TORONTO DUCTWORK

# Energy Recovery Ventilation (ERV/HRV)

Heat recovery ventilator and energy recovery ventilator installation, maintenance, and integration with existing HVAC duct systems

24 Expert Answers from Duct IQ

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Q1

## Does my Toronto home HRV need to run during the summer when windows are open?

**Running your HRV during summer in Toronto is a judgment call, but for most homes the answer is: run it at reduced capacity or use the recirculation mode — don't shut it off completely, and definitely don't run it at full ventilation speed on humid summer days with windows open.**

Toronto summers create a specific challenge for HRV operation. The GTA regularly sees outdoor humidity levels that push humidex values above 40, with dew points in the 22-26°C range on the worst days in July and August. An HRV (Heat Recovery Ventilator) exchanges indoor air with outdoor air while recovering heat energy — but in summer, that means it's pulling in hot, humid outdoor air and exhausting your cooled, dehumidified indoor air. On a muggy Toronto summer day, running your HRV at full speed actively works against your air conditioner, importing humidity faster than your AC can remove it.

**When windows are open**, the situation is straightforward: you're already getting natural ventilation, so there's no need for mechanical fresh air exchange. Most HRV manufacturers and HVAC professionals recommend switching your HRV to recirculation mode (if your unit has it) or simply reducing it to its lowest intermittent setting when you're running the home with open windows. Running it at full ventilation speed while windows are open wastes energy and makes no sense from an air quality standpoint — you're already exchanging far more air than any mechanical system would provide.

**When windows are closed and the AC is running** is where the decision gets more nuanced. Your home still needs fresh air for occupant health — Ontario Building Code and ASHRAE 62.2 set minimum ventilation rates based on home size and number of bedrooms. A typical GTA home needs roughly 50-100 CFM of fresh air continuously. Shutting the HRV off entirely during summer means your home becomes increasingly stale, CO? levels rise, and odours accumulate. The right approach is to run the HRV on its lowest intermittent setting — typically 20 minutes per hour — which provides the minimum required fresh air without overwhelming your AC with excessive humidity load.

Some newer HRV models have a summer bypass mode that opens a damper to allow direct air exchange without passing through the heat exchange core. In summer, this is actually useful on cooler nights (below 20°C outdoors) when you want to flush the house with cool night air without the heat exchanger warming it back up. If your unit has this feature, it's worth using on comfortable summer nights even with windows open.

**A practical summer HRV schedule for a Toronto home:** On hot, humid days (humidex above 30, windows closed, AC running) — run on lowest intermittent setting, 20 minutes per hour. On comfortable days with windows open — switch to recirculation or minimum setting. On cool nights below 20°C — consider running at higher speed

with bypass mode engaged if available.

One important note: if your home has condensation issues on duct surfaces or windows during summer, that's a sign your indoor humidity is already high. Running the HRV more aggressively in that scenario won't help — it will import more humidity. Address the moisture source first, and consider whether an **ERV (Energy Recovery Ventilator)** might be a better fit for your home. An ERV transfers moisture as well as heat, so it's significantly better than an HRV at managing humidity during Toronto's humid summers. Many HVAC professionals in the GTA now recommend ERVs over HRVs for air-conditioned homes for exactly this reason.

If you're unsure how your system is set up or whether your controls are configured correctly for seasonal operation, a ductwork and ventilation contractor can assess your HRV settings, airflow balance, and whether your unit is appropriately sized for your home. Toronto Ductwork can match you with a local ventilation professional through the Toronto Construction Network — find contractors in your area at torontoconstructionnetwork.com/directory?trade=hvac.

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Q2

## Does my Toronto home HRV need a condensate pump or can it drain by gravity?

**Most HRVs installed in Toronto homes can drain by gravity, but whether that's practical depends entirely on where your unit is located relative to a floor drain — and in many GTA basements, a condensate pump is the smarter, more reliable choice.**

HRVs produce condensate year-round, but especially during Toronto winters when extremely cold outdoor air (-15 to -20°C) meets warm, humid exhaust air inside the heat exchanger core. That temperature differential causes significant moisture to condense out of the exhaust stream. A properly sized HRV running continuously in a GTA home can produce anywhere from 1 to 4 litres of condensate per day during peak winter operation — enough that drainage is not optional, it's essential. A blocked or missing drain line will cause the unit to flood, damage the core, and potentially leak onto your mechanical room floor.

**Gravity drainage** works when your HRV is mounted at a height that allows a continuous downward slope (minimum ¼ inch per foot) from the drain port to a nearby floor drain, utility sink, or condensate drain. The drain line should be ¾-inch ID tubing, kept as short and straight as possible, and must maintain that slope throughout its entire run — any low spots will trap water and eventually block. If your floor drain is within 3 to 5 feet of the HRV and sits lower than the unit's drain port, gravity is perfectly adequate and the simpler solution. Many GTA homes with the HRV mounted on a wall bracket directly above a laundry sink or floor drain work exactly this way without any issues.

**A condensate pump becomes necessary** when there's no floor drain nearby, when the HRV is mounted in a location where achieving a continuous downward slope is impossible (common in finished basements or utility rooms where the drain is across the room or on the other side of a wall), or when the unit is mounted low enough that gravity drainage simply won't reach any drain without running the line uphill at some point. Condensate pumps for HRVs are inexpensive — typically $60 to $150 for the pump itself — and a contractor can install one in under an hour. Look for a pump with a safety float switch that will shut the HRV down if the reservoir fills up due to a blockage, preventing overflow damage.

### GTA-Specific Considerations Worth Knowing

Toronto's cold winters mean your HRV will go through **defrost cycles** — the unit temporarily reverses or reduces airflow to prevent the core from freezing. During defrost, condensate production spikes briefly. If your drain line has any sag or partial blockage, defrost cycles are often when overflow problems first appear. Check your drain line every fall before heating season.

Also worth noting: **older GTA homes** (pre-1980s) often have floor drains in the mechanical room that are infrequently used and may have dried-out P-traps. A dry P-trap allows sewer gases into your home. If your HRV drains into a floor drain, pour a litre of water into that drain every few months to keep the trap wet, or install a trap primer.

If your HRV drain line runs through an unheated space — even a short section through an exterior wall chase — insulate it. A frozen condensate line in January is a common service call in the GTA, and it's entirely preventable.

**A licensed HVAC contractor** should confirm your drain configuration when the HRV is installed or serviced. If you're unsure whether your current setup has adequate slope or whether your drain line is partially blocked, that's worth having checked during your annual HRV maintenance visit — which should include cleaning the core, checking filters, and verifying balanced airflow.

Need help finding an HRV installation or service contractor in the GTA? Toronto Ductwork can match you with a local ventilation professional through the Toronto Construction Network — browse the directory at torontoconstructionnetwork.com/directory?trade=hvac.

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Q3

## What happens if I never clean the filters in my Toronto home ERV system?

**Neglecting your ERV filters leads to a cascade of problems — reduced fresh air delivery, increased energy consumption, potential core damage, and degraded indoor air quality — all of which get progressively**

**worse the longer cleaning is deferred.**

An ERV (Energy Recovery Ventilator) works by transferring heat and moisture between incoming fresh air and outgoing stale air through a paper or polymer core. For that exchange to work efficiently, both the supply and exhaust airstreams need to flow freely through their respective filter media. When filters load up with dust, pet dander, and particulate matter — which happens quickly in Toronto homes during heating season when windows are closed for months — airflow through the core drops significantly. The ERV's fan motors compensate by working harder, drawing more electricity while delivering less fresh air. You're paying more to ventilate less.

The bigger concern is what happens to the core itself. ERV cores are delicate — they're made of thin, moisture-permeable material that transfers humidity between airstreams. When filters are clogged, the pressure differential across the core increases, which can physically deform or damage the core media over time. Replacement cores for residential ERVs typically cost **$200–$600**, and in some cases the entire unit needs replacement at **$3,000–$6,000 installed**. That's an expensive outcome for skipping a 20-minute maintenance task.

**In the GTA specifically**, this matters more than in milder climates. Toronto's long heating season — roughly October through April — means your ERV runs almost continuously for six or seven months straight. During that period, filters accumulate dust at a much higher rate than in a home that opens windows regularly. By February or March, a filter that was clean in October can be completely blocked. Meanwhile, Toronto's humid summers create a second loading period as the ERV works to manage indoor humidity during air conditioning season. Two heavy-use seasons per year means GTA homeowners should be cleaning ERV filters **every 3 months minimum**, and every 6–8 weeks during peak heating and cooling seasons.

**Practically speaking**, here's what to do. Locate your ERV unit — typically in the mechanical room, utility room, or attached to the furnace. Most residential units have two or four filters accessible through a front panel. Remove them, vacuum off loose debris, then wash with warm soapy water, rinse thoroughly, and allow to dry completely before reinstalling. Never reinstall damp filters — moisture in the filter media promotes mould growth directly upstream of your living space. While the filters are out, inspect the core for dust accumulation and wipe down the interior of the unit with a damp cloth.

