SYSTEM SENSOR®

FALL 2008

LifeSafety MAGAZINE

Information on life safety from the leader in fire detection

Are You Ready?

The Next Evolution of Fire Detection

Also Inside:

Eight Changes to NFPA 720

Four New Products Keep You Ahead of the Curve

Amber Lens Strobes

- Mass notification device
- Distinctive visual signaling for non-fire evacuations
- Automatic selection of 12 or 24 volt operation at 15 and 15/75 candela
- 11 field-selectable candela settings

ExitPoint™ Directional Sounder

- Broadband sound can improve evacuation times by up to 75%
- Transient occupants follow the sound to the nearest safe exit
- Ideal for open areas, corridors, stairways
- 15 field-selectable language choices, including dual language combinations

NEW! *Speakers & Speaker Strobes Join the SpectrAlert® Advance Notification Family*

- Plug-in design prevents ground faults by eliminating nicked wires.
- SP speakers offer high fidelity for clear voice messaging
- SPV speakers offer higher sound output levels to overcome high ambient noise applications
- Standard or high candela strobes
- Complete indoor and outdoor product lines
- Outdoor units include lightweight, weatherproof, plastic back boxes
- Outdoor models rated NEMA 4x
- Wall and ceiling units
- Universal mounting plates for wall and ceiling products

An extensive selection of accessories allows these speakers and speaker strobes to be installed in almost any application.

All SpectrAlert Advance products feature plug-in design for efficient installations. SpectrAlert Advance products are compatible with the System Sensor synchronization protocol and legacy SpectrAlert products. Rotary switches allow easy field selection.

Horns, Strobes & Horn/Strobes

- Our best-selling horn/strobe is the foundation of our annunciation line
- Horn rated at 88+ dbA at 16 volts to penetrate walls
- Standard and high candela models available
- Rotary switch for horn tone and three volume selections
- Available with "FUEGO" marking

Chimes & Chime/Strobes

- Ideal for private mode notification at guard and nurse stations
- Advance warning alarm allows trained personnel to verify emergency, take action
- 7 field-selectable candela settings for chime/strobes
- Instant feedback validates installation

Mini-Horns

- Small footprint blends into hotel, motel or residential fire system applications
- High/low volume and non-temporal tone options
- 12 or 24 volt operation
- Single-gang back box mounting

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Find out more about the benefits of the System Sensor SpectrAlert Advance notification appliances at www.systemsensor.com/av

Innovation: The Mark of a Leader

"Necessity [is] the mother of invention," penned playwright George Farquhar. Many fire and life safety products have come about following tragedy. Cries for change immediately following major fires have led to new laws and building code changes, and oftentimes they have served as the impetus for new technologies that better protect people and property.

Then there are times when there's nothing wrong with the available technology. It's just that inventive minds think of ways that the technology can be better utilized to serve our customers' needs. That's what happened in the case of several of the new products that System Sensor is announcing in this issue of *LifeSafety*.

The first is our new Advanced Multi-Criteria Fire Detector, which acts as four sensors in one. System Sensor has manufactured products that provide smoke, heat, carbon monoxide and flame detection, predominantly utilizing singular sensors. In the interest of offering the ultimate in fire detection while addressing the longstanding problem of nuisance alarms, we have brought these four detection elements together with advanced, logical algorithms that work collectively to analyze and determine whether there truly is a fire.

The second innovation is the new CO1224T carbon monoxide detector, which provides a simple, inexpensive test to confirm the CO cell's functionality using canned CO. A one-second test spray lets you rest assured that the CO sensor is functioning properly — a feature that puts System Sensor well ahead of the upcoming NFPA 720-2009 standard for CO devices.

Our third solution, which reflects your feedback on our Innovair™ line of duct smoke detectors, is the new InnovairFlex™ series duct detectors. InnovairFlex detectors offer the ultimate in flexibility and functionality, whether it's broader environmental specifications, greater wiring capabilities, enhanced sensor status indication or even the detector's physical footprint.

System Sensor engineering and product development teams continuously strive to not only improve existing detection and notification products, but to define the future standard for the industry. Interestingly enough, our methodology is fairly commonsensical — seek to identify and understand customers' unmet needs. However, it's the combination of our customer focus and the application of our leading technology that allows us to continually deliver innovative solutions such as these.

Thank you for the continued opportunity to serve your fire and life safety needs.

Tom Potosnak
General Manager
System Sensor U.S.

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Your thoughts and comments are welcome at **info@systemsensor.com**.
For more information on System Sensor products, call 1-800-736-7672 or visit **www.systemsensor.com**.

Are You Ready for the Next Evolution of Fire Detection?

Fire research from the 1970s remains relevant today in understanding how smoke detection saves lives. Based in part on research updates and findings, new technology offers the industry's most advanced detection and protection ever.

Where there's fire, there's smoke. According to the Centers for Disease Control and Prevention, more fire victims die from smoke and toxic gases than from burns.

There's no doubt that smoke detectors save lives. But that's a fact that we take for granted. Residential smoke detection installations rose astronomically following pivotal research conducted in the 1970s. This research provided a key understanding of how smoke detectors save lives in real-life scenarios. Although residential conditions have changed significantly since then, many of the findings from this period have remained relevant. This research, and an updated version of it, is shaping the new generation of detection technologies.

Clarifying Smoke

The *Detector Sensitivity and Siting Requirements for Dwellings*, known as the Indiana Dunes (Dunes I) research study, is still a benchmark for research. The study was conducted from 1974 to 1976 for the National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards, under contract with the Illinois Institute of Technology Research Institute and Underwriters Laboratories (UL). It focused on the placement and sensitivity requirements of smoke detectors in residential homes that were scheduled for demolition as part of an expansion of the Indiana Dunes National Lakeshore Park.

