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This chapter describes the maintenance of the Agilent 1290 Infinity II Flexible Pump.

### Introduction to Maintenance

Figure 15 on page 119 shows the main user-accessible assemblies of the Agilent 1290 Infinity II Flexible Pump. These parts can be accessed from the front (simple repairs) and don't require to remove the pump from the system stack.



Multi Purpose Valve

Figure 15 Overview of maintenance parts

### **Recommended Interval for Preventive Maintenance**

The recommended interval for preventive maintenance is:

• 100 L (150 L for Long Life Technology) or 1 year (whichever comes first).

This recommendation is valid for LC instruments on which "typical" applications are running.

A "typical" application can be characterized as follows:

- pressure range 100 800 bar,
- flow rates 0.5 3.5 mL/min,
- typical solvents used in reversed phase LC.

# Warnings and Cautions

### 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.

### 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

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.

# **Overview of Maintenance**

The following pages describe maintenance (simple repairs) of the module that can be carried out without opening the main cover.

# **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.

# **Install Fittings and Capillaries**

WARNING	Solvent can spray under high pressure.
	Observe appropriate safety procedures (for example, goggles, safety gloves and protective clothing), when opening flow path.
CAUTION	Deformation of fittings and seals
	Liquid drops under high pressure up to 1200 bar act like solid parts. Tightening connections under high pressure can deform or destroy fittings and seals.
	→ Never tighten flow connections under pressure.
NOTE	The lifetime of a fitting depends on how firmly it has been tightened; firm tightening reduces the lifetime.
	If fitting has been overtightened, replace it.
	<b>1</b> Install fittings and capillaries.
	<b>2</b> Tighten fittings and capillaries.

**Remove and Install Doors** 

# **Remove and Install Doors**

Parts required	p/n	Description	
	5067-5745	Door Assembly Infinity 180 Left	
	5067-5746	Door Assembly Infinity 180 Right	
NOTE	The figures shown in this procedure exemplarily show the Infinity II Multisampler mod The principle of how to remove and/or install doors works in the same way for all Infinity II modules.		



**Replace the Pressure Sensor** 

# **Replace the Pressure Sensor**

When	No or invalid pressure signal			
Tools required	p/n Description			
		Hexagonal key, 2.5 mm		
	5023-2502	Hex driver SW-6.35, slitted		
		Screwdriver		
Parts required	p/n	Description		
	G7104-60001	Pressure sensor 1300 bar		
Preparations	Turn off pump flow, switch off pump			
NOTE	This procedure describes how to replace the pressure sensor.			
	In case the cable to the sensor shall be replaced as well, please contact your Agilent service representative.			

NOTE

Working on connections to the pressure sensor may slightly change the displayed pressure. In case of a pressure offset at ambient pressure, a pressure offset calibration may be run.



**Replace the Pressure Sensor** 



**Replace the Inlet Weaver** 

# **Replace the Inlet Weaver**

Parts required	p/n	Description	
	G4204-81090	1290 Infinity Qua	ternary Pump Inlet Weaver Assembly
Preparations	<ul> <li>Switch off pump</li> <li>Open the doors</li> <li>Use an optional leakages</li> <li>For easy access degasser</li> </ul>	o at the main powe solvent shutoff va to the inlet weave	er switch Ive or lift up solvent filters inside solvent bottles for avoiding er assembly, remove tubing connections between MCGV and
1 Open the screw at	the bottom of the inl	et valve.	2 Open the fitting at the center of the multi-channel gradient valve (MCGV). Remove the inlet weaver from the MCGV.
3 Pull the Inlet Weak	ver out of the Inlet Va	lve.	<ul> <li>Insert the new inlet weaver to the inlet valve. Fix the weaver with the plastic screw.</li> </ul>

**Replace the Inlet Weaver** 



**Replace the Inlet Valve** 

# **Replace the Inlet Valve**

iption
ch, 14 mm
e wrench 1 – 25 Nm with 14 mm wrench
iption
/alve 1290 Infinity Quaternary Pump
main power switch
r v

- Use an optional solvent shutoff valve or lift up solvent filters inside solvent bottles for avoiding leakages
- · Remove the inlet weaver, see "Replace the Inlet Weaver" on page 128



- 3 Insert the inlet weaver, see "Replace the Inlet Weaver" on page 128.
- 4 Purge and condition the system to remove air.

