

RED1-420

Hazardous Location Flame Detector



General Information

The RED1-420 uses a multi-spectrum sensor array to detect flame signatures across UV, visible, and infrared wavelengths simultaneously. An onboard microprocessor evaluates each signal by analyzing intensity levels, rates of change, spectral relationships, and frequency distribution to distinguish genuine fire events from false alarm sources with a high degree of accuracy.

When a fire event is detected, the RED1-420 captures pre-fire spectral data and stores it in nonvolatile memory using FireScope™ technology. This stored data is retrievable through DataScan™ software, which connects via a computer and Interface Box to support diagnostics, installation verification, and post-event analysis.

When equipped with the optional UV Self-Test feature, the detector continuously monitors the integrity of the UV detection system, providing added confidence that the unit is performing as designed between scheduled maintenance intervals.

An optional Alarm Verification State adds an additional layer of confirmation before a fire alarm is triggered, reducing nuisance alarms in environments with challenging background conditions.

Routine testing is required to maintain compliance and ensure ongoing detection reliability. Testing intervals should follow the requirements of the authority having jurisdiction; minimum standards are outlined in NFPA 72.



Standard Features

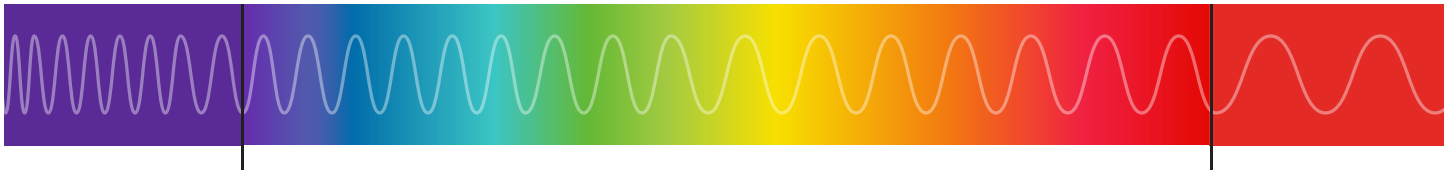
- Rated for Indoor & Outdoor Hazardous Locations
- Wide 120° Solid Cone of Vision
- UV / IR / Visible Sensor Array
- Broadband Detection for Silane, Hydrocarbon & Other Fuel Types
- Microprocessor Based Design
- FireScope™ & DataScan™ Enabled
- Field Programmable Sensitivity Settings

Available Options

- UV Self-Test System
- Alarm Verification State
- 4-20mA Output
- Red or White Housing



Sensor Coverage



ULTRAVIOLET (UV)

Dual UV detector tubes sense the UV energy produced by a fire. Solar UV produced in this range is absorbed by the upper atmosphere and does not affect the RED1.

VISIBLE LIGHT

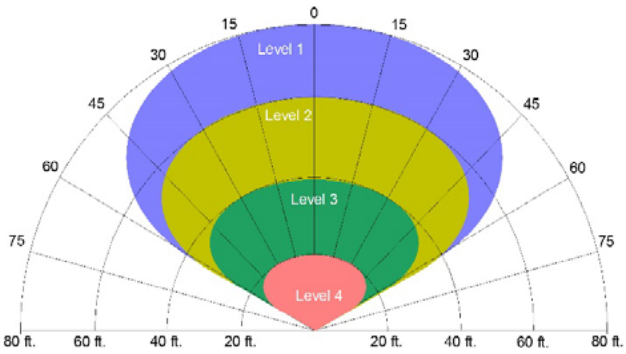
The visible light channel monitors the background radiant flux, which is used to discriminate against false alarm sources.

INFRARED (IR)

An IR sensor detects energy from 0.715 to 3.5 microns. This energy includes both black body (temperature) emissions and emissions based on the combustion chemistry of various fuels.

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 for each of the field selectable sensitivity settings.

False Alarm and Fire Response

Copper-free cast aluminum with F.D.A. approved epoxy finish for high corrosion resistance. Available in red or white. Includes two 3/4-inch NPT feed-through hubs.

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

Interface Response

Detector State	Interface Current
Fault	0 mA
Normal	4 mA
Fire	12 mA
Verified Fire	20 mA

Ordering Information

Model	Housing Color
RED1-420	Red
RED1-420-WB	White

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

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 3/4-inch NPT feed-through hubs.

Electrical

Input Voltage: 15 to 32 VDC
Current Draw Relay Models 24 VDC @ 72 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