



Agilent 1200 Infinity Series

Infinitely better automation tools and solutions



The Measure of Confidence



Agilent Technologies

INFINITELY MORE AUTOMATION FLEXIBILITY

Agilent offers the widest range of tools and solutions for automation of virtually any liquid chromatography application. Whether you need to increase sample throughput, accelerate method development, automate sample preparation, or solve any other challenging UHPLC application, Agilent's highly modular approach gives you utmost automation flexibility.

More Switching Flexibility

Agilent 1200 Infinity Series Quick-Change Valves allow you to automate a wide variety of applications such as column or solvent selection, column regeneration, or sample cleanup and enrichment. The valves' unique design with separate valve heads and drives gives you the flexibility to choose combinations that match your laboratory's individual application requirements.

More Device Control Flexibility

If your application requires a 3rd-party detector, the Agilent Universal Interface Box provides reliable analog-to-digital data conversion. Equipped with programmable contact closures, this module can be used to control many other devices.

More Reporting Flexibility

Agilent OpenLAB Intelligent Reporter lets you develop custom reports with ease, accelerating your data interpretation for increased sample throughput and higher productivity.



Inside: see how the 1200 Infinity automation tools and solutions for LC can boost laboratory productivity!



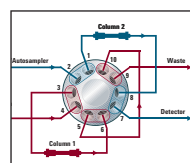
Select your automation tools



Pages 4-7



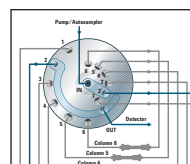
Increase sample throughput



Pages 8-9



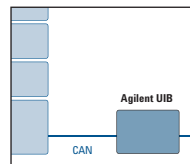
Accelerate method development



Pages 10-11



Control further devices



Page 12



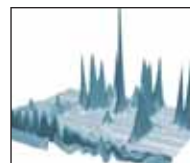
Customize your reports



Page 13



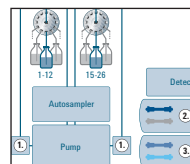
Optimize chromatographic resolution
with Agilent's ready-to-run 2D-LC solution



Page 14



Automate method development
with Agilent's ready-to-run multi-method solution



Page 15



INFINITELY MORE CHOICE

Designed with separate valve heads and drives, the Agilent Quick-Change Valves give you the freedom to configure an automation solution that matches exactly to the application demands in your laboratory. Choose between externally-mounted valves or valve-containing modules in your 1200 Infinity Series LC.

1290 Infinity Thermostatted Column Compartment

In addition to providing perfect temperature conditions from 10 degrees below ambient to 100 °C for up to four columns, the 1290 Infinity Thermostatted Column Compartment can house any Quick-Change Valve of your choice. For complex applications, you can cluster two or even three column compartments holding up to two valves and 8 columns.

1290 Infinity Flexible Cube

Up to two Quick-Change Valves can be fitted in the 1290 Infinity Flexible Cube that also contains a pump and an additional three-channel solvent selection valve for advanced applications. Combined with certain autosamplers, the Flexible Cube reduces sample carry-over down to 0.001% (10 ppm).

1290 Infinity Valve Drive

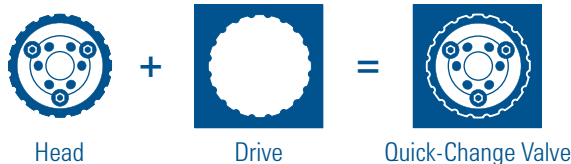
This external drive unit can be mounted directly on either side of your 1200 Infinity Series LC or on a free-standing, multi-purpose column/valve holder.

Full Compatibility With All Agilent LCs

All Agilent Quick-Change Valves can be used with any modules within the 1200 Infinity Series and are also compatible with earlier 1100 and 1200 Series modules.

Agilent Quick-Change Valves

Mix-and-match any valve head with any valve drive for ultimate flexibility.



Easy and Quick Exchange of Valve Heads

Valve heads and capillary connections can be easily exchanged by the user, regardless of where the valve drive is mounted.



Full Software Control of All Valves

All Agilent Quick-Change Valves are fully controlled by Agilent software such as OpenLAB CDS, Agilent MassHunter, and many 3rd-party CDS through Agilent Instrument Control Framework (ICF). Valve switching and position monitoring are integrated conveniently with the user interface regardless of where the valve drive is mounted.



