Fantech
Your Ventilation Solutions Company

AEV Series
Air Exchange 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 Air Exchange Ventilator by using the balancing procedure found in this manual.
It is always important to assess how the operation of any AEV 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".

AEV Models

AEV 1000

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

The Best Limited Warranty in the Business

- The motors found in all Fantech AEV'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.*

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Sizining (Example) for maximum airflow normally required.

AEV'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) **=**

1 cfm = 0.47189 l/s
1 l/s = 3.6 m³/hr

TECHNICAL DATA

Components

CASE - 22 gauge galvanized steel with powder coat paint, lined with strong top quality insulation.

FILTER - Synthetic high quality filter for better indoor air quality and clean air.

UNIT CONTROLS - Case mounted rocker switches provide the following functions. ON/OFF switch is to engage the operations of the ventilation system. At OFF position, the system can still achieve high speed from the remote dehumidistat or optional timer switch. LOW/MED switch is to control the continuous ventilation mode. At LOW speed, the system will be operating at its lowest ventilation requirement. At MED speed, the system will operate to meet building codes requirements according to sizing and design conditions.

REMOTE OVERRIDE -24 volts (low voltage) remote switching circuit for high speed operation to reduce the humidity level in the dwelling. This is archieved by a dehumidistat, an optional timer switch or any indoor air quality (IAQ) remote sensor

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, dust and lint.
- The motors feature maintance-free bearings and are the most dependable and efficient on the market.
- Built-in thermocontact prevents overheating
- Increased corrision protection

AEV Series Performance Data

Model	Airflow Cap. L/s (cfm)		
	High	Med	Low
AEV 1000	49 (104)	38 (60)	20 (42)

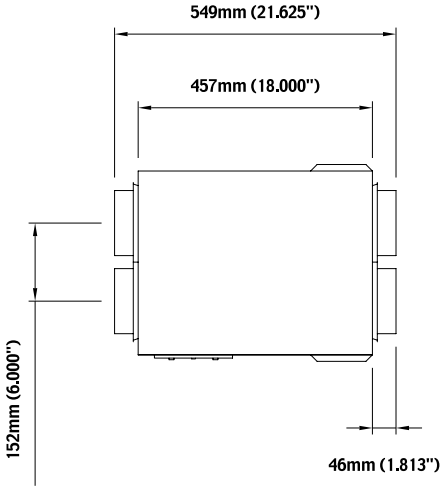
AEV Series Electrical Data

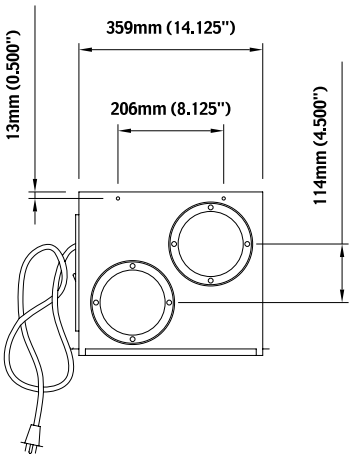
Model	Volts	Amp Rating
AEV 1000	115 V	0.6 A

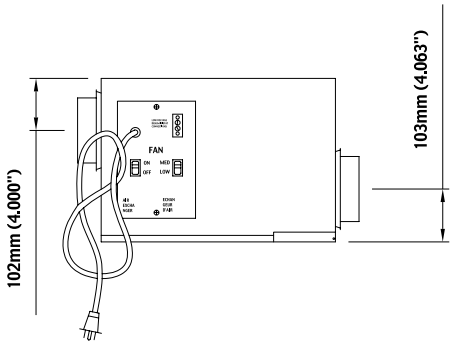
All of the AEV models are 120V unless specified otherwise.

C US

Dimensions







OPERATION

An Air Exchanger Ventilator (AEV) is designed to provide fresh air into a building while exhausting an equal amount of stale air. During the winter months, the incoming cold fresh air is warmed by mixing it with return air before it is supplied to the home. During summer months when the indoor space is air conditioned, the AEV will help in cooling the incoming fresh air with the stale air that is being exhausted.

Fantech AEV'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 3). Below are some examples of seasonal operation of an AEV.

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 AEV 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 AEV to standby.

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.

