

7.5.2.2 Protected areas

Smoke detection provided to automatically initiate the following need only be provided in circulation spaces:

- (a) Car park ventilation systems.
- (b) System shutdown.
- (c) Zone pressurization.
- (d) Fire isolated exit pressurization.
- (e) Lift shaft pressurization.

NOTE: For examples of circulation spaces, see Figure 7.5.2.2(A) to 7.5.2.2(C). Detector locations are only indicative.

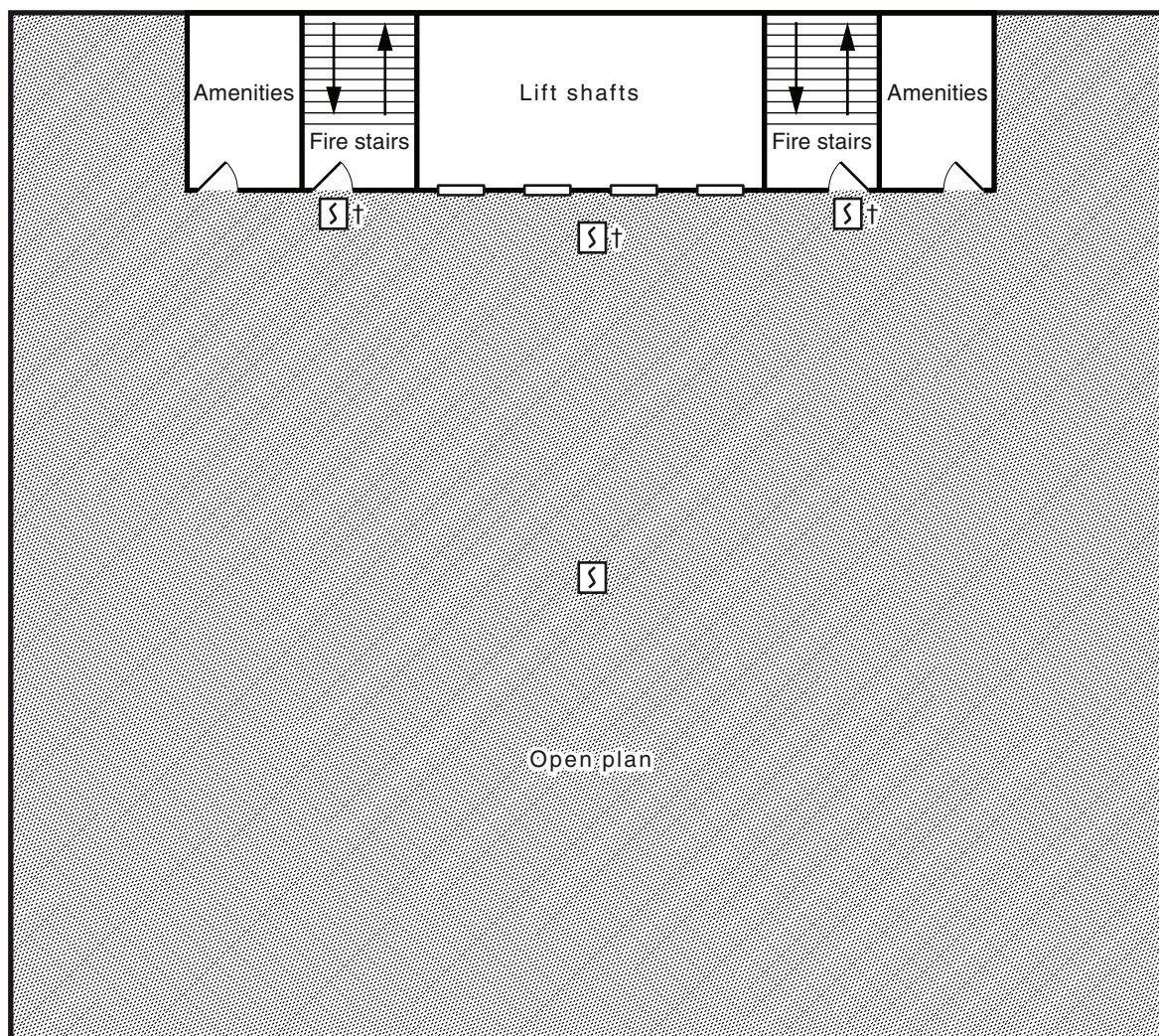
Smoke detection need not be provided in rooms that open directly into circulation spaces, except for the following:

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- (i) Rooms that have a dimension of 15 m or more in any direction on the horizontal plane shall have detection provided in the room in accordance with Clause 7.5. Detection is not required in any area not used by occupants for an extended period of time such as a storeroom with a floor area less than 30 m², sanitary compartment, plant room or the like.
- (ii) rooms that open directly into fire-isolated pressurized exit paths shall have detection provided in the room in accordance with this Section.

Smoke detection provided to automatically initiate hot layer smoke control systems shall be located throughout the smoke control zone serving the hot layer smoke control system.

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LEGEND:



Circulation space, see definition Clause 1.4.11



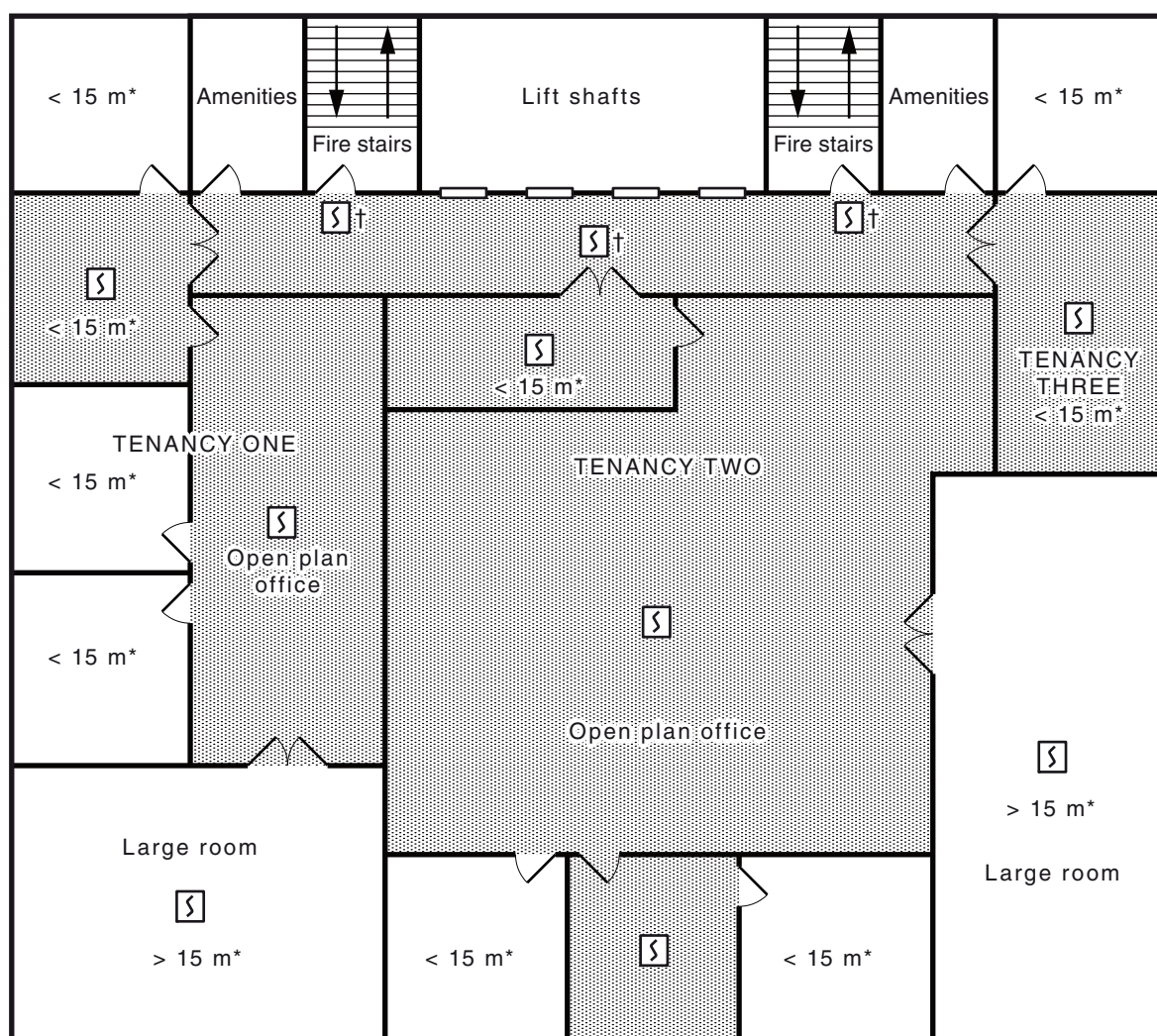
Smoke detector(s) required in accordance with Clause 7.5