Also check your exterior hoods — the fresh air intake and exhaust terminations on the outside wall. These can accumulate debris, bird nesting material, and ice in winter, restricting airflow independently of the filters. A blocked exterior hood is a common GTA winter problem that homeowners miss entirely because the issue is outside.

**A capable homeowner can absolutely handle ERV filter cleaning themselves** — it requires no tools and no technical knowledge beyond locating the unit and following the manufacturer's instructions. The annual maintenance task that does warrant a professional is a full ERV balancing check, where a technician measures airflow rates on both the supply and exhaust sides and adjusts the unit to deliver balanced ventilation. This should

be done every 3–5 years or any time you notice the unit seems to be running constantly or your home feels stuffy despite the ERV operating. Unbalanced ERVs can depressurize the home slightly, which in a home with a gas furnace or water heater creates a backdrafting risk — a combustion safety concern that TSSA takes seriously.

If your ERV hasn't been serviced in several years and you're noticing reduced airflow, musty odours from the vents, or higher-than-expected energy bills, it's worth having a ductwork and ventilation professional inspect the unit and the associated ductwork. Toronto Ductwork can match you with a local ventilation contractor for a free estimate — find professionals through the Toronto Construction Network at **torontoconstructionnetwork.com**.

Q4

## Can I connect my Toronto home ERV to a smart thermostat for automatic humidity-based control?

**Yes, most modern ERVs can be connected to smart thermostats for automatic humidity-based control, but the specific compatibility depends on your ERV model and thermostat type.** This integration allows your ERV to automatically increase ventilation when indoor humidity rises above your set point, providing superior indoor air quality management compared to basic timer controls.

### Smart Thermostat Compatibility and Control Options

Most ERVs manufactured in the last 10 years have control terminals that can interface with smart thermostats like Ecobee, Honeywell, and Nest models. The connection typically involves running a low-voltage control wire from your ERV to the thermostat's accessory terminals. Popular smart thermostats with ERV integration include the Ecobee SmartThermostat (which has built-in humidity sensing and ERV control), Honeywell T6 Pro series, and some Nest Learning Thermostat models with additional sensors.

The most sophisticated setup uses **humidity-based demand ventilation** — your smart thermostat monitors indoor humidity levels and automatically ramps up ERV speed when humidity exceeds your programmed threshold (typically 45-55% relative humidity in winter, 50-60% in summer for GTA homes). This is particularly valuable during Toronto's humid summers when cooking, showering, and laundry can quickly spike indoor humidity levels, and during winter when overly dry indoor air (below 30% RH) causes comfort issues and static electricity.

### GTA Climate Considerations for ERV Control

Toronto's extreme seasonal humidity swings make smart ERV control especially beneficial. During summer months with humidex values above 40, your ERV's energy recovery wheel transfers moisture from incoming humid outdoor air to outgoing indoor air, helping maintain comfortable indoor humidity without overworking your air conditioning. In winter, when outdoor air at -15°C holds almost no moisture, the ERV's energy recovery core transfers moisture from outgoing stale indoor air to incoming fresh air, helping maintain adequate indoor humidity levels.

Smart humidity-based control prevents the common problem of **over-ventilation during mild weather** — running your ERV at high speed when outdoor conditions are pleasant wastes energy and can create pressure imbalances. Conversely, during periods of high indoor humidity (dinner parties, multiple showers, laundry drying), automatic boost ventilation quickly removes excess moisture before it condenses on windows or promotes mould growth.

### Installation Requirements and Costs

Installing smart ERV control requires running low-voltage control wiring between your ERV unit and thermostat location. If your ERV is in the basement and thermostat on the main floor, this typically involves fishing wire through

wall cavities or basement ceiling — work that requires an **ESA-Licensed Electrical Contractor** in Ontario. The control wire installation typically costs $200-$500 depending on the wire run complexity.

You'll also need a compatible smart thermostat with humidity sensing and ERV control capabilities ($200-$400) and potentially an ERV control module if your existing unit lacks smart thermostat compatibility ($150-$300). Total project cost including professional installation typically ranges $600-$1,200.

**Professional Installation Recommended**

While the low-voltage wiring is technically simple, proper ERV integration requires programming the thermostat's ventilation schedules, setting humidity thresholds appropriate for your home's construction and occupancy, and ensuring the ERV control doesn't conflict with your HVAC system's operation. Many ERVs also have multiple speed settings and boost modes that need to be properly configured with your smart thermostat's programming.

**When to Hire a Pro:** ERV control integration involves both electrical work (ESA permit required) and HVAC system programming. A qualified HVAC contractor can ensure proper wiring, programming, and system integration while maintaining your equipment warranties.

Need help finding an HVAC contractor experienced with ERV smart controls? Toronto Ductwork can match you with local professionals through the Toronto Construction Network.

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Q5

## How does my Toronto home ERV perform during the humid August months versus dry January?

**Your ERV (Energy Recovery Ventilator) performs very differently between humid August and dry January in Toronto, with August being when it provides the most value and January presenting the biggest operational challenges.**

During **humid August months** when Toronto's humidex regularly exceeds 40, your ERV is working at peak efficiency. As it brings in fresh outdoor air at 30°C and 80% humidity, the ERV's enthalpy wheel transfers both heat and moisture from the incoming air to the outgoing stale air. This pre-conditioning dramatically reduces the load on your air conditioning system — instead of your AC having to cool and dehumidify 30°C/80% outdoor air down to 22°C/50%, it only needs to handle air that's already been partially cooled and dried to perhaps 26°C/65%. This can reduce your cooling costs by 20-30% during peak summer months while maintaining excellent indoor air quality.

**January's dry conditions** create the opposite scenario and present Toronto's biggest ERV challenge. When outdoor air is -15°C at 60% relative humidity, that air contains almost no moisture — cold air simply cannot hold much water vapor. As your ERV brings in this dry air and exhausts warm, humid indoor air, it's actually removing moisture from your home. Many Toronto homeowners notice their indoor humidity dropping to 15-25% in January despite having an ERV, leading to dry skin, static electricity, and respiratory discomfort. The ERV's moisture transfer works both ways — in winter, it's transferring your indoor humidity to the outgoing air.

**Condensation and freezing** become critical concerns during Toronto's coldest months. When humid indoor air passes through the ERV's heat exchanger core while outdoor temperatures drop below -10°C, condensation can freeze within the unit. Quality ERVs have defrost cycles that temporarily stop the incoming air fan and redirect warm indoor air through the core to melt ice buildup, but this reduces efficiency and fresh air delivery during defrost periods.

**Practical winter management** for your Toronto ERV includes running a whole-home humidifier to maintain 30-40% indoor humidity (the ERV alone cannot do this in January), ensuring the condensate drain is clear and not frozen, and potentially reducing ERV runtime during extreme cold snaps below -20°C when defrost cycles become frequent. Some homeowners install a bypass damper to temporarily recirculate indoor air instead of bringing in extremely cold outdoor air during the coldest weeks.

**Summer optimization** involves ensuring your ERV's filters are clean (dirty filters reduce moisture transfer efficiency), confirming the unit is properly balanced for your home's air change requirements, and potentially increasing runtime during peak humidity periods when the energy savings are greatest.

Your ERV provides year-round benefits, but August is when you'll see the biggest impact on comfort and energy bills, while January requires the most attention to prevent operational issues and maintain adequate indoor humidity levels.

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Q6

## How do I size ERV ductwork separately from the furnace supply ducts in a GTA home?

**ERV ductwork must be sized separately from your furnace system because it operates at different airflow rates and serves a completely different function — continuous fresh air exchange rather than heating and cooling distribution.**

ERVs (Energy Recovery Ventilators) require dedicated supply and exhaust ductwork sized for continuous operation at 50-150 CFM, which is much lower than your furnace system that moves 1,200-2,000 CFM during heating and cooling cycles. The ERV brings in fresh outdoor air while exhausting stale indoor air, transferring heat and moisture between the two airstreams to minimize energy loss.

**ERV Duct Sizing Fundamentals**

ERV ductwork is typically sized for 4-6 inch round ducts for the main trunk lines, with 3-4 inch branches to individual rooms. This is much smaller than furnace ductwork because ERVs move significantly less air. A typical residential ERV operates at 75-100 CFM total airflow (split between supply and exhaust), compared to a furnace that might move 1,500 CFM when heating or cooling.

The fresh air supply from the ERV should terminate in living areas (living room, bedrooms) while the exhaust pickup points go in moisture-generating areas (bathrooms, kitchen, laundry room). This creates a balanced ventilation strategy that brings fresh air where you spend time and removes stale, humid air from problem areas. Each supply and exhaust point typically requires 20-40 CFM, so a 6-inch main trunk can branch down to 4-inch or even 3-inch ducts for individual room connections.

**GTA Climate Considerations for ERV Ductwork**

In Toronto's extreme climate, ERV ductwork running through unconditioned spaces must be insulated to prevent condensation and freezing. The incoming fresh air duct carries outdoor air at -20°C in winter, while the outgoing exhaust duct carries warm, humid indoor air. Both ducts need R-8 insulation minimum when running through attics, crawlspaces, or unheated garages.

