INSTALLATIONS
5000 AND 5600 ANALOG GAS TRANSMITTERS

FREEDOM® SERIES
5000 AND 5600 ANALOG GAS TRANSMITTERS
The Freedom series transmitters offer full-featured 4-20mA, loop powered transmitters designed to reliably detect oxygen, hydrogen, and any of a number of other toxic gases. Its universal electronics and flexible, user-friendly features drive down gas detection costs for almost any facility.

Advanced Gas Sensors and Universal Electronics

The Freedom series advanced GasPlus sensor technology combines with the Freedom’s universal electronics to simplify use and minimize maintenance requirements of your gas detection system. Every Scott instruments “smart” sensor provides data such as gas type, range, and calibration data to the universal electronics for automatic transmitter configuration. A built-in lithium battery keeps the sensor “hot,” which eliminates the need for sensor warm-up time. On board electronics enables users to maintain and calibrate the sensor remote from the instrument. A patented elastomeric connector eliminates pin alignments and makes sensor replacement quick and easy.

Easy Installation, Operation and Maintenance

The unique electrical design of the Freedom transmitter and sensor virtually eliminate false alarms due to RFI/EMI sources. The transmitter can be mounted directly to rigid conduit and is available with several optional adapters including wall/surface mount and a special “L” shaped bracket to allow mounting on top of flat surfaces such as gas cabinets. Freedom series transmitters are also available with quick connect 1/4 turn sample draw and (flat or round) duct mount adapters. The sensor can be removed from the transmitter up to 50 feet with or without conduit. A special option allows separation of three feet, perfect for mounting the sensor near ground level while keeping the display at eye level. This option includes flexible conduit.

Operating our Freedom transmitters is simple and intuitive. After start-up, the transmitter automatically configures to the sensors parameters. The “missing sensor indicator” alerts operators that the sensor is either missing or the sensor transmitter connection has been broken.

Calibration is non-intrusive, performed by touching a magnet to the “Z” (zero) and “S” (span) markings on the enclosure. A programmable local inhibit feature and standard local display allows true one-man calibration.

Series 5600 transmitters also offer an optional integral relay board providing fail, low, and high 5A SPDT relay contacts. A remote reset terminal is provided and the high alarm can be configured as acknowledgeable. Relays can be configured to activate on either rising or falling gas concentration.

Explosion-proof Freedom 5600 with Sensor Self Test (SST) option.

Intrinsically safe, the Freedom 5000 is housed in a durable, chemical resistant, stainless steel body.

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FREEDOM™ SERIES 5000

MAKE INSTALLATION AND EVERYDAY OPERATION EASY

Easy Installation, Operation and Maintenance

The unique electrical design of the Freedom transmitter and sensor virtually eliminate false alarms due to RFI/EMI sources. The transmitter can be mounted directly to rigid conduit and is available with several optional adapters including wall/surface mount and a special “L” shaped bracket to allow mounting on top of flat surfaces such as gas cabinets. Freedom series transmitters are also available with quick connect 1/4 turn sample draw and (flat or round) duct mount adapters. The sensor can be remoted from the transmitter up to 50 feet with or without conduit. A special option allows separation of three feet, perfect for mounting the sensor near ground level while keeping the display at eye level. This option includes flexible conduit.

Operating our Freedom transmitters is simple and intuitive. After start-up, the transmitter automatically configures to the sensor’s parameters. The “missing sensor indicator” alerts operators that the sensor is either missing or the sensor transmitter connection has been broken.

Calibration is non-intrusive, performed by touching a magnet to the “Z” (zero) and “S” (span) markings on the enclosure. A programmable local inhibit feature and standard local display allows true one-man calibration.

Series 5600 transmitters also offer an optional integral relay board providing fail, low, and high 5A SPDT relay contacts. A remote reset terminal is provided and the high alarm can be configured as acknowledgeable. Relays can be configured to activate on either rising or falling gas concentration.

Explosively safe, the Freedom 5000 is housed in a durable, chemical resistant, stainless steel body.

