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# Specification

## Toxic Gas Detector Series HVS400 (Satellite) for Chlorine and Sulfur Dioxide Hazardous Gas Detection

### 1. Scope

This specification describes the Series HVS 400 (Satellite) Gas Detector for the detection of toxic gas like Chlorine and Sulfur Dioxide provided by Halogen Valve Systems, Inc. This system is designed for installation in conjunction with electronic interpretive systems (provided by others) that accept a 4-20mA signal and provide information for equipment that will remediate the problem or activate an Gas Shutoff System.

### 2. Description

The Satellite HVS400 Toxic Gas Detector is suitable for use in general purpose and hazardous areas as a unitized, entity-approved intrinsically safe device (when used with the appropriate I.S. barriers) with all transmitter electronics in a small, corrosion-resistant plastic housing. The electrochemical cell shall utilize a plug-in type connection, which allows for field replacement without area de-classification.

The transmitter shall be suitable for one-person adjustment-free calibration utilizing a magnet to initiate the calibration sequence. The detector shall be provided with an integral liquid crystal display with calibration & status prompts. The detector shall be capable of calibration, fail-to-zero, calibration fail-to-span, calibration incomplete, sensor absence, system faults and open sensor cells. The detector repeatability shall be  $\pm 2\%$  of full scale.

The detector shall be approved for operation in Class I, Div. 1, Groups A, B, C & D; Class II, Groups E, F, & G; Class III EEx ia IIC T6, IP67, Type 4X. The unit shall be approved by the CSA, UL, CUL, CENELEC and have CE Marking.

### 3. Detector Components

#### 3.1 Microprocessor

Microprocessor-based electronics monitors for fault conditions, processes input signals for the sensor and provides outputs in the form of display codes and an analog signal.

#### 3.2 One person - Calibration

Adjustment-free calibration can be initiated by use of a donut shaped magnet. After application of the calibrating gas the display will indicate the unit has completed the calibration. No user adjustments are required to complete the task.

#### 3.3 Two Segment LCD

The LCD readout element on the face of the corrosion resistant housing indicates gas present, operational modes fault codes and calibration cues.

#### 3.4 4 to 20mA Output

The 4 to 20mA output transmits fault, calibration and gas concentration levels to a remote display, computer or other device.

#### 3.5 Plug-in Sensors

The HVS400 uses a three-electrode electrochemical cell mated with a sensor identification board to provide a stable and accurate gas detector reading. The gas diffusing into the cell reacts at the sensing electrode by reduction or oxidation depending on the sensor type. The corresponding reaction causes the sensor to detect the gas and provide the appropriate signal.

## 4. Environmental Design

This unit shall be capable of operating within a temperature range of -4°F to 122°F (-20°C to 50°C). Ammonia operating specifications are -4°F to +104°F (-20°C to +40°C). The unit shall operate within a humidity range of 15% to 90% relative humidity, non-condensing and a pressure range of +/- 10% atmospheric.

## 5. Electrical Design

### 5.1 Control Circuitry

The unit shall be 2-wire loop powered with a voltage range of 10-35 VDC. (A third wire is provided for ground.) The output signal shall be an analog signal with a range of 0 to 22 mA and a maximum load rating of 600 ohms. The unit shall be capable of receiving power through a cable up to 8000 feet.

### 5.2 Output signals

Fault Signal	3.5mA
Start-up	3.6mA
Calibration	3.75mA
0-100 FS	4-20mA
Over-range	22mA

The HVS400 also complies with EN50081-2 and EN50082-2 for EMI/RFI protection.

### 5.3 Typical Sensor Configuration

HVS400-02-0-02	Chlorine Sensor (0-10 ppm) with no junction box housing. (Sensor only)
HVS400-02-2-02	Chlorine Sensor (0-10 ppm) with junction box sensor housing.

## 6. Detector Specifications

The HVS400 for each gas listed below shall meet the following Gas Detection Performance:

<u>Gas Name</u>	<u>Formula</u>	<u>Range-ppm</u>	<u>Time-sec.</u>
Ammonia	NH <sub>3</sub>	0-50/100	T90<120
Chlorine	Cl <sub>2</sub>	0-10	T90<60
Carbon Monoxide	CO	0-100	T90<30
		0-500	T90<30
Ozone	O <sub>3</sub>	0-1	T90<90
Sulfur Dioxide	SO <sub>2</sub>	0-20	T90<10
Chlorine Dioxide	ClO <sub>2</sub>	0-3	T90<60

## 7. Accessories

Optional accessories for each HVS400 Gas Detector shall include (1) Junction Box, (2) Splashguard, (3) Flow Plug Assembly and Calibration cup.

## 8. Warranty

This system shall have a two-year warranty on the electronics, one-year electrochemical cell sensing element. The manufacturer shall warrant this system to be free from defects in workmanship and material under normal use and service within the warranty period from the date of shipment.