Fantech
Your Ventilation Solutions Company

KHP Series
Heat Recovery Ventilator

IMPORTANT - PLEASE READ THIS MANUAL BEFORE INSTALLING UNIT

CAUTION - Before installation, careful consideration must be given to how this system will operate if connected to any other piece of mechanical equipement, i.e. a forced air furnace or air handler, operating at a higher static. After installation, the compatibility of the two pieces of equipment must be confirmed by measuring the airflow's of the Heat Recovery by using the balancing procedure found in this manual.
It is always important to assess how the operation of any HRV may interact with vented combustion equipment (i.e. Gas Furnaces, Oil Furnaces, Wood Stoves, etc.).

NEVER - install a ventilator in a situation where its normal operation, lack of operation or partial failure may result in the backdrafting or improper functioning of vented combustion equipment!!!

Your ventilation system should be installed in conformance with the appropriate provincial or state requirements or in the absence of such requirements with the current edition of the National Building Code, and / or ASHRAE's " good Engineering Pratice".

KHP 6000

KHP MODEL FOR LIGHT COMMERCIAL

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

The Best Limited Warranty in the Business

- The heat recovery heat pipe core has a limited lifetime warranty.
- The motors found in all Fantech HRV's require no lubrication, and are factory balanced to prevent vibration and promote silent operation.
- The limited warranty covers normal use. It does not apply to any defects, malfunctions or failures as a result of improper installation, abuse, mishandling, misapplication, fortuitous occurrence or any other circumstances outside Fantech's control.
- Inappropriate installation or maintenance may result in the cancellation of the warranty.
- Any unauthorized work will result in the cancellation of the warranty.
- Fantech is not responsible for any incidental or consequential damages incurred in the use of the ventilation system.
- Fantech is not responsible for providing an authorized service centre near the purchaser or in the general area.
- Fantech reserves the right to supply refurbished parts as replacements.
- Transportation, removal and installation fees are the responsibility of the purchaser.
- The purchaser is responsible to adhering to all codes in effect in his area.
- The warranty is limited to 5 years on parts and 7 years on the motor from the date of purchase, including parts replaced during this time period. If there is no proof of purchase available, the date associated with the serial number will be used for the beginning of the warranty period.

* *This warranty is the exclusive and only warranty in effect relative to the ventilation system and all other warranties either expressed or implied are invalid. Please fill out the warranty registration and return it within two weeks of purchase or the warranty will be voided.*

1 cfm = 0.47189 l/s
1 l/s = 3.6 m³/hr

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Sizining (Example) for maximum airflow normally required.

HRV's are typicaly sized to be able to ventilate the whole house at a maximum of 1/3 of an air change per hour. To calculate this simply take the square footage of the home (including basement)
multiply by the height of the ceiling to get cubic volume, and then multiply that by .005.

Example:		
	SQFT of House	1100
	Basement	1100
	Total SQFT	2200
	Height of ceiling	x 8
	Cubic volume	17600
		x .005
	Maximum airflow required (CFM)	88

* Always consult your local code for sizing requirements in your area.

Room classification	Number of rooms	CFM (L/s)	CFM Required
Master bedroom		x 20 cfm (10 l/s)	=
Basement	yes or no	if yes add 20 cfm / 10 l/s if no = 0	=
Bedrooms		x 10 cfm (5 l/s)	=
Living room		x 10 cfm (5 l/s)	=
Others		x 10 cfm (5 l/s)	=
Kitchen		x 10 cfm (5 l/s)	=
Bathroom		x 10 cfm (5 l/s)	=
Laundry room		x 10 cfm (5 l/s)	=
Utility room		x 10 cfm (5 l/s)	=
		Total ventilation Requirements (add last column)	=

TECHNICAL DATA - KHP 6000 HEAT RECOVERY VENTILATOR

Components

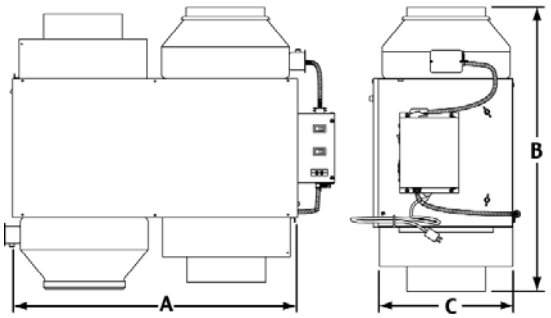
CASE	-	22 gauge textured steel with powder coat, lined with strong top quality insulation.
HEAT RECOVERY CORE	-	Rugged construction heat pipe core comes with state of the art technology in design for best performance and recovery.
FILTERS	-	Synthetic high quality filters for better indoor air quality and clean air.
UNIT CONTROLS	-	The unit is controlled by a three way rocker switch. The *low/standby/med* switch lets you choose between continuous operation and standby, (off). High speed is available when the unit is connected to an optional remote control.
INSTALLATION COMPONENTS	-	Each unit come complete with mounting brackets, drain nipple, hose and installation manual.
BLOWERS	-	The motors are factory-balanced to prevent vibrations, providing greater comfort without noise pollution. - Fans equipped with motors of insulation class "B" The motors are completely sealed , keeping out moisture and dust. The motors feature maintance-free bearings and are the most dependable and efficient on the market. - Built-in thermocontact prevents overheating - Increased corrision protection.
DEFROST	-	Fan shutdown

Dimensions

KHP 6000 modes of operation

Intermittent

Continuous



Model	A	B	C
KHP 6000	742 mm (29")	711 mm (28")	356 mm (14")

KHP 6000 come with 254 mm (10") port collars.

KHP Series Performance Data

Model	Airflow Cap. L/s (cfm)			Heat Recovery at 0°C (32°F)			Heat Recovery at -25°C (-13°F)		Electrical Data	
	High	Med	Low	Net Airflow L/s (cfm)	Sensible Recovery Efficiency	Apparent Sensible Effectiveness	Sensible Recovery Efficiency	Apparent Sensible Effectiveness	Volts	Amps
KHP 6000	264 (559)	–	–	176 (372)	–	55 %	–	57 %	120 V	3.5 A

Model		External Static Pressure Pa (inW.C.)				
		25 (0.1)	50 (0.2)	75 (0.3)	100 (0.4)	125 (0.5)
KHP 6000	Airflow L/s (cfm)	264 (559)	255 (540)	240 (509)	222 (470)	209 (442)

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OPERATION

A Heat Recovery Ventilator (HRV) is designed to provide fresh into a building while exhausting an equal amount of stale air. During the winter months, the incoming cold fresh air is warmed by utilizing the heat recovered from the stale air before it is exhausted to the outdoors. During summer months when the indoor space is air conditioned, the HRV will help in cooling the incoming fresh air with the stale air that is being exhausted.

Fantech HRV's are designed to run continuous or on intermittent, giving the homeowner complete control over their air quality. Continuous low speed ventilation is recommended, which will help eliminate carbon dioxide, voc's and other gases as well as freshen up the home. Intermittent high speed ventilation can be obtained through a variety of optional remote controls found in this manual (page 6). Below are some examples of seasonal operation of an HRV.

