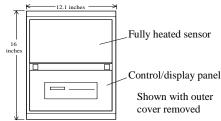


# **Control Instruments Corporation**

**Product Specifications** 

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#### **Standard Specifications**

Part Number

Calibration: PPM Parts Per Million Hydrocarbon

PPMC<sub>v</sub> PPM Carbon by Volume

mgC/m3 Milligrams carbon per cubic meter at 20°C

0 to 33ppm as Propane (~100 PPMCv) Minimum Range

0 to 20,000ppm as Propane Maximum Range

(60,000 ppmCv)

Total Accuracy1  $\pm 3\%$  full scale reading (cross calibration) Analyzer Accuracy<sup>2</sup>  $\pm 1\%$  full scale reading (single gas) Repeatability<sup>3</sup>  $\pm 0.5\%$  typical,  $\pm 1\%$  maximum Resolution<sup>4</sup>  $\pm 0.25\%$  worst case,  $\pm 0.03\%$  typical ±0.6% analog output

Zero Stability  $\pm$  1% in 30 days Span Stability  $\pm$  5% in one year Within 1% of full scale Linearity 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 99.99% Hydrogen (Zero Gas, contains Fuel Requirements

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

0% to 100% Relative Humidity **Humidity Range** 

-40°C to 65°C Ambient Temperature 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  $\Omega$  max. includes line length

RS-485 Serial, Modbus protocol **Digital Output** 

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) NEMA 12/13 Indoor (NEMA 4X **Enclosure Rating** 

corrosion-resistant, outdoor optional) 16.0" H x 12.1" W x 8.5" D

Assembly Dimensions Approximately 18 Kg (40 lbs) Weight

Meets CFR 40 Part 60 Method 25A Performance Criteria

<sup>1</sup> Total accuracy includes calibration gas, response factor and sample mix accuracies.

# Model 650 FID Sensor

#### **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.

<sup>&</sup>lt;sup>2</sup> Accuracy for a single gas, depends on accuracy of calibration gas & response factor.

<sup>&</sup>lt;sup>3</sup> 0.5% near calibration point, 1% worst case over entire full scale.

<sup>&</sup>lt;sup>4</sup> Based on digital signal processing and full scale of analyzer.