SAFE Flame ™

SafeFlame™
IR3 Optical Flame Detector

Inside the Technology!

SafeFlame's triple IR (IR3) flame detector compares three specific wavelength bands within the IR spectral range of a fire and their ratio to each other. This offers fast response without the fear of typical false alarms. One sensor monitors the 4.4 micrometer range and the other sensors monitor the bands above and below. This advanced technology allows the detector to distinguish between non flame IR sources, and flames that emit hot carbon dioxide in the combustion process (which have a spectral characteristic peak at 4.4 micrometers). As a result, both detection range and immunity to false alarms can be significantly increased. The SafeFlame 3 IR detectors can detect a 0.1m2 (1ft2) gasoline pan fire at up to 65m (215ft) in less than 5 seconds.

SafeFlame 's IR3 detector is designed to ignore constant background IR radiation, which is present in all environments. Instead it measures the modulated part of the radiation of a fire. When exposed to modulated non flame IR radiation, IR and UV/IR detectors become more prone to false alarms, while IR3 detectors become more immune to false alarms.
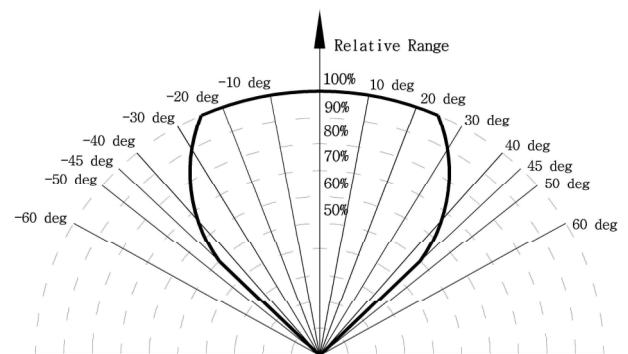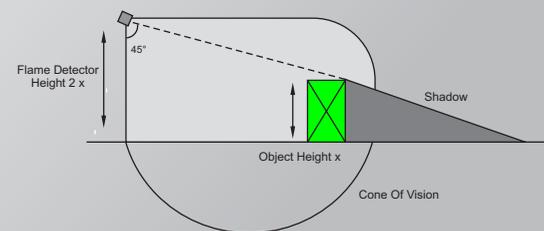
Detector Technology:

IR3 Detectors utilize a combination of 3 sensors. One of the sensors monitors the spectral band for CO_2 emissions. The other two sensors monitor adjacent spectral bands to reduce radiation interference and reduce false alarms.

The spectrum for the radiation emitted by a flame measured by the detector is altered by the distance between the detector and the fire. It is can also be influenced by the concentration of CO_2 gas in the atmosphere.

Operation Diagram:

Flame Detector Height 2 x
45°
Object Height x
Shadow
Cone Of Vision

Relative Range
100% 10 deg
−10 deg
−20 deg   20 deg
−30 deg   90%
−40 deg   80%   30 deg
−45 deg   70%   40 deg
−50 deg   60%   45 deg
           50%   50 deg
−60 deg   60 deg

[Figure 5] Cone of Vision