SENSOR SELF TEST

Any electrochemical sensor can potentially fail without warning. The Sensor Self Test (SST) option reduces overall maintenance costs by providing users with a means to conduct an automatic functional test of the sensor in wind speeds up to 22 mph. A built-in, programmable gas generator exposes the sensor to a “test gas” at user determined intervals and alerts personnel if the unit fails to respond by pulsing the Fault output for a 10 second interval once a minute. The SST continues to re-test the sensor until a successful functional test has been completed.

Only available for use with certain gas sensors. SST feature not available with flowcell, humi-shield, or duct mount configurations.
Standard Features of the Freedom Series

Freedom from stocking additional electronics. Universal transmitter electronics for all gas models.

Freedom from intrusive operation/calibration. A simple magnetic interface and local inhibit eliminates special tools or expensive IR remote controls.

Freedom from bump testing. Sensor Self Test option automatically challenges sensor with real gas.

Freedom from sensor pins or wires. Patented elastomeric connector makes for quick easy installation.

Freedom from field maintenance and calibration. Smart sensor technology permits sensor removal for remote calibration. Let Scott instruments calibrate your sensors with the CALPLUS sensor calibration program.

Freedom from zero drift or interfering gases. Rock Solid® Sensor Technology offers super stability and selectivity.

Freedom from sensor failure without warning. Built-in calibration factor notifies user of remaining sensor life.

Freedom from RFI/EMI induced alarms. Design concept eliminates interference through electronic design versus shielding.

Freedom from sensor warm-up times. An internal battery keeps the sensor “warm” for immediate start up.

Freedom from corrosion. All plastic (5000) and stainless steel construction with conformal coated internal circuitry.

We Make Sensors that Make a Difference.
Unlike most gas detection companies, Scott develops and manufactures the gas sensors used in its detection instruments. Our team of research and development scientists work every day to advance sensor technologies and improve manufacturing techniques. The result—over 40 reliable, stable, and gas specific sensors including our Rock Solid® series of high performance sensors.

High Performance Gas Sensors
Rock Solid high performance sensors use our proprietary technology that significantly enhances sensor performance. Rock Solid sensors can detect gas concentrations lower than any other electrochemical gas sensor.

Rock Solid sensors provide:
- Highest stability
- Lowest zero drift
- Greatest sensitivity
- Greatest specificity to the target gas
- Fastest speed of response and recovery time

Our advanced electrochemical, high performance Rock Solid sensors for the Freedom Series 5000 are available to detect most toxic gases.

- Ammonia
- Arsine
- Boron Trichloride
- Boron Trifluoride
- Bromine
- Carbon Monoxide
- Chlorine
- Chlorine Dioxide
- Chlorine Trioxide
- Fluorine
- Germane
- Hydrogen
- Hydrogen Bromide
- Hydrogen Chloride
- Hydrogen Cyanide
- Hydrogen Fluoride
- Hydrogen Sulfide
- Methyl
- Methyl Mercaptan
- Methyl Isocyanide
- Nitric Oxide (NO)
- Nitrogen Dioxide
- Oxygen
- Phosgene
- Phosphine
- Silane
- Silicon Tetrafluoride
- Sulfur Dioxide
- TEGS
- Tungsten Hexafluoride
FREEDOM™ SERIES ADVANTAGES
ADVANCED FEATURES AND SMART SENSOR TECHNOLOGY

Standard Features of the Freedom Series

Freedom from stocking additional electronics. Universal transmitter electronics for all gas models.

Freedom from intrusive operation/calibration. A simple magnetic interface and local inhibit eliminates special tools or expensive IR remote controls.

Freedom from bump testing Sensor Self Test option automatically challenges sensor with real gas.

Freedom from sensor pins or wires. Patented elastomeric connector makes for quick easy installation.

Freedom from field maintenance and calibration. Smart sensor technology permits sensor removal for remote calibration. Let Scott instruments calibrate your sensors with the CALPLUS sensor calibration program.

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We Make Sensors that Make a Difference.

Unlike most gas detection companies, Scott develops and manufactures the gas sensors used in its detection instruments. Our team of research and development scientists work every day to advance sensor technologies and improve manufacturing techniques. The result — over 40 reliable, stable, and gas specific sensors including our Rock Solid® series of high performance sensors.