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 AEV 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.*
- *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 Air Exchanger must be located in a heated space where it will be possible to conveniently service the unit. Typically the AEV 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 AEV It is not recommended, incuding:

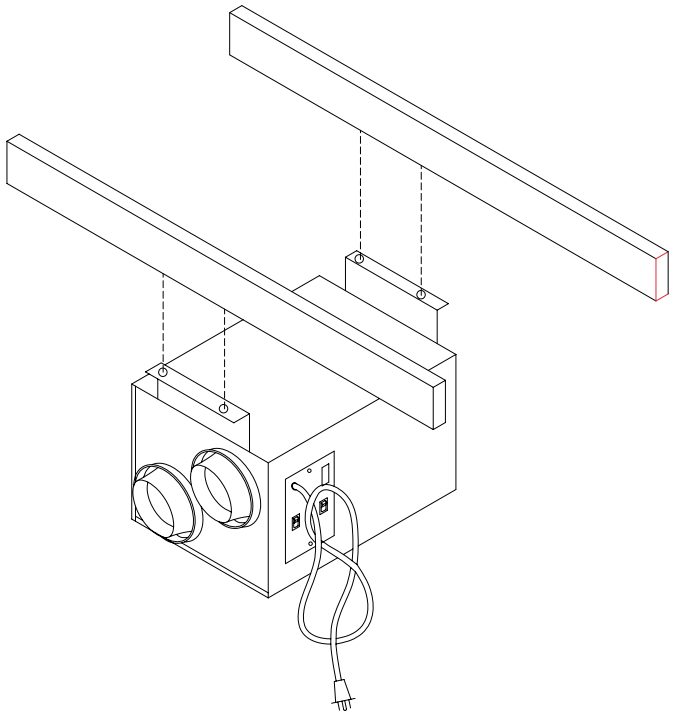
- clothes dryer
- range top
- stovetop fan
- central vacuum system

These appliance may cause lint, dust or grease to collect in the AEV , damaging the unit.
NOTE: Connecting any of these type of appliances to the AEV will invalidate your warranty

MOUNTING

• Although we recommend installing the unit as shown, the flexibility offered by our centrifugal external rotor motor allows for the unit to be installed in any position.

• Use #10 wood screws plus vibration insulator grommets supplied with the unit.



INSTALLING DUCTS GOING TO / FROM OUTSIDE

A well designed and installed ducting system will allow the AEV 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*

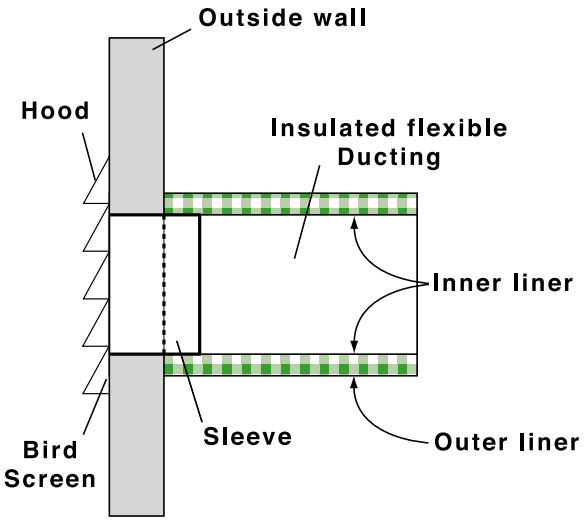
Locating the Exhaust Weatherhood

- *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 AEV. 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 AEV using tape and or caulking. A good bead of high quality caulking (preferably acoustical sealant) will seal the inner flexible duct to both the AEV port and the weatherhood prior to clamping.
To minimize air flow restriction, the flexible insulated duct that connects the two outside weatherhoods to the AEV 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 (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 AEV 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 AEV 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 Fantech grille {MGE (metal) or PGE (plastic)}s. 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 AEV 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 AEV.

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 Fantech grille {MGE (metal) or PGE (plastic)} 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.

