Spectrex SharpEye[™] 40/40 Series

Flame Detectors





Warning

WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

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1 Models

The SharpEye 40/40 Flame Detectors are electro-optical devices designed to identify fire events, enabling alarm activation. The detectors are intended for indoor or outdoor use and can be used stand alone or connected to an alarm/automatic extinguishing system.

The SharpEye 40/40 series comprises the following detectors:

SharpEye 40/40-I

The SharpEye 40/40C-I, a multispectrum Quad-sense™ flame detector, detects hydrocarbon fuel and gas fires with enhanced performance, advanced long distance detection of hydrocarbon fires, fast detection in under five seconds, and strengthened reliability. The SharpEye 40/40C-I is based on proven triple infrared (IR3) technology, ensuring high sensitivity with superior immunity to false alarms.

SharpEye 40/40C-M

The SharpEye 40/40C-M multispectrum Quad-sense IR flame detector is specifically designed for the detection of hydrocarbon and hydrogen flames with enhanced performance, advanced long distance detection of hydrogen and hydrocarbon fires, fast detection in under five seconds, and strengthened reliability. The SharpEye 40/40C-M is based on proven triple IR (IR3) technology, ensuring high sensitivity with superior immunity to false alarms.

SharpEye 40/40C-LB

The SharpEye 40/40C-LB is a dual spectrum ultraviolet (UV)/IR flame detector, designed to provide fast detection in under five seconds of a range of fires, such as hydrocarbon-based fuel and gas, hyrdoxyl, hydrogen, metal, and inorganic.

SharpEye 40/40C-L4B

The SharpEye 40/40C-L4B is a dual spectrum UV/IR flame detector designed to provide fast detection in under five seconds of hydrocarbon-based fuel and gas fires.

SharpEye 40/40D-I

The SharpEye 40/40D-I, an ultra-fast multispectrum Quad-sense IR3 flame detector, provides superior, longest distance detection of hydrocarbon fires at up to 295 ft. (90 m), exceptional ultra-fast detection in under 50 msec, and unparalleled reliability. The SharpEye 40/40D-I is based on proven Triple IR (IR3) technology, ensuring highest sensitivity with best immunity to false alarms.

SharpEye 40/40D-M

The SharpEye 40/40D-M is a multispectrum Quad-sense IR flame detector that provides superior, longest distance detection of hydrogen (at up to 165 ft. [50 m]) and hydrocarbon fires (at up to 295 ft. [90 m]), exceptional ultrafast detection in under 50 msec, and unparalleled reliability. The SharpEye 40/40D-M is designed to deal with the challenges of invisible fires based on proven IR3 technology, ensuring highest sensitivity with best immunity to false alarms.

SharpEye 40/40D-LB

The SharpEye 40/40D-LB is an ultra-fast UV/IR flame detector, which is able to detect in under 20 msec and 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.

SharpEye 40/40D-L4B

The SharpEye 40/40D-L4B is an ultra-fast UV/IR flame detector that is able to detect in under 20 msec, and features a unique dual sensor with selectable UV and IR channels that can be used separately or combined. The detector is designed to detect hydrocarbon-based fuel and gas fires.

Table 1-1: SharpEye 40/40 Series General Technical Specifications

Spectral response	Infrared and ultraviolet bands
Response time	Varies according to model, typically under 5 seconds
Field of view	Varies according to model, up to 100 degrees
Output	4-20 mA, relays, communication
Enclosure	Stainless steel 316 or aluminum polyurethane painted
Operating voltage	18-32 Vdc
Maximum power rating	9.6 W
Relay contacts	2A/30 Vdc
Over voltage category	2
Relative humidity	Non-condensing relative humidity up to 100%

A CAUTION

If the product is used outside of specified limits, this voids the product certification, and our company is not responsible for any incurred warranty expense.

Do not open this product, except for the terminal compartment as listed in this document, under any circumstances.

The detector is not field-repairable. Any attempt to modify or repair the internal circuits or change their settings, as this will impair the system's performance and void the product warranty.

