



Standard Specifications

Part Number	SNR650
Calibration:	PPM Parts Per Million Hydrocarbon
	PPMCv PPM Carbon by Volume
	mgC/m ³ Milligrams carbon per cubic meter at 20°C
Minimum Range	0 to 33ppm as Propane (~100 PPMCv)
Maximum Range	0 to 20,000ppm as Propane (60,000ppmCv)
Total Accuracy ¹	±3% full scale reading (cross calibration)
Analyzer Accuracy ²	±1% full scale reading (single gas)
Repeatability ³	±0.5% typical, ±1% maximum
Resolution ⁴	±0.25% worst case, ±0.03% typical ±0.6% analog output
Zero Stability	± 1% in 30 days
Span Stability	± 5% in one year
Linearity	Within 1% of full scale
Cell Response Time	1.2 seconds (T = 63.2%)
Operating Temperature	Sensor pneumatics heated up to 200°C
Power Requirement	120 VAC +10% -15% 50/60 Hertz or 230 VAC +10% -15% 50 Hertz 200 Watts typical, 425 Watts maximum
Fuel Requirements	99.99% Hydrogen (Zero Gas, contains less than 1 ppm Hydrocarbon as methane)
Fuel Consumption	40cc per minute, 40-45 PSIG
Compressed Air	20 PSIG, regulated, instrument grade
Air Consumption	30 SCFH, typical
Humidity Range	0% to 100% Relative Humidity
Ambient Temperature	-40°C to 65°C
Relays	60 Watt contacts
Relay functions	Six relays for: Warning; Danger; Fault; Horn, Calibration-in-Progress & Service needed.
Alarm Function	Adjustable alarm ranges
Analog Output	4-20mA, 275 Ω max. includes line length
Digital Output	RS-485 Serial, Modbus protocol
Flame Cell Material	Hard-coat aluminum
Sample Train Material	Hard-coat aluminum & stainless steel
Flame Cell Rating	Explosion Proof Class I, Division 1
Hazardous Area Rating	General Purpose (Div 1 & Div 2 optional)
Enclosure Rating	NEMA 12/13 Indoor (NEMA 4X corrosion-resistant, outdoor optional)
Assembly Dimensions	16.0" H x 12.1" W x 8.5" D
Weight	Approximately 18 Kg (40 lbs)
Performance Criteria	Meets CFR 40 Part 60 Method 25A

Sensor Design

The Model 650 FID is a high-temperature flame ionization sensor that continuously measures total hydrocarbon concentrations. Control Instruments' proprietary FID design assures an accurate and linear response.

A carefully metered pilot flame incinerates the sample. The resulting ionized carbon passes through an electrical field, creating a proportional current flow. An electrometer measures the current flow. The resulting electrometer output is amplified and displayed as either: parts per million of a hydrocarbon (PPM); Milligrams of Carbon per Cubic Meter (mgC/m³); or PPM of Carbon by Volume (PPMCv).

Heated Sampling System

To avoid condensation during sampling, the sensor pneumatic assembly is heated up to 200°C. This eliminates inaccurate readings caused by solvent dropout, excessive maintenance time due to sample condensation and clogging.

The Model 650 is suitable for monitoring high flash point solvent vapors and other compounds with high temperature dew points. The sensor is unaffected by the temperature of the process and can sample streams at 1500°F (and higher).

The sensor can be mounted directly onto the process ductwork, as close as possible to the sample pickup point. This eliminates external heated sample lines and allows the fastest response time.

The sensor employs customer-supplied compressed air to drive its integrated air-aspirated sampling system. This method is simple, highly effective and requires very little maintenance. The sampling system does not require bottled air or sample pumps.

Failsafe Operation

A fault relay de-energizes whenever any of the following occur: sensor electrical failure; loss of system power; loss of heat; loss of vacuum in the flame cell; and downscale readings caused by loss of flame or fuel.

Outputs

The Model 650 has three (3) single-pole, double-throw relays for Warning, Danger, and Malfunction; and three (3) single-pole, single-throw relays for Horn, Calibration-in-Progress and Service Needed. Other outputs include a 4-20mA analog output and an RS-485 serial port with Modbus protocol.

Performance

Detector response time is 1.2 seconds. The sensor exhibits a very stable zero: less than one percent drift in thirty days. Span accuracy is less than five percent error per year.

The sensor is an industrial strength assembly suitable for continuous use in harsh environments; the optional NEMA 4X housing is suitable for direct mounting on the process indoors or out.

¹ Total accuracy includes calibration gas, response factor and sample mix accuracies.

² Accuracy for a single gas, depends on accuracy of calibration gas & response factor.

³ 0.5% near calibration point, 1% worst case over entire full scale.

⁴ Based on digital signal processing and full scale of analyzer.