Winter:
Humidity control is very important during the winter months. This is when problems will be most apparent since condensation on the windows will often occur. The colder the outside temperature, the greater the risk of condensation in the home. The average relative humidity should be maintained between (30-60) to avoid condensation. Low speed continuous ventilation with high speed override is recommended.

Spring:
Temperatures are more moderate and become warmer each day. To keep the humidity and temperature uniform, set the dehumidistat higher and the switch on the HRV to standby.

Summer:
The air is sometimes hot and humid. To stop the warm humid air from entering, set the dehumidistat at its highest level and the switch on the HRV to standby. However, continuous ventilation is recommended.

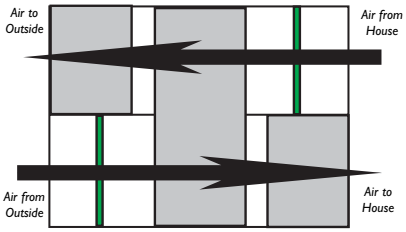
Fall:
Rain and rapid temperature changes make it difficult to control the internal humidity level and may result in condensation on the windows. A remote dehumidistat may help give greater control over the inside environment.

NOTE: Some products may not be exactly as illustrated in the Installation, Operation and Maintenance Manual.

Fantech Inc. reserves the right to modify, at any time and without notice, any or all of its products' features, designs, components and specifications, to maintain their technological leadership position.

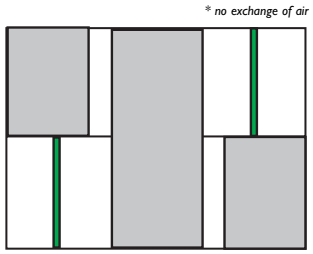
OPERATION (CON'T)

MODES OF OPERATION



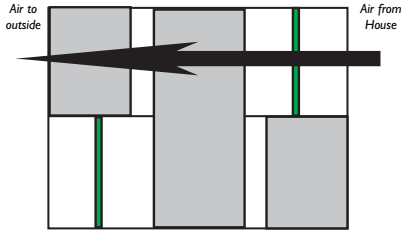
1. Continuous / Ventilation Mode

In this mode of operation both fans are operating and exchanging air with the outside. The heat recovery ventilator (HRV) constantly exchanges the air at the rate you select, either at low or medium speed, and switches to high speed when activated by an optional remote control. The "Low" and "Med" fan speed selection will cause the unit to operate in continuous exchange mode at an exchange rate of 35% and 50% maximum airflow rating respectively. Continuous mode is recommended, since pollutants are slowly but constantly being generated in your house.



2. Intermittent / Standby Mode (KHP Series of HRVs)

The system is always on standby and operates at high speed when activated by an optional remote control. "Standby" should be selected if the user wishes to stop the unit from continuous exchange. We recommend that the "Standby" mode only be used if your system is equipped with an optional external control, in which case, the unit would activate to "High" fan speed, until the control is satisfied and then return to standby (off).



3. Defrost (Fan shutdown 4 port models)

The automatic defrost cycle KHP models of HRV's consists of a fan shutdown. When the supply air stream temperature goes below -5°C (23°F), the supply motor shuts down and the exhaust motor goes in to high speed. Ambient air is passed through the unit until fully defrost. The supply motor will then re-start and run at the preset speed. The exhaust motor will also slow down to the preset speed. This fan shutdown defrost cycle continues until the supply air stream rises above 0°C (32°F).

OPTIONAL REMOTE CONTROLS

PRACTICAL TIPS

To avoid window condensation:

- *It is not necessary to change the humidity control every day. Monitor the average weekly temperature or experiment with various settings until you find a level that is comfortable for you. Adjust the control when needed.*

Dehumidistat I

The wall mount dehumidistat monitors the humidity level in the area it is installed. When the humidity level rises above the desired set-point, the HRV will activate to high speed/override mode. Once the humidity level returns to desired condition, the unit will return to the normal mode.
2 low voltage wires required for operation.

Air Quality Sensor

The wall mount Air Quality Sensor (AQS) monitors indoor air quality and activates the override mode when carbon monoxide, formaldehyde, benzene, volatile organic compounds and other pollutants are detected. The unit will then return to normal mode once the air pollutants are reduced to a pre-determined lower level.
Three low voltage wires are required for operation with transformer

* This control is not a warning device.

* All controls are low voltage. 18 to 24 gauge wire is recommended.

INSTALLATION

PRACTICAL TIPS

- *Install the unit close to the outside wall on which the supply and exhaust hoods will be mounted.*
- *Have a nearby power supply 120 Volts, 60 Hz.*
- *Have the possibility of mounting the unit to supporting beams.*
- *Mount the unit as level as possible in order to allow proper condensate drainage.*
- *Have access to a water drain for the condensate of the unit during defrost.*
- *Have a certain amount of heat around the unit (attic installation is not recommended).*
- *Minimize any noise level that would be created by the unit in the living area.*
- *Have access for future maintenance.*

LOCATION

The HRV must be located in a heated space where it will be possible to conveniently service the unit. Typically the HRV would be located in the mechanical room or an area close to the outside wall where the weatherhoods will be mounted. If a basement area is not convenient or does not exist, a utility or laundry room may be used.

Attic installations are not normally recommended due to:

- the complexity of work to install
- freezing conditions in the attic
- difficulty of access for service and cleaning

Connecting appliances to the HRV It is not recommended, incuding:

- clothes dryer
- range top
- stovetop fan
- central vacuum system

These appliance may cause lint, dust or grease to collect in the HRV , damaging the unit.

NOTE: Connecting any of these type of appliances to the HRV will invalidate your warranty.

MOUNTING

1 Place Fastening brackets on the strapping board or the floor joists.

2 Hang the unit by inserting the bolts (2) in the back of the unit and by putting the wing nuts on the bolts in front of the unit.

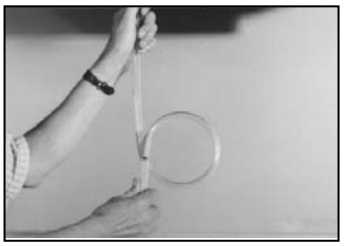
3 Place the machine in a neutral position. (Make sure the wing nuts are in between summer and winter settings.) In this neutral position the machine should be perfectly level.

Installing Drain Line

Through normal operation and during its defrost mode, the HRV may produce some condensation. This water should flow into a nearby drain, or be taken away by a condensate pump. The HRV and all condensate lines must be installed in a space where the temperature is maintained above the freezing point. A "P" trap should be made in the drain line. This will prevent odors from being drawn back up into the unit.

1 Place the unit in winter mode if it is winter.

2 Place the unit in summer mode if it is summer.



3 Install the drain hose, making a "P" trap

INSTALLING DUCTS GOING TO / FROM OUTSIDE

A well designed and installed ducting system will allow the HRV to operate at its maximum efficiency. Always try to keep duct runs as short and straight as possible.
See Installation Diagrams for installation examples.

