thermsaver
HEATING SOLUTIONS

regavent

WHOLE HOUSE VENTILATION WITH HEAT RECOVERY

1 Croftbank Crescent,
Uddingston,
Glasgow G71 7JD

Tel: 01698 327997
Fax: 01698 327776
www.thermsaver.co.uk
Email: graham@thermsaver.co.uk

INSTALLATION OF REGAVENT WHOLE HOUSE VENTILATION WITH HEAT RECOVERY

The suggested installation procedure is as follows:

1. Site central air unit.
2. Fit internal and external grilles.
3. Install attenuators and ducts.
4. Site electrical controls.
5. Make electrical connections.
6. Test and balance system

THE CENTRAL AIR UNIT

The Central Air Unit incorporates two fans, one extracts moisture, smells, stale air and wasted heat from all 'wet' parts of the house via ducting, and the other directs a fresh air supply through more ducting to the 'dry' rooms in the house. The fully variable speed air flow control unit allows the flow to be adjusted in the range 40% to maximum the switch speed control provides pre-set volumes at 40% flow and maximum

Inside the unit up to 70% of the heat from the stale air is retained and used to preheat the incoming fresh air via a highly efficient built-in heat exchanger. The two air flows are separate so no smells etc. are transferred from one flow to the other. Only heat is transferred.

SITE THE CENTRAL AIR UNIT

Ensure that the selected position for the unit allows access to all sides for connection of the ducts and clearance above the unit for removal of the top cover for maintenance.

To prevent any possibility of noise transmission to the living area of the dwelling the central unit must be mounted on a sound absorbent pad, this

should consist of a 19mm chipboard (or similar) base cut to the size of the unit with a hole cut through for the condensation drain. This should be positioned to cover 3 or 4 floor joists and screwed into position. The anti-vibration mount should be assembled and screwed to the mounting board.

A 22 mm condensate drain outlet is provided with the unit. This allows the condensation that forms in the unit to be routed to a suitable drainage pipe or gutter. The pipe system for this can be made using standard PVC overflow pipe and fittings. When forming the pipe system ensure that it remains below the level of the base of the unit to prevent a build up of water in the casing, and drops towards the drain point. If possible a loop should be formed in the pipe system to provide a trap which will prevent air loss through the drain system.

After fitting check that the Central Air Unit is firm and level on its base and that the condensate drain is below the level of the base of the unit for the entire length of its run to avoid condensate build up in the unit casing.

2. CUT HOLES FOR INTERNAL AND EXTERNAL GRILLES

As air is only extracted from the "wet" rooms of the house and fresh air introduced to the dry rooms the system relies on the free flow of air throughout the house. Internal room doors should not be tight fitting to the extent of preventing air movement, it may be necessary to shave a few millimetres from the bottom of doors that are a tight fit against carpeting. As a general rule a minimum air gap across the full width of the door should be 5 to 7 millimetres.

INTERNAL GRILLES

Fresh air grilles should be positioned to maximise air flow through living rooms, ideally as far as possible from the door into the room. Extract grilles should be sited as close as possible to the main source of water vapour, over the shower, bath or cooker, to remove moisture laden air as quickly as possible.

Both extract and supply grilles should be fitted in rooms where conventionally flued heating appliances are sited as air extraction only may result in incorrect combustion and the danger of flue gas spillage. The provision of both supply and extract air will prevent interference with the combustion process by equalising the air flows. Balanced flue appliances take their combustion air from outside the dwelling and are room sealed therefore air extraction will not affect them.

The two piece room air grilles consist of a body and cover and incorporate a washable filter. At this stage the body only is required thus the individual elements should be separated, as the covers and filters will not be fitted until the installation is complete. The duct aperture in the ceiling should be cut, with a pad or jigsaw, at the selected grille position, The hole sizes are 73mm for 63mm grilles and 110mm for 100mm grilles. If possible the holes should be spaced midway between the ceiling joists to allow easy fitting of the duct. Noggins may be required to ensure a firm fixing. The grille body may now be fitted through the ceiling and secured with the screws and plaster board fixings supplied. Alternatively, it is often easier to leave the fitting of the grilles until after the ducts are installed as this allows the end of the duct to brought through the ceiling, the grille body inserted into the duct and the joint sealed with tape. The duct and grille can then easily be pushed back through the ceiling hole and secured with the screws.

In some instances Air Valves will be used in place of air grilles, these will normally be of larger diameter, usually 125 or 160mm. In each case the fixing hole will be 10mm larger than the nominal size of the unit. Air valves are fitted in the same way as air grilles with the fixing ring being fitted to the duct and then screwed to the ceiling. The main part of the valve is fitted after the installation is complete.

EXTERNAL CONNECTIONS

When choosing the position of stale air exhaust and fresh air grille locations it should be borne in mind that cross contamination can occur. Thus they should be sited far enough apart to prevent this from occurring, a metre should be sufficient in all but the most turbulent conditions. The fresh air grille should also be located where there is no danger of drawing in combustion gases from flue outlets.

Wall Grilles: The hole size required for fitting the exhaust or fresh air duct is 10mm above the nominal diameter of the duct. When fitting wall grilles use the flexible duct to bridge the cavity and make good with mortar. When the mortar is hard the grille may be fixed using the screws and plugs provided. On timber frame construction ensure that the vapour barrier is resealed around the duct. The grille may be installed in the soffit if space permits.

Loft Air Inlet: The loft mounted fresh air inlet should only be used in well ventilated roof spaces. It should be mounted at high level to a roof truss or similar support to ensure that it is well above the level of any loft insulation material to prevent any fibres from being sucked into the filter element resulting in the need for frequent cleaning. It must then be connected to the fresh air inlet connection on the central air unit using a suitable length of duct, this duct does not need to be insulated.

Roof Terminal: The roof terminal is provided with an integral soft aluminium flashing plate which will mould easily to the majority of roof tile shapes. The corrosion resistant material may be painted to match the tile colour.

Ridge Tile Outlets: In cases where ridge tile outlets are used for exhaust or fresh air supply they must have sufficient free area to prevent any back pressure that could restrict air flow. In some cases it may be necessary to install two or even three ridge outlets to ensure free flow, utilising Tee pieces in the duct to connect them to the central air unit. It will generally be found that the ridge tile adapters have a socket connection requiring the duct to be fitted inside, the opposite of normal practice, this joint should be made good with tape and mastic.