Refer Clause 7.5.4

FIGURE 7.5.2.2(A) INDICATIVE DETECTOR LOCATIONS
EXAMPLE: OPEN PLAN FLOOR—NO FITOUT

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LEGEND:



Circulation space, see definition Clause 1.4.11



Smoke detector(s) required in accordance with Clause 7.5

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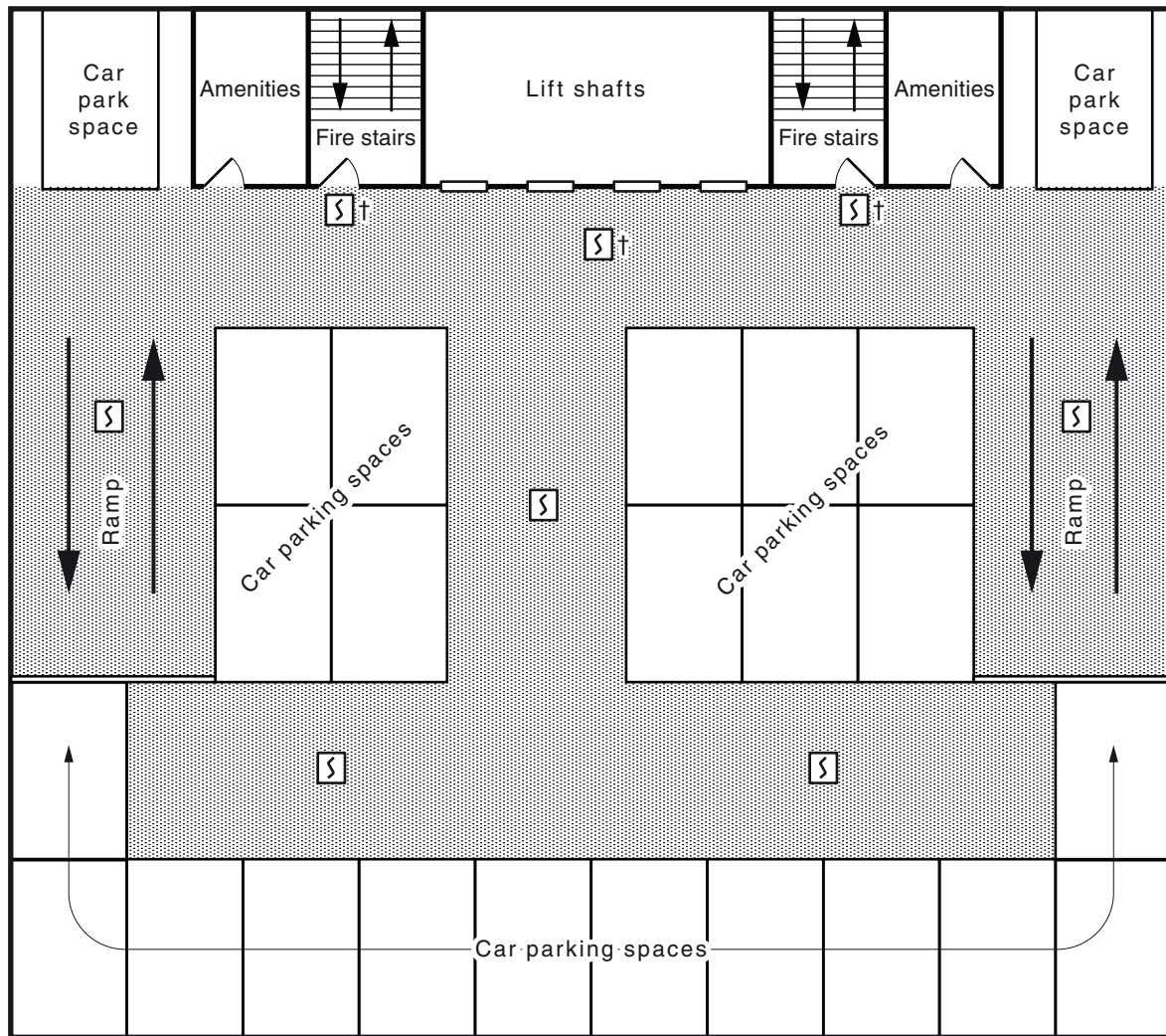
Refer Clause 7.5.2.2

