



Semiconductor innovation
with advanced technology.

Gas Safety Solutions for the Semiconductor Industry



Atmospheric hazards in Semiconductor manufacturing

Welcome to Cutting-Edge Gas Detection Solutions

In the dynamic landscape of semiconductor manufacturing, safety and efficiency are paramount. Introducing our state-of-the-art gas detection solutions tailored specifically for semiconductor fabs. With our advanced technology and expertise, we provide comprehensive gas detection systems designed to safeguard your facility, your personnel, and your processes.

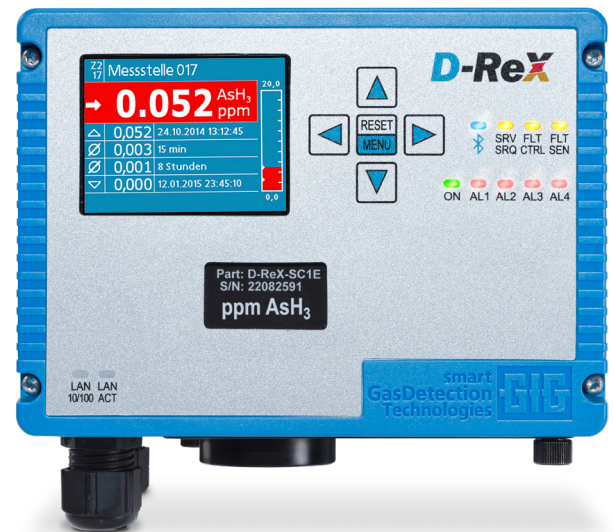
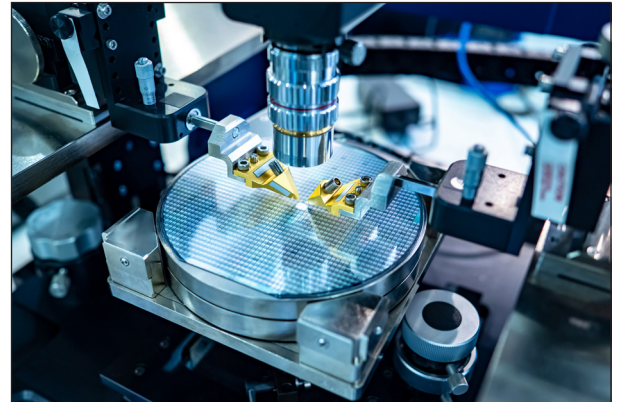
Why Gas Detection Matters

In semiconductor manufacturing, the presence of hazardous gases is a constant concern. From toxic substances to explosive mixtures, the risks associated with gas leaks are significant. Timely detection and mitigation of these hazards are crucial to maintaining a safe working environment and preventing costly production interruptions.

GfG Innovative Solutions

At GfG Instrumentation, we offer a range of cutting-edge gas detection solutions tailored to the unique needs of semiconductor fabs:

- » **High-Sensitivity Sensors:** With unparalleled sensitivity, our sensors can detect even trace amounts of hazardous gases, enabling proactive measures to prevent potential risks.
- » **Integration with Fab Systems:** Our solutions seamlessly integrate with existing fab infrastructure, allowing for centralized monitoring and control for enhanced efficiency and ease of operation.
- » **Continuous Monitoring:** Our systems provide continuous monitoring, ensuring round-the-clock protection against gas-related hazards, even in unmanned or remote areas of the facility.
- » **Data Logging and Analysis:** Detailed logging and analysis capabilities enable thorough review of historical data, facilitating process optimization and compliance with regulatory requirements.



User interface with display, control keys and status LEDs

Essential Gas Detection Monitoring Areas in Semiconductor Manufacturing



» Monitoring of Hazardous Gases:

Semiconductor manufacturing may involve the use of hazardous gases, such as arsine, phosphine, hydrogen sulfide, or ammonia. Gas detectors are essential for monitoring the levels of these gases to ensure worker safety.

» Cleanroom Environments:

Cleanrooms in semiconductor manufacturing facilities are controlled environments with strict limits on particulate and chemical contamination. Gas detectors are used to monitor for any leaks or releases of gases that could compromise the cleanroom environment.

