

# Sensor Data Sheet

# SENSALERT PLUS

# SENSIDYNE®



**Combustible Gas – Catalytic Bead  
(0 - 100 %LEL)  
Part No. 823-0211-31  
FM Performance Certified <sup>1,4</sup>**

Minimum Indicated Concentration .....	3 %LEL
Repeatability .....	± 2% of Reading
Accuracy <sup>2</sup> .....	± 10% of Reading
Span Drift .....	< 10% change per year (typical)
Response Time (Rise) <sup>3</sup> .....	T <sub>60</sub> : < 12 seconds
Recovery Time (Fall) <sup>3</sup> .....	T <sub>10</sub> : < 60 seconds
Temperature Range .....	-40° to 75°C (-40° to 167°F)
Humidity Range (continuous) .....	0–90 %RH, non-condensing
Humidity Range (intermittent).....	0–99 %RH, non-condensing
Pressure Range .....	Ambient atmospheric, ± 1 psi
Expected Sensor Life <sup>4</sup> .....	3 years from Shipping Date
Recommended Calibration Flow Rate .....	500 to 1000 cc/min
Oxygen Requirement.....	10% by volume, minimum
SensAlert 4-Channel Controller.....	Compatible

<sup>1</sup> For use in an FM Approved SensAlert Plus Transmitter.

<sup>2</sup> When unit is calibrated and serviced at recommended intervals.

<sup>3</sup> Room Temperature.

<sup>4</sup> FM-US Certified for General Combustible Gases, FM-Canadian Certified for non-Methane Gases

## Special Calibration Considerations:

### **Catalytic Bead Combustible Sensor (PN° 823-0211-31)**

#### Zeroing The Sensor

There are no special zeroing considerations for this sensor. Complete zeroing instructions are provided in Section 3.1 of the SensAlert<sup>Plus</sup> User Manual or SensAlert ASI User Manual.

#### Span Calibration

It is recommended that this sensor be calibrated at the half-scale concentration of 50 %LEL. Complete span calibration instructions are provided in Section 3.2 of the SensAlert<sup>Plus</sup> User Manual or SensAlert ASI User Manual.

The SensAlert<sup>Plus</sup> transmitter has the following preset K-Factors programmed into the system when either Methane or Propane is the calibration gas: Hydrogen, Methane/Propane, Hexane, Butane. For other target gases you can enter a "Custom K-Factor." A list of K-Factors for Catalytic Bead Combustible sensors is shown below. Complete instructions for using K-Factors can be found in the SensAlert<sup>Plus</sup> User Manual or SensAlert ASI User Manual.

#### Test-on-Demand Cell

There is no Test-On-Demand cell recommended for this sensor.

#### Inhibition & Poisoning

Inhibition and poisoning occur when the combustion by-products from some compounds are deposited onto the catalytic device within the sensor assembly. These depositions will deactivate the sensor. The degree of deactivation may be either partial or complete, and may be either reversible or irreversible, depending upon the concentration and duration of exposure to the interfering compound. The sensor assembly should never be exposed to any of the following substances known to inhibit and poison the catalytic device:

- Silicon-containing compounds, such as silicone oils and greases
- Phosphorous-containing compounds, such as pesticides
- Sulfur-containing compounds, such as carbon disulfide and hydrogen sulfide
- Halogen-containing compounds, such as fluorocarbons and chlorocarbons
- Lead -containing compounds, such as anti-knock petroleum additives

Following exposure to a poisonous substance, the transmitter must be re-calibrated in order to assure that the sensor assembly has not been damaged. If calibration is not successful, the catalytic device has been damaged and the sensor assembly must be replaced.

## Methane & Propane K-Factors for Catalytic Bead Combustible Sensors

The following tables show the variation in response for the Catalytic Bead Combustible sensor as K-Factors (multipliers). These figures are experimentally derived and are expressed relative to Methane and Propane.

**Using the K-Factor:** The respective Methane or Propane K-Factor is used to multiply the raw sensor reading to obtain the corrected displayed reading on the transmitter. The K-factor is set as a "Custom K-Factor within the "Sensor Adjustment" submenu of the System Configuration menu. Note the SensAlert Plus sensors will not operate above 100 %LEL.