PRACTICAL TIPS

- *Decide where your intake and exhaust hoods will be located.*

Locating the Intake Weatherhood

- *Should be located upstream (if there are prevailing winds) from the exhaust outlet*
- *At least 6' (2m) from the exhaust weatherhood*
- *At least 6' (2m) away from dryer vents and furnace exhaust (medium or high efficiency furnaces)*
- *A minimum of at least 6' (2m) from driveways, oil fill pipers, gas meters, or garbage containers*
- *At least 18" (457mm) above the ground, or above the depth of expected snow accumulation*
- *At least 3' (1m) from the corner of the building*
- *Do not locate in a garage, attic or crawl space*

Locating the Exhaust Weatherhood

- *At least 6' (2m) from the ventilation air intake*
- *At least 18" (457mm) above ground or above the depth of expected snow accumulation*
- *At least 3' (1m) away from the corner of the building*
- *Not near a gas meter, electric meter or a walkway where fog or ice could create a hazard*
- *Not into a garage, workshop or other unheated space*

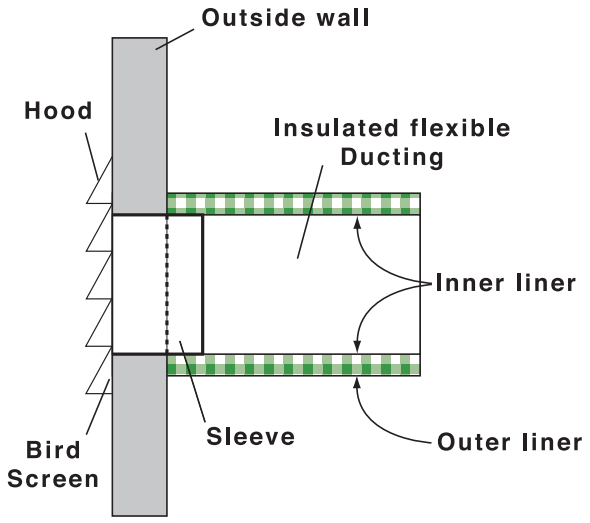
When installing the weatherhood, it's outside perimeter must be sealed with exterior caulking.

INSTALLING THE DUCTING TO THE WEATHERHOODS

The inner liner of the flexible insulated duct must be clamped to the sleeve of the weatherhoods (as close to the outside as possible) and to the appropriate port on the HRV. The insulation should remain full and not be squished. The outer liner, which acts as a vapor barrier must be completly sealed to outer wall and the HRV using tape and or caulking. A good bead of high quality caulking (preferably acoustical sealant) will seal the inner flexible duct to both the HRV port and the weatherhood prior to clamping.

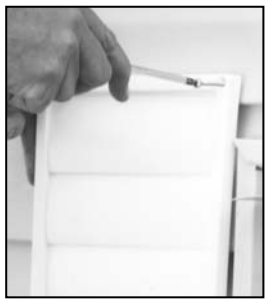
To minimize air flow restriction, the flexible insulated duct that connects the two outside weatherhoods to the HRV should be stretched tightly and be as short as possible.

Twisting of folding the duct will severely restrict air flow.

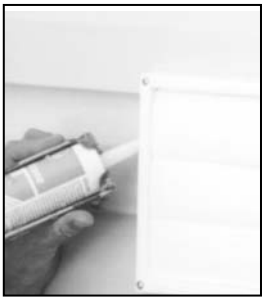


1 Using the collar of the outside hood, outline the intake & exhaust holes to be cut. The holes should be slightly larger than the collar to allow for the thickness of the insulated flexible duct. Cut a hole for both the intake and exhaust hoods.

2 Pull the insulated flexible duct through the opening until it is well extended and straight. Slide the duct's inner vinyl sleeve over the hood collar and secure, pull the insulation over the duct and then the vapour barrier over the sleeve and secure with duct tape.



3 Push the hood into the opening. Attach the hood to the outside wall with mounting screws. Repeat the installation procedure for both the Supply and Exhaust hood.



4 Using a caulking gun, seal around both hoods to prevent any leaks.

INSTALLING DUCTS TO / FROM INSIDE

To maximize airflow in the ductwork system, all ducts should be kept short and have as few bends or elbows as possible. Forty-five degree are preferred to 90o elbows. Use "Y" tees instead of 90o elbows whenever possible.
All duct joints must be fastened with screws or duct sealant and wrapped with a quality duct tape to prevent leakage. Aluminum foil duct tape is recommended. Galvanized ducting from the HRV to the living areas in the house is recommended whenever possible, although flexible duct can be used in moderation when necessary.

SUPPLY AIR DUCTING

In homes without a forced air furnace, fresh air should be supplied to all habitable rooms including, bedrooms and living areas. It should be supplied from high wall or ceiling locations. Grilles that diffuse the air comfortably such as Grilles are recommended.To avoid possible noise transfer through the ductwork system, a short length (approximately 12", 300 mm) of nonmetallic flexible insulated duct should be connected between the HRV and the supply/exhaust ductwork system.
The main supply and return lines to/from the HRV must be 10 inches (254 mm) minimum. Branch lines to the individual rooms may be as small as 4 inches (100 mm), but 5 inch (125 mm) lines are preferred.If the floor is the only option available, then special care should be taken in locating grilles. Areas such as under baseboard heaters will help to temper the air. Also optional inline duct heaters are available for mounting in the supply duct work to add heat if required.In homes with a forced air furnace, you may want to connect the HRV to the furnace ductwork (see information below).

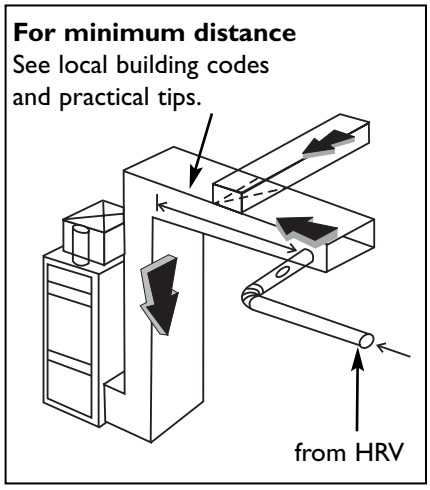
PRACTICAL TIPS

- *Building Codes and Combustion Appliance Installation Codes do not allow location of return air grilles or any opening such as a "breathing tee" in an enclosed room with spillage susceptible combustion appliances.*

- *The fresh air inlet from the HRV needs to respect a minimum distance from the furnace return drop to ensure proper air mixing and temperature at the furnace core.*
  See furnace manufacturer for appropriate specifications.

