

RecoupAerator® 200DX

Energy Recovery Ventilator

Owner's Manual & Installation Guide



UltimateAir®

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Section 1: Owner's Manual

Introduction

Thank you for your recent purchase of RecoupAerator, the most advanced air filtration system available today. Your RecoupAerator is designed to bring fresh, filtered air into your home or business while simultaneously exhausting stale air.

The 200DX is an Energy Recovery Ventilator (ERV), meaning that the RecoupAerator captures temperature and moisture from the stale, outgoing air and transfers it to the incoming air stream. No matter what the season, you're comfortable and breathe fresh, clean air.

In addition to having an energy transfer rating of up to 95%, the RecoupAerator moderates indoor humidity in the winter and turns away outdoor humidity in the summer.



Features & Benefits

- Automatically self-balances air flow
- 95%+ heat recovery efficiency
- 95% filtration at 1.8 microns (MERV 12)
- Up to 75% moisture transfer capability (depending on season)
- Whole-house air exchanges
- Energy-efficient blower motors
- Optional PressureGuard™ (senses and adjusts for changes in indoor air pressure)
- Optional CO₂Guard™ (senses and adjusts for elevations in CO₂)
- Optional EconoCool™ (brings in cool, filtered night air in summer)
- Compatible with many IAQ monitors and fans
- Automatic frost prevention down to 10° F
- Variable speed
- Quiet operation
- Low/easy maintenance
- Exceeds ASHRAE 62.2 ventilation recommendations
- No drain required
- Permanently lubricated ball bearings
- Filter service indicator
- Fully insulated
- 5-year Warranty

Specifications

Model	RecoupAerator 200DX Energy Recovery Ventilator (ERV). Includes pre-filters, patented energy transfer/filtration material, fans, controls, and motors.
Airflow Capacity	~70 – 210 CFM
Sensible Apparent Efficiency	95%
Heat Exchange Type	Patented rotary random matrix polymer
Filtration	Energy transfer/filtration material 95% effective at 1.8 microns (MERV 12), replaceable, with washable aluminum pre-filter
Electrical Ratings	120 VAC, 60 Hz., 6.0 amp (start up)
Fuse (low voltage)	¼ Amp, 250V 3AG slow blow fuse
Dimensions	25 in. H x 19 in. W x 25 in. D (63.5 cm H x 48.25 cm W x 63.5 cm D)
Unit Weight	72 lb (32 kg)
Shipping Weight	80 lb (36 kg)
Mounting	May be mounted by vertically or horizontally by suspending from floor joists, or placed on floor or shelf in conditioned spaces such as attics, basements, and utility rooms. Collars (four) are 6” in diameter.
Maintenance	Clean filters approximately every 6 months and replace when necessary

General Information

Application	RecoupAerator is designed to bring fresh, filtered, and conditioned air into your home or business while simultaneously exhausting stale air. The 200DX is an Energy Recovery Ventilator (ERV), meaning that the RecoupAerator captures temperature and moisture from the stale, outgoing air and transfers it to the incoming air stream.
Controls	RecoupAerator is equipped with a variable speed controller, unlimited boost function capability (i.e., you can add timers and controllers), “check filter” indicator light, EconoCool™ equipped, auxiliary IAQ and timer inputs, furnace wiring terminals, and auxiliary output. These controls allow you to adjust the airflow as needed to maintain a comfortable level of fresh air. The “check filter” indicator light is designed to let you know when to check and/or clean/replace your pre-filters and energy transfer/filtration material. For systems in which constant ventilation is not required, a remote on/off switch, timer, and/or furnace inputs can be wired directly to the unit.
Frost Control	Programmed to regulate heat exchange automatically to prevent frost build-up down to approximately 10° F.

Service & Maintenance

CAUTION

Before performing any service to RecoupAerator, switch off and disconnect power to the unit. You must disconnect power by either unplugging the unit or by switching the applicable breaker in your breaker box to OFF. Otherwise, the main power to the unit will remain hot and could cause serious bodily injury.

Maintenance Check List

- √ Check pre-filters and energy transfer/filtration material every six months or when the *Check Filter* light comes on. The *Check Filter* light comes on every 90 days of continuous operation. Turn off the *Check Filter* light using the directions in “Check Filter LED” below.
- √ Clean pre-filters every 3 to 4 months if continuously operated, or every 6 months otherwise.
- √ Replace energy transfer/filtration material when necessary.
- √ Check exterior weather caps regularly.
- √ Lightly vacuum or dust the cabinet interior yearly.

Check Filter LED

The “check filter” indicator light is located on the front side of the wall controller and will light up (red) after a continuous operation of 90 days. Because of differences in indoor and outdoor environments, your filters may or may not need cleaning/replacement every 90 days. The light is only an indication to check the filtration material. To reset the light (turn it off), locate the small hole in the faceplate of your controller cover just below the red check filter light. Using a small-diameter object (such as a paper clip), insert one end into the small hole and hold until the light goes off. The light will come on again after approximately 90 days. Check your pre-filters and MERV 12 energy transfer/filtration material for cleanliness at this time.

To order replacement filtration materials, visit us online at: www.ultimateair.com.

Aluminum Pre-filters

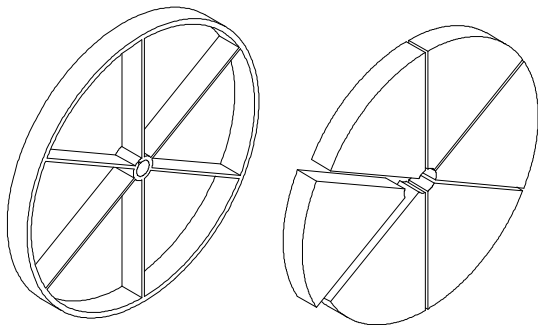
Clean the aluminum pre-filters at least once every six months. Clean more frequently if necessary. To clean the filters:

1. Disconnect power to the RecoupAerator.
2. Unscrew the thumbscrews on the top of the unit and remove the top sheet metal cover by lifting it free. Set the cover aside.
3. Remove the two rectangular filter door insulation inserts (one at each end) by grasping each at the recessed areas at the edges of the inserts. They will easily lift free.
4. Slide the two aluminum pre-filters out (one from each opening), being careful not to bend the frames. There is one long pre-filter and one short pre-filter.
5. Check the pre-filters for build-up. If the pre-filters are soiled, you can clean them by soaking them in warm soapy water, then rinsing. If they're clogged and don't respond to soaking, you will need to purchase a new set. Dry pre-filters completely before reinserting them into your RecoupAerator.
6. Place the pre-filters back into their respective slots.
7. Replace the filter door insulation inserts and the top sheet metal cover.
8. Replace the thumbscrews and tighten.
9. Restore power to the unit.

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Energy Transfer/Filtration Material (“Filter Pies”)

The RecoupAerator's patented energy transfer wheel contains six removable “filter pies” (see illustration below) that periodically require replacement. These pies are also known as energy transfer/filtration material because they not only filter incoming air, they are also the media that transfer heat and moisture from one air stream to the other.



To check the energy transfer/filtration material:

1. Disconnect power to the RecoupAerator.
2. Unscrew the thumbscrews on the top of the unit and remove the top sheet metal cover by lifting it free. Set the cover aside.
3. Remove the two filter door insulation inserts by grasping each at the recessed areas at the edges of the inserts. They will easily lift free.
4. Remove the long aluminum pre-filter as explained in the Aluminum Pre-Filter section above.
5. If the energy transfer/filtration material is dark gray or darker, and appears to be loaded with debris (dust etc.), it probably needs replaced. Pull out the exposed filter material “pies” by the plastic monofilament handle embedded in each section, manually rotating the wheel to access the remaining wedges.
6. If the filter is less than 2 years old it can be washed in a pale of warm water then gently squeezed to remove excess water. Then lay filters flat until dry before reinserting.
7. Reinsert new energy transfer/filtration material gently into the unit with the monofilament handle facing out for easy access in the future. Do not press hard, as undue pressure may stretch the mesh backing of the rotary wheel.
8. Rotate the wheel by hand, making sure that the pieces are completely and evenly replaced below the level of the spokes so that none drag on the center frame as the wheel rotates. You may need to access both sides of the wheel to make appropriate adjustments. To access the rear of the rotary wheel, remove the other filter door insulation insert and the short aluminum pre-filter. You can easily reach in and make any necessary adjustments.
9. Replace the aluminum pre-filters, filter door insulation inserts, and top sheet metal cover.
10. Replace the thumbscrews and tighten.
11. Restore power to the unit.

To order replacement filtration materials, visit us online at: www.ultimateair.com.

Exterior Weather Hoods

Check your exterior weather hoods periodically throughout the year to ensure that the fresh air inlet and stale air exhaust hoods mounted on the outside of your home or business do not become clogged with debris such as leaves, grass, snow, or bird nests. Remove any debris by hand or wipe out the caps with a dry cloth.

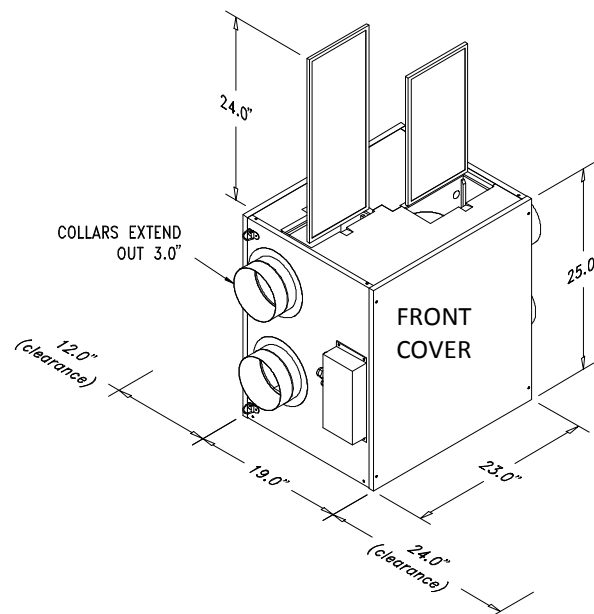
Changing the Drive Roller Belt

Part #3005

The Drive Roller Belt connects the wheel drive motor to the drive roller, which in turn physically rotates the energy recovery wheel. Please follow the following steps to replace the Drive Roller Belt.

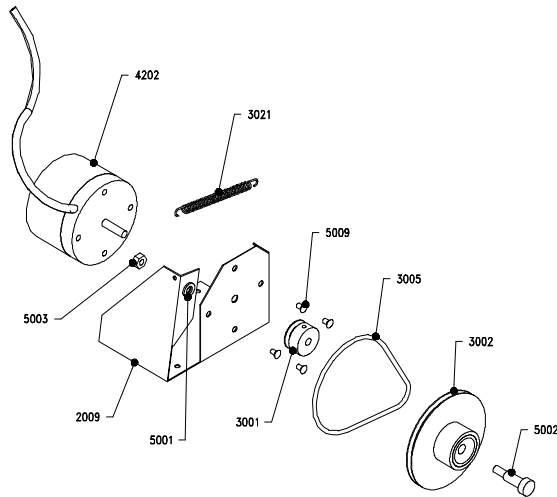
This should be done by a HVAC installer. Technical support is available by calling UltimateAir.

1. Disconnect power to the ERV, and turn the rocker switch on the unit off (white dot will be out).
2. Remove the four thumb screws, and the top sheet metal cover.
3. Remove the four hex head (5/16") screws which hold the 'front' sheet metal cover in place, and take it off. Also remove the white expanded polystyrene door insert directly behind the sheet metal cover.



4. Remove the two screws holding the motor mount / drive roller assembly in place. There are only two, and they are visible and closest to you. The rear two holes are on snap top fasteners.
5. Once the screws are out, reach in and firmly rotate the motor mount assembly clockwise to unsnap the rear fasteners. The entire assembly should come out. The wiring will still be connected. See pictures and details below.

Continued.....



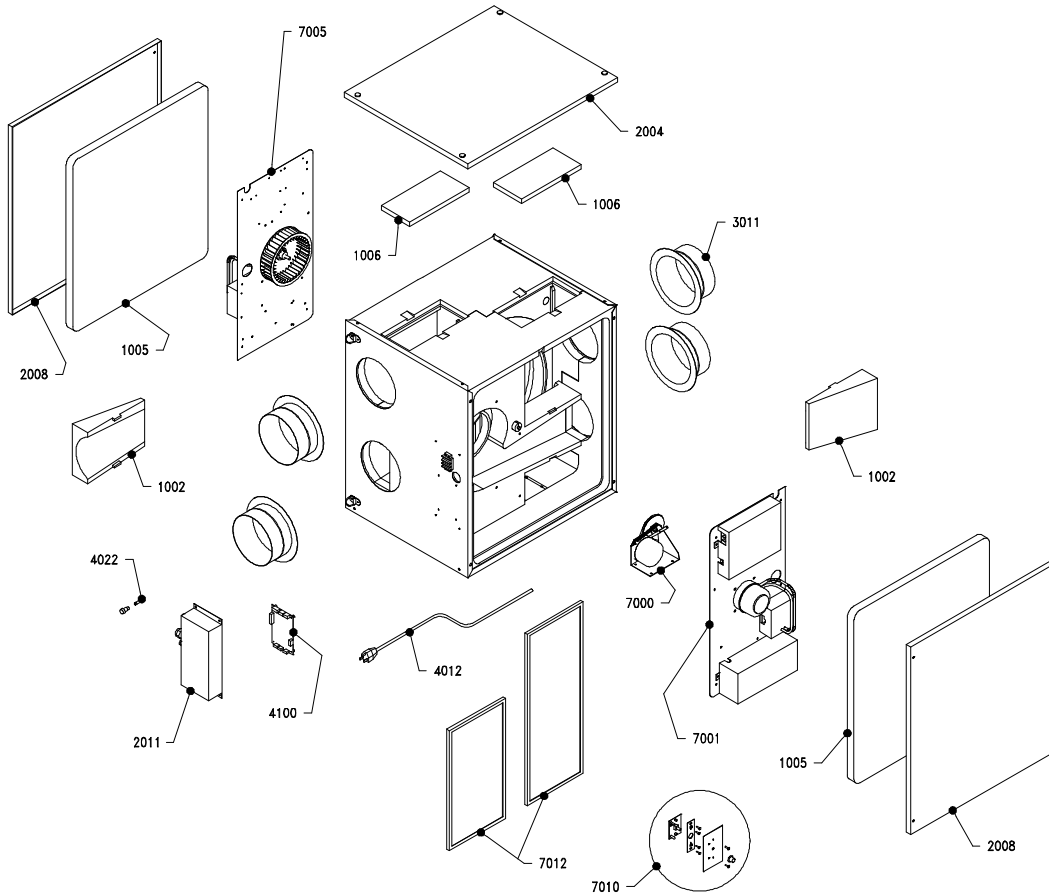
6. Replace Drive Roller Belt.
7. Install motor mount / drive roller assembly back into the unit by first snapping the rear snaps, then replacing the two screws.
8. Install white expanded polystyrene insert, front door.
9. Operate unit with wheel visible through top door to verify rotation.
10. Replace top door and thumb screws.

