

AUTOMATIC



Shown with Q9033A
Aluminum Swivel Mount

Protect•IR®

Multispectrum IR Flame Detector Model X3302 Enhanced



DESCRIPTION

Y E A R
5
WARRANTY

The Enhanced X3302 brings state-of-the-art IR flame detection to the difficult task of detecting invisible hydrogen flames. Focusing on the water-band IR emissions of hydrogen flame, the Enhanced X3302 overcomes the limited detection range and false alarm tendencies of other flame detectors by employing field proven multispectrum infrared (MIR) technology. The result is unsurpassed flame sensitivity with discrimination of non-flame sources in situations where traditional flame detectors are unsuitable.

Utilizing the Enhanced X3301's multi-patented* signal processing algorithms, the Enhanced X3302 provides a breakthrough in flame detection/surveillance of hazardous materials that produce mostly water vapor, and little or no Carbon Dioxide (CO₂) in the combustion process. The detection capability of the Enhanced X3302 is double that of traditional UV and UVIR detectors. At the same time, it attains solar resistance and insensitivity to artificial lights, lightning, and "blackbody" radiation, which still plague other detection technologies.

The Enhanced X3302 provides superior performance in applications that are at the extremes, and where background IR radiation is a normal condition:

- Hangars with hydrogen or hypergolic fueled vehicles
- Refineries hydrogen storage areas
- Chemical loading racks
- Hydrogen compressor areas
- Hydrogen cooled generators
- Fertilizer plants
- Silane storage
- Gas plants
- Refrigerator buildings

HIGHLIGHTS

Protect•IR TECHNOLOGY FEATURES

- FM 3260 (2018).
- Certified SIL 2 Capable.
- ATEX Directive compliant.
- Performance approved to hydrogen, methanol, syngas and methane fires.
- EQP models available.
- Extended detection range.
- New standard set for cone of vision.
- HART models available.
- FDT/DTM capable.
- Multiple sensitivity levels.
- Maximum false alarm rejection.
- Microprocessor controlled heated optics.
- Calibrated automatic optical check for each sensor eliminates need for testing with external test lamp.
- RFI and EMC Directive compliant.
- Event logging with time and date stamp.
- Integral wiring compartment for ease of installation.
- Solar resistance.

BENEFITS

- Lowest cost of coverage.
- Ability to detect smaller fires earlier.
- Solid cone of vision to 100 feet for hydrogen.
- Better detection zoning capability.
- Best combination of flame detection and false alarm rejection.
- Low maintenance costs.
- Reliable fault diagnostics.
- Suitable for heavy industrial applications.
- Explosion/flame proof (Ex d) or increased safety installations (Ex d e) in hazardous locations.

SPECIFICATIONS

Operating Voltage 24 Vdc. Operating range is 18 to 30 Vdc.

Power Consumption 4 watts minimum (without heater), 17 watts at 30 Vdc with EOL resistor installed and heater on maximum.

Relays Contacts rated 5 amperes at 30 Vdc.

Fire Alarm: — Form C (NO and NC contacts)
— normally de-energized
— latching/non-latching.

Fault: — Form A (NO contacts)
— normally energized
— latching/non-latching.

Auxiliary: — Form C (NO and NC contacts)
— normally energized
— latching/non-latching.

Current Output (Optional) 0–20 mA, with a maximum loop resistance of 500 ohms from 18–19.9 Vdc, 600 ohms from 20–30 Vdc.

Temperature Range Operating: –40°F to +167°F (–40°C to +75°C).
Storage: –67°F to +185°F (–55°C to +85°C).

Hazardous location ratings from –55°C to +125°C available on extended temperature model.

Humidity Range 0 to 95% relative humidity, can withstand 100% condensing humidity for short periods of time.

Spectral Sensitivity Range IR wavelength range 2.4 to 3.5 microns.

Wiring 16 AWG or 2.5 mm² shielded cable is recommended.

Enclosure Material Copper-free aluminum or 316 stainless steel.

Conduit Entry Size 3/4 inch NPT or M25.

Warranty 5 years.

Shipping Weight (Approximate) Aluminum: 7 pounds (3.2 kg).
Stainless Steel: 13.8 pounds (6.3 kg).

Field of View 90° horizontal by 75° vertical, with perfect cone of vision for hydrogen and methanol flame detection.