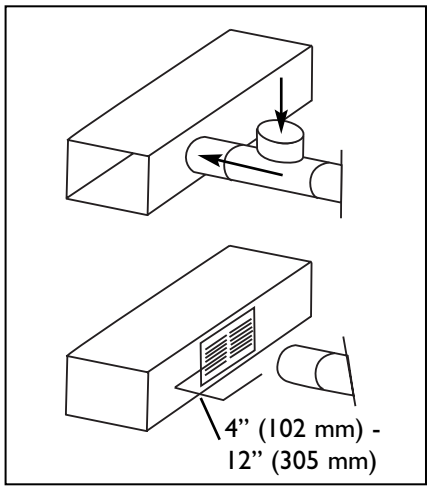
Direct Connection

- A direct connection requires that the fan of the furnace runs continuously. It may be inter-linked electrically (low voltage) with the HRV (Accessory Control Contacts) for intermittent demand. Should you wish to hard duct the supply air directly into the cold air return of the furnace, remember to check the airflow balance of the HRV with the furnace fan both "on"and "off" to determine that it does not imbalance the HRV more than 10%. Make sure you respect the minimum distance from the supply air in of the HRV and the furnace (Refer to your local and National Building & Heating Codes for any variations in these notes).



Indirect Connection

- The fresh air from the HRV may be directed at a grill installed in the cold air return duct of the furnace. In this installation, the supply outlet should be a minimum of 4" and a maximum of 12" from the furnace return air inlet. The forced air system should include a two speed fan. Except when high speed is required for heating, the fan should be operated continuously on low speed. Accordingly, fresh air will be supplied without affecting the comfort of the occupants. The installation can also be done with a "breathing tee" (Refer to your local and National Building & Heating Codes for any variations in these notes).



INSTALLING DUCTS TO / FROM INSIDE (CON'T)

Exhaust Air ducting

The stale air exhaust system is used to draw air from the points in the house where the worst air quality problems occur. It is recommended that return air ducts be installed in the bathroom, kitchen, and laundry room. Additional return air ducts from strategic locations (i.e. greenhouse, atrium, swimming pool, sauna, etc.) may be installed. The furnace return duct may be also used to exhaust from. In this method, the exhaust air is not ducted back from bathrooms, kitchens, etc to the HRV with "dedicated lines".

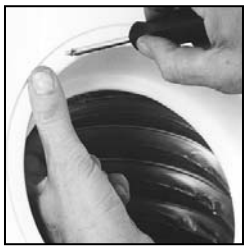
This method has become popular and provides good ventilation when installed in accordance with the instructions. The furnace blower must be running when the HRV is operating for this method to be effective.

PRACTICAL TIPS

- *For new construction, the rigid ducts are run in the walls.*
- *Choose the loction your Supply and Exhaust Hush Grilles. The Supply grilles should be located in every habitable room and the Exhaust Grilles should be located in the wet rooms.*
- *A piece of flexible ducting should be placed between the Suppy Air In and Out collar of the HRV and the rigid ducting to absorb any noise or vibrations.*
- *For proper network of ducting, see **TYPES OF INSTALLATIONS.***
- *The grilles are to be installed on the ceiling or on the wall 6" (152 mm) to 12" (305 mm) from the ceiling.*

Dedicated installation for existing home - non force air heating / cooling system.

1 Begin with the duct collar marked "Exhaust Air In". Slide a short piece (12") of flexible duct over the duct collar. Using duct tape, tape the flexible duct to the collar. Run the flexible ducting to the main rigid duct trunk line, which connects to the remainder of the ducts going to and from rooms in the house.. Repeat the steps for the "Supply Air Out" on the side of the HRV.



2 Working from a closet, attic or inside your joist wall, run the length of ducting required for the proper grille location and cut a hole in the gyprock. Fasten the mounting collar (optional) to the ducting and fasten the collar to the wall or ceiling with screws.

3 The hush grille airflow can be adjusted by rotating the inside unit. It is recommended that the grilles be completely opened at first and then adjusted later as needed.

4 Push the Hush Grille into the optional mounting collar or directly into installed elbow.

INSTALLATION EXAMPLES

It is the responsibility of the installer to ensure all ductwork is sized and installed as designed to ensure the system will perform as intended. All air movement devices have a performance curve. The amount of air (CFM) that an HRV will deliver is directly related to the total external static pressure (E.S.P.) of the system. Static pressure is a measure of resistance imposed on the blower by length of duct work/number of fittings used in duct work, duct heater etc.

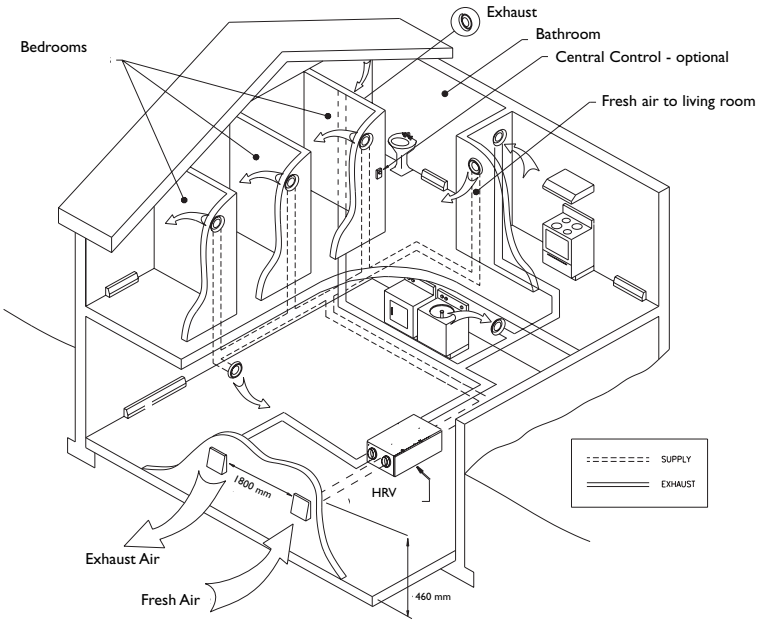
Example diagram only-duct configuration may change depending on model

Fully Dedicated System (new construction)

Stale air drawn from key areas of home (bathroom, kitchen, laundry)

Fresh air supplied to main living areas

HRV must be balanced



INSTALLATION EXAMPLES (CONT')

Example diagram only-duct configuration may change depending on model

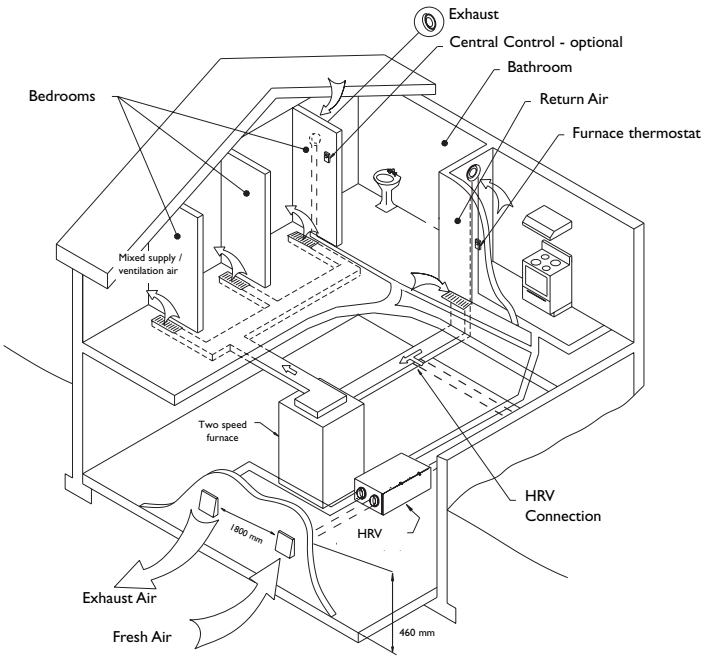
DIRECT CONNECTION of the SUPPLY AIR STREAM to the FURNACE COLD AIR RETURN (Stale air drawn from key areas of home)