Troubleshooting

Problem	Possible Cause	Recommended Solution
Green indicator light on wall controller does not come on	<p>Power switch is off</p> <p>Accessories connected to the unit are not powered or wired correctly</p> <p>Blown fuse</p> <p>Connections may not be grounded properly</p> <p>At least 100 VAC may not be reaching the electrical outlet</p> <p>Jumpers on three-motor controller may not be in the correct position</p> <p>Wires from the three-motor controller to the wall controller are crossed</p> <p>Wires may not be securely connected</p>	<p>Turn on power switch</p> <p>Review wiring</p> <p>Check and replace blown fuse(s)</p> <p>Verify all connections and replace any loose wiring</p> <p>Check the fuse and/or breaker panel</p> <p>Make sure that NA/EURO jumper is in the correct position and that the 0-10V/REM jumper is in the correct position</p> <p>Compare wiring with manual's wiring diagrams</p> <p>Tug on each wire to make sure that it is securely fastened</p>
Excess humidity	<p>RecoupAerator speed set too low (during heating season)</p> <p>RecoupAerator not operating continuously (during heating season)</p> <p>Moisture-producing source (e.g., indoor pool, hot tub, or unvented crawl space)</p>	<p>Set speed higher at wall controller</p> <p>Operate RecoupAerator continuously</p> <p>Maintain cover on pool or hot tub when not in use or vent crawlspace</p> <p>Consider additional exhaust fans in moisture-producing areas (e.g., bathrooms and kitchens)</p>
What's that sound?	<p>Small noises in your system</p> <p>Obstructions in pre-filters and ducts</p> <p>Heat recovery wheel rubbing on insulation</p>	<p>Short, insulated duct runs will minimize noise transmission through ductwork</p> <p>Duct mufflers are available from UltimateAir that will minimize noise transmission through duct</p> <p>Clean and clear airways of any and all obstructions, including termination vents and pre-filters</p> <p>Make sure pies are flush with heat recovery wheel edge, and that the pies are not rubbing</p>
Poor air flow	<p>Leaves or similar debris may be obstructing termination vents</p> <p>Restrictions in ductwork may exist</p> <p>Dirty energy transfer/filtration material</p> <p>Ductwork too long, excessive number of bends</p>	<p>Remove obstructions from any and all airways</p> <p>Remove any duct obstructions, excessive bends, and improperly mounted collapsed ducts</p> <p>Replace energy transfer/filtration material</p> <p>Contact your HVAC service professional to fix ducting</p>

Problem	Possible Cause	Recommended Solution
	Wall controller is not at the right setting	Adjust wall controller setting
Cold air	Un-insulated duct in unconditioned air space Heat recovery wheel not rotating	Insulate all duct work in unconditioned air spaces Check for broken or slipping belt. Fix or replace as necessary

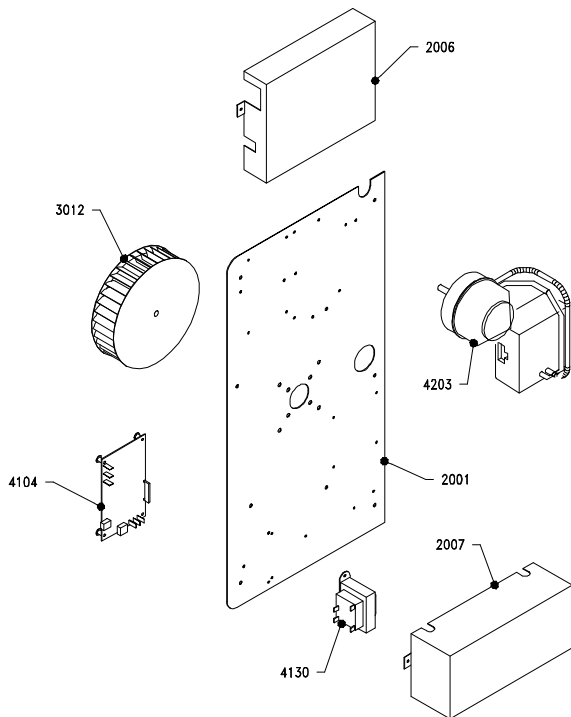
Assembly & Parts Diagrams



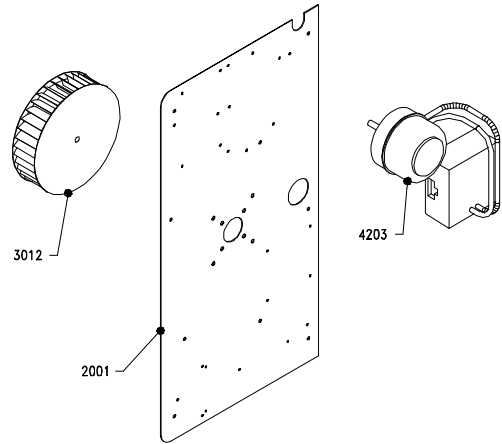
Unit Assembly

Part No.	Part Description	Qty
1002	Transition Cover	2
1005	Door Insulation	2
1006	Filter Door Insulation	2
2004	Top Door	1
2008	Front Door	2
2011	Exterior Electronics Cover	1
3011	6" Starter Collars	4
4012	Power Cord	1
4022	1/4 Amp Fuse	1
4100	Three Motor Controller	1
7000	Drive Roller / Motor Mount Assembly	1
7001	Front Motor Plate Assembly	1
7005	Back Motor Plate Assembly	1
7010	American Wall Controller Assembly	1
7012	Pre-Filter Set	1

Assembly 7001



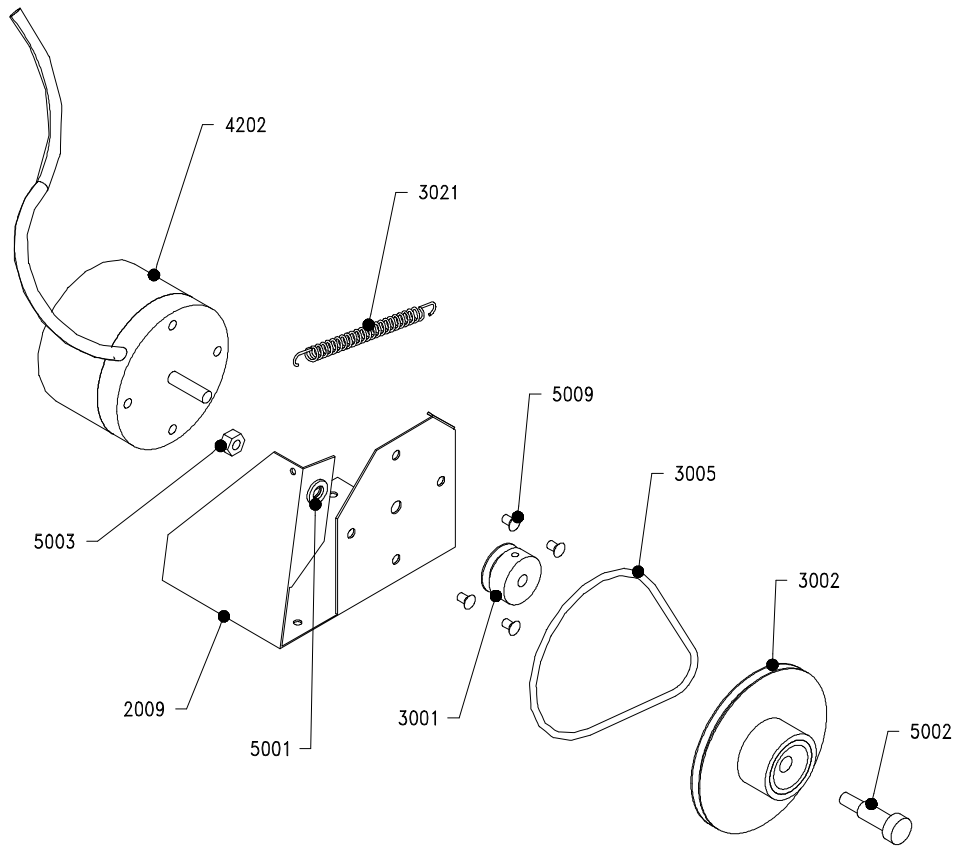
Assembly 7005



Electronics Assemblies

Part No.	Part Description	Qty
2001	Electronics Plate	2
2006	Electronics Cover 1	1
2007	Electronics Cover 2	1
3012	Impeller	2
4104	Wheel Drive	1
4130	Transformer	1
4203	Blower Motor	2

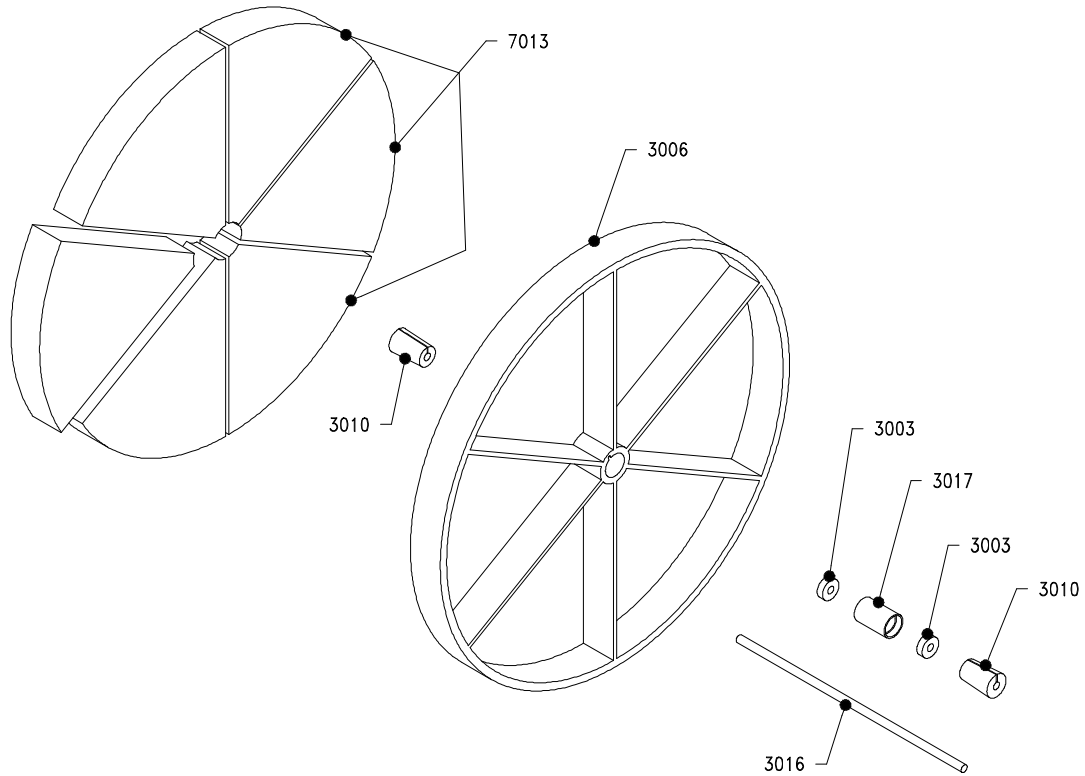
Assembly 7000



Drive Motor Assembly

Part No.	Part Description	Qty
2009	Drive Roller / Motor Mount	1
3001	Small Motor Pulley	1
3002	Drive Roller Pulley Assembly	1
3005	Driver Roller Belt	1
3021	Drive Roller Spring	1
4202	HRW Drive Motor	1
5001	M6 Metric Masher	1
5002	Metric Shoulder Screw	1
5003	Metric Locknut	1
5009	Flat Head Machine Screw	4
2009	Drive Roller / Motor Mount	1
3001	Small Motor Pulley	1
3002	Drive Roller Pulley Assembly	1
3005	Driver Roller Belt	1
3021	Drive Roller Spring	1
4202	HRW Drive Motor	1
5002	Metric Shoulder Screw	1

Assembly 7014



Heat Recovery Wheel Assembly

Part No.	Part Description	Qty
3003	Bearings	2
3006	Energy Recovery Wheel	1
3010	Centering Cone	2
3016	Shaft	1
3017	Hub	1
7013	Energy Transfer/Filtration Material (set of 6 "pies")	1

Section 2: Installation Guide

-Notes for Licensed Contractors-

We strongly recommend that a licensed HVAC technician install this product, because of complex considerations such as airflow dynamics and condensation issues. Installation by non-licensed HVAC personnel may void the warranty.

Unpack your RecoupAerator and check to make sure that the following are included and undamaged:

- UltimateAir RecoupAerator 200DX Energy Recovery Ventilator with four (4) starter collars (collars are shipped inside the unit).
- Literature package with maintenance guide, parts list, registration card, and warranty.
- Wall mount controller (pre-wired for test run, and shipped inside the unit).
- Mounting hardware (optional).
- Control options (if ordered).

When installing the RecoupAerator:

1. Read these instructions carefully before beginning any installation procedure. Failure to follow them closely may reduce ventilation effectiveness, cause a hazardous condition, and/or invalidate your warranty.
2. Review your plan for the installation, with the RecoupAerator sitting out of the box in front of you. Familiarize yourself with the intake and outlet duct configuration and installation dimensions. Decide how you will mount the unit. We recommend ACCA's manuals D & J for proper load calculations and duct sizing.
3. After installation is complete, test the operation of your RecoupAerator according to the instructions. Fill in contractor's name and phone number on the last page of this manual, and be sure to **complete the Warranty Registration** to validate your unit installation.

CAUTION

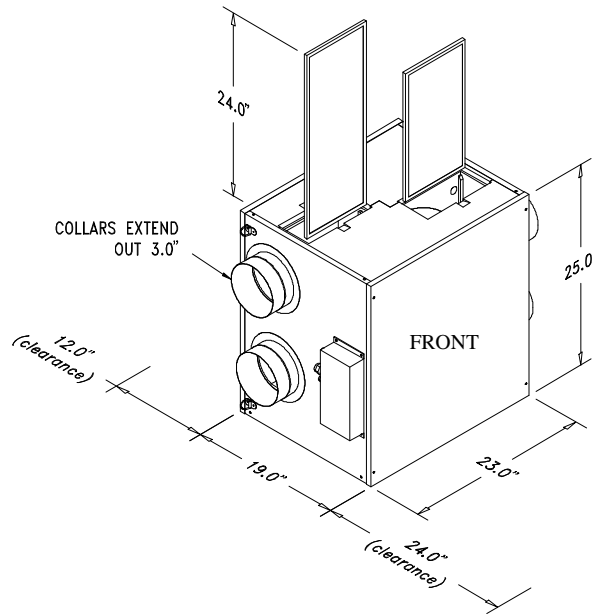
Always disconnect the power supply before wiring to prevent electrical shock and/or equipment damage.

