G7 INFRARED LEL SENSOR
TEMPERATURE STABILITY

ABOUT G7c CONNECTED SAFETY & GAS DETECTION

Blackline Safety's G7c devices combine optional gas detection capability, 2G/3G wireless communication and location technology into a compact wearable device. Location-enabled gas readings are communicated to the Blackline Safety Network for storage and to drive data analytics to assist businesses with managing a world-class gas detection program. Real-time low and high-gas alerts trigger a live emergency response to the employee's location when his or her G7 device detects a low or high-gas reading.

INFRARED LEL SENSOR

Blackline Safety has incorporated the MIPEX-02 infrared combustible gas sensor into the G7 product line of sensor cartridges. This sensor can be installed as one of up to five gases in either a diffusion cartridge or pump cartridge (coming soon).

The MIPEX-02 is a fully digital, microchip-based non-dispersive infrared (NDIR) optical gas sensor that leverages proprietary LED technology and offers low power consumption. Designed for leading performance in the most hazardous and toxic environments, this sensor demonstrates dependable reliability, accuracy of measurement and reaction to a growing gas concentration.

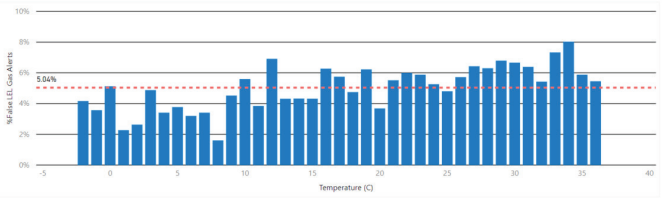
MIPEX-02 sensors feature a microcontroller and a modern digital interface. This sensor is capable of performing self-diagnostics for higher fault tolerance and applies special algorithms to ensure a linear output signal. The sensor includes a photo detector, patented LED emitter and signal processing algorithms that provides responsive gas detection and protection from temperature fluctuations.

TEMPERATURE PERFORMANCE REVIEW

Blackline's in-house Data Scientist recently leveraged Blackline Analytics to provide a long-term review the MIPEX-02 performance according to temperature over the last year.

G7 devices communicate each high-gas LEL alert to the Blackline Safety Network. High-gas alerts are managed from receipt to resolution by a live monitoring team in order to ensure that employees receive assistance as required. LEL high-gas alerts that were resolved as a false alert were charted in a histogram according temperature from -5–40°C. Each column in the following chart represents the average percentage of false alerts for each temperature interval.

The average rate of false alerts was computed to be 5.04% for the full year of high-gas LEL alert data, and is charted as a dotted red line in the histogram. Similarly, the percentage of false alerts was charted for each temperature range in blue.



As can be seen from the chart, the data is linear across the temperature range and indicates that the MIPEX-02 NDIR sensor delivers consistent and reliable performance. Additionally, this sensor provides reliable output when moving from one ambient temperature to another. If this sensor were to have experienced difficulties when moving from warm in-door temperatures to cold out-door environments (or vice versa), this data would have shown a significant increase in false alerts on the lower and/or upper range. This was not the case, confirming linear performance.

CANADIAN LEL PERFORMANCE CERTIFICATION

Canadian regulations require that manufactures of gas monitoring equipment pass the CSA 22.2 152 and ISA 12.13.1 Combustible Gas Instruments standards. This is the same performance test required for traditional pellistor combustible monitors and includes a temperature range of 0–40°C while maintaining ±3% LEL performance throughout the range. Blackline has tested the MIPEX-02 sensor beyond this range and saw no more than ±5% LEL deviation. No baseline drift was observed during certification testing.

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