

# Agilent InfinityLab

## Quick Change Valves G4234A/C

### Instructions

This technical note describes the installation and application of the Agilent InfinityLab Quick Change 6 Column Selector Valve Heads G4234A and G4234C in a 1290 Infinity Thermostatted Column Compartment (TCC) (G1316C).

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Agilent Technologies

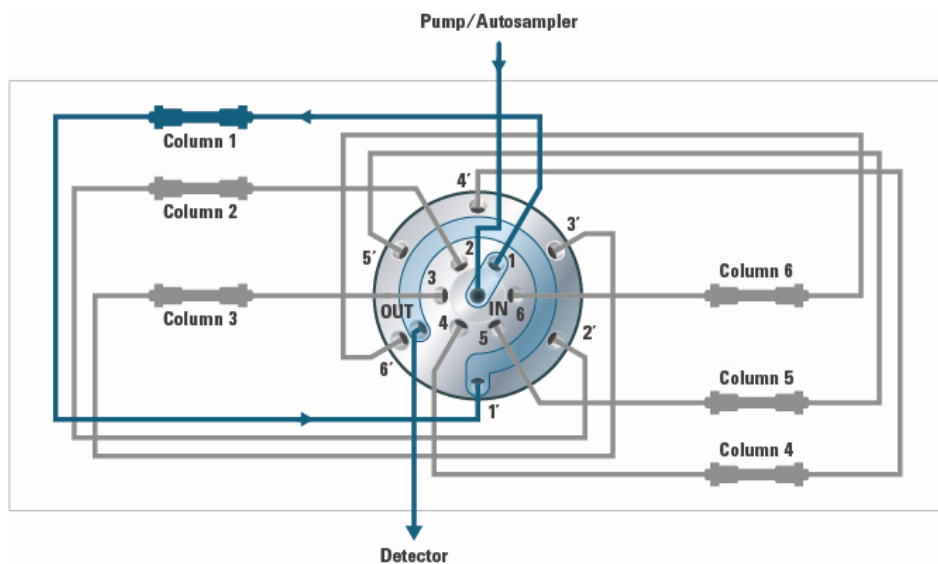
# Typical Applications

## Multicolumn Selection

### Advantages:

- Increase productivity
- Higher instrument up-time

Quickly change between up to four different stationary phases for different applications, or use identical stationary phases in columns with different dimensions for either faster run-times (short columns) or higher resolution (long columns) or for loading studies with different internal diameters.

