Product Data Sheet
MS-00913-0200-4975, Rev AA
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Spectrex™ 40/40C Flame Detector

The Spectrex 40/40C utilizes proven technologies, including QuadSense™ triple infrared (IR3) and ultraviolet infrared (UV/IR) to provide the fastest response to fire, the longest distance detection, superior immunity to false alarms, and unparalleled reliability and durability even in harsh conditions.

Detection performance can be easily adapted to all environments, applications, and requirements, by changing the detector's configuration parameters. Adjusting these parameters, as well as performing other maintenance and monitoring tasks, is possible by means of RS-485-based Modbus® communication or HART® communication.

Introduction

Spectrex 40/40C with QuadSense™ triple infrared (IR3) technology

The Spectrex 40/40C with QuadSense technology provides superior detection range and reliability and is the best choice for detecting hydrocarbon and Hydrogen(1) based fires in most industrial and commercial applications.

Spectrex 40/40C ultraviolet infrared (UV/IR) technology

The Spectrex 40/40C Ultra-Fast UV/IR Flame Detector features a unique dual sensor with selectable UV and IR channels that can be used separately or combined. The detector is designed to detect a range of fires, such as hydrocarbon-based fuel and gas, hydroxyl, hydrogen, metal, and inorganic.

Features and benefits

- Advanced long-distance detection of hydrocarbon-based fuel and gas fires at up to 215 ft. (65 m)
- Extended detection range more than doubles detection coverage
- Proven false alarm immunity
- Unparalleled reliability—150,000 hours Mean Time Between Failures (MTBF)
- Wide temperature range: –40 to +167 °F (–40 to +75 °C)
- Enhanced durability backed up by a three-year warranty
- Smart field of view integrity test, allowing flawless operation
- Innovative infrared built-in test (BIT)—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 a fast-ordering process
- 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
- Internal log event recorder to analyze past events

Contents

(1) Hydrogen fire detection is only on 40/40C-M (QuadSense) or 40/40C-LB (UV/IR) options.

Applications

- Oil and gas onshore and offshore installations and pipelines
- Hydrogenation (petroleum refining, food processing, and chemical)
- Chemical and petrochemical plants
- Storage tank farms
- Fuel and gas processing and storage facilities
- Aerospace industry
- Power generation facilities
- Pharmaceutical industry
- Printing industry
- Warehouses
- Automotive industry
- Explosives and munitions
- Waste disposal facilities
- Light industrial
- Fertilizer plants
- Vehicle battery charging stations
- Hydroxyl production and storage
- Hazardous materials storage areas
- Food processing
- Battery charging areas

Ordering information

You can order the Spectrex 40/40C as separate parts and accessories.

Spectrex 40/40C detector (PN 40/40C-X-64XAXXX).

Model

Code	Description
-I	QuadSense™ triple infrared (IR3)
-M	QuadSense triple infrared (IR3) with Hydrogen fire detection
-LB	Ultraviolet/infrared (UV/IR) with Hydrogen fire detection
-L4B	Ultraviolet/infrared (UV/IR)

Wiring

Code	Description
-6	Universal

Operating temperature range

Code	Description
4	–40 to +167 °F (–40 to +75 °C)

Electrical cable entries

Code	Description
1	M25
2	¾–in. NPT

Enclosure

Code	Description
A	Aluminum polyurethane painted

Hazardous area approvals

Code	Description
B	INMETRO
F	USA and Canada Explosion-Proof(1)
C	ATEX/IECEx/UKCA
R	EAC CU TR

