
Guide to Surveying High Rise Residential Smoke Control Systems

SMOKE CONTROL SYSTEMS PROTECTING THE COMMON ESCAPE ROUTES FROM HIGHER RISK RESIDENTIAL BUILDINGS (HRRBS)



Scope

Smoke control systems protecting the common escape routes from Higher Risk Residential Buildings (HRRBs).

Relevant standards

The primary objective is to meet the requirements of the Building Regulations. Also, where appropriate under the Construction Products Regulation (CPR), the products used should be CE marked to a harmonised European Standard.

The current standards are detailed in the table below, however it is important to take into account the standards prevailing at the time of the implementation of the original system as there is no requirement to bring existing installations up to the current standard during maintenance activities.

System/Product	Standard	Options
Mechanical Smoke Extract (smoke shaft)		
System (Design)	BS9991 & SCA Guide on Common Escape Routes in Apartment Buildings	
Extract Fans	BS EN 12101-3: 2015	F300
Roof Ventilators	BS EN 12101-2: 2003	
Lobby Dampers	BS EN 12101-8: 2011	
Control Panels	BS ISO 21927-9:2012 BS EN 12101-10: 2005	
Natural Smoke Extract		
Stairwell Ventilators	BS EN 12101-2: 2003	
Automatic Opening Ventilators (AOVs)	BS EN 12101-2: 2003	
Control Panels	BS ISO 21927-9:2012 BS EN 12101-10: 2005	

Current Standards for Smoke Control Systems

Process

PREPARATION (COMPLETE PRE-VISIT IF POSSIBLE)

For an effective appraisal of the installation, it is essential to gain an as-thorough-as-possible understanding of the purpose of the system, the design approach taken, the appropriate product specification and the service history.



Gather available system documentation

BS 7346-8:2013 Components for smoke control systems – Code of practice for planning, design, installation, commissioning and maintenance details the information that should be provided at handover as follows:

1. As-fitted drawings
2. Operating and maintenance instructions
3. Certificates of design, installation and commissioning
4. A logbook

The standard of information available will vary greatly depending on the capability of the installer and for effective long-term maintenance it is recommended that where information is not available at the site then the installer is contacted to request the above information.

Ascertain system type, it will usually be one of the following:

- Mechanical smoke shaft
- Natural smoke shaft (BRE shaft)
- Automatic Opening Ventilator
- Pressurisation System (outside the scope of this document, contact SCS Support for advice – see end of document for contact details or **click here**)

Identify system performance criteria

If the system complies with the requirements of **Approved Document B** then the performance criteria is detailed within the guidance and the key points are reproduced on page four.

Smoke control of common escape routes by natural smoke ventilation

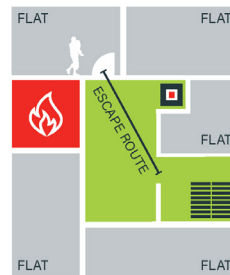
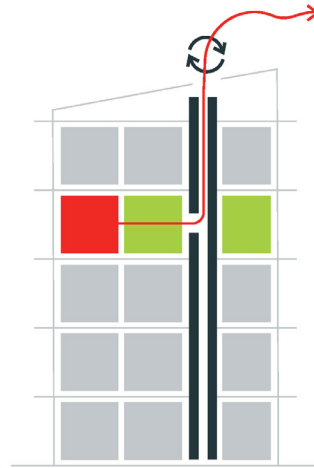
- 3.50** Except in buildings that comply with Diagram 3.9, the corridor or lobby next to each stair should have a smoke vent. The location of the vent should comply with both of the following.
- Be as high as practicable.
 - Be positioned so the top edge is at least as high as the top of the door to the stair.
- 3.51** Smoke vents should comply with one of the following.
- They should be located on an external wall with minimum free area of 1.5m².
 - They should discharge into a vertical smoke shaft, closed at the base, that meets all of the following criteria.
 - The shaft should conform to the following conditions.
 - Have a minimum cross-sectional area of 1.5m² (minimum dimension 0.85m in any direction).
 - Open at roof level, minimum 0.5m above any surrounding structures within 2m of it horizontally.
 - Extend a minimum of 2.5m above the ceiling of the highest storey served by the shaft.
 - The free area of all the following vents should be a minimum of 1m² in the following places.
 - From the corridor or lobby into the shaft.
 - At the opening at the head of the shaft.
 - At all internal locations within the shaft (e.g. safety grilles).
 - The smoke shaft should be constructed from a class A1 material. All vents should either be a fire doorset (see Appendix C, Table C1, item 2.e for minimum fire resistance) or fitted with a smoke control damper achieving the same period of fire resistance and designed to operate as described below. The shaft should be vertical from base to head, with a maximum of 4m at a maximum inclined angle of 30 degrees.
 - If smoke is detected in the common corridor or lobby, both of the following should occur.
 - Simultaneous opening of vents on the storey where the fire is located, at the top of the smoke shaft and to the stair.
 - Vents from the corridors or lobbies on all other storeys should remain closed, even if smoke is subsequently detected on storeys other than where the fire is located.
- 3.52** A vent to the outside with a minimum free area of 1m² should be provided from the top storey of the stair.
- 3.53** In single stair buildings, smoke vents on the storey where the fire is initiated, and the vent at the head of the stair, should be activated by smoke detectors in the common parts.
- In buildings with more than one stair, smoke vents may be activated manually. The control system should open the vent at the head of the stair before, or at the same time as, the vent on the storey where the fire is located. Smoke detection is not required for ventilation purposes in this instance.
- ### Smoke control of common escape routes by mechanical ventilation
- 3.54** Guidance on the design of smoke control systems that use pressure differentials is available in BS EN 12101-6.

