

SMC 4501-XX Toxic Gas Detector

The SMC 4501-XX Series Toxic Gas 2-wire gas sensor modules allow easy direct connection to many DCS, PLC and other control devices. The gas sensor is best in class for ease of installation, reliable operation, ease of use with 180 day calibration cycle, low cost of operation.

- Industry's longest calibration interval of 180 days
- 2-wire loop powered for easy installation and direct interface to common PLC and DCS
- Integral scrolling LCD 2-line, 16 character display
- Non-intrusive one-person calibration
- 316 Stainless Steel or Aluminum enclosure
- 4-20 mA output
- Long sensor life
- Robust RFI immunity
- Ability to rotate face plate to enable the enclosure to be mounted in any orientation



The SMC 4501-XX Gas Detector utilizes the electrochemical cell to monitor for the specified gas over various gas specific ranges. This compact detector requires minimal maintenance. Internal continuous self-diagnostics will automatically indicate any fault problems. The SMC 4501-XX is best in class providing all the built-in features desired by instrumentation and safety professionals.

How it Works

Electrochemical sensors are fuel cell-like devices consisting of an anode, cathode, and electrolyte. The components of the cell are selected so a subject gas, allowed to diffuse into the cell, will cause a chemical reaction and generate a current. The cells are diffusion limited so the rate the gas enters the cell is solely dependent on the gas concentration. The current generated is proportional to the rate of consumption of the subject gas in the cell.

The SMC electrochemical sensors provide improved reliability by allowing the gas to diffuse into the sensor through a capillary port, rather than diffusing through membranes. The result is an extremely stable sensor with very low temperature and pressure coefficients and the capability to monitor gas as ppm (toxics).

SMC 4501 Series Sensors	
4501-03	Oxygen, O ₂
4501-04	Carbon Monoxide, CO
4501-05	Hydrogen Sulfide, H ₂ S
4501-06	Chlorine, Cl ₂
4501-08	Chlorine Dioxide, ClO ₂
4501-10	Sulfur Dioxide, SO ₂
4501-12	Nitrogen Dioxide, NO ₂
4501-25	Ammonia, NH ₃
4501-26	Hydrogen Fluoride, HF
4501-27	Ethylene Oxide, ETO

Gas Type	Model	Std. Range ⁽¹⁾	Opt. Max Range	Resolution	Response Time ⁽²⁾	Sensor Life	Operating Range ⁽¹⁾		
							°F	°C	RH*
Oxygen	4501-03	0-25 %Vol	25 %Vol	0.2%	<10 sec.	20 Months	- 4 to 122	-20 to 50	15 – 90%
Carbon Monoxide	4501-04	0-1500 PPM	1200 PPM	0.5 PPM	<25 sec.	2 Years	- 4 to 122	-20 to 50	15 – 90%
Hydrogen Sulfide	4501-05	0-100 PPM	100 PPM	0.1 PPM	<30 sec.	2 Years	- 40 to 122	-40 to 50	15 – 90%
Chlorine	4501-06	0-10 PPM	10.0 PPM	0.1 PPM	<60 sec.	2 Years	- 4 to 122	-20 to 50	15 – 90%
Chlorine Dioxide	4501-08	0-3 PPM	3.0 PPM	0.1 PPM	<60 sec.	2 Years	- 4 to 122	-20 to 50	15 – 90%
Sulfur Dioxide	4501-10	0-100 PPM	100 PPM	0.5 PPM	<20 sec.	2 Years	- 4 to 122	-20 to 50	15 – 90%
Nitrogen Dioxide	4501-12	0-20 PPM	20.0 PPM	0.2 PPM	<35 sec.	2 Years	- 4 to 122	-20 to 50	15 – 90%
Ammonia	4501-25	0-100 PPM	20.0 PPM	1.0 PPM	<30 sec.	(3)	+14 to 113	-10 to 45	20 – 95%
Hydrogen Fluoride	4501-26	0-10 PPM	10 PPM	1.0 PPM	<90 sec.	(3)	+14 to 113	-10 to 45	20 – 95%
Ethylene Oxide	4501-27	0-20 PPM	20 PPM	0.1 PPM	<90 sec.	2 Years	- 4 to 122	-20 to 50	15 – 90%

