

Catalytic  
Combustible Gas Sensor  
Model CGS


**DESCRIPTION**

The Det-Tronics family of catalytic combustible gas sensors provide unmatched flammable gas detection performance in harsh environments and challenging conditions.

The heart of the catalytic sensor consists of a pair of computer matched pellistors (beads) that provide identical electrical resistance in clean air. When flammable gas is present, the active bead catalyzes the combustible gas molecules, while the inactive (reference) bead balances the reaction and compensates for normal changes in the ambient environment. The sophisticated design and construction of Det-Tronics catalytic sensors provides excellent sensitivity, response time, and resistance to physical shock and vibration.

All Det-Tronics catalytic gas sensors are poison-resistant, and are constructed with a one-piece 316 stainless steel housing. Other features include an integral thermal barrier to prevent bead interaction, and a sinter bonding technique to ensure superior protection against electromagnetic interference. All sensors are provided with a laser etched identification and approvals label that will withstand exposure to harsh outdoor industrial environments.

The CGS can be used for detection of virtually all combustible and flammable gases, including hydrogen, and is compatible with the FlexVu® UD10, Infiniti® U9500, Model 505 transmitter, EQ22xxDCUEX, and STB.

**FEATURES AND BENEFITS**

- One piece design with integral thermal barrier
- Sinter bonded flame arrestor provides superior EMI protection
- 316 stainless steel housing
- Excellent impact and vibration resistance
- Standard poison-resistant performance rating
- FM/CSA/ATEX/IECEx/Brazilian Approvals
- Compatible with all Det-Tronics combustible gas transmitters and controllers
- Sensor Separation Termination Box (STB) options available
- Extended operating temperature range
- Comprehensive list of conversion K factors for proper calibration available
- 3/4 inch NPT, 20 mm, or 25 mm thread types
- Six inch or optional 30 inch wire lead lengths
- Constant voltage or constant current sensor types available
- SIL2 certified to IEC61508 by exida® when used with UD10 SIL2 models.

## SPECIFICATIONS

**Temperature Range** Operating: -67°F to +257°F (-55°C to +125°C).  
Performance: -40°F to +167°F (-40°C to +75°C).

**Humidity Range** 0 to 99% RH, non-condensing.

**Response Time**  
(100% LFL Gas Applied)

Gas	T50, s	T90, s	Verification
Methane	<10	<30	FM, CSA, ATEX
Hydrogen	<5	<10	Det-Tronics

**Recovery Time** < 30 seconds after exposure to pure methane.

**Accuracy / Linearity** ±3% LFL from 0 to 50% LFL,  
±5% LFL from 51% to 100% LFL.

**Repeatability** ±1% LFL.

**Long Term Stability** Zero: < 1% LFL per month.  
Span: < 1% LFL per month in clean air.

**Temperature Stability** < ±5% LFL: -13°F to +167°F (-25°C to +75°C).  
< ±10% LFL: -40°F to -13°F (-40°C to -25°C).

**Sensor Life** 3 to 5 years, when environment is free of substances and conditions known to be detrimental to catalytic sensing elements.

**Storage Life** Indefinite, when stored in unopened original packaging.

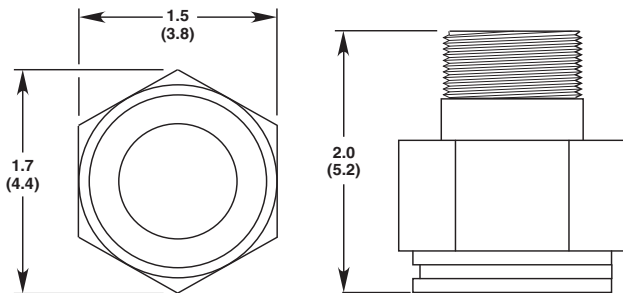
**Calibration Cycle** 30 days after initial calibration and every 90 days thereafter, or as required by the application and environment.

**RFI/EMI Immunity** Refer to selected transmitter specification.

**Dimensions** See Figure 1.

**Thread options**

- 3/4" NPT
- M20
- M25.



E1213

Figure 1—Dimensions of Sensor in Inches (Centimeters)

**Certification:**



**FM / CSA:** Class I, Div. 1, Groups B, C, & D  
Tamb = -40°C to +75°C  
Explosion-proof verified:  
-40°F to +257°F (-40°C to +125°C)  
Performance verified:  
-40°F to +167°F (-40°C to +75°C)  
Complies with ANSI/ISA-12.13.01-2000.



**ATEX:** **CE** 0539 **Ex** II 2 G  
Ex db IIC T3/T5  
DEMKO 02 ATEX 131323X  
T5 (Tamb = -40°C to +75°C)  
T3 (Tamb = -55°C to +125°C)



**IECEx:** Ex db IIC T3/T5  
IECEx ULD 10.0001X  
T5 (Tamb = -40°C to +75°C)  
T3 (Tamb = -55°C to +125°C)

**EN/IEC Standards:** EN/IEC 60079-0: 2012/2011  
EN/IEC 60079-1: 2014  
EN 60079-29-1: 2007

**Special Conditions for Safe Use (ATEX / IECEx):**

The CGS Combustible Gas Sensor is certified for use in the following ambient temperatures:

-40°C to +75°C  
Coding: **Ex db IIC T5**  
-55°C to +125°C  
Coding: **Ex db IIC T3**

The actual temperature range is marked on the sensor. The performance ambient temperature rating is limited to -40°C to +75°C.

The CGS can withstand repeated exposures to 125°C for periods up to 12 hours. It is recommended that the sensor be replaced after maximum 500 hours of exposure to the 125°C temperature condition.

The CGS must only be mounted into the enclosures of the FlexVu UD10 Display, Infiniti Gas Transmitter Model U9500A, the Combustible Gas Transmitter Model 505 Series, the Digital Communication Unit EQ22xxDCUEX Series or the Sensor Termination Box Model STB Series.

The actual enclosure must provide maximum measured reference pressure of 15 bar measured according to EN 60079-1: 2007, §15 (ATEX) & §16 (IECEx).

The CGS is to be installed in places where there is a low risk of mechanical damage.



**Brazil:** Ex d IIC T3, T5 Gb  
11/UL-BRHZ-0078X  
T5 (Tamb = -40°C to +75°C)  
T3 (Tamb = -55°C to +125°C)

**SIL:** Gas sensors are certified as SIL2 per IEC61508 when used with UD10XXX25T2C.

**NOTE:** Before installing the sensor, ensure that hazardous (classified) location rating is applicable in the area of intended use.

Specifications subject to change without notice.

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Det-Tronics manufacturing system is certified to ISO 9001—  
the world's most recognized quality management standard.



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