

FlameSpec™ IR3-CO2L-HD

Triple IR Hydrocarbon Flame Detector with HD Camera

The FlameSpec™ IR3-CO2L-HD flame detector has been optimised to provide fast, robust detection for a wide range of heavy hydrocarbon fires, where combustion exhaust gases may be present.

The detector also provides a high-definition (HD) colour video output of the monitored area with clear imaging of events and personnel 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 nonvolatile memory for post incident investigation. The recordings start one minute before detection and continue for up to four minutes.

Typical applications include:

- Aircraft hangars & hardened aircraft shelters
- Helipads (Onshore, Offshore, Hospitals)
- Areas with high vehicle activity eg Waste recycling facilities or Road / Rail tanker loading racks

Key Benefits

- Highest immunity to false alarms.
- Hydrocarbon flame detection. Three wavelengths, in the infrared spectral range of 4.0 to 5.0 μm , 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.
- Detects up to 262 ft. (80m) for a 1 ft² (0.1m²) n-heptane fire.
- 5 selectable sensitivity levels.
- Data/Event logger: Alarms, faults & videos are logged to non-volatile memory.
- Universal outputs, 3 & 4 wire, 4-20 mA sink / source, Fire, Auxiliary & Fault.
- Relays. RS485 port using Modbus RTU.
- Built-in-Test (BIT) – Automatic and manual self-test of window cleanliness and overall detector operation.
- HART® 7, as standard - Easy configuration and diagnostic capability, including dirty optics warning for preventive maintenance needs.
- Window heater to avoid condensation and icing.
- Stainless steel tilt mount with horizontal and vertical adjustment.
- Functional safety - SIL 2 capable.



FlameSpec-IR3-CO2L-HD detects liquid and solid hydrocarbon fires where exhaust gases from engines are a challenge for other detectors.

These include applications like aircraft hangars, helidecks, tipping floors and road tanker refueling gantrys, enabling quick mitigation before incidents escalate.

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Response Characteristics

Fuel	Size	Sensitivity	Distance ft. (m)	Avrg Resp.Time (s)
n-Heptane	1 x 1 ft.	Extreme	262 (80)	4.2
n-Heptane	1 x 1 ft.	High	197 (60)	3.7
n-Heptane	1 x 1 ft.	Medium	98 (30)	0.8
n-Heptane	1 x 1 ft.	Low	49 (15)	1.2
n-Heptane	1 x 1 ft.	Very Low	24.5 (7.5)	1.0
Diesel	1 x 1 ft.	Extreme	164 (50)	3.6
Diesel	1 x 1 ft.	Medium	79 (24)	2.4
Gasoline	1 x 1 ft.	Extreme	230 (70)	3.2
Gasoline	1 x 1 ft.	Medium	98 (30)	1.0
Isopropanol (IPA)	1 x 1 ft.	Extreme	180 (55)	2.5
Isopropanol (IPA)	1 x 1 ft.	Medium	75 (23)	1.2
JP5	2 x 2 ft.	Extreme	262 (80)	10.3
JP5	1 x 1 ft.	Extreme	164 (50)	3.6
JP5	1 x 1 ft.	High	148 (45)	3.2
JP5	2 x 2 ft.	Medium	148 (45)	3.2
JP5	1 x 1 ft.	Medium	82 (25)	1.4
JP5	1 x 1 ft.	Low	39 (12)	1.2
JP5	1 x 1 ft.	Very Low	20 (6)	1.1
Kerosene	1 x 1 ft.	Extreme	164 (50)	3.5
Kerosene	1 x 1 ft.	Medium	82 (25)	1.2
Lithium Ion Battery	5 cells 3.7 V 1.5 AH	Extreme	49 (15)	4.9
Lithium Ion Battery	5 cells 3.7 V 1.5 AH	Medium	33 (10)	3.7
Polypropylene	1 x 1 ft.	Extreme	115 (35)	3.3
Polypropylene	1 x 1 ft.	Medium	66 (20)	3.3
Wood	1 x 1 ft.	Extreme	131 (40)	5.7
Wood	1 x 1 ft.	Medium	66 (20)	1.0

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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 the 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

Part Numbers

FLS-IR3-HD-AS13	FlameSpec-IR3-CO2L-HD Flame Detector, SS316. M25. Color VID. HART®
FLS-IR3-HD-AS23	FlameSpec-IR3-CO2L-HD Flame Detector, SS316. 3/4" NPT. Color VID. HART®
FLS-IR3-HD-AS14	FlameSpec-IR3-CO2L-HD Flame Detector, SS316. M25. Near IR VID. HART®. XY Location Co-ordinates.
FLS-IR3-HD-AS24	FlameSpec-IR3-CO2L-HD Flame Detector, SS316. 3/4" NPT. Near IR VID. HART®. XY Location Co-ordinates.

