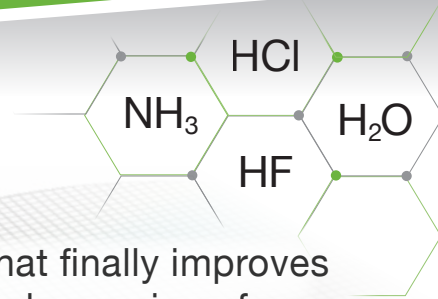


AMC Monitoring for Inorganic Gases

Semiconductor Analyzer for NH₃, HF, and HCl

SEMICONDUCTOR



Analytical data that finally improves yield with early warning of contamination events!

- Part per trillion sensitivity
- Fast, continuous, real-time measurements in seconds
- Minimum maintenance with no consumables
- No field calibration, verify with single span gas annually

NH₃, HF, and HCl 3-in-1 analyzer

Yield declines due to airborne molecular contamination (AMC) have been well documented. Picarro SI3401 NH₃, HF, and HCl analyzers utilize Picarro's highly selective, sensitive, and accurate cavity ring-down spectroscopy (CRDS) for real-time measurement of these gases in one convenient analyzer.

Designed to operate in both cleanrooms and plenum, this laser analyzer can operate for many months without user interaction. The analyzer can be commissioned and operating within minutes, with zero sample preparation. The gas concentration is displayed in real time with no post-processing requirements and data is continuously archived to the analyzer's internal hard drive. The analyzer can be configured to automatically export its measurement data at regular intervals via an Ethernet, RS-232 interface, or optional analog formats.

Picarro SI3401 3-in-1 analyzer offers the simplicity and reliability of CRDS technology for AMC cleanroom monitoring

in a robust compact, fixed or transportable package. NH₃, HF, and HCl are the most important inorganic gases that are routinely monitored in semiconductor manufacturing. The 3-in-1 analyzer provides the benefits of smaller footprint (one analyzer instead of two to cover the three gases), lower service costs, lower electricity consumption etc.

Designed for long-term stability and low maintenance, this analyzer is ideal for continuous operation in semiconductor manufacturing facilities such as the cleanroom, Plenum, as well as FOUP and EFEM. Prior to being mounted in a standard 19-inch, rack-mounted enclosure or transportable package, these analyzers undergo a rigorous set of factory tests to provide our end users with Documentation Packs for each analyzer by serial number certifying each analyzer's calibration and performance to published specifications.

PICARRO

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Performance Specifications	SI3401			
	H ₂ O	HCl	HF	NH ₃
Precision	20 ppm + (8 x %H ₂ O) (10 sec) 10 ppm + (4 x %H ₂ O) (100 sec)	≤75 ppt (10 sec), ≤25 ppt (100 sec)	≤40 ppt (10 sec), ≤15 ppt (100 sec)	≤300 ppt (10 sec), ≤100 ppt (100 sec)
Lower Detectable Limit (100 sec., 3σ)	30 ppm	75 ppt	40 ppt	300 ppt
Method Detection Limit (per Semi C10-1109)	40 ppm	250 ppt	500 ppt	500 ppt
Linearity (per IEC 61207)	±1%	±1%	±1%	±1%
Accuracy at span	±5% @ full scale	±5% @ full scale	±5% @ full scale	±5% @ full scale
Accuracy at zero	±40 ppm	±50 ppt	±25 ppt	±150 ppt
Instrument-to-Instrument Consistency	±5% @ full scale ±40 ppm @ zero	±5% @ full scale ±50 ppt @ zero	±5% @ full scale ±25 ppt @ zero	±5% @ full scale ±150 ppt @ zero
Measurement Range	0–40000 ppm	0–1 ppm	0–1 ppm	0–10 ppm
Measurement Interval*	<9 seconds			<5 seconds
Sample Flow Rate	~2 slm			
Combined Response Times (T90/10 + T10/90) @ 20 ppb	<20 sec (10,000 ppm challenge)			<3 min
Fall Times T90/10 @ 20 ppb	<10 sec (10,000 ppm challenge)			<1 min

* Measurement interval at span may increase as much as 2x above listed values.

SI3401 System Specifications	
Measurement Technique	CRDS
Operating Temperature	15 to 35°C (operating); -10 to 50°C (storage)
Ambient Humidity	<85% RH non-condensing
Accessories	Pump (external, included), keyboard (included), mouse (included), LCD monitor (optional)
Outputs	RS-232, Ethernet, USB
Fittings	1/4" Swagelok® PFA Fittings
Dimensions	Analyzer: 16.7" w × 8.4" h × 24.8" d (43 × 21.3 × 63 cm)
Weight	78 lbs. (35.4 kg) including pump
Power Requirements	100–240 VAC, 47–63 Hz (auto-sensing), <260 W start up (total): 110 W (analyzer), 120 W (pump) at steady state