The all-rounder – Sinteso ASA fire detector FDOOTC241

The Sinteso multi-sensor fire detector – for fast, reliable fire detection and additional detection of toxic carbon monoxide concentrations

With its new features for comprehensive safety, the innovative ASA neural fire detector FDOOTC241 from the Sinteso™ fire protection system sets a new standard in fast and reliable detection: it is the first fire detector of its kind equipped with two optical sensors, two thermal sensors, and an electrochemical carbon monoxide sensor. This means that FDOOTC241 not only detects fires with utmost reliability, but can also be used to measure hazardous carbon monoxide concentrations.

Dual-count protection – from fire damage and toxic gas

A single device with two functions increases safety – and saves costs: FDOOTC241 detects not only fires and therefore the fire-related development of carbon monoxide (CO), but also alerts to potentially harmful CO concentrations in ambient air. It signals gas buildup as soon as a predefined value is exceeded. This reduces the risk of CO poisoning in environments with large volumes of exhaust gases or process and production-related CO development.

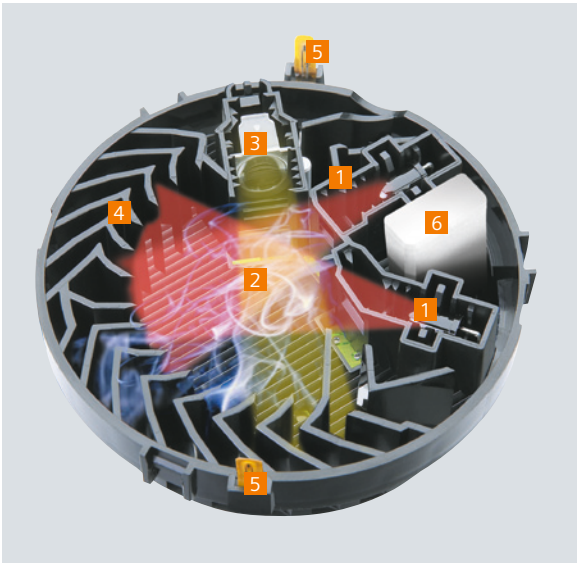
Typical application areas

Capable of early detection of smoldering fires, FDOOTC241 is very well suited for:
– Hospitals and nursing homes
– Hotels
– Historic buildings
– Museums and libraries

Additional CO alarming capability, makes FDOOTC241 ideal for:
– Covered parking lots and garages
– Automotive workshops and engine testing stands
– Incineration and fermentation plants
– Boiler rooms
– Chemical laboratories
– Production plants

Answers for infrastructure.

SIEMENS



Legend

1. Two IR light sources
2. The rays of the two IR light sources are scattered by smoke particles in the sampling chamber and strike the light receiver.
3. IR receiver: the special position of the two IR light sources helps to distinguish between light and dark smoke particles due to forward and backward light dispersion.
4. The patented labyrinth absorbs light emitted by the light sources, thus preventing random reflection. It also captures small fibers and dust particles so that they do not enter the sampling chamber.
5. Two redundant temperature sensors measure the temperature.
6. The monitored CO sensor measures the CO concentration.

Reliable fire detection including fire gas detection

Safe, intelligent fire detection

The ASA neural fire detector FDOOTC241 ensures the highest degree of safety and fast, very early reaction to CO-generating fires such as smoldering mattress fires in nursing homes. It combines the unique **ASA***technology*™ (ASA = Advanced Signal Analysis) with CO detection and contains two optical sensors, two thermal sensors, and one additional electrochemical carbon monoxide sensor. This enables it to detect the three most important fire criteria and to analyze them intelligently:
– Smoke
– Heat
– Fire gas

As a result, FDOOTC241 responds very quickly to all fires that generate carbon monoxide, such as smoldering fires. Moreover, the detector's sensitivity remains at its highest even in environments with deceptive phenomena.

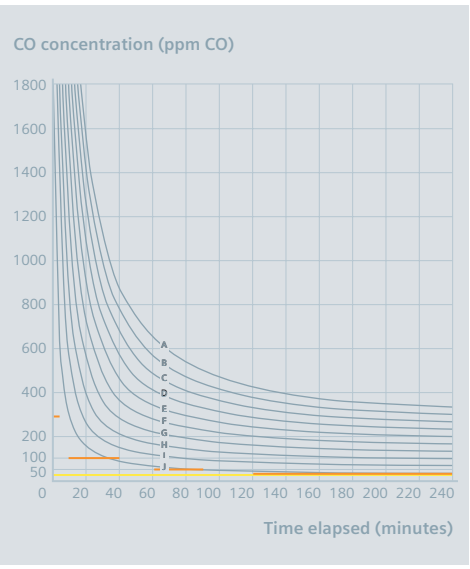
Sensors for three different fire criteria

With the two optical sensors, the detector detects light and dark smoke particles in the ambient air, using forward and backward light dispersion. With its two temperature sensors, FDOOTC241 also detects variations in temperature and whether the parameterized maximum value has been exceeded. An electrochemical sensor measures the CO concentration of ambient air. Because carbon monoxide is generated during the first phase of a smoldering fire and is lighter than air, it immediately rises to the ceiling. The detector includes these sensor data in its analysis even before visible smoke particles reach the sampling chamber. This enables early detection of low-energy, slow-smoldering fires.

Highest reliability thanks to ASA*technology* and real-time interpretation

ASA*technology* means that the signals recorded by the sensor are converted into mathematical components using algorithms and are compared with programmed values. With the selection of an ASA parameter set, the algorithms can be influenced. In other words, the ASA neural fire detector FDOOTC241 is adjusted to the expected local environmental influences. The optimal parameter set is selected by taking the individual risks and the existing environmental conditions into account.

