



Regavent Whole House Ventilation with Heat Recovery Installation Manual

Suitable for: 600R, 300R & 250R Loft and Wall mounted units

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The System

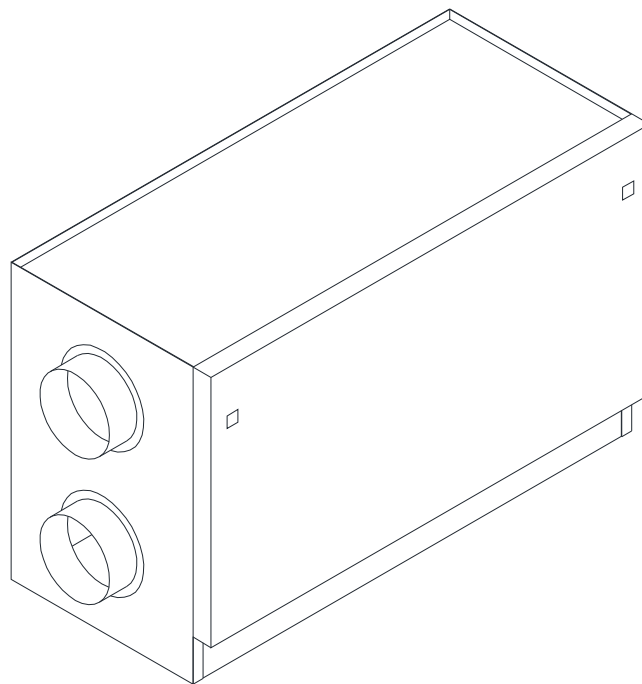
The **Regavent mechanical ventilation system with heat recovery** is designed to provide a fresh, healthy home environment whilst maintaining a high level of thermal efficiency.

The system consists of a central air handling unit, containing two fans and a heat exchanger connected to the rooms of the home by a duct system. The extract fan removes unwanted stale air and moisture from the wet rooms; bathrooms, toilet, kitchen etc. This air is passed through the heat exchanger before being exhausted to outside. Fresh air is drawn in from outside passing through the exchanger, where up to 90% of the heat from the extract air is recovered. This tempered fresh air is ducted to the bedrooms and living rooms of the home. Even with outside temperatures at freezing point the fresh air will come into the home at 15°C, increasing comfort levels and reducing the heating requirement.

All Regavent units have been tested by the Building Research Establishment and official test results are available online, they can be reached by visiting the SAP appendix Q product characteristic database:

<http://www.ncm-pcdb.org.uk/sap/>

Please Note: Design and installation of the system should only be done by a competent person and any electrical work involved must be completed by a qualified electrician.

