FlameSpec™ IR3-H2

Triple IR Flame Detector for Energy Transition

The FlameSpec™ IR3-H2 flame detector provides unrivaled response, high performance and reliable detection for a number of fires found in Energy Transition applications, such as hydrogen, methane, syngas, ammonia and methanol.

The detector addresses slow growing fires as well as fast eruptions of fire using improved IR3 technology. The detector operates in all weathers and light conditions.

These features, along with the built-in event logger, provide additional means to study the cause and development of fire events.

Key Benefits

- High immunity to false alarm, including arc welding.
- Detects, hydrogen, ammonia, methane & syngas flames using three infrared wavelengths, with clear separation.
- Each sensor has the same field of view to further improve false alarm immunity.
- Ultra-fast detection mode detection within 40 milliseconds for fireballs or explosions.
- High speed (< 0.5 s) model [X5] available for the detection of fires in enclosed spaces.
- 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 are logged to non-volatile memory.
- Built-in-Test (BIT) – Automatic and manual self-test of window cleanliness and overall detector operation.
- Additional dirty optics warning for preventive maintenance needs.
- HART® 7 for configuration & maintenance - option available.
- Heated window to avoid condensation and icing.
- Stainless steel tilt mount with horizontal and vertical adjustment.
- Marine approval - DNV type approval.
- Functional safety - SIL 2 capable - option available.

The FlameSpec™ IR3-H2 detector offers the fastest detection of fires and explosions, providing extra time that can be used to reduce damage to plant & property and initiate the evacuation of people.

FGD® FIRE & GAS DETECTION TECHNOLOGIES, INC.

Fire and Gas Detection Technologies, Inc. | 2570 E. Cerritos Ave, Anaheim, CA 92806 USA
Tel: (+1) 714-671-8500 | **support@fg-detection.com**

Model: FLS-IR3-H2

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Response Characteristics (Standard Model, X0, X1)

Fuel	Size	Sensitivity	Distance ft (m)	Avrg Resp.Time (s)
Hydrogen	32-in Plume	Extreme	98 (30)	1.5
Hydrogen	32-in Plume	Medium	66 (20)	1.5
Hydrogen	32-in Plume	Low	33 (10)	1.4
Hydrogen	32-in Plume	Very Low	16 (5)	1.5
Methanol	1 x 1 ft	Extreme	59 (18)	4.2
Methanol	1 x 1 ft	Medium	30 (9)	2.9
Methanol	1 x 1 ft	Very Low	10 (3)	4.9
Methane	32-in Plume	Extreme	66 (20)	1.7
Methane	32-in Plume	Medium	52 (16)	1.2
Methane	32-in Plume	Low	26 (8)	1.4
Methane	32-in Plume	Very Low	13 (4)	0.9
Syngas (30%CH_4:70%H_2)	32-in Plume	Extreme	82 (25)	3.0
Syngas (30%CH_4:70%H_2)	32-in Plume	Medium	55 (17)	3.0
Syngas (30%CH_4:70%H_2)	32-in Plume	Low	26 (8)	0.8
Syngas (30%CH_4:70%H_2)	32-in Plume	Very Low	13 (4)	2.1

Response Characteristics (Fast Model, X5)

Fuel	Size	Sensitivity	Distance ft (m)	Avrg Resp.Time (s)
Hydrogen	32-in Plume	Medium	59 (18)	0.2
Hydrogen	32-in Plume	Low	30 (9)	0.2
Hydrogen	32-in Plume	Very Low	16 (5)	0.2
Methanol	1 x 1 ft	Medium	26 (8)	0.2
Methanol	1 x 1 ft	Low	16 (5)	0.4
Methanol	1 x 1 ft	Very Low	8 (2.5)	0.3
Methane	32-in Plume	Medium	52 (16)	0.1
Methane	32-in Plume	Low	26 (8)	0.2
Methane	32-in Plume	Very Low	13 (4)	0.1
Syngas (30%CH_4:70%H_2)	32-in Plume	Medium	49.2 (15)	0.3
Syngas (30%CH_4:70%H_2)	32-in Plume	Low	23 (7)	0.1
Syngas (30%CH_4:70%H_2)	32-in Plume	Very Low	13 (4)	0.1

