TELEDYNE DETCON
Everywhereyoulook™

Model 700

Industrial Gas Detection Sensor



Model 700

Description

Model 700 industrial gas detection sensors are a new generation of intelligent sensor modules that incorporate and integrate several leading edge improvements. The sensors are specifically designed for harsh and extreme locations. This new and superior level of environmental durability in sensor design includes an electropolished 316 stainless steel housing, multi-layered transient spike protection circuitry and 100% encapsulated electronics. The sensor electronics are completely protected and immune to water ingress and corrosion. The gas detector sensor elements are all plug-in components and can easily be replaced in the field. Operator interface is non-intrusive via a small hand-held magnet. Configuration and routine calibration is intuitive and menu driven with fully scripted instructions. Sensor status is displayed on a built-in alphanumeric LED display. Model 700 intelligent sensor modules feature dual redundant outputs, a linear 4 - 20 milliamp analog signal and a Modbus RS-485 serial output.

It is becoming increasingly important that safety systems meet the Safety Integrity Level (SIL) requirements of IEC 61511. The SIL rating can only be determine by considering the complete safety system. The Model 700 sensor modules are designed with this in mind and feature a new and unmatched level of pre-emptive fault diagnostics. Application variable like input voltage range, operating temperature range, maintenance schedule, detector reliability and output integrity are all monitored and reported via the 4 - 20 mA and RS - 485 serial output. As a component of a SIL rated system, the Safe Failure Fraction (SFF) of Model 700 sensors are designed to meet the requirements for any SIL 2 rated system.

Model Series 700 sensors utilize six distinctive gas detection technologies to satisfy a wide range of industrial application that require monitoring of oxygen toxic and flammable gases.

Sensors for Hydrogen Sulfide



CHEMFET MOS Solid State Technology
Harsh and Extreme Locations
Wide Temperature & Humidity Range
10-year Sensor Warranty



Electrochemical Technology
Quick Response Time
Long Term Calibration Stability
Low Power Consumption

Sensors for Combustible Gas



Catalytic Technology
Non-selective Combustible Gas Detector
3 to 5 Year Life Expectancy
Rugged Construction



Infrared Technology
Combustible Hydrocarbon Gas Detector
5-Year Warranty
Miniature Plug-in Optical Detector

Sensors for Toxic Gases



Electrochemical Technology
Quick Response Time
Long Term Calibration Stability
Low Power Consumption



Photo Ionization
Universal Non-Selective VOC Sensor
Miniature Plug-in Detector

Oxygen Sensors



Electrochemical Technology
Quick Response Time
Embedded Temperature Compensation
2-year Sensor Warranty

CO2 Sensors



Infrared Technology
CO2 Gas Detector
5-Year Warranty
Miniature Plug-in Optical Detector

Model 700

Anatomy of a Model 700



Junction Box

RS-485 Modbus serial output

Surge Protection Termination Module

Power 11.5 - 28 VDC

4-20 mA output

Fully Encapsulated Circuitry
Eliminates failures due to water ingress, corrosion, and vibration

3/4" NPT Thread

Microprocessor Controlled Circuitry
With advanced level of I/O protection

Electropolished 316SS sensor housing

Viewing Lens and Display
Scrolling alpha-numeric LED display.
Displays reading, status, and supports user interface

Internal Magnetic Programming
Non-intrusive and simplified operator interface via handheld magnet.

Plug-in Replaceable Gas Sensors
Catalytic Bead, IR, Solid State H_2S, Electrochemical, O_2, PID

Corrosion-Resistant Lower Housing
Electropolished 316 SS threaded housing for quick release.