» Gas Cabinets:

Gases Used: Silane (SiH_4), dichlorosilane (DCS), ammonia (NH_3), nitrogen trifluoride (NF_3), etc.
Purpose: Gas cabinets store and supply gases to various tools, and gas detection is crucial to prevent leaks and ensure a safe working environment.

» Gas Delivery Systems:

Gases Delivered: Gases delivered through pipelines to various tools.
Valve Manifold Boxes (VMBs): connection hubs inside the fab to distribute gases throughout the different areas and tools.
Purpose: Gas detection is important to identify and respond to leaks in gas delivery systems.

» Chemical Vapor Deposition (CVD) Tools:

Gases Used: Precursors like silane, tungsten hexafluoride (WF_6), etc.
Purpose: Gas detection ensures the safe use and containment of gases during thin film disposition processes.

» Etching Tools:

Gases Used: Chlorine (Cl_2), fluorine (F_2), sulfur hexafluoride (SF_6), etc.
Purpose: Gas detection is essential to monitor and control the use of corrosive or toxic gases during the etching processes.

» Ion Implantation Tools:

Gases Used: Boron trifluoride (BF_3), arsenic pentafluoride (AsF_5), etc.
Purpose: Gas detection is critical to prevent leaks and ensure the safe operation of ion implantation equipment.

» Lithography Tools:

Gases Used: Photoresist solvents (e.g., acetone, isopropyl alcohol), nitrogen, etc.
Purpose: Gas detection helps monitor and control the use of volatile organic compounds (VOCs) and other gases during the lithography process.

» Bulk Gas Storage Areas:

Gases Stored: Various bulk gases like nitrogen, argon, oxygen, etc.
Purpose: Gas detection systems are installed to monitor bulk gas storage areas for leaks and ensure safe storage.

» Tool Exhaust Monitoring:

Semiconductor manufacturing tools often have exhaust systems to remove waste gases. Gas detectors are placed in these exhaust systems to monitor the effluent gases and ensure compliance with environmental regulations.

» Emergency Exhaust and Ventilation Systems:

Gases Involved: Various process effluents and emergency exhaust.
Purpose: Gas detection ensures the effectiveness of emergency exhaust systems and helps in responding to unexpected releases.

» Waste Gas Abatement Systems:

Gases Treated: Effluent gases from manufacturing processes.
Purpose: Gas detection monitors the efficiency of waste gas abatement systems and ensures environmental compliance.

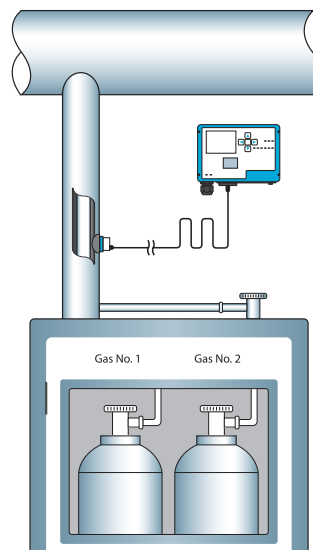
» Facility Utility Rooms:

Gases Present: Compressed air, specialty gases, etc.
Purpose: Gas detection in utility rooms helps identify leaks and maintain a safe working environment.

GfG Instrumentation - The premier solution for gas safety in the Semiconductor manufacturing industry

Key advantages of choosing GfG Instrumentation

- » **Enhanced Safety:** Our advanced gas detection systems provide early warning of potential hazards, minimizing the risk of accidents and ensuring the safety of personnel and assets.
- » **Optimized Efficiency:** By enabling proactive detection and mitigation of gas-related issues, our solutions help reduce downtime and maximize production uptime, leading to improved efficiency and cost savings.
- » **Regulatory Compliance:** With comprehensive monitoring and data logging capabilities, our systems assist in meeting regulatory requirements and industry standards, ensuring compliance with safety guidelines.
- » **Peace of Mind:** With GfG's reliable and robust gas detection solutions in place, semiconductor fabs can operate with confidence, knowing that their facilities are protected against gas-related risks.



Remote sensor mounted directly into pipe system



Remote diffusion mode gas detection at the Point of Installation (PoI)



Extraction mode gas detection at the Point of Sampling (PoS)