## **Remove the Jet Weaver**

Tools required	p/n	Description
	8710-0510	Wrench open 1/4 — 5/16 inch
	8710-0899	Pozidriv screwdriver
	5023-2502	Hex driver SW-6.35, slitted
Parts required	p/n	Description
	0100-1259	Plastic fittings
	G4204-04002	Cover RFID Tag Metal lid for Jet Weaver

#### Preparations

- Select **Do not use mixer** in ChemStation.
- Switch off the pump at the main power switch.



**Remove the Jet Weaver** 



# **Install the Jet Weaver**

When	The appl	optional Jet We ications which r	al Jet Weaver 380 μL for 1290 Infinity Quaternary Pump (G4204-68000) is available for s which require highest mixing performance, see chapter <i>Optimizing Performance</i> .		
Tools required	ols required p/n		Description		
	8710	)-0510	Wrench open 1/4 — 5/16 inch		
	8710	0-0899	Pozidriv screwdriver		
	5023	8-2502	lex driver SW-6.35, slitted		
Parts required	#	p/n	Description		
	1	G4204-6800	0 Jet Weaver 380 μL for 1290 Infinity Quaternary Pump containing		
	2	5500-1253	Capillary ST 0.17 mm x 130 mm SX/S Jet Weaver to Multi Purpose Valve		

**Preparations** Switch off the pump at the main power switch



**Install the Jet Weaver** 



# **Replace the Seal Wash Pump**

#### When In case of wear of the seal wash pump

Parts required	p/n	Description
	5065-4445	Peristaltic pump with Pharmed tubing
	5065-9978	Tubing, 1 mm i.d., 3 mm o.d., silicone, 5 m

#### **Preparations** Remove the flow connections from and to the seal wash pump.



**Replace the Multi-Channel Gradient Valve (MCGV)** 

# **Replace the Multi-Channel Gradient Valve (MCGV)**

Tools required	p/n	Description		
	0100-1710	Mounting Tool for Tubing Connections		
	8710-0899	Pozidriv screwdriver		
Parts required	p/n	Description		
	G1311-67701	Multi channel gradient valve (MCGV)		
Preparations	<ul> <li>Switch off pu</li> <li>Open the doc</li> <li>Use an optio leakages</li> </ul>	<ul> <li>Switch off pump at the main power switch</li> <li>Open the doors</li> <li>Use an optional solvent shutoff valve or lift up solvent filters inside solvent bottles for avoidin leakages</li> </ul>		
NOTE	For best perform buffer applicati	mance and life time, use lower channels A and D for aqueous solvents in ons.		



**Replace the Multi-Channel Gradient Valve (MCGV)** 



**Release a Stuck Inlet Valve** 

# **Release a Stuck Inlet Valve**

Tools required	p/n	Description
	9301-0411	Syringe, Plastic
	9301-1337	Syringe adapter
	0100-1710	Mounting Tool for Tubing Connections
		Beaker

### CAUTION

Pressure damages the multi-channel gradient valve (MCGV) and/or degasser

- → Never apply pressure to the MCGV or degasser.
- → Directly connect the syringe to the inlet weaver.



**Release a Stuck Inlet Valve** 

3 Slightly open the black plastic screw at the bottom of the inlet valve, and rotate the inlet weaver to the front. Then retighten the screw.	4 Disconnect the capillary from the pressure sensor inlet and route the capillary to a small beaker.
<ul> <li>Fill the syringe with a suitable wash solvent.</li> <li>NOTE</li> <li>For salt deposits, warm water is a good choice. For organic deposits, use ethanol or acetone.</li> </ul>	6 Connect the syringe and adapter to the inlet weaver.
7 Push the syringe for flushing the inlet valve and pump head.	<ul> <li>8 Restore original connections. Flush the system for several minutes.</li> </ul>

