Agilent Preventive Maintenance provides factory recommended service for your analytical systems to assure reliable operation and the accuracy of your results. Delivered by highly-trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides everything you need to reduce unplanned downtime and keep your systems operating at their peak.

For more information about Agilent Technologies services please visit our web site using the following URL http://www.chem.agilent.com/en-us/products/services/pages/default.aspx

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- Service engineer should contact the customer and discuss the system configuration and identify the specific kits needed for this service, based on the modules that are to be serviced.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures.
- Any parts, not included in the Parts Lists section of this document, are not part of the recommended Preventive Maintenance service, nor are they included in the price of this service.
- If a system requires the use of additional or special procedures and/or parts for the instrument service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Service Engineer's Responsibilities

- It is the Service Engineer's responsibility to abide by all safety and permit requirements issued by the customer for execution of this work.
- Only complete/printout pages that relate to the system or module being serviced.
- Complete empty fields with the relevant information.
- Complete the relevant checkboxes in the checklist using a "X" or tick mark "ü" in the checkbox.
- Complete Not Applicable check boxes to indicate services not delivered, as needed.
- Complete the PM service in the order of the tasks listed.
- Complete the Service Review section together with the customer.

Additional Instruction Notes

- At the end of the installation, run the System Test, which is described here.
- The following materials are required to complete:
  1. Water, HPLC grade or DI
  2. Acetone, HPLC grade, 100 mL
  3. Backpressure regulator

The complete HPLC system is used for this test. Connect the HPLC system as you would for normal operation with the exception of using a backpressure regulator in place of a column. Manually inject the 20mL of HPLC grade acetone through the Rheodyne valve on the mast kit.

The system and software automatically collect the fraction. This fraction collection test automatically runs five times and accurately simulates all of the necessary system functions of a normal separation without using a column.
The actual programming of the method depends on which instrumentation is being tested. The methods below are written with general parameters so that they can be used by any instrumentation.
The details of the programming should be implemented on the actual instruments being tested by someone knowledgeable in the operation of that particular instrument.

1. Set the UV detector to 220 nm.
2. Place the A1 and B1 lines in a reservoir containing DI water.
3. Set the operating parameters as shown below and the flow rate to 25% of the max system flow.

	1	2	3
Segment	Equil	Inject	Grad
%B	50	0	50
Duration	01:00	01:00	02:00
Shape	Linear	Linear	Linear
Flow	x	x	x
Inlet A	A1	A1	A1
Inlet B	B1	B1	B1

4. Open the Fraction Collection screen in the LC ReSponder software and set the operating parameters as shown below. Ensure the Set Time Zero function of the software indicates END OF INJECT.

	1
Type Event	Single peak
Detector	Det 1
Valve	1
Open	0
Close	2
Ascending	20
Descending	50

5. Save the method as PV-mm-dd-yyyy.method (where mm-dd-yyyy is the current date).
6. Start the gradient program and UV detector.
7. Open the Run Configuration screen LC ReSponder and set the number of cycles to 5.
8. Fill the loop with 20 mL of acetone at the injection segment of the gradient profile.
9. When the program is complete, print and attach the method and data results.

10. Repeat steps 8 and 9 for each of the five cycles.
11. Verify that during each cycle the LC ReSponder software automatically detects and collects the fraction of acetone at the desired peak heights.
12. Steps 1 - 11 were completed successfully.

System Information

Guidance

q Check this box if an instrument configuration report is attached instead of completing the table.

Instrument system name and ID	
Instrument system site and location	
List system components	**List the serial numbers of each component**
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

Preparation

q Discuss any specific issues with the customer prior to starting.
q Review the instrument logbook.
q Save instrument control settings before starting the procedure.
q Perform general inspection of system for cleanliness.
q Check for proper installation of safety-related parts, assemblies, sensors etc.
q Check for required firmware updates and verify with customers if they would like it installed.

Initial Check with System Test

q If the customer has indicated problems with the instrument, conduct a System Test, and make sure that it passes. Indicate this in the comments.

