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**Agrément Certificate**

**00/3727**

Product Sheet 1

### NUAIRE POSITIVE INPUT VENTILATION SYSTEMS

### DRIMASTER-ECO LOFT MOUNTED POSITIVE INPUT VENTILATION SYSTEMS

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Drimaster-ECO Loft Mounted Positive Input Ventilation Systems, for use as continuously running, low-energy ventilation systems (PIV) suitable for installation in the loft space of a dwelling.

(1) Hereinafter referred to as 'Certificate'.

#### CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



#### KEY FACTORS ASSESSED

**Ventilation** — the systems can provide up to 58.6 l·s<sup>-1</sup> of whole building ventilation (see section 6).

**Behaviour in relation to fire** — the diffusers are made from thermoplastic material or aluminium (incorporating intumescent elements) and can satisfy the relevant requirements of the national Building Regulations (see section 8).

**Conservation of fuel and power** — the specific fan power of the systems is less than the design limits for energy efficiency and, in standard loft modes, can be discounted in SAP calculations due to the source loft air being slightly warmer than the outdoor air (see section 9).

**Self-generated noise** — the outlet noise from the systems should not be considered as intrusive (see section 10).

**Durability** — subject to maintenance requirements, the fan unit case and diffuser can continue to perform for the life of the dwelling in which they are installed. The ducting, fan motor and other electrical components may require replacement during the lifetime of the dwelling (see section 13).



The BBA has awarded this Certificate to the company named above for the systems described herein. These systems have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Fourth issue: 19 August 2019

John Albon  
Chief Scientific Officer

Claire Curtis-Thomas  
Chief Executive

Originally certificated on 14 June 2000

*The BBA is a UKAS accredited certification body – Number 113.*

*The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk  
Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.  
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## Regulations

In the opinion of the BBA, Drimaster-ECO Loft Mounted Positive Input Ventilation Systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



### The Building Regulations 2010 (England and Wales) (as amended)

<b>Requirement:</b>	<b>B1</b>	<b>Means of warning and escape</b>
Comment:		Systems with the aluminium diffuser may be installed in buildings with a protected stairway. See section 8.2 of this Certificate.
<b>Requirement:</b>	<b>B2(1)</b>	<b>Internal fire spread (linings)</b>
Comment:		The systems can contribute to satisfying this Requirement. See sections 8.1 and 8.2 of this Certificate.
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:		The systems can contribute to satisfying this Requirement. See section 7 of this Certificate.
<b>Requirement:</b>	<b>F1(1)</b>	<b>Means of ventilation</b>
Comment:		The systems will contribute to satisfying this Requirement. See section 6.1 of this Certificate.
<b>Requirement:</b>	<b>L1(b)(i)</b>	<b>Conservation of fuel and power</b>
Comment:		The systems can contribute to satisfying this Requirement. See sections 9.1 and 9.2 of this Certificate.
<b>Regulation:</b>	<b>7</b>	<b>Materials and workmanship (applicable to Wales only)</b>
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship (applicable to England only)</b>
Comment:		The systems are acceptable. See section 13 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>26</b>	<b>CO<sub>2</sub> emission rates for new buildings</b>
<b>Regulation:</b>	<b>26A</b>	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
<b>Regulation:</b>	<b>26A</b>	<b>Primary energy consumption rates for new buildings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26B</b>	<b>Fabric performance values for new dwellings (applicable to Wales only)</b>
Comment:		The systems' contribution to satisfying these Regulations will depend on their mode of operation. See sections 9.1 and 9.2 of this Certificate.



### The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)(2)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:		The systems satisfy the requirements of this Regulation. See sections 12.1, 12.2 and 13 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	<b>2.5</b>	<b>Internal linings</b>
Comment:		The ceiling-mounted thermoplastic diffuser can be treated as a lighting diffuser and can satisfy this Standard, with reference to clause 2.5.4 <sup>(1)</sup> . The aluminium diffuser can be incorporated into a ceiling. See sections 8.1 and 8.2 of this Certificate.
Standard:	<b>2.9</b>	<b>Escape</b>
Comment:		Systems with the aluminium diffuser can satisfy this Standard in relation to installation within a protected zone in dwellings containing an apartment or kitchen with one floor more than 4.5 m above the ground, with reference to clause 2.9.8. See section 8.2 of this Certificate.

