

9 Maintenance

Introduction to Maintenance	108
Cautions and Warnings	109
Overview of Maintenance	111
Cleaning the Module	112
Correcting Leaks	113
Maintain the Column Switching Valve	114
Replace Valve Heads	116
Prepare the MCT for Transportation	120
Replace the Module Firmware	121

This chapter describes the maintenance of the MCT.



Introduction to Maintenance

The module is designed for easy maintenance. The most frequent maintenances such as maintaining valve heads (if optional valve drive is installed) or replacing heat exchangers can be done from the front with module in place in the system stack.

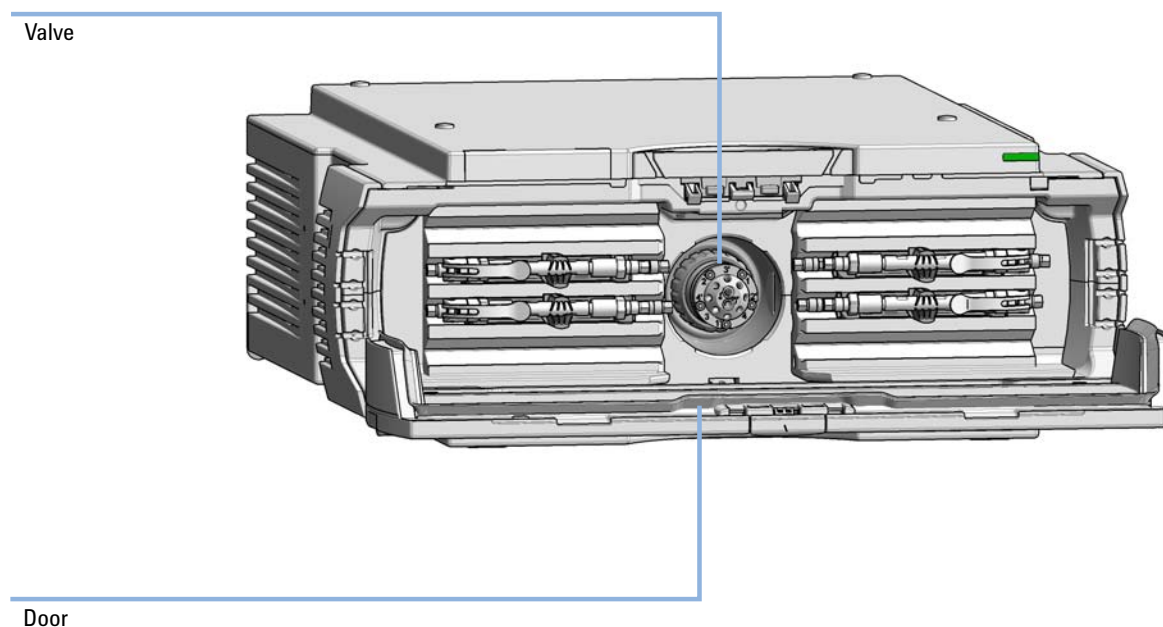


Figure 15 Overview of maintenance parts (G7116A)

NOTE

There are no serviceable parts inside.
Do not open the module.

Cautions and Warnings

WARNING

Toxic, flammable and hazardous solvents, samples and reagents

The handling of solvents, samples and reagents can hold health and safety risks.

- When working with these substances observe appropriate safety procedures (for example by wearing goggles, safety gloves and protective clothing) as described in the material handling and safety data sheet supplied by the vendor, and follow good laboratory practice.
 - The volume of substances should be reduced to the minimum required for the analysis.
 - Do not operate the instrument in an explosive atmosphere.
-

CAUTION

Hot heat exchangers 

The column compartment has two heat exchanger assemblies that might be hot.

- Allow them to cool down before starting repairs.
-

WARNING

Electrical shock

Repair work at the module can lead to personal injuries, e.g. shock hazard, when the cover is opened.

- Do not remove the cover of the module.
 - Only certified persons are authorized to carry out repairs inside the module.
-

WARNING

The module is partially energized when switched off, as long as the power cord is plugged in.

Repair work at the module can lead to personal injuries, e.g. electrical shock, when the cover is opened and the module is connected to power.

- Always unplug the power cable before opening the cover.
 - Do not connect the power cable to the instrument while the covers are removed.
-

WARNING

Personal injury or damage to the product

Agilent is not responsible for any damages caused, in whole or in part, by improper use of the products, unauthorized alterations, adjustments or modifications to the products, failure to comply with procedures in Agilent product user guides, or use of the products in violation of applicable laws, rules or regulations.

- Use your Agilent products only in the manner described in the Agilent product user guides.
-

CAUTION

Safety standards for external equipment

- If you connect external equipment to the instrument, make sure that you only use accessory units tested and approved according to the safety standards appropriate for the type of external equipment.
-

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.
-

Overview of Maintenance

The following pages describe maintenance procedures (simple repairs) that can be done without opening the main cover.

Table 4 Maintenance procedures

Procedure	Typical Frequency	Notes
"Cleaning the Module" on page 112	If required	
Changing Column Identification Tags	When column performance or new application requires a change	
"Install Heat Exchanger" on page 43	When new application requires a change	
Installing the capillaries	When new application requires a change	
Correcting Leaks	If a leak has occurred	Check for leaks
Replacing Valve Heads	If the valve performance shows indication of leakage or wear	
Preparing the MCT for Transportation	If the MCT shall be transported	
"Replace the Module Firmware" on page 121	If required	

Cleaning the Module

To keep the module case clean, use a soft cloth slightly dampened with water, or a solution of water and mild detergent.

