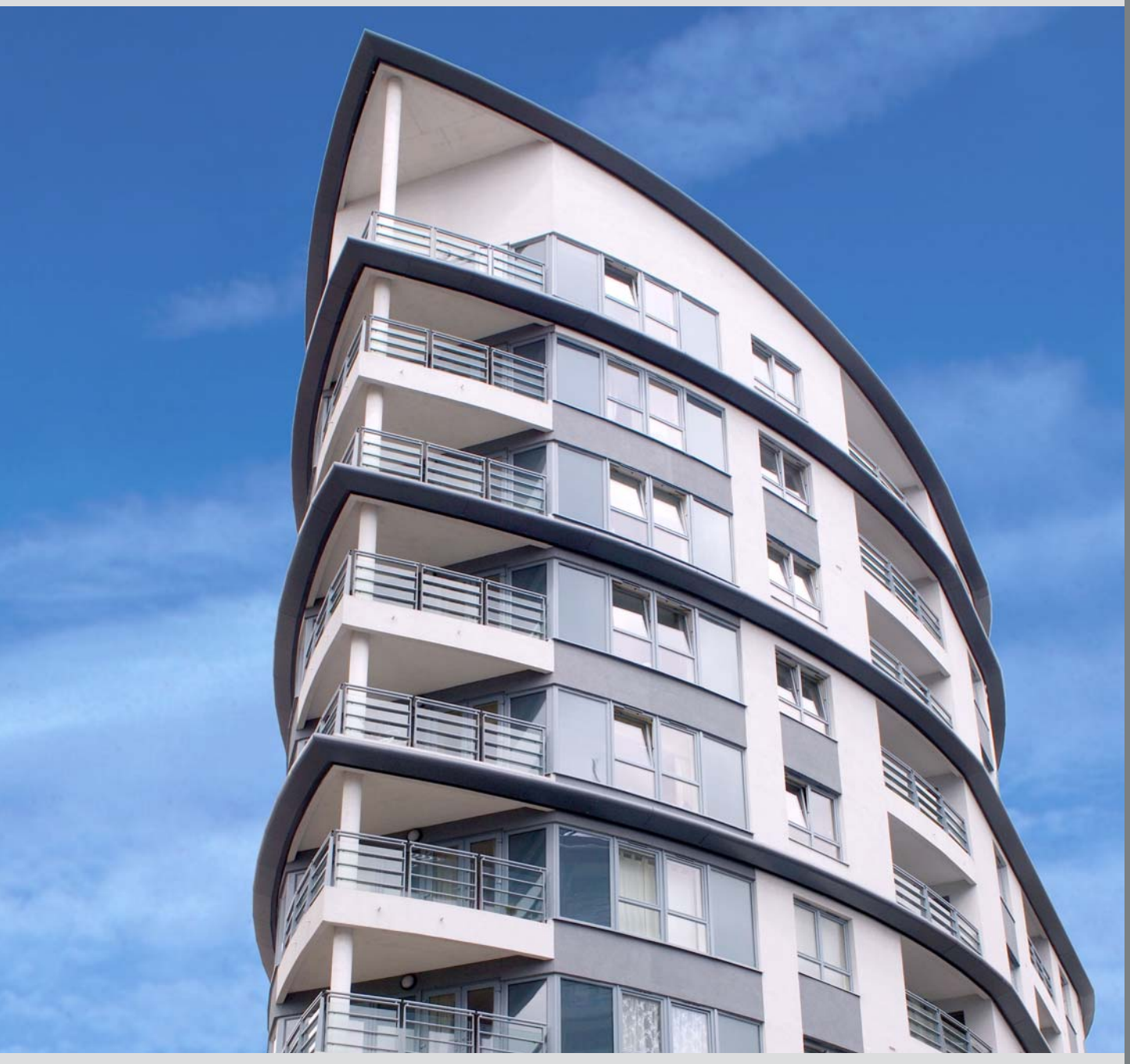
COLT

CI/SfB Classification

816	(57.6)	X	(K5)

Smoke Control

Smoke Control in Apartments and Fire Fighting Shafts



Introduction

Front Cover: The Centrium, Woking. Developer: Barratt Homes.
Colt Doorman actuators installed into smoke shafts with
Colt Seefire ventilators at the top of the shafts.

INTRODUCTION

This brochure is intended to provide an understanding of how smoke control systems can protect multi-storey residential buildings and what the legislative framework is.

Why provide smoke control in apartment buildings?

- In multi-storey apartment buildings, the main escape route is always via common corridors and/or lobbies to protected stairs.
- Smoke can easily spread from the accommodation, and if a door is simply left open for a short period of time quickly fill a corridor or lobby, making escape difficult for occupants.
- Smoke entering the stairs can also make escape difficult for occupants of higher storeys.
- In taller buildings the fire and rescue services need clear access to stairs and lobbies to form a bridgehead for operations, using a fire fighting shaft which is protected from smoke.

Legislation and standards

The legislative requirements derive from the Building Regulations for England and Wales (2000). Detailed recommendations to meet these requirements are provided in Approved Document B (ADB) 2006. Please note that the Building Regulations for Scotland and Northern Ireland vary in some details.

For apartment buildings, the most up to date guidance is contained within ADB. Smoke control systems are required to be designed for the means of escape (MOE) of the occupants. See pages 4 to 5 of this leaflet.

Furthermore, there is a requirement for most types of building above 18m to contain a fire-fighting core with at least one fire-fighting lift. This also applies in basements more than 10m deep. Fire-fighting cores without a lift are required where there are 2 or more basements each exceeding 900 m^2. The most relevant standard is BS 5588 -5: 2004: Access and facilities for fire-fighting. See page 6 of this leaflet.

These two approaches are explained in the following pages.

The design approaches

The design approach depends largely upon the building layout.

Openable ventilators or windows (OVs) or automatically opening ventilators (AOVs) may be used to evacuate smoke where common stairs, corridors or lobbies extend to external walls.

Where corridors or lobbies are enclosed, ventilation shafts with dampers or fire doors and natural or powered ventilators may be used to evacuate smoke.