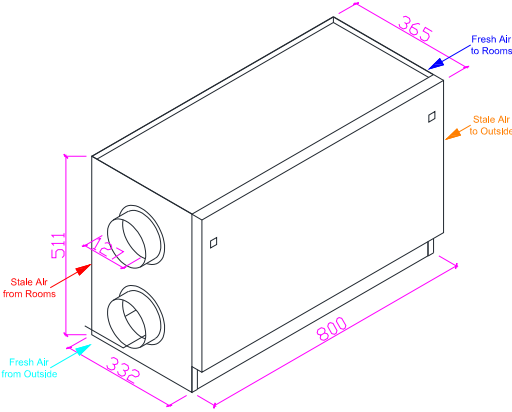


Regavent Whole House Ventilation with Heat Recovery

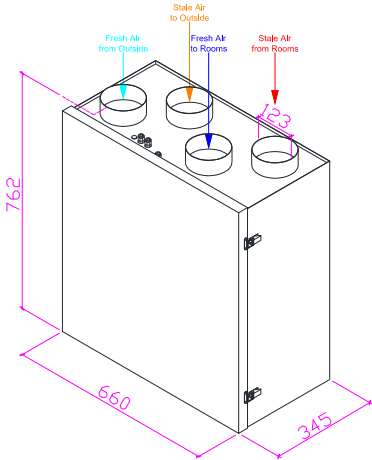
Installation - Central Units

Unit Dimensions

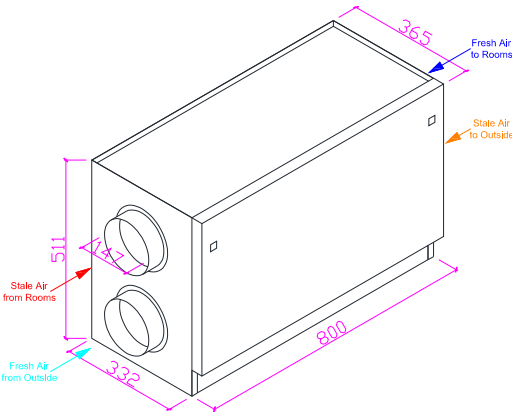
250R Loft



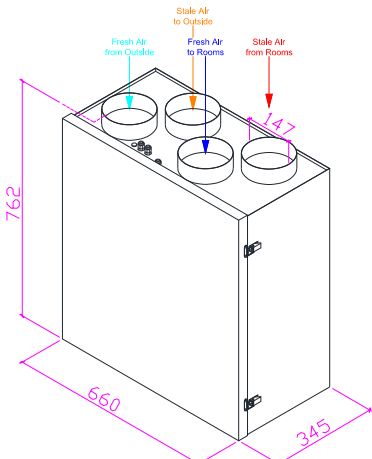
250R Wall



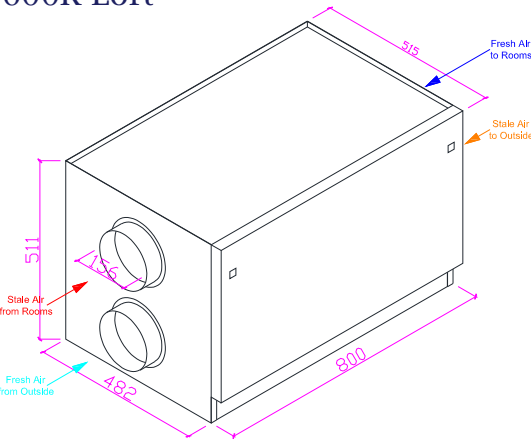
300R Loft



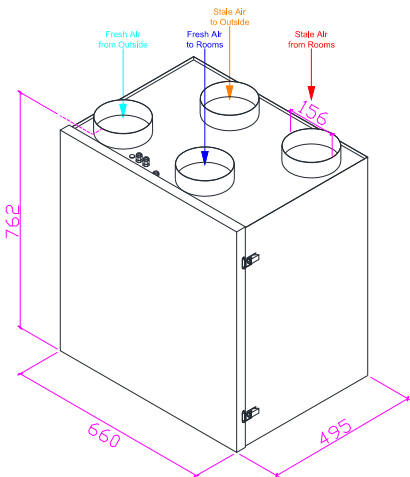
300R Wall



600R Loft



600R Wall



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Installation - Mounting Cradle

Mounting The Unit

Loft Unit

The Regavent loft unit is provided with an anti-vibration mounting cradle, to ensure noise transmission is kept to a minimum. This needs to be assembled as per the diagram (*fig 1.0*).

It is important to ensure that the higher parts of the mounting bracket are matching the drawing to ensure correct drainage of condensation.

For more information on the assembly of the mounting bracket see additional mounting bracket instructions provided with the unit.

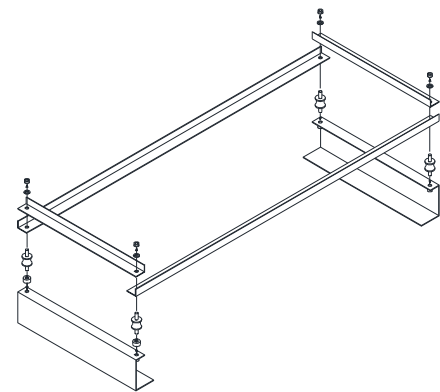


fig 1.0

Once the mounting cradle has been assembled it needs to be screwed in place on a piece of board slightly larger than the overall size of the unit. Ensure that the mounting bracket is square before fixing down.

With the mounting cradle in place it is time to lower the unit into position. The unit should be oriented so that the 'Stale air to outside' and 'Fresh air to rooms' spigots are on the lower side of the cradle (*fig 2.0*). With the unit in position; the condensate drain on the underside of the unit should be located near the lowest corner of the cradle.

