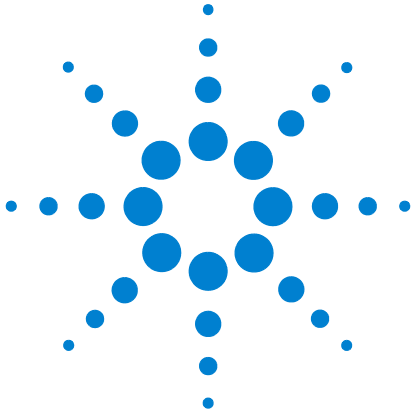

Agilent 7697A Headspace Sampler

Troubleshooting

Agilent Technologies

Notices

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Contents

8 Electronics

1 Concepts and General Tasks

This section provides general information applicable for troubleshooting problems found in the headspace sampler system.

Concepts

This manual provides symptoms associated with headspace sampler (HS) hardware or associated chromatographic output, Not Ready messages, and other common issues. It also provides the corresponding tasks to perform should you experience these symptoms.

Each section describes a problem and provides a bulleted list of possible causes for you to troubleshoot. These lists are not intended for use in the development of new methods. (For help when developing methods, see the Advanced Operation Guide.) Proceed with troubleshooting under the assumption that method(s) are working properly.

This manual also includes common troubleshooting tasks as well as a list of information needed prior to calling Agilent for service.

How to troubleshoot using this manual

Use the following steps as a general approach to troubleshooting:

1. Observe the symptoms of the problem.
2. Check the HS status displays and logs, especially the sequence log and event log. Check the GC logs, events, and display. If using a data system, check its logs also. These logs may contain valuable information that directly indicates the root cause of problem.
3. Consider what may have changed recently. See “What Changed?”.
4. Consider whether the symptom can be caused by the GC.
5. Look up the symptoms in this manual using the table of contents or the search tool. Review the list of possible causes of the symptom.
6. Check each possible cause or perform a test that narrows the list of possible causes until the symptom is resolved.

The [Status] key

Be sure to also use the [**Status**] and [**Info**] keys on the HS keypad while using this troubleshooting information. These keys will display additional useful information related to the status of the HS and its components.

Error conditions

If a problem occurs, a status message appears. If the message indicates broken hardware, more information may be available. Press [**Status**] to cycle through the status views. Look for more detailed error messages.

What Changed?

When troubleshooting, keep the following points in mind:

- If the problem occurred suddenly, look for what changed. Often sudden issues occur due to discrete events, such as maintenance, changes in gas supplies, changing to a different method or analysis, a defective part, and so forth. Resolving a sudden change often involves changing a consumable item, loading the correct method, or replacing a defective part.
- If the problem happens gradually, for example, a steadily rising baseline or gradual increase in ghost peak areas, look for routine maintenance or changes in the method to resolve the problem. These problems tend to be related to the sample, sample preparation, the method, and the consumables (such as the analytical column).

Keeping Configuration Settings Current

Certain configurable items in the HS must always be kept current. Failure to do so will lead to reduced sensitivity, chromatographic errors, and possible safety concerns.

Sample loop size

Reconfigure the sample loop size whenever you change the sample loop.

To confirm the sample loop size:

1 Press **[Config]**.

2 Scroll to **Loop Volume (mL)**.

Gas configuration

WARNING **Always configure the HS appropriately when working with hydrogen. Hydrogen leaks quickly and poses a safety concern if too much of it is released into the air or into the GC oven.**

Reconfigure the HS every time the gas type is changed. If the HS is configured to a gas other than what is actually being plumbed, incorrect flow rates will result.

To confirm the gas configuration:

1 Press **[Config]**.

2 Scroll through the display entries to see the configured gas types.

Column configuration

If using HS carrier gas control, reconfigure the HS every time the GC column is trimmed or changed. Also verify that the data system reflects the correct column type, length, id, and film thickness. The HS relies on this information to calculate flows. Not updating the HS after altering a GC column causes incorrect flows, changed or incorrect split ratios, retention time changes, and peak shifts.

Headspace Sampler Logs

The HS maintains internal event logs. Use these logs to troubleshoot problems, especially when a message no longer appears on the display. The most useful logs for troubleshooting are the **Sequence** log and the **Event** log.

The Sequence log

The **Sequence** log contains an entry for up to 256 significant events that occurred during the sequence. These entries include vial start and stop times, as well as deviations from the method. The HS also logs parameter changes, method changes, and sequence changes (if these occur during sequence execution). If the log becomes full, the HS overwrites the oldest entries. The log clears every time the HS starts a new sequence.

The Event log

The **Event** log contains up to 250 entries for general events (events not related to a sequence) that occur to the HS. For example, this log records power on/off events, faults, and firmware updates. If the log becomes full, the HS overwrites the oldest entries.

The Maintenance log

The **Maintenance** log contains up to 128 entries that record whenever a maintenance counter crosses a limit or when the counter is reset. If the log becomes full, the HS overwrites the oldest entries.

To View the Event Log, Sequence Log, or Maintenance Log

To access the logs, press [**Logs**] until the desired log displays. The display will indicate the number of entries the log contains. Scroll through the list.

Information Customers Should Provide When Calling Agilent for Service

Gather the following information before contacting Agilent for service:

- Symptoms.
- Problem description. Record details from the instrument logs and status screen.
- Hardware installed and parameters/configuration when the error occurred: sample, supply gas types, gas flow rates, GC detectors/inlets installed, and carrier gas configuration.
- Data system information: data system name, version, and also driver version. (Obtain the driver version from the live Status display, or from the instrument configuration utility.)
- Any messages that appear on the GC display.
- Results of any troubleshooting tests you have run.
- Instrument details. Obtain the following information:
  - HS serial number, which can be found on a sticker located beneath the keypad on the bottom right corner of the instrument.
  - HS firmware revision (press [**Status**], then [**Clear**]).
  - HS power configuration (located on a label on the back panel of the HS to the left of the HS power cable).

- Press the [**Status**] key to display previous Error, Not Ready, and other messages.

To obtain service/support contact numbers, see the Agilent Web site at www.agilent.com/chem.

2
Chromatographic Symptoms

This section provides troubleshooting information for resolving chromatographic issues in a headspace sampler system.

General Information

When troubleshooting chromatographic symptoms, always remember that the headspace sampler is only one part of the system. **Evaluate the whole system to isolate the problem.** Often, issues that appear in the chromatography can be caused by a problem in one or more of the following, in order:

- The sample.
- The sample preparation (including the consumable hardware, such as vials, septa, syringes, solvents, and so forth).
- The data system (acquisition setpoints, integration parameters, peak identification settings, quantitation settings, and reporting).
- The GC (method or hardware).
- The headspace sampler (method or hardware).

To troubleshoot chromatographic symptoms, begin troubleshooting with the sample and sample preparation.

Peaks Not Displayed/No Peaks

This topic assumes that peaks are no longer displayed when analyzing a sample using an existing method (not during method development).

- Check the GC.
  - Check for error messages and log entries.
  - If possible, mount an automatic liquid sampler (ALS) over the inlet and inject a sequence of internal or calibration standard directly into the inlet. If peaks appear then the problem is not in the GC.
  - If the problem is in the GC, refer to the GC's documentation for troubleshooting procedures.
- Check the HS sequence log, event log, and status displays for messages. Especially check the sequence log for method deviations and dynamic leak check failures.
- Check the vial pressurization gas pressure setting. The vial pressurization setpoint should not be less than the pressure developed in the vial during equilibration. (If not, you will vent sample.)
- Check the delivery gas pressures to the HS. See the Site Preparation Guide. The gas delivery pressure at the HS vial gas bulkhead fitting should be 138 kPa (20 psi) greater than the highest desired vial pressurization setpoint.
- Enable dynamic leak checking. This feature verifies that each sample vial is leak-free.
  - If not enabled, check the sample vial for cracks or other leaks. See the Operation Guide.
  - If using dynamic leak checking, make sure the entered leak rate is appropriate for the sample and its preparation technique.
- Confirm the six port valve is turning.
- Check for leaks in the HS.
  - Check for leaks in the transfer line to the GC inlet, including the connection to the inlet.
  - Check for a broken transfer line. Verify there is a flow of carrier gas from the HS to the GC inlet.
  - Check for leaks in the other parts of the sampling system (probe, six port valve, and lines and fittings between).

- Check for restrictions that block the vial pressurization flow path for filling the sample loop. Run the vial leak test.
- If using HS carrier gas control, confirm that the current HS column configuration matches the column actually installed in the GC.

Retention Times Not Repeatable

- Check the GC. See the GC's troubleshooting information. GC problems can include:
  - Leaks in the inlet, including septum
  - Leaks around the inlet liner, if applicable
  - Gas supply pressure
  - Wrong liner type used, if applicable
  - First run effects (has the GC stabilized?)
- Check the HS sequence log, event log, and status displays for messages. Especially check the sequence log for method deviations and dynamic leak check failures.
- If using HS carrier gas control, confirm that the current HS column configuration matches the column actually installed in the GC.
- Check for leaks in the transfer line to the GC inlet, including the connection to the inlet.
- Check for leaks in the other parts of the sampling system (probe, six port valve, and lines and fittings between).
- Enable dynamic leak checking. This feature verifies that each sample vial is leak-free.
  - If not enabled, check the sample vial for cracks or other leaks. See the Operation Guide.
  - If using dynamic leak checking, make sure the entered leak rate is appropriate for the sample and its preparation technique.

Peak Areas Not Repeatable

Poor area count reproducibility results from changes in the amount of sample reaching the GC detector. Check these general areas:

- Check for inconsistent sample preparation technique, including vial cap seals.
- Check the GC.
  - If possible, mount an automatic liquid sampler (ALS) over the inlet and inject a sequence of internal or calibration standard directly into the inlet. Check the area count reproducibility. If acceptable, check the HS. If unacceptable, the problem is in the GC.
  - If the problem is in the GC, refer to the GC's documentation for troubleshooting procedures.
- Check sample vial size. (The HS cannot distinguish between 20-mL and 22-mL vials.)
- Check the HS sequence log, event log, and status displays for messages. Especially check the sequence log for method deviations and dynamic leak check failures.
- Run replicates of known standards to verify the problem.
- Enable dynamic leak checking. This feature verifies that each sample vial is leak-free.
  - If not enabled, check the sample vial for cracks or other leaks. See the Operation Guide.
  - If using dynamic leak checking, make sure the entered leak rate is appropriate for the sample and its preparation technique.
- Poor choice of equilibration temperature or time. For the best reproducibility, the analytes in the sample and in the headspace of the vial must reach static equilibrium. Increase the equilibration time and/or increase the equilibration temperature.
- Try shaking the sample to improve equilibration time.
- Check sample loop size. If the installed sample loop is actually bigger than the configured sample loop size, precision may suffer. The vial headspace pressure may not be sufficient to repeatably fill the loop.

Low Peak Area or Height (Low Sensitivity)

- Check gas supply purity.
- Check all trap indicators and dates.
- Check the GC.
  - If possible, mount an automatic liquid sampler (ALS) over the inlet and inject a sequence of internal or calibration standard directly into the inlet. Check the sensitivity. If acceptable, check the HS. If unacceptable, the problem is in the GC.
  - If the problem is in the GC, refer to the GC's documentation for troubleshooting procedures.
- Check sample vial size. (The HS cannot distinguish between 20-mL and 22-mL vials.)
- Check the configured sample loop size. If incorrect, the peak areas may be reduced due to insufficient headspace pressure for filling a bigger sample loop than configured.
- Check the HS sequence log, event log, and status displays for messages. Especially check the sequence log for method deviations and dynamic leak check failures.
- Check that the transfer line is correctly installed at both ends.
- Check for leaks at the six port valve and within the rest of the sampling system (sample probe, its connections to the six port valve).

Contamination or Carryover

Carryover results when sample condenses on the flow path or is trapped in any unswept areas of the flow path. Normally, the HS reduces the possibility of carryover by purging the sampling system between injections using with a high flow rate of vial pressurization gas.

