

## Low Energy Positive Input Ventilation Unit

# DRI-ECOSMART/1 or 2

## Installation and Maintenance Details

 The EMC Directive 89/336/EEC  
 With modification 92/31/EEC  
 The Low Voltage directive 73/23/EEC

  
 energy saving control

### 1.0 Important notes to installers

The successful operation of the unit depends entirely upon installation and ongoing maintenance being carried out strictly in accordance with these instructions.

Please read this guide in its entirety before installation and then repeat the exercise step by step to ensure satisfactory completion.

Suitably qualified persons may achieve installation of the unit, however the provision of the electrical supply and the connection of the unit to the mains supply should only be carried out by a qualified electrician.

The unit can be installed in a home with a "cold roof" construction. These instructions are limited to installation in a home with a "cold roof". "Warm roofs" vary considerably and advice should be sought from Nuaire on an individual basis.

### 2.0 General description

The unit is a unique Low Energy Positive Input Ventilation (LEPIV) unit. Unlike conventional LEPIV units which only draw in external air via the loft in a "cold roof", the unit is capable of drawing in external air from different roof locations via three air inlet spigots each fitted with their own low energy open/close damper. (See fig. 1).

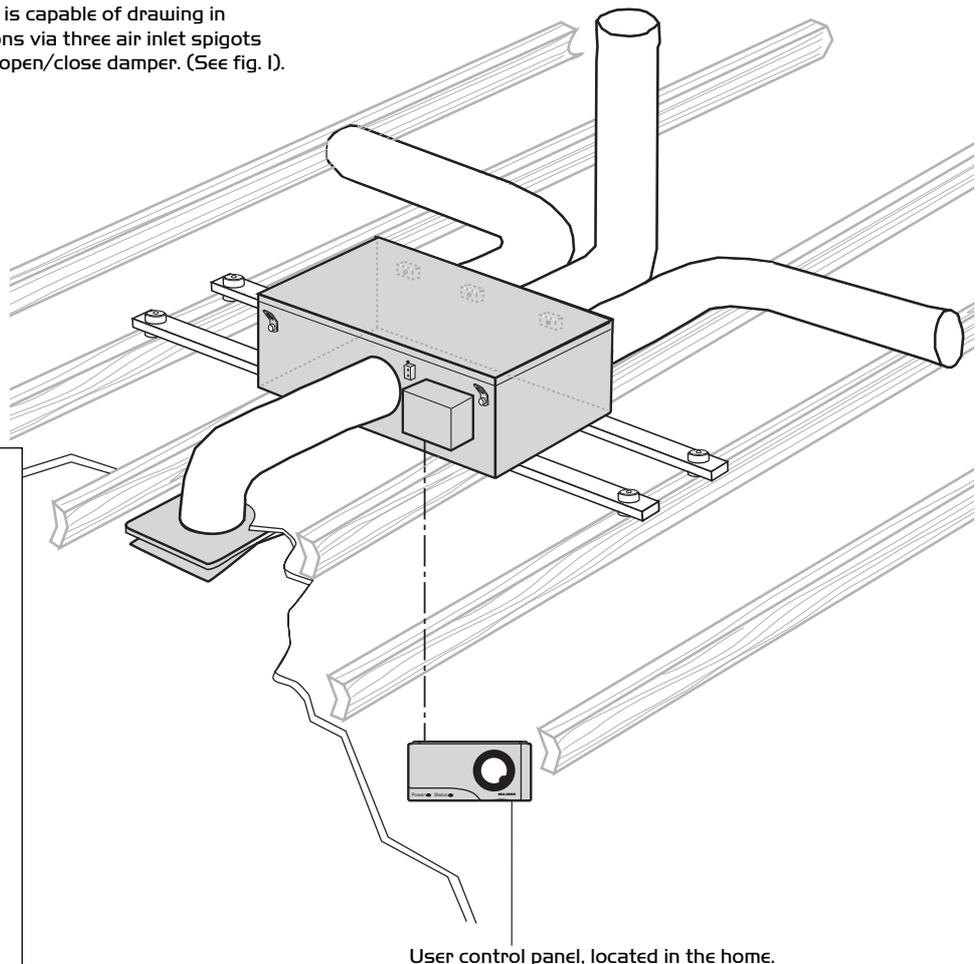
The unit's airflow and the opening/closing of each air inlet damper is controlled via an integral intelligent control system that measures, and appropriately responds to, temperatures at the various air inlet locations, the home itself, the "target temperature" selected by the occupants on the user control panel provided and the delivered air temperature into the home.

**There are two standard versions of the unit available. Each is coded/identified as follows:**

**DRI-ECOSMART/1** Unit supplied with control panel providing On/Off/Auto/Boost/Target Temperature selection and Unit/Filter Status Indication.

**DRI-ECOSMART/2** Unit supplied with control panel providing Target Temperature selection and Unit/Filter Status Indication.

Figure 1. General view of unit in a loft. (Shown located on AV mounts).



**Please note:**

**1. Only the items shown shaded are supplied as standard with the unit.**

**All other installation materials (see table on page 3) must be purchased separately by the installer.**

**2. The 4 temperature sensors (one for each of the air inlet locations and one for the home itself) and associated sensor cables (15m long) are also supplied with the unit.**

**3. The cable (10m long) connecting the unit to the user control is also supplied.**

User control panel, located in the home.