Standard:	3.14	Ventilation
Comment:		The systems can contribute to satisfying this Standard, with reference to clause 3.14.11 <sup>(1)</sup> . See section 6.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The systems can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)</sup> and 3.15.2 <sup>(1)</sup> . See section 7 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Comment:		The systems' contribution to satisfying this Standard will depend on their mode of operation with reference to clauses 6.1.1 <sup>(1)</sup> and 6.1.6 <sup>(1)</sup> . See section 9.2 of this Certificate.
Standard:	6.6(b)	Mechanical ventilation and air conditioning
Comment:		The systems can contribute to satisfying this Standard with reference to clause 6.6.2 <sup>(1)</sup> . See section 9.2 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The systems can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, depending on their operating mode, the systems can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 <sup>(1)</sup> [Aspect 1 <sup>(1)</sup> ], 7.1.6 <sup>(1)</sup> [Aspect 1 <sup>(1)</sup> ] and 7.1.7 <sup>(1)</sup> [Aspect 1 <sup>(1)</sup> ]. See section 9.2 of this Certificate.
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:		All comments given for these systems under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)</sup> and Schedule 6 <sup>(1)</sup> .

(1) Technical Handbook (Domestic).



## The Building Regulations (Northern Ireland) 2012 (as amended)

<b>Regulation:</b>	<b>23</b>	<b>Fitness of materials and workmanship</b>
Comment:		The systems are acceptable. See section 13 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>29</b>	<b>Condensation</b>
Comment:		The systems can contribute to satisfying the requirements of this Regulation. See section 7 of this Certificate.
<b>Regulation:</b>	<b>33(c)</b>	<b>Means of escape</b>
Comment:		Systems with the aluminium diffuser may be installed in buildings with a protected stairway. See section 8.2 of this Certificate.
<b>Regulation:</b>	<b>34</b>	<b>Internal fire spread – Linings</b>
Comment:		The ceiling-mounted thermoplastic diffusers can be treated as lighting diffusers. The aluminium diffusers can be incorporated into a ceiling. See sections 8.1 and 8.2 of this Certificate.
<b>Regulation:</b>	<b>39(b)</b>	<b>Conservation measures</b>
Comment:		The systems can contribute to satisfying this Regulation. See section 9.1 of this Certificate.
<b>Regulation:</b>	<b>40(2)</b>	<b>Target carbon dioxide emission rate</b>
Comment:		The systems' contribution to satisfying this Regulation will depend on their mode of operation. See section 9.2 of this Certificate.
<b>Regulation:</b>	<b>65(1)</b>	<b>Means of ventilation</b>
Comment:		The systems can contribute to satisfying this Regulation. See section 6.1 of this Certificate.

## **Construction (Design and Management) Regulations 2015 Construction (Design and Management) Regulations (Northern Ireland) 2016**

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections:                    5 *Practicability of installation* and 11 *Provision of an electrical supply and electrical safety* of this Certificate.

### **The Electrical Equipment (Safety) Regulations 2016**

These Regulations transpose Directive 2014/35/EU of the European Parliament relating to the making available on the market of electrical equipment designed for use within certain voltage limits. The Directive repeals and replaces Directive 2006/95/EC which was implemented in the United Kingdom by the *Electrical Equipment (Safety) Regulations 1994* (S.I. 1994/3260). These Regulations revoke and replace those Regulations. The BBA has not assessed the system for compliance with these Regulations.

### **The Electromagnetic Compatibility Regulations 2016**

These Regulations transpose Directive 2014/30/EU of the European Parliament relating to electromagnetic compatibility. The Directive repeals and replaces Directive 2004/108/EC of the European Parliament which was implemented in the United Kingdom by the *Electromagnetic Compatibility Regulations 2006*. The BBA has not assessed the system for compliance with these Regulations.

