LumaSense® TECHNOLOGIES

SF_6 Leak Detection Solutions

Accurate, reliable, and stable quantitative gas detection solutions for environmental and employee protection.

- Meet and comply with environmental regulations
- Reduce costs associated with potent SF_6 emissions
- Prevent catastrophic insulation failure via early leak detection
- Prevent exposure to excessive SF_6 concentration

Complete Solutions for SF_6 Leak Detection and Monitoring in Enclosed GIS Substations

High Sensitivity for Leak Detection using PAS

Photoacoustic Spectroscopy (PAS) gas instruments are field proven in several applications and were 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 microphones with very stable signal.

PAS Technology Features

- Extremely stable with low detection limit at 6 ppb
- Suitable for trace SF_6 leak detection, with up to 24 channel multiplexing possible
- Capable of measuring up to 3x the maximum allowable concentration (MAC = 1000 ppm for SF_6)
- System designed to minimize interference from vibration, and automatically compensate for temperature, pressure, and humidity interference.

SF_6 Filled Equipment Leak Detection

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.

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 installed to determine leak rate. By accurately measuring leak rate, utilities can improve operational quality while decreasing costs and emissions.

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.

Multi-Point Sampling in Substations

A 24 channel multiplexer is available that can sequentially draw gas samples from up to 24 locations. Integrating seamlessly with the SF_6 Leak Detector. This multipoint sampler extends its area monitoring capability.

It enables a good spatial resolution in the leak detection with a good flexibility in the choice of the sampling locations.

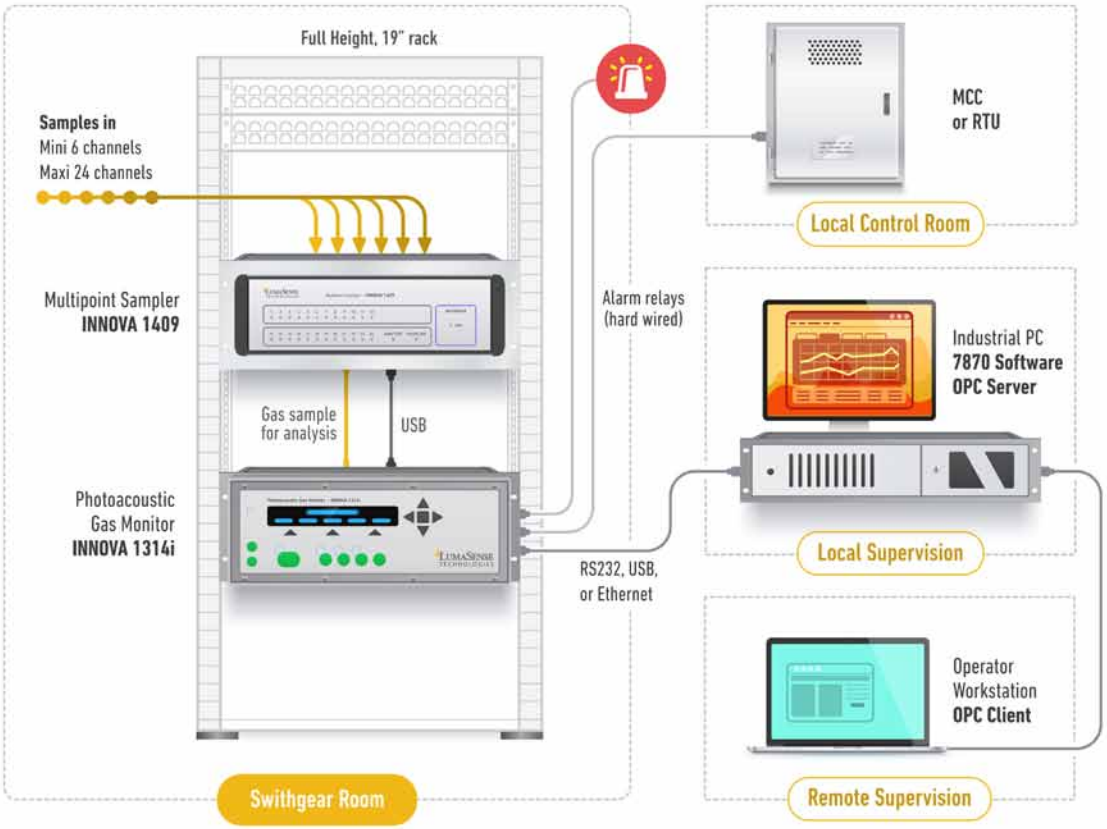
Field Monitoring

Ease of use, and long-term stability are required for the mostly unmanned GIS substations. With its low detection limit (6 ppb), and its accuracy over a high dynamic range, the permanent monitoring solution from LumaSense enables early leak detection in comparison with monthly visual checks of density gauges.