Harsh Environment Splashguard

Integral Calibration Port

Model 700

Technology Features

Environmentally Bulletproof

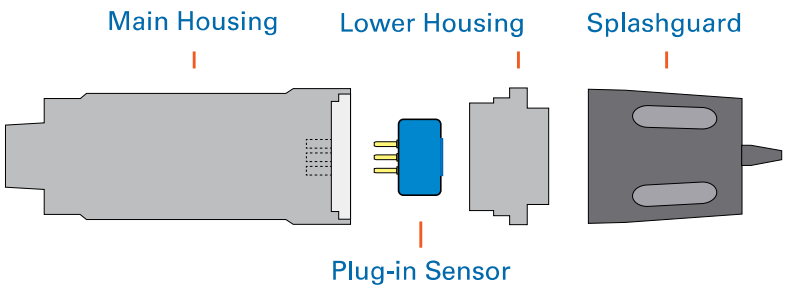
- Electropolished 316SS Construction
- 100% Encapsulated Circuitry
- Bullet-Proof I/O Protection
  - Over-voltage
  - Miswiring
  - EMI/RFI Immunity
- Water-Resistant, Corrosion-Resistant, Vibration-Resistant

Gold Plated
Mating Pins



Modular and Serviceable

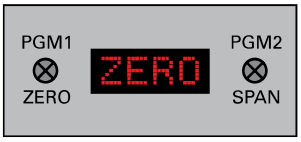
- Modular Design
- Plug and Play Components
- Minimal Spare Parts
  - Universal Design Concept
- Quick Thread Release
  - For Sensor Replacement
- Integral Calibration Port



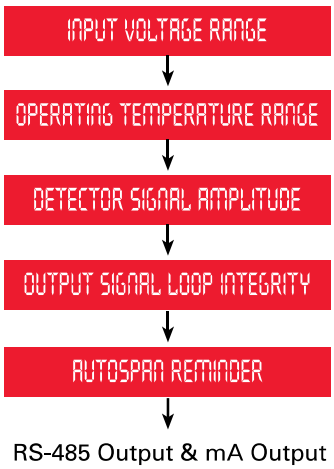
Failsafe User-Friendly Interface

- LED Display
  - With Antiglare Cover
- Full Text Display Method
- Non-intrusive Interface

Scrolling Full Message/Text Display

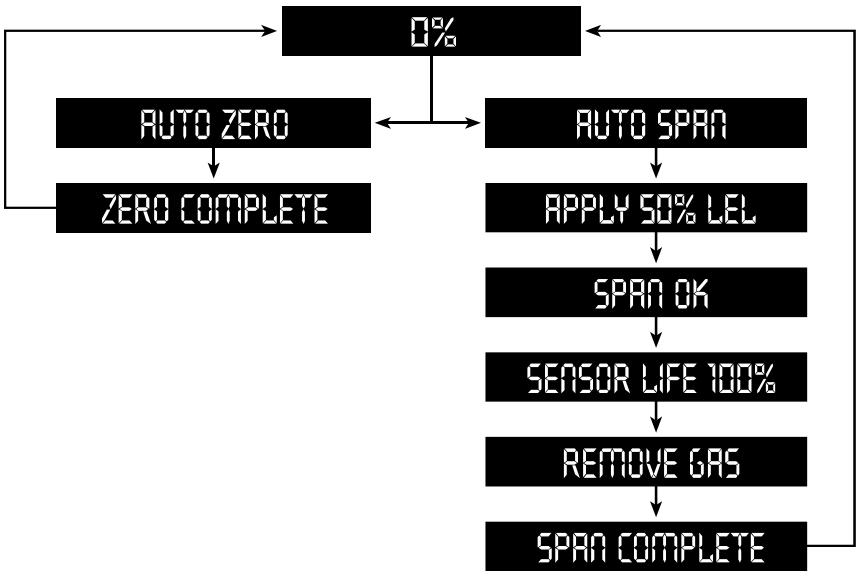


Pre-emptive Fault Diagnostics



RS-485 Output & mA Output

Auto Zero/Auto Span Sequence



Model 700

Specifications

Common Specifications

Input Voltage
11.5 - 2B VDC standard

Power Consumption
<2 watts typical
Outputs
Linear 4 - 20 mA DC
RS - 485 Modbus™ -RTU
Electrical Classification
Explosion Proof
FP - 700, TP - 700, IR - 700 - LEL, IR - 700 - CO2
Class I, Division 1, Groups B, C, D
II 2G Ex d IIB + H2
DM - 700 Toxics, DM - 700 - O2, PI - 700:
Class I, Division 1, Groups B, C, D
II 2G Ex d ib IIB+H2
Safety Approvals
cCSAus
ATEX
INMETRO
CNEX
PESO
ABS
Dimensions
7" High x 2 1/8" Diameter (sensor only)
Weight
2 Lbs
Functional Safety Rating
IEC 61508 SIL2 Certified (IR, TP, FP, DM)
Exida assessed SIL2 (FMEDA)
Performance Approvals
IR - 700, FP - 700 to ISA 12.13.01:2013, CSA #152
TP - 700, DM - 700 to ISA 92.00.01:1998

