



Ultima[®] MOS-5 Intelligent Sensor

Intelligent Sensor for H₂S Gas Detection

Description

The Ultima MOS-5 Intelligent Sensor is a microprocessor-based transmitter designed for use with MSA's Metal Oxide Semiconductor (MOS) sensor. This unit features one person calibration and can virtually self-calibrate through activation of a magnetic switch and the application of gas. It is designed to detect hydrogen sulfide in parts per million (ppm) levels and provide status indication and alarm outputs.

All of the Ultima MOS-5 Intelligent Sensor electronics are contained within an explosion-proof housing so that sensor information can be processed at the sensor site. It provides a 4-20 mA signal which is proportional to 0 to 100% of the detection range at the sensor. In addition, the Ultima MOS-5 Intelligent Sensor includes warning, alarm and fault relay contacts that can be used to indicate an alarm or fault condition, and dual redundant ModBus or HART communications. Configurations with relays, ModBus and HART are available to meet many needs.

The Ultima MOS-5 Intelligent Sensor includes a three (3) digit LED display. This local digital display continuously indicates gas concentrations during normal operation and in the calibration check mode, calibration prompts during calibration mode, display codes during the setup mode and eight fault codes.

The Ultima MOS-5 Intelligent Sensor has four different operating modes. The first is the normal operating mode in which alarms are active and the display and 4-20 mA readings are proportional to the gas concentration at the sensor. In the second mode, gas check, the user can apply a gas and check the sensor response while alarm outputs are inhibited. The third mode, calibration, enables gas to be applied to the sensor to calibrate the unit. Finally, a set-up mode allows the user to review or change setup options such as relay settings, sensor range, and ModBus parameters.

Selecting Setup Mode on the Ultima MOS-5 Intelligent Sensor is accomplished by using the magnetic switch, HART or ModBus command.



Features and Benefits

Event logging stores fault, gas check, calibration, and alarm event history

4-20mA output is the industry standard for remote alarm and fault indication

HART and ModBus communication provides complete status and control capability in the control room

Detection ranges: 0-20 ppm, 0-50 ppm and 0-100 ppm enable a wide range of applications

Warning, Alarm & Fault Relays provide local alarm capability

Calibration, Calibration Check, and Set-up Modes simplify operation and maintenance

Remaining Sensor Life Indication reduces downtime by providing an estimate of remaining sensor life

Wireless capability is compatible with ELPRO Technologies wireless devices

Options / Adjustable Features

- Sensor range (0-20 ppm, 0-50 ppm, 0-100 ppm)
- Energized/de-energized relays
- Latching/non-latching relays
- Alarm setpoints for relays
- Baud rate, data format, and address for each ModBus channel

System Specifications

Sensor Type	Continuous diffusion, adsorption type Metal Oxide Semiconductor (MOS)
Sensor Life	3 to 5 years typical
Repeatability	±2 ppm or 10% of the applied gas, whichever is greater
Response Time	T ₅₀ : 5-10 seconds (nominal) of full scale with full scale gas applied.
Measuring Ranges	0-20 ppm, 0-50 ppm, 0-100 ppm
Modes	Calibration, calibration check, setup, operating
Electrical Classification	CSA/FM Class I, Division 1, Groups B, C & D; Class I, Zone 1 IIB+H ₂ , T6. Type 4X (Tamb = -40°C to +60°C) ATEX EEx d IIB+H ₂ , T5 II2G, IP66 (Tamb = -40°C to +70°C)
Warranty	Two years
Approvals	ATEX, CSA, FM, CE Marking, HART registered, SIL 2 and 3 suitable*, FM certified to IEC 61508
Standard Part Number	MOS5-10011 0-100 ppm H ₂ S, 4-20 mA output, w/o relays or ModBus; FM, CSA & ATEX approvals

Environmental Specifications

Operating Temperature Range	Electronics -40°F to 167°F (-40°C to 75°C) Std. Sensor (FM) -40°F to 167°F (-40°C to 75°C) Std. Sensor (ATEX) -40°F to 158°F (-40°C to 70°C)
Storage Temperature Range	-58°F to 185°F (-50°C to 85°C)
Operating Humidity Range	5% to 100% RH, non-condensing

Mechanical Specifications

Length	6.4 inches (161mm)
Height	3.4 inches (86mm)
Width	4.1 inches (104mm)
Weight	5.5 lbs. (2.5 kg)
Mounting Holes	5.0 inches (127mm) (center to center)

Electrical Specifications

Input Power	24 VDC nominal, 20 to 36 VDC 350 mA max.
Relay Ratings (optional)	8A @ 250 VAC / 8A @ 30 VDC res. max. (3x) SPDT - Warning, Alarm & Fault
Analog Signal	0-20 mA (650 Ohms max. load) Malfunction 0 mA** Gas Check/Cal 1.5 mA*** Setup mode 1.5 mA*** Zero reading 4 mA+0.2 mA 0-100% scale 4-20 mA Over-range 20-22 mA
RFI/EMI Protection	Complies with EN50270, EN61000-3-2, EN61000-3-3
Status Indicators	Three-digit LED display with gas concentration, Warn and Alarm LEDs, calibration prompts, fault codes, and setup options
RS-485 Output (optional)	ModBus RTU, suitable for linking up to 128 units or up to 247 units with repeaters
Baud Rate	2400, 4800, 9600, or 19200 BPS
HART (optional)	HART 6, HART Device Description Language available. AMSAware
Wireless Communication	Available with ELPRO Technologies wireless devices
Faults Monitored	Calibration error, sensor heater error, low DC supply, EEPROM, EPROM, setup error, gas check time exceeded, switch input error, internal errors
Cable Requirements	3-wire shielded cable. Max. distance between Ultima MOS-5 Sensor and power source or remote sensor @ 24 VDC nominal (20 Ohm loop): 14 AWG - 2240 ft. (824 m) Max. distance for analog output (600 Ohms max): 14 AWG - 8000 ft. (2400 m)

* Use in typical environments has a lower safety rating than in clean environments

** Under HART, current values can be either 3.5 mA or 1.25 mA, depending on user selection

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Note: This bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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