If your output has contamination or unexpected peaks:

1. Check for contamination in the lab air or on the sample vials.
   - Use new, clean vials, caps, and septa.
   - Purge a vial with pure nitrogen or argon, then run a standard.
   - Consider the sample preparation process.
2. Check gas supplies. Check gas traps.
3. Check the GC.
   - Check GC split vent trap (as applicable).
   - Check the GC inlet flows. Verify there is enough septum purge flow to sweep the inlet weldment.
   - Check GC consumables. For example, When were the inlet liner and septum last changed?
   - If possible, mount an automatic liquid sampler (ALS) over the inlet and inject a sequence of air blanks or solvent blanks. (Use fresh solvent from a clean source.) If the carryover disappears, check the headspace sampler and original solvent source.
   - If the problem is in the GC, perform GC maintenance as needed (bakeout, inlet or detector maintenance, column maintenance, and so forth). Refer to the GC's documentation.
4. Check the HS.
5. Is the HS due for routine maintenance?
   - Run a series of solvent blanks. Use fresh solvent from a clean source. If the carryover in a series of solvent blanks does not decay for each run, the carryover is probably due to adsorbed or condensed sample in the flow path. Replace flow path parts as needed (sample loop, sample probe, transfer line, and so forth).

- For systems that have been exposed to long periods of use with aggressive samples, consider whether the flow path has been compromised. Replace flow path parts as needed.

6 Check the transfer line connection to the GC inlet. Verify the interface is hot. If using a split/splitless (or multimode) inlet on an Agilent 7890A GC, try installing a side inlet weldment accessory, G4556-67070. This accessory reduces unswept volume, allows easy ALS use on the GC inlet, and reduces the chance for sample condensation with at the transfer line to GC interface.

7 Check the reducer union where the transfer line connects to the six port valve.

8 Check the HS sequence log, event log, and status displays for messages. Especially check the sequence log for method deviations related to vial pressure and purge flow.

9 Check HS method parameters.

- Check the purge flow and the standby flow. Try increasing the purge flow (between sample vials) to further eliminate residual sample in the sample loop, probe, and related flow path. Try increasing the purge hold time. Make sure that standby flow is enabled to prevent contaminants from condensing in the sampling system during periods of inactivity.
- Check the oven, loop/valve, and transfer line temperature setpoints. The setpoints must be high enough to keep the analytes volatile.
- Check the vial pressurization pressure and time.

10 After running the HS solvent blanks, if the carryover decreases by a factor of 5 to 10 for each run, the carryover is probably due to an unswept area in the flow path.

If contamination exists in the six port valve, increase the purge flow or purge time to sweep residual sample from the system.

3
Log Entries and Errors

This section describes the headspace sampler (HS) logs most useful during troubleshooting. The headspace sampler logs any deviations to the **Sequence** log or **Event** log. While the sequence log resets at the start of each new sequence, it contains information very useful for troubleshooting chromatographic issues.

The **Maintenance** log contains records of user-performed maintenance tasks.

Sequence Log Entries

The sequence log contains entries related to the running or completed sequence. The log contains up to 256 records. If at capacity, any new entries overwrite the oldest ones.

Many entries simply log routine sequence events, such as starting and stopping. Others indicate potential problems. See Table 1.

See also "Vial Handling" and "Pressures and Flows".

Table 1 Sequence Log entries and descriptions

Message	Description
Start Sequence	
Stop Sequence	
Pause Sequence	
Resume Sequence	
Active Method Change	The active method in the HS changed. This happens frequently during a sequence. (It does *not* indicate changes to saved methods.)
Instrument ready	
Instrument not ready	
Setpoint changed	A method setpoint was changed during the sequence.
Chiller temp out of range, 0C	The chiller temperature went out of the expected temperature range.
Vial # skipped	The indicated vial was skipped. Look for other messages.
Vial # continue	The indicated vial was processed with some issue, in accordance with the method's sequence actions. Look for other messages.
Vial # not found	The indicated vial was missing.
Vial # wrong vial size	The method specified a different vial size than the one detected.
Vial # barcode read error	The barcode for vial # was not decoded.
Vial # barcode mismatch	The barcode for vial # was decoded but the decoded string did not match the expected string.
Vial # barcode chksum error	The barcode for vial # was decoded but the checksum character did not match the checksum calculated for the decoded string.
Vial # external not ready	When vial # was ready for injection, an external device was not ready.
Vial # external timed out	Vial # exceeded the method's time limit while waiting for an external device to become ready.
Start of vial equib time	

Table 1 Sequence Log entries and descriptions (continued)

Message	Description
Vial injection	
Vial pressurization, x.xxx psi	
Vial extraction, x.xxx psi	
Vial temperature, x.xxx	
Vial # missing spacer	Spacer missing from carousel for vial #. For 12 vial model instrument only.
Leak rate x.xxx mL/min	Dynamic leak test failed with indicated leak rate. Check the sample vial.
Vial # abort sequence	The sequence was aborted due to an error condition on vial # indicated.

Event Log Entries (Errors)

The event log records HS events that are not specifically related to sequence processing. These events include errors and instrument faults that are also shown on the HS display. The log contains up to 250 records. If at capacity, any new entries overwrite the oldest ones. The log remains until specifically cleared.

The table below lists selected event log entries and errors. For errors not listed, try power cycling the HS.

Table 2 Event log entries and descriptions

Message	Description
7697 power on successful	Normal.
7697 power on with exceptions	See any exception message descriptions.
7697 power on with warnings	See any warning message descriptions.
Vial pressure shut down	See Pressures and Flows.
Vial flow shut down	See Pressures and Flows.
Carrier pressure shut down	See Pressures and Flows.
Carrier flow shut down	See Pressures and Flows.
Firmware updated: XX.XX	The firmware was updated to the given version.
Tray Error # Tray Rail move failed.	See Table 5.
Tray Error # Tray Gantry move failed.	See Table 5.
Tray Error # Tray z-axis move failed.	See Table 5.
Tray Error # Tray gripper move failed.	See Table 5.
Reset to factory defaults	The active method and configuration have been reset to factory defaults.
Needle lifter error # #	See Tray Error Messages.
Tray lifter error # #	See Tray Error Messages.
Carousel error #	See Tray Error Messages.
Shutter error # #	See Tray Error Messages.
Six port valve error # #	See Tray Error Messages.

Table 2 Event log entries and descriptions (continued)

Message	Description
Spacer missing from carousel	12 Vial model only. Check for a missing vial spacer in the carousel. Check for contamination that can cause a spacer to stick to a vial.
BCR read error # #, t = #	The barcode reader failed to decode the barcode in time, t, seconds. Check the barcode label, See the Operation Guide and Barcode Reader Errors.

Maintenance Log Entries

The maintenance log records maintenance operations performed and logged by the user. The log contains up to 128 records. If at capacity, any new entries overwrite the oldest ones. The log remains until specifically cleared.

The HS always logs messages such as leak test results and firmware updates. However, “serviced” and “service due” messages are logged only when using the Early Maintenance Feedback (EMF) features of the instrument. (See the Advanced Operation guide.) When the user resets a resource counter, the HS assumes that maintenance has been performed.

Table 3 Event log entries and descriptions

Message	Description
<Component> serviced	Indicates that the counter was reset for the indicated component.
Firmware updated: x.xx.xx	Indicates an the instrument firmware update to the revision shown.
<Component> due, or <Component> service due	The EMF counter for the indicated component has been reached.
Tray calibrated	Indicates that a tray calibration was successfully performed.
Tray calibration failed	Indicates that a tray calibration failed.
Leak Test Passed	
Leak Test (Part 2) Passed	
Leak Test failed ##	Indicates a leak test step failed, where ## is the part of the test which failed.

Tray Error Messages

Table 4 summarizes the error messages related to the 111 vial tray hardware. These types of errors can occur when the carousel or lifters cannot move as desired, for example, when debris from a broken vial obstructs carousel or lifter movement.

Table 4 Tray error messages

Event Log Error	Comments
Carousel error #	**1** Check for obstructions in the carousel and oven. **2** Power cycle the HS. **3** Contact Agilent for service.
Needle lifter error #	**1** Check for obstructions in the carousel and oven. **2** Power cycle the HS. **3** Contact Agilent for service.
Shutter error #	**1** Check for obstructions near the shutter. **2** Power cycle the HS. **3** Contact Agilent for service.
Six port valve error #	See Six Port Valve Errors.
Tray lifter error #	**1** Check for obstructions in the carousel and oven. **2** Check for obstructions near the shutter. **3** Power cycle the HS. **4** Contact Agilent for service.

Table 5 lists selected tray and barcode reader errors that can occur during method execution.

Table 5 Tray error codes and messages

Error Number	Event Log Number	Description
103	Vial in gripper	The vial sensor senses a vial in the gripper when no vial is expected. See No Vial Found in Gripper/Vial In Gripper.
104	No vial in gripper	The vial sensor senses that there is no vial in the gripper when a vial is expected. See No Vial Found in Gripper/Vial In Gripper.
105	Received abort	The stop key was pressed on the instrument while the tray was executing a command. The command was aborted.

Table 5 Tray error codes and messages (continued)

Error Number	Event Log Number	Description
180	Bad barcode label	The barcode label does not have enough white space before the first line. See the Operating guide and Barcode Reader Errors.
181	Bad barcode label checksum	The method calls for a checksum on the barcode label and there is none or the label was not decoded correctly. See the Operating guide and Barcode Reader Errors.
182	Failed to decode barcode	The barcode label could not be read. See the Operating guide and Barcode Reader Errors.
183	Barcode code label not found	No barcode label was detected. See the Operating guide and Barcode Reader Errors.
301	Tray parked	The tray is in the park position and cannot execute a move command.
302	Tray rack not found	The rack sensor for a given rack location indicates there is no rack present. Check rack installation. Check sequence vial locations.
304	Vial not found	No vial was detected at the source location during a move operation. Check sequence vials locations. Were vials loaded correctly? Check sequence locations against vial placement in the tray.
305	Vial left in gripper	After a move operation completed the vial sensor still reports a vial in the gripper.
312	Z-axis stalled	Check for any obstructions to tray movement.
313	Gripper stalled	Check for any obstructions to tray movement.
314	Rail axis move timed out	Check for any obstructions to tray movement.
315	Gantry axis move timed out	Check for any obstructions to tray movement.
316	Z-axis move timed out	Check for any obstructions to tray movement.
317	Gripper move timed out	Check for any obstructions to tray movement.
330	Rail home failed	Check for any obstructions to tray movement. The rail axis homing routine failed.
331	Gantry home failed	Check for any obstructions to tray movement.
332	Z-axis home failed	Check for any obstructions to tray movement.
333	Gripper home failed	Check for any obstructions to gripper movement.
334	Gripper open failed	Check for any obstructions to gripper movement.
335	Gripper close failed	Check for any obstructions to gripper movement.

4 Leaks

This section discusses leak testing in the headspace sampler (HS). Chromatographic symptoms such as loss of sensitivity can result from leaks and restrictions. Use the following set of tests for verifying leaks and restrictions within the HS. Verify that the GC is leak free before checking for leaks within the HS.

Leak Check General Procedure

When checking for leaks, consider the system in three parts: external leak points, GC leak points, and HS leak points.

- **External leak points** include the gas cylinder (or gas purifier), the regulator and its fittings, the supply shutoff valves, and the connections to the HS and GC supply fittings.
- **For GC leak points**, refer to the GC user documentation.
- **HS leak points** include the connections at the six port valve (sample loop and transfer line), the transfer line connection to the GC inlet, and the connections for the sampling probe.