**Remove the Pump Head Assembly** 

## **Remove the Pump Head Assembly**

 Tools required
 p/n
 Description

 G7120-68708
 HPLC System Tool Kit-Infinity-II

 1
 In Lab Advisor go to Service & Diagnostics > Remove/Install Pump Head and follow instructions
 2
 Open the doors.



**Remove the Pump Head Assembly** 



**Remove the Pump Head Assembly** 



# **Pump Head Maintenance (Tool Free)**

1290 Infinity II Flexible Pumps (G7104A) and 1290 Infinity II High Speed Pumps (G7120A) are equipped with Long Life Pump Heads.

Long Life Pump Heads offer a significantly increased lifetime of pistons and seals compared to other pump heads.

Maintenance of Long Life Pump Heads requires no special tool.

The following procedures explain the maintenance of Long Life Pump Heads.

Please refer to Agilent 1290 Infinity II Easy Maintenance Pump Head Technical Note (01200-90120) for instructions on maintenance of Easy Maintenance Pump Heads, or to Agilent 1290 Infinity Pump Head Maintenance Technical Note (G4220-90122) for instructions on maintenance of classical pump heads.

Pump Head Maintenance (Tool Free)

### **Disassemble LongLife Pump Heads**

This procedure shows how to open the pump head assembly, exchange seals, and clean pistons.

Exchanging seals and cleaning pistons is exemplarily shown for the primary pump head, but works in the same way for the secondary pump head.

Tools required	p/n	Description
	G7120-68708	HPLC System Tool Kit-Infinity-II
	5043-1400	Pump Head Holder
	5067-6197	Seal Handling Device
	8660-0852	Abrasive mesh
		Isopropanol

NOTE

Seals must be exchanged and pistons must be cleaned in both primary and secondary pump heads.









17 Repeat for the other seal holder.	<b>18</b> Clean the piston with abrasive paper.	
<b>19</b> Rinse pump heads and pistons with isopropanol.		

### **Replace the Heat Exchanger**

Tools required	p/n	Description			
		Wrench, 19 mm			
	5023-2501	Screwdriver Torx-T10			
	5067-5688	Torque wrench 1 – 25 Nm with 14 mm wrench			
	G4220-20013	4 mm hex bit			
	G4220-20015	Adapter ¼ in square to hex			
	G4220-20041	Bit Torx 10x25 mm			
Parts required	p/n	Description			
	G4220-81013	Heat Exchanger Channel A (secondary pump head only)			
Preparations	<ul><li>Remove the pump head assembly from the pump</li><li>Remove the secondary pump head from the link plate</li></ul>				
CAUTION	Loss of small spacer fitting				
	<ul> <li>Inside the secondary pump head is a small spacer fitting, which can be dropped easily when removing the heat exchanger.</li> <li>→ The heat exchanger does not need to be removed for pump head maintenance.</li> </ul>				





### **Assemble LongLife Pump Heads**

This procedure shows how to exchange seals, and reassemble the pump head assembly.

Exchanging seals is exemplarily shown for the primary pump head, but works in the same way for the secondary pump head.

Tools required	p∕n G7120-68708 5067-5688		Description HPLC System Tool Kit-Infinity-II Torque wrench 1 – 25 Nm with 14 mm wrench 4 mm hex bit Adapter ¼ in square to hex Bit Torx 10x25 mm Pump Head Holder Seal Handling Device		
G4220-20013 G4220-20015 G4220-20041 5043-1400		20013			
		20015			
		20041			
		00			
	5067-6197				
			Isopropanol		
Parts required	#	p∕n	Description		
	2	0905-1719	PE Seal		
	2	0905-1175	Wash seal (PTFE)		

NOTE

Seals must be exchanged in both primary and secondary pump heads.