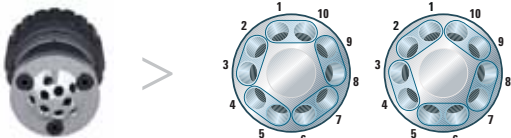

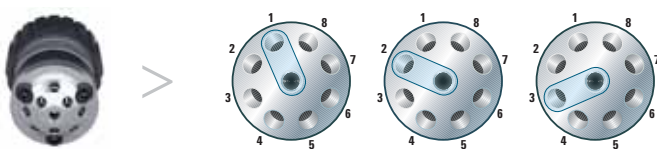
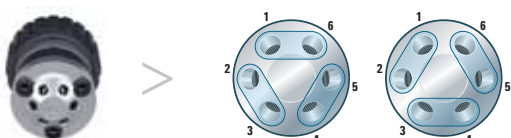

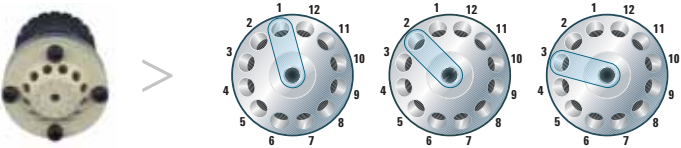

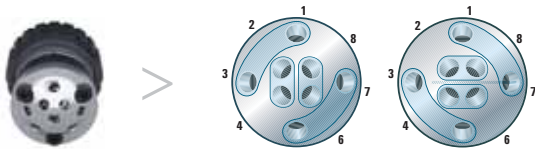
Selection Guide – Which Solution Is Best Suited For My Application?

- For column selection or sample enrichment applications, the 1290 Infinity Thermostatted Column Compartment is the best choice. With the switching valve and columns housed in a compact unit, capillary connections can be kept short for lowest extra-column band broadening. For method development using several columns, up to three column compartments can be clustered.
- For simple switching between two detectors, an externally-mounted 1290 Infinity Valve Drive offers not only the most cost-effective solution but also optimal routing of connecting capillaries. External valve drives can be added to existing LC stacks at any time.
- For all complex applications requiring several valves, the 1290 Infinity Flexible Cube optimizes tubing lengths within an LC stack. Two valve drives are pre-installed so you can mount valve heads whenever required by your application.

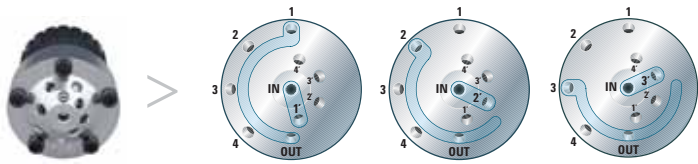
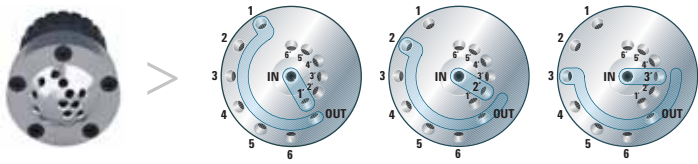


VALVE SELECTION GUIDE

Agilent Quick-Change Valves are available in stainless steel for high-pressure and ultrahigh pressure applications (600 and 1200 bar) as well as with bio-inert materials in the flow paths for bio-chromatographic applications.

Valve Typ	Positions/Flow Path	Applications	Max. Pressure	Order Number	
2-Position/10-Port* 	<ul style="list-style-type: none"> Any two-way switching between columns or detectors Column regeneration 	600 1200 600 600	G4232A (micro) G4232B G4232C G5632A		
8-Position/9-Port 	up to 8 positions >	<ul style="list-style-type: none"> Method development Column selection – up to eight columns (Agilent kit contains two 8-position/9-port valves) 	600 1200	G4230A G4230B	
2-Position/6-Port* 	<ul style="list-style-type: none"> Any two-way switching between columns or detectors Sample enrichment Sample clean-up 	600 1200 600	G4231A G4231B G5631A		
12-Position/13-Port 	up to 12 positions >	<ul style="list-style-type: none"> Solvent selection – up to 12 solvents Faction collection – up to 12 vessels 	200	G4235A	
2-Position/4-Port Duo 	<ul style="list-style-type: none"> 2-Dimensional Liquid Chromatography (2D-LC) 	1200	G4236A		

* Any application using a 2-position/6-port valve can also be performed using a 2-position/10-port valve – plus many more!
The 2-position/10-port valve is also available as a micro version with ultralow delay volume for capillary and nanoflow LC applications.

Valve Typ	Positions/Flow Path	Applications	Max. Pressure	Order Number
4-Position/10-Port 	up to 4 positions >	<ul style="list-style-type: none"> Column selection – up to four columns 	600	G5639A BIO inert
6-Position/14-Port 	up to 6 positions >	<ul style="list-style-type: none"> Column selection – up to six columns 	600 1200	G4234A G4234B

Bio-inert Valves

For applications in life sciences Agilent offers valves with biologically inert flow paths. All internal parts of the valves are completely free of stainless steel or metal-leaching alloys so that the bio-molecules in your sample come in contact only with ceramics or PEEK (suitable for pH 1 to 13).

