

Varian Modular Semi-Preparative HPLC Systems

RELIABLE, VERSATILE SEMI-PREPARATIVE HPLC



Whether you are using your HPLC for general analytical purposes with the occasional purification; to automatically scaling up from method development using analytical scale columns to semi-preparative columns; to a dedicated semi-preparative HPLC using 1 inch or 2 inch ID columns, Varian has an HPLC solution for you. Select a pre-configured solvent delivery system, optimized for commonly-performed HPLC purification work. Or customize your solvent delivery system to perfectly match your unique requirements. Since each module can be tailored for your particular application, the possibilities are as diverse as your needs.

Whatever you choose, you can be confident your system will provide outstanding performance and reliability day in, day out.

Key Benefits

- ▶ **Outstanding solvent delivery.** Engineered for continuous use, rugged solvent delivery modules provide reliable performance using a single-piston, rapid-refill design. Able to deliver solvents from 0.01 mL/min up to 200 mL/min, the solvent delivery systems are versatile enough to meet all of your semi-preparative needs.
- ▶ **Multiple detection options.** We have the perfect detector for your application. The range includes wavelength programmable UV-Vis, PDA, RI and ELSD detectors.
- ▶ **Accurate, reproducible fraction collection.** Use the real-time peak detection algorithms of Varian Galaxie™ Chromatography Software to achieve accurate, reproducible fraction collection time and time again.
- ▶ **Bio-inert capability.** Choose robust stainless steel components for most applications, or biocompatible PEEK™ or titanium to protect precious biological samples.
- ▶ **Adaptable.** Quickly extend the capabilities of your system by changing pump heads, detectors, valves, mixers and other accessories. Simply add an extra pump to upgrade from an isocratic to a gradient system. As your needs change or grow, the system can too.
- ▶ **Easy to use software.** Be in complete control of your purification, with Galaxie software. The Galaxie interface simplifies method development and baseline monitoring.
- ▶ **Global service and support.** Serviceable parts, such as pump heads, flow cells and lamps are readily accessible, to ease maintenance and maximize uptime and productivity. Global Varian support and training extends your instrument life, lowers the cost of ownership and gives you peace of mind.

NOTICE: This document contains references to Varian. Please note that Varian, Inc. is now part of Agilent Technologies. For more information, go to www.agilent.com/chem.



Agilent Technologies

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Outstanding Solvent Delivery Performance

Choose from pre-configured isocratic or binary gradient semi-preparative solvent delivery systems that include pump heads, purge valves and injectors suitable for semi-preparative HPLC purposes. Need a slightly different solvent delivery system or need to operate at higher pressures? No problem – choose whatever components you need. No matter which solvent delivery system you choose, you get:

- High performance pumps that deliver the required gradient and flow for reproducible separations every time (Figure 1).
- Exceptional flow rate accuracy, precision, compositional accuracy and gradient linearity specifications.
- Flow rates of 0.01–100 mL/min with a Varian 210 based system or up to 200 mL/min using a Varian 218 based solvent delivery system.

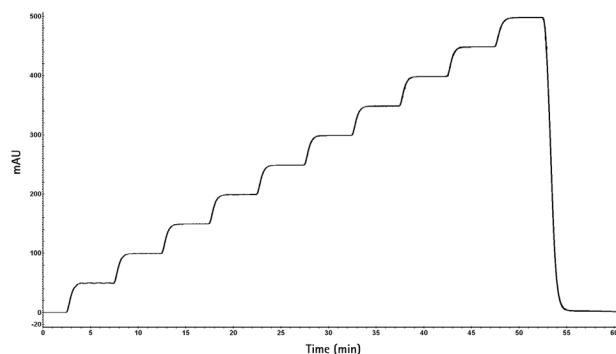


Figure 1. Reproducible flow rates and efficient dynamic mixing ensures accurate gradients.

Typical Configurations

Isocratic System with UV-Vis Detector

Add a Varian 325 programmable wavelength UV-Vis detector and 440-LC fraction collector (pictured on Page 1) to the isocratic solvent delivery system to make a semi-preparative HPLC that is ideal for purifying samples requiring a simple separation or where a gradient is not required. A typical system might include:

- Varian 210 based isocratic solvent delivery system with 25 mL/min head
- Varian 325 programmable wavelength UV-Vis detector with unique dual pathlength semi-prep flow cell (Figure 2)
- Varian 440-LC fraction collector
- Galaxie™ Chromatography Software with Modular System driver

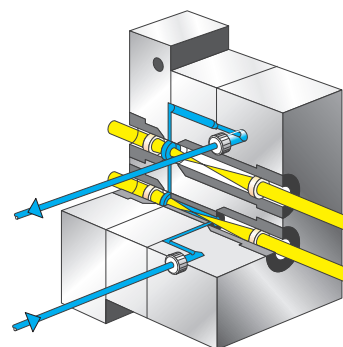


Figure 2. Use one dual pathlength flow cell in the Varian 325 UV-Vis or 335 PDA detectors for low and high flow rates, from low to very high absorbances. Dynamic range is up to 40 times more than with conventional detectors.

