

Smoke alarms are one of the most important safety devices in your residence. Getting an early warning of a fire allows you and your family to escape before you're overcome by smoke. With modern construction materials and furnishings in our homes, fires can quickly go from ignition to deadly, so seconds and minutes matter.

Removing or disabling smoke alarms is one of the most common violations that we find during our inspections. It is our hope that through this document you can learn how to mitigate those false alarms instead of defeating the alarm itself.

There are typically two reasons that tenants remove or disable their smoke alarms:

1. They are tired of false alarms.
2. They want to be able to smoke in their apartment.

While the second factor is definitely an issue, landlords can enforce no smoking policies that apply to both nicotine and marijuana products.

This document will concentrate on the first issue, false alarms, in the hopes that they can be mitigated by products and procedures rather than by permanently disabling the alarms.

## Types of Alarms

There are three types of smoke alarms, ionization, photoelectric, and a combination of the two where it has both sensors.

**Ionization** – This type of alarm uses a small amount of radioactive material to sense ions in the air that are created when there is a fire. It uses a chemical reaction to create a current that can then be detected.

Ionization detectors are better at detecting fast burning fires, like something on the stove igniting. Unfortunately, they are also more prone to false alarms from cooking smoke, like when you're frying bacon or burning the toast.

**Photoelectric** – In this type of alarm there is a T shaped chamber. On the left side of the T is a light, while at the bottom of the T is a sensor. Normally, the light beam does not reach the sensor. But if smoke is present, it will refract some of the light down to the sensor and the alarm will go off.

Photoelectric sensors are better at detecting smoldering fires, such as a cigarette left on a bed, or an electrical fire in a wall.

**Dual Sensor** – This type of alarm has both an ionization sensor and a photoelectric sensor in the same unit. This is the type of alarm that the National Fire Protection Association (NFPA) recommends. If either sensor detects a fire, the alarm is sounded.

**Intelligent Multicriteria** – This type of alarm is a dual sensor with an added heat sensor and it uses an algorithm to detect a fire. With multiple sensors, it is better at reducing the number of false alarms.

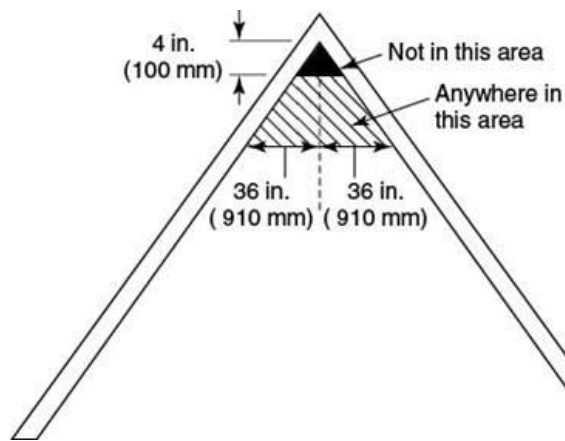
## Placement of Alarms

State fire code requires a smoke alarm in each bedroom, one outside the sleeping area (such as in the hallway), and at least one on each floor of the residential unit. If the apartment complex also has enclosed common stairways or hallways, smoke alarms are required there as well.

In bedrooms, a photoelectric sensor is definitely best, as they will react quicker to the type of fire most likely to happen while you are asleep.

Outside of the bedroom, the same recommendation applies.

For most small apartments the problem comes from the one outside the bedrooms because by necessity, it has to be close to the kitchen. Smoke alarms should be at least 10 feet away from the kitchen. Since kitchens generate the highest number of false alarms, it makes sense to install an alarm with a reset button (explained below).



Generally, the smoke alarm should be placed on the ceiling, or within 12" of it. If you have a peaked ceiling, follow the guidelines in the diagram.

Do not place alarms near windows, heater vents, wall heaters, or ceiling fans, as they will all tend to blow dust into the unit which can cause false alarms.

Certain strong chemicals such as paint thinner can also cause false alarms. We had one report of a landlord discovering that it was the tenant's scented candles on a shelf directly

below the smoke alarm that was causing the false alarms, even though the candles weren't actually being burned.

## When to Replace an Alarm

Smoke alarms should be replaced:

- Every 10 years based on date of manufacturer on the back label (7 years for Combination CO/Smoke Alarm)
- if the alarm sounds an end-of-life signal (see back of alarm for description of signal)
- if the alarm fails a monthly operability test
- or, after a fire event

## Features of Alarms

**Powered vs. Battery** – Newer homes and apartments are required to have wired in smoke alarms where they are powered by the home's electricity. They are still required to have a battery backup so they will work during a power outage.

