Onyx PCX

Next Generation HPLC Post-Column Derivatization Instrument

Introducing the Onyx PCX

The newest post-column instrument from Pickering Laboratories, part of our integrated family of instruments, chemistry and support.

Over 35 Years of Post-Column Innovation

Meet the Onyx PCX

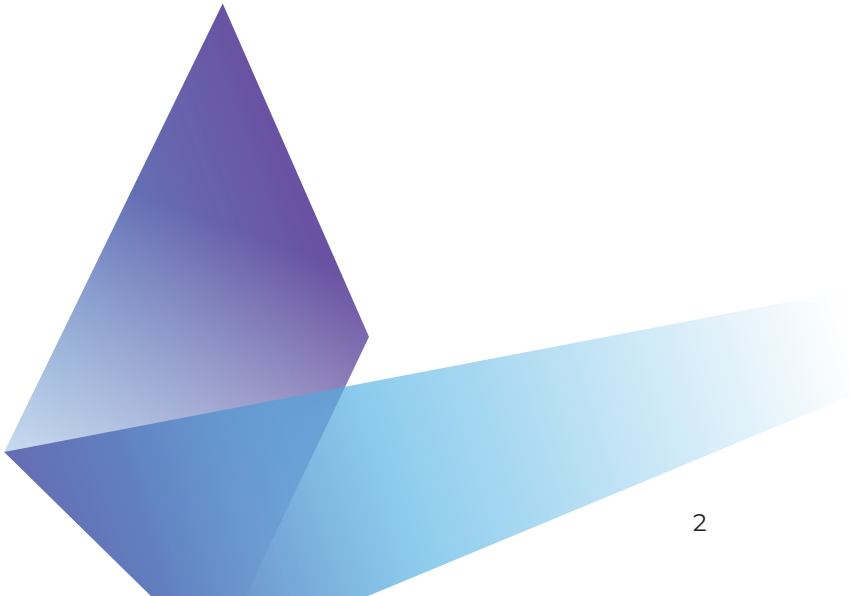
It's the next generation of HPLC post-column derivatization instruments resulting from Pickering Laboratories' 35+ years of experience in post-column instrument manufacturing. Previously, the Pinnacle PCX set the benchmark for innovative design as the top-of-the-line PCX model. Now, it is surpassed by the Onyx PCX as the best post-column instrument available on the market.

Pickering Laboratories still offers the only instrumentation optimized for the analysis of Amino Acids, Carbamates, Glyphosate, Mycotoxins, Antibiotics and many other applications. Each component is specifically designed to enhance sensitivity and selectivity. Only Pickering Laboratories offers complete application support, including chemicals, columns, methods and post-column systems. Because each part of the method is designed to work together, Pickering Laboratories can offer the extraordinary promise that the analysis is guaranteed to work for the intended application. The Onyx PCX reflects the ease of use, reliability and ruggedness customers have come to expect from Pickering Laboratories.

Onyx PCX Design Results in Optimized Analysis

Accuracy, Durability, Speed and Convenience

- Instrument layout is focused on ease of use, quick monitoring and rapid service.
- The electronic syringe pump provides true pulse-free flow for superior sensitivity and consistency. The pump cylinder and head are made from a single piece of inert ceramic for durability and non-reactivity.
- Electronic valves eliminate troublesome check valves and allow automated pump flushing.
- Quick-change reactor cartridges make application switching easy and replacements fast and inexpensive.
- The column oven utilizes circulating air for consistency of heating and quick cooling within 1 °C of setpoint.
- Inert flow paths extend system life and reduce maintenance.
- The Onyx PCX control software allows for precise control of the reagent delivery and conservation.
- Pre-programmed testing and maintenance procedures take the guesswork out of instrument care.
- Column oven temperature gradient programming improves separation and run times. Only Pickering Laboratories builds post-column systems with this feature.
- Works with any HPLC instrument, from any manufacturer.



