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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

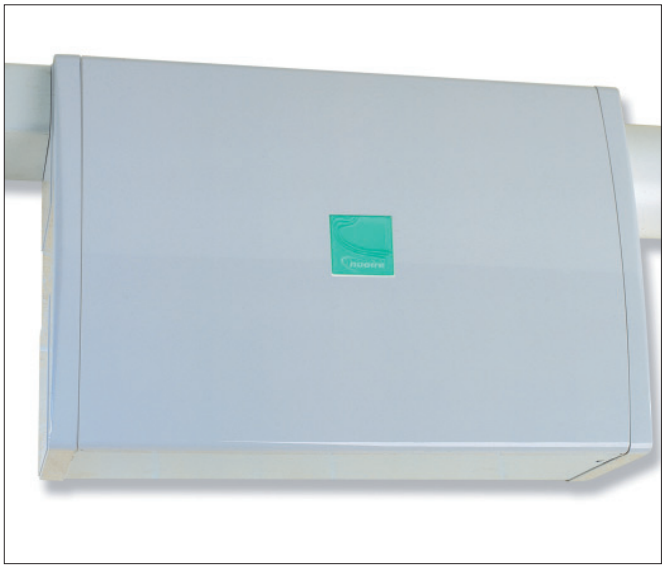
Agrément Certificate
00/3727
Product Sheet 2

NUAIRE VENTILATION SYSTEMS

FLATMASTER AND FLATMASTER 2000 SYSTEMS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Flatmaster and Flatmaster 2000 Systems, low-energy positive-input ventilation systems for use in flats or dwellings without a loft space.



AGRÉMENT 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 investigation
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Ventilation — the systems can contribute towards meeting this requirement (see section 5).

Behaviour in relation to fire — the grilles are made from thermoplastic material and the relevant conditions apply (see section 6).

Self-generated noise — details of the systems outlet noise are provided (see section 7).

Conservation of fuel and power — the systems can contribute to meeting this requirement (see section 8).

Durability — the systems are constructed from durable materials (see section 11).

The BBA has awarded this Agrément 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 First issue: 12 March 2009

Chris Hunt
Head of Approvals — Physics

Greg Cooper
Chief Executive

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, the Flatmaster and Flatmaster 2000 Systems, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	B2	Internal fire spread (linings)
Comment:		For the purpose of assessing the performance of the wall lining the internal grille is not included. See section 6.1 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The external grille constitutes a small unprotected area. See section 6.2 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The systems can contribute to meeting this Requirement. See section 5.5 of this Certificate.
Requirement:	F1	Means of ventilation
Comment:		The systems will contribute to meeting this Requirement. See sections 5.2 to 5.4 of this Certificate.
Requirement:	L1(a)(b)	Conservation of fuel and power
Comment:		The systems can contribute to meeting this Requirement. See sections 8.1 and 8.2 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The systems are acceptable. See sections 11.1 and 11.2 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The systems satisfy the requirements of this Regulation. See sections 10.1, 11.1 and 11.2 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	2.3	Structural protection
Comment:		The penetration of an element of structure by the wall mounted system must be considered in relation to clause 2.3.4[1] of this Standard. See section 6.2 of this Certificate.
Standard:	2.5	Internal linings
Comment:		The internal grille can satisfy this Standard, with reference to clause 2.5.1[1]. See section 6.1 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The external grille must be treated as an unprotected area with reference to clause 2.6.2[1]. See section 6.2 of this Certificate.
Standard:	3.14	Ventilation
Comment:		The systems can contribute to satisfying this Standard, with reference to clauses 3.14.2[1], 3.14.8[1] and 3.14.10[1]. See sections 5.2 to 5.4 of this Certificate.
Standard:	3.15	Condensation
Comment:		The systems can satisfy this Standard, with reference to clauses 3.15.1[1], and 3.15.2[1]. See section 5.5 of this Certificate.
Standard:	6.1(a)(b)	Carbon dioxide emissions
Comment:		The systems can contribute to satisfying this Standard, with reference to clause 6.1.1[1]. See section 8.2 of this Certificate.

(1) Technical Handbook (Domestic).