3. INSTALL ATTENUATORS AND DUCT ATTENUATION

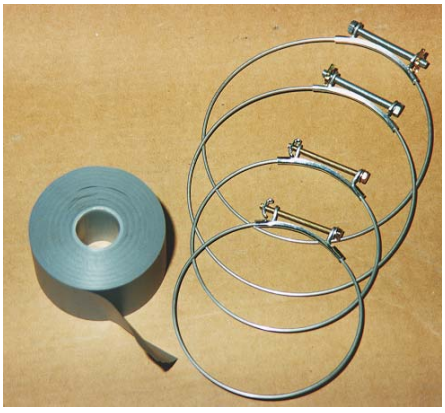
Sound absorbers are fitted into the duct system for a number of purposes. They prevent noise transmission from the central air unit to the living space, they prevent noise entry from outside and if required they stop the breakout of fan noise to the outside of the dwelling. Thus the degree of sound attenuation required will depend on the type and location of the home. In a central city location noise breakout to outside will be un-noticed, thus attenuation will only be required on the house side of the central unit to prevent noise entry. In a rural location fan noise escaping could prove a nuisance requiring sound absorbers on both sides of the central unit.

There are two forms of sound attenuation, Regatenuators or Acoustic duct. Regatenuators are purpose made sound absorbers generally 1 metre long with 50 mm acoustic insulation, as standard two attenuators are required one for the stale air extract duct and one for the fresh air supply. They should both be fitted on the room side of the central air unit and as close as possible to it. Short lengths of flexible duct should be fitted to central air unit connections using the worm drive clips, the spigot connection of the sound absorber will fit in this duct and the joint may be tape sealed. The attenuators may be formed to bends without loss of performance. For the prevention of noise breakout to outside further attenuators may be fitted to the exhaust and fresh air inlet ducts.

Acoustic duct is . This comprises an inner perforated aluminium duct, acoustic insulation and a polyester/aluminium laminate outer tube. The outer polyester tube is the actual seal against air leakage from the duct thus care must be used in handling to prevent puncturing, any punctures must be sealed with duct tape. Acoustic cladding the duct provides both sound attenuation and thermal insulation and is normally used throughout the loft space. Connections to fittings and the central air unit should be made using worm drive wire duct clips as these enable the outer polyester layer to be clamped tightly to prevent air loss.

FLEXIBLE DUCTS

After positioning the Central Air Unit and the internal and external grilles the duct system may be installed. Flexible ducts are supplied in 4 metre lengths that are compressed to 1 metre for ease of transport and site storage. Before installation they should be fully extended to their useable length, ideally this is a two man job with the tube being extended between them. The duct will tend to rotate slightly during the extension process, this is a factor of its spirally wound construction and is not detrimental to its performance.



Once extended it can easily be bent by hand to angles overcoming the need for elbows. Wherever possible

sharp bends should be avoided since they create resistance to air flow and can generate noise in the system. Do not repeatedly bend and flex the duct since the metal will weaken and may fracture. Cut it with snips or a sharp trimming knife blade.

Joints to fittings and connectors may be made with tape or duct clips. The PVC tape should be applied under tension to follow the contours of the tube, three turns of tape are normally sufficient to provide a strong air tight joint. Clips are normally used in confined spaces where duct application would be difficult. When using clips it is best to apply a layer of tape to the spigot before sliding the duct over, this avoids a metal to metal joint and gives the clip a resiliant surface to grip.

RIGID DUCT

Heavy gauge rigid ducts are generally only used in larger installations where long duct runs of flexible tube would result in excessive air flow resistance. The tubes are of spirally wound configuration and must be used with purpose made bends to achieve changes in direction. Spiral ducts may be cut using a fine tooth hacksaw and the joints sealed with duct tape.

DUCT FITTINGS

Tee's are used to provide branch ducts off of the main duct run, they are available as equal tee's with the branch the same size as the main duct or as reducing tee's with a smaller branch than main duct.

Reducers effect a reduction in the duct size and should be installed immediately after a tee where the air volume will be reduced due to the air flow diverted through the branch duct.

Bends are available in 30, 45, 60 and 90 degree angles and are only normally used with rigid duct systems.

Couplers provide a male fitting for joining lengths of duct and incorporate a centre stop to aid location of the duct.

Fire dampers prevent the spread of fire through the duct system. In installations that include a cooker hood a fire damper must be positioned in the extract duct as close as possible to the hood outlet. As the fire dampers are spring operated they may be installed in any plane.

INSULATION

All ducts installed in loft spaces or other unheated areas must be insulated to prevent heat loss. In the case of acoustic or pre-insulated ducts the materials are supplied ready to install. Plain ducts should be insulated before installation using the purpose made insulation sleeves. Fully extend flexible ducts before applying the sleeves. Wrap the sleeve longitudinally, overlap and fix with PVC tape.

DUCT INSTALLATION

To prevent possible confusion it is best to deal with a complete duct run in its entirety, whether extract or supply is unimportant. Installation should commence at the central air unit with the connections to the spigots using worm drive clips. Install the duct in accordance with the design using insulated ducts in unheated areas. Joints between tubes and fittings should be sealed using duct tape or in the case of acoustic duct with worm drive clips. Where reductions in the duct size are indicated in the design the reducer should be fitted directly after the tee piece using a short length of duct as a female connector.

Flexible ducts may be formed to bends of very tight radius, try to avoid these as they increase the system resistance. Gentle bends give better air flow.

Take each duct run to its grille outlet and make the connection using duct tape.

SITE ELECTRICAL CONTROLS

The controls provided as standard with any system are as follows:

Variable speed control. Provides on/off operation of the system and controls the speed of both fans to vary air volume. Two settings normal and boost for use when the house occupancy is higher than normal or more moisture may be generated, such as a major cooking session.

Summer/Winter switch. During summer months the windows of the home will normally be open providing an ample supply of fresh air. There is no requirement for fresh air to be provided by the system. The summer/winter switch isolates the fresh air fan allowing the stale air fan to operate independently to continue to extract stale and moist air. There is no heat recovery.

Generally the speed control will be used when cooking for additional extract or when showering or bathing, thus installation adjacent to any area associated with these activities is quite suitable. The speed control should not be installed in a bathroom or shower room. The summer/winter switch would normally be fitted next to the speed control for convenience of wiring.

