

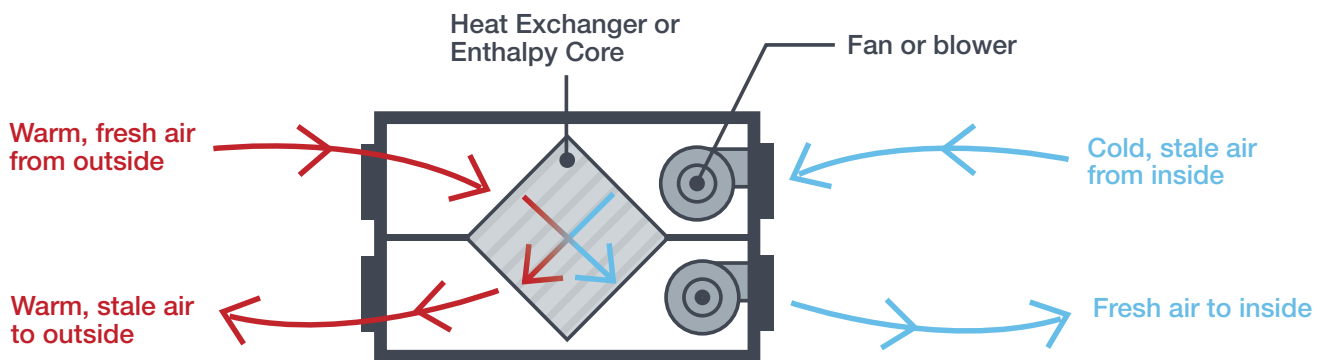
BASICS OF HEAT AND ENERGY RECOVERY VENTILATORS AND THEIR ROLE IN NORTHWEST CODES



Photo credit: Pacific Northwest National Laboratory

Proper ventilation is a necessity for healthy, high-performing homes. Without it, homes can trap moisture, pollen, and pollutants that mold thrives on, creating poor indoor air. Heat recovery ventilators (HRVs) and energy recovery ventilators (ERVs) are systems that remove these pollutants while also improving energy efficiency.

HRVs and ERVs lessen how much energy HVAC systems must exert to condition incoming air, also known as a home's energy penalty. HRVs harness the heat from exhausted air to pre-warm incoming cold air, minimizing energy loss, while ERVs transfer both heat and moisture (humidity) between the air streams.



Heat recovery ventilator (HRV) airflow

WHY HRVS AND ERVS ARE A SMART EQUIPMENT CHOICE FOR HIGH-PERFORMANCE HOMES

When considering strategies for exceeding residential energy code requirements, builders can focus on constructing tighter, more efficiently designed homes with higher performing ventilation systems. Improving the overall energy performance of a home through an HRV or ERV can help projects qualify for tax credits or above-code incentive programs, like [Idaho Power's Residential New Construction Program](#) and [Energy Trust of Oregon's EPS™ New Construction](#). The financial benefits of these opportunities could negate any increase in project costs associated with the new equipment.

Lori Sanders—owner of [Energy Incentives, Inc.](#) and a Rater who serves Eastern Washington—sees a lot of value in HRV and ERV systems. “They aren’t too expensive and perform well in Ekotrope models,” she said. Sanders especially recommends them to builders pursuing [ENERGY STAR® residential new construction certification](#). “HRVs and ERVs are probably the cost-effective way to get a bump in home energy performance.”

HRVS AND ERVS IN THE ENERGY CODES

Although the region’s current energy codes don’t prescriptively require HRVs and ERVs, that could change in the future. The [2021](#) and [2024](#) versions of the International Energy Conservation Code (IECC) already require them in some climate zones.

The Northwest state energy codes have already begun to account for these systems’ benefits.



IDAHO

The [Idaho energy code](#) is based on the 2018 IECC with state-specific amendments. As in Montana, Section R403.6 sets a minimum fan efficiency level of 1.2 cfm/W for any HRVs and ERVs installed.