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## 3.0 Loft inspection

Check to ensure that the loft has adequate ventilation. Look for ridge vents, tile vents, eaves vents and continuous air gaps etc. making sure none are blocked. In older properties these vents may not be provided. However, there should be enough 'leakage' to accommodate the requirements of the unit. A useful way of checking such lofts is to close the hatch, switch off the lights and look for any daylight penetration. If you can see daylight it is reasonable to assume that the loft has sufficient ventilation.

There may be occasions where a loft is so well sealed that additional ventilation may have to be provided by the owner/occupier or the unit installer.

This will not only assist the operation of the unit, but will help prevent possible expensive structural damage caused by inadequate air movement in the loft itself.

**It should be noted that there cannot be too much ventilation into the loft.**

Additional checks should be carried out as follows:

- Ensure that all water tanks are covered and sealed.
- Check that all water pipes are sealed.
- Ensure that any extract fans are discharging to outside and not into the loft.
- Check that the loft hatch is tightly sealed.
- Ensure all holes in the ceilings are sealed i.e. ceiling light fittings etc.
- A visual inspection of flues or chimneys for leakage in the loft should be carried out by the installer. If leakage points are found, or if there is any doubts regarding the same the installer should advise the house owner/provider and seek instruction from them before continuing with installation.

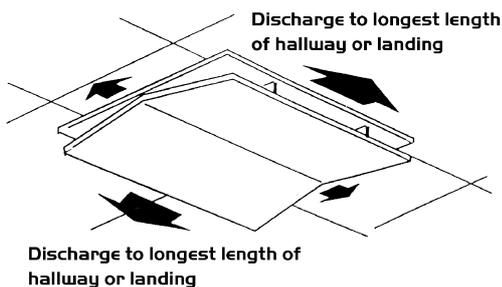
## 4.0 Siting the Diffuser

The diffuser has a unique air discharge pattern and it must be located correctly in the central hallway in single storey properties or in the ceiling of the top floor landing on 2 or more storey dwellings.

As can be seen (Figure 2) the diffuser discharges air from all four sides along the underside of the ceiling. The majority of the air is discharged through the two longer open sides and it is vital that the diffuser is positioned to ensure these two sides discharge the air down the longest lengths of the hallway or landing.

Obstructions within 1m of the diffuser will cause a poor airflow pattern and unacceptable draughts. Up to two sides of the diffuser may be closed off using the foam strips supplied.

Figure 2.



### Note: Smoke Detectors

**It is important that any open side of the diffuser is not positioned within 1m of a smoke detector.**

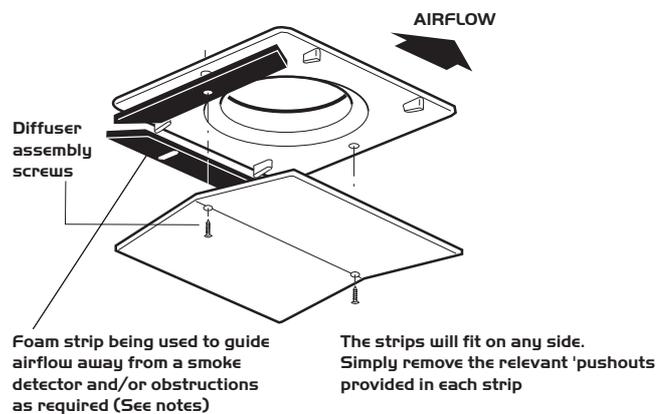
**If the diffuser cannot be repositioned, up to two sides of the diffuser may be closed off using the foam strips supplied so that the open sides face a minimum 1.5m unobstructed path away from the detector.**

**As an alternative to the aforementioned, a smoke detector maybe fitted directly onto the underside of the diffuser.**

## 5.0 Fitting the Diffuser

Cut a circular hole 225mm diameter in the ceiling between two joists. Position the diffuser frame and secure to the underside of the ceiling with the 1 1/2" x 8 csk screws and plugs provided. Attach the diffuser plate to the frame using the two 1" x 8 csk screws and plugs provided. (See figure 3).

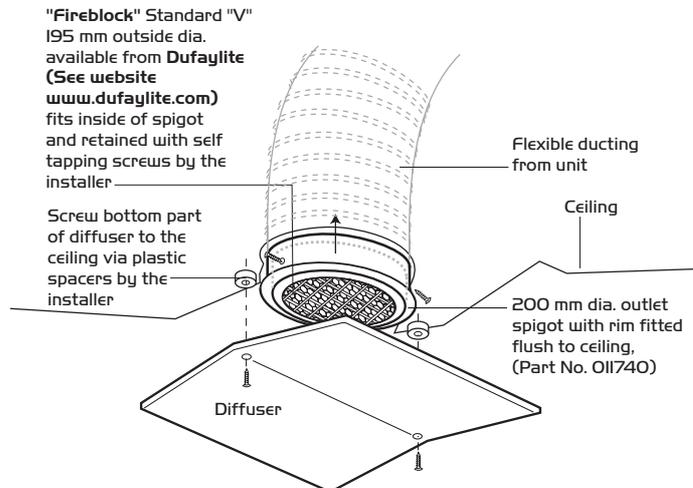
Figure 3.



Where there is a requirement for maintaining fire rating of the ceiling then the following alternative method of installing the diffuser using a 200mm dia. spigot available from Nuair and a "Fireblock" is recommended. (See figure 4).

Designed to provide 1 hour of fire resistance in accordance with BS476 Part 20 (1987) and ISO 834, this circular "Fireblock" is available to fit snugly inside our standard 200mm dia. spigot. (Part No. O11740).

Figure 4.



