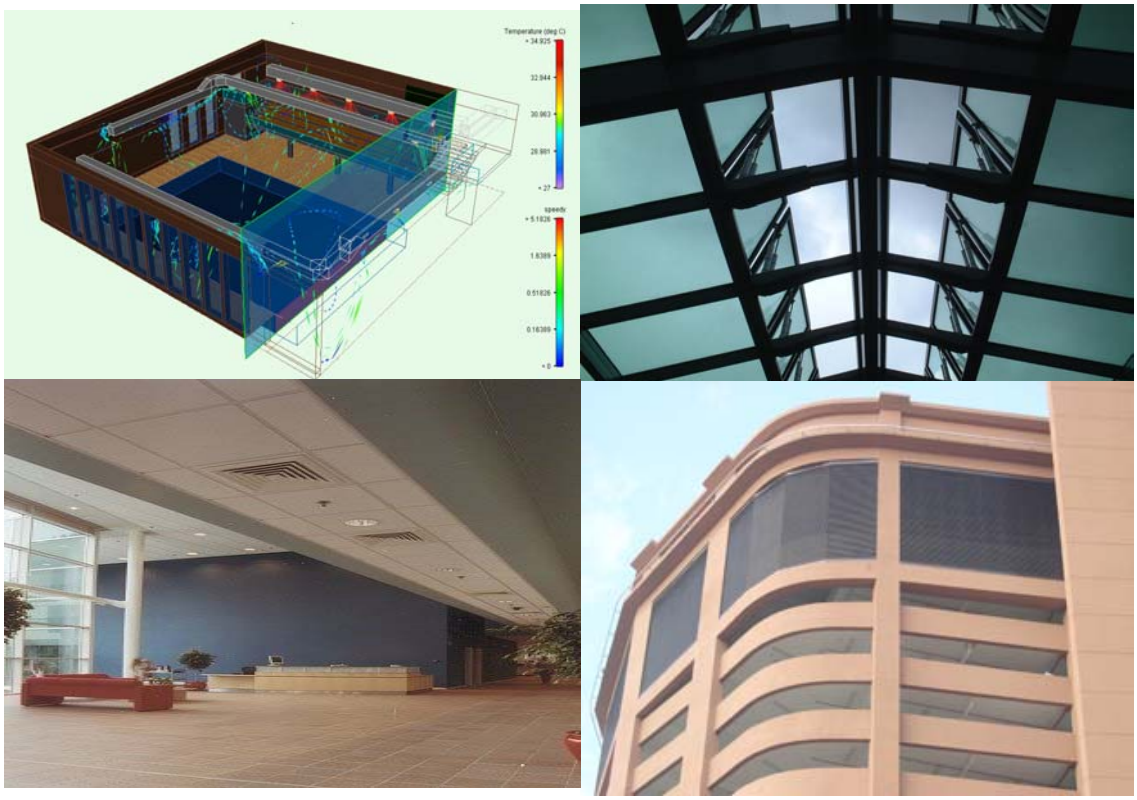
General Specification and Product Directory for Air Distribution and Related Equipment

December 2010



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THE AIR DISTRIBUTION MANUFACTURERS' GROUP

of the HEVAC Association was formed by Members involved in the manufacture and supply of Air Distribution Equipment.

The equipment offered by these Member firms covers the whole range of grilles, diffusers, air terminal devices, louvres, terminal units, fan coil units, chilled beams and ceilings, duct dampers, smoke/fire dampers and ventilators. The equipment is manufactured to a high standard of quality and design to meet the stringent requirements of the H.V.A.C. Industry.

This publication consists of a "General Specification" and Members "Product Directory" covering the full range of products in some detail. The contents will be of considerable value to those involved with the selection of Air Distribution Equipment.

Revisions to this 2004 edition include:

1. Chilled ceilings and beams have been included.
2. The fire damper section has been updated to include references to the new test methods.
3. The specification now includes all of the current and up to date European standards for reference purposes.
4. In the Fan Coil Unit section DC motors have been included which represent a potential saving of energy.
5. The list of companies includes all of the HEVAC members manufacturing the products listed in the specification.

HEVAC would like to thank the following people on the drafting and editing committee for their contribution to this publication:

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Air Distribution Manufacturers' Group

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1.0 AIR TERMINAL DEVICES (ATD'S)

Components of a ventilation installation which are designed with the purpose of achieving the predetermined movement of air into or from a treated space. They are located in openings in the boundaries of that space.

They can be divided into the following categories:

Automatically controlled
Manually controlled
Fixed (i.e. with adjustable parts)

Air terminal devices through which air enters the treated space should be designed in order to ensure the predetermined comfort conditions of temperature, velocity and noise in the occupied zone.

1.1 GRILLES

Generally, grilles are mounted in side walls, but on occasions they can be fixed into the floor or used as ceiling mounted extract terminals. These components are normally used as side wall grilles having either square or rectangular surrounds, generally having an aspect ratio of less than 10:1 (installation positions are governed by the throw, spread and drop of the resulting air stream).

1.1.1 Supply Grilles

Components of the air distribution system through which air enters the treated space. They usually consist of deflecting blades that impart specific direction(s) to the air stream entering the treated space and ensure the efficient mixing of the supply air with air in the treated space.

1.1.1.1 Single deflection grilles

These shall have one set of individually adjustable blades to control the spread and/or direction of air. The blades shall be either horizontal or vertical to suit the application.

1.1.1.2 Double deflection grilles

These grilles shall have two sets of individually adjustable blades to control the spread and/or direction of air. One set of blades shall be horizontal and one set vertical.

1.1.1.3 Fixed bar grilles

These grilles shall have one set of straight or angled blades which may be either horizontal or vertical.

Fixed bar grilles with air pattern control shall have one set of straight or angled blades plus one set of individually adjustable blades which are at right angled to the front set.
Fixed bar grilles used for floor application shall be suitably strengthened to meet the specification for floor loading and for conformity where required with BS EN 13264

1.1.1.4 Linear grilles

Components normally used as side wall grilles or in perimeter casings having a continuous appearance and generally having an aspect ratio of not less than 10:1.

Linear bar grilles used for floor application shall be suitably strengthened to meet the specification for floor loading and for compliance where required with BS EN 13264.

1.1.1.5 High Security grilles

Components which, dependant on the designed usage, are securely fitted with vandal proof grids or plates in addition to the normal deflecting, and/or balancing blades. The whole assembly shall be fixed in a tamper proof manner They can also be used for extract and transfer of air.

1.1.2 Exhaust Grilles

Components of the air handling system through which the air is extracted from the treated space.

1.1.2.1 Single deflection grilles

Single deflection grilles shall normally be used for exhaust air applications. However, double deflection grilles can be used for exhaust air to meet aesthetic requirements.

1.1.2.2 Fixed bar grilles

Fixed bar grilles shall have one set of straight or angled blades which can be either vertical or horizontal.

Linear bar grilles used for floor application shall be suitably strengthened to meet the specification for floor loading and for compliance where required with BS EN 13264.

1.1.2.3 Linear grilles

Components normally used as side wall grilles having a continuous appearance and generally having an aspect ratio of not less than 10:1.

Linear bar grilles used for floor applications shall be suitably strengthened to meet the specified floor loadings and for compliance where required with BS EN 13264

1.1.2.4 Lattice grilles

Lattice grilles shall have either a stamped, mesh or perforated face.

1.1.2.5 Eggcrate grilles

Eggcrate grilles shall have a high free area deep core.

1.1.2.6 Non vision grilles

Non vision grilles shall have one set of fixed blades of such section as to obstruct direct line of sight through the grille core

1.1.3 Transfer grilles

Components which permit the pre-determined passage of air from one treated space to another.

Transfer grilles normally shall have one set of non-vision type fixed angled or chevron shaped blades which obstruct direct line of sight through the grille core.

1.1.4 Controls

1.1.4.1 Balancing Dampers

Balancing dampers shall be, unless otherwise specified, of the opposed blade type fitted to the rear of the grille and adjustable through the grille face.

1.1.4.2 Equalisation Grids

Equalisation grids shall be either fixed or adjustable depending on application.