Pressurisation systems are an alternative method that protect escape routes and fire-fighting cores against the ingress of smoke by maintaining the pressure within the escape route at a higher pressure than that in the adjacent spaces. See pages 18 to 19 of this leaflet.

1 The Postbox Apartments, Birmingham.
Window actuators, smoke dampers, stairwell ventilators, car park ventilation.

2 The Centrium, Woking. (as above).

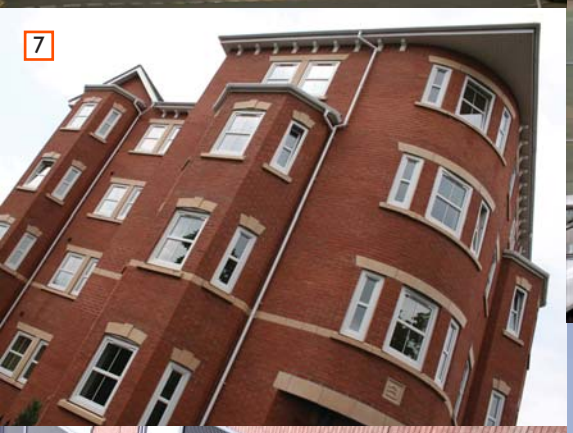
3 Castlegate House, Manchester.
Doorman door actuators, stairwell ventilators.

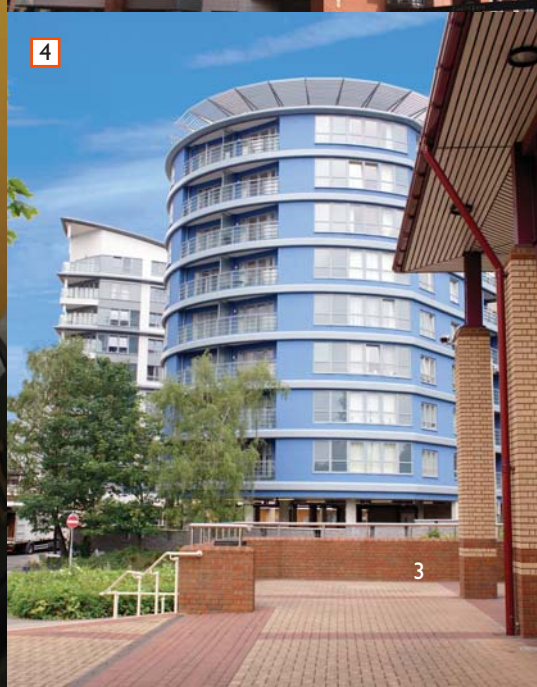
4 The Centrium, Woking. (as above).

5 Bridgewater Place, Manchester.
Doorman door actuators, stairwell ventilators.

6 Mount Pleasant, Liverpool.
Window actuators, stairwell ventilators.

7 Hardy's Development, Manchester
Doorman door actuators, stairwell ventilators.





Smoke Control for Means of Escape (MOE) in apartment buildings

MEANS OF ESCAPE

Approved Document B (2006) (ADB) accepts that, in the event of a fire in an apartment, some smoke will spread from the apartment into the corridor as the occupants make their escape. Consequently, it is a requirement that any corridor or lobby that opens into a staircase has ventilation to allow that smoke to be removed and, most importantly, to prevent that smoke from getting into the staircase.

Small single stair buildings
If the building is under 11m high, has no more than 3 storeys and the staircase does not connect to a covered car park, then only a stairwell ventilator is required, provided that the escape distances are limited to 4.5m in the corridor. If the corridor is also ventilated, then escape distances can be extended up to 7.5m.

All other apartment buildings
In all other apartment buildings, the travel distances are limited to 7.5m in one direction and 30m if escape is in two directions, and any corridor or lobby that opens onto a staircase should be ventilated.

If the corridor has outside walls, as in Figure A, then an AOV is a suitable means of ventilation, with a minimum free area of 1.5m^2.

If the corridor is landlocked as shown in Figures B or C then a shaft system will be required. This can be either natural or mechanical.

KEY TO ALL FIGURES

- Stairwell Ventilator
- AOV
- Self Closing Fire Door
- Smoke Shaft
- Apartment
- Corridor/Lobby
- Smoke Damper

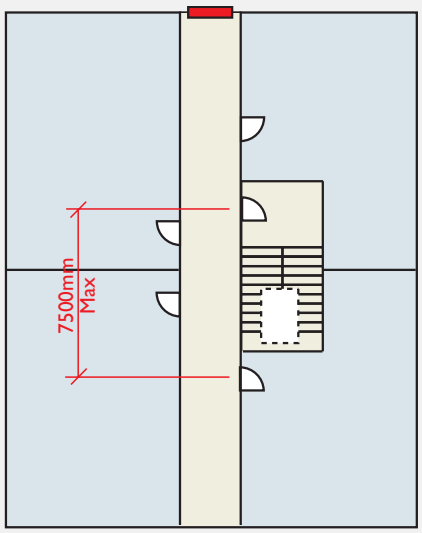


Figure A

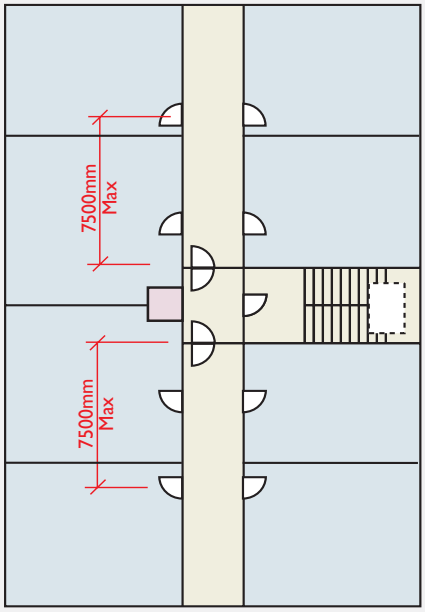


Figure B

If natural ventilation is used, ADB recommends that the shaft:

- Is closed at the base
- Has a minimum cross-sectional area of 1.5m² with a minimum dimension of 0.85m in either direction
- Extends at least 0.5m above the highest structure within 2m
- Extends 2.5m above the ceiling of the highest level served by the shaft
- Should be constructed from non-combustible material and the vents to be equivalent to an E30S fire door
- Should be vertical with no more than 4m at an inclined angle (max 30°).

