SMART CHOICES for SMOKE ALARM PLACEMENT

Smart Choices in Smoke Alarm Placement

Home is where most people feel the safest – but it's also where you are most likely to experience a fatal fire. According to the National Fire Prevention Association (NFPA), 85 percent of all fire fatalities – close to 2,650 people annually – occur in a home. Many of these deaths may have been prevented; most fire fatalities happen in the 29 percent of homes that either have inoperable smoke alarms, or no alarms, the NFPA noted.

While three-fourths of U.S. homes have at least one working alarm, the question remains as to whether they have enough alarms. Model code NFPA 72 requires newly constructed homes to have hard-wired, interconnected smoke alarms on each floor, in hallways and inside of all sleeping areas. But more than 84 million homes – most built prior to 1993 – only have isolated battery- or electric-powered smoke alarms. Millions more do not have an alarm inside of bedrooms.
Simply put, residents without a sufficient number of working smoke alarms are under protected and therefore at increased risk.

Recent studies identify that based on construction features and contents, families may have less than three minutes from the time the first smoke alarm sounds to escape a fire (National Institute of Standards and Technology). The sooner an alarm is heard, the more time there is to respond.

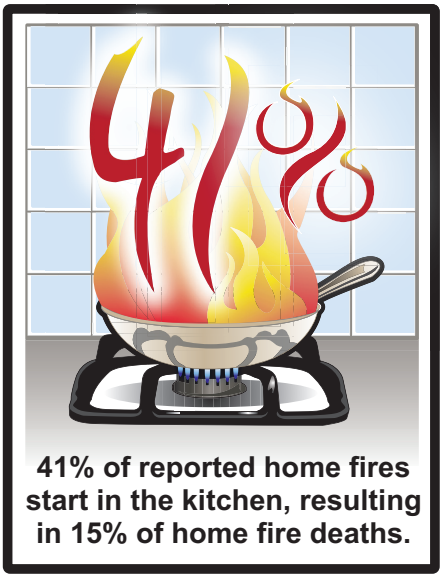
Because you can't predict what type of fire will start in a home, it is important that both smoldering and flaming fires are detected as quickly as possible. Therefore, both photoelectric and ionization technology – either in a mix of single technology alarms or a combination alarm -- is optimal. However, the most important thing is to ensure that there are working UL-listed smoke alarms on every floor of the home, in hallways, in living areas, inside bedrooms and outside of sleeping areas.

The Bedroom:

- More than half (55%) of all home fire fatalities occur in the bedroom. (USFA)
- More than a third (35%) of the victims were asleep at the time of the fire.
- Half of all home fire fatalities occur between the hours of 10 p.m. and 6 a.m., when most people are asleep. (NFPA)
- Since it is recommended to sleep with bedroom doors closed to assist in limiting the spread of a fire, it is important to place alarms within each bedroom as the shut door can cut the decibel level of an alarm outside of the room nearly in half – from 85 db to 46 db. (CPSC)

Kitchen:

- Cooking is the leading cause of home fires and injuries in the United States, and the third leading cause of home fire deaths. (NFPA)
- 41% of reported home fires start in the kitchen, resulting in 15% of home fire deaths. (NFPA)
- Install smoke alarms at least 20 feet from cooking appliances to prevent nuisance alarms. Also ensure the alarm has a hush button, which will temporarily halt the alarm during a nonemergency.



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NFPA

Hallways:

- Because sleeping areas are often located furthest from the exits of a house, it is important that smoke alarms be installed in the hallways and on all exit routes from bedrooms.
- Install smoke alarms on the hallway ceiling outside of sleeping areas.

Living Area:

- Although only 4% of home fires start in the living room, family room, or den, these fires cause 24% of deaths. (NFPA).
- Smoking is the leading cause of home fire fatalities, and most fatal smoking-related fires begin in the family room or den. (NFPA)
- Typically, abandoned or carelessly discarded smoking materials ignite trash, bedding or upholstery.

Alarm Installation Tips:

- Install at least one smoke alarm on each level or story of a multi-story dwelling, inside and outside of sleeping areas, in hallways, and living/kitchen areas.