(1) *Aluminum enclosure: FM, FMC*

Tilt mount

Code	Description
Y	Including tilt mount stainless steel 316
N	Without tilt mount

Protective cover

Code	Description
7	ABS plastic
8	Stainless steel 316

Accessories

Part Number	Description
FS-1100	Flame simulator (ex-proof) compatible with 40/40C-I model
FS-1200	Flame simulator (ex-proof) compatible with 40/40C-LB and 40/40C-L4B models
FS-1400	Flame simulator (ex-proof) compatible with 40/40C-M model
877090	Tilt mount
877670	Flame detector duct mount assembly
789260-2	Flame detector pole mount assembly, 2 in.
789260-1	Flame detector pole mount assembly, 3 in.
789260-3	Flame detector pole mount assembly, 4 in.
794079	USB RS-485 harness kit
877650	Flame detector air shield assembly
877263	Protective cover (Plastic)
877163	Protective cover (Stainless steel)
877563	Field of view limiter

Specifications

Table 1: Detection Ranges

At the highest sensitivity setting for 1 ft.^{2} (0.1 m^2) pan fire.

Fuel	40/40C-I	40/40C-M	40/40C-LB	40/40C-L4B
Gasoline	215 ft. (65 m)		50 ft. (15 m)	93 ft. (28 m)
N-Heptane	215 ft. (65 m)		50 ft. (15 m)	93 ft. (28 m)
Diesel fuel	150 ft. (45 m)		37 ft. (11 m)	70 ft. (21 m)
Kerosene	150 ft. (45 m)		37 ft. (11 m)	70 ft. (21 m)
Alcohol 95%	135 ft. (40 m)		30 ft. (9 m)	57 ft. (17 m)
Isopropyl alcohol (IPA)	135 ft. (40 m)		37 ft. (11 m)	70 ft. (21 m)
Methanol	135 ft. (40 m)		30 ft. (9 m)	57 ft. (17 m)
Methane	150 ft. (45 m)		33 ft. (10 m)	60 ft. (18 m)
Liquefied petroleum gas (LPG)	150 ft. (45 m)		33 ft. (10 m)	60 ft. (18 m)
Polypropylene	115 ft. (35 m)		33 ft. (10 m)	60 ft. (18 m)
Paper	82 ft. (25 m)		16.4 ft. (5 m)	33 ft. (10 m)
Hydrogen[(1)]	N/A	118 ft. (36 m)	37 ft. (11 m)	N/A

Table 1: Detection Ranges *(continued)*

Fuel	40/40C-I	40/40C-M	40/40C-LB	40/40C-L4B
Magnesium alloy[2]	N/A		16.4 ft. (5 m)	33 ft. (10 m)
Gunpowder[3]	141 ft. (43 m)		32.8 ft. (10 m)	91.9 ft. (28 m)
Fireworks	23 ft. (7 m)		5.25 ft. (1.6 m)	9.8 ft. (3 m)
Cooking oil	150 ft. (45 m)		37 ft. (11 m)	70 ft. (21 m)
Mineral oil: 20W-50	150 ft. (45 m)		37 ft. (11 m)	70 ft. (21 m)
Wood	82 ft. (25 m)		16 ft. (5 m)	33 ft. (10 m)
Ethylene glycol	118 ft. (36 m)		12 ft. (3.7 m)	23 ft. (7 m)
Butyl acrylate	175 ft. (54 m)		37 ft. (11 m)	70 ft. (21 m)
Vinyl acetate	175 ft. (54 m)		37 ft. (11 m)	70 ft. (21 m)
Flammable adhesive	150 ft. (45 m)		37 ft. (11 m)	70 ft. (21 m)
Solvents	175 ft. (54 m)		37 ft. (11 m)	70 ft. (21 m)
Oil paint	150 ft. (45 m)		37 ft. (11 m)	70 ft. (21 m)
Jet fuel JP5	150 ft. (45 m)		37 ft. (11 m)	70 ft. (21 m)
Jet fuel A1	150 ft. (45 m)		37 ft. (11 m)	70 ft. (21 m)
Battery[4]	200 ft. (61 m)		39 ft. (12 m)	75 ft. (23 m)

