Oxygen Analyzers for Industrial Gases

GPR-1600, GPR-2600, GPR-3100

High-accuracy oxygen analyzers for monitoring gas in industrial processes where trace oxygen from low parts per million to pure O₂ has to be precisely measured. Utilizing AII’s high performance galvanic oxygen sensors these advanced instruments are simple to use with a common, across-the-range chassis, HMI and menu structure, so an operator only needs to learn operation of just one instrument for multiple gas analysis applications at various oxygen levels. Available as bench-, 19” rack-, panel- and wall-mounted for flexible installation.

Highlights

- High accuracy (±0.02ppm in lowest range)
- Four measurement ranges with manual or auto-ranging
- 24 month sensor life with normal usage
- Sample in CO₂ backgrounds with XLT sensor
- Bench, rack or wall mounting options
- Two Alarms
- Integrated bypass valve (for GPR-1600)
- Easy access and sensor replacement
- Easy to use HMI

Applications

- Purity of product in industrial gas manufacture
- Trace oxygen in hydrogen generation by electrolysis
- Monitoring oxygen generators
- Measuring oxygen in metallurgical processes—heat treatment and annealing
- Gas measurement in poultry stunners
- Analysis of gas in double glazing manufacture
**Sensor Technology**

The sensors from AII have been designed to avoid potential weaknesses common in typical galvanic cell design. Our materials, construction and assembly methods have been continuously refined over decades. Each sensor type has been specifically engineered to provide the optimum balance between performance and longevity for individual applications. The result is confidence in the measurement and low maintenance. In the absence of oxygen, the sensor will produce zero output and the sensor is linear up to 100%, therefore only a span calibration is required in most cases (see graph).

**The Analytical Industries’ XLT sensor**

For applications with a background gas containing more than 0.5% CO₂, the specially designed XLT sensor should be selected. With most standard electrochemical sensors an alkaline electrolyte is used and this is neutralised over time when exposed to acidic gases, such as CO₂. To combat this, AII developed the XLT sensor with a special electrolyte formula and has the added benefit of being able to operate in temperatures as low as -10°C.

**Bypass sample system**

To protect the sensor when switching sample lines or during no-flow situations, there is an integral 4-way valve. This both extends the life of the trace oxygen sensor and reduces the time to reach process measurements as samples with low ppm O₂ can be trapped in the cell until the pipework is flushed.

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**Common features:**
- Barometric pressure & temperature compensation
- Stainless steel wetted parts
- 4 measurement ranges (manual or auto-selected)
- Range Identification output
- 4-20mA, 0-1V and 0-5V outputs
- 2 off user configurable alarm relays
- Universal mains powered

**Options:**
- Auto-Zero & auto-calibrations facilities
- Digital communication options
- Relay contacts for range ID

**GPR-1600**
As standard the GPR-1600 has an integral bypass sample system. The analyzer can be temporarily exposed to ambient air to perform a span calibration (20.9% O₂).

**Options:**
- External bypass system
- Heated sample system

**Measurement ranges:** 0-10 ppm, up to 0-1% O₂ (0-25% for calibration only).

**GPR-2600**
The GPR-2600 is an ideal instrument to monitor oxygen in applications which involve purging from ambient air to low percentage levels of oxygen with a variety of gases.

**Options:**
- Heated sample system

**Measurement ranges:** 0-1% up to 0-25% O₂

**GPR-3100**
The GPR-3100 is fitted with a temperature controlled sample handing system to provide an isothermal environment for the sample for increased accuracy.

