



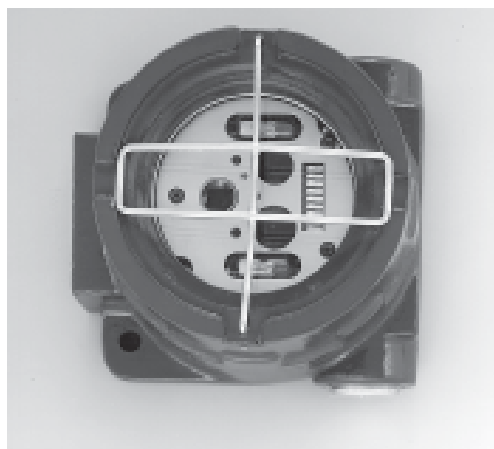
**sierra monitor corporation**

## Model 3100 Series Flame Detector

The Sierra Monitor Model 3100 Series Flame Detector utilizes Ultraviolet, Infrared and Visible spectrum to provide continuous and reliable flame detection. Flame detectors incorporating just IR or just UV can experience false alarms. Even some IR/UV detectors can experience false alarms. But the Model 3100 incorporates a unique three spectra design. This provides the Model 3100 with enhanced false alarm rejection. An additional benefit of this design is the ability of the Model 3100 to detect flame from hydrocarbon and non-hydrocarbon sources, making it the ideal product for typical chemical/petrochemical plants where the flame source could be from a variety of gases.

The microprocessor in the Model 3100 is programmed with state-of-the-art fire algorithms and continuously analyzes the data from the sensor array for individual intensity values, change of intensity values, relationship of intensity values, and frequency signature correlations. Each algorithm is designed to recognize a different type of flame signature from the detectors while rejecting common false sources. When the conditions of any one of the several fire algorithms are met the Model 3100 declares a fire.

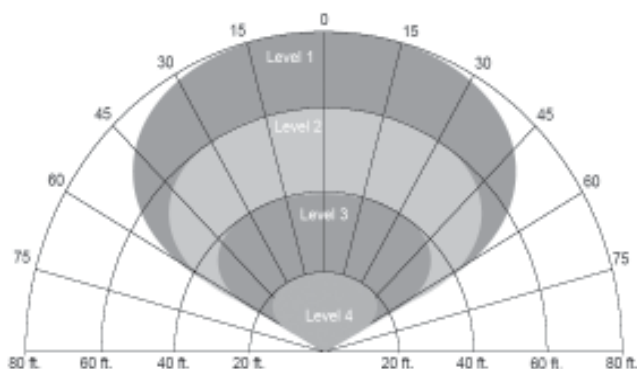
When the alarm decision is made in the microprocessor, the detector stores the pre-fire spectral data in nonvolatile memory and outputs an alarm signal in the form of a relay transition. The enhanced relay models also include a second alarm relay available for alarm verification purposes. The verification level is field selectable.



The Model 3100 is the only flame detector that provides RS-232 access to pre-fire spectral data and diagnostic information. Self diagnostic features of the micro-processor continuously perform system tests, watching for any faults which would impair its ability to accurately detect a flame and declare an alarm. The systems being checked include input power, sensor circuits, relay circuits and several other internal systems. The Model 3100 also performs a through-the-lens test of the sensor and lens systems. All faults are recorded in non-volatile memory and may be retrieved at any time by the operator.

The Sierra Monitor Flame Detector features 120 degree solid cone field of view, the widest in the industry. The Model 3100 series is in a copper-free cast aluminum NEMA 4X rated explosion proof enclosure.

### Field of View



### Detector Response To Various Fuels

Fuel	Distance	Fire Size	Response Time
Heptane	80 Feet	1 Square Foot	Less than 3 sec.
Silane	50 Feet	18 inch jet	Less than 3 sec.
Hydrogen	15 Feet	18 inch jet	Less than 5 sec.
Kerosene	75 Feet	1 Square Foot	Less than 5 sec.

# Model 3100 Series

# Flame Detectors

## Specifications

**Sensitivity:** 1 ft. sq. Pan fire on axis ~ 80 feet within 5 seconds (using standard fuel)  
Switch selectable from 20 to 80 feet to a 1 sq. ft. kerosene fire

**Field of View:** 120 degree cone

**Responsivity:** UV - 180 to 260 nm, IR - 0.715 to 3.5 microns, Visible - 480 to 560 nm

**Input voltage:** 15 to 32 volts, typically 24 volts

**Current draw:** @24 Volts DC: 72 mA normal mode, 82 mA alarm mode

## Temperature range:

Operating: -40°F to 185°F (-40°C to 85°C)  
Storage: -67°F to 230°F (-55°C to 110°C)

**LEDs:** Display switch settings, fault type, fire and verified fire information

## Relays:

Model 3100-01: Fire and Fault Relays  
**Fire Relay:** 0.5 amp ~ 120 VAC, 1.0 amp @ 24 VDC resistive, normally open and normally closed contacts, latching or fire-following modes  
**Fault Relay:** 0.5 amp ~ 120 VAC, 1.0 amp ~ 24 VDC resistive, normally open, common and normally closed contacts

Enhanced Relay Models: Fire, Fault, Verify and Aux Relays  
**Verify Relay:** 0.5 amp ~ 120 VAC, 1.0 amp ~ 24 VDC resistive, normally open and normally closed contacts are available. May be operated in either a latching or fire following mode.  
**Aux Relay:** 0.5 amp ~ 120 VAC, 1.0 amp ~ 24 VDC resistive, normally open and normally closed contacts are available. Normally used to indicate a Lens Check Fault.  
Copper-free Cast Aluminum with epoxy finish

## Enclosure:

### Hazardous area

**classification:** NEMA 4X Enclosure rating, Explosion Proof  
Class I, Div. 1 and 2, Groups B, C, D, Class II, Div. 1 and 2, Groups E, F, G, Class III

**Dimensions:** 5.4 x 4.8 x 3.7 inches (13.7 x 12.2 x 9.4 cm)

**Weight:** 3 lbs (1.3 Kg)

**Approvals:** FM Approved, CSFM: 7210-1608:100

False Alarm and Fire Response			
"This table shows the detectors ability to tolerate both modulated and unmodulated false alarm stimuli and still to detect a fire in the presence of the false alarm source (all fire tests used a 1.75" diameter alcohol pan fire at 6 feet)			
False Alarms Source	Distance	Unmodulated	Modulated
Resistive Electric Heater 1320 Watt	6 Feet	No Response	No Response
Fluorescent Lights (2) 40 Watt Bulbs	6 Feet	No Response	No Response
Halogen Light 500 Watt	10 Feet	No Response	No Response
Incandescent Light 100 Watt	6 Feet	No Response	No Response
Arc Welder 50 Watt	25 Feet	No Response	No Response

Ordering Information			
Model	Verified Alarm	Aux. Relay	Standard Alarm and Trouble Output
3100-01	N/A	N/A	These devices have both normally open and normally closed relay contacts.
3100-02	Open Contacts	Closed Contacts	
3100-03	Closed Contacts	Open Contacts	
3100-04	Open Contacts	Open Contacts	
3100-05	Closed Contacts	Closed Contacts	
3100-06	20mA	N/A	Normal 4 mA alarm 12 mA Trouble 0 mA