WARNING

Liquid dripping into the electronic compartment of your module can cause shock hazard and damage the module

- Do not use an excessively damp cloth during cleaning.
 - Drain all solvent lines before opening any connections in the flow path.
-

Correcting Leaks

When	If a leakage has occurred at the heat exchanger or at the capillary connections or at the column switching valve.
Tools required	<p>Description</p> <p>Tissue</p> <p>Pipette</p> <p>Wrench, 1/4 – 5/16 inch (for capillary connections)</p> <ol style="list-style-type: none"> 1 Remove the door. 2 Use a pipette and tissue to dry the leak sensor area. 3 Observe the capillary connections and the column switching valve for leaks and correct, if required. 4 Re-install the door.

Maintain the Column Switching Valve

When If valve leaks.

Tools required **Description**

Wrench, 1/4 inch (supplied in HPLC Tool-Kit)
OR
Hexagonal key, 9/64 inch (supplied in HPLC Tool-Kit)

- 1 Remove capillaries from ports.
- 2 Loosen each fixing stator screw two turns at a time. Remove bolts from head.
- 3 Remove the stator head (and stator face if applicable).
- 4 Remove the stator ring.
- 5 Remove the rotor seal (and isolation seal if damaged or contaminated).
- 6 Install the new isolation seal (if required). Ensure the metal spring inside the ring faces towards the valve body.
- 7 Install the new rotor seal.
- 8 Replace the stator ring. Ensure the stator ring is flush with the valve body.
- 9 Place the new (if required) stator face in place on the stator head. Reinstall the stator head.
- 10 Insert the stator screws in the stator head. Tighten the screws alternately two turns at a time until the stator head is secure.
- 11 Reconnect the pump capillaries to the valve ports.

CAUTION

Wrong use of **Pressure Test** may damage valve.

The current implementation of the **Pressure Test** automatically uses the maximum pressure generated by the pump used in the system.

→ Do not use the test for modules having a lower maximum pressure than the pump as this will damage the valve. For example do not use 400 bar valve in a TCC or Flex Cube in combination with a 600 bar pump.

-
- 12 Perform a **Pressure Test** to ensure the valve is pressure tight.

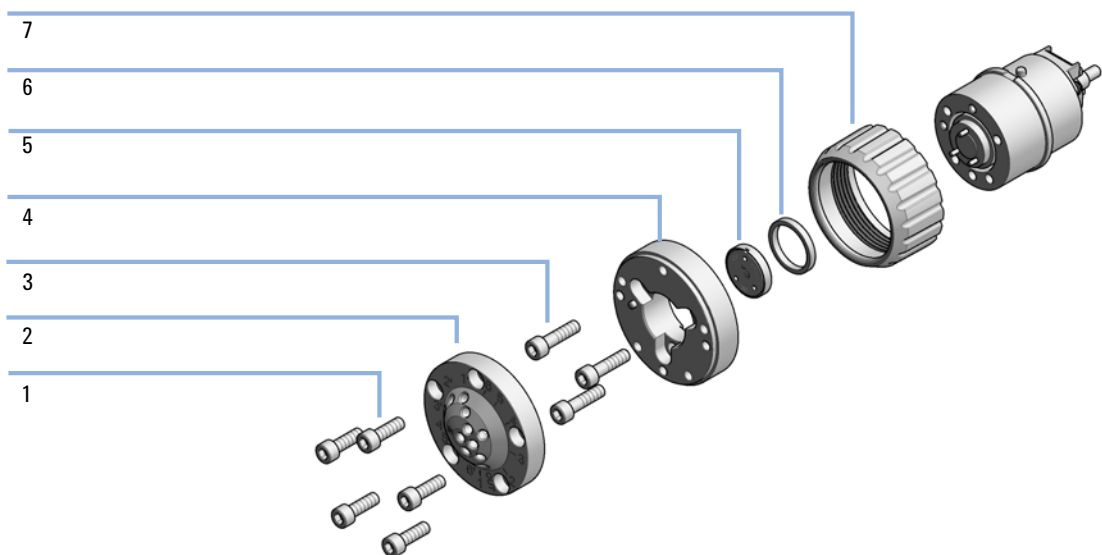


Figure 16 Valve Head Parts (example)

1	Stator screws
2	Stator head assembly
3	Stator ring screws (not available)
4	Stator ring (available for service only)
5	Rotor seal
6	Bearing ring
7	Spanner nut (available for service only)

NOTE

Figure 16 on page 115 illustrates replacement parts for the valve heads, with the 6-column 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.

Use “[Valve Options Overview](#)” on page 129 for identification of the required part numbers.

Replace Valve Heads

Several optional valve heads are available, which can be installed and exchanged easily.

Micro valves offer small internal volumes for minimum peak broadening, ideal for low flow rates in the nl/min and µl/min range.

Parts required

Description

Any Agilent Quick Change Valve Head.

For details, see [“Valve Options Overview”](#) on page 129

WARNING

Toxic, flammable and hazardous solvents, samples and reagents

The handling of solvents, samples and reagents can hold health and safety risks.

- Be sure that no solvent can drop out of the solvent connections when removing them from your valve head.
- When working with these substances observe appropriate safety procedures (for example by wearing goggles, safety gloves and protective clothing) as described in the material handling and safety data sheet supplied by the vendor, and follow good laboratory practice.

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.

NOTE

For details, please refer to the *Agilent 1290 Infinity II Method Development Solution User Guide*.

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

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 (part of Transportation Lock Kit (G1316-67001)) can be used instead of a functional valve. Do not touch parts inside the actuator.

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 have the valve correctly recognized by the Agilent Infinity Valve Drive you must have the valve drive powered off for at least 10 seconds.