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Refer Clause 7.5.4

FIGURE 7.5.2.2(B) INDICATIVE DETECTOR LOCATIONS
EXAMPLE: MULTIPLE TENANT FLOOR LAYOUT

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LEGEND:

Circulation space, See definition Clause 1.4.11

Smoke detector(s) required in accordance with Clause 7.5

† Refer Clause 7.5.4

FIGURE 7.5.2.2(C) INDICATIVE DETECTOR LOCATIONS EXAMPLE: CAR PARK

7.5.3 Relative sensitivity of detectors

In zoned pressurization systems and zoned hot layer smoke exhaust systems where there is a possibility of smoke migration to adjacent areas, all protected space smoke detectors shall be set to sensitivities such that any difference will not adversely affect the operation of the system.

C7.5.3 A mix of detector sensitivities (including point/multi-point type) in different smoke control zones could result in the air-handling plant serving a non-fire-affected smoke control zone, operating as if it was the fire-affected smoke control zone. Where in-duct or air-handling plant enclosure smoke detection is installed (as compared to the circulation space) a mix in detector sensitivity is not considered to be a problem as shutdown of the air-handling plant will still occur even though full building fire mode has not been initiated.

7.5.4 Location of detectors at doors to pressurized exits and lift landing doors

Where an exit pressurization or zone pressurization system is installed the following shall apply:

- (a) A smoke detector or sampling point shall be located in the circulation space adjacent to each required exit door, set back so that the horizontal distance from the door opening is not less than 1.5 m or not greater than 3 m, as shown in Figure 7.5.4(A).
- (b) For lifts, detectors shall not be greater than 3 m from any lift landing door and not closer than 1.5 m horizontal distance to the nearest lift landing door.
- (c) Where a circulation space leading to exits is formed by floor to ceiling height partitions and any access door from rooms leading into such a circulation space are within 1.5 m horizontal distance of the required exit door, then the detector shall be set back to not less than 0.3 m horizontal distance from the required exit door and not more than the distance from the required exit door to the access door, as shown in Figure 7.5.4(B).
- (d) Where a fire-isolated exit pressurization system is installed in accordance with AS/NZS 1668.1, smoke detectors need not be installed within the pressurized exit path.