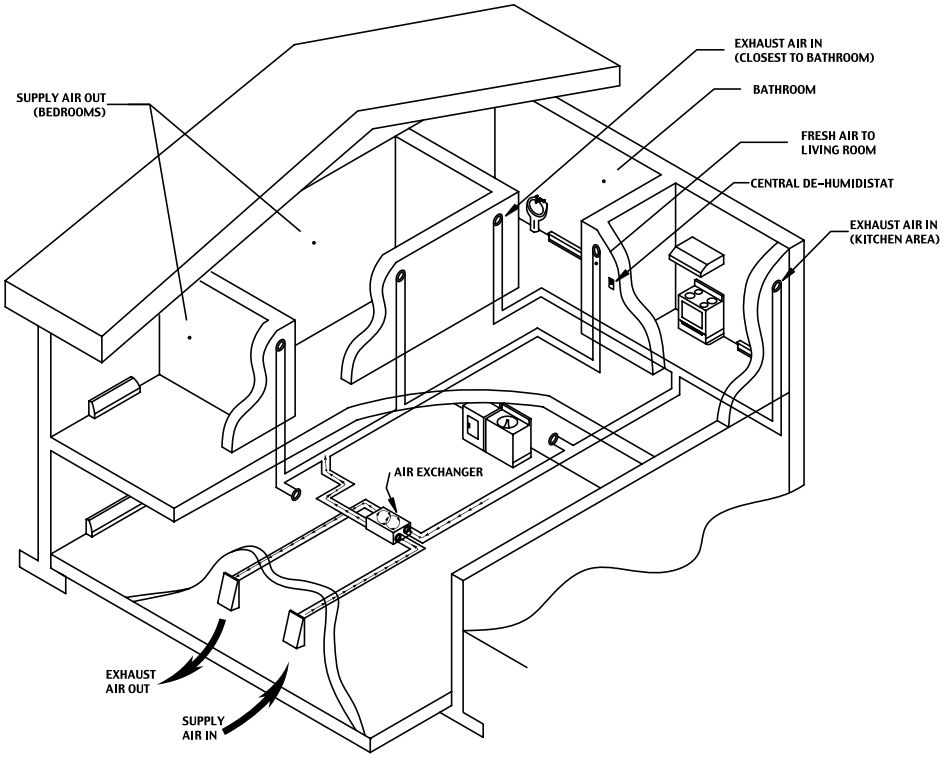
4 Push the Fantech grille {MGE (metal) or PGE (plastic)} into the optional mounting collar or directly into installed elbow.

INSTALLATION (CON'T)

Radiant, Hydronic and Electric Baseboard Heating

- This diagram shows the installation of your unit with radiant hydronic or baseboard heating.
  As shown, the stale air is extracted from the rooms with high humidity levels, and the fresh air is delivered in the living areas. In this case, a complete ducting system for ventilation must be installed.

PRACTICAL TIPS



Follow local building codes

AIR FLOW BALANCING

PRACTICAL TIPS

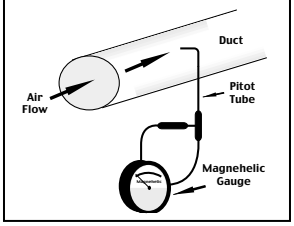
- *If the unit's airflows are not properly balanced...*

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

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

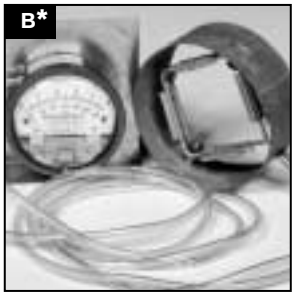
- The balancing procedure consists of measuring the exhaust air leaving the system and the supply air entering the system and ensuring that these two are equal. A deviation of 10% or less is acceptable. In such cases, it is recommended to have a greater amount of exhaust air than supply air as so to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

A* Pitot tube and gauge

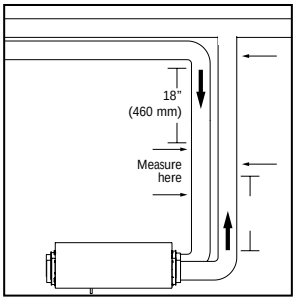


A The duct's airflow velocity is measured with a magnehelic gauge and a pitot tube. See "Pitot Tube Balancing Procedure" next page.

B*

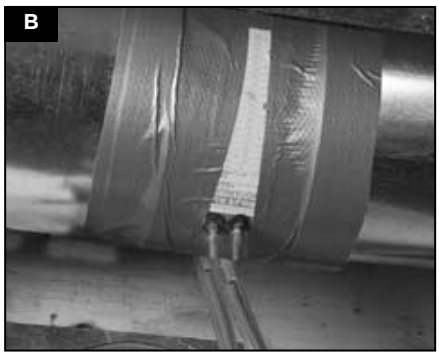


B This airflow measuring station reads the airflow by being connected to the ducting.



- 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 AEV. 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 AEV using a Pitot tube, advantageous in situations when flow stations are not installed in the ductwork. Procedure should be performed with the AEV 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 AEV itself and the forced air furnace or air handler if applicable. This will provide the maximum pressure that the AEV 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 should now 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