The most usual optional control is the humidistat unit which is generally installed in bathrooms or shower rooms. The humidistat senses increased air moisture levels and sends a signal to the central air unit to over ride any speed control setting, this increases the air change rate to maximum to ensure that the moist air is cleared as quickly as possible. Humidistat units should be fitted as close as possible to the moisture source but not within reach of any person using the bath or shower. They should be wall mounted at 300mm below ceiling height for maximum efficiency.

ELECTRICAL INSTALLATION

The unit should only be wired to a 220/240 volt 50 Hz supply fused to 5 Amps. The circuit must include a two pole isolation switch with a minimum contact gap of 3.0mm on all poles.

The suggested cable sizes are 2.5mm^2 for the mains supply wiring and 1mm^2 for the system wiring i.e. from the isolation switch to the unit and controls.

REGAVENT HRV OPERATING INSTRUCTIONS

SAFETY

Before carrying out any maintenance on the HRV system, other than cleaning of the filters, set the variable speed control and the mains isolation switch sited next to the unit to the OFF position.

HEATING APPLIANCES

With the exception of room sealed units (balanced flue) all fuel burning household appliances, including open fires require air for combustion. HRV systems can interfere with the supply of this air. Always ensure that there is an adequate combustion air supply to rooms housing flued appliances. HRV systems draw fresh air from outside the dwelling to replace the exhausted stale air. Take care to ensure that the fresh air intake is not sited close to any form of flue outlet to prevent poisonous fumes from being drawn into the home.

FIRE

Fire can be transmitted through ventilation ducts. As a minimum requirement steel or aluminium ducts shall be used in the exhaust from the kitchen cooker hood, and a fire damper installed as close as possible to the hood.

The above are minimum requirements. In addition the system should be designed by a competent heating and ventilating engineer to meet the Building Regulations and local bye-laws

MAINTENANCE

Routine maintenance of your RegaVent system is kept to a minimum but regular cleaning will maintain the efficiency of the system and prolong its working life.

BEFORE CARRYING OUT ANY MAINTENANCE ISOLATE THE SYSTEM FROM THE ELECTRICAL SUPPLY

Heat Recovery Ventilation Maintenance

If your HRV breaks down, it should be repaired at the first opportunity. Do not avoid repairing the HRV simply to save money. If your home was designed and built to have an operating mechanical ventilation system, it will have been built to airtight standards, poor indoor air quality, reduced comfort, and moisture problems may result if the system is not properly operated and maintained.

Maintenance Schedule

With routine preventative maintenance, you can avoid unnecessary problems, ensure the effectiveness of your HRV, and prolong its life. The summary below indicates some general HRV maintenance requirements. All Items are maintenance procedures a homeowner can undertake.

Be sure to disconnect the electrical power before servicing your system.

1. *Clean* or replace air filters.

Filter located in behind room air grille covers are easily accessed for regular maintenance, they should be inspected at monthly intervals and washed in mild detergent if required.

The main filters, which are located within the HRV unit should be inspected and cleaned every six months. The filters are washable, they should be vacuumed first, then washed in a mild detergent and water. The washable filters will last several years before needing to be replaced.

Dirty filters can reduce ventilation efficiency, result in unbalanced airflow. Replacement filter are available from Rega, filters not designed to operate with your HRV can add resistance to the airflow and may impair the unit's operation.

When cleaning the filters, take the opportunity to vacuum or clean any interior surfaces adjacent to the filters. As well, if your unit has an electric preheater element, carefully vacuum the element's surfaces.

2. Clear the exterior *intake and* exhaust vents of obstructions.

Check the outside vents regularly to ensure that the openings are not obstructed by grass, bushes, leaves or other debris.

You might want to check the vents more often in the autumn (when there are

leaves on the ground) and during the winter (to ensure that snow or frost build-up does not block the openings). Over time, you will become the best judge of how frequently you should check your HRV vents.

3. Check the *heat-exchange* core.

Inspect the heat-exchange core once a year and clean it as required. Although protected by filters over a period of years a build-up of dust and dirt can restrict airflow and reduce the efficiency of your HRV. Vacuuming the heat exchanger is usually effective in removing debris, but if a build up of grease has occurred the heat exchanger may need to be removed and washed in mild detergent or even replaced.

4. Clean the *condensate drain and pan.*

Once a year, check the condensate drain and tubing to ensure that they are open and free-flowing. To do this, find the hole that leads to the drain inside the unit, it is sited adjacent to the exhaust air fan in the base of the unit or low on the end plate, a brass connection on the outside of the unit helps locate the drain. Pour a small amount of warm water into the location of the drain outlet. If the water does not flow freely, unblock the drain using a piece of thin wire. The tubing can be disconnected for cleaning. The condensate drain must have a "trap" - an S or loop in the tubing that traps a quantity of water - to prevent air from entering the HRV via this tubing.