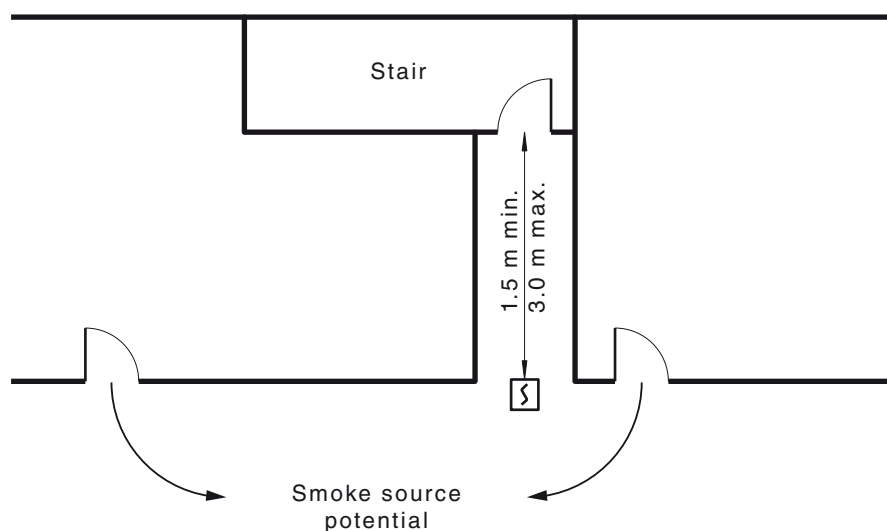


FIGURE 7.5.4(A) DETECTOR LOCATIONS-EXITS

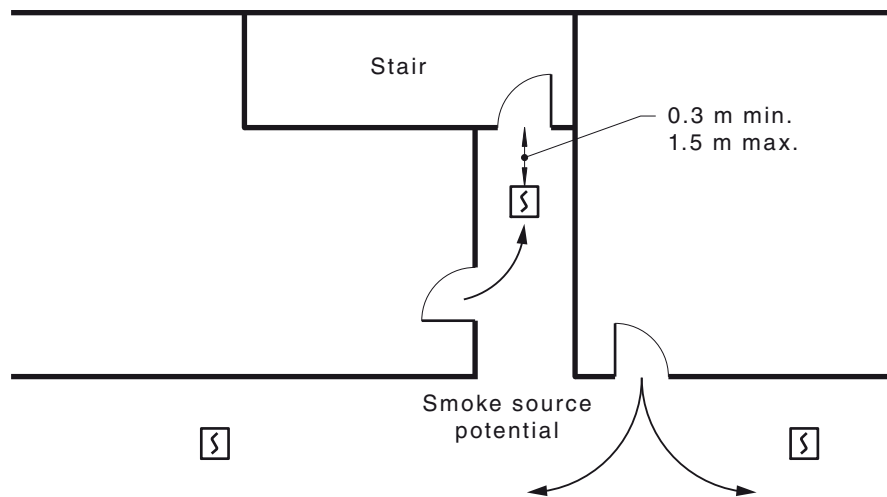


FIGURE 7.5.4(B) DETECTOR LOCATIONS-EXITS

7.6 MISCELLANEOUS SYSTEMS

7.6.1 Scope

This Section sets out the requirements for miscellaneous air-handling systems that do not form part of a smoke control system.

7.6.2 General

When fire mode is initiated, air-handling systems not designed to operate in fire mode shall shutdown in accordance with this Section.

7.6.3 Special purpose systems

Special purpose air-handling systems, such as those serving computers, operating theatres and refrigerated plant rooms, need not shutdown.

7.6.4 Single enclosures

Individual air-handling systems serving a single enclosure not served by a hot layer smoke control system need not shut down.

Where a system operates in the event of fire, supply air detection in accordance with this Section shall be provided to shut down the system on detection of smoke.

C7.6.4 *The intent of an exemption for single enclosures is to simplify the installation of systems, while preventing the spread of smoke to principle evacuation paths.*

7.6.5 Exhaust systems

7.6.5.1 Minor exhaust systems

Minor exhaust systems protected with fire dampers, are not considered to unduly contribute to the spread of smoke and are not required to shut down in the fire mode. Minor exhaust systems protected with subducts shall operate in the fire mode.

C7.6.5.1 *Minor exhaust systems are those systems that exhaust a relatively small quantity of air from each compartment including those required by AS 1668.2, e.g. toilet exhaust, battery charging, document copying, incinerators and domestic range hoods.*

7.6.5.2 Major exhaust systems

Where a major exhaust system does not form part of a smoke control system, they are considered to unduly contribute to the spread of smoke and shall be treated as a central air-handling system in accordance with AS/NZS 1668.1 or be a system incorporating shut down in accordance with AS/NZS 1668.1.

