

# FlameSpec IR3-HD

Triple IR Flame Detector



The FlameSpec IR3 will detect fires and explosions extremely quickly, thereby allowing mitigation steps to be initiated more rapidly to limit event escalation.

## Introduction

The FlameSpec-IR3-HD flame detector provides exceptional detection performance of all types of hydrocarbon fires (visible and non-visible). The detector responds to slow growing fires as well as fast fire eruptions using improved triple IR (IR3) technology operating in all weather and light conditions with highest immunity to false alarms.

The detector also provides a high-definition (HD) color video output of the monitored area with clear imaging of fire events and personnel at distances up to 100 ft. (30m) allowing responders to know the exact situation before entering the hazardous area. Video and data of events are stored saved quickly to non-volatile memory for post incident investigation. The recordings start one minute before detection and continue for up to four minutes.

## Key Benefits

- Highest immunity to false alarms
- Hydrocarbon flame detection. Three wavelengths, in the infrared spectral range of 4.0 to 5.0  $\mu\text{m}$ , with clear separation.
- Each sensor has the same field of view to further improve false alarm immunity.
- HD, or composite, video output with automatic HD video recording of events.
- Ultra-fast detection within 40 milliseconds for fireballs or explosions.
- Fast flame detection, <1.5 s for standard fire up to 30 m. Option for <0.5s, in compliance with NFPA 33, available.
- Optimized option for aircraft hangars, helipads & truck loading racks available, see FLS-IR3-HD CO2L data sheet.
- Detects up to 262 ft. (80m) for a 1 ft<sup>2</sup> (0.1m<sup>2</sup>) n-heptane fire.
- 5 selectable sensitivity levels
- Universal outputs, 3 and 4 wire, 4-20 mA sink / source, Fire, Auxiliary and Fault Relays. RS485 port using Modbus RTU.
- Event logger: Alarms, faults & videos are logged to non-volatile memory.
- Built-in-Test (BIT) – Automatic and manual self-test of window cleanliness and overall detector operation.
- HART® 7, for configuration and maintenance - option available.
- Dirty optics warning for preventive maintenance needs.
- Window heater to avoid condensation and icing.
- Stainless steel tilt mount with horizontal and vertical adjustment.
- SIL 2 capable - option available.

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Model: FLS-IR3-HD

## Response Characteristics

Fuel	Size	Sensitivity	Distance ft. (m)	Avrg Resp. Time (s)
n-Heptane	1 x 1 ft.	Extreme	262 (80)	9.0
n-Heptane	1 x 1 ft.	Extreme	230 (70)	4.1
n-Heptane	1 x 1 ft.	High	197 (60)	3.2
n-Heptane	1 x 1 ft.	Medium	98 (30)	2.2
n-Heptane	1 x 1 ft.	Low	49 (15)	1.2
n-Heptane	1 x 1 ft.	Very Low	24.5 (7.5)	1.6
Gasoline	2 x 2 ft.	Extreme	328 (100)	5.3
Gasoline	1 x 1 ft.	Extreme	230 (70)	3.6
Gasoline	1 x 1 ft.	Medium	98 (30)	1.5
Methane	32-in Plume	Extreme	148 (45)	3.3
Methane	32-in Plume	Medium	82 (25)	0.8
LPG	32-in Plume	Extreme	180 (55)	4.8
LPG	32-in Plume	Medium	98 (30)	1.4
LPG	32-in Plume	Low	49 (15)	1.4
Diesel	1 x 1 ft.	Extreme	164 (50)	2.9
Diesel	1 x 1 ft.	Medium	79 (24)	3.9
JP5	2 x 2 ft.	Extreme	295 (90)	9.2
JP5	1 x 1 ft.	Extreme	164 (50)	4.1
JP5	1 x 1 ft.	High	148 (45)	4.9
JP5	1 x 1 ft.	Medium	79 (24)	1.9
Kerosene	1 x 1 ft.	Extreme	164 (50)	4.1
Kerosene	1 x 1 ft.	Medium	79 (24)	2.5
Methanol	1 x 1 ft.	Extreme	131 (40)	4.1
Methanol	1 x 1 ft.	High	125 (38)	5.5
Methanol	1 x 1 ft.	Medium	75 (23)	1.2
Ethanol	1 x 1 ft.	Extreme	125 (38)	4.2
Isopropanol (IPA)	1 x 1 ft.	Extreme	180 (55)	3.5
Isopropanol (IPA)	1 x 1 ft.	Medium	75 (23)	1.0
Polypropylene	1 x 1 ft.	Extreme	115 (35)	10.1
Polypropylene	1 x 1 ft.	Medium	66 (20)	2.6
Syngas (30%CH <sub>4</sub> 70%H <sub>2</sub> )	32-in Plume	Extreme	98 (30)	3.3
Syngas (30%CH <sub>4</sub> 70%H <sub>2</sub> )	32-in Plume	Medium	49 (15)	0.8
Wood	1 x 1 ft.	Extreme	148 (45)	3.8
Wood	1 x 1 ft.	Medium	74 (22.5)	2.1

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## Immunity to False Alarm

False Alarm Source	Modulated		Unmodulated	
	Distance ft. (m)	Response	Distance ft. (m)	Response
Sunlight, (direct or reflected)	No response		No response	
Sunlight, (direct or reflected) with water droplets on sensors	No response		No response	
Incandescent frosted glass light, 300W	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Fluorescent, 70W (3x23.3W)	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Electric arc	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Arc welding	12.0 (3.5)	No Alarm	12.0 (3.5)	No Alarm
Radiation heater, 1850W	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Radiation heater, 1850W with water droplets on sensors	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Quartz lamp (1000W) shielded	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Quartz lamp (500W) non-shielded	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Mercury vapor lamp 160Wx3	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Car Exhausts	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Projector led	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Solenoid bell	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Soldering iron	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Electric Drill	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm