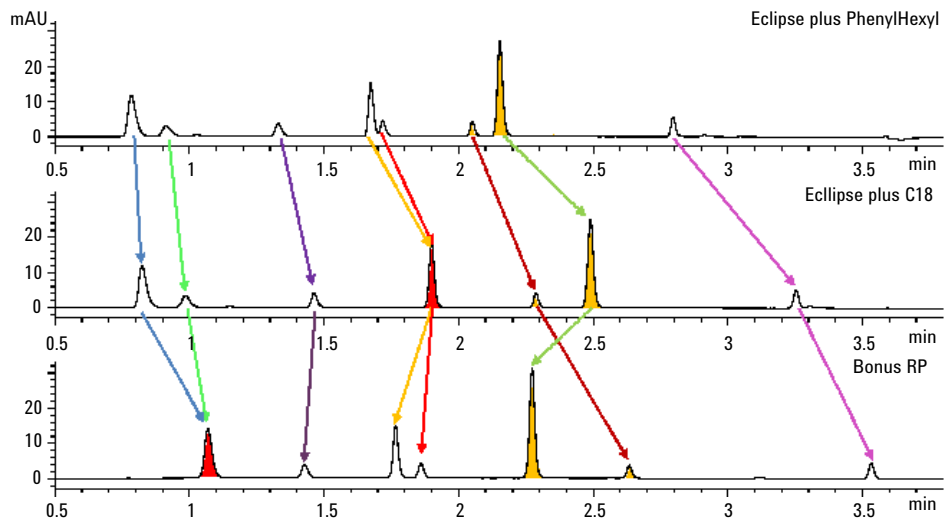


**Figure 1** Multiple column selection (example of schematic setup for 6-column selector)

# Method Development

## Advantages:

- Faster method development
- Automated method development possible



**Figure 2** Totally different chromatographic results by using the same sample but three different stationary phases

# Delivery Checklist

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

## **G4234A:**

<b>p/n</b>	<b>Description</b>
5067-4284	6-column selector valve head, 800 bar
5067-6187	6-column Selection Capillary Kit 0.12 mm ID, G1316C (OPTIONAL)
5067-4234	6-column Selection Capillary Kit 0.17 mm ID, G1316C (OPTIONAL)

## **G4234C:**

<b>p/n</b>	<b>Description</b>
5067-4273	6-column selector valve head, 1300 bar
5067-6187	6-column Selection Capillary Kit 0.12 mm ID, G1316C (OPTIONAL)

## Capillary Kit (5067-6187):

#	p/n	Description
2	G1316-60005	Low Dispersion Heat Exchanger Double Assy Order part number G1316-80022 for re-order
4	5500-1188	Quick Turn Capillary ST 0.12 mm x 105 mm, long socket Heat Exchanger to column
12	G7167-68703	Fitting Intermediate Kit Use 8x with capillaries 5500-1188, 4x on capillaries 5500-1200 to heat exchanger
8	5500-1200	Quick Turn Capillary ST 0.12 mm x 130 mm SL/M valve to heat exchanger / column to valve
1	5063-6591	PEEK Fittings 10/PK Column outlet fitting for capillary 5500-1200
1	5067-4737	Capillary ST 0.17 mm x 150 mm M/M Valve to valve (bypass)*
1	5067-4744	Capillary ST 0.12 mm x 340 mm SLV/M Autosampler to valve*
1	5500-1202	Capillary ST 0.12 mm x 500 mm M4-SL PS-PS Autosampler (dual stack) to valve
1	5500-1203	Capillary ST 0.12 mm x 280 mm M4-SL PS-PS Valve to detector
1	5042-9918	Column clip set, eight colors
1	5023-2504	Hex driver SW-4 slitted
1	G1375-87326	Waste tube Valve to waste
2	5067-6141	M4 Blank nut for plugging unused valve ports
1	G4234-90004	Technical Note G4234 TCC LDHE Double

\* Fittings: Removable fitting = connect to Column, Heat Exchanger; Metric M4 fitting = always connect to Valve Ports

## Capillary kit (5067-4234):

#	p/n	Description
1	5067-6188	Capillary ST 0.17 mm x 500 mm SL-M PS-PS Autosampler to TCC heater
2	5067-5113	Capillary ST 0.17 mm x 250 mm SL/M Heater to valve, valve to detector
4	5067-5112	Capillary ST 0.17 mm x 280 mm SV/M Valve to column
4	5067-5111	Capillary ST 0.17 mm x 150 mm SV/M Column to valve
1	5067-4737	Capillary ST 0.17 mm x 150 mm M/M Valve to valve (bypass)*
1	G1375-87326	Waste tube
1	5023-2504	Hex driver SW-4 slitted
1	5042-9918	Column clip set, eight colors
2	5067-6141	M4 Blank nut for plugging unused valve ports

\* Fittings: Removable fitting = connect to Column, Heat Exchanger;  
Metric M4 fitting = always connect to Valve Ports

# Valve Specifications

**Table 1** G4234A (5067-4284), 6-column selector valve head, 800 bar

Type	Specification
Maximum pressure	800 bar
Typical application	6-column selection
Port size	Accepts M4 male threaded fittings
Liquid contacts	PEEK, Stainless Steel
pH range	0 – 14*

\* incompatible with some mineral acids. For more information see Solvent Information.