Flexible Binary Gradient System for Complex Separations

The high pressure binary gradient system delivers excellent gradient reproducibility and flow precision. Combine the gradient solvent delivery system with a Varian 325 programmable wavelength UV-Vis detector with dual pathlength flow cell providing wide dynamic range from 0.005 mAU to 20 AU to make this system ideal for purifying more complex separations. A typical system might include:

- Binary gradient Varian 210 based solvent delivery system (pictured on Page 1) with 25 mL/min stainless steel heads
- Varian 325 programmable wavelength UV-Vis detector with unique dual pathlength semi-prep flow cell
- Varian 440-LC fraction collector
- Galaxie software with Modular System driver

Add a Varian 335 Photodiode Array (PDA) detector, which provides full spectral display for enhanced compound identification and purity information.

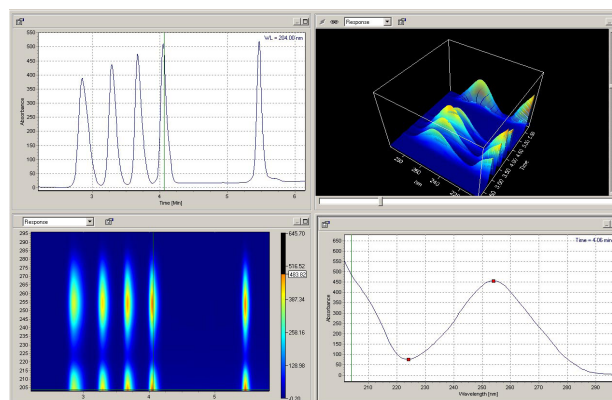


Figure 3. With a Varian 335 PDA and Galaxie software, uncover and decipher minute spectral differences for the most accurate information. This 'four view' display shows the chromatogram, 3D, iso absorbance and spectrum plots of methyl, ethyl, propyl, butyl and heptyl para-hydroxy benzoate.

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Fraction Collection You Can Depend On

The Varian 440-LC fraction collector uses Galaxie™ software to provide fully automated fraction collection that accurately, reliably and reproducibly collects your valuable samples in up to 270 vessels (Table 1) without operator intervention. Use the Varian 325 UV-Vis, 335 PDA, 356 Refractive Index or 380/385-LC Evaporative Light Scattering (ELSDs) detectors or even an analog input to trigger the fraction collection process using any combination of time slicing, threshold and slope. A simple manual over-ride is also available to ensure everything can be collected if required.

Table 1. Fraction capacity of the Varian 440-LC with different vessel sizes.

Tube OD (mm)	Max. Tube Vol (mL)	Max. No. of Vessels
13	7	270
16	13	180
20	25	120
25	38	72
30	50	63

Varian has an unbeatable solution to fraction collection with:

- Dual pathlength flow cells that 'see' all of the peak regardless of how large it is.
- Sophisticated real-time 'slope' detection that can reliably detect 'valleys' and 'saddles' between co-eluting peaks.
- Fast tube-to-tube movement so you won't waste your samples.

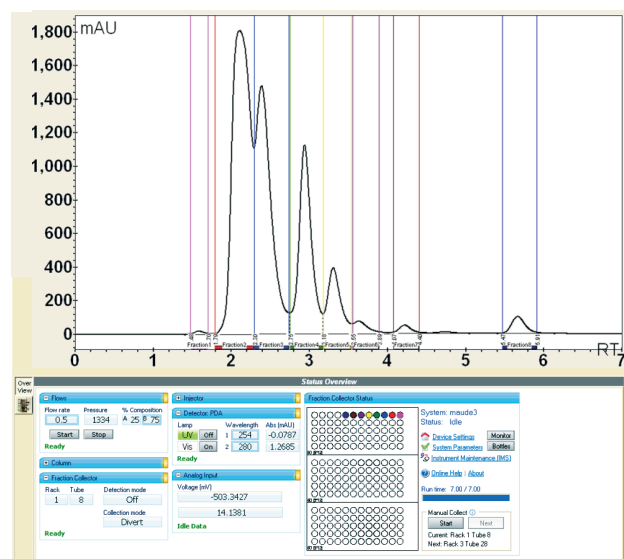


Figure 4. Perform automated collections of complex, unresolved mixtures using the Varian 440-LC fraction collector and Galaxie software.