ERV ductwork should never share pathways with furnace ductwork in the same chase or plenum. The different operating pressures and airflow patterns can cause cross-contamination between the systems. The ERV operates continuously at low pressure, while the furnace operates intermittently at much higher pressure and airflow rates.

**Installation and Integration Requirements**

ERV units are typically installed in basements, utility rooms, or conditioned attics with dedicated electrical supply (ESA-licensed electrician required) and condensate drainage. The unit itself needs clearance for filter access and maintenance. Unlike furnace ductwork that connects to a central plenum, ERV ductwork runs directly from the unit to individual termination points throughout the home.

The fresh air intake and stale air exhaust must terminate on exterior walls or the roof, positioned to prevent short-circuiting (exhaust air being immediately drawn back into the fresh air intake). These exterior terminations need proper weatherproofing and pest screens, and should be located away from dryer vents, gas appliance vents, and high-traffic outdoor areas.

### Professional Installation Recommended

ERV ductwork design requires balancing calculations to ensure proper airflow distribution and may require building permits for new installations. The system must integrate with your home's overall ventilation strategy without interfering with furnace operation or creating pressure imbalances. Professional installation ensures proper duct sizing, insulation, sealing, and commissioning of the complete system.

ERV installation typically costs $3,000-$6,000 in the GTA including the unit, dedicated ductwork, electrical connections, and commissioning. This investment pays back through reduced heating and cooling costs while maintaining excellent indoor air quality year-round.

Find HVAC and ventilation contractors experienced with ERV systems through the Toronto Construction Network directory at torontoconstructionnetwork.com/directory?trade=hvac for proper sizing and installation of your dedicated ERV ductwork system.

Q7

# Can I add a HEPA filter to my Toronto home HRV intake duct for wildfire smoke season?

**Yes, you can add a HEPA filter to your HRV intake duct, but it requires careful planning to avoid damaging the unit and may significantly reduce fresh air ventilation during wildfire events.** Most residential HRVs are not designed for the high static pressure that HEPA filters create, so you'll need a bypass system or upgraded fan motor.

### Understanding HRV Airflow and Filter Resistance

HRVs are designed to operate with minimal filter resistance — typically just a basic pleated filter (MERV 8-11) at the intake. HEPA filters create 3-5 times more static pressure resistance than standard filters. If you simply swap in a HEPA filter, your HRV's fan motor will struggle to pull adequate airflow, potentially overheating the motor and dramatically reducing fresh air exchange when you need it most during wildfire smoke events.

The most effective approach is installing a **bypass damper system** that allows you to temporarily shut off the HRV intake during heavy smoke periods and recirculate indoor air through a portable HEPA air purifier instead. This prevents smoky outdoor air from entering while maintaining some air circulation. When smoke clears, you reopen the dampers to resume normal fresh air ventilation.

### Professional Installation Options

A qualified HVAC contractor can install a **motorized damper** in your HRV intake duct with a HEPA filter housing upstream. The system would include a switch that closes the intake damper and activates a higher-powered inline fan to pull air through the HEPA filter when needed. This setup costs $1,500-$3,500 installed but provides automatic smoke protection without manual intervention.

Alternatively, some contractors install a **parallel filtration system** — a separate duct branch with HEPA filtration that can be activated during smoke events while the main HRV intake is temporarily closed. This preserves your HRV's normal operation while adding smoke protection capability.

### Practical Considerations for GTA Wildfire Seasons

Toronto's wildfire smoke typically arrives from northwestern Ontario or western Canada during late spring through early fall. These events are usually short-term (2-7 days) but can create hazardous air quality conditions. During these periods, **temporarily shutting off your HRV intake and relying on indoor air recirculation is often the most practical approach** for most homeowners.

Consider installing **high-MERV filters (MERV 13-16) in your main furnace return** as your first line of defense. These capture smoke particles from air that's already in your home without the extreme static pressure of HEPA filters. Combine this with portable HEPA air purifiers in bedrooms and main living areas during smoke events.

**When to Hire a Professional**

Any modifications to your HRV system should be done by an HVAC contractor familiar with ventilation equipment. Improper installation can damage the HRV motor, create air leakage, or compromise the heat recovery efficiency. The contractor will need to calculate static pressure requirements and may need to upgrade the fan motor or install additional inline fans to handle HEPA filtration.

For most GTA homeowners, a combination of upgraded furnace filters, portable HEPA units, and temporary HRV shutdown during smoke events provides effective protection without expensive system modifications.

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**Q8**

## Can I duct my Toronto home HRV fresh air supply to the bedrooms only and exhaust from the bathrooms?

**Yes, you can design an HRV system to supply fresh air directly to bedrooms and exhaust from bathrooms, and this is actually an excellent approach for Toronto homes.** This configuration provides fresh air where people sleep (where CO2 buildup is highest) and removes moisture and odors at the source.

This **dedicated HRV ductwork** approach is often superior to connecting the HRV to your main HVAC system because it operates independently of your furnace or air conditioning. When your HVAC system isn't running (common during Toronto's mild spring and fall weather), you still get continuous fresh air exchange and moisture

removal.

**For bedroom supply**, you'll want to install small supply grilles (typically 4" or 6" round) in each bedroom, positioned away from the bed to avoid drafts. The HRV should deliver approximately 15-20 CFM per bedroom for adequate fresh air. In Toronto's climate, this fresh air helps dilute CO2 buildup overnight and reduces stuffiness that's common in tightly sealed modern homes or older homes with new windows.

**For bathroom exhaust**, connect the HRV to existing bathroom exhaust points or install new grilles. Each bathroom should exhaust 20-30 CFM continuously, with boost switches available for higher extraction during showers. This constant low-level exhaust prevents moisture buildup that leads to mold growth - a significant concern in Toronto's humid summers and during winter when bathroom moisture has nowhere to go in sealed homes.

**The key advantage in Toronto's extreme climate** is that the HRV's heat recovery core captures 70-85% of the heat from outgoing stale air and transfers it to incoming fresh air. During a -20°C Toronto winter, incoming outdoor air is preheated to approximately 15-18°C before entering your bedrooms, dramatically reducing the energy penalty of ventilation. In summer, the process reverses - hot humid outdoor air is pre-cooled and dehumidified by the outgoing air-conditioned exhaust air.

**Installation considerations for GTA homes**: The HRV unit itself (typically mounted in the basement or utility room) needs two connections to the exterior - one for fresh air intake and one for stale air exhaust. These should be positioned at least 6 feet apart and away from dryer vents, gas appliance vents, and high-traffic areas. The dedicated ductwork runs are usually smaller diameter (4-6 inch) than your main HVAC ducts, making them easier to route through finished spaces.

**Ontario Building Code compliance**: This configuration meets OBC ventilation requirements and may actually exceed minimum standards by providing continuous fresh air to sleeping areas. The system should be balanced so supply and exhaust CFM are equal, preventing pressure imbalances that could affect combustion appliances.

**Professional installation is essential** for proper sizing, balancing, and commissioning. The HRV must be sized based on your home's square footage and occupancy, ductwork must be designed for proper airflow distribution, and the system requires electrical connections and controls integration. Expect to invest $3,000-$5,000 for a quality HRV system with dedicated ductwork in a typical GTA home.

Find local HVAC and ductwork contractors experienced with HRV installations through the Toronto Construction Network directory at torontoconstructionnetwork.com/directory?trade=hvac.

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**Q9**

# Should I install an ERV or HRV in my Toronto home for fresh air ventilation?

**For most Toronto homes with central air conditioning, an ERV (Energy Recovery Ventilator) is the better choice because it manages both heat and moisture transfer — a significant advantage during the GTA's humid summers.** If your home does not have air conditioning and you primarily need ventilation for winter moisture control, an HRV (Heat Recovery Ventilator) is the more appropriate and less expensive option.

Both ERVs and HRVs bring fresh outdoor air into your home while exhausting stale indoor air, passing the two airstreams through a heat exchanger core that recovers 70 to 85 percent of the energy from the outgoing air. The critical difference is that an ERV's core transfers both heat and moisture, while an HRV's core transfers only heat. In practical terms for a GTA homeowner, this means an ERV prevents hot, humid outdoor air from dumping its moisture load into your air-conditioned home during July and August — the ERV's core strips some of that humidity out before the air enters the house. An HRV would bring in outdoor air at full outdoor humidity, adding to your air conditioning and dehumidification load.

Conversely, during Toronto's dry winter months when indoor humidity drops to uncomfortable levels, an ERV retains some of the moisture from the outgoing air and returns it to the incoming air, helping maintain indoor humidity in the healthy 30 to 40 percent range. An HRV exhausts all that moisture, potentially making already-dry winter air even drier and forcing homeowners to run a humidifier harder.

**The Ontario Building Code requires mechanical ventilation in new homes** and any home that has been significantly air-sealed through energy retrofits. The minimum ventilation rate for a typical three-bedroom GTA home is approximately 50 to 70 CFM of continuous ventilation. Both ERVs and HRVs meet this requirement when properly sized and installed. The choice between them comes down to your home's cooling and humidity profile.