1.1.5 General

1.1.5.1 Materials

Grilles shall be constructed from aluminium, steel, stainless steel, plastic or synthetic material as specified in the schedule.

Steel products shall be protected against corrosion. All products shall be supplied in a fully finished condition as specified in the schedule.

1.1.5.2 Performance

All grilles shall be tested in accordance with BS EN 12238 and BS EN 5135.

1.1.5.2.1 Selection: Grilles shall be selected and sized to provide the correct performance as indicated in the schedule. Due consideration shall be given to ensure that air stagnation, draughts, excessive noise levels and excessive pressure losses do not occur.

Air movement in the occupied zone shall satisfy the thermal comfort criteria indicated in CIBSE Guide A or the relevant CEN documentation. In general, this requires that air velocities will be in the range 0.05-0.30m/s for sedentary occupation. Higher values may be specified for industrial applications or where occupation is transient.

Noise levels generated by grilles and balancing damper shall not exceed the levels indicated in CIBSE Guide A or relevant CEN documentation, unless otherwise specified.

1.1.5.2.2 Schedules: All schedules shall indicate clearly the product specification, manufacturers name, catalogue reference, size, volume flow rate, throw (minimum/maximum) and pressure drop. In addition the following should be specified: material, finish, noise level in the occupied zone in NC or dBA, supply and room temperature.

The following is a sample schedule:

Manufacturer:

Catalogue Ref	Size mm	Volume Flow m^3/s	Throw Min/ max m	Supply air temperature Differential ºC	Pressure drop Pa	Noise NC or dBA

1.1.5.3 Fixings

Grilles shall be fixed by 1 of 4 methods:
a) screw fixing through the grille border.
b) concealed fixing by means of fastener accessible through grille face.
c) spring fixing by means of clips attached to the grille core or grille frame.
d) sub-frame/quick release fasteners.
Further details are given in the HEVAC Guide To Air Distribution Technology for the Internal Environment, and the manufacturers literature.

NOTE: Where specified grilles shall be supplied with sub frames

1.1.5.4 Installation

Grilles and balancing dampers shall be installed in accordance with current good practice as detailed in the HEVAC Guide To Air Distribution Technology for the Internal Environment.

1.2 DIFFUSERS

Generally, diffusers are mounted in the ceiling area providing supply air. Architecturally, ceiling diffusers can be used for the purpose of extracting air. On occasions, radial discharge devices installed in the floor are also referred to as diffusers.

1.2.1 Linear (Slot)Diffusers

These are air terminal devices with single or multiple slots, each of which has an aspect ratio of greater than 10:1. Each slot may consist of a number of separate elements. Each slot may or may not have an adjustable control element or elements to vary the direction or directions of the air or the air flow rate delivered to the treated space.
When control elements are present the air discharge pattern may be set to one ,or any combination of the following:
Horizontal 1 way
Horizontal 2 way
Horizontal alternating discharge
Angled alternating discharge
Vertical

Fixed blade diffusers shall provide one way or two way horizontal air diffusion patterns

1.2.2 Circular Diffusers

Adjustable circular diffusers shall be pan or multi-cone type capable of being set to produce radial horizontal or vertical air diffusion patterns.

Fixed circular diffusers shall be pan or multi-cone type capable of producing a radial horizontal air diffusion pattern.

1.2.3 Square and Rectangular Diffusers

Adjustable square and rectangular diffusers shall be pan, perforated face or multi-blade type capable of being set to produce horizontal or vertical air diffusion patterns.

Fixed square and rectangular diffusers shall be pan, perforated face or multi-blade type capable of producing one, two, three or four way horizontal air diffusion patterns as specified.

1.2.4 Swirl Diffusers

The construction of this type of diffuser causes a swirling or higher turbulence discharge which accelerates the mixing of the supply air into the surrounding space. This is generally greater than the

mixing effect from conventional square or circular diffusers. Swirl motion of the discharge air is imparted by a device behind the diffuser face and/or the configuration of the face itself. The air direction is generally fixed for a horizontal discharge, but in special cases may be vertical or adjustable between vertical and horizontal. Design of this type of device varies from radial face designs to multiple slot arrays or perforated face units.

1.2.4.1 Floor Mounted Diffusers

These are specially designed swirl diffusers for floor discharge application where the unit shall impart a swirl motion of the discharge air by a device behind the diffuser face and/or by the configuration of the face itself. The discharge shall be vertical, horizontal or adjustable between the two. Units should be of a robust design to take the specified floor loading requirements for compliance where required with BS EN 13264.

1.2.4.2 Linear High Induction Diffusers

These units offer similar high turbulence discharge to the square or circular swirl diffusers which accelerate the mixing of the supply and room air over and above that offered by conventional slot diffusers. Units can be fixed or adjustable if required.

1.2.5 Controls

1.2.5.1 Balancing Dampers

Linear diffuser balancing dampers shall be fitted either:
a) within the diffuser eg. hit and miss or flap type.
b) behind the diffuser eg. opposed blade type.
c) within the plenum supply spigot e.g. butterfly, plate or opposed blade type.

Circular diffusers balancing dampers shall be fitted with either butterfly, plate, iris or radial vane type.

Square and rectangular diffuser balancing dampers shall be fitted with either opposed or rhombic blade, plate, butterfly or flap types.

All dampers shall be adjustable, through the diffuser face or from outside the duct or by removal of diffusers core, as specified.

1.2.5.2 Equalisation Grids

When required equalisation grids shall be either fixed or adjustable type depending on application.

1.2.6 General

1.2.6.1 Materials

Diffusers shall be constructed from aluminium, steel, stainless steel or plastic as specified in the schedule.

Steel products shall be protected against corrosion and all products shall be supplied in a fully finished condition as specified in the schedule.

1.2.6.2 Performance

All diffusers shall be tested in accordance with BS EN 12238 and BS EN5135

1.2.6.2.1 Selection: Diffusers shall be selected and sized to provide the correct performance as indicated in the schedule. Due consideration shall be given to ensure that air stagnation, draughts, excessive noise levels and excessive pressure losses do not occur.

Air movement in the occupied zone shall satisfy the thermal comfort criteria indicated in CIBSE Guide A or the relevant CEN documentation. In general, this requires that air velocities will be in the range 0.05-0.30 m/s for sedimentary occupation. Higher values may be specified for industrial applications or where occupation is transient.

Noise levels generated by diffusers and balancing damper shall not exceed the levels indicated in CIBSE Guide A or the relevant CEN documentation, unless otherwise specified.

1.2.6.2.2 Schedules: All schedules shall indicate clearly the product specification, manufacturers name, catalogue reference, size, volume flow rate, throw (minimum/maximum) and pressure drop. In addition the following should be specified: material,

finish, noise level in the occupied zone in NC or dBA, supply and room temperature.

The following is a sample schedule:

Manufacturer:

Catalogue Ref	Size mm	Volume Flow m^3/s	Throw Min/ max m	Supply air temperature Differential °C	Pressure drop Pa	Noise NC or dBA

1.2.6.3 Fixings

Fixings for diffusers are many and varied, for this reason it is recommended that reference is made to the HEVAC Guide to Air Distribution Technology for the Internal Environment, or the manufacturer's literature.

1.2.6.4 Installation

Diffusers and balancing dampers shall be installed in accordance with current good practice as detailed in the HEVAC Guide to air distribution technology for the internal environment.

1.3 SPECIALIST AIR TERMINAL DEVICES

1.3.1 Nozzles (Supply)

These air terminal devices are designed to achieve the maximum conversion of static pressure energy to dynamic energy and thus produce a maximum throw due to minimum entrainment.

These are generally divided into two separate groups related to function, (a) small nozzles for personal ventilation/spot cooling, (b) large nozzles for projecting air over long distances. Nozzles shall be either circular or rectangular, used as single units or multiple arrays and shall have the following facilities, as specified.
Fixed or adjustable air pattern.
Fixed or adjustable air discharge direction.
Air flow rate control.

1.3.2 Disc Valves (Supply/Extract)

Disc valves shall have an adjustable circular core complete with mounting sub-frame. Core position shall be adjustable for flow rate control purposes and suitable for exhaust air. Special designs are necessary for supply air use.

