

Carbon-monoxide & smoke alarms

Being safe is harder than it should be

HERE'S A CHALLENGE to America's smoke and carbon-monoxide alarm industry: Create one device that can sense flames and smoke and warn you about carbon monoxide. Our tests of 25 alarms show that safety is far too complicated.

For example, smoke alarms that use ionization technology were great at detecting a fast-flaming fire, like burning paper, but lousy at warning you of a smoldering fire, say, in a mattress. The opposite was true of photoelectric versions. A few smoke alarms, which use both technologies, warn you of both types of fire, but they don't detect leaks of CO, a colorless, odorless gas emitted by fuel-burning appliances that can cause brain damage or death. And combined smoke and CO alarms detect only one type of fire, depending on the maker.

Getting all of a home's alarms to communicate with one another via an electrical line or wireless signal, so you would be warned about a fire or CO leak in the basement even if you were asleep upstairs, is another hurdle. Adapters enable hardwired alarms to be connected with those made by a competitor. But wireless alarms can communicate only with other wireless alarms from the same company, since manufacturers use different frequencies. The industry should fix this problem.

Fortunately, you can safeguard your household with some mixing and matching. What's more, several models provide excellent protection. And any of the tested units would be better than having no detectors at all. Here are the details:

More smoke alarms do double duty. Three tested smoke alarms from First Alert and Kidde warn you of flaming and smoldering fires, saving you the hassle of installing separate ionization and photoelectric alarms for full protection. Kidde's PI2000, a CR Best Buy at \$30, connects to home wiring or an existing alarm system and has battery backup for blackouts.

Buying by type can make sense. Ionization alarms are more prone to false alarms from burnt toast and shower steam. That's why it's better to install a photoelectric smoke alarm outside a kitchen or bath. BRK's hardwired 7010B, \$25, includes battery backup for power outages, can be interconnected with some First Alert or other BRK alarms, and is less than half the cost of some battery-only alarms.

Kidde claims its Intelligent Ionization Alarm 900-0216 is less susceptible to false alarms. But it wasn't available in stores as we went to press; we will test it and report.

Some CO alarms were slow. The bottom-scoring Kidde stand-alone model took almost twice as long to respond as the top-scoring First Alert among intercon-

necting models, although the Kidde meets current standards for CO alarms.

How to choose

Some insurers offer a 5 percent discount if your home has smoke alarms. Install both types of smoke sensors and a CO alarm on every level and a smoke alarm in the attic and in all bedrooms and hallways. Our top picks focus on interconnecting models. Here's what else to consider:

Pick your power. Hardwired systems tie into a home's wiring and require professional installation (about \$250 per unit). Battery-only alarms and plug-in CO alarms are easy do-it-yourself projects.

Look for key features. Smoke alarms should have a hush button, safer than disabling the alarm by removing the power during a false alarm. On CO alarms, look for a digital display showing CO levels in parts per million; levels as low as 30 ppm can harm heart patients, pregnant women, and children. Some show peak levels that occurred while you were out.

Balance convenience and cost. First Alert's SCO501CN and Kidde's KN-COSM-1B combine CO and smoke detection. But each covers only one type of fire and, like all CO alarms, should be replaced every five years; smoke alarms, every 10 years.



BURN NOTICE Our flash-fire test tracks how long it takes for the smoke detectors, upper right, to set off an alarm. Senior project leader Deborah Wallace oversees testing in a sealed lab.

Overview

Top smoke alarms use dual sensors, can be interconnected, and have a hush button. Top CO alarms quickly sound an alarm at high and low levels and have digital displays.

CR Best Buy

These offer the best blend of performance and price. All are Recommended.

Recommended

These are high-scoring models that stand out for the reasons below.

Two to buy for top overall protection

These hardwired models include a battery backup. When used together they give the best protection against fire and CO.

A1 Kidde \$30 **CR Best Buy** and **D4 Kidde** \$60

A1 has dual smoke sensing. A peak memory on **D4** tells you the highest CO reached. You need both **A1** and **D4** to safeguard against fire and CO.

SMOKE ALARMS

Battery-powered smoke detection:

A2 First Alert \$25

A3 Kidde \$23

These combine both types of smoke sensing in a single battery-powered alarm.

For kitchens, baths, existing systems:

B1 First Alert \$15

C1 BRK \$25

Choose **B1** to add ionization sensing to an existing system, **C1** near baths and kitchens.