The vent into the shaft, the vent at the top of the shaft and any safety grilles in the shaft should all have a minimum free area of 1.0m².

Alternatively, mechanical ventilation or pressurisation may be used.

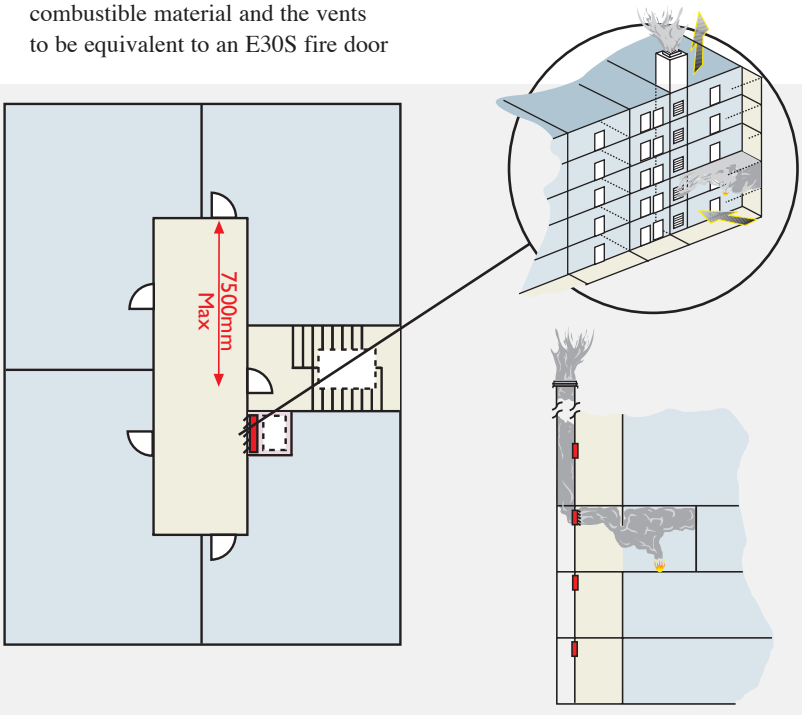


Figure C

OPERATION

If the building has only one escape stair, the system must be linked to an automatic detection system.

On detection of smoke in the corridor, the vent on the fire floor, at the top of the shaft and the top of the stair should all open simultaneously, and vents on all other levels should remain closed.

If the building has more than one escape stair, the ventilators can be operated manually but operation of the shaft ventilators and the stair vent must still be simultaneous.

Smoke Control for Fire-Fighting Cores

Fire-fighting cores provide smoke free access to the upper floors of a building and allow the fire fighters to attack the fire from a position of relative safety.

Fire-fighting cores include the following elements:

- A protected staircase
- A protected lobby
- A fire-fighting lift (not for shallow basements)

Note that for apartment buildings the protected lobby is not necessary and a normal protected corridor will suffice.

See figure D for a typical fire-fighting core layout.

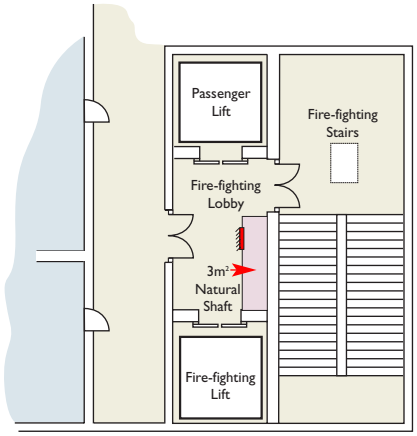


Figure D

Where an outside wall is adjacent to stairs and lobbies:

- A 1m² OV is required to each lobby.
- A 1m² OV is required to the stairs at each storey or a 1.5m² remote operated OV at the head of the stairs.

Where an outside wall is not available:

A vertical shaft system is usually used to ventilate the lobbies, consisting of either a conventional shaft, a BRE shaft or a mechanical shaft design.

A vent is also required at the head of the stairs; its type and size is dependent upon the type of shaft used to ventilate the lobbies.

The standard shaft

The standard smoke shaft as recommended in BS 5588 Part 5: 2004 comprises a shaft with a minimum cross sectional area of 3m². The shaft is terminated with an AOV to provide weather proofing when closed. At the bottom the shaft is open, or has an automatically opening ventilator or fire damper to the outside with a minimum free area of 1.5m².

At each storey an automatically controlled fire rated smoke damper or fire door is connected from high level in the lobby to the shaft, providing an air flow path from the lobby to the shaft. Each damper or door has a minimum free area of 1.5m².

Neville House, London.
Dampers, architectural grilles, stairwell ventilators, car park ventilation.

In automatic mode, the system is activated by the building fire detection system or a dedicated fire detection system incorporating smoke detectors in the accommodation adjacent to each door into the fire fighting core and supplied as part of the ventilation system. The detection system has the capability of distinguishing on which storey the fire occurs and providing a dedicated output for each storey. A break glass switch is also provided in the lobby on each storey for manual activation.

Under fire conditions the damper or door on the fire floor as well as the AOV open. The dampers or doors on all other storeys remain closed. The stair is ventilated by either a 1m² OV at each storey or a 1.5m² remote operated OV at the head.

The BRE shaft

In 2002 BRE introduced the BRE shaft as a simpler and better means of ventilating fire fighting stairs and lobbies in commercial buildings. This has now become the normal method for ventilating enclosed lobbies.

The requirement is for a 3m cross section shaft with a ventilator at the top and 1.5m² dampers to each lobby, and there is no requirement for inlet air at ground level. Automatic ventilation is required to the stairs with the BRE shaft, comprising a 1m² AOV at the head of the stairs. The recently updated BS 5588-5 now mentions the BRE smoke shaft as an alternative form of ventilation.

