ULTRAMAT 23 Gas Analyzer – Unique solution for Biogas applications

Continuous measurements for better process control

The well-proven ULTRAMAT 23 gas analyzer extended with an hydrogen sulfide (H2S) sensor provides the perfect, simple and complete solution for analysis in biogas plants.

It is a unique solution that combines the measurement of infrared active gases with oxygen and H2S sensors in a single unit to determine process states in the plant by continuous analysis of the gas composition.

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The ULTRAMAT 23 for biogas applications simultaneously measures 4 gas components: 2 infrared active gases, methane (CH\textsubscript{4}) and carbon dioxide (CO\textsubscript{2}), and oxygen (O\textsubscript{2}) and hydrogen sulfide (H\textsubscript{2}S) using electrochemical cells. The measurements of all components are made continuously allowing better process control which results not only in an economically optimized process but also in a better product quality.

The H\textsubscript{2}S sensor is integrated in the 19” rack ULTRAMAT 23 analyzer, which can also be mounted in a compact enclosure including a sample conditioning system (IP54).

The autocalibration feature of the ULTRAMAT 23 and the low drift of the H\textsubscript{2}S sensor enable maximum ease of use and minimum maintenance attention for effective, economic and reliable plant operation.

Applications
- Process control of the fermenter for biogas generation (crude side and clean side)
- Gas engine monitoring (electrical and thermal energy generation) for motor protection
- Optimization of methane yield and feed (biogas power generation)
- Quality control of biogas fed into commercial gas distribution network

### Technical Specifications, H\textsubscript{2}S Channel

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallest measuring range</td>
<td>0...500 vpm</td>
</tr>
<tr>
<td>Largest measuring range</td>
<td>0...5000 vpm</td>
</tr>
<tr>
<td>Drift</td>
<td>&lt; 1 % per month</td>
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<tr>
<td>Repeatability</td>
<td>&lt; 4 % of full scale</td>
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<tr>
<td>Resolution</td>
<td>0.2% of full scale</td>
</tr>
<tr>
<td>Delayed display (t\textsubscript{90}-time)</td>
<td>&lt; 80 s at approximately 1 ... 1.2 l/min sample gas flow</td>
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<tr>
<td>Permissible pressure fluctuations</td>
<td>750...1200 hPa</td>
</tr>
<tr>
<td>Permissible ambient temperature</td>
<td>5 ... 40° C</td>
</tr>
<tr>
<td>Sensor life cycle</td>
<td>ca. 12 months</td>
</tr>
</tbody>
</table>

### Benefits
- Better process control – continuous measurements of all four gas components including CH\textsubscript{4} and H\textsubscript{2}S in one compact analyzer
- Improved durability and process control even under extreme conditions – long operating life of the H\textsubscript{2}S sensor even at high concentrations
- Low maintenance and improved safety – no dilution of the measured gas, no purging of the H\textsubscript{2}S sensor
- Improved safety – measurement of flammable gases, as found in biogas plants (e.g. 70 % CH\textsubscript{4}) is allowed (TÜV certificate)
- Reduced calibration effort and costs – minimal drift of the H2S at the endpoint (< 1 % per month), autocalibration with ambient air
- Simplified process integration, remote operation and control – open interface architecture (RS485, RS 232; PROFIBUS PA/DP, SIPROM GA)
- Service information and logbook – preventive maintenance; help for service and maintenance personnel, cost savings
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