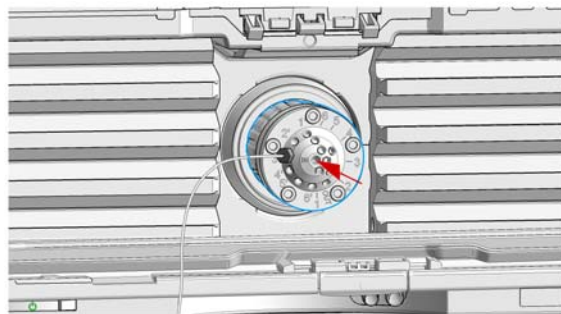
9 Maintenance

Replace Valve Heads

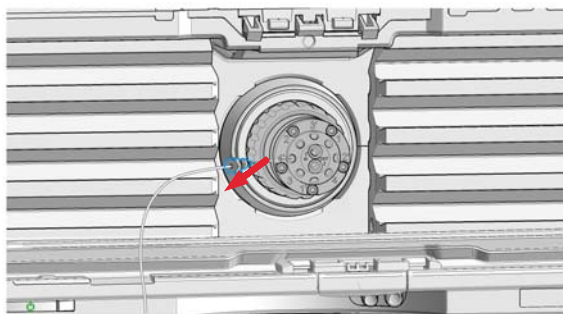
- 1 Switch off the module.



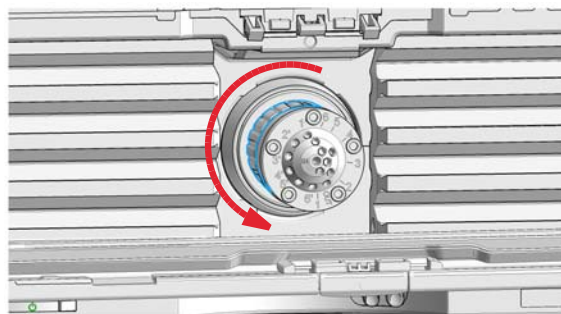
- 2 Push the valve head for bringing it to its outer position.



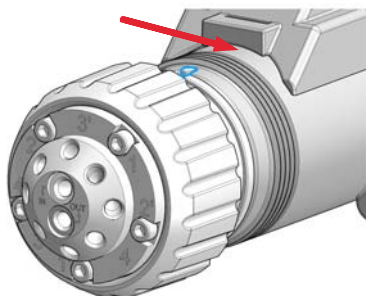
- 3 Remove all capillary connections from the valve head.



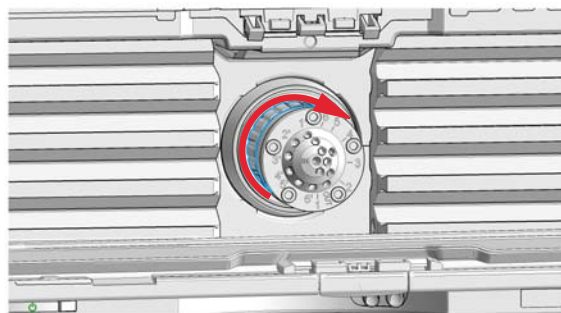
- 4 Unscrew the valve head.



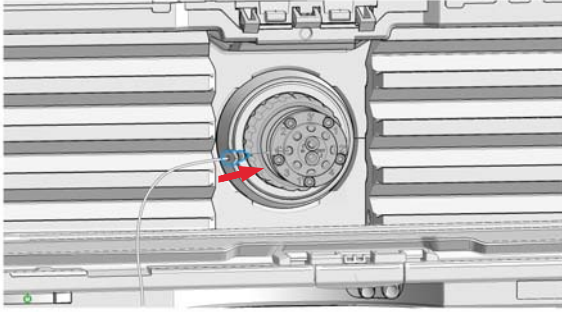
- 5 Put the new valve head onto the valve drive such that the lobe fits to the groove (see also “Installing Valve Heads” on page 49).



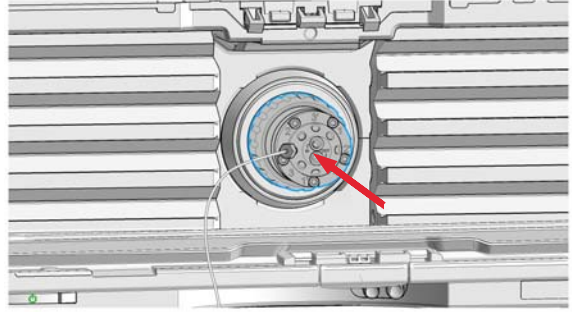
- 6 Screw the valve head onto the valve drive using the union nut (see also “Installing Valve Heads” on page 49).



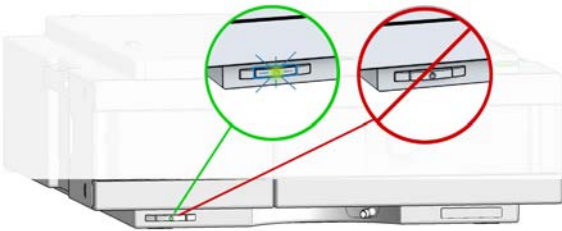
7 Install all required capillary connections to the valve.



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



9 Switch on the module.



Prepare the MCT for Transportation

When If an MCT including the Valve Drive Option shall be transported

NOTE

The module has been shipped with transportation locks, which must be used for transportation protection.

CAUTION

Damage to Internal Parts

Mechanical shocks for example when being transported by car or shipped by post.

→ Install a lock (Transportation Lock Kit).

