

## SPECIFICATION DATA



# Electrochemical Toxic Gas Detector GT3000 Series Includes Transmitter (GTX) and Sensor Module (GTS)



### DESCRIPTION

The Det-Tronics GT3000 line of electrochemical gas detectors is designed to provide continuous monitoring of the atmosphere for potentially hazardous gas leaks or oxygen depletion. Models are available for detecting a variety of gas types in various concentration ranges.

The GT3000 toxic gas detector is a two-wire loop powered device and is designed as a stand alone unit that supports local calibration. It is also fully compatible with the FlexVu® UD10/UD20/UD30 Universal Display Units.

The GT3000 consists of a replaceable sensor module (GTS) connected to a transmitter module (GTX). The transmitter generates a 4-20 mA output signal with HART, which is proportional to the concentration of the target gas and directly corresponds to 0-100% full scale.

The electrochemical sensor cell uses capillary diffusion barrier technology for monitoring gas concentrations in ambient air. When compared to solid state type sensors, the electrochemical sensing element provides improved accuracy, stability and reliability, and can also extend calibration intervals. This results in superior performance and reliability, as well as reduced maintenance.

### HIGHLIGHTS

- ▲ Performance approved and verified
- ▲ Electrochemical sensor cell for increased accuracy, stability and reliability
- ▲ Highly specific response reduces the chance of false alarms resulting from the presence of other gases
- ▲ Self-contained transmitter circuitry
- ▲ Temperature compensated to ensure consistent performance over entire operating temperature range
- ▲ Suitable for outdoor applications requiring IP66 rating
- ▲ Hydrophobic filter easily replaced without opening the device or use of tools
- ▲ Hot swappable IS sensor module for live maintenance without de-classification of hazardous area
- ▲ EMI/RFI hardened
- ▲ Event and calibration logs are stored in non-volatile memory and are accessible using a UD10/UD20/UD30, HART device or AMS software.
- ▲ Real-time clock with battery back-up
- ▲ Magnetic switch and LEDs for user interface



# SPECIFICATIONS

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| <b>Calibration</b>   | Sensors are calibrated at the factory. Gas type and range are read by the transmitter. Calibration is initiated at the detector, at the UD10/UD20 Universal Display Unit, or by some other HART interface device. Calibration cannot be initiated from the UD30. |
| <b>Operating Voltage</b>                                   | 24 Vdc nominal; Operating range is 12 to 30 Vdc  |
| <b>Power Consumption</b>                                   | 0.8 watt maximum @ 30 Vdc  |
| <b>Max. Loop Resistance</b>                                | 300 ohms at 18 Vdc, 600 ohms at 24 Vdc   |
| <b>Current Output</b>                                      | 4-20 mA (Normal operating mode)<br>3.8 mA indicates calibrate mode<br>3.5 mA or less indicates a fault condition   |
| <b>Wiring</b>  | 2x22 AWG, 1x16 AWG, 600V, 20"  |
| <b>Storage Temp.</b>                                       | (GTX) -55°C to +75°C (-67°F to +167°F)<br>(GTS) 0°C to +20°C (+32°F to +68°F)<br>Ideal: +4°C to +10°C (+39°F to +50°F)   |
| <b>Storage Life</b>  | 6 months in factory-sealed packaging   |
| <b>Humidity Range</b>                                      | 15 to 90% RH.  |
| <b>Tropicalization / PC BD Protection</b>                  | Conformal coated printed circuit boards:<br>CTI Rating of 600V, maximum allowed by standard<br>Third party tested per ASTM-D-3638-07   |
| <b>Pressure Range</b>                                      | Atmospheric ±10%   |
| <b>Warm-Up</b>   | Warm-up time can last up to 150 seconds  |
| <b>Thread Options</b>                                      | 3/4" NPT or M25  |
| <b>Enclosure Material</b>                                  | GTX Transmitter: 316 Stainless Steel<br>GTS Sensor Module: PPA (30% Carbon filled)   |
| <b>Expected Operating Life</b>                             | GTS: 2 years in an open air environment  |
| <b>Expected Shelf Life</b>                                 | GTS: 6 months in factory sealed packaging  |
| <b>Warranty (For the GTX. See Table below for the GTS)</b> | 18 months from date of shipment  |