**Table 2** G4234C (5067-4273), 6-column selector valve head, 1300 bar

Type	Specification
Maximum pressure	1300 bar
Typical application	6-column selection
Port size	Accepts M4 male threaded fittings
Liquid contacts	PEEK, Stainless steel
pH range	0 – 14*

\* incompatible with some mineral acids. For more information see Solvent Information.

# Installing the Valve Heads

The valve drives are factory-installed in the Thermostatted Column Compartments, in the 1290 Infinity Flexible Cube, and in the 1290 Infinity Universal Valve Drive. The valve heads are interchangeable and can be easily mounted.

At the first installation, the transportation lock (TCC only) and the dummy valve have to be removed, see [“Removing the transportation lock and the valve dummy \(only if used with TCC\)”](#) on page 9. The valve heads can be installed by mounting the valve heads onto the valve drives 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

### TCC only:

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.

If all capillaries are installed, push the valve back into its housing, see section *Installing the Valve Head and Connecting Capillaries* in the TCC-Manual.

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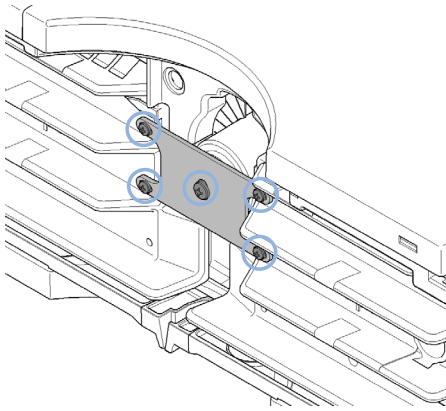


# Removing the transportation lock and the valve dummy (only if used with TCC)

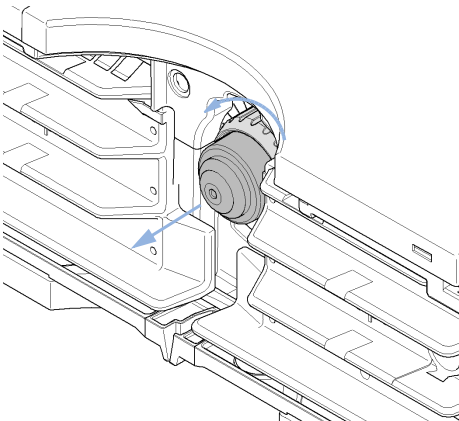
The following procedure demonstrates the necessary steps for installing the valve head to the valve drive of a TCC.

For the installation of a valve head to a G1170A 1290 Infinity Valve Drive or G4227A 1290 Infinity Flexible Cube you can ignore the steps that describe the TCC features of the transportation lock and spring loaded valve drive.

- 1 When unscrewing the transportation lock (TCC only), push it back until the last screw is removed - the valve rail is spring-loaded



- 2 To remove the valve dummy, loosen the nut manually.



## Installing the valve head and connecting capillaries (with the TCC as an example)

### CAUTION

The valve actuator contains sensitive optical parts, which need to be protected from dust and other pollutions. 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.
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### NOTE

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

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**NOTE**

The tag reader reads the valve head properties from the valve head RFID tag during the initialization of the module. The 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.

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**NOTE**

The Agilent 1290 Infinity Valve Drive recognizes the valve correctly, only if the valve drive was powered off for at least 10 s.

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**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.

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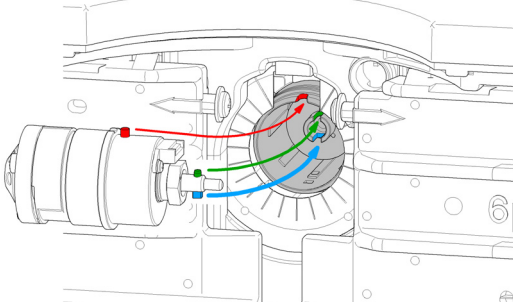
**NOTE**

For firmware requirements see Information on RFID Tag Technical Note (01200-90134) which is included to each valve head.

