sierra monitor corporation

# Model 4100 Series
## Gas Sensor Modules

*The Model 4100 Series Gas Sensor Modules monitor a variety of toxic and combustible gases and provide a 4-20 mA DC output signal of gas concentration*

The Model 4100 Series utilizes semiconductor sensor technology to provide monitoring of gases in the parts per million (PPM) ranges. These modules operate on 24 VDC input and have a non-linear 4-20 mA DC current loop output.

The four gas sensor modules in this series are:

| | |
|---|---|
| 4100-33 | Gas Sensor Module 4-20 mA DC |
| 4100-34 | Gas Sensor Module 4-20 mA DC |
| 4100-35 | Gas Sensor Module 4-20 mA DC |
| 4100-36 | Gas Sensor Module 4-20 mA DC |

These gas sensor modules can monitor a wide variety of gases. Table A provides a partial list of gases that can be reliably monitored. If your gas is not on this list, check with Sierra Monitor to determine if a 4100 Series gas sensor module is available to meet your requirements.

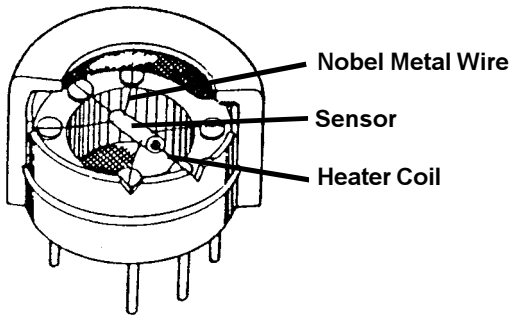
Also, these gas sensor modules can be calibrated with the gas of interest or with methane or carbon monoxide. Thus, the user does not have to obtain a special calibration gas.

The Model 4100 Series provides a non-linear 4-20 mA output signal that can interface with the Sierra Monitor Sensys controller or other linearizing controllers / indicators. Curves and linearizing equations can be provided for a specific gas and sensor to enable the operation of these sensor modules with other brand controllers.

**How it Works**

Semiconductor sensors have a resistance in air that is affected by oxygen adsorbed on the surface of the sensor. Oxygen atoms capture electrons on the semiconductor surface, thereby increasing its resistance.

The sensors can be impregnated with dopants such that the sensor's resistance changes when specific gases displace the adsorbed oxygen.




## Specifications

**Sensor**

| | |
|---|---|
| Type: | Solid State Metal Oxide Semiconductor |
| Range: | 20-500 ppm or 50-5000 ppm See Table A. |
| Response: | 80% of concentration in less than 3 mins. |
| Typical Life: | 1-3 years in Normal Service. |

**Detectable Gases And Vapors**

| | |
|---|---|
| Typical List: | See Table A |

**Maintenance**

| | |
|---|---|
| Calibration Adjustments: | Zero Adjust, Span Adjust |
| Sensor LED: | OFF indicates heater or film is an open circuit. |

**Environmental**

| | |
|---|---|
| Operating: | Temperature -10°C to +40°C (14°F to 104°F)<br>Humidity 5% to 95% non-condensing |
| Storage: | Temperature -55°C to +85°C (-67°F to 185°F) |

**Electrical Data**

| | |
|---|---|
| Wiring: | 3 wire non-isolated |
| Input Voltage: | 14 - 30 VDC |
| Current: | 70mA @ 4mA DC loop current;<br>90mA @ 20mA DC loop current at 24VDC. |
| Power: | 2.1 Watts |
| Output Range: | 4-20mA DC Non-linear |
| Loop Res.: | 800 ohms at 28VDC |

**Mechanical**

| | |
|---|---|
| Size: | 6.75" x 4" x 3.5" (HxWxD)<br>(17.1 cm x 10.2 cm x 8.9 cm) |
| Material: | Cast aluminum epoxy painted |
| Weight: | 2 pounds (0.9 Kg) |
| Classification: | Class I Division I Groups C,D |
| Mounting: | Connects to a vertical 3/4" electrical conduit |

*Sierra Monitor Corporation 1991 Tarob Ct. Milpitas, CA 95035 (408) 262-6611 800-727-4377 FAX: (408) 262-9042*
*Visit our Web site at: www.sierramonitor.com E-Mail: sierra@sierramonitor.com*

