



# Gas & Flame Detection



## 3M™ Detcon™ Model IR-700-CO<sub>2</sub> Carbon Dioxide Sensor

### Description

Detcon Model IR-700-CO<sub>2</sub> is a non-intrusive “Smart” sensor designed to detect and monitor carbon dioxide gas in air using miniature non-dispersive Infrared Optical (NDIR) sensor technology. Available in a low and a high range version, ranges of detection (by volume) are 0-0.3%, 0-1%, 0-3%, 0-5% (low range version) and 0-10%, 0-25%, 0-50%, and 0-100% (high range version). The plug-in, field replaceable detector provides a selective response to CO<sub>2</sub> and features over-sized gold-plated connections that help prevent corrosion. The Model 700’s rugged framework includes an electro-polished 316 stainless steel housing with fully encapsulated electronics and dual layer surge protection. This innovative design virtually eliminates sensor failure due to water ingress, corrosion, vibration, and transient spikes. A primary feature of the Model IR-700-CO<sub>2</sub> is embedded intuitive software that simplifies operator interface by guiding the user through routine calibration, configuration, and fault diagnostic functions using a built-in alpha/numeric display. The Model IR-700-CO<sub>2</sub> is equipped with standard analog 4-20mA, and Modbus™ RS-485 outputs. Among its unique features is a wireless option that can be used with Detcon’s SmartWireless® product line. Additional integration options include a Remote Alarm Module (RAM), HART, and Foundation Fieldbus. Detcon’s carbon dioxide gas sensor has an infinite shelf life and is supported by a 5-year pro-rated warranty.

Scrolling Full Message/Text Display



Non-dispersive Infrared Optical  
(shown as PN 967-424520-005 in SS junction box)



### Applications

- Chemicals
- Pesticides
- Agriculture & Horticulture
- Food & Beverage Bottling Plants
- Sewer Entry
- Waste Water Treatment Plants
- Coal Gasification
- Pulp & Paper Mills
- Enhanced Oil Recovery

### Features

#### Failsafe User-Friendly Interface

- LED Display (With Antiglare Cover)
- Full Text Display Method
- Non-intrusive Interface
- Auto Zero/Auto Span
- Pre-emptive Fault Diagnostics

#### Environmentally Bulletproof

- Electropolished 316SS Construction
- 100% Epoxy Encapsulated Circuitry
- Bulletproof I/O Protection
- Water-Proof, Corrosion-Proof, Vibration-Proof

#### Modular and Serviceable

- Modular Design
- Plug and Play Components
- Quick Thread Release (For Sensor Replacement)
- Integral Calibration Port



# 3M™ Detcon™ Model IR-700-CO<sub>2</sub>

## Carbon Dioxide Sensor

### System Specifications

#### Sensor Type

Continuous diffusion/adsorption  
Non-dispersive Infrared Optical (NDIR) - CO<sub>2</sub>  
Sub-miniature plug-in field replaceable

#### Sensor Life

5 years typical

#### Measurement Range (% by volume)

0-0.3, 0-0.5, 0-1, 0-3, 0-5 (low range version)  
0-10, 0-15, 0-20, 0-25, 0-50, 0-100 (high range version)

#### Accuracy/Repeatability

±5% of range

#### Response Time

T50 < 15 seconds, T90 < 40 seconds

#### Outputs

Linear 4-20 mA DC  
RS-485 MODBUS-RTU

#### Electrical Classification

Explosion proof  
cCSAus  
Class I, Division 1, Groups B, C, D (Tamb = -40°C to +75°C)  
Class I, Zone 1, Group IIB+H2  
ATEX  
II 2 G Ex d IIB + H2 T4 Gb (Tamb = -40°C to +70°C)

#### Ingress Protection

NEMA 4X, IP66

#### Safety Approvals

cCSAus  
ATEX  
CE Marking  
SIL2 Certified to IEC 61508

#### Warranty

Plug-in detector - 5 year pro-rated  
Transmitter - 2 Years

### Environmental Specifications

#### Operating Temperature Range

-40°F to +167°F; -40°C to +75°C

#### Storage Temperature Range

-40°F to +167°F; -40°C to +75°C

#### Operating Humidity Range

0-100% RH non-condensing

*Specifications subject to change without notice*

### 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)  
Mounting holes (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

11-30 VDC

#### Power Consumption

Normal operation = 68mA (<1.7 watt)  
Maximum = 85mA (2 watts)

#### Inrush Current

0.67A @ 24V

#### RFI/EMI Protection

Complies with EN50270

#### Analog Output

Linear 4-20mA DC (1,000 ohms max loop load @ 24VDC)  
0mA All Fault Diagnostics  
2mA In-Calibration  
4-20mA 0-100% full-scale  
22mA Over-range condition

#### Serial RS-485 Output

RS-485 Modbus™ RTU

#### Baud Rate

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

#### Status Indicators

4-digit LED display with gas concentration  
Full-script menu prompts for AutoSpan,  
Set-up Options, and Fault Reporting

#### Faults Monitored

Loop, Input Voltage,  
Zero, Sensor,  
Processor, Memory, Calibration

#### Cable Requirements

Power/Analog  
3-wire shielded cable  
Maximum distance is 13,300 feet with 14 AWG  
Serial Output  
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

### Order Guide

Specify junction box options (below)

PN 967-405520-005 IR-700-CO2 (5% Range) Sensor Assembly (no J-Box)  
PN 967-401520-005 IR-700-CO2 (5% Range) Sensor Assembly with Aluminum J-Box  
PN 967-404520-005 IR-700-CO2 (5% Range) Sensor Assembly with 316 SS J-Box  
PN 967-425520-025 IR-700-CO2 (25% Range) Sensor Assembly (no J-Box)  
PN 967-421520-025 IR-700-CO2 (25% Range) Sensor Assembly with Aluminum J-Box  
PN 967-424520-025 IR-700-CO2 (25% Range) Sensor Assembly with 316 SS J-Box

### Integration Options

Remote Alarm Module (Remote Operation and 2 Alarm Relays plus Fault)  
Hart Integration Module (Hart Communication Protocol version 7.0, HART Registered)

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