

Agilent InfinityLab

Quick Change Valve

G5631A Instructions

Contents

Typical Applications 2

Specifications 5

Delivery Checklist 6

Install the Valve Heads 7

Installation of Stainless Steel Cladded PEEK Capillaries 12

Replacement Parts 15



Agilent Technologies

Typical Applications

Dual column selection

Advantages:

- Increase productivity
- Higher instrument up-time

Quickly change between two different stationary phases to check your separation selectivity, or use two identical stationary phases to have the second column immediately available after the first one loses efficiency, for example with complex matrices.

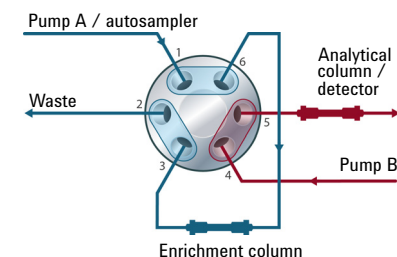
Sample Enrichment and Sample Cleanup

Advantages:

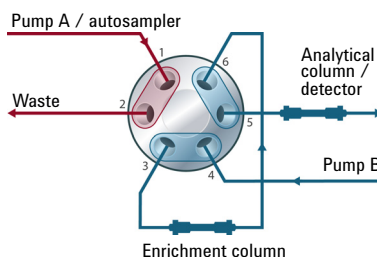
- Easy automation of sample preparation
- Higher reproducibility
- Increased productivity and sensitivity

Sample cleanup is essential for samples with complex matrices, such as biological fluids, food extracts and waste water. Before injection into an LC or LC/MS system, the sample matrix must be separated from the analytes of interest. Otherwise, contaminants can disrupt separation and detection or even damage the analytical column.

Sample Enrichment

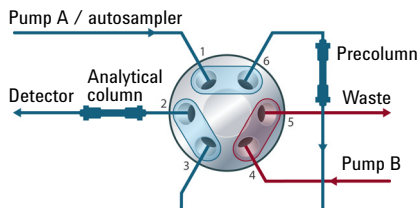


Position 1-6

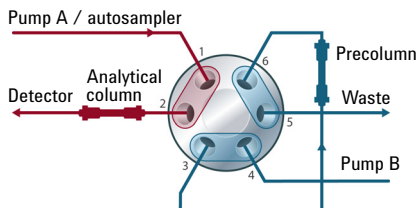


Position 1-2

Sample Cleanup



Position 1-6



Position 1-2

Enrichment methods

Enrichment methods are the techniques of choice to obtain highest sensitivity and to remove the sample matrix in such applications as proteomics, drug metabolism and environmental trace analysis. The analytes are retained and concentrated on the pre-column, while the sample matrix is passed to waste. After the valve switch, a second pump backflushes the analytes out of the pre-column onto the separation column. This allows injection of large volumes onto the pre-column, significantly expanding sensitivity in the range of ten to several thousands.

Stripping methods

Stripping methods handle analytes and matrices in the opposite way to enrichment methods. Matrix components are retained on the pre-column while the analytes pass through to the separation column. After the valve switches, an additional pump backflushes the matrix components out of the pre-column to waste, while the analytes are separated on the main column. Backflushing prepares the pre-column for the next injection.

Specifications

Table 1 G5631A (5067-4148), Bio-inert 2ps/6pt Valve head, 600 bar

Type	Specification
Maximum pressure	600 bar
Typical application	Any two-way switching, e.g. between two detectors, between waste and detector, between two columns
Port size	Accepts 10-32 male threaded fittings
Liquid contacts	PEEK, ceramic
pH range	0 – 14 [*]

^{*} incompatible with some mineral acids. For more information see Solvent Information.

Delivery Checklist

Check the content of the delivery. You should have received the following:

Table 2 G5631A Bio-inert 2pos/6port Valve Head kit

Description	Amount	Unit	Comment
2 position/6 port valve head, 600 bar, bio-inert (5067-4148)	1	ea	
Bio-inert Capillary kit for 2 pos/6 port valve (5067-4767)	1	ea	

The Bio-inert Capillary kit for 2 pos/6 port valve (5067-4767) contains the following parts:

Table 3 Bio-inert Capillary kit 0.17 mm 2pos/6ports

Description	Amount	Unit	Connection
Plastic fittings (0100-1259)	4	ea	
Waste tubing, 2 m (0890-1713)	2	m	
Column Holder Clips (2/Pk) (G7116-68003)	1	pk	
Fingertight fitting long, 10/pk (5062-8541)	1	ea	
PEEK tubing 0.18 mm x 1500 mm (0890-1763)	1	ea	column outlet to valve and valve to detector
Capillary PK/ST 0.17 mm x 400 mm RLO/RLO (bio-inert) (G5667-81004)	1	ea	Sampler to Valve
Capillary PK/ST 0.17 mm x 300 mm RLO/RLO (bio-inert) (G5667-81003)	2	ea	Valve to column

NOTE

The PEEK tubing 0.18 mm x 1500 mm (0890-1763) is for the low pressure side connection from the column outlet to the valve and from the valve to the detector. It is delivered in one piece of 1.5 m and needs to be cut individually. You can use the Plastic tubing cutter (8710-1930).