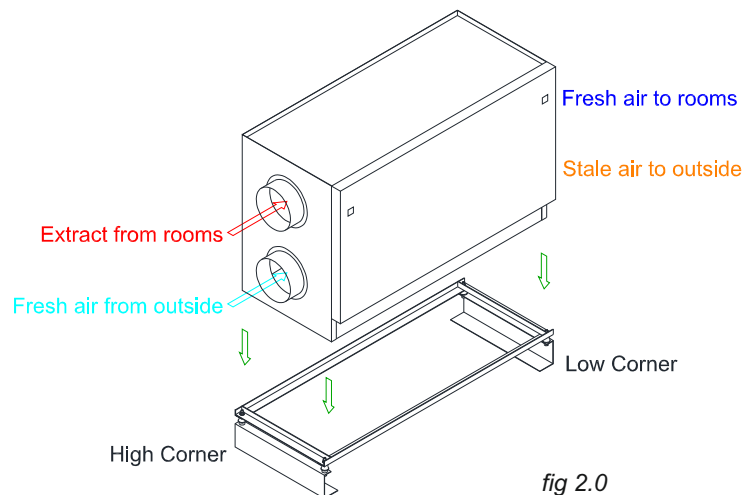


fig 2.0

Wall Unit

To mount the wall unit; first, locate the bottom bracket and fix it at the desired height using the 8 screw holes provided. We recommend a minimum distance of 1 metre from the bottom of the unit to any obstacles above, to allow for duct connections.

With the bottom bracket in position, simply lower the unit into the bracket so the lip on the rear of the unit fits into the slot in the bracket. Once this is done, slot the top bracket onto the unit on top of the unit, push the unit back and screw into place. (*fig 3.1*)

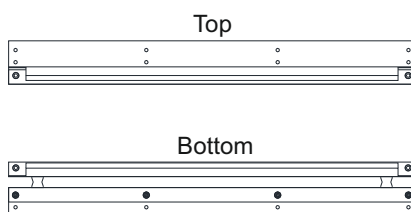


fig 3.0

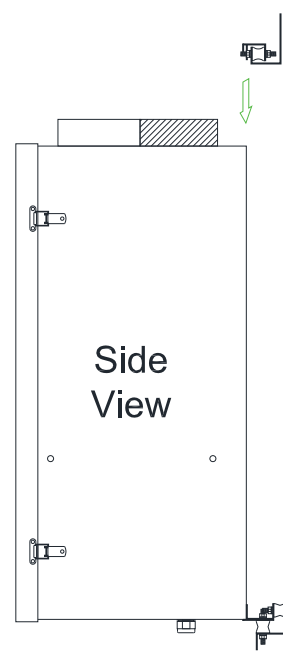


fig 3.1

Regavent Whole House Ventilation with Heat Recovery

Installation - Unit Connections

Condensate Drain Connection

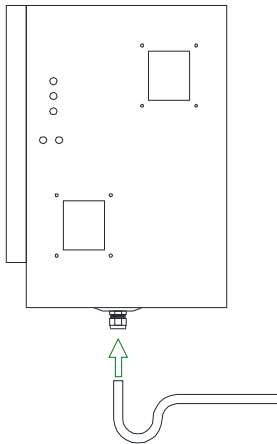


fig 4.0 - Loft unit condensate drain connection

When deciding a route for the condensate drain it is important to note that the tube must always stay below the level of the ventilation unit.

Connect the condensate drain tube, tightening the compression nut to make a watertight connection. The drain connection is located on the underside of both the wall and loft units (fig 4.0). Ensure that inside the unit the drain tube is level with the top of the fitting, and there is a U-bend with 60mm minimum water depth not protruding above as this will increase the accumulation of condensate. The other end of the tube must connect to either the nearest waste water point or directly to outside.

Finally test the condensate drain by pouring a small quantity; one or two litres, of water into the extract fan compartment. Make sure this drains away correctly and that there is no leakage around the drain connection.

External Connections

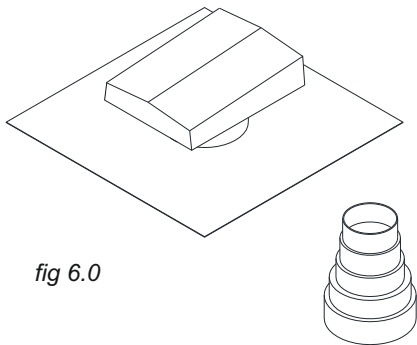


fig 6.0

Roof Terminals

The standard Regavent roof terminal provides a free area of 20.000 mm² and is provided with an adaptor to connect 125mm, 150mm or 160mm ducts. (fig 6.0) The unit is available in terracotta or anthracite finishes and includes an integral lead flashing to suit slate or tile roofs.