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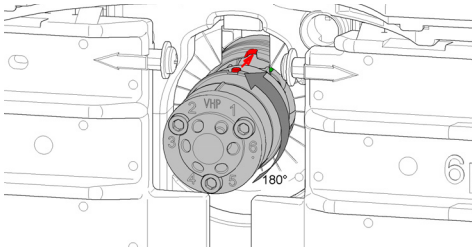
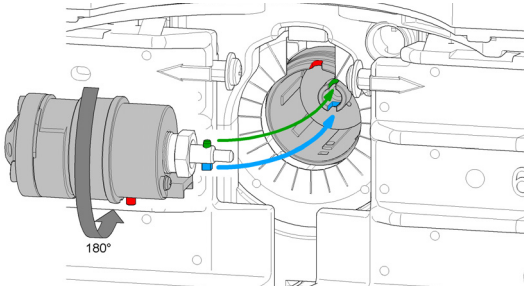
The following procedure demonstrates the necessary steps for installing the valve head to the valve drive of a TCC. For the installation of a valve head to a 1290 Infinity Valve Drive or 1290 Infinity Flexible Cube, you can ignore the steps that describe the TCC features of the spring loaded valve drive.

1 Insert the valve head into the valve shaft.

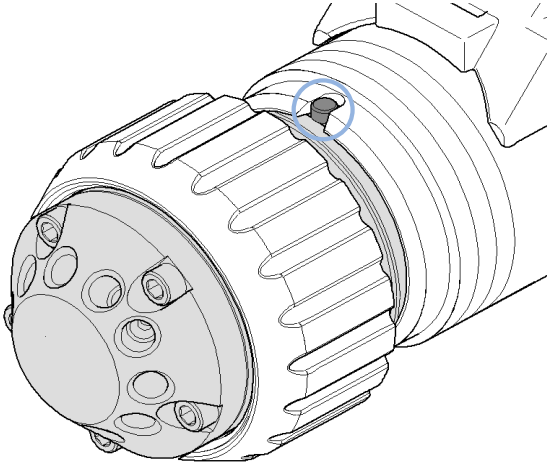


OR

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 continue turning the valve head until the pin fits into the groove.



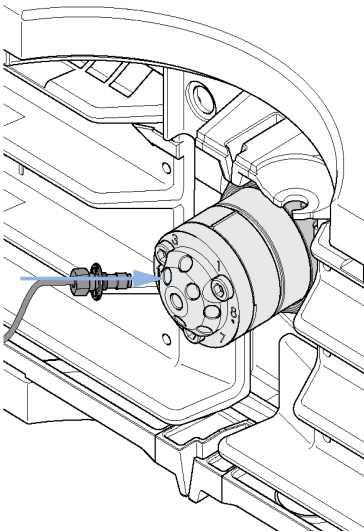
**2** When the outer pin is locked into the groove, manually screw the nut onto the valve head.



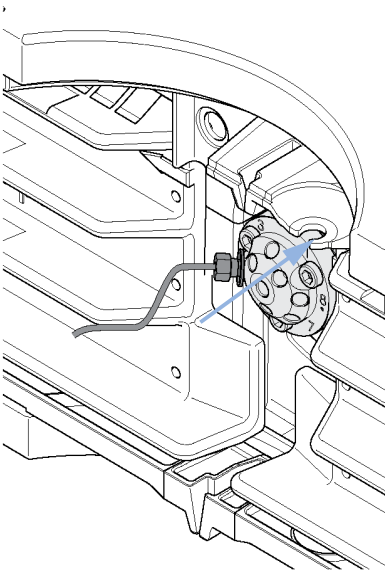
**NOTE**

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. (TCC only)



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

**NOTE**

Power Off the Infinity valve drive for at least 10 s.

# Connecting Valves, Heat Exchanger and Columns

## Installation of the Low Dispersion Heat Exchanger Double Assemblies

The device is typically mounted into the center location of either the left or the right heater element where it can support two columns.