Researchers selected readily available detectors and installed them in homes to measure their performance during a fire. Residences with contents manufactured in the 1960s and early 1970s were set afire and used as test beds. Each of the test rooms was instrumented so that conditions such as temperature and smoke obscuration were continually monitored. Test fires were ignited to judge when unassisted escape to safety (but not jumping out windows) would no longer be practical.

The report presented results in a unique way. It defined adequate life-saving potential by the amount of time people in a household would need to escape using the "primary escape path," which was defined as the path from any room to one of the exterior doors. The escape time was measured from the time when the detector went into alarm until a room's condition reached one of the defined tenability limits (e.g., smoke optical density, temperature, or CO concentration). This was the first test that evaluated detection performance based on the amount of escape time that started

upon detector actuation.

These escape times populated a probability plot showing the percent of experiments that met or exceeded specific minimum escape times. Results for safe escapes were determined by selecting a minimum escape time and then selecting the percent of cases in which that time was available. Based on the test results, smoke detection on every level of a home provided adequate escape time in approximately 90% of the fires.

Installing smoke detectors on every floor level of the home yields optimum performance because it is impossible to predict where a fire might start. The closer a smoke detector is to the fire, the faster it will respond, allowing more time for residents to escape. For example, walls, stairs and HVAC systems, especially air conditioning, can impede smoke propagation to a detector. Therefore, coverage on all levels is imperative.

The results of the Dunes I test established the sensitivity limits for the *Single and Multiple Station Smoke Alarms standard UL 217*, utilized for residential applications. The same smoke obscuration limits of 0.5% to 10% were subsequently adopted into *Smoke Detectors for Fire Alarm Signaling Systems standard UL 268*, applicable to commercial buildings.

Smoke Today

Modern construction materials are changing the composition of typical residential environments. Most homes today contain fewer natural materials and more synthetic fabrics than they did 30 years ago. There is less cotton, linen, and silk, and more nylon, polyester, and acrylic. That changes

Modern construction materials are changing the way fires burn and the types of smoke they generate.

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Thirty years after the Dunes I research, some members of the industry and the fire services administration community questioned whether the data would change when modern, synthetic materials were used with current smoke detector technologies. This question led to the 2004 *NIST Performance of Home Smoke Alarms Analysis of the Response of Several Available Technologies in Residential Fire Settings* research project, also known as Dunes II.

This research project was similar to Dunes I, except the furnishings were constructed of modern materials and more advanced instrumentation was installed to monitor and record data. Dunes II measured and analyzed smoke and toxic gas development to evaluate the current state of residential smoke detector requirements and compared resulting escape times in the modern environment. Dunes I data served as a baseline for comparison.

The results obtained were similar to those found in Dunes I. In essence, when properly installed and maintained, current smoke detection technologies still provide enough escape time in most fire scenarios. Interestingly, the results also indicated that the new building materials burn significantly faster and hotter than those used during the testing in the 1970s. This factor greatly reduces escape times. The average times for reaching untenable conditions for flaming and smoldering furniture fires were 17% and 47% less, respectively, than those found in Dunes I.

Another interesting discovery was that the smoke obscuration sensitivity levels of the smoke detectors in both Dunes tests were statistically the same. The smoke obscuration limit was about 1.5 ± 0.4% in Dunes I compared to 1.9 ± 0.7% in Dunes II.

To further understand the burning characteristics of new building and furnishing materials, UL, under contract to the Fire Protection Research Foundation (FPRF), conducted its own smoke characterization study.

In this study, researchers burned modern materials, collected the "products of combustion," analyzed and quantified the collected material, and developed profiles of smoke and gases emitted by the burning materials. The result of the study was an absolute characterization and relative quantification of smoke and various gases emitted by burning materials used in modern residential settings.

This smoke characterization project brings our knowledge of the chemical and physical properties of products of combustion, not just smoke, to a new level of sophistication. We now have a fingerprint for fire — a unique signature for each material being burned.

Calls for Change

New information from the Smoke Characterization and NIST Dunes II projects are changing the way the fire community perceives smoke produced in fires. This enhanced information is already leading to the development of new detection technology that will further reduce the risk of injury or loss of life due to fires.

However, there are also concerns about some of the current smoke detector technologies, as well as a call for change by some members of the fire services and other interested groups, based on the significant reduction of escape time related to modern synthetic materials. One such call was an early proposal by a UL task

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Next Evolution of Fire Detection

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group to modify the smoke obscuration limit from the current 0.5% sensitivity maximum and 10% minimum to 2.0% - 4.0%. The goal of this change would be to limit the maximum sensitivity to reduce the incidence of false alarms and assure that detectors are still sensitive enough to detect a fire.

Such a change, if adopted, would have placed the maximum sensitivity right at the average level recorded during the Dunes I and II projects. The Dunes testing concludes that sensitivity in the range of 1.0% - 2.0% would be better, but this questions whether a simple sensitivity shift is the correct response to reduced escape times. Further consideration by the UL task group has resulted in a revised sensitivity limit proposal of 1.0% to 7.0%.

Next Generation Technology

Fire detection remains within two boundaries: It must be sensitive enough to detect a fire at its earliest stage, yet not overly sensitive to cause nuisance alarms.

However, the smoke characterization data from the FPRF/UL study has opened a new chapter for fire detection technology. For instance, recently developed sensor technology has the capability to recognize the fingerprint nature of fire identified by the study.

