

OdorEyes Gas Odorant Monitor-Transmitter

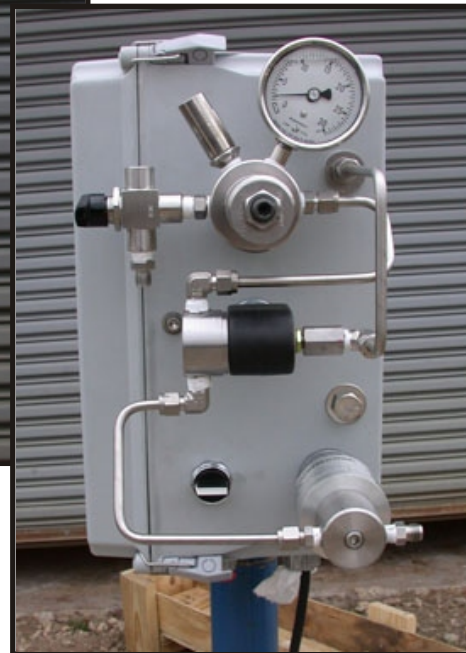
The OdorEyes Monitor-Transmitter automatically measures the concentration of any commonly used mercaptan odorant in natural gas or vaporized LPG (liquefied petroleum gas). The OdorEyes fixed monitor utilizes an electrochemical sensor which is exposed to a flowing sample at user selected intervals. The measurement signal can be recorded to verify the accuracy with which mercaptan has been added to odorless fuel by an odorizer system.

During each sample sequence, gas flows through the sensor chamber for four minutes at 0.5 liters per minute. The mercaptan measurement is an average concentration compiled during this sampling cycle. The latest reading is indicated by a four-digit display in pounds of mercaptan per million standard cubic feet of gas. It is also transmitted as a linear 4-20 mA DC signal with span of 0.0 to 2.0 lbs/MMscf. Programmable alarm signals and a communications link using RS-485 and MODBUS protocol are also provided. With periodic calibration using a known gas, accuracy is $\pm 3\%$ of full scale.



Fixed OdorEyes Monitor System

Simple, compact and efficient design.



- On Line verification of odorization level
- 4-20 mA output and relay alarms
- Smart Circuitry, MODBUS® communication
- Programmable



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Status indicators and photoelectric commands

The SmartMaxII has a display panel that can be viewed through the window of the assembly's outer housing. This display consists of an alpha-numeric LCD panel and 2 status lights. The panel also contains two pushbuttons and three phototransistors (used during "flashlight access").

PUSHBUTTON FUNCTION: There are two pushbuttons on the display panel MENU and SELECT

- 1 - Press the MENU pushbutton to scroll through menu items in the alpha-numeric display.
- 2 - Press the SELECT pushbutton to enter a submenu or to select a menu item.

Microcomputer electronics

The monitor is controlled by an internal microcomputer. This microcomputer provides advanced features such as interpretation of the sensor signal for optimum accuracy, user programming of alarm levels, maximum automation of user calibration and frequent diagnostics to detect, correct and report malfunctions. In accordance with standard convention, a persistent malfunction is reported as zero voltage in the analog output. User setting and key operational data are stored in nonvolatile memory to survive power interruptions. The electronics are robust and self-reliant as appropriate for an unattended installation. For instance, a watchdog timer circuit monitors activity of the microcomputer

Sensor replacement and calibration

The microcomputer continually compensates for aging in the sensor's response. Under standard operating conditions replacement of the mercaptan sensor should be calibrated every 6 -12 months to maintain optimum operating efficiency. Actual lifetime varies according to individual usage. Sensor replacement takes about five minutes. A calibration is performed at that time. This involves connecting source of 'span' gas having a mercaptan concentration of 2lbs/MMscf for about four minutes. To ensure optimum accuracy, the unit should be re-calibrated every six months.

Systems built to order

The standard system is built as shown. Custom units can be built to customer specifications. Special programming is available in the instrument unit.

Specifications: OdorEyes Gas Odorant Monitor-Transmitter

Measurement response and sensor characteristics:

Span: 0.25 to 2.0 pounds per million standard cubic feet of gas.
Sensitivity: Identical response (lbs/MMscf) to any commonly used mercaptan odorants in gaseous methane, propane or butane.
Cross sensitivity: 3%. Repeatability: 1%. Drift (at low end): 3%
Sensor life: depends on sample interval.
Interval between samples: Factory-set at 30 minutes, can be changed with a flashlight by user.
Calibration interval: Recommended every 6 -12 months.

Electrical connections:

Made inside the enclosure to separate plug-in terminal blocks for power input and signal outputs, routed through 1/2 inch FNPT conduit.

Power required:

120 VAC, 60 Hz. Approximate power consumption: varies from 4.8 to 14.2 W during sample cycle, average 7.1 watts over 30 minute cycle.

Atmospheric exhaust connection:

1/4 inch FNPT at sensor chamber. Connect to stack or provide discharge fitting.

Environmental and electrical safety:

Operating temperature range: Continuous -40 to 104 F
Intermittent -40 to 131 F
Storage temperature range: -67 to 257 F
Sensor storage temperature range: 32 to 68 F
Operating relative humidity range: 10% to 90%

Electrical Outputs:

4-20mA DC linear signal: 250 ohms maximum receiver resistance to power supply common ground.
Concentration alarm signals; Factory set at 1 lb/MMscf for high "warning" alarm and 0.5 lb MMscf for low "danger" alarm, can be changed with flashlight by user.
Digital communication: RS-485 twisted pair, MODBUS protocol. Maximum load of 60w.

Sample flow regulator

Inlet pressure range 20 to 1000 psig. Included output pressure gauge.
Inlet Connection: Compression fitting for 1/4 inch O.D. Stainless Steel tubing.
Achieves nominal 0.5 cfm by applying regulated pressure of 8 psig to a calibrated flow restrictor that discharges to virtually zero psig at solenoid valve leading to sensor chamber.

Pneumatic Connections:

Vent port 1/4 ". Should be vented to atmosphere without any restriction and to an area which would not effect the quality of gas at the air intake.