



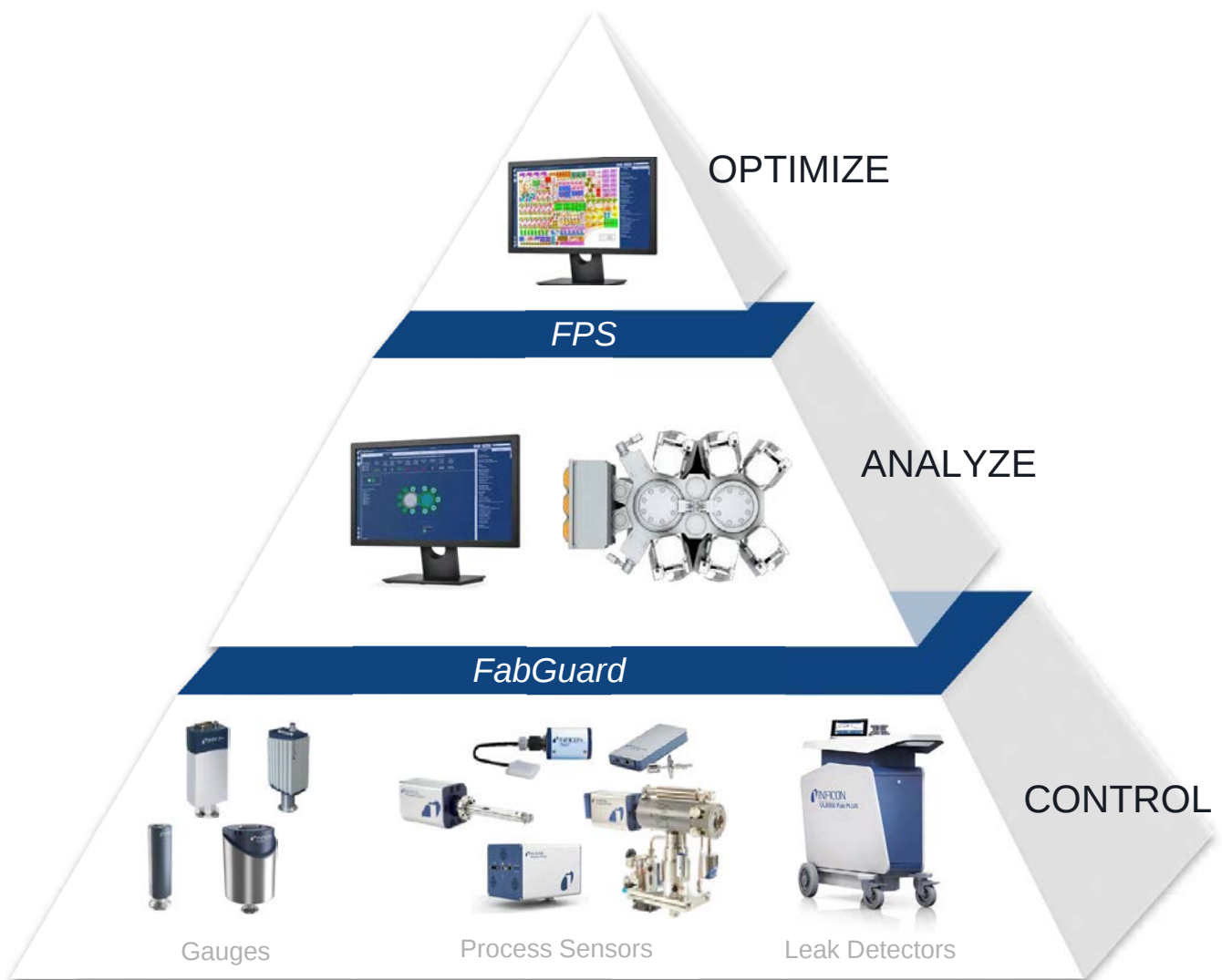
Transpector[®] CPX Residual Gas Analyzer

Compact Process Expert for
Advanced Process Monitoring



Leading-Edge Data Analytics and AI for Process Optimization

AI and Machine Learning Driven Solutions for Smarter Sensors, Enhanced Process Control, and Optimized WIP Scheduling



Enhanced Performance, Proven Reliability, and Application Versatility

FabTime functions as a central repository for factory data, managing both real-time and historical information, while also making it easy for users to locate relevant data. Within just a few clicks, users can drill down into reports and define specific metrics and parameters to efficiently reveal the root causes of problems.

Advanced Process Monitoring to Maximize Yield in Real Time

Modern semiconductor manufacturing is constantly evolving and Transpector CPX meets the demands of the semiconductor process evolution. With industry-leading measurement speed and sensitivity, Transpector CPX can monitor atomic layer processes, requiring deposition of extremely thin and uniform films, and detect any undesirable variance.

In addition to being the fastest RGA process monitor available, Transpector CPX also delivers maximum uptime with innovative inlet and ion source feature options, such as the optional dual-filament ion source, chosen for the application.

Transpector CPX is designed with the user in mind, allowing for more capable control of heating components as well as a 30% volume decrease from previous generations* for easier integration. This next-generation RGA remains the most reliable and versatile process monitor on the market.

