

Pyrotector*

INSTRUCTIONS

High Speed Glowing Ember Type Infrared Fire Detector Model 30-2054, Model 30-2054A



APPROVED
CALIFORNIA STATE
FIRE MARSHAL LISTED

APPLICATION

The Pyrotector Model 30-2054 High Speed Glowing Ember Detector and the Model 30-2054A High Speed, Ultra Sensitive Glowing Ember Detector respond to infrared (IR) radiation in the one to three micron range (10,000 to 30,000 angstroms). Both models are designed to detect glowing embers and smoldering fires in solid hydrocarbon materials such as coal, cotton, and wood, passing on conveyor belts or air-borne within conductor ducts, and moving at velocities from 25 to 10,000 feet per minute. The detectors are intended for use in dark areas (less than 10 foot candles of light).

DESCRIPTION

The Model 30-2054A is a long range, highly sensitive detection device with the capability to detect a 1/4 inch ember within a range of 18 to 54 inches.

The Model 30-2054 is a less sensitive device, with a detection range of 9 to 24 inches for a 1/4 inch ember.

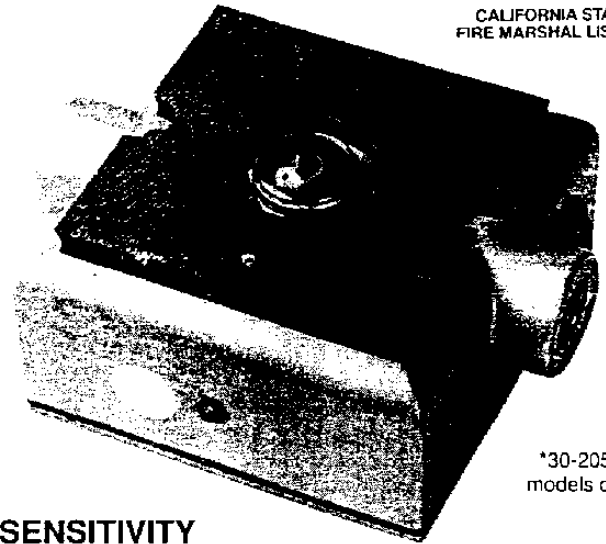
The detector is a compact, unitized package containing the detection cell, solid state electronics, and a dry contact Form C (SPDT) alarm relay. The detection cell is a single element infrared photoresistive cell and is contained within a Lexan lens end dome.

Both models are totally enclosed in a cast aluminum housing with a removable gasketed cover (Type FS electrical junction box).

The detectors can be mounted to any flat surface, such as a duct sidewall. They are equipped with a full face neoprene gasket to prevent air leakage or external light infiltration and are intended for indoor use only.

Both units are designed to operate with any standard 12 or 24 volt dc fire alarm control panel.

**Pyrotector is a brand name of Detector Electronics Corporation*



*30-2054A
models only

SENSITIVITY

Detector sensitivity is a function of the size of the fire or ember, its proximity to the detector, and its velocity. Average response time for both detector models is 8 milliseconds for a 1/4 inch diameter glowing ember at a distance of 6 inches. Table 1 shows the maximum detection distances for each detector with various ember velocities.

CONE OF VISION

The detector has a maximum cone of vision of 90 degrees, with the highest sensitivity along the central axis. As the angle increases, the sensitivity decreases. At an angle of 45 degrees from the central axis, the sensitivity is reduced to 75%. Figure 1 illustrates the detector viewing pattern.

SPECIFICATIONS

OPERATING VOLTAGE —
12 to 16 vdc for 12 vdc unit.
20 to 27 vdc for 24 vdc unit.

OPERATING CURRENT —
Standby: 12 milliamperes maximum at 12 or 24 vdc.
Alarm: 70 milliamperes maximum at 12 or 24 vdc.

RELAY CONTACT RATING —

1 ampere at 26 vdc.

SPECTRAL SENSITIVITY RANGE —

1.0 to 3.0 microns (10,000 to 30,000 angstroms), with peak response at 2.5 microns (25,000 angstroms).

RESPONSE TIME —

8 milliseconds average.

RESPONSE TO EMBER —

Ember size: 1/16 to 5/16 inch.

Movement: 25 to 10,000 feet per minute.

DETECTION DISTANCE (1/4 inch ember) —

Model 30-2054: Typically up to 24 inches.

Model 30-2054A: Typically up to 54 inches.

TEMPERATURE RANGE —

-13°F to +150°F (-25°C to +65°C).

HUMIDITY RANGE —

Up to 90% RH.

ENCLOSURE TYPE —

Electrical junction box, Type FS cast aluminum with gasketed cover, straight-through (in-line) 1/2 inch female entries.