Partially Dedicated System

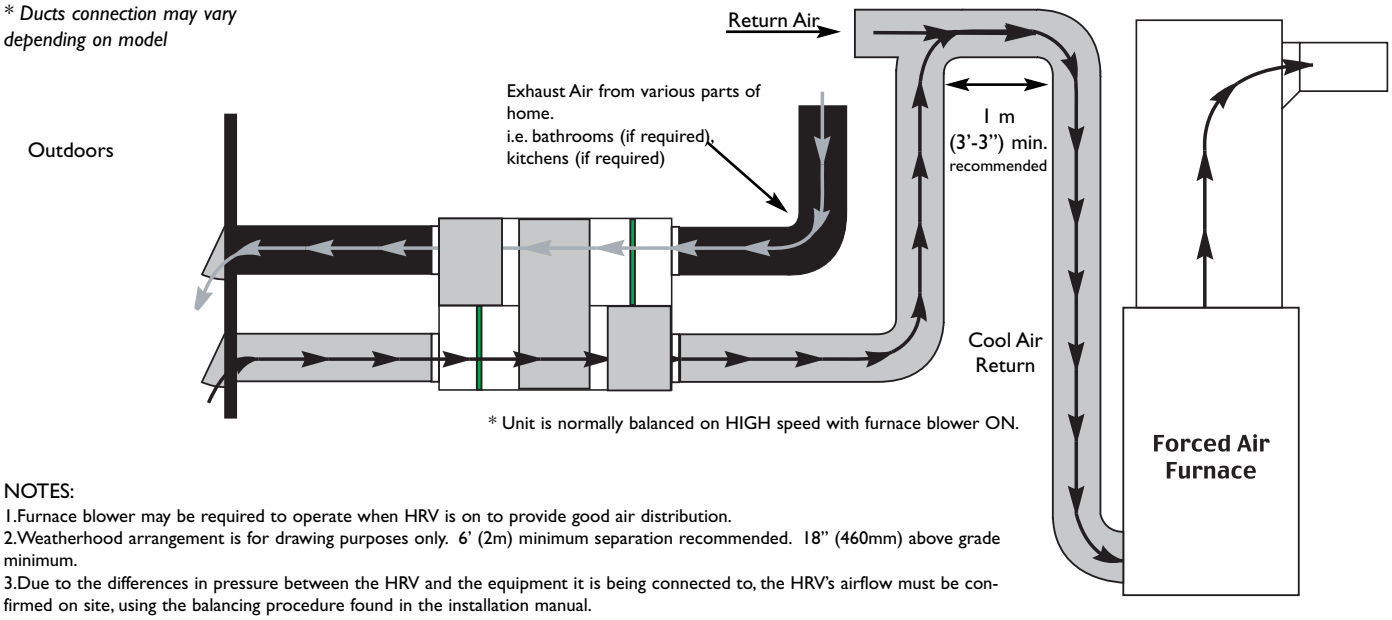
Stale air drawn from key areas of home (bathroom, kitchen, laundry)

Fresh air supplied to main living areas via the forced air system.

HRV must be balanced



** Ducts connection may vary depending on model*



NOTES:
1.Furnace blower may be required to operate when HRV is on to provide good air distribution.
2.Weatherhood arrangement is for drawing purposes only. 6' (2m) minimum separation recommended. 18" (460mm) above grade minimum.
3.Due to the differences in pressure between the HRV and the equipment it is being connected to, the HRV's airflow must be confirmed on site, using the balancing procedure found in the installation manual.

INSTALLATION EXAMPLES (CONT')

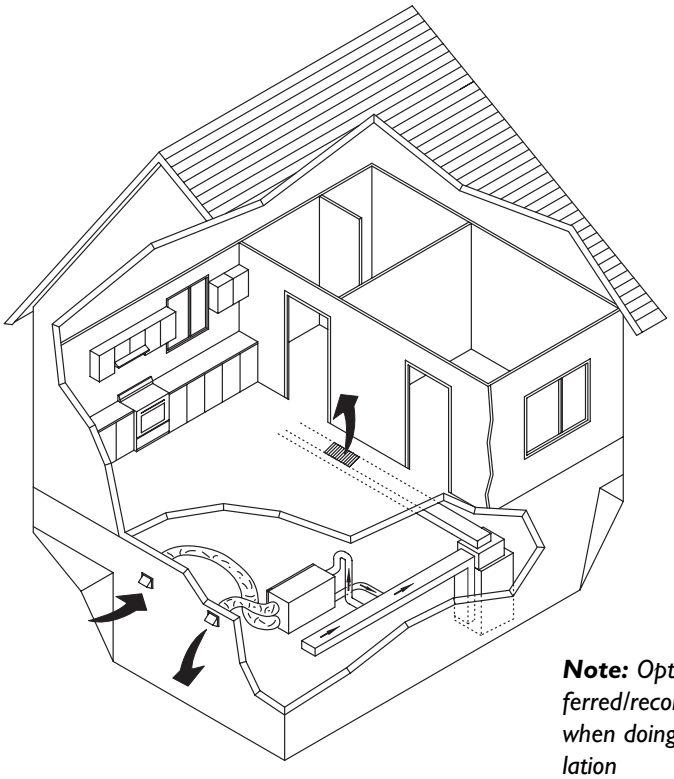
Example diagram only-duct configuration may change depending on model

