



FIRE SENTRY CORP.™

Fire Sentry Corporation (FSC)  
593 Apollo Street  
Brea, California 92821

Tel.: 714-671-1100  
Fax: 714-671-5821

## Multi-Spectral, Digital, Infrared Electro-Optical

FSC Model No.'s

# FS10-R™ and FS10-A™

## Unitized, Two Stage, Quick Response

# Flame Detectors

with Wide Band IR™

Unitized, "Stand-Alone" Version Detectors  
with Relay or 4-20 mA Analog Output

# SPECIFICATIONS

# FS10-R, -A *Unitized* Multi-Spectral Flame Detector

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## 1.0 APPLICATION

The Fire Sentry Models FS10-R™ (relay output) and FS10-A™ (analog output) are unitized (stand-alone) Flame Detectors designed *specifically* for detecting and alarming to fires in electrostatic paint spray booths and paint spray lines in industrial and automotive applications. These multi-spectral, digital, electro-optical Flame Detectors are housed in explosion proof enclosures and feature automatic "through-the-lens" self-test. The Detectors may be ordered with either dry contact relay or 4-20 ma analog outputs for interfacing to approved control panels. FS10-R Detectors each contain a built-in controller and are unitized versions of the proven, large installed base of the FS10 Flame Detectors with Card Controllers and FS10 Flame Detectors with Wall-Mounted Controllers.

The FS10 line of Detectors is designed primarily for indoor fire detection applications where combustible materials exist. Typical applications include:

- Automotive Painting
- General Finishing
- Powder Coating Booths
- Liquid Paint Spray Lines
- Aerosol Filling
- Curing Ovens
- Warehouse Storage
- Compressor Modules
- Paint Kitchens
- Paint Mixing Rooms
- Internal Storage Tanks
- Diesel Generators

## 2.0 DESCRIPTION

These multi-spectral flame Detectors, using Fire Sentry Corporation patented technology, span the Wide Band Infrared™ (IR), Near Band IR™, and Visible Band™ spectrums. Using microprocessor technology and digital signal processing, the Detectors can distinguish between a real fire and false alarm radiant energy sources. The Detectors simultaneously examine these three spectral radiant energy bands continuously and perform real-time Digital Signal Processing. The Detector stores all of the pre-fire spectral data from the multi-spectral sensor array in non-volatile on-board memory for retrieval and evaluation. The FS10-R and FS10-A store the last six FirePic™ events, each 8 seconds long; and 200 Event Histories with time and date stamp. The FirePic data can be used to help postulate the cause of a fire.

## 3.0 FEATURES

- Immune to false alarms caused by arcs or corona discharges.
- Built-in automatic "through-the-lens" self-test.
- Unique two-stage ALERT and FIRE ALARM responses.
- *Not* affected by absorbing smoke or paint solvent mist in liquid paint spray booth.
- "Sees" through paint, powder or oil residue on Detector's lens.
- Optional factory sensitivity settings.
- Sealed module containing electronics and sensors.
- Optional swivel mount for easy installation and positioning.
- Standard explosion-proof housing.
- Low power consumption (relay version), 2.4 watts @ 24 VDC during alarm condition.
- **FirePic:** retrieval of recorded pre-fire data.
- **SnapShot:** dynamic real-time graphical display of *what* Detector sees.
- Easy-to-use "Windows" PC software available for accessing FirePic and SnapShot.

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## 4.0 DETECTOR OPERATION

Fast reacting, digital, microprocessor-based, multi-spectral, electro-optical Flame Detector with built-in controller. Detector will respond to both fireball and flickering fires and is used as a stand-alone (unitized) device that interfaces with approved fire alarm panels. This Detector is housed in an explosion-proof enclosure and incorporates built-in "through-the-lens" optical testing of both the sensing elements and the window lens. This model is designed for indoor applications only.

Once powered by 24 VDC, the Detector performs "through-the-lens" test every 10 minutes (factory-set). If the "through-the-lens" Detector test fails, the Detector LED will blink three times every 10 seconds. This usually indicates a dirty window lens or a missing or dirty reflector lens guard. While these self-tests are occurring, the Detector is still functional and able to alarm to a fire.

**WARNING:** Responses to the FS10-R Detector relay output or FS10-A analog 4-20 mA output **must be isolated mechanically** (not solely by programming the control panel using software or firmware). This will avoid external alarms and/or suppression discharge when performing the following manual Detector test with a Portable Test Lamp, such as the Fire Sentry Model FS-846.

A manual Detector "end-to-end" test can be performed by activating the Detector using a portable Test Lamp, such as the Fire Sentry Model FS-846 handheld tester.

The Detector's built-in microprocessor provides the following Advanced System Diagnostics:

**FirePic™:** Stores the sensor spectral data of the last six fire events in Detector's non-volatile digital memory. FirePic provides the numerical spectral evidence to postulate the cause of a fire. The Detector records the time and the date of each FirePic.

**SnapShot™:** Displays and records dynamic graphical display of what Detector "sees."

**Event History:** Contains the Detector's time and date stamped files of Alarm, Fault, Reset, etc. other than normal operations.

The above Detector system diagnostics can be accessed by using the optional "Windows" PC Interface Kit (Part No. FS10-IK), through the Detector's built-in RS-485 communication channel located on the module's 10 pin connector.