The RecoupAerator is equipped with a three-pronged grounding plug for your protection against shock hazards and should be plugged directly into a properly grounded, 120V, 15 amp, three-pronged wall receptacle. If only a two-pronged outlet is available, it must be replaced with a properly grounded three-pronged receptacle in accordance with the National Electrical Code and local codes and ordinances. A qualified electrician should do this work. Use proper circuit protection. If you have any doubts about the grounding in your house, contact a qualified electrician.

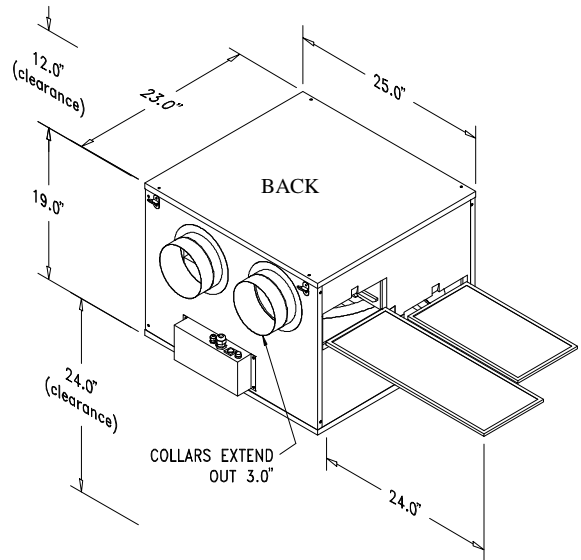
Initial Considerations

Installation Dimensions

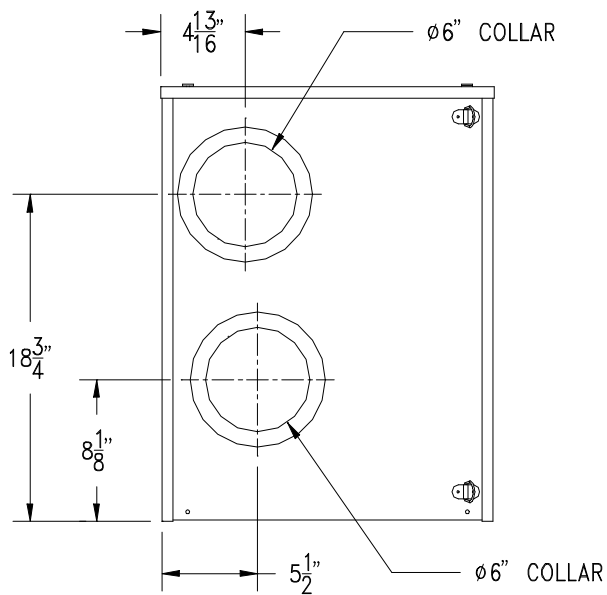
Vertical Installation



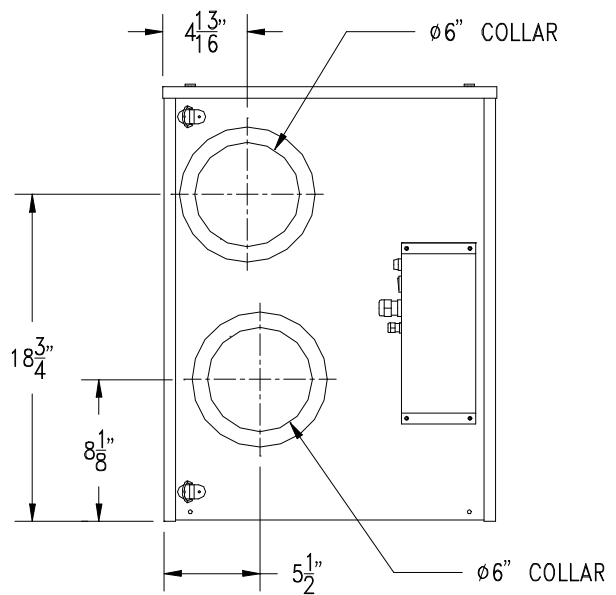
Horizontal Installation



Connect to the Inside



Connect to the Outside



Installation Options

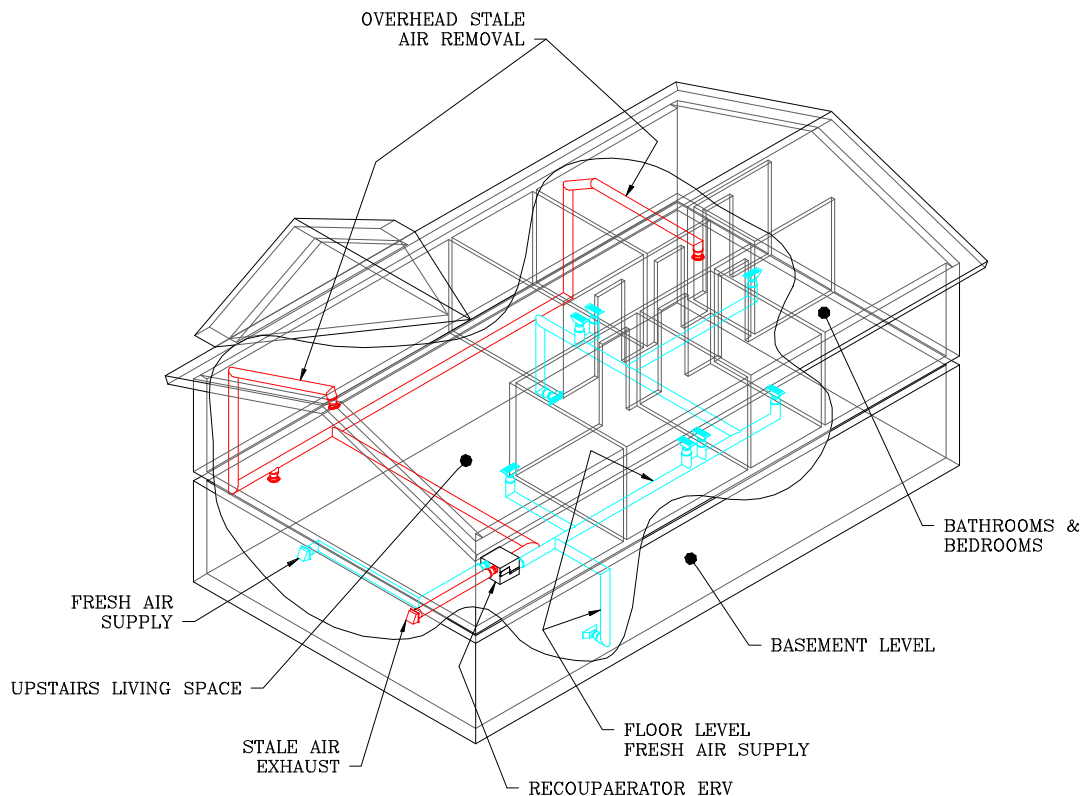
Described below are examples of ways to duct your RecoupAerator.

Option 1: Dedicated Ductwork Installation

This is the most complete installation option and is ideal for new construction. Use option 1 when a home or business is especially concerned with health issues (e.g., when an occupant has asthma or severe allergies). Option 1 is the only option for homes and businesses without existing forced air ductwork. Option 1 is also used for homes employing radiant heat flooring or geothermal heating.

The more rooms to which ductwork is run, the more effective the system. Dedicated ductwork is installed for the exhaust intake and the fresh air delivery. The kitchen, laundry room, and other areas with high contamination should contain registers for the exhaust intakes. Areas such as the living room, den, and bedrooms should receive the full benefit of the fresh air being brought in, and a good installation will feature supply vents in these locations. As a general note, fresh air is generally supplied at floor level, and stale air is removed at ceiling level.

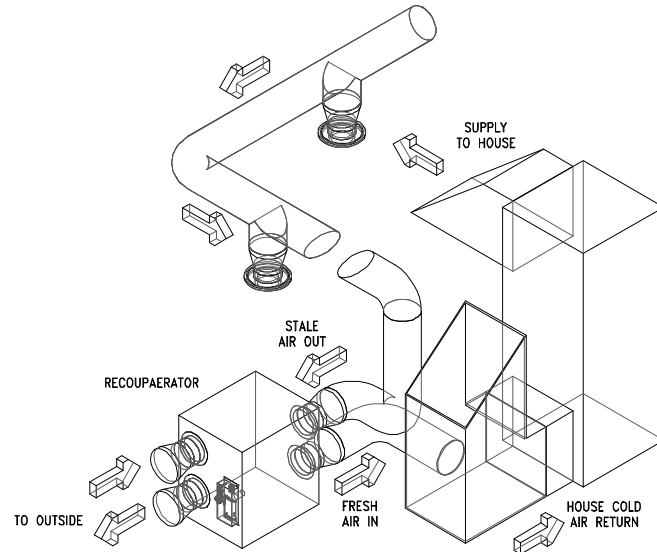
A simpler but somewhat less effective version of this system uses one exhaust and one or more delivery registers located strategically to encourage circulation throughout the house.



Example of dedicated ductwork installation

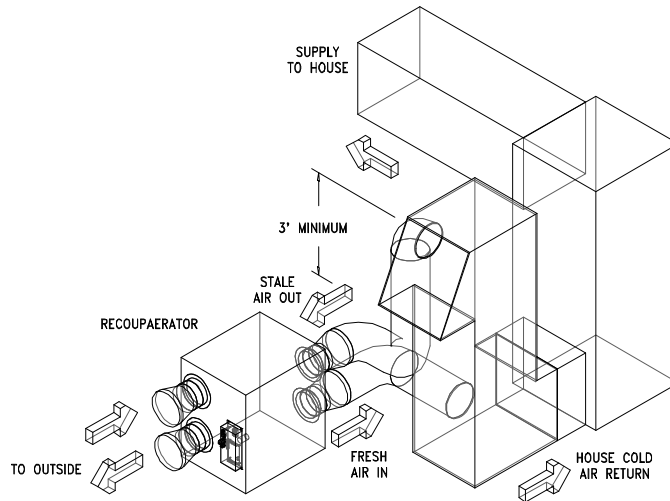
Option 2: Shared Ductwork Installation

Option 2A: Exhaust Ducted Installation. This method partially uses the existing HVAC duct system. The *Fresh Air In* duct from the RecoupAerator gets ducted into the cold air return side, or the supply side of the furnace. The *Stale Air Out* duct from the RecoupAerator is ducted separately to strategically located points throughout the house from which you'd like to remove stale air (e.g., the kitchen, hallway, open stairwell). This method allows for independent control between the HVAC air handler and the RecoupAerator (i.e., the air handler and the RecoupAerator are not interlocked and run independent of each other).



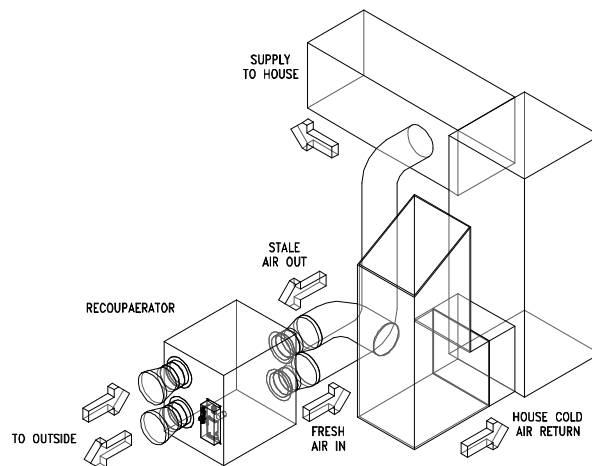
Example of exhaust ducted installation

Option 2B: Return Air Installation. This method uses the existing home or business's HVAC duct system completely. Both the *Stale Air Out* and the *Fresh Air In* ducts from your RecoupAerator are attached to the cold air return duct of your HVAC system. Be sure to keep at least three feet of space along the cold air return duct between the two ventilator ducts. When using this method, your RecoupAerator and your air handler must be wired to run simultaneously (i.e., they are interlocked). Refer to the furnace wiring instructions in this manual to wire your RecoupAerator to an air handler.



Example of return air installation

Option 2C: Return and Supply Air Installation. This method, like Option 2B, uses the existing HVAC duct system completely. The *Fresh Air In* duct from the Recoupaerator is ducted into the main supply duct to the house. The *Stale Air Out* duct from the Recoupaerator is ducted into the cold air return duct of the furnace. If you use this method, we recommend that you wire your Recoupaerator and your air handler to run simultaneously (i.e., they will be interlocked) to prevent recirculation. Refer to the furnace wiring instructions in this manual when wiring your Recoupaerator to a furnace.



Example of return and supply air installation

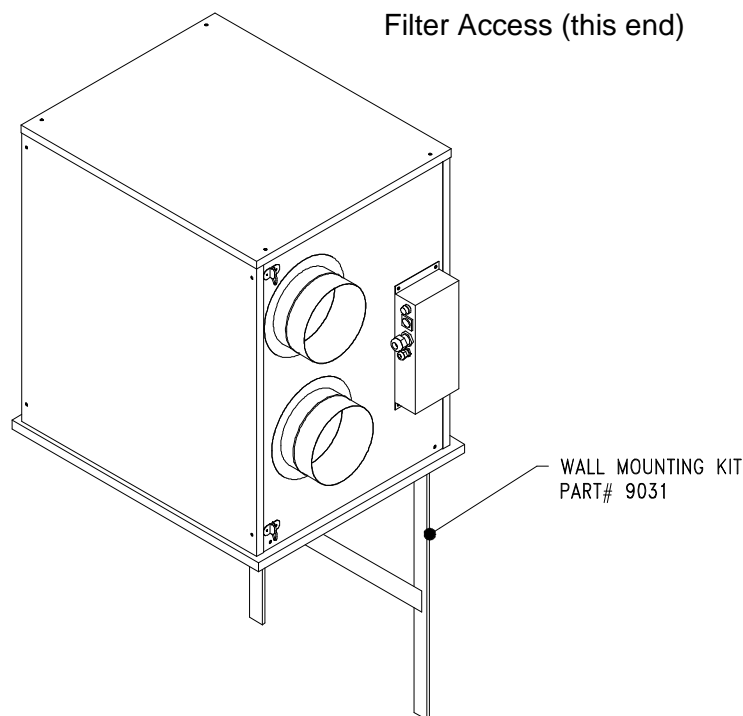
Positioning Your RecoupAerator

Location

Mount your RecoupAerator in a location convenient to existing ducting and furnace/forced air system, if using existing ductwork. We don't recommend that the RecoupAerator be mounted in an unconditioned space, as this will affect the performance and longevity of the unit. If possible, locate equipment away from the quiet rooms (e.g., bedrooms) in the house. Avoid directly suspending the RecoupAerator from the mid-span area of joists. This can result in structural vibration. Allow adequate space for maintenance and service of the unit (use the guidelines in "Mounting Positions" below).