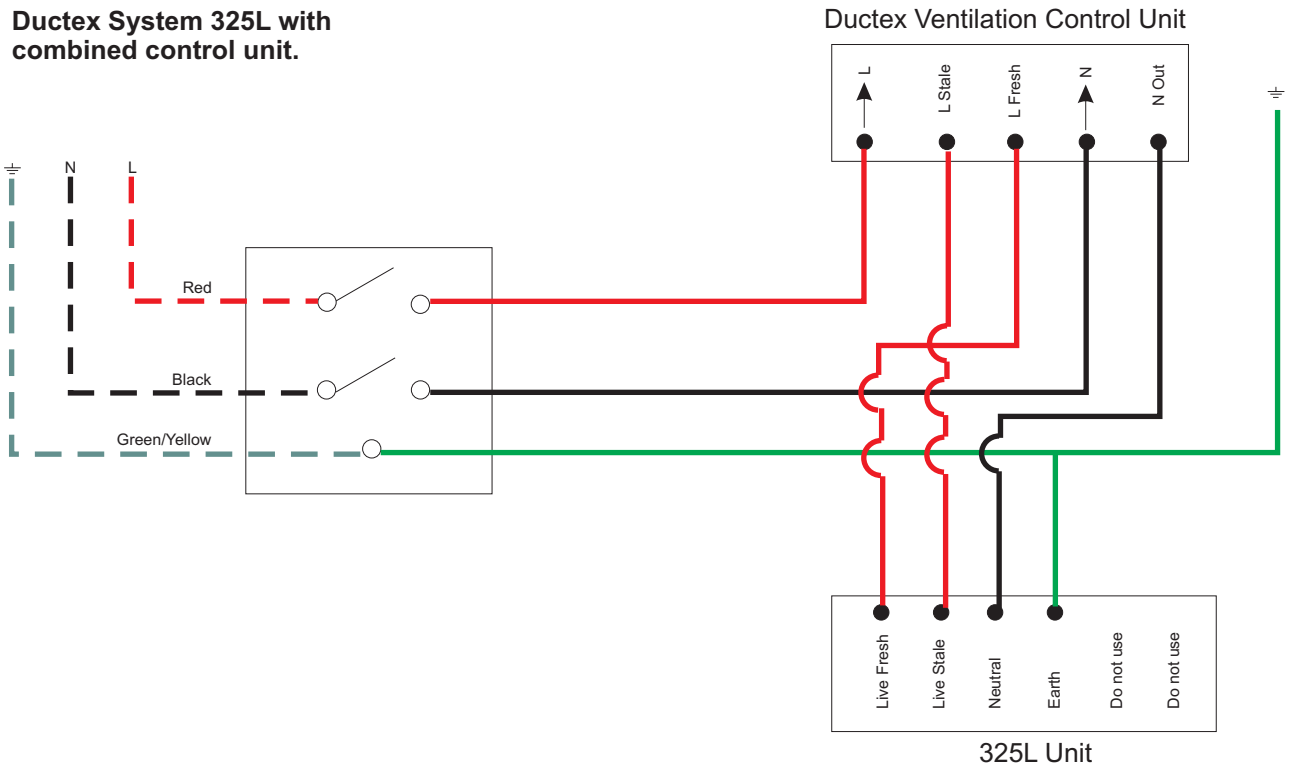
5. Service the fans.

Annually, check the fans on your HRV. The fan motors are sealed for life and are designed to operate continuously without any lubrication. The only maintenance required is to check that the fans rotate freely and inspect them for dirt on the blades, remove any build up by gently brushing the blades or using a vacuum cleaner. Fan life is normally 10 to 15 years in normal service, should they fail or become noisy replacement will be required. Replacement units are available from Rega Ventilation Ltd

6. Clean grilles *and* inspect the *ductwork.* Clean the duct grilles when they are dusty or greasy. At least once a year, visually inspect the interior surfaces of the ductwork leading to and from the HRV. These surfaces will collect dirt over time; however, professional ductwork cleaning is not usually needed except in extreme cases of filter neglect or heavily contaminated atmospheres.

Kitchen exhaust grilles should have filters to catch grease. These filters must be cleaned on a regular basis or as required.

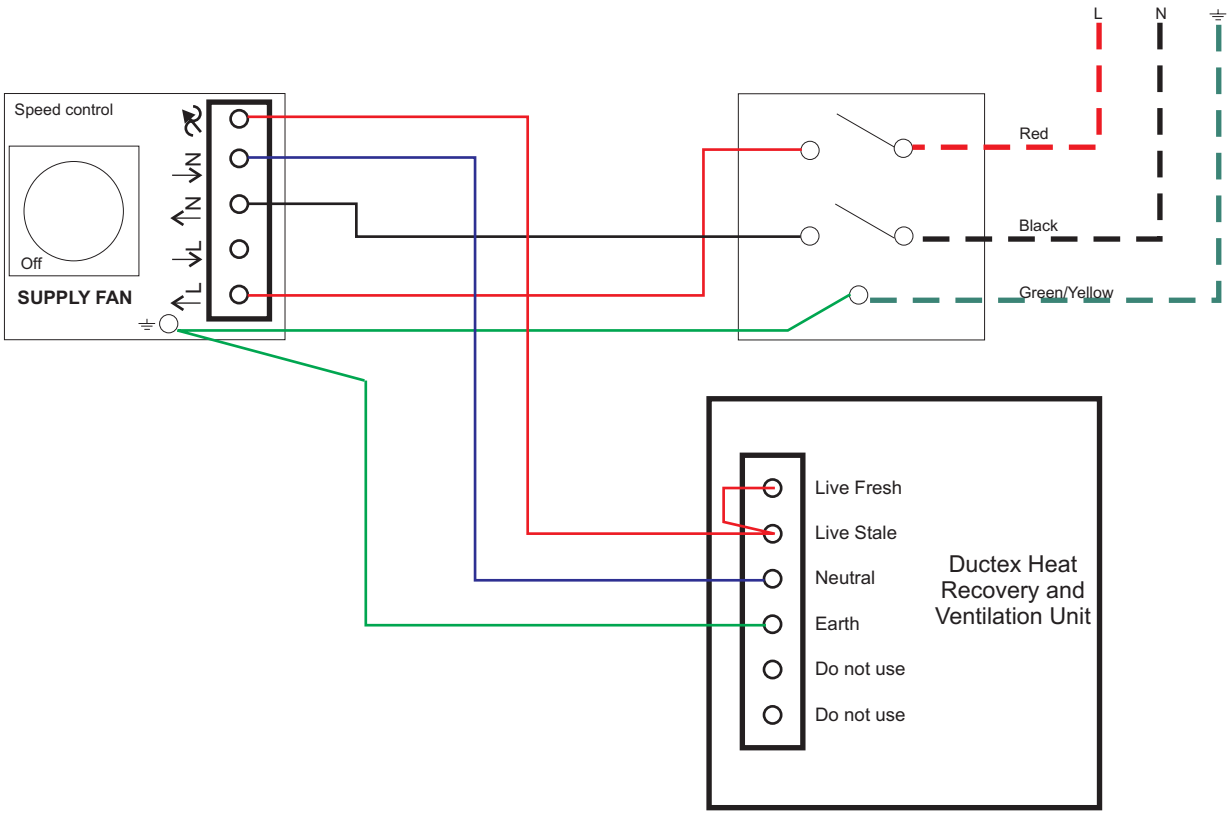
Ductex System 325L with combined control unit.