## Cost and Installation

An **HRV installed with dedicated ductwork** costs **$2,500 to $5,000** in the GTA market. An **ERV installed with dedicated ductwork** costs **$3,000 to $6,000**. The $500 to $1,000 premium for an ERV is easily justified in an air-conditioned home by reduced humidity load on the cooling system and improved comfort. If you already have an HRV or ERV and the existing ductwork is in good condition, a replacement unit costs **$1,500 to $3,500** installed.

The unit should have its own dedicated ductwork — supply air to bedrooms and living areas, exhaust air from bathrooms, kitchen, and laundry. Do not simply connect an ERV or HRV to your existing furnace duct system without proper design, as this creates balancing issues and may not provide adequate ventilation to all rooms. The system should be balanced so that supply and exhaust airflows are within 10 percent of each other, and the controls should allow for boost mode during cooking or showering.

**For the vast majority of GTA homeowners with central air conditioning — which is nearly everyone in the current market — an ERV is the recommended choice.** The humidity management alone pays for the modest price premium within a few summers. If you need help finding a ventilation specialist, Toronto Ductwork can match you with experienced installers through the Toronto Construction Network.

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Q10

## What is the difference between an ERV and an HRV for a Toronto home?

**The core difference is simple: an HRV (Heat Recovery Ventilator) transfers only heat between incoming and outgoing airstreams, while an ERV (Energy Recovery Ventilator) transfers both heat and moisture.** This single distinction has significant practical implications for comfort, energy costs, and indoor air quality in a GTA home across all four seasons.

Both units perform the same basic function — they bring fresh outdoor air into the home and exhaust stale indoor air, using a heat exchanger core to recover energy from the outgoing air before it leaves. A modern unit recovers 70 to 85 percent of the thermal energy, meaning that in January when it is minus 15 degrees Celsius outside and 21 degrees inside, the incoming fresh air arrives pre-warmed to roughly 10 to 15 degrees rather than hitting your furnace at minus 15. This saves substantial energy compared to simply opening a window.

**Where they differ is moisture handling.** An HRV's core (typically aluminum or plastic plates) transfers heat but allows moisture to pass through unchanged. In winter, dry outdoor air enters the home at its original low humidity, and the moist indoor air is exhausted, taking its moisture with it. This means an HRV tends to dry out the home in winter — helpful if you have condensation problems on windows, but potentially uncomfortable if your indoor air is already too dry. In summer, an HRV brings in outdoor air at Toronto's full outdoor humidity — often humidex values above 40 — dumping that moisture load onto your air conditioning system.

An ERV's core (typically a polymer membrane or treated paper) transfers both heat and moisture. In winter, the core retains a portion of the moisture from the outgoing air and transfers it to the dry incoming air, helping maintain indoor humidity in the comfortable 30 to 40 percent range without over-relying on a humidifier. In summer, the core strips moisture from the incoming humid outdoor air before it enters the home, reducing the dehumidification load on the air conditioning system. For an air-conditioned Toronto home, this moisture transfer can reduce cooling energy consumption by 5 to 15 percent during the humid months of June through September.

### Which Is Right for Your GTA Home?

**Choose an ERV if** your home has central air conditioning (the vast majority of GTA homes), you want to maintain comfortable humidity levels year-round without excessive humidifier or dehumidifier use, or you are building new and want the most versatile system. An ERV costs **$3,000 to $6,000 installed** with dedicated ductwork.

**Choose an HRV if** your home does not have air conditioning and you primarily need winter ventilation, you have persistent condensation problems on windows that indicate excess indoor humidity, or your budget is tighter. An HRV costs **$2,500 to $5,000 installed** with dedicated ductwork.

Both systems require dedicated ductwork with supply points in bedrooms and living areas and exhaust points in bathrooms, kitchens, and laundry rooms. Both need annual filter cleaning and core washing, and both require professional balancing at installation to ensure equal supply and exhaust airflows. The Ontario Building Code requires mechanical ventilation in new homes and significantly air-sealed existing homes, and either an ERV or HRV meets this requirement.

If you are unsure which system suits your home, a ventilation assessment by a qualified HVAC contractor will determine the right choice based on your home's air-sealing level, cooling system, and humidity patterns. Toronto Ductwork can connect you with ventilation specialists across the GTA through the Toronto Construction Network.

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Q11

## Does my Toronto home need an HRV if it was built after 2012?

**If your Toronto home was built after 2012, it almost certainly already has an HRV installed — and yes, it absolutely needs one.** The Ontario Building Code (OBC) has required mechanical ventilation in new residential construction since the mid-2000s, and by 2012 virtually all new homes built in the GTA came equipped with an HRV or ERV as standard. Homes built to current energy efficiency standards are significantly more airtight than older Toronto housing stock, which means natural air infiltration through cracks, gaps, and leaky windows is no longer adequate to maintain healthy indoor air quality.

The reason this matters so much in the GTA is our extreme climate. During Toronto winters, when temperatures drop to -15 or -20 degrees Celsius, homeowners seal up their homes tightly to conserve heat. Without an HRV cycling fresh outdoor air through the home while recovering heat from the outgoing stale air, moisture from cooking, showering, and breathing builds up rapidly. This excess humidity condenses on cold window surfaces, leading to

the window condensation problems that plague so many newer Toronto homes. Beyond condensation, a sealed-up home without mechanical ventilation accumulates carbon dioxide, volatile organic compounds from flooring and furniture, cooking odours, and other pollutants that degrade indoor air quality.

Your HRV works by drawing stale, humid air from bathrooms and the kitchen through one set of ducts and simultaneously pulling fresh outdoor air in through a separate set. Inside the HRV unit, the two air streams pass through a heat exchanger core where the outgoing warm air transfers roughly 70-85% of its heat to the incoming cold air — so you get fresh air without losing most of your heating energy. In a well-built post-2012 GTA home, this is not optional equipment — it is essential infrastructure.

**If your post-2012 home does not have a functioning HRV**, that is a significant issue worth investigating. Check your mechanical room — the HRV is typically a box-shaped unit mounted on the wall near the furnace, with four duct connections (two to the interior, two to the exterior). Some homeowners unknowingly disconnect or turn off their HRV because they hear it running or feel a slight draft from the fresh air supply, not realizing they are compromising their home's ventilation system. The unit should run continuously at low speed at minimum, with boost capability for high-moisture events like showers.

Maintaining your HRV is straightforward but essential. Clean or replace the filters every 3 months, wash the heat exchanger core once or twice per year with warm water, and check the exterior intake and exhaust hoods for blockage from leaves, snow, or ice — Toronto ice storms can completely block these openings. A neglected HRV runs inefficiently and fails to deliver the fresh air your home needs. If your HRV is original to a 2012 home, it is now 14 years old and approaching end-of-life — most units last 15-20 years with proper maintenance. Budget $2,500-$5,000 for HRV replacement installed if yours is showing signs of failure.

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Q12

## How does an HRV connect to existing ductwork in a Toronto home?

**An HRV connects to your Toronto home's existing ductwork through one of two main configurations: integrated with your furnace duct system, or through a fully dedicated independent duct network.** The approach that works best depends on your home's age, duct layout, and whether you want the HRV to operate independently of your heating and cooling system.

The most common installation method in GTA homes is the **simplified integrated approach**, where the HRV ties into your existing furnace ductwork. In this setup, the HRV's fresh air supply duct connects to your furnace's return air plenum, and the HRV's stale air exhaust picks up air from dedicated exhaust grilles in bathrooms and the kitchen. When fresh air enters the return plenum, it mixes with recirculated house air and gets distributed through your existing supply ducts to every room. This approach is cost-effective because it uses your furnace blower to distribute the fresh air, avoiding the need to run new supply ducts throughout the house. GTA installation cost for an integrated HRV setup typically runs $2,500-$4,500 including the unit, ductwork connections, and exterior wall or roof penetrations.

The key requirement for an integrated installation is that your furnace blower must run whenever the HRV is operating, even when neither heating nor cooling is called for. Most modern furnaces have a "fan on" or "continuous circulation" setting that runs the blower at low speed for this purpose. Without the furnace blower running, fresh air from the HRV simply sits in the return plenum and never reaches your living spaces. This does add a small amount to your electricity bill — roughly $10-$20 per month for continuous low-speed fan operation — but it is necessary for proper ventilation.

The **fully dedicated duct system** is the premium approach. The HRV gets its own supply and exhaust ducts completely independent of the furnace system. Fresh air supply ducts run to bedrooms and living areas, while stale air pickup ducts run to bathrooms, the kitchen, and the laundry room. This configuration delivers superior ventilation because it operates regardless of your furnace status and provides precise control over where fresh air enters and where stale air exits. However, running dedicated ducts through a finished Toronto home is significantly more expensive — typically $4,000-$6,000 installed — and involves opening walls and ceilings, which is why this approach is most practical during renovations or in new construction.

For older GTA homes — particularly pre-1975 homes in Scarborough, Etobicoke, or North York with undersized ductwork — an integrated installation requires careful assessment. If your existing return ductwork is already undersized (which is extremely common in post-war Toronto homes with single central returns), adding HRV airflow to the return plenum can worsen airflow problems. A qualified HVAC contractor should measure static pressure in your duct system before connecting an HRV to confirm the existing ductwork can handle the additional airflow.

