

# HARRINGTON

## Infrared Flame Detector

### Model 30-2056E

#### Harrington Signal, Inc.

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#### APPLICATION

The Pyrotector Model 30-2056E Infrared Flame Detector is designed for use in applications where the occurrence of lightning or arc welding within the protected area can cause an ultraviolet fire detector to register a false alarm. The detector is virtually immune to actuation caused by lightning, arc welding, and most other extraneous light sources. It is ideally suited for use in a variety of both indoor and outdoor applications, in nearly any ambient lighting environment, including the full range of artificial lighting. The housing is explosion-proof, watertight, and dust-tight, and conforms to applicable NEMA and NEC requirements. Typical applications that can use the 30-2056E Flame Detector include:

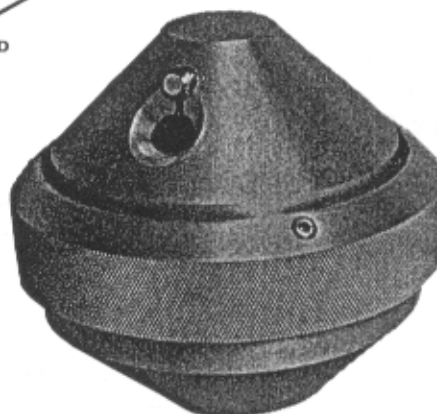
- Hydrocarbon processing plants
- Hazardous storage facilities
- Offshore oil platforms
- Airport facilities
- Fuel loading racks
- Aircraft hangars and maintenance areas (Meets requirements for "Intended Use" per AFR 88-15 for Hangar Applications, as verified by testing at Factory Mutual).

#### FEATURES

- High immunity to false alarms caused by lightning, arc welding, and sunlight.
- Ultrafast response to large gasoline fires.
- Compatible with standard alarm systems.
- Remote test feature assures reliable response.
- Explosion-proof and watertight housing for use in a variety of applications.

#### DESCRIPTION

The Model 30-2056E IR Flame Detector is a compact, unitized package containing an IR detection cell, solid state electronics, and a dry contact Form C (SPDT) alarm relay. The detector is engineered to respond to the nominal 4.3 micron band of infrared radiation, which is commonly known as the CO<sub>2</sub> spike. See Figure 1. A characteristic of burning hydrocarbons is the emission of unusually high levels of IR radiation in



this narrow portion of the radiation spectrum. On the other hand, extraneous light sources that are capable of triggering an alarm in other types of fire detectors emit very low levels of radiation in this range. By concentrating on this narrow band of the spectral range that is highly specific to burning hydrocarbons, combined with the use of optical filters to discriminate against most extraneous background radiation from a variety of sources including hot objects, the Model 30-2056E is able to provide a high level of reliable fire detection, while being relatively immune to false alarm signals.

#### SPECIFICATIONS

OPERATING VOLTAGE —  
18 to 30 volts dc, with maximum ripple 0.5 vpp at 60 to 120 Hz.

OPERATING CURRENT —  
Standby: 16 milliamperes.  
Alarm: 65 milliamperes maximum.  
Test: 150 milliamperes.

RELAY CONTACT RATING —  
1 ampere at 26 vdc, Form C contacts.

SPECTRAL SENSITIVITY RANGE —  
4.1 to 4.7 microns.

**RESPONSE TIME —**

Detector responds to a 1 ft<sup>2</sup> gasoline fire (at zero axis to the detector) in 75 milliseconds at 10 feet, 3 to 6 seconds at 35 feet. See Figures 2 and 3.

**CONE OF VISION —**

90 degrees nominal, with sensitivity reduced to 70% at 45 ± 2 degrees of zero axis. See Figure 4.

**TEMPERATURE RANGE —**

Operating: -40°F to +158°F (-40°C to +70°C).  
Storage: -67°F to +185°F (-55°C to +85°C).

**ENCLOSURE —**

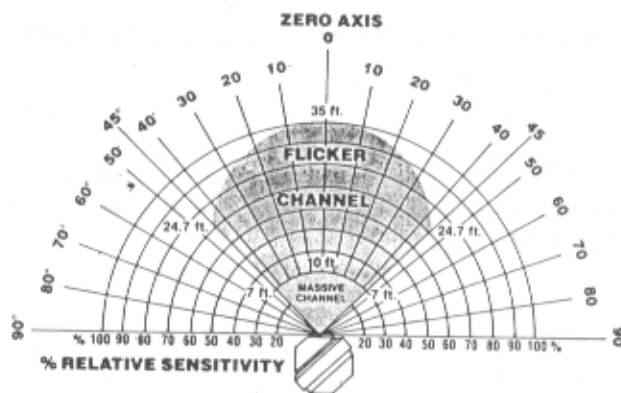
Explosion-proof and watertight, corrosion resistant, hard anodized aluminum 6061 T6 (standard).  
FM and CSA approved.  
Explosion-proof: Class I, Div. 1, Groups A, B, C, D. Class II, Div. 1, Groups E, F, G.  
Watertight: NEMA 4  
Conduit fitting: 3/4 inch NPT (Female).

**SHOCK AND VIBRATION —**

Shock: 10 g.  
Vibration: 0.02 inch at 10 to 30 Hz.

**WEIGHT —**

3.0 pounds.



-Cone of Vision of Detector

**ENGINEERING SPECIFICATIONS**

The flame detector shall be a narrow band, dual channel infrared sensing device designed to operate on 24 vdc. It shall be explosion-proof and weatherproof to meet NEMA-4 and NEC standards for Class I, Groups A, B, C, and D and Class II, Groups E, F, and G. It shall be compatible with standard fire alarm systems and shall include a Form C (SPDT) alarm relay.

The detector shall respond to a 1 x 1 foot gasoline fire at a distance of 35 feet in less than six seconds when viewed head-on. It shall respond to a 1 x 1 foot gasoline fire at 10 feet in less than 75 milliseconds. Detector shall respond to a 10 x 10 foot JP-4 fuel fire at a distance of 150 feet in less than five seconds.

The detector shall not respond to normal ambient light conditions such as sunlight, incandescent and

fluorescent lighting, and it shall not respond to arc welding or lightning.

The detector shall have an integral alarm condition indicator that is visible when the detector is in alarm. It shall also contain a solid state output for remote annunciation.

The detector shall have an integral test feature that is initiated by a remote switch. The test radiation source shall be external to the lens of the detector.

The peak sensitivity of the detector shall be at a wavelength of 4.3 microns. The detector shall incorporate a flicker channel for discriminating against unwanted alarms due to spurious signals.

The unit shall be Factory Mutual approved, CSA certified.

