Driving Smart Manufacturing Innovation

INFICON provides the most comprehensive and advanced Intelligent Manufacturing Systems solutions for the electronics manufacturing industry. Our products are proven to increase capital productivity, labor efficiency, and overall factory efficiency by presenting critical information, automating complex decision making, and delivering industry-leading execution capability—all in real-time.

- Hundreds of sensors for thousands of applications
- Core technologies: mass spectrometry, quartz crystal microbalance, RF DC detector, OES
- Real-time in situ process monitoring turning data into knowledge
- Leading sensor developer for state of the art technology

- Microelectronic industry's most holistic digital twin integrates your relevant data
- Transforming raw data into knowledge, enabling predicting, AI/ML
- Creates a comprehensive learning digital version of your factory

- Expanding suite of predictive applications optimizing factory performance
- Fab and metrology scheduling, Smart FDC, AI/ML, excursion prediction, advanced process control, process tool maintenance
- Scheduling more factories than any company in the world

INFICON

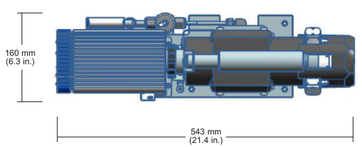
TRANSPECTOR APX RESIDUAL GAS ANALYZER

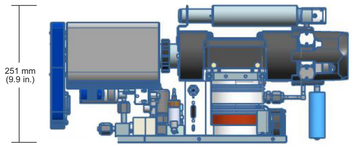
SPECIFICATIONS			
Mass range	1 to 100 amu	1 to 200 amu	1 to 300 amu
Peak width @ 10% peak maximum	<1 amu		
Ion source type	Closed Ion Source		
Total pressure range[1]	5E-7 to 1E-3 Torr (6.6E-7 to 1.3E-3 mbar)		
Total pressure accuracy[2]	±25% 1E-6 to 1E-3 Torr (1.3E-6 to 1.3E-3 mbar)		
Maximum ion source operating pressure[3]	1E-3 Torr (1.3E-3 mbar)		
Nominal ion source operating pressure[4]	2E-4 Torr (2.6E-4 mbar)		
System operating pressure	1E-8 Torr (1.3E-8 mbar) to 1.2 atmospheres (with orifices/capillary)		
Sensitivity at low emission, FC mode	>4.0E-6 amps/Torr (>3E-6 amps/mbar)	>2.0E-6 amps/Torr (>1.5E-6 amps/mbar)	>1.0E-6 amps/Torr (>7.6E-7 amps/mbar)
Sensitivity at high emission, FC mode	>2.0E-5 amps/Torr (>1.5E-5 amps/mbar)	>1.0E-5 amps/Torr (>7.6E-6 amps/mbar)	>5.0E-6 amps/Torr (>3.8E-6 amps/mbar)
Minimum detectable partial pressure[5]	1.0E-13 Torr (1.3E-13 mbar)	2.0E-13 Torr (2.6E-13 mbar)	4.0E-13 Torr (5.3E-13 mbar)
Maximum Data Rate (analog scans or selected peaks)	1.8 ms per point (555 data points per second)		
Abundance sensitivity[6]	<5 ppm	<10 ppm	<100 ppm
Zero blast[7]	<1 ppm	<15 ppm	<100 ppm
Detection limit[8]	<10 ppb	<25 ppb	<50 ppb
Linearity[9]		±20%	
Minimum background pressure	<1.0E-8 Torr (<1.3E-8 mbar)		
Maximum sensor and inlet operating temperature	150°C		

1 The pressure reading at low emission using a total pressure lens.
2 The total pressure accuracy at low emission.
3 The maximum ion source operating pressure at low emission (the filament turn-off threshold).
4 2E-4 Torr in the closed ion source produces 1E-5 Torr in the quadrupole region.
5 The MDPP with the electron multiplier (EM) on at 10,000 gain and a one second dwell time.
6 The mass 40 contribution onto 41 amu.
7 The zero blast contribution onto 2 amu.
8 The minimum detectable concentration with krypton in air at a two second dwell time.
9 For 1 Torr orifices and lower. Linearity at low emission at 0.1 to 2 times the nominal orifice pressure.

CE

DIMENSIONS





INFICON Inspired by visions. Proven by success.

www.inficon.com reachus@inficon.com

Transpector® APX Residual Gas Analyzer

Advanced Process Monitor for ALD, CVD, and Etch Processes

INFICON
Inspired by visions. Proven by success.

Precision measurement for advanced semi processes

INFICON Transpector APX remains the market leading Residual Gas Analyzer (RGA) for semiconductor and display process monitoring. INFICON knows semiconductor and display customers have unique needs, and the latest revision of the Transpector APX allows for more flexibility to meet specific application requirements, while maintaining industry leading measurement speed and sensitivity. Transpector APX is the ideal RGA process monitor for semiconductor processes such as ALD, CVD, PVD, and etch.

MINIMIZE SCRAP AND MAXIMIZE YIELD IN REAL TIME

Modern semiconductor processes are more demanding than ever. The increasingly competitive semi and display manufacturing landscape drives the constant need for maximizing throughput and yield. Higher performing semiconductors require increased manufacturing complexity, resulting in higher costs. Minimizing scrap by increasing cleanliness standards, tool qualification, and process monitoring is essential for wafer and panel production. Designed to provide premier trace gas analysis for semiconductor applications, Transpector APX is the choice instrument for monitoring advanced processes such as ALD and HDP CVD.