## **Additional Information**

### **NHBC Standards 2019**

In the opinion of the BBA, Drimaster-ECO Loft Mounted Positive Input Ventilation Systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 8.1 *Internal services*, Clauses 8.1.10 and 8.1.12.

## **Technical Specification**

### **1 Description**

1.1 Nuaire Loft Mounted Positive Input Ventilation Systems comprise a fan unit mounted in the loft space, together with filter(s) and ducting. A diffuser is mounted in the ceiling. Air is drawn through the filters by the fan and expelled through the ducting and out of the diffuser into the dwelling (see Figure 1).

Figure 1 Loft-mounted ventilation unit



1.2 The range includes different control options and dwelling-type applications (see Table 1).

Table 1 Product range

	Loft controlled	Hall controlled	Wireless controls	Heater element	3-storey compatible
DRI-ECO-LC	✓	–	–	–	–
DRI-ECO-HC	–	✓	–	–	–
DRI-ECO-LINK-HC	–	✓	✓	–	–
DRI-ECO-HEAT-HC	–	✓	✓	✓	–
DRI-ECO-3STOREY	✓	–	–	–	✓

1.3 Nuaire offer either thermoplastic or aluminium diffusers. The aluminium diffuser incorporates intumescent materials which provide resistance to the spread of flame.

1.4 The main components of the systems are:

- spherical outer casing of the fan unit
- centrifugal impeller
- filter(s)
- flexible ducting
- ceiling diffuser (thermoplastic or aluminium).

1.5 The DRI-ECO-HEAT-HC is fitted with a 400w heater element located at the diffuser. On the underside of the diffuser is a small control panel which allows the installer and user to adjust the required outlet temperature to between 5 and 15°C. As a default, units are supplied at 10°C. This facility is intended to temper the incoming air and should not be regarded as a secondary heating system; however, indicative assessments in the standard loft mode suggest that the heater may be on for between 5 and 15% of the time, depending on the fan speed setting, at loft temperatures below 10°C.

1.6 All Drimaster-ECO units include an internal sensor to regulate the fan speed according to the loft temperature. As a default the fan will:

- increase in speed between 19 and 23°C
- enter standby mode above 23°C.

Other temperature-control strategies are possible; details are available from the Certificate holder. In addition, wireless switches and sensors can also be used— see Tables 1 and 2 and Figure 2.

**Table 2** *Drimaster-ECO product-specific components*

Product-specific components	DRI-ECO- LC	DRI-ECO- HC	DRI-ECO- LINK-HC	DRI-ECO- HEAT-HC	DRI-ECO- 3STOREY
Integral heater	–	–	–	✓	–
Compatible with relative humidity sensor	–	–	✓	✓	–
Compatible with CO <sub>2</sub> sensor	–	–	✓	✓	–
Compatible with remote two-way boost switch	–	–	✓	–	–
Compatible with four-way remote switch with boost and heater control	–	–	–	✓	–
Remote monitoring device	–	–	✓	✓	–
Commissioning and controls behind diffuser	–	✓	✓	✓	–
Controls/commissioning at unit	✓	–	–	–	✓
Modern circular ceiling diffuser	✓	✓	✓	✓	–
Aluminium intumescent diffuser	–	–	–	–	✓

**Figure 2** *Typical controls and sensors*



1.7 The systems incorporate a selector switch, allowing six settings. The setting required depends on the size and layout of the property and the level of moisture being produced in the property. The standard factory default setting is setting 2.

1.8 Depending on the use, the diffuser can be supplied in thermoplastic material or aluminium (code suffix 3Storey). The aluminium version includes intumescent closure elements.

1.9 Ancillary items for use with the product, but outside the scope of this Certificate:

- control electronics
- fixing kits, enabling the installer to fix the unit in position

1.10 All components and raw materials are subject to inspection. Items designated as critical to the operation or performance of the fan are sampled in accordance with the requirements of BS 6001-1 : 1999. All completed units are inspected to ensure correct assembly, operation and electrical safety.

## 2 Manufacture

2.1 The production process consists of the assembly and testing of printed circuit boards and the mechanical assembly of the fan unit.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Nuaire (a trading division of Polypipe Ltd) has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate FM 665203).