Mounting Positions

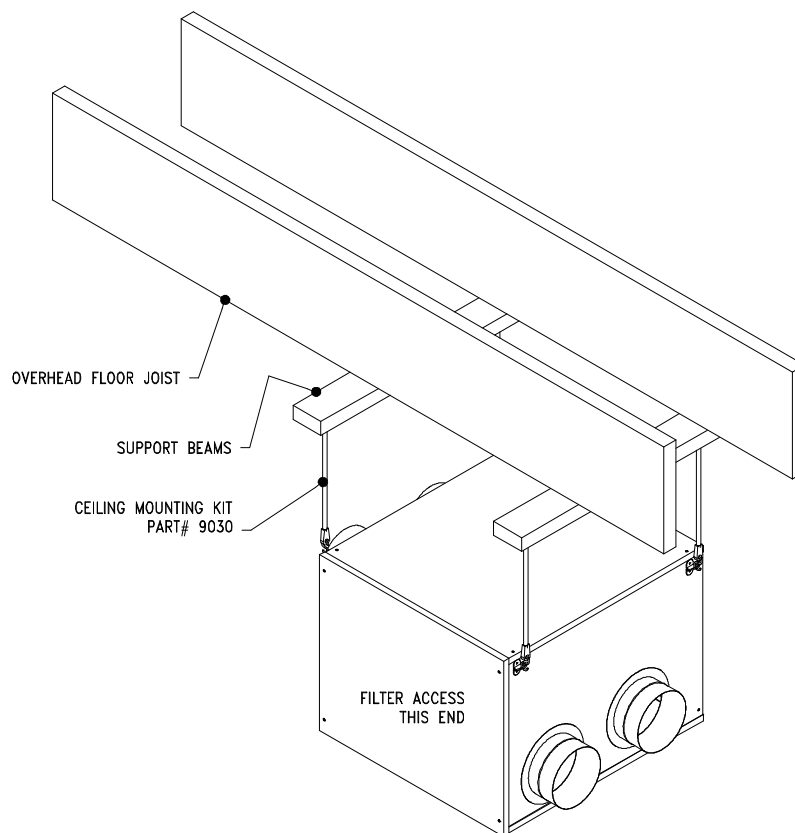
Vertical. The RecoupAerator rests on four rubber feet when mounted vertically. Set the unit on a flat, dry, level surface at least 20 inches by 24 inches that is able to support a minimum of 85 lbs. The Wall Mounting Bracket Kit may be used to mount the RecoupAerator on a wall (shown below). Allow 24 inches above the unit for removal of the pre-filters. Position the top cover (labeled "To clean heat exchange material, remove THIS cover") so that it may easily be lifted away for removal of the heat recovery/filtration material. Allow 24 inches on the front side of the unit for servicing.



Vertical mounting configuration

Vertical Floor Mount. The RecoupAerator rests on four rubber feet when mounted vertically. Set the unit on a flat, dry, level surface at least 20" x 24" that is able to support a minimum of 85 lbs. Allow 24" above the unit for removal of the pre-filters. Position the top cover (labeled "To service heat exchange material, remove THIS cover") so that it may easily be lifted away for removal of the heat recovery/filtration material. Allow 24" on the front side of the unit for servicing.

Horizontal. Use a Ceiling Mounting Kit to suspend the RecoupAerator from the "D" rings located on the four corners of the unit. The front side of the unit should face the floor. Allow adequate space (12") between the ceiling and the unit to allow for servicing. Allow 24" below the unit for servicing. Allow 24" on the left (filter access) side of the unit, which has thumbscrews to facilitate removal of the energy transfer/filtration material and aluminum pre-filters.



Horizontal mounting configuration

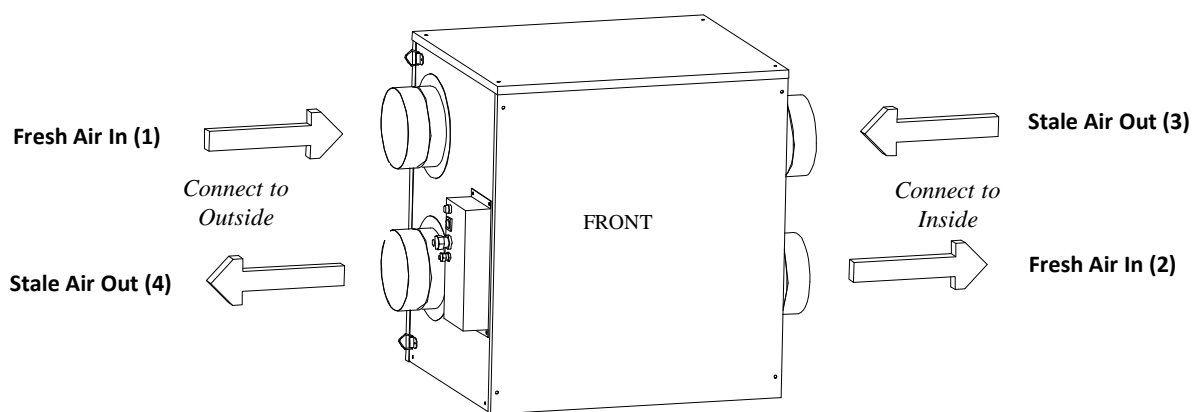
Ducting

Ducting between the RecoupAerator and the outdoors (where the unit is labeled *Connect to Outside*) and all ducting in unconditioned spaces *must be insulated and sealed with a vapor barrier*.

Planning the Duct Work

Your unit ships with four six-inch starter collars, which ship inside of the unit (remove the top to access them). Locate all four collars and attach to the unit at each of the four 6" holes. Peel the backing from the double-sided tape on the collars and then attach them to the unit with three self drilling screws each (provided).

Two duct holes are labeled *Connect to Outside*. The other two duct holes are labeled *Connect to Inside*.



The RecoupAerator's labeled collars

To ensure maximum airflow, use the largest practical duct for the installation. A licensed HVAC contractor should calculate appropriate duct diameters from required airflows and distances of duct runs. Under no circumstances should the trunk duct size be less than six inches, as this will restrict the airflow considerably. Insulated flex ducts tend to reduce air flow noise levels but add airflow resistance, and galvanized ducts provide the least resistance to airflow, but may amplify noise. Duct connections inside each house will vary. The outside duct connections are the same for all installations and *must be insulated*. Design and installation of ductwork must be in accordance with HVAC standards and regulations to allow required quantities of fresh air to circulate through the home or business, and to exhaust adequate quantities of stale indoor air.

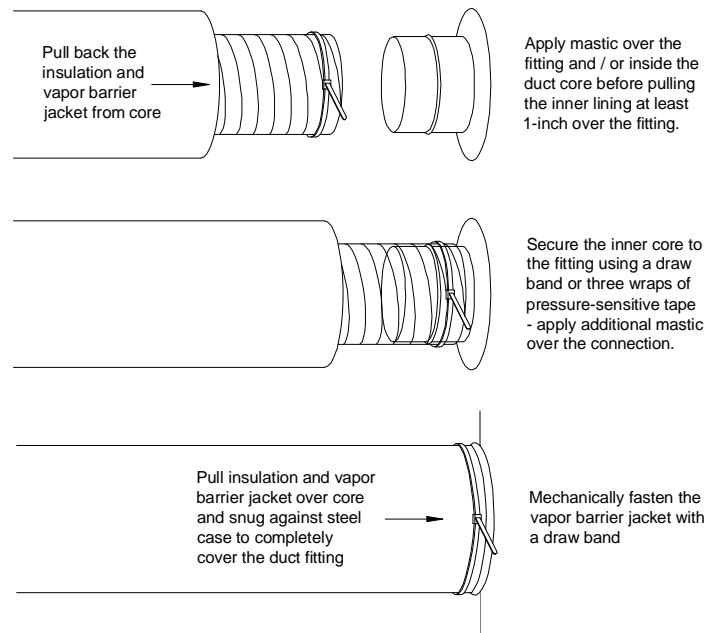
General Duct Design Guidelines

1. Use a minimum of six-inch-diameter round duct or equivalent for all connections to and from the RecoupAerator. Use of eight-inch ducts on main trunks is recommended, especially for ducts running to the outside. Again, a licensed HVAC contractor should do the duct design calculations.
2. To minimize backpressure: Make the intake and exhaust duct runs as short and as straight as possible, with few elbows or bends. Always use 45-degree elbows instead of 90-degree where practical. Where flex duct is used, make sure that no “crimping” or “collapsing” of the duct occurs. Stretch flex duct evenly to avoid air restriction. Use “Y” connections instead of “T” connections wherever possible.
3. Position fresh air intakes away from known sources of pollution such as dryer vents, chimneys, and automobile exhaust. Locate fresh air intake and stale air exhaust at least six to ten feet apart, 40 inches from the corner of the building, and above the projected snow plane (above 18 inches if possible).
4. Position inside grill/register vents so that fresh air does not blow directly onto occupants or the thermostat.
5. Fasten joints between duct components with screws, sealant, and/or rivets and wrap them with metal foil duct tape to ensure no leaks.
6. Minimize any noise transmission through the ducts by using a short run (2-3 ft) of insulated flex duct on duct trunks coming from the unit and going to the inside of the house. If this isn’t enough, you can install an optional duct muffler.
7. Ensure that branches from main trunks are typically not smaller than five inches in diameter.
8. If you install a RecoupAerator in an unconditioned space (not recommended), you must insulate the section(s) of the inside ducts (and possibly the unit itself) that are exposed to an unconditioned environment.
9. Ensure that ducting to the outdoors is installed above anticipated snow and flood lines and is fitted with screened weather caps to prevent animal, insect, and debris entry.
10. Ensure that your final operational duct system exhibits less than 0.6 in. wg total external static pressure at maximum airflow. Lowering the static pressure will lessen the electrical usage of the unit.

Flexible Ducting Tips

1. Ensure that your duct installation follows the following standards:
 - a. **Mechanical integrity** — The system will remain as built for the life of the house, without developing leaks, obstructions, or insulation failure.
 - b. **Freedom from leaks** — All air moved by the air handler will be drawn from and delivered to the intended conditioned spaces.
 - c. **Proper insulation** — Conditioned air does not exchange heat with unconditioned spaces.

2. Size new ductwork according to recognized industry standards such as Manuals D and J, published by the Air Conditioning Contractors of America (ACCA).
3. Observe the guidelines and instructions provided with duct installation materials.
4. Ensure that tapes and sealants used on connections are listed for UL 181B, *Closure Systems for Use with Flexible Air Ducts and Connectors*.
5. Assemble the tools to install non-metallic flexible duct:
 - a. **Knife or Scissors/Wire Cutter:** Use knife or scissors to cut duct wall. Use wire cutters to cut spiral wire helix.
 - b. **Duct Tape:** Use only tapes that have been listed and labeled to Standard UL 181B and labeled "181B-FX". Use two wraps of 1½" minimum width.
 - c. **Draw Band/Plastic Clamp/Clamp Tool:** Use for low-pressure systems up to four-inch wg (diameters of three to 10') and up to two-inch wg (diameters of 12" and over). To achieve proper tensioning of clamp, set clamp to max tension setting.
6. Use only the minimum length of flexible duct necessary to make connections.
7. Support hardware (e.g., terminal devices, couplings, and fittings) independently of flexible duct using elbows or other devices.
8. Repair torn or damaged vapor barrier jacket. If internal core is penetrated, replace or splice flexible duct.
9. Install duct **fully extended** along straightest path possible.
10. Flexible duct shall be supported at manufacturer's recommended intervals, but at no greater distance than five feet, and the maximum permissible sag is ½" per foot of spacing between supports.
11. In no case will the hanger or saddle material supporting the flexible duct be less than 1½" wide.

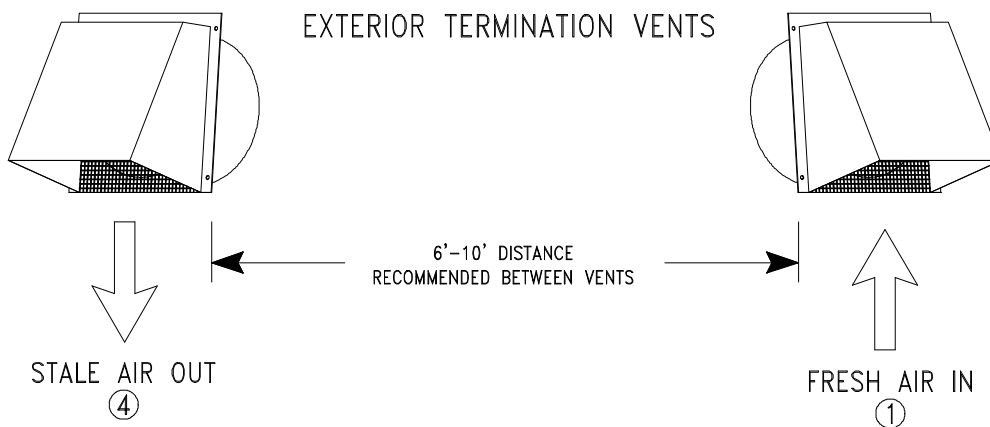


Attaching flexible ductwork to RecoupAerator collars

Installing the Outside Ducts

Note: The ducts to the outside must be insulated. The starting collars labeled *Connect to Outside* must be ducted to the outside of the building, and the following precautions should be taken.

1. The ends of the two ducts should be as far apart as practical (at least six feet, either horizontally or vertically) to minimize re-circulation of the exhaust air.
2. Terminate the ducts using exterior weather hoods. Ensure that the exterior weather caps have wire mesh to keep out birds, small animals, insects, and debris. Angle the weather caps down and away from each other and place them away from exhaust vents for other appliances such as dryers or hot water heaters. Avoid placing air intake vents near exhaust vents from adjacent buildings or sources of automobile exhaust. Never place an air intake in a garage, for instance.
3. Make sure that the joints between the termination vents and the walls are sealed to prevent air and moisture penetration.



Exterior Termination Vents

Installing the Inside Ducts

Location of supply and exhaust vents inside the house is an important factor in ventilation. Consider the following guidelines for maximum effectiveness:

1. Locate the air exhaust point(s) high in a room, as far as possible from the point of air entry. This will allow maximum distance for the air to circulate.
2. In kitchens, do not place an exhaust vent within three feet horizontally in any direction from the surface of the cooking range up to the ceiling. If you place an exhaust vent anywhere near a cooking range, it must either be equipped with a grease filter or the ducts/filtration material must be accessible for cleaning or replacement regularly.