Opening the attachment screws to dismantle the front part of the detector from remaining parts is restricted and voids the product warranty.

2 Installing the detector

Table 2-1: Required Tools

Tool	Function
Hex key 1.5 mm	Fasten back cover security screw
Hex key 6 mm	Adjust the tilt mount
Hex key 10 mm	Affix the detector to the tilt mount
Hex key 3/16-in.	Attach protective cover to detector
Flat screwdriver 6 mm	Connect ground terminal
Flat screwdriver 2.5 mm	Connect wires to the terminal blocks
Hex key 5/16-in.	Stop plug 3/4 national pipe thread (NPT)
Open wrench 28 mm	Stop plug M25 only

Note

These are standard tools and are not supplied with the detector.

2.1 Mounting accessories

2.1.1 Tilt mount

The tilt mount (PN 877090) enables the detector to be mounted on flat wall surfaces.

For more information, see Attach detector to tilt mount.

2.1.2 Duct mount

The duct mount (PN 877670) allows flame detection in cases where the detector cannot be installed inside the area.

The duct mount limits the cone of vision of the installed detector to 70 degrees horizontal and vertical.

For more instructions, refer to the Duct Mount Manual (00809-0600-4975).

2.1.3 Pole mount

Use the pole mount to mount the detector on poles with the following diameters:

Table 2-2: Pole Mount Options

Pole diameter	Part number
2 in. (50.8 mm)	789260-2
3 in. (76.2 mm)	789260-1
4 in. (101.6 mm)	789260-3

For more instructions, refer to the Pole Mount Reference Manual.

2.2 Attach detector to tilt mount

Procedure

- 1. Unpack the detector.
- 2. Insert location pins on the tilt mount into the openings on detector housing.



3. Thread the holding screw and tighten it.

Note

To change the detector field of view, release the horizontal and vertical locking screws.

- 4. Point the detector toward the protected area and ensure the view of the area is unobstructed.
- 5. Secure the detector in that position by tightening the locking screws on the tilt mount.

The detector is now correctly located, aligned, and ready to be connected to the system.

2.3 Open the back cover

Procedure

1. Loosen the back cover security screw.



- A. Back cover security screw
- B. Protective plug
- 2. Unscrew the back cover.

Note

The back cover is attached by a security cable.

3. Remove the protective plug.

2.4 Wire terminals and ground cable

A CAUTION

Improper wiring may damage the detector.

Procedure

Connect the terminals according to Table 2-3.
 The terminal details are also on the inside back cover.

Figure 2-1: Terminal Box

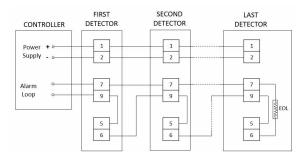


Table 2-3: Terminal Box

Terminal	Function
T1	24 Vdc (+)
T2	24 Vdc (-)
Т3	External built-in test (BIT) switch
T4	Fault relay - normally open
T5	Fault relay
Т6	Fault relay - normally closed
Т7	Alarm relay - normally open
Т8	Alarm relay
Т9	Alarm relay - normally closed
T10	0-20 mA (+)
T11	0-20 mA (-)
T12	Alarm output (40/40D models)
T13	RS485 (+)
T14	RS485 (-)
T15	Accessory relay - normally open
T16	Accessory relay
T17	Accessory relay - normally closed

2. Use Figure 2-2, Figure 2-3, Figure 2-4, and Figure 2-5 for typical wiring configurations.

Figure 2-2: Typical Wiring for Four-Wire Controllers



- A. Controller
- B. First detector
- C. Second detector
- D. Last detector
- E. Power supply
- F. Alarm loop
- G. End of line

Figure 2-3: Non-Isolated Sink (Three Wires)

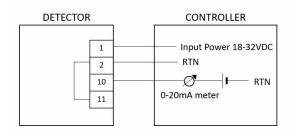


Figure 2-4: Sink Four-Wire

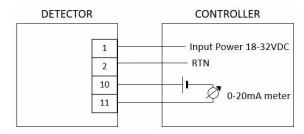
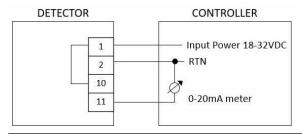


Figure 2-5: Source Three-Wire



Note

For additional configuration options, please refer to the *Modbus*® *Manager Manual*.

