Model **S4000CH**

Intelligent Sensor for Combustible Gas Detection

General Monitors

Features & Benefits

- Fully automatic calibration available with Automatic Remote Gas Calibrator (ARGC)
- Event logging stores fault, gas check, calibration, and alarm event history.
- HART and Modbus communication provides complete status and control capability in the control room.
- Industry standard 4-20 mA output for remote alarm and fault indication.
- Warning, alarm and fault relays provide local alarm capability.
- Calibration, calibration check and setup modes simplify operation and maintenance.
- Remaining sensor life indication reduces downtime by providing estimate of remaining sensor life.

Description

The General Monitors S4000CH Intelligent Sensor is a microprocessor-based transmitter designed for use with General Monitors' catalytic bead sensors. The unit features one-person calibration and can virtually self-calibrate by simply activating a magnetic switch and applying gas. It is designed to monitor combustible gases and vapors within the lower explosive limit (LEL) and provide status indication and alarm outputs.

All S4000CH electronics are contained within an explosion-proof housing so that sensor information can be processed at the sensor site. The detector uses a 4-20 mA analog output signal that is proportional to 0 to 100% LEL gas concentration at the sensor. In addition, the S4000CH includes warning, alarm, and fault relay contacts that can be used to indicate an alarm or fault condition and dual redundant Modbus or HART communication. Configurations with relays, Modbus, and HART are available to meet many needs.

The S4000CH also includes a three-digit LED display. This local display continuously indicates gas concentrations during normal operation or in Gas Check Mode, calibration prompts during Calibration Mode, display codes during Setup Mode, and eight fault codes.

The S4000CH has four operating modes.

1. Normal operating mode in which alarms are active and the display and 4-20 mA readings are proportional to gas concentration at the sensor.
2. Gas check mode that allows users to apply gas and check sensor response while alarm outputs are inhibited.
3. Calibration mode in which gas is applied to the sensor to calibrate the unit.
4. Setup mode that allows users to review or change setup options such as relay settings, calibration level, and Modbus parameters. Selecting Setup Mode on the S4000CH is accomplished by using the magnetic switch or HART or Modbus command. Options include:
    - Calibration level
    - Energized/de-energized relays
    - Latching/non-latching relays
    - Alarm set points 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, low temperature catalytic bead
SENSOR LIFE	3 to 5 years
ACCURACY	±3% LEL up to 50% LEL ±5% LEL ≥ 51% LEL
ZERO DRIFT	Less than 5% of full scale per year
RESPONSE TIME	T50 <10 s, T90 <30 s with 100% LEL methane applied
MEASURING RANGES	0-100% LEL
MODES	Calibration, gas check, setup
APPROVALS CLASSIFICATION CSA/FM ATEX/IECEx	 Class I, Division 1, Groups B, C & D; T6 (Tamb = -40°C to +75°C) Ex db IIB + H_2 T4 GB (Tamb = -40°C to +70°C) 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	CSA, FM, ATEX, IECEx, MED, DNV GL, Inmetro, EAC, PESO, CE marking. Complies with ANSI/ISA 12.13.01-2000 and EN 60079-29-1, HART registered, SIL 2 / 3 suitable (FM)

Environmental Specifications	
OPERATING TEMPERATURE RANGE ELECTRONICS STANDARD SENSOR HIGH TEMP SENSOR	 -40°F to 167°F (-40°C to 75°C) - CSA/FM -40°F to 158°F (-40°C to 70°C) - ATEX/IECEx -40°F to 200°F (-40°C to 93°C) -40°F to 392°F (-40°C to 200°C)
STORAGE TEMPERATURE RANGE	-58°F to 185°F (-50°C to 85°C)
OPERATING HUMIDITY RANGE	0% to 95% RH, non-condensing

† Under HART, current values can be either 3.5 mA or 1.25 mA, depending on user selection.
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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 alloy or stainless steel

Electrical Specifications	
INPUT POWER	24 VDC nominal, 20 to 36 VDC 250 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/Calibrate 1.5 mA‡ Setup mode 1.5 mA‡ Zero reading 4 mA ± .05 mA 0-100% LEL 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 with block and single data transfer modes
BAUD RATE	2400, 4800, 9600, or 19200 BPS
HART *OPTIONAL*	HART 6, HART Device Description Language available. AMS Aware
FAULTS MONITORED	Calibration error, sensor error, low DC supply, EEPROM, EPROM, setup error, gas check time exceeded, switch error, ARGC, internal error
CABLE REQUIREMENTS	Three-wire shielded cable. Max. distance between S4000CH and power source @ 24 VDC nominal (20-Ohm loop): 14 AWG - 2303 ft (702 m) Max. distance for analog output (650 Ohms max): 14 AWG - 9000 ft (2740 m)
STANDARD CONFIGURATION	**S4000CH-1-0-01-1** 4-20 mA, standard aluminum sensor, aluminum housing

ID 1465-03-MC / February 2017

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