## 5.0 DETECTOR WIRING

The recommended Detector wiring is a 10-conductor, twisted pair, shielded, 18 to 22 gauge cable, and rated @ 300 Volts rms minimum. When installed in a hazardous area, a metal conduit and proper conduit seals must be installed that meet the National Electric Code and any other local codes. The conduit should not be used for other electrical equipment. Connection to the Detector is through a 10-pin plug-in connector located at the back of the Detector module.

## 6.0 SPECIFICATIONS

### 6.1 GENERAL

<b>6.1.1 Field of View</b>	90 Degrees ( $\pm 45^{\circ}$ horizontal and vertical)
<b>6.1.2 Spectral Sensitivity</b>	Wide Band Infrared: 0.7 to 3.5 micrometers Near Band Infrared: 0.7 to 1.1 micrometers Visible Band: 400 to 700 nanometers
<b>6.1.3 Response Time</b>	<b>Alert:</b> 0.3 second (response to "fireball" type fires) <b>Fire Early Warning:</b> 1 second (early response to a fire alarm) <b>Fire Alarm:</b> Less than 5 seconds (if fire continues)

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**6.1.4 Sensitivity** **Alert/Fire Early Warning** and **Fire Alarm** respond to a one-square foot Heptane reference pan fire at the following distances, that are pre-set at the factory:

	<u>15 feet</u>	<u>30 feet</u>	<u>*45 feet</u>
-R (Relay Version)	FS10-R15	FS10-R30	FS10-R45
-A (Analog Version)	FS10-A15	FS10-A30	FS10-A45

\*Detectors set at the 45-foot sensitivity do not have the **Alert/Fire Early Warning** output available.

## 6.2 ENCLOSURE

<b>6.2.1 Type</b>	Copper-free aluminum, Red powder-coated finish. NEMA 3 & 4 rated
<b>6.2.2 Weight</b>	3.8 lbs. (1.7 Kg)
<b>6.2.3 Dimensions</b>	4.81 inches diameter, 4.65 inches deep
<b>6.2.4 Conduit Entry</b>	Two 3/4" NPT
<b>6.2.5 Mounting</b>	Optional swivel bracket assembly

## 6.3 ELECTRICAL

<b>6.3.1 Input Voltage</b>	24 VDC nominal (18 to 28 VDC)
<b>6.3.2 Power</b>	-R Relay version: Normal 1.44 watts, Alarm 2.40 watts -A Analog version: Normal 1.60 watts, Alarm 2.88 watts

## 6.4 OUTPUTS

<b>6.4.1 Relay Version</b>	<p><b>Alert/Fire Early Warning (FEW):</b> Normally Open (N.O.) relay contacts with no power applied. The relay will energize and close contacts. Relay Contact Rating: 1 amp @ 24 VDC <u>Note:</u> Standard factory setting is latching. The non-latching option is available.</p> <p><b>Fire Alarm:</b> Normally Open (N.O.) relay contacts with no power applied. The relay will energize and close contacts. Relay Contact Rating: 1 amp @ 24 VDC <u>Note:</u> Standard factory setting is latching. The non-latching option is available.</p> <p><b>Fault:</b> Normally Open (N.O.) relay contacts with no power applied or the relay is energized during normal operation and will <u>de-energize</u> and open the contacts during a Fault or power failure. Relay contact rating: 1 amp @ 24 VDC</p>
<b>6.4.2 Analog Version</b>	<p><b>Fault:</b> 0 mA ± 0.6 mA</p> <p><b>Normal Mode:</b> 4 mA ± 0.6 mA</p> <p><b>Alert / FEW:</b> 12 mA ± 0.6 mA</p> <p><b>Fire Alarm:</b> 20 mA ± 0.6 mA</p>

## 6.5 ENVIRONMENTAL

<b>6.5.1 Operating Temperature:</b>	- 40 to +185 °F (- 40 to +85 °C)
<b>6.5.2 Humidity:</b>	10% to 90% (RH), non-condensing

## 6.6 DETECTOR APPROVALS

Factory Mutual (FM), CENELEC, CE

## 6.7 ELECTRICAL CLASSIFICATION

Explosion-Proof; Class I, Div. 1 & 2, Groups B, C, & D, Class II, Div. 1 & 2, Groups E, F & G, Class III

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## 6.8 WARRANTY

Two (2) years from factory shipping date

## ORDERING INFORMATION

	<u>Part Number</u>
FS10-R Detector with <b>relay</b> outputs and <b>15 ft.</b> sensitivity	<b>FS10-R15</b>
FS10-R Detector with <b>relay</b> outputs and <b>30 ft.</b> sensitivity	<b>FS10-R30</b>
FS10-R Detector with <b>relay</b> outputs and <b>45 ft.</b> sensitivity	<b>FS10-R45</b>
FS10-A Detector with <b>analog</b> output and <b>15 ft.</b> sensitivity	<b>FS10-A15</b>
FS10-A Detector with <b>analog</b> output and <b>30 ft.</b> sensitivity	<b>FS10-A30</b>
FS10-A Detector with <b>analog</b> output and <b>45 ft.</b> sensitivity	<b>FS10-A45</b>
Heavy duty swivel mount	<b>SM2</b>
Portable handheld test lamp	<b>FS-846</b>
Air shield for powder coating or dirty applications	<b>DASA1-P</b>
Patented Disposable protective cover for Detector	<b>DPC-12</b>
PC "Windows" Interface Kit for accessing Detector Data	<b>FS10-IK</b>

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