It Has What It Takes

Features and Benefits

- All Onyx PCX components specifically designed for post-column derivatization
- Programmable temperature gradient column oven for faster Amino Acids Analysis run times
- Column oven is oriented for easy column switching and features improved tubing guards
- Electronic pulse-free syringe pump provides greater sensitivity
- Automatic piston washes and programmable system flush
- Full-size removable reagent tray provides convenience and meets secondary containment requirements
- Electronic valves have no expensive check valves to service and replace
- Quick change reactor cartridges enable fast application switching and easy cartridge replacement
- Inert flow path protects from metal contamination and extends system life while reducing maintenance
- Color LCD display provides for continuous system monitoring and critical message alerts
- All fluidics located on front panel for instant access and easy leak checks, drip tray included
- Improved pump access for expedient maintenance
- Integrated gas manifold allows for easy set-up and facilitates reagent preparation and preservation
- Onyx PCX control software runs from Windows PC for easy operation and reagent conservation between runs
- Software stores methods and sequences, allowing for flexible application setup and switching
- Seamless application migration from Pinnacle PCX to Onyx PCX, including method transfers
- Log files collect continuous data, from system status to error messages
- Pickering Support Team available for rapid log file interpretation and troubleshooting assistance
- Serviceability simplified with removable instrument side panels and isolated electronics
- Field calibration now available by trained Pickering Laboratories service engineers to support recertification

Programmable Temperature Gradient: Amino Acids Analysis

The Onyx PCX provides an unique opportunity to combine the eluant gradient capabilities of modern HPLC instruments with programmable column temperature gradients. As might be expected, this capability helps reduce Amino Acids Analysis run times.

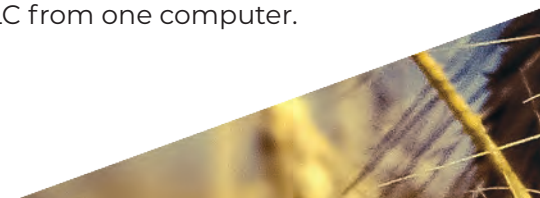
Even more significant is the ability to resolve coelutions. Consider such metabolic markers as Alloisoleucine (MSUD) and Argininosuccinic acid (ASA); under standard isothermal conditions these amino acids coelute with Cystathionine and Isoleucine respectively, but both are resolved using a targeted temperature gradient program.

The ability to accomplish this derives from the multiple retention mechanisms of the gel-type resins employed in ion-exchange, enabling all the amino acids to appear in the same chromatogram. The exact position of each amino acid is influenced by an array of mechanisms including partitioning, adsorption, charge exclusion, etc. So even though two amino acids might coelute, their proximity is incidental. And since retention processes are affected differently by changes in pH, salt concentration and temperature, all these parameters have significant influence on selectivity.

Onyx PCX Control Software

The Onyx PCX is controlled by PCX Control Software, compatible with Windows 7 or newer Windows operating systems. Using the same computer as the HPLC, the PCX Control Software interfaces easily with Agilent OpenLab or communicates with any other modern HPLC using a relay connection.

The computer physically connects to the Onyx PCX unit through a USB cable. After an easy installation and configuration, the software runs in a window or as an icon on the computer desktop. The main software display matches the instrument's digital LCD display, where all PCX functions of temperature, flow rate and system status are displayed in real time. This allows for monitoring and control of the PCX and HPLC from one computer.



Methods are managed within the PCX Control Software and can be created, edited and saved to create a library for all application parameters. A sequence table is used to schedule multiple runs of the same or different methods in a series. At the end of the sequence a full system flush can be programmed. System and pump performance can be evaluated in the maintenance menu, using a pump pressure test and system pressure test. An instrument log file continually records system status and error messages for later reference and can be sent to Pickering Labs Support for remote diagnostics.