Foam strips should also be used as required when this method of installing the diffuser is used.

## 6.0 Fitting the Main Fan Unit

The main fan unit is supplied with eyelets for suspension between the roof trusses. It is the responsibility of the installer to supply and fit suitable hanging brackets/wires (See Figure 5).

Install the unit in a position that ensures that all ducting takes the least complex route.

The main fan unit should be positioned to ease maintenance. Please note that a clear distance of 500 mm should be available above the unit to allow access for maintenance.

Figure 5. Fan unit shown suspended.

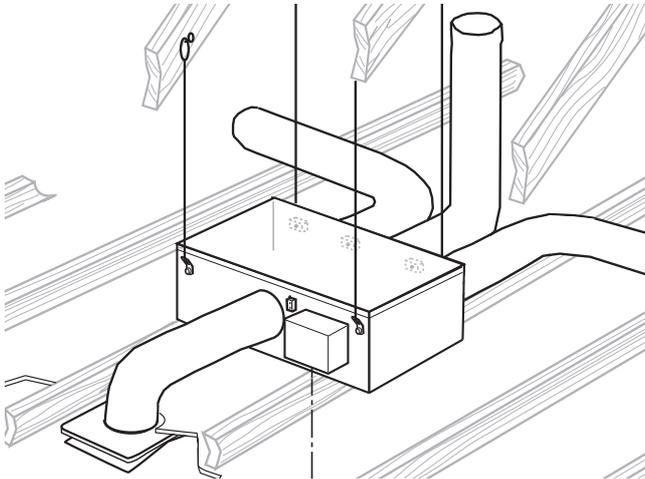
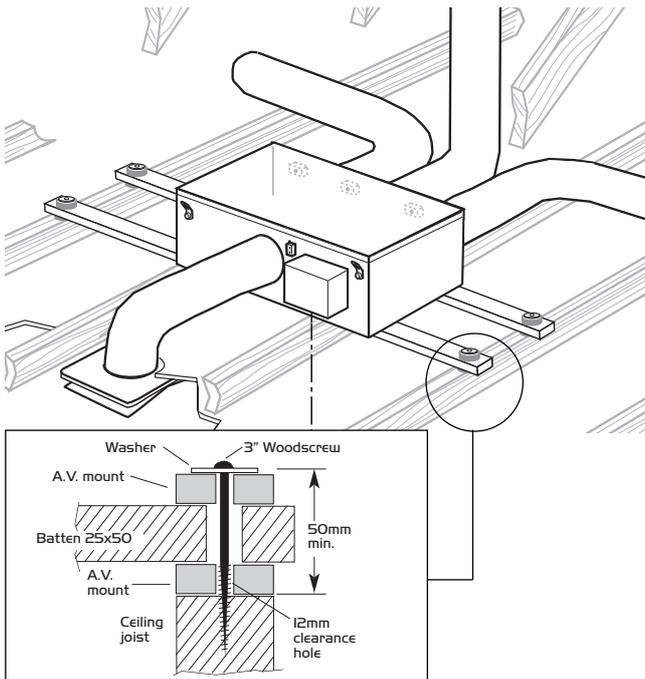


Figure 6. Fan unit shown mounted on roof joists using AV mounts.



The fan unit can also be mounted directly onto the roof joists using an AV mounting kit available from Nuair (Part No. 771393). Screw the battens (not supplied), to the unit via the 5mm dia. holes in the base under the filters, then lower complete onto the joists. (See Figure 6).

Mark and drill the 12mm dia. clearance holes required in the ends of the battens and place anti-vibration mounts above and below each batten fixing point. Using the four large screws and special washers, fix the unit to the joists.

**Do not over tighten fixings. The distance from the top washer to the joist when installed must not be less than 50mm.**

## 7.0 Main fan unit air outlet connection

The main fan single air outlet spigot should be connected to the diffuser spigot using a length of 200mm diameter insulated ducting and dynotie connector, both supplied by the installer.

## 8.0 Main fan units air inlet and associated sensor connections

As explained previously the unit is capable of drawing in external air from different roof locations via three air inlet spigots each fitted with their own low energy open/close damper. Air inlet locations may include the following:

1. A portion of the roof tiles/slates on a southerly facing roof (using them to heat or cool the outside air) using felt (or breather membrane fitted in a similar way) spacers, a specially created insulated plenum and insulated ducting all supplied by the installer, (see 8.1).
2. The loft space at high level through uninsulated ducting supplied by the installer, (see 8.2).
3. Depending on the property, ONE of the following options:
  - a) The soffit through a grille and ducting supplied by the installer, (see 8.3).
  - b) or wall grille and ducting supplied by the installer, (see 8.4).
  - c) or roof tile vents by others and ducting supplied by the installer, (see 8.5).