However it still requires a 3m² shaft area, space that can be difficult or expensive to find. Colt has therefore developed the Colt shaft.

The Colt Shaft

THE COLT SHAFT

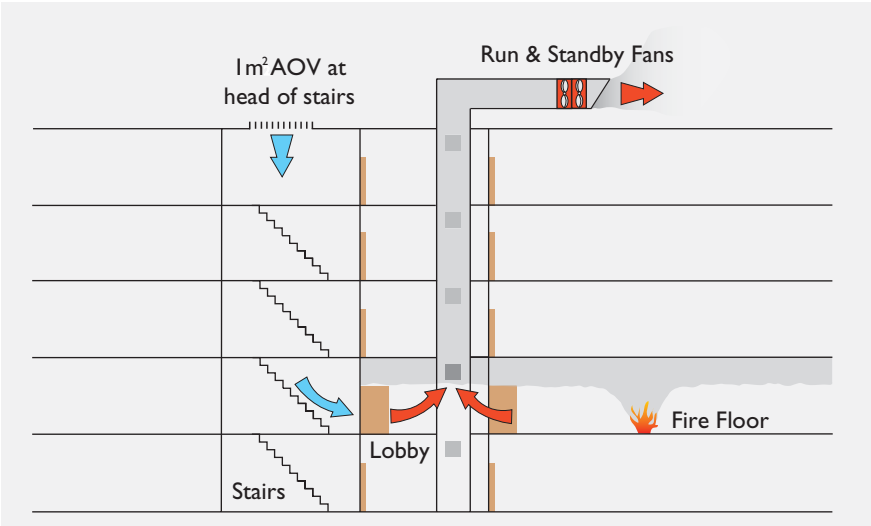
What is the Colt shaft?

The Colt shaft is a mechanical shaft system which provides equivalent performance to a BRE shaft for the ventilation of fire fighting lobbies. It can therefore be considered an equivalent to the recommendations of Approved Document B and BS 5588-5:2004 for ventilation of fire fighting shafts.

This shaft performs as well as or better than the BRE shaft and requires only 20% of the shaft area.

The Colt Shaft, which is suitable for use in any fire-fighting core, requires a shaft of only 0.6m² compared with 3m² for the BRE shaft. This represents an 80 per cent reduction in the floor space required. It opens up the space on each floor, which allows architects to be more creative in their design, and improves the saleable or lettable space in commercial buildings for the client. This in turn increases the profits for developers and the income for landlords of commercial buildings, and permits more usable space.

Automatic ventilation is required to the stairs, comprising a 1m² AOV at the head of the stairs.



The Colt shaft in detail

The Colt shaft incorporates duty and standby variable speed extract fans with a Seefire duct termination, linked to a pressure sensor via the control panel.

The Colt Shaft solves two common problems associated with mechanical extraction. Firstly, since the lobby is fire rated, the area of ventilation into it is usually small so even a small amount of extract will cause a high negative pressure in the lobby, which could make doors difficult to open. Secondly, negative pressure could cause smoke to be drawn into the lobby from the fire compartment, with devastating effect.

However, the Colt Shaft avoids excessive negative pressures without compromising the integrity of the stairs and lobby by automatically reducing the ventilation rate when the lobby doors are closed. It does this via a pressure sensor linked into the control system that varies the fan speed. With all doors open, the fan runs at full speed to extract smoke discharging from the accommodation. With all doors closed, the fan runs at minimum speed to help mop up any smoke leaking past the closed door. In intermediate conditions, the fan speed modulates to ensure adequate ventilation without excessive depressurisation.

Extended Corridor

Colt has conducted a series of smoke tests which demonstrate that the Colt Shaft can perform to an equivalent standard as a standard 3m² BRE Shaft when this is fitted in the same situation. The tests also showed that the system reacts quickly to pressure changes, smoke clears quickly from the lobby when the accommodation or stair doors are opened, and the lobby is kept clear of smoke once the accommodation door is closed.

With the door to the accommodation closed, a typical 5m² lobby will clear totally within 15 to 20 seconds of opening the stair door.

Please contact Colt to obtain a copy of the short report describing these tests. A video is also available for demonstration at a client's office, and it can also be viewed at www.coltinfo.co.uk.

COLT EXTENDED CORRIDOR SYSTEM

A further development of the Colt Shaft is the Extended Corridor System, which can extend travel distances in means-of-escape corridors. Please see datasheet PD 65: 02/07 for further details.

WHY USE COLT?

Colt is able to provide a all the equipment necessary for smoke control of apartment buildings: OVs, AOVs, the Colt Shaft, smoke dampers, smoke door and window actuators, smoke detectors, breakglass switches, and manual and automatic controls. This equipment is described on the following pages.

All systems may be completely designed, supplied and installed inclusive of wiring and fully commissioned by Colt, with the advantage that all the components are contained within one package of works.

Calculation of Minimum Free Area for Apartment Ventilators

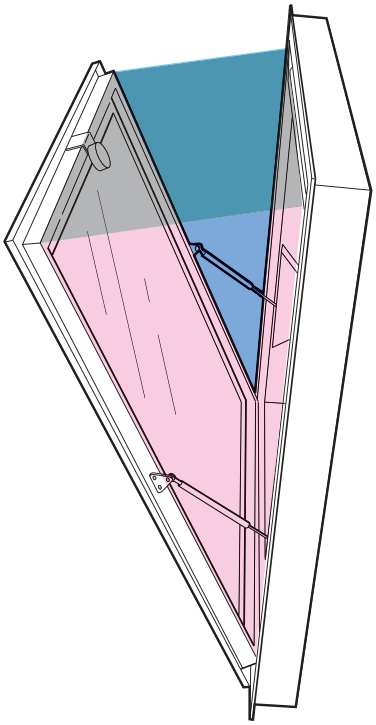


Fig A

Prior to the latest edition of ADB, there was no defined method of measuring the free area of an AOV. As a result the common practice was to provide a bottom hung casement ventilator and sizing it so that the aggregate of the two side sections and the top opening resulted in a total of 1.5m² as shown above. The plan area of the ventilator would also have to exceed 1.5m².