- 1 Remove the valve head as described in [“Replace Valve Heads”](#) on page 116.
- 2 Replace the valve head by the transportation valve head. Bring the transportation valve head to the outer position.
- 3 Fix the Transportation Lock to the MCT.

Replace the Module Firmware

When

- The installation of newer firmware might be necessary
- if a newer version solves problems of older versions or
 - to keep all systems on the same (validated) revision.
- The installation of older firmware might be necessary
- to keep all systems on the same (validated) revision or
 - if a new module with newer firmware is added to a system or
 - if third party control software requires a special version.

Tools required

Description

Agilent Lab Advisor software

Parts required

Description

- | | |
|---|---|
| 1 | Firmware, tools and documentation from Agilent web site |
|---|---|

Preparations

Read update documentation provided with the Firmware Update Tool.

To upgrade/downgrade the module's firmware carry out the following steps:

- 1 Download the required module firmware, the latest FW Update Tool and the documentation from the Agilent web.
<http://www.agilent.com/en-us/firmwareDownload?whid=69761>
- 2 For loading the firmware into the module follow the instructions in the documentation.

Module Specific Information

Module is a hosted module and always needs to be connected to a host with matching firmware of same revision.



10

Parts and Materials for Maintenance

Plastic Parts [124](#)

Leak Parts [126](#)

Valve Options and Parts [127](#)

Column ID Parts [130](#)

Accessories and Consumables [131](#)

Accessories and Consumables (for G7116A) [131](#)

Additional Heater Devices [133](#)

InfinityLab Quick Connect and Quick Turn Fittings [135](#)

This chapter provides information on parts for maintenance.



Plastic Parts

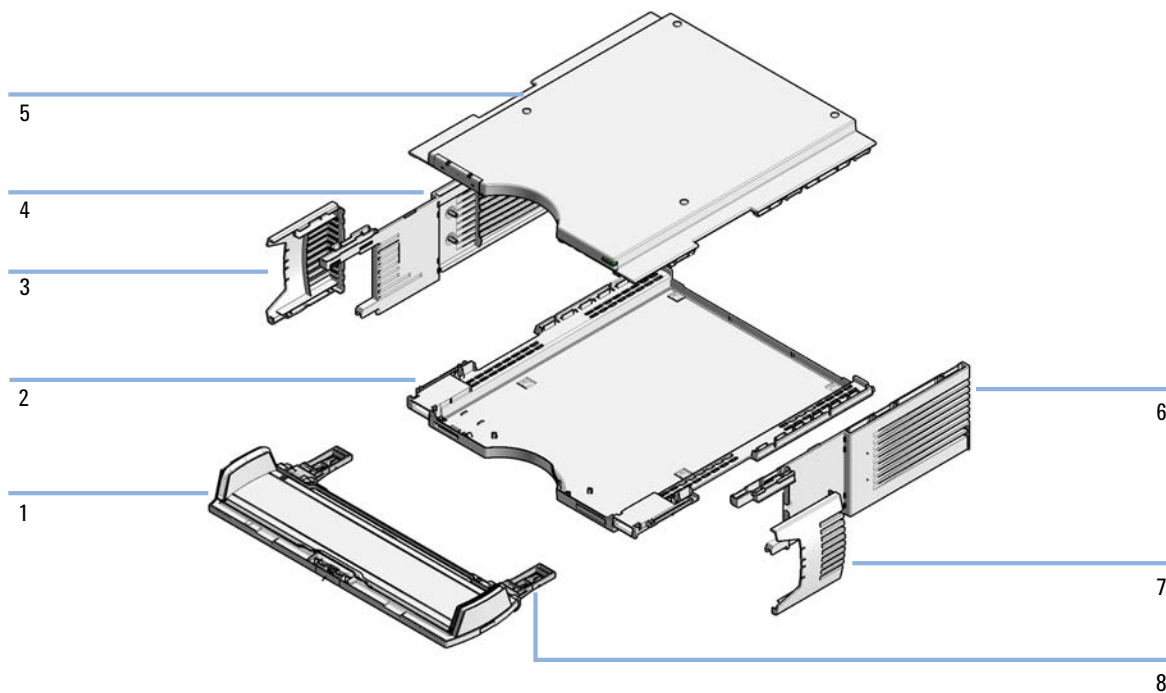


Figure 17 Plastic parts

Item	p/n	Description
	G7116-68713	Cabinet Kit Infinity II MCT
1	G7116-60001	Door Kit IF II MCT (for G7116A)
2	G7116-40100	Base Cover IF-II-MCT
3	G7116-40103	Side Cover Left Insert IF-II-MCT
4	G7116-40102	Side Cover Left IF-II-MCT
5	5067-5908	Top Cover
6	G7116-40105	Side Cover Right IF-II-MCT
7	G7116-40106	Side Cover Right Insert IF-II-MCT
8	G7116-67004	MCT Hinge Base Assembly Kit
	G7116-60003	Transportation Foam Assembly

Leak Parts

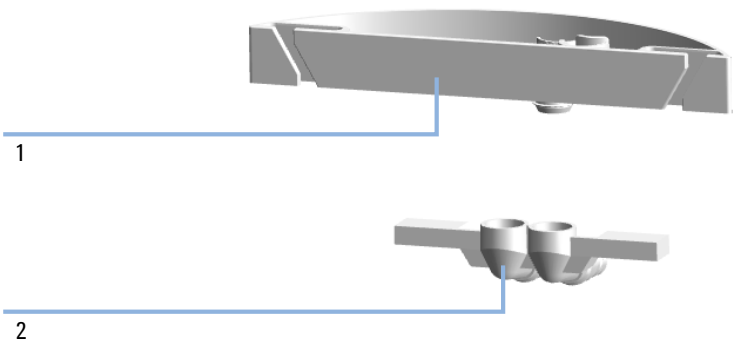


Figure 18 Plastic parts

Item	p/n	Description
1	G7116-40043	Leak Adapter Top MCT 2K
2	G7116-40013	Leak Adapter HITCH MCT

Valve Options and Parts

MCT:

p/n	Description
G1353D	Valve drive upgrade kit for MCT

**External Valve
Drive:**

p/n	Description
G1170A	External Valve Drive
5067-6138	Valve Holder Kit Right-IF-II-G
5067-6139	Valve Holder Kit Left-IF-II-G
G1170-68705	Accessory Kit with Clamp for mounting on 1290 Infinity II module

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.

