



**ProAir 600**

**Heat Recovery Ventilation Systems**

**OPERATION  
MAINTENANCE  
&  
TECHNICAL  
MANUAL**

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## System Description

Your whole house ventilation system has been professionally designed and manufactured in Ireland by ProAir Heat Recovery Ventilation Systems Ltd. and has been installed and tested in accordance with the relevant EN standards and in conformity to Part F and B of the DOE SI 497 of 1997 & DOE SI 581 of 2007 Regulations.

It has been designed to:

- Continuously ventilate all the rooms in your house in a controlled manner to give a healthy environment.
- Remove moisture & odours thereby preventing condensation build-up, mould growth etc.
- Provide a draught free environment with the required amount of filtered fresh air for the occupants.
- Minimise the energy losses by recovering the heat from the extracted stale air & transferring up to 90% of this heat to the incoming fresh air.

The principle behind energy efficient whole house ventilation is to continuously supply fresh air & extract stale air, such that the air is changed in the house around ten times per day. Air is supplied to living areas (bedrooms living room) and extracted from service areas (bathrooms, kitchen, utility).

It is normal to feel a very slight air movement at supply points. This air will be within 2 degrees of the average temperature of your house (17-19°C) but may still feel cool. This is because of the movement of the air and because your body temperature will be normally around 37°C.

The temperature of the supply air is dependant on the average of all the extract points. If for some reason one extract point is at low temperature (because of an open window) then this will bring down that average and cause supply air temperature to be low throughout the system.

The ProAir system in your house is the PA 600 model shown in fig.1

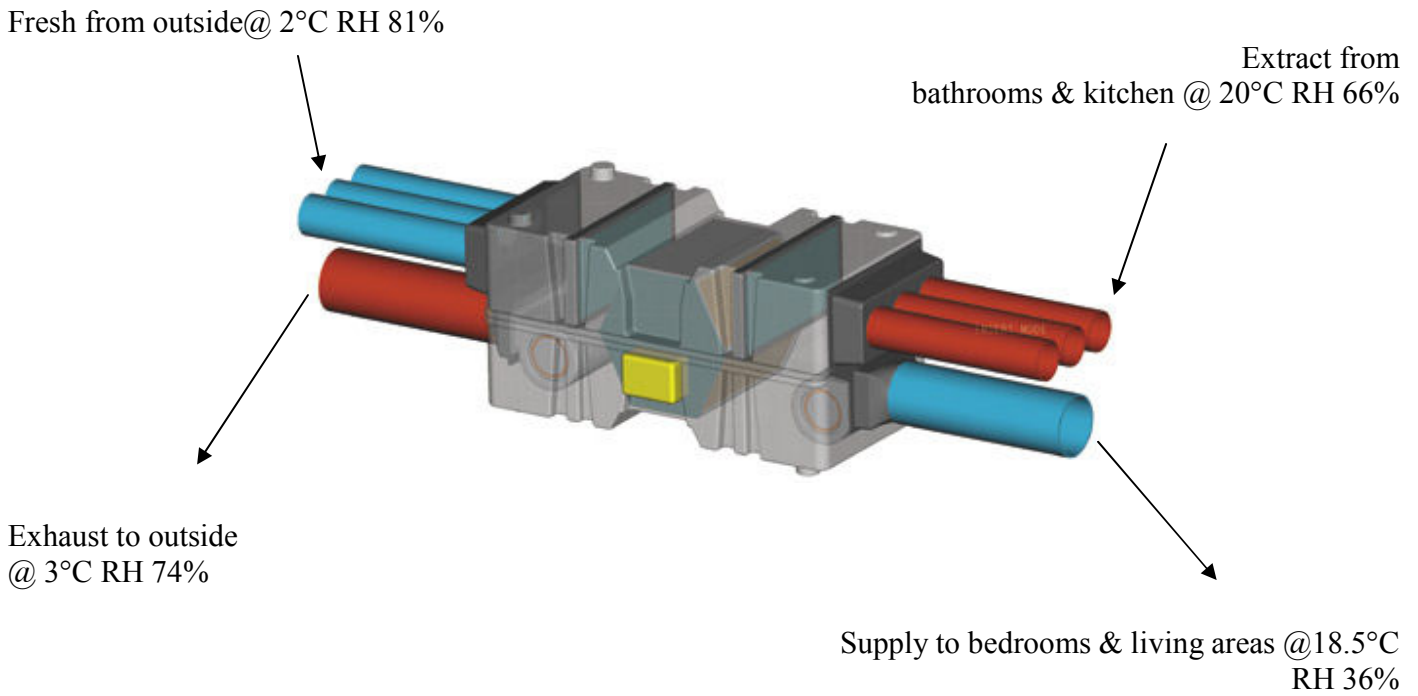


Figure 1

The primary reason for installing domestic ventilation is to ensure that moisture is removed and damaging condensation is avoided. The ProAir system achieves this because;