In some cases it may be preferable to use the roofing suppliers integrated roof outlets for reasons of aesthetics but these must provide an equivalent free area to the size of the duct connections from the unit to outside. These are:

125mm	12,000mm ²
150mm	17,500mm ²
160mm	20,000mm ²

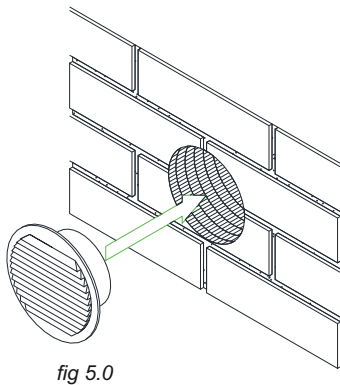


fig 5.0

Wall Grilles

Grilles may be used as gable wall outlets or soffit vents. Grilles are available in sizes to suit the duct outlet diameters and in various colours to suit brickwork. Standard colours are White, Grey, Brown, Terracotta and Cotswold Stone.

Where grilles are to be installed in an external wall, wall sleeves 400mm long are supplied in order to give a secure connection. The sleeves will fit into a core drilled hole (127, 152 or 162mm to suit duct size). The sleeve will have one tapered end to allow duct to be fitted, and the other end will tightly receive the external vent. Simply apply a generous amount of sealant to the spigot of the external vent and push into the wall sleeve. (fig 5.0)

Where the grilles are installed in the soffit the space may be restricted for routing the duct over the wall plate. A flexible rectangular duct is available for use in these situations, these are in two sizes 200mm x 60mm or 220mm x 90mm

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Installation - Duct Systems

Rega offer two types of duct systems, a 'branched system' and a 'radial system'. The branched system uses a larger main duct which the individual rooms are branched from, whereas a radial duct system splits all the duct runs to rooms into individual smaller runs using a manifold. Typically both will incorporate mainly semi-rigid aluminium duct systems.

When supporting duct, in the loft space the lightweight ducts can simply rest on the floor joists. They are self supporting so will not sag between supports. Vertical duct runs should be held in place using punched metal banding or cable ties

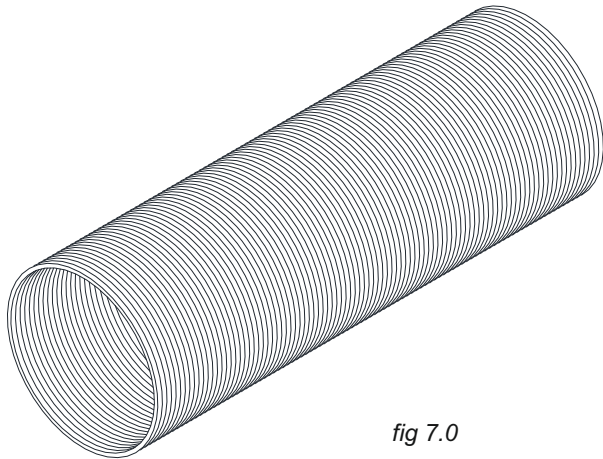


fig 7.0

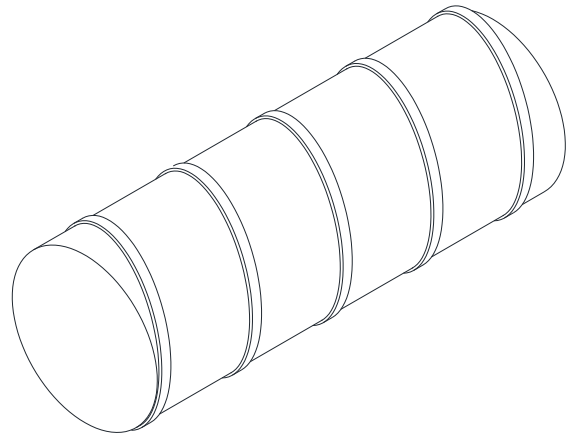


fig 8.0

Semi-Rigid Aluminium Ducts

Regavent Aluminium Bendable duct are ideal for use in domestic ventilation systems. They are lightweight, self supporting without spring back and may be easily formed to bends or offset negating the use for purpose made bends. Unlike wire spiral type flexible ducts aluminium bendable ducts do not materially increase air flow resistance when compared to rigid ducts.

Aluminium bendable ducts are supplied in 4 metre lengths compressed to 1 metre for transport in larger diameter, or 10 metre coils; uncompressed, for smaller diameter. Fully extend the compressed duct before use. This is best carried out by two people, allow the duct to twist whilst extending.

The duct should be cut to length using a sharp bladed knife, not serrated.

Joints between semi rigid ducts and fittings such as tees, connectors and reducers should be made using the supplied worm drive clips. Before making a clip joint apply a single layer of PVC tape to the spigot of the fitting, this give a resilient surface for the clip to grip rather than a metal to metal joint.

When joining tees to reducers use a short length of duct, 100mm is sufficient, as a coupler, then tape and clip the joint in the normal way.