Install the Valve Heads

The valve drives are factory-installed in the Agilent 1290 Infinity Thermostatted Column Compartment (G1316C), the Agilent InfinityLab LC Multicolumn Thermostat (G7116A/B) and in the Agilent 1290 Infinity Valve Drive. The valve heads are interchangeable and can be easily mounted.

At the first installation, the dummy valve has to be removed from the valve drive. To make this possible, the transportation lock (G1316C) or transportation protection (G7116A/B) have to be removed by unscrewing them from the front. The valve head can be installed by mounting it onto the valve drive and fastening the nut manually (do not use any tools).

Be sure that the guide pin snaps into the groove of the valve drive thread.

NOTE

The valves are mounted on pull-out rails to allow easy installation of capillaries. Push the valve gently into its housing until it snaps into the inner position, push it again and it slides out.

When all capillaries are installed, push the valve back into its housing, see [“Install the Valve Head and Connect Capillaries”](#) on page 8.

Install the Valve Head and Connect Capillaries



For bio-inert modules use bio-inert parts only!

CAUTION

The valve actuator contains sensitive optical parts, which need to be protected from dust and other pollution. Pollution of these parts can impair the accurate selection of valve ports and therefore bias measurement results.

- Always install a valve head for operation and storage. For protecting the actuator, a dummy valve head can be used instead of a functional valve. Do not touch parts inside the actuator.
-

CAUTION

Column Damage or Bias Measurement Results

Switching the valve to a wrong position can damage the column or bias measurement results.

- Fit the lobe to the groove to make sure the valve is switched to the correct position.
-

CAUTION

Valve Damage

Using a low pressure valve on the high pressure side can damage the valve.

- When using multiple column compartments as part of a method development solution, make sure that the high pressure valve head is connected to the autosampler and the low pressure valve head is connected to the detector.
-

CAUTION

Sample degradation and contamination of the instrument

Metal parts in the flow path can interact with the bio-molecules in the sample leading to sample degradation and contamination.

- For bio-inert applications, always use dedicated bio-inert parts, which can be identified by the bio-inert symbol or other markers described in this manual.
- Do not mix bio-inert and non-inert modules or parts in a bio-inert system.

CAUTION

Wrong combination of fitting with valve

The InfinityLab Quick Turn fitting (5067-5966) is not compatible with the G5639A Bio-inert 4-Column Selector Valve. Misuse can lead to extra dead volume and leaks.

- As fitting, use UHP fitting (5067-5403) instead.

NOTE

For information about the compatibility mode of 800 bar valve heads see Information on RFID Tag Technical Note (01200-90134).

NOTE

For a correct installation of the valve head, the outside pin (red) must completely fit into the outside groove on the valve drive's shaft (red). A correct installation is only possible if the two pins (green and blue) on the valve head fit into their corresponding grooves on the valve drive's actuator axis. Their match depends on the diameter of the pin and groove.

NOTE

The tag reader reads the valve head properties from the valve head RFID tag during initialization of the module. Valve properties will not be updated, if the valve head is replaced while the module is on. Selection of valve port positions can fail, if the instrument does not know the properties of the installed valve.

NOTE

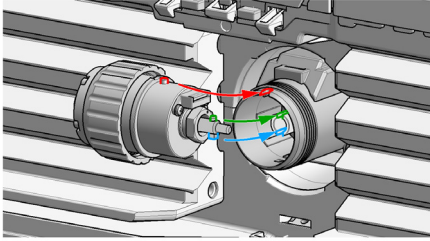
To allow correct valve identification, power off the valve drive for at least 10 s.

NOTE

For firmware requirements see Information on new RFID Tag Assembly Version Technical Note (01200-90133) which is included to each valve head.

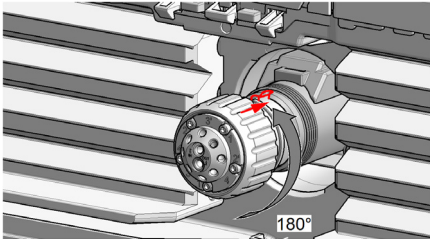
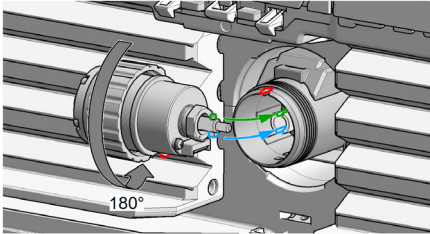
The following procedure shows the valve head installation with an G7116A/B (MCT) module as an example. For other modules it is similar.

- 1** Insert the valve head into the valve shaft.