**Compared to our legacy Transpector CPM 3*

ADVANTAGES AT A GLANCE

- ✓ **Advanced Systems** — The industry-leading pumping system increases pumping speeds and the heater cartridges offer advanced temperature control of the RGA
- ✓ **Smaller Fab Footprint** — 30% reduction in system volume, compared to Transpector CPM 3, for easier installation and RGA integration in space-constrained applications
- ✓ **Optional Dual Filament Ion Source** — Designed for extended lifetime of the ion source and improved tool uptime to maximize yield
- ✓ **Configurable HexBlock™** — With up to three pressure inlets for specific pressure ranges, designed for reduced surface area to provide the fastest response times
- ✓ **Corrosion Resistant Capacitance Diaphragm Gauge (CDG)** — Allows users to monitor the process pressure and automatically protect the system from pressure excursions
- ✓ **Automated Calibration** — Ensures long-term data stability and accuracy for sensor to sensor and tool to tool chamber matching
- ✓ **Process Integration** — Transpector CPX becomes a powerful process monitoring and diagnostics tool when integrated with FabGuard® software and supported by INFICON world-class applications experts



PROCESS CHARACTERIZATION AND MONITORING FOR:

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

CALIBRATION TANK — AUTOMATED CALIBRATION

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

SENSOR — MAXIMUM UPTIME

Transpector CPX is the longest mean time to maintenance process monitoring system available. Includes robust, field replaceable ion sources and an array of inlet options designed for adaptation to specific process requirements.

HEXBLOCK — FIELD-PROVEN INLET SYSTEM

Transpector CPX includes the INFICON field-proven HexBlock inlet — adaptable enough to sample up to three different process pressures, yet robust enough to withstand the most challenging corrosive applications.

GAUGE — PROCESS GAUGE

Corrosion resistant process pressure gauge for long life in aggressive applications.

ELECTRONICS BOX — FAST DATA COLLECTION

Short RF settling times for data collection speed up to 1.8 milliseconds per data point (approximately 555 data points per second), ideal for challenging semiconductor applications such as ALD and HDP CVD.

EM — 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.

TURBOMOLECULAR PUMP — BEST FIT AND FUNCTION

High-performance pumping platform with fast pumping and speed provides the lowest detection limits and reduced footprint for ease of installation in the fab.

FABGUARD — DATA COLLECTION AND ANALYSIS

When integrated with the INFICON FabGuard software suite, Transpector CPX 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®



Transpector CPX Residual Gas Analyzer

SPECIFICATIONS			
Mass range	100 amu	200 amu	300 amu
Peak width @ 10% peak maximum	<1 amu		
Ion source type	Single-Filament Closed Ion Source Dual-Filament 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 Torr (1.3E mbar) to 1.2 atm (with orifices/capillary)		
Sensitivity at low emission, FC mode	> 4E-6 A/Torr (> 3E-6 A/mbar)	> 2E-6 A/Torr (> 1.5E-6 A/mbar)	> 1E-6 A/Torr (> 7.6E-7 A/mbar)
Sensitivity at high emission, FC mode	> 2E-5 A/Torr (> 1.5E-5 A/mbar)	> 1E-5 A/Torr (> 7.6E-6 A/mbar)	> 5E-6 A/Torr (> 3.8E-6 A/mbar)
Minimum detectable partial pressure ⁵	1E-13 Torr (1.3E-13 mbar)	2E-13 Torr (2.6E-13 mbar)	4E-13 Torr (5.3E-13 mbar)
Maximum Data Rate (analog scans or selected peaks)	1.8 ms per point (555 data points per second)		
Detection limit ⁶	<200 ppb	<500 ppb	<1 ppm
Single Filament Linearity ⁷	±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

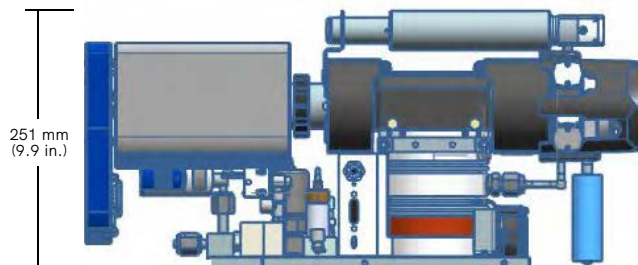
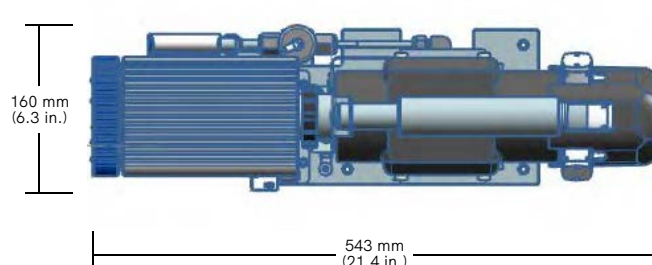
5 The MDPP with the electron multiplier (EM) on at 10,000 gain and a one-second dwell time.

6 The minimum detectable concentration with krypton in air at a two-second dwell time.

7 For 1 Torr orifices and lower; linearity at low emission at 0.1 to 2 times the nominal orifice pressure



DIMENSIONS



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Due to our continuing program of product improvements, specifications are subject to change without notice.

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