The additional heater can be arranged in the G1316C in various locations depending on the application needs. Some examples are shown in [Figure 3](#) on page 15.



**Figure 3** Arrangements of Heating and Cooling Devices (G1316C)

### NOTE

If the additional heating and cooling devices are used as shown in [Figure 3](#) on page 15 (top), the column identification system cannot be used. If the column identification system is required, fix the heating and cooling devices in the upper or lower locations or fix them right/left of the current location.

### NOTE

The maximum flow rate to be used with the Low Dispersion Heat Exchangers is 2.5 mL/min at 100 °C and 20 °C ambient.

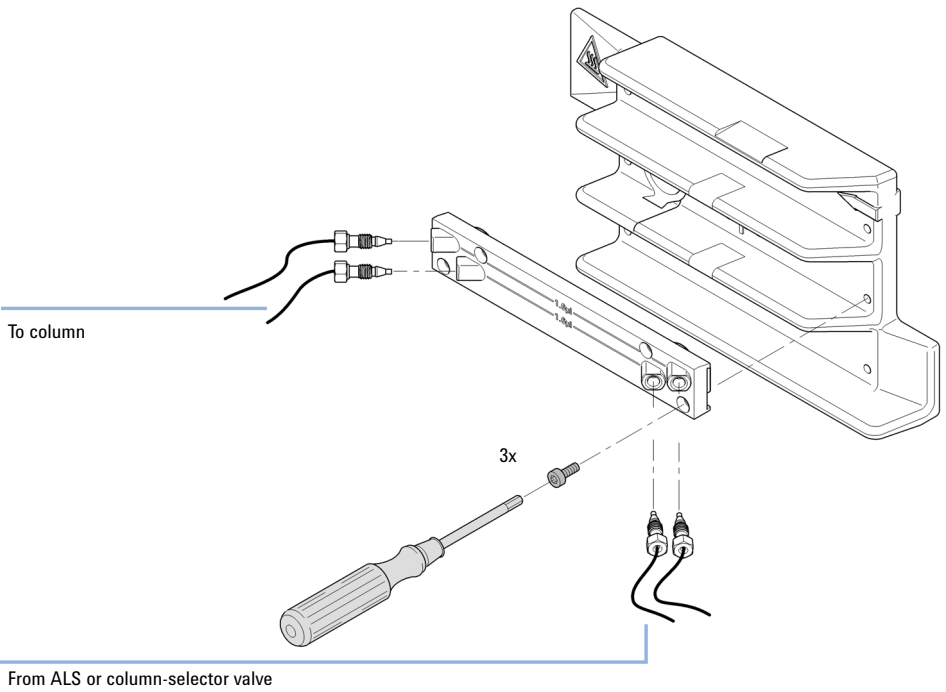
## Delivery Checklist (G1316-80002):

#	p/n	Description
1	G1316-60005	Low Dispersion Heat Exchanger Double Assembly Incl. 3 screws for mounting
2	5500-1188	Quick Turn Capillary ST 0.12 mm x 105 mm, long socket Heat Exchanger to Column
4	G1314-68703	Capillary fitting kit special Heat Exchanger Outlet Port and Column Inlet Port (alternative fittings shown below)

## Tools Required:

p/n	Description
8710-2412	Hex key 2.5 mm, 15 cm long, straight handle Required for fixing the Low Dispersion Heat Exchanger to the Heater Assembly
5023-2502	Hex driver SW-6.35, slitted Recommended for tightening the fitting nuts



