



Model DM-100-PH3

Phosphine Sensor

GAS DETECTION SENSORS ■ INTEGRATED CONTROL SYSTEMS ■ SMARTWIRELESS® ■ PIPELINE ANALYZERS ■ ALARMS

Description

Detcon Model DM-100-PH3 is a gas detection sensor designed to detect and monitor Phosphine in air over the range of 0-5 ppm using electrochemical sensor technology. Method of detection is by diffusion adsorption. Air and gas molecules diffuse through a porous membrane contacting an electrolyte solution which creates a change in electrical conductance between a reference and measure electrode. This change in conductance is conditioned by internal electronic circuitry to provide a linear 4-20 milliamp signal proportional to the gas concentration.

Model DM-100 Series sensors feature intelligent electronics, non-intrusive operator interface and comprehensive fault diagnostics. The sensor is packaged in an electro-polished 316 stainless steel housing fitted with a 3/4 inch NPT thread. The plug-in, field replaceable sensor cell features large surface area gold-plated pins that reduce the effects of corrosion in harsh industrial environments. Signal conditioning electronics are completely encapsulated in the sensor housing adding a high level of durability to the design. The packaging is XP-intrinsically safe. This innovative design marks a return to a simple, more affordable, and durable gas detection sensor without compromising quality.

Model DM-100 sensors provide a 2-wire loop powered 4-20 mA current signal equivalent to the sensor range of detection. Upper enclosure options are aluminum and stainless steel (includes a transient protection terminal board). Additional accessories include wireless communications, a loop powered digital display, Remote Alarm Module (RAM), HART, and a current to RS-485 converter. The standard serial converter is Modbus RTU. Each sensor is shipped with a splash guard with integral calibration port. Detcon's toxic gas sensors have a long shelf life and are supported by an industry-leading warranty.

Features

- ▶ XP-intrinsically Safe
- ▶ NEMA 4X Weatherproof & NEMA 7 Explosion Proof
- ▶ Class I, Div. 1, Groups A, B, C, & D
- ▶ 2 Wire Loop-powered
- ▶ Field Replaceable Electrochemical Sensor
- ▶ Non-intrusive Magnetic Interface
- ▶ Built-in Diagnostics
- ▶ Fully Encapsulated Electronics
- ▶ Electropolished 316SS Construction
- ▶ Quick Thread Release (for sensor replacement)
- ▶ Integral Calibration Port

Applications

- ▶ Oil & Gas
- ▶ Chemical Plants
- ▶ Food and Beverage
- ▶ Steel Mills
- ▶ Pulp and Paper
- ▶ Refineries
- ▶ Wastewater Treatment Plants
- ▶ Utilities



(shown as PN 961-200022-005 in Aluminum j-box with Loop Powered Display)

System Specifications

Sensor Type

Continuous diffusion/adsorption
3-electrode electrochemical cell
Plug-in field replaceable Type

Measurement Range

0-5 ppm, Other ranges available

Accuracy/Repeatability

±2% FS

Response/Clearing Time

T90 <30 seconds

Span Drift

<1% signal loss per month

Outputs

Linear 4-20 mA DC

Electrical Classification

Explosion proof
CSA and US (NRTL)
Class I, Division 1, Groups A, B, C, D (Tamb = -40°C to +50°C)
Class I, Zone 1, Group IIC
ATEX
II 2 G Ex d [ib] ib IIC T4 (Tamb = -40°C to +50°C)
II 1 G Ex ia II C T4 (with IS barrier installed)

Ingress Protection

NEMA 4X, IP66

Safety Approvals

cCSAus
ATEX
CE Marking

Sensor Life/Warranty

Plug-in cell - 1 1/2 years; Transmitter - 2 Years

Environmental Specifications

Operating Temperature Range

-4°F to +104°F; -20°C to +40°C

Storage Temperature Range

-31°F to +131°F; -35°C to +55°C (typical)

Operating Humidity Range

20% to 95% RH non-condensing (continuous)
5%-100% RH (intermittent)

Operating Pressure Range

Atmospheric ±10%

Specifications subject to change without notice

Order Guide

961-200025-005 DM-100-PH3 (no junction box)
961-200021-005 DM-100-PH3 with aluminum j-box
961-200023-005 DM-100-PH3 with 316 SS j-box
961-200022-005 DM-100-PH3 with alum j-box & loop powered display
961-200024-005 DM-100-PH3 with 316 SS j-box & loop powered display

Mechanical Specifications

Dimensions

7"H x 2.2" Dia.; 178mmH x 65mm Dia. (sensor assembly only)
11"H x 6.1"W x 3.75"D; 280mmH x 155mmW x 96mmD (with junction box)
Mechanical Connection:

3/4" male NPT threaded connection with locking nut

Electrical Connection:

Four 18 gauge wire leads - 5.5" long

Mounting holes (with J-box) 5.5" (140mm) center to center

Weight

2 lbs; 0.907kg (sensor only)
6 lbs; 2.72kg (w/aluminum j-box)
9 lbs; 4.08kg (w/stainless steel j-box)

Electrical Specifications

Power Input

10-28 VDC

Power Consumption

Normal operation = 4mA (0.1 watts @ 24VDC)
Maximum = 20mA (0.5 watts @ 24VDC; 0.23 watts @ 11.5VDC)

RFI/EMI Protection

Complies with EN61362

Analog Output

Linear 4-20mA DC (750 ohms max loop load @ 24VDC)

1.2mA All Fault Diagnostics (without display)

3mA All Fault Diagnostics (with display)

4-20mA 0-100% full-scale

22mA Over-range condition

Serial RS-485 Output (optional)

RS-485 Modbus™ RTU

Baud Rate (optional)

9600 BPS (9600,N,8,1 Half Duplex)

Status Indicators

4-digit LED display with gas concentration & fault (optional)

Faults Monitored

Missing Sensor, Zero,
Calibration, Temperature

Cable Requirements

Power/Analog

2-wire shielded cable

Maximum distance is 13,300 feet with 14 AWG

Serial Output (optional)

2-wire twisted-pair shielded cable specifically for use with RS-485 installations

Maximum distance is 4,000 feet to last sensor

I/O Protection

Over-voltage, Miswiring, EMI/RFI Immunity

Accessories

Junction Box (aluminum or 316-SS with Transient Protection Terminal Board)

Loop Powered Digital Display (Provides a Direct Display of Sensor Readings)

Remote Alarm Module (Remote Operation and 2 Alarm Relays plus Fault)

Hart Integration Module (Hart Communication Protocol version 7.0, HART Registered)

Current to RS-485 Converter (Modbus RTU)

Wireless Communications (Detcon Model RXT-320 SmartWireless® Transceivers)

Houston ■ Odessa ■ Shanghai ■ Dammam ■ Del Carmen ■ Europe



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