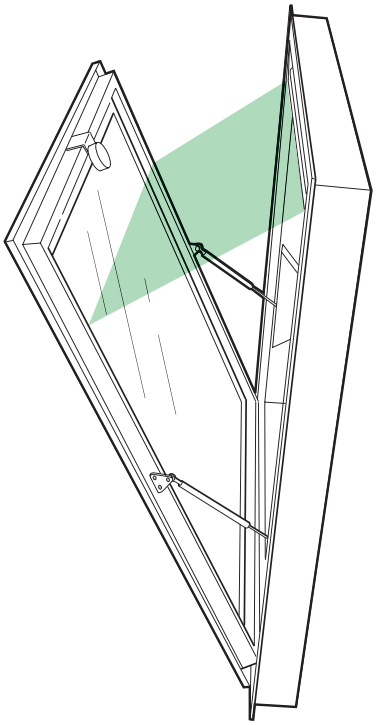


Fig B

Under the new Approved Document B, however, the way AOV's are measured has changed with the definition of 'minimum free area'. If using a casement ventilator, the side openings sections are no longer taken into account and the top section is measured at 90° to the casement. As a result, a 1.5m wide (throat) ventilator opening to an angle of 30° needs to have a throat height of 2.0m to achieve the required area. Obviously, this results in a much larger ventilator than the previous method and in a lot of instances, this may prove impractical.

Fig A - Prior to 2006 Edition of ADB

1.5m² achieved as an aggregate area.

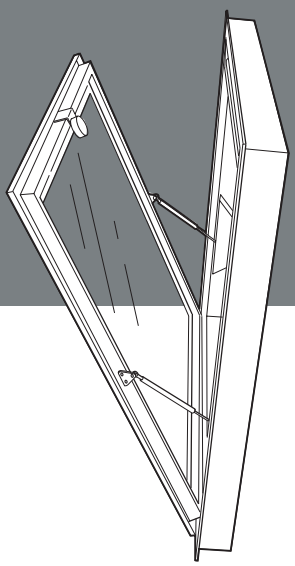
Total area = + + = 1.5m²

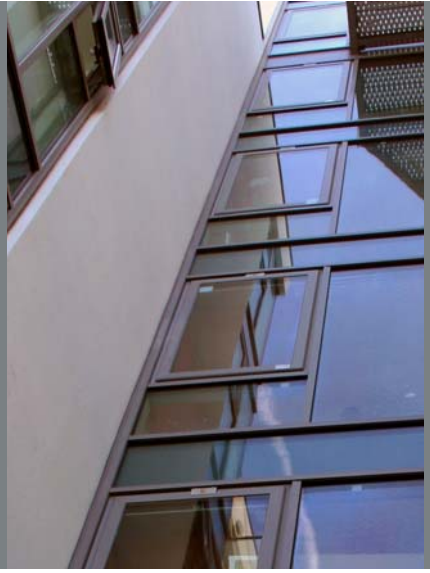
Fig B - As per current version of ADB

1.5m² can only be achieved via open area at 90° to the casement.

Total area = = 1.5m²

Kameleon Ventilator





Kent St, Liverpool.
Kameleons.

Application

Colt Kameleon is an AOV (automatic opening) ventilator designed to ventilate corridors and stairwells in the event of a fire.

General description
Kameleon is a natural casement ventilator, available in a wide range of sizes, flap options and control options. It may be installed into glazing systems or other types of walling systems, and can provide both day to day and smoke ventilation, into the vertical only. It may be either top or bottom hung.

Kameleon has been tested to EN 12101-2 (2003), and is CE marked as a smoke and heat ventilator. Kameleon is manufactured to the ISO 9000 quality standard.

Construction
All principal base components are manufactured from aluminium alloy type 6063 T6 and the frame is thermally broken.

Versions

- 8mm, 10mm single glazed clear glass unit
- 20mm, or 28mm double-glazed clear glass unit
- Double skin aluminium with infill material.

Controls
Controls are either 24v dc or 230v ac electric, power to open and close. The controls mechanisms are concealed.

Dimensions
Flap sizes are from 400mm wide/high to 2000mm wide/high. The maximum dimensions depend on the type of panel, the ventilator geometry and the angle of inclination. To calculate the overall ventilator sizes, add 60mm to the flap widths and/or heights (the width of the frame is 30mm all round). Its opening angle is approx 50º.

Finishes
Kameleon is available mill finish, polyester powder coated to a RAL colour, or anodised.

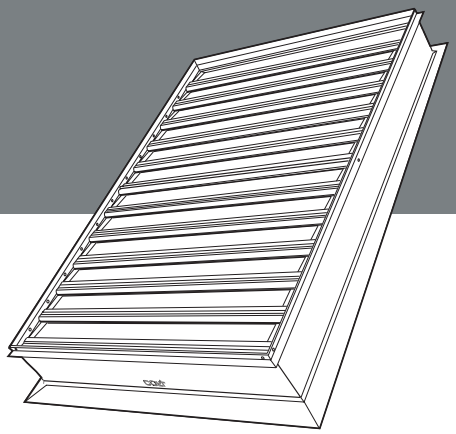
Installation
The ventilator is designed for installation at an angle of 90° to the horizontal plane, into fully drained glazing systems or structural openings.

Performance

The performance of Kameleon varies depending on the exact configuration.

In the best situation, Kameleon can be designed to provide a complete ventilator U value as good as 1.8 W/m^2/K, an air permeability of 0.7 m^2/h/m at 100 Pa (Class 4 to EN 12207), and weather resistance of class 9a (to EN 12208). Typically Kameleon has a coefficient value (Cv) of 0.60. Please see www.coltinfo.co.uk for the specification.

EN Stairwell Ventilator



APPLICATION

Please refer to Figures A, B, C and D on pages 4 and 5.

