Model **S4000TH**

Intelligent Sensor for H_2S Gas Detection

General Monitors

Features & Benefits

- Event logging stores fault, gas check, calibration, and alarm event history
- Industry standard 4-20mA output 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, 0-100 ppm) allow wide range of applications
- Warning, alarm & fault relays provide local alarm capability
- Calibration, calibration check, and set-up mode simplify operation and maintenance
- Remaining sensor life indication reduces downtime

Description

The S4000TH Intelligent Sensor is a microprocessor-based transmitter designed for use with General Monitors' Metal Oxide Semiconductor (MOS) sensor. This unit features one person calibration and can virtually self-calibrate by simply activating a magnetic switch and applying gas. It is designed to detect hydrogen sulfide in parts per million (ppm) levels and provide status indication and alarm outputs.

All of the S4000TH 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 S4000TH 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 S4000TH 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 S4000TH has four different operating modes. First, 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. Second, the gas check mode that allows the user to apply gas and check the sensor response while alarm outputs are inhibited. Third, a calibration mode in which gas is applied to the sensor to calibrate the unit. Finally, a set-up mode which allows the user to review or change setup options such as relay settings, sensor range, and Modbus parameters. Selecting Setup Mode on the S4000TH is accomplished by using the magnetic switch, HART or Modbus command.

Options

- Gas 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

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General Monitors by MSA

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	T50 < 14 seconds (screen) T50 < 30 seconds (sintered) with full scale gas applied according to ISA 92.0.01
MEASURING RANGES	0-20 ppm, 0-50 ppm, 0-100 ppm
MODES	Calibration, calibration check, setup
CLASSIFICATION CSA/FM	Class I, Division 1, Groups B, C & D; T6 (Tamb = -40°C to +75°C)-CSA (Tamb = -40°C to +60°C)-FM
CSA	Ex db IIB + H2 T4 Gb (Tamb=-40°C to +70°C); Ex tb IIIC T135°C Db
ATEX/IECEX	II 2 GD Ex db IIB+H_2, T4 Gb, Ex tb IIIC T135°C Db (Tamb = -40°C to +70°C)
WARRANTY	Two years
APPROVALS	ATEX, CSA, FM, IECEx, EAC, CE Mark, HART registered, SIL 2 and 3 suitable*, FM certified to IEC 61508

Environmental Specifications	
OPERATING TEMPERATURE RANGE (ELECTRONICS)	-40°F to 167°F (-40°C to 75°C) - CSA (div.) -40°F to 158°F (-40°C to +70°C) - CSA (zone) -40°F to 140°F (-40°C to +60°C) - FM -40°F to 158°F (-40°C to +70°C) - ATEX/IECEx
STORAGE TEMPERATURE RANGE	-58°F to 185°F (-50°C to 85°C)
OPERATING HUMIDITY RANGE	0% to 95% RH, non-condensing

Mechanical Specifications	
LENGTH	6.4 inches (161 mm)
HEIGHT	3.4 inches (86 mm)
WIDTH	4.1 inches (104 mm)
WEIGHT	5.5 lbs. (2.5 kg) - AL, 14.0 lbs. (6.4kg) - SS
MOUNTING HOLES	5.0 inches (127 mm) (center to center)
HOUSING	Aluminum 6061-T6 alloy (cover), A356-T6 alloy (base) or 316 Stainless Steel

Electrical Specifications	
INPUT POWER	24 VDC nominal, 20 to 36 VDC 350 mA max.
POWER CONSUMPTION	270 mA (start-up) 120 mA (normal)
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/Calibrate 1.5 mA*** Setup mode 1.5 mA*** Start-up 3.5 mA Zero reading 4 mA ± 0.2 mA 0-100% FS 4-20 mA Over-range 20-22 mA
EMC PROTECTION	Complies with EN 50270, EN 61000-6-4
STATUS INDICATORS	Three-digit LED display with gas concentration, Warn and Alarm LED's, calibration prompts, fault codes, and setup options
RS-485 OUTPUT *OPTIONAL*	Dual redundant 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*	RX 100K, CS 5nF
FAULTS MONITORED	Calibration error, sensor heater error, low DC supply, EEPROM, EPROM, setup error, gas check time exceeded, switch error, magnet errors
CABLE REQUIREMENTS	3 wire shielded cable. Max. distance between S4000TH 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)
STANDARD CONFIGURATION	**S4000TH-1-0-01-1** (4-20 mA, P/N 50445-1, 0-100 ppm aluminum sensor, aluminum housing, push terminals)

** 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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