1 Lubricate th chambers v	he seals, the seal holder, and the pump vith isopropanol.	2	Place the piston seal onto the designated nose of the Seal Handling Device. The metal spring of the piston seal must be visible.
		(	










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# **Install the Pump Head Assembly**

p/n

**Tools required** 

#### Description

G7120-68708HPLC System Tool Kit-Infinity-II5067-5688Torque wrench 1 – 25 Nm with 14 mm wrenchG4220-200134 mm hex bitG4220-20015Adapter ¼ in square to hex

 Bring the pump drive to the maintenance position using the Lab Advisor user interface: Go to Service & Diagnostics > Remove/Install Pump Head and follow instructions given on the screen. Both pump drives must be retracted.



### CAUTION

Damage to the pump head Using a wrong torque will damage the pump head.

- For handling the torque wrench, setting and applying the right torque, consult the manual of your torque wrench.
- 2 Install the new pump head assembly by tightening the screws step by step. Apply 5 Nm using a torque hex key, which is included to the 1290 Infinity Service Kit p/n 5067-4699.



**Install the Pump Head Assembly** 



# **Replace the Outlet Valve**

When	If Outlet valve is	defective.
Tools required	p/n	Description
		Wrench, 14 mm
	5067-5688	Torque wrench 1 – 25 Nm with 14 mm wrench
	G4220-20015	Adapter ¼ in square to hex
	G4220-20041	Bit Torx 10x25 mm
Parts required	p/n	Description
	G4220-60028	Outlet valve (primary pump head)
	G4220-20020	Internal gold seal for Outlet Valve
Preparations	<ul> <li>Switch off pump at the main power switch</li> <li>Open the doors</li> <li>Use an optional solvent shutoff valve or lift up solvent filters inside solvent bottles for av leakages</li> <li>Remove the pump head from the module</li> </ul>	
1 Remove the ca	p from the outlet valve	e. 2 Counter the outlet valve while opening the lock screw of the heat exchanger capillary.

**Replace the Outlet Valve** 



7	Remove the pump head from the module again.	<ul> <li>8 Position the entrance slit for the heat exchanger capillary to face exactly to it, and then seat the heat exchanger capillary back into the outlet valve by moving it into the valve and pressing it down.</li> </ul>
9	Counter the outlet valve and tighten the lock screw of	Next Steps:
	approx. 3 Nm.	<b>10</b> Place the cap on the Outlet Valve.
110	approx. 3 Nm	<ul><li>11 Mount the pump head assembly to the module, reconnect all hydraulic connections, and power up the pump.</li><li>12 Purge the system to remove air.</li></ul>

**Replace the Multi Purpose Valve** 

## **Replace the Multi Purpose Valve**

Tools required	p/n		Description
	5023	-2502	Hex driver SW-6.35, slitted
Parts required	#	p/n	Description
	1	0100-1259	Blank nut (plastic)
	1	01080-83202	Blank nut (stainless steel)
	1	5067-4237	Multi Purpose Valve Head
	2	5500-1253	Capillary ST 0.17 mm x 130 mm SX/S (OPTIONAL)

**1** Remove all capillary connections from the Multi Purpose Valve.



**3** Unscrew the black union nut and remove the head of the purge valve by pulling it to the front.



- 2 Remove the clamp with the inline filter (if installed).
- **4** Put the new valve head onto the valve drive such that the lobe fits to the groove. Screw the valve head onto the valve drive using the union nut.



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The central (C) port is connected to the outlet of the filter outlet.

- Port 1 is connected to the outlet of the optional Jet Weaver
- Port 2 is connected to the inlet of the optional Jet Weaver
- Port 3 is blocked by a blank nut (plastic)
- Port 4 is connected to the system (typically multisampler)
- Port 5 is connected to the outlet of the optional inline filter
- Port 6 is blocked by a blank nut (SST)
- Port 7 is connected to the waste capillary
- Port 8 is connected to the inlet of the optional inline filter

Block unused ports with blank nuts.

If the optional inline filter is not installed, connect ports 5 and 8 with a capillary (Capillary ST  $0.17 \times 120 \text{ mm}$ , SLV/SV (5067-5416)).

If the optional Jet Weaver is not installed, connect ports 1 and 2 with a capillary (Capillary ST 0.17 mm x 130 mm SX/S (5500-1253)).