Response Characteristics

Very High Sensitivity

Fuel	Size/Flow Rate	Distance feet (m)	Average Response Time (seconds)**
Hydrogen	30 inch plume/100 SLPM*	125 (38.1)	3.4
Methanol	1 x 1 foot	70 (21.3)	3.1
Syngas***	30 inch plume/120 SLPM*	110 (33.5)	3.5
Methane	30 inch plume/40 SLPM*	65 (19.8)	2.8

* Standard Liters Per Minute (Standard conditions defined as +25°C and 14.696 PSIA).
** Add 2 seconds for EQP model.
*** Syngas composition: 53% H₂, 24% CH₄, 11% N₂, 8% CO, 4% CO₂

Field of View

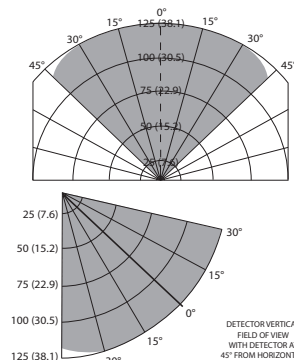
Very High Sensitivity

Fuel	Size/Flow Rate	Distance feet (m)	Horiz.	Avg. Horiz. Response Time (seconds)**	Vert.	Avg. Vert. Response Time (seconds)**
Hydrogen	30 inch plume/100 SLPM*	100 (30.5)	+45 -45	1.1 2.1	+45 -30	2.1 2.4
Methanol	1 x 1 foot	70 (21.3)	+45 -45	3.8 8.2	+45 -30	6.6 4.5
Syngas***	30 inch plume/120 SLPM*	85 (25.9)	+45 -45	2.6 4.1	+45 -30	3.8 1.4
Methane	30 inch plume/40 SLPM*	55 (16.8)	+45 -45	3.3 3.2	+45 -30	2.3 3.0

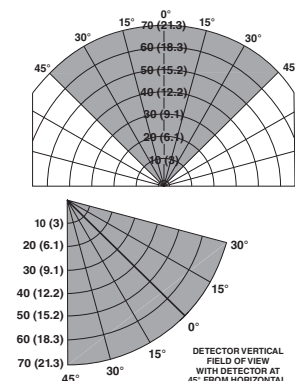
* Standard Liters Per Minute (Standard conditions defined as +25°C and 14.696 PSIA).
** Add 2 seconds for EQP model.
*** Syngas composition: 53% H₂, 24% CH₄, 11% N₂, 8% CO, 4% CO₂.

NOTE: Refer to the X3302 instruction manual (95-8768) for additional sensitivity levels.

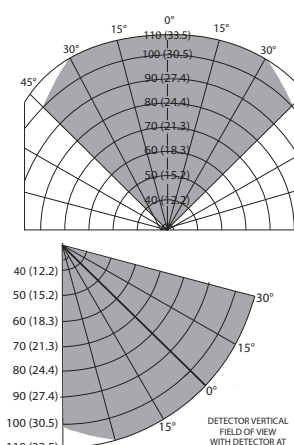
Field of View at Indicated Distance in Feet for Hydrogen (Very High Sensitivity)



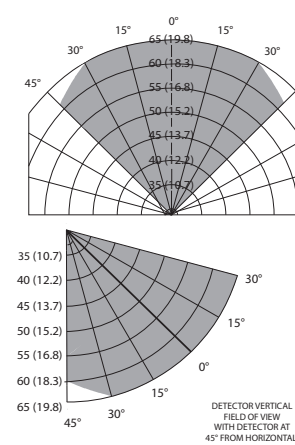
Field of View at Indicated Distance in Feet for Methanol (Very High Sensitivity)



Field of View at Indicated Distance in Feet for Syngas (Very High Sensitivity)



Field of View at Indicated Distance in Feet for Methane (Very High Sensitivity)



SPECIFICATIONS

Certification



Class I, Div. 1, Groups B, C & D (T4A);
Class II, Div. 1, Groups E, F & G (T4A);
Class I, Div. 2, Groups A, B, C & D (T3C);
Class II, Div. 2, Groups F & G (T3C);
Class III.
Enclosure NEMA/Type 4X
For FM and CSA Zone approval information,
refer to the X3302 instruction manual (95-8768).



IECEx Certificate of Conformity

IECEx ULD 06.0017X
Ex db eb IIC T6...T5
Ex tb IIIC T130°C
T6 (Tamb = -50°C to +60°C).
T5 (Tamb = -50°C to +75°C).
IP66.

– OR –

Ex db IIC T6...T4
T6 (Tamb = -55°C to +60°C).
T5 (Tamb = -55°C to +75°C).
T4 (Tamb = -55°C to +125°C).
IP66/IP67.



DEMKO 01 ATEX 130204X Increased Safety Model

CE 0539 Ex II 2 G
II 2 D

Ex db eb IIC T6...T5
Ex tb IIIC T130°C
T6 (Tamb -50°C to +60°C)
T5 (Tamb -50°C to +75°C)
IP66.

Flameproof Model

CE 0539 Ex II 2 G

Ex db IIC T6...T4
T6 (Tamb -55°C to +60°C)
T5 (Tamb -55°C to +75°C)
T4 (Tamb -55°C to +125°C)
IP66/IP67.



IEC 61508

Certified SIL 2 Capable.
Applies to specific models –
Refer to the SIL 2 Certified
X3302 Safety manual (95-8720).

Specifications subject to change without notice.

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Det-Tronics manufacturing system is certified to ISO 9001—
the world's most recognized quality management standard.



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