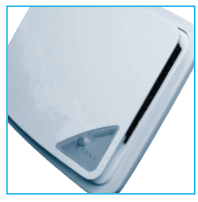
COMMERCIAL CATALOGUE


FOR THE COMPLETE VENTILATION SOLUTION

Uniclass	EPIC
CI/SfB (57.6)	

OUR **COMPANY**

OUR **PRODUCTS**

NUAIRE'S PEDIGREE

Nuaire is a world leader in the development and manufacture of ventilation products and solutions. With roots stretching back to the 1930s and a tradition of excellence in ventilation since 1963, the Nuaire name has been at the forefront of the industry for more than 40 years.

Nuaire is renowned worldwide for its expertise, commitment to innovation and the outstanding quality of its products and customer service. People are at the heart of Nuaire, and the company has over 450 highly committed staff dedicated to customer satisfaction. These include leading experts who are constantly setting new standards for the industry by developing new, innovative products in the company's research and development department – the largest and most advanced in the UK.

NUAIRE MISSION

TO DELIVER EXCELLENCE IN EVERYTHING WE DO AND TO ALWAYS EXCEED CUSTOMER EXPECTATIONS.

Nuaire was the first fan manufacturer in the world to achieve the quality standard ISO 9001, and its commitment to quality remains embedded in all aspects of its operations.

With its roots in fans and mechanical ventilation products, Nuaire has progressively expanded its range and extended its capabilities to encompass all technologies and levels of ventilation solutions. Nuaire are the only company able to deliver the total ventilation solution for the built environment.

ENVIRONMENT
AND SUSTAINABILITY

Nuaire is committed to improving the impact of its activities on the environment, and achieves this through clearly defined environmental objectives and through design of energy efficient solutions. We acknowledge that we have a duty and responsibility to reduce the environmental impact of our business activities on the local and wider community.

GO² IS NUAIRE'S INTERNAL ENVIRONMENTAL CAMPAIGN THAT ENSURES WE MEET OUT STRINGENT TARGETS.

NUAIRE ACHIEVED ISO14001 STANDARD IN MAY 2008.

CARBON TRUST STANDARD
REDUCING CO2 YEAR ON YEAR

ENVIRONMENTAL

Nuaire were the first ventilation company to gain the prestigious Carbon Trust Standard in 2009, and has recently retained this award for another two years. The standard is literally a mark of trust, an award for organisations that provide evidence of measuring, managing and reducing their carbon footprint against the strictest criteria. Accreditation is based on long-term strategies for change not just a snapshot of improvement at a given moment in time.

As well as a dedicated staff examining environmental policy and metrics, Nuaire product development and continuous improvement programmes include the specific environmental objectives of reducing energy consumption, carbon emissions and promoting the use of renewable technologies.

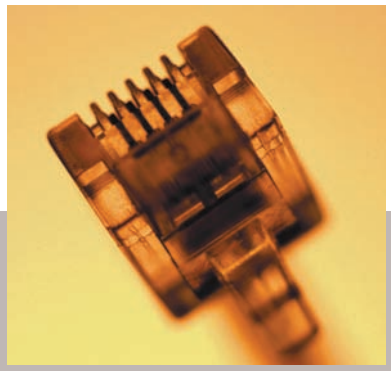
SUSTAINABILITY AND SOCIAL RESPONSIBILITY

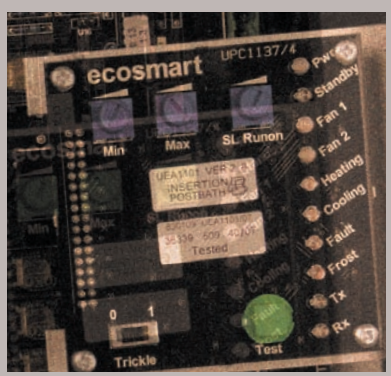
The core business of Nuaire is the provision of high quality ventilation solutions. Nuaire understand that sustainability encompasses economic, environmental and social considerations, and recognise that our business activities affect many different people – customers, suppliers and the local community.

Nuaire products are UK manufactured, from raw materials though to finished goods, with components sourced within the UK where possible. Alongside our policies on recycling, embedded carbon and transportation Nuaire ensure the ecological impact is minimised.

Nuaire endeavour to employ local people, are an equal opportunity employer, and support the local community through involvement in various charitable events and other educational initiatives. Nuaire regularly contributes to the favoured charities of our customers and our people alike.

LOW ENERGY
HIGH EFFICIENCY





Ecosmart plug-in system and control example.

Energy saving products. Nuaire pioneered and was the first to introduce low voltage, energy saving control systems and fans with 'Ecosmart' technology to varying the ventilation rate to suit changing occupant levels.

Ecosmart minimises energy loss by reducing the heating or cooling requirements of the ventilation air, not only saving energy and carbon emissions but also prolonging the life of the fan unit. The system also reduces noise levels, because the fans only run at maximum duty when absolutely necessary.

SIMPLE, PRECISE COMMISSIONING
As recommended in Part L, Ecosmart enables the system to be accurately commissioned via an integrated speed control, minimum and maximum speeds easily adjusted via commissioning panel integral to the control.

QUIETER SYSTEMS
With Ecosmart your system is only at maximum design duty when absolutely necessary. The noise levels within your systems are lower because the fans or air handling units are rarely at full speed.

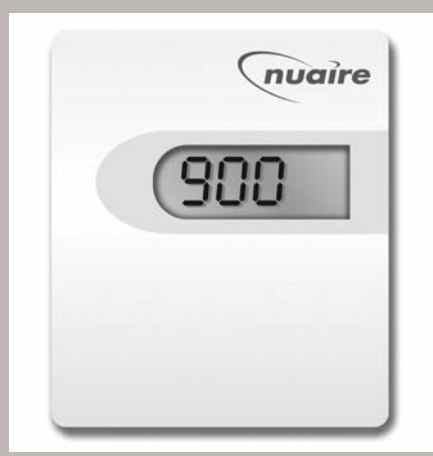
IMPROVED LIFECYCLE
Ecosmart enables the fan or air handling unit to be run at lower speeds. This reduces the maximum load and wear and therefore increases the overall working life of the units.

DEMAND VENTILATION
Only ventilates the area when you want it to - why fully ventilate a room when it's not occupied - maximum savings possible achieved.

HEALTHY ATMOSPHERE
Ecosmart has a trickle function as standard which when activated, via a simple switch, enables you to set a background ventilation rate, keeping the rooms fresh when unoccupied, whilst still saving energy. System will boost or ramp to maximum design duty when triggered by an Ecosmart or other external device.
Ecosmart has a 5 year warranty.

OTHER CONTROL OPTIONS AVAILABLE
Refer to Controls & Ancillaries Section.

ES-PIR2 sensor.

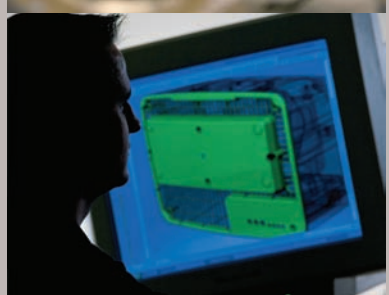


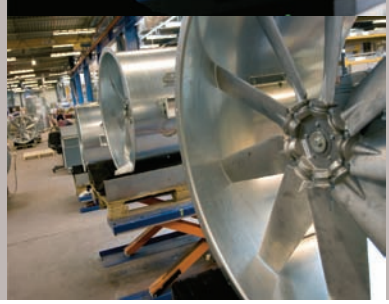
ES-CO_2 RM sensor.

ecosmart

All controls are pre-assembled, configured and installed directly into the fan or air handling unit, this includes 3-port motorised valves and actuators, pipework, off coil thermostats and sensors, frost protection, etc. Site time kept to a minimum, quality and efficiency maintained.

QUALITY
AND CONTINUOUS
IMPROVEMENT





The company was the first fan manufacturer in the world to achieve the ISO 9001 quality standard. Its commitment to quality goes back to when it became the first company in the industry to achieve British Standard 5750, and it continues to improve its quality still further.

Constantly striving to improve on its already high standards, Nuaire is now aiming to achieve Occupational Health and Safety assessment Series OH SaS 18001 which will recognise the company's fully-integrated approach to quality.