Technology Specifications

Accuracy/Repeatability
FP - 700: ±3% 0-50% LEL; ±5% 50-100%
TP - 700: ±10% of reading or ±2 ppm (greater of)
DM - 700 - O2: ±2% full scale
IR - 700 - CH: ±3% 0-50% LEL; ±5% 50-100% LEL
IR - 700 - CO2: ±5% full scale
PI - 700: ±10% of reading: ±2.5% of range (greater of)
DM - 700 (toxics): Contact factory for specific gases

Operating Humidity Range (Continuous)
FP - 700: 0-99% RH non-condensing
TP - 700: 15-100% RH non-condensing
DM - 700 - O2: 0-99% RH non-condensing
IR - 700 - CH: 0-99% RH non-condensing
IR - 700 - CO2: 0-99% RH non-condensing
PI - 700: 0-100% non-condensing
DM - 700 (toxics): typically 10-90% RH contact factory for specific gases

Warranty

Teledyne Gas & Flame Detection warrants each new Model 700 Intelligent Transmitter Module to be free from defects in material and workmanship under intended normal us for a period of two years from the date of shipment tot the original purchaser. Teledyne Gas & Flame Detection warrants each new plug-in replacable sensor to be free from defects in material and workmanship under intended normal us for the period described in the table on the left. All warranties are FOB the Teledyne Gas & Flame Detection. Factory located in the Woodlands, Texas, USA.

Model 700

Ordering Information

Combustible Gas Sensor (matched pair catalytic bead)

Model #	Gas/Symbol	Range*	Temperature	Warranty**
FP-700	Combustible Gas	0-100% LEL	-40ºC to + 70ºC	2 Years

Hydrogen Sulfide Gas Sensor (solid state metal oxide semiconductor)

Model #	Gas/Symbol	Range*	Temperature	Warranty**
TP-700	Hydrogen Sulfide/H2S	0-100 ppm	-40ºC to + 70ºC	10 Year conditional

Oxygen Gas Sensor (galvanic metal air battery)

Model #	Gas/Symbol	Range*	Temperature	Warranty**
DM-700-O2	Oxygen/O2	0-25%	-20ºC to + 50ºC	2 Years

Combustible Hydrocarbon & Carbon Dioxide Gas Sensors (non-dispersive infrared optical - PID)

Model #	Gas/Symbol	Range*	Temperature	Warranty**
IR-700-CH	Combustible Hydrocarbons	0-100% LEL	-40ºC to + 70ºC	5 Years Pro-Rated
IR-700-CO2	Carbon Dioxide/ CO2	0-3%	-40ºC to + 70ºC	5 Years Pro-Rated

VOLATILE ORGANIC COMPOUND (VOC) GAS SENSORS (photo ionization detector - PID)

Model #	Gas/Symbol	Range*	Temperature	Warranty**
PI-700-VOC	Volatile Organic Compounds	0-10 ppm	-20ºC to + 50ºC	1 Year
PI-701-VOC	Volatile Organic Compunds	0-1,000 ppm	-20ºC to + 50ºC	1 Year

Toxic Gas Sensors (electrochemical fuel cell)

