

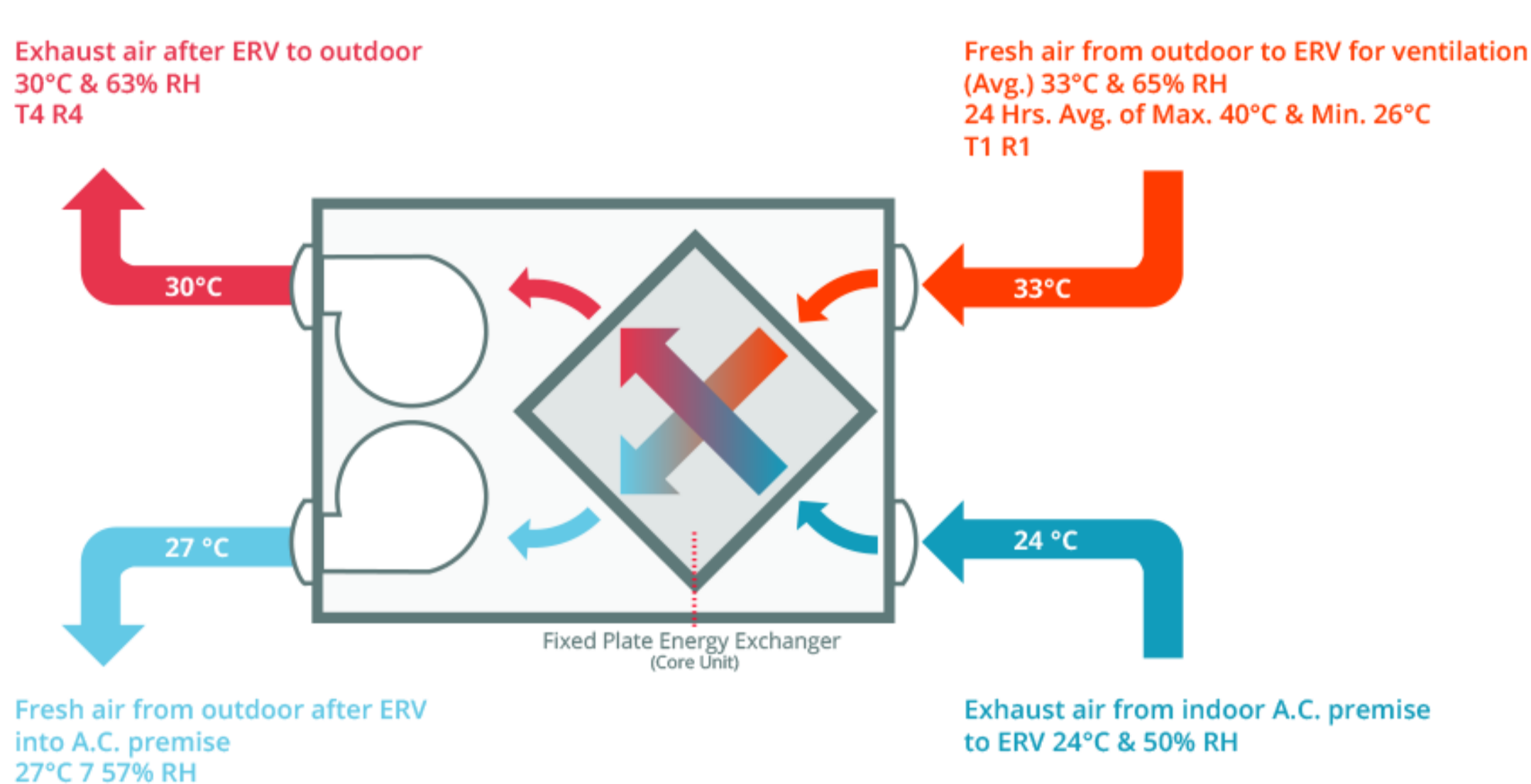


CREATE AN ENERGY EFFICIENT FRESH AIR SUPPLY Step 8

Airtight construction saves energy and improves the durability of buildings. While an energy efficient home can never be “too tight”, it is necessary to provide automatic ventilation in all homes that have been air sealed below 4 Air Changes per Hour (ACH). This ventilation helps to control the flow of water vapor and maintains superior air quality for the health of the occupants. To reduce energy loss in zero energy homes, heat from the ventilated air can be captured rather than wasted by installing heat recovery ventilators (HRVs) or energy recovery ventilators (ERVs). These ventilators bring fresh air into a home and discharge stale air, while retaining about 70% to 90% of the heat from the discharged air and returning it to the incoming air. In addition, HRVs and ERVs each help manage moisture in the air in different ways. [Learn more about HRVs and ERVs from Green Building Advisor.](#)