3. In a laundry room, we recommend use of a lint filter for any exhaust vents.
4. Terminate fresh air supply ducts with registers that both maximize the airflow and have dampers to adjust the airflow.

Wiring

CAUTION

Before performing any service to your RecoupAerator, switch off the unit and disconnect power from the unit. You must disconnect power by either unplugging the unit or by switching the applicable breaker in your breaker box to off. Otherwise, the main power to the unit will remain hot and could cause serious bodily injury.

Basic Electrical Wiring

The RecoupAerator Model 200DX is supplied with two blower motors, one energy recovery wheel drive motor, and a detached wall controller that can be mounted near the unit or in a remote location. Follow all applicable electrical codes.

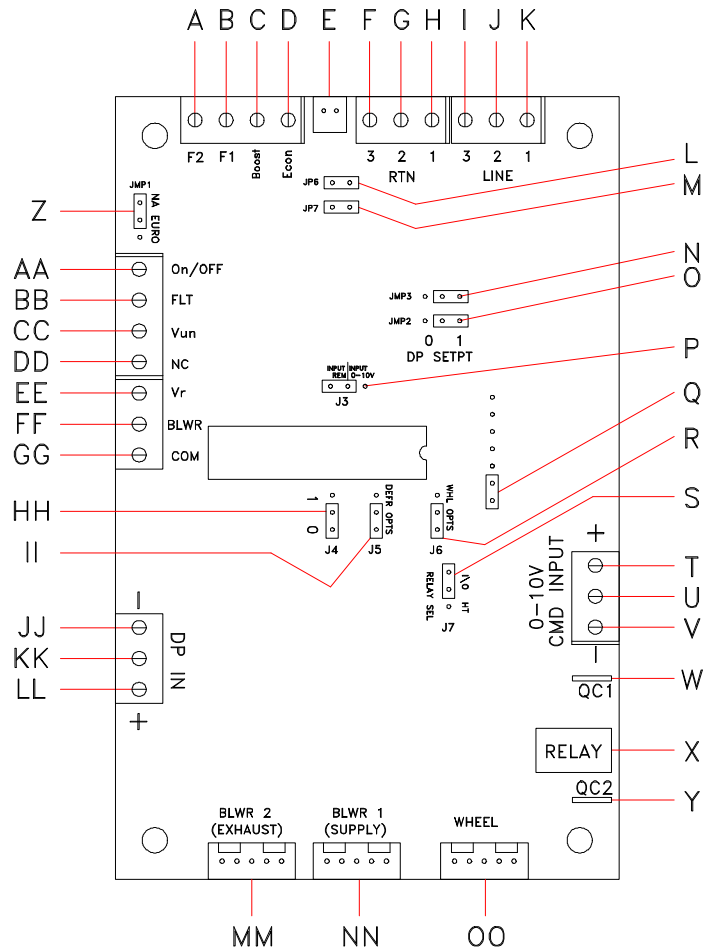
The RecoupAerator can be wired in a number of different ways depending on desired features. This section of the manual describes each benefit option and shows the wiring procedure to accomplish them.

Factory Settings

Airflow. This unit contains two blower motors, each independently controlling the airflow coming into the building (Blower 1, supply), and leaving the building (Blower 2, exhaust). The unit has the capability of lowering the airflow from the building going to the outside by a selectable set of offset jumpers on the three-motor control board. Factory settings provide for “balanced” airflow, that is, equal airflow both coming into the building and exiting the building.

Input. This unit comes equipped to handle several different types of control input. From the factory, the unit is set up for a North American remote wall controller, which is supplied with each unit, unless otherwise specified at the time of order.

EconoCool. This unit comes with an economic ‘night’ cooling feature. There is a low voltage switch mounted next to the power switch to turn this feature on and off. Please see the ‘econocool’ section in this manual for further detail.



Three-motor control board

- A. F2: Wiring input from furnace. 24 VAC common (in some cases “C” post from thermostat wiring on the furnace). If wiring to furnace, REMOVE jumpers at L and M.
- B. F1: Wiring input from furnace. 24 VAC line (in some cases “G” post from thermostat wiring on the furnace). If wiring to furnace, REMOVE jumpers at L and M.
- C. Boost input. When this post receives a 24 VAC signal (from I, J, or K), the unit will be turned on, and commanded to high speed (max air flow).
- D. EconoCool input: When this post receives a 24 VAC signal (from I, J, or K), the EconoCool function will be enabled. See EconoCool in this manual for further information.
- E. Temperature thermistor input. Temperature information from the temperature thermistor located in the incoming air stream (duct 1) is fed to the controller through this input.
- F. RET 3: 24 VAC return post. Common terminal from the internal transformer.
- G. RET 2: 24 VAC return post. Common terminal from the internal transformer.

- H. RET 1: 24 VAC return post. Common terminal from the internal transformer.
- I. LINE 3: 24 VAC line post. Line voltage from the internal transformer.
- J. LINE 2: 24 VAC line post. Line voltage from the internal transformer.
- K. LINE 1: 24 VAC line post. Line voltage from the internal transformer.
- L. JP6: Jumper connecting 24 VAC line voltage from internal transformer to F1.
- M. JP7: Jumper connecting 24 VAC return from internal transformer to F2.
- N. JMP3: Offset / DP Set point jumper. Selects air flow offsets. See Air Flow offsets in this manual for further detail.
- O. JMP2: Offset / DP Set point jumper. Selects air flow offsets. See Air Flow offsets in this manual for further detail.
- P. J3: Control Input jumper. Selects control input from either the remote wall controller, or a 0-10V DC input voltage (at T and V).
- Q. Programming jumper. Must be in place for unit operation.
- R. J6: Wheel Options. Selects control for heat wheel rotation. (default '0' position)
- S. J7: Relay selection. This jumper selects whether the normally open relay (X) closes when the unit turns on (position I/O), or when the temperature thermistor reads below 10°F (position HT). Default is position I/O.
- T. 0-10V DC input post. When J3 is in the 0-10V position, this post accepts the positive line voltage 0-10V DC command from an outside control source.
- U. Not connected. Empty socket.
- V. 0-10V DC input post. When J3 is in the 0-10V position, this post accepts the negative side 0-10V DC command from an outside control source.
- W. QC1: Quick Connect 1. Used as an auxiliary output control option. QC1 will be electrically connected to QC2 when the relay (X) is closed. Max rating: 1A@24VAC.
- X. Low voltage pilot duty relay. Normally open. Closes according to selection made at J7 (S). Default: closes when the ERV is turned on.
- Y. QC2: Quick Connect 2. Used as an auxiliary output control option. QC2 will be electrically connected to QC1 when the relay (X) is closed. Max rating: 1A@24VAC.
- Z. JMP1: Remote control input selection. Default wall controller in the North American remote wall control (NA position). J3 (P) must be in the REM INPUT position. When J3 is in the 0-10V position, JMP1 MUST be in the EU position for the 0-10V input to work.
- AA. On/Off terminal. For wiring to mating terminal on NA wall controller.
- BB. FLT terminal. For wiring to mating terminal on NA wall controller.
- CC. Vun terminal. For wiring to mating terminal on NA wall controller.
- DD. NC terminal. Empty terminal. Do not wire to this terminal.
- EE. Vr terminal. For wiring to mating terminal on NA wall controller.
- FF. BLWR terminal. For wiring to mating terminal on NA wall controller.
- GG. COM terminal. For wiring to mating terminal on NA wall controller.
- HH. J4: Blower control jumper. Default is '0' position for CFM control.

- II. DEFR OPTS: Defrost Options jumper. Default position is the '0' position. Unit will be in defrost mode between 18°F - 8°F, and OFF when outside temperatures are below 8°F.
- JJ. DP IN: Delta pressure control input, negative side. Not functional without Pressureguard option installed (standard unit has air flow offset capabilities instead, see offsets).
- KK. Not connected. Empty socket.
- LL. DP IN: Delta pressure control input, positive side. Not functional without Pressureguard option installed (standard unit has air flow offset capabilities instead, see offsets).

Low Voltage Accessory: Overview and Limitations

Your RecoupAerator has the latest low voltage control technology, equipped with a 20 volt-ampere (VA), 120 to 24 VAC transformer. This auxiliary low voltage power can be accessed at the three-motor controller on the outside of the unit, under the exterior electrical cover. Use the screw terminals labeled 24 VAC LINE (1, 2, and 3) and 24 VAC RETURN (1, 2, and 3) to power low voltage accessories.

Limitations: Note that your RecoupAerator uses 4 VA under normal operating conditions, thus leaving 16 VA for optional accessories. Below is a list of accessories UltimateAir offers, along with their power usage.

PressureGuard	3 VA
CO ₂ sensing switch	3 VA
Dual Function Timer	1.4 VA

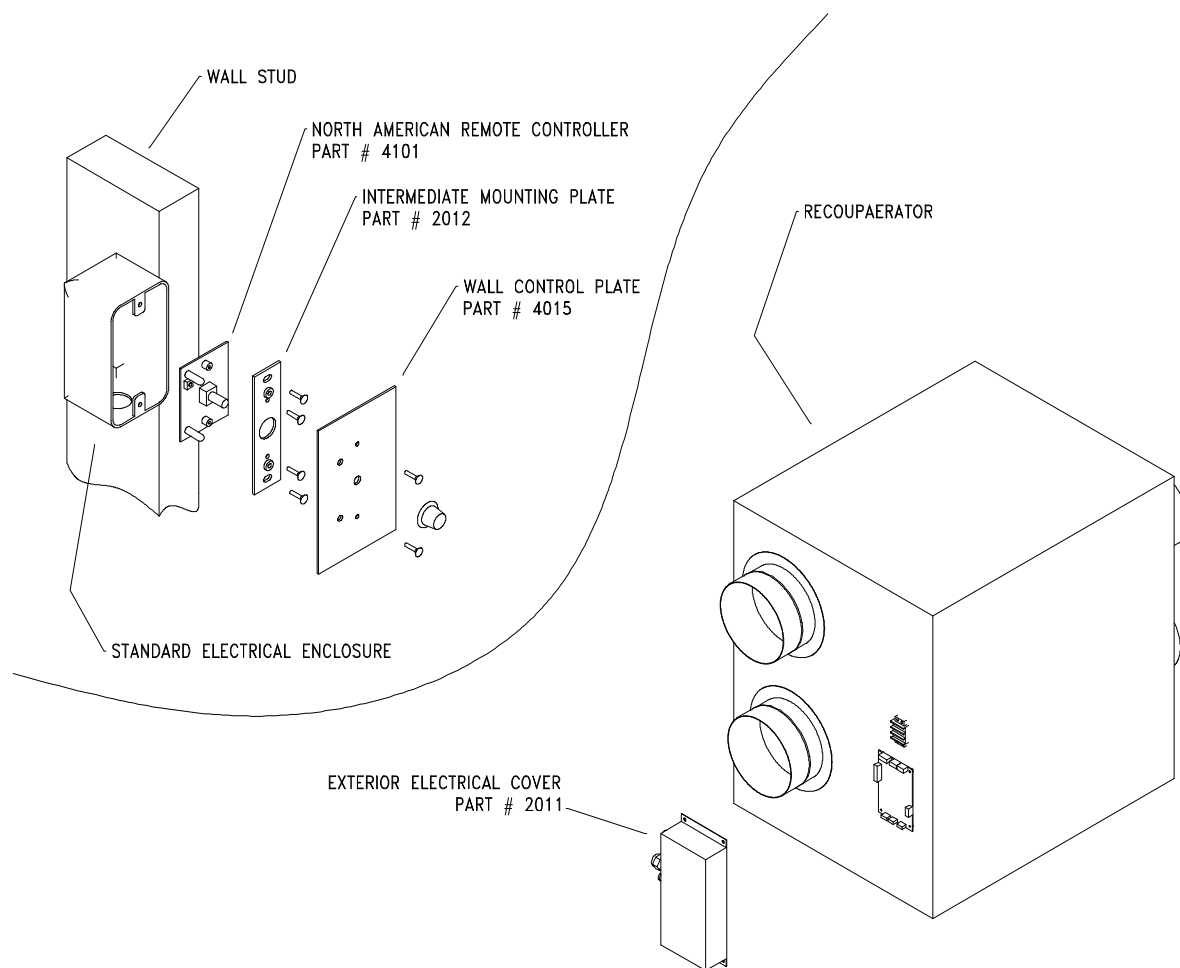
When designing your control strategy, keep in mind that you cannot over draw the 20 VA transformer in the RecoupAerator. Contact UltimateAir for more information.

North American Remote Wall Controller

Your unit was shipped with a remote wall controller pre-wired to the unit on a 30" cord. Locate the controller and follow the steps below to re-wire the controller to the unit.

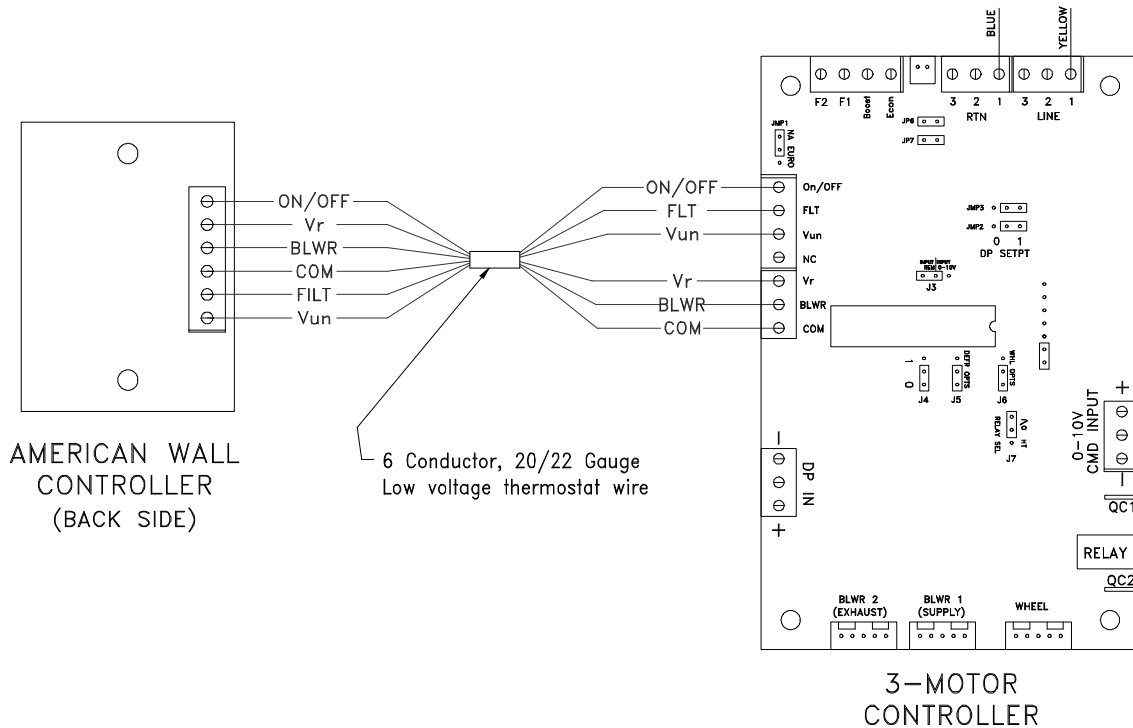
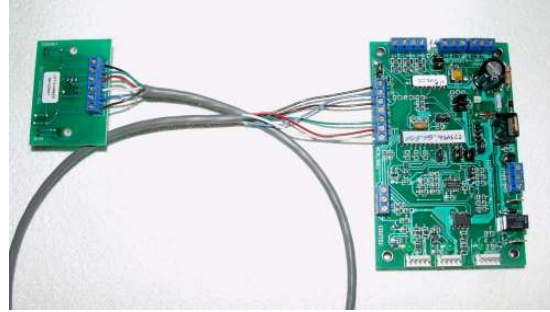
1. Be sure the unit is off and unplugged, or otherwise disconnected from power.
2. Remove the exterior electrical cover via the four #10 screws holding it in place, using a flat tip screw driver or a 5/16" nut driver.
3. Loosen the two strain reliefs on the face of the exterior electrical cover by unscrewing them. One will have the power cord through it. Feed the power cord into its strain relief and move the cover as far out of the way as the wires connected to it will allow.