1.3.3 Air Handling Luminaires (Supply)

Air Handling Luminaires shall be complete with an adjustable or fixed linear slot diffuser with integral plenum box, incorporating flow control blades to set the pattern for horizontal one way or vertical air diffusion, fitted to either one or more sides of a luminaire.

1.3.4 Ventilated Ceilings (Supply)

These are modular air terminal devices designed to uniformly diffuse air to the treated space from a pressurised plenum through holes or slots in the ceiling surface .

1.3.5 Laminar Flow Panels

Laminar flow panels have a large perforated face plate complete with rear plenum box and spigot entry. Generally incorporating a damper for flow control purposes and all designed to provide uniformed air discharge at 90% to the panel face. Normally used for supply applications but can be matched for appearance purposes for extract applications.

1.3.6 Displacement Ventilation Panels

Displacement ventilating panels are constructed with a large face area normally using a perforated material. The remaining construction normally incorporates a rear plenum box with spigot entry in which an air inlet damper can be fitted for flow rate control if required. Displacement ventilation panels are designed to provide uniform air discharge at low velocity over the face area and to supply air directly into the occupied zone of a conditioned space. Note: In addition to flat diffusers, Displacement ventilation panels can be supplied in 90°, 180° and 360° configurations mainly for floor mounting applications.

1.3.7 General

1.3.7.1 Materials

Air terminal devices shall be constructed from aluminium, steel, stainless steel or plastics as specified in the schedule.

Steel products shall be protected against corrosion and all products shall be supplied in a full finished condition as specified in the schedule.

1.3.7.2 Performance

All terminal devices shall be tested in accordance with BS EN 12238 for mixed flow applications and BS EN 12239 for displacement applications. Acoustic performance should be evaluated to BS EN 5135

1.3.7.2.1 Selection: Air terminal devices shall be selected and sized to provide the correct performance as indicated in the schedule. Due consideration shall be given to ensure that air stagnation, draughts, excessive noise levels and excessive pressure losses do not occur.

Air movement in the occupied zone shall satisfy the thermal comfort criteria indicated in CIBSE guide A. In general, this requires that air velocities will be in the range 0.05-0.30 m/s for sedentary occupation. Higher values may be specified for industrial applications or where occupation is transient.

Noise levels generated by grilles, diffusers and balancing damper shall not exceed the levels indicated in the CIBSE Guide, unless otherwise specified.

1.3.7.2.2 Schedules: All schedules shall indicate clearly the product specification, manufacturers name, catalogue reference, size, material and finish. In addition, if terminal sizing is required, the following information should be provided: volume flow rate, throw (minimum/maximum), supply air/room air temperature differentials, mounting height, maximum noise level in occupied zone, maximum pressure differential.
The following is a sample schedule:

Manufacturer:

Catalogue Ref	Size mm	Volume Flow m^3/s	Throw Min/ max m	Supply air temperature Differential °C	Pressure drop Pa	Noise NC or dBA

1.3.7.3 Fixings

Fixings for specialist air terminal devices are many and varied. For this reason it is recommended that reference is made to the HEVAC Guide To Air Distribution Technology or the manufacturers literature.

1.3.7.4 Installation

Specialist air terminal devices shall be installed in accordance with current good practice as detailed in the HEVAC Guide To Air Distribution Technology.

2.0 LOUVRES

Louvre systems may be used as air flow terminations to the outside of the building or for purely aesthetic purposes. They normally comprise a series of horizontally or vertically mounted angled blades assembled at a fixed pitch onto mullions to form a flat panel mounted vertically, inclined or horizontally. An external frame is normally supplied to conceal the ends of the louvre blades and to provide a sill.

2.1 Weather Louvre

Weather louvres may be single or multi-bank with fixed front louvre blades mounted horizontally/vertically, arranged to allow the passage of air, while providing a measure of protection against environmental influences.

When integrated into runs of cladding louvre or louvre screens they shall tend to merge in by virtue of identical pitch and similarity of louvre blade profile.

2.2 Cladding Louvre

Cladding louvres shall be single bank with fixed louvre blades mounted horizontally/vertically. Generally each run of louvres shall have a continuous external appearance, unbroken by framing.

2.3 Louvre Screen

Louvre screens may be single or multi bank with fixed louvre blades arranged to obstruct line of sight from normal vantage points by virtue of their design or

orientation. Generally each run of louvres shall have a continuous external appearance, unbroken by framing.

2.4 Penthouse Louvre/Louvre Turret

Penthouse louvres shall be assemblies of vertical weather louvre panels, generally mounted in a square or rectangular format over a ventilation aperture, with frame and water shedding roof arranged so as not to degrade the weather resistance of the louvres.

2.5 Sand Trap Louvre

Sand trap louvres shall have fixed vertical louvre blades, in labyrinth form, arranged to allow the passage of air but to resist the entry of airborne sand into the building.

2.6 Acoustic Louvre

Acoustic louvres may be single or multi bank fixed louvres mounted horizontally/vertically, arranged to allow the passage of air but to reduce the transmission of noise into/out of the building.

Acoustic media shall be vermin proof, rot proof and non- hygroscopic and shall be suitably protected from water.

2.7 General

2.7.1 Controllable Louvre

Controllable louvres shall have a set of pivoted blades either within or behind the fixed louvres to control the passage of air. Actuation shall be pneumatic, electrical or manual.

2.7.2 Accessories

Louvre assemblies shall be provided with bird and/or insect guards as specified in the schedule.

Louvre assemblies shall be provided with insulated/un-insulated blanking panels as specified in the schedule.

Single/double leaf louvre doors with visible/concealed framing shall be provided as specified in the schedule.

2.7.3 Material

Louvre assemblies shall be constructed from aluminium, stainless steel, galvanised steel, mild steel or materials as specified in the schedule.

Steel products shall be protected against corrosion. All products shall be finished as specified in the schedule.

Controllable louvre blades shall pivot on nylon, bronze or other suitable bearings to resist wear and seizure.

2.7.4 Performance

Weather louvre performance shall be at least class A/B/C/D 1/2/3/4 at the installed suction velocity when tested in accordance with BS EN13030: Performance testing of louvres subjected to simulated rain.

Sand trap louvre shall have a sand rejection effectiveness as specified when tested in accordance with BS EN 13181 " Performance testing of louvres subjected to simulated sand".

Acoustic louvre shall provide an insertion loss as specified when tested in accordance with the HEVAC Technical Specification "Test procedure for Acoustic Louvres".

2.7.5 Installation

All louvre systems shall be securely fixed to the structure to resist local design wind loads as specified/calculated in accordance with BS 6399-2. The design wind load shall not cause any part of the system to become detached or suffer a permanent deflection of more than $1/250^{th}$ of the span.

Installation methods and details shall be in accordance with current good practice and shall not compromise the specified performance for the system.

2.7.6 Schedule

Schedules shall indicate clearly the product specification, manufacturer's name, catalogue reference, type of louvre, size, material, finish, accessories and design wind load.

For all louvres handling airflow, relevant data should clearly indicate air flow rate and direction, maximum pressure loss, BS EN classifications, maximum generated noise level and acoustic insertion loss where appropriate.

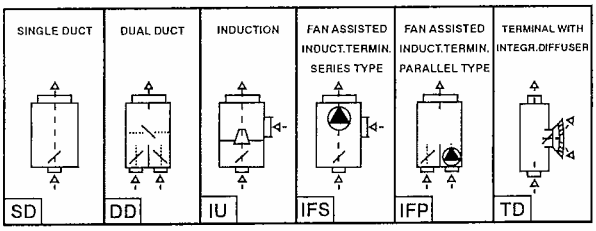
A sample schedule could be:
Manufacturer: The Louvre Co Ltd
Catalogue Ref: Model W
Material: Aluminium
Finish: Matt poly powder to RAL1234

louvre ref	Size width x ht	type	airflow			HEVAC class	Design load	Access-ories	doors
			In/ext	rate	ΔP				
L5/3	*2000 1200*	*weather*	*inlet*	*2.1*	*-*	*A2*	*1,200*	*Insect guard*	*-*
L5/4	*14000 1600*	*cladding*	*-*	*-*	*-*	*-*	*1,200*	*None*	*2 single 800 x 1600*

3.0 TERMINAL UNITS

3.1 Constant and Variable Air Flow Rate

Constant and variable air flow rate terminal units shall be provided in one of the six basic forms as illustrated in figure 1.