**Replace Parts of the Multi Purpose Valve** 

# **Replace Parts of the Multi Purpose Valve**

Tools required	p/n	Description			
	8710-2394	9/64 inch hex key			
Parts required	p/n	Description			
	1535-4045	Bearing ring			
	5068-0202	Rotor seal, Multi Purpose Valve, 1300 bar			
	5068-0120	Stator ring			
	5068-0001	Stator head			
	1535-4857	Stator screws, 10/Pk			
Preparations	Remove all cap	illary connections from the Multi Purpose Valve.			
	<b>1</b> Use the 9	/64 inch hex key for opening the valve head.			
	2 Replace parts as required.				
	<b>3</b> Reassemble the valve head and mount it to the valve drive				
Bearing ring					
Rotor seal					
Stator ring					
Stator head					
Stator screws					

**Replace the High Pressure Outlet Filter or Filter Frit** 

## **Replace the High Pressure Outlet Filter or Filter Frit**

When	For r repla	removing blockages and leaks in the high pressure filter assembly. The outlet filter should be aced as required depending on the system usage.	
Tools required	p/n		Description
	5023	-2502	Hex driver SW-6.35, slitted
	8710	-0510	Wrench open 1/4 — 5/16 inch
	8710	-1924	Wrench open 14 mm
	5067	-5688	Torque wrench 1 – 25 Nm with 14 mm wrench
	5067	-5690	Torque wrench head, 14 mm, for torque wrench
Parts required	#	p/n	Description
	1	G4204-6000	4 Outlet filter 1290 Infinity Quaternary Pump
OR	1	5067-5716	Frit for 1290 pump outlet filter 2/pk

**1** Remove the capillary from the high pressure outlet filter to the pressure sensor (1) and from the high pressure outlet filter to the Multipurpose valve (2).



holder.

**2** Remove the high pressure outlet filter from the filter

**Replace the High Pressure Outlet Filter or Filter Frit** 



## **Install the Inline Filter**

Tools required	p/n	Description
	8710-0510	Wrench open 1/4 — 5/16 inch
Parts required	p/n	Description
	G7104-68000	Inline Filter Upgrade Kit The kit includes:
	5067-5407	Inline Filter Assembly
	5067-4748	Capillary ST, 0.17 mm x 90 mm
	G4204-40000	Clamp for In-Line Filter

#### **Preparations** Turn the pump off.



**Install the Inline Filter** 



7

## **Remove the Inline Filter**

Tools required	p/n	Description
	8710-0510	Wrench open 1/4 — 5/16 inch
Parts required	p/n	Description
	5067-5416	Capillary ST 0.17 x 120 mm, SLV/SV



**Replace Parts of the Inline Filter** 

# **Replace Parts of the Inline Filter**

Tools required	p/n	Description	
	8710-0510	Wrench open 1/4 — 5/16 inch	
Parts required	p/n	Description	
	5023-0271	Frit 0.3 µm for inline filter, 5/pk	
CAUTION	Stuck Capillary in Multi Purpose Valve		
	Shortcutting the inline filter by directly connecting its right capillary to valve port 5 can damage the Multi Purpose Valve.		
	The size/position of this capillary in its fitting is incompatible, so it may get stuck irreversibly to the valve.		
	Do not shortcut the filter by directly connecting its right capillary to valve port 5 in case the inline filter cannot or shall not be used.		
	→ Use Capillary S	ST 0.17 x 120 mm, SLV/SV (5067-5416) instead.	
NOTE	The inline filter ca Agilent instrumen	n be cleaned using the back-flush function in the user interface of your t control software.	
	Only use the back	-flush option, if an inline filter is installed.	

**Replace Parts of the Inline Filter** 



**Replace Parts of the Inline Filter** 

 

 5
 Put the inline filter to the clamp and install its capillaries. The integrated capillary is connected to port 5 of the Multi Purpose Valve. The removable capillary is connected to port 8.

