

## Technology Comparison: Point Infrared vs. Catalytic Gas Sensor

Detector Electronics Corporation manufactures both point infrared absorption and catalytic bead-type combustible gas detectors. A general comparison and life-cycle cost comparison of these sensing technologies is provided below.

Comparison item	Catalytic-Bead Gas Detector	Pointwatch IR Gas Detector
Sensor warranty period	2 years	5 years
Recommended field calibration frequency	every 30-60 days	once per year
Gas measurement technique?	Destructive. Flammable gas molecules are catalyzed	Non-destructive optical measurement
Detect non-hydrocarbon gases?	Yes, including hydrogen, silane, and others	No, gas/vapor of interest must contain H-C bond
Suitable for low oxygen environments?	No, minimum of 10-15% O <sub>2</sub> is required for accurate measurement	Yes, O <sub>2</sub> concentration does not affect accuracy
Prone to failure caused by sensor poisons?	Yes, numerous sensor poisons are well known	Not subject to poisoning
Recommended for areas with constant, low level, flammable background gases present?	No, exposure to constant background gases will shorten sensor life	Yes, exposure to constant background gases will not affect service life
Recommended in areas where high flammable gas concentrations are likely?	No, exposure to high concentrations of gas will shorten sensor life	Yes, exposure to high concentrations of gas will not affect service life
Failsafe, ie sensor will alert operator to sensor performance problem?	No, sensor can fail without notification (poisoning)	Yes, any internal detector performance problem is signaled via failsafe output
Prone to failure caused by exposure to halon, foam, or other agents	Yes, exposure to these may render the sensor dead without notification	No effect after exposure to these fire extinguishing agents
Sensitive to typical levels of industrial EMI/RFI?	Sensor separation configurations require shielded cabling to prevent noise problems.	Provides 4-20 ma output signal from detector to external devices.
Performance affected by high wind speeds or airflow rates?	Yes, velocity rates greater than 5.5 meters/second may cause loss of accuracy	No degradation of accuracy in high windspeed areas.
Suitable for outdoor monitoring of heavy vapors at ground-level elevation?	Not recommended outdoors at ground level due to deflected rainwater exposure problems	Recommended for outdoor ground level installations as baffle system in self-draining
Suitable for applications with multiple flammable gas types?	Yes; all gases present must be identified for proper calibration setting	Yes; all gases present must be identified for proper calibration setting

## TECHNICAL BULLETIN

### Technology Comparison: Point Infrared vs. Catalytic Gas Sensor

#### Life Cycle Cost Comparison

Item		Catalytic	PIR
A	Calibrations per year	4	1
B	Amount of time required to calibrate (hrs)	0.25	0.25
C	Number of calibrations per gas cylinder	20	20
D	Hourly personnel expense	50	50
E	Catalytic sensor life expectancy in years	2	N/A
F	PIR MTBF	N/A	8.73
G	Average repair (IR) or replacement (catalytic) cost	250	200
H	Sensor warranty period (years)	2	5
I	Gas cylinder replacement cost	125	125

Yearly catalytic calibration expense

**\$177**

"A\*B\*D+(I/C\*A)+G/E"

Yearly PIR calibration expense

**\$42**

"A\*B\*D+(I/C\*A)+G/F"

Life cycle cost of maintaining the sensor for 14 years

**\$2,472**

**\$583**

Cost savings of PIR vs Catalytic over projected life cycle

**\$1,889**