WARNING **Hydrogen (H2) is flammable and is an explosion hazard when mixed with air in an enclosed space (for example, a flow meter). Purge flow meters with inert gas as needed. Always measure gases individually.**

WARNING **Hazardous sample may be present.**

1. Gather the following:
   - Electronic leak detector capable of detecting the gas type (Agilent part number G3388A).
   - 7/16-inch, 9/16-inch, and 1/4-inch wrenches for tightening Swagelok and column fittings.
   - Leak test kit, Agilent part number G4556-67010. Includes: no hole ferrule, 11 mm low bleed septa, headspace (blue) leak test vial, 1/8-in. nylon tube fitting plug, 1/16-in. stainless steel ZDV plug (six port valve cap).
2. Check any potential leak points associated with any recent maintenance.
3. Check for external leaks. See “Checking for External Leaks”.
4. Check the GC for leaks. See the GC user documentation.

5 Check HS fittings and connections that undergo thermal cycling, since thermal cycling tends to loosen some fitting types. Use the electronic leak detector to determine if a fitting is leaking.

- Start by checking any newly made connections first.
- Remember to check connections in the gas supply lines after changing traps or supply cylinders.

6 Run the HS **Restriction & pressure decay** test. See To Run the Restriction and Pressure Decay Test.

7 Run the HS **Cross port leak test**. See To Run the Cross Port Leak Test.

Flow Paths

Figure 1 and Figure 2 below show the flow paths within the headspace sampler (HS).

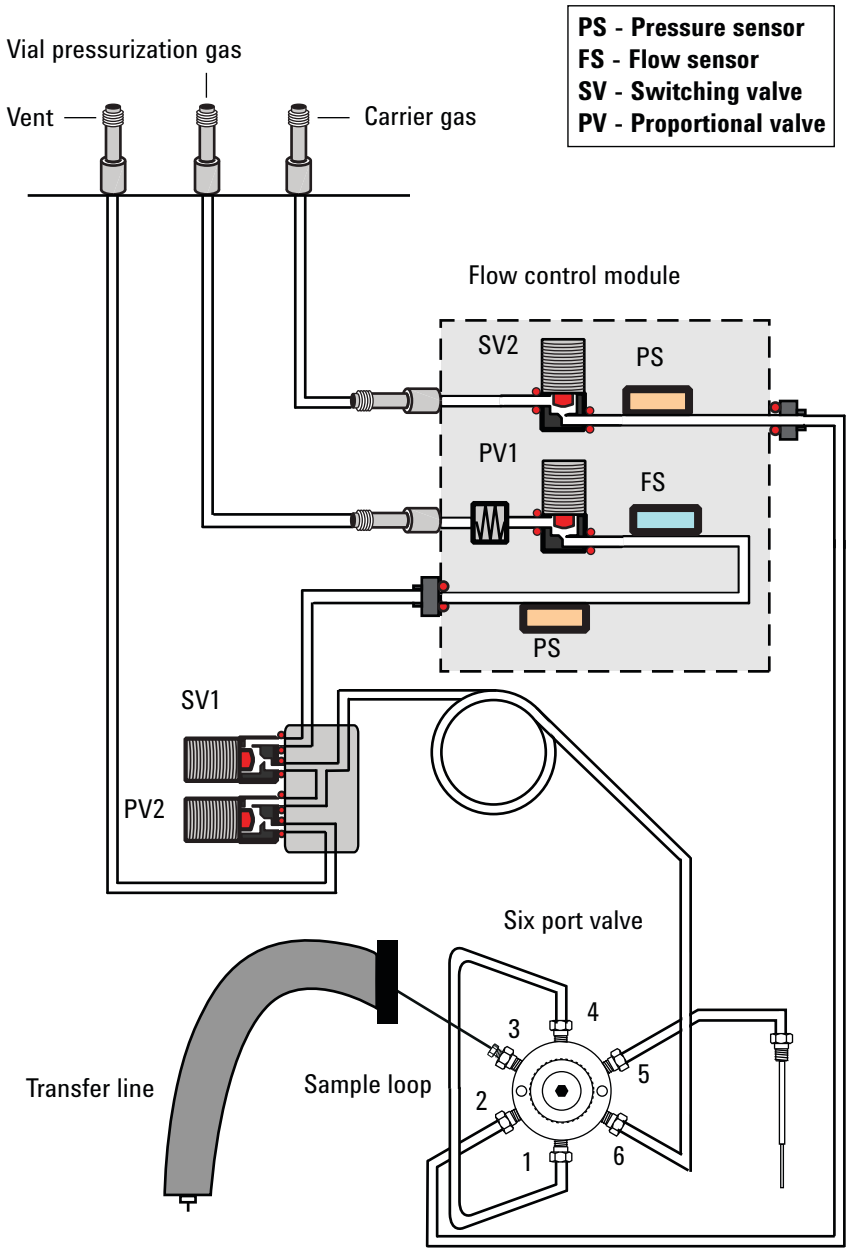


Figure 1 HS flow paths (standard installation)

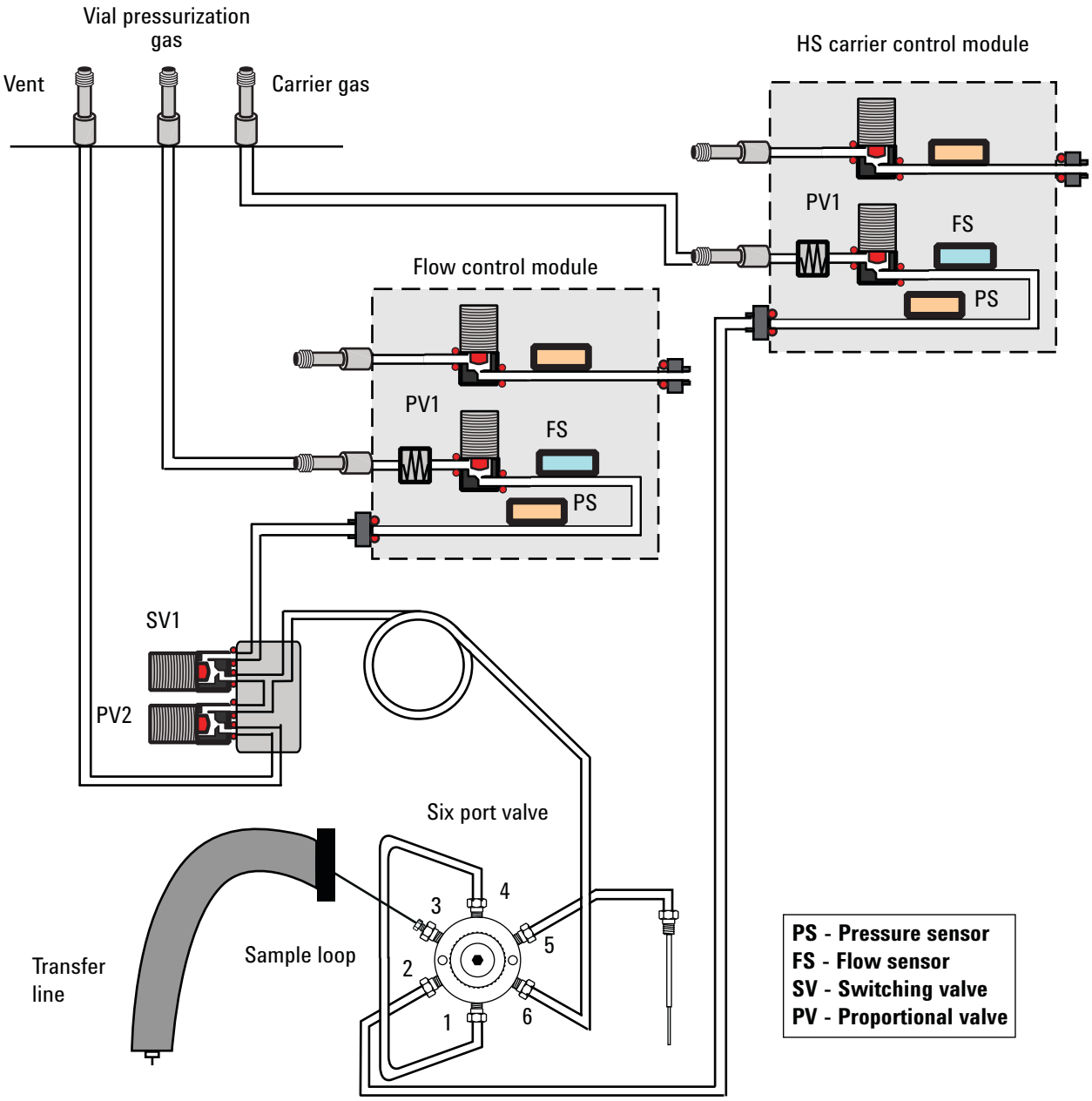


Figure 2 HS flow paths with optional G4562A 7697A Carrier Gas EPC Module Accessory installed

Checking for External Leaks

Figure 3 below shows typical external leak points to check. Check all fittings and correct as needed.

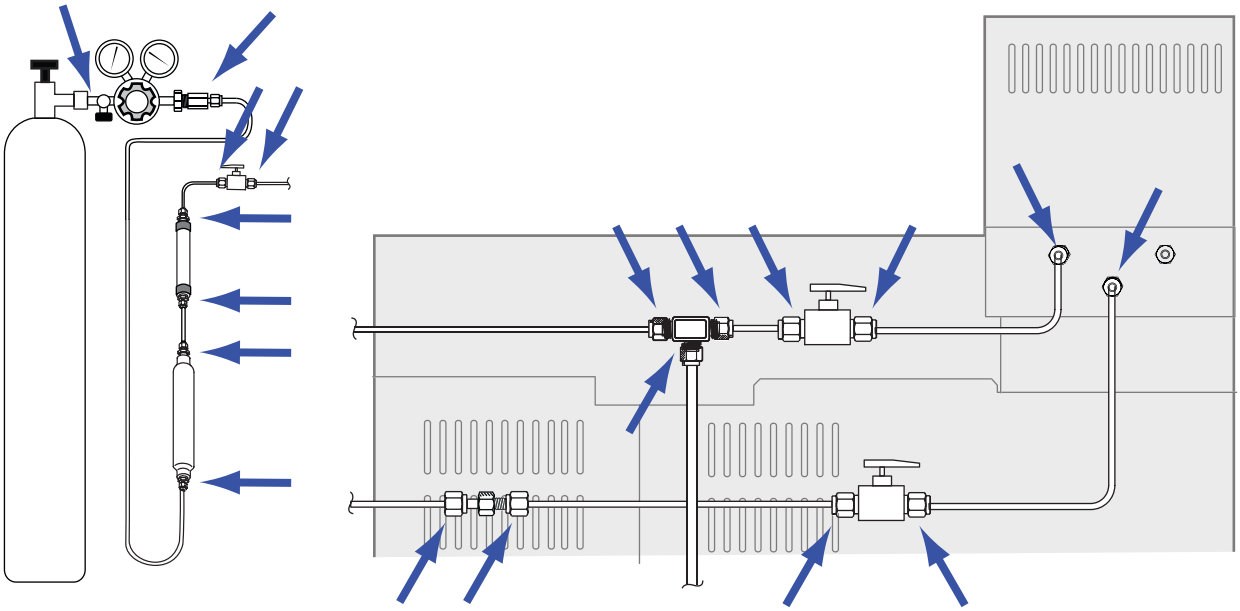


Figure 3 External leak points (HC configured with GC carrier gas control, with optional valves and fittings shown)

- Gas supply bulkhead fittings
- Gas cylinder fittings
- Regulator fittings
- Traps
- Shut-off valves (if installed, not included in ship kit)
- Unions and tee fittings (if installed, not included in ship kit)
- Transfer line connection to the GC

Perform a pressure drop test.

CAUTION A pressure decay test cuts off carrier flow through the HS and GC. To prevent damage to the flow path components (column, inlet liner, and so forth), cool the HS and GC before beginning.

1. Cool the HS sample loop, transfer line, and GC inlet and column oven to prevent damage during the test.
2. Turn off the HS.
3. Set the regulator pressure to 415 kPa (60 psi).
4. Fully turn the regulator pressure adjustment knob counterclockwise to shut the valve.
5. Wait 5 min. If there is a measurable drop in pressure, there is a leak in the external connections. No drop in pressure indicates that the external connections are not leaking.

