InProcess Instruments
Analytical Solutions. Tailor-made.

GAM 2000

Gas Analysis System

- Modular system concept
- Perfect fit for a wide variety of applications
- Gas inlet systems for up to 192 process gas lines
- Programmable gas selection and inlet
- Flexible and user-friendly software suite

Analytical Specifications

Detection Limits	SEM: < 100 ppb (without peak interference)
Mass Range	1 – 200 u (300 u and 512 u on request)
Mass Resolution	Unit resolution
Response Time	t_{90} < 300 ms (2-stage gas inlet)
Measurement Time	Typical < 1 s for one measurement cycle (process applications with 4 – 6 gas components) 4 ms per channel

Technical Specifications

Number of Channels		Up to 1024 channels per run
Ion Source Configuration	Standard	Crossbeam ion source with two filaments (yttrium or tungsten)
Communication Interfaces		Ethernet to PC, IoT-enabled OPC UA, PROFIBUS, PROFINET, MQTT, others on request
Dimensions	Standard (incl. Pumping System)	500 x 620 (1025) x 550 mm (w x h x d), approx. 110 kg 20 x 25 (41) x 22 in. (w x h x d), approx. 245 lbs

System Requirements

Gas Quality	Temperature Humidity Particles	> Dew point Not condensing < 4 µm particle size
Environmental Conditions (During Operation)	Temperature Humidity	+15 to +35 °C (59 to 95 °F) < 75 %, not condensing
Power		230 VAC, 50 Hz, approx. 1.2 kVA (115 VAC, 50/60 Hz on request)
Exhaust		KF16 high vacuum flange for connection to customer's exhaust system
Compressed Air		Min. 6 bar, filtered and oil-free (for gas inlet configurations with pneumatic valves)

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GAM 2000

Modularity at its Best

Requirements to analytical hardware regarding performance, gas type compatibility and system features can change over time or from project to project.

To address this fast moving world of new research interests and developments in industry and academia IPI has designed the modular gas analysis system GAM 2000. This state-of-the-art mass spectrometer system utilizes IPI's patented quadrupole mass filter and patented fully digital electronics.

Depending on the application requirements a GAM 2000 gas analysis system consists of different building blocks.

The heart of the unit is the GAM 2000 itself which is available as a desktop or floor standing unit. If the location of the system is not fixed and it is used in the lab for multiple purposes or different projects wheels can be attached to the unit to make relocation a simple and easy task.

The central GAM 2000 unit can house all the vacuum components, pumps and all electronics necessary to connect the device to your process. If higher pumping speeds are necessary the system can be upgraded with an additional pumping unit which can be equipped with two large rotary vane or scroll pumps. Because the units can be stacked the system's footprint does not change even with the optional pumping unit installed.

Gas inlet systems, heatable and/or unheated can also be included into the central unit up to a high degree of complexity. For more complex gas inlet systems with a high number of valves or dedicated pumping equipment a third unit can be integrated into the GAM 2000 gas analysis system.
These units, called Gas Stream Selectors or GSS, are tailor-made for special purposes and applications and can include gas switching valves for up to 64 gas streams in a single unit, for example.
Gas Stream Selectors can be interconnected which allows to create even the most complex gas inlet systems at a very small footprint.

The modularity and robustness of the GAM 2000 guarantees the usability of the system for decades.

Modular units allow easy and fast reconfiguration of the analysis system.
The stackability of the building blocks allows to design complex tailor-made system configurations at small footprints.

Gas Stream Selector (optional)

- Fully automated gas selection
- Up to 192 process lines by stacking up to three GSS 64
- Ports for calibration gases
- Heatable up to 200 °C
- Adaptable to a wide range of gas pressures and flows

Gas Analysis System

- Robust and reliable design
- Long service life
- Low cost of ownership
- Analyze up to eight gases with integrated gas handling systems
- Fully digital RF generator
- Hyperbolic rod system
- 100 ppb to 100 % dynamic range
- Wide range of interface types to connect to process control systems and third-party software (MQTT, PROFINET, PROFIBUS, OPC UA, Ethernet)

Pumping System (optional)

- Adaptable pumping configuration
- Rotary vane or dry running membrane or scroll pumps depending on process gases
- Optional sealing gas and sorption traps for the use of aggressive gases

Most gas inlet systems can be integrated into the base unit allowing a desktop use of the system without additional hardware.

For special applications, that require the higher pumping speeds of rotary vane or scroll pumps, dedicated pumping systems are available which can be mounted directly underneath the base unit without changing the system's footprint.

More Information