

Summary - Duct Smoke Detector Requirement

Air-moving systems supplying air in excess of 2,000 cfm to enclosed spaces within buildings shall be equipped with an automatic shutoff. The automatic shutoff shall interrupt the power to the air-moving system by the use of a smoke detector, located in the main supply air duct. If the building is equipped with a fire alarm system, the smoke detector shall be supervised by such system and shall provide an alarm.

Definition: Air-moving system is a system designed to provide heating, cooling, or ventilation in which one or more air-handling units are used to supply air to a common space or are drawing air from a common plenum or space.

Code Interpretation: All commercial/industrial buildings having one tenant are considered to be one common enclosed space.

In multi-tenant commercial/industrial buildings, each tenant space may be considered one common enclosed space if no openings are provided in the demising walls between such tenants.

If multiple air-moving systems are provided for one common enclosed space, and the aggregate cfm exceeds 2,000 cfm, shutoff for smoke control is required. For calculating the total aggregate cfm, air moving systems which serve only a designated area or room may at the discretion of the administrative authority not be required to be equipped with shut-offs for smoke control.

Duct smoke detectors required in air-moving systems shall transmit an alarm signal to either:

- (1) the fire alarm panel which is supervising the building fire sprinkler system and valve tamper or
- (2) to a separate stand-alone remote indicator panel (second fire alarm panel) supervising the duct detectors exclusively.

Activation of any duct detectors shall cause a visual and an audible signal in a normally occupied area.

Note: All five exceptions to section 608 are applicable. If exception number 2 is to be utilized, when multiple air-moving systems are installed for one common space, all the air-moving systems must have shutoff for smoke control if any of the air-moving systems serve a room that doesn't have a (1) direct exit to the exterior of the building (2) travel distance of less than 100 feet.

2016 California Mechanical Code – Section 608.0

Air-Moving Systems and Smoke Detectors.

Air-moving systems supplying air in excess of 2000 cubic feet per minute (cfm) to enclosed spaces within buildings shall be equipped with an automatic shutoff. Automatic shutoff shall be accomplished by interrupting the power source of the air-moving equipment upon detection of smoke in the main supply-air duct served by such equipment. Duct smoke detectors shall comply with UL 268A, shall be labeled by an approved agency, approved and listed by California State Fire Marshal, and shall be installed in accordance with the manufacturer's installation instructions. Such devices shall be compatible with the operating velocities, pressures, temperatures, and humidities of the system. Where fire-detection or alarm systems are provided for the building, the smoke detectors shall be supervised by such systems in an approved manner, and installed in accordance with NFPA 72 and the California Building and Fire Codes.

Exceptions:

- (1) Where the space supplied by the air-moving equipment is served by a total coverage smoke-detection system in accordance with the California Fire Code, interconnection to such system shall be permitted to be used to accomplish the required shutoff.
- (2) Automatic shutoff is not required where occupied rooms served by the air-handling equipment have direct exit to the exterior and the travel distance does not exceed 100 feet.
- (3) Automatic shutoff is not required for Group R, Division 3 and Group U occupancies.
- (4) Automatic shutoff is not required for approved smoke-control systems or where analysis demonstrates shutoff would create a greater hazard, such as shall be permitted to be encountered in air-moving equipment supplying specialized portions of Group H occupancies. Such equipment shall be required to have smoke detection with remote indication and manual shutoff capability at an approved location.
- (5) Smoke detectors that are factory installed in listed air-moving equipment shall be permitted to be used in lieu of smoke detectors installed in the main supply-air duct served by such equipment.



California State Fire Marshal **CODE INTERPRETATION**

Date Issued	06-17-02	Interpretation #	02-024
Topic	Automatic Shutdown with Multiple HVAC Units <2000 CFMs		
Code Section(s)	§608, California Mechanical Code (1998)		
Requested by	Mark F. Redmond Ted Jacob Engineering Group, Inc. 1763 Broadway Oakland, CA 94612-2105		

1. *Does the California Mechanical Code require that automatic shutoff be provided for air-moving systems which are comprised of multiple terminal air volume boxes for zone control, all of which are less than 2000 cfms, that cumulatively supply air in excess of 2,000 cubic feet per minute to an enclosed space within buildings?*

Yes. Section 608 of the California Mechanical Code requires that automatic shutoff be provided for *air-moving systems supplying air in excess of 2,000 cubic feet per minute* to enclosed spaces within buildings. Multiple HVAC distribution units including terminal air volume boxes for zone control which cumulatively supply air in excess of 2,000 cubic feet per minute to an enclosed space within buildings also would require automatic shutoff upon smoke detection. Several exceptions to the CMC Section 608 may apply based on individual conditions.