The following installation materials, not supplied with the unit, can be purchased separately by the installer direct from Nuair Home Ventilation, Tel: 08705 002555 Fax: 08705 002666. E-mail: info@nuair.co.uk

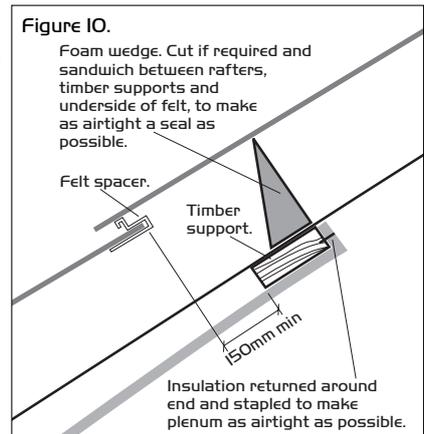
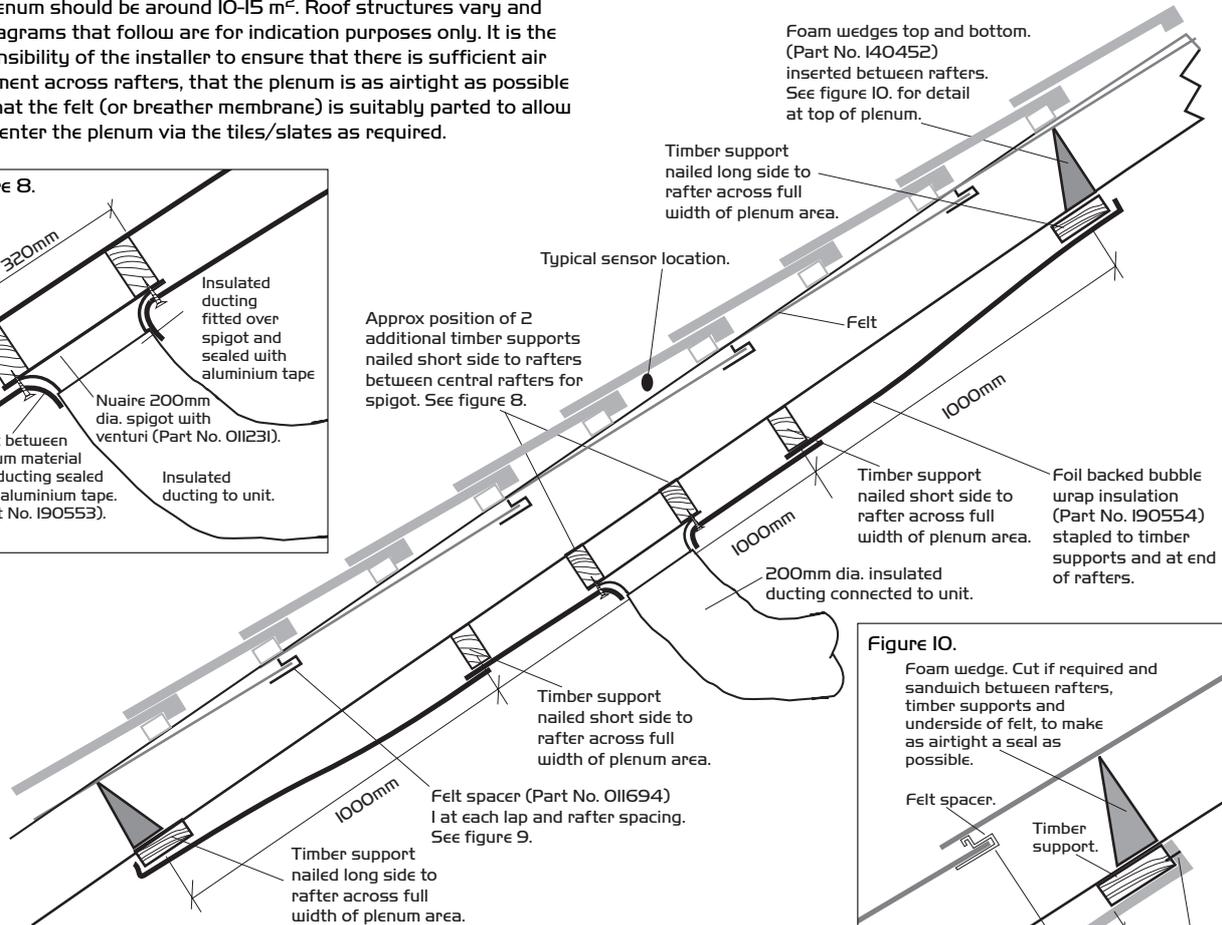
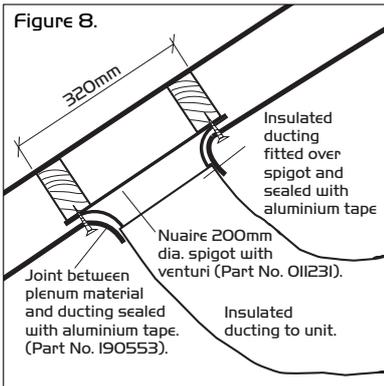
Part No	Description
190554	50m by 1.05m roll of foil backed bubble wrap insulation. Type as manufactured by Encon Insulation or equivalent. This is used to create the plenum (See 8.1) to the underside of the rafters and should be sufficient for 3 average plenum installations.
011694	Galvanised steel felt spacers. For use when plenum created (See 8.1). Approximately 20 are required per installation.
011231	200mm dia. spigot with venturi for connecting duct to plenum (See 8.1).
140452	600mm long foam wedges, 125 x 100 x 160mm used to seal the plenum chamber (See 8.1). Approximately 18 are required per installation.
190553	45m long roll of aluminium foil tape used to seal the plenum chamber (See 8.1). Should be sufficient for 3 average installations.
PVC 933WH	3m length of 222mm x 90mm flexible PVC ducting for use on soffit inlets (See 8.3). This length should be sufficient for 3 average installations.
518920	128mm x 260mm soffit grille (See 8.3).
FDC 200	200mm duct connector for connecting 222 x 90 flexible duct to 200 dia. insulated duct (See 8.3).
FB250	199 x 215 x 20mm white plastic wall grille (See 8.4).
GB250-T200	150mm dia. pipe for wall grille (See 8.4).
541044	Dynotie Zip ties, used for connecting 200mm ducting to spigots. 8 off should be sufficient for all types of installation.
FLDI 200	5m length of 200mm dia. <b>insulated</b> ducting.
FLD 200	5m length of 200mm dia. <b>un-insulated</b> ducting.
011740	200mm dia. outlet spigot. For use with "Fireblock" (See figure 4).
771393	AV mounting kit (See figure 6).

