FlameSpec
IR3-H2-HD
Triple IR Flame Detector for Energy Transition

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

Introduction

The FlameSpec-IR3-H2-HD flame detector provides unrivaled response, high performance and reliable detection for a number of fires found in Energy Transition applications. 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.

The detector provides high-definition (HD) video output of the monitored area with near IR filtered imaging of fire events and personnel at distances up to 100 ft. (30m). This allows the rescue team to be aware of 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

- 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.
- HD, or composite, video output with automatic HD video recording of events.
- 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.
- Data/Event logger – alarms, faults & videos as well as other relevant events are logged to non-volatile memory.
- Built-in-Test (BIT) – Automatic and manual self-test of window cleanliness and overall detector operation.
- Universal outputs, 3 and 4 wire, 4-20 mA sink / source, Fire, Auxiliary and Fault Relays. RS485 port using Modbus RTU.
- HART® 7, for configuration & maintenance - option available.
- Dirty optics warning for preventive maintenance needs.
- Heated window to avoid condensation and icing.
- Stainless steel tilt mount with horizontal and vertical adjustment.
- SIL 2 capable - option available.

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Response Characteristics (Standard models, X1 & X2)

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)	0.1
Hydrogen	32-in Plume	Low	30 (9)	0.1
Hydrogen	32-in Plume	Very Low	16 (5)	0.2
Methanol	1 x 1 ft.	Medium	26 (8)	0.3
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	53 (16)	0.1
Methane	32-in Plume	Low	26 (8)	0.2
Methane	32-in Plume	Very Low	13 (4)	0.2
Syngas ($30\%CH_4:70\%H_2$)	32-in Plume	Medium	50 (15)	0.4
Syngas ($30\%CH_4:70\%H_2$)	32-in Plume	Low	23 (7)	0.2
Syngas ($30\%CH_4:70\%H_2$)	32-in Plume	Very Low	13 (4)	0.1

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	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, 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	Detection time and distance	40ms for fast burst of explosion 1.5s for 32" (0.8m) hydrogen fire at 0−66 ft. (0−20m) 4s for 32" (0.8m) hydrogen fire at 66−100 ft. (20−30m)
	Sensitivity range	5 sensitivity ranges: Extreme, High, Medium, Low, Very Low
	Field of view (IR detection)	90° Horizontal, 75° Vertical
	Time Delay	0-30 seconds
	Built in Test	Automatic and Manual
VIDEO FUNCTIONALITY	**HD Video**	Near IR filtered HD, as standard. Color HD option (X2 available on request)
	Video recording of alarm events	1 minute pre-event and up to 3 minutes post-event
	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)
	Conduit Entries	2x cable and conduit entries 3/4" NPT(F) or M25x1.5
	Wiring	12-20AWG (2.5-0.35mm^2)
OUTPUTS	**Relays**	SPST volt-free contacts rated 2A at 30 VDC 3 relays: Alarm & Auxiliary − normally open; Fault − normally closed
	0-20 mA (stepped) current output	3 wire and 4 wire configurations (sink and source) HART® rev 7.0 (option available)
	Indication	Tri-colorLED (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 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 & PESO	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
	FMus & FMc	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
	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	Complies to SIL2, per IEC 61508 (option available)
ACCESSORIES	**Stainless steel weather cover, model FLS-WCO-S02**	
	Flame simulator, model FLS-FSIM-IR3-H2-KIT	
	2" & 3" pole mount adapter, model FLS-PMA-S23	
	Airshield for areas with high airborne contamination, model FLS-ASD-S02	
	Paint shield / cover	
WARRANTY	**5 years**	