High Performance Gas Sensors

Rock Solid high performance sensors use our proprietary technology that significantly enhances sensor performance. Rock Solid sensors can detect gas concentrations lower than any other electrochemical gas sensor.

High Performance Gas Sensors

Flexible Conduit Remote Sensor Remote Enclosure with SST Option

We Make Sensors that Make a Difference.

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High Performance Gas Sensors

Rock Solid high performance sensors use our proprietary technology that significantly enhances sensor performance. Rock Solid sensors can detect gas concentrations lower than any other electrochemical gas sensor.
Silicon Tetrafluoride (SiF₄)  Rock Solid (0-1, 3, 5) PPM
Methyl Iodide (CH₃I) (0-25) PPM
Methyl Mercaptan (0-3 with filter) PPM
Nitric Oxide (NO) (0-25, 50, 100, 500) PPM
Ozone (O₃) (0-1, 2, 3, 5, 10, 15, 25, 50, 100, 150, 250, 500, 1000) PPM
Chlorine (Cl₂) Rock Solid (0-1, 3, 5, 10, 15, 25, 30, 300, 500) PPM
Chlorine (Cl₂) (0-2, 3, 5, 10, 15, 25, 30, 50, 100) PPM
Chlorine Dioxide Rock Solid (0-1, 3, 5, 10, 15, 25, 30, 50, 100) PPM
Dichlorodichloromethane (Cl₂CCl₂) - Rock Solid HCl sensor
Dichlorosilane (SiH₂Cl₂) - Order Rock Solid HCl sensor
Boron Trifluoride (BF₃) Rock Solid (0-1, 3, 5) PPM
Diborane (B₂H₆) (0-1000 PPB, 2, 10) PPM
Fluorine (F₂) (0-1, 3, 5, 10, 15, 25, 30, 50, 100) PPM
Germane (GeH₄) (0-1000 PPM, 3, 10) PPM
Hydrogen (H₂) (10-1%, 4%, 5%, 10%) PPM
Hydrogen Bromide Rock Solid (0-2, 3, 5, 10, 15, 25, 30, 50) PPM
Hydrogen Chloride Rock Solid (0-3, 5, 10, 15, 25, 30, 50, 100, 200) PPM
Hydrogen Chloride (HCl) (0-30, 50, 100, 200, 500) PPM
Hydrogen Cyanide (HCN) Rock Solid (0-1, 3, 5, 10, 15, 25, 30, 50) PPM
Hydrogen Fluoride (HF) (0-3, 5, 10, 15, 25, 30, 50, 100) PPM
Hydrogen Sulfide (H₂S) (0-30, 50, 100, 200, 500) PPM
Methane (CH₄) (0-500) PPM
Methyl Mercaptan (0-500) PPM
Methyl Ethelene (CH₂=CH₂) (0-500) PPM
Nitrous Oxide (N₂O) (0-25, 50, 100) PPM
Nitrogen Dioxide (NO₂) (0-100, 250, 500, 1000) PPM
Nitrogen Trifluoride (NF₃) (0-100) PPM
Oxygen (O₂) (0-10%, 5%) PPM
Ozone (O₃) (0-1, 2, 3, 5, 10, 15, 25, 30, 50, 100) PPM
Ozone Solid Rock Solid (0-1, 3, 5, 10, 15, 25, 30, 50, 100) PPM
Phosphine (PH₃) (0-1000 PPM, 1, 3) PPM
Phosphorus (P₂O₅) (0-1000 PPM, 1, 3) PPM
Silica (SiO₂) (0-500) PPM
Silicon Tetrafluoride (SiF₄) Rock Solid (0-1, 3, 5) PPM
Sulfur Dioxide (SO₂) Rock Solid (0-1, 3, 5, 10, 15, 25, 50, 100) PPM
Sulfur Dioxide (SO₂) (0-10, 25, 50, 100, 500) PPM
TEOS (Si(OC₂H₅)₄) (0-500) PPM
Tungsten Hexafluoride (WF₆) Rock Solid (0-1, 3, 5) PPM