Use the table ("[Valve Options Overview](#)" on page 129) for identification of the required part numbers.

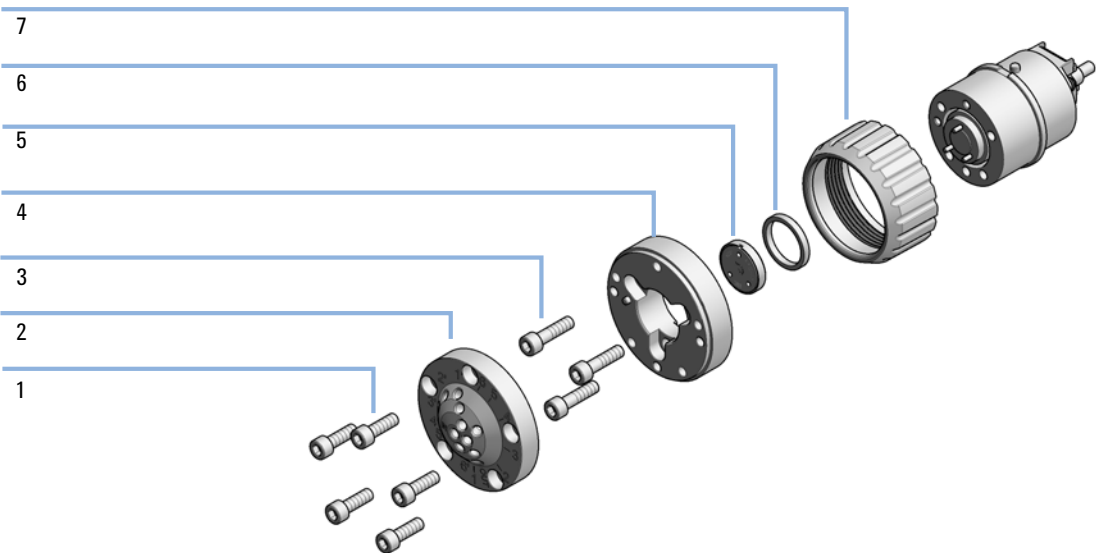


Figure 19 Valve Head Parts (example)

1	Stator screws
2	Stator head assembly
3	Stator ring screws (not available)
4	Stator ring (available for service only)
5	Rotor seal
6	Bearing ring
7	Spanner nut (available for service only)

Valve Options Overview

NOTE

The 800 bar InfinitLab Quick Change Valves are backward compatible to the 600 bar Valves.

Table 5 Replacement parts standard valve heads for G7116A

Valve Head	Rotor Seal	Stator Head	Stator Screws	Stator Ring	Stator face	Other
5067-4279 4 Column Selector 800 bar	5068-0264 (PEEK)	5068-0263	5068-0089	n.a.		
5067-4284 6 Column Selector 800 bar	5068-0298	5068-0241	5068-0089	n.a.		
5067-4282 2ps/6pt Valve 800 bar	0101-1409 (PEEK)	0101-1417	1535-4857	5068-0120		
5067-4148 2ps/6pt Valve Bio-inert 600 bar	0101-1409 (Grove rotor seal, pack of 3)	5068-0060	5068-0020 (10/pack)	5068-0120	0100-1851 (ceramic)	Isolation seal: 1535-4045
5067-4132 2ps/10pt Valve Bio-inert 600 bar	5068-0041	5068-0040	5068-0059	n.a.	5068-0095	Bearing ring: 1535-4045
5067-4283 2ps/10pt Valve 800 bar	0101-1415 (PEEK)	5068-0165	5068-0019	n.a.		
5067-4134 4ps/10pt Valve 4 column selector Bio-inert 600 bar	5068-0045 (PEEK)	5068-0044	5068-0059	n.a.	5068-0093	Isolation seal: 1535-4045

Column ID Parts

p/n	Description
G7116-68073	Column ID upgrade kit for G7116A
5067-5917	Custum column ID TAG (Column ID Kit required)

Accessories and Consumables

Accessories and Consumables (for G7116A)

Accessory Kit (for G7116A)

The accessory kit contains accessories and tools needed for the installation and maintenance.