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| <b>Certification</b>            |  |
| <b>Explosion-Proof Model</b>    | <p>FM: Class I, Div. 1, Groups A, B, C &amp; D<br/>Class I, Zone 1, Group IIC<br/>IP66<br/>Conduit seal not required<br/>Acidic atmospheres excluded</p> <p>CSA: Class I, Div. 1, Groups A, B, C &amp; D (T6)<br/>Class I, Div. 2, Groups A, B, C &amp; D (T6)<br/>IP66</p> <p>IECEX: Ex d mb [ia Ga] IIC T4 Gb IP66<br/>IECEX FMG 10.0003X</p> <p>INMETRO: UL-BR 15.0752X<br/>Ex db mb [ia Ga] IIC T4 Gb IP66<br/>Tamb -40°C to +50°C (H2S)<br/>Tamb -20°C to +50°C (other)</p> |
| <b>Intrinsically Safe Model</b> | <p>FM: IS Class I, Div. 1, Groups A, B, C &amp; D<br/>Class I, Zone 0, Group IIC<br/>Performance verified per ANSI/ISA 92.00.01 and FM6340<br/>IP66</p> <p>CSA: Class I, Div. 1, Groups A, B, C &amp; D (T4)<br/>IP66</p> <p>IECEX: Ex ia IIC T4 Ga IP66<br/>IECEX FMG 08.0005X</p> <p>INMETRO: UL-BR 15.0404X<br/>Ex ia IIC T4 Gb IP66<br/>Tamb -40°C to +50°C</p>  |
| <b>SIL Approval</b>             | IEC 61508<br>Certified SIL 2 Capable<br>SIL Certification includes H <sub>2</sub> S, H <sub>2</sub> S+ and O <sub>2</sub> models only  |