Rigid Spiral Ducts

Regavent rigid spiral duct is a good alternative to semi-rigid, ideal for use where duct is exposed or will be prone to knocks (e.g dropping in a cupboard or wardrobe).

Rigid spiral duct is supplied in 3m lengths and should be supported every 3m. Where the duct is hidden this can be done with metal banding, but if the duct is exposed Rega offer a more sophisticated support clip to give a more aesthetically pleasing finish.

Spiral duct is available with bends of 15°, 30°, 45°, 60° and 90° to suit all installation requirements.

Joints for rigid spiral duct should be made using silicon sealant to ensure an air tight connection.

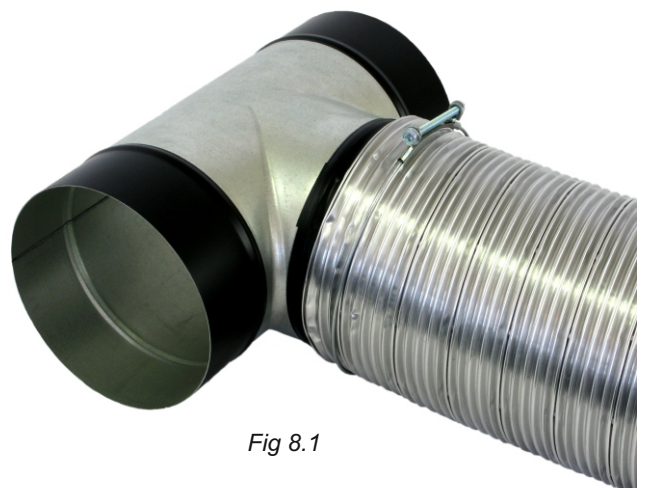


Fig 8.1

Installation - Insulated Duct Systems

Acoustically Insulated Aluminium Ducts

Regavent Acoustic Aluminium ducts; easily identifiable due to the perforated inner tube (fig 9.0), provide two functions. They provide thermal insulation to prevent heat loss from the air in cold locations but more importantly prevent sound transmission through the duct whether from the air unit, from outside the dwelling or from one room to another.

The inner aluminium tube is perforated to allow sound waves in the duct to expand and dissipate. This means that the outer aluminium/polyester membrane is the air sealing tube, if this is punctured it must be repaired using foil tape to maintain air tightness.

Joints made to fittings should use the worm drive wire clips. To make a joint, firstly fold or slide back the outer sleeve to allow access to the insulation. Cut back and remove the end section of insulation for a distance of some 75mm, do not cut the inner perforated tube. Slide the outer sleeve back over the inner aluminium tube, then fit the worm drive clip over the outer sleeve so it rests 25mm from the end of both the bendable inner tube and the membrane outer. Apply a layer of PVC tape to the spigot of the fitting, slide the end of the tube over and tighten the worm drive clip clamping the outer sleeve and inner tube securely to the fitting.

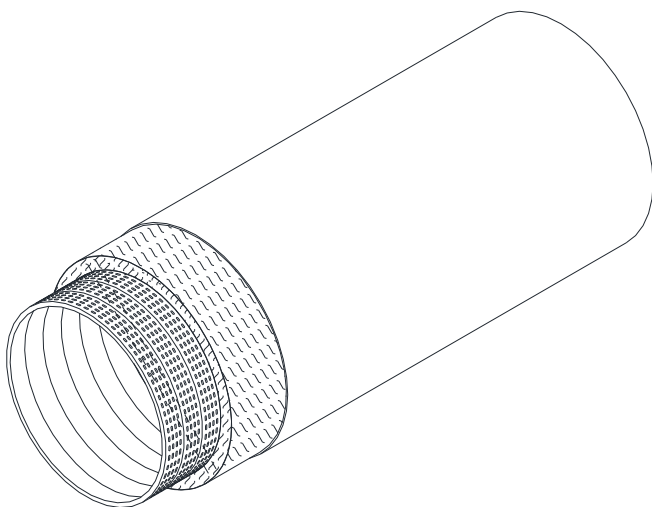


fig 9.0

Thermally Insulated Aluminium Ducts

Thermally Insulated Aluminium ducts (fig 10.0) are used in cold locations to prevent heat losses from the air streams. They are also used in 'warm roof' situations for the exhaust and inlet duct connection to outside, the air in these ducts is cold and if uninsulated, condensation would occur on their external surfaces.

The inner aluminium tube is not perforated on the thermally insulated ducts but care must still be taken not to damage the outer polyester/aluminium tube as this prevents moisture from coming in contact with the inner tube which can condensate on the outside of the aluminium tube.