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FIRE DETECTION	Detection Time and Distance	40ms for fast fire burst or explosion 1.5s for 1 ft² (0.1m²) n-heptane pan fire at 0–100 ft. (0–30m) 4s for 1 ft² (0.1m²) n-heptane pan fire at 100–262 ft. (30–80m)
	Sensitivity Range	5 sensitivity ranges: Extreme, High, Medium, Low, Very Low
	Field of View (IR detection)	90° Horizontal, 80° Vertical
	Time Delay	0–30 seconds
	Built in Test	Automatic and Manual
VIDEO FUNCTIONALITY	HD Video	Color HD, as standard. Near IR filtered option (X4 available on request)
	Video Recoding of Alarm Events	1 minute pre-event and up to 3 minutes post-event
	System Integration Protocol	System integration protocol ONVIF (Open Network Video Interface Forum) Profile S
ELECTRICAL SPECIFICATIONS	Operating Voltage	24 VDC nominal (18–32 VDC)
	Current Consumption	Standby: 180mA Maximum: 300mA (including window heater)
	Electrical Entries	2x cable and conduit entries 3/4" NPT(F) or M25x1.5
	Wiring	14–17 AWG (2.5–1.0 mm²)
OUTPUTS	Relays	SPST volt-free contacts rated 2A at 30 VDC 3 relays: Alarm & Auxiliary – normally open; Fault – normally closed
	0–20mA (stepped) Current Output	3 wire and 4 wire configurations (sink and source) HART® rev 7.0
	Indication	Tri-color LED (Green, Yellow, Red)
	Modbus	RTU compatible on RS-485
	Digital (for video)	IP network IEEE 802.3 100Base-T
	Composite Video	NTSC or PAL
MECHANICAL SPECIFICATIONS	Size	7.87 x 5.12 x 5.12" (200x130x130mm)
	Weight	Detector (Stainless Steel 316): 9.8 lbs. (4.4 kg) Tilt mount (Stainless Steel 316): 5.4 lbs. (2.4 kg)
ENVIRONMENTAL SPECIFICATIONS	Temperature Range	Operating: -67°F to +185°F (-55°C to +85°C) Storage: -67°F to +185°F (-55°C to +85°C)
	Humidity	Up to 99% (RH), non-condensing
	Ingress Protection	IP66 & 68; NEMA 4X & 6P
APPROVALS	ATEX	ATEX: II 2 G D Ex db IIC T6 Gb or Ex db eb IIC T6 Gb and Ex tb IIIC T85°C Db -55°C<Ta<60°C 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
	IECEx, INMETRO & PESO	Ex db IIC T6 Gb or Ex db eb IIC T6 Gb and Ex tb IIIC T85°C Db -50°C<Ta<60°C Ex db IIC T5 Gb or Ex db eb IIC T5 Gb and Ex tb IIIC T95°C Db -50°C<Ta<75°C Ex db IIC T4 Gb or Ex db eb IIC T4 Gb and Ex tb IIIC T105°C Db -50°C<Ta<85°C
	FMus & FMc	Class I, Div. 1, Groups B, C & D; T4 -50°C≤Ta≤85°C or T5 -50°C≤Ta≤75°C or T6 -50°C≤Ta≤60°C Class II/III, Div. 1, Groups E, F, G; T4 -50°C≤Ta≤85°C or T5 -50°C≤Ta≤75°C or T6 -50°C≤Ta≤60°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 Class I, Zone 1, AEx/Ex db IIC T5 Gb or Class I, Zone 1, AEx/Ex db eb IIC T6 Gb -50°C≤Ta≤60°C Zone 21, AEx/Ex tb IIIC T105°C Db -50°C≤Ta≤85°C or Zone 21, AEx/Ex tb IIIC T95°C Db -50°C≤Ta≤75°C or Zone 21, AEx/Ex tb IIIC T80°C Db -50°C≤Ta≤60°C
	Performance	ANSI FM 3260 EN 54-10
	Functional Safety	Certified SIL2 capable, per IEC 61508:2010 High & Low demand
	Marine	DNV Type Approval
ACCESSORIES	Tilt mount, model FLS-TMO-S02	FLS-FSIM-IR3-KIT
	Weather cover, model FLS-WCO-S02	Paint shield / cover
	2" & 3" pole mount adapter, model FLS-PMA-S23	Airshield, model FLS-ASD-S02
	Duct mount with window, model FLS-DMW-S02	Duct mount for airshield, model FLS-DMX-S02
WARRANTY	5 years	