C7.6.5.2 *Major exhaust systems cover those systems not classified as minor. In most instances it is likely that these systems will be designed for smoke control. Where not so designed, they have the capacity to allow an unacceptable quantity of smoke to spread between compartments, and smoke dampers are, therefore, required to maintain the integrity of compartmentalization and close off the openings on detection of smoke.*

7.6.6 Supply air systems

7.6.6.1 Minor supply air systems

Minor supply-air systems are not considered to unduly contribute to the spread of smoke and are not required to shut down in fire mode.

Where a system operates in the event of fire, supply air detection shall be provided in accordance with this Section.

C7.6.6.1 *Where a system is designed to shut down in fire mode, supply air smoke detectors are not required. If the system is allowed to operate in fire mode, then supply air smoke detectors are required.*

7.6.6.2 Major supply air systems

Major supply systems are considered to unduly contribute to the spread of smoke and shall be treated as part of a smoke control system or be systems incorporating shutdown.

C7.6.6.2 *In most instances major supply air systems will be designed for smoke control. Where not so designed, they have the capacity to allow an unacceptable quantity of smoke to spread between compartments and smoke dampers are therefore required to maintain the integrity of compartmentalization and close off the smoke leakage path.*

7.6.7 Exhaust duct heat detectors

Exhaust duct detection shall comply with Clause 3.27.3(c).

7.6.8 Car park ventilation systems

7.6.8.1 General

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In car parks and loading docks where ventilation systems are installed in accordance with AS 1668.2, car parks and loading docks served by lifts or fire isolated pressurized exit paths shall have smoke detectors or ASD sampling points in circulation spaces and at each required exit and lift landing door in accordance with this Section.

7.6.8.2 Override control

To enable manual control, fans that are not required to shut down on initiation of fire mode in the car park shall be provided with a control switch at the designated building entry point. Signage should be located at the car park entry indicating the location of the control switches.

Where an additional air-moving device installed in accordance with AS 1668.2 is a fan (such as a jet fan), a separate switch shall be provided to enable restart and manual control. Where more than one fan is utilized in a fire compartment, they shall be controlled by a common switch. Where there are multiple fire compartments, a switch shall be provided for each fire compartment.

Where the building is provided with an FDCIE, each control switch and indication shall be incorporated in the FDCIE as an FFCP, with operating and maintenance instructions provided in accordance with this Section. Indication is not required for switches controlling additional air-moving devices installed in accordance with AS 1668.2 (such as a jet fan).

All control switches and accompanying indications shall be provided in accordance with this Section.

7.6.8.3 Supply air smoke detectors

Supply air smoke detection shall be provided in accordance with this Section.

7.6.8.4 Operation in fire mode

Where automatic fire detection or suppression is provided in the car park, activation of any of these systems shall cause the ventilation system to operate at full ventilation rate.

Supply air systems shall shut down upon the detection of smoke in the supply air. Supply air systems shall restart on clearance of the smoke from the detector in accordance with the requirements of this Standard.

Where an additional air-moving device installed in accordance with AS 1668.2 is a fan (such as a jet fan), such fans shall shutdown on initiation of fire mode or activation of a sprinkler system in the car park.