DIRECT CONNECTION of both the HRV SUPPLY AIR STREAM and EXHAUST AIR STREAM to the FURNACE COLD AIR RETURN

Simplified Installation

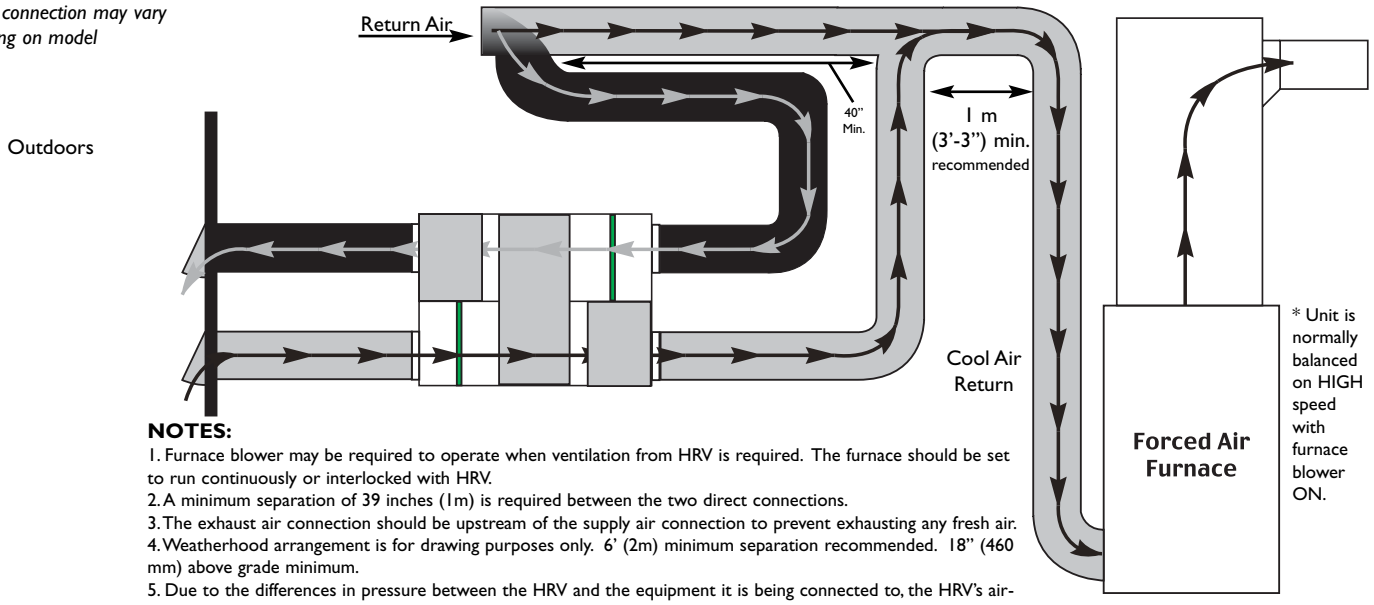
Option 1
(Return/Return Method)

- HRV must be balanced
- It is mandatory that the furnace blower run continuously or HRV operation be interlocked with the furnace blower
- Check local codes/authority having jurisdiction for acceptance



Note: *Option 1 is the preferred/recommended method when doing a simplified installation*

* *Ducts connection may vary depending on model*



NOTES:

1. Furnace blower may be required to operate when ventilation from HRV is required. The furnace should be set to run continuously or interlocked with HRV.
2. A minimum separation of 39 inches (1m) is required between the two direct connections.
3. The exhaust air connection should be upstream of the supply air connection to prevent exhausting any fresh air.
4. Weatherhood arrangement is for drawing purposes only. 6' (2m) minimum separation recommended. 18" (460 mm) above grade minimum.
5. Due to the differences in pressure between the HRV and the equipment it is being connected to, the HRV's airflow must be confirmed on site, using the balancing procedure found in the installation manual.

INSTALLATION EXAMPLES (CONT')

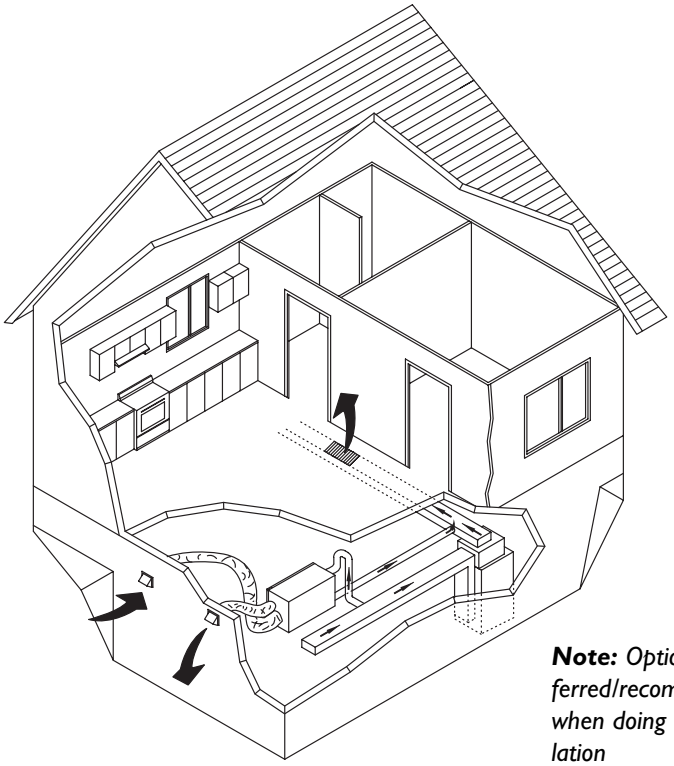
Example diagram only-duct configuration may change depending on model

DIRECT CONNECTION of both the HRV SUPPLY AIR STREAM & EXHAUST AIR STREAM to the FURNACE COLD AIR RETURN & SUPPLY AIR SIDE

Simplified Installation

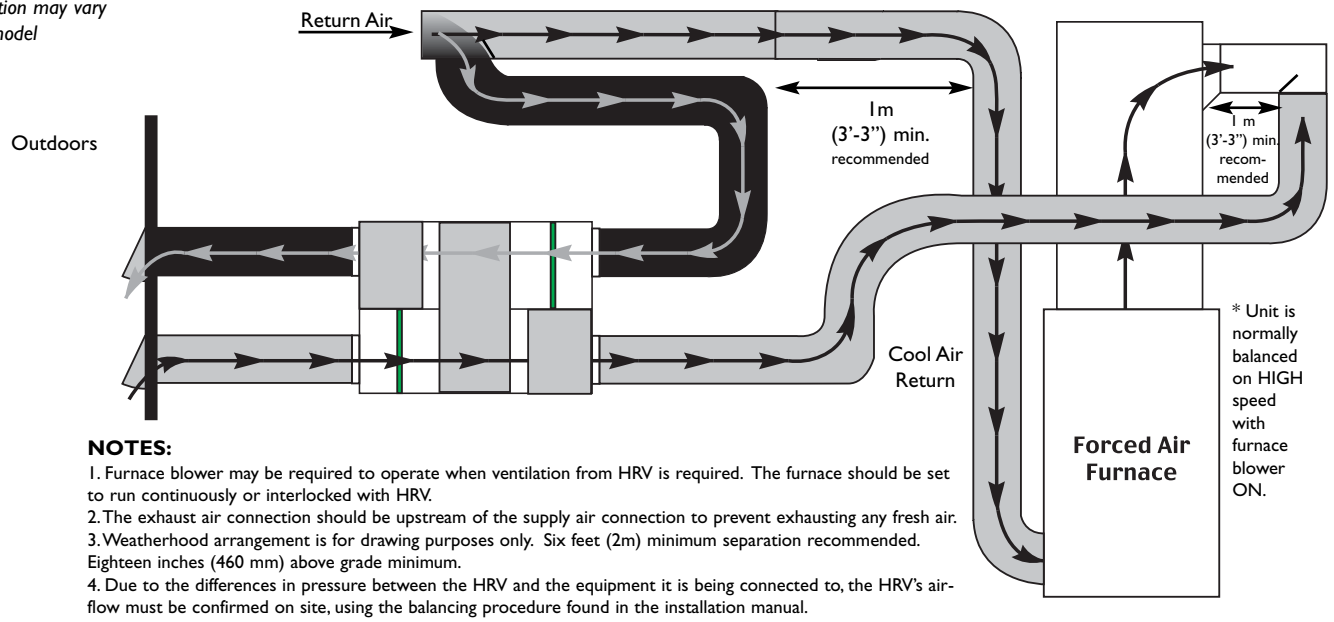
Option 2
(Supply/Return Method)