FORWARD THINKING

Quality in manufacturing is at the core of Nuaire's operations, and uniquely within the industry in the UK, the company has developed internationally-recognised expertise in quality manufacturing processes.

As the company increasingly produces custom-engineered solutions, rather than high volumes of standard products, new techniques are required, and Nuaire has been quick to develop innovative procedures in Quick Response Manufacturing (QRM).

This means Nuaire's quality of service is improved even further, and major companies and leading academics from around the world have been keen to learn from Nuaire's experience.

PRODUCT DESIGN AND TEST

Products are designed with the latest software tools, including 3D CAD solid modelling and CFD (computational fluid dynamics). Every product is tested during development and manufacture, ensuring that no Nuaire product leaves the site without having undergone extensive scrutiny.

Nuaire's multi-million pound test facilities are among the most advanced and comprehensive in the world, designed to meet the latest industry standards and carry the appropriate approvals including BSI (British Standards Insititute) and AMCA (Air Movement and Controls Association). The two reverberant chambers (Type D and Type A configurations) test for both aerodynamic and acoustic performance. Clients are welcome to visit the laboratories for 'factory witness testing' and the laboratories are also in demand by other companies to test their products.

The quality assurance which such facilities deliver is recognised throughout the industry, and the test laboratories are in demand by other companies who have not invested in such equipment. All products are subjected to rigorous testing both during development and production. Initial testing is supported with regular audit testing with products taken straight from the production line.

Nuaire's processes are increasingly recognised by external organisations and the company has achieved accreditation by Exor, Constructionline and the Contractor Health and Safety Assessment Scheme. This puts Nuaire among an elite group of companies, which have undergone an active and robust programme of checking, testing and independent validation.

IT'S ALL ABOUT PEOPLE

A top quality business is built on top quality people, and Nuaire invests in its staff to ensure all employees are able to both develop their full potential and deliver Nuaire's company values. Many employees are highly-qualified specialists, who are leading experts in their field, with all staff highly trained.

The company places a high value on integrity, honesty, openness, personal excellence, constructive self-criticism, continuous improvement and mutual respect among its employees.

Training programmes cover a wide variety of topics ranging from basic appreciation of ventilation through to specialist subjects including residential and commercial legislation, integrated controls and the latest renewable technologies.

ALONGSIDE EMPLOYEES UNDERTAKING FURTHER AND HIGHER EDUCATION, NUAIRE RUNS INSTITUTE OF LEADERSHIP AND MANAGEMENT COURSES IN-HOUSE, ENSURING WE ARE TRAINING AND DEVELOPING THE LEADERS OF TOMORROW.

A comprehensive training facility and product showroom at the South Wales site provides the opportunity to run CPD seminars. Nuaire also boasts a full replica 30 seat classroom for training or witness testing of product and has recently opened a BPEC approved installation area allowing customers to undergo training courses to gain qualifications in residential installation, inspection, testing, and commissioning.

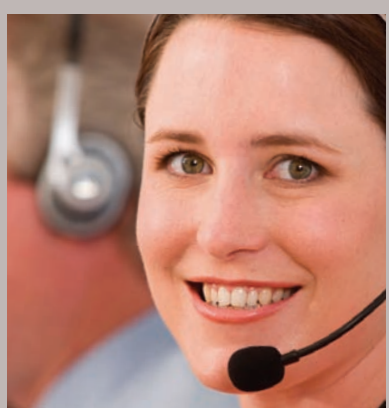
CUSTOMER CARE

Responding positively and promptly to customers' needs is a key to Nuaire's success as the industry leader, and understanding that every customer is unique sets the company apart from its competitors. Nuaire boasts highly experienced, expert staff across all its operations, ensuring the best advice is available for the perfect solution for any project.

Design and installation advice on OEM and applications projects, for example, is offered by a specialist applications engineering team. Nuaire offer the best solution whether that is for the smallest, quietest or most attractive fan. Alternatively, customers can search through a comprehensive fan selector CD by identifying the required specifications. This CD includes full technical data and photographs of every product; and a similar extensive online catalogue is available on the Nuaire website.

Regular contact with customers and feedback invited through surveys ensure that Nuaire builds a deep understanding of customers' needs and can respond appropriately.

This special relationship with customers is fostered through an extensive network of technical sales engineers. This expert team of over 60 specialists is spread throughout the UK, covering every major city, and ensuring a rapid personal response to any customer query. These engineers arrange regular face-to-face meetings with customers to ensure Nuaire is always aware of changing or developing requirements, and can give personal, expert advice on the spot. They can also demonstrate samples of products to ensure customers get what they want.



Corporate Member
Institute of Customer Service

For customers who want immediate contact by telephone, Nuaire offers direct-dial personal contact with customer service and technical support teams at the head office.

This responsive ethos is one of the key reasons why thousands of customers, large and small, remain loyal to Nuaire. The company constantly searches for good practice across all sectors and adopts the best of the best, making it the industry leader for responsive customer care. The company has a vision to make customer care a strategic priority, and this commitment is demonstrated by membership of the Institute of Customer Service.

INNOVATION
& NEW DIRECTIONS

Nuaire has an unrivalled reputation for innovation in the design and manufacture of ventilation products and systems.

The company's top-level team of experts includes acoustic, mechanical, electronic, manufacturing, software and hardware engineers, all dedicated to innovation. Nuaire are able to file 10 successful patents and launch as many as 20 new products every year – more than any other company in the industry with an ever-increasing proportion of the company's rapidly growing turnover coming from such new products.

Nuaire's expertise means it has a deep understanding of the needs of the market and can keep ahead of competitors and of legislative requirements. The company continues to lead the industry in developing best practice and helping clients reduce their energy demands and carbon emissions.

With roots in fans and mechanical ventilation products, Nuaire has progressively expanded its range and extended its capability to encompass all technologies and levels of ventilation solutions. Nuaire are the only company able to offer the total ventilation solution for the built environment.

NEW PRODUCTS AND SERVICES

Nuaire now supply the award-winning, energy efficient e-stack natural ventilation systems. These natural ventilation products complement mechanical ventilation and use a combination of natural ventilation techniques to keep buildings supplied with fresh clean air 365 days a year whilst reducing energy costs.

The XBOXER AHU range has been extended and now includes tailor-made solutions to improve the climate in any environment. With the addition of the bespoke AHUs the airflow covered is from 0.1m^3/s to 20m^3/s. The unit platform could be standardised, whereas a selection of the functions are customised making XBOXER the most flexible AHU range available.

Nuaire has also extended its service offering to provide the total package for smoke control with schemes designed to fully comply with statutory and regulatory requirements. Our team of skilled engineers include experienced staff, who were responsible for introducing the first pulse fans to the UK for car park applications.

Our experience on heat recovery has been extended in our residential products, with additional MVHR units.

NUAIRE OFFER A RANGE OF CATALOGUES AND ON-LINE SERVICES COVERING NEW INNOVATIONS

COMMERCIAL CATALOGUE | AHU CATALOGUE | RESIDENTIAL CATALOGUE

For further information visit our sites and microsites:
www.**nuaire.co.uk**
www.**nuaire.co.uk/naturalventilation**
www.**nuaire.co.uk/xboxer**
www.**nuaire.co.uk/smoke**

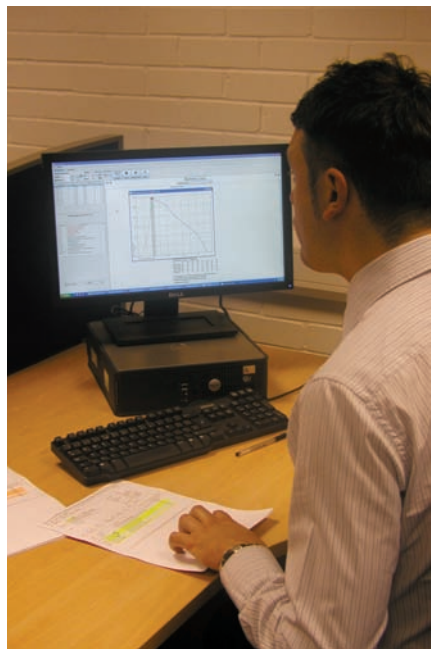
FULL SERVICE
FOR THE COMPLETE VENTILATION SOLUTION

Modern ventilation is about people and providing a good level of indoor air quality, while ensuring an effective building performance. Critical factors such as air quality, energy efficiency and noise pollution are always considered to ensure suitable selection.

