sierra monitor corporation

3600-M
Multi IR Flame Detector Series
Superior performance, reliability and immunity to false alarms

The new 3600-M Multi IR Flame Detector is specifically designed for detection of hydrocarbon and hydrogen flames. It detects hydrocarbon-based fuel and gas fires at long distances with the highest immunity to false alarms. The 3600-M can detect a gasoline pan fire at 215 ft (65m) or a hydrogen flame at 100 ft (30m) in less than 5 seconds.

The 3600-M is the most durable and weather resistant range of flame detectors currently on the market. Its features include a heated window, to eliminate condensation and icing; HART capabilities, for digital communications; lower power requirements, and a compact, lighter design.

Due to increased reliability, the 3600-M Series is approved to IEC 61508 Safety Integrity requirements of SIL2 (TUV).

Features & Benefits

- Multi Spectrum Design - for long distance detection of hydrocarbons and hydrogen flames
- High false alarm immunity
- Heated window - for operation in harsh weather conditions (snow, ice, condensation)
- Multiple output options for maximum flexibility and compatibility
  - Relays (3) for Alarm, Fault and Auxiliary
  - 0-20mA (stepped)
  - HART Protocol for maintenance and asset management
  - RS-485, Modbus Compatible
- High Reliability - MTBF - minimum 150,000 hours
- Approved to Safety Integrity Level 2 (SIL2-TUV)
- 2-Year Warranty
- User Programmable via HART or RS-485
- Ex approved for Zone 1 hazardous area location
  - ATEX - FM *
  - IECEx - CSA *
- 3rd party Performance Tested
  - EN54-10 (LPCB) - FM3260 (FM)
- Sensitivity Selection - to ensure no zone crossover detection
- Automatic Built-In-Test (BIT)* and Manual - to assure continued reliable operation

* Option

Applications

- Offshore Oil & Gas installations
- Onshore Oil & Gas installations and pipelines
- Chemical plants
- Petrochemical plants
- Storage Tank farms
- Space Industry hydroxyl propellant
- Aircraft hangers
- Power Generation facilities
- Pharmaceutical industry
- Printing industry
- Warehouses
- Automotive industry
- Static Fuel Cell systems
- Explosives & Munitions
- Waste Disposal facilities
- Hydrogen Fuel Cell industry
- Hydrogen Vehicle Parking & Refueling
- Battery Charging areas
- Refinery Hydrogenation

Ordering Information

Model Number	Type	Wiring Config (Table1)	Temperature	Elec Entry	Housing	EX Approval
3600	- M = Multispectrum	- 1	- 1 = 75C std	- 1 = -M25	- S = SS	- F = FM
		- 2	- 2 = 85C	- 2 = 3/4" NPT	- A = AL	- C = ATEX/IIECEx
		- 3				
		- 4				
		- 5				

Table 1: Wiring Options

All units are provided with RS-485 and HART enabled if mA output is used

Option	4-20mA	Fault Relay	Aux Relay	Alarm Relay
1 default	Sink	NC	--	NO
2	Source	NC	--	NO & NC
3	Source	NO	--	NO & NC
4	X	NC	NO	NO
5	X	NO	NO	NO

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Specifications:

Spectral Response	Multi IR Bands		
Detection Range (at highest Sensitivity Setting for 1 ft^2 ($0.1m^2$) pan fire)	n-Heptane: 215 ft (65m) Gasoline: 215 ft (65m) Diesel Fuel: 150 ft (45m) JP5: 150 ft (45m) Hydrogen*: 100 ft (30m)	Kerosene: 150 ft (45m) Ethanol 95%: 135 ft (40m) Methanol: 115 ft (35m) IPA (Isopropyl Alcohol): 135 ft (40m) *20" (0.5m) high, 8" (0.2m) with plume fire	Methane*: 100 ft (30m) LPG*: 100 ft (30m) Polypropylene Pellets: 16 ft (5m) Office Paper: 33 ft (10m)
Response Time	Typically 5 seconds		
Adjustable Time Delay	Up to 30 seconds		
Sensitive Range	4 Sensitive Ranges for 1 ft^2 ($0.1m^2$) n-heptane pan fire from 50 ft (15m) to 215 ft (65m)		
Field of View	67° horizontal, 70° vertical for Gasoline 80° horizontal, 80 vertical for Hydrogen		
Built-in-Test (BIT)	Manual and Automatic		
Temperature Range	Operating: -67°F to +167°F (-55°C to +75°C) Operating Option: -67°F to +185°F (-55°C to +85°C) Storage: -67°F to +185°F (-55°C to +85°C)		
Humidity	Up to 95% non-condensing (withstands up to 100% RH for short periods)		
Heated Options	To eliminate condensation and icing on the window		
Electrical Specifications			
Operating Voltage	24 VDC nominal (18-32 VDC)		
Power consumption	Standby: Max. 90mA (110mA with heated window) Alarm: Max. 130mA (160mA with heated window)		
Cable Entries	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO		
Wiring	12 - 22AWG ($2.5mm^2$ - $0.3mm^2$)		
Electrical Input Protection	According to MIL-STD-1275B		
Electromagnetic Compatibility	EMI/RFI protected to EN61326-3 and EN61000-6-3		
Electrical Interface	The detector includes twelve (12) terminals with five (5) wiring options (factory set)		
Outputs			
Relays	Alarm, Fault and Auxiliary SPST volt-free contacts rated 5A at 30 VDC or 250 VAC		
4-20mA (stepped)	Sink (source option) configuration Fault: 0 +1mA BIT Fault: 2mA ±10% Normal: 4mA ±10%	 Warning: 16mA ±5% Alarm: 20mA ±5% Resistance Loop: 100-600 ohms	
HART Protocol	Optional HART communication on the 0-20mA analog current (FSK) - used for maintenance, configuration changes and asset management, available in mA source output wiring options		
RS-485	RS-485 Modbus compatible communication link that can be used in computer control installations		
Mechanical Specifications			
Materials	- Heavy-duty copper free aluminum (less than 1%), red epoxy enamel finish (ATEX Approval only)		
Enclosure Options	- Stainless Steel 316L with electro polish finish (FM or ATEX Approval)		
Mounting	Stainless Steel 316L with electro polish finish		
Dimensions	Detector: 4" x 4.6" x 6.18" (101.6 x 117 x 157 mm)		
Weight	Aluminum: 2.8 Lb (1.3 Kg) Stainless Steel 316L: 6.1 Lb (2.8 Kg) Tilt mount: 2.2 Lb (1.0 Kg)		
Environmental Standards	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp		
Water and Dust	IP66 and IP67 per En60529, NEMA 250 6P		
Approvals			
Hazardous Area			
ATEX & IECEx	Ex II 2 GD, Ex de IIB + H2 T5 (-55°C to + 75°C) Ex tD A21 IP66/X7 T 95°C	 Ex de IIB + H2 T4 (-55°C to + 85°C) Ex tD A21 IP66/X7 T 105°C	
FM / CSA *	Class I Div. 1, Groups B, C & D	Class II/III Div. 1, Groups E, F & G	
Performance	EN54-10 (LPCB) FM-3260 (FM)		
Reliability	IEC61508 - SIL-2 (TUV)		
Accessories			
Fire Simulator	20/20-310		
Tilt Mount	3600-01		
Weather Protector	777163		
Air Shield	777161		
Mini Laptop Kit	777820		
USB RS485 Harness Kit	794079-5		
Laser Pointer (Detector area coverage)	777166		

* Contact Sierra Monitor
Specifications subject to changes without notice

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