## Performance of Electrochemical Gas Sensors

| Gas                                   | Range                  | Response Time <sup>1</sup>                           | Operating Temperature Range  | Accuracy / Repeatability (Whichever is greater) | Performance Approved Standard | Zero Drift    | Storage Temperature Range | Warranty (from ship date) |
|---------------------------------------|------------------------|--|--|---|-------------------------------|---------------|---------------------------|---------------------------|
| Hydrogen Sulfide+ (H <sub>2</sub> S+) | 0-20 PPM               | T20 = ≤10 Sec.,<br>T50 = ≤13 Sec.,<br>T90 = ≤30 Sec. | For -10°C to +55°C, ±2 ppm or ±10% of Reading <sup>6</sup> , ISA 92.00.01 <sup>4</sup> .<br>For -20°C to -10°C, ±3 ppm or ±15% of Reading <sup>6</sup> , Det-Tronics Verified.<br>For -40°C to -20°C, ±3 ppm or ±30% of Reading <sup>6</sup> , Det-Tronics Verified. |   |                               | ± 1 ppm/Mo.   | 10°C to 30°C              | 18 months                 |
| Hydrogen Sulfide+ (H <sub>2</sub> S+) | 0-50 PPM               |  |  |   |                               | ± 1 ppm/Mo.   | 10°C to 30°C              | 18 months                 |
| Hydrogen Sulfide+ (H <sub>2</sub> S+) | 0-100 PPM              |  |  |   |                               | ± 2 ppm/Mo.   | 10°C to 30°C              | 18 months                 |
| Ammonia (NH <sub>3</sub> )            | 0-100 PPM <sup>2</sup> | T50 = 24 Sec., T90 = 65 Sec.                         | For +20°C to +40°C, ±4ppm or ±15% of Reading <sup>6</sup> , Det-Tronics Verified.<br>For -20°C to +20°C, ±4ppm or -20% to +65% of Reading <sup>6</sup> , Det-Tronics Verified.   |   |                               | ± 2 ppm/Mo.   | 0°C to 20°C               | 12 months                 |
| Ammonia (NH <sub>3</sub> )            | 0-500 PPM <sup>2</sup> | T50 = 30 Sec., T90 = 120 Sec.                        | For +20°C to +40°C, ±4ppm or ±15% of Reading <sup>6</sup> , Det-Tronics Verified.<br>For -20°C to +20°C, ±4ppm or -15% to +65% of Reading <sup>6</sup> , Det-Tronics Verified.   |   |                               | ± 10 ppm/Mo.  | 0°C to 20°C               | 12 months                 |
| Oxygen (O <sub>2</sub> ) <sup>5</sup> | 0-25% V/V <sup>3</sup> | T20 = 7 Sec., T90 = 30 Sec.                          | -20°C to +50°C   | < 0.5% V/V <sup>7</sup>                         | FM6340 <sup>4</sup>           | < 2 %/Mo.     | 0°C to 20°C               | 18 months                 |
| Carbon Monoxide (CO)                  | 0-100 PPM              | T50 = 15 Sec., T90 = 40 Sec.                         | For +20°C to +50°C, ±5ppm or ±10% of Reading <sup>6</sup> , Det-Tronics Verified.<br>For -20°C to +20°C, ±6ppm or ±25% of Reading <sup>6</sup> , Det-Tronics Verified.   |   |                               | ± 2 ppm/Mo.   | 0°C to 20°C               | 18 months                 |
| Carbon Monoxide (CO)                  | 0-500 PPM              | T50 = 12 Sec., T90 = 25 Sec.                         |  |   |                               | ± 9 ppm/Mo.   | 0°C to 20°C               | 18 months                 |
| Sulfur Dioxide+ (SO <sub>2</sub> +)   | 0-20 PPM               | T50 = 12 Sec., T90 = 30 Sec.                         | For -40°C to +55°C, ±0.6ppm or ±15% of Reading <sup>6</sup> , Det-Tronics Verified.  |   |                               | ± 0.4 ppm/Mo. | 0°C to 20°C               | 12 months                 |
| Sulfur Dioxide+ (SO <sub>2</sub> +)   | 0-100 PPM              | T50 = 15 Sec., T90 = 35 Sec.                         | For -40°C to +55°C, ±0.6ppm or ±15% of Reading <sup>6</sup> , Det-Tronics Verified.  |   |                               | ± 0.4 ppm/Mo. | 0°C to 20°C               | 12 months                 |
| Chlorine (Cl <sub>2</sub> )           | 0-10 PPM               | T50 = ≤14 Sec., T90 = ≤34 Sec.                       | For +20°C to +50°C, ±0.6ppm or ±30% of Reading <sup>6</sup> , Det-Tronics Verified.<br>For -20°C to +20°C, ±0.6ppm or -40% to +60% of Reading <sup>6</sup> , Det-Tronics Verified.   |   |                               | < 0.2 ppm/Mo. | 0°C to 20°C               | 12 months                 |
| Hydrogen (H <sub>2</sub> )            | 0-1000 PPM             | T50 = 8 Sec., T90 = 60 Sec.                          | For +20°C to +40°C, ±50ppm or ±10% of Reading <sup>6</sup> , Det-Tronics Verified.<br>Operating range is down to -20°C.  |   |                               | ± 20 ppm/Mo.  | 0°C to 20°C               | 18 months                 |
| Nitrogen Dioxide (NO <sub>2</sub> )   | 0-20 PPM               | T50 = 7 Sec., T90 = 31 Sec.                          | For +20°C to +40°C, ±2ppm or ±10% of Reading <sup>6</sup> , Det-Tronics Verified.<br>Operating range is down to -20°C.   |   |                               | ± 0.1 ppm/Mo. | 0°C to 20°C               | 12 months                 |

<sup>1</sup> Time to reach percentage of final reading when gas concentration equal to full scale is applied to sensor (per ISA 92.00.01).  
<sup>2</sup> Background concentrations of Ammonia may shorten lifetime of sensor.  
<sup>3</sup> Sensor approved for Oxygen depletion (< 21% V/V) only.  
<sup>4</sup> Performance Approved by FM Approvals.  
<sup>5</sup> Oxygen sensor will indicate fault if <1% volume oxygen is detected.  
<sup>6</sup> Accuracies only apply to initial gas exposure and temperature-range testing at 50% of full scale (ISA 92.00.01).  
<sup>7</sup> Accuracies only apply to temperature-range testing at 20.9 percent Oxygen (per FM 6340).



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