Nuaire's technical application team can offer expert advice on suitable ventilation solutions. Providing a simple, quick selection or alternatively offering advice on compliance with the very latest building regulations and environmental issues.

The team can provide detailed quotations, fan schedules (formatted to suit customer's own template) and datasheets, electronically or via hard copy depending on customer requirements.

On residential applications we can also provide a drawing service showing appropriate duct runs, listing all necessary ancillaries needed. **Drawings can be emailed to drawings@nuaire.co.uk**



FAN SELECTOR
HELPING TO MAKE YOUR JOB EASIER

Fan selector is a practical and extremely useful tool to help assist with the selection of products to meet your specification. It enables detailed datasheets comprising efficiency, performance, sound and specification.

To download fan selector simply visit:
www.**nuaire.co.uk/fanselector**

EXPERT ADVICE
CPD SEMINARS

With our vast experience of ventilation our technical training team and field staff can provide over 15 different CPD seminars covering all market areas. Seminars can also be provided at your choice of location and all seminars qualify as CPD hours towards your continuing development. So whether it's a refresher course on a particular topic or just an area of interest contact us at **cpd@nuaire.co.uk**

OUR **SPECIFICATION** 13

- COMMERCIAL LEGISLATION
- USEFUL INFORMATION
- TYPICAL APPLICATIONS

Nuaire are designing and manufacturing increasingly efficient, low-energy fans and other components to help designers and engineers achieve an overall 25% reduction in Carbon dioxide emissions across the non-domestic sector.

BUILDING REGULATIONS PART L2 (CONSERVATION OF FUEL AND POWER IN NON-DOMESTIC DWELLINGS) EFFECTIVE FROM OCTOBER 2010

The new part L2 Part A for new buildings and Part B for work on existing buildings came into force in October 2010.

To fall in Line with the EU Energy Performance in Buildings Directive (EPDB), the new L2 2010, Part F (Northern Ireland – update due 2012) and the Technical Handbook - Section 6 (Scotland) 2011 documents require a major change in the way buildings are to be assessed for compliance with energy efficiency and carbon emission standards.

The new approach taken is to compare the CO_2 emissions for the actual building (Building Emission rate – BER) with those of a notional building of the same size and shape, and constructed to a concurrent specification laid down in the National Calculation Methodology (NCM) – the approved procedure for demonstrating compliance with the UK building regulations – (Target Emission rate – TER).

This approach has been adopted because of the variations in improvement potential across a variety of building types. Extensive research was carried out into the main building categories, and appropriate levels of CO_2 emission reductions were identified based on the cost of achieving them in the various building types. When factored together with the likely build mix and build rates, the aggregate CO_2 emissions reduction over 2006 emissions rates is 25%.

Part L requires a reasonable provision for the conservation of fuel and power in buildings by:

a. limiting heat gains and losses:
i. through thermal elements and other parts of the building fabric: and;
ii. from pipes, ducts and vessels used for space heating and space cooling and hot water services:
b. providing and commissioning energy efficient fixed building services that are fitted with effective controls and;
c. providing the building owner with sufficient information about the building and the fixed building services and their maintenance requirements, to allow their efficient operation.

Approved Documents offer technical guidance on means of compliance with the Buildings regulations. They are not intended to represent the only methods available, but they do provide reference points that are useful in the practical process of compliance. If the guidance is followed, there is a presumption that the compliance requirements will be met.

Approved Document Part L2A covers work on new non-domestic buildings and major extensions to existing non-domestic buildings – i.e. where the additional useful floor area is greater than 100m^2 and 25% of the original building's floor area.

Approved Document Part L2B addresses works on existing buildings including extensions (smaller than those mentioned above), change of building use, provision or extension of controlled services and fittings, replacement of thermal elements and consequential improvements. The latter being general fabric or services upgrades triggered by a complex set of criteria related to intended works.

The new regulations require the submission of a checklist that demonstrates that compliance has been met against five defined criteria. These criteria are detailed in Approved Document L2A.

Criteria1 is mandatory and refers directly to Building regulation 17C. Criteria 2-5 are considered as guidance.

Criteria Main Points

1. The Building emission rate (BER) must be less than the Target emissions rate (TER) as calculated under the approved methodology.
2. The performance of the building fabric and heating, hot water and fixed lighting systems should achieve reasonable overall standards of energy efficiency. To avoid a situation where poorly performing systems or construction details are compensated for by other means, **limits on design flexibility** are imposed for building fabric and services. For building services, this includes the use of appropriate controls, equipment with minimum efficiency levels (verified by testing to acceptable standards) see "Associated Documents" below, and appropriate levels of metering and monitoring.

3. The building shall be provided with appropriate passive control measures to limit solar gains – to reduce the need for, or capacity of air conditioning systems. (Note that compliance with the suggested assessment method does not imply that acceptable levels of comfort will be achieved in the space.
4. The performance of the building, as built, is consistent with the BER. Credits are given in the emissions calculation procedures where this can be demonstrated. Particular attention is required to building air-tightness, where extensive guidance exists and to the continuity of thermal insulation, for which it is suggested that reference be made to accredited construction details and third party verification of design detail. Building services are required to be commissioned effectively (where possible) according to the approved procedures in CIBSE guide M – Commissioning Management. Documentary evidence of the use of the approved procedure is required for Building Control to issue a final compliance certificate. Air leakage testing of ductwork may be required, depending on the classification claimed in the BER calculation.
5. The necessary provisions for energy-efficient operation of the building are put in place. This is best achieved by using the guidance in CIBSE TM31 – Building Log Book toolkit. Information on the building services equipment may be cross referenced to the specification documentation and the manufacturers' operation and maintenance manuals. Data used to calculate the TER and BER should be included in the Log Book along with the recommendations for improvements that are generated by the assessment software package used.

ASSESSMENT TOOLS - SOFTWARE

The carbon emissions calculation methodology required when generating the BER, TER and the compliance checklist, is implemented in the Simplified Building Energy Model (SBEM) with its user interface - iSBEM – freely obtainable from the National Calculation Methodology web site. Local authorities are authorised to accept calculations only from persons deemed by Building Control Bodies as suitably competent.

Several dynamic thermal modelling software tools have also been approved for the purpose of assessment and are commercially available, and offer additional functionality.

Note that it is required to provide Building Control with the design based TER / BER calculations, together with details of the building specifications upon which they have been based, prior to the commencement of construction works.

At the end of construction, calculations based on the completed design, and details of changes in construction method or specification must also be submitted.

ASSOCIATED DOCUMENTS

Because of the large amount of technical data and information that is now required to prove compliance with the Building Regulations, and the relative inflexibility of the Approved document as a design tool, it has become necessary to refer to additional documentation for much of the technical detail. These associated documents again offer guidance on requirements without necessarily providing absolute limits of performance. In many cases, reference is made to a wide variety of relevant harmonised European technical standards that exist to support the important EU directives such as the Energy performance in Buildings Directive, and the Energy Using / Energy Related Products Directive.

For building services products, the Non Domestic Building Services Compliance Guide describes performance standards for the majority of equipment types that are encountered in current designs, including heating, cooling, hot water, pipe and duct insulation, lighting, pumping and, of most relevance to Nuaire products – Section 10: Air Distribution systems.

This guidance considers the following system types :-
Central air conditioning systems, central mechanical ventilation systems with heating, cooling or heat recovery, all "other" central systems, zonal supply and extract systems where the fan is remote from the zone and ducting is required – for example in a ceiling void or on the roof, and local systems serving one room directly (un-ducted) such as a window mounted fans.

The principal means of efficiency regulation for ventilation systems is the use of limiting Specific Fan Power (SFP).

As a straight-forward, easily calculated location and duty specific measure, this single figure reference effectively combines the actual efficiency rating of the product, and the adequacy of the actual system design. Calculated as the mains delivered power (W) divided by the system delivered airflow (l/s), the guide provides SFP limits for each system type.