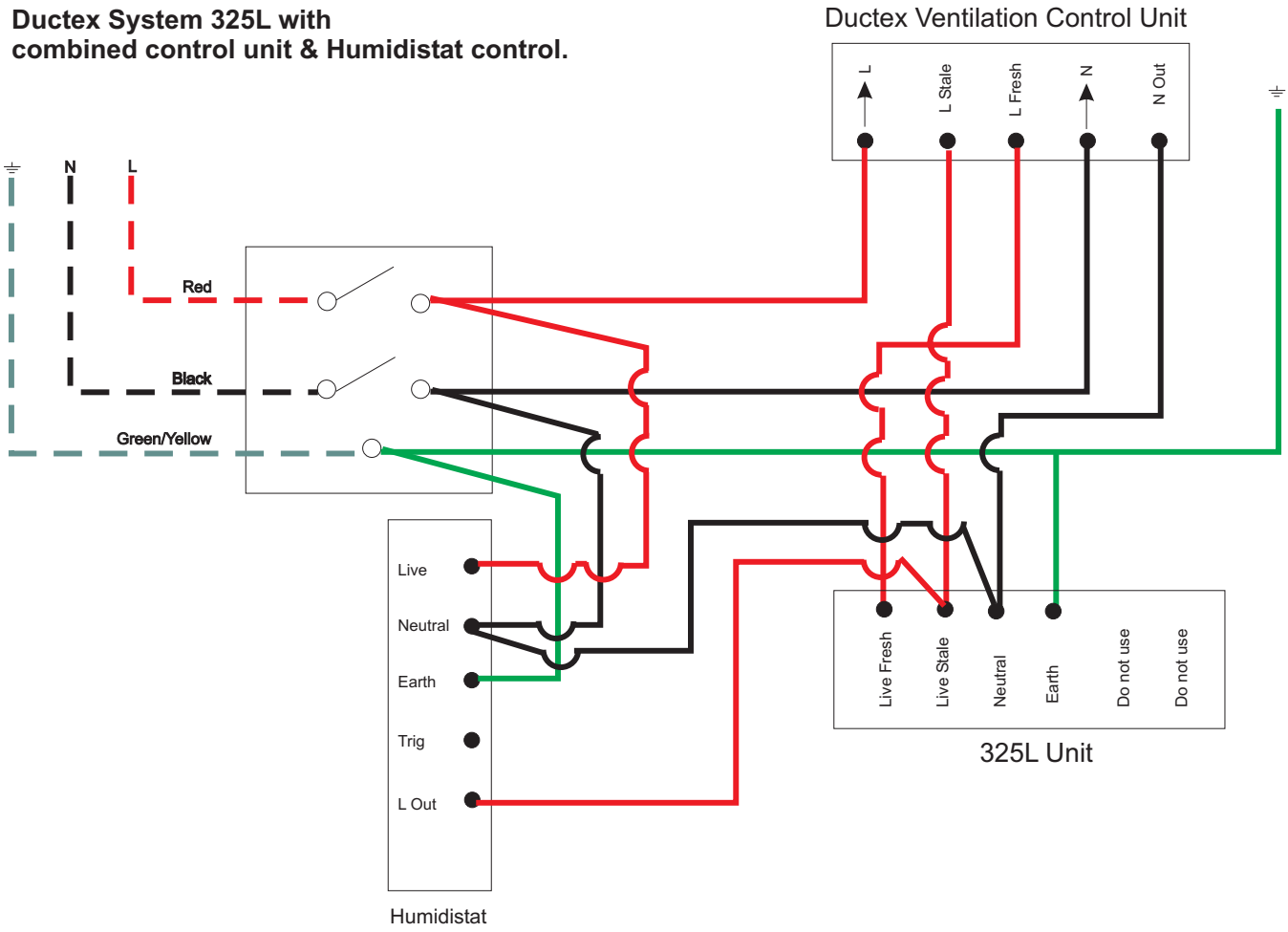
Wiring Diagram - 650L

5A Fused Mains Supply
240V 50Hz
Through a 2 pole
isolation switch
fitted with 3mm
Seperation contacts
(customer supply)

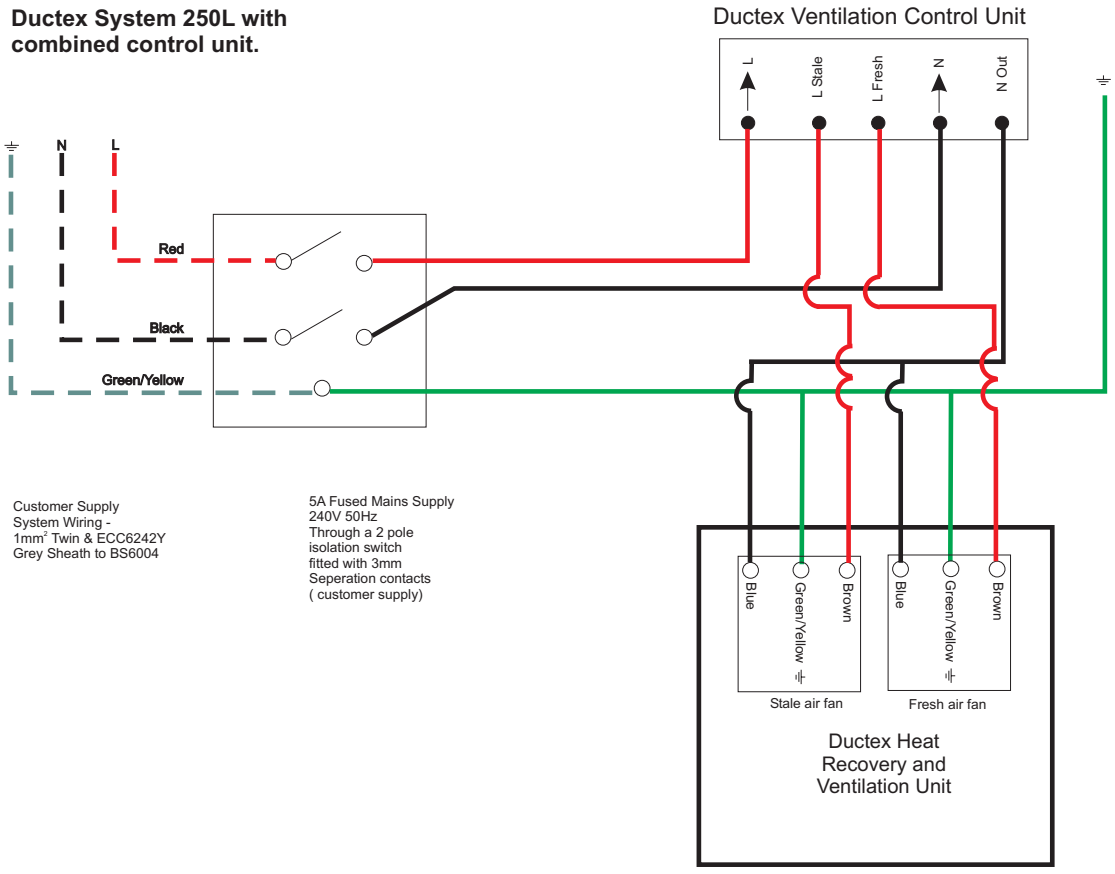
Customer Supply
System Wiring -
1mm² Twin & ECC6242Y
Grey Sheath to BS6004