When making connections with thermally insulated duct work, simply stretch the inner aluminium duct slightly out of the insulation sleeve to expose enough uninsulated duct to fit a worm drive clip. Once the connection has been made and the worm drive clip has been tightened, the sleeve can be pulled back over the uncovered duct to ensure a maximum insulation coverage.

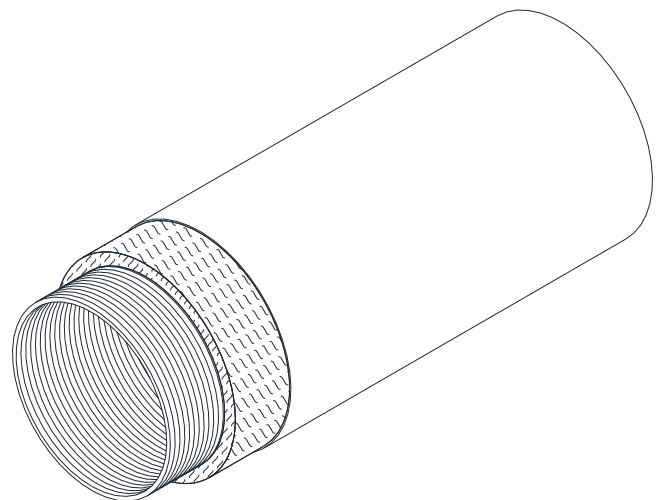


fig 10.0

Installation - Rectangular Duct Systems

Rectangular PVC Ducts

Rectangular Ducts are used in confined spaces, normally as vertical runs in stud walls routed through the first floor to the ground floor rooms or as horizontal runs where space is limited, for example, in a suspended ceiling void.

Joints between rectangular ducts and fittings are simply push fit but should be sealed with a couple of layers of 75mm aluminium foil tape (fig 11.1) to ensure air tightness. Joints between aluminium bendable ducts and the circular adaptors of the rectangular duct should be made using worm drive clips.

The duct can be cut to length using a fine tooth hacksaw or 4.5" angle grinder with cutting blade.

Bends for rectangular duct are available in 90° vertical or horizontal. Where more specific bend angles are required the duct can be cut and formed to shape. When doing this it is important to ensure an airtight seal remains. This can be done using PVC and aluminium foil tape.

Clips are available for use with the rectangular PVC ducts but these are only really useful on flat horizontal surfaces so in most situations such as the underside of beam and block floor punched banding is a better alternative to

Manifold Connection Units for Radial Systems

When installing a radial system, a manifold connection unit will be provided. This will have one large spigot connection, to suit 125mm, 150mm or 160mm duct, and several 80mm connections.

The large spigot is to allow for a duct connection between the MVHR unit and manifold. There should be at minimum 1 metre of acoustic duct between the main unit and the manifold to remove any fan noise from the system.

The remaining 80mm connections are for the connections to the rooms. The duct connection to the manifold should be made using the worm drive clips provided.

Any unused spigot connections on the manifold unit should be blanked off with a suitable cap end to maintain the air tightness of the unit. (fig 12.0)