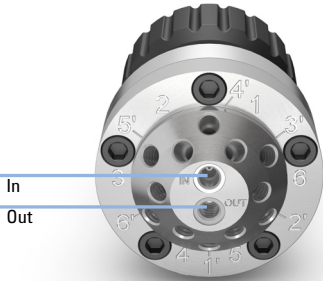


**Figure 4** Fixing Heating or Cooling Devices (G1316C)

# Install the Capillaries

## 1 Install the in and out connectors.

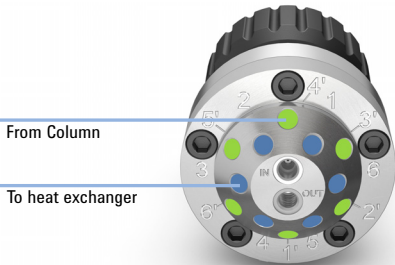
- from sampler to the valve ( Capillary ST 0.12 mm x 500 mm M4-SL PS-PS (5500-1202))
- from valve to the detector ( Capillary ST 0.12 mm x 280 mm M4-SL PS-PS (5500-1203))



The *In* port is hydraulically connected to the column inlet ports 1-6 on the inner ring while the *Out* port connects to the column outlet ports 1`-6` on the outer ring.

## 2 Install the column inlet and outlet connections.

- 
- *ports 1-6* for connections from valve to the heat exchanger ( Quick Turn Capillary ST 0.12 mm x 130 mm SL/M (5500-1200)) or waste line (Waste tube (G1375-87326))
  - *ports 1`-6`* for connections from column outlet to valve ( Quick Turn Capillary ST 0.12 mm x 130 mm SL/M (5500-1200)), use fingertight PEEK fittings for connecting the column outlet
- 



# Valve Parts

## Replacement Parts

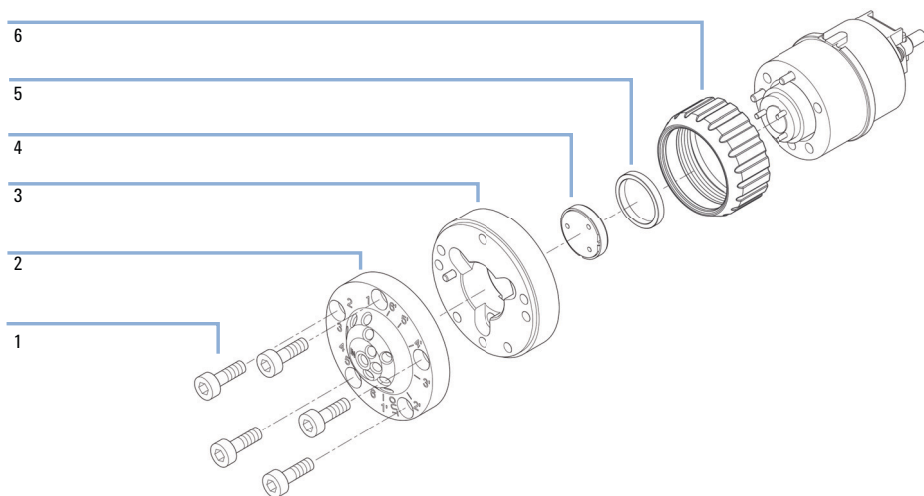
**Table 3** Replacement parts

<b>Valve</b>	<b>Rotor Seal</b>	<b>Stator Head</b>	<b>Stator Screws (pack of 10)</b>	<b>Bearing Ring</b>
<b>5067-4284</b> 6-column selector valve head, 800 bar	5068-0298 (PEEK)	5068-0241	5068-0089	1535-4045
<b>5067-4273</b> 6-column selector valve head, 1300 bar	5068-0242 (PEEK)	5068-0241	5068-0089	1535-4045

## Valve Head Parts

### NOTE

The figure below illustrates replacement parts for the valve heads, with the 12ps/13pt Selector valve as an example. The valves can vary in their appearance and do not necessarily include all of the illustrated parts. Neither, every spare part is available for each flavor of the valve.



**Figure 5** Valve Head Parts (example)

1	Stator screws
2	Stator head assembly
3	Stator ring (available for service only)
4	Rotor seal
5	Bearing ring
6	Spanner nut (available for service only)