When air is heated the relative humidity of the air reduces as shown above. This allows water to be picked up and expelled to outside in one of two ways.

1. Exhausted directly with the stale air as water vapour.
2. Condenses in the heat exchanger exhaust passages and drains to outside via a 15mm hose connected from the bottom of the HRV unit to outside or to your waste water system.

## Operation

Your ProAir heat recovery ventilation system is designed to operate 24 hours per day, 7 days per week, and running at a low speed while the house is normally occupied. (Time-clocks can sometimes be appropriate, but are not supplied as standard with the system) At other times when there is higher than normal water vapour generated (cooking & showers) the system can be triggered to extract higher volumes of air, for a pre-defined period.

These two modes (low and occasional boost) will provide you with the regulation air-changes required for you and your dwelling.

## Summer use

Your ProAir 600 system is primarily a ventilation system and is **not** designed to be a heating or cooling system. Heating or cooling by means of the air system would require considerably more hardware and associated costs.

During summer, when the outdoor temperature is similar to the indoor, no heat exchange will occur and the supply air will be the same as external. In this situation, you will operate your house as normal with windows open as you please and it would be recommended that your system be switched off at the main control as described below.

The system is designed, to fully ventilate the house without opening any windows during the heating season (anytime the external temperature is below 14°C). Below this temperature, your heating system, if properly controlled, will come on at a low level and will not appreciate the ingress of cold air through an open window. Above this temperature, when there will be no heating demand it is human nature to open doors and windows and at this point, your system can be switched off.

Even with the main switch in the off position, the boost switches will operate the system temporally to remove moisture during showers etc.

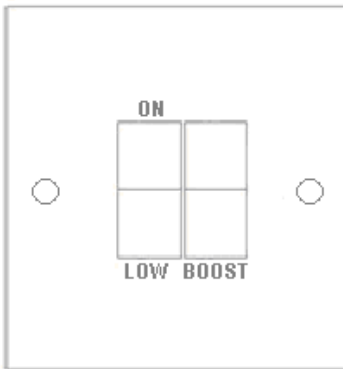
## Control

In the utility room or at some central point in the house you will find a switch as shown below in Figure 1. This is the master control. The options for controlling the unit are as follows:

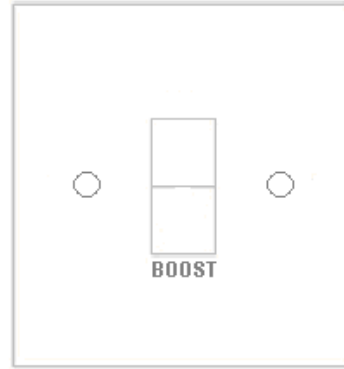
Off: As with any other electro-mechanical system it can be switched off as required, but it is recommended to run the system as much as possible, especially during the heating season.

On/low In this position the system comes on at a low speed which has been set by the ProAir commissioning technician at a level appropriate to your conditions. This level can be adjusted on request.

Boost Speed: Momentary depression of this switch sends a signal to the inbuilt control of the HRV unit which tells it to provide a pre-set timed boost for high water vapour generation (Cooking & showers). It is normal that this switch does not stay on. The default pre-set time is 15 minutes, but this can be adjusted by the ProAir technician as required. While the system is in the boost mode, the off/low switch is non-operational. This allows you to temporarily boost (for cooking/showers etc)the system in summer-time when the system may be off The system goes back to the low or off mode after the pre-set time has elapsed.



**Figure 2**



**Figure 3**

At other locations throughout the house you will find switches as shown in Figure 3. These are mimics of the boost switch on the main controller (Fig. 2) and allow you to go to boost mode from outside your shower.

Pressing more than one boost switch together does not cause a problem. Whoever gets there first, triggers the timer.