- HRV must be balanced
- It is recommended that the furnace blower run continuously
- Check local codes /authority having jurisdiction for acceptance



Note: *Option 1 is the preferred/recommended method when doing a simplified installation*

** Ducts connection may vary depending on model*



NOTES:

1. Furnace blower may be required to operate when ventilation from HRV is required. The furnace should be set to run continuously or interlocked with HRV.
2. The exhaust air connection should be upstream of the supply air connection to prevent exhausting any fresh air.
3. Weatherhood arrangement is for drawing purposes only. Six feet (2m) minimum separation recommended. Eighteen inches (460 mm) above grade minimum.
4. Due to the differences in pressure between the HRV and the equipment it is being connected to, the HRV's airflow must be confirmed on site, using the balancing procedure found in the installation manual.

AIR FLOW BALANCING

PRACTICAL TIPS

- *If the unit's airflows are not properly balanced...*

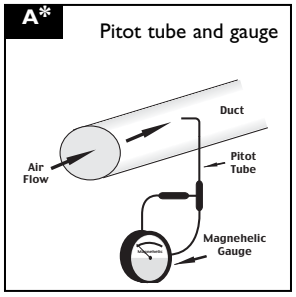
- *The unit may not operate at it's maximum efficiency.*

- *Heat recovery core damage may occur.*

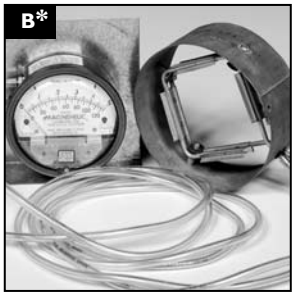
- *The unit's use could cause negative or positive pressure in your home causing cold air to enter or other combustible equipment to backdraft.*

- *The unit may not defrost properly.*

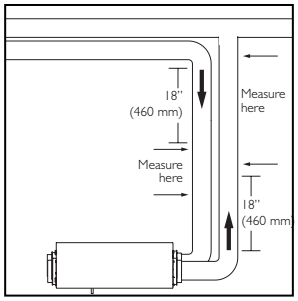
- The balancing procedure consists of measuring the exhaust air leaving the system and the supply air entering the system and ensuring that these two are equal. A deviation of 10% or less is acceptable. In such cases, it is recommended to have a greater amount of exhaust air than supply air as so to increase the supply air's temperature.



A The duct's airflow velocity is measured with a magnehelic gauge and a pitot tube. See "Pitot Tube Balancing Procedure" next page.

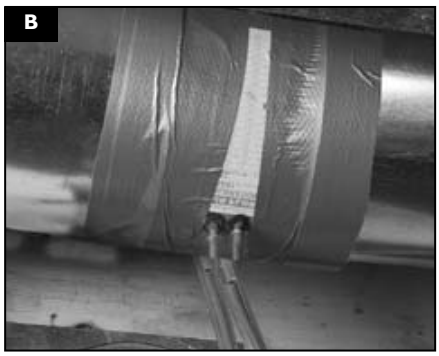


B This airflow measuring station reads the airflow by being connected to the ducting.



- To avoid airflow turbulence and incorrect readings, the airflow velocity should be measured on steel ducting a minimum of 18" (457 mm) from the unit or elbow and before any transition.

AIR FLOW BALANCING (CONT')



1 For this flow measuring station, cut the duct and place the flow measuring station between each station. Make sure that the flow measuring station's air direction arrow points in the direction of the airflow. Secure the flow measuring station with duct tape.

2 Before taking the reading, make sure that the magnehelic gauge is level and at 0. Refer to the flow measuring station's chart to determine your unit's airflow velocity.

3 The airflow is regulated by a balancing damper located inside the collar of the HRV. Adjust the "Supply Air Out" damper until you reach the desired velocity. Follow the previous
steps to adjust the "Exhaust Air Out" damper.

PITOT TUBE BALANCING PROCEDURE

PITOT TUBE

BALANCING PROCEDURE

The following is a method of field balancing an HRV using a Pitot tube, advantageous in situations when flow stations are not installed in the ductwork. Procedure should be performed with the HRV on high speed.

The first step is to operate all mechanical systems on high speed, which have an influence on the ventilation system, i.e. the HRV itself and the forced air furnace or air handler if applicable. This will provide the maximum pressure that the HRV will need to overcome, and allow for a more accurate balance of the unit.

Drill a small hole in the duct (about 3/16), three feet downstream of any elbows or bends, and one foot upstream of any elbows or bends.
These are recommended distances but the actual installation may limit the amount of straight duct.
The Pitot tube should be connected to a magnehelic gauge or other manometer capable of reading from 0 to 0.25 in (0-62 Pa) of water, preferably to 3 digits of resolution. The tube coming out of the top of the pitot is connected to the high pressure side of the gauge. The tube coming out of the side of the pitot is connected to the low pressure or reference side of the gauge.

Insert the Pitot tube into the duct; pointing the tip into the airflow. For general balancing it is suffivient to move the pitot tube around in the duct and take an average or typical reading. Repeat this procedure in the other (supply or return) duct. Determine which duct has the highest airflow (highest reading on the gauge). Then damper that airflow back to match the lower reading from the other duct. The flows shouldnow be balanced. Actual airflow can be determined from the gauge reading. The value read on the gauge is called the velocity pressure. The Pitot tube comes with a chart that will give the air flow velocity based on the velocity pressure indicated by the gauge. This velocity will be in either feet per minute or metres per second. To determine the actual airflow, the velocity is multiplied by the cross sectional areas of the duct being measured.

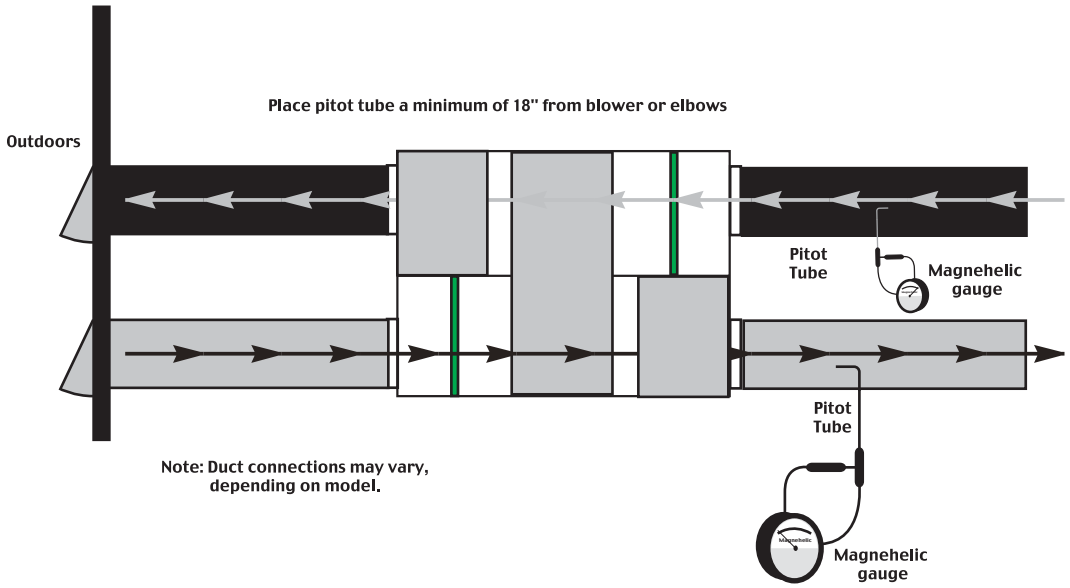
This is an example for determining the airflow in a 6" duct.
The Pitot tube reading was 0.025 inches of water.
From the chart, this is 640 feet per minute.
The 6" duct has cross sectional area of
= [3014x(6" 12)2 4
=0.2 squeare feet
The airflow is then:
640 ft./min.x0.2 square feet-128cfm

