Gas-Safe™: Advanced Burner Protection and Energy Savings in One System

**How Advanced Sensor Technologies can monitor gas fired systems to improve safety and energy efficiency**

In industrial operations where gas-fired systems, hydrogen burners, or confined space processes are in use, safety is not just a compliance requirement it’s a lifeline for equipment, production, and personnel. The **Gas-Safe™ Measurement System** from **Elementale Enterprises** (in partnership with **CDS Group)** is engineered to deliver continuous gas monitoring, fast response, and intelligent alarms, preventing dangerous incidents while optimizing operational uptime and energy use.

**Why Gas-Safe?**

Combustion-related explosions and shutdowns can stem from:

* Loss of burner flame followed by delayed reignition of accumulated fuel
* Fuel leakage into idle chambers igniting unexpectedly
* Multiple failed ignition attempts without adequate purging

These scenarios can cost companies not only in repairs but also in lost production runs, emergency orders, and, most critically, worker safety.

The **Gas-Safe™ System** addresses these risks by **continuously measuring hazardous or combustible gas levels** and triggering alarms before danger escalates. This proactive protection reduces downtime, safeguards product quality, and **most importantly**, protects people.

**Built for Critical Industries**

The system excels in high-risk environments such as:

* **Natural Gas and Hydrogen Fueled Burner Systems**: Where thermal processing is a critical part of the manufacturing process the **Gas-Safe™** continuously monitors the process to ensure a safe operating environment (consistent with NFPA and ATEX Standards) while also ensuring that energy efficiency is maximized reducing unnecessary purging and exhaust.
* **Mining and Fertilizer Processing:** Continuous gas monitoring is used to prevent potentially dangerous accumulation in underground shafts and/or storage areas, protecting personnel and equipment.
* **Food Production**: Accurate detection ensures safe processing environments and prevents contamination risks.
* **Vaporizer Protection:** Industrial vaporizers are indispensable, but they carry inherent risks due to the nature of their operation. A **Gas-Safe™** system provides the vigilant, intelligent defense necessary to prevent these risks from manifesting into accidents. Through continuous monitoring, rapid response, and seamless integration, **Gas-Safe™** transforms the vaporizer from a potential hazard into a reliably safe asset, allowing industries to focus on productivity and quality.
* **Confined Space Monitoring (Air Handling Units, Boiler Houses, Steam Generators, etc):** In low-occupancy plant rooms or areas with combustible gas or leak risks, **Gas-Safe™** issues advanced alarms for any incidents, ensuring safety for personnel and equipment.

**Gas-Safe™** comes standard with **Class I, Division II** certification for hazardous locations, and offers **optional Class I, Division I** for tougher settings. It fits easily into general or hazardous areas, including both new installs and retrofits.

**Technical Excellence**

The Gas-Safe™ system is more than a simple gas detector—it’s a **fully engineered asset protection solution**:

* **Single or Dual-sensor configuration** for simultaneous monitoring of one or two gases (e.g., methane & CO, hydrogen & CO₂)
* **High accuracy**: ±0.02% by volume
* **Fast T90 response**: <25 seconds (T90 = time to reach 90% of final reading)
* **Robust build**: Dust and moisture filtration for measurement stability
* **Mechanical “Loss of Flow” diagnostics for added reliability**
* **Digital display and Remote HMI Options** **for centralized monitoring**
* **Horn and strobe alarms included for immediate onsite alerts**

**Typical gas detection ranges include:**

* **Hydrogen:** 0–4% Vol
* **Methane:** 0–100% LEL
* **Carbon Monoxide:** 0–1000 PPM
* **Oxygen:** 0–25% Vol
* **CO₂**: up to 20% Vol
…**and more than 30 other hazardous gases**

**Energy Savings Through Smarter Monitoring**

One of the hidden costs in gas-fired systems is **excessive purge cycles** after flame loss or failed ignitions. These cycles waste heated air, increase fuel consumption, and extend downtime.

Gas-Safe™ reduces purge time by confirming actual gas concentrations in real time—meaning purge cycles can be shorter, safer, and more targeted. The result:

* **Lower Fuel Consumption**
* **Faster System Restarts**
* **Reduced Emissions** from unnecessary exhaust air purging / dumping

This smarter approach to purge management not only saves energy but also boosts operational efficiency, directly improving production margins.

**Safety by Design**

* **Engineered for Compliance:** Designed to meet USA NFPA-85 Standard for Boiler & Combustion System Safety Code
* **Advanced Sensing:** Integrated SIL2 certified flammability sensor, with FAILSAFE functions for O2 and CO2 readings.
* **Hazard-Ready:** Built for Continuous monitoring in Class I Division II areas as standard, with optional Class I Division I

## **Automated Safety Response**

Upon detection of unsafe gas levels, the **Gas-Safe™** triggers preprogrammed responses:

* **Alarm Activation**: Audible and visual alarms alert operators, prompting immediate investigation and action.
* **Process Shutdown**: The system can directly interface with vaporizer controls to halt operations, preventing further gas release and ignition risk.
* **Ventilation and Purging**: **Gas-Safe™** can activate ventilation systems to dilute hazardous concentrations or trigger automated purging cycles to clear idle chambers before reignition, thereby preventing accumulation and flashback.
* **Failed Ignition Attempts**: Repeated ignitions without adequate purging may leave residual fuel in the system. **Gas-Safe™** prevents unsafe operation by enforcing purging cycles and alerting operators to abnormal conditions.

**Protecting Assets, Product, and People**

* **Assets:** Fewer shutdowns and failures mean lower repair costs and higher equipment longevity.
* **Product:** Preventing failed batches and missed production schedules maintains throughput and customer satisfaction.
* **People:** Continuous monitoring and instant alerts minimize risks to personnel in hazardous work environments.

**Conclusion**

The **Gas-Safe™ Measurement System** is more than a safety device, it’s a productivity tool, an energy saver, and a safeguard for your workforce. Whether you operate in power generation, manufacturing, or process industries**, Gas-Safe™** delivers peace of mind while driving operational efficiency.

**Contact Information**

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**GENERAL ARRANGEMENT OF GAS-SAFETM**



**COMPACT SAFE DESIGN OF THE GAS-SAFETM**

**TYPICAL SIZE 30” x 30” x 9” (760mm x 760mm x 230mm)**