The terminal units are described below.

3.1.1 Single Duct Terminal Units (SD)

Single duct terminal units shall be constant or variable flow rate devices to handle supply or exhaust air as defined in the schedule with single duct connection and shall be designed to handle air at low, medium or high velocity. Single duct units shall incorporate controls as defined in 3.9 to regulate air flow rate in accordance with the system and schedule requirements to control zone temperatures or pressures.

3.1.2 Dual Duct Terminal Units (DD)

Dual duct terminal units shall be constant or variable air flow rate devices as defined in the schedule with two supply duct connections to blend hot and cold air to satisfy zone temperature and humidity requirements.

3.1.3 Induction Units (IU)

These units shall incorporate a single primary connection with a variable flow rate device and an induction port. Primary and induced air shall be mixed within the unit by utilisation of the primary system air pressure before being discharged from the assembly through an outlet connection.

3.1.4 Fan Assisted Induction Terminal Series (IFS)

These units shall incorporate a single primary connection with a variable flow rate device, series fan and induction port(s). The series system generally shall have continuous fan operation and therefore produce a nominally constant discharge air flow rate. The series fan induces void air which it mixes with primary air to provide a constant discharge. The system can run to maximum primary air zero induction depending upon the setting of the variable air flow rate device. Series systems are generally suitable for low temperature supply air.

3.1.5 Fan Assisted Induction Terminal Parallel (IFP)

As for the IFS units, these assemblies shall also incorporate a single primary variable flow rate device together with a parallel port which incorporates a unit fan combination. The parallel system shall generally have intermittent fan operation and provide a variable air volume at constant temperature with additional cooling/heating capacity being provided by the parallel fan/coil system.

3.1.6 Terminal Unit With Integral Diffuser (TD)

These units shall incorporate a primary inlet and outlet connection with a combined variable flow rate device and outlet diffuser on a supply branch. The design of these assemblies shall allow for primary air to pass through the unit and connect to further series units in the system, while regulating the amount of take off air to its own integral diffuser.

3.2 Auxiliary Devices

Terminal units may be supplied with auxiliary devices in accordance with the schedule including:

a) reheat coils (electrical, hot water or steam).

b) secondary silencers fitted either upstream and/or downstream of the terminal to prevent duct borne noise transmission through the system and possible breakout noise. Silencers shall be tested and rated in accordance with BS EN ISO 7235 or equivalent except that the noise source shall be the terminal unit.

c) Multiple discharge outlets to evenly distribute air flow from the low pressure side of the terminal unit.

3.3 Controls

Terminal units may be specified to operate with various schedule system control functions which may be either pressure dependent or pressure independent.

Controls systems shall be as specified in the schedule and may be either:

i) mechanical
ii) electrical/electronic/digital
iii) pneumatic
iv) system (self) powered

3.4 General

3.4.1 Materials

Steel products shall be protected against corrosion and all products shall be supplied in a full finished condition as specified in the schedule.

3.4.2 Performance

All terminal units shall be tested and rated in accordance with BS EN 12589 .and BS EN 5135

3.4.2.1 Selection

Terminal units shall be sized and selected to satisfy the acoustic and aerodynamic performance criteria as defined in the schedule and performance requirements.

3.4.2.2 Schedule

Schedules shall indicate clearly the product specification, manufacturers name, catalogue reference, size and control system. In addition the following information shall be provided; maximum air flow rate, minimum air flow rate (if applicable), supply air temperature (s), minimum and maximum operating pressure differentials, case leakage, closed valve (s) leakage, duct borne and case radiated noise, acoustic insertion loss and reheat coil performance (if applicable).

3.4.3 Installation

Terminal Units shall be installed in accordance with the manufacturer's recommendations.

4.0 FAN COIL UNITS

4.1 General

Fan coil units shall be vertical or horizontal types as detailed within the schedules. Room mounted units shall be finished with a decorative outer casing. Chassis units shall be used for mounting within the false ceiling or within builders work. Units shall be 2 pipe with a cooling coil only, 2 pipe change over with a single coil to provide either heating or cooling, or 4 pipe with both cooling and heating coils, or using electric heating and 2 pipe as detailed within the schedules.

4.2 Structure and cabinet

The fan coil unit structure (or chassis) and cabinet shall be manufactured from galvanised steel, or other

suitably protected material. Acoustic or thermal insulation, where fitted, shall be Class 0 fire rated to BS476. Inlet and outlet grilles shall be either pre-painted steel, aluminium or ABS plastic.

4.3 Fans

Fans shall be of the forward curved centrifugal type or tangential type. They shall be manufactured from plastic, galvanised steel or other suitably protected material. Fan housing shall be accessible and manufactured from galvanised steel or other suitably protected material.

4.4 Motor

Permanent split capacitor motors shall be used, which may have automatic reset internal overload protection and suitable for operation with a 198 to 254 volt, single phase, 50Hz supply.

Speed control will be achieved by either variable voltage supply or multi-tap motor operation.

4.5 Heat Exchangers

Chilled and hot water coils shall have copper tubes to a minimum thickness of 0.3mm, mechanically expanded aluminium fins with a minimum thickness of 0.1mm. Water connections with the coils shall be via suitable BSP threaded or plain tube as required. An air vent shall be provided for each coil circuit.

4.6 Drain Pan

A drain pan constructed from galvanised steel or other suitably protected material shall be provided. Metallic drain pans shall be insulated using a class 0 material to BS476, or other equivalent anti-condensation treatment.

4.7 Air Filter

A filter shall be provided to comply with a minimum EU2 standard.

4.8 Controls

Controls shall generally be as offered by the manufacturer and allow for (delete options not required):

- Remote or unit mounted temperature control loop for unit or remote mounting, incorporating a sensor and set point adjustment.
- Fan speed control may be included as part of the temperature controller, or separate.
- 230VAC or 24VAC supplies.
- Valves, 2, 3 or 4 port, from 230VAC or 24VAC by on/off or modulating signals.
- Damper motor shall be fully modulating and shall operate on a 230VAC or 24VAC supply.
- Signal from controller modulates air flow through coils to achieve required performance.

5.0 CHILLED CEILINGS & BEAMS

5.1 General

The generic term of chilled ceilings covers a range of terminal products which can generally be divided into three groups.

5.2 Chilled Ceilings

5.2.1 Radiant

The most common form usually consisting of a lay in or bonded chilled water element/matrix in the rear of a metal ceiling panel. Thermal transfer between the water, water pipe and the tile rear surface cools the room side tile surface.

5.2.2 Integrated

In this case the water ways are integrated into the ceiling panel or plank construction. There is approximately a 50/50 split between radiant and convective cooling.

5.2.3 Convective

Fully convective systems usually consist of angled fins with integral water piping. The cooling is mainly due to air flow through the cooled fins.

5.3 Passive Chilled Beams

Consist of a conventional cooling coil and associated casing. The basic function is fully convective, room air passes into the coil thus being cooled causing it to drop down towards the occupied space. The process is enhanced by the presence of the casing i.e. negative stack effect. The passive beam can be integrated with an air terminal device (slot or grille) however the supply air is independent and does not have any influence on the beam thermal performance.

5.4 Active Chilled Beams

The most common configuration consists of some form of nozzle system through which primary air passes. This causes direct induction of room air through a cooling coil. The mixed induced and primary air is then discharged through slots in the casing giving a one or two way horizontal discharge pattern when in the presence of continuous flat suspended ceiling. These units can have heating as well as cooling coils.

If the top of the beam casing is open to the ceiling void then air is induced from this area and it is referred to as an "Open Active Beam".