For your convenience, the cross sectional area of some common round duct is listed below:

DUCT DIAM. (inches)	CROSS SECTION AREA (sq ft.)
5	0.14
6	0.20
7	0.27
8	0.35

The accuracy of the air flow reading will be affected by how close to any elbows or bends the readings are taken. Accuracy can be increased by taking an average of multiple readings as outlined in the literature supplied with the Pitot tube.

PITOT TUBE BALANCING PROCEDURE (CONT')



* Pitot tube should be kept at least 12" away from fans elbows and dampers to ensure acurate reading.

MAINTENANCE

CAUTION MAKE SURE UNIT IS UNPLUGGED BEFORE ATTEMPTING ANY MAINTENANCE WORK

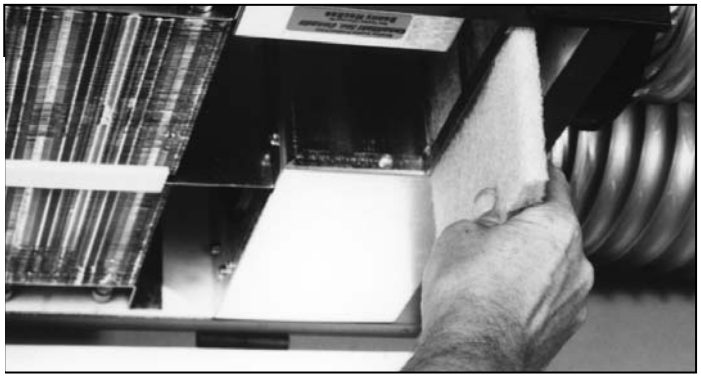
The following components should also be inspected regularly and well maintained.

PRACTICAL TIPS

- *To prevent electrical shock, check that the unit is unplugged before doing any repairs or maintenance.*
- *A yearly inspection is recommended to ensure the efficiency and trouble-free use of your system. Run through the system and verify the different operating modes.*

FILTERS

The filters need to be checked and cleaned every three months or when they appear dirty. This unit has two filters. To clean, remove the filters and vacuum. If the filters still appear dirty, they can be washed in warm sudsy water (mild detergent). Replace the filters if they become too soft after washing. The filters should be replaced yearly or when they can no longer be cleaned properly. You may have to change to synthetic filter after washing a few times.



The motor - The motors are factory balanced and lubricated for life. They require no maintenance.

The unit - The inside of the unit should be vacuumed yearly. Be careful not to damage any of the mechanical components and electrical connections.

Condensation Panel - The condensation panel should be cleaned yearly.

The drain and drain line - Units with drain lines should have their line and connection checked regularly.

Outside hoods - The outside hoods need to be checked every season to make sure there are no leaves or insects blocking the airflow. Check regularly that there are no pollutants near the intake hood. Make sure they are clear of any snow accumulation during the winter months.

THE HEAT RECOVERY CORE

The heat recovery core needs to be checked and cleaned every six months. It is recommended to clean the core in the summer or when the temperature is mild.

Clean Core and Filters Every 3-6 months. *Unplugged before doing any repairs or maintenance*

a) open access panel.
b) carefully grip ends of core and pull evenly out ward. Core may be snug, but will slide out of the channel.
c) once removed from the cabinet remove filters.
d) wash core in warm soapy water (do not use dishwasher).
e) install the clean filters
f) install clean core

NOTE: Some products may not be exactly as illustrated in Installation, Operation and Maintenance manual.

TROUBLESHOOTING

Problem	Causes	Solutions
Air is too dry	Dehumidistat control is set too low	Increase the desired level of humidity. Change ventilation mode from continuous mode to standby.
	HRV out of balance	Balance HRV
Air is too humid	Dehumidistat control is set too high	Reduce the desired level of humidity. Combine this step with use of continuous exchange mode.
	Sudden change in temperature	Wait until outside temperature stabilizes (winter). Heating will also improve situation.
	Storing too much wood for heating	Store a majority of your wood outside. Even dried, a cord of wood contains more than 20 gallons of water.
	Dryer vent exhaust is inside home	Arrange outside vent for dryer.
	Poor air circulating near windows	Open curtains or blinds. Bay or bow windows may require mechanical method.
	HRV out of balance	Balance HRV
	Basement door is closed	Open the door or install a grill on the door.
Persistent condensation on window	Improper adjustment of dehumidistat control	Reduce the desired level of humidity. Combine this with the use of continuous exchange mode.
	HRV out of balance	Balance HRV
Poor Air Flows	-1/4" (6mm) mesh on the outside hoods is plugged -filters plugged -core obstructed -house grilles closed or blocked -dampers are close if installed -poor power supply at site -ductwork is restricting HRV -improper speed control setting -HRV airflow improperly balance	-clean exterior hoods or vents -remove and clean filter -remove and clean core -check and open grilles -have electrician check supply voltage at house -check duct installation -increase the speed of the HRV -have contractor balance HRV
Supply air feels cold	-poor location of supply grilles, the air-flow may irritate the occupant -outdoor temperature extremely cold	-locate the grilles high on the walls or under the baseboards, install ceiling mounted diffuser or grilles so as not to directly spill the supply air on the occupant (eg. Over a sofa) -turn down the HRV supply speed. A small duct heater (1kw) could be used to temper the supply air -placement of furniture or closed doors is restricting the movement of air in the home -if supply air is ducted into furnace return, the furnace fan may need to run continuously to distribute ventilation air comfortably
HRV and / or Ducts Frosting up	-HRV air flows are improperly balanced -malfunction of the HRV defrost system	-Note: minimal frost build-up is expected on cores before unit initiates defrost cycle functions -have HVAC contractor balance the HRV
Condensation or Ice Build Up in Insulated Duct to the Outside	-incomplete vapour barrier around insulated duct -a hole or tear in outer duct covering	-tape and seal all joints -tape any holes or tears made in the outer duct covering -ensure that the vapour barrier is completely sealed.

Fantech

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