- Since smoke travels up, smoke alarms should be installed on the ceiling or high on a wall. Mount on the ceiling as close to the center as possible and at least four inches away from the wall.
- Install alarms 20 feet away from "sources of combustion particles" (stoves, furnace, water heater, etc.) that could cause nuisance alarms, such as in the kitchen.
- Install 10 feet away from bathrooms or other damp, humid areas. The steam can often set off nuisance alarms.
- Do not install in areas where the temperature is below 40 or higher than 100 degrees Fahrenheit, such as an attic. Colder or warmer temperatures might set off false alarms and shorten the life of the alarm's battery.
- The living area smoke alarm should be installed in the living room and/or near the stairway leading to the upper level. The alarm should not be located in the stairway.
- Smoke alarms should be placed in finished attics; the attic area smoke alarm should be located in the attic near the stairway from the floor below. (NFPA)
- The basement smoke alarm should be installed in the basement, within 10 feet of the stairway. The alarm should not be located in the stairway. (NFPA)
- If installed on an open joists ceiling, the alarm should be placed on the bottom of the joists. (NFPA)
- If a hallway is more than 30 feet long, install a unit at each end. Smoke alarms should also be placed at the top of the first-to-second floor stairway, and at the bottom of the basement stairway. (Kidde recommendation)
- Do not install in dusty, dirty or greasy areas – or near air vents, ceiling fans or other drafty areas (drafts can blow the smoke away from the smoke alarm, preventing the alarm from sounding).
- Most importantly, install alarms according to manufacturer's instructions in the owner's manual.

Always remember:
Smoke alarms do not last forever. Replace smoke alarms in accordance with the manufacturer's recommendations or at least every 10 years. Additionally, test smoke alarms monthly.

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Understanding Smoke Alarm Technologies

Fires can have different characteristics. Some can flame and spread quickly while other fires may take more time to spread but produce more smoke. While types of fires may be different, any type of fire will pose a danger.

Smoke alarm technology has advanced over the years and consumers today have choices on what technology to use in their homes. While understanding what types of alarms are available is important, it is critical to remember that installing working UL-listed alarms and testing them regularly is the key to providing you additional notice and increased time to escape a fire.

Experts divide home fires into two categories:

- Flaming fires result from the ignition of items such as flammable liquids, wood or paper, or from open flames, such as candles that ignite other items. These fires produce large quantities of flames and lesser amounts of smoke.
- Smoldering fires most often occur when smoking materials, such as cigarettes, are left unattended. These fires produce minimal amounts of flames, but larger quantities of smoke.

National Fire Incident Reporting System (NFIRS) data shows that 93 percent of all residential fires are flaming and that flaming fires account for 75 percent of residential fire deaths. Together, both types of residential fires claim about 2,650 lives annually (NFPA).

Smoke Alarm Technologies

There are two types of smoke alarm technologies currently available to home-owners: ionization and photoelectric. Smoke alarms may be purchased with either ionization or photoelectric technology, or in a dual-sensor smoke alarm that combines both technologies into one unit.

- Ionization smoke alarms may detect flaming fires sooner as these fires generally release millions of smaller and less visible charged (“ionized”) fire particles. These particles interfere with the electrical current that flows through the detection chamber which then triggers the alarm to sound.
- Photoelectric smoke alarms may detect smoldering fires sooner as these fires generally produce larger, more visible fire particles. These particles interfere with and reflect the alarm’s light beam, which then triggers the alarm to sound.

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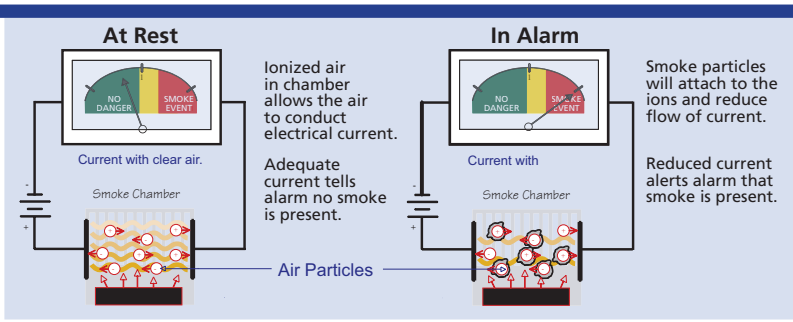

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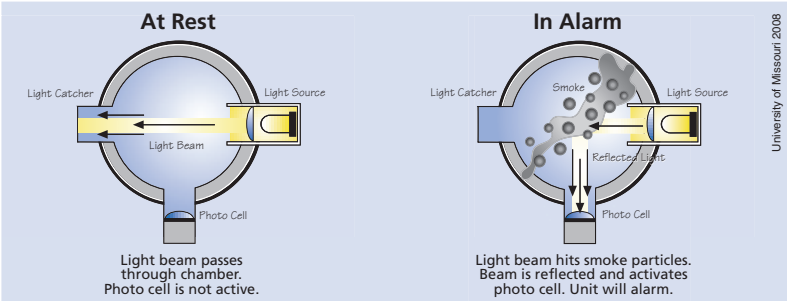

Experts Recommend Having Both Technologies

The International Association of Fire Chiefs (IAFC), along with virtually every other recognized fire authority – including the National Fire Protection Association (NFPA), the U.S. Fire Administration (USFA), the National Institute of Standards and Technology (NIST), Consumer Products Safety Commission (CPSC), the National Association of State Fire Marshals (NASFM) and Underwriters Laboratories (UL) – recommends the installation of both ionization and photoelectric technology to maximize protection from either flaming or smoldering fires.