Please note that Nuair do not supply any timber for the AV mounts or the installation of the plenum to the rear of the rafters.

Typical installation details of each of the aforementioned air inlet arrangements using the material above are detailed on the following page. The installer may use alternative materials to those above. In these circumstances Nuair cannot take responsibility for their suitability.

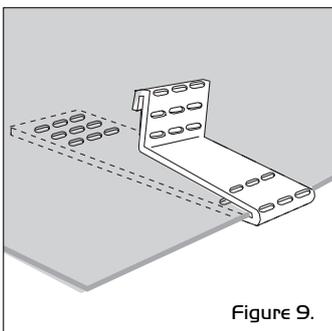
## 8.1 Via a portion of the roof tiles/slates on a southerly facing roof (using them to heat or cool the outside air) using felt (or breather membrane fitted in a similar way) spacers, a specially created insulated plenum and insulated ducting supplied by the installer.

In order to draw external air in via the tiles/slates, a plenum, as airtight as possible, has to be constructed by the installer. Ideally the plenum should be around 10-15 m<sup>2</sup>. Roof structures vary and the diagrams that follow are for indication purposes only. It is the responsibility of the installer to ensure that there is sufficient air movement across rafters, that the plenum is as airtight as possible and that the felt (or breather membrane) is suitably parted to allow air to enter the plenum via the tiles/slates as required.

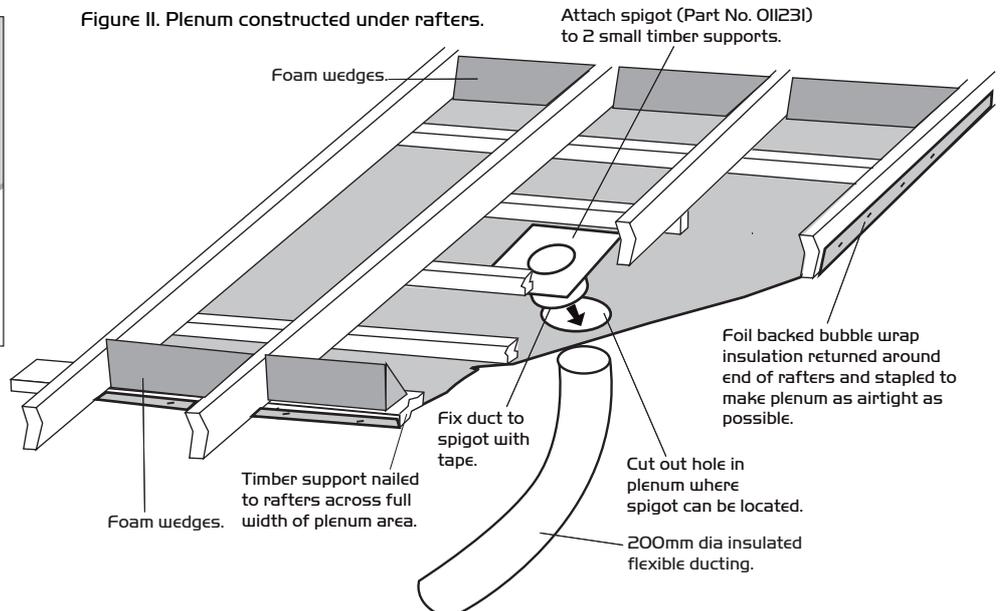


### Note regarding roofs with sarking between top of rafters and the roofing felt (or breather membrane).

In these roofs, gaps in the sarking, 100mm wide, centred on the felt laps and running the full width of the plenum, are required to allow access for installation of the felt spacers and free flow of air into the plenum.



**Figure 11. Plenum constructed under rafters.**



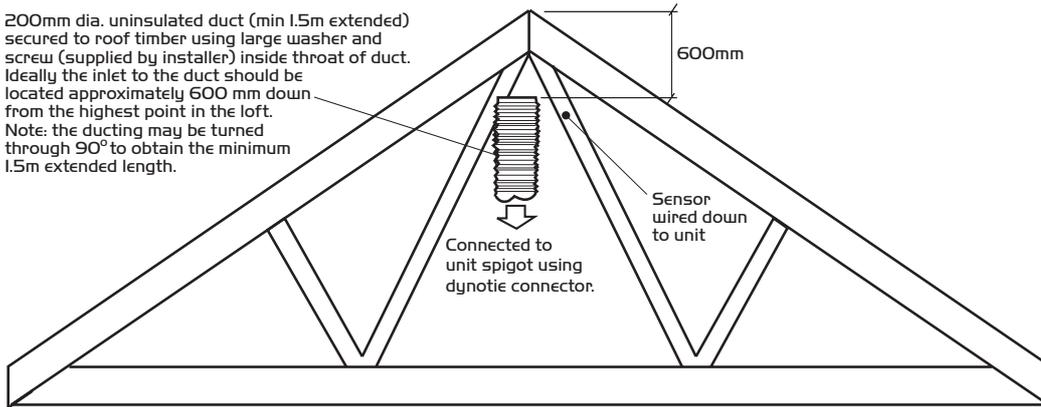
### Note:

1. All insulation joints to be sealed using aluminium sealing tape.
2. Timber supports to be 50 x 25mm minimum size.
3. The sensor head with attached cable should be pushed through the gap in felt adjacent to a centrally located spacer, to the underside of the tile. The cable can then be fed through the plenum material, clipped to the roof structure and connected to the unit.

