

## Analytical Specifications

Detection Limits	SEM: < 10 ppb (without peak interference)
Mass Range	1 – 300 u (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 600 x 1105 x 900 mm (w x h x d), approx. 190 kg 24 x 44 x 35 in. (w x h x d), approx. 420 lbs

## System Requirements

Gas Quality	Temperature > Dew point Humidity Not condensing Particles < 4 µm particle size
Environmental Conditions (During Operation)	Temperature +15 to +35 °C (59 to 95 °F) Humidity < 75 %, not condensing
Power	230 VAC, 50 Hz, approx. 1.8 kVA (115 VAC, 50/60 Hz on request)
Cooling	Closed cycle water cooling with external chiller
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)

# GAM 3000

## Gas Analysis System

- Unattended operation in harsh industrial environments
- Process specific gas handling
- Robust and stable data acquisition
- Communication interfaces (Modbus, OPC, MQTT etc.)
- Application specific control and acquisition software



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# GAM 3000

## Robust and Reliable

Many applications exist far off the cleanliness of pharmaceutical or research laboratories which nevertheless require the same precise and accurate gas analysis.

IPI has developed the GAM 3000 especially for the use in harsh environments like for example the gas concentration analysis in steel mills to analyze the gas in blast furnaces, electric furnaces or converters.

The all-in-one enclosure design is separated in two parts. The upper part houses the quadrupole mass spectrometer and all electronic components. This dustproof part of the enclosure is rated IP54.

It is also equipped with a water cooled radiator to ensure a constant temperature inside the housing.

The build quality and the structural design of the unit ensure a worry-free operation and reliable measurement data in nearly every harsh industrial environment (incl. ATEX zone: ATEX II 2G IIC T4).

An industrial computer is continuously communicating internally with the IPI QMS electronics and externally with the plants' control infrastructure by sending system status and gas concentration values to the plants' process control system.

The service friendliness by design and the highly trained IPI service team together with our worldwide network of service partners guarantee short down times due to scheduled preventive maintenance.

The GAM3000 is a workhorse, once installed it measures and analyzes the composition of gas streams and sends the concentration data via standard industrial communication protocols to the plants' process control system.

Automatic calibration routines guarantee reliable data for your process control for decades.

## Gas Inlet System

- Customized gas inlet configuration
- Example configuration consisting of:
  - 2 process gas connections
  - 8 calibration gas connectionsand is heatable up to 120 °C
- High degree of modularization allows realization of even more complex setups

## IPI QMS Electronics

- Patented fully digital RF generator
- Autotuning functionality
- Fully computer controlled
- Allows for unattended and automated tuning and calibration cycles

## Control System

- Integrated industrial computer with application specific software
- Industry standard communication interfaces: OPC UA over PROFIBUS or PROFINET, MQTT

## Fore-Vacuum System

- All-in-one solution combines analyzer and vacuum pumping system
- Application specific configuration
- Rotary vane, membrane or scroll pumps depending on application requirements



The IPI GAM3000 is designed to be operated in harsh and even dusty environments outside of the clean laboratory atmosphere.



The upper part of the cabinet that houses the spectrometer and electronic components is rated IP54 and is equipped with a cooling system with a water cooled radiator.



More Information