Learn more about Agilent's bio-inert solutions at:

www.agilent.com/chem/1200BioLC

Custom Valves

Agilent offers custom valves for individual application requirements. Contact your Agilent representative for details of how to order.



Learn more: www.agilent.com/chem/1200valves

INFINITELY HIGHER SAMPLE THROUGHPUT

Pages 8 through 11 give you just a glimpse of what is possible with Agilent's valve portfolio.

All standard switching applications are possible – plus many more, limited only by your imagination!

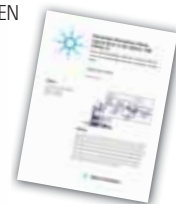
Automated Column Regeneration

Optimizing analysis times through automated column regeneration can increase sample throughput significantly – up to two-fold! Two identical columns are connected through a 2-position/10-port valve – while an analysis is running on one column, the second column is flushed and equilibrated by an additional regeneration pump.



2-Position/10-Port Valve

Download Application Note from
www.agilent.com/chem/library
Search for publication number
5990-5069EN



Sample Enrichment

The determination of trace components is always a challenge in the analysis of drug metabolites, environmental samples, or foods and beverages. Enrichment of the analyte prior to analysis is often required to achieve highest sensitivity. A 2-position/6-port valve can be used to automate trace component enrichment. While the matrix is flushed to waste, the analytes are retained and concentrated on a precolumn or SPE cartridge. A second pump then flushes the analytes out of the precolumn and onto the separation column.



2-Position/6-Port Valve

Download Application Poster from
www.agilent.com/chem/library
Search for publication number
5990-6922EN



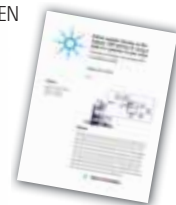
Sample Cleanup

Sample cleanup is essential for samples with complex matrices, such as biological fluids, food extracts or wastewater. Before injection into an LC or LC/MS system, the analytes of interest must be separated from the sample matrix. Stripping methods for sample cleanup deal with analytes and matrices in the opposite way to enrichment methods – while the matrix is retained on a precolumn, the analytes are flushed through to the separation column.



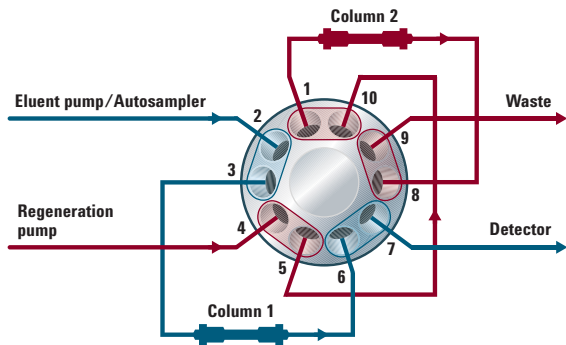
2-Position/6-Port Valve

Download Application Note from
www.agilent.com/chem/library
Search for publication number
5990-5255EN

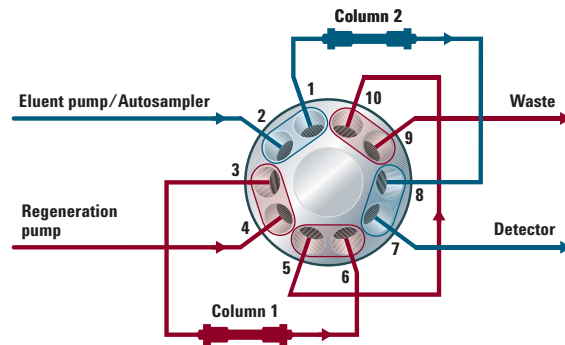


Automated Column Regeneration

While the analysis is running on column 1, column 2 is regenerated using the flow from a second pump.

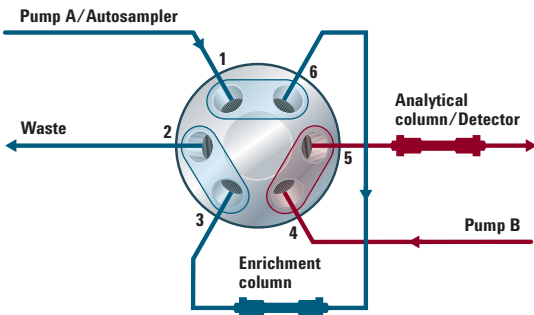


After the analysis on column 1, the flow switches to column 2 for analysis while column 1 is regenerated.