**Exterior penetrations are critical in a GTA installation.** The HRV needs two openings through your exterior wall — one for fresh air intake and one for stale air exhaust. These must be at least six feet apart to prevent exhausted air from being pulled back into the intake. In Toronto's freeze-thaw climate, these penetrations must be properly flashed and sealed to prevent water infiltration, and the intake hood should be positioned away from driveways, garbage areas, and gas meter vents.

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Q13

## Can I install an ERV without existing ductwork in my older Toronto home?

**Yes, you can install an ERV in an older Toronto home without existing ductwork, but the approach is different from a standard ducted installation — and the options range from simple single-point units to fully dedicated duct systems.** Many pre-war and post-war Toronto homes in neighbourhoods like the Annex, Riverdale, Leslieville, and Cabbagetown were built with hot water radiator heating or gravity furnace systems that have no ductwork at all, so this is a very common scenario in the GTA.

The most practical option for a ductless older home is a **wall-mounted or ceiling-mounted single-room ERV unit** . These self-contained units mount on an exterior wall, require only a single penetration through the wall, and provide balanced ventilation for the room they serve. They contain their own heat and moisture recovery core, fans, and filters — no ductwork required. Several manufacturers make units designed specifically for retrofit applications. You would typically install one in the main living area and one in the primary bedroom to cover the spaces where you spend the most time. GTA pricing for a single-room ERV unit runs $800-$2,000 per unit installed, depending on the brand and capacity.

The limitation of single-room units is obvious — they only ventilate the room they are in. Bathrooms, the kitchen, and other bedrooms still lack mechanical ventilation. For whole-house ventilation, you will need to run dedicated ERV ductwork through the home. In older Toronto homes, this is a more involved project but absolutely doable during a renovation.

**Running dedicated ERV ducts through an older GTA home** typically involves routing small-diameter ducts (3-4 inch round) through closets, soffits built along ceiling edges, or through the basement ceiling and up interior wall cavities. Some installers use semi-rigid small-diameter duct systems designed specifically for ERV retrofit installations — these flexible tubes are easier to snake through existing walls than traditional rigid ductwork. Fresh air supply ducts run to bedrooms and the living room, while stale air exhaust ducts run to bathrooms and the kitchen. The ERV unit itself is usually mounted in the basement or a utility closet. Budget $3,500-$6,500 for a fully ducted ERV installation in an older Toronto home, depending on the number of rooms served and the difficulty of routing ducts through finished spaces.

**Why an ERV rather than an HRV for a ductless older home?** Toronto summers are humid, with humidex values regularly exceeding 40 degrees. An ERV transfers moisture as well as heat between the air streams. In summer, this means the ERV removes some humidity from the incoming outdoor air before it enters your home, reducing your cooling load. In winter, it retains some indoor humidity in the outgoing air stream, preventing the bone-dry conditions that plague tightly renovated older Toronto homes. If your older home has been updated with new windows, insulation, and air sealing, an ERV is especially important because you have eliminated the natural air

leakage that previously provided ventilation.

One important consideration for pre-1945 Toronto homes: if the home has any asbestos-wrapped ductwork, pipe insulation, or vermiculite insulation in the walls, have these materials tested before any ERV installation that involves cutting into walls or ceilings. Professional asbestos abatement adds $2,000-$5,000 to the project but is required by Ontario regulation and essential for your family's safety.

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Q14

## What size ERV or HRV do I need for a Toronto home based on square footage?

**Sizing an ERV or HRV for your Toronto home is based primarily on the number of bedrooms and bathrooms — not square footage alone — because the Ontario Building Code ties ventilation rates to occupancy capacity.** That said, square footage is still a useful starting point for ballpark sizing, and most GTA homeowners want a quick answer before diving into the technical details.

As a practical guideline for GTA homes, here are typical sizing ranges. A home under 1,500 square feet with 2-3 bedrooms generally needs an HRV or ERV rated at 100-150 CFM. A mid-size home of 1,500-2,500 square feet with 3-4 bedrooms typically requires 150-200 CFM. Larger homes of 2,500-3,500 square feet with 4-5 bedrooms usually need 200-300 CFM. Homes above 3,500 square feet or with more than 5 bedrooms may need 300+ CFM or multiple units.

**The proper way to size an HRV or ERV** follows CSA F326, which is the Canadian standard for residential mechanical ventilation. This calculation considers the total number of rooms, the number of bedrooms (which determines assumed occupancy), and the required exhaust rates for bathrooms, kitchens, and laundry rooms. The

total continuous ventilation rate equals the sum of the supply requirements for all habitable rooms plus the exhaust requirements for all service rooms. Your HVAC contractor should perform this calculation — it takes about 15 minutes and ensures the unit is neither undersized (inadequate ventilation) nor oversized (excessive energy consumption and potential indoor humidity problems in winter).

Oversizing is a real concern in Toronto's cold winters. An HRV that is too large for the home will exchange more air than necessary, pulling in excessive cold outdoor air that the heat exchanger core cannot fully temper. This leads to cold drafts at supply grilles, increased heating costs, and — counterintuitively — excessively dry indoor air in winter. Dry air below 30% relative humidity causes respiratory discomfort, static electricity, cracking hardwood floors, and damage to wood furniture and musical instruments. Properly sized, your HRV should maintain indoor humidity between 30-40% in winter while providing adequate fresh air.

**The heat recovery efficiency rating matters as much as the CFM rating** in a cold-climate city like Toronto. Look for units with a Sensible Recovery Efficiency (SRE) of 75% or higher at -25 degrees Celsius. High-end units achieve 80-85% heat recovery, meaning they capture most of the heat from the outgoing stale air and transfer it to the incoming fresh air. At Toronto winter temperatures of -15 to -20 degrees, a unit rated at 80% SRE will deliver incoming fresh air at roughly 15-18 degrees Celsius — cool but not cold. A unit rated at only 60% SRE will deliver air closer to 5-8 degrees, causing noticeable drafts and higher heating costs.

Budget $2,500-$5,000 for a properly sized HRV installation in a typical GTA home, or $3,000-$6,000 for an ERV. The unit itself accounts for roughly half the cost, with the remainder going to ductwork, electrical connections, controls, and exterior penetrations. Always get three quotes from qualified HVAC contractors, and confirm they will perform the CSA F326 sizing calculation before specifying equipment. Browse HVAC and ductwork contractors in your area through the Toronto Construction Network directory at torontoconstructionnetwork.com/directory?trade=hvac.

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Q15

## How do I maintain my HRV unit and filters in a Toronto home?

**Maintaining your HRV is one of the most important and most neglected tasks in a GTA home — a clean, well-maintained unit runs efficiently and delivers fresh air, while a neglected one wastes energy, circulates poor-quality air, and fails years before its time.** The good news is that HRV maintenance is straightforward, takes about 30 minutes per session, and is entirely within a homeowner's ability.

**Filters should be cleaned or replaced every 3 months** — more frequently if you have pets, live near a busy road, or notice reduced airflow. Most HRV units have two filters: one on the incoming fresh air side and one on the

outgoing stale air side. Many units use washable foam or synthetic mesh filters that can be vacuumed and rinsed with warm water, then allowed to dry completely before reinstalling. Some higher-end units use disposable pleated filters that need replacement. Check your owner's manual to confirm which type your unit uses. Replacement filters typically cost $15-$40 per set. Running your HRV with dirty, clogged filters is one of the most common maintenance failures in Toronto homes — airflow drops dramatically, the unit works harder, the motors run hotter, and your home's ventilation suffers.

**The heat exchanger core needs cleaning once or twice per year** — ideally in the fall before the heating season begins and again in the spring. Remove the core from the unit (it slides out on rails in most models), then soak it in warm water with a mild dish soap for 15-20 minutes. Gently rinse it under running water, shake off excess water, and allow it to dry completely before reinstalling. The core is where heat transfer happens between the outgoing and incoming air streams, and dust buildup on the core surfaces reduces heat recovery efficiency. A dirty core means colder incoming air in winter and higher heating bills.

**Drain pans and condensate drains require attention every 3-6 months.** During Toronto's heating season, moisture condenses inside the HRV as warm, humid indoor air passes over the cold core surfaces. This condensation collects in a drain pan and exits through a small drain tube. If this drain becomes clogged with dust, mould, or mineral deposits, water backs up inside the unit and can overflow, causing water damage and creating a mould-friendly environment. Flush the drain line with warm water and check that water flows freely to the floor drain or condensate pump.

**Exterior intake and exhaust hoods need seasonal inspection.** This is especially critical in Toronto's climate. In winter, check for ice buildup or snow blockage after every major storm — a blocked intake starves your home of fresh air, while a blocked exhaust can cause the unit to shut down on high pressure. After fall leaf drop, check for leaves and debris covering the hoods. In summer, check for bird nests or wasp nests in the hoods — both are common in the GTA. The intake and exhaust hoods should have screens to prevent insects and animals from entering, but verify these screens are intact.

**Interior supply and exhaust grilles should be vacuumed every 3 months.** Bathroom and kitchen exhaust grilles accumulate dust, lint, and grease that restrict airflow. Fresh air supply grilles in bedrooms and living areas also collect dust. A quick vacuum with a brush attachment keeps air flowing freely.

