

## SharpEye Flame Detector Selection Guide

### Current Model Range and Characteristics

Model Number*	Detector Type	Max. Detection Range** ft (m)	Response Time (Typical)	Description
40/40U-UB 20/20U-UB	UV	50 (15)	3 sec.	UV detector for indoor applications, detects organic and inorganic flames
40/40L-LB 20/20L-LB	UV/IR	50 (15)	5 sec. (150 msec.)	Dual UV/IR for detection of organic and inorganic flames for indoor and outdoor applications
40/40L4-L4B	UV/IR	50 (15)	5 sec. (150 msec.)	Dual UV/IR for detection of hydrocarbon fires
20/20F	UV/IR	20 (6)	Max. 5 msec.	High Speed UV/IR Flame Detector with high reliability and immunity to false alarms
40/40R 20/20R	IR	50 (15)	5 sec.	Single IR Detector for hydrocarbon fires for indoor applications
40/40I 20/20SI (SIL)	Triple IR (IR3)	215 (65) 200 (60)	5 sec.	Triple IR (IR3) offers two to three times the detection distance of single IR or UV/IR detectors and the highest immunity to false alarms. This model includes heated optics, HART and complies with SIL-2
20/20SI	Triple IR (IR3)	200 (60)	5 sec.	Triple IR (IR3) as above but without heated optics, HART and SIL-2
40/40M	Multi IR	HCs - 215 (65) H2 -100 (30)	5 sec.	Special design for the detection of invisible hydrogen flames and hydrocarbon fires
20/20FI	Triple IR (IR3)	33 (10)	0.2-1 sec.	High Speed Triple IR (IR3) Model for industrial applications
20/20CTIN & CTIP	CCTV - IR3	200 (60) & video 100 (30)	5 sec.	CCTV Flame detector is a Triple IR (IR3) detector that incorporates a video color camera



20/20MI	Triple IR (IR3)	133 (40)	5 sec.	Triple IR performance in a compact design with 80% less power consumption
20/20ML	UV/IR	50 (15)	5 sec.	Special compact design UV/IR flame detector for industrial applications
20/20SH	Triple IR (IR3)	100 (30)	5 sec.	Special design IR3 detector for invisible Hydrogen fires

\* All models, except those noted below, have automatic and manual Built-in-Test (BIT) to verify proper operation and cleanliness of lens.

Models without BIT:  
 - 20/20U, 20/20F and 20/20L  
 - 40/40U, 40/40L and 40/40L4

\*\* Max detection range based upon a 1ft<sup>2</sup> (0.1 m<sup>2</sup>) gasoline / heptane pan fire.  
 Note: All 40/40 Models incorporate heated optics, HART and comply with SIL-2 requirement.

### Comparison of Various Types of SharpEye Flame Detector

Each of the Spectrex flame detector families uses one or more of the Ultraviolet (UV) and/or Infrared (IR) techniques. However, each family is recommended only for specific applications, usually determined by evaluating to what extent false alarms could create problems.

Detector Type	Applications	Advantages	Disadvantages
Triple IR (IR3)	<ul style="list-style-type: none"> <li>Hydrocarbon fires</li> <li>Indoors and outdoors</li> </ul>	<ul style="list-style-type: none"> <li>Moderate speed</li> <li>Highest sensitivity</li> <li>High immunity to false alarms</li> <li>Longer detection range</li> <li>Unaffected by solar radiation</li> </ul>	Affected by IR sources only at short range in certain rare fire scenarios
Multi IR	<ul style="list-style-type: none"> <li>Hydrocarbon and Hydrogen fires</li> <li>Indoors and outdoors</li> </ul>	<ul style="list-style-type: none"> <li>As IR3 but with hydrocarbon and hydrogen fire detection</li> </ul>	As IR3

Hydrogen (IR3)	<ul style="list-style-type: none"> <li>Hydrogen fires only</li> <li>Indoors and outdoors</li> </ul>	<ul style="list-style-type: none"> <li>Detects invisible Hydrogen flames</li> <li>Longer detection range</li> <li>High immunity to false alarms</li> <li>Unaffected by solar radiation</li> </ul>	Not to be used for Hydrocarbon fire detection
CCTV (IR3+Video)	<ul style="list-style-type: none"> <li>Hydrocarbon fires</li> <li>Indoors and outdoors</li> </ul>	<ul style="list-style-type: none"> <li>As IR3 but with color video</li> <li>More information &amp; record of the protected area before, during and after fire scenario</li> </ul>	As IR3
Dual Band UV/IR	<ul style="list-style-type: none"> <li>Hydrocarbon, Hydrogen, Silane, Ammonia, other hydrogen-based fuel fires and Metal fires</li> <li>Indoors and outdoors</li> </ul>	<ul style="list-style-type: none"> <li>Moderate speed</li> <li>Moderate sensitivity</li> <li>Low false alarm rate</li> <li>Unaffected by solar radiation</li> </ul>	<p>Affected by specific UV/IR ratio created by false stimuli</p> <p>Blinded by thick smoke, vapors, grease and oil deposits on the detector window</p>
Single I (IR)	<ul style="list-style-type: none"> <li>Hydrocarbon fires</li> <li>Indoors</li> </ul>	<ul style="list-style-type: none"> <li>Moderate speed</li> <li>Moderate sensitivity</li> <li>Unaffected by solar radiation</li> <li>Low cost</li> </ul>	Subject to false alarms (in the presence of flickering IR sources)
Single Ultraviolet (UV)	<ul style="list-style-type: none"> <li>Hydrocarbon, Hydrogen, Silane, Ammonia, other hydrogen-based fuel fires and Metal fires</li> <li>Indoors</li> </ul>	<ul style="list-style-type: none"> <li>High speed</li> <li>Moderate sensitivity</li> <li>Unaffected by solar radiation</li> <li>Unaffected by hot objects</li> <li>Low cost</li> </ul>	<p>Subject to false alarms from UV sources (arc welding, electrical sparks, halogen lamps)</p> <p>Blinded by thick smoke, vapors, grease and oil deposits on the detector window</p>