**Measurement ranges:** 0-100% up to 90-100% O₂

**Installation Options**
There are 4 mounting options available for the range (HxWxD):
- Bench mounting (dimensions: 35.3 x 25.1 x 34cm)
- Panel mounting (dimensions: 19 x 27.4 x 28.6cm)
- 19” rack mounting with optional bezel (dimensions: 19 x 48 x 72cm)
- Wall mounting (dimensions: 34.6 x 26.7 x 17.8cm)
- Wall mounting W (dimensions 34.6 x 31.8 x 19.7cm)
- Wall mounting W306 (dimensions 46.4 x 40.7 x 17.2cm)
## Technical Specifications

<table>
<thead>
<tr>
<th></th>
<th>GPR-1600</th>
<th>GPR-2600</th>
<th>GPR-3100</th>
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<tbody>
<tr>
<td><strong>Measurement range</strong></td>
<td>0-10, 0-100, 0-1000 ppm, 0-1% (0-25% calibration only)</td>
<td>0-1%, 0-5%, 0-10%, 0-25%</td>
<td>0-100%, plus suppressed zero ranges. 50, 80, or 90-100%</td>
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<tr>
<td><strong>Accuracy</strong></td>
<td>&lt; ±2% of selected range ±0.1% at constant conditions after calibration with 95-100% oxygen (GPR-3100)</td>
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<tr>
<td><strong>Response time</strong></td>
<td>T90 &lt; 10 seconds</td>
<td>T90 &lt; 13 seconds</td>
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<tr>
<td><strong>Recovery time</strong></td>
<td>60 sec in air to &lt; 10 ppm in &lt; 1 hour on N2 purge</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Sensitivity (LDL)</strong></td>
<td>50 ppb</td>
<td>50 ppm</td>
<td>0.1% oxygen</td>
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<tr>
<td><strong>Linearity</strong></td>
<td></td>
<td></td>
<td>&lt; 0.5% of scale</td>
</tr>
<tr>
<td><strong>Sensor model</strong></td>
<td>GPR-12-333</td>
<td>GPR-11-32-4</td>
<td>GPR-11-120-OP</td>
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<tr>
<td></td>
<td>XLT-12-333 for gas mixture with &gt; 0.5% CO₂</td>
<td>XLT-11-24-4 for gas mixture with &gt; 0.5% CO₂</td>
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<tr>
<td><strong>Sensor life at 25°C and 1 atm</strong></td>
<td>24 months in &lt; 1000 ppm O₂</td>
<td>GPR-11-32-4 32 months; XLT-11-24-4 24 months</td>
<td>24 months in 100% oxygen</td>
</tr>
<tr>
<td><strong>Calibration interval</strong></td>
<td>Typically: 1-3 months</td>
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<tr>
<td><strong>Inlet pressure</strong></td>
<td>0.34 – 2 barg (5-30 psig) with atmospheric vent</td>
<td>248 bar g (3600psig)</td>
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<tr>
<td><strong>Flow rate (constant)</strong></td>
<td>0.5 - 1.0 Nl/min (1-2 SCFH)</td>
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<td><strong>Gas connections</strong></td>
<td>1/4&quot; compression tube fittings</td>
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<tr>
<td><strong>Display</strong></td>
<td>Graphical LCD 12.7 x 7cm (5 x 2.75“); resolution 0.01</td>
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<tr>
<td><strong>Enclosure</strong></td>
<td>Painted aluminum</td>
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<td></td>
<td>See individual mounting options for dimensions</td>
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<tr>
<td><strong>Compensation</strong></td>
<td>Barometric pressure and temperature; Temperature controlled sample system and sensor (GPR-3100 only)</td>
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<tr>
<td><strong>Analog output</strong></td>
<td>4-20 mA isolated, 0-1V, and 0-5V</td>
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<tr>
<td><strong>Range ID</strong></td>
<td>1-5 V or 4-20mA, optional relay contacts</td>
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<td><strong>Communications</strong></td>
<td>Choose from RS485, RS232 or USB</td>
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<td><strong>Alarms</strong></td>
<td>Two user-adjustable alarm relays</td>
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<tr>
<td><strong>Operating temperature</strong></td>
<td>GPR sensor: 5°C to 45°C (41°F to 113°F)</td>
<td>XLT sensor: -10°C to 45°C (14°F to 113°F)</td>
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<td><strong>Power</strong></td>
<td>Universal 100-240 V AC</td>
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