

## IR3-H2-HD Triple IR Hydrogen Flame Detector

The IR3-H2-HD flame detector provides an ultra-fast 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 weather and light conditions.

The detector provides high-definition (HD) video output of the monitored area with clear imaging of a fire event 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 and 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 alarms, including arc welding
- Ultra-fast detection mode detection within 40 milliseconds for Hydrogen fireballs or explosions
- Detects hydrogen, ammonia, methane & Syngas flames: 3 infrared wavelengths with clear separation
- Five selectable sensitivity levels
- HD or composite video output with automatic HD video recording of events
- Data/Event logger – alarms, faults, and other relevant events are logged to non-volatile memory
- Universal outputs, 3 and 4 wire, 4-20 mA sink/source, Fire, Auxiliary, and Fault Relays, RS485 port using Modbus RTU
- Built-in-Test (BIT) – Automatic and manual self-test of window cleanliness and overall detector operation
- Window heater to avoid condensation and icing
- Stainless steel tilt mount, adjustable horizontally/vertically



## ORDERING

|                             |  |
|-----------------------------|--|
| <b>FIK-IR3-H2-HD-AS11</b>   | IR3 Hydrogen Flame Detector, SS316, 2 x M25 entries, Near IR VID, standard configuration                 |
| <b>FIK-IR3-H2-HD-AS11-H</b> | IR3 Hydrogen Flame Detector, SS316, 2 x M25 entries, Near IR VID, process industry (SIL 2 – HART®)       |
| <b>FIK-IR3-H2-HD-AS21</b>   | IR3 Hydrogen Flame Detector, SS316, 2 x 3/4" NPT entries, Near IR VID, standard configuration            |
| <b>FIK-IR3-H2-HD-AS21-H</b> | IR3 Hydrogen Flame Detector, SS316, 2 x 3/4" NPT entries, Near IR VID, process industry (SIL 2 - HART®)  |
| <b>FIK-IR3-H2-HD-AS12</b>   | IR3 Hydrogen Flame Detector, SS316, 2 x M25 entries, Color VID (SIL 2-HART®)                             |
| <b>FIK-IR3-H2-HD-AS22</b>   | IR3 Hydrogen Flame Detector, SS316, 2 x 3/4" NPT entries, Color VID (SIL 2-HART®)                        |
| <b>FIK-IR3-H2-HD-AS15</b>   | IR3 Hydrogen Flame Detector, SS316, 2 x M25 entries, Near IR VID, NFPA 33 (SIL 2-HART®) <sup>1</sup>     |
| <b>FIK-IR3-H2-HD-AS25</b>   | IR3 Hydrogen Flame Detector, SS316, 2 x 3/4"NPT entries, Near IR VID, NFPA 33 (SIL 2-HART®) <sup>1</sup> |
| <b>ACCESSORIES</b>          |  |
| <b>FIK-TMO-S02</b>          | Tilt Mount, SS316, HD Detector (shown above)   |
| <b>FIK-WCO-S02</b>          | Weather Cover, SS316, HD Detector  |
| <b>FIK-PMA-S23</b>          | Pole Mount Adapter, 2 and 3 inch   |
| <b>FIK-PMA-S06</b>          | Pole Mount Adapter, 6 inch   |
| <b>FIK-ASD-S02</b>          | AIRSHIELD, HD Detector <sup>2</sup>  |
| <b>FIK-FSIM-IR3-H2-KIT</b>  | Flame Simulator Kit, IR3-H2 Detector   |
| <b>FIK-USB/RS485</b>        | USB/RS485 Converter Kit <sup>3</sup>   |

<sup>[1]</sup> Automotive / Spray booth

<sup>[2]</sup> Provides protection against dust, snow and other interferences.

<sup>[3]</sup> For PC/Laptop USB port. Includes FLS Flame Detector Communicator software.