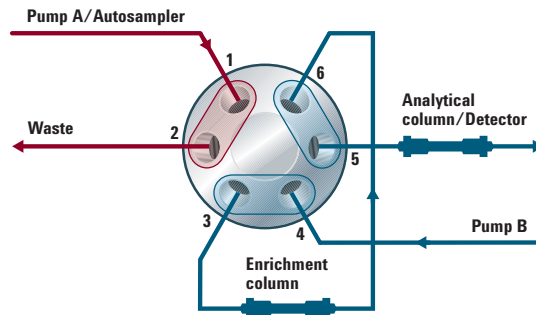


Sample Enrichment

The analyte is retained and concentrated on an enrichment column while the sample matrix flows to waste.

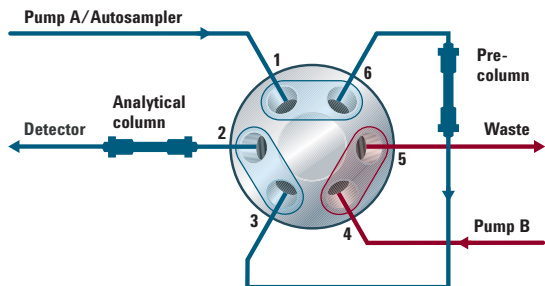


For analysis, the concentrated sample is flushed out of the enrichment column to the analytical column.

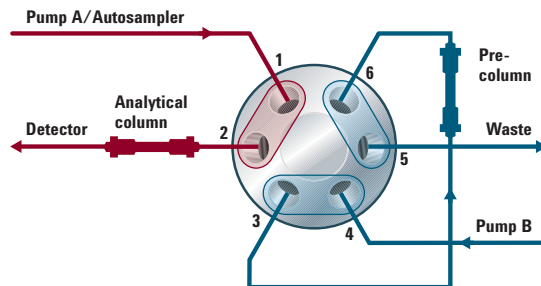


Sample Cleanup

Matrix components are retained on a precolumn while the analytes pass through to the analytical column for separation.



After sample cleanup or matrix stripping, the precolumn is flushed in reversed flow direction by the second pump.



INFINITELY FASTER METHOD SCOUTING

Here are further examples of how you can deploy Agilent valves to automate your LC workflows and boost your laboratory's productivity.

Column Selection

To develop an appropriate LC method and determine the optimum separation conditions – for example, for chiral screening – samples must be analyzed on several stationary phases. This process can be accelerated significantly using a 6-position/14-port valve that gives you automated access to up to six columns.

Using two 8-position/9-port valves mounted in two, stacked 1290 Infinity Thermostatted Column Compartments speeds up the process further with access to up to eight columns. Combination with further switching valves for solvent selection gives you a comprehensive solution for automated method development, see page 15 for details.



6-Position/14-Port Valve



8-Position/9-Port Valve

Solvent Selection and Fraction Collection

The 12-position/13-port valve can be used as a solvent selector for analytical flow rates. It provides access to up to 12 different mobile phases. Combined with a column selection valve, this solvent selection valve offers utmost flexibility for developing new methods, see page 15 for details. Further, solvent selection allows you to use step gradients to elute strongly retained samples also with an isocratic pump. This valve can also be used to collect fractions using time-based triggering, which makes it ideal for collecting fractions in large vessels.



12-Position/13-Port Valve

Detector Selection

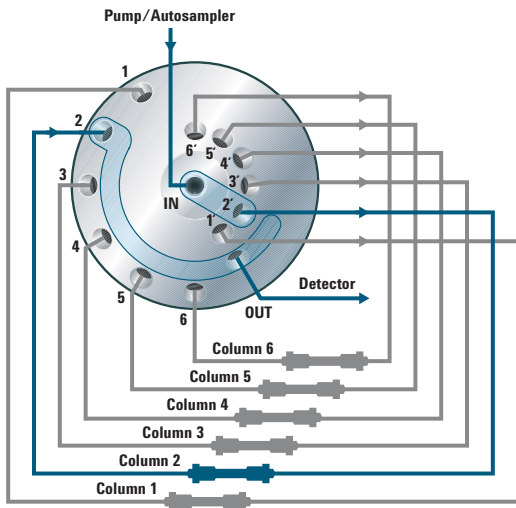
The design of the 2-position/6-port valve allows you to switch between two flow paths. Hence it can be used to direct the column effluent to another detector – simply select the detector that is best suited for your application. Similarly, this valve can also be used to switch between two columns. The valve is ideally suited for newcomers to method development, facilitating dual-column selection or detector switching.