Accessory Kit:

p/n	Description
5181-1516	CAN cable, Agilent module to module, 0.5 m
5063-6527	Tubing assembly, i.d. 6 mm, o.d. 9 mm, 1.2 m (to waste)
0100-1516	Fitting male PEEK, 2/pk
5500-1193	Capillary ST 0.17 mm x 105 mm, long socket
G7167-68703	Fitting Intermediate Kit
G7116-60051	Quick-Connect Heat Exchanger Large ID
G7116-68003	Column Holder Clips (2/Pk)
5043-0915	Fitting mounting tool for bio-inert capillaries
5067-5966	InfinityLab Quick Turn fitting
5500-1191	Capillary ST 0.12 mm x 280 mm, long socket

10 Parts and Materials for Maintenance

Accessories and Consumables

Accessory Kit Bio-inert:

p/n	Description
5067-5966	InfinityLab Quick Turn fitting
5181-1516	CAN cable, Agilent module to module, 0.5 m
5067-4780	Capillary 300 ID 0.17 w/Socket OD 1.6 BIO
G7116-68003	Column Holder Clips (2/Pk)
0100-1516	Fitting male PEEK, 2/pk
G7116-60041	Quick-Connect Heat Exchanger Bio-inert
5043-0915	Fitting mounting tool for bio-inert capillaries
5063-6527	Tubing assembly, i.d. 6 mm, o.d. 9 mm, 1.2 m (to waste)
5067-5403	UHP fitting
5067-4741	ZDV union (Bio-inert)

Available Consumables (for G7116A)

p/n	Description
G7116-68003	Column Holder Clips (2/Pk)
G7116-68004	Column Holder Clamp (2/PK) for Infinity II
G7116-60006	Divider Assembly MCT
5067-5917	Custum column ID TAG
5043-1356	Colum Holder Lamella
5043-1375	Column holder clamp

Additional Heater Devices

Table 6 Heat Exchanger Overview

Flow rate	0.17 mm i.d. capillary
< 2 mL/min	<i>Large ID</i> G7116-60051 (Internal volume: 3.0 µL)
> 2 mL/min	<i>Large ID High Flow</i> G7116-60061 (Internal volume: 6.0 µL)
Bio-inert, all flow rates	<i>Bio-inert</i> G7116-60041 (Internal volume: 9.0 µL)

See “[Additional Heater Devices \(for G7116A\)](#)” on page 134 for details.

Additional Heater Devices (for G7116A)



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

Table 7 InfinityLab QuickConnect Heat Exchanger

Item	Description
A long, thin, cylindrical metal component with a central body and two long, thin tubes extending from each end.	Quick-Connect Heat Exchanger Bio-inert (G7116-60041)
A shorter, wider cylindrical metal component with two short tubes extending from each end.	Quick-Connect Heat Exchanger Large ID (G7116-60051)
A shorter, wider cylindrical metal component with two short tubes extending from each end, similar to the previous one but with a slightly different internal structure.	Quick-Connect Heat Exchanger Large ID High Flow (G7116-60061)

InfinityLab Quick Connect and Quick Turn Fittings

InfinityLab Quick Connect Fittings

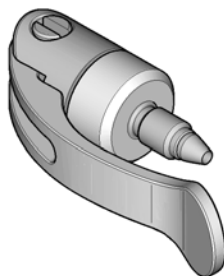


Figure 20 InfinityLab Quick Connect Fitting

p/n	Description
5067-5965	InfinityLab Quick Connect LC fitting (fitting without pre-installed capillary)
5043-0924	Front Ferrule
5067-5961	InfinityLab Quick Connect Assy ST 0.075 mm x 105 mm
5067-6163	InfinityLab Quick Connect Assy ST 0.075 mm x 150 mm
5067-6164	InfinityLab Quick Connect Assy ST 0.075 mm x 220 mm
5067-6165	InfinityLab Quick Connect Assy ST 0.075 mm x 280 mm (fitting without pre-installed capillary)
5067-5957	InfinityLab Quick Connect Assy ST 0.12 mm x 105 mm
5067-5958	InfinityLab Quick Connect Assy ST 0.12 mm x 150 mm
5067-5959	InfinityLab Quick Connect Assy ST 0.12 mm x 220 mm
5067-5960	InfinityLab Quick Connect Assy ST 0.12 mm x 280 mm
5067-6166	InfinityLab Quick Connect Assy ST 0.17 mm x 105 mm
5067-6167	InfinityLab Quick Connect Assy ST 0.17 mm x 150 mm
5067-6168	InfinityLab Quick Connect Assy ST 0.17 mm x 220 mm
5067-6169	InfinityLab Quick Connect Assy ST 0.17 mm x 280 mm

InfinityLab Quick Connect Fitting Replacement Capillaries

p/n	Description
5500-1174	InfinityLab Capillary ST 0.075 mm x 105 mm
5500-1175	InfinityLab Capillary ST 0.075 mm x 150 mm
5500-1176	InfinityLab Capillary ST 0.075 mm x 220 mm
5500-1177	InfinityLab Capillary ST 0.075 mm x 250 mm
5500-1178	InfinityLab Capillary ST 0.075 mm x 280 mm
5500-1173	InfinityLab Capillary ST 0.12 mm x 105 mm
5500-1172	InfinityLab Capillary ST 0.12 mm x 150 mm
5500-1171	InfinityLab Capillary ST 0.12 mm x 220 mm
5500-1170	InfinityLab Capillary ST 0.12 mm x 280 mm
5500-1179	InfinityLab Capillary ST 0.12 mm x 400 mm
5500-1180	InfinityLab Capillary ST 0.12 mm x 500 mm
5500-1181	InfinityLab Capillary ST 0.17 mm x 105 mm
5500-1182	InfinityLab Capillary ST 0.17 mm x 150 mm
5500-1183	InfinityLab Capillary ST 0.17 mm x 220 mm
5500-1230	InfinityLab Capillary ST 0.17 mm x 280 mm
5500-1231	InfinityLab Capillary ST 0.17 mm x 500 mm
5500-1259	InfinityLab Capillary ST 0.25 mm x 150 mm
5500-1260	InfinityLab Capillary ST 0.25 mm x 400 mm

