DET-TRONICS

Technical Bulletin

Optical Flame Detector Technologies

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Optical flame detectors provide the fastest detection of a flammable liquid or gaseous fire in the early ignition stage. Today's optical flame detectors are offered in a variety of reliable, flame sensing technologies as described below.

Ultraviolet (UV) flame detectors provide reliable, ultra-high speed detection to virtually all fires. In general they operate by counting the electron discharge from each UV photon. Their sensitivity to radiation from welding, lightning, X-rays, and other nuclear sources may limit them. They can also be adversely affected by airborne contaminants.

Single Frequency Infrared (SFIR) flame detectors provide reliable detection of carbon-based fires by responding to the infrared emissions from a flame. They generally ignore welding, lightning, X-rays, and other nuclear sources and offer high resistance to blinding from airborne contaminants or attenuators, reducing maintenance. Some SFIR detectors could false alarm to modulated black bodies such as hot pipes, engines, and people.

Ultraviolet/Infrared (UV/IR) detectors provide a combination of the UV and IR technologies, which help reduce the likelihood of false alarms. However, the limitations for each of the individual technologies remain and detection ranges are typically less.

Multi-Spectrum Infrared flame detectors have the ideal combination of flame sensitivity and false alarm rejection. Most Multispectrum Infrared (MIR) optical flame detectors utilize three sensors at three different infrared wavelengths. Some MIR detectors have sophisticated software algorithms which provide the ability to ignore modulated black bodies and other non-fire sources in its field of view yet still retain its alarm capabilities.

In summary all detectors have advantages and limitations, which must be evaluated before the selection of a flame detector for a given application. The two most critical aspects of the selection must guaranty detection of the fire and hold false alarms to the lowest possible level. Do not expect the same level of performance from all brands of detectors that may call their product by the same technology name. Since most of the current technology advances are patented inventions and are not duplicable.

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Jan 04