## 8.2 Via the loft space at high level through uninsulated ducting supplied by the installer

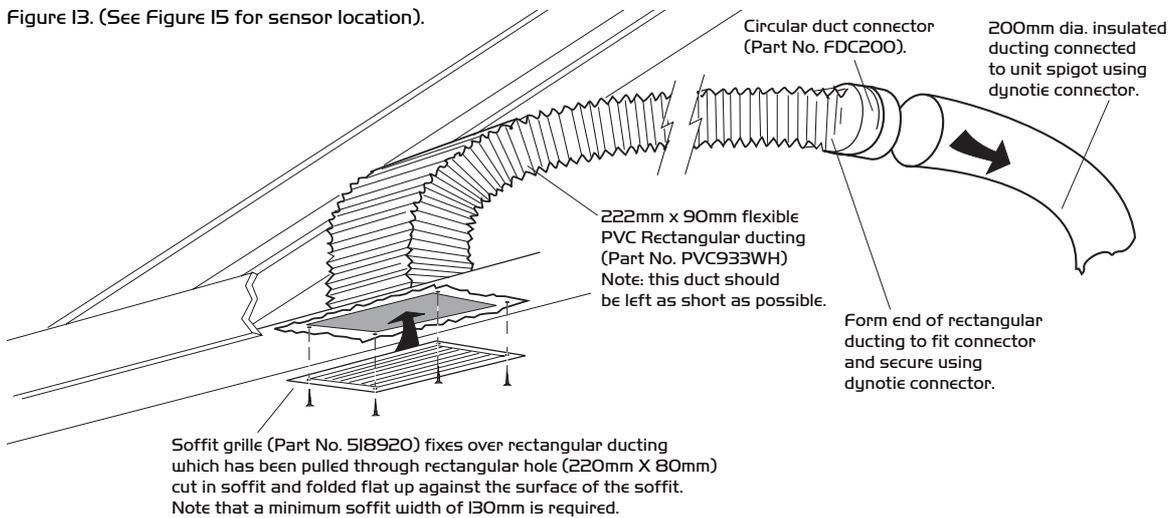
Figure 12.

200mm dia. uninsulated duct (min 1.5m extended) secured to roof timber using large washer and screw (supplied by installer) inside throat of duct. Ideally the inlet to the duct should be located approximately 600 mm down from the highest point in the loft. Note: the ducting may be turned through 90° to obtain the minimum 1.5m extended length.



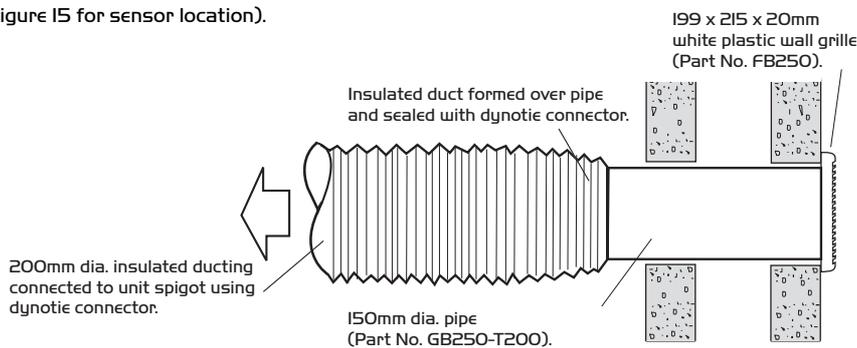
## 8.3 Via the soffit through a grille and ducting supplied by the installer

Figure 13. (See Figure 15 for sensor location).



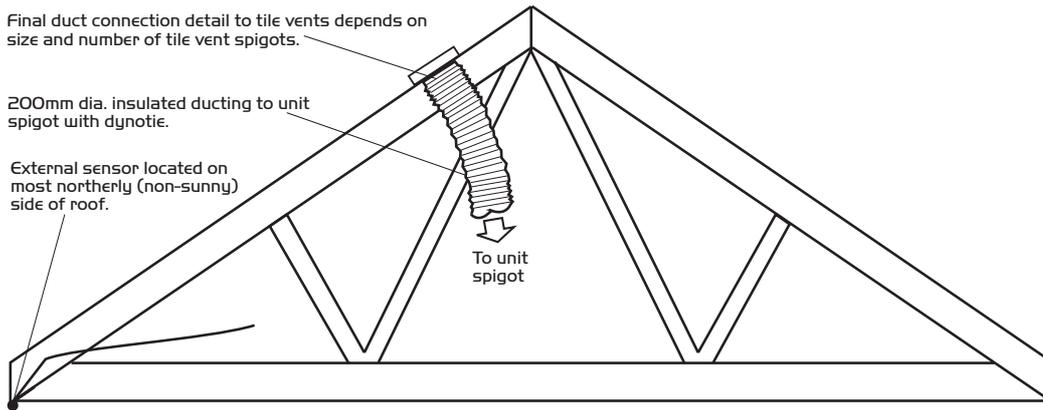
## 8.4 Via a wall grille and ducting supplied by the installer

Figure 14. (See Figure 15 for sensor location).