The variations shown are related to assumptions made about the efficiencies of the available impellers / motors / drives employed, and the aerodynamic resistances of the internal components – for example coils and filters – within air handling units, and of the distribution ductwork etc.

Additional SFP allowances are given for various system elements.

Some of the application classes defined are extremely tightly specified in this regard, and this leads to a situation where fan types that may have practical benefits (for example in acoustic properties) cannot be used.

There are practical limits to the efficiency of commercially available components, and this will ultimately constrain the types of distribution systems that may be used in terms of the operational system resistance.

The latest edition of the Scottish Technical handbook Section 6, includes limiting values for external system resistance (this was also planned for the England and Wales version, but deleted late on in the process).

The guide very clearly states (10.3 Key Terms) that the specific fan power of an air distribution system should be calculated according to the procedure given in BS EN 13779 2007 Annex D:- *Ventilation for Non-residential buildings – Performance requirements for ventilation and room conditioning systems*.

This important and informative standard describes in Annex D: - the SFP value for the entire building, defined as the weighted average of the SFPE values of individual units and fans.

For variable air volume flow systems, the SFPE shall be defined at a partial operating air flow and related external pressure drop - specified for the fan or air handling unit.

If the operating profile (of flow rate with respect to time) of the unit is known, then this can be used to establish the partial flow rate, and if not known, then a default value of 65% of design maximum is suggested as "a realistic mean annual value" for normal comfort ventilation.

Additional design criteria are defined for the equipment: - for SFP at 25% of maximum duty to be no more than that at full speed; provision of variable speed drives for fans with motors of over 1100 W; and for the enclosure leakage grade to be L2 as defined in BS EN 1886:2007 *Ventilation for buildings - Air handling units - Mechanical performance*.

Ducting leakage standards are also defined.

Minimum control packages are suggested for each system type, and it is stated that Heat recovery devices should be included where supply and extract ventilation systems include heating and/or cooling.

PART F – BUILDINGS OTHER THAN DWELLINGS

Almost in complete contrast to the extreme detail given concerning residential ventilation systems, Approved Document F sets out guidance for the following non-domestic buildings – offices, car parks & "other" building types.

General guidance is given on indoor air quality criteria to facilitate the development of alternative ventilation solutions (from first principles).

Guidance is given on provision for maintenance access, and the necessity to ensure the cleanliness of ventilation systems and the security of a clean fresh air supply for the protection of occupant health.

For office ventilation (for which a considerable amount of technical research exists) several outline methods are proposed for system design.

Alternative approaches (including natural and mixed mode ventilation) are referred to via the appropriate CIBSE guides.

For Car Parks, including those below ground simple criteria are expressed for the provision of adequate ventilation by means of accurate Carbon Monoxide level control. Although not referred to in ADF, CO based ventilation alone may not control visual contamination levels, particularly where diesel engined vehicles predominate.

Approved Document B is also very relevant to car parks and should be cross referenced.

An alternative approach using natural ventilation openings is given, and also mechanical systems with simple air change rate limits are described, and references given to additional sources of guidance.

For "other" buildings, Table 6.3 details an extensive list of reference documents covering the ventilation requirements of a wide range of buildings.

For more details about ventilation systems that can help you meet part F contact Nuaire on 02920 858 200.

SCHOOL BUILDINGS.

Compared to most other types of buildings, schools and hospitals are extreme environments. They have high occupancy levels and house many different activities and functions within them. Areas include offices, classrooms/study areas, canteens, commercial kitchens and accommodation – a great mix and more varied than most buildings.

Part F of the Building regulations applies to schools. Ventilation provisions in schools can be made in accordance with the guidance in DfES Building Bulletin. BB101 exists as a complete design guide to ventilation in schools, covering design rules for natural and mechanical ventilation systems and concepts involved.

All major school building projects must now undergo formal environmental assessment using the Building Research Establishment's environmental assessment method BREEAM schools and the application of new building regulations should reduce carbon emissions significantly.

HOSPITAL BUILDINGS

Nuaire has been supplying ventilation systems to hospitals for many years and are aware of the issues for ventilating clinical environments.

Health Technical Memorandum 03-01 'specialised ventilation in healthcare premises' (published in two parts):

i part A deals with the design and installation of ventilation systems
ii part B covers operational management.

The guidance applies to new installations and major refurbishments of existing installations.

The above memorandum also includes a revision to reflect current guidance on theatre suite layout and room sizes whilst including other key issues such as:
Issues relating to patient comfort and the prevention of health care associated infections. Specialist systems play important roles in these areas.

- Methods of controlling the casual exposure of staff to anaesthetic substances
- The design and acceptance testing of general and ultra-clean ventilation (UCV) systems.
- Setting out the minimum requirements for the design of air-handling units with the regards to the control of Legionella and other dangerous contaminants, and safe access for routine inspection and maintenance.

For further details on school and hospital ventilation system please contact Nuaire on 02920 858 200.

NUAIRE PRODUCTS

ACOUSTIC GUIDELINES

IT IS AT LEAST TEN TIMES MORE EXPENSIVE TO CORRECT AN ACOUSTIC PROBLEM THAN TO PREVENT IT.

All Nuaire products are tested in accordance with UK, European and International industry Standards for performance and sound levels.

These laboratory test standards are designed to provide a consistent test method and which to a limited extent that simulate the ways that a fan may be used in a variety of installations.

Nuaire generally quote the noise levels separately for the unit inlet, outlet and casing radiated (or breakout) sources, to enable the system designer to properly evaluate the product in the application.

The noise level measured on site, for example during the commissioning process, is the sound pressure level – and this cannot be directly compared with the sound power levels quoted in our fan selection tools (Nuaire catalogue and Fan Selector).

Nuaire typically also quote a free field dBA level at 3m, and this figure, whilst useful for comparison with other products, has a very specific definition – and cannot be used for acoustic design purposes.

The dBA @ 3m figure quoted will never correspond to a dBA measurement taken at 3m from a product in a real building.

Acoustics is a complicated subject and must be treated with caution as part of the services design process. Our sales engineers and technical support staff will often be able to offer advice on appropriate product types for an application, but it is often necessary to refer to acoustic specialists for a definitive design solution.

Nuaire have put together the following bullet points for your information and assistance:-

SYSTEM DESIGN – GENERAL AND COMMON SENSE ISSUES

- Position the fan for minimum noise impact
- Position grilles and diffusers for minimum noise impact
- Design the system for low pressure drop and smooth air flow = low velocity ducting and grilles etc.
- Where appropriate, use barriers and enclosures of a suitable specification – ensuring that they are properly installed (eg ceiling tiles and bulkheads). Special acoustic grade materials are generally available, and the first principle is to add mass to the system – eg layers of plasterboard.
- Use appropriately specified attenuators and Anti-Vibration mounts – again - properly installed and not bridged to the support structure.
- Flexible or lightweight supporting structures, or slow running fans, can require higher levels of mechanical isolation, and this can only be achieved with high deflection spring type mounts.
- Flexible Connectors are often a particular source of breakout noise – if they must be used in sensitive areas, then an acoustic grade should be specified.
- Single skinned rectangular attenuators can also be vulnerable to breakout at the fan connection – consider this carefully in your specification. Ideally, use attenuators that have been specified with breakout protection, and fit the flexible connectors at inlet attenuator entry and outlet attenuator exit. Any deviation from a straight inlet/outlet condition, whether by crumpled flexible connectors, bends, or offset transformation pieces, will lead to an increase in the quoted in-duct noise levels.
- Specify the correct duty with minimal allowances - and commission the systems properly.

As a very rough "rule of thumb", due to the combined effects of an acoustic room property known as "directivity" and a distance correction for a real room situation, it is possible that the dBA level measured in a room with a ceiling void mounted fan above it, can be increases of 8-9 dBA up to 14 dBA higher than the Free Field figure.

In general terms, a specification of NR 35 or 40 dBA represents a very acceptable level for most people in an office environment.

A requirement to achieve levels of NR 30 or 35 dBA or less in a working space, can be considered as challenging, and may require specialist acoustic assistance. At the very least, with such a specification, the acoustic requirements should be a major design consideration.