If the casing above the ceiling is closed and the air is induced directly from the room this configuration is referred to as a "Closed Active Chilled Beam"

5.5 Controls

The most critical aspect is the control of water temperature relative to room dew point to avoid any condensation risk. It is normal for the water flow temperature to be set at one degree C above the room dew point. Also primary air supply must incorporate dehumidification. If windows are open-able then either the chilled water system is shut down or chilled water temperature is rescheduled. It is recommended that condensation sensing is fitted to water flow pipe work in the ceiling void.

5.6 General

5.6.1 Materials

Chilled ceiling elements shall have pipe matrices of either copper or plastic supported by aluminium or steel structure. Chilled beams shall be constructed from steel and/or aluminium, coils for this application shall be conventional aluminium fins fitted to copper pipes.

5.6.2 Performance

Thermal performance of chilled ceilings shall be established using BS EN14240 :2003.
Thermal performance of passive chilled beams shall be established using pr EN14518.
Thermal performance of active chilled beams shall be established using appropriate BS ENs.
The acoustic performance of active chilled beams shall be established us in BS EN5135.

5.6.3 Selection

The Chilled ceilings, passive and active chilled beams shall be sized to satisfy thermal, aerodynamic and acoustic performance as appropriate and as defined in the schedule.

5.6.4 Schedule

Schedules shall clearly indicate product specification, manufacturers name, catalogue reference and size. In addition the following information shall be provided: cooling capacity, chilled water flow temperature room temperature and additionally for active beams primary air flow rate and temperature and required space noise level.

5.6.5 Installation

Chilled ceilings and beams shall be installed in accordance with manufacturer's recommendations. Manufacturing tolerances for chilled ceilings, passive and active beams and their interaction with suspended ceiling tolerances must be agreed at the design stage.

6.0 AIRFLOW CONTROL DAMPERS & VALVES

6.1 GENERAL

Balancing dampers, isolation valves and control dampers are elements inserted into an air distribution system, or elements of an air distribution system. Balancing dampers permit modification of the air resistance of the system and consequential changing of the airflow rate; isolation valves shut off the airflow completely and control dampers control the airflow rate and in addition may provide low leakage closure of the airflow.

Dampers and valves in ductwork have three functions:

6.1.1 Isolation Valve

With low air leakage in the closed position, normally the valve blades will be fully open or fully closed. In the fully open position, the valve blades should have minimum resistance to air flow, and when closed, will achieve complete shut-off. This type of valve is either manually or power actuated.

6.1.2 Balancing damper

Balancing dampers are used to achieve the required distribution of air in the ductwork system. For this purpose, the damper blades are set and locked manually in any required position between fully open and fully closed.

6.1.3 Control damper

Control dampers are used to secure dynamic control of the air flow in the ductwork system. In this function, the damper will always be power - actuated and may require to be modulated between fully open and fully closed, and to be capable of taking up any position between these extremes. In the fully open position, the damper should have a minimum pressure drop. In the fully closed position, it will not necessarily achieve a complete shut off (as would be the case with an isolation valve).

6.2 Types of airflow control damper

Airflow control dampers of various types are available for specific purposes, as follows:

6.2.1 Single blade dampers

Single blade dampers shall consist of a single pivoted blade contained within a duct casing. The blade shall be adjustable through a normal 90° angle by means of a quadrant or similar operating mechanism. Where automatic control of the damper is required the spindle shall be extended to enable a powered actuator to be fitted.

Single blade dampers (single skin section) shall have a maximum duct width of 300mm for rectangular ducts; and for circular ducts a maximum diameter of 315mm.

Single blade dampers (double skin section) are suitable for use in rectangular ducts, and shall have a maximum duct width of 1250mm and a maximum duct height of 300mm.

6.2.2 Multi-blade dampers (single or double skin) parallel and opposed blade

Multi-blade dampers shall consist of a number of pivoted blades contained within a casing. The blades shall be adjustable through a normal 90° angle simultaneously by interconnected linkage which provides either parallel or opposed blade action as specified. One damper spindle is then extended to a hand locking quadrant or similar operating mechanism. Where automatic control of the damper is required the spindle extension shall have a powered actuator fitted to it.

There is no restriction on the size of the duct in which multi-blade dampers or damper assemblies may be used but manufacturer's recommendations should be followed. Where dampers are required for spans in excess of 1250mm, the blades should be suitably re-inforced or supported. No individual damper blade should exceed 300mm in width. When the recommended size for a single unit is exceeded multiple arrays of units should be supplied with suitable reinforcing and modular connections

6.2.3 Iris Dampers

Iris dampers shall consist of a number of inter-connected blades which open or close within a casing with duct connection spigots. The blades shall be simultaneously adjusted by a quadrant or similar operating mechanism. Iris dampers are uni-directional with regard to airflow.

Iris dampers should be installed as specified and in accordance with manufacturer's operating and installation instructions
Iris dampers are available for circular ducts only, in diameters up to 800mm.

6.3 Constructional requirements

6.3.1 Dampers used in low and medium pressure systems

The following recommendations apply to dampers forming an integral part of low and medium pressure ductwork.

The dampers shall be constructed to prevent distortion and jamming in operation. The blades shall be sufficiently rigid to minimise movement when in the locked position.

The blades shall be securely fixed to the operating mechanism. Spindles shall be carried in either non-ferrous, synthetic or roller bearings. All balancing dampers shall have a locking device located on the outside of the case and shall give clear indication of the actual blade position. All penetrations of the duct shall be fitted with suitable seals where necessary.

6.3.2 Dampers used in high pressure systems

Control dampers used in high pressure systems shall meet the constructional requirements specified in 6.3.1, and shall have operating mechanisms outside of the air stream.

6.3.2 Proprietary types of damper

The use of any specific type of proprietary damper shall be confirmed by the designer. In all cases, proprietary dampers shall meet the relevant requirements of this specification.

6.4 Materials

Dampers shall be constructed from steel, stainless steel, aluminium or synthetic materials.

All products shall be protected against corrosion as necessary and supplied in a fully finished condition as specified in the schedule.

6.5 Schedule

Schedules shall indicate clearly the product specification, manufacturer's name or supplier's and manufacturer's name, catalogue reference, size and appropriate control mechanism detail.

6.6 Installation

Dampers shall be installed in accordance with any relevant ISO, EN or British Standard, local Building Regulations and National Codes of Practice as well as the manufacturer's recommendations.

6.7 Performance Testing

Duct damper casings shall be constructed to meet the equivalent leakage performance standard specified for the ductwork system to which they are installed.

Classes A, B and C are used to signify the leakage performance of the damper casing with the respective testing method illustrated and specified in BS EN 1751.

In order to supply the square metreage leakage calculation as detailed in the standard, the reference casing areas shall be taken as the perimeter size of the damper multiplied by an equivalent length of one metre i.e. an 800mm x 400mm duct dampers shall have a surface area for casing leakage performance calculated as follows: [(2 x 0.8) + (2 x 0.4)] x 1 = 2.4m² casing area.

Other performance and rating test methods for dampers and valves that may be specified are :

a) Leakage past a closed damper or valve BS EN 1751
b) Flow rate/pressure requirement characteristics BS EN 1751
c) Operational torque testing BS EN 1751

d) Thermal transfer testing BS EN 1751
e) Regenerated sound power levels BS EN 5315

7.0 FIRE DAMPERS

7.1 General

Fire dampers are used to maintain the integrity of compartments where ventilation and air conditioning ducts penetrate fire separating elements: i.e. they should be used where air handling ducts pass from one compartment to another, or at the point where they penetrate the enclosure of a protected escape route. They may also be used in un-ducted applications where air transfer is required. (This is a requirement of Approved Document B).

Compartment fire separating elements may take the form of, but not be limited to, masonry walls, concrete floors, stud partitions and cavity barriers.

They shall be fire tested to and be confirmed to meet the requirements of BS EN 1366-2. Specific dampers may have a different performance depending on the type of fire separating element into which they are built, and by what method this is done.

7.2 Classifications

7.2.1 Fire damper – meets the integrity only criteria of BS EN1366-2

7.2.2 Leakage rated fire damper – meets the integrity and reduced leakage criteria of BS EN1366-2

7.2.3 Insulated damper – meets either of the above and also the insulation criteria of BS EN1366-2. The examples shown below have to achieve the integrity criteria, but may, or may not, fulfil either of the other two. Generally,

- Curtain dampers usually meet the integrity only criteria.
- Combination Fire and Smoke dampers should be required to meet the leakage rated fire damper criteria for at least one hour, particularly if an element of smoke control is required of the system. These should be actuated in some way to respond to a smoke alarm.