Model #	Gas/Symbol	Range*	Temperature	Warranty**
DM-700-C2H2	Acetylene/C2H2	0-100 ppm	-20ºC to + 50ºC	2 Years
DM-700-NH3	Ammonia/NH3	0-100 ppm	-20ºC to + 40ºC	2 Years
DM-700-AsH3	Arsina/AsH3	0-1 ppm	-20ºC to + 40ºC	1 1/2 Years
DM-700-Br2	Bromine/Br2	0-5 ppm	-20ºC to + 50ºC	2 Years
DM-700-C4H6	Butadiene/C4H6	0-100 ppm	-20ºC to + 50ºC	2 Years
DM-700-CO	Carbon Monoxide/CO	0-100 ppm	-40ºC to + 50ºC	3 Years
DM-700-Cl2	Chlorine/Cl2	0-10 ppm	-20ºC to + 50ºC	2 Years
DM-701-CLO2	Chlorine Dioxide/ClO2	0-1 ppm	-20ºC to + 50ºC	2 Years
DM-700-B2H6	Diborane/B2H6	0-5 ppm	-20ºC to + 40ºC	1 1/2 Years
DM-700-C2H5OH	Ethanol/C2H5OH	0-100 ppm	-20ºC to + 50ºC	2 Years
DM-700-C2H5SH	Ethyl Mercaptan/C2H5SH	0-100 ppm	-40ºC to + 50ºC	2 Years
DM-700-C2H4	Ethylene/C2H4	0-100 ppm	-20ºC to + 50ºC	2 Years
DM-700-C2H4O	Ethylene Oxide/C2H4O	0-100 ppm	-20ºC to + 50ºC	2 Years
DM-700-F2	Fluorine/F2	0-1 ppm	-10ºC to + 40ºC	1 1/2 Years
DM-700-CH2O	Formaldehyde/CH2O	0-100 ppm	-20ºC to + 50ºC	2 Years
DM-700-GeH4	Germane/GeH4	0-2 ppm	-20ºC to + 40ºC	1 1/2Years

Model 700

Ordering Information

Toxic Gas Sensors (electrochemical fuel cell)

Model #	Gas/Symbol	Range*	Temperature	Warranty**
DM-700-H2	Hydrogen/H2	0-100 ppm	-20ºC to + 50ºC	2 Years
DM-701-H2	Hydrogen/H2	LEL	-40ºC to + 40ºC	2 Years
DM-702-H2	Hydrogen/H2	0-1%	-40ºC to + 40ºC	2 Years
DM-700-HBr	Hydrogen Bromide/HBr	0-30 ppm	-20ºC to + 40ºC	1 1/2 Years
DM-700-HCL	Hydrogen Chloride/HCl	0-30 ppm	-20ºC to + 40ºC	1 1/2 Years
DM-700-HCN	Hydrogen Cyanide/HCN	0-30 ppm	-40ºC to + 40ºC	2 Years
DM-700-HF	Hydrogen Fluoride/HF	0-10 ppm	-20ºC to + 35ºC	1 Year
DM-700-H2S	Hydrogen Sulfide/H2S	0-100 ppm	-40ºC to + 50ºC	2 Years
DM-700-CH3OH	Methanol/CH3OH	0-100 ppm	-20ºC to + 50ºC	2 Years
DM-700-CH3SH	Methyl Mercaptan/CH3SH	0-100 ppm	-40ºC to + 50ºC	2 Years
DM-700-NO	Nitric Oxide/NO	0-100 ppm	-20ºC to + 50ºC	3 Years
DM-700-NO2	Nitrogen Dioxide/NO2	0-10 ppm	-20ºC to + 50ºC	2 Years
DM-700-O3	Ozone/O3	0-1 ppm	-10ºC to + 40ºC	2 Years
DM-700-PH3	Phosphine/PH3	0-5 ppm	-20ºC to + 40ºC	1 1/2 Years
DM-700-SiH4	Silane/SiH4	0-50 ppm	-20ºC to + 40ºC	1 1/2 Years
DM-700-SO2	Sulfur Dioxide/SO2	0-20 ppm	-20ºC to + 50ºC	2 Years

Accessories

Description
Remote Control/Alarm Relay Module in NEMA 7 Junction Box (Aluminum or Stainless Steel)
Hart RAM in NEMA 7 Junction Box (Aluminum or Stainless Steel)
Hart Bridge Module in NEMA 7 Junction Box (Aluminum or Stainless Steel)
Wireless Interface Module in NEMA 7 Junction Box (Aluminum or Stainless Steel)

*Standard Range - contact factory for other ranges. **Replacable plug-in sensor.
Contact the factory for other gases not on this list. Cross sensitivity data available on request.

Teledyne Gas & Flame Detection quality assurance programmes demand the continuous assessment and improvement of all our products. Information in this leaflet could thus change without notification and does not constitute a product specification. For more information, please contact us or your company representative

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