Most HRV units last 15-20 years with proper maintenance. If your unit is approaching that age and you notice reduced airflow despite clean filters, unusual noise from the motors, or frost forming on the core during moderate winter temperatures (above -10 degrees), it may be time for replacement. Budget $2,500-$5,000 for a new HRV unit installed in a typical Toronto home.

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Q16

## Does an HRV help with condensation on windows in a Toronto home during winter?

**Yes, a properly operating HRV is one of the most effective solutions for winter window condensation n Toronto homes — and in many cases, it is the only real fix.** Window condensation happens when warm, humid indoor air contacts cold glass surfaces, and the moisture in the air condenses into water droplets. During Toronto winters, with outdoor temperatures regularly dropping below -10 degrees Celsius, even double-pane windows can become cold enough to trigger condensation when indoor humidity is too high.

The root cause of winter window condensation is excess indoor humidity trapped inside a well-sealed home. Every Toronto home generates significant moisture from daily activities — cooking produces 2-3 litres of moisture per day, a 10-minute shower produces about half a litre, each person exhales about 1 litre per day, and houseplants, laundry, and even gas fireplaces add more. In an older, leaky home, much of this moisture escapes through air leaks around windows, doors, and the building envelope. But in newer GTA homes built after 2000 — or older homes that have been renovated with new windows, insulation, and air sealing — that moisture has nowhere to go. It builds up inside the home until it finds the coldest surface available, which is always the windows.

**An HRV solves this by exhausting the humid indoor air and replacing it with dry outdoor air.** Toronto winter air is extremely dry — at -15 degrees Celsius, outdoor air at 70% relative humidity contains very little actual moisture. When this cold, dry air enters your home through the HRV and warms up to 20-21 degrees, its relative humidity drops to roughly 15-20%. This dry incoming air mixes with your humid indoor air, lowering the overall indoor humidity to the 30-40% range where condensation stops forming on most window types.

The target indoor humidity level depends on your window quality and outdoor temperature. With standard double-pane windows common in GTA homes, you want indoor humidity around 30-35% when outdoor temperatures drop below -10 degrees. With triple-pane windows, you can maintain 35-40% humidity without condensation. If you see condensation between the panes of a sealed window unit, that indicates a failed seal in the insulated glass — the HRV will not fix that, and the glass unit needs replacement.

**If you already have an HRV and still see condensation**, several issues could be at play. The most common is that the HRV is not running or is running on too low a speed. Check that the unit is powered on and set to at least low continuous operation. Second, check the filters — clogged filters reduce airflow dramatically, and a filter that has not been cleaned in six months is barely moving air. Third, check the exterior intake and exhaust hoods for ice blockage, which is common after Toronto ice storms and freezing rain events. A blocked hood shuts down effective ventilation entirely. Finally, if your home has been recently air-sealed or renovated (new windows, added insulation, spray foam), your existing HRV may now be undersized for the tighter building envelope. A home that used to leak

air freely now retains much more moisture, and the HRV may need to run at higher speed or be upgraded to a larger unit.

**For homes without an HRV**, installing one is the best long-term solution for chronic winter condensation. Budget $2,500-$5,000 for installation in a typical Toronto home. In the meantime, running bathroom exhaust fans for 20-30 minutes after showers and using a kitchen range hood while cooking helps reduce moisture levels.

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Q17

## Can I run my ERV ductwork independently from my furnace ductwork in Toronto?

**Yes, you can absolutely run your ERV ductwork as a fully independent system from your furnace ductwork — and in many cases, a dedicated duct system delivers better ventilation performance than an integrated setup.** This is a premium installation approach, but it gives you the most control over fresh air distribution and eliminates the dependency on your furnace blower for ventilation.

With an independent ERV duct system, the ERV unit has its own dedicated supply ducts delivering fresh air to bedrooms and living areas, and its own dedicated exhaust ducts pulling stale air from bathrooms, the kitchen, and laundry. The ERV operates on its own schedule using its own internal fans, completely separate from your furnace. This means ventilation continues whether your furnace is running, off for the season, or even disconnected for replacement — your home always has fresh air flowing.

The primary advantage of an independent system in the GTA context is **consistent ventilation regardless of HVAC status.** With an integrated system — where the ERV ties into the furnace's return plenum — the furnace

blower must run continuously for the ERV to distribute fresh air. If the blower is off, fresh air just pools in the return plenum and never reaches your living spaces. Running the furnace blower continuously on low speed costs roughly $10-$20 per month in electricity, and the blower motor wears faster with constant operation. An independent ERV system avoids both of these issues because it uses its own small, efficient fans designed for continuous operation.

Another significant benefit for Toronto homes is **better moisture management.** An integrated ERV mixes fresh air with recirculated house air in the furnace plenum, diluting the ventilation effect. An independent system delivers fresh air directly to the rooms that need it — typically bedrooms where people sleep with doors closed — and exhausts stale, humid air directly from bathrooms and the kitchen where moisture is generated. This targeted approach is more effective at managing humidity, reducing winter window condensation, and maintaining good air quality throughout the home.

**The cost difference is meaningful.** An integrated ERV installation in a GTA home typically runs $3,000-$5,000, while a fully independent ducted system costs $4,500-$7,000 because of the additional ductwork required. The extra cost comes from running separate supply and exhaust ducts to each room, which means opening walls and ceilings in finished homes or running ducts through soffits, closets, and utility chases. In new construction or during a major renovation where walls are already open, the incremental cost of independent ducts is much lower — this is the ideal time to install a dedicated system.

For older Toronto homes — particularly post-war homes in Scarborough, North York, and Etobicoke — an independent ERV system avoids the common problem of overloading already-undersized furnace ductwork. Many of these homes have minimal return ductwork (often a single return grille on the main floor), and adding ERV airflow to an already strained return plenum makes existing comfort problems worse.

**Installation considerations for a Toronto independent ERV system** include duct sizing (typically 4-6 inch round for branch runs), insulating any ducts that pass through unconditioned spaces with R-8 minimum, and ensuring the exterior intake and exhaust penetrations are properly spaced at least six feet apart and sealed against Toronto's freeze-thaw weather. The ERV unit requires an electrical connection and a condensate drain — have an ESA-Licensed Electrical Contractor handle the wiring.

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Q18

## What are the Ontario Building Code requirements for HRV installation in new Toronto homes?

**The Ontario Building Code (OBC) requires mechanical ventilation in all new residential construction, and an HRV or ERV is the standard method of meeting this requirement in new Toronto homes.** The relevant provisions fall primarily under OBC Part 6 (Heating, Ventilating and Air Conditioning) and reference the CSA F326 standard for residential mechanical ventilation, which sets the detailed requirements for ventilation rates, duct sizing, and system design.

**The core ventilation requirement** is that new homes must have a mechanical ventilation system capable of providing continuous whole-house ventilation at a rate based on the home's number of rooms and occupancy capacity. Under CSA F326, the total ventilation capacity must equal the sum of supply air requirements for all habitable rooms (bedrooms, living rooms, dining rooms, dens) plus the exhaust air requirements for all service rooms (bathrooms, kitchens, laundry rooms). For a typical 3-bedroom, 2-bathroom Toronto home, this works out to roughly 100-150 CFM of continuous ventilation capacity.

**Specific exhaust requirements** dictate minimum airflow rates: bathrooms require a minimum of 50 CFM exhaust capacity, kitchens require a minimum of 100 CFM, and all exhaust must terminate to the exterior of the building — never into the attic, soffit, or garage. The HRV system must be designed to provide these exhaust rates from each service room through dedicated exhaust duct connections.

**Fresh air distribution is equally regulated.** Supply air from the HRV must be delivered to habitable rooms — bedrooms, living rooms, and family rooms. This can be accomplished through dedicated supply ducts from the HRV to each room, or through integration with the furnace duct system where the HRV's fresh air supply connects to the furnace return plenum. When using the integrated approach, the OBC and CSA F326 require that the furnace blower be interlocked to operate whenever the HRV is running to ensure proper air distribution.

**Heat recovery efficiency requirements** ensure the HRV actually recovers energy rather than just creating an expensive hole in the building envelope. For Ontario's cold climate zone, the OBC effectively requires HRV units to meet minimum sensible heat recovery efficiency ratings as defined by CSA C439. In practice, most units sold for new construction in the GTA achieve 70-85% sensible recovery efficiency. Higher-efficiency units cost more upfront but save significantly on heating costs over their 15-20 year lifespan.

**Ductwork requirements for HRV installations** include proper sizing per Manual D or CSA F326 airflow calculations, sealing all joints with UL 181-rated foil tape or mastic, insulating ducts in unconditioned spaces to R-8 minimum, and supporting duct runs at maximum 4-foot intervals. Flex duct is permitted for branch runs but must be pulled taut with no kinks or excessive bends. All ductwork materials must meet fire safety ratings specified in the OBC.

**Additional code considerations** include the make-up air requirement when kitchen exhaust exceeds 75 litres per second (approximately 159 CFM), condensate drainage from the HRV unit to an approved drain, and electrical connections performed by an ESA-Licensed Electrical Contractor. If the HRV installation involves any gas appliance connections or combustion venting modifications, a TSSA-registered contractor must perform that work.