There is no specific requirement for dampers in the UK to have an insulation rating.

It is unlikely that assessments for installations other than those tested will be forthcoming. For these other applications Local Fire Officer approval will be required, based on existing test information, or it may involve further testing.

It is essential that all approvals are obtained before dampers are supplied.

7.3 Types of Fire Dampers

7.3.1 Folding Curtain Fire Dampers

Folding curtain fire dampers are constructed of a series of interlocking blades, which fold to the top of the assembly permitting the maximum free area in the airway. The blades are held open by means of a thermal release mechanism normally rated at 72°C ± 4°C. The blades fall/are sprung to fill the airway to prevent the passage of the fire. They are designed to close against static air conditions. Test results or assessments are required for plane of installation (e.g. horizontal and vertical) and the method of installation.

7.3.2 Single Blade Fire Dampers

Single blade fire dampers are constructed with a single pivoting blade within a frame. The blade is released from its open position by means of a thermal release mechanism normally rated at 72°C ± 4°C. The blade pivots/moves to close the airway to prevent the passage fire. Test results or assessments are required for plane of installation (e.g. horizontal and vertical) and the method of installation.

7.3.3 Multi-blade Fire Dampers

Multi-blade dampers are constructed with a number of linked pivoting blades contained within a frame. The blades are released from their open position by means of a thermal release mechanism normally rated at 72°C ± 4°C. The blades pivot/move to close the airway to prevent the passage fire. Test results or

assessments are required for plane of installation (e.g. horizontal and vertical) and the method of installation.

7.3.4 Intumescent Fire Dampers

Intumescent fire dampers incorporate components, which swell by intumescent activity under the action of heat, to close the airway to prevent the passage of fire. The intumescent materials form the main component for fire integrity. In some instances this may be supported with a mechanical device to prevent cold smoke leakage. Activation temperatures will be influenced by the type of intumescent material selected and these temperatures typically range from 120°C to 270°C. Test results or assessments are required for plane of installation (e.g. horizontal and vertical) and the method of installation.

7.3.5 Insulated Fire Dampers

Insulated fire dampers are fire dampers of all the above types that show insulation characteristics when tested. Note curtain type fire dampers do not usually fall into this category

7.3.6 Multi-section dampers

Where the damper required exceeds the maximum tested size of individual unit (or single section), manufacturers may provide multi-section units. These will generally be supplied with some type of joining strip or mullion to allow the unit to be assembled on site. This joining is not, necessarily, structural. Consideration must be given by installers for additional support, particularly on larger multi-section units.

7.4 Materials/corrosion resistance

The damper shall be constructed from steel or stainless steel or other approved material.
Steel products shall be protected against corrosion and supplied in a fully assembled condition as specified in the schedule.

7.5 Schedule

Schedules shall indicate clearly the product specification, manufacturer's name or supplier's and manufacturer's name, catalogue reference, size, the appropriate control mechanism the method of installation and the classification required.

7.6 Installation

Fire dampers shall be installed in accordance with the advice provided by manufacturers and local regulations. All methods of installation should be agreed with local authorities before installation work is undertaken.

7.7 Performance

Damper pressure drops and specific cold blade leakage should be reported as tested and classified to BS EN 1751.

7.8 Casing Airtightness

Fire damper casings shall be constructed to meet the equivalent leakage performance standard specified for the ductwork system to which they are installed. Classes A, B and C are used to signify the leakage performance of the damper casing with the respective testing method illustrated and specified in BS EN1751.

In order to apply the square metreage leakage calculation as detailed in the standard, the reference casing area shall be taken as the perimeter size of the damper multiplied by an equivalent length of one metre i.e. an 800mm x 400mm duct damper shall have a surface area for casing leakage performance calculated as follows: [(2 x 0.8) + (2 x 0.4)] x 1 = 2.4m^2 casing area.

7.9 High temperature operation

If dampers are required to operate at higher temperatures (e.g. 300°C for 1 hour etc), they should be proven to do this with third party (e.g.LPC/BRE/WFRC) witnessed/certificated ad-hoc testing

7.10 Testing and Maintenance

All fire dampers should be tested by competent persons on completion of the installation and at regular intervals not exceeding two years
Spring operated fire dampers should be tested annually and fire dampers situated in dust laden and similar atmospheres should be tested much more frequently, at intervals suited to the degree of pollution (BS5588 Part 9).
Fire dampers used as part of a smoke control system, should be tested and maintained as described in BS 5588 Part 4.

8.0 SMOKE CONTROL DAMPER

Smoke control dampers are single or multi-blade dampers that would generally have two safety positions, open to allow smoke extraction, or closed to maintain compartmentation. They do not have thermal release mechanisms, relying on a control system to ensure that they achieve the correct position.

Specific standards for this product are currently being developed.

9.0 SMOKE & HEAT VENTILATORS

9.1 Smoke and Heat Exhaust Ventilators

As key components of a correctly designed smoke and heat control system, they are used to remove smoke and hot gases from a building or enclosure. Smoke and heat exhaust control systems can create and maintain a clear layer beneath the smoke to:-

- keep escape and access routes free ;
- facilitate fire fighting operations ;
- reduce the potential for flashover and thus full development of the fire;
- protect equipment and furnishings;
- reduce thermal effects on structural components during a fire;
- reduce damage caused by thermal decomposition products and hot gases.

The choice of powered or natural smoke ventilators depends on aspects of the building's design and siteing in relation to its surroundings.

9.2 Natural Ventilators

Devices harnessing natural buoyancy forces to exhaust smoke and heat from a building. They are generally roof mounted, although with suitable controls high wall mounting may be suitable.
They may be dual purpose, also being used for day to day environmental control.

There are, within the generic grouping of natural ventilators, different product types.

9.2.1 Louvred ventilators

Louvred ventilators shall contain a series of controllable louvres which when opened provide a relatively unrestricted opening.
Generally installed at an angle of between 0° and 30° from the horizontal.

9.2.2 Weathered ventilators

Weathered ventilators shall provide two airflow paths. The main path, generally provided by opening top flaps or louvres, shall allow a relatively unrestricted opening for smoke and heat exhaust and for dry weather environmental ventilation. The secondary path, generally provided by opening side dampers, shall allow a more restricted weathered opening for environmental ventilation in inclement weather.
Generally installed at an angle of between 0° and 30° from the horizontal.

9.2.3 Flap ventilators

Flap ventilators shall contain one or more flaps which when opened provide a relatively unrestricted opening.
Generally installed at an angle of between 0° and 30° from the horizontal.

Single flap ventilators installed in the 0°to 10° plane shall open 140° from the angle at which they are installed to prevent possible inletting in adverse wind conditions.

9.2.4 Casement ventilators

Casement ventilators shall contain a bottom hung, top opening, single flap.

Generally installed at an angle of between 0° and 60° from the vertical.

9.3 Mechanical Ventilators

Devices exhausting smoke and heat by mechanical means, generally using a fan driven by an electric motor.

They may be dual purpose, also being used for day to day environmental control.

They are generally designed to remove large volumes of gas and smoke at high temperatures. As a result, consideration of the noise generated by such equipment may need to be given in relation to fire alarms and sounders, particularly where voice address alarm systems are in use.

9.3.1 Roof Mounted

Roof mounted ventilators shall consist of a high temperature fan and motor unit installed into a weatherproof housing, generally fitted to the roof of the building.

9.3.2 Duct Mounted

Duct mounted ventilators shall consist of a high temperature fan and motor unit connected via flanged and jointed ductwork, constructed in accordance with DW 144, from the initial extract location within the building to the external exit terminal.

Ductwork shall be suitably fire rated and/or insulated as necessary if it passes through areas other than the fire zone.

9.4 Controls

Ventilators and their controls shall be arranged in such a manner as to be fail safe in operation. The controls shall be activated automatically from the building Fire Detection Systems or directly from smoke detectors, beam detectors, sprinkler flow switches or similar automatic devices.