(1) *30 in. (0.75 m) high, 10 in. (0.25 m) wide plume fire.*
(2) *Contact Spectrex representative for guidance on detecting magnesium alloy.*
(3) *1.5 in. x 1.5 in. (3.8 cm x 3.8 cm) wide, 4 in. (10 cm) tall.*
(4) *One Lithium-ion battery cell. Height: 2.6 in. (65 mm). Diameter: 0.72 in. (18.4 mm).*

Table 2: General Specifications

	40/40C-I	40/40C-M	40/40C-LB	40/40C-L4B
Spectral response	Four infrared (IR) bands between 4 µm and 5 µm	Four infrared (IR) bands between 2 µm and 5 µm	Ultraviolet: 0.185 to 0.260 µm Infrared: 2.5 to 3.0 µm	Ultraviolet: 0.185 to 0.260 µm Infrared: 4.3 to 4.8 µm
Field of view	Horizontal: 100° Vertical: 95°	Hydrogen: horizontal - 90°, vertical - 90° For other fuels: horizontal - 80°, vertical - 80°	Horizontal: 100° Vertical: 95°	
Coverage area (m^3)	1,709,660 ft. (48,412 m)[1]	4,281,515 ft. (121,239 m)[1]	73,000 ft. (2,067 m)[1]	474,912 ft. (13,448 m)[1]
Coverage area (m^2)	15,058 ft. (1,399 m)[1]	30,462 ft. (2,830 m)[1]	1,895 ft. (176 m)[1]	6,598 ft. (613 m)[1]
Sensitivity ranges	Five sensitivity ranges		Two sensitivity ranges	Three sensitivity ranges
Detection response time	Standard response: Typically < 5 seconds			
Temperature range	Operating: –40 to +167 °F (–40 to +75 °C) Storage: –40 to +167 °F (–40 to +75 °C)			
Humidity	Non-condensing relative humidity up to 100%			

(1) *Gasoline and N-Heptane fuels.*

Table 3: Electrical Specifications

Operating voltage	24 Vdc nominal (18 to 32 Vdc)

Table 3: Electrical Specifications *(continued)*

Cable entries	2 x ¾–in.–14 NPT conduits or 2 x M25 x 1.5 mm ISO
Electrical input protection	According to EN 50130
Electromagnetic compatibility	EMI/RFI protected to EN61000-6-3 and EN 50130
Electrical interface	The detector includes 17 terminals and one wiring option

Table 4: Typical Power Consumption (24 Vdc)

Mode	40/40C-I, 40/40C-M	40/40C-LB, 40/40C-L4B
Normal power consumption without a heater	60 mA, 1.4 W	90 mA, 2.2 W
Normal power consumption without a heater, with an alarm	90 mA, 2.2 W	120 mA, 2.9 W
Standard power mode heater with alarm	280 mA, 7.6 W	320 mA, 7.7 W

Table 5: Outputs

Relays	Alarm, fault, and auxiliary SPDT volt-free contacts rated 2 A at 30 Vdc
Analog output default(1)	**Analog port malfunction:** 0 V (< 0.5 V) **Normal:** 2 V ± 0.3 V **Alarm/explosion:** 5 V ± 0.3 V
0–20 mA (stepped) default(1)	**Fault**: 0 ± 1 mA **Built-in test (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 communication on the 0–20 analog current (Frequency-Shift Keying [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) *This output is configurable.*

Table 6: Mechanical Specifications

Enclosure options	Heavy-duty copper-free aluminum (less than 1%), polyurethane painted
Mounting	Electropolished stainless steel 316
Dimensions	Detector: 4 x 4.6 x 6.18 in. (100.6 x 117 x 155 mm)
Weight	Detector aluminum: 2.8 lb. (1.3 kg) Tilt mount: 2.5 lb. (1.1 kg)
Water and dust	IP66 and IP68 per EN60529 NEMA® 250 6P

Approvals

For approvals information, see Spectrex 40/40 Series Certification Information.

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For more information: **Spectrex.net**

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