Maintenance to SD-1 Solvent Delivery Module(s)

q **Section NOT Applicable**

q Check the maintenance log for each of the following parts. If the number is approaching or exceeding the lifetime of the part, replace the part.
  - q Piston Seal for each pump head.
  - q Inlet check valve for each pump head.
  - q Outlet check valve for each pump head.
  - q Solvent filters (if installed).

q Check battery voltage.

q Check the flow rate.

q Reset maintenance logs.

Maintenance to SD-2 Solvent Delivery Module(s)

q **Section NOT Applicable**

q Check the maintenance log for each of the following parts. If the number is approaching or exceeding the lifetime of the part, replace the part.
  - q Piston Seal for each pump head.
  - q Inlet check valve for each pump head.
  - q Outlet check valve for each pump head.
  - q Pump head spring seals
  - q O-rings
  - q Solvent filters (if installed).

q Check the flow rate.

q Reset maintenance logs.

Note the orientation of the pump heads as they are mounted on the SD-2. The SD-2 has four directional check valves, and if the pump heads are installed incorrectly, a no flow situation will occur.

Replacing the pump head spring seals is a destructive process so the spring seal will be unusable after removal. It is critical not to scratch any portion of the pump head body because it may ruin sealing surfaces, causing leaks.

Maintenance to Agilent 218 Solvent Delivery Modules

- q **Section NOT Applicable**
- q Check the service log for each of the following parts. If the number is approaching or exceeding the lifetime of the part, replace the part.
  - q Piston Seals.
  - q Inlet check valve.
  - q Outlet check valve.
  - q Solvent filters (if installed).
- q Check battery voltage.
- q Check the flow rate.
- q Reset maintenance logs.

Maintenance to the Manual Injector Module

- q **Section NOT Applicable**
- q Check the number of switches for each of the following parts. If the number is approaching or exceeding the lifetime of the part, replace the part.
  - q Injection valve rotor.

Maintenance to the Agilent 325 UV/vis Dual Wavelength Detector

- q **Section NOT Applicable**
- q Check the number of ignitions and running hours for each of the following parts. If the number is approaching or exceeding the lifetime of the part, replace the part.
  - q The D2 (UV) lamp. If you replace the lamp, run a lamp calibration.
  - q The Quartz Halogen (Vis) lamp. If you replace the lamp, run a lamp calibration.
- q Run a wave scan test and check to make sure that the lamp counts for the D2 lamp at maxima are above 6000 counts. Replace the D2 lamp, and/or the flow cell, if the number is less and run the test again. If still less than the minimum, contact the factory for advice on the repair options available.
- q Clean the flow cell.

Maintenance to the 530 fraction collector

- q **Section NOT Applicable**
- q Check all the tubing
  - q If kinked change
- q Check for any leaks in inlet and outlet ports
  - q Change tubing nuts and ferrules if leak observed

Restore Instrument

- q Restore the instrument to the customer's conditions.
  - q Flush instrument
  - q Purge all inlets
  - q Purge all fraction collection lines
  - q Return instrument to initial conditions
  - q Perform system checkout procedure or validation tests

Guidance

If the PM service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument set up and checkout.

Service Review

- q Attach available reports/printouts of all tests to this documentation.
- q Record the PM service activity in the customer's instrument records/logbook
- q Update/reset instrument maintenance counters as appropriate
- q Affix the PM sticker to the system or instrument logbook based on the customer's request.
- q Complete the Service Review Comments section below if there are additional comments
- q Review the Full System Test results with the customer.
- q If the Instrument firmware was updated, record the details of the change in the Service Engineer's Comments box below or if necessary, in the customer's IQ records.

Modular LC System Parts List Table

Part Description	Part Number	Model#	Product Number	Lifetime	Quantity Consumed
Piston seal HDPE 50mL	R007105650	SD-1	G9302A,G9303A	640 hrs	
Piston seal HDPE 200mL	R007105620	SD-1	G9302A,G9303A	640 hrs	
Piston seal HDPE 500mL	393548991	SD-1	G9302A,G9303A	640 hrs	
Piston seal HDPE 800mL	R007105680	SD-1	G9302A,G9303A	640 hrs	
Piston seal HDPE 3200mL	R007105734	SD-1	G9302A,G9303A	640 hrs	
Inlet check valve cartridge 50,200mL	R007105626	SD-1	G9302A,G9303A	4000 hrs	
Inlet check valve cartridge 500,800mL	R007105686	SD-1	G9302A,G9303A	4000 hrs	
Inlet check valve cartridge 3200mL	393518301	SD-1	G9302A,G9303A	4000 hrs	
Outlet check valve cartridge 50,200mL	R007105627	SD-1	G9302A,G9303A	4000 hrs	

