



11th July 2022

Technical Performance Note

Subject: FGD Technologies H2 Flame detector test

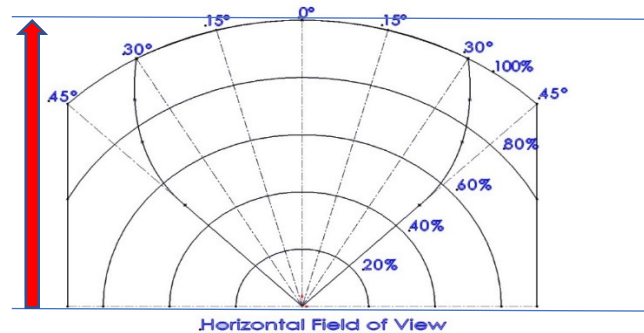


As part of the FGD technologies approach to the Energy Market as it transitions to a net zero environment, Fire & Gas Detection Technologies have performed a number of tests using both the Standard H2 Flame detector and HD H2 Flame Detector. The results shown here are for the Flame Detector FLS-IR3-H2-HD-ASX1.

Three main tests were completed to establish device performance related to speed of response and Field of Vision with methane and transition gases to establish the effectiveness of the FLS-IR3-H2 Detector as a device to be used from conversion from Methane to Hydrogen. False alarm rejection has already been completed as part of the original H2 FM3260 performance review.

Whilst the standard detection range for the Hydrogen flame detector is 30m with a FoV of 90° we wanted to test performance against other fuels used in transition from Methane and testing methane specifically using the H2 IR3 detector.

30m Detection Range H2



1. H2 Detection Field of View test Methane and Syngas

Model FLS-IR3-H2-HD-ASX1 - Field of view test

Extreme Sensitivity

Fuel	Pan Size	Distance ft (m)	Average Response Time			
			Horizontal		Vertical	
			L (45°)	R (45°)	D (45°)	U (30°)
Syngas	32-in Plume	(12.5)	3.2	1.6	5.5	2.0
Methane	32-in Plume	(12.5)	1.6	1.0	0.7	1.0



2. Detection of Methane and Syngas using HD CCTV version IR3 H2 Flame Detector

Model FLS-IR3-H2-HD-ASX1

Extreme Sensitivity

Fuel	Pan Size	Distance ft (m)	Average Response Time (Seconds)
Methane	32-in Plume	(20)	1.7
Syngas	32-in Plume	(25)	3.6

High

Fuel	Pan Size	Distance ft (m)	Average Response Time (Seconds)
Methane	32-in Plume	(20)	2.6
Syngas	32-in Plume	(25)	0.2

Medium

Fuel	Pan Size	Distance ft (m)	Average Response Time (Seconds)
Methane	32-in Plume	(16)	0.9
Syngas	32-in Plume	(17)	2.8

Low

Fuel	Pan Size	Distance ft (m)	Average Response Time (Seconds)
Methane	32-in Plume	(8)	1.1
Syngas	32-in Plume	(8)	1.1

Very Low

Fuel	Pan Size	Distance ft (m)	Average Response Time (Seconds)
Methane	32-in Plume	(4)	0.8
Syngas	32-in Plume	(4)	2.2
Methanol	1 x 1 ft	(3)	3.6
H ₂	32-in Plume	(5)	1.3



- Detection of Methane, Syngas, Methanol and H2 with HD CCTV version IR3 H2 Flame Detector in short range, fast response more for applications

Model FLS-IR3-H2-HD

Medium

Fuel	Pan Size	Distance ft (m)	Average Response Time (Seconds)
Methane	32-in Plume	(16)	0.1
Syngas	32-in Plume	(15)	0.4
Methanol	1 x 1 ft	(8)	0.3
H ₂	32-in Plume	(18)	0.1

Low

Fuel	Pan Size	Distance ft (m)	Average Response Time (Seconds)
Methane	32-in Plume	(8)	0.2
Syngas	32-in Plume	(7)	0.2
Methanol	1 x 1 ft	(5)	0.4
H ₂	32-in Plume	(9)	0.1

Very Low

Fuel	Pan Size	Distance ft (m)	Average Response Time (Seconds)
Methane	32-in Plume	(4)	0.2
Syngas	32-in Plume	(4)	0.1
Methanol	1 x 1 ft	(2.5)	0.3
H ₂	32-in Plume	(5)	0.2

In Summary, using the H2 detector in standard mode, the tests indicate that speed of response to methane and syngas out to a range of 20m and 25m respectively stays below 2 secs when using the correct/appropriate sensitivity setting.

For close range <16m, (as seen within a turbine enclosure, storage or H2 generation container), using the fast response mode response times remain below 0.5 second for all gases tested.