- Determine the location where the controller will be mounted and obtain the appropriate length of 6-conductor wire (20/22 gauge). Run the wire from the unit to the wall controller's location following all applicable electrical codes. At the unit, the wire should pass through the smaller strain relief.



The North American remote wall controller installation

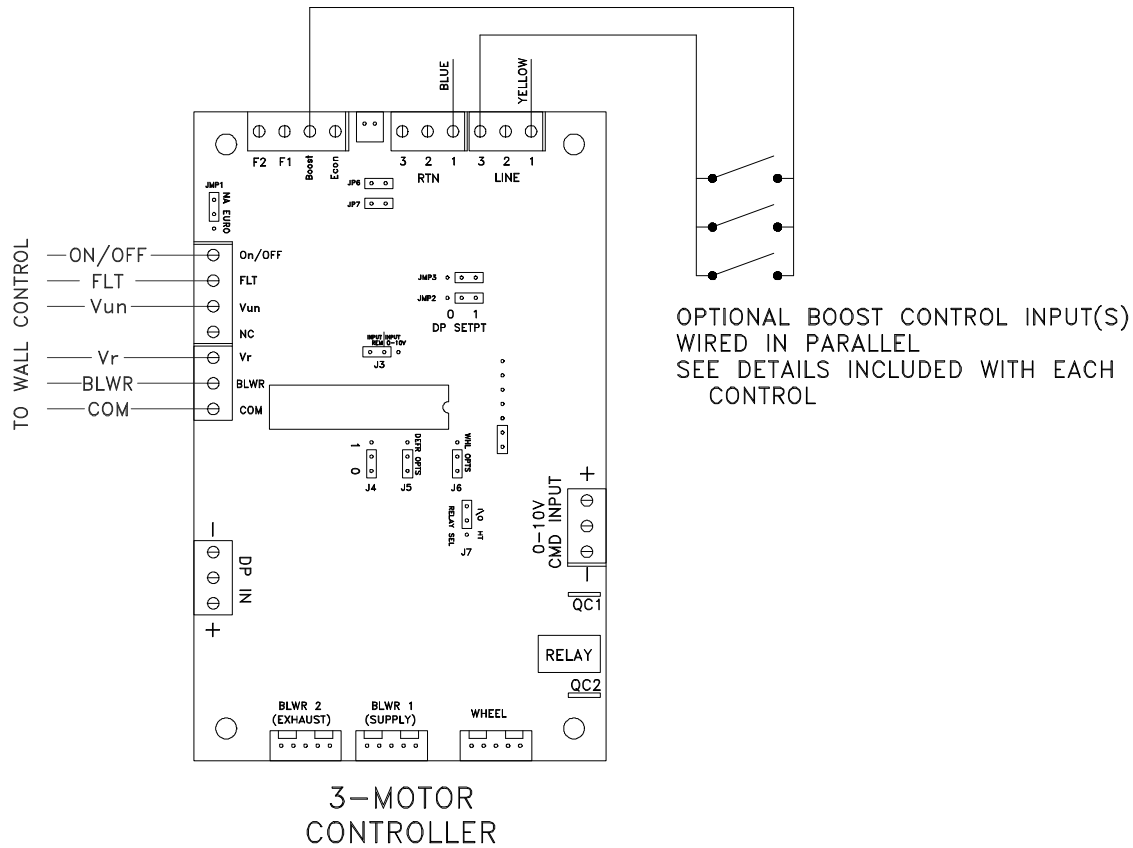
- Un-wire the pre-wired wall controller from the unit, making specific note as to how it is wired. You should have already run the unit before un-wiring, to be sure that everything is in working order.
- After stripping 1/4" of insulation from each of the wire ends, complete the wiring at both the unit and the wall outlet side according to the diagram below.



North American remote wall controller wiring

7. Match each labeled screw post with the corresponding post between the 3-Motor Controller and the American Wall Controller. Be sure all connections are tight by lightly tugging on each wire.
8. Re-assemble the wall box end, replace the exterior electrical cover, and tighten both strain reliefs at the unit.
9. If not wiring to a furnace, jumpers JP6 and JP7 (see designations in this manual) MUST be in place on the board. If wiring to a furnace, you MUST REMOVE jumpers JP6 and JP7. See furnace wiring for more detail in this manual.

Optional Boost Controls

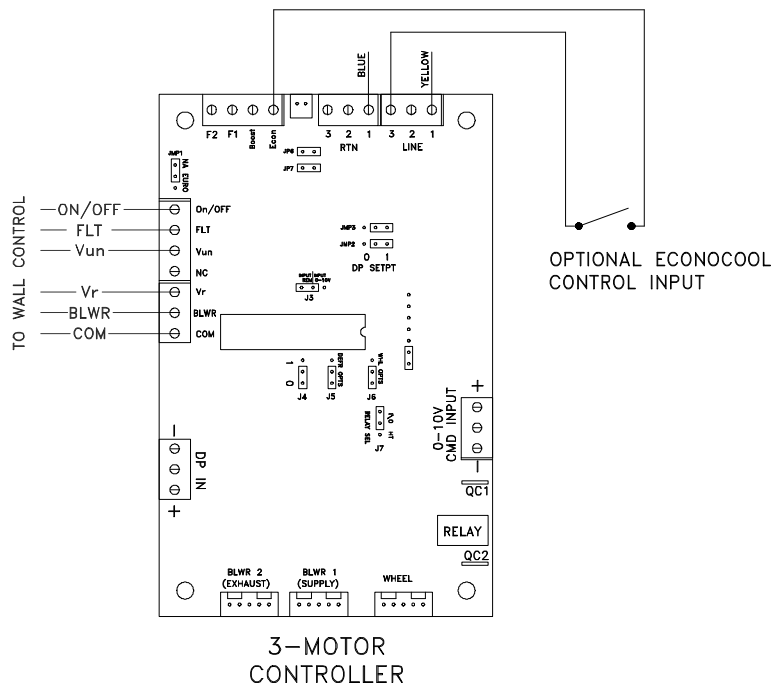


Boost control input wiring

On the three-motor controller, there is one screw terminal specifically for boost input. This feature allows for an override of the RecoupAerator's variable speed ability, so that users can ramp the unit to maximum air flow using a low-voltage signal input, from any wall control speed setting, including overriding the off position. Typically, boost inputs include bathroom timers, CO₂ monitors, and humidity monitors. Note that all controller relays must be capable of switching LOW VOLTAGE.

When wiring the controller, run two separate wires (20/22 gauge), connected to the three-motor controller as shown, to the outside of the exterior electrical cover and out of the strain relief. These wires will be used to wire your boost functions (leave extra length if the termination of these wires has yet to be determined). For further details on these options, please see the detailed instructions that came with your optional boost controls.

EconoCool™



Your RecoupAerator is EconoCool™-equipped, so that you can make use of outside air in summer (e.g., during the night) to cool your home or business, thereby providing AC energy savings. Using a temperature sensor on the incoming air stream, the RecoupAerator® automatically stops energy recovery at a preset temperature, usually between 55° and 70° Fahrenheit. The EconoCool switch must be on for this function to work. Typically, homeowners can turn this switch on in summer and off in winter.

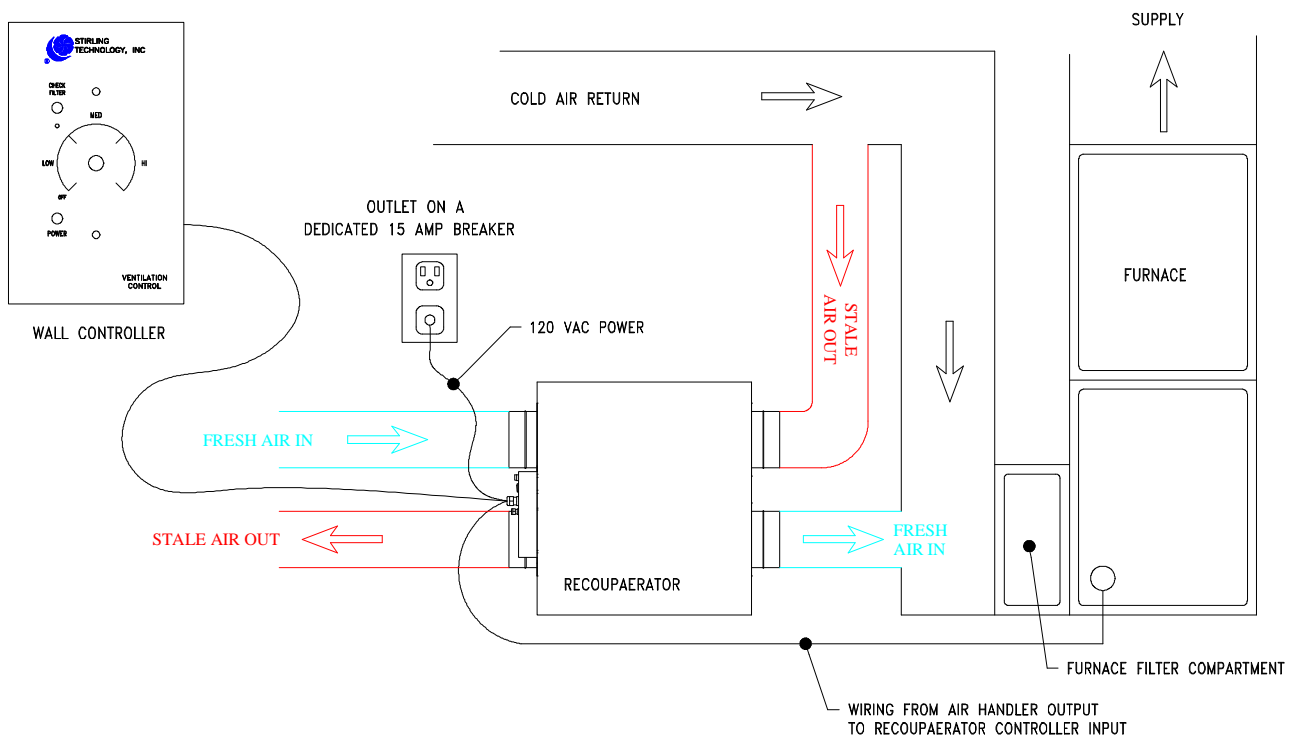
The EconoCool feature is an automatic feature, once enabled (turned on). The EconoCool feature is wired to an external switch so it can be regulated by the user, who can turn the switch on or off depending on conditions. For instance, if outdoor humidity is high, the user will probably not activate this feature. All RecoupAerator 200DX models are “EconoCool-equipped.”

Wiring to the Furnace

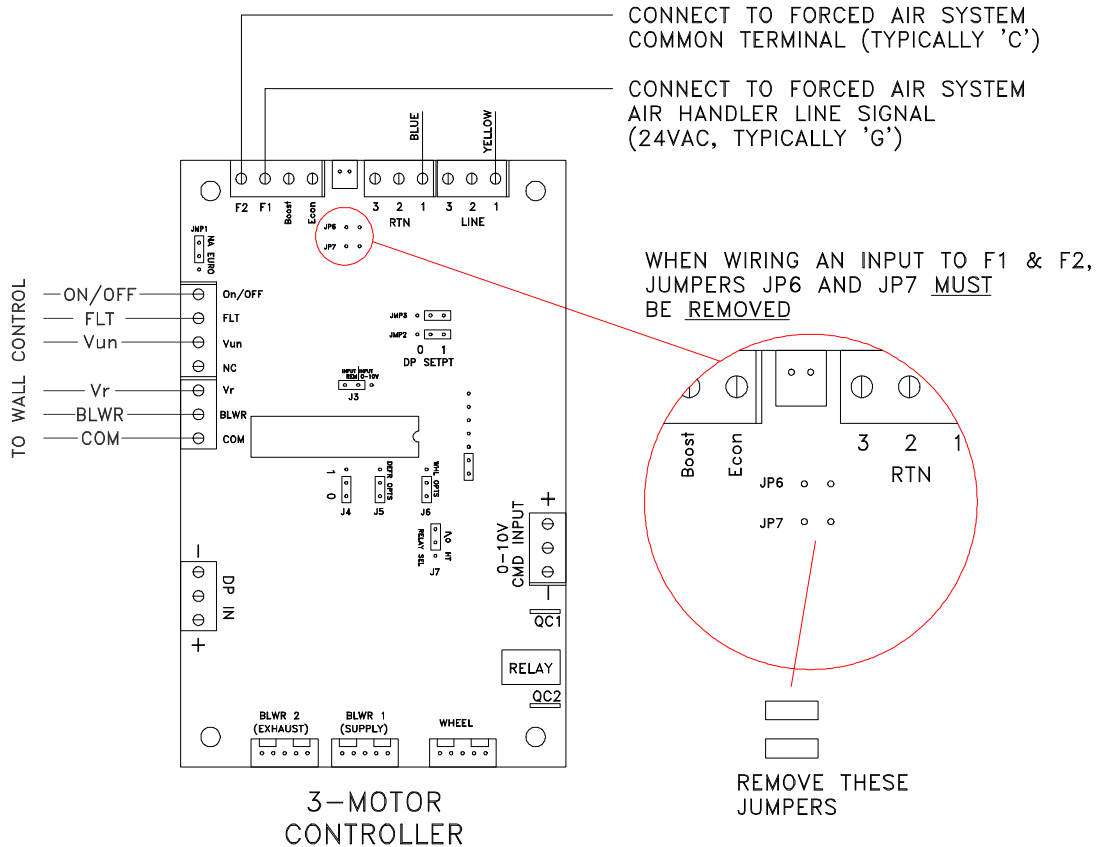
If you’re installing the RecoupAerator into existing forced air ductwork, you may need to operate it in conjunction with the furnace/AC air handler. (See ducting installation options) Having the RecoupAerator run only when the forced air system’s air handler is operating prevents recirculation inside the duct. To wire your RecoupAerator to existing forced-air

equipment, use the furnace or AC handler's manufacturer's wiring diagram in conjunction with the directions below.

