



H o t

S p o t s

A F i r e P r o t e c t i o n N e w s l e t t e r

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Duct Detectors

Even if your facility does not have a fire alarm system, duct smoke detectors may be required. In general, stopping the movement of smoke throughout a facility is critical to life safety, and is the main reason duct smoke detection may be required. Requirements for duct detectors on air handling equipment vary greatly among the various codes. In fact, some code requirements seem to conflict. For example:

NFPA 90 A:

*Supply Side: Duct detector required on supply side if HVAC unit over 2,000 cfm.

*Return Side: Duct detector required on return side if HVAC unit is over 15,000 cfm. An exception in NFPA allows the return detector to be omitted where the unit serves a space which is equipped with spot smoke detection.

IBC/IMC

*Return side: Duct detector required on return side if HVAC unit is over 2,000 cfm

*Consult code or a code professional for full requirements and exceptions. Both families of codes require the duct detectors to be supervised. If a fire alarm system exists, the duct detectors are required to be monitored by the fire alarm system. This is usually annunciated at the fire alarm panel only, and as a supervisory alarm (which would not activate audible/visual devices). In some instances, the local Authority Having Jurisdiction (such as the local Fire Marshal) may require the alarm to be annunciated as an alarm (which would result in the same audible/visual activation as a sprinkler waterflow or manual fire alarm, necessitating the evacuation of the building).

Even where a fire alarm system does not exist, code still requires the duct detector, and annunciation of its activation. This is typically done by connecting a 120 VAC strobe or strobe/horn unit to the duct detector, placing the strobe or strobe/horn in a space which is constantly attended (or at least attended whenever the building is occupied), and activating the strobe or strobe/horn unit upon activation of the duct detector.

Activation of a supply side detector is usually indicative of a problem with the belts or filters associated with the unit. Activation of a return detector may indicate a fire located somewhere within the space served by the air handling unit. However, duct detectors sample great quantities of air. This tends to dilute smoke concentration, and duct detection is not considered as reliable as, nor is it intended to replace or serve as spot smoke detection.

Finally, activation of duct smoke detectors is intended to reflect an abnormal condition existing in the unit or the space it serves. Therefore, activation of duct detectors is required to shut down the associated air handling unit(s). This helps prevent circulation of smoke throughout the space served by the air handling unit(s).

Clean Agent Protected Enclosures

Would you leave for an important appointment in a car with a leaking gas tank? You most likely would not. In addition to the obvious fire hazard, if the leak is substantial enough, you might not have enough gas to get to your destination.

The same philosophy applies to enclosures protected with Clean Agent Extinguishing systems. These gaseous extinguishing systems are normally used to protect critical equipment, such as data processing centers, telecommunications equipment etc. For the system to extinguish a fire, it must reach the extinguishing concentration, and hold it for a "soak" period, typically 10 minutes. The following are possible ways the integrity of the enclosure could be compromised: improper damper closure and air handling unit shutdown, holes in enclosure walls, ceilings and floors, and leakage around doors and windows. This allows gas leakage and introduction of air into the enclosure, resulting in the dilution of extinguishing agent concentrations. You may not "have enough gas to reach your destination!"

The tool to identify a room with this problem is a door fan integrity test. The requirements and procedures for conducting this test are outlined in NFPA 2001 "Clean Agent Fire Extinguishing Systems" (2004 Edition) sections 6.7.2.4 and Annex section C. This test will allow most penetrations and leakages to be identified and addressed. Once an enclosure has been integrity tested and the system designed and installed, you can walk away, confident of the room's integrity. Right? Wrong! Most enclosures occupied for data processing or telecommunications equipment are active areas, with penetrations for new power and data cables being added throughout the life of the room. NFPA 2001 addresses this in section 6.4 and 6.4.1, where either an annual enclosure inspection or a documented administrative control program is required. In either case, the objective is to identify new penetrations and ensure that they are adequately sealed.

The final item to monitor is actual room configuration. Expansion of the volume of the enclosure by room expansion or changing raised floor and drop ceiling heights will affect the amount of gas necessary to extinguish a fire. Anytime a room is reconfigured, an evaluation should be conducted of the Clean Agent System. Make sure you have enough gas to reach your destination!

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