

# Spectrex SharpEye™ 40/40D-M

## Ultra Fast Multi IR Quad-Sense™ Flame Detector



The SharpEye 40/40D-M Multispectrum Quad-Sense flame detector is part of the leading, next generation SharpEye 40/40 series.

Featuring superior, longest distance detection of hydrogen and hydrocarbon fires, exceptional ultra-fast detection in under 50 msec and unparalleled reliability, the 40/40D-M is based on proven Triple-IR (IR3) technology, ensuring highest sensitivity with proven immunity to false alarms and absolutely keeping a SharpEye on your safety!



# Features and benefits

Multi-Spectrum Quad-Sense™ flame detector - integrating four IR sensors to further improve differentiation of flame sources from non-flame background radiation.

- Superior longest distance detection of hydrogen and hydrocarbon-based fuel and gas fires at up to 300 ft. (90 m)
- Ultra fast detection, high speed response under 50 msec
- Proven false alarm immunity
- Unparalleled reliability - 150,000 hours MTBF
- Best in class temperature range:  
-76 °F to +185 °F (-60 °C to +85 °C)
- Enhanced durability backed up by with five-year warranty
- Six sensitivity levels, adapting to any application
- Smart field of view integrity test, allowing flawless operation
- Innovative 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
- Two mode heated optics for impeccable performance in challenging environmental conditions
- Worldwide and regionally certified for hazardous areas
- Performance and reliability approved by recognizable certification bodies
- SIL3 compatible

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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	Four infrared bands between 2 and 5 $\mu\text{m}$
Detection ranges (at highest sensitivity setting for 1 ft <sup>2</sup> [0.1 m <sup>2</sup> ] pan fire)	See <a href="#">Table 3</a> .
Sensitivity ranges	6 sensitivity ranges for 1 ft <sup>2</sup> (0.1 m <sup>2</sup> ) n-heptane pan fire
Field of view	Hydrogen: horizontal 90°, vertical 90°
Temperature range <sup>(1)</sup>	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 < 2 sec. at 131 ft. (40m) 10 sec. at 300 ft. (90 m)
High speed response time (explosion)	50 msec for 1 ft. (0.30 m) diameter sphere LPG-air mixture explosion at 66 ft. (20 m)

**Table 3: Detection Range**

Fuel	ft/m
Hydrogen <sup>(1)</sup>	164/50
Gasoline (Petrol) <sup>(2)</sup>	300/90
N-Heptane <sup>(2)</sup>	300/90
Diesel fuel <sup>(2)</sup>	210/63
Methane <sup>(1)</sup>	210/63
Liquefied petroleum gas (LPG) <sup>(1)</sup>	210/63
Kerosene <sup>(2)</sup>	210/63
Jet fuel JP5 <sup>(2)</sup>	210/63
Jet fuel A1 <sup>(2)</sup>	210/63
Ethanol 95% <sup>(2)</sup>	57/17
Isopropyl alcohol (IPA) <sup>(2)</sup>	185/55
Methanol <sup>(2)</sup>	185/55
Ethylene glycol <sup>(2)</sup>	164/50
Solvents <sup>(2)</sup>	246/75
Flammable adhesive (flash point 140 °F < 60 °C) <sup>(2)</sup>	210/63
Butyl acrylate <sup>(2)</sup>	246/75
Vinyl acetate <sup>(2)</sup>	246/75
Oil paint <sup>(2)</sup>	210/63

**Table 3: Detection Range (continued)**

Gun powder <sup>(3)</sup>	197/60
Fireworks <sup>(4)</sup>	33/10
Magnesium alloy <sup>(5)</sup>	33/10
Polypropylene pellets <sup>(2)</sup>	163/49
Office paper <sup>(2)</sup>	115/34
Wood <sup>(2)</sup>	111/34
Mineral oil (20w50) <sup>(2)</sup>	210/63
Cooking oil <sup>(2)</sup>	210/63
Lithium ion battery <sup>(6)</sup>	279/85

- (1) 2.46 ft. (0.75 m) high, 0.82 ft. (0.25 m) width plume fire
- (2) 1 ft x 1 ft (0.3 m x 0.3 m) pan
- (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 <sup>(1)</sup>	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)	±0.3 mA for 2 mA and 4 mA, and ±0.5 mA for 16 mA and 20 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
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**Table 6: Mechanical Specifications (continued)**

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 <sub>a</sub> ≤ +85 °C)
	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 <sub>a</sub> = -50 °C to +85 °C NEMA Type Rating 6P
	TR CU (EAC)	Ex db eb IIC T4 Gb X Ex tb IIIC T110 °C Db X (-60 °C ≤ T <sub>a</sub> ≤ +85 °C) (-55 °C ≤ T <sub>a</sub> ≤ +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-1400
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) <sup>(1)</sup>
	877163 (PU painted stainless steel 316)

(1) Supplied free of charge with the detector



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