Designated "Quiet" areas and bedrooms will need to operate at these levels and preferably lower.

A final note: It is at least ten times more expensive to correct an acoustic problem than prevent it.

USEFUL INFORMATION

RULES OF THUMB

Plant/System	Selection requirement	Rule of thumb
Ductwork	Typical duct velocities	
	– Low velocity systems	3 – 5m/s
	– High velocity systems	7.5 – 15m/s
	– Inlet louvres	2.5m/s through free areas
Ductwork	Maximum pressure drop rates	
	– Low velocity systems	1 Pa/m run
	– High velocity systems	8 Pa/m run
Ductwork	Typical system resistances (including air handling plant)	
	– Low velocity supply	900 Pa
	– Low velocity extract	300 Pa
	– High velocity supply	1.5 – 2kPa
	Air leakage allowance	5% in low velocity systems

Environmental Building Application Factor	Rule of thumb
Comfort Noise Levels:	
Recommended maximum background noise levels for:	
• very quiet rooms, eg concert halls, sound studios	NR20
• quiet rooms, eg bedrooms, theatres, churches	NR25
• private rooms, eg small offices, libraries, living rooms	NR30
• public rooms, eg general offices, classrooms, small shops	NR35
• general areas, eg reception areas, restaurants	NR40
• work areas, eg kitchens, computer rooms, large shops	NR45
Intelligibility of telephone conversations at background noise levels of:	
• up to NR50	Satisfactory
• up to NR60	Slightly difficult
• up to NR75	Difficult
• up to NR75	Unsatisfactory

VENTILATION RATES

The points which affect this are:

(a) the size of the building or room
(b) the purpose for which it is used
(c) the number of occupants
(d) the type of work they are doing
(e) heat gains from other sources, e.g., electric motors and equipment
(f) the amount of steam, dust and odours from production processes
(g) whether the customer has any particular temperature requirement for the building

The table of recommended ACH given in information leaflets, and the more extensive and detailed list given for different types of rooms and buildings is based on a combination of practical experience and theory, and can safely be used as a guide for all normal conditions in this country.

ACH = Air changes per hour

AIR CHANGE RATINGS

The simplest method of determining the ventilation rate required is to make use of the accumulated experience of the industry expressed in a table of air change rates.

The volume in cubic metres (m^3) of the space to be ventilated is calculated and multiplied by the number of air changes per hour to give the ventilation rate in the m^3 per hour. Division by 3.6 converts this to litres per second.

$$\text{Ventilation rate (litres/s)} = \frac{\text{Volume } (m^3) \times \text{air changes per hour}}{3.6}$$

RECOMMENDED AIR CHANGES

While the Building Regulations detail the level of ventilation required in specific premises many engineers will also refer to the 'Recommended Air Change Rates' detailed within the CIBSE (Chartered Institute of Building Services Engineers) guides.

Application	Air changes per hour
Banks	4 to 6
Cafes/Coffee Bars	10 to 12
Cellars	3 to 10
Changing Rooms	6 to 10
Cinemas/Theatres	6 to 10
Conference Rooms	8 to 10
Dance Halls	10 to 12
Dark rooms	10 to 15
Dental Surgeries	12 to 15
Entrance Halls	3 to 5
Factories/workshops	8 to 10
Garages	6 to 10
Gymnasiums	6 to 8
Hospital Wards	6 to 8
Kitchens – commercial	15 to 30
Laundries	10 to 15
Libraries	3 to 4
Offices	4 to 6
Public House Bars	6 to 10
Restaurants	10 to 15
Schoolrooms	4 to 6
Shops/supermarkets	8 to 10
Showers/Bathrooms	15 to 20
Stores/Warehouses	3 to 6
Swimming Baths	15 to 20
Toilets – public	6 to 8
Utility rooms	15 to 20

RULES OF THUMB FOR AIR TIGHTNESS

The Building Regulations require all commercial and industrial buildings with a gross floor area greater than 500m^2 to be tested for air tightness to a minimum standard of 10m^3/h.m^2 at 50 Pascals.

Note that many passive and low energy comfort control systems, such as Termodeck, require values of fabric airtightness considerably better than required by the Building Regulations for them to perform optimally.

Source: Building regulations

THERMAL LOADS

Thermal load	Type of Building or load	Load per unit area
Heating load	Offices	70 W/m^2
	Industrial	80 W/m^2
	Educational	100 W/m^2
	Retail	110 W/m^2
	Residential	60 W/m^2
Total cooling load	General office	125 W/m^2
	Interior zones (more than 7m from windows)	75 W/m^2
	Perimeter zones – 65% glazing	180 W/m^2
	60% glazing	120 W/m^2
Typical buildings	Retail	140 W/m^2
	Banks	160 W/m^2
	Restaurants	220 W/m^2
	Hotels	150-300 W/m^2
	Computer suites	400 W/m^2
Solar Heat gains	Windows with internal blinds south facing, June-Sept	250W/m^2 of glass
	Windows with internal blinds east-west facing, June-Sept	150W/m^2 of glass
Other heat gains	Metabolic	10 W/m^2
	Lighting	12 W/m^2
	Office machinery	15 W/m^2

Source: Rules of Thumb, BG 14/2003. BSRIA Blue Book 2008 www.bsria.co.uk

USEFUL INFORMATION

RECOMMENDED COMFORT CRITERIA

Building/room type	Winter dry resultant temperature (°C)	Summer dry resultant temperature (°C)	Suggested air supply (l/s/person)	Maintained illuminance (lux)
Offices				
Executive	21-23	22-24	10	300-500
General	21-23	22-24	10	300-500
Open-Plan	21-23	22-24	10	300-500
Retail				
Shopping Malls	12-19	21-25	10	50-300
Small Shops	19-21	21-23	10	500
Supermarkets	9-21	21-23	10	750/1000
Banks, building societies, post office				
Counters	19-21	21-23	10	500
Public areas	19-21	21-23	10	300
Relative humidity for comfort	40-60%			

Source: CIBSE Guide A 2006

ANNUAL SERVICE CHARGES
(lettable areas)

Design area	Application	Other information	Rule of thumb*
Offices (let)[1]	Air-conditioned for heating and air conditioned maintenance	Average service charge	£1.29/ft^2
	Non air-conditioned	Average service charge for heating maintenance	£0.67/ft^2
	Lifts	Average service charge for lift maintenance	£0.23/ft^2
Shopping centres[2]	Average service charge by size, location and type	Enclosed air-conditioned	
		• small	£4.60-£5.30/ft^2
		• medium	£5.45-£6.96/ft^2
		• large	£4.60-£5.30/ft^2
		Enclosed non air-conditioned	
		• small	£3.48-£4.51/ft^2
		• medium	£3.98-£5.28/ft^2
		• large	£3.48-£4.51/ft^2

Source: 1 Office Oscar 2006, Jones Lange LaSalle
2 Retail/Oscar 2006, Jones Lange LaSalle. As referenced BSRIA Blue Book 2008

ANNUAL M&E MAINTENANCE COSTS
(Gross floor area)

Design area	Application	Rule of thumb
M&E maintenance	Factories	£800/100m^2
	Factory/office	£800/100m^2
	Warehouses	£700/100m^2
	Offices – air conditioned	£2250/100m^2
	Offices – non air conditioned	£1300/100m^2
	Call centres	£2400/100m^2
	Banks/building societies	£2150/100m^2
	Shopping centres – air conditioned	£950/100m^2
	Shopping centres – non air conditioned	£750/100m^2
	Supermarkets	£1550/100m^2
	Shops (non food)	£1100/100m^2
	Hospitals	£1800/100m^2
	Nursing homes and hospices	£1100/100m^2
	Swimming pools	£1900/100m^2
	Sports centres	£1400/100m^2
	Sports centres with swimming pools	£1850/100m^2
	Primary schools	£1250/100m^2
	Secondary Schools	£950/100m^2
	Universities	£1500/100m^2
	Museums	£1400/100m^2
	Libraries	£1700/100m^2
	Computer buildings	£2400/100m^2

