

Smoke Alarms • Carbon Monoxide Alarms • Heat Alarms • Fire Extinguishers

Smoke Alarm Troubleshooting Guide for Contractor, Builder & Facility Service Managers

Why can smoke alarms go into alarm when no smoke is present?

Any of these situations can cause unwanted alarms:

- **Cover or sensor chamber is covered by dust or dirt.**
Alarms may look clean, but dust can accumulate inside the cover, especially in newly built homes. Gently vacuum smoke alarms regularly using the soft brush attachment. Be sure electricians install the provided dust cover to keep alarm clean during construction.
- **Insects covered or clogged the sensor chamber.**
Clean the smoke alarm with the soft brush attachment on your vacuum.
- **Alarm was triggered from another part of the home.**
In a system of interconnected AC or AC/DC alarms, the unit triggering the alarm is in another part of the home - smoke may be present, but you can't see it.
- **Power interruptions to AC/DC smoke alarms.**
Smoke alarms may alarm briefly when power is interrupted, then restored. Power interruptions are common in areas where utility companies switch grids in the early hours of the morning.
- **A loose electrical connection on AC or AC/DC smoke alarms.**
In AC or AC/DC smoke alarms, a loose hot wire connection can intermittently disconnect power to the smoke alarm. The effect is the same as a power failure. When power is restored, the units may alarm briefly. Note: A loose or disconnected neutral wire may cause the alarm to chirp or go into alarm. For residential applications, connecting stranded 18 AWG wire from the smoke alarm to solid 14 AWG wire can be difficult. Be sure wire is making a reliable connection.
- **Are there any appliances on the same circuit as the alarms?**
A large current load, like a vacuum cleaner, on the same circuit may cause nuisance alarms. This situation is aggravated if the load is located at the end of the wiring run, that is, electrically far away from the circuit box, and if the resistance of the wiring to the load is large. The voltage drop of the wiring to the load will be imposed on the interconnect wire thus causing the alarm to sound. Note: According to the NEC smoke alarms are required to be tied to general lighting or outlet circuits in bedrooms. This was done so it would be more likely a homeowner would recognize their circuit breaker had tripped and power was interrupted to their alarms versus when alarms were on dedicated circuits where they would have to recognize the power light was off on their alarm. Unfortunately this may increase the chance for nuisance alarms.
- **When the furnace is turned on for first use:**
 - Oil and residue is present on and in furnaces and ductwork from the factory to protect the metal surfaces. This can cause smoke to be emitted for a period of time and possibly set off smoke alarms.
 - Dirt, drywall dust and construction debris is often present in ductwork. First use of the furnace can cause fine particles to be blown through the house possibly causing nuisance alarms. This is why the homeowner may be in the house for several months without incident and why nuisance alarms tend to increase during the Fall.
- **Humidity-**
Ionization smoke alarms are more susceptible to nuisance alarms when placed near a bathroom or other potentially high humidity area.
- **Near Cold Air Returns**
Smoke alarms placed near a cold air return are more susceptible to nuisance alarms because dusty air can be blown through the alarm sensing chamber.
- **Smoke alarm may need to be relocated.**
If possible, install smoke alarms at least 20 feet from appliances like furnaces and ovens, which produce combustion particles. Alarms should be at least 10 feet from high humidity areas like showers and laundry rooms, and at least 3 feet from heat/AC vents and fluorescent lights

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whenever possible. In areas where a 20-foot (6 meter) distance is not possible – in modular, mobile, or smaller homes, for example – it is recommended the Smoke Alarm be placed as far from these fuel-burning sources as possible. The placement recommendations are intended to keep these Alarms at a reasonable distance from a fuel-burning source, and thus reduce “unwanted” alarms. Unwanted alarms can occur if a Smoke Alarm is placed directly next to a fuel-burning source. Ventilate these areas as much as possible.

Why do smoke alarms chirp intermittently?

The “chirp” will only be caused by issues surrounding the battery or miss wiring. However, a homeowner may confuse the chirp with an intermittent alarm. Try and get the homeowner to be specific as to what they are hearing. A “chirp” will have a higher pitched tone and sound in equal intervals about once every minute. An intermittent alarm will be random, sound usually for several seconds and have a lower pitched tone. Any of these situations can cause unwanted chirps:

- **Battery pull-tab is still in the alarm.**
The battery pull-tab must be removed after AC power is provided to the alarm.
- **The Battery Drawer is open.**
The battery drawer must be completely closed for the battery to make contact with the terminals.
- **Low battery.**
As the battery in a smoke alarm becomes weak, the smoke alarm will “chirp” about once a minute to alert you that the battery needs to be replaced. Note: Only the alarm with a low battery will chirp. No signal is sent through the interconnect wire. The other alarms will be silent.
- **Tip for Facility Managers.**
During the moving season, inform Facility Managers who maintain apartment buildings that if they are shutting down power to unoccupied apartment units, to be sure to open the battery drawer on alarms to keep the battery from draining. Remind them that if they restore power temporarily (e.g. to show the unit) the alarm will chirp if the drawer is open. The alarm now thinks there is no battery. This is also important for single-family houses that will be unoccupied for extended periods.
- **Battery is present but part of the terminal is obstructed.**
The battery may not be fully making contact with the terminals in the alarm. Check to be sure the battery pull-tab or some other obstruction is completely removed.
- **A different device or appliance.**
Security systems, monitors, carbon monoxide alarms, and other devices have similar low battery or alert signals.
- **How long will a battery last in a smoke alarm?**
A fresh carbon zinc battery in the 9120B will last up to one year; depending on how fresh it was before it was installed and when it was activated. UL 217 mandates that the battery in a backup mode only need to last for 24 hours in standby condition and thereafter be able to be in alarm for at least 4 minutes. As a rule of thumb in smoke alarms, alkaline batteries will last for about 1-2 years and Lithium batteries for 6 years plus.
The SC9120B battery will last for about 20 to 30 days. UL 2034 states that the battery should last for 7 days in standby condition and thereafter be able to be in alarm for at least 4 minutes.
- **Why does the alarm chirp when power is disconnected and the battery is removed?**
The circuitry of the alarm contains capacitors that store energy. You must press and hold the test button to dissipate the capacitor. You will hear a steadily weakening sound until it is silent.