The SF_6 Leak Detector can complimentarily meet the health & safety requirements in enclosed areas where SF_6 leaks may occur. Sampling points can indeed be located in low lying and confined areas where SF_6 would build up over its MAC level (1000 ppm) or even up to an asphyxiation risk level.

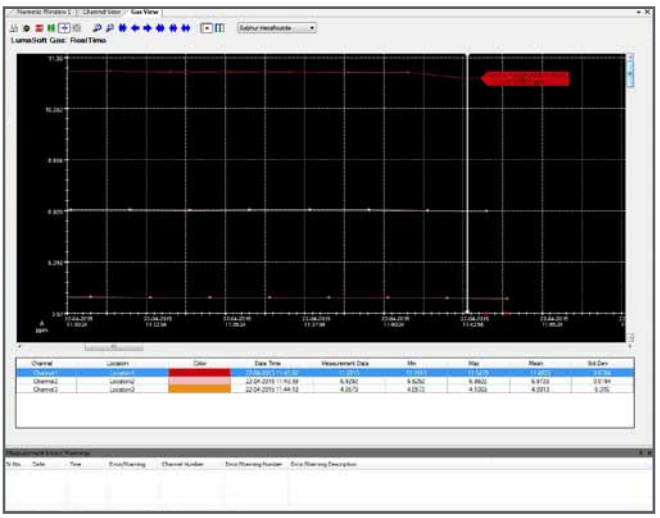
Alarm relays can be set up on two SF_6 concentration levels to alert on a potential leak or to warn of a hazardous situation.

Ultra-Sensitive SF_6 Leak Detector - with Multipoint Sampler



Schematic of the SF_6 multipoint monitoring solution: A local computer (or remote computer) is connected to the SF_6 Gas Monitor, it synchronizes the monitoring and the sampling devices. The same application software operates on either of the computers which enable online supervision with the OPC interface allowing remote access to the same data. The two (2) Alarm relays can be connected to a local warning device (bell, buzzer, or alarm light) or be connected to a local RTU device for remote alarm signals.

LumaSense offers multi-point SF_6 leak detection and monitoring



The LumaSoft 7870 application software enables the display of measured data for each channel and of alarm indication either locally or remotely.

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 Detection Technical Data

Measurement	
Detection Principle	Photoacoustic Infrared Spectroscopy
Detection Limit	6 ppb (standard)
Response Time	27s (Standard Mode); 13s (Fast Mode)
Dynamic Range	5 - 50,000 ppb (50 ppm) Standard; 1 - 4,000 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
System Interface	
Communication with local PC	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

Physical Characteristics	
Dimensions	SF_6 Detector: 175 mm (H) x 483 mm (W) x 375mm (D) (6.9 in x 19 in x 14.8 in) 1409 rack version: 155 mm (H) x 483 mm (W) x 260 mm (D) (6.10 in x 19 in x 10.2 in)
Weight	SF_6 Detector: 14 kg (30.81lbs) 1409 with 6/12/24 channels: 6.6/7.9/10.3 kg (14.6/17.4/22/7 lbs)
Electrical	
Power Supply	100-240V (50-60 Hz)
Power Consumption	135 VA (SF6 detector + sampler)
Environmental Specifications	
Certifications	CE
Safety	EN/IEC 61010-1 3rd edition
EMC Emission	EN 61326-1:2006: Class B, Basic and Industrial locations. Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
Environment	Operation: 5 to 40°C; Storage: -25 to 55°C
Enclosure	IP20

Ordering Information

- 1409 Multipoint Sampler – INNOVA 1409 Configuration versions: 6- 12- or 24- channels
- 7870 LumaSoft Gas Multi Point Software
- AF0614 PTFE tubing
- AS0001A USB Cable
- BZ7002 Calibration Software
- BZ7003 Offline Software
- Technical Manual on CD

Optional Accessories

- WL0950-003 RS232 Interface Cable
- UD5023 External air-filter
- EB6000 External pump (small), 230V
- EB6004 External pump (small), 115V
- EB6002 External pump (large), 230V
- EB6003 External pump (large), 115V

LumaSense Technologies — **Awakening Your 6th Sense**

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