**FREEDOM 5000 AND 5600 GAS LIST**

**FREEDOM 5000 SENSOR CONNECTIONS AVAILABLE**

Integral Sensor with Transmitter
Separated Sensor with 3 ft of cable (available at 50 ft are available)
Integral Sensor with Transmitter and Sensor Test Self Test
Transmitter with Remote Sensor/Sensor Junction Box
(4:9 Cable Standard/Max. Length 50 ft)
Transmitter with Remote Sensor, SST option and Junction Box
(4:8 Cable Standard/Max. Length 50 ft)
Transmitter with Integral Sensor and Condensing Humidity Sensor Housing
and Humi-Shield End-Cap and Junction Box
(4:8 Cable Standard/Max. Length 50 ft)
Transmitter with Remote Sensor, (No Junction Box) (Max. length 50 ft)

**FREEDOM 5600 ADAPTERS AVAILABLE**

Rain Shield
Flat Duct Adapter
Round Duct Adapter (6 to 8 in diameter typical)
Flow Cell

**FREEDOM 5000 SENSOR SELF TEST OPTIONS**

Type A (Integral Sensor with Transmitter and Sensor Self Test must be ordered)
Type A used with Rock Solid BCL3, BF3, Cl₂, ClO₂, HBr, HCl, HF, Os, SxFs, WFs sensors and conventional Cl₂ sensor.
SST not available with remote sensor, flow cell, humi-shield or duct mount configurations
Type B used with HCl sensor

**FREEDOM 5600 TRANSMITTER MOUNTING ADAPTER**

Wall/Surface Mount
L" bracket used for mounting on horizontal surfaces

**FREEDOM 5000 SENSOR CONNECTIONS AVAILABLE**

Integral Sensor with Transmitter
Integral Sensor with Transmitter and Sensor Test Self Test
Transmitter with Remote Sensor/Sensor Junction Box
(4:9 Cable Standard/Max. Length 50 ft)
Transmitter with Remote Sensor, SST option and Junction Box
(4:8 Cable Standard/Max. Length 50 ft)
Transmitter with Integral Sensor and Condensing Humidity Sensor Housing
and Humi-Shield End-Cap, and Junction Box
(4:8 Cable Standard/Max. Length 50 ft)
Transmitter with Remote Sensor, (No Junction Box) (Max. length 50 ft)

**FREEDOM 5600 ADAPTERS OPTIONS**

Quarter Turn Rain Shield (typical)
Combined Rain Shield/Cal Adapter with Stainless Steel End Cap
(For remote sensor calibration applications)
Quarter Flows
Flat Adapter (for Transmitter with Remote Sensor Only)
Round Duct Adapter (for Transmitter with Remote Sensor Only)

**COMMON SPECIFICATIONS**

Self-Diagnostics
- Weak sensor indication:
  - Electronic missing sensor: Sensor configuration (range and type), and SST failure Output drops to 1 mA in above failures
  - Sensor indication (output unaffected)
- Repeatability
  