Thus, the technology is available today to produce fire detectors with multi-criteria sensors that base the alarm decision on multiple factors, eliminating the need to balance sensitivity against potential nuisance alarms.

A detector need no longer be limited to photoelectric or ionization; rather, it could encompass multiple types of sensors. Next, incorporating a microprocessor with profiles of each fire signature identified during the smoke characterization research would empower the detector with high sensitivity without raising the incidence of false alarms by unequivocally differentiating the fire fingerprint.

Today's multi-criteria detectors, whether conventional or addressable, use signal processing embedded in the detector head to enable an alarm signal only if the composite output of the individual sensors justifies the decision. Some multi-criteria detectors combine as many as four independent sensors, such as a carbon monoxide sensor, a photoelectric smoke sensor, a temperature sensor and an infrared light sensor — all managed by an embedded microprocessor running a set of sophisticated and responsive algorithms in one low-profile housing. By measuring and processing the individual sensor outputs with intelligent algorithms, this multi-criteria detector becomes immune to false alarms and yet ultra-sensitive to fires. By using a combination of inputs, the incidence of nuisance alarms is reduced while improving response time to actual fires.

Occupant Response

As sophisticated as fire detector technology becomes, one thing is certain: When the alarm sounds, occupants have only precious moments to get to safety. Detectors and notification appliances do an invaluable job of alerting people to the presence of smoke and fire. Once people know there is a fire, they need more information. They need to know how to exit the building safely.

For example, people are aware of what a fire alarm means, but that alarm alone does nothing to ensure that people can leave the burning building without harm. We know they may have as little as three minutes to evacuate, and every effort needs to be made to use this time effectively.

Consider how quickly one can become lost, disoriented, or confused during a fire emergency. This often happens because people do not know where exits are, or in their panic, they immediately rush from the building the same way they entered without looking for an alternate exit. Directional sound technology differs from other fire and life safety systems by helping people find their way out of burning buildings. Unlike smoke alarms, which simply warn people that there is a fire in the building, directional sound technology provides audible exit instructions so that occupants can evacuate quickly and efficiently by knowing where the nearest exit is.

Directional sound technology uses broadband, multi-frequency sounds with low-, mid- and high-range signals instead of the narrowband noise emitted by standard notification appliances. This is a significant difference: People cannot reliably localize narrowband noise because they have great trouble determining its source.

Directional sound devices can be connected directly to the notification appliance circuit. This allows them to be activated automatically as soon as a sensor detects the presence of fire or smoke and to deliver easy-to-understand cues that intuitively lead people to the nearest exit. Furthermore, voice messaging can be used with directional sound technology to provide precise vocal instructions to building occupants.

Fire protection is a system of early detection and warning equipment, coupled with a plan for safe, effective, and expedited evacuation. It's a matter of early detection that warns people of a fire as soon as possible and directional sound to make the best use of the time to safely evacuate building occupants. Our technology will continue to find new detection methods and devices that respond to those new methods. In the end, it is about only one thing: saving lives. LS

New Advanced Multi-Criteria Fire Detector Combats False Alarms

False alarms are a serious problem: In 2004, more than 280,000 false alarms were generated throughout the United States by automatic fire detection systems, causing disruption, unnecessary cost and a waste of firefighters' time. In response to this critical issue, System Sensor has developed an innovative solution based on advanced technology. The Advanced Multi-Criteria Fire Detector is the first detector specifically optimized to address false-alarm issues while also offering major response time improvements.

Scheduled for introduction to U.S. markets in fall 2008, the Advanced Multi-Criteria Fire Detector is the first detector to integrate four independent sensors into a single-point fire detector. It combines a carbon monoxide (CO) sensor, a photoelectric smoke sensor, a temperature sensor and an infrared light sensor. All four are continually analyzed by an embedded microprocessor running sophisticated and responsive algorithms in one low-profile housing unit. By controlling, measuring and processing the individual sensor outputs with intelligent algorithms, the Advanced Multi-Criteria Fire Detector is ultra-immune to false alarms, yet is very sensitive to fires.

Based on signal data, the Advanced Multi-Criteria Fire Detector automatically adjusts the sensitivities of the four sensors. When one element of a fire is detected, it will increase the sensitivity of the other sensors in case of a fire. The alarm will activate only when the combined sensor inputs indicate that a genuine fire condition is present. Similarly, the Advanced Multi-Criteria Fire Detector is unaffected by false-alarm threats because the absence of a key element of a fire (most commonly CO) means the device knows there is no cause for concern. Unlike other detection technologies, it rejects the threat because of the lack of other key elements.

Although the Advanced Multi-Criteria Fire Detector monitors each of the four major elements of a fire (not just the generated particles), it's a fire detector that bases its decision on enhancement of the smoke-detection element. This fundamental difference sets the Advanced Multi-Criteria Fire Detector apart from any other product on the market, moving the science of early fire detection onto a far higher level of efficiency.

The integration of continual monitoring of all four major fire elements has enabled System Sensor to create a detector that responds more quickly to an actual fire, has high immunity to nuisances and is highly configurable from the panel, allowing the detection system to be profiled to changes in the use and occupation of the protected building.

Managed by on-board intelligence running advanced algorithms, the Advanced Multi-Criteria Fire Detector is able to be re-characterized on the fly as ambient conditions change. Based on sensor signals, the program is capable of dynamically changing its sensor thresholds, sensor gain, time delays, combination, sampling rates and averaging rates. If any sensor fails, the Advanced Multi-Criteria Fire Detector is able to change sensitivity of the remaining sensors, as well as indicate a fault condition. The unique combination of sensors, in addition to on-board intelligence, enables the Advanced Multi-Criteria Fire Detector to significantly outperform all detectors using alternative single or multi-sensor technology.