## Fire Size and Maximum Detection Distances

The following table lists typical detection distances for different types of SharpEye Flame Detectors and for a range of fuels.

Fuel	Fire size	40/40I	20/20SI 20/20CTI	20/20 MI-1	40/40L- LB & 20/20L- LB	40/40L4- L4B	40/40U- UB & 20/20U- UB	40/40R & 20/20R	40/40M	20/20SH
		IR3	IR3	IR3	UV/IR	UV/IR	UV	IR	Multi IR	IR3 H2
Gasoline	1ft <sup>2</sup> (0.1 m <sup>2</sup> ) pan fire	215 (65)	200 (60)	132 (40)	50 (15)	50 (15)	50 (15)	50 (15)	215 (65)	-
n-Heptane		215 (65)	200 (60)	132 (40)	50 (15)	50 (15)	50 (15)	50 (15)	215 (65)	-
Diesel Fuel		150 (45)	150 (45)	89 (27)	36 (11)	36 (11)	36 (11)	36 (11)	150 (45)	-
JP5		150 (45)	150 (45)	100 (30)	36 (11)	36 (11)	36 (11)	36 (11)	150 (45)	-
Kerosene		150 (45)	150 (45)	100 (30)	36 (11)	36 (11)	36 (11)	36 (11)	150 (45)	-
Alcohol (Ethanol)		135 (40)	90 (27)	100 (30)	25 (7.5)	25 (7.5)	36 (11)	25 (7.5)	135 (40)	63 (19)
IPA (Isopropyl Alcohol)		130 (40)	90 (27)	100 (30)	25 (7.5)	25 (7.5)	36 (11)	25 (7.5)	135 (40)	-
Methanol		116 (35)	76 (23)	80 (24)	25 (7.5)	25 (7.5)	25 (7.5)	25 (7.5)	116 (35)	26 (8)
Methane		20" (0.5 m) Plume fire	100 (30)	66 (20)	40 (12)	16 (5)	16 (5)	40 (12)	16 (5)	100 (30)
LPG (Propane)	100 (30)		66 (20)	40 (12)	16 (5)	16 (5)	40 (12)	16 (5)	100 (30)	-
Hydrogen	-		-	-	16 (5)	-	33 (10)	-	100 (30)	100 (30)
Polypropylene Pellets	8" (0.2m) Ø pan fire	16 (5)	16 (5)	16 (5)	16 (5)	16 (5)	20 (6)	13 (4)	16 (5)	-
Office Paper	1ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire	33 (10)	66 (20)	50 (15)	16 (5)	16 (5)	20 (6)	20 (6)	33 (10)	-

(1) 20/20SI and 20/20CTIN-CTIP

(2) 20/20L-LB and 20/20ML 40/40L-LB, 40/40L4-L4B

(3) 20/20U-UB, 40/40U-UB

(4) 20/20R, 40/40R

(5) 20/20SH

(6) 40/40M

(7) 40/40I

-Does not detect

## Recommended Types of Fire Detectors

Fire Source	UV (a)	IR (b)	UV/IR (c)	IR3 (d)	Hydrogen (e)	Multi IR
Gasoline	1	1	1	1	4	1
Diesel Fuel	2	2	2	2	4	2
N-Heptane	1	1	1	1	4	1
Kerosene	2	2	2	2	4	2
JP8/JP4/JP5	2	2	2	2	4	2
Alcohol (Ethanol)	2	2	2	2	2	2
Methane	2	3	3	3	4	3
LPG	2	3	3	3	4	3
Hydrogen	2	4	3	4	1	2
Petrochemicals	1	1	2	1	4	1
Metals	2	4	3	4	4	4
Propellants (Black Powder)	1	3	2	3	4	3
Textiles (Cotton)	3	3	3	3	4	3
Aromatic Solvents	2	2	2	2	4	2
Wood, Paper	3	3	3	3	4	3
Bonding Glue Substances	2	2	2	2	4	1



*keep a **SharpEye**™ on your safety*

- (a) 20/20U-UB, 40/40U-UB
- (b) 20/20R, 40/40R
- (c) 20/20L-LB, 20/20ML, 20/20F, 40/40L-LB, 40/40L4,L4B
- (d) 20/20SI, 20/20XI, 20/20MI, 20/20FI, 20/20CTIN/CTIP, 40/40I
- (e) 20/20SH
- (f) 40/40M

- (1) 100%-75% of the detector sensitivity
- (2) 75%-50% of the detector sensitivity
- (3) 50%-25% of the detector sensitivity
- (4) Not suitable

**Authorized Distributor:**  
**GasDetectorsUSA.com**  
**Houston, TX USA**  
**832-615-3588**  
**sales@GasDetectorsUSA.com**

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