To Run the Restriction and Pressure Decay Test

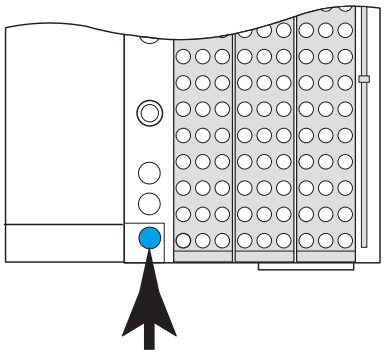
The built-in restriction and pressure decay test sequentially checks for restrictions and leaks in the sampling system. The test checks for:

- Restrictions in the sample probe
- Restrictions in the vent line
- Leaks around the sample probe
- Leaks around the sample loop
- Leaks in valves and in the six port valve

The test consists of several parts. If one part fails, the test reports the failure and stops before attempting any subsequent parts. Correct the problem, then re-run the test. Continue correcting problems and retesting until the test completes successfully.

Before running the built-in restriction and pressure decay test, check the GC for leaks. See "Leak Check General Procedure" and the GC user documentation.

1 Gather the following:
   - Leak test kit (G4556-67010). Includes: six port valve cap (G6600-80039), no hole ferrule (5181-7458), blue leak test vial (G4556-20600), 1/8-inch Nylon Swagelok plug (0100-2414)
   - GC liner, O-ring, and septum as needed
   - 3/16-inch wrench
   - 7/16-inch wrench
   - 1/4-inch wrench
   - 5/16-inch wrench
2 If unsure of the quality of the GC inlet septum, liner, and liner O-ring, change them now. Refer to the GC user documentation for details.
3 Set the active method vial size to 20 mL. Press [**Vial**], scroll to **Vial size**, press [**Mode/Type**] to select the vial size from a list, then press [**Enter**].
4 Install a new septum into the blue leak test vial.
5 Place the blue leak test vial into priority position 1 (111 vial model) or into tray position 1 (12 vial model).



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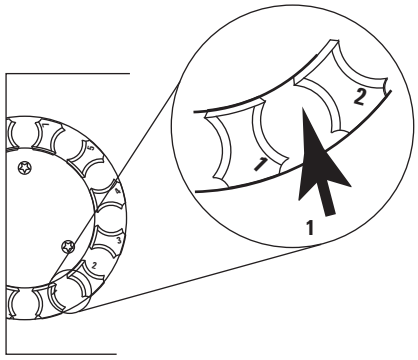

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6 Set the carrier pressure to a low value.

If using HS Control or GC Control:

a Cool the GC inlet and column oven.

b When cool, press [**Carrier**].

c Set the carrier pressure setpoint to 14 kPa (2 psi). (If in a flow mode, reduce the flow setpoint until the carrier pressure is below 14 kPa (2 psi).)

If using GC + HS Control:

- Press [**Carrier**], then reduce the flow setpoint until the carrier pressure is below 14 kPa (2 psi).
- Leave the GC carrier pressure or flow unchanged.

7 Start the test. Press [**Service Mode**], select **Restriction & pressure decay**, then press [**Enter**].

The test begins.

8 The test displays information for the current action (for example, “Purging,” “Zeroing Pressure Sensor,” or “Moving Test Vial,” and the pressure and flow readings).

See “If the test passes” or “If the test fails”.

9 After the test passes, restore the instrument to operating condition.

If the test passes

If the test passes all stages, the sampling system is leak free. If still experiencing leak-like symptoms:

- Check the transfer line.
- Check the interface to the GC.

- If not already done, check the GC. The HS leak test cannot test for leaks in the GC.

If the test fails

If the test fails, the display provides:

- The reading for the stage that failed (for example, leak rate or flow rate).
- Command lines to toggle related valves (for example, a switching valve or the six port valve).

  SV1 or **SV2** or **PV1** or **PV2**: Scroll to this line and press [**On/Yes**] to turn on (energize) the valve, or [**Off/No**] to turn it off.

  Six-port valve: Scroll to this line and press [**On/Yes**] to switch the valve to the load position, or [**Off/No**] to switch it to the inject position.
- A selection to exit the test.

  Exit test?: Select this line then press [**On/Yes**] to abort the test.
- A failure code

See the sections below for troubleshooting information for each stage of the test.

Needle (Sample Probe) restriction test, stage 1: Vent CLOSED (INJECT)

During this stage, the HS flow paths are as shown in Figure 4:

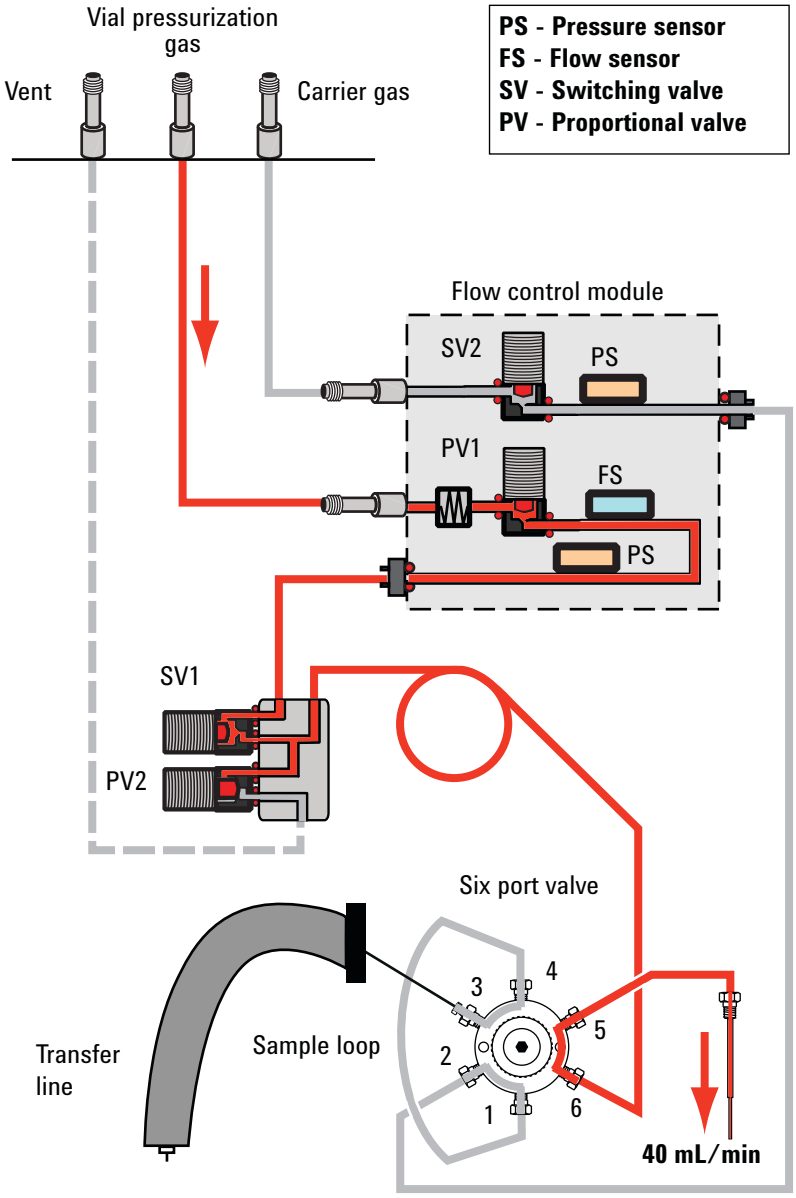


Figure 4 Flow paths: Needle restriction test, stage 1: Vent CLOSED (INJECT)

In this stage, the displayed pressure reading should stabilize at some value. This is your baseline value. If the test fails this stage, check:

- The sample probe
- A leak causing no restriction value

Needle (Sample Probe) restriction test, stage 2: Vent CLOSED (STANDBY)

During this stage, the HS flow paths are as shown in Figure 5:

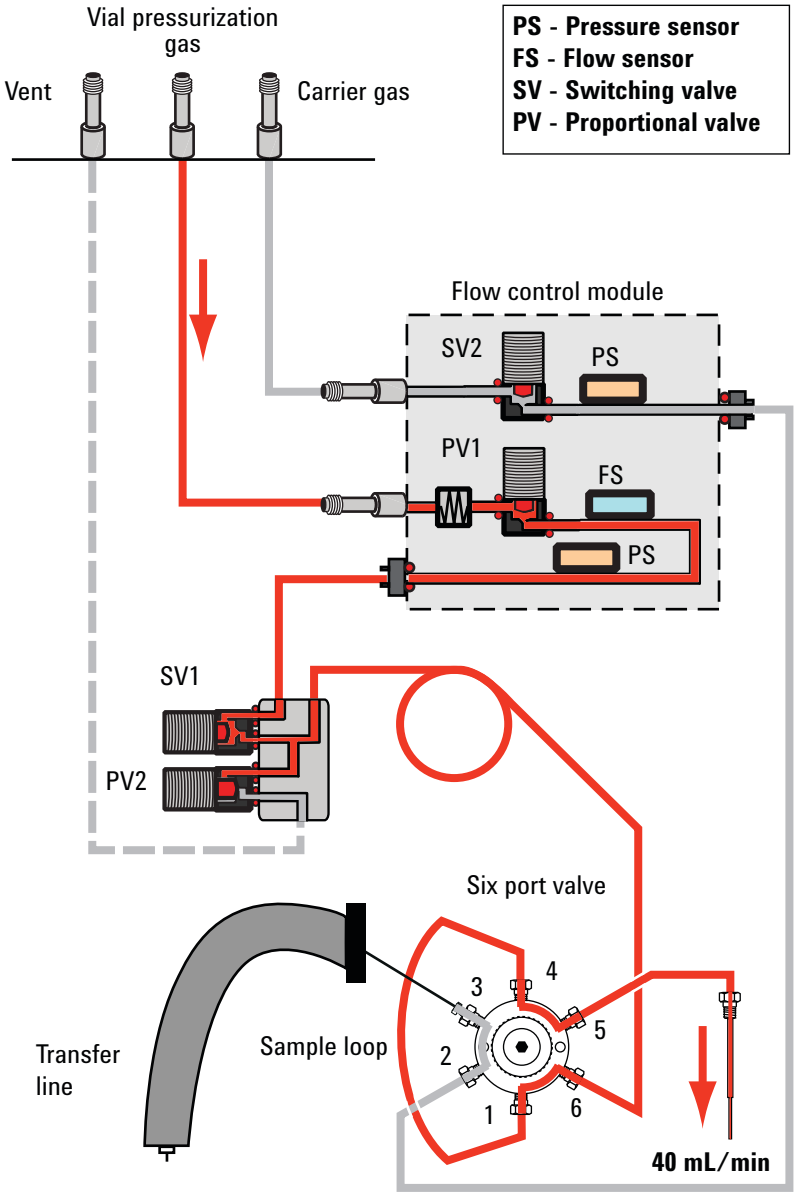


Figure 5 Flow paths: Needle (Sample Probe) restriction test, stage 2: Vent CLOSED (STANDBY)

In this stage, the pressure should stabilize at a higher value than in stage 1, depending on your sample loop size. If the test fails this stage, check:

- The sample probe
- The sample loop or sample loop configuration

Needle (Sample Probe) restriction test, stage 3: Vent OPEN

During this stage, the HS flow paths are as shown in Figure 6:

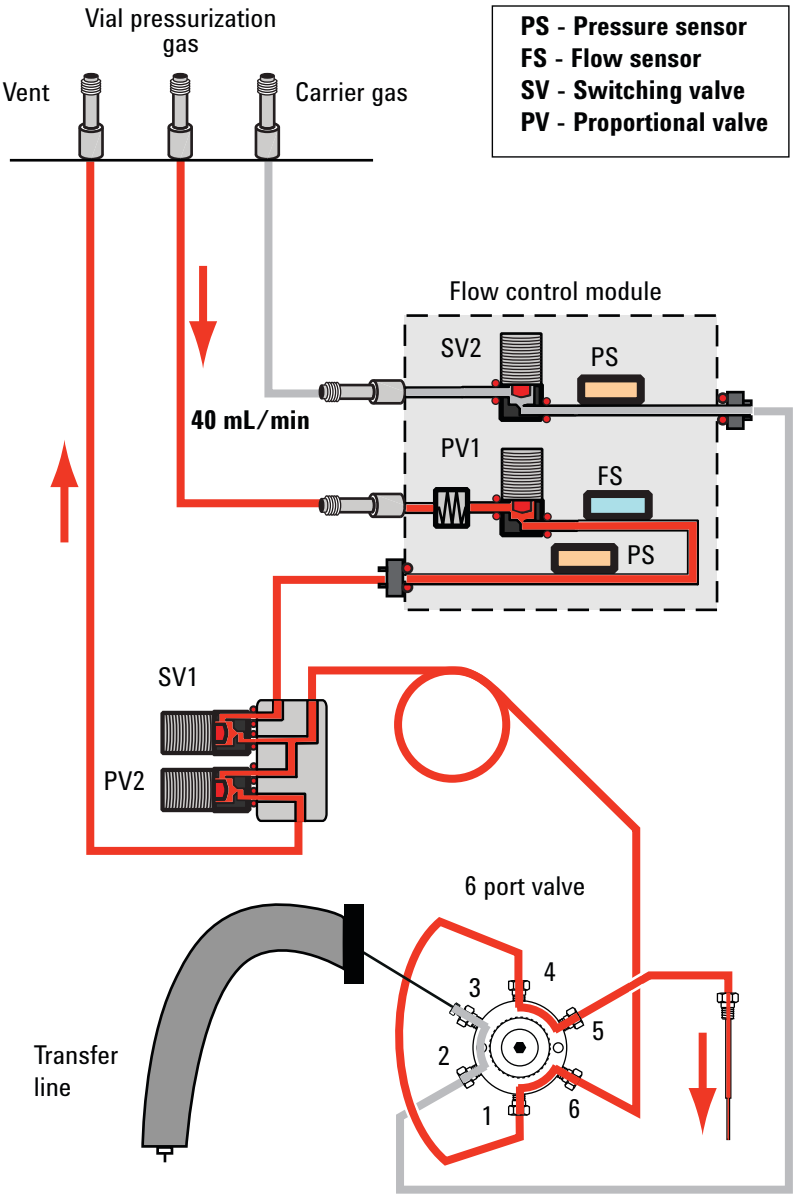


Figure 6 Flow paths: Needle (Sample Probe) restriction test, stage 3: Vent OPEN

In this stage, the pressure should drop to a very low value since the vent is open. If the test fails this stage, check:

- The vent line
- The vent valve (contact Agilent for service)

Vial leak test, stage 1: Test up to SV1

During this stage, the HS flow paths are as shown in Figure 7:

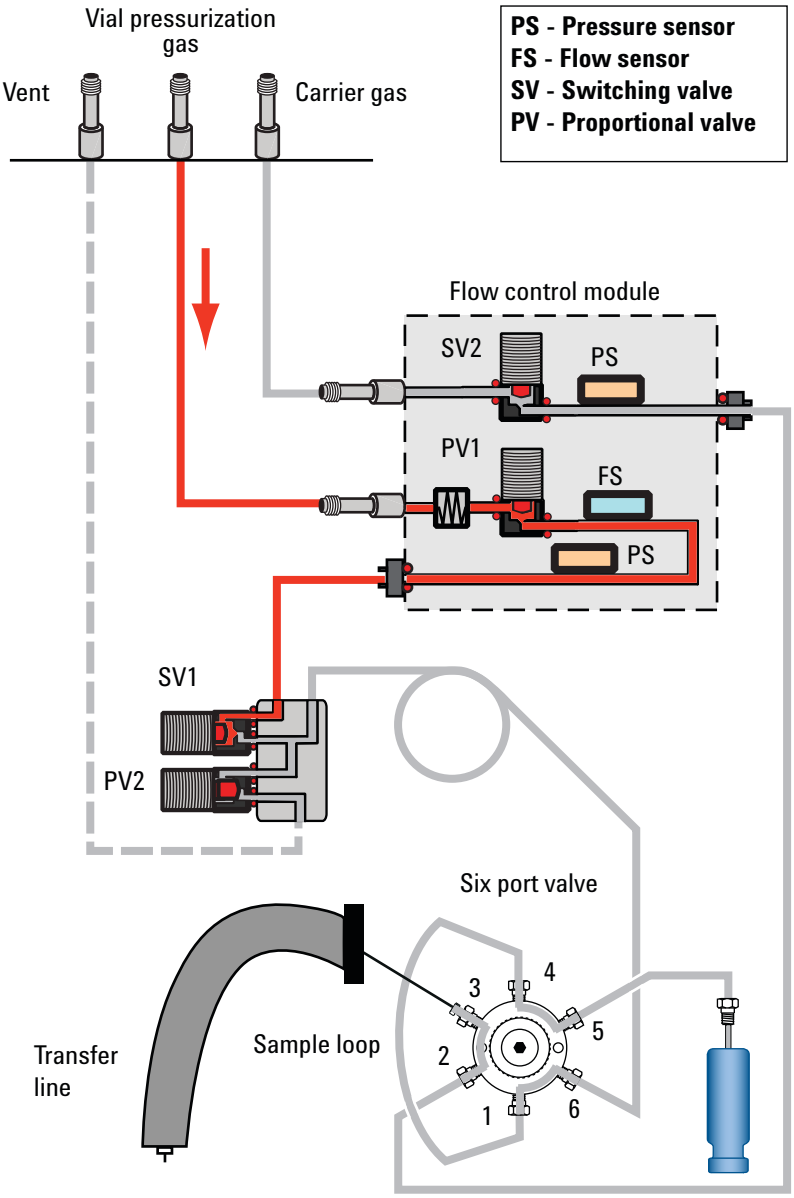


Figure 7 Flow paths: Vial leak test, stage 1: Test up to SV1

If the test fails this stage, check:

- SV1, the pressurization valve (contact Agilent for service)
- The O-ring seats on the PCM module connection (contact Agilent for service)

Vial leak test, stage 2: Test 6PORT (STANDBY)

During this stage, the HS flow paths are as shown in Figure 8:

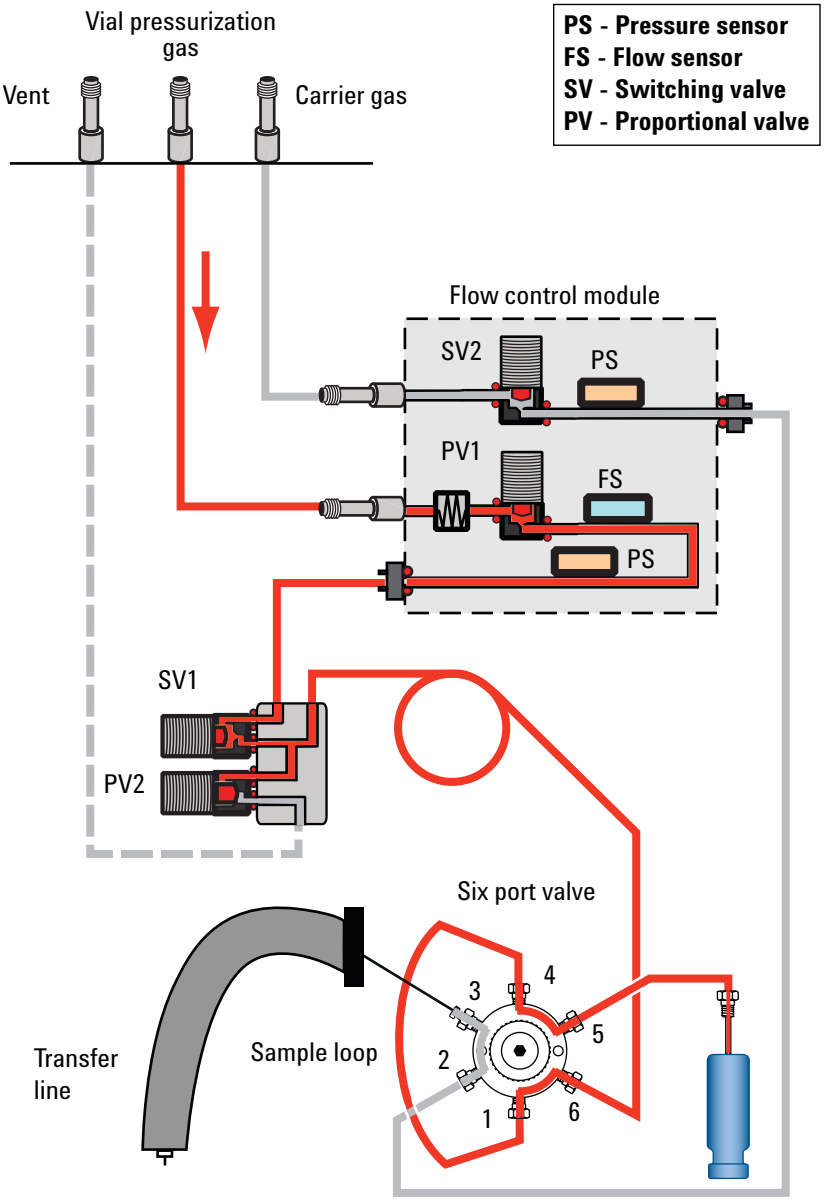


Figure 8 Flow paths: Vial leak test, stage 2: Test 6PORT (STANDBY)

If the test fails this stage, check:

- The vent valve. Cap the vent line and retest. If the test passes, contact Agilent for service. If the test fails again, the vent valve is operating properly.

- The sample probe connections to the six port valve
- The sample loop connections to the six port valve
- Port 6 on the six port valve

Vial leak test, stage 3: Test 6PORT (INJECT)

During this stage, the HS flow paths are as shown in Figure 9:

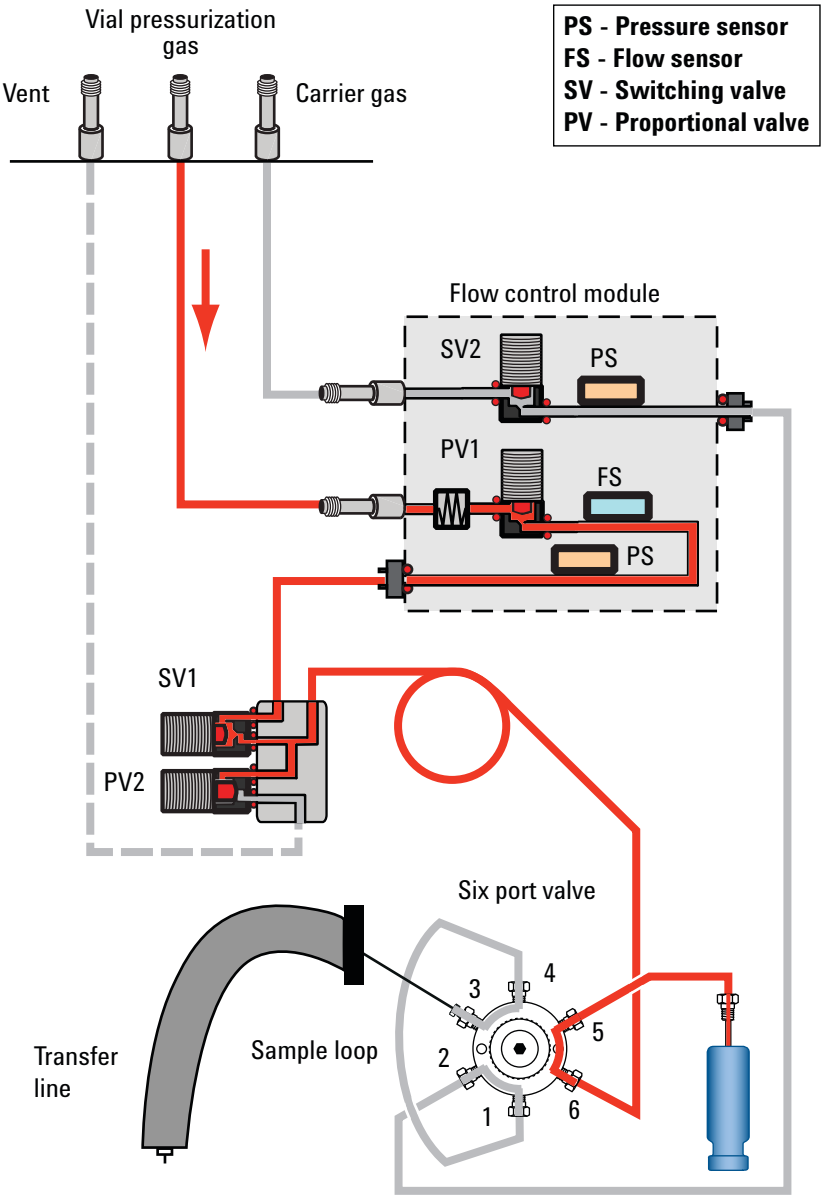


Figure 9 Flow paths: Vial leak test, stage 3: Test 6PORT (INJECT)