The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The systems are acceptable. See sections 11.1 and 11.2 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The systems are acceptable. See section 10.1 of this Certificate.
Regulation:	C5	Condensation
Comment:		The systems can contribute to meeting the requirements of this Regulation. See section 5.5 of this Certificate.
Regulation:	E3	Internal fire spread — Linings
Comment:		For the purpose of assessing the performance of the wall lining the internal grille is not included. See section 6.1 of this Certificate.
Regulation:	E5(a)	External fire spread
Comment:		The external grille must be treated as an unprotected area. See section 6.2 of this Certificate.
Regulation:	F2(b)	Conservation measures
Regulation:	F3	Target carbon dioxide Emission Rate
Comment:		The systems can contribute to meeting this Regulation. See sections 8.1 and 8.2 of this Certificate.
Regulation:	K2	Means of ventilation
Comment:		The systems will contribute to meeting this Regulation. See sections 5.2 to 5.4 of this Certificate.

Construction (Design and Management) Regulations 2007
Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: *4 Practicability of installation*, *9 Provision of an electrical supply and electrical safety* (9.1 to 9.4), and *12 Installation* (12.3) of this Certificate.

The Electrical Equipment (Safety) Regulations 1994 and the Electromagnetic Compatibility Regulations 2005

These Regulations implement the Low Voltage Directive 2006/95/EC and the Electromagnetic Compatibility Directive 2004/108/EC and require manufacturers to carry out assessment of their products against the criteria given in the Directives. Declarations of Conformity have been provided by the Certificate holder. The BBA has not assessed the systems for compliance with these Directives.

Non-regulatory information

NHBC Standards 2008

NHBC accepts the use of the Flatmaster and Flatmaster 2000 Systems, when installed and used in accordance with this Certificate in relation to *NHBC Standards*, Chapter 8.1 *Internal services*, Clauses D10 and D11.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA the Flatmaster and Flatmaster 2000 Systems, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual*, Section *5 Internal / external works, services & finishes*, Sub-section *Services* (pages 298, 301 and 326).

General

This Certificate relates to the Flatmaster and Flatmaster 2000 Systems for use in eliminating or reducing surface condensation and/or providing whole home ventilation within dwellings.

The systems are installed internally and transfer air from the outside to the inside via ducting through a grille.

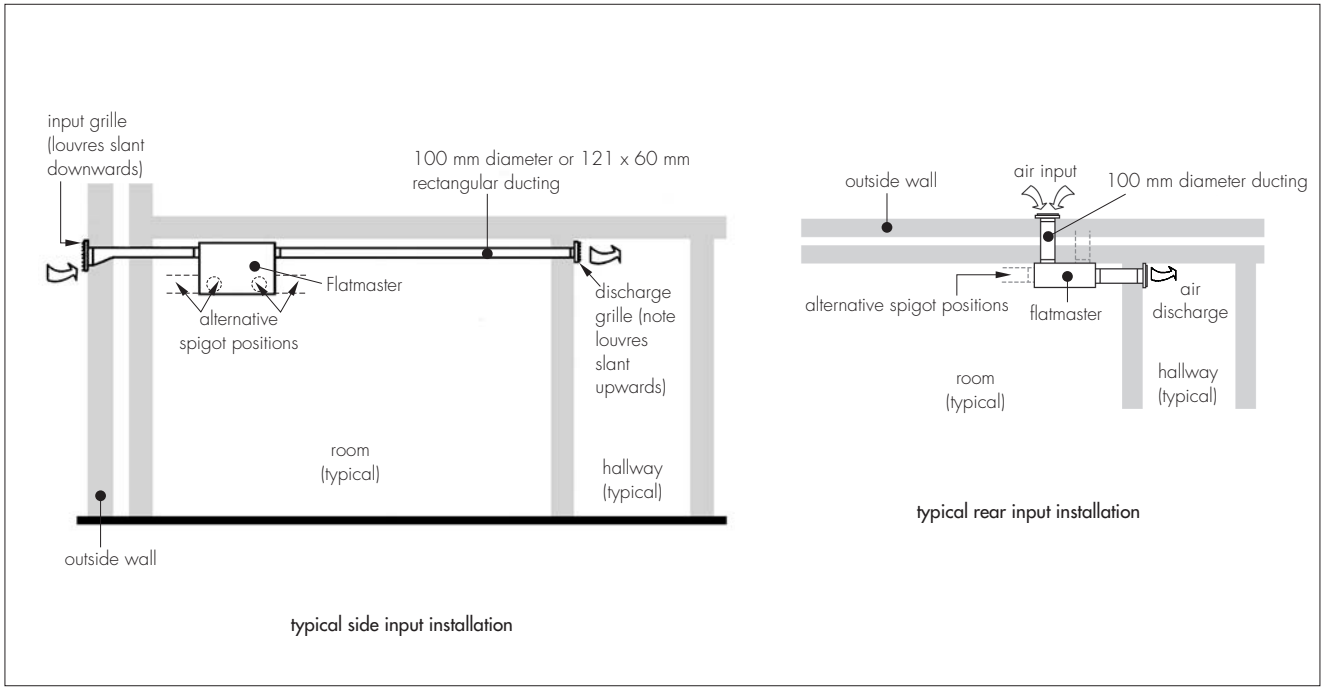
It is important that the designers, planners, contractors and/or installers ensure that the systems are installed and used in accordance with the Certificate holder's instructions and the information given in this Certificate.

