

Overview

The 5100-02-IT Combustible Gas Sensor Module is a key member of the powerful Sierra Monitor IT Series family of gas sensor modules. The 5100-02-IT provides the features needed by safety and instrumentation engineers including:

- 180 day calibration interval
- FM and UL Approval for performance & safety
- SIL-2 certified
- Modbus RTU RS-485 interface
- 4-20 mA output isolated and non-isolated
- HART Interface option
- SMC Sentry digital bus interface
- ATEX Certified
- Optional Integral and Trouble alarm relays - Alarm, Warning
- Aluminum or 316 Stainless Steel enclosure
- Non-intrusive calibration
- Integral scrolling LED display
- Optional remote sensor
- Remote alarm reset capable



Model 5100-02-IT utilizes the proven, reliable, catalytic bead technology to monitor for combustible gases (methane and others). Output range is 0-100% of Lower Explosive Limit (LEL). This detector has minimal maintenance requirements and is Factory Mutual approved for six month calibration intervals. Internal, continuous self-diagnostics automatically detect and alarm any fault problems. The 5100-02-IT can be used as a 4-20 mA component or as a Modbus RTU node. For higher level system capability the module can interface directly to Sierra Monitor's Sentry Controller enabling system level Modbus serial communications, area and zone alarm management, extensive system diagnostic features, WebServer interface, and multiplexing sensor connections.

Factory Mutual (FM) and UL 2075 Approval for performance, electrical safety and environmental parameters including Class I, Div. 1, Groups B, C, D and Class I, Zone 1, Group IIB + H₂ – T5. With a NEMA-4X enclosure standard, approved multiplexing, and approved six month calibration interval, cost of ownership is minimized at the acquisition, installation and operating stages.

How It Works

Catalytic Bead gas sensors detect gas by comparing the resistance of two heated elements. One element is catalytic to enhance the burning of combustible gases, the other element is passive. Electronic circuits are used to compare the change in the catalytic bead resistance relative to the passive bead. The relative change is calibrated to determine the concentration of the gas of interest.

Features

- Six-month calibration interval
- Non-intrusive calibration
- Network-compatible with Modbus, 4-20 mA, Sentry bus, HART and relay interface
- FM and UL Approved for Performance and Hazardous Areas
- SIL-2 Certified
- Local scrolling display

Benefits

- Longest rated and FM-approved calibration cycle for any catalytic-bead gas detector - reduced maintenance
- Able to calibrate module without declassifying the area
- Easily meets user's needs for access to critical plant safety information
- Proven and approved for installation in areas where combustible gases are located
- Meets long term reliability design standards
- Ease of calibration and easy access to gas concentration, relay status and diagnostics

Sensor

Type: Catalytic Bead

Performance

Repeatability: +/-1% LEL

Response Time: T60<10sec

Calibration freq: 180 days

Accuracy: +/- 1% for 0-50% LEL range
 +/- 2% for 51-100% LEL range

Output

Display: Fixed and Scrolling LED

Signal Output: Sentry digital bus

Analog 4-20 mA

3-wire Non-Isolated

4-wire Isolated

Serial RS-485 Modbus RTU

Relay: Optional

Options

Relays: 5 amp Alarm, Warning (0.25 amp Trouble)

5A@ 250 VAC, 5A@ 30VDC (Alarm, Warning)

Board includes auxiliary connection for Sentry multiplexing

HART: Termination board includes HART, Modbus RS-485, 4-20mA, Digital Input, 2A Relay output, No Sentry Bus

Remote Sensor: Up to 50 feet (15.2m)

Power

Power consumption: 3 watts maximum

Input voltage: 24 VDC nominal: 10-30VDC

RFI/EMI Protection: EN50081-2, EN50082-2

Operating Range

Ambient Temp Range: -40° to 176°F (-40° to 80°C)

Relative Humidity: 0-99% Non-Condensing

Construction

Dimensions: (HxWxD)

(A1 & A2) = 6.9 x 5.7 x 3.9 in .

(17.5 x 14.5 x 9.9 cm)

(S1 & S2) = 7.5 x 5.0 x 4.4 in .

(19 x 13 x 11 cm)

Weight: (A1 & A2) = 3.4 lb. (1.5 Kg)

(S1 & S2) = 7.2 lb. (3.3 Kg)

Housing: Epoxy coated Aluminum or

316 Stainless Steel

Enclosure Hazardous Area Classification

Explosion proof, Class I, Div. 1, Groups B, C, D

Class I, Zone 1, Group IIC, IP66, IP65, NEMA 4X

II2 GD, Ex d IIC T6 = -40°C to 85°C

Warranty: 2 years

Approvals

UL 2075: Combustible Gas Detector Performance

FM Approval 6320: Combustible Gas Detector Performance

FM Approval 3600: Class I Div. 1, Groups B, C, D

SIL-2 Certified: IEC 61508

ATEX Certified: II 2G, Ex d IIB + H2 T5 Gb

CE Marked: Certificate of Approval

CSA: For enclosure in hazardous locations

ABS: Certificate of Compliance

CQST: Certificate for China

CCOE/PESO: Certificate for India



*Specifications subject to change without notice



Remote Sensor Option

It is often necessary to sample the combustible gas at some distance from the gas sensor module. The IT Series enables the user to mount the sensor remotely from the transmitter without the need for expensive and high-maintenance sample pumps. The Remote Sensor Option provides a separate gas sensor that can be mounted up to 50 feet from the transmitter and connected via a cable included.

Ordering Information: The following part number is essential in selection of the correct product. Please build up the desired part by inserting the code for each element into the appropriate space (ie. 5100-02-IT-S1-00-1-0-C).

| Model | Enclosure | Relay/Connection Output | Gas Type | Sensor Protection | Remote Option | Approvals |
|------------|--|--|----------|-------------------|-----------------------------------|------------|
| 5100-02-IT | ↓ | ↓ | -00 | ↓ | ↓ | ↓ |
| | - A1 = AL ¾" NPT - A2 = AL M20 x 1.5 - S1 = SS ¾" NPT - S2 = SS M20 x 1.5 | - 01 = No Relays (std) - 02 = Relays Option - 05 = HART Option | | - 0 = Standard | - 0 = None - 1 = Remote Sensor | - C = ATEX |

Accessories:

- 5311-00 Rainshield
- 5311-02 Rainshield with calibration port

Calibration Accessories:

- 5358-01 Calibration Head, Standard
- 5360-00 Calibration Gas Delivery Fitting

Calibrators High Capacity:

- 1250-01 Gas Sensor Calibration Kit, Type A (CO, H2S)
- 1260-02 50% LEL Methane Gas Cylinder Type A
- 1260-30 25% LEL Methane
- 1260-42 Hydrogen, 50% LEL, Gas Cylinder, Type A
- 1260-00 Zero Gas (Air), Gas Cylinder, Type A (if satisfactory zero ambient air not available)