InfinityLab Quick Turn Fitting

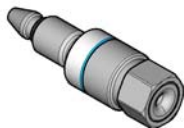


Figure 21 InfinityLab Quick Turn Fitting

p/n	Description
5067-5966	InfinityLab Quick Turn fitting
5043-0924	Front Ferrule

Capillaries for use with the InfinityLab Quick Turn Fitting

p/n	Description
5500-1198	Capillary ST 0.075 mm x 105 mm, long socket
5500-1232	Capillary ST 0.075 mm x 150 mm, long socket
5500-1206	Capillary ST 0.075 mm x 250 mm
5500-1205	Capillary ST 0.075 mm x 500 mm
5500-1188	Capillary ST 0.12 mm x 105 mm, long socket
5500-1189	Capillary ST 0.12 x 150 mm, long socket
5500-1233	Capillary ST 0.12 mm x 180 mm, long socket
5500-1190	Capillary ST 0.12 mm x 200 mm, long socket
5500-1191	Capillary ST 0.12 mm x 280 mm, long socket
5500-1192	Capillary ST 0.12 mm x 500 mm, long socket
5500-1193	Capillary ST 0.17 mm x 105 mm, long socket
5500-1194	Capillary ST 0.17 mm x 150 mm, long socket
5500-1234	Capillary ST 0.17 mm x 180 mm, long socket
5500-1195	Capillary ST 0.17 mm x 200 mm, long socket
5500-1196	Capillary ST 0.17 mm x 280 mm, long socket
5500-1235	Capillary ST 0.17 mm x 380 mm, long socket
5500-1236	Capillary ST 0.17 mm x 400 mm, long socket
5500-1197	Capillary ST 0.17 mm x 500 mm, long socket
5500-1237	Capillary ST 0.17 mm x 700 mm
5500-1262	Capillary ST 0.25 mm x 150 mm
5500-1263	Capillary ST 0.25 mm x 400 mm
5500-1200	Capillary ST 0.12 mm x 130 mm SL/M
5500-1288	Capillary ST 0.12 mm x 150 mm
5500-1290	Capillary ST 0.17 mm x 150 mm



11 Identifying Cables

Cable Overview	140
Analog Cables	142
Remote Cables	144
CAN/LAN Cables	148
RS-232 Cables	149
USB	150

This chapter provides information on cables used with the Agilent 1200 Infinity Series modules.



Cable Overview

NOTE

Never use cables other than the ones supplied by Agilent Technologies to ensure proper functionality and compliance with safety or EMC regulations.

Analog cables

p/n	Description
35900-60750	Agilent 35900A A/D converter
01046-60105	Analog cable (BNC to general purpose, spade lugs)

Remote cables

p/n	Description
5188-8029	ERI to general purpose
5188-8044	Remote Cable ERI – ERI
5188-8045	Remote Cable APG – ERI
5188-8059	ERI-Extension-Cable 1.2 m
5061-3378	Remote Cable to 35900 A/D converter
01046-60201	Agilent module to general purpose
5188-8057	Fraction Collection ERI remote Y-cable

CAN cables

p/n	Description
5181-1516	CAN cable, Agilent module to module, 0.5 m
5181-1519	CAN cable, Agilent module to module, 1 m

LAN cables

p/n	Description
5023-0203	Cross-over network cable, shielded, 3 m (for point to point connection)
5023-0202	Twisted pair network cable, shielded, 7 m (for point to point connection)

RS-232 cables (not for FUSION board)

p/n	Description
RS232-61601	RS-232 cable, 2.5 m Instrument to PC, 9-to-9 pin (female). This cable has special pin-out, and is not compatible with connecting printers and plotters. It's also called "Null Modem Cable" with full handshaking where the wiring is made between pins 1-1, 2-3, 3-2, 4-6, 5-5, 6-4, 7-8, 8-7, 9-9.
5181-1561	RS-232 cable, 8 m

USB cables

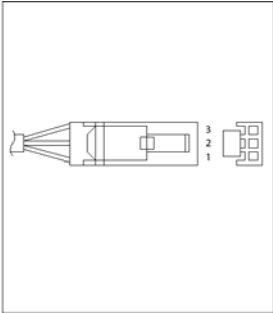
p/n	Description
5188-8050	USB A M-USB Mini B 3 m (PC-Module)
5188-8049	USB A F-USB Mini B M OTG (Module to Flash Drive)

Analog Cables




One end of these cables provides a BNC connector to be connected to Agilent modules. The other end depends on the instrument to which connection is being made.

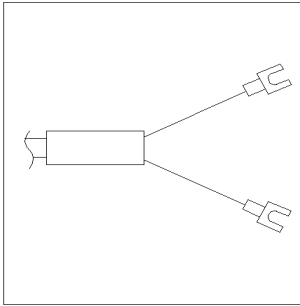
Agilent Module to 35900 A/D converters

p/n 35900-60750	35900	Pin Agilent module	Signal Name
	1		Not connected
	2	Shield	Analog -
	3	Center	Analog +

Agilent Module to BNC Connector

p/n 8120-1840	Pin BNC	Pin Agilent module	Signal Name
	Shield	Shield	Analog -
	Center	Center	Analog +

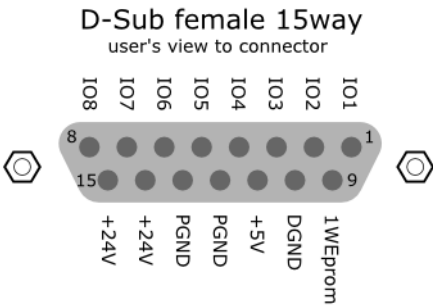
Agilent Module to General Purpose

p/n 01046-60105	Pin	Pin Agilent module	Signal Name
	1		Not connected
	2	Black	Analog -
	3	Red	Analog +