Part Description	Part Number	Model#	Product Number	Lifetime	Quantity Consumed
Outlet check valve cartridge 500,800mL	R007105687	SD-1	G9302A,G9303A	4000 hrs	
Outlet check valve cartridge 3200mL	393518501	SD-1	G9302A,G9303A	4000 hrs	
Solvent filter 50,200mL	R007105629	SD-1	G9302A,G9303A	12 mth	
Solvent filter 500,800mL	R007105689	SD-1	G9302A,G9303A	12 mth	
PE/Zinc Chromate (White) Seals (200ml)	PCG601660210	SD-2	G9304A,G9305A, G9307A	640 hrs	
PE/Zinc Chromate (White) Seals (800ml)	PCG601660010	SD-2	G9304A,G9305A, G9307A	640 hrs	
PE/Zinc Chromate (White) Seals (1200ml)	PCG601680012	SD-2	G9304A,G9305A, G9307A	640 hrs	
Viton O-Rings (200,800,1200ml)	PCG60130088100	SD-2	G9304A,G9305A, G9307A	640 hrs	
Check Valve Cartridge (200,800ml)	PCG549A00005T	SD-2	G9304A,G9305A, G9307A	4000 hrs	
Check Valve Cartridge (1200ml)	PCG549A00006	SD-2	G9304A,G9305A, G9307A	4000 hrs	
Piston seal (HDPE) (5ml)*	R007101446	218	G9306A	640 hrs	
Piston seal (HDPE) (10ml)*	R007101447	218	G9306A	640 hrs	
Piston seal (HDPE) (25ml)*	R007101643	218	G9306A	640 hrs	
Piston seal (HDPE) (50ml)*	R007101434	218	G9306A	640 hrs	
Piston seal (HDPE) (100ml)*	R007101774	218	G9306A	640 hrs	
Piston seal (HDPE) (200ml)*	393654101	218	G9306A	640 hrs	
Inlet check valve cartridge (5,10,25ml)*	R007101408	218	G9306A	4000 hrs	
Inlet check valve cartridge (50,100ml)*	R007101416	218	G9306A	4000 hrs	
Inlet check valve cartridge (200ml)	393654801	218	G9306A	4000 hrs	
Outlet check valve cartridge (5,10,25ml)*	R007101409	218	G9306A	4000 hrs	
Outlet check valve cartridge (50,100,200ml)*	R007101417	218	G9306A	4000 hrs	
Inlet solvent filter SS mixer (0.6,1.2mL)*	R007000054	218	G9306A	1920 hrs	
Magnetic stir bar (need 2 of these)	R002500002	218	G9306A	1920 hrs	

Part Description	Part Number	Model#	Product Number	Lifetime	Quantity Consumed
Mobile phase inlet filter assy 5,10,25mL	R007101604	218	G9306A	1920 hrs	
Mobile phase inlet filter assy 50,100, 200mL	R007101804	218	G9306A	1920 hrs	
D2 (UV) lamp	110715400	325	G9309A	1500 hrs	
Quartz Halogen (Vis) lamp (optional)	5610136500	325	G9309A	1500 hrs	

If pump seals or piston wash seals other then HDPE are needed, they will need to be ordered separate. Consult the manual for the correct part number.

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System Test Results

Pass/Fail

Service Engineer Comments (optional)

If there are any specific points you wish to note as part of performing the service or other items of interest for the customer, please write in this box.

Other Important Customer Web Links

- How to get information on your product: Literature Library - http://www.agilent.com/chem/library
- Need to know more? - www.agilent.com/chem/education
- Need technical support, FAQs? - www.agilent.com/chem/techsupp
- Need supplies? - www.agilent.com/chem/supplies

Service Completion

Service request number _____ Date service completed _____

Agilent signature _____ Customer signature _____