CARBON-MONOXIDE ALARMS

For larger spaces:

D1 First Alert \$70 **CR Best Buy**

D2 First Alert \$83

Each can talk to other wireless First Alert alarms. **D1** combines CO and photoelectric smoke detection; **D2** provides CO detection only.

Stand-alone models for small spaces:

E1 First Alert \$40 **CR Best Buy**

E3 Kidde \$45

Both are plug-in with battery backup—fine for small, one-story homes and apartments.

Guide to the Ratings

Smoke alarm performance is based on flaming and smoky fires and includes convenience features such as hush buttons. Overall scores are not listed because performance was similar within types. **Flaming fires** is response time to paper fires with little smoke.

Smoldering fires is response time to wood-fed smoky fires. **CO alarm** scoring is based on response time to lower and higher levels of CO, accuracy of digital display or voice message. **High CO levels** is response to CO of 300 parts per million; **low CO levels** is response to 150 ppm. **Price** is approximate retail.

A1 Kidde



D1 First Alert

Ratings Smoke alarms

In performance order, within types. (Types designated A, B, etc.)

- Excellent
- Very good
- Good
- Fair
- Poor

Recommendation	Rank	Brand & model	Price	Test results		Features		
				Flaming fires	Smoldering fires	Power supply	Interconnectable	Hush button

A DUAL-SENSOR MODELS Best for detecting most types of fires.

✓	1	Kidde PI2000 [1]	\$30	●	●	hardwired w/BB*	●	●
✓	2	First Alert SA302CN	25	●	●	battery	●	●
✓	3	Kidde PI9000	23	●	●	battery	●	●

B IONIZATION MODELS Best for detecting fast, flaming fires.

✓	1	First Alert SA9120BCN	15	●	●	hardwired w/BB*	●	●
	2	Kidde Silhouette KN-5M-FM-1	60	●	●	hardwired w/BB*	●	●
	3	Kidde Combination KN-COSM-1B [2]	45	●	●	hardwired w/BB*	●	●
	4	Kidde RF-SM-DC	40	●	●	battery	●	●
	5	First Alert SA303	12	●	●	battery	●	●
	6	First Alert SA304LCN	24	●	●	battery	●	●

C PHOTOELECTRIC MODELS Best for detecting smoky, smoldering fires.

✓	1	BRK 7010B	25	●	●	hardwired w/BB*	●	●
	2	First Alert SA501CN	60	●	●	battery	●	●
	3	First Alert SC0501CN [2]	70	●	●	battery	●	●
	4	First Alert SA720CN	20	●	●	battery	●	●
	5	Kidde PE120	20	●	●	hardwired w/BB*	●	●
	6	Kidde PE9	15	●	●	battery	●	●

*BB=battery backup. [1] Units made between Aug. 1, 2008, and May 4, 2009, have been recalled; others are fine. Date is stamped on back of unit. [2] Combination smoke/carbon-monoxide alarm, also rated as CO alarm.

Ratings CO alarms

In performance order, within types. (Types designated D and E.)

Recommendation	Rank	Brand & model	Price	Overall score	Test results			Features	
					High CO levels	Low CO levels	Display/voice	Power supply	Peak memory

D INTERCONNECTED MODELS Can be linked together so all sound an alarm at the same time.

✓	1	First Alert OneLink SC0501CN [1]	\$70	90	●	●	●	battery	●
✓	2	First Alert OneLink C0511B	83	89	●	●	●	battery	●
	3	Kidde Combination KN-COSM-1B [1]	45	58	●	○	NA	hardwired w/BB*	●
✓	4	Kidde Silhouette KN-COPP-1	60	56	○	○	●	hardwired w/BB*	●

E STAND-ALONE MODELS Best for small or one-level homes and apartments.

✓	1	First Alert C0615	40	87	●	●	●	plug-in w/BB*	●
	2	First Alert C0410	40	74	●	●	●	battery	●
✓	3	Kidde Nighthawk KN-COPP-3	45	66	●	○	○	plug-in w/BB*	●
	4	Kidde Nighthawk KN-COPP-B	40	54	○	○	●	battery	●
	5	Kidde Nighthawk KN-COB-DP-LS	35	52	●	○	NA	plug-in w/BB*	●
	6	Kidde Nighthawk KN-COB-B-LS	35	49	○	○	NA	battery	●

*BB=battery backup. [1] Combination carbon-monoxide/ionization smoke alarm, also rated as smoke alarm.