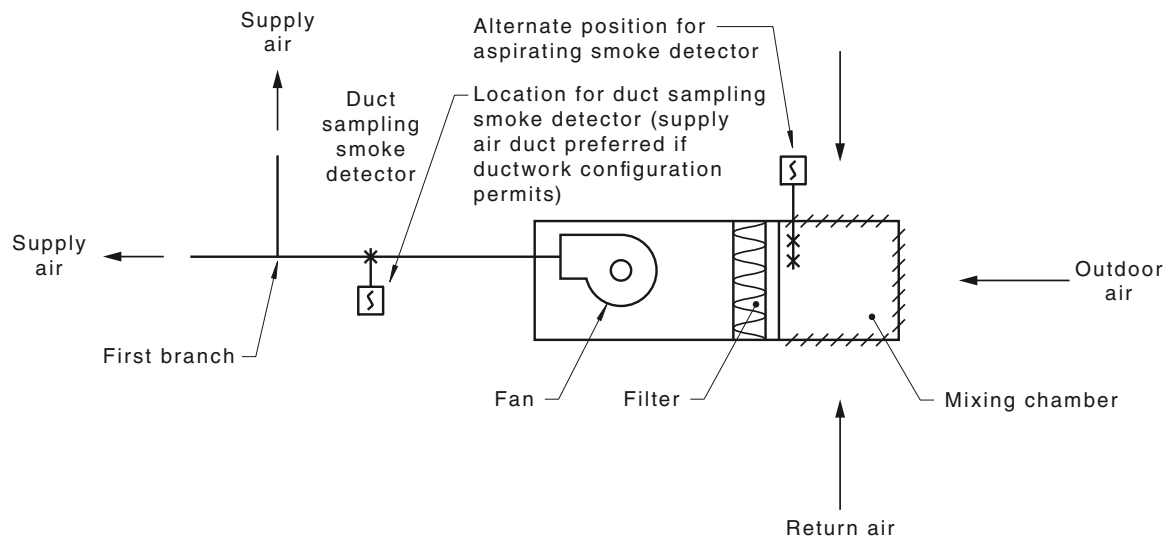
7.7 SUPPLY AIR SYSTEMS

Where air handling equipment is used to provide supply air, makeup air or outside air in fire mode, the following is required:

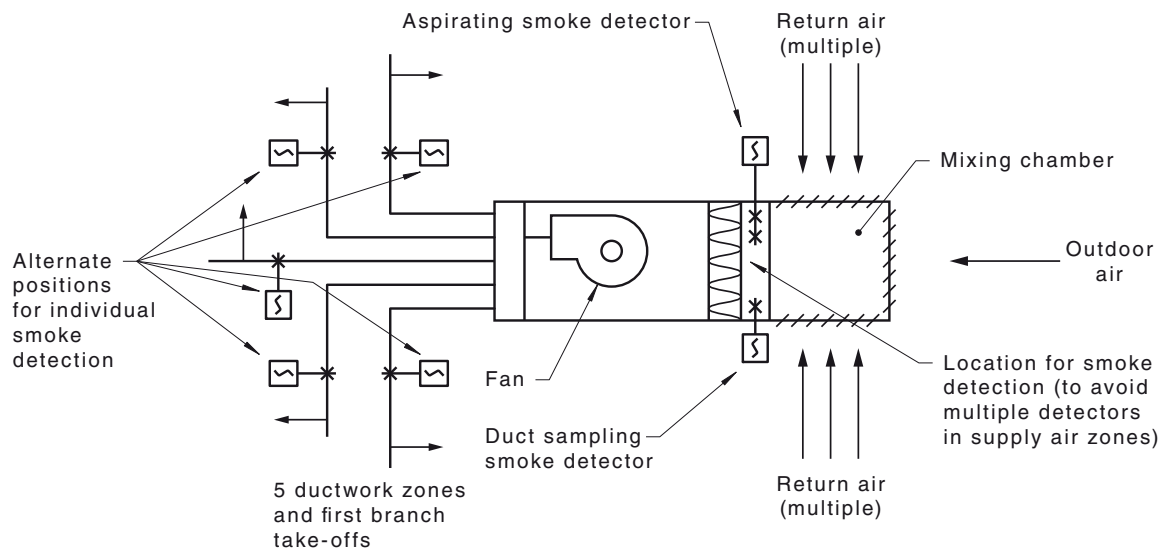
- (a) A smoke detector shall be located downstream of the air filter and supply air fan of each air-handling plant and upstream of the first branch take-off or, where this is not possible, either within the outdoor/return air mixing chamber upstream of the supply air fan, or within each supply air duct emanating from the air handling plant.

See Figure 7.7.