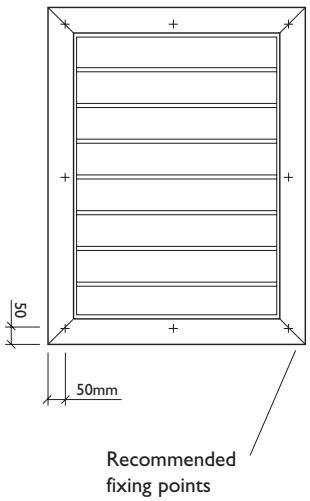
THE PRODUCT

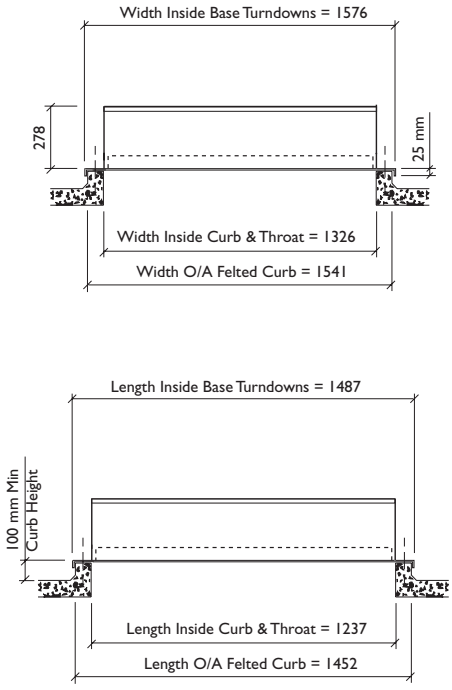
The EN Stairwell ventilator is a low profile, roof or wall mounted louvred natural ventilator which is designed to provide heat and smoke exhaust ventilation in protected stairwells and corridors within residential apartments, hotels, shops and offices.

It is principally applied to protect means of escape for occupants, who would otherwise remain trapped inside the premises, and to create a safe means of access for fire fighters.

The example illustrated has a free area of 1.13m^2.

The EN Stairwell ventilator can be installed either vertically or horizontally, and is equally as effective as a corridor ventilator.





CERTIFICATION

The EN Stairwell ventilator can be used for applications in BS 5588 Parts 1,5 & 6. It failsafes to open on loss of power, and is CE marked in compliance with EN 12101-2.

OPTIONAL EXTRAS

- Paint finish to any RAL colour
- Burglar guard
- Break glass switch
- Battery back-up unit
- Bird guard, Insect guard
- Firemans override switch
- Alternative base details

CONTROLS

Stairwell ventilators should be controlled by clearly visible manual switches at the top of the stairwell and close to the final exit from the stairwell. The optional break glass switch or firemans override switch are recommended for this.

SPECIFICATION

Product Reference
Colt EN Stairwell Ventilator

Description
Clear opening louvred natural extract ventilator, suitable for installation at any angle from vertical to horizontal. CE marked in compliance with EN 12101-2. The ventilator shall have an open area of at least 1.0m^2 in accordance with the requirements of Approved Document B to the Building Regulations and BS 5588.

Operation
The ventilator shall open on loss of power, either 240V ac or 24V dc, and shall close automatically when power is reinstated. Operated by a manual break glass switch or fireman's override switch. Switches shall be located at the head of the stairs and at the final exit from the stairs. To avoid the ventilator opening in the case of a power failure, a maintained supply or a battery backup system capable of keeping the ventilator closed for at least 30 minutes is required. The mains supply (by others) shall terminate [select] in the protected stairwell / close to the battery backup panel.

Material
All principal components manufactured from corrosion resistant aluminium alloy grade 3005 in accordance with EN 573-3, with stainless steel fixings.

Louvre blades
Single skin aluminium/ Insulated double skin aluminium / Twin wall opaque or clear polycarbonate / Single skin laminated or toughened glass. Fitted with low-loss seals to minimise air leakage when closed.

Controls
24v dc or 230v ac OPV addressable electronic, failsafe open. Thermal release at the ventilator for added security.

Guards
Factory fitted Bird guard / Insect guard / Security guard / Burglar guard.

Finish
Mill finish Aluminium/ Polyester Powder Paint Finish/ PVF2.

Defender Smoke & Fire Dampers

DEFENDER 1 SMOKE DAMPER

The Colt Defender 1 is an addressable motorised smoke shaft or fire damper that allows the passage of smoke from corridors, lobbies and stairwells into smoke shafts. It is ideal for residential shaft applications.

In the event of a fire, the Colt OPV panel operates the Defender fire / smoke damper on the specific fire floor in conjunction with the roof mounted ventilator at the top of that shaft, allowing smoke to pass from the fire floor into the smoke shaft. The other dampers on the floors above and below will remain closed, so as not to allow any leakage of smoke or fire spread onto the other floors. When all clear the fire damper will be closed by the motor. It is recommended that 24 volt dc motors be used, since this will allow a simple battery back up system to be incorporated.

FEATURES AND BENEFITS:

- Robust 1.5mm galvanised steel construction
- Wide range of sizes and controls options
- Low leakage rate
- High free area
- Wide range of optional decorative fascia grilles
- Exhaustively tested
- Sleeved option with motor at the front avoiding need to access the shaft for maintenance.

For further details, please see leaflet PD 66: 02/08.

DEFENDER 2 FIRE DAMPER

The Colt Defender 2 is a motorised fire damper suitable for use in all types of HVAC ductwork. It has been designed to prevent the passage of fire from one area to another.