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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, 300 W	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Fluorescent, 70 W (3 x 23.3 W)	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Electric arc	3.0 (1.0)	No Alarm	3.0 (1.0)	No Alarm
Arc welding	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Radiation heater, 1850 W	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Radiation heater, 1850 W with water droplets on the sensors	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Quartz lamp (1000 W) shielded	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Quartz lamp (500 W) non-shielded	2.0 (0.5)	No Alarm	2.0 (0.5)	No Alarm
Mercury vapor lamp 160 W x 3	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-H2-AS10	Triple IR (IR3) Flame Detector for Energy Transition Fires - including hydrogen. Non-SIL, Non-HART® SS316 Stainless Steel Housing with 2 x M25 entries.
FLS-IR3-H2-AS20	Triple IR (IR3) Flame Detector for Energy Transition Fires - including hydrogen. Non-SIL, Non-HART® SS316 Stainless Steel Housing with 2 x 3/4 NPT entries.
FLS-IR3-H2-AS11	Triple IR (IR3) Flame Detector for Energy Transition Fires - including hydrogen. SS316 Stainless Steel Housing with 2 x M25 entries. HART® 7 & SIL 2.
FLS-IR3-H2-AS21	Triple IR (IR3) Flame Detector for Energy Transition Fires - including hydrogen. SS316 Stainless Steel Housing with 2 x ¾ NPT entries. HART® 7 & SIL 2.
FLS-IR3-H2-AS15	Triple IR (IR3) Flame Detector for Energy Transition Fires - e.g. hydrogen. SS316 Stainless Steel Housing with 2 x M25 entries. HART® 7 & SIL 2. NFPA33.
FLS-IR3-H2-AS25	Triple IR (IR3) Flame Detector for Energy Transition Fires - e.g. hydrogen. SS316 Stainless Steel Housing with 2 x ¾ NPT entries. HART® 7 & SIL 2. NFPA33

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FIRE DETECTION	**Detection Time and Distance**	40 ms for fast fire burst or explosion 1.5 s for 32" (0.8 m) hydrogen fire at 0 – 66 ft (0 – 20 m) 4 s for 32" (0.8 m) hydrogen fire at 66 – 100 ft (20 – 30 m)
	Sensitivity Range	5 sensitivity ranges: Extreme, High, Medium, Low, Very Low
	Field of View (IR Detection)	90° Horizontal, 80° Vertical
	Time Delay	Configurable 0 - 30 seconds
	Built in Test	Automatic and Manual
ELECTRICAL SPECIFICATIONS	**Operating Voltage**	24 VDC nominal (18 - 32 VDC)
	Current Consumption	Standby: 120 mA 180 mA all systems in operation (including window heater)
	Electrical Entries	2x cable and conduit entries 3/4" NPT(F) or M25 x 1.5
	Wiring	14 - 17 AWG (2.5 – 1.0 mm^2)
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 (isolated) configurations (sink and source) HART® rev 7.0 (option available)
	Indication	Tri-color LED (Green, Yellow, Red)
	Modbus	RTU compatible on RS-485
MECHANICAL SPECIFICATIONS	**Size**	5.83 x 4.65 x 4.65" (148 x 118 x 118 mm)
	Weight	Detector (Stainless Steel 316): 6.6 lbs. (3.0 kg) Tilt mount (Stainless Steel 316): 3.3 lbs. (1.5 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 (2m, 24hr); 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 T80°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 -50°C≤Ta≤60°C Ex db IIC T5 Gb -50°C≤Ta≤75°C Ex db IIC T4 Gb -50°C≤Ta≤85°C
	FMus & FMc	Class I, Div. 1, Groups B, C & D; T4 Class I, Zone 1, AEx/Ex db IIC T4 Gb T4 -50°C≤Ta≤85°C; T5 -50°C≤Ta≤75°C; T6 -50°C≤Ta≤60°C
	EAC CU TR	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
	Performance	ANSI FM 3260
	Functional Safety	Certified SIL2 capable, per IEC 61508:2010 High & Low demand (option available)
	Marine	DNV Type Approval

ACCESSORIES	**Tilt mount, model FLS-TMO-S01**	**High vibration mounting bracket, model FLS-VMO-S01**
	Weather cover, model FLS-WCO-S01	**Flame simulator, model FLS-FSIM-IR3-H2-KIT**
	2" & 3" pole mount adapter, model FLS-PMA-S23	**Airshield, model FLS-ASD-S01**
	Duct mount with window, model FLS-DMW-S01	**Duct mount for airshield, model FLS-DMX-S01**
WARRANTY	**5 years**	

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