**Note:** The calibration gas concentration should not be adjusted when calibrating the sensor with Methane or Propane.

Combustible Gas/Vapor	Methane K-Factor	Propane K-Factor
Methane	1.00	0.53
Acetaldehyde	1.80	0.95
Acetic Acid	3.43	1.81
Acetic Anhydride	1.97	1.04
Acetone	2.23	1.16
Acetonitrile	1.67	0.88
Acetylene	1.67	0.88
Ammonia	0.80	0.42
Aniline	2.93	2.93
Benzene	2.50	1.32
1,3- Butadiene	2.57	1.35
n- Butane	2.03	1.07
iso-Butane	1.83	0.96
1-butene	2.13	1.12
cis-Butane-2	2.07	1.09
trans-Butane-2	1.90	1.00
n-Butyl Alcohol	3.03	1.60
n-Butyric Acid	2.43	1.28
Carbon Disulfide	7.13	3.75
Carbon Monoxide	1.27	0.67
Carbonyl Sulfide	1.03	0.54
Chlorobenzene	2.93	1.54
Cyanogen	1.07	0.56
Cyclohexane	2.50	1.32
Cyclopropane	1.50	0.79

### IMPORTANT

Information about substances not listed in this table was unavailable at the time of this printing. Listed K-Factors are not warranted, but can be used to estimate the %LEL concentration of substances from direct readings of Methane and Propane. K-Factors can be used to obtain approximate direct readings of %LEL concentration of substances by calibration with Methane or Propane. Error varies from one sensor to another and with the age of the sensor. The typical K-Factor conversion error can be as high as 20-30%. In order to achieve the most accurate detection of a substance, calibration should be performed using a known %LEL concentration of the substance.

## Methane & Propane K-Factors for Catalytic Bead Combustible Sensors

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**Note:** The calibration gas concentration should not be adjusted when calibrating the sensor with Methane or Propane.

Combustible Gas/Vapor	Methane K-Factor	Propane K-Factor
Methane	1.00	0.53
n-Decane	3.43	1.81
Diethyl Ether	2.27	1.19
Diisopropyl Ether	2.33	1.23
Dimethyl Ether	1.73	0.91
Dimethyl Sulfide	2.33	1.23
Dimethylbutane	2.70	1.42
Dimethylhydrazine	1.43	0.75
Dimethylpentane	2.33	1.23
1,4 Dioxane	2.50	1.32
Ethane	1.40	0.74
Ethyl Acetate	2.57	1.35
Ethyl Alcohol	1.70	0.89
Ethyl Bromide	0.93	0.49
Ethyl Chloride	1.77	0.93
Ethyl Formate	2.37	1.25
Ethyl Mercaptan	1.77	0.93
Ethyl Methyl Ether	2.33	1.23
Ethylamine	1.40	0.74
Ethylbenzene	2.77	1.46
Ethylene	1.53	0.81
Ethylene Dichloride	1.50	0.79
Ethylene Oxide	2.33	1.23
Ethylpentane	2.37	1.25
Gasoline	2.23	1.18
n-Heptane	2.70	1.42

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## Methane & Propane K-Factors for Catalytic Bead Combustible Sensors

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**Note:** The calibration gas concentration should not be adjusted when calibrating the sensor with Methane or Propane.

Combustible Gas/Vapor	Methane K-Factor	Propane K-Factor
Methane	1.00	0.53
1,4-Hexdiene	1.50	0.79
n-Hexane	2.33	1.23
Hydrazine	1.97	1.04
Hydrogen	1.23	0.65
Hydrogen Cyanide	2.00	1.05
Hydrogen Sulfide	2.33	1.23
Iso-Butyl Alcohol	2.57	1.35
Iso-Propyl Alcohol	2.57	1.35
Isobutylene	1.97	1.04
Methyl Acetate	2.17	1.14
Methyl Alcohol	1.43	0.75
Methyl Bromide	1.07	0.56
Methyl Chloride	1.30	0.68
Methyl Ethyl Ketone	2.63	1.39
Methyl Formate	1.87	0.98
Methyl Mercaptan	1.60	0.84
Methyl Propionate	2.07	1.09
Methyl Propyl Ketone	2.70	1.42
Methylamine	1.27	0.67
Methylcyclohexane	2.57	1.35
Methylene Chloride	1.03	0.54
Methylhexane	2.37	1.25
Methylhydrazine	2.37	1.25
Methylpentane	2.70	1.42

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**Note:** The calibration gas concentration should not be adjusted when calibrating the sensor with Methane or Propane.

Combustible Gas/Vapor	Methane K-Factor	Propane K-Factor
Methane	1.00	0.53
Nitromethane	2.13	1.12
n-Nonane	4.00	2.11
n-Octane	2.87	1.51
n-Pentane	2.23	1.18
Iso-Pentane	2.33	1.23
neo-Pentane	2.37	1.25
1-Pentane	2.33	1.23
Propane	1.90	1.00
Propene	1.87	0.98
n-Propyl Alcohol	1.97	1.04
n-Propyl Chloride	1.83	0.96
n-Propylamine	2.07	1.09
1,2-Propylene Oxide	2.57	1.35
Propyne	2.33	1.23
tert-Butyl Alcohol	1.80	0.95
Tetrahydrofuran	1.83	0.96
Toluene	2.50	1.32
Triethylamine	2.50	1.32
Trimethylamine	1.97	1.04
Trimethylbutane	2.27	1.19
Vinyl Chloride	1.83	0.96
o-Xylene	3.03	1.59
m-Xylene	2.70	1.42
p-Xylene	2.77	1.46

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