Older residences can use battery powered devices. Current California fire code only allows alarms with 10-year lithium batteries to be sold.

**Interlinked** – California now requires for new construction smoke alarms that are interlinked, so that if one goes off, they all go off. This is especially important if your apartment or house is multi-floor. For older residences this same feature can be accomplished with alarms that communicate with each other wirelessly. Often this type of alarm can be part of a smart house app, so that you can receive notice on your phone whenever they activate.

**Reset Button** – Some alarms have a very handy feature of a reset or silence button. This allows you to press a button on the outside of the alarm if it sounds and you have determined it is a false alarm. This will stop the alarm from sounding, and temporarily disable the alarm for a period of time (usually 8-30 minutes) so you can finish cooking your bacon in peace.

**Combination Smoke Alarm & Carbon Monoxide Alarm** – During our inspections we're seeing more and more combination alarms, where a smoke alarm is combined with a carbon monoxide alarm in the same unit. These are a great solution with one caveat: It is important that the residents know that they have combination alarms, and they should know the difference in the sound of the alarms.

If you are considering installing combination alarms, look for the ones that have a voice warning in addition to the normal beep patterns. They will say "Fire, Fire" or "Carbon Monoxide Emergency, Get Out" or something like that. That makes it very clear which type of emergency it is.

The problem with combination alarms that don't have the voice feature is that residents might not be aware it's a combination device, and seeing it on the ceiling they may assume it's just a smoke alarm. If it goes off, they might assume it's a false alarm since they don't see a fire and ignore and disable the alarm, when in reality, it is the carbon monoxide alarm going off and they should be evacuating the building.

Always remind your tenants and family of the differences between the two alarms:

Smoke alarms have a pattern of three longer beeps: --- ---

Carbon monoxide alarms have a pattern of four shorter beeps: - - - - - - - -

**ADA Smoke Alarms for the hard of hearing or deaf** – For individuals who are hard of hearing or deaf, there are two solutions. Either an alarm with a visual strobe, or a separate device that will detect the sound of an alarm going off and vibrate their pillow, or even a remote device they can wear. For the second option, it is important that your smoke alarm uses the NFPA standard tone and pattern which modern smoke alarms are required to use. However, if your alarm doesn't have that standard pattern, it's probably old enough it should be replaced anyways.

## Maintenance of Alarms

Smoke alarms do require some regular maintenance. First off, the life span of a smoke detector is 10 years. New ones have a place on the back to record when they were installed. A good practice for apartments and schools is to write the date on the side with a sharpie so it can easily be seen.

All smoke alarms should be tested once a month. Even though newer models with 10-year batteries do not require the twice a year battery replacement, it's still a good idea to test them regularly. The testing procedure varies by model, but they will have a test button on the outside. Some will go off when you press the button, some will go off when you release the button, and some you have to hold for 5 seconds before they go off. We've even come across one model that will initially chirp as if it has a low battery, but five seconds later it will do the full test if you keep holding the button. So read those instructions!

If you have tall ceilings, it is useful to keep a long stick handy so you don't need to climb a ladder to test it. Also look for alarms that have a button that is easy to hit with a stick.

As dust can accumulate in them and start causing false alarms, it's a good idea to vacuum them once in a while, especially if you are having repeated false alarms that don't seem to have any discernible cause.

Another potential cause of false alarms is that insects can be attracted to the little extra bit of heat they find inside a smoke alarm and can crawl into the chamber. This often happens during the first few months of autumn as temperatures begin to fall.

## Resources

### NFPA

<https://www.nfpa.org/Public-Education/Staying-safe/Safety-equipment/Smoke-alarms/Installing-and-maintaining-smoke-alarms>

<https://www.nfpa.org/News-and-Research/Publications-and-media/Blogs-Landing-Page/NFPA-Today/Blog-Posts/2022/01/28/What-kind-of-smoke-alarm-smoke-detector-should-I-buy>

### Ionization vs. Photoelectric

<https://www.mcgill.ca/oss/article/technology-general-science/smoke-alarms-are-not-created-equal>

### Manufacturers

First Alert - <https://www.firstalert.com>

Kidde - <https://www.kidde.com>

Universal Security – <https://www.universalsecurity.com>

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