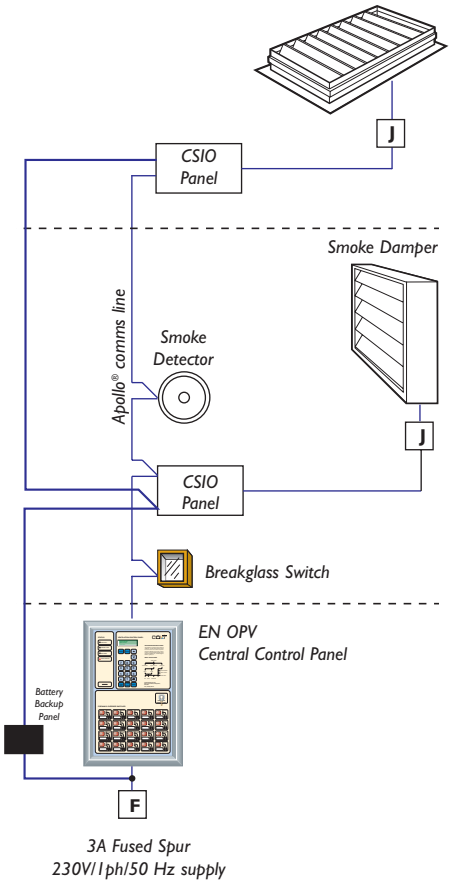
Defender 2 is operated by the fire detection system, with the additional back-up of a thermal link which closes the damper at a pre-determined temperature. In the event of a fire, the Colt OPV panel closes the Defender in the specific duct. When all clear the damper will motor open. It is recommended that 24 volt dc motors be used, since this will allow a simple battery back up system to be incorporated.

FEATURES AND BENEFITS:

- Stainless steel interlocking blades and frame side seals, Class C airtight to DW 144
- Wide range of sizes and controls options
- Precision blade linkage mechanism
- High free area
- Wide range of optional decorative fascia grilles
- Tested and approved to BS 476 Part 20, providing a four hour fire rating
- A successful 50,000 lifecycle test with damper fully operational at the test conclusion.

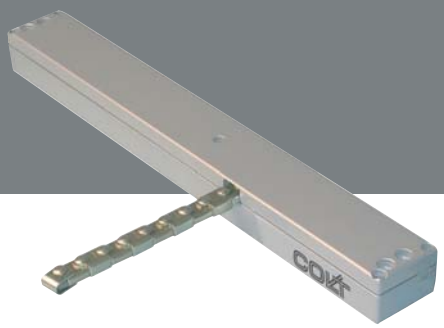
For further details, please see leaflet PD 66: 02/08.

TYPICAL CONTROLS CONFIGURATION



Doorman Door Actuator and Window Actuators

Colt Doorman installed onto a fire door. View from inside the shaft.



Colt can provide a wide range of window actuators for use when windows are to be operated as part of a Smoke Control System.

DOORMAN SMOKE DOOR ACTUATOR

The Colt Doorman is an addressable smoke shaft door operator. It controls the movement of doors when they are used as part of a smoke control scheme, allowing the passage of smoke from corridors and lobbies into smoke shafts, as an alternative to a smoke damper.

The Doorman consists of individually addressable and controllable door actuation systems linked to the fire alarm system via a Colt OPV system. Each Doorman includes the door operator, and communication module, and it is all packaged to allow easy installation on site.

During normal, non-fire conditions, the system is in its monitoring mode. In the event of a fire, the Colt OPV panel operates the Doorman Door Operator on the specific fire floor in conjunction with the roof mounted ventilator at the top of that shaft allowing smoke to be extracted from the fire floor.

FEATURES AND BENEFITS

- Robust mechanism ensures doors stay locked when not in use but open when required
- Modular design allows ease of installation and flexibility in location of components. Supplied completely assembled, and simple installation onto rear face of door
- One standard size for all doors - 790mm wide (door height would then need to be 2150mm to meet Approved Document B)
- A ‘Colt Shaft’ option allows for the narrower doors that are used on these systems, suitable for doors 600mm wide and above
- Exhaustively tested in-house
- 230v ac and 24v dc options.

Colt offers a complete install, wire and commissioning service, thus all the components are contained within one package of works and under one company’s responsibility.

SPECIFICATION

Addressable smoke shaft door operator for smoke ventilation from corridors, lobbies and stairwells into smoke shafts. Designed to allow the passage of smoke from such areas into smoke shafts, by opening the shaft door(s) on the fire floor and keeping any shaft doors on the non fire floor(s) closed.

Each unit individually addressable and controllable, and able to communicate back to a central panel. Each operator includes actuator, communication module, local reset switch and adjustable fixing brackets which allow release of the mechanism from the corridor if necessary. (Front fix option only).

Designed to be installed onto the back of a certified fire door of a minimum 790mm width. It is suitable for fire doors requiring up to 30 Nm opening and closing torque, as Certifire Technical Schedule TS 21: Smoke Door Seals.

Actuator tested and has successfully completed 10,000 operations at full design load.

Incorporating a 230 V ac / 24 V dc electric chain drive motor. Suitable for use where a maintained mains electrical supply is installed in the building.

1 Discovery Dock, London.
Doorman door actuators, stairwell ventilators.

2 Holy Cross Apartments, Liverpool.
Doorman door actuators, stairwell ventilators, car park ventilation.

3 Holliday Wharf, Birmingham.
Doorman door actuators, stairwell ventilators.

Pressurisation Systems

West India Quay, London.

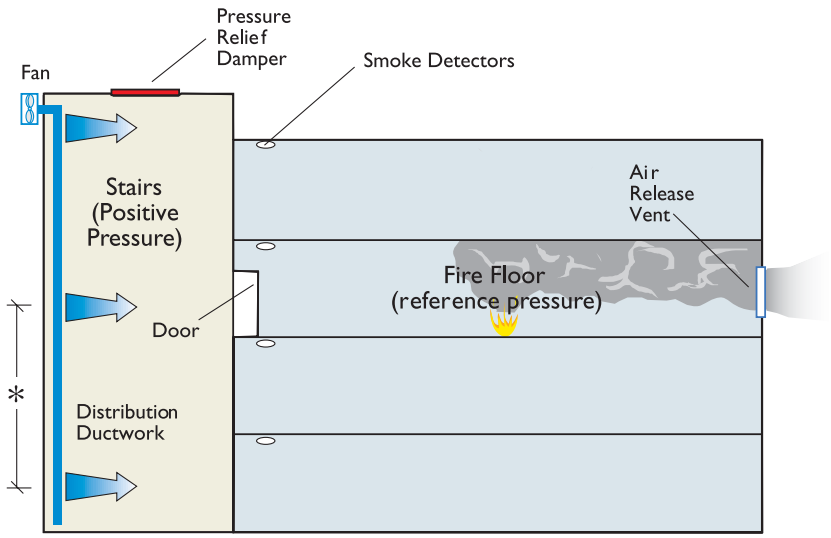
PRESSURISATION SYSTEMS

Pressurisation systems protect escape routes and fire-fighting shafts against the ingress of smoke by maintaining the pressure within the escape route higher than that in the adjacent spaces.