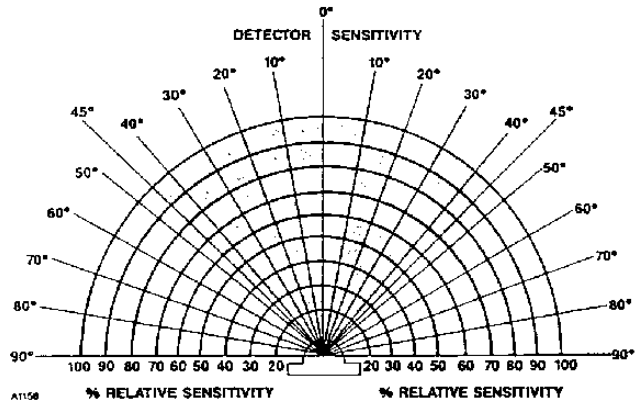


Figure 1—Detector Viewing Pattern

DIMENSIONS —

4.5 inches long, 4.5 inches wide, 2.25 inches high. See Figure 2 for mounting dimensions.

WEIGHT —

1.7 pounds.

APPLICATION CONSIDERATIONS

To ensure maximum sensitivity, the lens of the detector must be kept clean at all times. When testing the sensitivity of the detector, a 40 watt soldering iron held at a distance of 6 inches from the detector can be used for simulating a typical ember.

The detector is a non-discriminating device. Therefore, care must be taken when installing the detector to prevent sunlight or incandescent light from reaching the detector and causing a false actuation. Fluorescent lighting has minimum effect. For best results, the detectors should be used in dark or semi-dark areas of less than 10 foot candle ambient illumination.

INSTALLATION

Install the detector so that the lens is exposed only to darkened areas such as the inside of a duct (light levels of 10 foot candles or less). The lens should

Table 1—Detection Distances (1/4 Inch Ember)

Ember Velocity (ft/min)	Model 30-2054A (inches)	Model 30-2054 (inches)
Minimum	Maximum	Maximum
25	18	9
75	24	10
100	30	10
200	36	14
400	40	17
600	44	20
800	48	20
1200	50	20
1600	50	20
2000	53	20
2500	53	20
3500	54	22
4500	54	23
5500	54	26
6500	54	27
7500	54	30
9500	54	30

Maximum detection distance is in inches head-on to the detector. Sensitivity decreases to 75% at 45 degrees.

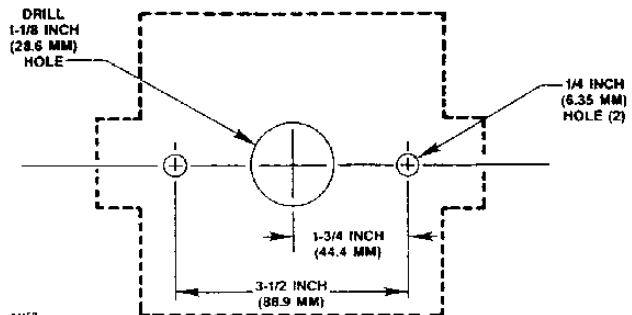


Figure 2—Detector Mounting Holes

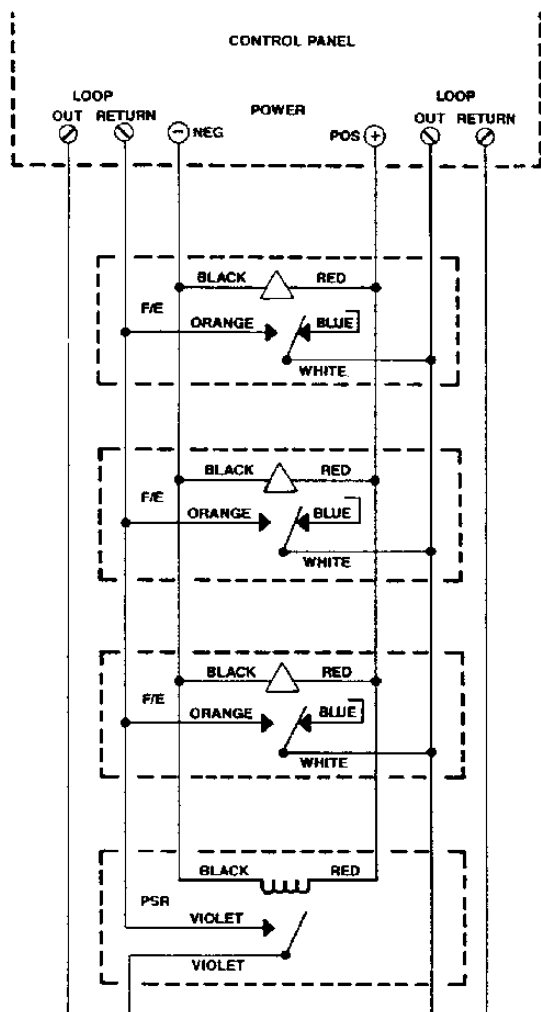
face the center of the area to be protected. The detector has a viewing angle of 90°. Additional detectors may be required for wider angles or larger areas.