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FIRE DETECTION	<b>Detection time and distance</b>	40ms for fast fire burst or explosion 1.5s for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) n-heptane pan fire at 0–100 ft. (0–30m) 9.0s for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) n-heptane pan fire at 100–262 ft. (30–80m)
	<b>Sensitivity range</b>	5 sensitivity ranges: Extreme, High, Medium, Low, Very Low
	<b>Field of view (IR detection)</b>	90° Horizontal, 75° Vertical
	<b>Time Delay</b>	0-30 seconds
	<b>Built in Test</b>	Automatic and Manual
VIDEO FUNCTIONALITY	<b>HD Video</b>	Color HD, as standard. Near IR filtered option (X2 available on request)
	<b>Video recording of alarm events</b>	1 minute pre-event and up to 3 minutes post-event
	<b>System integration protocol</b>	ONVIF (Open Network Video Interface Forum) Profile S
ELECTRICAL SPECIFICATIONS	<b>Operating Voltage</b>	24 VDC nominal (18-32 VDC)
	<b>Current Consumption</b>	Standby: 180mA Maximum: 300mA (including window heater)
	<b>Conduit Entries</b>	2x cable and conduit entries 3/4" NPT(F) or M25x1.5
	<b>Wiring</b>	12-20AWG (2.5-0.35mm <sup>2</sup> )
OUTPUTS	<b>Relays</b>	SPST volt-free contacts rated 2A at 30 VDC 3 relays: Alarm & Auxiliary – normally open; Fault – normally closed
	<b>0-20 mA (stepped) current output</b>	3 wire and 4 wire configurations (sink and source) HART® rev 7.0 - option available
	<b>Indication</b>	Tri-color LED (Green, Yellow, Red)
	<b>Modbus</b>	RTU compatible on RS-485
	<b>Digital (for video)</b>	IP network IEEE 802.3 100Base-T
	<b>Composite video</b>	NTSC or PAL
MECHANICAL SPECIFICATIONS	<b>Size</b>	7.87 x 5.12 x 5.12" (200x130x130mm)
	<b>Weight</b>	Detector (Stainless Steel 316): 9.8 lbs. (4.4 kg) Tilt mount (Stainless Steel 316): 5.4 lbs. (2.4 kg)
ENVIRONMENTAL SPECIFICATIONS	<b>Temperature Range</b>	Operating: -67°F to +185°F (-55°C to +85°C) Storage: -67°F to +185°F (-55°C to +85°C)
	<b>Humidity</b>	Up to 99% (RH), non-condensing
	<b>Ingress Protection</b>	IP66 & 68; NEMA 4X & 6P
APPROVALS	<b>ATEX</b>	ATEX: II 2 G D Ex db IIC T5 Gb or Ex db eb IIC T5 Gb and Ex tb IIIC T95°C Db -55°C<Ta<75°C Ex db IIC T4 Gb or Ex db eb IIC T4 Gb and Ex tb IIIC T105°C Db -55°C<Ta<85°C
	<b>IECEX &amp; PESO</b>	Ex db IIC T5 Gb or Ex db eb IIC T5 Gb and Ex tb IIIC T95°C Db -55°C<Ta<75°C Ex db IIC T4 Gb or Ex db eb IIC T4 Gb and Ex tb IIIC T105°C Db -55°C<Ta<85°C
	<b>FMus &amp; FMc</b>	Class I, Div. 1, Groups B, C & D; T4 -50°C≤Ta≤85°C or T5 -50°C≤Ta≤75°C Class II/III, Div. 1, Groups E, F, G; T4 -50°C≤Ta≤85°C or T5 -50°C≤Ta≤75°C Class I, Zone 1, AEx/Ex db IIC T4 Gb or Class I, Zone 1, AEx/Ex db eb IIC T4 Gb -50°C≤Ta≤85°C Class I, Zone 1, AEx/Ex db IIC T5 Gb or Class I, Zone 1, AEx/Ex db eb IIC T5 Gb -50°C≤Ta≤75°C Zone 21, AEx/Ex tb IIIC T95°C Db -50°C≤Ta≤75°C or Zone 21, AEx/Ex tb IIIC T105°C Db -50°C≤Ta≤85°C
	<b>EAC CU TR</b>	1Ex d IIC T5 Gb or 1Ex de IIC T5 Gb and Ex tb IIIC T95°C Db -55°C≤Ta≤75°C 1Ex d IIC T4 Gb or 1Ex de IIC T4 Gb and Ex tb IIIC T105°C Db -55°C≤Ta≤85°C
	<b>Performance</b>	ANSI FM 3260 EN 54-10
	<b>Functional safety</b>	Complies to SIL2, per IEC 61508 - option available
	<b>MED</b>	DNVGL Certificate Number MED-B-00006AM - available upon request
	<b>ACCESSORIES</b>	<b>Stainless steel weather cover, model FLS-WCO-S02</b> <b>Flame simulator, model FLS-FSIM-IR3-KIT</b> <b>2" &amp; 3" pole mount adapter, model FLS-PMA-S23</b> <b>Airshield for areas with high airborne contamination, model FLS-ASD-S02</b> <b>Paint shield / cover</b>
<b>WARRANTY</b>	<b>5 years</b>	