

ASK THE INSPECTOR COLUMN FOR FEBRUARY 10, 2016
HEADLINE: IS AN HRV WORTH INSTALLING?

A reader wrote recently with this question, “We installed new windows and added insulation to the attic last fall. We followed your winter maintenance tips for caulking and sealing our home. We got a lot of condensation on the windows so far this winter even though our home is electric heat. We have read that a ventilation system may help us, is this true?”

Having a licensed and skilled tradespersons install a Heat Recovery Ventilator (HRV) can make a considerable difference in the air quality of a home. It is not uncommon for any home built before the 80’s to exchange the air strictly by air leakage from the envelope of the home. Moisture created by human occupancy, showers and cooking will transfer to the exterior by a natural process called the “stack effect.” Stack effect is the process of external air entering the home from the lower levels, such as the basement and exhausting through the attic, windows, doors and other voids in the building envelope. However, when better insulation, caulking, sealing and new windows and doors are installed, the exchange of the moisture-laden air in the home is affected. Excessive condensation is not recommended, as it permits mould growth and any number of impurities that have previously escaped the home and which will now remain inside.

My first suggestion to the reader is to invest in a hygrometer. This is a mechanical device that measures the level of humidity in the home. We like to see a home remain in the 40-50% humidity range. If your windows have considerable condensation and the hygrometer constantly remains over 60%, these are prime conditions for mould.

Since they have electric radiant baseboard heaters and there is no duct system in the home, our reader is going to need to install one for the HRV to operate correctly. This home should have exhaust grills in the bathrooms, kitchen and laundry room and fresh air supply to the bedrooms and living area, depending upon the design. The contractor should have a certified HRV designer draft up the system. If the reader had had a forced air furnace, he could have used the furnace return air duct. Both the supply and exhaust ducts can be used for the return air, but that is not as effective as a separate exhaust duct system would be.

Next, I’d recommend our reader have individual controls installed in the bathrooms, kitchen and laundry room, which would allow him to increase the speed of the fan in the HRV. HRV units generally have two speed fans that operate on low speed during the operational season. High speed can be manually operated for increased ventilation during cooking or showers. Once the HRV is installed, the technician will balance the system for CFM (cubic feet per minute). This will ensure your home is not incorrectly pressurized. Today, we balance an HRV at zero exchange, allowing the system to bring in the same amount of air as it exhausts.

I recommend our reader shop around for prices for a full system, as recommended here. This could easily reach the \$2,000 to \$3,000 level and, if access is limited by a finished basement, it will be higher since holes in the walls and ceilings will be necessary.

What are the key points to look for in a properly installed system? The duct runs should be kept as short as possible, with a minimum number of elbows. The entire system

should be inside the heated envelope of the home. HRV units have a certain vibration to them; they often hang on chains with spring supports. Do not install near a bedroom or a reading area. The HRV should have easy access for service. Most units have two filters, the secondary foam ones that should be cleaned every month and the primary heater core, which should be cleaned at least once a year. The external supply hood should not be located where exhaust gases, dryer vents or septic vents are present. They should be 18" off the grade and the supply/exhaust vent hoods should be a minimum of six feet apart. Make sure the proper screens are installed to prevent birds or rodents from entering. The exhaust air should not be discharged to a crawl space or attic. All of the joints in the ductwork should be properly taped or coated with duct seal. The ducts supplying the fresh air and exhaust air to the HRV must be insulated, to a minimum of R4. Most installers use the black insulated flex duct. The balancing dampers are installed in the metal duct side of the duct system, usually just outside the actual HRV cabinet. The metal duct can be supported with plumbers wire, but the insulated soft ducts, used for supply/exhaust, should be supported with wide metal bands no less than 1 ½ to 2" wide. The entire system should be secured snugly or separated by vibration damper material, if necessary.

Lastly, an HRV is not designed to supply combustion air for the furnace, or any fossil burning fuel appliance for that matter. If you have any wood burning installations, fireplace, wood stove or pellet stove, make sure they have enough make-up or combustion air. Make sure your installer understands how often you use your wood burning appliance, since some type of additional combustion air source may be needed in the home.

Every home I have built and lived in since the late 80's has had an HRV, including our 1894 renovated church. The filters are cleaned, as recommended by the manufacturer, and, every few years, I get the CFM checked for balance. We often get comments from visitors, especially in the winter, about how fresh the air in our home smells and feels. Indoor air quality is important. There is a fine balance between energy efficiency, sufficient air exchange and excess condensation, as our reader has discovered.

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