Since it can't be predicted what type of fire will start in a home, it is important that both smoldering flaming fires are detected as quickly as possible. Therefore, it is vital that the correct type (technology) of smoke alarm and their placement (location) within the home be utilized correctly. Additionally, you can leverage the strengths of each technology by considering the location and environment they are placed in.

For example, some studies have shown that ionization smoke alarms may be more prone to nuisance alarms, such as those that occur due to cooking.
Consumers may reduce that potential by placing ionization smoke alarms at least 20 feet from appliances, or by installing a photoelectric alarm near a cooking area.
Most smoking-material fires, which tend to smolder, begin in a den, family room, living room or bedroom. Families with members who smoke may consider installing photoelectric alarms or dual-sensor alarms in those areas.

The most important thing is to ensure that you have working smoke alarms on every floor of your home, inside each bedroom and outside sleeping areas.

For more information on smoke alarms, visit www.SmartAlarmChoices.org.

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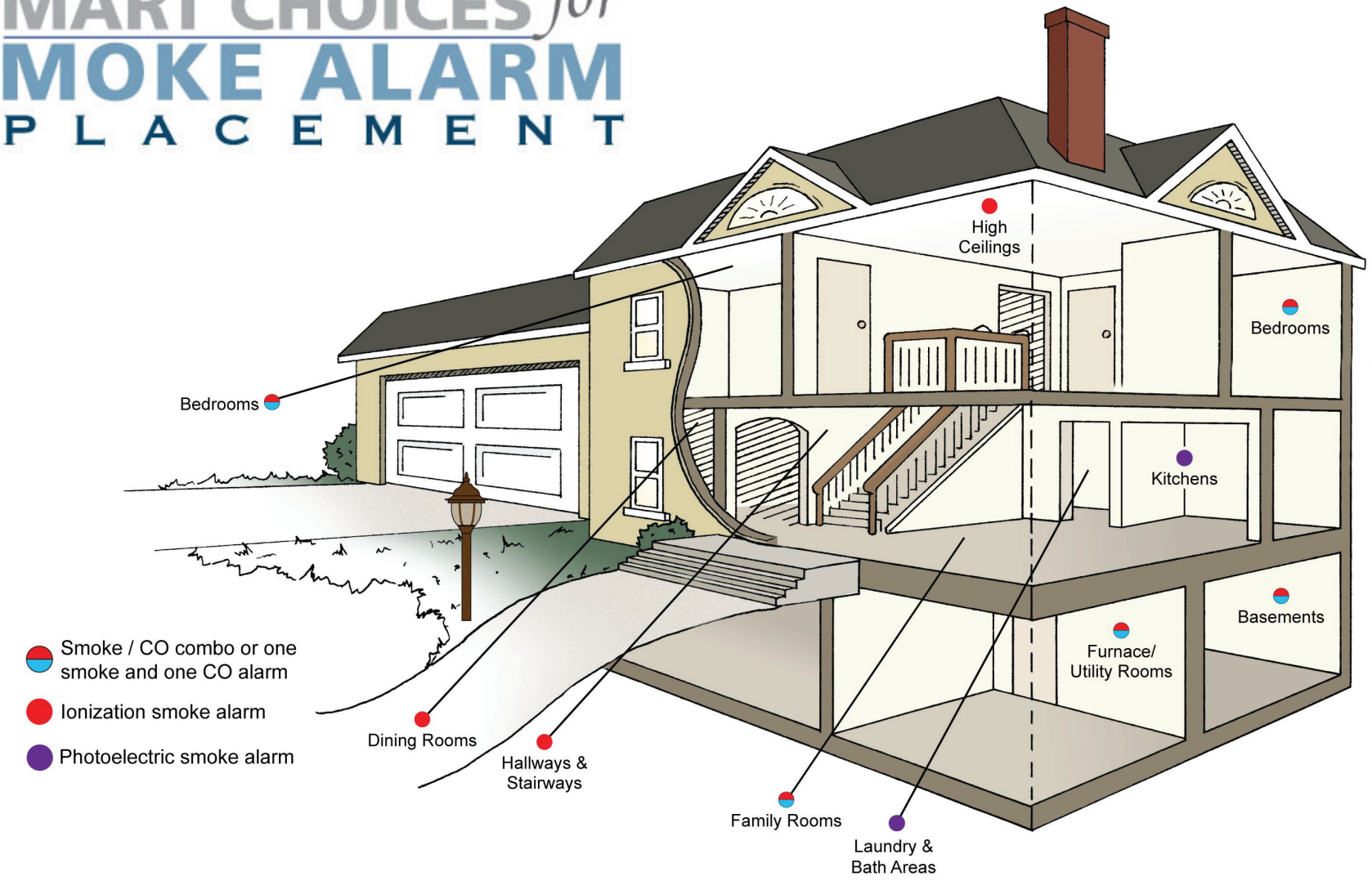