1. Locate the low voltage output and common wires from the furnace (or air handling device), which output 24 VAC when the air handler comes on. The wires are usually denoted G for Go on the furnace fan and C for Common; refer to your furnace manufacturer's manual.
2. You **MUST REMOVE** jumpers JP6 and JP7, which are located just under the temperature sensor input, and are denoted as 'L' and 'M' on the 3-motor description at the beginning of this wiring section.
3. Run two wires (20/22GA) from your furnace to the input terminals on the controller denoted as F1 (24 VAC Line) and F2 (24 VAC common). This tells the ventilator to run only when the furnace (A/C) air handler is in operation. (For this purpose, never use a device that cycles the main power supply to the RecoupAerator. Use of this method to cycle the unit on and off is detrimental to the system electronics and will void the factory warranty.)



RecoupAerator-to-furnace typical installation configuration



Wiring the three-motor controller to a forced air system air handler

Optional Pressurization / Airflow Offset

Your RecoupAerator can affect your home's or business's indoor air pressure by allowing for an air flow offset between the incoming and outgoing air streams, thus discouraging moisture and gases from entering the wall cavities and/or interior space. Implement the optional airflow offset only if you're a qualified specialist familiar with indoor pressure-related issues. The factory setting for this feature is balanced air flow into and out of the space with respect to outside.

****Note:** the standard airflow offset feature is different from the PressureGuard™ option, which continuously samples indoor and outdoor pressure and adjusts airflow to provide for desired indoor air pressure. This option is covered in a separate manual.

1. To offset airstreams, locate the three-motor controller on the outside of the unit.
2. Remove the controller's exterior cover.
3. Inside on the 3-motor control board, locate the jumpers labeled JMP2 and JMP3, which determine the offset between the two air streams at maximum air flow. Notice on the board directly beside these jumpers are the numbers "0" and "1". These numbers refer

to the position of the jumpers. The factory setting is: JMP2 = JMP3 = 1, which means no offset is in effect and the unit will provide balanced supply and exhaust air flow.

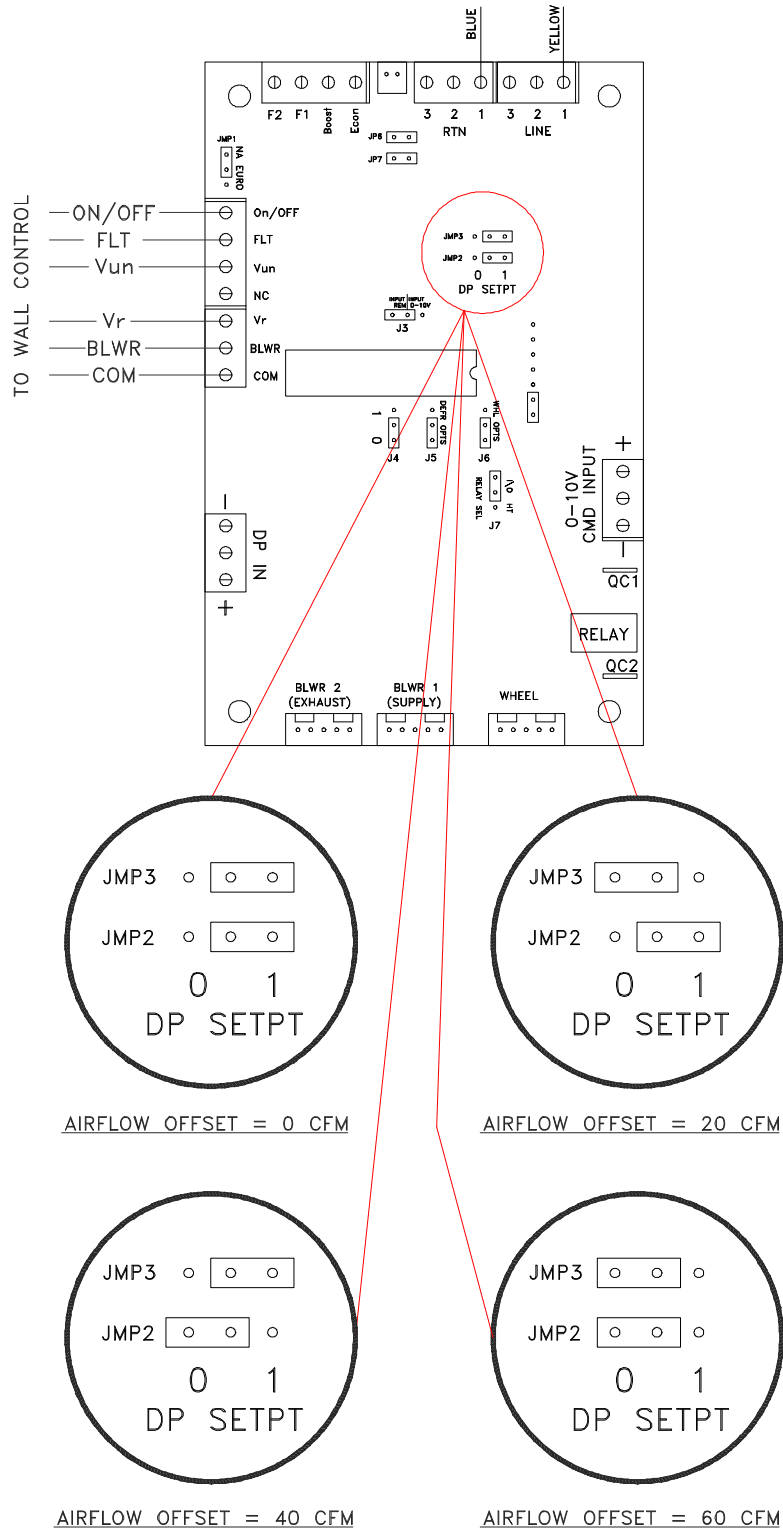
4. To change the selection, shut off the unit and disconnect the power source for at least 20 seconds.
5. Move the jumpers to set the jumper configurations for their corresponding air flow offset as follows:

JMP2=JMP3=1	no offset (balanced)
JMP2=1, JMP3=0	~20 cfm offset
JMP2=0, JMP3=1	~40 cfm offset
JMP2=0, JMP3=0	~60 cfm offset

*Note: airflow is approximate.

*See diagram below for further instruction

When an offset is selected, the unit will drop the exhaust air flow by the specified amount at the maximum air flow setting. At lower air flow settings, the air streams will become proportionally closer together until they are equal at the minimum air flow.

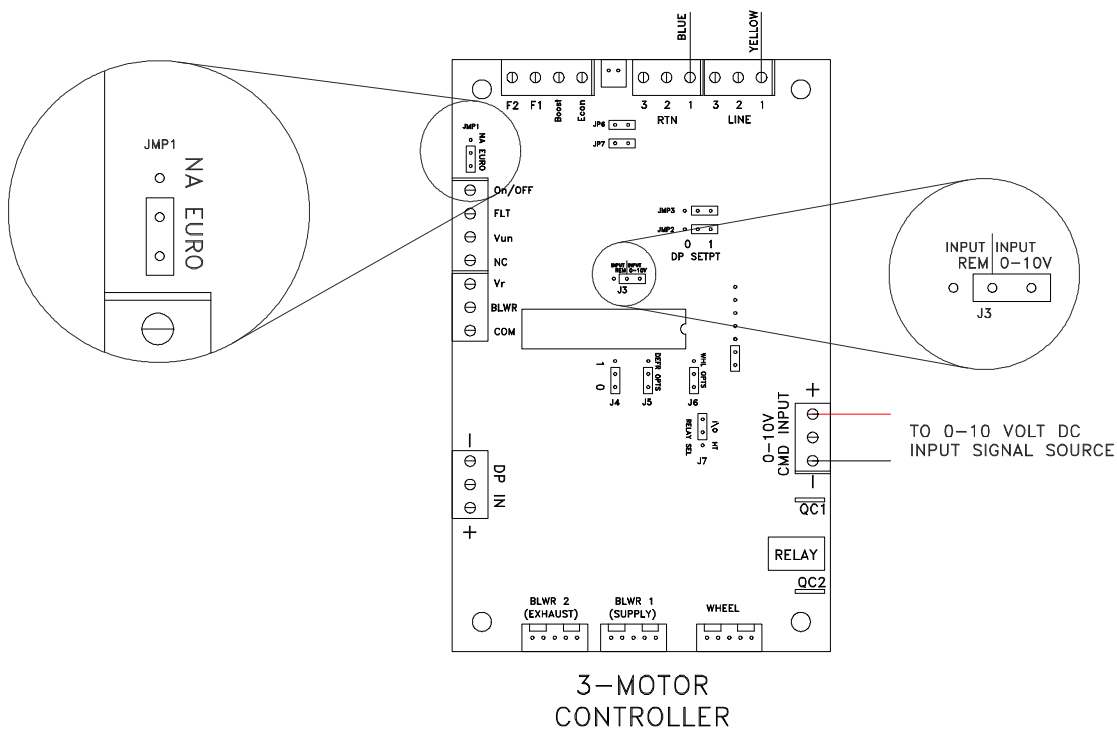


Airflow offset jumpers

Using a 0-10 VDC Input Signal Control System

Your RecoupAerator can be programmed into a “smart house” control, so that it can be controlled remotely or using any 0-10 VDC control signal. To set up a 0-10 VDC input signal control system, **disconnect all power to the unit** and proceed as follows:

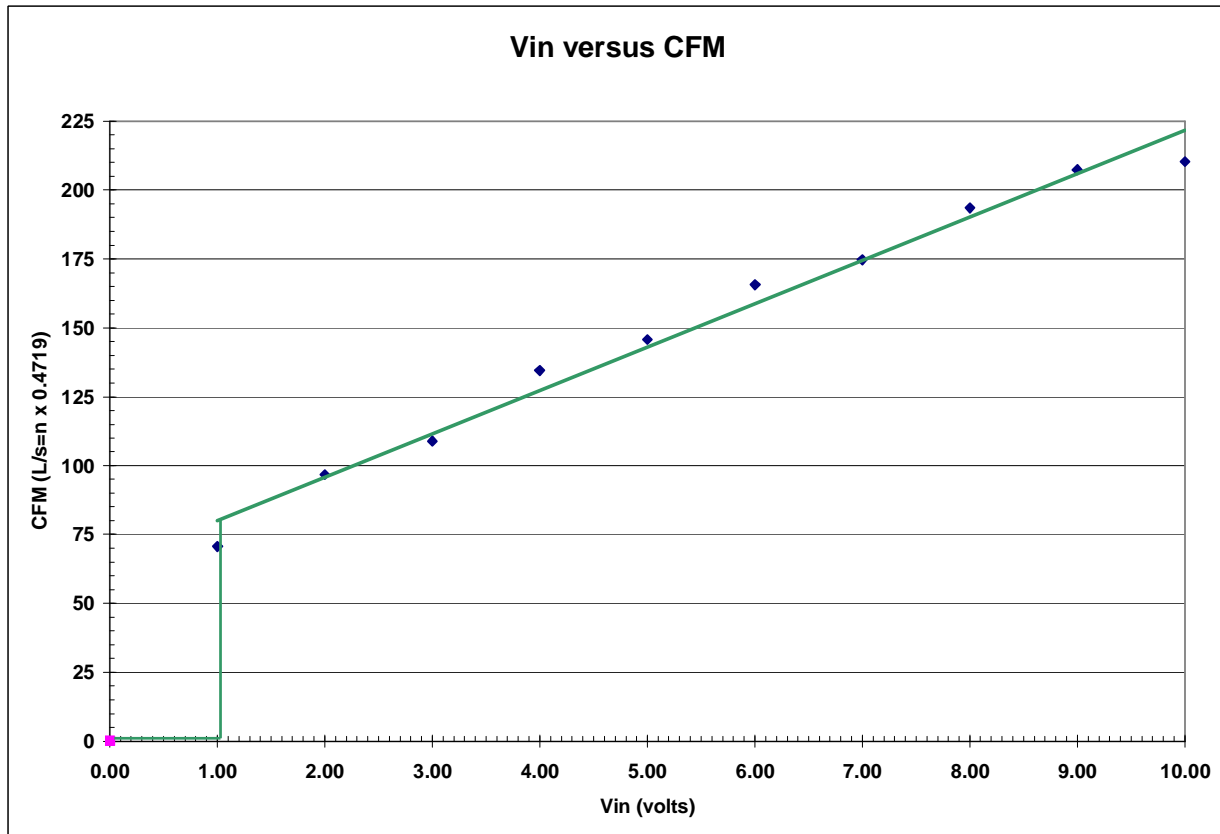
1. Set jumpers JMP1 to the EU position, and J3 to the 0-10V INPUT position on the three-motor controller as shown in the drawing below to enable the 0-10 VDC control input.
2. If a wall controller is attached to the unit, remove it. You do not need a wall controller when operating the unit with a 0-10VDC input control signal.



0-10 VDC Input wiring and setting on the three-motor controller

3. Locate the two screw terminals labeled “0-10V CMD INPUT”, as shown above, and connect the signal control wires to these posts as indicated.

Boost, EconoCool™, air flow offsets, and furnace input functions are still operational when using the 0-10V input signals to control the unit. Review the below graph for the input VDC versus airflow relationship to help program your control.

