



**SE**  
**SENSOR**  
ELECTRONICS

## SEC IREvolution™ Infrared Hydrocarbon Gas Detector

**HART**  
COMMUNICATION PROTOCOL

Document #1460033 Revision A

- Features**
- *Reliable infrared sensing technology*
  - *Virtually maintenance free*
  - *Low cost of ownership, over ten years operating life*
  - *Immune to poisoning and etching*
  - *Designed for harsh environments*
  - *Explosion proof*
  - *Anodized aluminum or stainless steel construction*
  - *Fast response time*
  - *Smart calibration*
  - *Self-compensating optics, pressure and temperature (U.S. Patents 6,414,310 and 7,132,657)*
  - *No moving parts*
  - *Heated optical chamber*
  - *Low power consumption*
  - *Operates in constant hydrocarbon background*
  - *Operates in anaerobic atmospheres*
  - *Fault indications for all failure states*
  - *Frequent calibrations are not required. Zero calibrate every 12 months.*
  - *4 to 20 mA output, HART® enabled*
  - *0 to 100% LFL detection range - %LEL, % Vol, PPM, Density*
  - *Digital display option available*
  - *Can be coupled with SEC 3100, 3120, or 3101 SE-ERA transmitter for network applications*

### Applications

The **SEC IREvolution™** hydrocarbon detectors are designed to be used as an upgrade in the same applications where catalytic bead sensors have been applied.

- Refineries, process applications
- Drilling and production platforms
- Fuel loading facilities
- Oil well logging
- LNG/LPG processing and storage facilities
- Gas turbines
- Chemical plants
- Compressor stations
- Wastewater treatment facilities
- Transportation facilities

### Operation / Description

**SEC IREvolution™** is a complete self contained optical hydrocarbon gas detector. The sensing and reference elements are self-compensating for optical integrity and other signal inhibitors. The industry standard 4 - 20 mA analog output provides remote alarm, fault and calibration signals.

### Specifications

**Model:** Sensor Electronics Corporation  
SEC 5000 IREvolution™ Infrared  
Gas Detector

**Available Gases:**

Propane	Propylene	Difluoromethane
Methane	n-Butane	Diesel
Gasoline	Ethanol	Isopropyl Alcohol
Ethylene	Methanol	DF 2000
Pentane	Ammonia	Green Earth
Cyclopentane	Jet A	Isobutane
Sulfur Hexafluoride (SF6)		PFC Gases
Acetylene	Isopar	Tetrafluoropropene
Chloroprene	Acetone	Methyl N-Amyl Ketone

*Please note that this list is not all-inclusive. The SEC IREvolution™ can be calibrated for most hydrocarbons, CO<sub>2</sub>, NH<sub>3</sub>, provided a calibration gas is available. For more information please contact Sensor Electronics Corporation.*

**Detection Method:** Diffusion. Compatible with Optional Sample-Draw Accessories. (requires a minimum of 1 liter per minute flow rate.)

**Output (analog):**  
4-20 mA (Source type), HART  
max. 1000 Ohm load at 24 VDC supply voltage (including field wiring)

**Response Time:**  
T50 < 10 seconds  
T90 < 20 seconds

**Construction:**  
316 stainless steel or anodized aluminum

**Accuracy:**  
+/- 5% of value or 0.5% of full scale

**Repeatability:**  
+/- 2% of value

**Operating Temperature Rating:**  
-40° to +50°C at 0 to 99% RH (non-condensing)

**Operating Range:**  
18 to 32 VDC measured at the detector head

**Power Consumption:**  
5 Watts Max

**Current Draw: (at 24VDC)**  
Average: 210 mA Peak: 400 mA

**U.S. Patent:** 6,414,310  
7,132,657

**Installation Category:** Cat. I, Pollution Degree 2

**Weight:** 3.25 lbs. (1.5 kg.)

**Dimensions:** Length 4.75" Diameter 2.5"

**Certification**  
CSA/NRTL Class 1, Div. 1, Groups A, B,C,D T5  
IECEX: Ex db op is IIB T5 Gb  
FM Class 1, Div. 1, Groups A,B,C,D T5 FM6320  
0-100%LEL Methane when Paired w/ SEC3100  
P/N: 3100-001-000HTR

### Unit Status Chart

Current Output	Status
4-20 mA	Normal measuring mode
0.6 mA	Unit Fault
0.8 mA	Reference channel fault
0.9 mA	Analytical channel fault
0.7 mA	Unit warm up
1.0 mA	Optics fault
1.2 mA	Zero drift fault
1.6 mA	Calibration fault
2.0 mA	Unit spanning
2.2 mA	Unit Zeroing
4.0 mA	Zero gas level
5.6 mA	10% LEL
8.0 mA	25% LEL
12 mA	50% LEL
16 mA	75% LEL
20 mA	100% LEL
20.1 – 23 mA	Over range (>100%)

### Other Products Available

Gas Detectors – Explosion proof  
Gas Detectors – Non-explosion proof  
Infrared Gas Detectors  
Process Gas Analyzers  
Dual Gas Analyzers  
Portable Fire Suppression Systems:  
Dry Chemical  
Halotron  
Twin Agent  
Stationary Fire Suppression Systems



### Sensor Electronics Corporation

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