If the test fails this stage, check:

- The sample probe connections to the six port valve
- Port 6 on the six port valve

To Run the Cross Port Leak Test

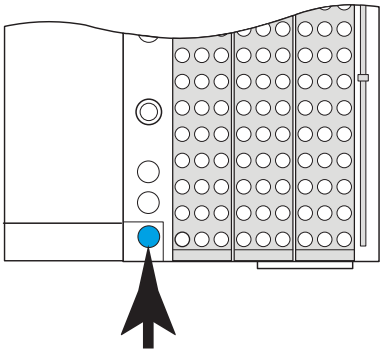
Run cross port leak test immediately after the HS passes the restriction and pressure decay test. See "To Run the Restriction and Pressure Decay Test". These instructions assume that the HS is already prepared and that the GC is leak-free.

The built-in cross port leak test sequentially checks for leaks across the six port valve, from the carrier side to the vial pressurization side.

The test consists of two parts. If one part fails, the test reports the failure and stops before attempting any subsequent parts. Correct the problem, then re-run the test. Continue correcting problems and retesting until the test completes successfully.

1 Install a new septum into the blue leak test vial.

2 Place the blue leak test vial into priority position 1 (111 vial model) or into tray position 1 (12 vial model).



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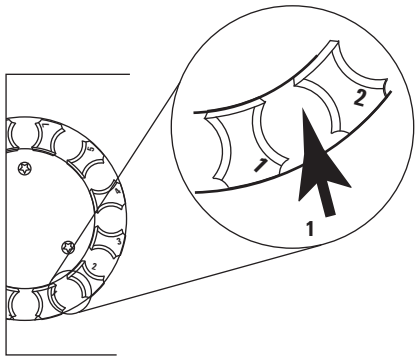

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3 Set the carrier pressure to 172 kPa (25 psi).

If using GC + HS Control:

- Press [**Carrier**], then increase the flow setpoint until the carrier pressure is 172 kPa (25 psi).
- Leave the GC carrier pressure or flow unchanged.

4 Start the test. Press [**Service Mode**], select **Cross port leak test**, then press [**Enter**].

The test begins.

The test displays information for the current stage, for example, the flow path being tested and the setpoint and actual pressure or flow readings.

To stop the test, press [**Clear**] during a purge step (monitor the HS display). Otherwise, the test continues until it passes or fails.

See "If the test passes" or "If the test fails".

5 After the test passes, restore the instrument to operating condition.

If the test passes

If the test passes all stages, the sampling system is leak free. If still experiencing leak-like symptoms:

- Check the transfer line.
- Check the interface to the GC.
- If not already done, check the GC. The HS leak test cannot test for leaks in the GC.

If the test fails

If the test fails, the display provides:

- The reading for the stage that failed (for example, leak rate or flow rate).
- Command lines to toggle related valves (for example, a switching valve or the six port valve).

  SV1 or **SV2** or **PV1** or **PV2**: Scroll to this line and press [**On/Yes**] to turn on (energize) the valve, or [**Off/No**] to turn it off.

  Six-port valve: Scroll to this line and press [**On/Yes**] to switch the valve to the load position, or [**Off/No**] to switch it to the inject position.

- A selection to exit the test.

  Exit test?: Select this line then press [**On/Yes**] to abort the test.

- A failure code

See the sections below for troubleshooting information for each stage of the test.

Cross port leak test, stage 1: Test 6PORT (STANDBY)

During this stage, the HS flow paths are as shown in Figure 10:

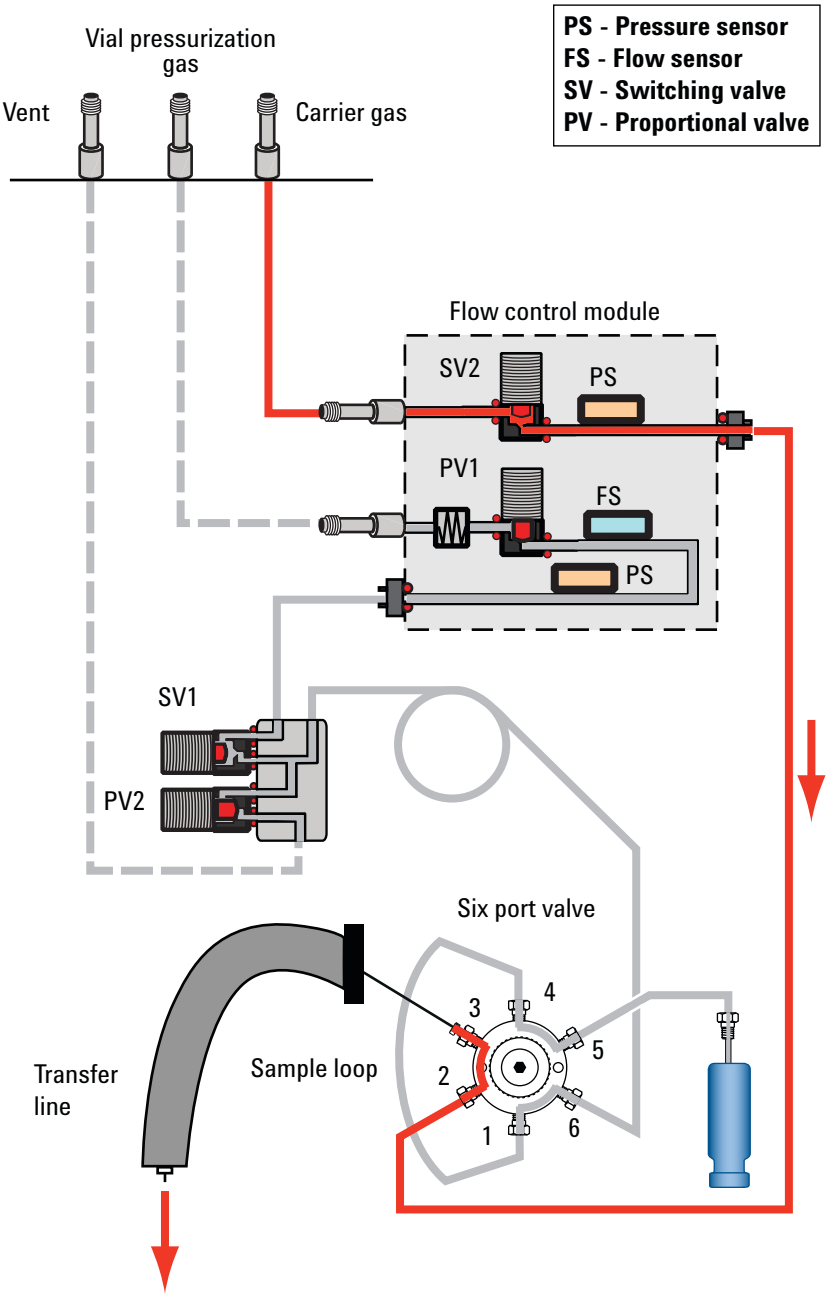


Figure 10 Flow paths: Cross port leak test, stage 1: Test 6PORT (STANDBY)

If the test fails this stage, check:

- A leak across six port valve ports 3 and 4, or 1 and 2. Replace the valve rotor.

Cross port leak test, stage 2: Test 6PORT (INJECT)

During this stage, the HS flow paths are as shown in Figure 11:

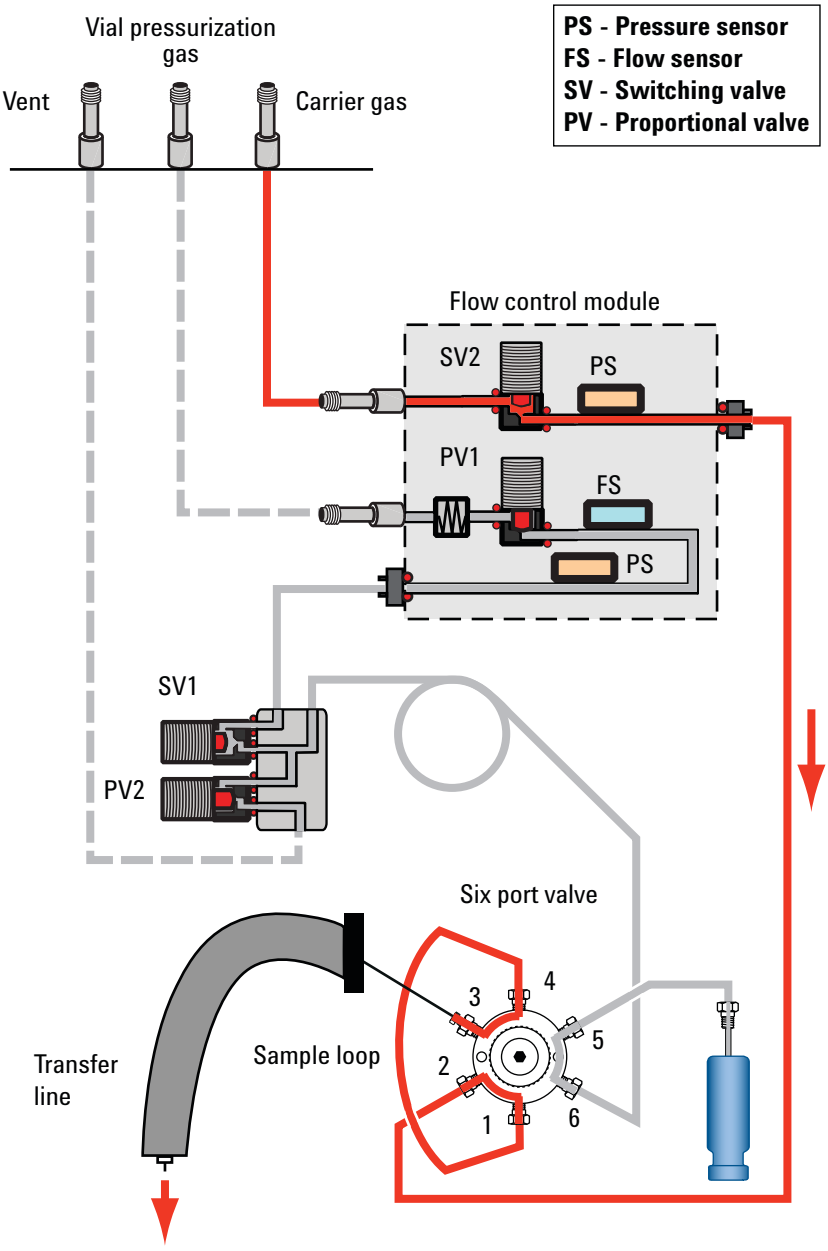


Figure 11 Flow paths: Cross port leak test, stage 2: Test 6PORT (INJECT)

If the test fails this stage, check:

- A leak across six port valve ports 4 and 5, or 1 and 6. Replace the valve rotor.

