

Dual Spectrum®
Infrared Flame Detector
Model PM-5MPX


DESCRIPTION

The Det-Tronics PM-5MPX Dual Spectrum® flame detector is optimized for the rigorous semiconductor fabrication industry, which is beset with many hazards that result in stringent requirements for fire protection safety systems. Flame detection requirements for this industry are specific: Factory Mutual Approvals (FM) addresses the detailed specific requirements for this application in Factory Mutual Loss Prevention Data Sheets 7-7/17-12, Semiconductor Fabrication Facilities. The PM-5MPX meets both industry and FM requirements.

A typical accident scenario involves a solvent or plastic wetbench component being ignited by faulty or misused electronics. If not detected and extinguished quickly, such fires and their combustion byproducts can severely contaminate the clean room and other facilities resulting in large production losses. The detector incorporates unique Dual Spectrum® infrared sensor technology, which establishes a new standard in flame detection and false alarm immunity. The polypropylene enclosure enables the detector to be utilized in both solvent or chemical etch wet benches.

Typical Applications:

- Semiconductor fabrication and processing facilities
- Fume hoods
- Semiconductor chemical process areas
- Clean rooms
- Gas cabinets
- Silane dispensing

FEATURES AND BENEFITS
FEATURES

- Performance approved to FM 3260: 2000
- Dual Spectrum® IR design
- Compact size
- LED indicator for operational status
- Built-in mounting plate
- Typical response time of < 0.5 second
- Explosion response – 25 milliseconds
- Polypropylene housing: Excellent resistance to corrosion and contamination effects
- Intrinsically safe for Haz. Loc.: Class I, Division 1, Groups C and D; Class I, Division 2, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class II, Division 2, Groups F and G; and Class III, Divisions 1 and 2
- Internal electrical shielding and completely encapsulated

BENEFITS

- Excellent false alarm resistance
- Highest level EMI and RFI resistance
- Easy mounting
- Faster response means less contamination and production downtime
- Rapid response in the event of an exothermic reaction or pyrophoric fire
- Suitable for use in corrosive environments
- Allows Class I, Division 1 installations.



SPECIFICATIONS

Operating Voltage 9 to 30 volts dc

Power Consumption 10 ma at 30 vdc for normal operation and alarm

Relays 100 milliamps maximum at 30 volts dc
Non-latching fire relay contacts close for 5 to 15 seconds
Alarm Output: Normally open contacts
Fault: Normally closed contacts

Wiring
(Stranded wire)

Color	Description
BLK	V-
BRN	V-
RED	V+
ORG	V+
YEL	Alarm +
GRN	Alarm +
BLU	Alarm -
VIO	Alarm -
GRY	Trouble +
WHT	Trouble -

Temperature Range 32°F to 120°F (0°C to 49°C)

Humidity Range 0 to 93% relative humidity
Can withstand hose-down and liquid immersion

Ingress Protection (IEC) IP67

Chemical Resistance No degradation to housing or wire jacket observed after exposure to Cyclohexanone, NMP, HMDS, Photo Resist, Developer, Acetone, Isopropyl Alcohol, MEK, or Methanol at 60°C

Certifications FM: Approved to 3260: 2000. Tested to requirements of Factory Mutual Loss Prevention Data Sheets 7-7/17-12, Semiconductor Fabrication Facilities

Intrinsically Safe for:
Class I, Division 1, Groups C & D;
Class II/III, Division 1, Groups E, F & G;
Non-Incendive for:
Class I, Division 2, Groups A, B, C & D;
Class II/III, Division 2, Groups F & G

EMC: CE compliant

Cone of Vision 110° horizontal by 110° vertical, with highest sensitivity along the central axis

Enclosure Material Polypropylene

Dimensions Length: 3.1 by 3.1 in.(7.87 by 7.87 cm)
Depth: 1.7 in. (4.3 cm)
Cable Length: 50 ft. (15 m)

Shipping Weight (Approximate) 3.3 pounds (1.5 kg)

RESPONSE CHARACTERISTICS (Typical Response Time < 0.5 Sec.)

Fuel	Size	Distance (feet)
n-Heptane	1 x 1 foot	18
Isopropanol	8 in. dia.	8
Polypropylene	8 in. dia.	8

Note: Response time measurements based on shuttered test method.

FALSE ALARM IMMUNITY COMBINED WITH 10 INCH PROPANE FIRE SOURCE

False Alarm Source	False Alarm Source Distance (feet)	Fire Source Distance (inches)
Arc welding, unmodulated	3.5	12
Arc welding, modulated	3.5	12
70 W sodium vapor lamp, unmodulated	0.5	24
70 W sodium vapor lamp, modulated	0.5	19
250 W mercury vapor lamp, unmodulated	1.0	20
250 W mercury vapor lamp, modulated	1.0	20
300 W incandescent lamp, unmodulated	0.67	27
300 W incandescent lamp, modulated	0.67	21
500 W shielded quartz halogen lamp, unmodulated	2.5	25
500 W shielded quartz halogen lamp, modulated	2.5	18
1500 W electric quartz heater, unmodulated	9	24
1500 W electric quartz heater, modulated	9	27
Two 34 W fluorescent lamps, unmodulated	0.25	20
Two 34 W fluorescent lamps, modulated	0.25	24

FALSE ALARM IMMUNITY

False Alarm Source	Distance (inches)	Modulated Response	Unmodulated Response
Arc welding, Type E6012 rod, 1/8" dia., 1/4" plate	42	No alarm	No alarm
70 W sodium vapor lamp	6	No alarm	No alarm
250 W mercury vapor lamp	12	No alarm	No alarm
300 W incandescent lamp	8	No alarm	No alarm
500 W quartz halogen lamp shielded w/window	30	No alarm	No alarm
1500 W electric quartz heater	108	No alarm	No alarm
Two 34 W fluorescent lamps	<3	No alarm	No alarm

Specifications subject to change without notice.

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Det-Tronics manufacturing system is certified to ISO 9001—
the world's most recognized quality management standard.



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