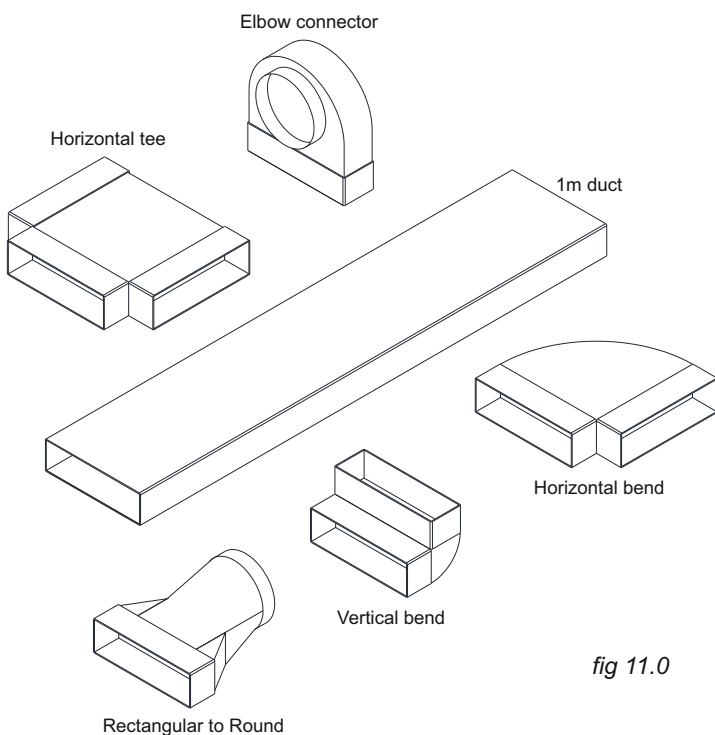


fig 11.0

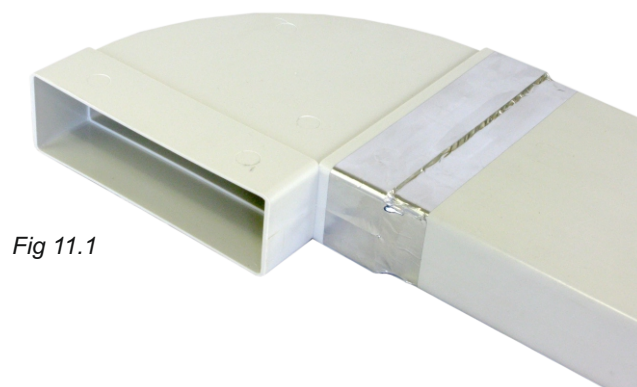


Fig 11.1

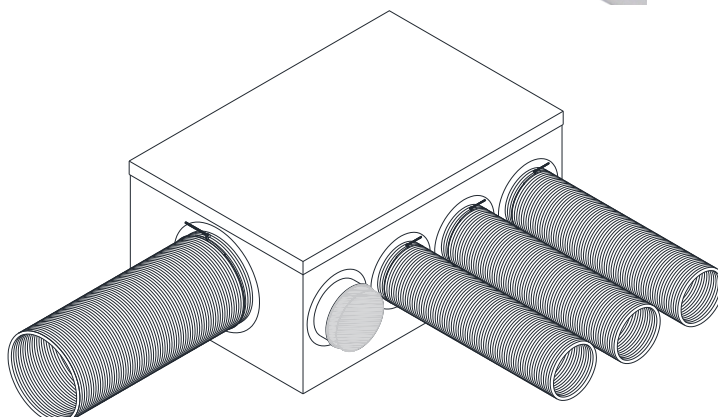


fig 12.0

Regavent Whole House Ventilation with Heat Recovery

First Fix Completion

Electrical Connections

Once the extract and supply duct runs are completed to all rooms and the connections for fresh air and exhaust to outside are made the only part of first fix remaining is the provision for electrical cables.

A 13 amp fused supply should be made to the location of the central air handling unit.

Control cables will be required from the location of the air handling unit to selected location of the system controls. The standard control system all Regavent systems are supplied with is a boost and summer/winter switch. This will simply need a 4 core low voltage cable routed from the main unit to wherever the switch plate is to be located. An ideal location for the switch plate is normally in the kitchen or utility room for easy access.

The connections at the central unit are reachable by removing the lid of the unit to expose a circuit board at the fan end of the unit, the cable can be run into the unit using the unused cable gland near the circuit board. For a wiring diagram see fig 13.0.

If the system being installed has more than just the standard control systems (i.e PIR, humidistat or Time clock automatic control systems) an additional wiring connection box will have been supplied specific to the control system. There will be two terminals in this control box labelled for connection to the central unit and these will need to be connected to the terminals marked 'Ba'. Each of the various additional supplied sensors will need to be electrically connected to the wiring connection box.

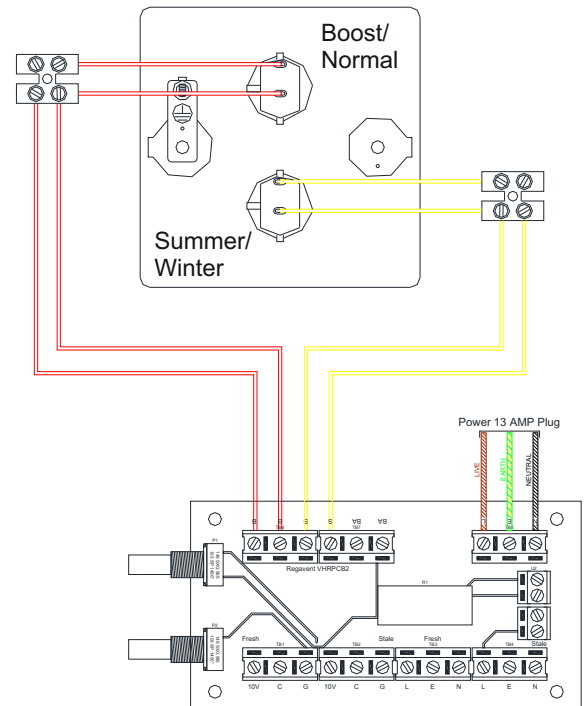
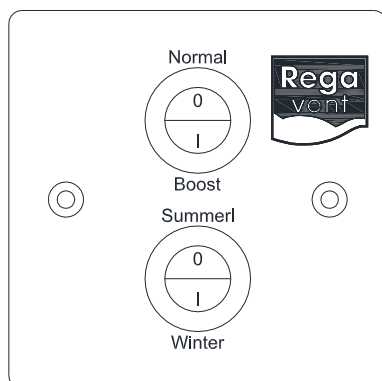