## Installation

The system consists of

- Air Handling Unit (AHU) unit usually located in the attic
- Intake and exhaust vents leading to outside
- Ducting to facilitate the transport of air to and from this unit to the various rooms
- Ceiling/wall terminals for the delivery and extraction of air in rooms
- Control switches

The Air Handling Unit (AHU) is located in either the attic or a utility area. It contains a high efficiency counter-flow heat exchanger, fans to drive air in and out and filters to clean the air. It is mains powered (220V) from a standard 13Amp socket. When installed in the attic, it is suspended by light chain (from 4 metal 'L' brackets on centre-line of unit) from the rafters and supported slightly proud of the ceiling joists. This is for two reasons, (a) to prevent any vibration and (b) to allow house insulation to be fitted under the unit. If installed in the utility room it can be mounted vertically (the fresh and exhaust go through the wall at low level) on specially designed brackets fixed to the wall, or horizontally also suspended with chain.

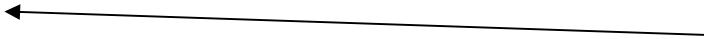
The outer casing is made of polypropylene and is insulated on the inside where relevant, to minimise noise levels and heat loss. When mounted horizontally, the unit is suspended just **off level in accordance with the drawing on the side of unit (fig 4)**. This ensures that condensate water, which naturally occurs in the exhaust air path in cold conditions, will drain correctly. Ideally, this drain hose, (a 16mm clear hose) will be connected via a suitable smell trap, to the grey-water system of the building. In an attic installed situation, this drain hose should also be suitably insulated (15mm pipe lagging) where exposed to cold conditions. This hose, should be connected to the 16mm plastic nipple on the bottom of the unit and clamped firmly with jubilee clip provided. This drain point must be at a higher level than the end of the hose.

In situations where it is not practicable to connect the drain to the waste water system, the drain can be ran to the soffit and drained on to the footpath as amounts of water are small usually. There are a few important things to remember, in this instance.

- Do not drain over a doorway as this will contribute to nuisance.

- Use the southern aspect of the building if possible for this purpose.
- It is advisable to use an anti-frost kit in this situation.

**This line must be level when unit is in final position**



The above instruction must be adhered to, or warranty on fans etc will be rendered invalid.

#### **Figure 4**

#### **Duct connections**

Each end of the unit is a mirror image of the other, with one end connected to outside in order to take in fresh air and exhaust stale air, while the other is connected to inside to supply and extract. The end to connect to outside can be identified, as that, nearest the drain point on the bottom of the unit. There are a few options for making this connection.

1. Duct connections to slate vents.
2. Duct connections to soffits.
3. Duct connections to gables.
4. Duct connections to walls (Utility room installation).
5. A combination of any of above.

Ducts to outside should be as short as possible, as incoming air can develop some condensation on the outside of the duct and outgoing air can have condensation on the inside.

The outdoor and intake vents have been reasonably separated or faced in opposing directions to ensure that the exhaust air is not collected as fresh air.

Plastic ducts have been installed to carry the air to and from each room. Sealant has been applied at all joints to make sure that no air leaks occur. The ducts are supported where appropriate. Duct runs are optimized to the shortest overall length. As much of the ducting system as possible should be installed beneath the house insulation. Any ducts carrying warm air, to or from the unit, which contain any risk of being exposed in the attic are thermally insulated Min (25mm duct wrap) in order to (i) eliminate the possibility of condensation happening inside the ducts and (ii) avoid heat losses to the attic. The number of bends has been minimized. Similarly the use of flexible ducting is usually minimized to less than 5% of the total installation, so as provide an internal surface that is as smooth as possible thereby minimizing air flow resistance. In locations where access is limited, it may be necessary to use extra flexible ducting. The higher resistance to airflow of this medium is compensated for by pulling it tight, running it in straight lines and if necessary, over-sizing.