### 3 Delivery and site handling

3.1 The units are supplied in cardboard cartons and include the fan unit, ducting, diffuser, fixing kit and installation instructions.

3.2 Boxes should be stored internally and kept dry.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Drimaster-ECO Loft Mounted Positive Input Ventilation Systems.

## Design Considerations

### 4 Use

4.1 Drimaster-ECO Loft Mounted Positive Input Ventilation Systems are continuously running, low-energy, positive input ventilation systems which will contribute to eliminating or reducing surface condensation and/or which will contribute to providing whole-home ventilation within dwellings. It is essential that the loft space is adequately ventilated to the outside (for example, as described in BS 5250 : 2011) and that any ceiling penetrations (for example, pipes and loft hatches) are well sealed.

4.2 The diffuser is mounted in the ceiling of the upper landing as near as possible to the centre, as far as possible from all doors, and, preferably, above the stairwell.

4.3 The thermoplastic diffuser is fitted with the Drimaster-ECO units and is suitable for use in one- and two-storey dwellings up to 4.5 m high (ground floor and first floor). In single-storey buildings, the diffuser should be sited in the entrance hall or lobby.

4.4 The aluminium diffuser is fitted with the DRI-ECO-3STOREY and is suitable for use in dwellings with at least one floor more than 4.5 m above ground level.

4.5 The use of positive input ventilation systems is detailed in BRE Report BR 281 : 1995.

4.6 The BBA has not assessed the units in respect of radon or other harmful gas mitigation.

### 5 Practicability of installation

Although the systems are designed to be installed by a competent general builder or a contractor experienced with these types of systems, the provision of an electrical supply and the connection of the unit to the supply should be carried out only by a suitably qualified electrician. See section 11 and the *Installation* part of this Certificate.



## 6 Ventilation



6.1 The systems can provide adequate whole-dwelling ventilation; see Tables 3 and 4.

6.2 Specifiers must ensure that in the overall design:

- all rooms have an appropriately sized ventilation opening, for example an opening window, for rapid (purge) ventilation
- any kitchen, bathroom, utility room or sanitary accommodation is directly accessible from the central hallway or landing into which the unit delivers air
- internal doors are not tight fitting; an undercut of 10 mm above the floor finish should be sufficient (standard methods of construction should provide sufficient leakage)
- dwelling volume is  $> 120 \text{ m}^3$  and as-built<sup>(1)</sup> airtightness is  $> 3 \text{ m}^3 (\text{h}\cdot\text{m}^2)^{-1}$  at 50 Pa for two storeys
- dwelling volume is  $> 120 \text{ m}^3$  and as-built<sup>(1)</sup> airtightness is  $> 5 \text{ m}^3 (\text{h}\cdot\text{m}^2)^{-1}$  at 50 Pa for three storeys.

(1) A higher design target will be required as referred to in Approved Document F, section 5.10.

**Table 3 Indicative performance levels<sup>(1)</sup> with the thermoplastic diffuser – DRI-ECO-LC**

Fan speed setting	Airflow ( $\text{l}\cdot\text{s}^{-1}$ )	Power (W)	Specific fan power (SFP) <sup>(2)</sup> ( $\text{W}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$ )
1	9.7	2.57	0.27
2	19.3	3.01	0.16
3	29.1	3.84	0.13
4	38.9	5.25	0.14
5	48.5	8.53	0.18
6	58.6	11.23	0.19

(1) The values given relate to Drimaster-ECO units. These airflow rates are adjusted automatically to suit an individual loft and house temperatures to optimise heat available in the loft.