WORKING OF ERV

OUTSIDE ATMOSPHERE



ENERGY RECOVERY AT 70% EFFICIENCY LEVEL

INSIDE OF A.C. PREMISE

Both types of recovery devices use an exchange core to pass heat from one airstream to the other. The exchange core in an HRV can be aluminum or plastic. This core prevents indoor moisture and odors from crossing into the flow of fresh, outside air. ERVs are the same as HRVs except the core is made of coated paper or perforated plastic, which allows water vapor to pass, but keeps odors out. HRVs are best for most cool climates, however ERVs are a better choice in warm and humid, or extremely dry climates. In these cases, good moisture management requires that water vapor stays outside in humid climates or inside in dry climates. Most manufacturers offer both HRVs and ERVs. [Learn more about about selecting an appropriate ventilation system.](#)



Efficiency versus Cost

The efficiency of any HRV depends on the core ERV material and size. ERVs can take advantage of the energy contained in the water vapor they recover, giving them a slightly higher efficiency than HRVs. Both types of ventilators have motors that can run continuously, requiring considerable energy to operate fans. Greater efficiency is gained with an electrically-commutated motor (ECM), which also has the benefit of variable speed operation.

Consider selecting a more energy efficient HRV or ERV system, such as the [UltimateAir RecoupAerator 200DX ERV](#), the [Venmar EKO 1.5 HRV](#) or the [Zehnder ComfoAir](#). Or consider less efficient, lower cost units such as [Life Breath ERVs and HRVs](#) or [Panasonic WhisperComfort ERV](#). As of this writing, the UltimateAir RecoupAerator ERV and Zehnder ComfoAir are the most efficient ERVs, claiming 90% efficiency in recovering heat from expelled air and utilizing energy-efficient fans with electronically commutated motors (ECMs). However, highly efficient ERVs like these are more expensive. New models may become available that are less expensive and/or more efficient. The Home Ventilating Institute website maintains a current [list of equipment specification for up-to-date information on a wide variety of ventilation systems.](#)

It's important to choose equipment that matches the needs of the project. The most efficient system may not be the best overall choice. For most applications, a moderately efficient unit will be sufficient. For example, homes under 1,000 square feet may not need a large amount of airflow, and would be better served by a smaller, somewhat less efficient, system such as the [Panasonic Whisper Comfort Spot ERV](#).

Location

HRVs and ERVs have two duct systems. One system removes air from high moisture areas, such as bathrooms, kitchens, and laundry rooms. The other supplies outside air to bedrooms and living spaces. This arrangement helps mix air throughout the home. To keep duct runs short and inside the conditioned space, it's best to pick a central location for the main unit, which houses the exchange core and fans. Because all ventilation systems make a modest amount of noise, take care not to place the unit near bedrooms or minimize potential disturbance by using sound-abatement methods.

Manage Moisture

Try to maintain indoor relative humidity between 30% and 50%. Most climates will benefit from removing small amounts of indoor water vapor with an HRV. In dry climates the home will benefit from an ERV that retains some water vapor in the living area. In warm humid climates, ERVs help keep excessive humidity outside. Just moving the air regularly with either type of ventilation system will help prevent mold and keep indoor air pleasant. [Learn more about moisture management in homes.](#)

Replacing Exhaust Fans

Bathroom exhaust fans can cost several hundred dollars each when installed by an electrician. Let the HRV/ERV do the work of exhaust fans and save money. Most HRV/ERVs can operate at multiple speeds. They are generally sized so that the lowest speed meets the home's ventilation requirement. Boosting the speed to high can clear bathroom moisture and odors, making exhaust fans unnecessary. This has the added benefit of reducing building air leakage by eliminating penetrations for exhaust fan ducts to the outside.

Using an ERV or HRV vent in the kitchen, instead of a vented range hood, eliminates another penetration of the sealed building envelope and avoids venting heated air directly out of the kitchen. The ERV vent should be at least 6 feet from the stove in order to prevent grease buildup from cooking. Check with the building inspector in your jurisdiction before replacing the range hood with an HRV/ERV as this may or may not pass inspection depending on local code. If needed a recirculating range hood can be used in conjunction with an HRV/ERV for kitchen ventilation.

Use Non-Toxic Building Materials

Wherever possible, low- and non-VOC paints should be used and cabinets should be formaldehyde-free in air tight homes. In most rooms, hardwood and tile flooring or non-toxic carpeting should be used without the use of glue. These measures combined with a fresh air supply make a much healthier home.

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