Care should be taken to ensure a minimum level of sound carry-over from room to room as well as a minimization of air and unit-noise transmission throughout the system. To this end, ProAir have adopted the following strategy;

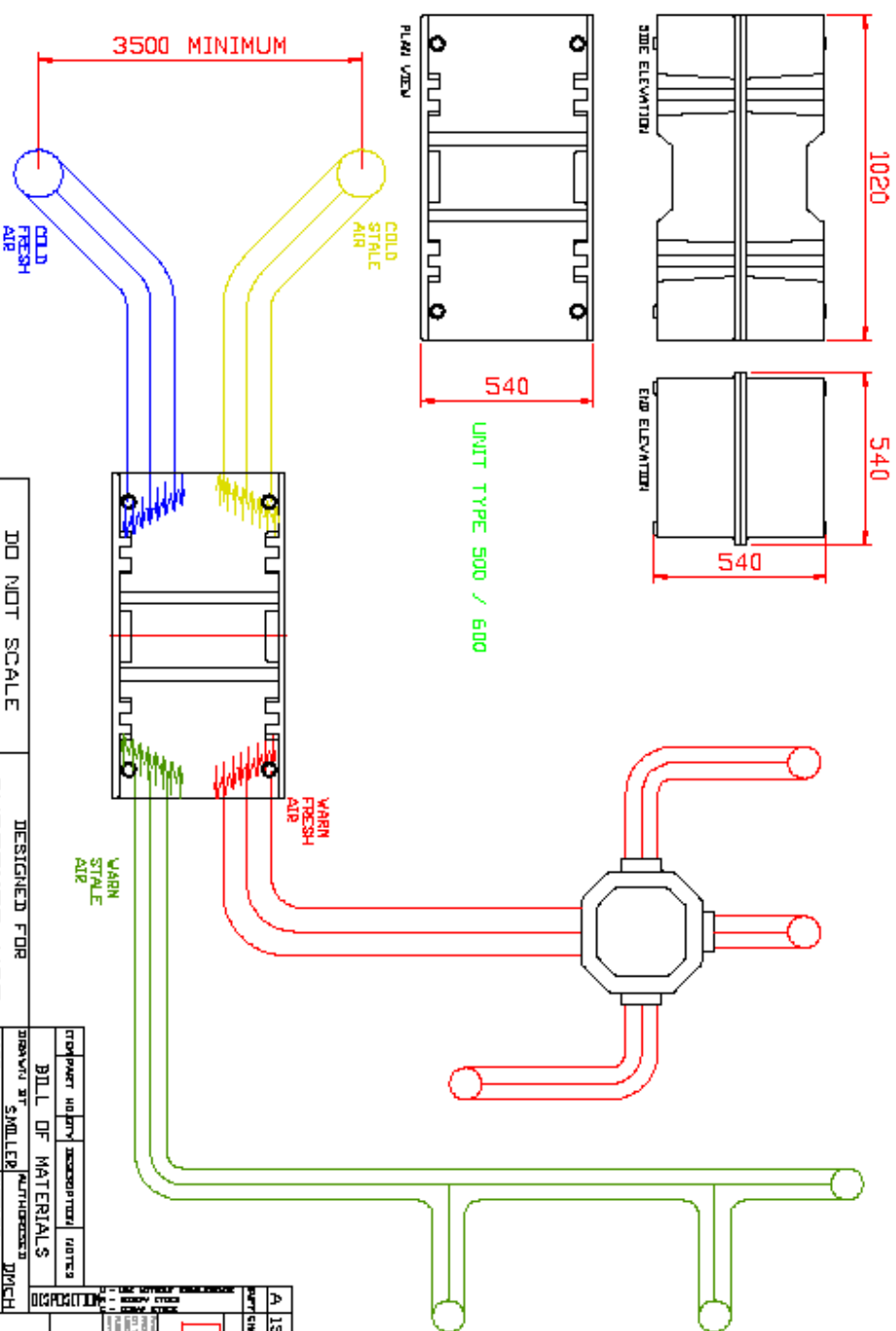
- Mounting of the unit is such that any machine-noise is not transmitted (suspended with light chain)
- Final connections with silencer media.
- Distribution of supply air, (especially to bedrooms) via an acoustically lined, specially designed distribution box, as shown on typical layout diagram below.

In each room you will find a delivery or extract terminal as shown in Figure 3. These terminals have an adjustable centre disc which we use to control air-flow and balance the system.

Your system has been tested & balanced by our technicians and needs no further adjustment. These terminals should not be adjusted in any way as to do so will impede the effective operation of the entire system.