2-Position/6-Port Valve

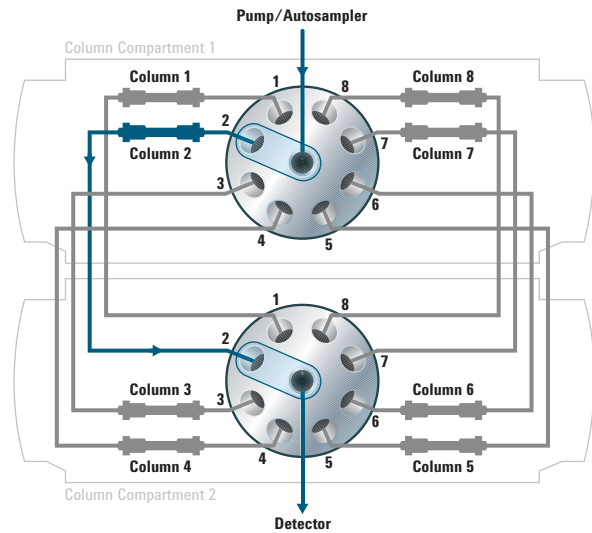
Column Selection

Selection from up to six columns using the 6-position/14-port valve.



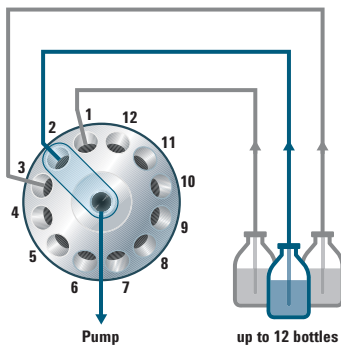
Column Selection

Select from up to eight columns using two 8-position/9-port valves housed in two column compartments.



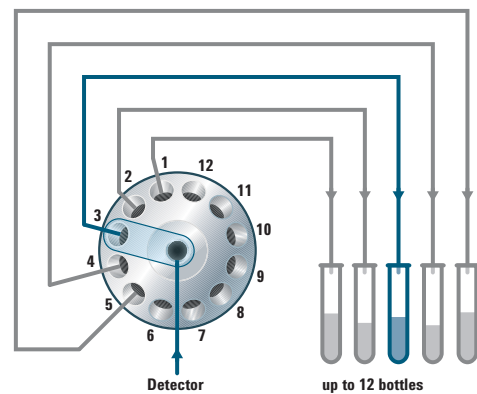
Solvent Selection

Choose from up to 12 different mobile phases for utmost flexibility when developing new analytical methods.



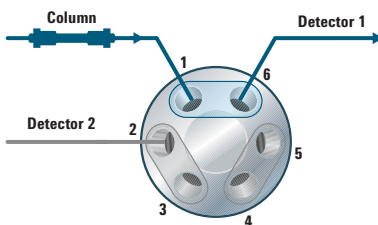
Fraction Collection

Use time-based triggering to collect your separated fractions in up to 12 collection vessels.

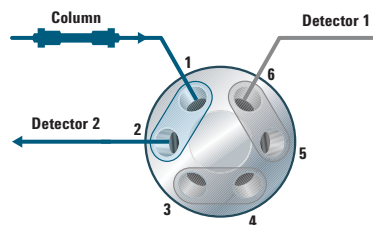


Detector Selection

Detect your sample analytes on one detector.



Then switch to a different detection technique for the next sample.



FLEXIBLE CONTROL OF EXTERNAL DEVICES

Agilent's new 1200 Infinity Universal Interface Box II can handle almost any type of input or output signal, giving you the flexibility to control and monitor a wide range of devices such as detectors, fraction collectors, pumps or switching valves.