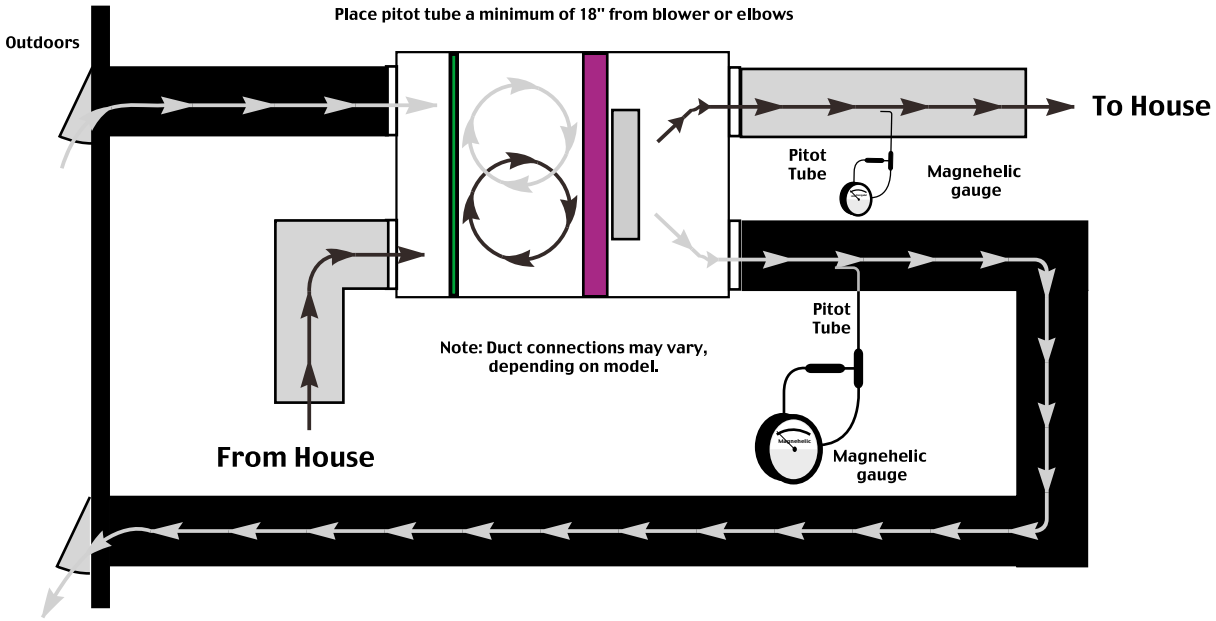
The airflow is then:
640 ft./min.x0.2 square feet-128cfm

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

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.*

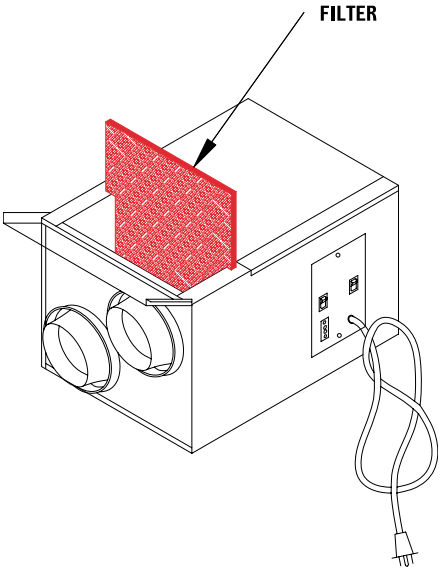
The motor - The motor are factory balanced and lubricated for life. They require no maintenance.

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

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.

