

Product Engineering Sheet

Engineering Specification for a Multispectral Infrared (IR) Optical Flame Detector

GENERAL DESCRIPTION

The flame detector shall detect and respond to the presence of hydrocarbon and hydrogen flames. It shall be based on light of sight detection of radiation emitted in the IR spectral bands by flames. The unit shall be designed to detect the absorption of light at specific wavelengths, allowing it to discriminate between flames and false alarm sources.

SYSTEM SPECIFICATIONS

The detector's spectral response shall have hot carbon dioxide spectral emission bands at 4.2 – 4.7 μm and hot water spectral emission bands at 2.7 – 3.0 μm . The unit shall detect a 1 ft. x 1 ft. n-heptane fire up to 215 ft. (65 m.) from the source. The field of view shall be horizontal 67° and vertical 70° for gasoline fires and horizontal 80° and vertical 80° for hydrogen fires. Average response time shall be five seconds with the option of an adjustable time delay. The unit shall support multiple outputs: 4-20 mA, HART, RS-485, and relays. The detector shall have an internal test function to verify window cleanliness and sensor functionality. End to end testing shall be performed with an external flame simulator. The warranty on the detector shall be five years. The detector shall be designed to meet certifications for CSA Class I, Division 1, Groups B, C, and D; Class II/III Division 1, Groups E, F and G; and ATEX Class I, Zone 1 and 2, IIC; II 2 G D, Ex d IIC T5 Gb Ex tb IIIC T96.°C Db.

MECHANICAL SPECIFICATIONS

Housing size for the units shall be:

Detector: 4" x 4.6" x 6.18" (101.6 x 117 x 157 mm)

Weight for the units shall be:

Detector (Stainless Steel): 6.1 lbs. (2.8 kg)

Detector (Aluminum): 2.8 lbs. (1.3 kg)

Tilt Mount (Stainless Steel): 2.2 lbs. (1.0 kg)

The enclosure material shall be stainless steel 316L with electro polish finish or heavy duty copper free aluminum (less than 1%), red epoxy enamel finish.

There shall be two conduit entries supplied with ¾" NPT or M25 x 1.5-6H.

ELECTRICAL SPECIFICATIONS

The operating voltage shall be 24 VDC nominal with a range of 18-32 VDC.

Power consumption for the detector shall be:

Detector (standby): Max. 90 mA (110 mA with heated window)

Detector (alarm): Max. 130 mA (160 mA with heated window)

Standard alarm outputs shall include one (1) 4-20 mA signal (600 ohm load max.) and two (2) single pull single throw (SPST) relays as follows:

4 – 20 mA current output

State	Output
Fault	0 ± 1 mA
Built In Test Fault	2 mA ± 10%
Normal	4 mA ± 10%
Warning	16 mA ± 10%
Alarm	20 mA ± 10%

Relays shall be two (2) SPST, 2 amperes @ 30 VDC resistive maximum.

Relay options shall be selectable for:

- Latching/Non-Latching Alarm and Fault
- Energized/De-Energized Alarm and Fault

Warning & Alarm level set-points at 16 mA and 20 mA respectively. The unit shall have a tri color light emitting diode (LED) indicator which depicts the detector state.

The system shall be certified to CSA, ATEX, IECEx and FM standards and have the CE Marking. The device shall also be IEC 61508 certified to SIL 2. The detector will be continuously tested for electronics failure, sensor failure, and window cleanliness. The unit shall use a portable, external means of device to perform full, functional end to end testing of the detector and the fire protection system.

ENVIRONMENTAL SPECIFICATIONS

The operating temperature of the system shall be -67 °F to +167 °F (-55 °C to +75 °C). The operating humidity range of the system shall be 0 to 95 % RH, non-condensing. The system must meet the performance requirements of FM 3260 and EN 54-10. The system shall have a weatherproof rating of Type 4X, IP66/67.