## SPECIFICATIONS

|                                     |  |  |
|-------------------------------------|--|--|
| <b>FIRE DETECTION</b>               | <b>Detection time and distance</b>     | 40ms for fast burst or explosion<br>1.5s for 32" (0.8m) hydrogen fire at 0-66 ft. (0-20m)<br>4s for 32" (0.8m) hydrogen fire at 66-100 ft. (20-30m)  |
|                                     | <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 (adjustable)  |
|                                     | <b>Built in Test</b>                   | Automatic and Manual   |
| <b>VIDEO FUNCTIONALITY</b>          | <b>HD Video</b>                        | Near-IR filtered HD, as standard. Color HD 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   |
| <b>ELECTRICAL SPECIFICATIONS</b>    | <b>Operating Voltage</b>               | 24 VDC nominal (18-32 VDC)   |
|                                     | <b>Current Consumption</b>             | Standby: 180mA<br>Maximum: 300mA all systems in operation (including window heater)  |
|                                     | <b>Conduit Entries</b>                 | 2x cable and conduit entries 3/4" NPT(F) or M25x1.5  |
|                                     | <b>Wiring</b>                          | 12-20AWG (4.0-0.50mm <sup>2</sup> )  |
| <b>OUTPUTS</b>                      | <b>Relays</b>                          | SPST volt-free contacts rated 2A at 30 VDC<br>Alarm – normally open<br>Auxiliary – normally open<br>Fault – normally closed  |
|                                     | <b>0-20mA (stepped) current output</b> | 3 wire and 4 wire configurations (sink and source)<br>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 10Base-T   |
|                                     | <b>Composite video</b>                 | NTSC or PAL  |
|                                     | <b>MECHANICAL SPECIFICATIONS</b>       | <b>Size</b>  |
|                                     | <b>Weight</b>                          | Detector (stainless steel 316): 9.8 lbs. (4.4 kg)<br>Tilt mount (stainless steel 316): 5.4 lbs. (2.4 kg)   |
| <b>ENVIRONMENTAL SPECIFICATIONS</b> | <b>Temperature Range</b>               | Operating: -67°F to +185°F (-55°C to +85°C)<br>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  |
| <b>APPROVALS</b>                    | <b>ATEX</b>                            | ATEX: II 2 G D<br>Ex db IIC T5 Gb or Ex db eb IIC T5 Gb and Ex tb IIIC T95°C Db -55°C<Ta<75°C<br>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</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<br>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<br>Class II/III, Div. 1, Groups E, F, G; T4 -50°C≤Ta≤85°C or T5 -50°C≤Ta≤75°C<br>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<br>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<br>Zone 21, AEx/Ex tb IIIC T95°C Db -50°C≤Ta≤75°C or<br>Zone 21, AEx/Ex tb IIIC T105°C Db -50°C≤Ta≤85°C |
|                                     | <b>Performance</b>                     | ANSI FM3260  |
|                                     | <b>Functional Safety</b>               | Complies with SIL2, per IEC 61508 (option available)   |
|                                     | <b>CSFM</b>                            | Listing 7210-2010:0524   |
|                                     | <b>WARRANTY</b>                        | <b>5 Years</b>   |

## IMMUNITY TO FALSE ALARMS AT EXTREME SENSITIVITY (modulated/unmodulated)

| False Alarm Source  | Maximum Distance in ft. (m) |
|---|-----------------------------|
| Sunlight, Direct, Reflected                                 | No response at any distance |
| Sunlight, Direct, Reflected, with water drops on sensors    | No response at any distance |
| Incandescent frosted glass light, 300W                      | 2.0 (0.5)                   |
| Fluorescent, 70W (3x23.3W)                                  | 2.0 (0.5)                   |
| Electric arc  | 3.0 (1.0)                   |
| Arc welding   | 2.0 (0.5)                   |
| Radiation heater, 1850W                                     | 2.0 (0.5)                   |
| Radiation Heater, 1850W with water droplets on sensors      | 2.0 (0.5)                   |
| Quartz lamp (1000W) shielded                                | 2.0 (0.5)                   |
| Quartz lamp (500W) non-shielded                             | 2.0 (0.5)                   |
| Quartz lamp (500W) non-shielded with water drops on sensors | 2.0 (0.5)                   |
| Mercury vapor lamp 160Wx3                                   | 2.0 (0.5)                   |
| Car Exhausts  | 2.0 (0.5)                   |
| Projector LED   | 2.0 (0.5)                   |
| Solenoid bell   | 2.0 (0.5)                   |
| Soldering iron  | 2.0 (0.5)                   |
| Electric Drill  | 2.0 (0.5)                   |

## IR3-H2-HD RESPONSE CHARACTERISTICS (Standard Models, X1 & X2)

| Fuel  | Size        | Sensitivity | Distance ft. (m) | Average Response Time (Sec) |
|---|-------------|-------------|------------------|-----------------------------|
| Hydrogen (H <sub>2</sub> )                      | 32-in Plume | Extreme     | 98 (30)          | 1.5                         |
| Hydrogen (H <sub>2</sub> )                      | 32-in Plume | Medium      | 66 (20)          | 1.5                         |
| Hydrogen (H <sub>2</sub> )                      | 32-in Plume | Low         | 66 (20)          | 1.4                         |
| Hydrogen (H <sub>2</sub> )                      | 32-in Plume | Very Low    | 16 (5)           | 1.3                         |
| 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)           | 3.6                         |
| Methane   | 32-in Plume | Extreme     | 66 (20)          | 1.7                         |
| Methane   | 32-in Plume | Medium      | 66 (20)          | 0.9                         |
| Methane   | 32-in Plume | Low         | 66 (20)          | 1.1                         |
| Methane   | 32-in Plume | Very Low    | 13 (4)           | 0.8                         |
| Syngas (30%CH <sub>4</sub> :70%H <sub>2</sub> ) | 32-in Plume | Extreme     | 82 (25)          | 3.6                         |
| Syngas (30%CH <sub>4</sub> :70%H <sub>2</sub> ) | 32-in Plume | Medium      | 82 (25)          | 2.8                         |
| Syngas (30%CH <sub>4</sub> :70%H <sub>2</sub> ) | 32-in Plume | Low         | 82 (25)          | 1.1                         |
| Syngas (30%CH <sub>4</sub> :70%H <sub>2</sub> ) | 32-in Plume | Very Low    | 13 (4)           | 2.2                         |

For performance details of model 5, the following document is available on request:

- Model 5 provides fast response for enclosed space/automotive/spray paint booth applications, see document F101V0024.06.



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