Atomic layer processes require depositing extremely thin and uniform films. Process optimization requires precise control over precursor chemical doses. With industry leading measurement speed and sensitivity, the enhanced Transpector APX can monitor reaction by products to confirm process continuity and identify any unwanted variance.

In addition to being the fastest RGA process monitor available, Transpector APX also delivers maximum uptime due to an array of innovative inlet and ion source options selectable based on the process conditions. The next generation Transpector APX inlet systems are designed to survive process chemistries prone to particle or coating generation like ALD or PECVD. This allows for continuous monitoring to capture data points at all the critical process steps. In addition simplified and HexBlock inlet options are available with INFICON proprietary coating for resistance to corrosive gases, essential for chamber clean endpoint monitoring applications.

ADVANTAGES AT A GLANCE

- Application specific platform design enables unique configurations for longest lifetime on your ALD or CVD process for the best wafer and panel protection and process optimization, for example endpoint detection.
- EUV fab ready with specific ion source and inlet designs optimized for the lowest level hydrocarbon contamination detection.
- Process integration—Transpector APX becomes a powerful process monitoring and diagnostics tool when integrated with FabGuard® software and supported by INFICON world-class applications experts
- Smaller fab footprint and easier installation due to new high performance pumping system. 30% smaller with higher pumping speeds and adjustable heaters that lower system background for superior detection limits.
- Configurable with Hexblock for up to three pressure inlets or simplified inlets for specific pressure ranges, designed for reduced surface area to minimize surface reactions and provide the fastest response times.
- Proprietary system coatings provide industry leading chemical resistance and compatibility for highly aggressive processes
- Automated calibration—ensures long-term data stability and accuracy for sensor to sensor and tool to tool chamber matching

PROCESS CHARACTERIZATION AND MONITORING FOR:

- Advanced Processes including Atomic Layer Deposition (ALD)
- Etch processes including: metal, dielectric, silicon etch and high density plasma etch
- CVD Processes including: high k dielectrics, HDP CVD, LP CVD, SA CVD, CVD low k, PE CVD
- Diffusion and Epitaxy processes
- 300 mm wafer degas
- Ion implantation

AUTOMATED CALIBRATION

Automated calibration can be easily performed with FabGuard software using an integrated calibration reference gas mixture.

EUV FAB READY

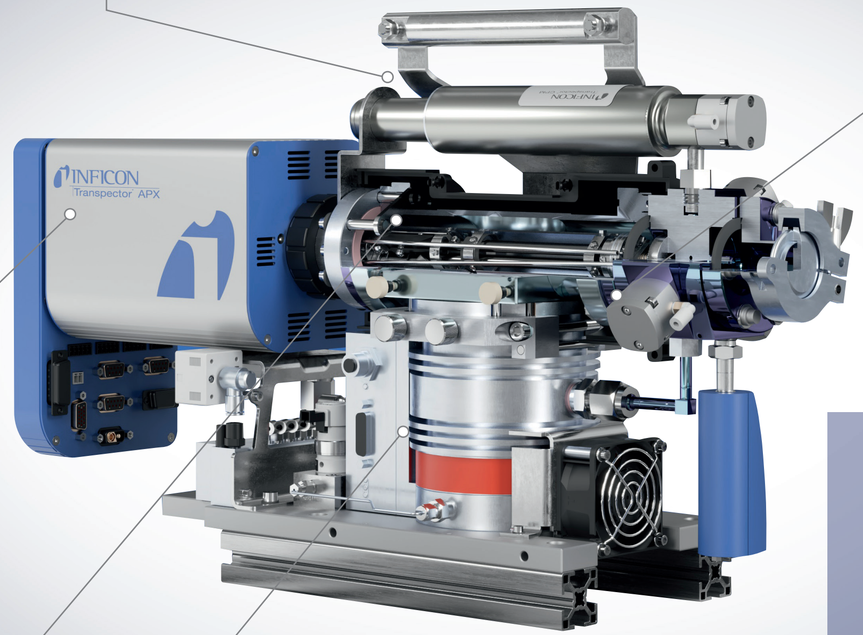
Semi needs for contamination monitoring are expanding. Specialized options are available for leading EUV fabs, with custom ion source and inlet designs that ensure the lowest hydrocarbon detection limits to protect wafers and equipment.

MAXIMIZE UPTIME

Transpector APX is the longest mean time to maintenance process monitoring system. Includes robust, field replaceable ion sources and an array of inlet options designed to be adapted to specific process requirements. Wetted parts are protected with INFICON proprietary coating for increased chemical compatibility and resistance to aggressive gases used in typical ALD, CVD, and Etch processes.

FAST DATA COLLECTION

Industry leading electronics enable shorter RF settling times for data collection speed up to 1.8 milliseconds per data point (approximately 555 data points per second). With this fast data speed, Transpector APX is ideal for challenging semiconductor applications such as ALD and HDP CVD.



INNOVATIVE ELECTRON MULTIPLIER

A low-noise, high-gain continuous dynode electron multiplier can be replaced in the field, resulting in decreased maintenance downtime and increased tool uptime.

BEST FIT AND FUNCTION

New high performance pumping platform with faster pumping and speed provides the lowest detection limits and reduces the footprint by 30% for ease of installation in the fab.

FABGUARD DATA COLLECTION AND ANALYSIS

When integrated with the INFICON FabGuard software suite, Transpector APX becomes a powerful process monitoring and diagnostics tool which can be used for:

- Advanced process control (endpoint detection)
- Run-by-run and real-time fault detection and classification
- Statistical process control (SPC)
- Maintenance and decision support with FabRecover