(2)  $\text{SFP} (\text{W}\cdot\text{l}^{-1}\cdot\text{s}^{-1}) = \frac{\text{Power (W)}}{\text{Airflow} (\text{l}\cdot\text{s}^{-1})}$

**Table 4 Indicative performance levels<sup>(1)</sup> with thermoplastic diffuser – DRI-ECOHEAT-HC<sup>(3)</sup>**

Fan speed setting	Airflow ( $\text{l}\cdot\text{s}^{-1}$ )	Power (W)	Specific fan power (SFP) <sup>(2)</sup> ( $\text{W}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$ )
1	9.4	2.68	0.29
2	18.8	3.09	0.16
3	28.5	3.98	0.14
4	38.4	5.60	0.15
5	48.1	8.36	0.17
6	58.0	12.91	0.22

(1) The values given relate to the Drimaster-ECO-HEAT-HC unit. The Drimaster-ECO-HEAT-HC unit airflow rates and heat output are adjusted automatically to suit individual loft and house temperatures to optimise heat available in the loft.

(2)  $\text{SFP} (\text{W}\cdot\text{l}^{-1}\cdot\text{s}^{-1}) = \frac{\text{Power (W)}}{\text{Airflow} (\text{l}\cdot\text{s}^{-1})}$

(3) In the opinion of the BBA, the DRI-ECO-HC and DRI-ECO-LINK-HC would be expected to perform similarly to the DRI-ECO-LC.

6.3 Where a design condition specified in section 6.2 is not met, additional measures should be considered, as appropriate.

6.4 For detailed guidance, designers should refer to the documents supporting the national Building Regulations.



## 7 Condensation risk



The systems will contribute to eliminating or reducing condensation in dwellings when installed in accordance with the manufacturer's instructions and this Certificate. The systems supply the building with air drawn from the loft space which, normally, will have a moisture content less than that in the occupied part of the building.

## 8 Behaviour in relation to fire



8.1 The thermoplastic diffuser is classified as TP(b) and can be installed in one- and two-storey dwellings but not in protected stairways (or, in Scotland, protected zones).

8.2 The aluminium diffuser incorporates intumescent closure elements and may be used in protected stairways (or, in Scotland, protected zones) in dwellings with one floor more than 4.5 m above ground.

8.3 Where protected stairways (or, in Scotland, protected zones) exist, smoke detectors must be provided by the contractor and wired into the fan unit using the correct connections.

8.4 Designers should refer to the documents supporting the national Building Regulations for detailed guidance relating to the risks of smoke or fire spread into the protected stairway or zone.

## 9 Conservation of fuel and power



9.1 The specific fan power of the systems (see Tables 3 and 4) does not exceed the maximum design limit of  $0.5 \text{ W}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$  specified in documents supporting the national Building Regulations.

9.2 For the purposes of SAP calculations, the energy used by the fan may be taken as counterbalancing the effect of using slightly warmer air from the loft space compared with outside. For other modes, the specific fan power  $0.5 \text{ W}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$  (see section 8.1) should be used.

9.3 It is essential that the ceiling construction minimises any circulation of air from the dwelling to the roof space.

## 10 Self-generated noise

Outlet noise depends on the fan setting but measurements indicate that it should not be considered intrusive. The outlet noise is given in Table 5.

Table 5 *Drimaster-ECO nominal outlet noise*

Fan speed setting	Outlet noise [dB(A) at 3 m]
2	<1
3	1
4	9
5	17
6	19

## 11 Provision of an electrical supply and electrical safety

11.1 For electrical safety, the provision of an electrical supply and the connection of the unit to the supply should be carried out by a qualified electrician.

11.2 The systems should be connected to a suitable mains electrical supply through an isolating spur. A fuse rated at a maximum of 3A should be used. The provision of the electrical supply should be in accordance with the *IET Wiring Regulations*.

11.3 In England and Wales, all installations must satisfy the requirements of The Building Regulations 2010 (England and Wales) (as amended), Part P *Electrical Safety*. Notification should be made to the Local Authority Building Control in advance of installation. As an alternative to this procedure, electrical connections can be carried out by a person registered with a government-approved Competent Persons Scheme (CPS) for electrical work, using materials suitable for the purpose.

11.4 In Scotland, to satisfy the requirements of Mandatory Standard 4.5, with reference to clause 4.5.1<sup>(1)</sup> of The Building (Scotland) Regulations 2004 (as amended), all installations should be designed, constructed and tested in accordance with the requirements of BS 7671 : 2018.

(1) Technical Handbook (Domestic).