2251 Advanced Multi-Criteria Fire Detector

Specifications:	
Size:	2.4 in H x 4.0 in Dia.
Shipping Weight:	4.6 oz
Color:	Ivory
Material:	Bayblend FR110
Operating Humidity Range:	10 to 93% relative humidity (non-condensing)
Application Temperature Range:	32°F to 100°F (0°C to 38°C)
Operating Voltage Range:	15 to 32 VDC
Maximum Standby Current:	300 µA at 24 VDC (one communication every 5 sec. with LED blink enabled)
Maximum Alarm Current (LED on):	7 mA at 24 VDC

System Sensor introduces RealTest,™ the first functional CO test

Yes, It Really Is That Easy

Wouldn't it be great to know for certain that every carbon monoxide detector you install is offering the protection it promises? Testing the mechanical and electronic components of a CO detector is easy. But testing the CO sensing cell? That hasn't been possible. Until now.

Introducing a true first – RealTest™

The CO1224T detector from System Sensor now offers RealTest, the first of its kind: a true functional carbon monoxide test. With a simple short spray, you can test the sensing cell to be assured that it is doing its job.

To learn more about the CO1224T CO detector, call 800/736-7672. To see a video of RealTest in action, visit **systemsensor.com/co.**

Stop wondering. Start testing.

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Eight Points to Know About NFPA 720-2009 Changes

NFPA 720-2009 is a complete rewrite of the CO detection standard, which now covers commercial occupancies and impacts CO detector development, installation, testing and off-premise signal transmission.

Prior to 2005, NFPA 720, the carbon monoxide (CO) detection standard set by the National Fire Protection Association, was little more than a recommendation. In 2005, in reaction to greater public awareness of CO poisoning and local CO detection legislation, NFPA 720 was changed from a recommended practice to an installation standard with teeth.

The new edition, NFPA 720-2009, will be issued in October and will be the *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*. The standard has been completely rewritten to encompass more types of occupancies and to more specifically define CO detection system usage.

There are eight main changes and additions to NFPA 720 that will affect you:

1) NFPA 720 nationally standardizes CO detection for all buildings, not just residences. This includes schools, hotels, nursing homes and other commercial structures.

The 2005 edition of NFPA 720 addressed only dwelling units. Since then, the number of states requiring the installation of CO detection in residential, and in some cases commercial buildings, has more than doubled. Commercial occupancies where CO detection is required include hotels, rooming houses, dormitories, day care centers, schools, hospitals, assisted-living facilities and nursing homes.

In the absence of a national installation standard, each jurisdiction has developed its own requirements. This has resulted in considerable confusion in the industry. Several key areas of concern are installation, testing and off-premise signal transmission to the supervising station. NFPA 720-2009 is a huge step toward minimizing these concerns.

The new commercial installation requirements in NFPA 720-2009 contain extracts from NFPA 72®: National Fire Alarm Code®, and can be found in chapters 1 through 8. Chapter 9 covers households.

2) CO alarm signals need to be distinct from other signals and indicate sensor failure or end of life.

In the 2005 edition of NFPA 720, CO detectors were required to be connected to a control panel via a supervisory circuit only. NFPA 720-2009 requires CO alarm signals to be distinct and "descriptively annunciated" from fire alarm, CO supervisory and CO trouble signals. Furthermore, the CO alarm signal should take precedence over supervisory or trouble signals. The actuation of a CO detector or system should be distinctly indicated as a CO alarm signal.

CO detector trouble signals must be indicated visually and audibly at the control panel and supervising station. Therefore, the CO detector must have an integral trouble relay that will send trouble conditions to the control panel, such as a sensor failure or sensor end-of-life signal.

3) CO detectors are now held to the same life safety standard as smoke detectors: They will send trouble signals to the control panel and facilitate wiring supervision.

CO detector trouble signals are required to be indicated visually and audibly at the control panel and supervising station. Therefore, conventional hard-wired CO detectors must have an integral trouble relay that will send trouble conditions to the control panel such as a sensor failure or end-of-life signal.

NFPA 720-2009 requires manufacturers of system-connected CO detectors to incorporate the same critical life safety supervision concepts as smoke detection devices to prevent undetected device failures. In addition

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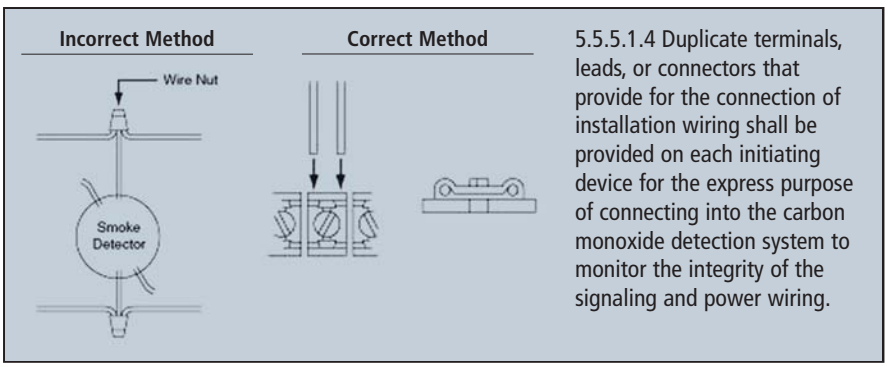

5.5.5.1.4 Duplicate terminals, leads, or connectors that provide for the connection of installation wiring shall be provided on each initiating device for the express purpose of connecting into the carbon monoxide detection system to monitor the integrity of the signaling and power wiring.