Source: BSRIA Blue Book 2008 www.bsria.co.uk

CONVERSION FACTORS

Length	25.4mm	0.039in
	0.3048m	3.28ft
	1609m	0.00062 miles
Area	6.4516cm^2	0.155in^2
	0.0929m^2	10.76ft^2
	16.39cm^3	0.061m^3
	28.32dm^3	0.035ft^3
	0.7646m^3	1.307yd^3
	0.4047 hectares	2.471 acres
Capacity	4.4546dm^3	0.224 UK gallon
Speed	0.3048m/s	3.28ft/s
	0.00508m/s	196.85ft/min
Mass	0.45359kg	2.205lb
	1.016 tonne	0.984imperial ton
Density	16.019kg/m3	0.062lb/ft^3
Fuel Consumption	0.354km/litre	2.82mpg
Force	91 807N	0.0000108kgf
Energy	3.6 MJ	0.278kWh
	1055J	0.239callT
	1055J	0.00095btu
	105.5MJ	0.0095therm
Power	745.7W	0.00134hp
	0.2931W	3.412btu/h
	3.517kW	0.284ton refrigeration
	746.08W	0.00134hp
Specific Energy	2326J/kg	0.00043btu/lb
Heat Content (volume basis)	37.259kJ/m^3	0.0269btu/ft^3
Specific Heat Capacity	4187J/KgK	0.00024btu/lb°f

Source: BSRIA Blue Book 2008 www.bsria.co.uk

USEFUL INFORMATION

KEY INDUSTRY CONTACTS

American Society for Heating, Refrigerating & Aircon Engineers (ASHRAE)
T: 0800 962130 www.ashrae.org

Asbestos Removal Contractors' Association (ARCA)
T: 01283 531 126 www.arca.org.uk

Association for Consulting and Engineering (ACE)
T: 0207 222 6557 www.acenet.co.uk

Association for Environment Conscious Building
T: 0845 4569773 www.aecb.net

Association for the Conservation of Energy
T: 0207 359 8000 www.ukace.org

Association of Fire Consultants
T: 08700 114 514 www.afc.eu.com

Association of Noise Consultants
T: 01727 896092 www.association-of-noise-consultants.co.uk

BRE Environmental Assessment Method (BREEAM)
T: 01923 664 000 www.bre.co.uk

British Approvals for Fire Equipment
T: 0208 541 1950 www.bafe.org.uk

British Automatic Sprinkler Association Ltd
T: 01353 659187 www.basa.org.uk

British Council for Offices (BCO)
T: 0207 283 0125 www.bco.org.uk

British Institute of Facilities Management
T: 0845 058 1356 www.bifm.org.uk

British Refridgeration Association
T: 0118 940 3416 www.feta.co.uk/bra

Building Research Establishment (BRE)
T: 01923 664 000 www.bre.org.uk

British Standards Institution
T: 0208 996 9000 www.bsi-global.com

Building Services Research and Information Association (BSRIA)
T: 01344 456 600 www.bsria.co.uk

Climate Change Action Plan
T: 0207 983 4100 www.london.gov.uk

The Carbon Trust
T: 0800 085 2005 www.carbontrust.co.uk

Chartered Institute of Building
T: 01344 630700 www.ciob.org.uk

Chartered Institution of Building Services Engineers
T: 0208 6755211 www.cibse.org

Commissioning Specialists' Association
T: 01403 754133 www.csa.org.uk

Construction Design and Management Regulations 2007 (CDM) – HSE
T: 0745 345 0055 www.hse.gov.uk

Construction Industry Research & Information Association
T: 0207 549 3300 www.ciria.org.uk

Energy Institute
T: 0207 467 7100 www.energyinst.org.uk

Energy Saving Trust
T: 0207 222 0101 www.est.org.uk

Environment Agency
T: 01454 624400 www.environment-agency.gov.uk

Heat Pump Manufacturers Association
T: 0118 940 3416 www.heatpumps.org.uk

Heating and Hot Water Information Council
T: 0845 600 2200 www.centralheating.co.uk

Heating and Ventilating Contractors Association
T: 0207 313 4900 www.hvca.org.uk

HEVAC Association
T: 0118 9403416 www.feta.co.uk/hevac

Institute of Acoustics
T: 01727 848195 www.ioa.org.uk

Institute of Maintenance & Building Management
T: 01252 710994 www.imbm.org.uk

Institute of Swimming Pool Engineers
T: 01603 499959 www.ispe.co.uk

Institution of Engineering and Technology
T: 0207 2401871 www.theiet.org

Institution of Mechanical Engineers
T: 0207 222 7899 www.imeche.org.uk

Institution of Structural Engineers
T: 0207 235 4535 www.istructe.org.uk

Lifetime Homes for Individual and Community Well Being
T: 0207 822 8700 www.lifetimehomes.org.uk

Lift and Escalator Industry Association
T: 0207 935 3013 www.leia.co.uk

The London Plan
T: 0207 983 4100 www.london.gov.uk

National Association of Chimney Engineers
T: 01526 322555 www.nace.org.uk

Royal Institute of British Architects
T: 0207 580 5533 www.riba.org

Royal Institution of Chartered Surveyors
T: 0207 222 7000 www.rics.org

Smoke Control Association
T: 0118 9403416 www.feta.co.uk

Solar Trade Association
T: 01908 442290 www.greenenergy.org.uk/sta

Specification Expert
T: 01344 899280 www.barbour.info

The Climate Group
T: 0207 960 2970 www.theclimategroup.org.uk

UK Thermography Association
T: 01604 630124 www.ukta.org

Source: BSRIA Blue Book 2008 www.bsria.co.uk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e bsria@bsria.co.uk
www.bsria.co.uk

TYPICAL APPLICATION

ALL BUILDINGS HAVE THEIR OWN UNIQUE REQUIREMENTS FOR VENTILATION. WITH THE NEW GOVERNMENT GUIDELINES ON ENERGY EFFICIENCY IT IS MORE DIFFICULT TO MAINTAIN A COMFORTABLE, HEALTHY ENVIRONMENT WHILST PROVIDING AN ENERGY EFFICIENT SOLUTION.

NATURAL VENTILATION

Provides low energy ventilation systems, using the principles of natural mixing ventilation in the winter and natural upward displacement in the summer.

MECHANICAL EXTRACT FOR OFFICES & COMMUNAL AREAS

Extract fans are the simplest form of ventilation for office and communal environments. Whether duct, wall, window or ceiling mounted these fans will extract moisture from wet rooms and offices to provide continuous fresh air.

STAIRWELL PRESSURISATION & SMOKE EXTRACT FOR MULTI-FLOOR REQUIREMENTS

Nuaire have manufactured smoke and car park ventilation for over 30 years and a design service is available to complement the complete range of smoke pressurisation and extract fans (duct or roof mounted) for 300/400°C for 1 & 2 hours, certified to EN12101-3 2002.

CAR PARK EXTRACT

The comprehensive range of AXUS smoke fans together with the Impulse car park fan meets the ever increasing need to provide smoke extract for car parks.

SMOKE SOLUTIONS

STAIRWELL PRESSURISATION & SMOKE EXTRACT APPLICATIONS

AXUS SMOKE & AXT

High temperature & ambient axial extract fans up to 85m³/s.

XS RANGE

Wall, window, ceiling and roof extract fans (up to 530l/s).

MULTI-ROOM VENTILATION

CONSTANT PRESSURE VARIABLE VOLUME

Twin fan - high performance extract up to 2.65m³/s.

CONSTANT PRESSURE VOLUME

Control damper - energy efficient volume damper for use with constant pressure twin fan.

E-STACK (F, A, S & R SERIES UNITS)

Range of low energy systems developed as a solution for use in new buildings.

NUAIRE HAS OVER 40,000 PRODUCT LINES TO SELECT FROM WHATEVER YOUR REQUIREMENTS. WE HAVE THE SOLUTION FROM A SMALL EXTRACT FAN TO LARGE AIR HANDLING UNITS.