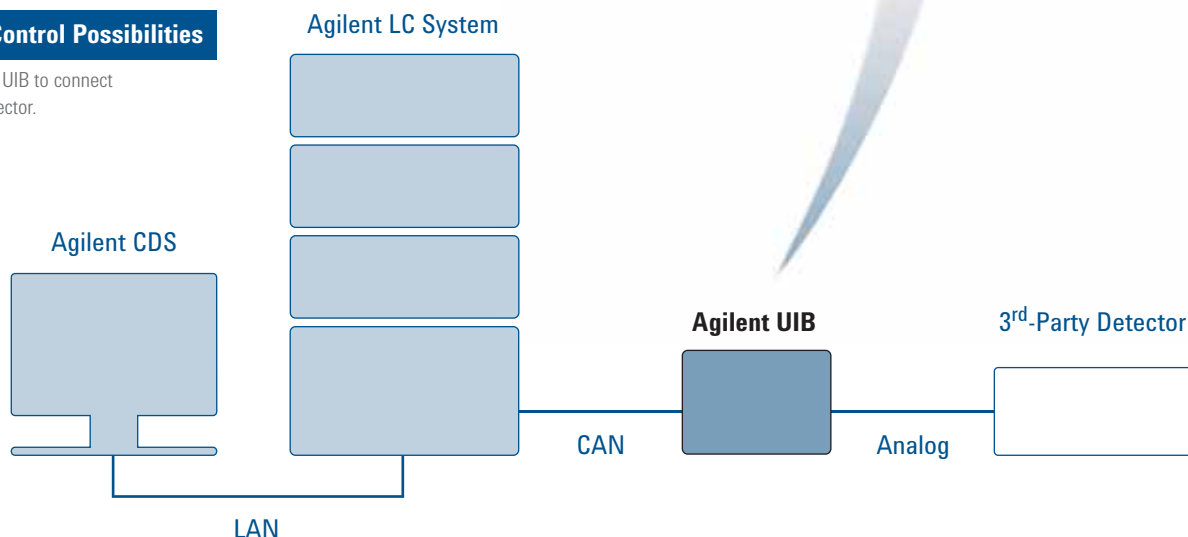
Flexible Handling of Any Signal

- Analog input for data collection from many 3rd-party detectors such as laser-induced fluorescence, radioactivity or charged aerosol detectors
- Input (ERI) for data collection from many 3rd-party sensors such as pH or temperature
- Analog-to-digital conversion of analog input for full data analysis through Agilent chromatography data system, or for peak-based fraction collection triggered by baseline threshold or peak slope (peak width > 0.2 seconds)
- Analog output to feed detector signals or pump pressure traces
- General purpose input/output interface (GPIO/ERI) for digital mass-based fraction triggering and general purpose use
- Low voltage output of 5 V and/or 24 V
- Four programmable relay contacts for control of external devices through close/open commands
- External leak sensor with separate input line for improved laboratory safety
- CAN connection to 1200 Series or 1200 Infinity Series modules



Flexible Control Possibilities

Use the Agilent UIB to connect a 3rd-party detector.



FLEXIBLE AND INDIVIDUAL REPORTING

Whether in the pharmaceutical industry or in life sciences, in industry or academia, a key challenge in today's laboratories is to convert raw analytical data into meaningful information and knowledge. Users' workflows therefore require adequate tools for instrument control, data acquisition and report generation.

Flexible Reporting for Better Decision Making

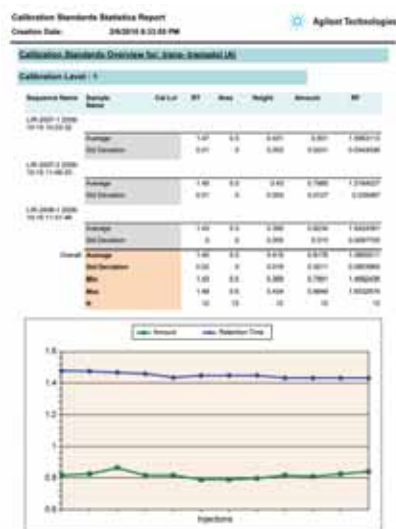
Reporting tools are needed to extract information from raw data in a convenient, flexible and automated manner. Agilent OpenLAB Chromatography Data Systems includes OpenLAB CDS Intelligent Reporter, which comes with a number of standard report templates that are easily adapted to suit your individual needs. In addition, OpenLAB Enterprise Content Manager (ECM) provides database-based reporting. Using OpenLAB ECM Intelligent Reporter, users can query for data in the ECM database and create reports across sequences easily.

Download brochure from www.agilent.com/chem/library
Search for publication number 5990-8702EN



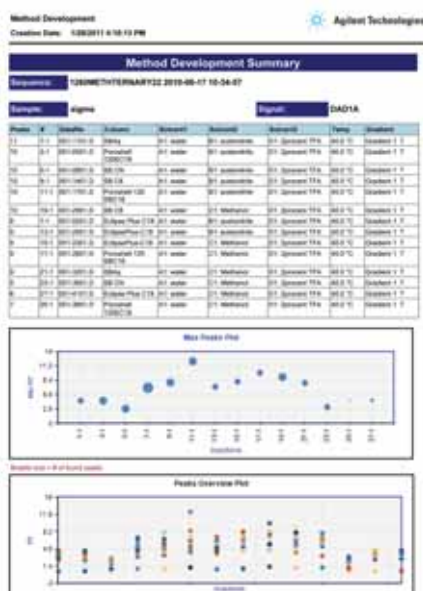
Standard Calibration Report

Aggregated results from different sequences stored in OpenLAB ECM.