Building permits are required for HRV installation in new Toronto construction as part of the overall mechanical permit. The City of Toronto Building Division inspects the HRV installation as part of the rough-in and final mechanical inspections. Permit fees for the mechanical portion typically run $200-$600 depending on project scope. Ensure your HVAC contractor pulls proper permits and schedules inspections — unpermitted mechanical work creates problems at resale and may void your home warranty.

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Q19

## How do I know if my Toronto home HRV core needs to be replaced?

**The heat exchanger core is the heart of your HRV — it is where heat transfers from the outgoing warm air to the incoming cold air — and when it fails, your HRV becomes little more than an expensive pair of fans blowing cold air into your Toronto home.** Most HRV cores last 10-20 years depending on the unit quality and how well it has been maintained, but several clear signs indicate when replacement is necessary.

**Frost forming on the core during moderate winter temperatures** is one of the earliest warning signs. All HRV cores frost up during extreme cold — most units have a defrost cycle that periodically shuts off the incoming air fan to let warm exhaust air melt frost off the core. But if you notice frost or ice buildup on the core when outdoor temperatures are only -5 to -10 degrees Celsius, the core's efficiency has degraded significantly. A healthy core in good condition should handle these moderate Toronto winter temperatures without frosting. Frequent defrost cycling — where you hear the unit repeatedly switching modes every few minutes — also indicates a core that is losing efficiency and working harder than it should.

**Noticeably cold air coming from your HRV supply grilles during winter** is another strong indicator. A properly functioning HRV core recovering 75-80% of heat should deliver incoming air at roughly 14-18 degrees Celsius when outdoor temperatures are around -10 degrees. If the air coming from your HRV supply registers feels cold — closer to 5-8 degrees — the core is no longer transferring heat effectively. You can verify this by holding a thermometer at the supply grille while the HRV is running on a cold day. Compare the incoming air temperature to the expected output based on your unit's rated efficiency and the outdoor temperature.

**Visible damage to the core** is an obvious reason for replacement. Remove the core from your unit and inspect it carefully. Look for cracked or warped plates, separated layers, mineral deposits that will not wash off, mould growth that persists after cleaning, or physical damage from improper handling. The core plates must maintain their precise spacing to transfer heat effectively — if plates are bent, collapsed, or stuck together, heat recovery drops dramatically. Also check for condensation leaking through the core from the exhaust side to the supply side, which indicates cracked plates.

**Rising energy bills during Toronto heating season** without other explanation can indicate a failing HRV core. When the core loses efficiency, more heat escapes with the exhaust air and colder air enters the home, forcing your furnace to work harder. A core operating at 50% efficiency instead of its rated 80% can add $200-$400 to your annual heating costs in a typical GTA home — enough to justify core replacement within a couple of heating seasons.

**Persistent odour transfer between air streams** suggests the core has developed internal leaks. If you smell cooking odours or bathroom smells in the fresh air supply, the core's separation between exhaust and supply air

streams has been compromised. This cross-contamination defeats the purpose of the HRV and typically means the core needs replacement.

Replacement HRV cores cost $200-$800 depending on the unit brand and model. Some manufacturers sell replacement cores directly, while others require ordering through an HVAC distributor. If your HRV unit is more than 15 years old and needs a core replacement, it is worth considering whether replacing the entire unit makes more sense — a new unit comes with a fresh core, updated motors, better efficiency ratings, and a full warranty. A complete HRV replacement in a Toronto home typically runs $2,500-$5,000 installed, using the existing ductwork connections.

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Q20

## Why does my HRV seem to bring in cold air during Toronto winters?

**If your HRV supply grilles are blowing noticeably cold air during Toronto winters, there is likely a specific, fixable cause — a properly functioning HRV should deliver incoming air that feels cool but not cold, even when outdoor temperatures drop to -15 or -20 degrees Celsius.** This is one of the most common complaints from GTA homeowners, and the most frequent reaction — turning off the HRV entirely — is exactly the wrong solution because it eliminates your home's ventilation and leads to humidity buildup, window condensation, and poor indoor air quality.

**The most common cause is dirty filters restricting airflow through the unit.** When filters are clogged with dust, the HRV cannot move enough air through the heat exchanger core for efficient heat transfer. The incoming cold air passes through too slowly and does not pick up adequate heat from the outgoing warm air. Clean or replace your

filters — if they have not been serviced in 6 months or more, this is very likely your problem. Filters should be cleaned every 3 months in a Toronto home, and more frequently if you have pets or live near a busy road.

**A dirty heat exchanger core significantly reduces heat recovery.** Dust, grease, and debris accumulate on the core plates over time, insulating them and blocking the heat transfer that is the entire purpose of the unit. Remove the core and wash it in warm soapy water, rinse thoroughly, and dry completely before reinstalling. If you have never cleaned the core in several years of operation, you may be shocked at how much buildup has accumulated and how much warmer the supply air becomes after cleaning.

**Frosting and excessive defrost cycling** cause cold air complaints during the coldest Toronto weather. When outdoor temperatures drop below -15 to -20 degrees, moisture in the warm exhaust air freezes on the cold incoming side of the core. The HRV's defrost cycle responds by temporarily shutting off the supply fan while keeping the exhaust fan running — warm exhaust air melts the frost. During this defrost period (typically 5-10 minutes), no fresh air enters the home, and when the supplyy fan restarts, the initial burst of air is very cold until the core warms back up. In extreme cold snaps, this cycle can repeat frequently, making it seem like the HRV is constantly blowing cold air.

Some HRV models have a **recirculation defrost mode** that is less noticeable — instead of shutting off the supply fan, they recirculate indoor air through the supply side while the exhaust thaws the core. If your unit uses the supply-off method and you find the cold blasts objectionable, upgrading to a unit with recirculation defrost may be worthwhile.

**Blocked or partially blocked exterior hoods** create airflow imbalances that reduce heat recovery. After Toronto ice storms or heavy snowfalls, check both the intake and exhaust hoods on your exterior wall. Ice buildup, snow, or debris blocking either hood disrupts the balanced airflow the HRV needs for efficient heat transfer. The intake hood is especially vulnerable to ice formation because cold outdoor air meets any residual moisture around the opening.

**An aging or damaged heat exchanger core** may simply no longer recover heat efficiently. If your HRV is 12-15 years old and you have cleaned the filters and core thoroughly but supply air is still uncomfortably cold, the core may need replacement ($200-$800 for the part) or the entire unit may be approaching end of life. A qualified HVAC technician can measure the actual heat recovery efficiency by comparing supply and exhaust air temperatures on both sides of the core. If efficiency has dropped below 60%, core or unit replacement is justified. Find local HVAC professionals through the Toronto Construction Network at torontoconstructionnetwork.com/directory?trade=hvac.

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Q21

## What is the best brand of ERV or HRV for the Toronto climate?

**The best ERV or HRV brands for Toronto's climate are Lifebreath, Fantech, Broan, Venmar, and Zehnder**, each with strengths that suit different GTA homes and budgets. There is no single "best" brand — the right choice depends on your home's size, whether you run air conditioning, your humidity control needs, and your budget for the unit and installation.

**Lifebreath** is a Canadian manufacturer based in Ontario and is one of the most commonly installed brands across the GTA. Their units are designed specifically for Canadian winters, with defrost controls calibrated for the -20 degree cold snaps Toronto experiences several times each winter. Lifebreath HRVs are widely available, well-supported by local HVAC suppliers, and most GTA contractors are familiar with installing and servicing them. Their residential models range from $1,200 to $2,500 for the unit alone, with total installed costs of $2,500 to $5,000 depending on whether dedicated ductwork is needed.

**Fantech** and **Venmar** (now part of the Broan-NuTone family) are also strong Canadian options with excellent cold-climate performance. Venmar units have been installed in Ontario homes for decades and have a proven track record in GTA conditions. Broan's integration of the Venmar line has expanded parts availability and service support across the Toronto market. These mid-range units typically cost $1,000 to $2,200 for the unit, with installed costs similar to Lifebreath.

**Zehnder** represents the premium end of the market, offering counterflow heat exchangers with heat recovery efficiency ratings above 90 percent. These units are significantly more expensive — $3,000 to $6,000 for the unit alone, with installed costs of $5,000 to $10,000 or more — but they deliver superior energy recovery and whisper-quiet operation. Zehnder units are popular in high-performance and Passive House builds across the GTA.

For most Toronto homeowners, the bigger decision is **ERV versus HRV**. If you run central air conditioning in summer, an ERV is generally the better choice because it transfers both heat and moisture, helping to keep humid summer air from adding moisture load to your cooling system. If you do not have air conditioning and your primary concern is winter ventilation, an HRV is typically sufficient and slightly less expensive. Toronto's high-humidity summers with humidex values regularly above 40 make ERVs increasingly popular across the GTA market.