fig 13.0

Final Checks

If power is available run the system to check that there is air movement from all room ducts and that it is in the right direction. Exhausting from 'wet' rooms and bringing fresh air to bedrooms and living rooms.

Check that the tails of all room ducts are in the correct location and showing below ceiling level. The location of the duct tails should be marked when the ceiling boards are fitted but it is worth taking some reference measurements to prevent possible future problems.

Regavent Whole House Ventilation with Heat Recovery

Second Fix

Once Boarding is completed the final operations can be completed. This includes installing ceiling or wall grilles, making electrical connections and testing and balancing the system.

Supply & Extract Grilles

Before fitting ensure that the correct grilles are selected for each location. Each extract grille is fitted with a filter to prevent dust from entering the duct system. As the incoming air is filtered at the air handling unit no filters are fitted in fresh air supply grilles.

Locate the position of the duct tails in each room and cut holes for the ceiling grilles. The hole size for a 100mm connection is 110mm and for a 125mm connection 135mm. It is important that the holes are as close to this diameter and as circular as possible to ensure a good fixing for the grilles.

Pull the tails of aluminium duct through the cut holes and trim the duct so it extends 50mm below ceiling level. Separate the body of the room grille from its cover. The room grille is permanently fixed to the ceiling using the black metal retaining clips and sealed to the duct using adhesive. Firstly loosen the retaining clips, then apply a fillet of non solvent based grab adhesive to the body of the valve and to the back of the flange that will be in contact with the ceiling.

Hold the end of the duct and slide the grille body in to it, once fully home compress the duct to push the grille finally into position in the ceiling, and tighten both retaining clips.

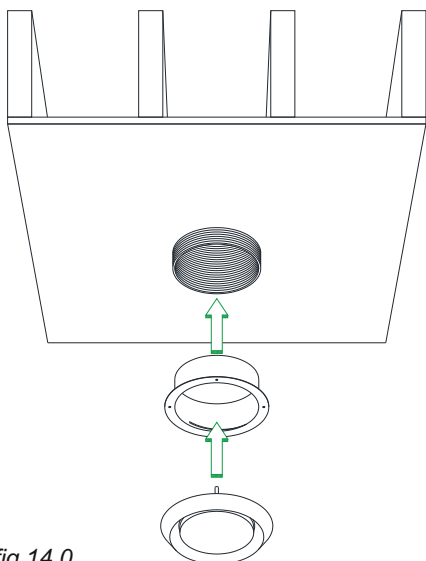


fig 14.0

Balancing the System

The system must be balanced to achieve the air change rates calculated to meet the requirements of Building Regulation Part F.

This will require an air flow meter to measure the air velocity in metres per second at each inlet or extract point. The velocity measurement in metres per second is used to calculate the air volume in litres per second as follows:

100mm duct	1 m/s = 8 l/s
125mm duct	1 m/s = 12 l/s
150mm duct	1 m/s = 18 l/s

Make the final electrical connections to the unit if this hasn't already been done and run the system at approximately 70% capacity. For greatest accuracy ensure that all windows and doors are shut as this will replicate most closely the conditions under which the system will normally operate.

Generally the air inlets and outlets closest to the system will have the greatest flow rates, in an unbalanced system, and those furthest away the least.

Check the air flow volumes at all of the outlets and note the air volume to each room, whilst doing this make sure that the direction of flow is correct.

If the measured air flow is above or below the requirement adjust each air valve by removing the cover and rotate the central cone on its screw thread to increase or decrease the size of the air opening. Replace the cover and re-measure the air volume. Repeat this process until the correct flow rate is achieved.

When all inlets and outlets are measured it may be found that the total for extract or supply may be greater or lesser than required in which case the speed of the fans must be adjusted at the air handling unit.

As any adjustments of individual air valves will affect the flow rates of all other valves on the duct system it will usually be necessary to re-balance the system three or more times before the correct readings are achieved in every room.