- 3. Check the wires for secure mechanical connection and press them neatly against the terminal to prevent them from interfering while closing the back cover.
- 4. Close the terminal compartment by screwing the back cover on to the housing.
- 5. Tighten the back cover security screw.

Figure 2-6: Closing Security Screw



- A. Back cover security screw
- B. Ground cable connection point
- 6. Connect the ground cable.

WARNING

The terminal temperature may be higher than 185 °F (85 °C).

A CAUTION

To comply with EMC directive 2014/30/EU and protect against interference caused by radio frequency interference (RFI) and electromagnetic interference (EMI), shield the cable to the detector and ground the detector. Ground the shield at the detector end.

2.5 Install the protective cover

A CAUTION

The protective cover should always be installed with the detector.

The protective cover is available in ABS plastic or stainless steel.

Table 2-4: Protective Cover

Material	Part number
ABS plastic	00975-9000-0020
Stainless steel	00975-9000-0021

Procedure

1. Place the protective cover on top of the detector.



2. Secure the protective cover by tightening the screw.

Note

When installing the stainless steel protective cover, the same installation instructions apply.

3 Special conditions for safe use

 Lids securing fasteners shall be property class A4 with a yield stress of 344N/mm².

- Units may be painted or fitted with optional accessories, some of which
 are made of non-metallic material or have a non-metallic coating which
 could potentially generate an ignition-capable level of electrostatic
 charge under certain extreme conditions (such as high pressure steam)
 which might cause a build-up of electrostatic charges on the nonconducting surfaces. Additionally, cleaning of the equipment should
 only be done with a damp cloth.
- Under rated conditions, the cable entries reach a temperature exceeding 158 °F (70 °C), and the branching point exceeds a temperature of 176 °F (80 °C); this shall be considered when installing cable glands, and only cables that have temperature ratings suitable for the application shall be used.
- Flameproof joints are not intended to be repaired.
- The SharpEye 40/40 Series Flame Detectors can be fitted with an unmolded (non-encapsulated) end of line (EOL) resistor. Such a resistor can only be fitted into the flameproof "Ex d" compartment as indicated in the instructions. The EOL resistor shall be rated at 1.56 k Ω , 1 W minimum.

To reduce the risk of ignition of a flammable or explosive atmosphere, strictly adhere to the following statements:

WARNING

Do not open when energized.

Do not open when an explosive atmosphere is present.

Temperature at branching point may exceed 212 °F (100 °C).

A CAUTION

Potential electrostatic charging hazard

See instructions.

4 Declarations of Conformity

Figure 4-1: SharpEye 40/40C



EU_1410E

EU Declaration of Conformity

We, at Rosemount Inc., 6021 Innovation Blvd, Shakopee, MN 55379 United States, declare under our sole responsibility that the product listed below is in conformity with the EU-Type Examination Certificate and with the following directives by application of the listed standards:

Spectrex SharpEye 40/40C Flame Detector

Batch No:	<ba< th=""><th>atch No.></th></ba<>	atch No.>	
Model No:	<mc< th=""><th colspan="2"><model no.=""></model></th></mc<>	<model no.=""></model>	
CSANe 20AT	EX12	49X	
		Ex II 2 G D Ex db eb IIC T4 Gb Ex tb IIIC T100°C Db (Ta -40°C to +75°C)	
Issued by the Notified Body:		CSA Group Netherlands B.V. Utrechtseweg 310 (B42), 6812AR ARNHEM, Netherlands 2813	
Surveillance of Quality Assurar Production by:		SGS FIMKO OY, Takomotie 8 00390 Helsinki, Finland 0598	
Manufacturer:		Rosemount, Inc. 6021 Innovation Blvd, Shakopee, MN 55379, USA	