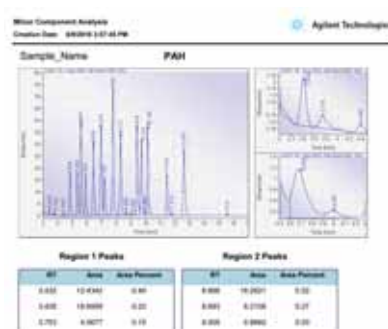
Method Development Report

Summarized results of method scouting for fast identification of optimal separation parameters.



Trace Impurities Report

Reports retention times, absolute and relative peak areas.



READY-TO-RUN 2D LIQUID CHROMATOGRAPHY

When your application requires the utmost in chromatographic resolution, the new Agilent 1290 Infinity 2D-LC Solution provides a flexible, easy-to-use approach for analysis of complex samples in metabolomics, polymer science or natural products industry.

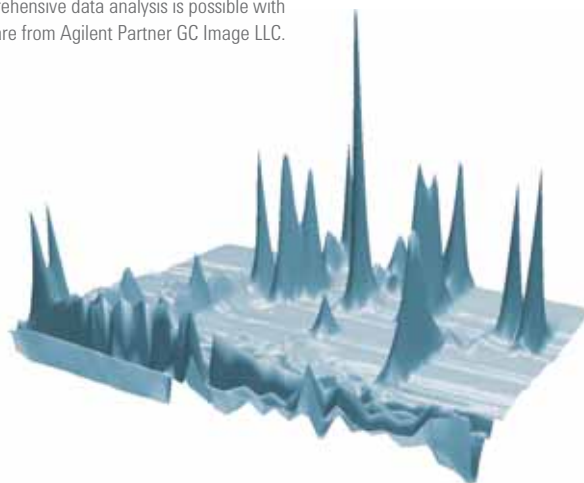
A Single Valve for Flexible 2D-LC

Innovative hardware and software makes the new 1290 Infinity 2D-LC Solution exceptionally easy to use and helps you to achieve highest performance while reducing operational costs. Besides supporting most literature-cited 2D-LC setups using 2-position/10-port or 2-position/6-port valves, Agilent offers a dedicated 2D-LC valve. This new, specially-designed 2-position/4-port duo valve facilitates both comprehensive and heart-cutting 2D-LC.

- In comprehensive 2D-LC the complete effluent from the first column is transferred to the second column
- With heart-cutting 2D-LC only selected parts of the first column's effluent are transferred to the second column

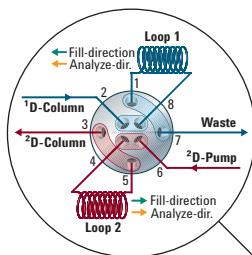
Capture Orthogonal Data With 2D-LC

Comprehensive data analysis is possible with software from Agilent Partner GC Image LLC.