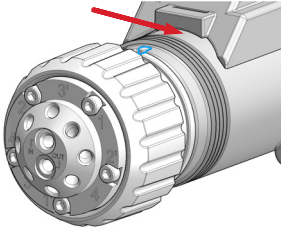


OR

If the outside pin does not fit into the outside groove, you have to turn the valve head until you feel that the two pins snap into the grooves. Now you should feel additional resistance from the valve drive while continuously turning the valve head until the pin fits into the groove.



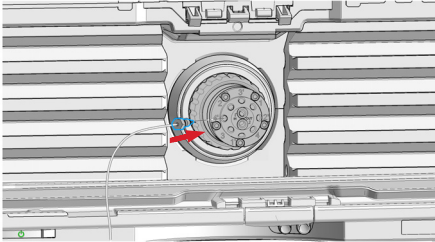
- 2 When the outer pin is locked into the groove, manually screw the nut onto the valve head.



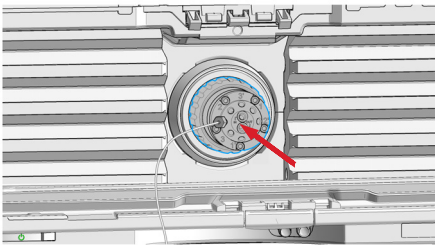
NOTE

Fasten the nut manually. Do not use any tools.

- 3 Install all required capillary connections to the valve.



- 4 Push the valve head until it snaps in and stays in the rear position.



- 5 Power on or power-cycle your module, so the valve head gets recognized during module initialization.

Installation of Stainless Steel Cladded PEEK Capillaries

Installation of Stainless Steel Cladded PEEK Capillaries

The Agilent 1260 Infinity Bio-inert LC System uses PEEK capillaries, which are cladded with stainless steel. These capillaries combine the high pressure stability of steel with the inertness of PEEK. They are used in the high pressure flow path after sample introduction (needle seat capillary) through the column compartment/heat exchangers to the column. Such capillaries need to be installed carefully in order to keep them tight without damaging them by overtightening.

CAUTION

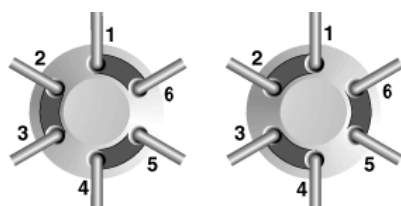
Strong force/torque will damage SST cladded PEEK capillaries

- Be careful when installing stainless steel cladded PEEK capillaries.
 - For correct installation see Agilent 1260 Infinity Bio-inert Quaternary LC System Manual.
-

Connecting the capillaries

Flow Diagram

A schematic of the valve flow switching pattern is shown below. The numbered circles represent the ports in the valve stator and stator face assembly. The slots represent the connecting passages in the rotor seal.



Position 1

Position 2

Figure 1 Flow connections of the valve at different positions

The following tables give you an overview about the different connection setups with and without installed Bio-inert Heat Exchanger (9 μ L internal volume, 600 bar max pressure) (G5616-81000) or Quick-Connect Heat Exchanger Bio-inert (G7116-60009).

Table 4 Dual column selection setup

Port	Connection without additional heat exchangers	Connection with additional heat exchangers
1	Right column inlet	Right heat exchanger IN
2	From pump	From pump
3	Left column inlet	Left heat exchanger IN
4	Left column outlet	Left column outlet
5	To detector	To detector
6	Right column outlet	Right column outlet

Table 5 Sample enrichment setup (Enrichment column = left, Analytical column = right, Analytical column outlet connected to detector)

Port	Connection without additional heat exchangers	Connection with additional heat exchangers
1	From autosampler and loading pump	From autosampler and loading pump
2	To waste	To waste
3	Enrichment column outlet	Enrichment column outlet
4	From analytical pump	From analytical pump
5	Analytical column inlet	Right heat exchanger (connected to analytical column)
6	Enrichment column inlet	Left heat exchanger (connected to enrichment column)

Table 6 Sample clean-up setup (Pre-column = left, Analytical column = right, Analytical column outlet connected to detector)

Port	Connection without additional heat exchangers	Connection with additional heat exchangers
1	From autosampler and loading pump	From autosampler and loading pump
2	Analytical column inlet	Right heat exchanger (connected to analytical column)
3	Pre-column outlet	Pre-column outlet
4	From analytical pump	From analytical pump
5	To waste	To waste
6	Pre-column inlet	Left heat exchanger (connected to Pre-column)

Replacement Parts

p/n	Description
5067-4148	2 position/6 port valve head, 600 bar, bio-inert
0100-1851	Stator face, ceramic
0101-1409	Rotor Seal (PEEK)
1535-4045	Bearing ring
5068-0020	Stator Screws, 10/pack
5068-0060	Bio-inert stator head
5068-0120	Stator ring



G5631-90001

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Agilent Technologies, Inc
Hewlett-Packard-Strasse 8
76337 Waldbronn, Germany