NFPA 720-2009 Changes

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to the trouble signals noted previously, CO detectors must facilitate wiring supervision.

The connection between the initiating device circuit conductors and the CO detector are required to be monitored for integrity.

Requirements (see figure on page 9) are particularly important for installers when selecting a CO detector.

4) CO detector location is more specific than ever.

Unlike smoke detectors, the 2005 edition of NFPA 720 had limited requirements for the placement of CO detectors. The standard required CO detectors to be centrally located outside of each separate sleeping area in the immediate vicinity of the bedrooms, and it also referred to the manufacturer's published instructions. Instructions differed between manufacturers, however, and this confused installers and Authorities Having Jurisdiction (AHJ). Some manufacturers call for detectors to be installed on the ceiling, while others call for wall installation.

Based on research conducted by the Fire Protection Research Foundation (FPRF), NFPA 720-2009 has specific requirements for the location of CO detectors in commercial buildings and dwelling units. In commercial buildings, CO detectors need to be located on the ceiling in the same room as permanently installed fuel-burning appliances and centrally located on every habitable level and in every HVAC zone of the building. In dwelling units, CO detectors must be installed outside each separate sleeping area and on every level of a dwelling unit, including basements. Applicable laws, codes and standards may require additional locations.

New Carbon Monoxide Detector Tests Cells to Assure Functionality

Carbon Monoxide (CO), a colorless, odorless, flavorless gas, accounts for hundreds of accidental deaths each year. A monitored CO detector can prevent these deaths by alerting people when CO reaches dangerous levels. System Sensor is announcing its newest carbon monoxide detector, the CO1224T with RealTest™.

The new CO1224T carbon monoxide detector provides a simple, inexpensive test that verifies the CO cell's functionality when using canned CO. Prevention is assured because the components and the actual CO sensing cell can be trusted to detect poisonous gas.

"The CO1224T detector builds on our proven CO technology. We've added RealTest technology as an option. Now, with a one-second spray, you can rest assured that the sensing cell is functioning properly," said Jack Ogden, System Sensor product manager. "Simply press the test button to test the detector's circuitry. If needed, you can then spray CO into the detector's sensor – the detector will go into alarm, indicating a functional unit. RealTest technology makes this happen."

The CO1224T device includes a six-year, end-of-life timer to indicate the necessary replacement of the detector. This model, a 12/24 VDC detector, will operate on most industry security and fire alarm control panels.

CO1224T Carbon Monoxide Detector

Specifications	
Operating Voltage:	12/24 VDC
Audible Signal:	85 dB in alarm
Standby Current:	20 mA
Alarm Current:	40 mA (75 mA test)
Alarm Contact Ratings:	0.5 A @ 30 VDC
Trouble Contact Ratings:	0.5 A @ 30 VDC
Dimensions:	5.1 in L x 3.3 in W x 1.3 in H
Approximate Weight:	7 oz
Operating Temperature Range:	32°F to 104°F (0°C to 40°C)
Operating Humidity Range:	22 to 90% RH
Input Terminals:	14 to 22 AWG
Mounting:	Single-gang back box; surface mount to wall or ceiling

5) New secondary power supply requirements for CO detection systems differ considerably from fire alarm systems.

NFPA 720-2009 requires CO detection systems to have sufficient secondary power to operate the system under quiescent load (system operating in a normal condition) for at least 24 hours. After that time, the system must operate all of the CO notification appliances for 12 hours if a supervising station does not monitor the system. If the CO detection system is monitored by a supervising station, the 12-hour requirement can be reduced to 60 minutes.

Though a five-minute requirement is mandated for fire alarm systems, a 12-hour alarm requirement for CO systems is necessary for non-monitored systems because occupants could be away from the unit for several hours. If the CO alarm signal stopped sounding before occupants returned, the occupants would be unaware that there were dangerous levels of CO gas present.

6) Testing requirements have been inserted into the new standard. However, functional tests won't take effect until 2012, and sensitivity tests won't take effect until 2015.

One of the more significant requirements in NFPA 720-2009 pertains to CO detector testing. Many AHJs, engineers and building owners have requested the ability to test a CO detector just as they are able to test a smoke detector with canned smoke. The NFPA technical committee agreed that testing should be required, but it wanted to give manufacturers enough time to implement safe testing protocols.

The new CO1224T detector from System Sensor already meets this testing requirement. (See "New Carbon Monoxide Detector Tests Cells to Assure Functionality" on page 10.)

Thus, functional testing will only apply to system detectors installed after January 1, 2012. At that time, CO tests will be required at initial acceptance and then annually by introduction of CO into the sensing chamber or element. An electronic check (magnets, analog values, etc.) would not comply with this requirement.

Sensitivity testing will take effect January 1, 2015. In units other than one- and two-family dwellings, sensitivity of CO detectors and single- and multiple-station CO alarms will need to be checked within one year after installation and every alternate year thereafter, unless otherwise permitted. After the second required calibration test, if sensitivity tests indicate that the device has remained within its listed and marked sensitivity range, the length of time between calibration tests can be extended to five years.

7) NFPA 720 clarifies what supervisory stations should do when they receive a CO alarm signal.

One area of considerable confusion in the industry has been what the supervising station should do when a CO alarm signal from the protected premises is received. Off-premises signal transmission requirements for commercial buildings now set a priority of signals. A CO alarm signal must be distinctively indicated as a CO alarm signal and needs to be distinct from a fire alarm signal and take priority over supervisory or trouble signals.