Model code NFPA 72 requires newly constructed homes to have hardwired, interconnected smoke alarms on each floor, in hallways and inside of all sleeping areas. However, more than 84 million homes – most built prior to 1993 – only have isolated battery- or electric-powered smoke alarms. Millions more do not have an alarm inside of bedrooms. Simply put, residents without a sufficient number of working smoke alarms are under protected and therefore at increased risk.

According to the IAFC, it is critical to ensure that there are working UL-listed smoke alarms on every floor of the home, in hallways, in living areas, inside bedrooms and outside of sleeping areas. This diagram illustrates the optimum locations of smoke alarms in the home.

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Media Talking Points

The following messages can be used when discussing the importance of having enough working smoke alarms and the advantages of location-based smoke alarms in residences.

General Statement on Location-Based Alarms

85 percent of all fatal fires occur in someone's residence. That's approximately 2,650 people losing their life as the result of a fire in their home, according to the National Fire Protection Association (NFPA).

Smoke alarms have been proven to increase the chances of survival by giving the residents additional time to get out of the house. However, many residents do not have the appropriate number of working smoke alarms in their house which leave them under protected. The NFPA and IAFC recommends that homes have a smoke alarm on each floor, in hallways and inside of all sleeping areas.

There are two types of smoke alarm technologies currently available to homeowners: **ionization** and **photoelectric**. The IAFC, along with virtually every other recognized fire authority including the NFPA, recommends the installation of both ionization and photoelectric technology to maximize protection from either flaming or smoldering fires. For more information, contact your local fire department.

Key Messages

- **Smart Choices for Smoke Alarm Placement**
  Smart Choices for Smoke Alarm Placement is a new IAFC program that provides fire departments educational materials and other useful resources to help inform their communities about the importance of having a sufficient number of working smoke alarms in homes, how smoke alarm technologies work and the proper placement of the alarms.

Most fatal fires occur in the home

- **85 percent** of all fatal fires occur in the home (NFPA)
- Approximately **2,650 Americans** die each year in home fires (NFPA)

More working smoke alarms in the home increases the chances of surviving a fire

- On average, families have **less than three minutes** from the time the first smoke alarm sounds to escape a fire. The sooner an alarm is heard, the more time there is to respond.
- It is important that both smoldering and flaming fires are detected as quickly as possible. Both photoelectric and ionization smoke alarms meet NFPA 72 code and a combination of the two technologies is optimal.

- The most important thing is to ensure that there are working UL-listed smoke alarms on every floor of the home, in hallways, in living areas, inside bedrooms and out side of sleeping areas.

Residents without a sufficient number of working smoke alarms are under protected.

- More than 84 million homes – most built prior to 1993 – only have isolated battery- or electric-powered smoke alarms, and millions more do not have an alarm inside of bedrooms.

Install at least one smoke alarm on each level or story of a multi-story dwelling, inside and outside of sleeping areas, in hallways, and living/kitchen areas.

- When installing smoke alarms, always refer to the manufacturer's instructions in the owner's manual.

Smoke alarms should be in every bedroom or just outside the bedroom in the hallway

- More than half (55 percent) of all home fire fatalities occur in the bedroom. (USFA)
- More than a third (35 percent) of the victims were asleep at the time of the fire. (USFA)
- Placing smoke alarms in bedrooms as well as in hallways could increase a family's escape time by up to 15 minutes. (NIST)
- Half of all home fire fatalities occur between the hours of 10 p.m. and 6 a.m., when most people are asleep. (NFPA)

Cooking is the leading cause of home fires and injuries in the United States

- Cooking-related fires are the third leading cause of home fire deaths. (NFPA)
- Install smoke alarms at least 20 feet from cooking appliances to prevent nuisance alarms.