- Linearity
  
- Offset
  
- Max. Load
  
- Power
  
- Separated Sensor
  
- Up to 99% RH, non-condensing

**FREEDOM 5000 SPECFICATIONS**

**FREEDOM 5600 SPECFICATIONS**

**FREEDOM 5000 SPECIFICATIONS**

**FREEDOM 5600 SPECIFICATIONS**
<table>
<thead>
<tr>
<th>Gas Name</th>
<th>Description and PPM Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Tetrafluoride (SiF&lt;sub&gt;4&lt;/sub&gt;)</td>
<td>Rock Solid (0-1, 3, 5) PPM</td>
</tr>
<tr>
<td>Methyl Iodide (CH&lt;sub&gt;3&lt;/sub&gt;I)</td>
<td>(0-25) PPM</td>
</tr>
<tr>
<td>Methyl Mercaptan (CH&lt;sub&gt;3&lt;/sub&gt;S)</td>
<td>(0-3 with filter) PPM</td>
</tr>
<tr>
<td>Phosgene (COCl&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(0-1) PPM</td>
</tr>
<tr>
<td>Phosgene with HCN filter (COCl&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(0-2) PPM</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NO&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(0-10, 25, 50, 100, 500, 1000) PPM</td>
</tr>
<tr>
<td>Nitric Oxide (NO)</td>
<td>(0-25, 50, 100, 500, 1000) PPM</td>
</tr>
<tr>
<td>Nitrogen Trifluoride (NF&lt;sub&gt;3&lt;/sub&gt;)</td>
<td>(0-10) PPM</td>
</tr>
<tr>
<td>Ozone (O&lt;sub&gt;3&lt;/sub&gt;)</td>
<td>(0-1, 2, 3, 5, 10, 15, 20, 25, 50, 100, 200, 500) PPM</td>
</tr>
<tr>
<td>Chlorine (Cl&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(Rock Solid: 0-1, 3, 5, 10, 15, 25, 50, 100) PPM</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>(0-50, 100, 150, 200, 250, 500, 1000, 2500, 5000, 10000) PPM</td>
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<tr>
<td>Hydrogen (H&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(0-1%, 4%, 5%, 10%)</td>
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<tr>
<td>Chlorine Dioxide (ClO&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(0-1, 3, 5, 10, 15, 20, 25, 30, 50, 100) PPM</td>
</tr>
<tr>
<td>Diborane (B&lt;sub&gt;2&lt;/sub&gt;H&lt;sub&gt;6&lt;/sub&gt;)</td>
<td>(Rock Solid: 0-1000 PPB, 500 PPB, 2, 3, 5, 10) PPM</td>
</tr>
<tr>
<td>Dichlorosilane (SiH&lt;sub&gt;2&lt;/sub&gt;Cl&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>- Order Rock Solid HCl sensor</td>
</tr>
<tr>
<td>Dichloroethane (CH&lt;sub&gt;2&lt;/sub&gt;Cl&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(0-1000 PPM)</td>
</tr>
<tr>
<td>Dibromochloromethane (CH&lt;sub&gt;2&lt;/sub&gt;BrCl)</td>
<td>(0-1000 PPM)</td>
</tr>
<tr>
<td>Hydrogen Fluoride (HF)</td>
<td>(0-10, 15, 25, 50, 100) PPM</td>
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<tr>
<td>Hydrogen Cyanide (HCN)</td>
<td>(0-10, 25, 30, 50, 100) PPM</td>
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<tr>
<td>Hydrogen Chloride (HCl)</td>
<td>(0-10, 25, 50, 100) PPM</td>
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<tr>
<td>Hydrogen Sulfide (H&lt;sub&gt;2&lt;/sub&gt;S)</td>
<td>(0-10, 25, 50, 100, 200, 500) PPM</td>
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<tr>
<td>Hydrogen Bromide (HBr)</td>
<td>(0-10, 25, 50, 100) PPM</td>
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<tr>
<td>Nitriding (N&lt;sub&gt;2&lt;/sub&gt;O)</td>
<td>(0-10, 25, 50, 100, 200, 500) PPM</td>
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<tr>
<td>Ammonia (NH&lt;sub&gt;3&lt;/sub&gt;)</td>
<td>(0-50, 100, 150, 250, 500) PPM</td>
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<tr>
<td>Oxygen (O&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(0-10%, 5%)</td>
</tr>
<tr>
<td>Fluorine (F&lt;sub&gt;2&lt;/sub&gt;)</td>
<td>(0-1, 3, 5, 10, 15, 20, 25, 30, 50, 100) PPM</td>
</tr>
</tbody>
</table>

**FREEDOM 5000 SENSOR CONNECTIONS AVAILABLE**
- Integrated Sensor with Transmitter
- Separated Sensor with 3 ft of cable (cables up to 50 ft are available)
- Integrated Sensor with Transmitter and Sensor Self Test
- Remote Sensor Option for Bonded Conductant Installations
- Separated Sensor with 3 ft of cable and customer supplied conduct (cables up to 50 ft are available)
- Flexible Conductant Option: Separated Sensor with 3 ft of cable and flexible conduct (use PVC jacketed cord, sunlight resistant, liquid tight, 1/4" conduit with stainless steel fittings supplied)