Technical Specification

1 Description

1.1 The Flatmaster and Flatmaster 2000 Systems (Flat2000R and Flat2000L) (see Figure 1) comprise a fan unit mounted on the wall, together with filters and plastic ducting. The ducting draws air through a grille on an outside wall, through the unit and is ducted to the internal grille, which is placed on an internal wall of a central area (hallway).

Figure 1 Typical installation of Flatmaster unit



1.2 The Flatmaster 2000 unit includes a remote manual boost switch for increased airflow. When additional heating of the incoming air is required, the thermostatically controlled integral heater (see Figure 2) can be used. The heater has a manual override. The heater, when enabled, is activated when the temperature of the incoming air falls below 10°C, unless set to a different temperature.

Figure 2 Manual boost switch and integral heater

1.3 The systems incorporate a selector switch, allowing three settings (see Tables 1 and 2). The setting required is dependent upon the size of the property, layout and the level of moisture being produced in the property.

Table 1 Nominal performance levels[1] for Flatmaster

Fan speed setting	Airflow (ls^{-1})	Power (W)
low	12.5	3.1
medium	18.2	5.7
high	21.8	9.4

(1) Results at free air (0 Pa).

(2) Unit tested with internal and external grilles, ducting and transition fittings.

Table 2 Nominal performance levels[1][2] for Flatmaster 2000

Temperature difference outlet-inlet (°C)	Fan speed setting	Airflow (ls^{-1})	Outlet velocity (ms^{-1})	Input power (heater off) (W)	Input power (heater on) (W)
17	low	13.2	1.8	5.1	285
12	medium	18.7	2.6	8.3	291
10	high	22.7	3.1	12.8	296
6	boost	35.2	4.8	47.2	330

(1) Results at free air (0 Pa).

(2) Unit tested with internal and external grilles, ducting and transition fittings.

1.4 The main components comprise:

- fan unit (Flatmaster) or fan unit with integral heater (Flatmaster 2000)
- plastic ducting[1]
- external grille[1]
- internal grille[1]
- remote boost switch
- filters.

(1) Can be supplied by the Certificate holder.

1.5 All components and raw materials are subject to inspection by the manufacturer. 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 subjected to inspection to ensure correct assembly, operation and electrical safety.

2 Delivery and site handling

2.1 The units are supplied in cardboard cartons and include the fan unit, optional boost switch (for Flatmaster 2000), installation instructions and ducting, internal grille and external grille, if supplied. Each carton bears the BBA identification mark incorporating the number of this Certificate.

2.2 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 the Flatmaster and Flatmaster 2000 Systems.

Design Considerations

3 Use

3.1 The Flatmaster and Flatmaster 2000 Systems will contribute to eliminating or reducing surface condensation in dwellings as the unit supplies the building with air drawn from outside.

3.2 The unit transfers air from the outside to the inside via an arrangement of rigid plastic ducting and connectors to a grille or grilles, depending on the layout of the dwelling.

3.3 The units are suitable for use in one- and two-storey flats. The internal grille should be sited in a central area (hallway).

4 Practicability of installation

Although installation of the systems may be achieved by suitable craftsmen, 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 sections 9.1 to 9.4 and the *Installation* part of this Certificate).

5 Ventilation

5.1 The ventilation rates, when measured in accordance with BS 848-1 : 2007, are given in Table 1.

5.2 Dwellings incorporating the systems will meet or contribute to meeting the national Building Regulations and Standards for background ventilation as detailed below (see also 5.3 and 5.4). However, provision for rapid (purge) ventilation, eg opening windows must also be made.

England and Wales — Approved Document F

Scotland — Mandatory Standard 3.14, clauses 3.14.2[1], 3.14.8[1] and 3.14.10[1]

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet K.

