

**Phosphine  
Gas Detection Sensor Specification  
Detcon Model DM-700-PH3**

The Gas Detection Sensor Assembly shall be designed and constructed to provide maximum reliability and a high level of safety integrity when operating in the harshest of environments.

**General Description**

The method of detection shall be Electrochemical Cell with a proven service life in harsh locations and shall be supported by a 1 1/2-years warranty. The electrochemical cell shall be plug-in style and shall include an integral intelligent digital interface that provides for seamless interchangeability between Intelligent Transmitter Modules. The Intelligent Transmitter Module shall be a universal design that adapts to any sensor type or range and shall be supported by a 2-year warranty. Sensor range change shall be implementable directly through the user interface. The sensor design shall incorporate an internal intrinsically safe barrier circuit which eliminates the requirement for a flame arrestor and allows for direct sample contact with the sensing element. The sensor shall provide an industry standard 4-20 mA output and a serial communication interface utilizing the MODBUS RTU protocol via RS-485 connection. The analog and serial data shall be available simultaneously. The user interface shall be non-intrusive and conducted via magnetic tool action. Calibration, configuration, test, and verification features shall be provided via this interface. A user initiated full-scale signal output simulation shall be provided for system integrity checking. A four character LED display shall be used to display all functional data via scrolling plain language messages. The display shall be clearly visible in all ambient light conditions. Sensor element replacement shall be accomplished without removal of power via plug-in modules utilizing heavy duty gold-plated pins.

**Performance Characteristics**

Range of sensitivity shall be 5 PPM. The gas detection sensor shall have a response time of T-90 <30 seconds. Accuracy shall be  $\pm 2\%$  of Full Scale. The output signal shall be linear. The continuous operating temperature range shall be  $-20^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ . The continuous operating humidity range shall be 20-95% relative humidity, non-condensing.

**Fail-Safe Fault Diagnostics**

The Gas Detection Sensor Assembly shall feature pre-emptive fail-safe fault diagnostics including input voltage range, operating temperature range, 4-20 mA loop integrity, sensor integrity, transmitter integrity, sensor life expectancy, missing sensor, and autospan reminder. The mA output signal shall include 0 mA = Fault, 2 mA = In-Cal, and 22 mA = Over-Range.

**Environmental Protection**

The Gas Detection Sensor Assembly shall be constructed of electro-polished 316 stainless steel. The electronics shall be totally encapsulated in order to provide water proofing, corrosion proofing, and vibration proofing. Plug-in sensor interfaces shall be heavy duty gold-plated pins.

**Design Criteria, Electrical Certifications**

The Gas Detection Sensor Assembly shall be designed in accordance with Safety Integrity Level requirements as detailed in IEC 61508 and IEC 61511. The Gas Detection Sensor Assembly shall be CSA-NRTL and ATEX certified for use in hazardous locations: Class I, Division 1, Groups B, C, D and Class I, Zone 1, Group IIC.