9.5 Materials

Ventilators shall be constructed from aluminium, stainless steel, galvanised steel, mild steel or materials as specified in the schedule.

Steel products shall be protected against corrosion. All products shall be finished as specified in the schedule.

Controllable louvre blades shall pivot on nylon, bronze or other suitable bearings to resist wear and seizure.

9.6 Performance

All natural ventilators shall have been tested to, and conform to, BS 7346 part 1 or BS EN 12101-2

All mechanical ventilators shall have been tested to, and conform to, BS 7346 part 2 or BS EN 12101-3.

Note: From 2005 all smoke and heat exhaust ventilators will require to be CE marked to show compliance with the requirements of BS EN 12101.

9.6.1 Selection

Smoke and heat ventilators shall be selected and sized to provide the correct performance as indicated in the schedule or the system design details.

System design shall follow the guidance provided in the BS 5588 and BS 7346 series, Smoke Ventilation Association guides, and/or EN 12101 series.

9.6.2 Schedule:

The schedule shall clearly indicate the product specification, manufacturers name, catalogue reference, size, material and finish. In addition; for natural ventilators the coefficient of performance shall be stated and for mechanical ventilators volume flow, resistance, temperature and duration of operation shall be stated.

9.7 Installation

All smoke and heat exhaust ventilators shall be securely fixed to the building structure in accordance with the manufacturer's recommendations.

9.8 Service and Maintenance

A product such as a smoke and heat exhaust ventilator, which is primarily part of a life safety system must be serviced and maintained in accordance with the manufacturer's recommendations to ensure the correct operation of the ventilator in a fire condition. This is a requirement of the Fire Precautions (Workplace) Regulations.

Product Directory 1st July 2024

	Grilles	Diffusers	Specialist Air Terminal Device	Louvres	Terminal Units	Fan Coil Units	Chilled Beam / Ceiling	Airflow control dampers / valve	Fire Dampers (FD)	Motorised ES Fire Dampers (MFD)	Smoke Control Dampers (SCD)	Smoke & heat ventilators	Damper Actuators	VAV Controls
Advanced Air (UK) Ltd	■	■	■	■	■	■		■	■	■	■	■		
Airedale International Air Conditioning														
Airex Manufacturing Inc.														
Belimo Automation UK Ltd*		■	■	■	■	■	■	■	■	■	■	■	■	■
BSB Engineering Services Ltd								■	■	■	■			
Colt International Ltd				■		■						■		
Elta UK Ltd														
Flakt Woods Limited t/a Woods Air Movement	■	■	■		■	■	■	■	■	■		■		
Gilberts (Blackpool) Ltd	■	■	■	■	■			■	■	■	■	■		
H.V.C. Supplies (Stourbridge) Ltd	■	■	■	■				■	■		■			
Konvekta Ltd	■	■		■										
Mandik UK Ltd								■	■	■	■			
Nationwide Specialist Projects Ltd														
Neatafan Ltd														
Nuaire														
Smiths Environmental Products Ltd						■								
Smoke Control Dampers Ltd									■	■	■			
Swegon UK & I	■	■	■	■	■		■	■	■	■	■	■		■
TROX UK Ltd	■	■		■	■	■	■	■	■	■	■			

** Actuators / Valves /Sensors & controls only*

LIST OF HEVAC MEMBERS AND ADDRESSES – Dec 2010

A.J. Services
Units 2/3 Bullring Trading Estate, Green Street, Digbeth,
Birmingham, West Midlands B12 0NB
Tel 0121 766 8126 Fax 0121 766 7239
info@ajs-accessdoors.co.uk www.ajs-accessdoors.co.uk
Manufacturers of volume control dampers, fire dampers and access doors for rectangular and spiral

Ability Projects Ltd
Johnson Road, Fernside Park
Wimborne, Dorset BH21 7SE
Tel 01202 851440 Fax 01202 876111
sales@abilityprojects.co.uk www.abilityprojects.co.uk
Design and manufacture of fan coil units

Actionair (Ruskin Air Management Ltd)
Joseph Wilson Industrial Estate, South Street
Whitstable, Kent CT5 3DU
Tel: 01227 276100 Fax: 01227 264262
sales@actionair.co.uk www.actionair.co.uk
Manufacturers of Air, Fire and Smoke Dampers, Smoke Damper Control Systems and waterside and airside fancoil units.

Advanced Air (UK) Ltd
PO Box 153, Burrell Way
Thetford, Norfolk IP24 3WB
Tel: 01842 765657 Fax: 01842 762032
sales@advancedair.co.uk www.advancedair.co.uk
Fire/Smoke/Control dampers, smoke management system, access doors and air distribution equipment

Aereco Ventilation Ltd
The Technocentre, Puma Way
Coventry CV1 2TT
Tel: 024 7623 6066 Fax: 024 7623 6077
aerecovent@btopenworld.com www.aereco.com
Manufacturers of humidity controlled air inlet units, tricklevents and extract units for passive stack ventilation (PSV) and assisted ventilation (AV) systems

Air Diffusion (Ruskin Air Management Ltd)
Birchwood Trading Estate, 164 Great North Road
Hatfield, Hertfordshire AL9 5JN
Tel 01707 272601 Fax 01707 274951
sales@air-diffusion.co.uk www.air-diffusion.co.uk
Manufacturers of grilles and diffusers and volume control products.

Airflow Developments Ltd
Lancaster Road, Cressex Business Park
High Wycombe, Buckinghamshire HP12 3QP
Tel 01494 525252 Fax 01494 461073
info@airflow.co.uk www.airflow.co.uk
Manufacturers of industrial fans and blowers, domestic ventilation and Airflow measuring instruments. Also distributors of extensive ranges of ventilation supplies.

Airsonett UK Ltd
1 Marlborough Close
Tunbridge Wells, Kent TN4 8XZ
Tel 07787 123 556
annica.anderberg@airsonett.com www.airsonett.com
Airsonett is a clinically based medical technology company

Airvent Systems (Services) Ltd

Systems House, Lamby Industrial, Wentloog Avenue
Cardiff CF3 2EX
Tel 029 2077 6160 Fax 029 2077 6161
services@airvent.co.uk www.airvent.co.uk
Airvent are the UK's largest provider of turnkey whole life support for all types of smoke control and ventilation systems.

Biddle Air Systems Ltd

St. Mary's Road
Nuneaton, Warwickshire CV11 5AU
Tel 024 7638 4233 Fax 024 7637 3621
biddle@biddle-air.co.uk www.biddle.co.uk
Air Curtains, Fan Convectors, Fan Coil Units and Unit Heaters.

BSB Engineering Services Ltd

Unit E, Tribune Drive, Trinity Trading Estate
Sittingbourne, Kent ME10 2PG
Tel 01795 422609 Fax 01795 429543
sales@bsb-dampers.co.uk www.bsb-dampers.co.uk
Manufacturers of Air, Fire, Combination Fire and Smoke Dampers, Smoke Dampers and Damper Control Panels. Damper Actuators and Accessories.

Carrier Air Conditioning

United Technologies House, Guildford Road
Leatherhead, Surrey KT22 9UT
Tel 01372 220220 Fax 01372 220241
andrew.keogh@carrier.utc.com www.uk.carrier.com
Manufacturer of chillers, fan coils, packaged split systems and controls.

CIAT (UK) Ltd

5 The Byfleet Technical Centre, Canada Road
Byfleet, Surrey KT14 7JX
Tel 01932 354955 Fax 01932 342998
infosales@ciat.co.uk www.ciat.fr
Fan coils, air handling units (AHUs), Air cooled and water cooled chillers, close control units.

Clivet UK Ltd

4 Kingdom Close
Fareham, Hampshire PO15 5TJ
Tel 01489 572238 Fax 01489 573033
a.mayes@clivet-uk.co.uk www.clivet.com
Manufacturer of Versatemp applied and packaged heat pumps, Isovel close control air conditioning equipment, chillers, fan coils, air handling units and packaged systems.