Ductex System 325L with combined control unit & Humidistat control.

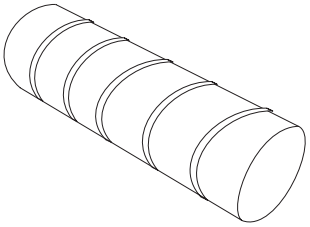


Ductex System 250L with combined control unit.



Galvanised Steel Rigid Spiral Duct

High strength rigid duct for use in exposed situations or long duct runs. Resistant to damage but generally more expensive and difficult to install than bendable aluminium duct. Galvanised steel fittings are used with both spiral and bendable ducts



Size Range

I.D.	Length
100mm	x 3.0 metre
125mm	x 3.0 metre
150mm	x 3.0 metre
160mm	x 3.0 metre

Fittings: Galvanised Steel.

Installation: Cut to length with a fine tooth hacksaw.

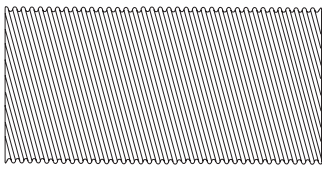
Joints: Seal with PVC tape or drill, rivet and seal with mastic.

Aluminium Bendable Duct.

Corrugated Aluminium Duct, fire resistant to BS476 Part 20. May be formed to tight bends and offsets, stays put once formed. Ideal for long duct runs with few joints.

Size Range

I.D.	Length
100mm	x 4.0 metre
125mm	x 4.0 metre
150mm	x 4.0 metre
160mm	x 4.0 metre
200mm	x 4.0 metre



Fittings: Galvanised Steel

Installation: Supplied in 1 metre lengths, fully extend to 4 metres before use. Cut the tube with a fine bladed hobby , "stanley", knife

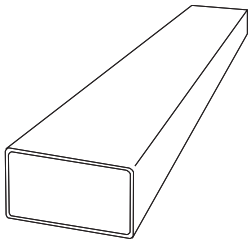
Joints: Seal with PVC tape or worm drive wire fixing clips.

Low Profile Extruded PVC Duct

Low profile duct for restriced space installations. Usually used to provide a concealed duct dropping through stud first floor partitions to ventilate ground floor rooms.

Size Range

W x H	Length
110mm x 54	x 1 metre
110mm x 54	x 1.5 metre
200mm x 60	x 1 metre
200mm x 60	x 1.5 metre



Fittings: Injection moulded plastic.

Installation: Cut to length with a fine tooth hacksaw.

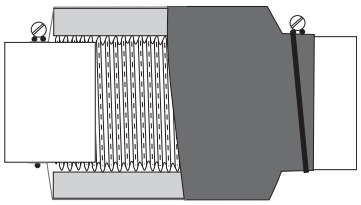
Joints: Seal with PVC tape or drill, rivet and seal with mastic.

Aluminium Bendable Acoustic Duct

Provide both thermal and acoustic insulation to prevent noise entry from outside and from one room to another. Used in roof space to ensure a quiet system.

Size Range

I.D.	Length
100mm	x 4.0 metre
125mm	x 4.0 metre
150mm	x 4.0 metre
160mm	x 4.0 metre
200mm	x 4.0 metre



Fittings: Galvanised Steel.

Installation: Cut the tube with a fine bladed hobby , "stanley", knife. The outer polyester cover is the air tube, it is easily punctured resulting in loss of air flow. Repair any damage with PVC or foil tape.

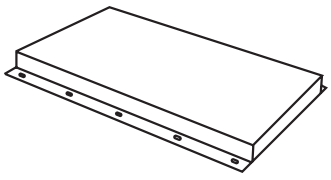
Joints: The polyester tube is the air carrier and must be sealed to the duct fittings. Firstly, slide the outer casing 150mm back from the end of the tube, carefully remove 100mm of insulation from the end of the tube using a sharp knife. Return the polyester sleeve to align with the end of the aluminium inner corrugated tube. Take the correct size wire fixing clip, ensure that it is fully open, and slide it over the polyester outer tube. Take the fitting to be used and apply a single layer of PVC tape to the spigot connection. Slide the fitting inside the corrugated tube and tighten the worm drive screw to clamp the tube to the fitting. The polyester sleeve should be sandwiched between the corrugated tube and the clip to provide an airtight seal.

Lowline Galvanised Steel Rigid Duct

Ultra low profile, 25mm deep, duct for installation below concrete or beam and block floors. Fits within the depth of normal battens used for plaster board fixing. May be produced in non-standard widths to suit free area required.

Size Range

W x H	Length
225mm x 25	x 1.2 metre
225mm x 25	x 1.2 metre
225mm x 25	x 1.2 metre



Fittings: Galvanised Steel.

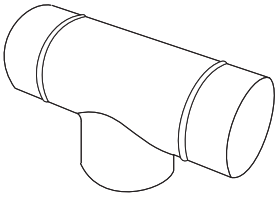
Installation: Cut to length with a fine tooth hacksaw.

Joints: Seal with PVC tape or drill, rivet and seal with mastic.

Galvanised Steel Fittings

Tee Piece
Size Range

Body		Branch
100mm	x	63mm
100mm	x	100mm
125mm	x	63mm
125mm	x	100mm
125mm	x	125mm
160mm	x	100mm
160mm	x	125mm

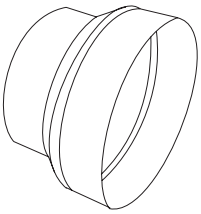


Joints: Seal with PVC tape or drill, rivet and seal with mastic.