MONTANA

The [Montana energy code](#) is based on the 2021 IECC with state-specific amendments. In [Section R403.6 Mechanical Ventilation](#), the code states whole-house mechanical ventilation fans must meet minimum efficiency requirements. Table 403.6.2 shows that code-minimum HRVs and ERVs are more efficient than alternative ventilation options.

Builders must also select an additional energy-efficient feature to satisfy code requirements. [Section R408 Additional Efficiency Package Options](#), Table R408.2.5 lists eight choices, one of which includes installing an HRV or ERV.



OREGON

Chapter 11 of the [2023 Oregon State Energy Code](#) says builders can install whole-house ventilation systems with heat recovery as one of the possible additional measures that builders need to choose for code compliance.



WASHINGTON

Section R406 Additional Energy Efficiency Requirements of the [2021 Washington State Energy Code](#) outlines energy credit options builders can choose from to meet a home’s minimum credit value. All three Air Leakage Control and Efficient Ventilation Options in Table R406.3 require whole-house ventilation with heat recovery in accordance with [International Residential Code](#) or [International Mechanical Code](#) standards. “About 80% of the homes that I inspect in Washington use this credit for code compliance,” said Sanders.

HOW HOMEOWNERS CAN APPRECIATE HRVS AND ERVS

Beyond achieving or exceeding code requirements, opting for HRVs and ERVs can make selling homes easier due to the benefits they provide homeowners, namely those related to health and energy savings.

Stale air holds onto unpleasant odors and contaminants like dust, pollen, and other allergens. HRVs and ERVs give homeowners more control over the air quality in their homes as these ventilation systems often have built-in filtration. This can offer homeowners peace of mind that the air they are breathing is clean and constantly refreshed.

ERVs also help maintain a home's optimal humidity level, improving comfort. They can prevent the air from becoming too dry in the winter or too moist in the summer, helping homeowners avoid respiratory problems and mold growth.

Providing homeowners with an orientation of these systems, explaining how it works and when and how to change filters can go a long way toward ensuring the system delivers long-term benefits.

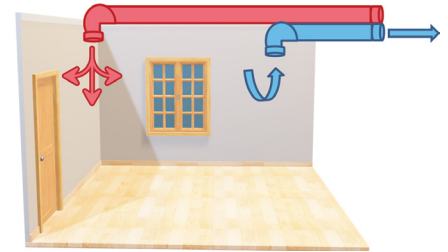


Diagram of supply air entering room on opposite side from where air is exhausted



HRVs and ERVs boost home energy performance by offering highly efficient ventilation

GIVING HRV AND ERV SYSTEMS A SHOT: WHERE TO START

Interested in incorporating HRVs and ERVs into your next project? Work with a ventilation design expert early in the design phase and follow these steps to achieve a successful outcome.

- 1. Calculate the home's ventilation airflow requirements:** Use tools such as [RED Calc](#), which utilize ASHRAE standard 62.2 to calculate ventilation.
- 2. Choose ERV or HRV:** Consider humidity, condensate lines, and performance metrics such as sensible recovery efficiency and total recovery efficiency.
- 3. Select efficient equipment:** Choose products that are ENERGY STAR rated or consult the [Home Ventilating Institute \(HVI\) Certified Products Directory](#).
- 4. Create a dedicated duct system:** Locate exhaust and fresh air points and the fan unit.
- 5. Integrate with forced air heating system:** Consult with your Rater or ventilation expert to learn about your options.
- 6. Testing and Commissioning:** Follow manufacturers' procedure as processes can differ across manufacturers and some products are self-balancing.

Knowing what to look for when deciding to install an HRV or ERV in your projects will help you make the right choices to achieve your energy-performance goals and improve the home's indoor air quality.

Review the following training courses to expand your knowledge of HRV and ERVs:

- [Installation Elements for ERVs & HRVs](#)
- [Design & Quality Control Best Practices for ERVs/HRVs](#)