 Image: Port 5
 Port 5

 Port 8
 Integrated capillary

 Integrated capillary
 Removable capillary

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## **Replace the Seal Wash Sensor**

Parts required p/n Description 5067-6172 Seal Wash Sensor Pre Assembly

Preparations

• Shut-down the pump.

• Remove the seal wash tubing from the seal wash solvent bottle.



**Replace the Seal Wash Sensor** 



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# **Replace the Module Firmware**

When	<ul> <li>The installation of newer firmware might be necessary</li> <li>if a newer version solves problems of older versions or</li> <li>to keep all systems on the same (validated) revision.</li> <li>The installation of older firmware might be necessary</li> <li>to keep all systems on the same (validated) revision or</li> <li>if a new module with newer firmware is added to a system or</li> <li>if third party control software requires a special version.</li> </ul>			
Tools required	Description			
	Agile	nt Lab Advisor software		
OR	Instant Pilot G4208A (only if supported by module)			
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 De th	ownload the required module firmware, the latest FW Update Tool and the documentation from the Agilent web.		
	ht	tp://www.agilent.com/en-us/firmwareDownload?whid=69761		
	<b>2</b> For loading the firmware into the module follow the instructions in the documentation.			
	Module Specific Information			
	Ther	e is no specific information for this module.		

**Prepare the Pump Module for Transport** 

## **Prepare the Pump Module for Transport**

When If the module shall be transported or shipped.

Parts required	p/n	Description
	9301-0411	Syringe; Plastic
	9301-1337	Syringe adapter
	G7104-44000	Transport protection foam

### CAUTION

Mechanical damage

- → For shipping the module, insert the Protective Foam to protected the module from mechanical damage.
- → Be careful not to damage tubing or capillary connections while inserting the module in the Protective Foam.



Prepare the Pump Module for Transport

<b>9</b> Reconnect the degasser outlet tubings to the MCGV.	<b>10</b> You may keep internal tubing and capillary connections.
Remove the degasser inlet tubings.	MCGV Degasser High pressure outlet filter Valve Valve Inlet weaver Pump heads Inline filter
<b>11</b> Carefully insert the protective foam to the front part of the instrument. Do not damage any tubing or capillary connections.	Next Steps: 12 Close the doors.
	<b>13</b> For transport or shipment, put the module and accessory kit to the original shipment box.

**Prepare the Pump Module for Transport** 



# **Parts and Materials**

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This chapter provides information on parts for maintenance.



8 Parts and Materials

**Overview of Main Assemblies** 

## **Overview of Main Assemblies**



Figure 16 Overview of main assemblies

#### Parts and Materials 8 Overview of Main Assemblies

ltem	p/n	Description
1	5067-5416	Capillary ST 0.17 x 120 mm, SLV/SV
1	5067-5407	Inline Filter Assembly (OPTIONAL)
	5023-0271	Frit 0.3 $\mu m$ for inline filter, 5/pk (OPTIONAL)
	G4204-40000	Clamp for In-Line Filter (OPTIONAL)
2	5067-4237	Multi Purpose Valve Head
3	G4204-60022	Inlet Valve 1290 Infinity Quaternary Pump
4	G4204-81090	1290 Infinity Quaternary Pump Inlet Weaver Assembly
5	G1311-67701	Multi channel gradient valve (MCGV)
	5041-8365	Blank plug for MCGV
6	G4204-60350	Long Life Pump Head Quat
7	G4220-60028	Outlet valve (primary pump head)
8	5065-4445	Peristaltic pump with Pharmed tubing
9	G7104-60001	Pressure sensor 1300 bar
10	G4204-68000	Jet Weaver 380 $\mu L$ for 1290 Infinity Quaternary Pump (OPTIONAL)
11	G4204-60004	Outlet filter 1290 Infinity Quaternary Pump
	5067-5716	Frit for 1290 pump outlet filter 2/pk