**FREEDOM 5000 ADAPTERS AVAILABLE**
- Rain Shield Adapter
- Flat Duct Adapter

**FREEDOM 5000 SENSOR SELF TEST OPTIONS**
- Type A: Integrated Sensor with Transmitter and Sensor Self Test must be ordered
- Type A used with Rock Solid BCL3, BFs, ClO, ClO₂, HBr, HCl, HF, H₂O, SO₂, SfVs sensors and conventional Cl₂ sensor
- SST not available with remote sensor, flow cell, humi-shield or duct mount configurations
- Type B: used with wireless output

**FREEDOM TRANSMITTER MOUNTING ADAPTER**
- Wall/ Surface Mount
- "L" bracket used for mounting on horizontal surfaces

**FREEDOM 5000 DISPLAY/RELAY OPTIONS**
- Local Display with Magnetic Switches
- Programmable: 3.0 to 20mA
- Local Display with Push Button Switches
- Requires cover to be removed for use

**FREEDOM 5000 SENSOR CONNECTIONS AVAILABLE**
- Integrated Sensor with Transmitter and Sensor Self Test
- Transmitter with Remote Sensor Junction Box (4-20 mA Standard/Max. Length 50 ft)
- Transmitter with Remote Sensor and SST Option
- Transmitter with Remote Sensor, SST option, Junction Box (4-20 mA Standard/Max. Length 50 ft)

**FREEDOM 5600 ADAPTERS AVAILABLE**
- Quarter Turn Rain Shield (typical)
- Combined Rain Shield/Cal Adapter with Stainless Steel End Cap
- (for remote sensor calibration applications)
- Quarter Flow
- Flat Duct Adapter (for Transmitter with Remote Sensor Only)
- Round Duct Adapter (for Remote Sensor Only)

**COMMON SPECIFICATIONS**
- **Self-Diagnostics:** Weak sensor indication; Electronic faulting; Sensor configuration (range and type); and SST failure Output drops to 3 mA in above failures (Weak sensor indication; common configuration; SST failure Output unaffected)
- **Repeatability:** 3% FS
- **Linearity:** ± 0.5% FS
- **Offset:** 0.5% FS
- **Max. Load:** 2.5 Vdc, 700 ohms at 24 Vdc
- **Power:** 10 to 28 Vdc, 2-wire loop power, 2.5 Watts at 24 Vdc
- **Separated Sensor:** Up to 50 ft (15.25m)
- **Transmitter:** 1 Year
- **Concentration Indicator:** Programmable: 0 to 20mA
- **Transmitter Temperature:** 3.5 digit LCD, 2-wire loop power, Concentration Indicator (C); STT: Temperature Indicator (T); INH: Inhibit Indicator (I)
- **Concentration Output:** 0 to 20mA
- **Temperature Output:** 0 to 20mA
- **Low Scale Failure:** 0 to 20mA
- **High Scale Failure:** 0 to 20mA
- **Humi-Shield:** Not recommended for continuous extreme high/humidity applications
- **Warranty:** 1 Year

**FREEDOM 5000 SPECIFICATIONS**
- **Transmitter Enclosure:** NEMA 4X (Rock Solid), stainless steel, baked epoxy finish, 1" H x 7 3/4" W x 6 1/2" L
- **Weight:** 1.0 lbs (0.45kg) without accessories
- **Approval:** CSA Ex ia IIC T4, ATEX ia IIC T4, UL 508A Zone 0 (Class I, Division 2, Groups A, B, C, and D (with conforming U.S. barrier))
- **CE:** Class I, Division 2, Groups A, B, C, and D
- **Relay Options:** Requires separate additional 24 Vdc power supply (3) SPDT 5A comutative fields; Low, High, Configurable latching/muting; latching/delay/timeout/muting/false alarm can be used in transmissible/gas leakable.
INSTALLATIONS
5000 AND 5600 ANALOG GAS TRANSMITTERS

FREEDOM® SERIES
5000 AND 5600 ANALOG GAS TRANSMITTERS

SERIES 5000

SERIES 5600

ELECTRICAL CONNECTIONS - SERIES 5000

ELECTRICAL CONNECTIONS - SERIES 5600