Regardless of brand, proper installation matters far more than the nameplate. An ERV or HRV must be balanced — supply and exhaust airflow should be within 10 percent of each other — and the dedicated ductwork must be correctly sized and sealed. A premium unit installed poorly will underperform a mid-range unit installed correctly. Ask your contractor about their balancing procedure and whether they use a flow hood to verify airflow at commissioning. Installation typically runs $2,500 to $6,000 depending on whether your home has existing dedicated ventilation ductwork or needs new runs installed. Browse HVAC and ductwork contractors in your area through the Toronto Construction Network directory to get quotes from professionals experienced with ventilation systems in GTA homes.

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Q22

## Can an ERV reduce indoor humidity problems in a Toronto home during summer?

**Yes, an ERV (Energy Recovery Ventilator) can meaningfully reduce indoor humidity problems in a Toronto home during summer** by transferring moisture from incoming outdoor air to the outgoing exhaust stream, preventing humid outside air from adding its full moisture load to your home. This is one of the key reasons ERVs are increasingly preferred over HRVs in air-conditioned GTA homes.

During a typical Toronto summer, outdoor humidity levels regularly push humidex values above 40, with dew points frequently reaching 20 to 24 degrees Celsius. When your home's ventilation system brings in fresh air — which is essential for indoor air quality — that humid outdoor air adds a significant moisture load that your air conditioning system must work harder to remove. An ERV's enthalpy core transfers approximately 50 to 70 percent of the moisture difference between the incoming and outgoing air streams, meaning far less humidity enters your home with each air exchange. Over an entire summer, this reduces the strain on your air conditioner's dehumidification capacity and helps maintain a more comfortable indoor relative humidity between 40 and 50 percent.

**An ERV is not a dehumidifier, though, and it is important to understand the distinction.** If your humidity problems stem from internal moisture sources — a damp basement, concrete that has not fully cured, inadequate bathroom exhaust, cooking without a range hood, or a high water table pushing moisture through your foundation — an ERV will not solve those issues. An ERV manages the humidity load from ventilation air exchange only. For homes with significant basement moisture intrusion, which is extremely common across the GTA's clay-heavy soils in neighbourhoods like Scarborough, North York, and Mississauga, you may need a standalone dehumidifier in addition to an ERV.

That said, many Toronto homeowners notice a dramatic improvement after ERV installation because their previous ventilation setup — often just a fresh air intake duct dumping unconditioned outdoor air directly into the return plenum — was flooding the home with hot, humid air all summer. Replacing that basic fresh air intake with a properly installed ERV is one of the most effective comfort upgrades for GTA homes built from the 1990s onward, where tighter building envelopes trap moisture more readily.

**Installation costs for an ERV in the GTA typically range from $3,000 to $6,000**, including the unit and dedicated ductwork. If your home already has an HRV with dedicated ductwork, swapping to an ERV is simpler and less expensive — typically $1,500 to $3,500 since the existing ductwork can often be reused. The ERV core should be cleaned every three to six months and the filters checked monthly during peak season. Most GTA HVAC contractors recommend running the ERV continuously at a low speed during summer rather than cycling it on and off, as this provides the most consistent humidity and air quality control. Get matched with a ductwork contractor

through the Toronto Construction Network for a free estimate on ERV installation for your home.

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Q23

## How does Toronto winter humidity affect my ductwork and ventilation system?

**Toronto's winter humidity creates a deceptive problem for ductwork — outdoor air is dry, but indoor moisture from cooking, showers, and breathing raises relative humidity inside your home, and that moisture condenses on cold duct surfaces running through unconditioned spaces.** This is one of the most overlooked causes of duct damage, mould growth, and energy waste in GTA homes during the heating season.

During a typical Toronto winter, outdoor temperatures regularly drop to -10 to -20 degrees Celsius. When your furnace pushes warm air through supply ducts running through an uninsulated attic or crawlspace, the metal duct surface stays cold on the exterior side. Warm, moist indoor air that leaks through gaps in the duct system hits those cold surfaces and condenses immediately. Over time, this condensation soaks surrounding insulation, rusts galvanized steel ducts, and promotes mould growth on duct exteriors and adjacent framing. In older Scarborough, North York, and Etobicoke homes where return air runs through panned joist cavities, this effect is even worse — the leaky joist bays pull cold, dry air from the crawlspace or exterior walls, mixing it with conditioned air and creating temperature differentials that drive condensation at every connection point.

The return side of your system is equally vulnerable. Cold air infiltrating through leaky return ducts in unconditioned spaces chills the duct surface below the dew point of the surrounding air, causing moisture to collect on the outside of the ductwork. In GTA homes with basements, this often shows up as water stains on ceiling tiles below return duct runs, or visible rust streaking on exposed return ducts in utility rooms.

**Proper duct insulation is your primary defence.** All supply and return ducts running through unconditioned spaces — attics, crawlspaces, garages, and unheated portions of basements — should be wrapped with a minimum R-8 duct insulation with an intact vapour barrier facing outward. In the GTA market, professional duct insulation runs $1.50 to $3.00 per square foot installed. Sealing all duct joints with UL 181-rated foil tape or duct mastic before insulating is essential — you need to stop air leakage first, then insulate against temperature differentials. Aeroseal duct sealing, which costs $1,500 to $3,500 for a typical GTA home, is an excellent option for sealing joints in ducts hidden behind walls and ceilings.

An HRV (Heat Recovery Ventilator) is one of the best investments a Toronto homeowner can make for managing winter humidity. An HRV exhausts stale, moist indoor air and brings in fresh outdoor air, recovering 70 to 80 percent of the heat energy in the process. This controlled ventilation reduces indoor humidity to the 30 to 40 percent range recommended for Canadian winters, which dramatically reduces condensation risk on ductwork. HRV installation in the GTA typically runs $2,500 to $5,000 including dedicated ductwork.

Before winter each year, inspect any visible ductwork in your basement, attic, or crawlspace for signs of condensation damage — rust spots, water stains, sagging insulation, or musty odours. If you notice any of these signs, have a professional ductwork contractor assess the insulation and sealing of your system. Toronto Ductwork can match you with a local ductwork professional through the Toronto Construction Network for a free estimate.

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Q24

## How do I prevent frozen condensate in my Toronto home HRV ductwork during winter?

**Frozen condensate in HRV ductwork is one of the most common winter problems in Toronto homes, and it happens because the HRV's heat exchange core cools incoming outdoor air and outgoing indoor air to temperatures below freezing, causing moisture to condense and freeze inside the unit and its connected ductwork.** Preventing this requires proper installation, regular maintenance, and understanding how your HRV manages defrost cycles in GTA winter conditions.

During a typical Toronto cold snap when outdoor temperatures drop below -10 degrees Celsius, the warm, moist exhaust air leaving your home through the HRV passes through the heat exchange core and transfers its heat to the incoming fresh air stream. As the exhaust air cools, its moisture condenses on the core surfaces. When outdoor temperatures drop below about -5 degrees Celsius, this condensation freezes, gradually blocking airflow through the core. Every quality HRV has a built-in defrost cycle that periodically shuts off the incoming fresh air supply while continuing to run the exhaust fan, allowing warm exhaust air to melt the ice buildup. If your HRV is not defrosting properly, ice accumulates until airflow stops completely, and the condensate drain backs up and overflows.

**The condensate drain is the most critical maintenance point.** Your HRV produces significant condensation — several litres per day during cold weather. This condensate drains from the bottom of the unit through a drain line to a floor drain, condensate pump, or laundry tub. If this drain line freezes, clogs, or disconnects, water backs up into the unit and overflows. Check your condensate drain monthly during the heating season. Pour warm water through the drain to verify it flows freely, and clean the drain line with a mixture of warm water and vinegar to prevent biological buildup. If your HRV is installed in an unheated space where the drain line could freeze, the drain must be heat-traced or rerouted to a heated area.

**Inspect and clean the HRV core every two to three months during winter.** Most residential HRV cores are removable — slide the core out, wash it with warm water and mild soap, rinse thoroughly, and let it dry before reinstalling. A dirty core restricpts airflow, reduces heat recovery efficiency, and causes the defrost cycle to trigger more frequently. Clogged cores also cause excessive condensation buildup that overwhelms the drain system.

**Check the outdoor intake and exhaust hoods regularly throughout winter.** Snow, ice, and frost can block these openings, preventing the HRV from operating. The intake and exhaust hoods should be installed at least 18 inches above expected snow accumulation and separated by a minimum of six feet to prevent short-circuiting (exhausted air being drawn back into the intake). After heavy snowfalls, clear any accumulation around both hoods.

**Ductwork insulation on the outdoor air intake duct is essential in the GTA climate.** The section of duct between the exterior wall penetration and the HRV unit carries air at outdoor temperature — potentially -20 degrees Celsius or colder. This duct must be insulated with a minimum R-8 duct wrap and a sealed vapour barrier to prevent condensation from forming on the exterior of the duct and dripping onto surrounding building materials. If this duct runs through a heated space, condensation on the uninsulated cold surface will drip steadily during cold weather.

If your HRV continues to have freezing problems despite proper maintenance, the unit may need its defrost control board calibrated or replaced, or the installation may have design issues that require professional assessment. HRV service and repair in the GTA typically costs $150 to $400 per visit. Find a qualified HVAC professional through the Toronto Construction Network directory.

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