

Spectrex SharpEye™ 40/40D-LB

Ultra Fast UV/IR Flame Detector



The SharpEye 40/40D-LB UV/IR flame detector is part of the leading, next generation SharpEye 40/40 series.

Featuring ultra-fast detection in 20 msec with proven immunity to false alarms, integrating UV and IR optical sensors to ensure flawless performance to keep a SharpEye on your safety!

Detects flames with a large variety of hazardous sources, such as hydrocarbon-based fuel and gas, hydroxyl, hydrogen, metal, inorganic, etc.



Features and benefits

Integrating UV and IR optical sensors for detection of detection of fires from a large variety of hazardous sources, such as hydrocarbon-based fuel and gas, hydroxyl, hydrogen, metal, inorganic, etc.

- 20 msec Ultra Fast detection
- Proven false alarm immunity
- Unparalleled reliability - 150,000 hours MTBF
- Best in class temperature range:
-76 to +185 °F (-60 to +85 °C)
- Worldwide and regionally certified for hazardous areas
- Performance and reliability approved by recognizable certification bodies
- SIL3 compatible
- Enhanced durability backed up by with five-year warranty
- Smart field of view integrity test, allowing flawless operation
- Innovative UV & IR Built-In-Test - continuously validating the optical integrity and the electronic circuitry
- Multiple output options for maximum compatibility with standard infrastructures
- Plug-and-Play - factory calibrated for immediate use in any fire detection system
- Universal wiring option for fast ordering process
- Three sensitivity levels, adapting to any application
- Two mode heated optics for impeccable performance in challenging environmental conditions

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Applications examples

- Offshore oil and gas installations
- Onshore oil and gas installations and pipelines
- Hydrogenation (Petroleum Refining, Food Processing, Chemical)
- Chemical plants
- Petrochemical plants
- Storage tank farms
- Fuel and gas processing and storage facilities
- Power generation facilities
- Explosives and munitions
- Fertilizer plants
- Automotive industry
- Vehicle battery charging stations
- Hydroxyl production and storage
- Aerospace industry
- Waste management facilities
- Hydrogen fuel cell industry
- Pharmaceutical industry
- Printing industry
- Hazardous materials storage areas
- Food processing
- Silane storage

Specifications

Table 1: General Specifications

| | |
|--|--|
| Spectral response | UV: 0.185–0.260 μm ; IR: 2.5–3.0 μm |
| Detection ranges (at highest sensitivity setting for 1 ft ² [0.1 m ²] pan fire) | See Table 3 . |
| Sensitivity ranges | 3 sensitivity ranges for 1 ft ² (0.1 m ²) n-Heptane pan fire |
| Field of view | Horizontal: 100°, vertical: 95° |
| Temperature range ⁽¹⁾ | Operating: -76 to +185 °F (-60 to +85 °C) Storage: -76 to +185 °F (-60 to +85 °C) |
| Humidity | Non-condensing relative humidity up to 100% |

(1) *Self declaration*

Table 2: Detection Response Time

| | |
|--------------------------------------|---|
| Standard response time | Typically 5 sec. at 93 ft. (28 m) |
| Ultra fast response time | 20 msec for flash fire pan fire from 9.84 ft. (3 m) distance via analog voltage output |
| High speed response time (explosion) | 50 msec for 1 ft. (0.30 m) diameter sphere LPG-air mixture explosion at 32.8 ft. (10 m) via analog voltage output |

Table 3: Detection Range

| Fuel | ft/m |
|--|-------|
| Gasoline (Petrol) ⁽¹⁾ | 93/28 |
| N-Heptane ⁽¹⁾ | 93/28 |
| Diesel fuel ⁽¹⁾ | 70/21 |
| Methane ⁽²⁾ | 60/18 |
| Liquefied petroleum gas (LPG) ⁽²⁾ | 60/18 |
| Kerosene ⁽¹⁾ | 70/21 |
| Jet fuel JP5 ⁽¹⁾ | 70/21 |
| Jet fuel A1 ⁽¹⁾ | 69/21 |
| Ethanol 95% ⁽¹⁾ | 57/17 |
| Isopropyl alcohol (IPA) ⁽¹⁾ | 70/21 |
| Methanol ⁽¹⁾ | 57/17 |
| Ethylene glycol ⁽¹⁾ | 23/7 |
| Solvents ⁽¹⁾ | 70/21 |
| Flammable adhesive (flash point 140 °F < 60 °C) ⁽¹⁾ | 70/21 |
| Butyl acrylate ⁽¹⁾ | 70/21 |
| Vinyl acetate ⁽¹⁾ | 70/21 |
| Oil paint ⁽¹⁾ | 70/21 |