If the communications methodology is shared with any other usage, all fire alarm, CO alarm, supervisory and trouble signals will take priority, in that order of priority, over all other signals unless otherwise permitted by the AHJ. If the order of the signal priority cannot be assured, the maximum duration between the initiation of an alarm signal at the protected premises, transmission of the signal, and subsequent display and recording of the alarm signal at the supervising station shall not exceed 90 seconds.

Upon receipt of a CO alarm signal, supervising station personnel will

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New Duct Smoke Detector Offers Mounting Flexibility

Building, fire and life safety codes often require the installation of duct smoke detectors in heating, ventilating and air conditioning (HVAC) ducts for the detection of fires in HVAC systems. Typically, these codes refer to *NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems*, to determine if and where they are required. NFPA 72 in turn refers to the National Fire Alarm Code for specific design, installation, and maintenance criteria for these detectors.

A duct smoke detector is a device or group of devices used to detect the presence of smoke in the airstream of ductwork sections of the HVAC air-handling systems used in public facilities. Duct smoke detection not only serves to assist in preventing the spread of toxic smoke and combustion gases, it can also be used to assist in equipment protection applications.

What differs in every building is the HVAC footprint. Until now, most duct smoke detectors have been very similar in shape and have not been flexible to accommodate varying air-duct systems.

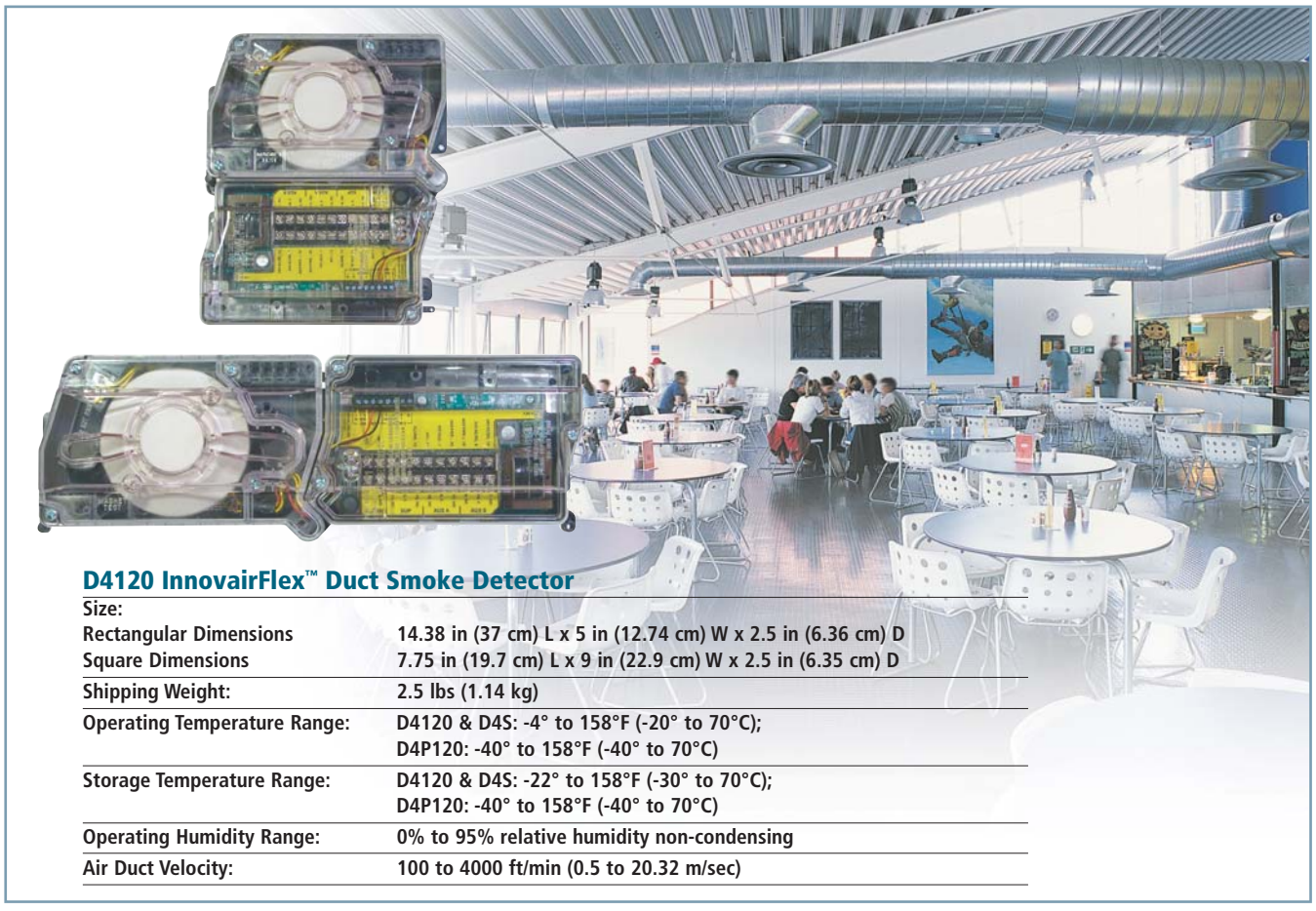
The new System Sensor InnovairFlex™ duct smoke detector line makes it possible for the first time to accommodate multiple HVAC footprints with one unit. These versatile duct smoke detectors accommodate rectangular and square configurations.

"This revolutionary design began with extensive customer research. We took our customers' wish lists and fed that information back to our engineers," said Andy Kuester, System Sensor director of product marketing. "It's amazing how many upgrades we were able to make to an existing product that was already a leader in the market."

