

I need a system to run my samples unattended, but keep me informed of its progress

I need a system that lets me reprocess and quantitate data from any computer

I need one software package to control analytical, prep, and MS systems

I need to compare chromatograms from multiple columns

I need to collect data from several different detectors

I need easy-to-use software for everyone in my lab

I need an automated method development tool

Discovery VP® HPLC Systems

Fulfilling Your Needs from Method Development to Purification

 **SHIMADZU**
Solutions for Science
since 1875

Shimadzu HPLC Solutions

Discovery VP Systems

Discovery VP systems were developed to meet the requirements of customers who want queue-based sample submission, programmable gradient profiles, automatic report printing, and a simple interface that anyone can walk up to and use. A System Administrator has access to password-protected configuration screens to establish default methods for columns, enable email notification, and activate system protection features.

HPLC users of all experience levels work in the Method Builder screen to submit samples to the run queue. Six clicks are all it takes for chemists to get meaningful data while they concentrate on other tasks.

6 Clicks to Chromatography

Discovery VP Method Builder (Analysis)

Select a Column From The List Below (Click To Load Method)

Vial Number: 10

Injection Volume: 10 (10 µl)

Start % B: 10 (10 percent)

Final % B: 100 (100 percent)

Gradient Time: 5 (5 min)

Stop Time: 5 (5 min)

Flow Rate: 1.0 (1.0 mL/min)

Wavelength: 254 nm

Replicates: 1

Force Flush: ☐ Gradient: ☐ Invertible: ☐ Gradient Program: ☐ Queue Name:

Comment: Standard 1

Save Method Next Cancel

It's This Easy

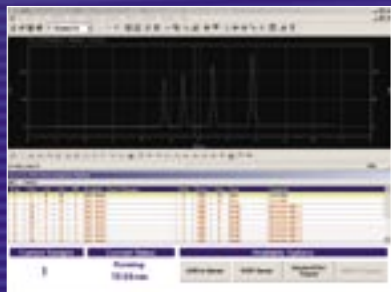
- 1 Select a column.
- 2 Input the vial position.
- 3 Add a comment to identify your sample.
- 4 Enter your name or email address.
- 5 Press "Next" to preview run information.
- 6 Review and Submit.

Sequence Preview

Run	Vial	Col	Inj. Vol.	Comment
1	10	6	10	Standard 1

Delete Submit Back

Off and Running



Once samples are submitted to the run queue, Discovery VP takes over so you can concentrate on other tasks.

- Columns are flushed and equilibrated, then the baseline is checked for stability before injection
- When runs are complete, Discovery VP can send an email to the user with an attached data file for reprocessing and quantitation at a desktop computer
- Upon completion of the queue, Discovery VP goes into a standby or “sleep” mode until another user adds a sample
- System shutdown at the Administrator-specified time with a complete flush of all columns used in the queue, and power off to the pumps and detector

The System Administrator's Role

The System Administrator is responsible for configuring Discovery VP behind-the-scenes so it will do the work for you.

- Create a name and email list of users for notification when sample runs are complete
- Select installed components from drop-down menus in the Hardware Configuration screen
- Enable printing, select sample rack type, indicate standby and shutdown times
- Identify columns and assign limits for pressure and strong/weak solvent exposure
- Specify a default method for a column that will load automatically
- Set slope and level ranges for triggering fraction collection
- Define Mass Spec scan modes, adduct values, and flow splitting if necessary
- Assign network server address and contact information to receive status updates from Discovery VP



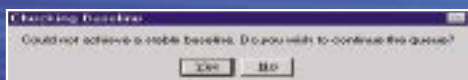
Configuration is fast and easy, yet it gives the Administrator total control over the system.

System Protection Features

Since Discovery VP is designed to run unattended after users submit samples, several features were built in to protect columns and to notify the System Administrator of any abnormalities.



Column protect: A system may consist of columns with vastly different chemistries and a variety of mobile phases including aqueous, organic, and buffers. The Administrator can, for example, limit the amount of aqueous solvent that reaches a C18 column to avoid phase collapse, or prevent certain solvent combinations to be used on any column.



Unstable Baseline Standby: Conserves solvent and notifies the Administrator if a stable baseline is not achieved before injection, which may indicate low lamp energy.