## ORDERING INFORMATION

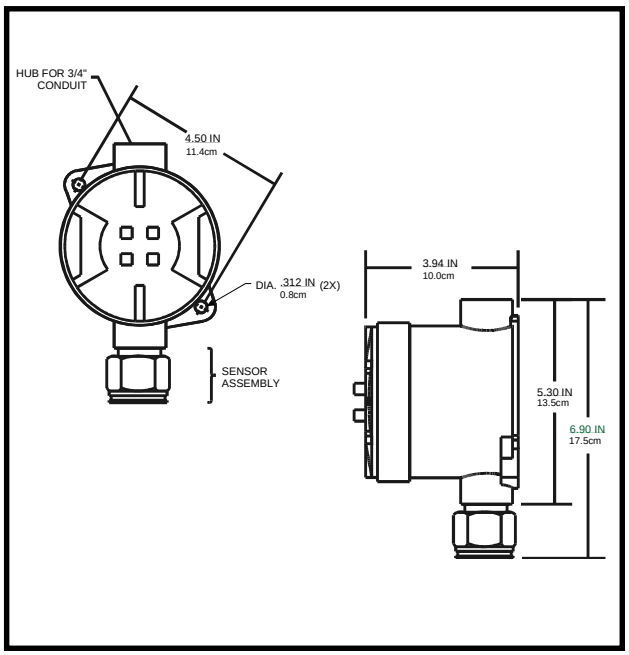
| | |
|---|---|
| 4100-33 | Gas Sensor Module 4-20 mA DC |
| 4100-34 | Gas Sensor Module 4-20 mA DC |
| 4100-35 | Gas Sensor Module 4-20 mA DC |
| 4100-36 | Gas Sensor Module 4-20 mA DC |

### Spare Parts & Accessories

| | |
|---|---|
| 4200-33 | Sensor Replacement Assy for 4100-33 |
| 4200-34 | Sensor Replacement Assy for 4100-34 |
| 4200-35 | Sensor Replacement Assy for 4100-35 |
| 4200-36 | Sensor Replacement Assy for 4100-36 |
| 5311-00 | Rainshield |
| SPM 28009 | Assembly, Transmitter Electronics |

### Calibration Accessories

| | |
|---|---|
| 1200-26 | Gas Sensor Calibrator w/2 gas cylinders |
| 1290-03 | Gas Cylinder - Methane 5000 ppm |
| 1290-04 | Gas Cylinder - Methane 1000 ppm |
| 1290-05 | Gas Cylinder - Carbon Monoxide 100 ppm |




### Table A: Gases and ranges for 4100 Series Gas Sensor Modules

| GAS | 500 PPM FULL SCALE | 5,000 PPM FULL SCALE | GAS | 500 PPM FULL SCALE | 5,000 PPM FULL SCALE |
|---|---|---|---|---|---|
| acetic acid | 4100-34 | 4100-35 | hexafluoropropylene | 4100-34 | 4100-33 |
| acetone | 4100-34 | 4100-35 | hydrogen | 4100-34 | |
| acetonitrile | 4100-34 | 4100-35 | methane | | 4100-35 |
| acetylene | 4100-34 | 4100-35 | methanol | 4100-34 | 4100-35 |
| acrylonitrile | 4100-34 | 4100-35 | methyl bromide | 4100-34 | 4100-35 |
| ammonia (<0$^{o}$C) | 4100-34 | | methyl chloride | 4100-34 | 4100-35 |
| ammonia (>0$^{o}$C) | 4100-36 | | methyl ethyl ketone | 4100-34 | 4100-35 |
| benzene | 4100-34 | | methyl propyl ketone | 4100-34 | 4100-35 |
| 1-butanol | 4100-34 | | methylene chloride | 4100-34 | |
| 2-butanol | 4100-34 | | nitroethane | 4100-34 | 4100-35 |
| i-butane | 4100-34 | 4100-35 | nitromethane | 4100-34 | 4100-35 |
| n-butane | 4100-34 | 4100-35 | 1-pentanol | 4100-34 | 4100-35 |
| 1-butanol | | 4100-35 | propanal | | 4100-35 |
| 2-butanol | | 4100-35 | propane | 4100-34 | |
| i-butanol | 4100-34 | 4100-35 | i-propanol | 4100-34 | 4100-35 |
| t-butanol | 4100-34 | 4100-35 | n-propanol | 4100-34 | 4100-35 |
| butene | 4100-34 | 4100-35 | propylene | 4100-34 | 4100-35 |
| carbon monoxide | 4100-34 | | R-11 | 4100-33 | |
| chloroform | 4100-34 | | R-12 | 4100-33 | |
| cyclohexane | 4100-34 | 4100-35 | R-22 | 4100-33 | |
| cyclopentane | 4100-34 | 4100-35 | R-113 | 4100-33 | |
| diethylketone | 4100-34 | 4100-35 | R-123 | 4100-33 | |
| dipropylether | 4100-34 | 4100-35 | R-134a | 4100-33 | |
| ethane | 4100-34 | 4100-35 | R-141b | 4100-33 | |
| ethanol | 4100-34 | 4100-35 | R-142b | 4100-33 | |
| ethylene | 4100-34 | 4100-35 | R-500 | 4100-33 | |
| n-heptane | 4100-34 | 4100-35 | R-502 | 4100-33 | |
| n-hexane | 4100-34 | 4100-35 | toluene | 4100-34 | |
| 1-hexanol | 4100-34 | 4100-35 | xylene | 4100-34 | |

*Sierra Monitor Corporation 1991 Tarob Ct. Milpitas, CA 95035 (408) 262-6611 800-727-4377 FAX: (408) 262-9042*
*Visit our Web site at: www.sierramonitor.com E-Mail: sierra@sierramonitor.com*