Vaisala SPECTRACAP® Oxygen Transmitter OMT355

Laser sharp oxygen measurement
OMT355 Oxygen Transmitter for Industrial Process Measurements

The Vaisala SPECTRACAP® Oxygen Transmitter OMT355 is ideal for oxygen monitoring in moist and aggressive process gases. Typical applications include gas generation, inert gas blanketing, fermentation and composting process monitoring.

Laser based measurement
The OMT355 incorporates a compact tunable diode laser (TDL) gas spectrometer built in the measurement probe. This optical measurement technology is well known for unmatched stability and robustness. For the first time, the SPECTRACAP® sensor offers TDL technology in a compact probe suitable for field use.

Direct installation
In many applications, the OMT355 can be flange-mounted directly into a process. No sampling or sample conditioning equipment is needed. This feature provides real time measurement data without sampling or sample switching delays.

Sampling cell installation
An optional sampling cell is available for processes with high temperatures, elevated pressures or extremely difficult mechanical conditions. Due to the robustness of the SPECTRACAP® sensor and its low sensitivity to gas flow and pressure variations, the sampling system can be very simple and it can be installed near the sampling point.

Low maintenance
A stainless steel mesh filter and an optional porous PTFE filter protect the OMT355 probe optics from dust and dirt. An intelligent measurement algorithm further minimizes contamination effects and provides a maintenance alert well before the measurement performance is affected.

Long calibration interval
Calibration or field checking of the instrument can be done either with ambient air or with zero/span gases injected through an optional calibration gas connector. The calibration interval of the OMT355 is 12 months.

User friendly interfaces
For calibration and configuration, the OMT355 features both software and keypad user interfaces and an LCD display.

Features/Benefits
- Minimizes need for sample conditioning equipment
- In-situ probe or sampling cell options
- Tolerates aggressive chemicals
- Tolerates excessive amounts of moisture even in liquid form
- Low maintenance
- Diagnostic output for preventive maintenance
- Heated optical surfaces to prevent condensation
**TDL Technology**

The Tunable Diode Laser (TDL) technology used in the SPECTRACAP® sensor is one of the most powerful technologies in gas measurement on the market today.

The technology is based on measuring the attenuation of a beam of laser light in the sample gas. For oxygen sensing the laser is tuned to a wavelength which is characteristic and unique for the oxygen molecule. Therefore, the measured attenuation is an extremely selective measure for the amount of oxygen on the path of the laser beam.

**The Vaisala SPECTRACAP® sensor**

The SPECTRACAP® sensor contains no moving parts or sensitive components that are exposed to the measured gas. For the user, this means a measurement performance that is unaffected by vibrations or even aggressive chemicals.

The fundamental optical absorption principle, combined with the highly optimized sensing algorithm used in the sensor, yields a very stable measurement.

The semiconductor lasers used in the sensor have undergone extensive aging tests that show a lifetime of more than 10 years in continuous operation. This means considerable savings in the lifetime cost of the instrument as sensor replacements are very seldom needed.
**Technical Data, Dimensions**

