IAQ

Deficient IAQ can cause allergies, headaches, coughs, asthma, skin irritations and breathing difficulties, as well as cancer, liver disease, kidney damage and nervous-system failure.

1. Contaminated Airborne Aerosols: Aerosols generated by coughing, sneezing, talking and breathing can act as carriers for viruses and bacteria
2. Humidity: Exhaled breath, water sources (faucets, showers, leaks, floods)
3. Carbon Dioxide: Constituent of exhaled breath
4. Formaldehyde: Off-gassed from adhesives, fabric treatments, stains, varnishes
5. Odors: Bathrooms, kitchens, dry-erase markers, occupant odors (perfume, soap/shampoo residue, clothing detergent, general odors), pets
6. Tobacco smoke: Smoking areas close to building entrance
7. Phthalates: Off-gassed from adhesives, vinyl flooring, wood finishes, plastic plumbing pipes, other building materials
8. VOCs, toxic gases, vapors: Off-gassed from furniture, carpets, paints, cleaners, solvents, glues, building materials
9. Ozone: Off-gassed from copiers, electrostatic air cleaners, other office equipment

Everyone is at risk of suffering from deficient IAQ. Due to weaker immune systems, children and seniors are the most vulnerable. Children are especially susceptible because proportionally they inhale more pollutants than adults and have narrower airways (World Health Organization).

Reduction Indoor Air Contaminants

Ventilation with outdoor air is vital to diluting airborne contaminants and decreasing disease transmission rates.

Reduce Indoor Air Contaminants

Indoor Air Quality Matters
HIGHEST-QUALITY INDOOR AIR VIA VENTILATION

The solution to pollution is dilution achieved via increased and balanced ventilation, which is the most effective way to realize cleaner and healthier indoor air. With enough controlled fresh and filtered outdoor air coming in to replace equal parts of stale indoor air via balanced design, IAQ will be enhanced.

### Types of Home Ventilation

<table>
<thead>
<tr>
<th>Exhaust</th>
<th>Good</th>
<th>Better</th>
<th>Best</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust-Only (Balanced)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhausted</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Balanced</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>HRV</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ERV</td>
<td>Yes</td>
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### Exhausts Contaminants from Whole House

- Generally, exhaust-only ventilation, such as bath fans and oven hoods, only expel contaminants from a localized single source. The optimal solution will provide whole-house ventilation.
- Provides filtered supply air: Exhaust-only units bring in uncontrolled outdoor air that has seeped through cracks and openings. Uncontrolled air is not filtered air. Controlled supply air is preferable as contaminants are filtered out.
- Performs well in all climates year-round: Hot, humid or sub-zero extreme environments add a heavy load onto home heating and cooling systems. Because RenewAire ERVs temper the air (temperature and humidity) via energy recovery, they work well in all climates. Additionally, RenewAire ERVs do not have issues with freezing in winter conditions, which can be problematic for HRVs.
- Since humidity is transferred via core material in an ERV, the core itself will not freeze so there is no need for defrost (known issue with HRVs).
- There are no condensate lines to freeze in an ERV (known issue with HRVs).

### Optimizes Energy and Saves Money

Energy recovery recycles energy by reusing the otherwise-wasted energy and humidity from exhaust air to temper incoming outdoor air, which saves money year after year by lowering demand/load on your mechanical AC/heating equipment.

### Easy to Install

- RenewAire ERVs can be mounted in multiple orientations and they do not require drain pans, which can complicate installation. Also, ERVs provide a single exhaust point, which means less equipment to purchase and install (no need for individual bath fans).

### Easy to Maintain

- Since RenewAire ERVs do not require drain pans (like HRVs), issues with frozen drain lines in cold-weather applications are avoided. Additionally, since ERVs provide a single exhaust point, this means less maintenance and cleaning.
- Our ERVs are effortless to maintain—simply check and replace disposable filters as needed and vacuum the ERV core face once a year.

### Minimum Ventilation Airflow Required by Home Size

<table>
<thead>
<tr>
<th>Square Feet</th>
<th>1 Bedroom</th>
<th>2 Bedrooms</th>
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<th>5 Bedrooms</th>
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<tr>
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### BETTER HEALTH + LOWER BILLS = INCREASED VENTILATION VIA ERVs

The American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) 62.2 committee has established a residential ventilation standard, known as Ventilation and Acceptable Indoor Air Quality in Residential Buildings. The goal of this standard and its continuous revisions are to not only evaluate and recommend every building’s minimum ventilation needs, but also emphasize indoor air quality and its relationship with occupant health.

See the chart below to calculate the minimum ventilation required for your home: 0.63 sq. ft. + 7.5 (bedroom +1). For example, a 2,200 sq. ft. home with 4 bedrooms requires a minimum of 104 CFM.

### THE BEST SOLUTION

The best solution is RenewAire’s energy recovery ventilation technology, which provides enhanced IAQ, greater ventilation efficiency and major energy cost savings.