Electronic Syringe Pumps and Valves

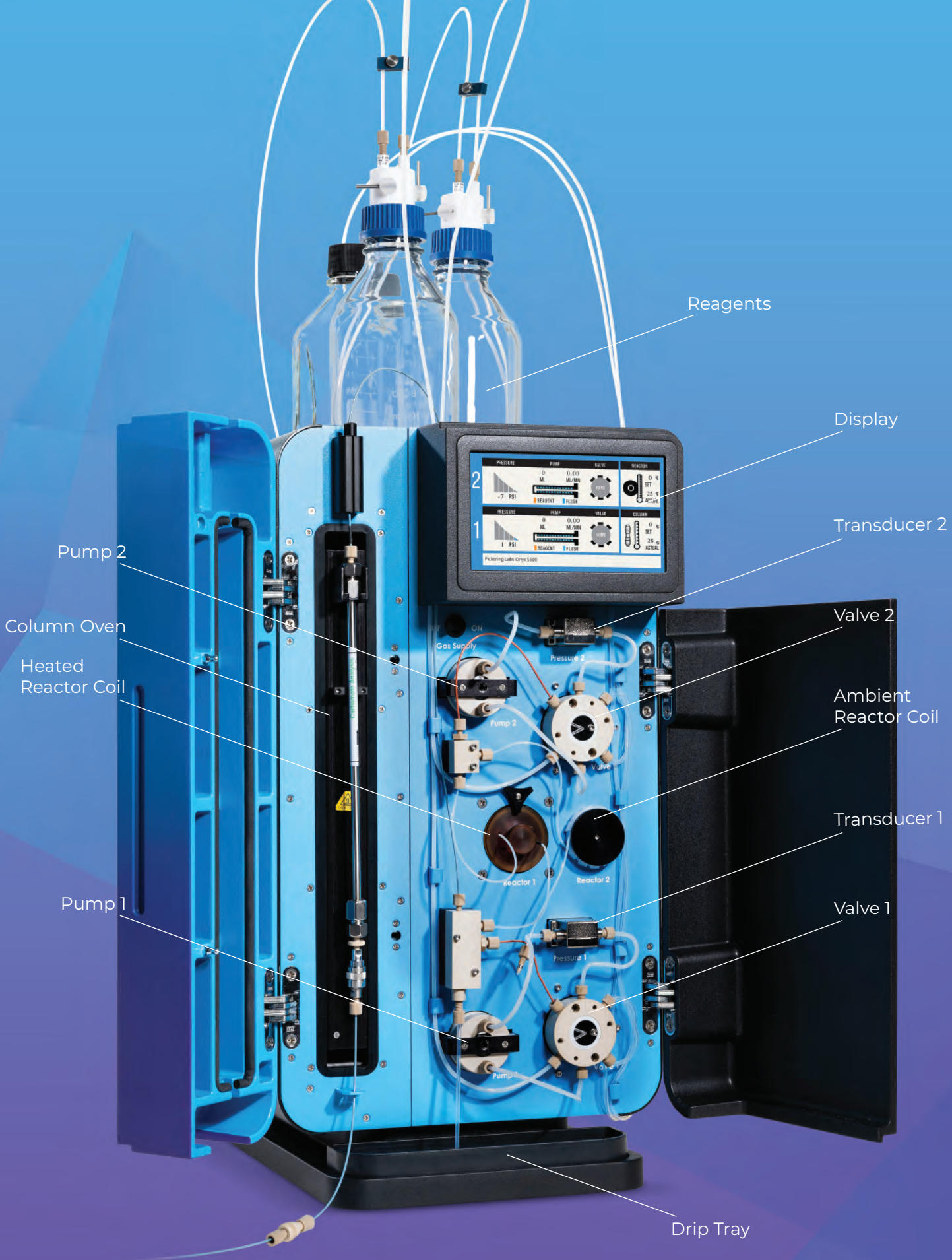
The syringe pump's cylinder and head are made from a single piece of 99.9 % Alumina for ruggedness and non-reactivity. The piston surface is made from PEEK with an inert O-ring seal. The piston seal is protected by an automatic piston wash system that provides long seal life. The programmable flow rates range from 50 ul to 1500 ul/minute with a refill cycle of under 60 seconds. The electronic valve utilizes PEEK and PTFA with a port layout that eliminates cross contamination.