⁽¹⁾ Optional ranges and temperatures available

⁽²⁾ Response time to 90% full signal value for applied concentration

* = Non-Condensing

⁽³⁾ Ammonia and HF sensors require periodic electrolyte recharge

SMC 4501-XX Specifications

Output

Display: LCD, 2-line, 16-characters

Signal Output: 2-wire sensor powered analog 4-20mA

(Trouble: 3.6mA)

Loop Resistance: 800 ohm

Electrical Data

Power consumption: 0.2 watts

Connection type: 2-wire, loop-powered

Input voltage: 24VDC nominal: 14-30VDC

RF/EMI Protection: EN50081-2, EN50082-2

Construction

Dimensions: (HxWxD)

7.0 x 3.6 x 4.0 in. (17.8 x 9.1 x 11.2 cm.)

4501-25/26 8.4 x 4.4 x 3.9 in. (21.3 x 11.2 x 9.9 cm.)

Weight: 2.2 lb. (1.0 Kg) Al or 4.6 lb. (2.1 Kg) AL

4501-25/26 3.0 lb. (1.3 Kg) Al or 5.0 lb. (2.3 Kg) SS

Enclosure: Aluminum, Stainless Steel

Operating Range

Ambient Temp Range:

Standard -4° to 122°F (-20° to 50°C)

4501-25/26 14° to 113°F (-10° to 45°C)

Extended Temp: Sensor and 4-20 mA will continue

To operate to -40°F (-40°C) but

the LCD display will decay over

time if exposed to temperatures

below -4o (-20oC) for significant

time (not for 4501-25).

Storage Temp: -4° to 122°F (-40° to 50°C)

Relative Humidity:

Standard 15-90% Non-Condensing

4501-25/26 20-90% Non-Condensing

2 Year Warranty

Approvals

Hazardous Location: Explosion proof, NEMA 4X

FM: Class I, Div. I, Groups B, C, D

Class II, Div. I, Groups E, F, G

CSA: Class I, Div. I, Groups B, C, D

Class II, Div. I, Groups E, F, G

CQST: Certificate for China (4501-05)

4501-05 FM Performance Approval: 4501-05 Approval

FM ISA: 92.0.01, Part I-1998 and FM 3600

ATEX (4501-05): II 2G, Ex d IIB + H2 T6 TA = -22°C to 50°C

IECEX (4501-05): Certificate of Approval



Accessories

High Capacity Calibration Accessories

1250-01	Gas Sensor Calibration Kit, Type A (CO, H2S)
1250-02	Gas Sensor Calibration Kit, Type B (SO2, NO2)
1250-03	Gas Sensor Calibration Kit, Type C (Cl2, ClO2)
1260-00	Gas Cylinder, Air (Type A) 105 liters
1260-04	Gas Cylinder, Carbon Monoxide, 100 ppm, Type A
1260-05	Gas Cylinder, H2S in N2, 25 ppm Type A
1260-06	Gas Cylinder, Chlorine, 5 ppm, Type C
1260-10	Gas Cylinder, Sulfur Dioxide, 50 ppm, Type B
1260-12	Gas Cylinder, Nitrogen Dioxide, 10 ppm, Type B
1260-13	Gas Cylinder, Carbon Monoxide, 1000 ppm, Type A
1260-45	Gas Cylinder, H2S in N2, 10 ppm, Type A
9210-00	Calibrator, Permeation tube
9211-09	Permeation Tube, Ammonia, NH3
SPX 27057	Kit, Sensor Recharge, for 4501-25

Accessories

5311-00	Rainshield
5311-02	Rainshield with calibration port
Calibration Accessories	
5358-01	Calibration Adapter, Standard
5360-00	Calibration Gas Delivery Fitting
5358-51	Calibration/Configuration Magnetic Tool, 4501-XX

Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice.

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