HRV SYSTEM BEST PRACTICES FOR THE NORTHWEST

Achieving reliable ventilation effectiveness in relatively tight homes requires a balanced system. Heat recovery ventilators, HRVs, are the optimal home ventilation system for the Northwest. Energy recovery ventilators, ERVs, are better suited for humid climates and do not perform well in our dry summer conditions. Due to complexity and added operational costs, we also don't recommend integrated HRV/ERV systems. Read below for tips and recommendations to make the most of your HRV installation—unless properly designed, installed and operated, an HRV may not save more energy than an exhaust fan.

1 Planning

SYSTEM DESIGN CONSIDERATIONS

If located in the same room, supply air should be delivered on the opposite side of the room from the entry door or exhaust air.

System filters and core must be easily accessible for maintenance.

Install exhausts in bathrooms, supplies in bedrooms, and both in the main living area.

If the system recirculates air for defrost, position the defrost air ducts to draw from conditioned space.

HRV supply and exhaust air vents should be >10 ft. apart. Never install vents on a roof.

Ensure proper condensate drainage. Consider the usefulness of gravity for drainage purposes.

Situate unit in a tempered or conditioned space (but never in an attic or crawlspace).

2 System CFM Specification & Efficiency

Are you planning to have continuous ventilation?

YES

Ensure HRV is capable of delivering airflow (recommended at a medium-range speed setting) at the following rates:

(sq. ft. x 0.01) + [(# of bedrooms + 1) x 7.5] and ensure that each full bathroom is receiving 20 CFM continuous ventilation. When determining the CFM requirements for an HRV, you must be able to meet ASHRAE 62.2 2010 (or other applicable standards) for whole-house and spot-ventilation requirements at medium-range speed.

NO

Ensure HRV is capable of delivering airflow at the continuous rate (recommended at a medium-range speed setting—see box to the left). Recommended intermittent settings are:

For 20 min. of ventilation and 40 min. of recirculation, use:
{(sq. ft. x 0.01) + [(# of bedrooms + 1) x 7.5]} x 3

For 40 min. of ventilation and 20 min. of recirculation, use:
{(sq. ft. x 0.01) + [(# of bedrooms + 1) x 7.5]} x 1.5

Minimum run time for intermittent ventilation is 20 min. per hour.

Efficiency considerations

For efficiency and comfort, the system must have high SRE, high ASE and high efficacy.

SRE > 80 Percent* = High Efficiency
High SRE keeps operating costs low. The SRE indicates how efficient an HRV is at capturing heat transfer between the incoming and outgoing airstreams. SRE lower than 80 percent will increase energy consumption.

ASE > 85 Percent* = High Effectiveness
High ASE leads to maximum comfort. The ASE of an HRV indicates how warm the delivered air will be in winter and how cool it will be in summer. ASE lower than 85 percent may result in comfort issues and therefore discontinued use of the system.

High Efficacy = Low Energy Costs
The fan efficacy indicates the amount of air that can be moved per unit of energy used. Efficacy lower than 1.25 CFM/watt may still transfer heat from airstreams efficiently, but risks using higher fan energy.

Time to start duct layout and installation.

3 Installation

DUCT LAYOUT AND INSTALLATION CONSIDERATIONS

Install high-quality duct fittings with no 90-degree turns.

Install elbows on all boots.

Install flex with 5 percent maximum compression.

Seal and insulate all ducts.

The unit must be able to deliver the calculated requirements at medium-range speed setting at a static pressure of no greater than 0.4 IWC.

Never design systems for continuous high-speed operation.

If recommended by the manufacturer, install balancing dampers on the HRV.

If using a packaged HRV and duct system, use the manufacturer guidelines for duct sizing. If using an HRV and standard ducts, size ducts to table below:

Max. CFM	Sheet Metal	Flex Duct Size (inches)
30	4	5
50	4	5
75	5	6
110	6	7
175	7	8
325	9	10

Whenever possible, install all ducts inside a conditioned space and insulate all ducts outside of conditioned space. Regardless of location, insulate fresh air supply and exhaust to outside ducts.

4 Testing & Commissioning

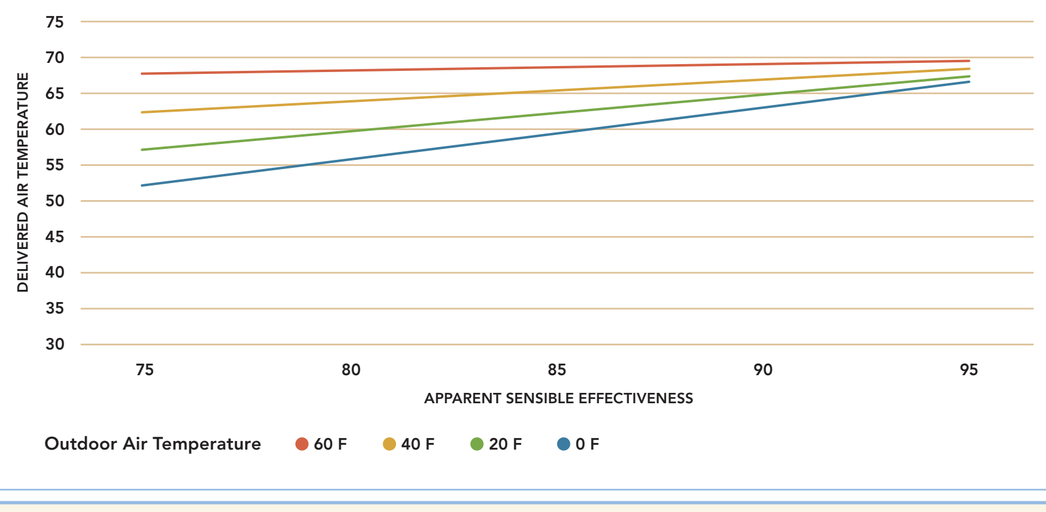
Balance system to manufacturer's specs. System imbalance lowers efficiency and may negatively affect delivered air temperature.

Measure airflow for exhaust and supply registers against design values.

Program HRV controller to meet ASHRAE 62.2 2010.

Educate homeowner: Always provide the manufacturer's HRV system operations and maintenance manual and consider providing a customized ventilation manual.

Delivered Air Temperature at Various Outdoor Temperatures and ASEs



*Performance measured at the lowest tested airflow using CSA C439-09.

Helpful Resources

- Detailed product information: www.hvi.org/proddirectory/index.cfm
- ERV vs. HRV information: www.greenbuildingadvisor.com/blogs/dept/musings/hrv-or-erv
- ENERGY STAR® specifications: https://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/hrv_erv/herv_prog_req.pdf?3cb0-72ec

Legend

HRV: heat recovery ventilator
ERV: energy recovery ventilator
SRE: sensible recovery efficiency
ASE: apparent sensible effectiveness
CFM: cubic feet per minute
Vent: intake or exhaust from the HRV to the exterior
Register: termination inside a room