LUMASENSE TECHNOLOGIES

SF_6 Measurement Solutions

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 SF_6 emissions
- Improve quantitative analysis capabilities

Complete Solutions for SF_6 Detection, Monitoring and Analysis for Circuit Breakers and Switchgears

High Sensitivity for Leak Detection and Analysis using PAS

Photoacoustic Spectroscopy (PAS) gas instruments are field proven in several applications and was perfected for SF_6 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 SF_6 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 micro-phones. The instrument also uses low sample volume so that the SF_6 is not wasted or liberated to the atmosphere during detection.

PAS Technology Features

- High-sensitivity microphones to measure gas absorbtion in the infrared region
- Extremely stable with detection limits in ppb ranges
- Suitable for SF_6 leak detection, with 12-channel multi-plexing up to 500 ppm
- Two-microphone system to minimize interference from vibration
- Automatically compensates for humidity interference

PAS Enabled Leak Detection

SF_6 Filled Equipment Testing

Sulfur Hexafluoride (SF_6) is one of the most potent greenhouse gases, with a Global Warming Potential of more than 22,000 times than that of CO_2. Over the past decades, SF_6 has been commonly used as insulation gas in medium and high voltage switch gears. Today, the power utility industry uses roughly 80% of all SF_6 produced worldwide.

In order to meet final test standards and to uphold any future regulations regarding the use of SF_6, a manufacturer of SF_6 filled equipment must perform quality assurance testing. The SF_6 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 SF_6 gas in an enclosed area where the switch gear (or other SF_6 filled equipment) is tested to determine leak rate. By accurately measuring leak rate, utilities and manufacturers can improve quality while decreasing costs and emissions.

Ultra-Sensitive SF_6 Leak Detector - Fixed Unit

Ultra-Sensitive SF_6 Leak Detector - Portable Unit

Multi-Point Sampling Option Available

Reliable by Design

The SF_6 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 SF_6, 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 SF_6 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 SF_6 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.

High Voltage Switch Gear in AREVA Suzhou (China)

Multi-Point Sampling in Substations

The multipoint sampler extends the area monitoring capabilities of SF_6 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 SF_6 Leak Detector. The area monitors can be configured for up to 24 point channel sampling.

Lumasense offers single-point, multi-point and area leak detectors and analyzers

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 Photoacoustic 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.

SF_6 Leak Detector Technical Data

Measurement	
Detection Principle	Photoacoustic Infrared Spectroscopy
Detection Limit	6ppb (standard)
Response Time	27s (Standard Mode); 13s (Fast Mode)
Dynamic Range	5 - 50,000 ppb (50 ppm) Standard; 5 - 500,000 ppb (500 ppm) Optional
Repeatability	1% of Measured Value
Zero Drift	± Detection Limit per Quarter
Influence of Temperature	±10% of Detection Limit per ˚C
Influence of Pressure	±0.5% of Detection Limit per mbar
Range Drift	±2.5% of Measured Value per Quarter
Influence of Temperature	±0.3% of Measured Value per ˚C
Influence of Pressure	-0.01% of Measured Value per mbar
Physical Characteristics	
Dimensions	Portable: 175 mm (H) x 395 mm (W) x 300 mm (D) (6.9 in x 15.6 in x 11.8 in) Fixed: 175 mm (H) x 483 mm (W) x 375mm (D) (6.9 in x 19 in x 14.8 in)
Weight	Portable: 9 kg (19.8 lbs) Fixed: 14 kg (30.81lbs)

Interface	
Communication	IIEEE, RS232, USB, and TCP-IP
Relays	2 Alarm Relays (Visual/Audio) with User-Defined Levels. Max 25 VDC and 100 mA
Data Storage	Capacity for 22 days
Electrical	
Power Supply	100-240 VAC +/- 10 %
Power Consumption	120 VA
Backup Battery	3V Lithium
Certifications	CE and CSA
Safety	EN/IEC 61010-1; UL61010A-1; CAN/CSA - C22.2 No. 61010-1-04
Environment	UL 61010A-1; Operation: 5 to 40°C; Storage: -25 to 55°C
Enclosure	IP20

Standard Accessories

- AT 2177 — 4m PTFE Tubing
- AS0001A — 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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