To Check for Leaks in the Transfer Line

- Check for leaks at the six port valve and interface connection to the GC.
- Check for flow out of the transfer line fused silica. No flow indicates broken fused silica.
- Also consider other leaks in the GC inlet (liner, O-ring, septum and so forth).

5
Vial Handling

This section describes vial handling issues and how to resolve them.

How the Headspace Sampler Handles Vials

How the HS handles vials is important for understanding error messages and entries made in the sequence log and event logs.

In the 12 vial model, the tray (carousel) rotates for loading samples and when moving sample vials into position. The sample probe lifter raises and lowers the current vial into the single-vial oven, and to and from the sampling probe.

In the 111 vial model, the tray resides on top of the unit. To move a sample vial, the HS uses the gantry, z-axis assembly, gripper assembly and gripper, shutter, and vial lifters. See Figure 12.

- The gantry, z-axis assembly, gripper assembly and gripper are used to move sample vials to and from the barcode reader and to and from the tray lifter.
- The shutter opens and closes when the HS transfers a vial to and from the vial oven.
- The lifters inside the HS move vials from the tray and onto the sampling probe.
- The oven stores vials in a carousel.

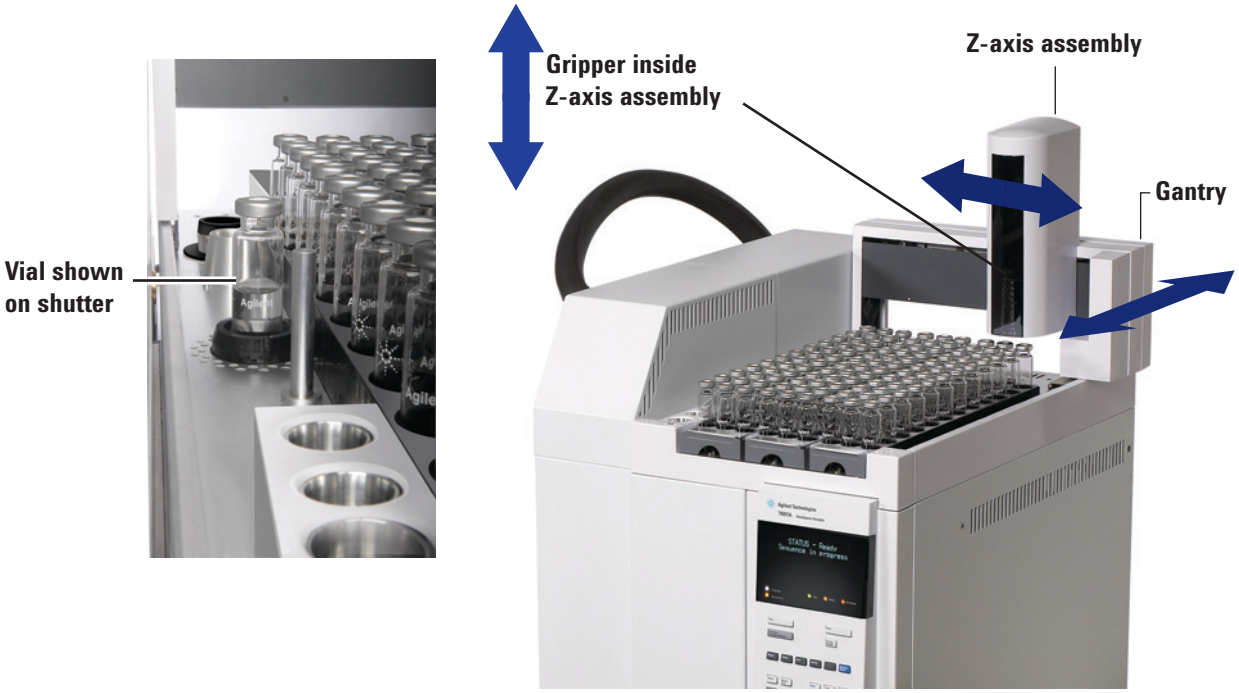


Figure 12 Moving parts in the tray

No Vial Found in Gripper/Vial In Gripper

The headspace sampler tray did not find a vial where it expected to find it, or the vial did not leave the gripper as expected. The HS logs the deviation, then follows the method's sequence action parameters.

To resolve the problem, do the following:

- Check the HS sequence log, event log, and status displays for messages. (Was this error caused by another problem?)
- Check all vials. Were they loaded into the tray correctly?
- If running a priority sample, was the vial placed into the correct location?
- Check vial rack installation.
- Check vial size configuration.

If there were no other errors reported, you can try using the HS again. If the problem recurs:

- Check the vial gripper fingers and motor.
- Check the sensor on the gripper and ensure it can move up and down.

Vial Size Errors

The HS checks vial height:

- When loading a vial onto the sampling probe (12 vial model)
- When grasping a vial with the gripper (111 vial model)

If the vial height does not match the expected value for the vial size defined in the method, a vial size error is logged. The HS proceeds in accordance with the defined sequence action for vial size.

Note that 20-mL and 22-mL vials are the same height. The HS cannot distinguish between them. (An internal capacity of 20 mL or 22 mL is within the range of exterior dimensions for either vial type.)

Carousel Errors

A carousel error indicates that the carousel could not function properly. For a 12 vial model, this is the vial tray. For the 111 vial model, the carousel resides in the vial oven.

Possible causes include:

- Broken vial in the oven
- Obstruction in the shutter. (111 vial model)
- Other obstruction in the oven
- Carousel stepper motor issue
- Belt issue

Before proceeding, cool down the vial oven (111 vial model)

WARNING **The oven and contents in it may be hot enough to cause burns. Cool the oven to a safe handling temperature before proceeding, or wear heat-resistant gloves.**

WARNING **If there is a broken vial in the oven, the oven will contain sharp, broken glass as well the contents of any sample material.**

- Check the HS sequence log, event log, and status displays for messages. (Was this error caused by another problem?)
- Check the oven shutter. Is it open or closed?
- Check the carousel/tray for broken glass or other obstructions. See the procedure for cleaning the 12 vial oven tray or vial oven in the *Maintenance* manual.
- If the problem remains, contact Agilent for service.

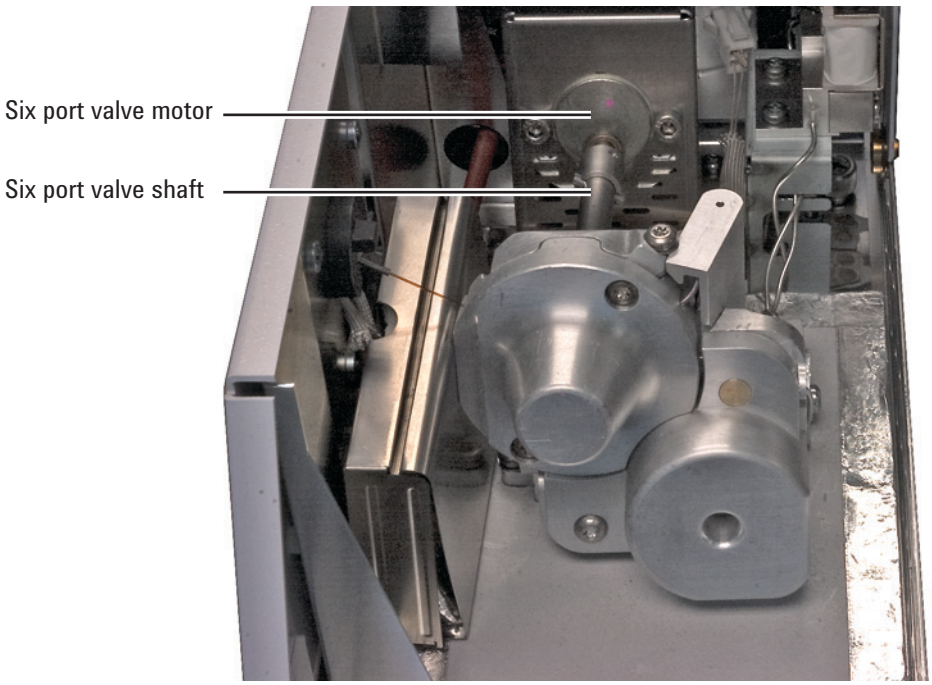
Sample Probe Lifter Errors

The sample probe lifter raises the sample vial onto the sampling probe and lowers it back into the rotating tray. A sample probe lifter error indicates that the lifter could not function properly.

- Check the HS sequence log, event log, and status displays for messages. (Was this error caused by another problem?)
- Check the carousel/tray for broken glass or other obstructions. See the procedure for cleaning the 12 vial oven tray or vial oven in the *Maintenance* manual.
- Check vial size configuration.
- Contact Agilent for service.

Six Port Valve Errors

The six port valve rotates during the sampling cycle. If the valve cannot rotate, power cycle the HS. Check for obstructions in the pneumatics area (such as whether the insulating cover interferes with the valve drive shaft). If the error persists, contact Agilent for service.



Shutter Errors (111 Vial Model)

The shutter opens and closes when transferring a vial to and from the vial oven.

- Check the HS sequence log, event log, and status displays for messages. (Was this error caused by another problem?)
- Check the shutter for obstructions, for example a vial.
- Contact Agilent for service.

Tray Lifter Errors (111 Vial Model)

The tray lifter transfers the sample vial between the shutter and the carousel. A tray lifter error indicates that the lifter could not function properly.

- Check the HS sequence log, event log, and status displays for messages. (Was this error caused by another problem?)
- Check the shutter.
- Check the carousel/tray for broken glass or other obstructions. See the procedure for cleaning the 12 vial oven tray or vial oven in the *Maintenance* manual.
- Contact Agilent for service.

Barcode Reader Errors

If using the optional barcode reader, a barcode error indicates that the barcode reader could not read the barcode as expected.

- Check the vial barcode label positioning, sizing, and type. See the Operating guide.
- Barcode label not heat resistant.
- Check vial locations. Was this vial the correct vial?
- Check the barcode label. Is the label smudged or illegible? Is the label too glossy? If possible, try reading the barcode using another device.
- Check the HS sequence log, event log, and status displays for messages.
- Check the method. Does the barcode type specified in the method match the barcode applied to the vial?
- If the barcode failed checksum or its value did not match the expected value, check vial locations. Check barcode type used.
- If the problem persists, try test vials with new labels. Be sure each vial meets the labeling requirements.

Tray Errors (111 Vial Model)

A tray error indicates that the HS tray did not operate properly, typically during a move.

- Check vial rack installation. Racks must be installed in their clips and must lay flat.

- Check for obstructions in the tray area.
- Power cycle the HS.
- Calibrate the HS tray.

Gripper Errors (111 Vial Model)

A gripper error indicates that the gripper could not properly lift or release a vial.

- Check vial rack installation.
- Check for obstructions in the tray area.
- Check that the gripper fingers are not sticky (contaminated by spilled sample, for example)
- Calibrate the HS tray.

Vial Breaks During Thermal Equilibration

- Reused vial. Agilent does not recommend reusing headspace vials.
- Vial damaged when preparing sample.
- Vial does not meet guidelines for headspace sampling.
- Vial oven temperature too high, exceeds boiling point(s) in sample vial.

6
Pressures and Flows

This section describes issues related to pressures and flows within the headspace sampler, and how to resolve them.

Flow and Pressure Shutdowns

The HS monitors the vial pressurization gas stream. If the optional G4562A Carrier Gas EPC module is installed and enabled for use, the HS also monitors the carrier gas flow. If a gas is unable to reach its flow or pressure setpoint, the HS assumes that a leak exists. It will warn you with a beep after 25 seconds, and it will continue to beep in intervals. After about 5 minutes, the HS will shut down components to create a safe state.

In general, a flow or pressure shutdown will not stop ongoing vial equilibration processing. However, no new vials will be handled. The HS will not perform injections.

Purge Flow Deviations

If the HS cannot maintain the correct purge flow after an injection, it logs the method deviation into the sequence log.

- Check the gas supplies.
- Check for leaks.

If the problem remains, the problem may be a restriction in the vial pressurization flow path or defective flow control hardware. Contact Agilent for service.