2. *Do smoke detectors need to be installed in the main supply-air ducts of all of these HVAC units and interconnected for automatic shutoff of all the fan units?*

Yes. CMC Section 608 requires the automatic shutoff for air-moving systems to be upon detection of smoke in the main supply-air duct served

by such equipment. Duct smoke detectors must comply with this requirement when they are listed for the air velocity, pressure, humidity, and temperature present in the HVAC system and located in all the main supply-air ducts downstream of both the fan and filters.

As an alternate to smoke detection installed in the main HVAC supply-air duct, Section 608 Exception #1 allows an area smoke detection system to be used to accomplish the required automatic shutoff, when smoke detectors are located in all areas served by the HVAC system.



California State Fire Marshal CODE INTERPRETATION

Date Issued	02-10-03	Interpretation #	03-014
Topic	Smoke Detectors Controlling HVAC Shut-off		
Code Section(s)	§608, California Mechanical Code (1998 ed)		
Requested by	Jeffrey Montero TMAD Engineers 320 N Halstead St #220 Pasadena, CA 91170		

1. ***Section 608 of the California Mechanical Code requires shut-off for air handling systems supplying in excess of 2000 CFM in which the automatic shut-off is accomplished by interrupting the power source upon detection of smoke in the main supply air duct. Does the code allow equipment-mounted smoke detectors where the smoke detector is mounted inside the equipment supply air chamber at the fan discharge?***

Yes. The detectors must be listed and installed per the manufacturers instructions and engineered for the specific application. However, it must be remembered that the in-duct detectors on the supply side must be downstream of the fan and filters.

2. ***If the code allows such an installation, doesn't it conflict with provisions of §2-10.5 of NFPA 72 and §4-4.4 of NFPA 90A where the smoke detectors are required to be installed in air duct systems due to the needed air sampling and prevent stratification and dead air spaces?***

No.

3. ***If the code does not allow such an installation and requires smoke detectors to be installed in the supply air ducts and a 12 Zone-Multizone Air Handling Unit is installed, does the code require the installation of 12 separate smoke detectors (each one serving one zone branch duct); OR, could a single smoke detector be installed in the branch with the highest CFM capacity?***

If the system is over 2,000 CFM, all 12 branch ducts must be sampled for smoke. This can be accomplished using a single detection device listed for air-velocity, temperature, etc. if it is installed in accordance with the manufacturer's instructions.

4. ***Section 608 of the California Mechanical Code doesn't address smoke detector requirement for the return duct system while NFPA 90A requires smoke detectors at the return side of air handling systems with a capacity of 15,000 CFM and greater. Does the State Fire Marshal require such a smoke detector for systems with such capacity?***

The answer to your question depends upon the design of the return air system controls. Section 2-10.4.2.2 refers to detection in return air ducts. Section 2-10.3.2 states that "if smoke detectors are used to initiate selectively the operation of equipment to control smoke spread, the requirements of Section 2-10.4.2.2 shall apply". This means that if air-handling equipment is "globally" shut down, then Section 2-10.4.2.2 does not apply and return air detectors are not required.

CITY OF NAPA FIRE SCOPE LETTER REQUIREMENTS

1. SCOPE LETTERS ARE FOR 5 OR LESS DEVICES OR HEADS BEING ADDED, ALTERED, MOVED OR REMOVED
2. IF NO MODIFICATIONS ARE NEEDED, SCOPE LETTER SHALL STATE SUCH
3. SCOPE LETTERS SHALL BE ON THE COMPANIES LETTERHEAD AND INCLUDE THE COMPANIES LICENSE NUMBER
4. SCOPE LETTERS SHALL INCLUDE COMPANIES WET STAMP
5. THE LETTER SHALL INCLUDE THE ADDRESS OF THE PROJECT
6. THE "SCOPE OF WORK" PARAGRAPH SHALL INCLUDE:
 - a. THE AREA THE WORK IS BEING COMPLETED IN (E.G., OFFICE 123, BREAK ROOM, REAR STORAGE AREA)
 - b. THE QUANTITY OF DEVICES OR HEADS BEING CHANGED
 - c. A DESCRIPTION OF THE CHANGE ADDED, ALTERED, MOVED, OR REMOVED
7. CONFIRMATION THAT THE ITEM IS COMPATIBLE WITH EXISTING EQUIPMENT
8. SPRINKLER HEADS ARE THE SAME K FACTOR OR TEMP RATING
9. FIRE ALARM DEVICES ARE COMPATIBLE WITH EXISITNG EQUIPMENT