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DO NOT SCALE  
IF IN DOUBT ASK  
ALL DIMENSIONS ARE IN MILLIMETRES  
ORIGINAL FRAME SIZE 809mm x 562mm

DESIGNED FOR CUSTOMER USE  
UNLESS SPECIFIED OTHERWISE ALL DIMENSIONS TO BE DECIMAL TO ONE PLACE  
TWO DIGIT ROUNDING TO BE REMOVED

DATE	BY	CHECKED	DATE	BY	CHECKED
01 MAY 06	SM/LEP	SM/LEP	01 MAY 06	SM/LEP	SM/LEP
SCALE	SCALE	SCALE	SCALE	SCALE	SCALE
1:1	1:1	1:1	1:1	1:1	1:1
WEIGHT	WEIGHT	WEIGHT	WEIGHT	WEIGHT	WEIGHT
ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL

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HEAT RECOVERY VENTILATION  
Profin 500 / 600 Unit  
DRAWING NO. 78101  
SHEET 4 OF 11 A1

MATERIAL SEE B.I.O.M.  
FINISH NATURAL

LIST ISSUE - ENDSIM  
PERFORMANCE & MODIFICATION PROVISIONS  
MODIFICATIONS

## Maintenance

In order for the system to work correctly and effectively it is important that approved maintenance procedures are followed.

The main component of general maintenance is changing the filters (2 of). The frequency of replacement will depend on three things;

1. The quality of the external air.
2. The number of people for the size of house.
3. The usage pattern.

It is a good idea to check every three months and replace if necessary. If when held up to the light and they cannot be seen through, then a change is required.

**WARNING Safety is of the utmost importance whilst working on the system. The power supply must be disconnected before attempting any procedure. Wear protective clothing and an appropriate face mask in the attic space if recommended by the insulation provider. Gloves should be worn when handling filter media.**

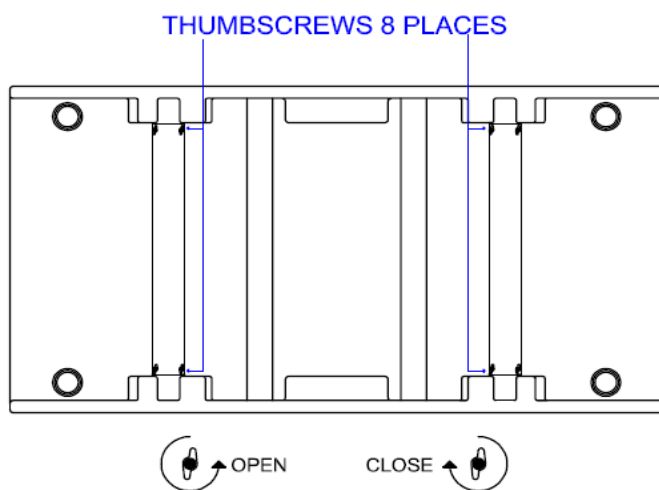


Figure 4

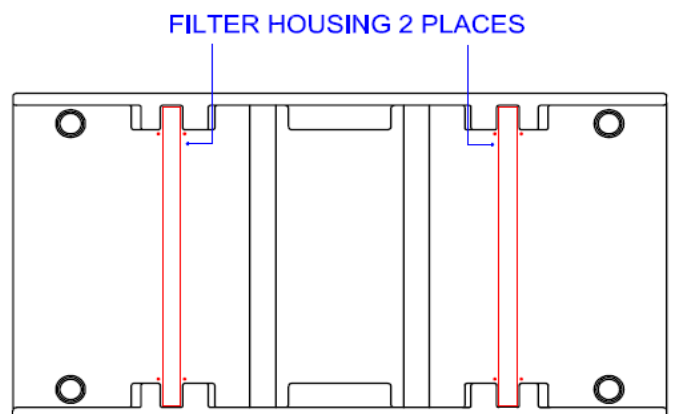


Figure 5

### **Checking / changing .**

Dirty or clogged filters can lower ventilation efficiency. It is highly recommended they are checked every three months.

Having turned off the power

- a. Remove the 4 thumb screws from the topside of the exchanger unit (Figure 4).
- b. Remove the cover to reveal the filter cartridge (Figure 5).
- c. Extract each filter cartridge separately noting it's location and orientation.
- d. Check and replace as necessary.
- e. Refit the filter cartridge exactly as previously fitted.
- f. Replace the HRV unit cover.
- g. Refit the 4 thumb screws.

### **2. Three year service by ProAir technician.**

This consists of cleaning the heat exchanger, checking the fans for dirt build-up and clearing of same, check and cleaning of condensate drain, replacing of filters and overall check of the system operation.