1. Provide holes in the duct wall as shown in Figure 2.
2. Remove the back cover of the detector.
3. Use two screws (not supplied) to secure the detector to the duct wall.
4. Connect external wiring to the detector as shown in Figures 3 and 4.
5. Replace the back cover of the detector.

DETECTOR MAINTENANCE

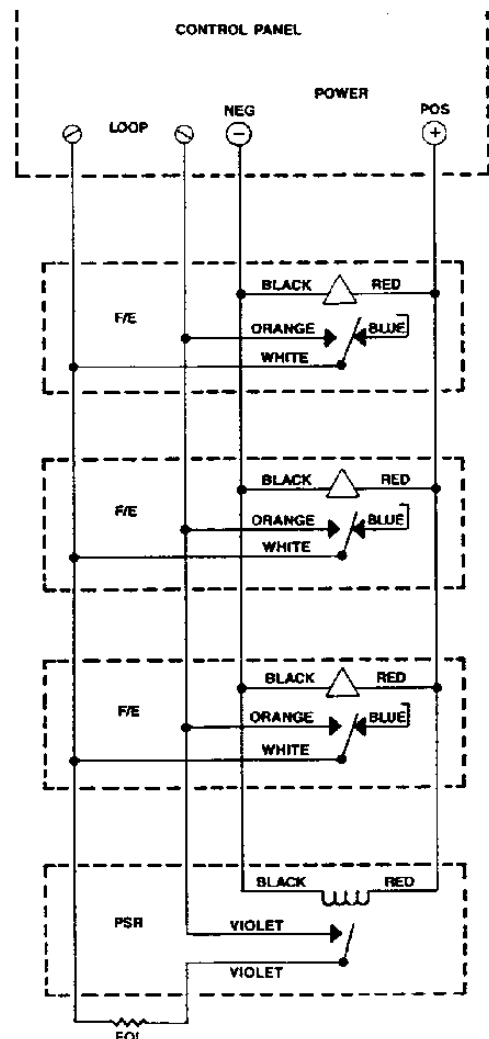
To assure maximum detector sensitivity, the lens should be kept free of dirt or other contaminants.

The detector should be tested periodically to assure proper functioning. A cigarette or soldering iron can be used to simulate an ember. Move the cigarette rapidly in front of the lens. The red LED alarm indicator located on the side of the detector will be illuminated when the detector senses the ember.



F/E - FLAME OR EMBER DETECTOR
 PSR - POWER SUPERVISION RELAY P 2040 OR EQUIVALENT,
 REQUIRED BY PANEL
 EOL - END OF LINE DEVICE AS REQUIRED BY PANEL

Figure 3—Wiring Diagram - Double Loop Panel



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Figure 4—Wiring Diagram - Single Loop Panel

ENGINEERING SPECIFICATIONS

The detector shall be a high speed infrared Pyrotector glowing ember detector or equivalent, designed to operate with any 12 vdc or 24 vdc fire alarm control panel.

The unit shall be capable of sensing a 1/4 inch ember moving through its cone of vision at velocities up to 10,000 feet per minute. Detection range shall be up to 24 inches (Model 30-2054) or up to 54 inches (Model 30-2054A). Response time shall be 8 milliseconds, nominal. The detector will function in dark areas with less than 10 foot-candles of light.

The detector shall be totally enclosed in a cast aluminum housing with a removable gasketed cover. The detector assembly shall be a unitized package containing detection cell, solid state electronics, and a dry contact Form C (SPDT) alarm relay.

The detector shall have a 90° cone of vision and shall maintain at least 75% of its sensitivity at 45° of the central axis.

The unit shall be Factory Mutual approved (Model 30-2054A only).

WARRANTY POLICY

Detector Electronics Corporation products are manufactured from high quality components and the completed device is rigorously inspected and tested before shipment; however, any electronic device is subject to failure beyond the control of the manufacturer. To ensure system reliability, it is important for the user to maintain the system as recommended by the instruction manuals and to determine the frequency of functional checking of the system required for each specific installation. The more frequent the checking, the greater the system reliability. For the highest reliability, a completely redundant system is necessary. The manufacturer warrants its products against defective parts and workmanship, and will replace or repair equipment returned to the manufacturer for these reasons within 12 months after purchase date. See manufacturer's Standard Terms and Conditions on the invoice for complete details. Please note that no other warranties, written or implied, will be honored by the manufacturer.

DEVICE REPAIR AND RETURN

Prior to returning devices or components, contact Detector Electronics so that an RMI (Return Material Identification) number can be assigned. A written statement describing the malfunction must accompany the returned device or component to expedite finding the cause of the failure, thereby reducing the time and cost of the repair to the customer. Return all equipment transportation prepaid to the factory in Minneapolis.

Detector Electronics Corporation

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