

Sentinel Gas Detector (Model SGD-1000)

Combustible gas detector
Data Sheet

Description

SGD-1000 is a gas detector designed to detect and monitor combustible hydrocarbon gases in air over the range of 0-100% LEL using an Intrinsically Safe non-dispersive Infrared Optical (NDIR) technology.

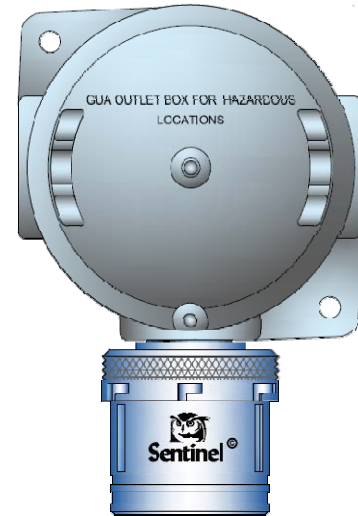
The gas detector is equipped with anti-splash guard to prevent the ingress of water, and also features a 0.1 mm mesh filter to prevent the ingress of dust and insects that may damage the optics.

The SGD-1000 is a smart integrated system and includes mirror optical system, photodiode and LED, signal amplifiers, microcontroller, current driver of the infrared LED, UART interface signal generator and supply forming voltage unit. Sensor microcontroller performs storage of unique sensor calibration constants, processing of measurement results and concentration of measured gas, and information exchange.

The SGD-1000 is specifically designed to work with MCL Control's WiFi Sentinel WFS-1000 wireless transmitter and Micro RTU allowing to connect up to two SDG-1000 and other two 4-20 mA process variable transmitters and report to a control panel via Modbus RTU or Modbus TCP.

Features

- Low power and fast response sensor suitable for wireless applications.
- UART interface allows the deployment of several sensors in a field bus with minimal wiring to the transmitter.



- Calibration available for different types of gas: CH₄, C₂H₄, C₃H₈, C₂H₆, C₄H₁₀, C₆H₁₄.
- Intrinsically Safe approved sensor.
- Plug-in sensor to ease replacement.
- On Site calibration cap (Optional).
- Long term stability to extend calibration periods up to 30 month.
- Stainless steel sensor housing for harsh environments.

Typical applications

- Refining and Petrochemical
- Oil and Gas Production Plants
- LNG/CNG Plants
- Hydrocarbon Tank farms and distribution plants
- Compression plants
- Low power, wireless gas detection applications

Specifications

The SGD-1000 is equipped with a fast response stainless steel Mipex-02 NDIR gas sensor from Mipex Technology by Optosense LLC. For Methane calibration (CH₄) the sensor model used is MIPEX-02-1-II-2.1A and for Propane (C₃H₈) calibration the sensor model is MIPEX-02-2-II-2.1A. For further information about the Mipex-02 sensor visit (<http://www.mipex-tech.com>).

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Table 1.- Gas detector general specifications

Item	Description
Gas sampling method	Diffusion
Operating principle	Non-Dispersive Infra-Red (NDIR)
Target gas	CH ₄ . 0 to 2.5% volume C ₃ H ₈ . 0 to 1.5% volume
Operating, storage and transportation conditions	Relative humidity (%): up to 98 Atmospheric pressure (kPa): 80 to 120 Temperature ⁽¹⁾ (°C): -55 to +60
Temperature range (°C)	-40 to +60
Overall Dimensions (mm)	150 (Height) x 100 (Width) x 95 (depth)
Weight (kg)	2.5
Housing material	Junction Box: Feraloy Sensor: Stainless steel Sensor cover: Polyamide plastic, UV resistant
Sensor Life time expectancy ⁽²⁾ (not less than) (years)	10
Sensor shelf life time (not less than) (years)	8
Sensor IP rating	54
Sensor reference accuracy (20°C to 25°C)	- ± 0.1% vol. or ± 5% of indication (whichever is greater) for CH ₄ - ± 0.05% vol. or ± 5% of indication (whichever is greater) for C ₃ H ₈
Sensor response time (T90) when dust filter provided by Optosense LLC is installed (seconds)	10

Note 1: The term “operating temperature” refers to ambient temperature, at which sensor operates and its intrinsic safety is ensured.

Note 2: To guarantee stated accuracy during sensor lifetime, zeroing and span calibration should be performed periodically, at least once in 30 months.

Table 2.- Electrical specifications, marking and standards compliance

Item	Description
Operating supply voltage ⁽¹⁾ , VDC (min...max)	+3.0 to +5.0
Communication interface	UART
Power consumption (mW)	< 5
Marking and standards compliance ⁽²⁾	Ex ia I Ma/Ex ia IIC Ga acc. to IEC 60079-0, IEC 60079-11. - 55 ≤ Ta ≤ +60 °C <small>RECOGNIZED COMPONENT</small>  <small>Class I, Division 1, Group A, B, C, D</small> <small>CONFORMS TO UL Std 913, 60079-0, 60079-11</small> <small>Interrel: 4004454</small> <small>CERT. TO CAN/CSA Std. C22.2 No. 157-92</small>

Note 1: The operating voltage is supplied from the WFS-1000 (WiFi Sentinel wireless transmitter).

Note 2: Marking and standard compliance is for the gas sensor device (MIPEX-02). As it is an intrinsically safe device, there is no need for the junction box where the detector is connected to be Explosion Proof as long as the power and communication wiring is supplied from the WFS-1000 and the intrinsically safe parameters are satisfied for the complete wiring from the WFS-1000 to the SGD-1000. Marking and standards compliance is only guaranteed when connected to WFS-1000 and Intrinsic Safety parameters described below are satisfied.

Wiring

SGD-1000 is equipped with four wires for connection to the Wireless Sentinel (WS-1117-WF). The description of each signal is as follows:

Signal	Description
+ (Red)	Power Supply positive lead (3.3VDC)
- (Black)	Power Supply negative lead
TX (Yellow)	UART Transmit output
RX (Yellow)	UART receive input

Intrinsic Safety

SGD-1000 sensor’s intrinsic safety is provided by:

- Limiting parameters of its electrical circuits to intrinsically safe values in accordance with IEC/EN 60079-11;

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- Providing the required electrical clearances and creepage paths in accordance with IEC/EN 60079-11;
- Insulation between intrinsically safe circuit and sensor housing, which withstands test voltage of 500 V in accordance with EN 60079-11.

Combined intrinsically safe sensor circuits parameters:

- IECEx/ATEX: $U_i = 5.0$ V, $I_i = 450$ mA, $P_i = 0.25$ W, $C_i = 38.8$ μ F, $L_i = 0$ mH.
- CAN/CSA: $V_{max} = 5.0$ V, $I_{max} = 450$ mA, $P_{max} = 0.25$ W, $C_i = 38.8$ μ F, $L_i = 0$ mH.

Warranty

Manufacturer guarantees compliance with this specification if customer follows operating, transportation and storage terms.

During warranty period, manufacturer replaces or repairs for free all its products that do not operate because of production fault.

Risks and costs of transportation and packaging as well as other contingencies concerning product

return to manufacturer are carried out by the customer.

Warranty period is 24 months since product is shipped to customer.

Ordering information and support

Ordering information:

Model: SGD-1000

Part	Description
20-01	SGD-1000 sensor assembly for CH ₄ (Methane) with Feraloy junction box and terminals blocks
20-02	SGD-1000 sensor assembly for C ₃ H ₈ (Propane) with Feraloy junction box and terminals blocks
20-03	On Site calibration cap

Support

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