Reactor

The reactor is designed for quick heating and easy switching between applications. The heating and control electronics are in the base unit of the reactor while the coil volumes are inserted with a 'quick-change' cartridge on the front fluidics panel. The temperature range holds within 1 °C resolution from 5 °C above ambient room temperature to 130 °C maximum setpoint.

Column Heater

The column heater utilizes recirculating airflow technology to provide quick and uniform column heating. Fast column cooling is assisted by the introduction of a fresh air flow into the chamber. The temperature range holds within 1 °C resolution from 5 °C above ambient room temperature to 75 °C maximum setpoint. The temperatures can be programmed for a gradient with as many steps as required for fine-tuning an analysis.


Reagents
Display
Transducer 2
Pump 2
Column Oven
Heated
Reactor Coil
Valve 2
Ambient
Reactor Coil
Transducer 1
Pump 1
Valve 1
Drip Tray

Specifications

Dimensions

- 22.4 H x 12.0 W x 19.15 D inches (56.9 x 30.5 x 48.6 cm), instrument with doors closed

Weight

- 60 lbs or 27 kg for dual-pump systems
- 50 lbs or 23 kg for single-pump systems

Electrical

- Factory configured as either 100-120 VAC, 50/60 Hz, 1.7 A, 200 W or 200-240 VAC, 50/60 Hz, 0.8 A, 200 W
- Mains voltage ± 10 % of nominal
- Current 5 A maximum
- Installation (over voltage) category II, pollution degree 2
- Fuses, 2 ea., 5 mm x 20 mm, 6.3 A, 250 VAC, time lag

Environmental

- Indoor use only
- Altitude up to 6500 ft (1981 m)
- Ambient temperature 15 - 29 °C
- Relative humidity up to 80 % at 31 °C

Reagent Pumps

- True pulse-free syringe pump with single piece ceramic barrels
- Maximum operating pressure 35 bar (500 psi)
- Programmable flow rates of 50 µL to 1500 µL/minute
- Refill cycle of 60 seconds or less
- Automatic piston wash
- Automatic reagent flush cycle
- No instrument check valves

Reactor

- Heated reactor temperature from 5 °C above ambient to 130 °C maximum setpoint
- Stability +/- 0.5 °C
- Accuracy +/- 1 °C
- Thermal safety switch limits temperature to 150 °C to prevent damage
- Easy replacement coil cartridges
- Range of reactor dwell volumes available, from 0.1 mL to 3 mL
- Reaction coil withstands up to 42 bar (600 psi) inlet pressure at 130 °C

Column Heater

- Heater accepts 6 or 8 mm OD (0.25 or 0.31 inch) x 50-250 mm in length Column and guard
- Temperature holds within ± 1 °C resolution from 5 °C above ambient to 75 °C maximum setpoint
- Programmable temperature gradient
- Easy access to column compartment and improved tubing guards

Instrument Package and Flow Path

- Advanced fluidics valve management system
- Completely inert flow path
- Easy access to internal components
- Standard fittings
- Side panels remove easily for service
- Integrated reagent reservoir tray compliant with secondary containment requirements

Display

- LCD display, color 800 x 480 pixels, 153 x 85 mm viewing area
- Real time temperature, pressure and critical system alerts shown
- Intuitive system status icons

Gas Pressure Manifold and Regulator

- Panel-mounted gas manifold
- Regulator maintains 0.3 bar (3-5 psi) on reagent reservoirs with 3-5 bar (45-75 psi) source pressure
- Safety pressure-relief valve opens at 0.7 bar (10 psi)
- Manifold with anti-siphon valves and two 1/4-28 fittings

Safeguards

- In-line check valve prevents reagent back flow into the column when HPLC pressure drops
- Replaceable reagent filters to prevent reactor fouling
- Post-column system over-pressure protection from pre-calibrated relief valve opens at 35 bar (500 psi) to prevent rupture of the post-column reactor tubing in the event of down-stream blockage
- Back-pressure regulator applies 7 bar (100 psi) to the detector flow cell outlet (waste line) to prevent detector noise and precipitation due to out-gassing or boiling

EMC Compliance

- Onyx PCX complies with EN 61326-1

PICKERING
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CATALYST FOR SUCCESS

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