

Fire Alarms for Business Occupancies

Fire alarm systems in business occupancies (Group B) provide early detection and notification to quickly evacuate occupants when businesses are open. The alarms also can alert emergency services during closed hours, which can reduce property damage and inventory loss. The number of occupants and their ability to evacuate are the two main determining factors in deciding whether or not a fire alarm is required in a business occupancy. The 2020 edition of the Minnesota State Fire Code (MSFC) and adopted 2016 edition of NFPA 72 provide detailed requirements for the selection and installation of the initiating devices and notification appliances throughout the entire business occupancy.

A fire alarm is required in a business occupancy when:

- The building has an occupant load of 500 or more people.
- The building has an occupant load of 100 or more people above or below the lowest level of exit discharge.
- The building contains an ambulatory care facility.

In other than ambulatory care facilities, a fire alarm system is not required when an approved automatic sprinkler system is installed throughout the building.

Initiation devices in new *and existing* business occupancies

Automatic initiation devices

Automatic fire detectors are required throughout the building to continually monitor ambient conditions for smoke or heat. Unless a device is specifically referenced an automatic fire detector can be a smoke detector, heat detector, sprinkler, or other approved device.

- Automatic fire detectors must be installed in laundry rooms, boiler and furnace rooms, mechanical and electrical rooms, shops, kitchens, trash-collection rooms, storage rooms, and similar areas.
- Automatic smoke detectors must be installed above fire alarm control panels and power supplies in areas that are not constantly attended (See MSFC Section 907.4.1).
- Automatic smoke detectors installed in air distribution or air-handling systems for shutdown purposes, or to control fire/smoke damper operation, must initiate a supervisory signal, and not a general emergency alarm. (See MSFC Section 907.3.1.1).
- Automatic smoke detectors installed to control or recall elevators or to control doors for elevators, elevator lobbies, or elevator shafts must initiate a supervisory signal, and not a general emergency alarm. Elevator recall and firefighters emergency operation for elevators must only be controlled by the designated elevator smoke detectors and should not be initiated by other building fire detectors or alarm signals (See MSFC Section 907.3.2).



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Notification in new *and existing* business occupancies

- Activation of the fire alarm system or automatic sprinkler system shall initiate a general evacuation signal.
 - The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of not less than 60 seconds, whichever is greater, in every occupiable space within the building (See MSFC Section 907.5.2.1.1).

Fire alarm in ambulatory care facilities

Ambulatory care or outpatient care is medical care that includes patients that may be incapable of self-preservation and require evacuation or relocation by emergency responders, medical staff or other occupants. Early detection and effective notification is important to expedite the evacuation process for these types of facilities. Because of the occupant's immediate state of vulnerability, ambulatory care facilities are required to have a fire alarm system initiated by both manual and automatic means. There is no exemption for a fire alarm system where an automatic fire sprinkler system is installed.

Initiation devices in ambulatory care facilities

Manual initiation devices

Fire alarm pull boxes are required as a way to manually initiate an alarm signal. (See MSFC Section 907.4.2)

- **Location**
 - Within the facility and throughout the egress system to the point of exit discharge.
 - In buildings without an automatic sprinkler system, pull boxes must be arranged so the travel distance to any one device does not exceed 200 feet.
- **Height**
 - No lower than 42 inches and no higher than 48 inches when measured at the pull handle.
- **Color**
 - Must be red in color.

Automatic initiation devices

- Automatic fire detectors must be installed in laundry rooms, boiler and furnace rooms, mechanical and electrical rooms, shops, kitchens, trash-collection rooms, storage rooms, and similar areas.
- Corridors and rooms or spaces open to corridors within an ambulatory care facility shall be protected by an automatic smoke detection system. (See MSFC Section 907.2.2.3)
- Automatic smoke detectors must be installed above fire alarm control panels and power supplies in areas that are not constantly attended (See MSFC Section 907.4.1).
- Automatic smoke detectors installed in air distribution or air-handling systems for shutdown purposes, or to control fire/smoke damper operation, must initiate a supervisory signal, and not a general emergency alarm. (See MSFC Section 907.3.1.1).



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- Automatic smoke detectors installed to control or recall elevators or to control doors for elevators, elevator lobbies, or elevator shafts must initiate a supervisory signal, and not a general emergency alarm. Elevator recall and firefighters emergency operation for elevators must only be controlled by the designated elevator smoke detectors and should not be initiated by other building fire detectors or alarm signals (See MSFC Section 907.3.2).

Notification in ambulatory care facilities

- Activation of the fire alarm or automatic sprinkler systems will initiate a general evacuation signal.
 - The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of not less than 60 seconds, whichever is greater, in every occupiable space within the building (See MSFC Section 907.5.2.1.1).
 - Visual notification appliances are allowed to be used in patient care areas where audible notification would not be beneficial.

Monitoring in new and existing business occupancies

Where sprinkler systems are provided, valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all sprinkler systems shall be electrically supervised by a listed fire alarm control unit and monitored by an approved supervising station service (See MSFC Section 903.4):

- In new buildings with more than six limited area sprinklers.
- In existing buildings when the number of sprinklers is 100 or more.

Nuisance alarms

Fire alarm equipment consists of precise sensors and other sensitive electronics. To limit nuisance alarms, fire alarm panels and devices should be selected and installed to provide the proper fire protection without compromising the integrity of the equipment. Fire alarm equipment should only be installed where:

- Ambient conditions do not exceed the voltage, temperature, and humidity limits specified by the product manufacturer or product listing.
- Vibration or jarring does not exist.
- Devices are not subject to high air movement.
- There is no electrical or radio frequency (RF) interference.
- Devices are not subject to normal ambient smoke such as in kitchens or garages or normal ambient humidity such as in bathrooms with showers.

Where ambient conditions prohibit installation of an automatic smoke detector, an automatic heat detector shall be permitted (See MSFC 907.4.3).

Questions

Contact the SFMD 651-201-7221 or by email at fire.code@state.mn.us