Smoking is the leading cause of home fire fatalities

- Most fatal smoking-related fires begin in the family room or den.
- Typically, abandoned or carelessly discarded smoking materials ignite trash, bedding or upholstery.

Smoke alarms do not last forever

- Smoke alarms should be replaced every 10 years and be tested monthly.
- Replace alarm batteries at least once a year or when the alarm signals ("chirps") the end of the battery life. Follow manufacturer's instructions if you have a 10-year smoke alarm which uses a long-life lithium battery.

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PSA

30-second PSA for radio:

Every three hours, someone in the U.S. dies in a home fire. And if a fire breaks out, you only have minutes to escape. Is your family prepared?

The (INSERT FIRE DEPARTMENT NAME) reminds you that placement matters; install working smoke alarms on each floor, in hallways, living areas and inside of all bedrooms. The sooner you hear an alarm, the more time your family has to escape. Check alarms regularly, replace them if they're more than 10 years old, and develop and practice an escape plan with your family.

It's these Smart Choices that could save lives.

For more information, go to www.SmartAlarmChoices.com

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Supporting Studies

The National Fire Protection Association (NFPA) and the U.S. Fire Administration (USFA) estimate that the use of smoke alarms in homes has risen from less than 10% in 1975 to its current rate of 96%. During that time, the number of home fire deaths has been cut nearly in half. Thus the home smoke alarm can be credited as one of the greatest success stories in fire safety in the last part of the 20th century.

However, over the past 10 years, home fire deaths have reached a plateau of approximately 2,650 per year. More education and awareness is needed about replacing outdated alarms, i.e. ones that are 10 years or older, and about installing alarms in rooms throughout the home. This document summarizes fire industry studies which support the importance of location-based smoke alarms the IAFC's Smart Choices for Smoke Alarm Placement Campaign toolkit.

USFA Position on Smoke Alarms

- Locations of smoke alarms in a home may be more important than the type of smoke alarm present, depending on the location of a fire. Users should follow the owner's manual on the recommended location of smoke alarms in a home.

National Sample Survey of Unreported Residential Fires (performed by the CPSC)

- 82% of the households that had unreported fires and 84% of non-fire households had smoke alarms on every level.
- Less than one-quarter (22%) of fire households had smoke alarms in all bedrooms.
- Almost one-third (31%) of non-fire households had smoke alarms in all bedrooms.

Home Smoke Alarms – The Data as Context for Decision (performed by NFPA)

- Some portion of the 34% of fire deaths resulting from fires with working smoke alarms may be reduced by changes in smoke alarm placement practices.
- Requirements for smoke alarms in bedrooms and interconnectivity increases the likelihood that occupants will be alerted to fire in another part of the home.
- Many homes with smoke alarms do not have alarms on every level.
- Ambient noise and closed doors can diminish a smoke alarm's waking effectiveness.

Civilian Fire Fatalities in Residential Buildings (performed by the USFA)

- The leading specific location where civilian fire fatalities occur in residential buildings is the bedroom (55%).
- 55% of civilian fire fatalities in residential buildings occur between the hours of 10 p.m. and 6 a.m. This period accounts for 47% of fatal fires.
- 35% of fire victims in residential buildings were sleeping at the time of their deaths.

Smoke Alarms in U.S. Home Fires (performed by NFPA)

- Almost all U.S. households have at least one smoke alarm, yet in 2005-2009, smoke alarms were present in less than three-quarters (72%) of all reported home fires and operated in half (51%) of the reported home fires.
- More than one-third (38%) of all home fire deaths resulted from fires in homes with no smoke alarms, while one-quarter (24%) resulted from fires in homes in which smoke alarms were present but did not operate.
- The death rate per 100 reported fires was twice as high in homes without a working smoke alarm as it was in home fires with this protection.

Residential Structure and Building Fires (performed by the USFA)

- Nearly 40% of all residential fires are caused by cooking, while smoking is the number one cause of residential fire fatalities (19%).
- Although fire incidents drop when people sleep, fatal fires are at their highest late at night and early in the morning.

An Analysis of the Performance of Smoke Alarms (performed by NIST)

- A combination of ionization and photoelectric alarm technologies is ideal for homes.
- Vulnerable populations who may require significantly more time to escape than more mobile populations would benefit the most from dual alarm technology or side-by-side photoelectric and ionization alarms with alarm placement following current NFPA 72 requirements.

Home Smoke Alarm Tests (performed by NIST)

- Smoke alarms of either the ionization type or the photoelectric type consistently provided time for occupants to escape from most residential fires.
- Ionization alarms provided somewhat better response to flaming fires than photo electric alarms, and photoelectric alarms provide faster response to smoldering fires than ionization type alarms.