Vial Pressurization Setpoint Deviations

If the HS cannot pressurize the vial to the method setpoint, it logs the method deviation into the sequence log.

- Check the gas supplies.
- Check the delivery gas pressures to the HS. See the Site Preparation Guide. The gas delivery pressure at the HS vial gas bulkhead fitting should be 138 kPa (20 psi) greater than the highest desired vial pressurization setpoint.
- Check the sequence log for a dynamic leak check failure entry for this vial.
- Check the method vial pressure setpoint. If the method setpoint is higher than the safety feature for the vial cap, the vial cap may be releasing the excess pressure.
- Check for leaks.
- If the vial pressure is too high, consider the method setpoint. Is the vial developing an equilibration pressure higher than the setpoint while equilibrating?

If the problem remains, the problem may be defective flow control hardware. Contact Agilent for service.

Carrier Gas Deviation or Shutdown

The HS, if equipped with the optional G4562A Carrier Gas EPC Module Accessory, can control carrier gas flow or pressure in one of two modes. The HS provides either all carrier gas flow into the GC, or an added flow during the injection cycle (in this mode, the GC still provides its own carrier gas control).

HS provides all carrier flow

If the HS cannot maintain carrier gas flow or pressure at setpoint, the HS will do the following:

- Log a deviation in the sequence log.
- Display a flow or pressure shutdown message.
- Turn off the flow to avoid column damage.
- Turn off the transfer line.

The HS will continue to process sequence vials through thermal equilibration. While in shutdown, it will not perform injections. The HS will log deviations for any vial which exceeds setpoint for equilibration.

However, the GC may continue to operate, depending on the model and the type of carrier gas control used.

CAUTION If the HS is the primary source for carrier flow, and if the HS shuts down the carrier flow, cool the GC oven to protect the column. The HS cannot control the GC.

HS provides additional flow during the injection

If the HS cannot achieve and maintain either the added flow during injection or the carrier saver flow after the injection, the HS will log the deviations and may enter shutdown.

- The HS will always log a deviation in the sequence log.
- If the flow does not reach setpoint after about 5 minutes, the HS displays a flow or pressure shutdown message. Processing of samples continues as described in “HS provides all carrier flow”.

If the method is short, it is possible that the HS may not have time to shut down the flow. In this case, the deviations are still logged.

To resolve a carrier flow deviation or shutdown

- Press [**Carrier**], scroll to the appropriate flow parameter, and press [**Off/No**] to turn off the beeping. Turn on the flow after resolving the problem.
- Check the gas supplies.
- Check for leaks.
- Check the transfer line installation. Is the transfer line broken?

7 Communications

This section provides basic communications troubleshooting for the Agilent 7697A Headspace Sampler.

Troubleshooting Headspace Sampler Communications

The Agilent 7697A Headspace Sampler uses only LAN communications. This topic provides information and tasks designed to help resolve problems related to TCP/IP network communications when controlling the HS using an Agilent data system. This topic assumes a basic knowledge of network communications, including the TCP/IP protocol, a basic understanding of networks and networking, and a basic understanding of the hardware and functions of networks (cabling types, hubs, switches, routers, static versus dynamic IP addresses, DNS servers, subnets, gateways, and so forth).

Network-based communications problems can appear with any of the following symptoms:

- Cannot connect to an instrument
- Intermittent loss of communications with an instrument
- Sudden loss of communications to an instrument

General information

Each computer and instrument uses a Network Interface Card (NIC) to provide network communications. In the Agilent 7697A HS, the NIC is built-in. For some other instruments, the NIC is a separate accessory or “card” that is installed. In either case, the NIC provides communications programming and the physical connector (jack) for the network cable.

Using DHCP

While the HS can be set to receive its IP address from a DHCP server, not all data systems support DHCP. In most cases, if the data system supports DHCP, then the DHCP server must be set so that either:

- The HS receives a host name, and only the host name is used for data system connections, or
- The DHCP server provides a static IP address to the HS.

If using DHCP, and there is a communications problem with the HS, try setting the IP address directly at the front panel instead.

To Troubleshoot LAN Connectivity Issues

1 At the HS front panel, show the current communications options: Press [**Options**], then select **Communications**. The display lists the HS IP address information. Note especially:

- The number of **Connections** (devices communicating with the HS). If the number of connections is greater than expected, another data system or utility is communicating with the HS.
- The DHCP setting. See "Using DHCP".
- Record the HS IP address, subnet mask, and gateway.

2 Determine the IP addresses used in the configuration. Each computer, printer, and instrument on the network must have a unique IP address. Duplicated addresses cause conflicts and disrupted communications. To determine the current computer IP address:

a Click **Start...> Run**, then in the **Open** field type **cmd**. Click **OK**.

b Type **Ipconfig /all**, then press [**Enter**]. The command lists communications settings for all network devices in the computer.

c Record the IP address, subnet mask, and gateway settings for the PC.

d Check to make sure that you have the same class IP address and the associated subnet mask in your network.

3 Record the IP address, subnet mask, and gateway for the instruments controlled by the data system.

- If using many Agilent instruments (most MS and MSDs, the 7697A, and the 6890N, 6850N, or 7890A GCs) the IP address can be obtained from the front keypad.
- For other instrument types, or for other addressing protocols, see the data system documentation or the instrument documentation.
- Also record IP addresses for other local devices, such as networked printers.

4 Compare the collected IP addresses. Make sure that the IP addresses entered into the data system match the IP addresses used for the instruments.

5 Check cables and LAN LEDs at each device. Ensure that all the network cables are plugged in tightly at both ends.

Check the end in the hub/switch and the one in the network card of the PC or instrument. When properly connected and working, network cards provide green and yellow LEDs as a visual indicator of network connectivity. Look on the back of the NIC adapter of the PC and the back of the instrument.

- If there is no green LED, there is no connectivity. Look for a hardware problem such as a disconnected cable, dead network, defective switch/hub, router, or defective NIC.
- If there is a red LED lit, there is a problem with the NIC.
- If the green LED is lit, with a flashing yellow or orange LED, the network card is properly connected and working. This condition indicates an active network, and verifies that the jack in the wall is working.

Disconnect the network cable and confirm that the network reports it is disconnected. Re-connect the network cable and confirm the PC reports the connection.

Power cycle the router.

6 Check your firewall settings and make sure that the firewall is not blocking the incoming and outgoing traffic.

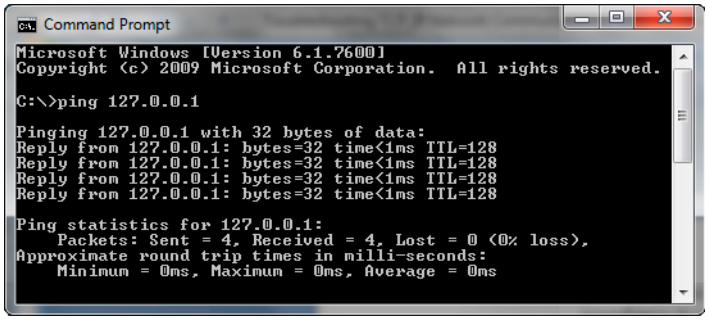
7 You can test to see if the wall jack is having trouble by plugging your cable into another jack you know is working. You can also plug another device with a working network connection, such as a laptop, into the same jack as the HS.

8 If you see the error message “Service Control Manager reported an error” when you logon to Windows, this could indicate a bad NIC card or corrupt software driver for the NIC card. If this occurs, check the Windows Event Viewer program for details.

9 Check if the computer's network card is functioning properly and that TCP/IP is installed correctly as follows:

a Click **Start > Run**, then type **cmd** and click **OK**.

b Type **ping 127.0.0.1** and press **[Enter]**. You should see four lines that read something like this “**Reply from 127.0.0.1: bytes=32 time<10ms TTL=64**”. If you are getting anything else, there is a problem with your NIC card. Reinstall the driver of the NIC adapter and if the problem is still there then change the NIC adapter and reconfigure it.



c You might have to reinstall the NIC adapter and the software drivers that came with it.

d If you are getting a normal ping response, next ping your PC IP address. You should see four lines that read something like this "**Reply from 192.176.xxx.xxx: bytes=32 time<10ms TTL=64**". A successful ping means TCP/IP is installed and correctly initialized. If you are getting anything else, there is a problem with your TCP/IP protocol. Remove the TCP/IP protocol that you have in your network configurations and then reinstall it.

If the ping failed with "Request timed out" errors

1. Check the cabling. (Did the cable become unplugged?)
2. Test the cabling connection by disconnecting and reconnecting the cabling and check the PC for the network connection status.
3. Check the hub, switch, or router settings. Make sure the instrument is not connected to the switch or hub cascade port. Try a different switch or hub.
4. Power off the hub/switch or router and power it back on again, then repeat the instrument's ping test. Use a crossover cable (no switch/hub) to one instrument and ping again.

If ping succeeds, but you still cannot connect

1. Consider if the network is just very busy. If there is too much traffic on the network, this can interfere with data acquisition and instrument control. Monitor the collision lights on the switch or hub.
2. Verify that the same IP address is used in the instrument and the data system.

3 If the ping request was answered successfully by the instrument but you cannot connect to the instrument with your data system, you need to verify that your Windows TCP/IP settings (especially the subnet mask and gateway settings) are correct for the selected network. PING only checks the hardware levels and not the subnet mask or gateway. The gateway and subnet mask can be incorrect and you can PING (receive a reply) the instrument but not connect to the instrument using a data system.

4 The instrument may be in use by another software application.

5 Recheck the instrument configuration in the data system software. The HS must be configured as the correct type of instrument, for example as a 7697A headspace sampler, not as a GC.

The GC Does Not Start After the HS Injects

If the HS makes an injection, but the GC does not start a run, check the following:

- Headspace sampler multiple headspace extraction mode for this method. Press [**Adv Function**] and check the **Extraction Mode**. If performing concentrating extractions, the HS only starts a GC run after the final concentrating injection.
- APG remote cable connection.
- The HS method **APG Remote enable** setting. If turned off, the HS will not wait for GC readiness before injecting.
- **System Not Ready** sequence action setting for the HS method. If set to continue, the HS will inject regardless of GC readiness state.
- GC readiness. If the GC is not ready, it will not start.

7 Communications

8 Electronics

This section describes how to resolve issues in the headspace sampler electronics, including temperature control.

To Check the Headspace Sampler Power Configuration

The headspace sampler must be properly configured for the local mains voltage supply. To check the current power configuration of the HS, read the label shown in the back of the instrument.

If the power configuration shown does not match the mains voltage available, contact Agilent. You will need to obtain the correct voltage configuration plug and power cord. See the Installation manual and Site Prep guide for more information.

To Perform the Instrument Self Test

The instrument performs its self-test during startup.

1 Turn off the instrument.

2 Wait approximately 1 minute, then turn on the instrument. If the main status appears in the display, the instrument passed self-test.

```
Agilent 7697A
A.01.01

Power on successful
```

Thermal Shutdowns

The headspace sampler controls the temperature for areas including: the vial oven, the sample loop and valve, and the transfer line. (If using the optional tray chiller, this is another controlled zone.) If the heated zone is not within its allowable temperature range (lower than minimum temperature or higher than maximum temperature), an error message displays. Depending on the severity of the problem, the HS may also shut the zone down to prevent damage or injury. Several things could cause a thermal shutdown:

- A problem with the electrical supply to the instrument.
- A malfunction of the zone control electronics.
- A shorted or open temperature sensor.
- A shorted or open heater.

To recover from this state:

1. Press [**Status**] and check for additional messages.
2. Press [**Temps**]. Look for any additional messages.
3. Scroll to the offending thermal zone, then press [**Off/No**] to turn off any audible alarm.
4. Check for any issues that may have caused the problem:
   - Missing thermal cover over transfer line and six port valve
   - Missing or damaged insulation on transfer line
   - Missing external covers on HS
   - Sample valve cover installed over heater/sensor cable
5. Power cycle the HS.
6. If the problem does not resolve, contact Agilent for service.

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