Check all the ductwork leading to and from your HRV.

If ductwork is damaged, crushed, kinked etc. contact ProAir to have it repaired correctly.

A record of all maintenance work done should be kept. A page at the back of this booklet has been provided for this purpose.

## Service Record

Date	Filter Cleaning	Filter Replacement	Service by ProAir



# Order Form

ProAir  
Heat Recovery Ventilation Systems  
Hi Tech House Unit 18,  
Claregalway Corporate Park,  
Claregalway,  
Co Galway.

Customer Name		Serial No.	
Address 1		Date of Installation	
Address 2		Date of last full service(if applicable)	
Address 3			

<input type="checkbox"/>	Please supply set of filters for above unit
<input type="checkbox"/>	Please arrange full service
<input type="checkbox"/>	Tick as appropriate

Details of costs are outlined on our website [www.proair.ie](http://www.proair.ie)

Payment to be made in advance.

Signed .....

Date .....

## Warranty

A 5 year warranty starts from the day of commissioning. It includes parts and labour for the first 2 years. The warranty covers parts only (excluding filters) for the remaining 3 years. Replacement filters should be ordered from ProAir, either directly or via [www.proair.ie](http://www.proair.ie). This warranty is conditional on planned maintenance being undertaken as scheduled in the Maintenance section above.

## Technical Specification.

Length 0.995m

Width 0.490m

Height 0.495m

Weight 32Kg

Casing: Polyethylene.

Heat exchanger **Type;** Counter flow reed exchanger  
**Material;** Polystyrene.

Filters:

Exhaust air G4 grade media in cardboard panel 450\*225\*20mm

Fresh air G4 grade media in cardboard panel 450\*225\*20mm

Fans: FB190C Backward curved centrifugal impellers  
2 No

## Technical performance values

Notes on above technical data.

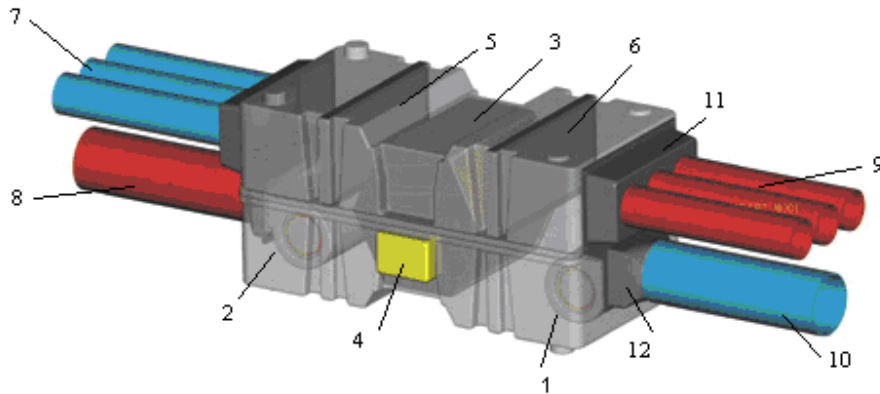
1. Power consumed is for the total unit including both fans and connected to a live system.

The ProAir 600 is fitted with the new generation electronically commutated (EC) motors to drive its FB190C backward curved centrifugal fans.

One of the advantages of the new EC motors is their controllability. There is an option of 10 control points within the range. This means that each installation can be commissioned to match the application exactly, within the air-flows shown. The ProAir technician will programme in, the two speeds suitable for your house size.