## 8.5 Via roof tile vents by others and insulated ducting supplied by the installer

Figure 15. Final duct connection detail to tile vents depends on size and number of tile vent spigots.



## 9.0 Connecting the temperature sensors to the main fan unit

Supplied with the unit are four black leads each incorporating a temperature sensor which is sealed at one end.

The sensor end of the leads connected to connection 1, 2 and 3 (see figure 16) should be located as follows:-

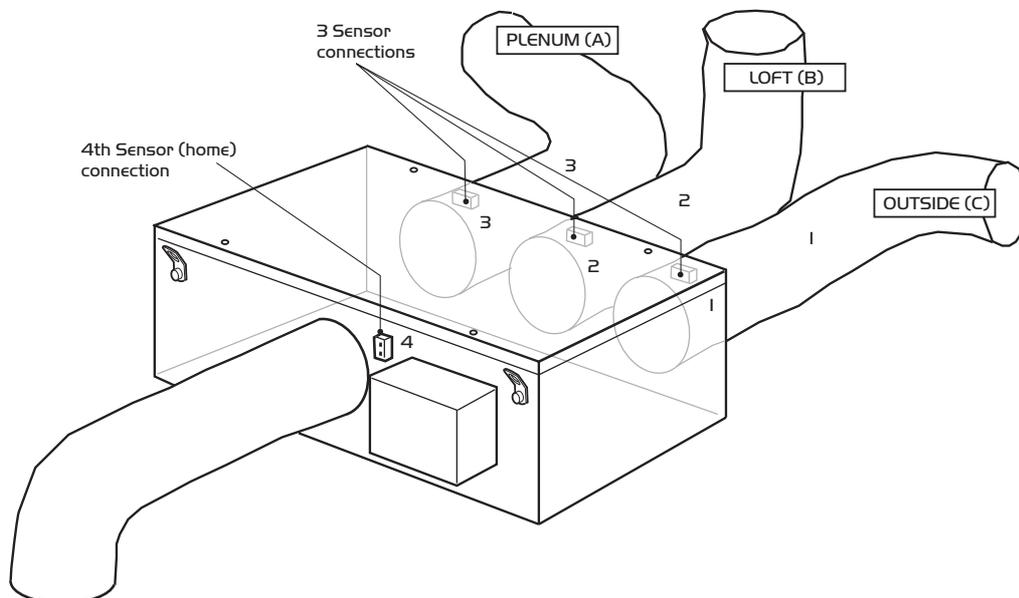
- i) Measuring the outside air temperature at the eaves. (see figure 15).
- ii) Any two of 8.1, 8.2 and 8.3 as required.

With the cable sensors installed as described above, attach the other ends of the cables to the appropriate connector block on the main unit.

Fit the fourth temperature sensor in a suitable location in the home. Select a position unaffected directly by heating radiators or possible draughts from opening windows. Using a small screwdriver, pierce a hole in the corner of the ceiling and push the end of the sensor through until it just protrudes into the room.

Connect the other end of the sensor cable to the fourth connector block (Figure 16).

Figure 16.



### IMPORTANT

Ensure temperature sensor wires are connected to their respective plugs adjacent to duct spigots.

## 10.0 Electrical Connection

Please note: the electrical connection of the unit must be carried out by a qualified electrician.

### Electrical details:-

**Voltage:** 240V lph 50Hz

**Consumption:** 40W (max)

**Fuse rating:** 3 Amp

**NOTE** This unit must be earthed

The three core cable from the mains power supply should be connected to a fixed wiring installation, via a fused isolator, in accordance with current IEE wiring regulations.

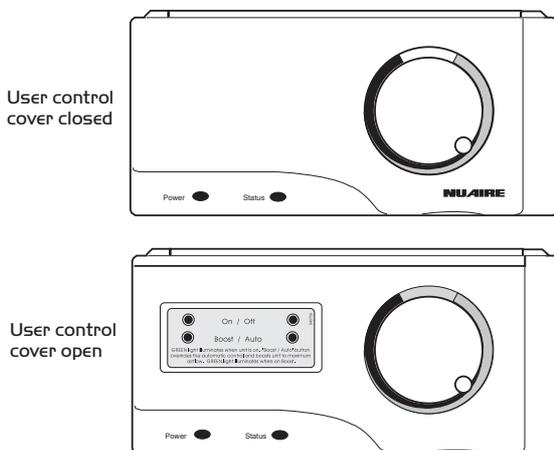
## 11.0 User Control

The user control should be fitted to an appropriate wall (fixings supplied). Position the control so that the user can gain easy access. Instructions for fixing are supplied with the control.

Screw the backplate to the wall. Connect the cable (supplied) and clip the control into place. Route the cable to the left and connect to the main unit control module panel (see figure 18).

Secure the cable to prevent accidental dislocation.

Figure 17.



### User Control Test

Ensure the power light is on green and the status light is either green or amber.

If the power light is not on check the wiring and connections between the fan unit and the user control.