**Performance**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range</td>
<td>0 ... 100 % O&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>Accuracy (including noise, linearity, and repeatability)</td>
<td>±0.2 % O&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>Temperature dependence over T range</td>
<td>±2 % of reading</td>
</tr>
<tr>
<td>Stability</td>
<td>±1 % of reading/yr</td>
</tr>
<tr>
<td>Zero drift</td>
<td>±0.1 % O&lt;sub&gt;2&lt;/sub&gt;/yr</td>
</tr>
<tr>
<td>Response time of measurement</td>
<td>3 s</td>
</tr>
<tr>
<td>Diffusion limited response in still air</td>
<td>T&lt;sub&gt;i&lt;/sub&gt;/T&lt;sub&gt;w&lt;/sub&gt;</td>
</tr>
<tr>
<td>without filters</td>
<td>10 s / 20 s</td>
</tr>
<tr>
<td>with stainless steel mesh filter</td>
<td>10 s / 25 s</td>
</tr>
<tr>
<td>with stainless steel mesh and PTFE filters</td>
<td>30 s / 70 s</td>
</tr>
<tr>
<td>Pressure dependence without pressure compensation</td>
<td>0.8 ... 1.2 bar -2 % of reading</td>
</tr>
<tr>
<td></td>
<td>1.2 ... 1.4 bar -5 % of reading</td>
</tr>
<tr>
<td>Accuracy of pressure compensation</td>
<td>±0.25 % of reading</td>
</tr>
<tr>
<td>Background gas effects for CO&lt;sub&gt;2&lt;/sub&gt; and H&lt;sub&gt;2&lt;/sub&gt;O uncompensated</td>
<td>&lt;1 % of reading for &lt;6 vol-% CO&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td></td>
<td>&lt;1 % of reading for gas dewpoint &lt; 30 °C</td>
</tr>
<tr>
<td>Accuracy of background gas compensation</td>
<td>0 ... 50 vol-% CO&lt;sub&gt;2&lt;/sub&gt; ±0.5 % of reading</td>
</tr>
<tr>
<td></td>
<td>0 ... 300 g/m&lt;sup&gt;3&lt;/sup&gt; H&lt;sub&gt;2&lt;/sub&gt;O (T&lt;sub&gt;d&lt;/sub&gt; = 80 °C) ±1 % of reading</td>
</tr>
</tbody>
</table>

**Operating Environment**

- **Operating temperature range**
  - For probe (in-line installation): -20 ... +80 °C
  - For electronics (housing): -40 ... +60 °C
  - For transmitter (ambient gas measurement): -20 ... +60 °C
- **Storage temperature range**: -55 ... +80 °C
- **Operating pressure range**: 0.8 ... 1.4 bar
- **Maximum pressure range for probe**: up to 10 bar
- **Compliance**
  - IEC(EN)-61326 Electrical equipment for measurement, control and laboratory use. EMC requirements
  - EN50104 Electrical apparatus for the detection and measurement of oxygen. Performance requirements and test methods.
  - EN50271 Electrical Apparatus for the Detection and Measurement of Combustible Gases, Toxic Gases or Oxygen
  - Laser safety: Class 3R laser product

**Options and accessories**

- **Hydrophobic PTFE filter, pore size 8 µm**
  - With EPDM O-rings: 217065
  - With Kalrez® O-rings: 217066
- **1/2” NPT conduit fitting**
  - 217197
- **M12 male 8-pin connector for user cable**
  - 214806SP
- **Sample cell with wall mounting bracket gas fittings for O.D. 6 mm tube volume 260 cm<sup>3</sup>**
  - T<sub>63</sub> response time with 1 l/min sample flow and mesh filter, 18 s
  - Weight: 2.6 kg
  - With EPDM O-rings: 217052
  - With Kalrez® O-rings: 216619

**Inputs and Outputs**

- **Power supply**
  - Input range: 11 ... 36 VDC
- **Power consumption**
  - Maximum: 6 W
  - Typical: 3 W
- **Analog output**
  - 0/4 ... 20 mA, sourcing
  - Maximum load: 500 Ω
- **Serial output (2-wire, non-isolated)**
  - RS-485
- **Alarm/control relay**
  - 30 VAC/60 VDC

**Mechanics**

- **Housing material**: G-AlSi10 Mg (DIN 1725)
- **Probe material**: AISI 316
- **Housing classification**: IP66
- **Weight**: 2.2 kg
- **Mounting flange diameter**: 97 mm

*Can be fitted to standard flanges. Minimum sizes: DIN (25278) DN50 and ANSI (150) 2.5"*

**Cable bushing**

- **Cable gland M20 x 1.5**
- **Stainless steel mesh filter**
- **PTFE (optional)**
- **Silicon, MgF<sub>2</sub>**

For complete specifications, refer to the User’s Guide.