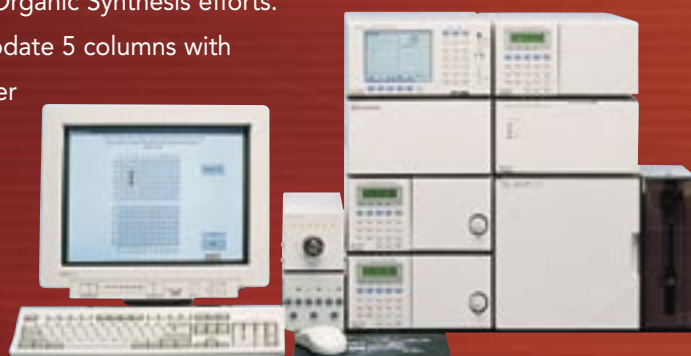
No Collection Alert: System shutdown and Administrator notification if no fractions are collected for a specified number of runs. No collection may indicate a dry solvent or autosampler rinse reservoir, or an empty vial in the sample rack.

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Discovery VP Analytical System

The Discovery VP Analytical system is designed for characterization of microgram to milligram quantities of lead candidates generated from Drug Discovery, Medicinal Chemistry, Natural Product Isolation, or Organic Synthesis efforts.

The standard configuration will accommodate 5 columns with automatic pump priming. Adding another column selection valve increases the column capacity to 10. Optional solvent selection valves let you work with 2 or 4 different mobile phases.



Run samples under isocratic conditions, simple linear gradients, or create complex gradients to include multiple timed steps.

Browse to select multiple samples from a graphical representation of the vial tray (2 mL, 4 mL, or microtiter plates).

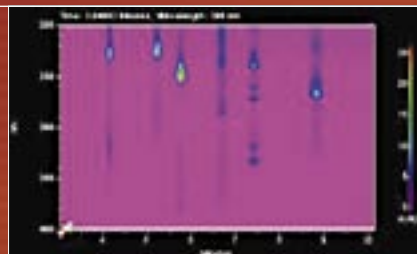
In the Sequence Preview screen you can go "Back" to change any field in the Method Builder, and when runs are complete, Discovery VP can send you an email with the data file attached.



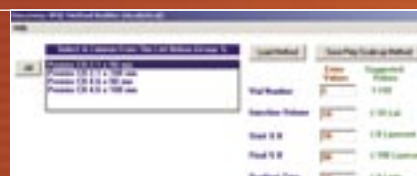
Add a photodiode array detector to scan a wavelength range for a complete spectral picture of your samples.

Isolate four individual wavelengths to monitor reaction products and starting materials.

For mass information, LC-2010A control is integrated in Discovery VP for APCI or Electrospray ionization in SIM or SCAN modes.



Once separation conditions are optimized, the Auto-Scale-Up feature saves your method so you can import it to a Discovery VP preparative system for isolation and purification of a target compound.



Powerful Method Development



Versatile Method Development tool

In response to customer requests for greater functionality of the Discovery VP system, increased column capacity and solvent selection were added to the analytical system, making it a true Method Development tool.

Up to ten columns and four solvent pairs can be configured, so you have the potential for 40 unique separation conditions for each sample. Get ready to optimize separations and resolve impurities in record time.

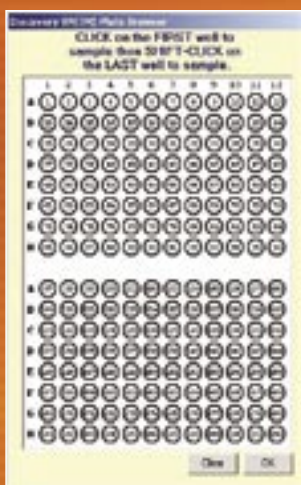
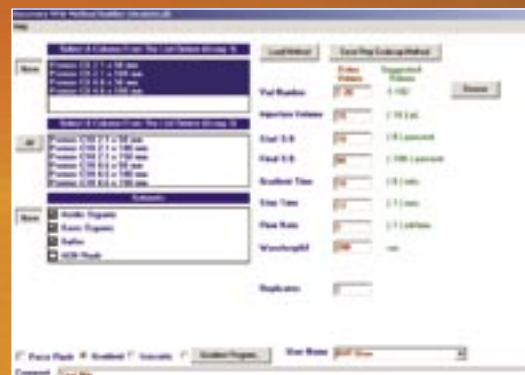
You decide what solvents to use: buffers, reversed-phase, normal phase, MS compatible...and Discovery will automatically purge the system in between solvent pairs. The System Administrator controls solvent compatibility for configured columns to assure longevity and optimum performance.