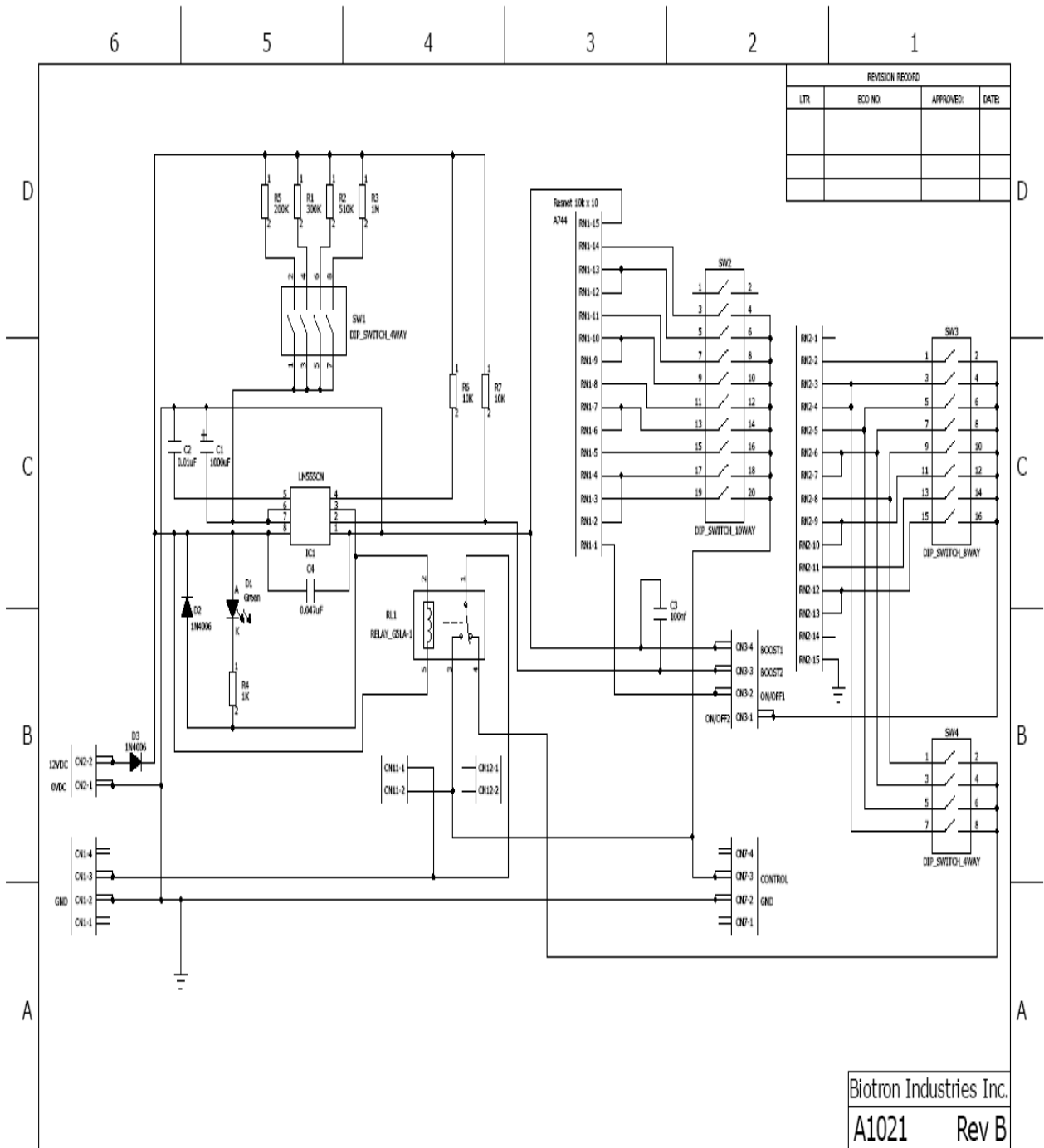
With a traditional AC induction motor, efficiency is compromised at lower speeds, which is the region that ventilation fans are usually operated at. This is why the electronically commutated motors are so well suited to this application.

## PA 600 parts list



1	Supply fan
2	Extract fan
3	Heat Exchanger
4	Electrical control panel
5	Supply air filter
6	Extract air filter
7	Fresh air inlets(3 of)
8	Exhaust to outside
9	Extract from bathrooms & kitchen
10	Supply to bedrooms & living areas
11	Exterior Spigot Plate
12	Interior Spigot Plate