Remote Cables

ERI (Enhanced Remote Interface)

- 5188-8029 ERI to general purpose (D-Sub 15 pin male - open end)
- 5188-8044 ERI to ERI (D_Sub 15 pin male - male)
- 5188-8059 ERI-Extension-Cable 1.2 m (D-Sub15 pin male / female)

p/n 5188-8029	pin	Color code	Enhanced Remote	Classic Remote	Active (TTL)
	1	white	I01	START REQUEST	Low
	2	brown	I02	STOP	Low
	3	green	I03	READY	High
	4	yellow	I04	POWER ON	High
	5	grey	I05	NOT USED	
	6	pink	I06	SHUT DOWN	Low
	7	blue	I07	START	Low
	8	red	I08	PREPARE	Low
	9	black	1wire DATA		
	10	violet	DGND		
	11	grey-pink	+5V ERI out		
	12	red-blue	PGND		
	13	white-green	PGND		
	14	brown-green	+24V ERI out		
	15	white-yellow	+24V ERI out		
	NC	yellow-brown			


- 5188-8045 ERI to APG (Connector D_Subminiature 15 pin (ERI), Connector D_Subminiature 9 pin (APG))

p/n 5188-8045	Pin (ERI)	Signal	Pin (APG)	Active (TTL)
	10	GND	1	
	1	Start Request	9	Low
	2	Stop	8	Low
	3	Ready	7	High
	5	Power on	6	High
	4	Future	5	
	6	Shut Down	4	Low
	7	Start	3	Low
	8	Prepare	2	Low
	Ground	Cable Shielding	NC	

11 Identifying Cables
Remote Cables

- 5188-8057 ERI to APG and RJ45 (Connector D_Subminiature 15 pin (ERI), Connector D_Subminiature 9 pin (APG), Connector plug Cat5e (RJ45))

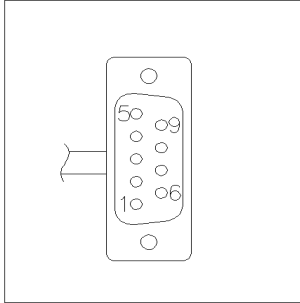
Table 8 5188-8057 ERI to APG and RJ45

p/n 5188-8057	Pin (ERI)	Signal	Pin (APG)	Active (TTL)	Pin (RJ45)
	10	GND	1		5
	1	Start Request	9	High	
	2	Stop	8	High	
	3	Ready	7	High	
	4	Fraction Trigger	5	High	4
	5	Power on	6	High	
	6	Shut Down	4	High	
	7	Start	3	High	
	8	Prepare	2	High	
	Ground	Cable Shielding	NC		

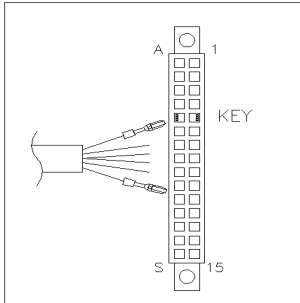


One end of these cables provides a Agilent Technologies APG (Analytical Products Group) remote connector to be connected to Agilent modules. The other end depends on the instrument to be connected to.

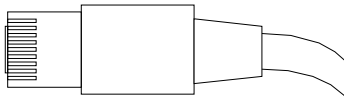
Agilent Module to Agilent 35900 A/D Converters

p/n 5061-3378	Pin 35900 A/D	Pin Agilent module	Signal Name	Active (TTL)
	1 - White	1 - White	Digital ground	
	2 - Brown	2 - Brown	Prepare run	Low
	3 - Gray	3 - Gray	Start	Low
	4 - Blue	4 - Blue	Shut down	Low
	5 - Pink	5 - Pink	Not connected	
	6 - Yellow	6 - Yellow	Power on	High
	7 - Red	7 - Red	Ready	High
	8 - Green	8 - Green	Stop	Low
	9 - Black	9 - Black	Start request	Low

Agilent Module to General Purpose

p/n 01046-60201	Wire Color	Pin Agilent module	Signal Name	Active (TTL)
	White	1	Digital ground	
	Brown	2	Prepare run	Low
	Gray	3	Start	Low
	Blue	4	Shut down	Low
	Pink	5	Not connected	
	Yellow	6	Power on	High
	Red	7	Ready	High
	Green	8	Stop	Low
	Black	9	Start request	Low

CAN/LAN Cables



Both ends of this cable provide a modular plug to be connected to Agilent modules CAN or LAN connectors.

CAN Cables

p/n	Description
5181-1516	CAN cable, Agilent module to module, 0.5 m
5181-1519	CAN cable, Agilent module to module, 1 m

LAN Cables

p/n	Description
5023-0203	Cross-over network cable, shielded, 3 m (for point to point connection)
5023-0202	Twisted pair network cable, shielded, 7 m (for point to point connection)

RS-232 Cables

p/n	Description
RS232-61601	RS-232 cable, 2.5 m Instrument to PC, 9-to-9 pin (female). This cable has special pin-out, and is not compatible with connecting printers and plotters. It's also called "Null Modem Cable" with full handshaking where the wiring is made between pins 1-1, 2-3, 3-2, 4-6, 5-5, 6-4, 7-8, 8-7, 9-9.
5181-1561	RS-232 cable, 8 m

USB

To connect a USB Flash Drive use a USB OTG cable with Mini-B plug and A socket.

p/n	Description
5188-8050	USB A M-USB Mini B 3 m (PC-Module)
5188-8049	USB A F-USB Mini B M OTG (Module to Flash Drive)