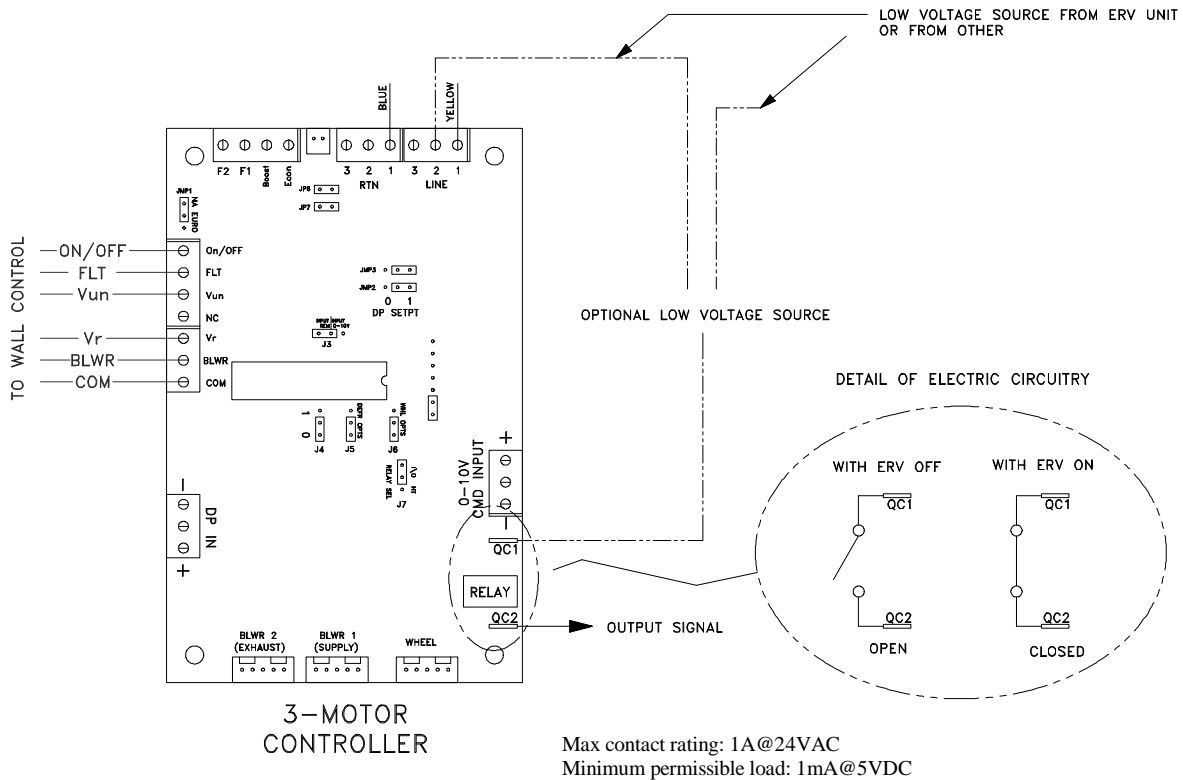


Note: Curves are generated from actual test data but should only be used as general guidelines. Actual results may vary.

Input (VDC) vs. air flow (CFM)

Optional Auxiliary Output

Your RecoupAerator allows you to run auxiliary options, such as duct power dampers, fans, humidifiers, and dehumidifiers. For instance, you can use the auxiliary output to turn on the furnace fan. Your RecoupAerator is equipped with a low-voltage pilot-duty relay (normally open) on the three-motor controller (denoted 'X' in the 3 motor controller description). The relay controls any auxiliary options you may want to operate in conjunction with your ventilation unit. When the RecoupAerator is turned on by the remote wall controller or by other means (e.g., fan, furnace, boost, and building input), the relay switches from normally open to closed, completing the circuit between QC1 (1/4" quick-disconnect tab) and QC2 (1/4" quick-disconnect tab), denoted as "W" and "Y" on the 3 motor controller description. Jumper J7 must be in the I/O position for this relay to activate on unit start.



Wiring auxiliary output

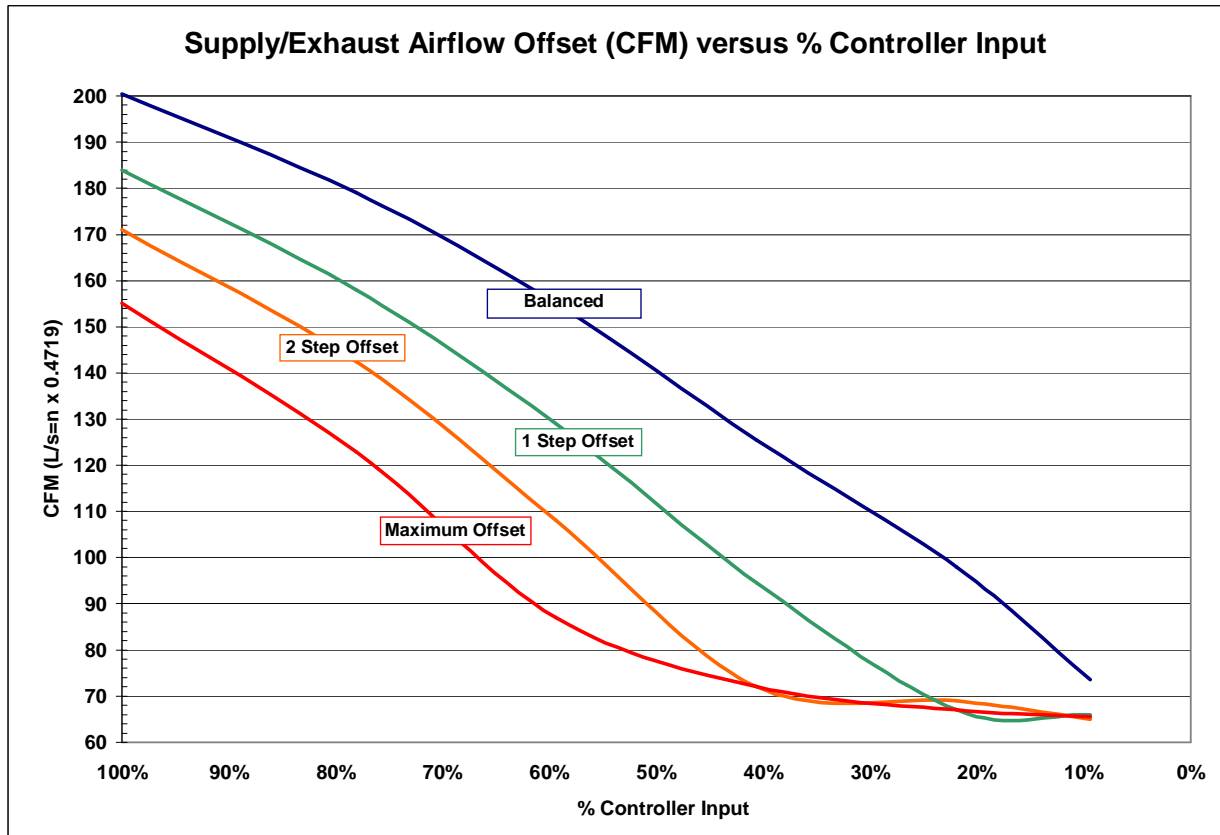
Tips on Making a Noisy Duct System Quieter

In some installations, the unit may be too noisy for the occupants. Here are some options for correcting the situation:

1. When installing the unit, allow for a three-foot section of insulated flexible duct to go from the starting collar on the unit to the rest of the ductwork (on all four collars). This will help dampen noise being transmitted from the unit into the home or business, at the source.
2. Locate the unit farther away from the source of the noise pollution area (e.g., if the unit is close to a living room vent where the noise is too loud, locate the unit farther away from this location). This will allow the noise to dissipate in the longer duct length.
3. Purchase duct muffler(s) for the duct that is too loud.
4. Wire the unit to run only with the furnace air handler.
5. Run the unit at lower speeds.

Technical Data

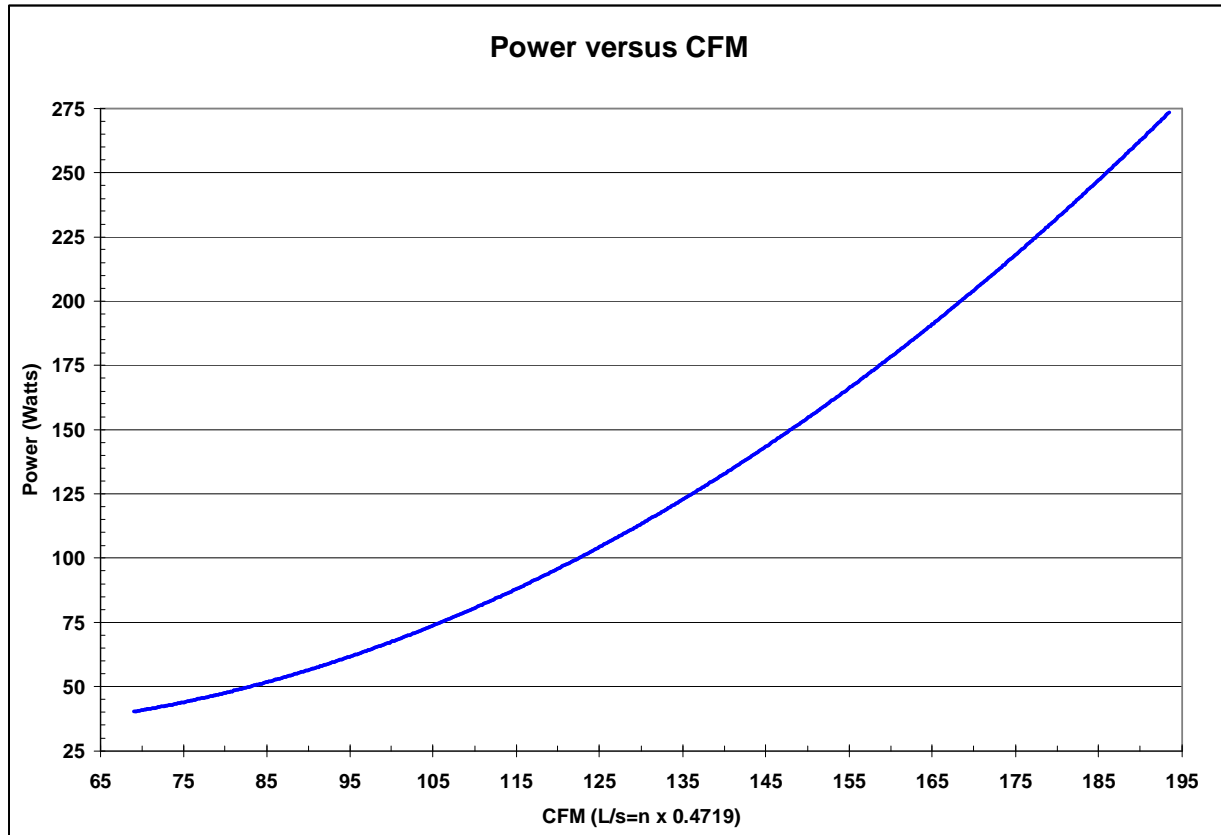
Airflow Curve



Note: Curves are generated from actual test data but should only be used as general guidelines. Actual results may vary.

Illustration 1. Airflow Curves

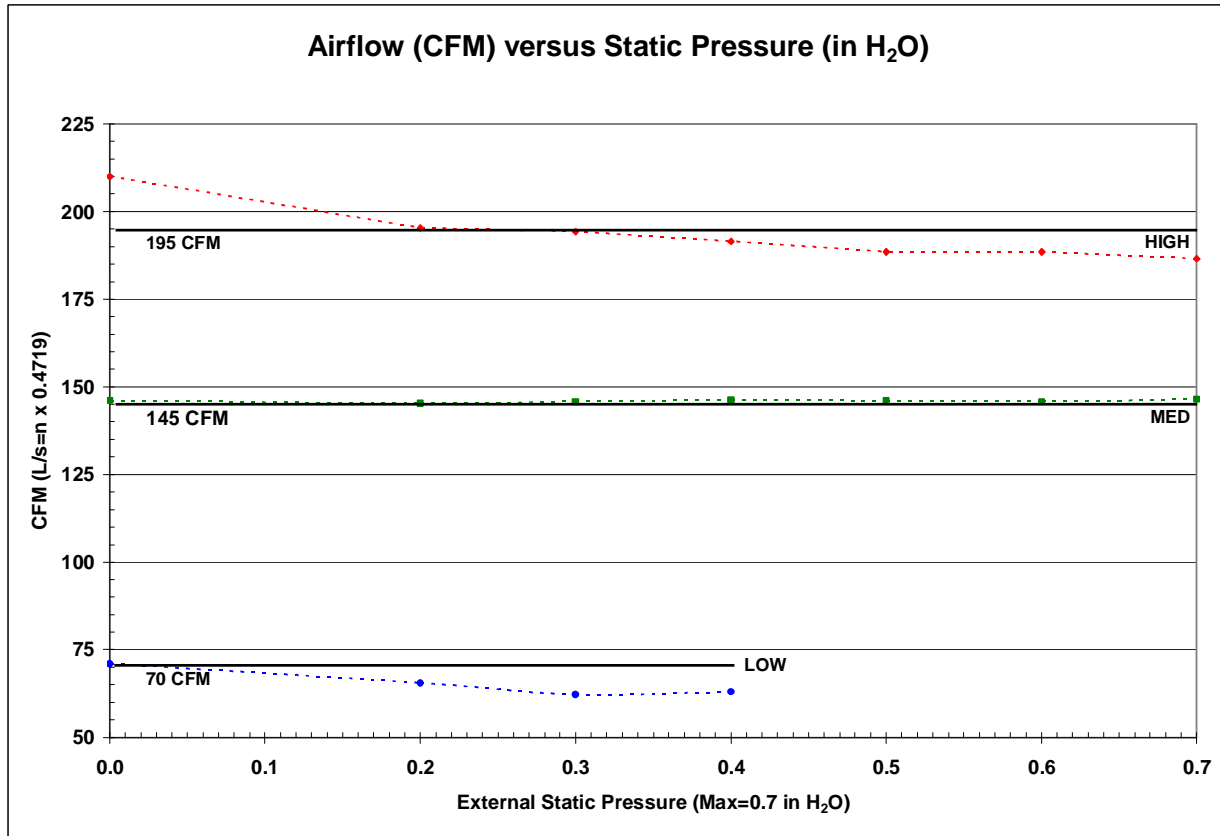
Power Curve



Note: The power curve was generated using the average air flow rate over all four ducts.

Illustration 2. Power vs. cfm

Fan Curves



Note: Curves are generated from actual test data and should only be used as general guidelines. Actual results may vary.

Illustration 3. Airflow (cfm) vs. static pressure (in H₂O)

General Warranty Information

Be sure to promptly return your warranty registration to ensure your product is registered.

Your RecoupAerator is guaranteed to be free from defects in materials or workmanship for five (5) years from the date of purchase. See Warranty document (not part of this manual) for complete warranty information. If you have lost your warranty or have questions concerning your warranty protection, email us at info@ultimateair.com.

Installation Record

Date of Purchase:		Model #:	
Date of Install:		Serial #:	
Contractor Info			
Company		Contact Person	
Address			
City, State Zip		Phone	
Notes			

Serial No: 12904 - xxxxx