Options For YOUR Application

The Varian 500 Column Valve Module (CVM, Figure 5) with column selection valve and solvent selector provides automated scale-up from 4.6 mm ID analytical columns to 25 mm ID columns minimizing errors and slashing your method development time.



Figure 5. Fully automate the analytical to semi-preparative scale-up process by configuring the Varian 500 CVM with manual injection, column selection and solvent selector valves and column heaters.

For analytes without a UV absorbing chromophore, the Varian 380/385-LC ELSDs (Figure 6) provide great sensitivity due to enhanced nebulizer technology. Patented gas flow technology gives unrivalled detection performance even for semi-volatile compounds.



Figure 6. Easily detect non-UV absorbing volatiles with the Varian 380/385-LC ELSD.

For biological samples, gradient and isocratic solvent delivery systems are available in both PEEK™ and titanium. The use of inert material such as PEEK in the flow path, avoids adsorption of proteins, guaranteeing the highest recoveries and reproducibility.

Columns and Accessories

Enhance your productivity with these Varian accessories:

- Column ovens
- Degassers
- Full line of high performance pre-packed columns from small particle size to full prep and process size in a range of phases and dimensions
- Load & Lock™ axial compression column packers for preparative use
- Variety of media for use with self-packing columns

With a full range of accessories, tubing, mixers, purge valves, fittings and sample vials, Varian is the one stop shop for all your HPLC needs.

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Ordering Information

Solvent Delivery Systems

Part Number	Description
0010096600	210 solvent delivery module (isocratic system) <ul style="list-style-type: none">• 25 mL/min head• Pump module• Purge valve• Mast kit• Manual injector with loop• Stainless steel plumbing kit
0010096200	2 x 210 solvent delivery modules (binary system) <ul style="list-style-type: none">• 25 mL/min heads• Purge valve• Mixer• Mast kit• Manual injector• Stainless steel plumbing kit

Column Valve Modules

Part Number	Description
393587402	500-LC base unit
393580001 (110 V) 393580002 (240 V)	Column heater assembly for CVM

Detectors and Flow Cells

Part Number	Description
0010081300	325 programmable wavelength UV-Vis
0010081500	325 dual wavelength programmable UV-Vis
0010083800	335 PDA, microbore to analytical
0010083900	335 dual PDA, analytical to preparative
0210181900	9 x 1 mm pathlength preparative flow cell
0210224200	4 x 0.25 mm pathlength semi-prep flow cell
0210182000	4 x 0.15 mm pathlength super prep flow cell
PL0890-0110 (110 V) PL0890-0240 (240 V)	380-LC Evaporative Light Scattering - for detecting semi-volatile compounds
PL0890-1110 (110 V) PL0890-1240 (240 V)	385-LC Evaporative Light Scattering - sub-ambient for detecting volatile compounds

Fraction Collector

Part Number	Description
0010088900	Varian 440-LC fraction collector

Accessories

Part Number	Description
393550001	Isocratic 210 solvent delivery module
393650001	Isocratic 218 solvent delivery module
R007101064	25 mL/min titanium pump head
R007101074	25 mL/min PEEK™ pump head with piston wash
R007101065	50 mL/min stainless steel pump head with piston wash
R007101075	50 mL/min PEEK pump head with piston wash
R007101077	100 mL/min titanium pump head with piston wash
R007101076	100 mL/min PEEK pump head with piston wash
393650701	200 mL/min titanium pump head kit (for 218 only)
393554801	1.2 mL volume stainless steel analytical dynamic mixer
393554901	1.2 mL volume titanium analytical dynamic mixer
393555001	1.2 mL volume PEEK analytical dynamic mixer
393502201	10 mL volume titanium preparative dynamic mixer
393502301	10 mL volume PEEK preparative dynamic mixer
393557491	ProStar 210/218 pump solvent delivery module Mast Kit
RE3725	Rheodyne 3725 PEEK prep injector valve
RE3725i	Rheodyne 3725 PEEK prep injector valve with switch
RE3725038	Rheodyne 3725 stainless steel prep injector valve
RE3725i038	Rheodyne 3725 stainless steel prep injector valve with switch
2ZB2XJ2SSP	1/8 in. stainless steel prime/purge valve
R000481802	1/16 in. stainless steel purge valve
R000220193	1/16 in. titanium prime/purge valve
R000481567	1/16 in. PEEK prime/purge valve

Software

Part Number	Description
0395000096 (Single license) 0395000094 (Four license)	Galaxie™ Chromatography Software with Varian LC drivers

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check our Web site.