## 12 Maintenance



12.1 Under normal operating conditions, the filters should be replaced every five years.

12.2 The intumescent closure elements of the aluminium diffuser must be inspected annually for mechanical damage or blockage. The elements must not be exposed to water.

12.3 When the aluminium diffuser is used, a durable notice is attached to the fan unit containing information on the maintenance of the intumescent closure elements.

12.4 The ducting should not require maintenance unless it is subject to impact damage.

12.5 The motor is fitted with a sealed-for-life bearing that will not require maintenance or lubrication.

12.6 Reasonable provision should be made to ensure that the owner/occupier of the building is provided with sufficient information about the system so that it can be operated and maintained.

## 13 Durability



13.1 The fan unit case and diffusers are made of durable materials and, under normal operating conditions, will have a life equal to that of the dwelling in which they are installed.

13.2 The ducting, fan motor and other electrical components may require replacing during the lifetime of the unit.

## Installation

### 14 General

14.1 Installation of the unit should be in accordance with the manufacturer's instructions provided with each unit, and this Certificate (see also section 11).

14.2 The diffusers must not be allowed to discharge air if there is an obstruction, such as a wall or smoke alarm within one metre of the diffuser sides. If the thermoplastic diffuser cannot be repositioned, up to two sides may be closed off (using two of the three blanking strips supplied) to encourage air through the open sides (which must have at least one metre of unobstructed area).

14.3 An open side of the diffuser must not be placed within one metre of a smoke alarm. If the thermoplastic diffuser cannot be repositioned, three sides of the diffuser must be closed off using the blanking strips supplied to encourage air through the remaining open side (which must face at least 1.5 metres of unobstructed area from a smoke alarm sensor). A smoke alarm may be fitted directly onto the underside of the diffuser.

## 15 Procedure

15.1 A hole for the diffuser is cut in the ceiling (using the template provided) between two convenient joists. The diffuser base may be fitted from below and fixed using the screws provided. The diffuser cover is fitted onto the diffuser base by four clips.

15.2 The fan unit should be mounted in the loft space at a minimum distance of 800 mm from the diffuser and the flexible ducting should be connected without stretching.

15.3 If the fan unit is to be mounted directly onto the joists, two battens (50 by 25 mm) are cut long enough to span between two joists and, with the mountings that can be supplied on request, the unit is fixed to the joists, ensuring that the fixings are not over tightened. The fan unit should be fixed centrally to the battens.

15.4 The fan unit may also be suspended from the roof structure, using the suspension kit supplied, in accordance with the Certificate holder's instructions.

15.5 The flexible ducting is supplied with the unit and is connected to the unit spigot and diffuser spigot using the tie bands supplied. All duct joints should be made airtight.

15.6 The fan unit must be connected to a suitable electrical supply by the three-core flying lead, through the isolating spur.

15.7 The power supply to the unit should be switched on.

15.8 The selector switch on the fan unit should be set to the required setting dependent on the size and layout of the property and the level of moisture being produced in the property.

15.9 In England, Wales and Northern Ireland, the unit should be checked for correct operation in accordance with the relevant requirements of the *Domestic Ventilation Compliance Guide*.

## Technical Investigations

### 16 Tests

Results of tests were assessed to determine:

- outlet noise
- fan performance
- fire performance of the aluminium diffuser.

### 17 Investigations

17.1 The unit's behaviour in relation to fire was assessed.

17.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality of components used.

17.3 Independent airflow performance tests were undertaken to BS EN 13141-11 : 2015.

## Bibliography

BRE Report 281 (BR 281 : 1995) *Positive pressurisation : a BRE guide to radon remedial measures in existing dwellings*

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS 6001-1 : 1999 *Sampling procedures for inspection by attributes — Sampling schemes indexed by acceptable quality limit (AQL) for lot-by-lot inspection*

BS 7671 : 2018 *Requirements for electrical installations — IET Wiring Regulations*

BS EN 13141-11 : 2015 *Ventilation for buildings — Performance testing of components/products for residential ventilation — Supply ventilation units*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

### 18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

18.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

18.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

18.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.