5.3 The systems will enable a dwelling to meet the national Building Regulations and Standards above if the following criteria apply:

(a) the internal doors are not unusually tight fitting; an undercut of 10 mm should be sufficient (standard methods of construction should provide sufficient leakage)

(b) all rooms have a ventilation opening, for example an opening window, for rapid (purge) ventilation (a minimum of 1/20th of the floor area for habitable rooms and sanitary accommodation in England and Wales and Northern Ireland. A minimum of 1/30th of the floor area is required for a room or toilet in Scotland)

(c) any kitchen, bathroom, utility room or sanitary accommodation is directly accessible from the central hallway or landing into which the unit delivers air

(d) appropriately sized background ventilators must be fitted throughout the building in flats less than 120 m^3 in volume to prevent excessive pressurisation, or for envelope airtightness values less than 3 m^3 $(hm^2)^{-1}$ at 50 Pa (flats up to 4.5 m).

5.4 In circumstances where the requirements of section 5.3(b) and/or section 5.3(c) do not apply, the unit will only contribute to meeting the Requirements, Standards and Regulations. Therefore, the following additional measures[1] outlined below, should be included to enable a dwelling fitted with the unit to meet the national Building Regulations and Standards detailed in section 5.2:

(a) any kitchen, bathroom, utility room or sanitary accommodation not complying with 5.3(b) should be fitted with a mechanical extract fan capable of continuous operation at low background level with boost extraction facility (nominal air flow rates should be as detailed in the relevant Building Requirements, Regulations and Standards)

(b) any kitchen, bathroom or utility room not complying with section 5.3(c) should either be supplemented by the measures given in 5.4(a) or have air transfer grilles fitted in walls/doors as required, to allow free flow of air to and from these areas and the central hallway or landing fitted with the diffuser. This may involve air passing through habitable rooms (room in Scotland), and therefore this option can only be adopted if each of these areas is separated from the central hallway or landing by no more than one habitable room (two habitable rooms may be treated as a single room if there is an area of permanent opening between them equal to at least 1/20th of the combined floor area and 1/15th in Scotland)

(c) any sanitary accommodation not complying with section 5.3(c) should either be supplemented by the measures given in 5.4(b) above or have background ventilation (trickle-ventilation in Scotland) as detailed in the relevant Building Requirements, Regulations and Standards (a minimum of 4000 mm^2 in England and Wales, Northern Ireland and Scotland).

(1) With these measures, it should be noted that mechanical extract ventilation shall not be provided (and is not required) where an open-flued, solid fuel burning appliance is installed. Mechanical ventilation need not be provided where an open-flued appliance is installed having a flue with a free area of at least equivalent to 125 mm diameter duct and when the appliance's combustion air inlet and dilution air inlet are permanently open when the appliance is not in use.

5.5 The systems will contribute to eliminating or reducing condensation in dwellings when installed in accordance with the manufacturer's instructions and this Certificate. Therefore, the unit will contribute to meeting or contribute to satisfying the relevant national Building Regulations and Standards:

England — Approved Document C2

Scotland — Mandatory Standard 3.15, clauses 3.15.1(1) and 3.15.2(1)

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet C.

6 Behaviour in relation to fire

6.1 The surface area covered by the internal grille is small enough not to have an adverse effect on the spread of fire in the internal lining of the wall in which it is installed and can be ignored.

6.2 The external grille constitutes an unprotected area which may be disregarded provided the appropriate minimum distances from other unprotected areas are maintained, thus:

England and Wales — the distances given in Diagram 20 of Approved Document B

Scotland — Mandatory Standard 2.6, clause 2.6.2(1) – the grille should not be fitted to walls 500 mm or less from a boundary. Edge protection of the penetration is not normally required to meet Mandatory Standard 2.3, clause 2.3.4(1), but may be necessary where the proximity of other penetrations constitutes a potential weakness

Northern Ireland — the distances given in Diagram 4.4 of Technical Booklet E.

6.3 Where the systems are installed in flats where regulations require the provision of a protected entrance hall or protected enclosure and the outlet of the systems are within that enclosure, it is necessary to ensure that the safety of the enclosure is not compromised either in relation to its fire resistance or the entry of smoke. Smoke detectors must be connected to the fan unit so that it shuts down if smoke enters the ductwork. Ductwork must be of steel, with the point of penetration fire stopped, or if non fire-resistant ducting is used, it must be protected in fire-resisting construction up to the point where it penetrates the wall of the protected entrance hall or protected enclosure. Where the systems are installed in flats where these regulatory provisions do not apply, good installation practice should be observed; for example the use of smoke detectors to control the fan, to ensure that occupant safety levels are not reduced.

7 Self-generated noise

The outlet noise, as measured in accordance with BS 848-2.2 : 2004, is given in Table 3.