Galvanised Steel Fittings

Reducer
Size Range

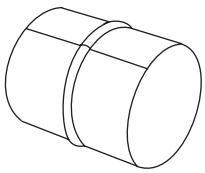
Body		Branch
100mm	x	63mm
125mm	x	63mm
125mm	x	100mm
160mm	x	100mm
160mm	x	125mm



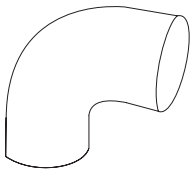
Joints: Seal with PVC tape or drill, rivet and seal with mastic.

Galvanised Steel Fittings

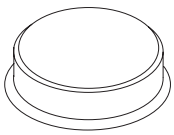
Duct Connector



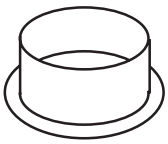
90 Degree Bend



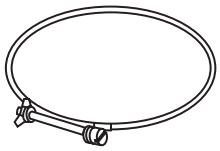
Cap End



Flange Sigot



Wire Duct Clip

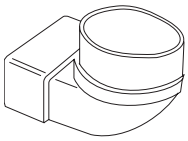


Size Range
100mm
125mm
160mm
200mm

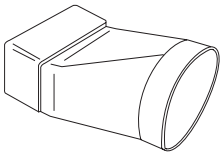
Joints: Seal with PVC tape or drill, rivet and seal with mastic.

Plastic Rectangular Duct Fittings

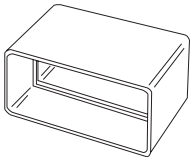
Circular Elbow Connector



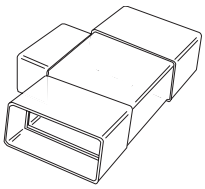
Circular Straight Connector



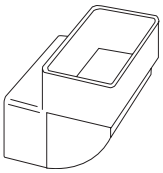
Rectangular Connector



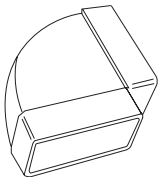
Rectangular Tee Piece



Vertical Bend



Horizontal Bend

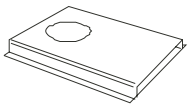


Size Range
110mm wide x 54mm high
200mm wide x 60mm high

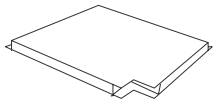
Joints: Seal with PVC tape or drill, rivet and seal with mastic.

Lowline Galvanised Steel Rectangular Duct Fittings

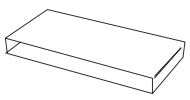
Ceiling Grille Adaptor



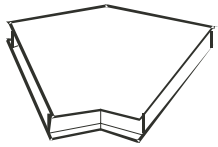
Horizontal Bend 90



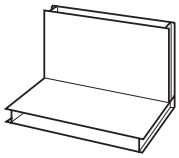
Lowline Connector



Horizontal Bend 45



Vertical Bend



Size Range

225mm wide x 25mm high
300mm wide x 25mm high
400mm wide x 25mm high
300mm wide x 40mm high

Joints: Seal with PVC tape or drill, rivet and seal with mastic.

Q. Why is there a need for ventilation?

A. Normal household activities such as cooking, bathing, showering etc. all produce potentially harmful water vapour. In the past houses built by traditional methods had open flues to every room and plenty of air gaps. This allowed a constant flow of air through the house, removing the water vapour before condensation could occur. Today's energy saving measures, double glazing, wall insulation and draught proofing have resulted in tightly sealed houses having little natural ventilation.
The following illustrates the amount of water generated in 24 hours by typical household activities:

Clothes washing	0.5 litre
Dish washing	1.0 litre
Bathing	1.0 litre
Cooking	3.0 litres
Clothes drying	3.0 litres

Q. What is condensation?

A. The ability of air to hold water vapour varies with the air temperature and the amount of water in the air. Condensation will occur when the warm moist air meets a cold surface that causes the air to drop to a temperature below its dew point. At this point the water vapour in the air will appear as condensation on the cold surface.
Typical Dew Point Temperatures

Air Temperature	Relative Humidity	Dew Point
21^{O}C	50%	13^{O}C
21^{O}C	70%	15^{O}C
21^{O}C	80%	17.5^{O}C
21^{O}C	100%	21^{O}C

Q. What are the effects of condensation?

A. The most obvious visible effect of condensation is the appearance of moisture on windows and other cold impervious surfaces, whilst irritating, this water can be easily removed. Much more harmful is the moisture that condenses on absorbent surfaces such as masonry and timber, here the water is absorbed into the surface and cannot easily be removed. The continued absorption of moisture will result in spoilt decorations with peeling wall paper and growth of black mold and long term structural damage to the fabric of the building.

Q. Are there other problems associated with inadequate ventilation?

A. Yes, increased moisture levels lead to a rise in the house dust mite population and these are now proved to be a major contributor to the rise in Asthma cases in children. Tests have shown that reducing the moisture levels below 55% can eliminate dust mites. More obvious but less harmful, cooking smells, tobacco smoke, pet smells, toilet odours and generally stale, musty and stuffy atmospheres are all associated with lack of air changes in the home.

Q. Will a dehumidifier solve the condensation problem?

A. Yes, A dehumidifier is designed to remove moisture from the air and will reduce condensation. However, condensation is only part of the problem associated with inadequate ventilation. A dehumidifier does nothing to change the air in the house and has no effect on the air contaminants of cooking smells etc. It will only affect the room in which it is situated; a unit capable of coping with a whole house would be far too massive and noisy to be practical. Thus a separate unit will be required for each problem room with subsequent effects on electricity costs due to the power consumption of 300 to 400 watts for each unit.

Q. What is the best answer to ventilation problems?

A. Balanced whole house ventilation with heat recovery is the most satisfactory solution to air change problems in today's energy efficient tightly sealed homes. It ensures a clean pleasant household environment for maximum comfort whilst retaining heat for maximum economy.