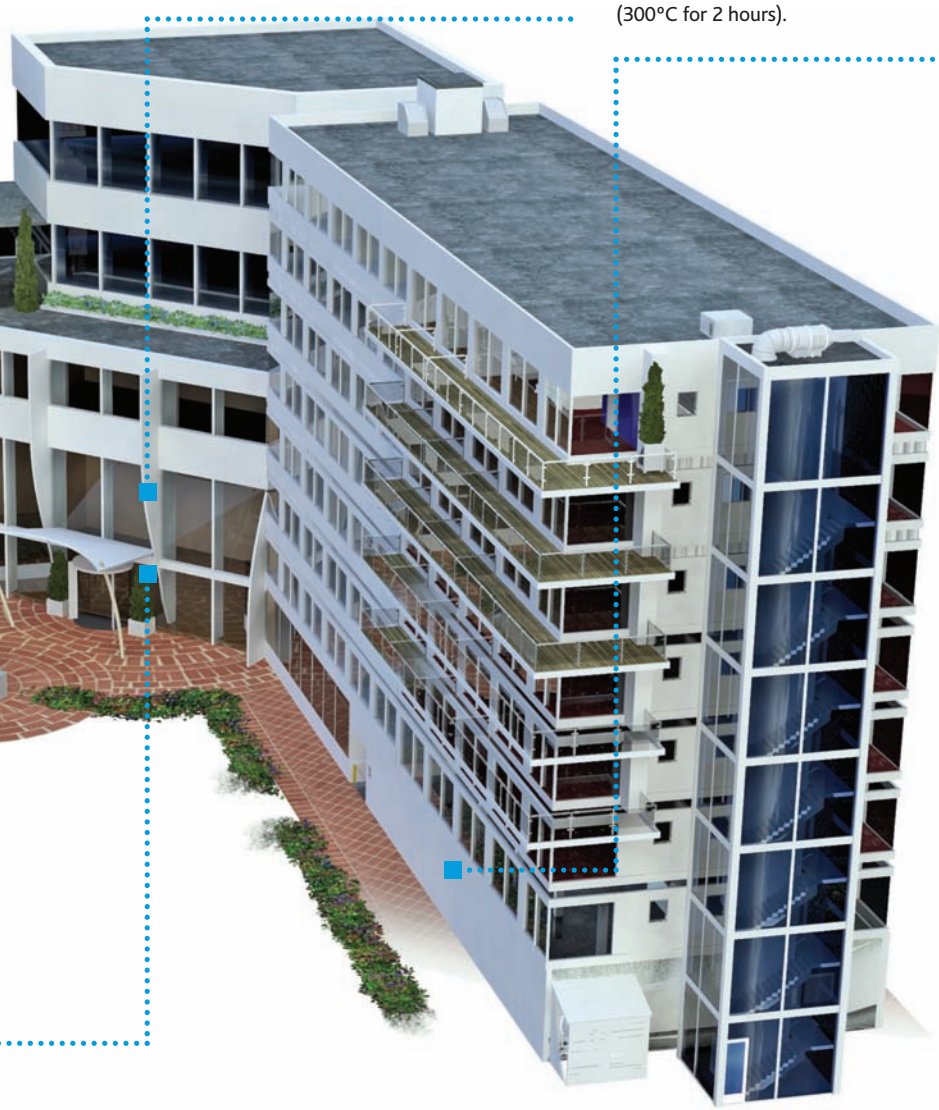
XBOXER TAILOR MADE AHUS

23 sizes covering airflow range up to 20m³/s.

CAR PARK EXTRACT OPTIONS

IMPULSE HIGH TEMPERATURE EXTRACT

Powerful impulse fan certified to EN12101-3 (300°C for 2 hours).



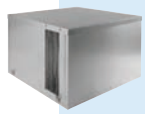
MECHANICAL EXTRACT FOR OFFICES AND COMMUNAL AREAS

ES-OPUSDC

Energy efficient range of inline, surface and recessed fans up to 115l/s.

ECOSMART SQURBO

Energy efficient make up air supply and extract units up to 0.5m³/s.



XTRACTOR

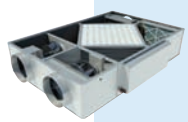
High efficiency centrifugal fan up to 6.2m³/s.

TERMINATOR

Horizontal discharge roof extract fan.

XBOXER THERMAL WHEELS

Available in 6 sizes up to 10m³/s.



XBOXER PACKAGED HEAT RECOVERY

Low depth, high performance range up to 5m³/s.

SQUIF RANGE

Run and standby units ideal for 'out of airstream' applications such as commercial kitchens. Twin fan option.

MRXBOX95 WALL & LOFT HEAT RECOVERY

High efficiency up to 95% efficient.

PRODUCT NAVIGATOR

APPLICATION	FAN LOCATION	FAN TYPE	MAX PERFORMANCE	PRODUCT SECTION	PAGE
ACCOMMODATION/ STUDENT ACCOMMODATION	Inline (central)	Constant Pressure	2.4m³/s	Twin fans	228
	Inline wall	Opus 40/60/95	95l/s	Supply & Extract	94
	Wall/Loft/Heat Recovery	MRXBOX95-WH1	117l/s	Refer to Residential catalogue (MVHR)	30
	Inline duct	Ecosmart Opus DC	115l/s	Supply & Extract	100
	Inline duct	MEVDC & AC	110l/s & 95l/s	Refer to Residential catalogue (Extract)	84
	Supply/Extract	OpusXbox	75l/s	Refer to AHU catalogue	34
	Extract/HR	MRXBOX90	125l/s	Refer to Residential catalogue (MVHR)	60
	Extract	Cookerhood	138l/s	Refer to Residential catalogue (Extract)	126
	Extract/HR	LPXBOXDC-2	75l/s	Refer to Residential catalogue (MVHR)	64
	Wall/Window/Ceiling/Roof	XS	0.55m³/s	Supply & Extract	112
	Supply/Extract/Heat Recovery	XBOXER AHU & Heat recovery	20m³/s	Commercial Heat Recovery & AHU catalogue	69
HOUSING NEW BUILD	Loft/Heat Recovery	MRXBOX95-LH1	132l/s	Refer to Residential catalogue (MVHR)	44
	Wall/Loft/Heat Recovery	MRXBOX95-WH1	117l/s	Refer to Residential catalogue (MVHR)	30
	Roof/Loft	Sunwarm Air Solar	80l/s	Refer to Residential catalogue (Renewables)	76
	Extract	Flatmaster/2000	45l/s	Refer to Residential catalogue (PIV)	148
	Extract	Cookerxbox	54l/s	Refer to Residential catalogue (MVHR)	68
	Wall/Window/Inline	Genie/DC/DCE	25l/s-31l/s	Refer to Residential catalogue (Extract)	94
	Supply/Extract	OpusXbox	75l/s	Refer to AHU catalogue	34
BOILER ROOMS	Inline	AXUS	92m³/s	Axial Fans	272
	Roof	Terminator	9.2m³/s	Roof Fans	382
	Wall	Ezplate	9.4m³/s	Axial Fans	318
CAR PARKS	Smoke	Impulse Axial	1.8m³/s	Smoke Fans	328
	Smoke	Impulse Centrifugal	2.69m³/s	Smoke Fans	330
	CO exhaust	Squif	6.5m³/s	Smoke Fans	336
	Smoke	HT AXUS & AXT	64m³/s	Smoke Fans	338
	Wall	Ezplate*	9.4m³/s	Axial Fans	318
	Roof based system	R & S series e-stack		Natural Ventilation	33
CHANGING AREAS	Inline or roof	Ecsomart twin fans	5.9m³/s	Twin Fans	228
	Wall/Ceiling	XS	0.55m³/s	Supply & Extract	112
	Inline	Ecosmart Boxer	7.6m³/s	Refer to AHU catalogue	98
	Roof based system	R & S series e-stack		Natural Ventilation	33
	Supply/Extract/Heat Recovery	XBOXER AHU & heat exchange	20m³/s	Commercial Heat Recovery & AHU catalogue	65
FACTORIES & WORKSHOPS	Supply	Boxer MSE	9.8m³/s	Refer to AHU catalogue	154
	Wall	Ezplate	9.4m³/s	Axial Fans	318
	Roof	Terminator	9.2m³/s	Roof Fans	382
	Smoke	HT AXUS	64m³/s	Smoke Fans	342
	Roof based system	R & S series e-stack		Natural Ventilation	33
HOSPITALS & HEALTHCARE	Supply/Extract/Heat Recovery	XBOXER AHU & Heat recovery	20m³/s	Commerical Heat Recovery	65
	For buildings with Atria	A series		Natural Ventilation	33
	Supply/Extract	Ecosmart Boxer	7.6m³/s	Refer to AHU catalogue	98
	Supply/Extract/Heat Recovery	XBOXER AHU & Heat recovery	5m³/s	Commerical Heat Recovery & AHU catalogue	66
	Wall/Window/Roof/Ceiling	XS	0.55m³/s	Supply & Extract	112
	Inline	Ecsomart Twin	5.9m³/s	Twin Fans	228
	Roof	Ecsomart Twin	5.9m³/s	Twin Fans	228
	In line duct	Ecosmart Opus DC	115l/s	Supply & Extract	216
HOTELS	For buildings with Atria	A series & other systems		Natural Ventilation	33
	Roof/Loft	Sunwarm Air Solar	80l/s	Refer to Residential catalogue (Renewables)	76
	Inline	Constant Pressure /CVD	2.4m³/s	Twin Fans	246
	Wall/Ceiling	Opus 40/60/95	95l/s	Supply & Extract	94
	Inline duct	Ecosmart OpusDC	115l/s	Supply & Extract	100
	Inline duct	Opus Plus	150l/s	Supply & Extract	106
	Supply/Extract/Heat Recovery	XBOXER AHU & heat recovery	20m³/s	Commercial Heat Recovery & AHU catalogue	66
KITCHENS - COMMERCIAL	Inline	Twin Squif	6.2m³/ss	Twin Fans	200
	Smoke	Twin Squif	6.2m³/s	Smoke Fans	374
	Supply	Ecosmart Boxer & XBOXER AHU	20m³/s	Refer to AHU catalogue	98
	Inline	Squif	6.5m³/s	Supply & Extract	190
	Inline	Twin Squif	6.2m³/s	Supply & Extract	200
	Roof	Mark Ten	8.2m³/s	Roof Fans	396
	Wall/Ceiling	Opus 40/60/95	95l/s	Supply & Extract	94
	Inline	Ecosmart OpusDC	115l/s	Supply & Extract	100
	Safety Control	Gas interlock system	Contact Nuaire	Supply & Extract	208
KITCHENS - DOMESTIC	Wholehouse	Cookerxbox	54l/s	Refer to Residential catalogue (MVHR)	68
	Extract/Wall	Genie NKF1	70l/s	Refer to Residential catalogue (Extract)	112
	Extract/Wall	XS	0.55m³/s	Supply & Extract	112

