Accurate, reliable, and stable quantitative gas detection solutions based on Photoacoustic Spectroscopy (PAS) technology for environmental protection and greenhouse gas reduction.

- Meet test standards and comply with environmental regulations
- Prevent dangerous leaks and reduce costs associated with potent SF₆ emissions
- Improve quantitative analysis capabilities
High Sensitivity for Leak Detection and Analysis using PAS

Photoacoustic Spectroscopy (PAS) gas instruments are field proven in several applications and was perfected for SF₆ leak detection. The PAS technique is highly accurate, stable, provides a direct measurement independent of background, and does not require any carrier gas or consumables.

In a PAS instrument, the SF₆ gas is irradiated by modulated infrared light of a pre-selected wavelength to provide high selectivity and accuracy. The gas molecules absorb some of the light energy and converts it into an acoustic signal which is detected by sensitive microphones. The instrument also uses low sample volume so that the SF₆ is not wasted or liberated to the atmosphere during detection.

PAS Technology Features

• High-sensitivity microphones to measure gas absorption in the infrared region
• Extremely stable with detection limits in ppb ranges
• Suitable for SF₆ leak detection, with 12-channel multiplexing up to 500 ppm
• Two-microphone system to minimize interference from vibration
• Automatically compensates for humidity interference

PAS Enabled Leak Detection

SF₆ Filled Equipment Testing

Sulfur Hexafluoride (SF₆) is one of the most potent greenhouse gases, with a Global Warming Potential of more than 22,000 times than that of CO₂. Over the past decades, SF₆ has been commonly used as insulation gas in medium and high voltage switch gears. Today, the power utility industry uses roughly 80% of all SF₆ produced worldwide.

In order to meet final test standards and to uphold any future regulations regarding the use of SF₆, a manufacturer of SF₆ filled equipment must perform quality assurance testing. The SF₆ Leak Detector’s high accuracy and low detection limits enable manufacturers to complete these tests more efficiently, in a shorter time, and with greater precision.

The system measures the total concentration of the SF₆ gas in an enclosed area where the switch gear (or other SF₆ filled equipment) is tested to determine leak rate. By accurately measuring leak rate, utilities and manufacturers can improve quality while decreasing costs and emissions.
Reliable by Design

The SF₆ Leak Detectors are capable of measuring accurately over a wide dynamic range. This enables manufacturers and utility end users to not only monitor the presence of SF₆ but to measure it quantitatively. Our monitors can be moved without any loss in accuracy or need for recalibration, allowing users to locate areas that are a cause for concern.

Simple to Use

Simply turn on the leak detector and press the “Measure” button. That’s really all that you need to know. The monitor’s extended self-test routines maintain the reliability of the results, which are available online or can be downloaded as required. The only maintenance task necessary is changing the air filter. However, it is recommended that you calibrate the unit annually.

Field Monitoring Circuit Breakers

Low detection limits (6 ppb), ease-of-use, and long term stability are critical in the field. Enclosed areas that contain SF₆ may have leaks, and it is important to monitor confined rooms with low lying areas to minimize asphyxiation risks. An accurate, reliable system is crucial for personnel safety and problem identification.

The LumaSense SF₆ Leak Detector meets all of these requirements. In addition, the monitor can operate unattended for long periods of time allowing our customers to focus their manpower on other key tasks. The monitor can also be combined with an INNOVA 1309 Multipoint Sampler to enable broad area coverage.

Multi-Point Sampling in Substations

The multipoint sampler extends the area monitoring capabilities of SF₆ monitors. The INNOVA 1309 is a 12-channel multiplexer that can draw gas samples from up to 12 locations and can be used with the SF₆ Leak Detector. The area monitors can be configured for up to 24 point channel sampling.

AREVA References

EUROPE:
- FRANCE: AREVA in Aix les Bains, Villeurbanne, Montpellier and Macon
- GERMANY: AREVA in Kassel, Germany

ASIA:
- CHINA: AREVA in Xiamen and Suzhou
- INDIA: AREVA T & D India Ltd., Chennai and Vadodara

40+ Years of Experience with PAS

LumaSense is the industry leader in the use of Photo-acoustic Spectroscopy and Non-Dispersive Infrared technologies and has deployed thousands of systems in the field. With over 40 years of experience, LumaSense is redefining the way gases are measured.
**SF₆, Leak Detector Technical Data**

### Measurement

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection Principle</td>
<td>Photoacoustic Infrared Spectroscopy</td>
</tr>
<tr>
<td>Detection Limit</td>
<td>6ppb (standard)</td>
</tr>
<tr>
<td>Response Time</td>
<td>27s (Standard Mode); 13s (Fast Mode)</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>5 - 50,000 ppb (50 ppm) Standard; 5 - 500,000 ppb (500 ppm) Optional</td>
</tr>
<tr>
<td>Repeatability</td>
<td>1% of Measured Value</td>
</tr>
<tr>
<td>Zero Drift</td>
<td>± Detection Limit per Quarter</td>
</tr>
<tr>
<td>Influence of Temperature</td>
<td>±10% of Detection Limit per °C</td>
</tr>
<tr>
<td>Influence of Pressure</td>
<td>±0.5% of Detection Limit per mbar</td>
</tr>
<tr>
<td>Range Drift</td>
<td>±2.5% of Measured Value per Quarter</td>
</tr>
<tr>
<td>Influence of Temperature</td>
<td>±0.3% of Measured Value per °C</td>
</tr>
<tr>
<td>Influence of Pressure</td>
<td>-0.01% of Measured Value per mbar</td>
</tr>
</tbody>
</table>

### Physical Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable</td>
<td>175 mm (H) x 395 mm (W) x 300 mm (D) (6.9 in x 15.6 in x 11.8 in)</td>
</tr>
<tr>
<td>Fixed</td>
<td>175 mm (H) x 483 mm (W) x 375 mm (D) (6.9 in x 19 in x 14.8 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>Portable: 9 kg (19.8 lbs) Fixed: 14 kg (30.81 lbs)</td>
</tr>
</tbody>
</table>

### Interface

<table>
<thead>
<tr>
<th>Communication</th>
<th>IEEE, RS232, USB, and TCP-IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relays</td>
<td>2 Alarm Relays (Visual/Audio) with User-Defined Levels. Max 25 VDC and 100 mA</td>
</tr>
<tr>
<td>Data Storage</td>
<td>Capacity for 22 days</td>
</tr>
</tbody>
</table>

### Electrical

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>100-240 VAC +/- 10 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Consumption</td>
<td>120 VA</td>
</tr>
<tr>
<td>Backup Battery</td>
<td>3V Lithium</td>
</tr>
</tbody>
</table>

### Certifications

<table>
<thead>
<tr>
<th>Certifications</th>
<th>CE and CSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>EN/IEC 61010-1; UL61010A-1; CAN/CSA - C22.2 No. 61010-1-04</td>
</tr>
<tr>
<td>Environment</td>
<td>UL 61010A-1; Operation: 5 to 40°C; Storage: -25 to 55°C</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP20</td>
</tr>
</tbody>
</table>

### Standard Accessories

- AT 2177 4m PTFE Tubing
- A50001A USB Cable
- 7810 LumaSoft Gas Single Point monitoring software
- BZ7002 Calibration Software
- BZ7003 Offline Software
- Technical Manual on CD

### Optional Accessories

- AO 0265 IEEE-IEEE Interface Cable
- 1309 Multipoint Sampler – INNOVA 1309
- 7860 LumaSoft Gas Multi Point Software
- WL0950-003 RS232 Interface Cable

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