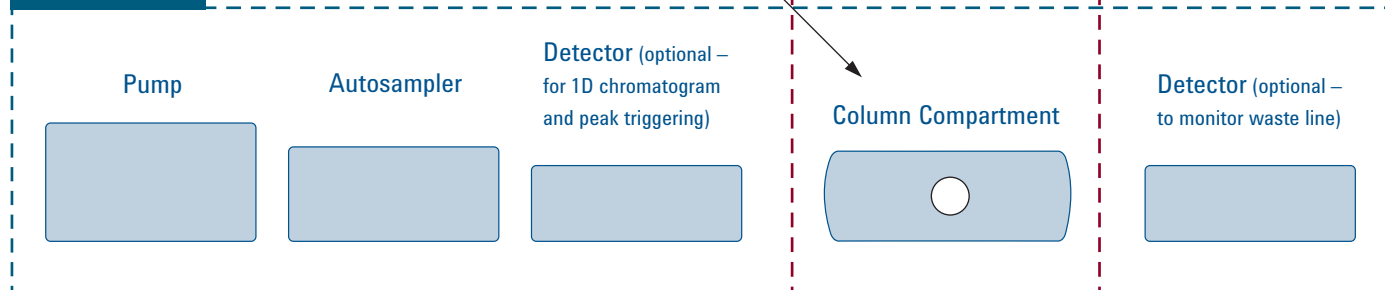


Agilent 1290 Infinity 2D-LC Solution

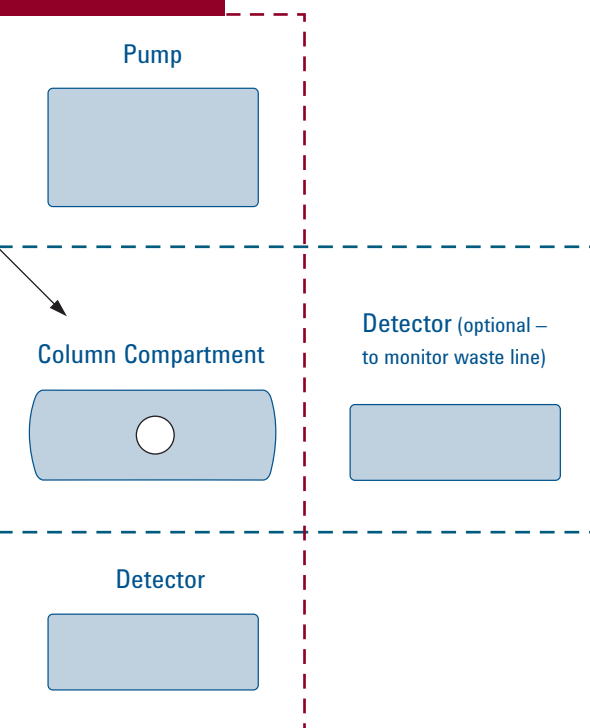
The new Agilent 2-position/4-port duo valve is the heart of the 2D-LC system for utmost chromatographic resolution.



First Dimension



Second Dimension



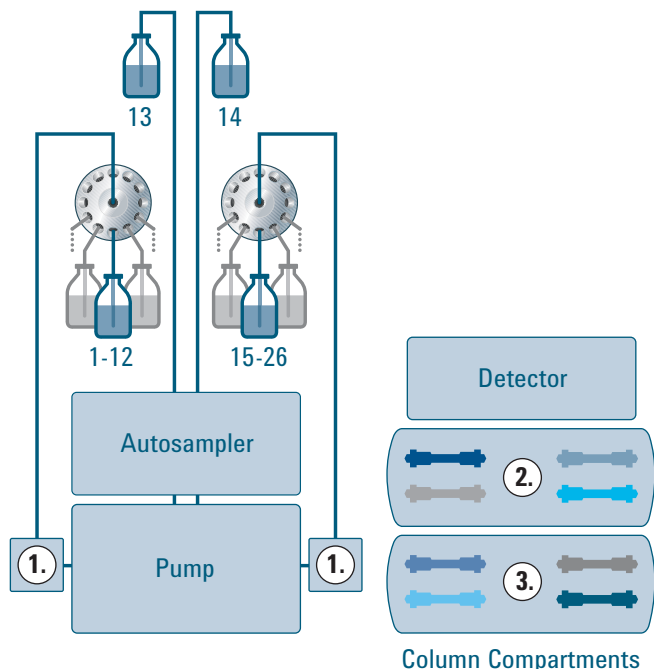
READY-TO-RUN AUTOMATED METHOD DEVELOPMENT

Agilent 1200 Infinity Multi-Method Solution gives you automated access to more than 1000 sets of unique separation conditions, making development and optimization of LC methods an easy task.

Superior Hardware and Software

Agilent 1200 Infinity Multi-Method Solutions combine superior hardware with dedicated software for smooth automation of LC method development. Hundreds of different combinations of stationary phases and solvents are at your fingertips to determine the optimum separation conditions for your application. The key component of this solution is the 1290 Infinity Thermostatted Column Compartment whereby two or even three units can be clustered.

- Up to 26 solvents
- Up to eight columns
- Up to six different temperature zones
- Up to 1200 bar for fast or high resolution UHPLC



1. 12-position/13-port valve for up to 12 additional solvents
2. 8-position/9-port outlet valve for column selection
3. 8-position/9-port inlet valve for column selection

Agilent Method Scouting Wizard

This software is an efficient and straightforward tool for screening samples in a multidimensional matrix of columns, solvents, gradients and temperatures. The Method Scouting Wizard guides you through setup, takes flushing and column equilibration into consideration automatically, supports setup of multiple samples and injections, and stores settings as templates for later reuse.

For advanced functionality, Agilent has partnered with Advanced Chemistry Development ACD Labs, ChromSword and S-Matrix. Choose an Agilent Partner Solution if your analytical methods need to be developed in a fully automated manner, including automated optimization of separation parameters in unattended operation.



Download application note and brochure from
www.agilent.com/chem/library
 Search for publication numbers
 5990-5600EN and
 5990-6226EN



Learn more

www.agilent.com/chem/1200valves

Find an Agilent customer center

www.agilent.com/chem/contactus

USA and Canada

1-800-227-9770, agilent_inquiries@agilent.com

Europe

info_agilent@agilent.com

Asia Pacific

inquiry_lsca@agilent.com

This information is subject to change without notice.

© Agilent Technologies, Inc. 2012
Published in the USA, August 1, 2012
5991-0291EN



Agilent Technologies