

U.S. Fire Administration / National Fire Academy

Coffee Break Training

Topic: Smoke Detectors and HVAC Diffusers

Learning objective: The student shall be able to identify the minimum spacing requirements between smoke detectors and heating, ventilation, and air-conditioning (HVAC) diffusers.

Mechanical air handling systems can have a negative effect on automatic smoke detection devices. The moving air currents can push contaminants into detectors, resulting in unwanted alarms, or can draw smoke and other products of combustion away from detectors, resulting in delayed alarms.



Smoke detectors should be at least three feet from HVAC diffusers

Always refer to the manufacturer's listing documents for guidance in placing detectors near supply diffusers or return openings. As a general rule, detectors should not be located within 3 feet of a supply diffuser or return grille. One study by the National Institute of Standards and Technology (NIST) found that with some diffusers a separation as much as 10 feet is needed.

As air velocities increase, the distance from HVAC openings should increase as well. When air velocities exceed 300 feet per minute, specially listed smoke detectors are required.

For additional information, refer to manufacturer's listing documents and NFPA 72, *National Fire Alarm Code*[®].