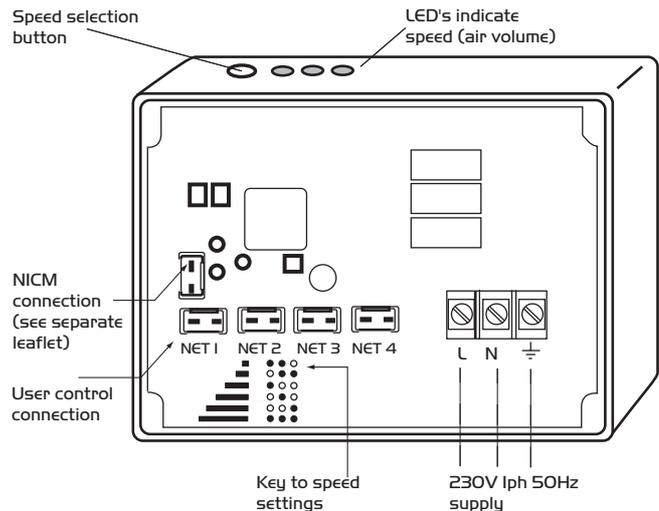
### DRI-COSMART/1

The user control as shown in figure 18 above, has a target temperature setting dial knob and two press buttons (under the flap) which enable the fan to be switched off or the airflow to be boosted to its maximum duty.

### DRI-COSMART/2

The user control is similar to the one shown above but excluding the "on/off" and "boost/auto" switches. It has a target temperature setting dial knob and provides automatic control of the airflow into the dwelling.

Figure 18. Control module panel on unit (cover removed).



## 12.0 Airflow Adjustment on fan unit

The unit has six air volume (speed) settings. The setting switch is located on the main control box on the fan case.

Figure 19. shows the LED's that, when illuminated, indicate the corresponding air volume for the unit.

For example, a one bedroom, one person bungalow would be adjusted to the lowest setting (two LED's on the left illuminated). A five bedroom seven person detached house would need to be set to the highest (all three LED's illuminated).

With power connected the three LED's will flash randomly for approximately 2 minutes and will then indicate the speed currently set. To select another speed, simply continue to press the button down until the required setting is shown.

**13.0 Dimensions (in mm) and weights**

Figure 19. Diffuser.

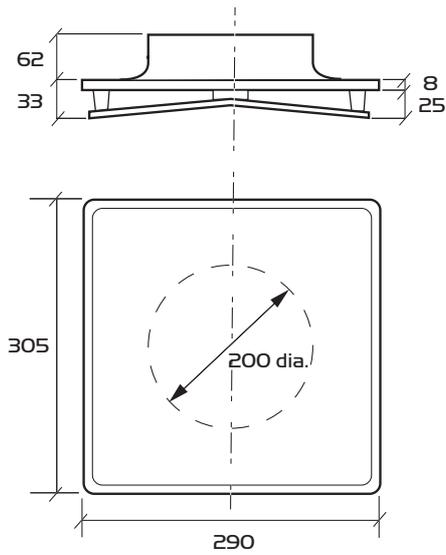


Figure 20. Main fan unit

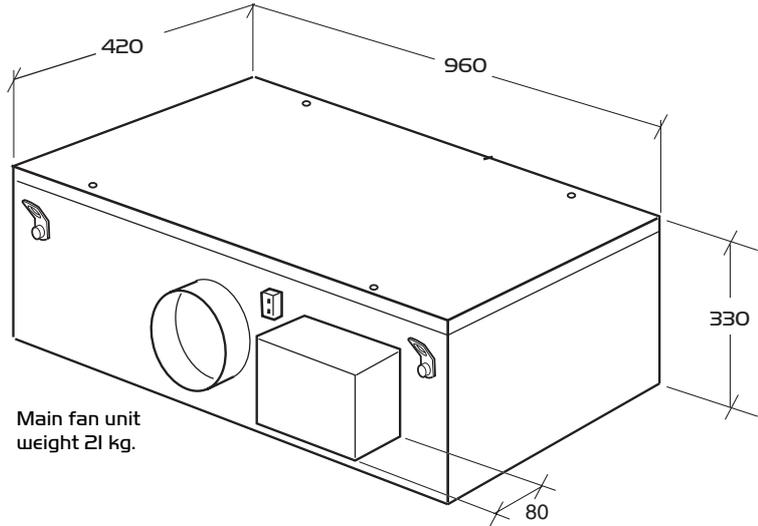
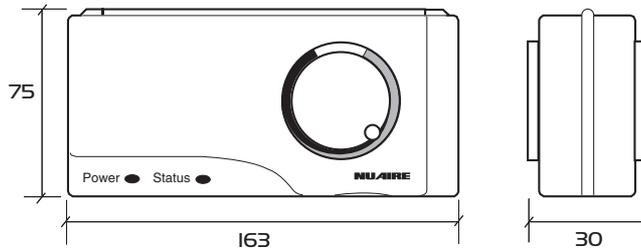


Figure 21. User control.



**14.0 Maintenance**

The unit does not require any maintenance other than a filter change and a check of electrical connections every 5 years. The status light on the user control panel will flash red when a filter change is required.

New filters can be purchased direct from Nuairé using the following code: 040718 (5 year filter).

If the status light is permanently red, or if the units performance has been reduced dramatically and there is no flashing red light, please contact our service department.

Dust can occasionally accumulate through static, on the diffuser and the adjacent ceiling. This can be removed if required by vacuuming.

**Note:** A clear distance of 500mm should be available above the unit to allow access for maintenance.

**15.0 Warranty**

The units 5 year warranty starts from the day of delivery and includes parts and labour.

**16.0 Service Enquiries**

Nuairé can assist you in all aspects of service. Our service department will be happy to provide any assistance required, initially by telephone and If necessary arrange for an engineer to call.

**Telephone 08705 002 555**

Technical or commercial considerations may, from time to time, make it necessary to alter the design, performance and dimensions of equipment and the right is reserved to make such changes without prior notice.