Same Intuitive Software

The Analytical Method Builder screen has the same user-friendly features as the standard analytical software, with additional column capacity and a selection box for up to four unique mobile phases.

Choose the solid phase chemistry by selecting up to 10 columns. Use the same dimensions and different packing materials, or a variety of column sizes. Choose the mobile phase chemistry by selecting up to four solvent pairs of different organic composition, pH range...the choice is yours!

Next, create a common gradient method for all columns—or allow the default method to load automatically. Enter your name and sample information and submit runs to the queue



Easy Graphical Programming

Program your method development runs with the same easy interface as the standard analytical system. Build new methods, open stored methods, or have them load automatically.

Enter vial numbers manually or by using a graphical browser. In just seconds, you can program hundreds of injections that will screen samples using 40 different chromatographic conditions.

Walk away confident that Discovery VP will do the method development work for you. Focus on other tasks while you wait for the results.

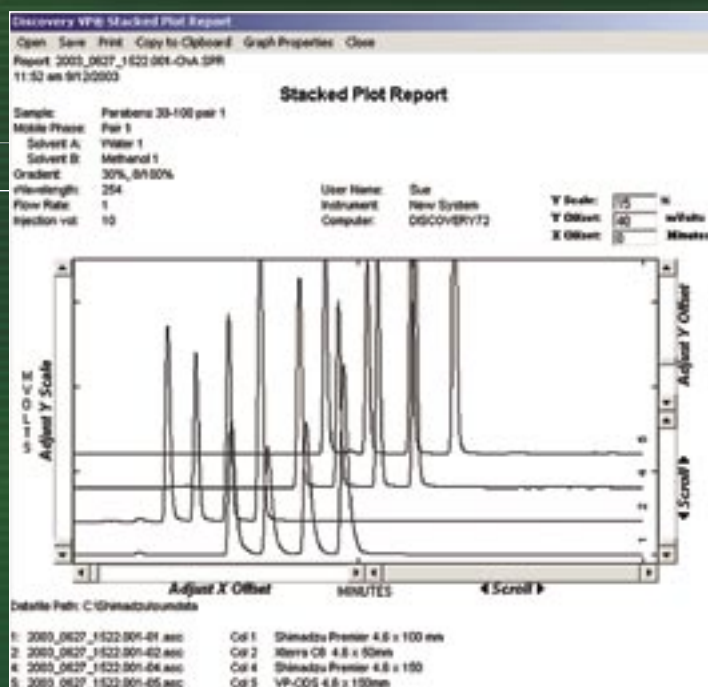
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YOU choose the best method conditions

Discovery VP will automatically overlay chromatograms and create a "Stacked Plot Report" for you to examine and choose optimum separation conditions—no matter how many peaks are in your sample. The final decision making for column choice, flow rate, and gradient program is left to the analyst, not the software.

Chromatograms can be manipulated in the report to focus on the baseline, which may reveal impurities early in the method development process and prevent costly and time-consuming reanalysis of samples.

Reports are saved with unique date/time filenames for archiving and sharing with colleagues. Header information includes all chromatographic conditions so anyone can reproduce the separation.



Shimadzu Mass Spectrometer Features and System Hardware Options

Analytical & Preparative Systems

In keeping with the theme of Discovery we have made LCMS easy to use. Simply input the mass of your compound and the ionization polarity (positive, negative, or positive/negative switching) prior to submitting your samples to the run queue. Discovery VP takes care of the rest. The LCMS-2010A high-sensitivity single quadrupole mass spectrometer will support both analytical and preparative operation, and switching between modes is simple – one click in the Hardware Configuration screen. This total support provides a quick solution for chemists optimizing separations on an analytical scale before working up to preparative scale.

Use of the Shimadzu APV flow-sampling valve allows you to choose APCI or ESI in either analytical or preparative modes. Discovery VP supports both SIM and SCAN modes for your known and unknown sample mixtures. The APV flow-sampling valve has a variety of split ratios, so you can also get a UV or PDA trace to go with your sample's mass information for better compound identification.