Q. How many air changes are needed for proper ventilation?

A. In today's well insulated homes over 40% of the total heat loss takes place through ventilation air losses. Reducing this requires a balance between excessive ventilation with consequent heat loss and sufficient ventilation for a pleasant household environment. At present the Building Research Establishment suggest an ideal ventilation rate of 0.5 to 1.5 air changes per hour (ach). Countries with a greater experience of energy efficient ventilation specify a lower change rate. Sweden 0.5 ach, Canada 0.5 ach with a minimum ventilation rate of 18 cubic metres of air per room and finally Germany with 25 to 34 cubic metres per hour for each person normally occupying the dwelling. At present to conform to the UK and Scottish Regulations a heat recovery ventilation system should be designed to give 0.5 ach plus the ability to achieve a 50% boost to 0.75 ach.

Q. I know that the heat recovery system will improve my household environment but is it expensive to operate?

A. On the contrary, unlike other forms of ventilation such as trickle vents, extract fans and passive stack, Heat Recovery Ventilation can reduce your heating costs. In order to combat the problems of moisture production and poor atmosphere in the home it is now mandatory to fit extract fans and trickle ventilations in all new houses. These uncontrolled systems generally give an excessive ventilation rate of 3 air changes per hour and all of the heat in the air exhausted to outside is lost. With a heat recovery system the air change rate is controlled to a much lower level, typically 1 air change per hour and a high proportion of the heat in the exhaust air is transferred to the incoming fresh air. Energy savings vary with the type and location of the dwelling but as an example a house in the south of England operating a system from September to May at 100 cubic metres per hour would recover 2000 Kilowatts with a fan running cost of 800 Kilowatts showing an energy saving of 1200 Kilowatts.

Q. Can heat recovery ventilation be installed in all homes?

A. Heat recovery ventilation systems can be installed in all houses, flats or bungalows. To achieve maximum energy savings it is essential that the home be tightly sealed to ensure the controlled ventilation occurs without excessive air movement caused by badly fitting doors and windows. Therefore it is most important that the home is draught proofed.

Q. What size system do I need?

A. The first step is to calculate the total volume to be ventilated by multiplying the floor area by the room height. Then simply taking 75% of this total gives the air change requirement with an allowance for 50% boost.

Q. What is the power consumption of the air handling unit?

A. Units are available capable of handling air volumes from 250 m^3/h to 680 m^3/h having power consumptions from 140 watts to 220 watts at maximum operating capacity. They are controlled electronically which results in lower speeds using less power with the resultant reduction in operating costs.

Q. Are the systems noisy?

A. Heat recovery ventilation systems are designed to run 24 hours a day during the winter period, therefore it is essential that they are quiet in operation. The Regavent system incorporates extensive sound absorption measures to ensure almost silent operation. Typical room sound levels are measure at less than 25 Db.

Q. How is the air distributed to the rooms?

A. Air distribution takes place through aluminium bendable ducts of diameter suited to the air volume carried. Generally the ducts to the rooms are of 100mm or 63mm diameter. The corrugated ducts are of all metal construction and are supplied in 4 metre lengths compressed to 1 metre for ease of transport, they are easily extended by hand to their full length for installation. In specific locations such as vertical runs in partition walls ducts or rectangular profile may be used, these flat section profiles are available with depths as shallow as 25mm.

Q. Are the duct obtrusive?

A. In a bungalow all of the rooms may be supplied by ducts in the roof space making installation simplicity itself. In a house, whilst the upstairs rooms can be connected with loft mounted ducts, more thought must be given to the duct runs to the down stairs rooms. To avoid “boxing in” the ducts should be routed through cupboards, wardrobes or stud walls.

Q. Do the ducts need to be insulated?

A. Duct runs in the heated part of the house do not need insulation as any heat that escapes through the duct wall will return to the room through which the duct runs. In the loft, unless it is a “warm roof” construction, the ducts must be insulated. This can be achieved by wrapping the ducts with insulation sleeves, or by using pre-insulated duct lengths. This factory made insulated duct has a perforated inner tube covered with a layer of mineral wool and an outer foil/polyester sleeve. This construction not only gives thermal insulation but performs a valuable noise absorption function to make the system almost silent in operation.

Q. Are there any major problems in fitting the system?

A. With care taken at the planning stage no problems are normally experience during installation. The most important area to consider are the duct routes to the lower floor where it must be remembered that duct cannot cross floor joists but can run between them, thus the correct location of the dropping ducts from the loft space is critical. The other areas to consider are the supply and extract connections to outside. There are three possible locations roof outlet, through ridge or tiles, soffit grille or gable end grille. Any one or a combination of these may be used depending on individual dwelling requirements.

Q. How should I operate the system? Can I control it with a timer?

A. To achieve the maximum benefit and ensure a fresh household environment it is vital to operate the system on a continuous 24 hour basis. The speed of the fans and hence the air volume moved can be set between normal and boost, thus the system can be adjusted to suit household conditions with normal speed for periods of light contamination or high speed for when cooking or showering. In this way continuous ventilation can be achieved with economy of operation, no further controls are necessary?

Q. How do I control the system?

A. The system is supplied with a control centre incorporating three switches. On/Off, Normal/Boost for controlling the fan speed and Summer/Winter which isolates the supply fan allowing the extract system to be used during the summer months with replacement fresh supplied by open windows.

Q. Must I operate the system throughout the year?

A. It is only important to operate the system when the windows are closed and the home tightly sealed, in fact it would be most uneconomic to operate it under other conditions. A normal operating period would be during the heating season from September to May. If during the summer months,for security reasons, the windows are closed it will be necessary to continue to operate the system under the winter setting but the AHU will need to be fitted with a summer bypass to allow the system to operate without heat recovery.

Q. What is the expected life of the system operating on a continuous basis?

A. The ventilation system is designed to give a long maintenance free life under normal operating conditions. The only moving parts are the fans and speed control which require not routine servicing and have a proven history of reliability. The system filters are washable but will require replacement after a long period of service, typically five years or more under normal conditions. If the filters are maintained in good condition the heat exchanger will not need cleaning in domestic use. The complete system is designed to give an anticipated life of at least ten years and even after this period of service only the fans may need replacement.

Q. We have an open fire, how does the effect the system?

A. An open chimney will give excessive ventilation and is very wasteful of energy. In most cases the fire is only used for occasional secondary heating and in this case a damper should be fitted into the chimney allowing the flue to be closed when not in use. To meet Building Regulations a separate air supply must be provided for combustion air for the appliance.