### RENEWAIRE SINGLE/MULTI-FAMILY ERV FRESH AIR SYSTEM

**SL SERIES**
- 30–130 CFM
- Low-profile, commercial-grade appliance, often used for multi-family units
- EC-motors, variable speed with boost-mode, Dial-A-Flow easy balancing, plug-in and hard wired power available
- MERV 13 filter accessory

**BR SERIES**
- 40–140 CFM
- Two-duct design

**GR SERIES**
- 40–110 CFM
- Contractor grade—four-duct design

**EV SERIES**
- 40–200 CFM
- Four-duct design

**TecHome Builder’s 2023 Brilliance Award**

**EC motors, variable speed with boost-mode, Dial-A-Flow easy balancing, plug-in and hard wired power available**

**MERV 13 filter accessory**

**EV Premium SH, MH, LH awarded**

**The Best Solution**
- ERV provides a single exhaust point, which means less equipment to purchase and install (no need for individual bath fans).
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RENEWAIRE ERVs are the sustainable ventilation solution. Our static plate, cross-flow core separates the outgoing polluted indoor airstream from the incoming fresh airstream—while simultaneously transferring total energy (heat and water vapor) between the two. Annular cores of aluminum and polyurethane are transferred across partition plates. In the winter, these means that the cold, dry outside air is warmed and humidified before entering the building. In the summer, the warm, outside air is processed and returned to the atmosphere, with the incoming cooling coil air.

**COMMERCIAL ERVs**

The simplicity, flexibility, reliability and efficiency of the RenewAire HE and LE Series Commercial ERVs excel in every commercial application. The packaged solutions of the HE Series and the large capacity of the LE Series allow: a wide range of airflow rates as well as static capacities. These innovative commercial ERVs are designed to be used in any building that is looking to increase ventilation efficiency, increase HVAC equipment and reduce costs.

**APPLIED ERVs**

The flexibility and efficiency of the RenewAire CA, PA and SA Series allow for numerous applications, airflow rates and configurations. The CA Series modular cabinets house up to six energy recovery cores and can be installed individually or stacked up to five cabinets high. The PA Series modules can be up to 36 in. or 13 in. energy recovery cores can be installed side by side. The SA Series is designed for handling Custom Engineered Manufacturing modules (CFMs) and canisters to greater airflow needs.

**INDUSTRY-LEADING PERFORMANCE**

RenewAire ERVs moderate the extremes of outdoor supply-air temperature and humidity year-round, providing a sustainable ventilation solution for every climate.

**ASHRAE 90.1 ENERGY STANDARD**

The outgoing air-conditioned interior air.

**INNOVATIVE CONSTRUCTION**

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**RENEWAIRE ERV REDUCE UNIVERSITY’S ANNUAL HVAC COST BY 40% BIT.LY/2JPAFT5**

**RENEWAIRE ERVS TEMPER THE AIR**

But ERVs moderate the extremes of outdoor supply-air temperatures and humidity year-round, providing a sustainable ventilation solution for every climate.

**RENEWAIRE ERVS ARE THE SUSTAINABLE VENTILATION SOLUTION**

Despite criteria within various regimes call for DOAS-type products to deliver 100% outdoor air to each occupied space. Additionally, certain codes for the increasing energy recovery components. When ever not mandated, it is one of the best ways to improve a building’s energy efficiency.

**DOAS SYSTEMS**

Specific criteria within various regimes call for DOAS-type products to deliver 100% outdoor air to each occupied space. Additionally, certain codes for the increasing energy recovery components. When ever not mandated, it is one of the best ways to improve a building’s energy efficiency.
WHY ENERGY RECOVERY IS CRITICAL

DECARBONIZATION AND ENERGY EFFICIENCY DEMANDS

The main responsibility of a 100% outdoor air unit is to dehumidify the incoming air. In this process, the system inherently handles large heating and cooling loads. Adding energy recovery significantly minimizes these loads and the HVAC equipment required to condition the air.

ASHRAE 90.1-2010 requires the use of energy recovery based upon a unit’s supply airflow, outdoor air percentage, geographic location and hours of operation. The standard mandates the total effectiveness (sensible and latent) by a minimum of 50% when required.

The effectiveness of energy recovery devices varies depending on the type, material and airflow balance. This value is determined based on the test procedure outlined in the Air Conditioning, Heating and Refrigeration Institute’s (AHRI) Standard 1060.

<table>
<thead>
<tr>
<th>ZONE</th>
<th>PERCENTAGE OF OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30% ≤ 40%</td>
</tr>
<tr>
<td>3B, 3C, 4B, 4C, 5B</td>
<td>NR</td>
</tr>
<tr>
<td>1B, 2B, 5C</td>
<td>NR</td>
</tr>
<tr>
<td>6B</td>
<td>≥ 11,000</td>
</tr>
<tr>
<td>1A, 2A, 3A, 4A, 5A, 6A</td>
<td>≥ 5,500</td>
</tr>
<tr>
<td>7, 8</td>
<td>≥ 2,500</td>
</tr>
</tbody>
</table>
RENEWAIRE SUPPORTS THE PILLARS OF SUSTAINABILITY

For unit details and certifications, visit: RenewAire.com/our-ervs