- (b) Each detector mounted in an air-handling system shall indicate as a separate detection zone.
- (c) Duct sampling smoke detectors shall be used for monitoring air in ducts.
- (d) Duct sampling probes shall be installed as specified in Clause 3.27.3.
- (e) Detectors installed in air-handling systems shall be provided with permanent indelible labels, stating zone designation, affixed adjacent to the detectors.
- (f) Integral alarm indicators on smoke detectors located in air-handling systems shall be clearly visible. Where this condition cannot be met, remote indicators are required. Remote indicators shall be labelled in accordance with Clause 3.17.
- (g) The supply air smoke detector alarm condition shall be indicated by a light emitting indicator grouped with the other fan indicators on the FFCP and meet the following requirements:
 - (i) Be red when lit.
 - (ii) Meet all other requirements for FDCIE alarm indicators.
 - (iii) Have a separate dedicated indicator or flash the red 'fan running' indicator with its function described in operation instruction.
- (h) The supply-air detection zone alarm condition shall not activate a general fire alarm condition on the FDCIE. The detector alarm condition shall only stop the associated supply air fan.
- (i) After the detector has been in the non-alarm state for a continuous period of not less than 60 s and not more than 90 s, the FDCIE shall initiate a control signal to restart the supply air fan. AVF shall not be applied to this detection zone. Detectors installed in air-handling systems shall be provided with permanent indelible labels, stating fire detection zone designation, detector number and air handling equipment identifier, affixed adjacent to the detectors. All visual alarm indicators on smoke detectors located in air-handling systems shall be clearly visible. Where this condition cannot be met, appropriately labelled remote indicating devices shall be provided.



(a) AHU single duct discharge



(b) AHU multiple duct discharge

NOTE: The choice for location of the smoke detector is available to assist with the ease of access according to configuration of air-handling plant ducting arrangements.

FIGURE 7.7 DETECTOR LOCATION-SUPPLY AIR

7.8 KITCHEN EXHAUST HOOD SYSTEMS

7.8.1 General

Where kitchen exhaust hood systems form part of, or are used to assist, required smoke control systems, the requirements of this Section for fans operating in fire mode shall apply.

7.8.2 Operation under fire conditions

On initiation of fire mode, if the kitchen exhaust hood system is already operating, it shall not be shut down. Where a kitchen exhaust hood system includes a dedicated supply air system, the supply air system is not required to shut down in the event of a fire.

On activation of any installed exhaust duct heat detector or separately monitored sprinkler head, any dedicated supply air system shall stop but the exhaust hood system need not shut down.

7.8.3 Override control

Where kitchen exhaust hood systems are required to form part of a smoke control system they shall be provided with controls and indicators at the FFCP to enable manual control.

7.9 SHUTDOWN SYSTEMS—OPERATION IN FIRE MODE

Except as required for miscellaneous systems, all air-handling systems not required to operate in the fire mode shall automatically shut down on initiation of fire mode.

Air dampers installed in these air-handling systems shall automatically close on initiation of fire mode or loss of power.

7.10 ZONE PRESSURIZATION SYSTEMS

7.10.1 Operation in fire mode

Smoke control zones of zone pressurization systems shall be initiated by the alarm condition of the detection zone for the fire affected smoke control zone. Components of the air-handling system shall be controlled and monitored in accordance with this Section.

Spread of smoke outside the smoke control zone of origin shall activate the pressurization systems in other smoke control zones as the smoke spreads to these locations.

7.10.2 Override control

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All smoke control fans and non-interlocked air and smoke dampers shall have override control switches and indicators located on the FFCP in accordance with this Section.

7.11 HOT LAYER SMOKE CONTROL SYSTEMS

7.11.1 System arrangement

Smoke detection shall be provided throughout the space in accordance with this Standard and zoned so that at least one smoke control zone protects each smoke reservoir.

Activation of each smoke control zone shall initiate the smoke exhaust and make up air provisions for the reservoir it protects.

C7.11.1 *For the purposes of this Section, the main features of a hot layer smoke control system arrangement are as follows:*

Smoke is collected in a hot layer under and within the bounding construction of smoke reservoirs.

7.11.2 Operation in fire mode

Hot layer smoke control systems shall be initiated by the alarm condition of the fire-affected smoke control zones. Components of the air-handling system required to operate in fire mode shall be controlled and monitored in accordance with this Section.

Spread of smoke outside the smoke control zone of origin shall activate the smoke exhaust mode in other smoke control zones as the smoke spreads to these locations.

Except as required for miscellaneous systems of AS/NZS 1668.1, all air-handling systems not required to operate in fire mode shall automatically shut down on initiation of fire mode.

7.11.3 Override control

All smoke control fans shall have override control switches located on the FFCP in accordance with this Section.