Provisions of Directive		Number and Date of Issue of Standard
305/2011/EU	Construction Products Directive-CPR	EN54-10:2002+A1:2005
2014/34/EU	ATEX Directive	EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-7:2015+A1:2018, EN 60079-31:2014
2014/30/EU	EMC Directive	EN 50130-4:2011, EN 61000-6-3:2007+A1:2011+AC:2012,
2011/65/EU	RoHS Directive	EN50581:2012

Approved By:

Date:

June 1, 2021

6021 Innovation Blvd, Shakopee, MN 55379, USA | Phone: + 1 (800) 452-2107, + 1 (973) 239-8398 | Website: www.spectrex.net; Email: spectrex.csc.rmtna@emerson.com

Figure 4-2: SharpEye 40/40D



Manufacturer:

EU 1400F

EU Declaration of Conformity

We, at Rosemount Inc., 6021 Innovation Blvd, Shakopee, MN 55379 United States, declare under our sole responsibility that the product listed below is in conformity with the EU-Type Examination Certificate and with the following directives by application of the listed standards:

Spectrex SharnEve 40/400 Flame Detector

	Specifies SharpEye 40/40D Flame Detector	
Batch No:	<batch no.=""></batch>	
Model No:	<model no.=""></model>	
CSANe 20AT	EX1249X	
	Ex II 2 G D Ex db eb IIC T4 Gb Ex tb IIIC T110°C Db Ta = -50°C to +85°C	
Issued by the Notified Body:	CSA Group Netherlands B.V. Utrechtseweg 310 (B42), 6812AR ARNHEM, Netherlands 2813	
Surveillance of Quality Assurar Production by:		

Provisions of Directive		Number and Date of Issue of Standard
305/2011/EU	Construction Products Directive-CPR	EN54-10:2002+A1:2005
2014/34/EU	ATEX Directive	EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-7:2015+A1:2018, EN 60079-31:2014
2014/30/EU	EMC Directi∨e	EN 50130-4:2011, EN 61000-6-3:2007+A1:2011+AC:2012,
2011/65/EU	RoHS Directive	EN50581:2012
2014/90/EU	Marine Equipment Directive 2014/90/EU amended by implementing regulation "2020/1170" MED/3.51e	EN 54-10:2002 incl. A1:2005, IEC 60092-504:2016, IEC 60533:2015. SOLAS 74 Reg. II:27, IMO Res.MSC.36(63)-(1994 HSC Code) 7, IMO Res.MSC.97(73)-(2000 HSC Code) 7, IMO Res.MSC.98(73)-(FSS Code) 9, IMO MSC.1/Circ.1242

*EC Type Examination Model B Certification No. MEDB000078F expires 25th May 2026 plus EC Type D Certification of Conformity No. MEDD00001WT expires 2th July 2024 issued by the Notification Body: DNV Notification Body No.: 0098

6021 Innovation Blvd, Shakopee, MN 55379, USA



Complies with Chapter 11 of IGF Code, Edition 2015

Rosemount, Inc.

We hereby declare that the following specified equipment complies with the Marine Equipment Directive 2014/90/EU amended by implementing regulation "2020/1170"

Approved By:

Date:

June 1, 2021

6021 Innovation Blvd, Shakopee, MN 55379, USA | Phone: + 1 (800) 452-2107, + 1 (973) 239-8398 | Website: www.spectrex.net; Email: spectrex.csc.rmtna@emerson.com

5 Reference data

To view current SharpEye 40/40 ordering information, specifications, and drawings:

Procedure

- 1. Go to https://spectrex.net/en-us/flame-gas-detectors/flame-detectors/40-40-series.
- 2. Select the appropriate flame detector.
- 3. For installation drawings, click *Drawings and Schematics* and select the appropriate document.
- 4. For ordering information, specifications, and dimensional drawings, click *Data Sheets & Bulletins* and select the appropriate Product Data Sheet.



Quick Start Guide 00925-0200-9975, Rev. AA May 2021

For more information: www.emerson.com

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