The InnovairFlex product line offers superb false alarm immunity, a broad temperature range from -4°F to 158°F (-20°C to 70°C), and superior status and test features. All InnovairFlex products are backward compatible to existing Innovair products, including remote test accessories.

Technicians can install new sampling tubes from the front or the back without using tools. They snap into place with a positive lock to assure a solid installation. Designers also made sure that the sampling tube spaces lined up with existing models for retrofit applications.

The range of products and accessories in the InnovairFlex product line assists you in meeting any type of code requirement. LS



D4120 InnovairFlex™ Duct Smoke Detector

Size:	
Rectangular Dimensions	**14.38 in (37 cm) L x 5 in (12.74 cm) W x 2.5 in (6.36 cm) D**
Square Dimensions	**7.75 in (19.7 cm) L x 9 in (22.9 cm) W x 2.5 in (6.35 cm) D**
Shipping Weight:	**2.5 lbs (1.14 kg)**
Operating Temperature Range:	**D4120 & D4S: -4° to 158°F (-20° to 70°C); D4P120: -40° to 158°F (-40° to 70°C)**
Storage Temperature Range:	**D4120 & D4S: -22° to 158°F (-30° to 70°C); D4P120: -40° to 158°F (-40° to 70°C)**
Operating Humidity Range:	**0% to 95% relative humidity non-condensing**
Air Duct Velocity:	**100 to 4000 ft/min (0.5 to 20.32 m/sec)**

NFPA 720-2009 Changes

(Continued from page 11)

immediately retransmit indication of the signal to the communications center (where required by the emergency response agency) and contact responsible party(s) in accordance with the notification plan.

For households, off-premise transmissions shall immediately retransmit indication of the CO alarm signal to the emergency response agency, where required, and contact the responsible party(s). Once contacted, the occupants must be informed of proper actions, such as evacuating and counting heads.

8) CO notification appliances must meet certain audible and visible requirements.

In most cases, the integral sounder of a CO detector will be sufficient for notifying occupants of commercial and residential buildings. The audible CO alarm shall be a temporal 4 signal consisting of a single-tone pattern including four cycles of 100 milliseconds ±10 percent "on" and 100 milliseconds ±10 percent "off," followed by five seconds ±10 percent "off." After the initial four minutes of alarm, the five-second "off" time can be changed to 60 seconds ±10 percent. The alarm signal should repeat until the alarm resets or is manually silenced and is synchronized within the notification zone.

The new standard does not require the installation of CO horns and strobes throughout a building. It allows occupant notification to be limited to the notification zone encompassing the area where the CO signal is originated, if the CO alarm signal is transmitted to a constantly attended on-site location or off-premises location.

The new standard spells out specific requirements for A/V devices, if they are installed. Notification appliances for CO signaling cannot have the word FIRE, or any form of a fire symbol, on the appliance that is visible to the public. Notification appliances with multiple visible elements shall be permitted to have fire markings only on those visible elements used for fire signaling.

Lights used for CO signaling shall be clear or nominal white, or it can be another color as required by the emergency plan or AHJ for the area or building. Lights shall not exceed 1000 cd. LS

Carbon Monoxide Deaths Prompt Legislative, Legal Action

- North Branch, Minn., resident Andrew Carlson, 17, was killed and his parents were hospitalized in December 2006 as a result of faulty installation of a boiler system in their home. According to a state report, CO built up in the home because a contractor failed to completely hook up the boiler's combustion ducts. The state of Minnesota now requires building inspectors to have national certification documenting their competency to ensure furnace installations meet code requirements.
- A pool mechanic was acquitted in the death of tennis star Vitas Gerulaitis, who was overcome by CO from an improperly vented pool heater in September 1994. Gerulaitis, 40, died while napping in a pool-house bedroom on a Long Island, New York, estate.
- A British jury found a builder guilty of manslaughter in April 2008 in the death of Robert Schenker, who died of CO poisoning after the builder blocked the flue leading from Schenker's kitchen boiler.

Major Trade Shows in 2008-09

2008

American Fire Sprinkler Association (AFSA)
Convention & Exhibition
Washington, D. C.
October 15-19
http://www.firesprinkler.org

Central Station Alarm Association (CSAA)
Grand Cayman Islands
October 24-29
http://www.csaaul.org

ASPE Engineered Plumbing Expo
Long Beach, CA
October 27-28
http://www.aspe.org

ISC East Expo
New York, NY
October 29-30
http://www.isceast.com

Securing New Ground Conference
New York, NY
November 11-12
http://www.securingnewground.com

2009

Association of Heating & Refrigeration Expo (AHR)
Chicago, IL
January 26-28
http://www.ahrexpo.com

NFMT
Baltimore, MD
March 10-12
http://www.nfmt.com

ISC West Expo
April 1-3
Las Vegas, NV
http://www.iscwest.com

National Fire Sprinkler Association (NFSA)
Orlando, FL
April 30-May 1
http://www.nfsa.org

NFPA Conference & Expo
Chicago, IL
June 8-10
http://www.nfpa.org

System Sensor Online

Revised Guides Available for A/V Appliances and Sprinkler Systems Monitoring

Application guides provide the basic principles for installing and maintaining early warning fire and smoke detection systems. To keep users informed, System Sensor updates its guides as the systems and codes change. Two newly revised guides are the *Audible/Visible Appliance Reference Guide* and the *Fire Sprinkler Systems Monitoring Guide*.

