

Pickering Post-column Derivatization Instrument



Post-column derivatization provides the selectivity, sensitivity and the chromatographic reproducibility often lacking in direct UV-vis or pre-column derivatization methods. When combined with a standard HPLC system, the PCX5200, along with chemicals and post-column protocols, provides a reliable and precise means for selectively derivatizing and detecting analytes of interest.

The PCX5200 is a versatile post-column derivatization instrument which can be configured for a variety of post-column methods and chemistries. It replaces the earlier PCX5100 and PCX3100 which were designed for, respectively, two post-column reagents and a single post-column reagent.

With the PCX5200 it is easy to convert to other applications, whether using single or two-step post-column derivatization by the addition of one or more applications kits. These kits include columns and might include Pickering's Chromatographic Grade eluants and post-column reagents. You may also add or substitute a flow-conditioner panel and (possibly) a reactor with a desired dwell volume or configure a system tailored to your own methodology and chemicals for applications not yet available from Pickering.

- Modular design facilitates re-configuration or upgrades by the user for a range of HPLC post-column applications, standard or custom.
- Front-removable gauge/flow conditioner panels for easy substitution of panels and access to internal components for service or substitutions.
- Built-in column heater accessible from front
- Microprocessor control: Five user-adjustable preset temperatures for different applications; Flash ROM for adding software enhancements; computer interface for external control or monitoring (requires user-written programming).
- Low-pulsation precision metering pumps for reproducibility; piston seal wash to extend seal life
- Reagent pulse-dampening network for smooth baseline
- Reactor with heavy-wall PTFE capillary allows operating pressure up to 35 bar (500 psi); standard and custom volumes available.
- Reagent reservoirs pressurized by inert gas to extend working life of oxygen-sensitive reagents and enhance pump performance.
- Column pressure interlock permits unattended operation with controlled shutdown; prevents reagent back-up into column.
- Non-metallic flow-path option permits use of corrosive reagents such as Sulfuric Acid in Methanol.

Safeguards to Prevent:

Post-Column Reagent Backflow

A pressure transducer installed between LC (eluant) pump and sample injector turns off power to reagent pumps and reactor when the eluant pump pressure drops to ≤ 35 bar (500 psi), ensuring that reagent will not flow upstream and damage the analytical column. Low eluant pressure can result from power failure, eluant pump malfunction, automatic or intentional shutdown or an empty reservoir. The PCX5200 will not restart automatically.

Check valves in reagent supply lines prevent pressurized reagents from continuing to flow through the pump and into the column when the reagent pump is off.

Post-column system over-pressure

A relief valve pre-calibrated to open at 35 bar (500 psi) prevents rupture of the post-column reactor tubing in the event of downstream blockage and reduces the possibility that all or part of the reagent flow will be diverted to the column.

Detector noise, precipitation

Back-pressure regulator applies 7 bar (100 psi) to the detector flowcell outlet (waste) to prevent detector noise and precipitation due to solvent out-gassing or boiling. Adjustable (2-10 bar).

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Reagent Pumps

- Independently adjustable, low-pulsation, phase-locked
- Flow rates factory pre-set at 0.3 mL/min; adjustable from 0.05 to 0.7 mL/min against back-pressure of up to 410 bar (6000psi)
- Sapphire pistons
- Liquid ends, including check valve housings, Type 316 SS (PEEK available)
- Bypass/purge valves for each pump located on front of instrument panel
- Piston wash

Gauges and Flow Conditioning Panels

- Independent 210 bar (0-3000 psi) pressure gauges for each pump
- 70 bar (0-1000 psi) gauge displays post-column system pressure
- Diamond-packed restrictors, matched to flow rate and viscosity of reagents
- Bypass/purge valves
- Replaceable reagent filter

Reactor

- Heated reactor controls at $\pm 0.4^\circ\text{C}$ for temperatures from 10°C above ambient to 130°C . Range of reactor dwell volumes, depending upon application
- Reaction coil withstands 42 bar (600 psi) inlet pressure at 130°C
- LCD display of actual temperature or set point
- Thermal safety switch limits temperature to 150°C

Column Heater and Temperature Controller

- Heater accepts 6-8mm OD (0.25 or 0.31 inch) x 50, 100, 150, or 250mm column and guard
- Temperature holds within $\pm 0.4^\circ\text{C}$ of set point; can be set with 1°C resolution from 5°C above ambient to 75°C
- Solvent preheater eliminates temperature gradient through column
- LCD display of actual temperature or set point
- Insulated, hinged cover allows access to column

Gas Pressure Manifold and Regulator

- Regulator maintains 0.3 bar (3-5 psi) on reagent reservoirs with 3-5 bar (45-75 psi) source pressure
- Pressure-relief valve opens at 0.6 bar (8 psi)
- Manifold with anti-siphon valves has four 1/4-28 tubing connections

Pressurized Reagent Reservoir

- One liter capacity (2 and 5 L reservoirs available)
- Maintained under inert gas pressure to inhibit oxidation of OPA or other oxygen-sensitive reagents
- Valve built into reservoir cap permits sparging during reagent preparation
- Reagent reservoirs fitted with 3.1 mm OD oxygen-impermeable Saran® tubing for oxygen-sensitive reagents and/or with 3.1 mm ODFEP tubing

Specifications

Dimensions: 37 (H) x 38 (W) x 38 (D) cm (14.5" x 15" x 15")

Weight: 13 to 15kg (28 to 33lb.)

Electrical: 100-120 V, 50/60 Hz, or 200-240 V, 50/60 Hz

PCX5200 Instrument Ordering Information

All PCX5200 configurations come with a gas manifold, accessories, spares, reservoirs, power cord and UM5200 Instrument User's Manual.

This table lists the standard configurations.

Cat.No.	Reag. Pumps	Reactor Vol.	Typical Applications	Price
1152-1111	1	0.15mL	AAA, Polyaminesw/OPA	
1152-1221	1	0.5mL	AAA, Ninhydrin detection	
1152-1411	1	1.4mL	Aflatoxins	
1152-2211	2	0.5mL	Carbamates, Glyphosate	
1152-3431	1*	1.4mL	Polyether Antibiotics	
1152-4431	2*	1.4mL	Polyether Antibiotics	

*PEEK

Flow Conditioner Panels

Cat.No.	Description	Price
1452-0021	Reagent #1, OPA or CB130 or GA116	
1452-0022	Reagent #2, OPA	
1452-0024	Reagent #1, TRIONE Ninhydrin	
1452-0025	Reagent #1, PEEK flowpath	
1452-0026	Reagent #2, PEEK flowpath	

Application Kits Ordering Information

All Application Kits come complete with column(s), guard, accessories, reservoir labels and an Applications Manual. Some include eluants and/or reagents as described for each kit.

Cat. No.	Post Column Application Kits	Price
0352-0002	Expanded Carbamates (23+): 25cm C8 column, OPA, Thiofluor, diluent, test mixture	
0352-0003	12 Carbamates: 25cm C18 column, OPA, Thiofluor, diluent, test mixture	
0352-0004	12 Carbamates: 15cm C18 column, OPA, Thiofluor, diluent, test mixture	
0352-0010	Glyphosate: Cation-exchange column, eluant, OPA Thiofluor, diluent, text mixture	
0352-0040	Polyamines: ALTION™ column, eluants, OPA, Thiofluor, diluent	
0352-0041	Aminoglycoside Antibiotics: ALKION column, eluants, OPA, Thiofluor, diluent	
0352-0042	Paraquat and Diquat: ALKION column, eluants	
0352-0050	Aflatoxins: ALFAX™ column	