

SharpEye Flame Detector Selection Guide

-Current Model range and Characteristics-

<u>Model Number*</u>	<u>Detector Type</u>	<u>Max. Detection Range** m</u>	<u>Response Time (Typical)</u>	<u>Description</u>
40/40U-UB 20/20U-UB	UV	15	3 sec.	UV detector for indoor applications – detects organic and inorganic flames.
40/40L-LB 20/20L-LB	UV/IR	15	5 sec. (150msec.)	Dual UV/IR for detection of organic and inorganic flames for indoor and outdoor applications.
40/40L4-L4B	UV/IR	15	5 sec. (150msec.)	Dual UV/IR for detection of hydrocarbon fires.
20/20F	UV/IR	6	Max. 5 msec.	High Speed UV/IR Flame Detector with high reliability, immunity to false alarms.
40/40R	IR	15	5 sec.	Single IR Detector for hydrocarbon fires –20/20R Indoor applications
40/40I 20/20(S)I (SIL)	Triple IR (IR3)	65 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)	60	5 sec.	Triple IR (IR3) generally as above but without Heated optics, HART and SIL-2.
40/40M	Multi IR	HCS – 65 H2 - 30	5 sec.	Special design for detection of invisible hydrogen flames and hydrocarbon fires.
20/20FI	Triple IR (IR3)	10	0.2-1 sec.	High Speed Triple IR (IR3) Model for industrial applications.
20/20CTIN & CTIP	CCTV - IR3	60 & video 30	5 sec	CCTV Flame detector is a Triple IR (IR3) detector that incorporates a video color camera.
20/20MI	Triple IR (IR3)	40	5 sec.	Triple IR performance in a compact design with 80% less power consumption.
20/20ML	UV/IR	15	5 sec.	Special compact design UV/IR flame detector for industrial applications
20/20SH	Triple IR (IR3)	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 lens cleanliness.
Models without BIT: - 20/20U, 20/20F, 20/20L, 40/40U, 40/40L and 40/40L4

** Max detection range based upon a 1ft² (0.1m²) 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.

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

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.

Sensitivity to a 0.1m² pan fire

* = sensitivity to a 20"(0.5m) Plume fire

**= sensitivity to a 0.2m² pan fire

Fuel	40/40I	20/20SI 20/20CTI	20/20 MI-1	40/40L-LB 20/20L-LB	40/40L4 40/40-L4B	40/40U-UB 20/20U-UB	40/40R 20/20R	40/40M	20/20SH
	<u>IR3</u>	<u>IR3</u>	<u>IR3</u>	<u>UV/IR</u>	<u>UV/IR</u>	<u>UV</u>	<u>IR</u>	<u>Multi IR</u>	<u>IR3 (H2)</u>
Gasoline	65	60	40	15	15	15	15	65	-
n-Heptane	65	60	40	15	15	15	15	65	-
Diesel Fuel	45	45	27	11	11	11	11	45	-
JP5	45	45	30	11	11	11	11	45	-
Kerosene	45	45	30	11	11	11	11	45	-
Alcohol (Ethanol)	40	27	30	7.5	7.5	11	7.5	40	19
IPA (Isopropyl Alcohol)	40	27	30	7.5	7.5	11	7.5	40	-
Methanol	35	23	24	7.5	7.5	7.5	7.5	35	8
Methane *	30	20	12	5	5	12	5	30	-
LPG (Propane) *	30	20	12	5	5	12	5	30	-
Hydrogen*	-	-	-	5	-	10	-	30	30
Polypropylene pellets**	5	5	5	5	5	6	4	5	-
Office Paper	10	20	15	5	5	6	6	10	-

Recommended Types of Fire Detectors

<u>Fire Source</u>	<u>UV (a)</u>	<u>IR (b)</u>	<u>UV/IR (c)</u>	<u>IR3(d)</u>	<u>Hydrogen(e)</u>	<u>Multi IR (f)</u>
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

(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.