Fire-engineered solutions

For fire-engineered solutions, typically mechanical extract systems (as pictured in this diagram), the performance criteria should be detailed within the design document submitted to Building Control as part of the approval process and should also be contained within the commissioning documentation.

It is essential to ascertain this criteria to complete a meaningful assessment of system performance.

Further information on the design and installation of mechanical smoke shafts can be found in the ***Smoke Control Association document Guidance on Smoke Control to Common Escape Routes in Apartment Buildings (Flats and Maisonettes)***.



Check commissioning data

Review the commissioning reports if available to assess actual system performance at handover of project.

Check latest service reports

Review service reports and log book if available to assess what testing has been undertaken. Model service procedures are available from Group SCS by clicking the links below:

[Car park system service template](#)

[Smoke shaft service template](#)

SITE SURVEY PROCEDURE

Once system type and performance criteria have been established, follow the inspection and test process for the given system and record results.

Download system checklist (click links below)

- **Automatic Opening Ventilator Checklist**
- **Stairwell Ventilator Checklist**
- **Natural Smoke Shaft (BRE Shaft) Checklist**
- **Mechanical Extract System Checklist**

Assessment

Once survey has been completed, compare the results of the inspection and test process with the performance criteria identified in the system documentation or the relevant parts of the Building Regulations and British Standards.

Reporting

On completion of the survey a report should be prepared and issued to the client as soon as practicable, detailing the current status of the system and identifying any areas of non-conformance together with recommendations for remedial action where needed.

An indication of the severity of any defects should be provided highlighting any issues preventing correct functioning of the system which prejudice the safety of the occupants of the building.

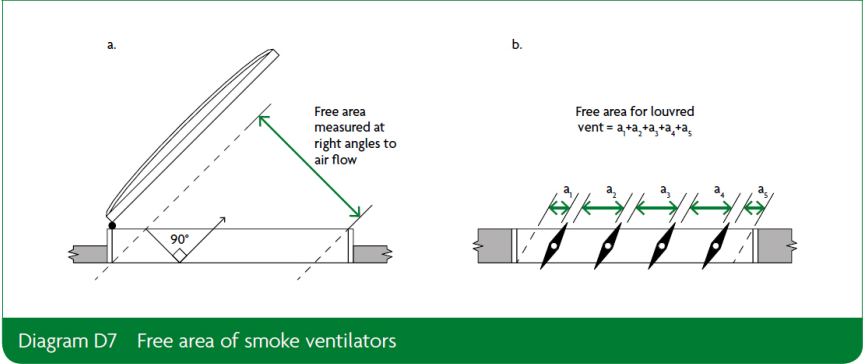
Need further assistance with your project?



For further information please contact Group SCS's Support Division at service@groupscs.co.uk or call 0300 303 4104.

Appendix

Appendix A





GROUPSCS.CO.UK

0300 303 4104

INFO@GROUPSCS.CO.UK

CARDIFF

Group SCS
Unit T2
Capital Business Park
Parkway
Cardiff CF3 2PZ

LONDON

Group SCS
3rd Floor
26 Finsbury Square
London EC2A 1DS

BOURNEMOUTH

Group SCS
Manufacturing
Unit 70 Condor Close
Woolsbridge Industrial
Park
Three Legged Cross
Wimborne BH21 6SU

PORTSMOUTH

Group SCS
58a Station Road
Hayling Island
Hampshire
PO11 0EL