The real-time interpretation of environmental conditions triggers the selected ASA parameters to be dynamically adjusted. This automatically shifts the optimum application range of the detector. In harsh environments with deceptive phenomena, FDOOTC241 reacts with adapted sensitivity in detecting carbon monoxide. The result is unique fire detection reliability with unsurpassed immunity to deception phenomena.



Time-dependent carbon monoxide concentration

A 50% COHb (permanent brain damage, death)
B 45% COHb (coma, permanent brain damage)
C 40% COHb (collapse)
D 35% COHb (vomiting)
E 30% COHb (drowsiness)
F 25% COHb (headache and nausea)
G 20% COHb (headache)
H 15% COHb (slight headache)
I 10% COHb (no symptoms)
J 5% COHb (no symptoms)

COHb: carbon monoxide hemoglobin

MAC value*
Values according to EN 50291

Additional carbon monoxide detection saves lives

Why is carbon monoxide so dangerous?

Carbon monoxide is a highly toxic gas with life-threatening consequences for the central nervous system and the heart. Without a carbon monoxide detector, it can go unnoticed until it's too late, since CO is odorless, colorless, and non-irritating. This is why carbon monoxide is one of the most common causes of fatal poisonings in many countries. Moreover, the gas is flammable and can form explosive mixtures in combination with air.

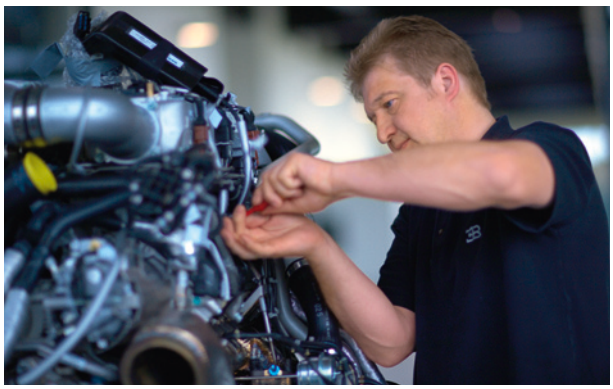
Where does carbon monoxide develop?

Carbon monoxide caused by fire is especially produced during partial or incomplete combustion processes like smoldering fires. Without detection, smoldering fires can remain unnoticed for long periods, giving rise to high CO concentrations. Apart from fires, incomplete oxidation as well as exhaust gases, a defective gas heating, and chemical and production-related processes can lead to a hazardous CO concentration.

Reliable detection of toxic carbon monoxide

To detect dangerous concentrations of carbon monoxide as early as possible, the innovative ASA neural fire detector FDOOTC241 now also detects fire-independent CO development. Therefore, the detector can be used as a fire and gas detector at the same time. The CO detection occurs through an independent CO alarm channel, with the alarm displayed on the control panel. In addition, the detector processes the signal for the CO alarm channel independently from the fire detection channel.

The detection behavior for the CO alarm channel can be set independently from the ASA parameter sets for fire detection: for example, via new parameter sets that were developed especially to comply-with the Life Safety norms TLV value, EN 50291, UL 2034, and UL 2075. Therefore, the detector fulfills workplace safety regulations that play a very important role particularly in the pharmaceutical and chemical industries. In addition, the detection behavior for the pre-alarm or main alarm can also be individually set using either freely definable threshold values or a specific average value derived from a 15-minute period.



In parking lots, the ASA neural fire detector FDOOTC241 ensures fast and deception-free fire and CO detection.

Application area: covered parking lots

Covered parking lots and garages are a good example of the various applications for FDOOTC241. Temporary high concentrations of carbon monoxide and soot occur in these areas from exhaust gases produced while starting a car, parking, and driving into and out of the parking lot – which is why standard light-scattering smoke detectors can trigger false alarms.

FDOOTC241 protects against dangerous CO concentrations by immediately detecting whether the measured CO value exceeds the average value set for the CO alarm channel. It thereby ensures that short-term CO peaks from running motors do not trigger a false alarm, for example, by averaging the measured concentrations over the previous 15 minutes. At the same time, FDOOTC241 assures fast and deception-free fire detection thanks to a special parameter set.

Application area: hospitals

Defective power cables, telephones or unauthorized smoking can cause smoldering cotton fires in patient rooms. Immobile patients are at high risk of prolonged CO exposure due to the longer evacuation time required to move them to safety. Patients with lower CO tolerance levels, such as infants, pregnant women, and people with heart or lung conditions, can benefit greatly from early CO detection, particularly since CO poisoning symptoms (headache, dizziness, nausea or chest pains) can be mistaken for symptoms related to their pre-diagnosed health condition.

With a special parameter set, FDOOTC241 ensures earliest fire detection. Thanks to its additional CO detection, it provides utmost saftey, as the smallest CO concentration triggers an alarm. This reduces the risk of CO poisoning and saves precious time during intervention. Thus, FDOOTC241 offers optimal life safety – and unmatched immunity to deception.

Highlights

- Evaluation of the three fire criteria: smoke, heat, and gas
- Fast response to fires generating carbon monoxide – especially smoldering fires
- Early, reliable fire detection
- Additional fire-independent detection of toxic carbon monoxide
- Individually adjustable CO detection behavior
- Sophisticated evaluation even in environments with fluctuating CO concentrations

www.siemens.com/sinteso

Siemens Switzerland Ltd
Industry Sector
Building Technologies Division
International Headquarters
Gubelstrasse 22
6301 Zug
Switzerland
Tel +41 41 724 24 24