PRODUCT NAVIGATOR

APPLICATION	FAN LOCATION	FAN TYPE	MAX PERFORMANCE	PRODUCT SECTION	PAGE
LIFT MOTOR ROOMS	Wall	XS Integrated thermostat	0.55m³/s	Supply & Extract	112
	Inline	AXUS	92m³/s	Axial Fans	227
	Inline	Ecosmart Squrbo	0.5m³/s	Supply & Extract	134
LOADING BAYS	Smoke	HT AXUS	64m³/s	Smoke Fans	342
	Smoke	Impulse Axial	1.8m³/s	Smoke Fans	328
	Smoke	Impulse Centrifugal	2.69m³/s	Smoke Fans	330
	Smoke	Natural Ventilation	David Bristoll	Smoke Fans	*
OFFICES - LARGE	For buildings with Atria	A series		Natural Ventilation	54
	Roof	Terminator	9.2m³/s	Roof Fans	382
	Supply	Ecosmart Boxer	7.6m³/s	Refer to AHU catalogue	98
	Supply/Extract	XBOXER AHU & Heat Recovery	20m³/s	Commerical Heat Recovery & AHU catalogue	66
	Inline	Xtractor	5.9m³/s	Supply & Extract	146
	Wall	XS	0.55m³/s	Supply & Extract	112
	Supply/Extract/HR	MRXBOX90	125l/s	Refer to Residential catalogue (MVHR)	60
OFFICES - SMALL	Inline or Wall	Opus 40/60/95	95l/d	Supply & Extract	94
	Inline	Ecosmart OpusDC	115l/s	Supply & Extract	100
	Inline duct	Opus Plus	150l/s	Supply & Extract	106
	Supply/Extract	OpusXbox	75l/s	Refer to AHU catalogue	34
	Inline	Ecosmart Squrbo	0.5m³/s	Supply & Extract	134
	Roof	Terminator	9.2m³/s	Roof Fans	382
	Inline or Roof	Ecosmart Twins	5.9m³/s	Twin Fans	228
REFURBISHMENT	Loft	Drimaster/2000	80l/s	Refer to Residential catalogue (PIV)	130
	Wall/Window	XS	0.55m³/s	Supply & Extract	112
	Wall/Window/Inline	Genie	25l/s	Refer to Residential catalogue (Extract)	106
	Wall	Flatmaster	35l/s	Refer to Residential catalogue (PIV)	148
	Supply/Extract/Heat Recovery	XBOXER heat recovery	10m³/s	Commercial Heat Recovery	66
SCHOOLS	Roof based system	R Series		Natural Ventilation	36
	Roof based system	S Series		Natural Ventilation	42
	Roof & Plant room	XBOXER AHUs	20m³/s	Refer to AHU catalogue	144
	Supply/Extract/Heat Recovery	XB55	0.6m³/s	Refer to AHU catalogue	56
	Supply/Extract/Heat Recovery	XBOXER heat recovery	10m³/s	Commercial Heat Recovery	66
	Supply/Extract/Re-circ	Classaire	Project specific	Refer to AHU catalogue	90
	For buildings with Atria	A series & other systems		Natural Ventilation	54
SHOPPING CENTRES/RETAIL	Façade based system	F series & other systems		Natural Ventilation	48
	For buildings with Atria	A series & other systems		Natural Ventilation	54
	Smoke	HT AXUS	64m³/s	Smoke Fans	342
	Smoke	Impulse Axial	1.8m³/s	Smoke Fans	328
	Smoke	Impulse Centrifugal	2.69m³/s	Smoke Fans	380
SPORTS HALLS	Roof based system	R & S series e-stack		Natural Ventilation	36
	For buildings with Atria	A series		Natural Ventilation	54
	Inline	AXUS	92m³/s	Axial Fans	272
	Roof based system	Terminator	9.2m³/s	Roof Fans	382
	Wall	Ezplate	9.4m³/s	Axial Fans	318
	Wall	XS	0.55m³/s	Supply & Extract	112
STAIRWELLS	Smoke	HT AXUS	64m³/s	Smoke Fans	342
SUPERMARKETS	Roof based system	R & S series e-stack		Natural Ventilation	36
	Inline	Ecosmart Airmover	10.8m³/s	Supply & Extract	180
	Inline	Squif	6.5m³/s	Supply & Extract	190
	Roof	Ecosmart Twin	5.9m³/s	Twin Fans	228
	Supply/Extract/Heat Recovery	XBOXER AHU & Heat recovery	20m³/s	Commercial Heat Recovery & AHU catalogue	66
TOILETS - LARGE	Supply/Extract/Heat Recovery	XBOXER/constant pressure	10m³/s	Commercial Heat Recovery	66
	Supply/Extract	XBOXER AHUs	20m³/s	Refer to AHU catalogue	144
	Inline or roof	Ecsomart twins	5.9m³/s	Twin Fans	228
	Inline (central)	Constant pressure/CVD	2.4m³/s	Twin Fans	246
TOILETS - SMALL	Inline or Wall	Opus 40/60/95	95l/s	Supply & Extract	94
	Wall/Ceiling	Opus Plus	150l/s	Supply & Extract	106
	Wall/Ceiling	XS	0.55m³/s	Supply & Extract	112
	Wall/Window	Genie	25l/s	Refer to Residential catalogue (Extract)	106
WAREHOUSES	Inline	AXUS	92m³/s	Axial Fans	272
	Roof	Terminator	9.2m³/s	Roof Fans	382
	Wall	Ezplate	9.4m³/s	Axial Fans	318
	Roof	R & S Series		Natural Ventilation	33

*** = Please contact Nuaire for high temperature options.**

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