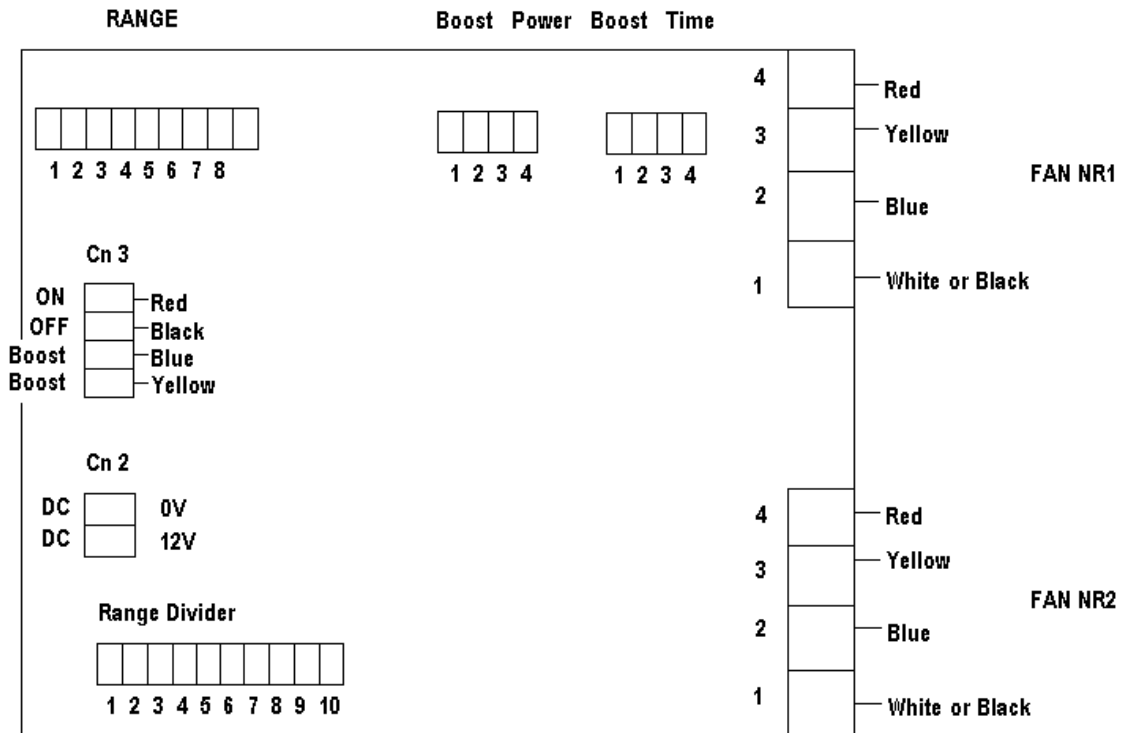
# Electrical schematic



		Range Divider (V) Speed (m/s)							
RANGE		1	2	3	4	5	6	7	8
1	Control voltage	1.3V	1.1V	0.9V					
	m/s	0.6	0.5	0.3					
	m3/hr	38	32	19					
2	Control voltage	1.9V	1.6V	1.3V	1.1V				
	m/s	1	0.8	0.6	0.5				
	m3/hr	64	51	38	32				
3	Control voltage	2.5V	2.1V	1.8V	1.5V	1.2V	1.0V		
	m/s	1.5	1.2	0.8	0.7	0.5	0.4		
	m3/hr	95	76	51	45	32	25		
4	Control voltage	3.2V	2.7V	2.2V	1.9V	1.6V	1.3V	1.0V	
	m/s	2.2	1.8	1.2	1	0.8	0.6	0.4	
	m3/hr	140	115	76	64	51	38	25	
5	Control voltage	4.2V	3.4V	2.9V	2.4V	2.0V	1.6V	1.3V	0.9V
	m/s	3.7	2.4	1.9	1.3	1.1	0.8	0.6	0.3
	m3/hr	235	153	121	83	70	51	38	19
6	Control voltage	5.5V	4.5V	3.7V	3.1V	2.5V	2.1V	1.6V	1.2V
	m/s	4.8	3.9	3	2.1	1.5	1.2	0.8	0.5
	m3/hr	305	248	191	134	95	76	51	32
7	Control voltage	7.7V	6.0V	4.9V	4.0V	3.3V	2.6V	2.0V	1.4V
	m/s	6.8	5.3	4.2	3.3	2.4	1.7	1.1	0.7
	m3/hr	433	337	267	210	153	108	70	45
8	Control voltage	7.7V	6.0V	4.9V	4.0V	3.3V	2.6V	2.0V	1.5V

	m/s	6.8	5.3	4.2	3.3	2.4	1.7	1.1	0.7
	m3/hr	433	337	267	210	153	108	70	45

		1	2	3	4
<b>Boost</b>	Control voltage	10.4V	7.2V	5.2V	4.2V
	m/s	7.9	6	4.7	3.7
	m3/hr	503	382	299	235



Field connections are to Cn 3 and are extra-low voltage. These are connected to switches as per figures 2&3 above (page6).