8 Parts and Materials Flow Connections

## **Flow Connections**



Figure 17 Flow connections of the pump

ltem	p/n	Description
1	G4220-60035	Tubing kit 140 mm, 2/pk Degasser to MCGV
2	G7120-60007	Bottle Head Assembly
	5067-5760	Solvent Cabinet Kit (not shown)
3	5065-9978	Tubing, 1 mm i.d., 3 mm o.d., silicone, 5 m
4	5065-4445	Peristaltic pump with Pharmed tubing
5	5067-4656	Capillary ST, 0.25 mm x 80 mm Pressure Sensor to Outlet Filter, to Pump Head, and to Multi Purpose Valve
6	5067-4748	Capillary ST, 0.17 mm x 90 mm Multi Purpose Valve to Inline Filter
7	G4220-67000	Waste Tubing with Fitting
8	5500-1217	Capillary ST 0.17 mm x 900 mm SI/SX ps-ps Pump to Multisampler
	5500-1245	Capillary ST 0.17 mm x 400 mm SI/SI
	5500-1253	Capillary ST 0.17 mm x 130 mm SX/S for Jet Weaver (not shown)
	G7120-68070	Ultra Clean Tubing Kit (includes bottle head assemblies and tubing connections within the pump)
	G4220-60070	Tubing Kit 140 mm - Ultra Clean Tubing (tubes from SSV to shutoff valve or degassing unit to MCGV)
	G7120-60017	Bottle Head Assembly Ultra Clean Tubing (bottle heads and tubing to shutoff panel / degasser)



## **Pump Heads**

The following pages contain parts information for LongLife Pump Heads.

For parts information on other pump head types, please refer to Agilent 1290 Infinity II Easy Maintenance Pump Head Technical Note (01200-90120) and to Agilent 1290 Infinity Pump Head Maintenance Technical Note (G4220-90122).

## **Pump Head Assembly Parts**



Figure 18 Pump head assembly parts

Long Life Pump Head Quat (G4204-60350)

ltem	p/n	Description
1	G4220-60660	Secondary Pump Head Assembly Pendulum
2	G4220-60661	Primary Pump Head Assembly Pendulum
3	G4204-60022	Inlet Valve 1290 Infinity Quaternary Pump
4	G4220-60028	Outlet valve (primary pump head)
	G4220-20020	Internal gold seal for Outlet Valve (not shown)
5	5042-9966	Cap Outlet Valve
6	G1312-60001	Adapter
7	G4220-81013	Heat Exchanger
8	G4220-40001	Link Plate
9	0960-2971	RF Transponder

## **Primary Pump Head Parts**



Primary Pump Head Assembly Pendulum (G4220-60661)

ltem	p/n	Description
1	5067-5975	Plunger Assy ZrO <sub>2</sub> LL
2	0515-6154	Screw-Socket-HD-Cap Hex-Recess M5X0.8 40
3	G4220-60046	Preload-Support Assembly LL
4	0905-1175	Wash seal (PTFE)
5	G4220-60616	Seal Holder Integrated Assembly EM/LL
6	0905-1719	PE Seal
7	G4220-60533	Body Head Primary EM/LL

## **Secondary Pump Head Parts**



Secondary Pump Head Assembly Pendulum (G4220-60660)

ltem	p/n	Description
1	5067-5975	Plunger Assy ZrO <sub>2</sub> LL
2	0515-6154	Screw-Socket-HD-Cap Hex-Recess M5X0.8 40
3	G4220-60046	Preload-Support Assembly LL
4	0905-1175	Wash seal (PTFE)
5	G4220-60616	Seal Holder Integrated Assembly EM/LL
6	0905-1719	PE Seal
7	G4220-25513	Body Head Secondary EM/LL
8	G4220-20001	Spacer Fitting
9	G4220-20028	Headless screw for 1290 Infinity pump heads
10	G4220-20000	LID
11	G4220-20003	Pump Head Screw

8 Parts and Materials Multi Purpose Valve

# Multi Purpose Valve



**Figure 19** Multi Purpose Valve parts

ltem	p/n	Description
1	1535-4857	Stator screws, 10/Pk
2	5068-0001	Stator head
3	5068-0120	Stator ring
4	5068-0202	Rotor seal, Multi Purpose Valve, 1300 bar
5	1535-4045	Bearing ring
# **Cover Parts**



