

RED1

Hazardous Location Flame Detector



General Information

The RED1 sensor array simultaneously monitors multiple spectral bands. An internal microprocessor evaluates the incoming data by analyzing intensity levels, rates of change, spectral relationships, and frequency distribution to identify flame signatures.

DataScan™ software, used with a computer and Interface Box, supports evaluation of detector operation and installation quality. When an event is detected, pre-fire spectral data (FireScape™) is written to nonvolatile memory and can be retrieved for review and analysis through DataScan™.

Most RED1 models include a UV Self-Test circuit that continuously verifies the integrity of the UV sensor system.

Enhanced models add an alarm verification relay, providing additional confirmation that a fire event has occurred. These models also include a separate auxiliary relay that activates when UV sensor integrity is compromised.

Test the detector at intervals specified by the authority having jurisdiction. NFPA 72 lists typical testing requirements.



Standard Features

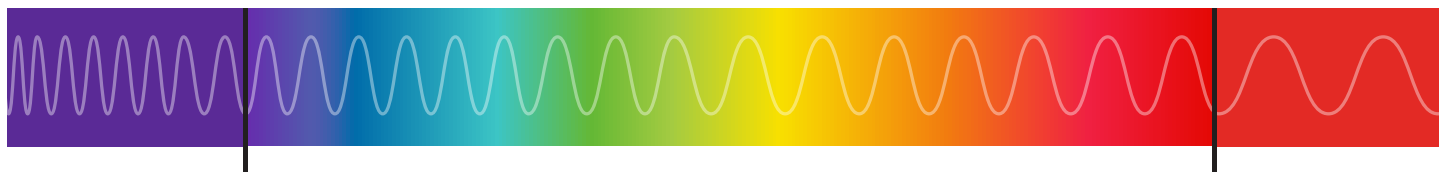
- Rated for Indoor & Outdoor Hazardous Locations
- Wide 120° Solid Cone of Vision
- UV / IR / Visible Sensor Array
- Broadband Detection for Silane, Hydrocarbon & Other Fuel Types
- Microprocessor-Based Design
- FireScape™ & DataScan™ Enabled
- Field Programmable Sensitivity Settings

Available Options

- UV Self-Test System
- Alarm Verification & UV Test Relays
- Red or White Housing



Sensor Coverage



ULTRAVIOLET (UV)

Two UV detector tubes monitor the UV energy characteristic of open-flame combustion. Solar UV in this wavelength range is absorbed by the upper atmosphere and does not reach ground level, so the RED1 is not affected by solar UV.

VISIBLE LIGHT

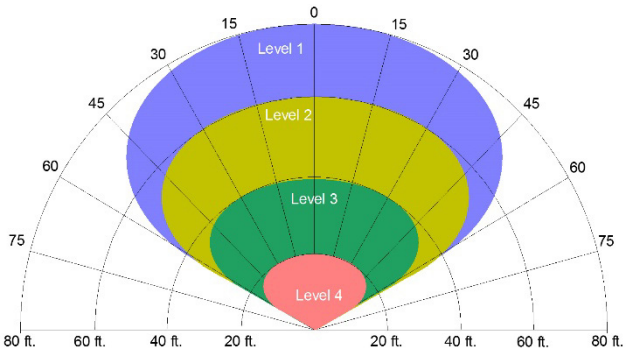
The visible light channel tracks background radiant flux across the monitored area. This data is used by the processing algorithms to screen out spurious sources and reduce false alarms.

INFRARED (IR)

The IR sensor covers 0.715 to 3.5 microns, capturing both blackbody (thermal) emissions and the chemistry-based emission signatures of specific fuel types.

Detector Response to Various Fuels

Fuel	Distance (in feet)	Fire Size	Average Response Time
Heptane	80 feet	1ft ²	2.75 seconds
Silane	50 feet	18-inch jet	3.42 seconds
Hydrogen	15 feet	18-inch jet	3.28 seconds
Kerosene	75 feet	1ft ²	2.85 seconds
Isopropyl	6 feet	1.75-inch diameter	2.60 seconds



This graph illustrates the range and wide field of view of the RED1 for each of its field selectable sensitivity settings.

False Alarm and Fire Response

This table shows the RED1’s ability to reject modulated and unmodulated false alarm stimuli while simultaneously detecting a fire. All fire tests used a 1.75-inch diameter IPA pan fire at 6 feet.

False Alarm Source	Distance to Source	Distance to Fire	Modulated/Unmodulated	Response Time To Fire
Resistive Electric Heater (1320 watt)	6 feet	6 feet	No response	<5 seconds
Fluorescent Light (two 40 Watt Bulbs)	6 feet	6 feet	No response	<5 seconds
Halogen Light (500 Watt Bulb)	10 feet	6 feet	No response	<5 seconds
Incandescent Light (100 Watt Bulb)	6 feet	6 feet	No response	<5 seconds
Arc Welder (50 Watt)	25 feet	6 feet	No response	<5 seconds

Ordering Information

Model	Fire/Fault Relay	Verify Relay	Aux. Relay	UV Self Test
RED1NT	○ ●	N/A	N/A	✗
RED1ST	○ ●	N/A	N/A	✓
RED1E1	○ ●	○	●	✓
RED1E2	○ ●	●	○	✓
RED1E3	○ ●	○	○	✓
RED1E4	○ ●	●	●	✓

Note: Normally Open = ○ Normally Closed = ●
White housing: add-WB to the model number (e.g., RED1-ST-WB).

Specifications

Sensitivity

Field selectable sensitivity settings allows a detector to respond to a 1 sq. ft. heptane fire on axis within 3 seconds at distances of 20, 40, 60 or 80 feet.

Hazardous Classification

NEMA 4X, Explosion Proof Class I Divisions I & II Groups B, C, D Class II Divisions I & II Groups E, F, G Class III

Relay Contacts

0.5 amp @ 120 VAC 1.0 amp @ 30 VDC Resistive

Test Fuels

Heptane, Hydrogen, Silane, Kerosene and Isopropyl Alcohol (70%)

Enclosure

Copper free cast aluminum with F.D.A. approved epoxy finish for high corrosion resistance. Available in red or white. Includes two ¾-inch NPT feed-through Hubs.

Electrical

Input Voltage: 15 to 32 VDC Current Draw Relay Models 24 VDC @ 62 ma nominal

Spectral Response

Ultraviolet: 185 to 260 nm
Infrared: .715 to 3.5 μm
Visible: 480 to 560 nm

Field-of-View

120-Degree Solid Cone

Weight

3.5 pounds (approximate)

Dimensions

4.5" × 4.8" × 3.7"

Temperature Range:

Tamb (Operating): -40° C to 85° C
Storage: -55° C to 110° C