Table 3: Detection Range (continued)

| | |
|--------------------------------------|-------|
| Gun powder ⁽³⁾ | 66/20 |
| Fireworks ⁽⁴⁾ | 10/3 |
| Magnesium alloy ⁽⁵⁾ | 33/10 |
| Polypropylene pellets ⁽¹⁾ | 60/18 |
| Office paper ⁽¹⁾ | 33/10 |
| Wood ⁽¹⁾ | 33/10 |
| Mineral oil (20w50) ⁽¹⁾ | 70/21 |
| Cooking oil ⁽¹⁾ | 70/21 |
| Lithium ion battery ⁽⁶⁾ | 75/23 |

- (1) 1 ft x 1 ft (0.3 m x 0.3 m) pan
- (2) 2.46 ft. (0.75 m) high, 0.82 ft. (0.25 m) width plume fire
- (3) 1.5-in. sq.
- (4) 10 pcs per test
- (5) Only for UV detector
- (6) One cell of battery per test

Table 4: Electrical Specifications

| | |
|-------------------------------|--|
| Operating voltage | 24 Vdc nominal (18-32 Vdc) |
| Power consumption | Standby: Max. 3 W (8 W with heated window) Alarm: Max. 4.2 W (9.6 W with heated window) |
| Cable entries | 2 x ¾-in.-14 NPT conduits or 2 x M25 x 1.5 mm ISO |
| Electrical input protection | According to EN50130 |
| Electromagnetic compatibility | EMI/RFI protected to EN61000-6-3 and EN50130 |
| Electrical interface | The detector includes 17 terminals with one wiring option |

Table 5: Outputs

| | |
|--------------------------------------|--|
| Relays | Alarm, fault, and auxiliary SPST volt-free contacts rated 2 A at 30 Vdc |
| Analog voltage output ⁽¹⁾ | Analog port malfunction: 0 V (< 0.5 V) Nomal: 2 V ± 0.3 V Alarm/Explosion: 5 V ± 0.3 V |
| 0-20 mA (stepped) | Fault: 0 ± 1 mA BIT fault: 2 mA ± 0.3 mA Normal: 4 mA ± 0.3 mA Warning: 16 mA ± 0.3 mA Alarm: 20 mA ± 0.3 mA |
| HART® protocol | HART communications on the 0-20 mA 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 controlled installations |

- (1) Ultra fast detection only

Table 6: Mechanical Specifications

| | |
|-------------------------|---|
| Enclosure options | Electropolished Stainless Steel 316 Heavy duty copper free aluminum (less than 1%), polyurethane paint |
| Mounting | Stainless steel 316 with electro polish finish |
| Dimensions | Detector 4 x 4.6 x 6.18-in. (100.6 x 117 x 155 mm) |
| Weight | Detector stainless steel: 6.3 lb. (2.9 kg) Detector aluminum: 2.8 lb. (1.3 kg) Tilt mount: 2.5 lb. (1.1 kg) |
| Environmental standards | DNV 2-4 |
| Water and dust | IP66 and IP68 per EN60529, NEMA 250 6P |

Table 7: Approvals

| | | |
|----------------|----------------------------|--|
| Hazardous area | ATEX and IECEx | Ex II 2 G D Ex db eb IIC T4 Gb Ex tb IIIC T110 °C Db (-50 °C ≤ T _a ≤ +85 °C) IP66/68 |
| | FM/FMC/CSA | Class I Division 1, Groups B, C, and D, T4 Class II/III Division 1, Groups E, F, and G, T4 Class I Division 2, Groups B, C, and D, T4 T _a = -50 °C to +85 °C Type 6P; IP 66/68 2 m for 45 minutes |
| | TR CU (EAC) | II 2 GD Ex db eb IIC T4 Gb X Ex tb IIIC T110 °C Db X (-60 °C ≤ T _a ≤ +85 °C) |
| Marine | MED "Wheelmark" (DNV) | |
| Performance | EN54-10 (VdS) FM3260 | |
| Reliability | IEC61508 - SIL3 compatible | |

Table 8: Accessories

| Accessory | Part number |
|----------------------------|--|
| Flame simulator (Ex proof) | FS-1200 |
| Tilt mount | 877090 |
| Duct mount (Ex proof) | 877670 |
| U-bolt/pole mount | 2-in. (50.8 mm) pole: 789260-2 |
| | 3-in. (76.2 mm) pole: 789260-1 |
| USB RS-485 harness kit | 794079 |
| Air shield | 877650 |
| Protective cover | 877263 (conductive ABS plastic) ⁽¹⁾ |

Table 8: Accessories (continued)

| Accessory | Part number |
|-----------|---|
| | 877163 (PU painted stainless steel 316) |

(1) Supplied free of charge with the detector

For more information: www.emerson.com

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