A pressurisation system consists of three main components: Supply Air (where air is injected into the area that is to be protected), Pressure Relief (to avoid overpressure when doors are closed) and Air Release (air and smoke is released from the adjoining fire area). Combining these elements creates a positive pressure difference which prevents lobbies and staircases from filling up with smoke.

Pressurisation systems should meet the recommendations of Approved Document B and BS EN 12101-6 “Specification for Pressure Differential Systems” or BS 5588-4 - “Code of practice for smoke control using pressure differentials”.

In commercial buildings pressurisation is normally carried through up to the final door to the accommodation, with air release provided from the accommodation. In apartment buildings it is usually impractical to carry pressurisation up to each apartment door due to the difficulty of providing air release from each apartment. Therefore stairs and lobbies are usually pressurised with air release from the corridor.



** One outlet at a maximum of every 3 storeys*

Beetham Tower
Birmingham

THE SYSTEM COMPRISES

- Inlet Fans for introducing air into the designated area. The run and standby fans and control equipment should be housed in a separate plant room or outdoors and the inlet should be protected from smoke. Dual inlets with automatic smoke dampers are required for high level inlet.
- Ductwork and Outlet Grilles, to provide distribution of air exactly where it is needed.
- Pressure Relief Dampers, to release excess air in the closed door condition from the stair area. This should be ducted to discharge directly to atmosphere independent of the wind direction. Damper blades are set to start opening at 50 Pa pressure differential.
- Automatic air release to prevent unwanted pressure build up in the adjacent spaces. This may be automatic vents, natural shafts or mechanical extract systems.

The control system should operate automatically from the smoke detection system with a manual on/off switch also provided within either the pressurisation plant room, near the building entrance (to suit fire service), or within the central building services control room.

SYSTEM REQUIREMENTS

There are two requirements to maintain within a pressurisation system. These are:

- Maintaining a pressure difference for a closed door condition. Here the pressure difference is required to overcome buoyancy pressure generated by the hot smoke layer, expansion of the gases in the compartment due to heating, stack pressure and wind pressure
- Maintaining a velocity for an open door condition. Here maintaining a velocity for an opened door is required to hold back the smoke on the fire floor when the door onto the fire floor is open.

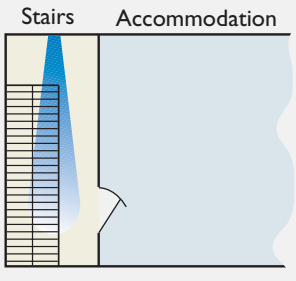
Getting the right balance for a pressurisation system needs careful design in order for the system to work effectively. Insufficient pressure difference across a closed door will allow the passage of smoke into the protected space. Excess pressure will impede door opening and hence escape.

DESIGN METHODOLOGY

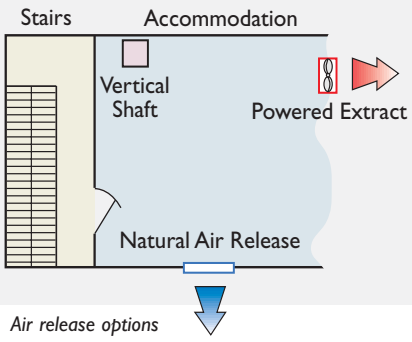
- Assess the usage and layout of the building, the area to be pressurised and the class of system required.
- Assess the leakage paths (through doors, lifts, vents).
- Calculate the required volume flow rates.
- Calculate the area of pressure relief dampers.
- Calculate the area of air release ventilation.

Colt can assist with the design of pressurisation schemes.

Colt offers a free technical design service on all projects undertaken. Please contact Colt for further information.



Supply air example



Air release options

THE COLT PACKAGE

Colt International offers the following services:

- Scheme design of all types of Smoke and Heat Exhaust Ventilation Systems (SHEVS)
- Scheme design of pressurisation systems
- Scheme design of smoke containment systems
- Provision of performance specifications
- Project management
- Supply, installation, commissioning and maintenance of systems, including all necessary controls, which will be designed to interface with others' control systems.

A free full system check will be carried out approximately 9 months after a Smoke Control System has been installed and commissioned by Colt. Besides the opportunity to check that the system is performing as designed, this will allow for any further training of local personnel that may be necessary. Assuming that this visit falls within the warranty period, any defective parts are replaced free of charge. A test certificate will be issued.

Other reasons to choose Colt:

- Colt Smoke Control systems are suited to both commercial and industrial buildings, and may be adapted to suit most architectural requirements.
- Over the years Colt has funded a large proportion of the research into smoke control, and its representatives maintain an unparalleled level of technical expertise.
- Colt's in-house research and development capability ensures that Colt smoke control systems are designed, tested and updated by Colt to meet or exceed relevant legislation and standards.
- The majority of Colt's Smoke Control systems are manufactured in the UK under BS EN ISO 9001:2000 and BS EN ISO 14001:2004. They are also CE marked, where relevant, in compliance with EN 12101-2.

COLT SERVICE

Part of the Colt Group of companies, Colt Service offers a comprehensive range of maintenance packages incorporating the maintenance and repair of all building services equipment including non Colt products.

Colt Service provides a 24 hour, 365 day emergency cover as standard.

MAINTENANCE

Maintenance of a smoke control system is essential. Regular maintenance protects your investment and brings peace of mind that the system will operate effectively in an emergency.

The British Standard, BS 5588-12: 2004 recommends that smoke control systems should be serviced at least once a year and tested weekly.

CPD MEMBER
Construction CPD Certification Service

"People feel better in Colt conditions"

80th ANNIVERSARY 1931-2011

Architectural Solutions
Climate Control
Smoke Control
Service and Maintenance

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