For preparative applications, trigger fraction collection with a UV detector, or any "other" detector such as RID or ELSD, and confirm peak identity with the MS. Alternatively, fraction collection can be triggered by the MS to collect only the compound(s) of interest.



Autosampler Options

The SIL-10ADvp handles sub-microliter injections and has a cooling option for temperature-sensitive samples. Use 1 mL, 2 mL, 4 mL vials, or 2 microtiter plates.

The SIL-HT gives you maximum capacity (4 microtiter plates) and low carryover – ideal for a multi-user environment. The high-speed injection cycle runs samples in record time.



Detector Options

Discovery VP can accept an analog signal from any detector. Measure conductivity of ionic samples or monitor refractive index changes during isocratic runs of non-chromophoric analytes.

The ELSD-LT evaporative light scattering detector complements any detector and allows gradient analysis of samples in volatile mobile phases. The high sensitivity of the ELSD-LT lets you see everything in your sample.



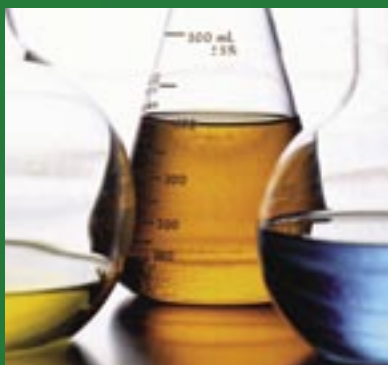
Discovery VP HPLC Solutions

Fulfilling the Needs of Diverse Markets

Pharmaceutical Discovery and Method Development

Combinatorial chemistry techniques produce large numbers of compounds that must be screened for structure-activity relationships. The Discovery VP Analytical and Preparative systems quickly reveal which reactions produced "hits" for further study.

Add multiple solvents and columns and the Discovery VP Method Development system will isolate impurities and let you create and save scale-up methods. Use the Discovery VP Preparative system for final purification and large-scale reactions.



University Laboratories

A Discovery VP Preparative system is ideal for a synthetic organic chemistry group to assist in the creation and purification of new compounds. As a dedicated instrument in a single lab, or a shared resource in a large department, Discovery VP can simplify or eliminate tedious flash chromatography and maximize productivity from students.

No more standing in front of a hood with a rack of test tubes, spotting each one on a TLC plate and checking with a UV lamp. Discovery VP will collect only peaks, so you save test tubes and prevent multiple components in the same tube, making purification of intermediates easier in multi-step reactions.

Nutraceutical

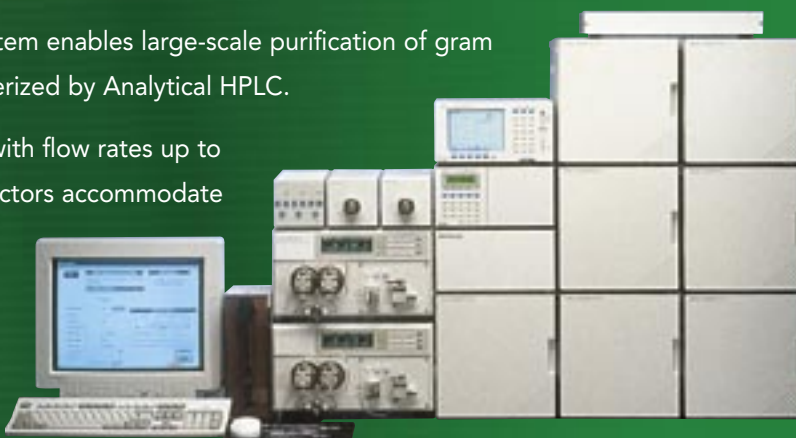
The natural products industry has undergone a tremendous amount of growth in the last decade. Discovery VP Preparative systems are invaluable for purifying raw materials and isolating compounds of medicinal value. Analytical systems will be used for final batch testing to ensure consistent amounts of active ingredients from lot to lot.



Discovery VP Preparative System

The Discovery VP Preparative system enables large-scale purification of gram quantities of compounds characterized by Analytical HPLC.

Five columns can be configured with flow rates up to 150 mL/minute, and up to 6 collectors accommodate over 350 20 mL fractions.