Table 3 Nominal outlet noise

Fan speed setting	Outlet noise [dB(a) at 3m]	
	Flatmaster	Flatmaster 2000
low	15	19
medium	18	23
high	23	28
boost	–	39

8 Conservation of fuel and power

8.1 The Specific Fan Power of the systems (see Table 4) does not exceed the maximum design limit of 0.8 Wl^{-1}s^{-1} specified in supporting documents to the national Building Regulations:

England and Wales — Approved Document L1A, Section 1, Table 3

Northern Ireland — Technical Booklet F1, Table 2.3.

Table 4 Specific Fan Power for Flatmaster[1] and Flatmaster 2000[1]

Fan speed setting	Specific Fan Power ($Wl^{-1}s^{-1}$)		
	Flatmaster	Flatmaster 2000	
		Power (heater off)	Power (heater on)
low	0.2	0.4	21.6
medium	0.3	0.4	15.6
high	0.4	0.6	13.0
boost	–	1.3	9.4

(1) Results at free air (0 Pa).

8.2 For the purposes of SAP calculations, the systems may be modelled in the same way as a continuously operating extract fan, with an air throughput of 0.5 ach plus infiltration and a Specific Fan Power of 0.8 $Wl^{-1}s^{-1}$.

8.3 Reasonable provision should be made to ensure that the owner/occupier of the building is provided with sufficient information about the products so that they can be operated and maintained to maximise their potential for the conservation of fuel and power.

9 Provision of an electrical supply and electrical safety

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

9.2 The systems should be connected to a suitable mains electrical supply through an isolating spur. A fuse rated at a maximum of 1A should be used. The provision of the electrical supply should be in accordance with the IEE Wiring Regulations.

9.3 In England and Wales, all installations must meet the requirements of the Building Regulations 2000 (as amended) (England and Wales), 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 for electrical work using materials suitable for the purpose.

9.4 In Scotland, to meet the requirements of Mandatory Standard 4.5, with reference to clause 4.5.1[1] of the Building (Scotland) Regulations 2004 (as amended) all installations should be designed, constructed and tested such that they are in accordance with the requirements of BS 7671 : 2001.

(1) Technical Handbook (Domestic).

10 Maintenance

10.1 The units are fitted with filters which should be cleaned at one- to two-yearly intervals (can be vacuum cleaned).

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

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

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

11 Durability

11.1 The fan unit case and internal grille are constructed of durable materials.

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

Installation

12 General

12.1 Installation of the unit should be in accordance with the manufacturer's instructions provided with each unit (see also section 9).

12.2 The unit can be installed in different configurations and is supplied with enough interchangeable spigots to enable it to be used with either round (100 mm) or rectangular (121 mm by 60 mm) ducting, ensuring that the minimum number of bends is used. The unit can be turned through 180° to any angle if required.

12.3 The louvres of the external grille must slant downwards and those of the internal grille must slant upwards.

12.4 The internal grille must not be placed within 1.5 m of a smoke alarm.

13 Procedure

13.1 The unit has four mounting pads. These pads are marked through when the unit is in the correct position. Holes are drilled in the wall and suitable raw plugs inserted. The PCB cover is removed and the electrical cable is fed through the grommet hole (standard 1 mm three core lighting cable is recommended) in the rear of the unit. The unit is screwed to the wall.

13.2 The correct airflow direction is set up and the deflector plate is fitted. The transformation piece should be on the appropriate scroll outlet and must be fitted into the chosen spigot insert, prior to fitting. For internal/external grille installation see Figure 1.

13.3 All necessary ducting must be supplied and fitted by the installer.

General

13.4 The unit must be connected to a suitable electrical supply through an isolating spur.

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

13.6 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.

13.7 The unit should be checked for correct operation.

Technical Investigations

14 Tests

Tests were carried out on the Flatmaster and Flatmaster 2000 Systems by the manufacturer to determine:

- fan performance to BS 848-1 : 2007.
- outlet noise to BS 848-2.2 : 2004

15 Investigations

15.1 The performance in use was examined by a survey of users of the systems.

15.2 The procedures and equipment of the manufacturer were examined and found to be satisfactory.

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

15.4 The unit's performance in use was assessed by computer modelling and evaluation.

Bibliography

BS 848-1 : 2007 *Industrial fans — Performance testing using standardized airways*
BS 848-2.2 : 2004 *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions — Reverbant room method*

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 : 2008 *Requirements for electrical installations. IEE Wiring Regulations. Seventeenth Edition*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

16.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

16.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

16.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

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