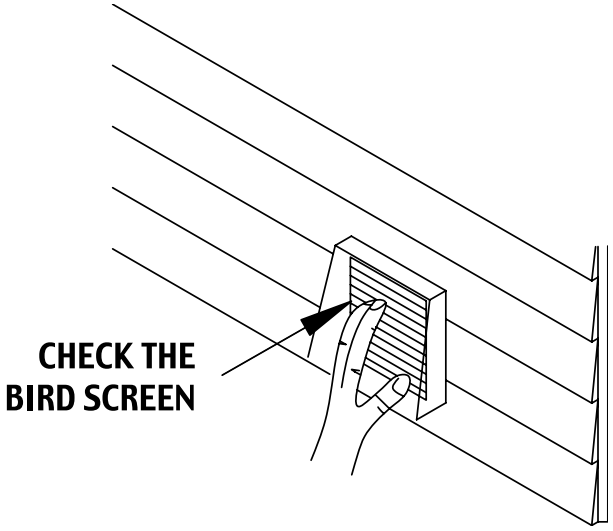
FILTER

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



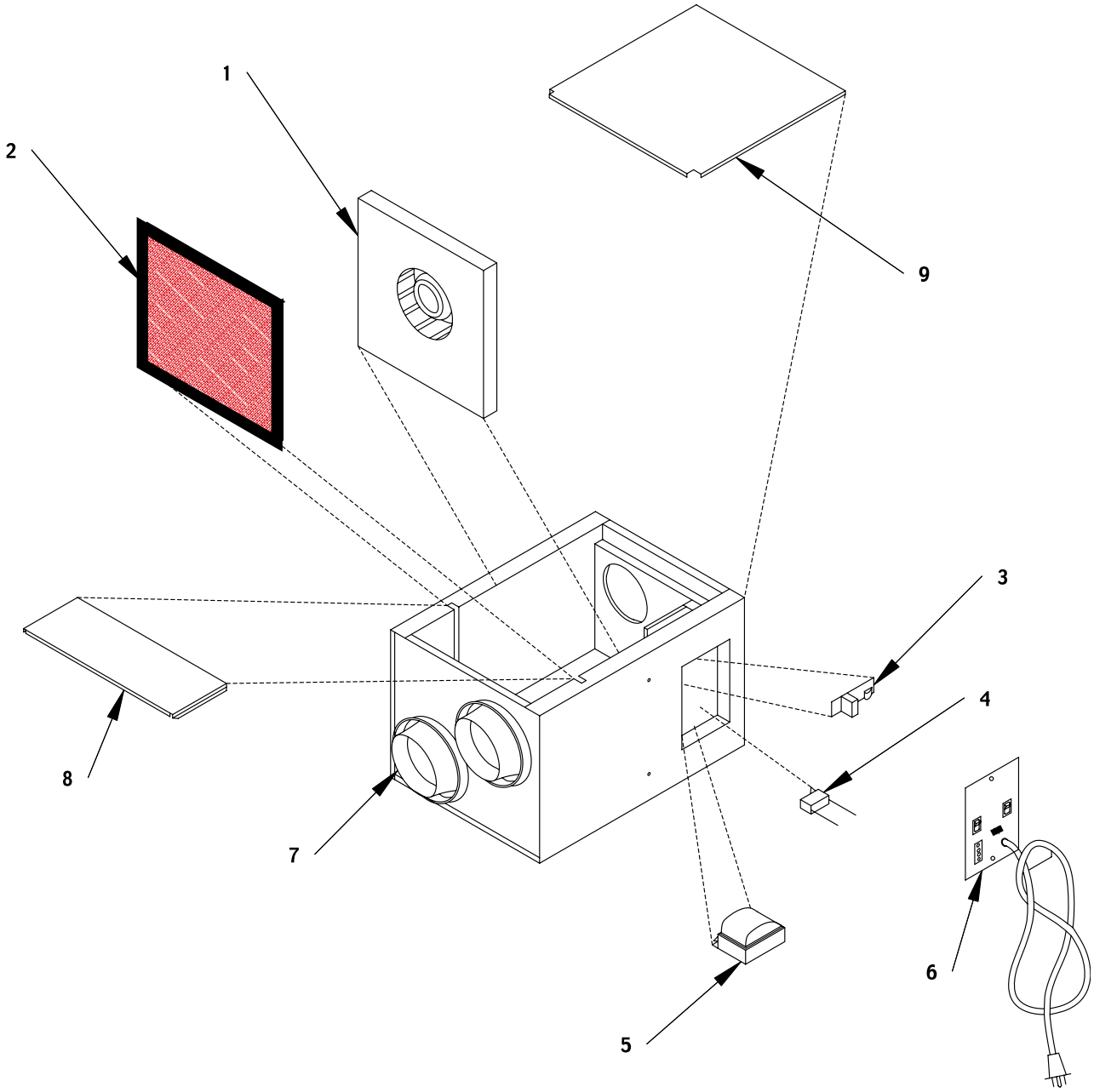
OUTSIDE HOODS

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.



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

SERVICING



PARTS LIST

Description	Part #
1 Motorized Impeller	500000
2 Filter	017068
3 Override Relay Board	410150
4 Capacitor	410428
5 Auto-Transformer	410350
6 Control Panel	200422
7 5” Collar	530172
8 Filter Door	200426
9 Access Panel	203939

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.
	AEV out of balance	Balance AEV
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.
	AEV out of balance	Balance AEV
	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.
	AEV out of balance	Balance AEV
Poor Air Flows	-1/4" (6mm) mesh on the outsid hoods is plugged -filter plugged -house grilles closed or blocked -dampers are close if installed -poor power supply at site -ductwork is restricting AEV -improper speed control setting -AEV airflow improperly balance	-clean exterior hoods or vents -remove and clean filter -check and open grilles -have electrician check supply voltage at house -check duct installation -increase the speed of the AEV. -have contractor balance AEV
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 AEV 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
AEV and / or Ducts Frosting up	-AEV air flows are improperly balanced -malfunction of the AEV system	-Note: minimal frost build-up is expected -have HVAC contractor balance the AEV -Duct heaters
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

Technical support hotline 1.800.565.3548

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