Colman Moducel

Oldfields Business Park, Birrell Street
Fenton, Stoke on Trent ST4 3ES
Tel 01782 599995 Fax: 01782 599220
info@eaton-williams.com www.eaton-williams.com
Suppliers of air distribution products, fan coil units and air handling units.

Colt International Ltd

New Lane
Havant, Hampshire PO9 2LY
Tel 023 92 451111 Fax 023 92 454220
info@coltgroup.com www.coltgroup.com
Designers, manufacturers and installers of natural and powered smoke ventilation, louvre, solar shading and environmental control systems.
Designers and manufacturers of water source reverse cycle heat pumps, fan coil units and air handling units.

Daikin Airconditioning UK Limited
Daikin House, 1 River Court, Albert Drive
Woking, Surrey GU21 5RP
Tel 01483 711800 Fax 01483 711890
ukmarketing@daikineurope.com www.daikin.org.uk
Manufacturers of a range of air conditioning and water chillers

Designed for Sound Ltd, T/A Krantz Systems
6l - 67 Rectory Road
Wivenhoe, Essex CO7 9ES
Tel 01206 827171 Fax 01206 826936
rs@krantz.uk.com www.krantz.uk.com
Air diffusion equipment covering ceiling, wall and floor air outlets and cool ceilings and beams.

Dunham-Bush Ltd
European Headquarters, Downley Road
Havant, Hampsire PO9 2JD
Tel 023 92 477700 Fax 023 92 450396
info@dunham-bush.co.uk www.dunham-bush.co.uk
The design, manufacture and marketing of heating, air conditioning and refrigeration products together with aftermarket services.

Fläkt Woods Limited
Unit 6204, Bishops Court,
Solihull Parkway, Birmingham B37 7YB
Tel 0121 717 4680 Fax 0121 717 4699
enquiry@flaktwoods.com www.flaktwoods.com
Manufacturer of air handling products.

Frenger Systems Ltd
33 Shaftesbury Street
Derby, Derbyshire DE23 8YH
Tel 01332 295678 Fax 01332 381054
sales@frenger.co.uk www.frenger.co.uk
Manufacturer of chilled beams and ceilings.

Gilberts (Blackpool) Ltd
Clifton Road, Marton,
Blackpool, Lancashire FY4 4QT
Tel 01253 766911 Fax 01253 767941
mail@gilbertsblackpool.com www.gilbertsblackpool.com
Manufacturers of a comprehensive range of grilles, diffusers, VAV and constant volume units, volume control, fire and smoke dampers, louvres.

Halton Products Ltd
5 Waterside Business Park
Witham, Essex CM8 3YQ
Tel 01376 507000 Fax 01376 503060
sales@halton.com www.halton.com
Supplier of air distribution equipment, including iris and constant volume dampers, VAV systems, kitchen canopies, displacement ventilation, ventilated cooled beams, grilles and diffusers.

Kent Tooling and Components Ltd
Windgates, Church Lane, Waltham
Canterbury, Kent CT4 5SS
Tel 01227 700015 Fax
kent_tooling@btinternet.com www.divingproducts.co.uk
Manufacturer/Distributor of Tri-Pro combined volume control/smoke/fire dampers

Konvekta Ltd
Helmcroft House, Knowsley Road Industrial Estate, Haslingden
Rossendale, Lancashire BB4 4RX
Tel 01706 227018 Fax 01706 831124
sales@konvekta.co.uk www.konvekta.co.uk
Manufacturers of air distribution equipment

Krantz Systems
6l - 67 Rectory Road
Wivenhoe, Essex CO7 9ES
Tel 01206 827171 Fax 01206 826936
rs@krantz.uk.com www.krantz.uk.com
Air diffusion equipment covering ceiling, wall and floor air outlets and cool ceilings and beams.

Lennox Industries Ltd
Cornwell Business Park, Salthouse Road
Brackmills, Northampton NN4 7EA
Tel 01604 669100 Fax 01604 669150
ann.howard@lennoxind.com www.lennox.com
Manufacturer and supplier of heating, ventilation and air conditioning equipment for comfort and close control applications.

Marstair Ltd
Armytage Road
Brighouse, West Yorkshire HD6 1QF
Tel 01484 405600 Fax 01484 405620
info@marstair.com www.marstair.com
Manufacturer of Marstair (direct expansion) split systems and Airking (chilled water) fan coil units, chilled water cassettes and active chilled beams. The product range also includes: close control units, cellar coolers, a heat pump ventilation unit and Chillers (6 - 1100kW).

NACO (Ruskin Air Management Ltd)
Stourbridge Road
Bridgnorth, Shropshire WV15 5BB
Tel. 01746 761921 fax. 01746 766450
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Manufacturers of louvres.

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Manufacturers and suppliers of energy efficient ventilation, smoke ventilation and air handling equipment, for all domestic, commercial and industrial applications.

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Tel 0208 645 9993 Fax 0208 645 9994
phoenix@commtechgroup.co.uk www.commtechgroup.co.uk
Design and installation of chilled beams and ceilings

Ray Hudson Ltd T/A RHL
43 Suttons Business Park, Suttons Park Avenue
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Tel 0118 966 5055 Fax 0118 966 1655
sales@rhldirect.com www.rhldirect.com
Ray Hudon Limited T/A RHL is an independent fan manufacturer founded by Ray and Rosemary Hudson in 1995.

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Heathpark,
Honiton, Devon EX14 1SP
Tel 01404 41651 Fax 01404 46227
sales@royair.co.uk www.royair.co.uk
Manufacturers of grilles and diffuser products.

S & P Coil Products Ltd
S.P.C. House, Evington Valley Road
Leciester LE5 5LU
Tel 01162 490044 Fax 01162 490033
spc@spcoils.co.uk www.spcoils.co.uk
Manufacturer of heat exchangers and heating and cooling products.

SAS International
27/28 Suttons Business Park, London Road
Reading, Berkshire RG6 1AZ
Tel 0118 929 0900 Fax 0118 926 8831
sasint@compuserve.com www.sasint.co.uk
Manufacturer of chilled beams and ceilings.

Solid Air UK Ltd
The Graftons, Stamford New Road
Altrincham, Manchester WA14 1DQ
Tel 0161 929 3939 Fax 0161 929 3938
mail@solid-air-ltd.co.uk www.solid-air.com
Ventilation products (Grilles, Diffusers, Displacement, VAV, Louvres, Dampers, Chilled Beams

Stifab Farex
Essex House, Astra Centre, Edinburgh Way,
Harlow, Essex CM20 2BN
Tel 01279 416077 Fax 01279 416076
farexuk@aol.com farexuk@aol.com; www.stifarex.se
Active and passive chilled beams.

Trox (U.K.) Ltd
Caxton Way
Thetford, Norfolk IP24 3SQ
Tel 01842 754545 Fax 01842 763051
trox@troxuk.co.uk www.troxuk.co.uk
Manufacturers of air conditioning, air filtration and noise control products and systems for VAV, fan coils, multi service beams, IT cooling and laboratory control. Offices in Manchester, Glasgow, Bristol, London and Birmingham.

Vectaire Ltd
Lincoln Road
Cressex Business Park
High Wycombe, Buckinghamshire HP12 3RH
Tel 01494 522333 Fax 01494 522337
sales@vectaire.co.uk www.vectaire.co.uk
Manufactures full range of fans and emergency extract systems

Vent-Axia Ltd
Fleming Way
Crawley, West Sussex RH10 9YX
Tel 01293 526062 Fax 01293 612143
info@vent-axia.com www.vent-axia.com
Manufacturer of fans, ventilation accessories, heating, heat recovery and air conditioning products as well as a full range of products for the hygiene market.

York International Ltd

Gardiners Lane South
Basildon, Essex SS14 3HE
Tel 01268 246000 Fax 01268 246001
ian.lilley@uk.york.com www.york.com
Manufacture, sale and service of refrigeration and air conditioning equipment.

Waterloo Air Products plc

Unit A, 111 Mills Road, Quarrywood Estate, Aylesford
Maidstone, Kent ME20 7NB
Tel 01622 717861 Fax 01622 710648
sales@waterloo.co.uk www.waterloo.co.uk
Producers of Grilles, Diffusers, Louvres, VAV and Chilled Beams.

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