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p/n	Description
G7104-68713	Cabinet Kit 180 Infinity II (includes sides, bottom, top, leak adapter top and Status Indicator Insert)
5043-0286	Base Cover
G7104-60200	Cover Side Right
G7104-60201	Cover Side Left
5067-5908	Top Cover
5043-0856	Leak Adapter (not shown)
5067-5745	Door Assembly Infinity 180 Left
5067-5746	Door Assembly Infinity 180 Right

8 Parts and Materials Accessory Kit

# **Accessory Kit**

#### G7104-68705

#	p/n	Description
2	0100-1816	Fitting Waste Tube to Purge Valve
1	0890-2207	Tubing/Sleeving-Flex
2	5043-1013	Tubing Clip
3	5063-6527	Tubing assembly, i.d. 6 mm, o.d. 9 mm, 1.2 m (to waste)
1	5067-5443	Inlet tubing
1	5181-1519	CAN cable, Agilent module to module, 1 m
6	5500-1155	Tube Connector, 90 degree, ID 6.4
1	5500-1245	Capillary ST 0.17 mm x 400 mm SI/SI
1	9301-6476	Syringe with luerlock 5 mL Polypropylene
1	G1311-90107	Algae note
1	9301-1337	Syringe adapter
1	5500-1156	T-Tube Connector ID6.4
3	5500-1169	Y Tube Connector ID6.4
1	5500-1217	Capillary ST 0.17 mm x 900 mm SI/SX ps-ps
1	01200-90091	1290 Infinity Pump Quick Reference Sheet
1	5067-6197	Seal Handling Device
1	5043-1400	Pump Head Holder
1	5067-5716	Frit for 1290 pump outlet filter 2/pk

### **Tool Kit**



#### 8 Parts and Materials

Tool Kit



# **Identifying Cables**

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Cable Overview 194 Analog Cables 196 Remote Cables 198 CAN/LAN Cables 202 Agilent Module to PC 203 USB Cables 204

This chapter provides information on cables used with the 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** Description p/n 35900-60750 Agilent 35900A A/D converter 01046-60105 Analog cable (BNC to general purpose, spade lugs) **Remote cables** Description p/n 5188-8029 ERI to general purpose Remote Cable ERI – ERI 5188-8044 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 Fraction Collection ERI remote Y-cable 5188-8057 CAN cables p/n Description

h\ u	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	n/n	Description
board)	p/ n	
	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**

### 4**---**140

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.

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

#### Agilent Module to 35900 A/D converters

### Agilent Module to BNC Connector

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

### **Agilent Module to General Purpose**

p/n 01046-60105	Pin	Pin Agilent module	Signal Name
	1		Not connected
1 and 1 an	2	Black	Analog -
19	3	Red	Analog +
42			

## **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)
	D-Sub female 15way		white	101	START REQUEST	Low
IO1 IO2 IO3 IO5 8	2	brown	102	STOP	Low	
		3	green	103	READY	High
$\bigcirc$	15	4	yellow	104	POWER ON	High
	1W8 DGP +5V PGN +24	5	grey	105	NOT USED	
		6	pink	106	SHUT DOWN	Low
5	C.	7	blue	107	START	Low
		8	red	108	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			

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	

• 5188-8045 ERI to APG (Connector D\_Subminiature 15 pin (ERI), Connector D\_Subminiature 9 pin (APG))

• 5188-8057 ERI to APG and RJ45 (Connector D\_Subminiature 15 pin (ERI), Connector D\_Subminiature 9 pin (APG), Connector plug Cat5e (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
50 00	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	<b>Purpose</b>
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p/n 01046-60201	Wire Color	Pin Agilent module	Signal Name	Active (TTL)
	White	1	Digital ground	
	Brown	2	Prepare run	Low
E KEY	Gray	3	Start	Low
	Blue	4	Shut down	Low
	Pink	5	Not connected	
s 0 15	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)

# **Agilent Module to PC**

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

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)



**1290 Infinity II Flexible Pump User Manual**