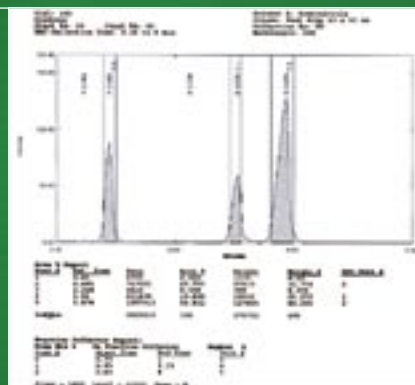
Import a Scale-Up method from your Analytical system and Discovery VP will automatically calculate new parameters based on flow rate or gradient time priority.

Choose a detector to trigger collection: Shimadzu's UV, MS, ELSD, or your detector to handle all sample types.

The System Administrator configures the collection parameters: volume per tube, ranges for slope and level to trigger collection, shutdown alert if no fractions are collected, and the buffer for minimum tubes remaining before Discovery VP will switch to the next collector.

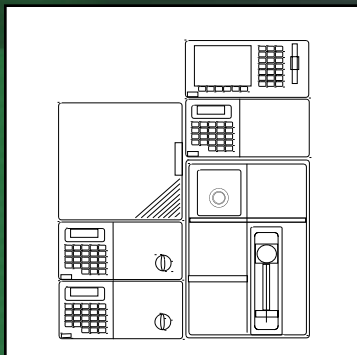


Discovery VP's Integrated Prep Report gives you a concise listing of tube locations and fraction start and stop times. The chromatogram shading instantly identifies the most concentrated part of the peak. Isolate entire peaks in a single tube as part of the purification process, or break large peaks into multiple tubes to recover the purest fractions for use in future synthetic steps.

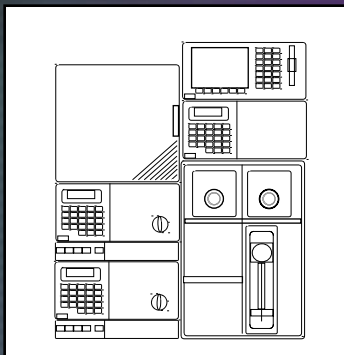


System Configurations

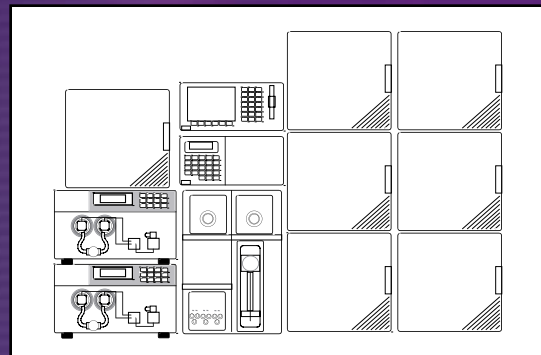
Analytical



Method Development



Preparative



Model	Description	Part Number	Analytical	Method Development	Preparative
LC-10ATvp	Pump	228-39001-92	2	2	
FCV-10ALvp	Solvent Selection Valve	228-34700-39	Option	2	
FCV-11ALvp	Solvent Selection Valve	228-35322-93	Option	Option	1
DGU-14A	Degasser	228-35359-92	Option	Option	
LC-8A	Pump	228-35740-92			2
SIL-10AF	Autosampler	228-38599-92	1	1	
SIL-10AP	Autosampler	228-38598-92			1
SIL-10ADvp	Autosampler	228-39005-92	Option	Option	
SIL-HTa	Autosampler	228-41000-32	Option	Option	
SIL-HTc	Autosampler w/ Cooler	228-41001-32	Option	Option	
Option Box L	Valve Controller	228-35720-91	1	1	1
FCV-14AH	Column Switching Valve	228-35325-92	1 (Columns 1-5)	1 (Columns 1-5)	1 (Columns 1-5)
FCV-14AH	Column Switching Valve	228-35325-92	Option (Columns 6-10)	Option (Columns 6-10)	1 (FRC 1-6)
SPD-10Avp	UV Detector	228-39300-92	1	1	1
SPD-M10Avp	PDA Detector	228-35555-92	Option	Option	
SCL-10Avp	System Controller	228-34350-92	1	1	1
FRC-10A	Fraction Collector	228-35800-92			1 (Option for 6)

Contact your local Shimadzu representative for more details.



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