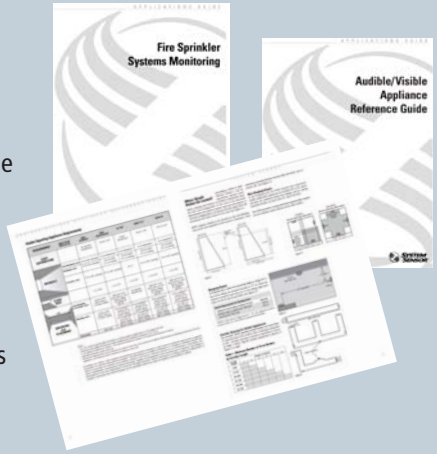
The *Audible/Visible Appliance Reference Guide* covers updated compliance issues regarding audible/visible appliances for fire and life safety. The guide also offers information for specifying engineers, installers and enforcement authorities on proper installation and use of these appliances in commercial applications.

Numerous charts clearly spell out various code requirements, such as the light distribution, intensity, flash rate, and mounting and placement of visible signaling appliances relative to the area to be protected. Key points are illustrated through diagrams, such as those depicting correct and incorrect room spacing allocations for strobes.

The new *Fire Sprinkler Systems Monitoring Guide* provides an extensive overview of the various types of fire sprinkler systems and the procedures for specifying and installing the appropriate system for a specific environment.

This new publication contains valuable reference information and detailed diagrams showing the four basic sprinkler systems that detect, control, suppress, or extinguish fires. The guide provides information for operation, product placement, testing, and device maintenance, such as water flow detectors, supervisory switches, pressure switches, alarm bells, and horn/strobes.

Both application guides list basic requirements of existing standards from the National Fire Protection Association, the International Building Code, and International Fire Code. Contact information for building code resources and Underwriters Laboratories testing and laboratory facilities is also offered.



System Sensor offers easy access to the application guides on its Web site, **www.systemsensor.com/html/applicat.html**.

Faster Installations Possible with SpectrAlert® Advance Speakers/Strobes

Now that the SpectrAlert® Advance product line has expanded to include the next generation of speakers and speaker strobes, you can reduce ground faults and benefit from easier, quicker installation.

The plug-in design enables pre-wiring of mounting plates and dressing the wires before plugging in the speakers. The plastic cover on the speaker covers exposed components, which prevents nicked wires. Faster installations can be achieved with the instant feedback that ensures the wiring is properly connected, rotary switches to select voltage and power settings, and 11 field-selectable candela settings for wall and ceiling speaker strobes.

SpectrAlert Advance makes installation easy:

- Attach a universal mounting plate to a 4x4x2⅛ inch back box. Flush mount applications are achievable without needing an extension ring.
- Connect the notification appliance circuit or speaker wiring to the terminals on the mounting plate.
- Attach the speaker or speaker strobe to the mounting plate by inserting the product tabs into the mounting plate grooves. Rotate the device into position to lock the product pins into the mounting plate terminals. The device will temporarily hold in place with a catch until it is secured with a captured mounting screw.

Four Color Lens Options

For distinctive visual signaling, System Sensor SpectrAlert Advance color lens attachments are available in four color options: amber, blue, green, and red. These may be used for mass notification, severe weather, emergency response, and other non-fire applications. The lenses easily attach to any non-fire printed SpectrAlert Advance strobes, including horn strobes, speaker strobes and strobe-only devices. The lenses may be used with wall or ceiling strobes in indoor or outdoor applications. LS

Meet the New Problem Solver

The first fire detector in the industry accurate enough to KNOW when a fire is a fire.

The implementation of emergency response procedures or evacuations at medical facilities can carry tremendous costs in terms of life safety and lost revenues.

The Advanced Multi-Criteria Fire Detector uses sophisticated technology to adjust to changing environmental conditions and respond accordingly. This latest innovation from System Sensor combines FOUR detection methods to monitor the FOUR major products of combustion and respond with exceptional accuracy.

The Advanced Multi-Criteria Fire Detector incorporates:

1. a traditional photoelectric chamber to monitor smoke particles;
2. a thermistor to measure both fixed (135°F) temperatures and rate-of-rise;
3. a carbon monoxide (CO) sensor recognizes the by-products of a smoldering fire that result from incomplete combustion. CO production during a fire can vary from miniscule amounts (alcohol) to significant amounts (smoldering cotton); and
4. an infrared (IR) sensor watches ambient light levels and flame signatures to provide coverage across 360 degrees, giving our detector the unique capability to look into the space, expanding its detection beyond the physical boundaries of the detector itself.

How it works
If one of the sensors detects a fire condition, the on-board intelligence verifies the condition with another sensor before going into alarm. As site conditions change, an internal algorithm compensates by changing sensor thresholds, sensor combinations, and sampling rates to ensure immediate response to fires and maximum immunity to nuisance alarms.

Here are just a few examples where the nuisance alarm discrimination and accuracy provided by the Advanced Multi-Criteria Fire Detector are warranted:

- Medical facilities
- Research and development organizations
- Data processing centers
- Financial institutions
- High capacity entertainment venues
- Performance theatres
- Complex manufacturing operations
- Specific areas prone to nuisance alarms

The System Sensor Advanced Multi-Criteria Fire Detector senses fires in ALL environments and provides the best immunity to nuisance alarm threats. It's accurate. It's precise. It's ideal when it is imperative to KNOW when a fire is a fire.

To learn more and receive a specification packet, visit **www.SystemSensor.com/multi** or call 800/736-7672.

SYSTEM SENSOR®
advanced ideas. advanced solutions.™

800/736-7672
www.systemsensor.com/multi