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Agilent 6400 Series Triple Quad LC/MS Installation Checklist

Thank you for purchasing an Agilent instrument solution. This checklist is used by the installing engineer to ensure that the instrument and associated systems are correctly installed, upgraded and functioning as designed in your facility. This checklist will be completed at the end of the service and provided to you as a record of the installation.

Customer Information

Customers should provide all necessary operating supplies upon request of the engineer.

The customer should ensure that the installation site is prepared in accordance with the specifications contained in the relevant site preparation document, and that the necessary operating supplies, consumables and usage dependent items such as gases, vials, syringes, solvents, etc. are available. A customer representative should be present at all times during the installation.

Service Engineer's Responsibilities

Only complete/printout pages that relate to the system being installed.
Complete empty fields with the relevant information
Complete the relevant checkboxes in the checklist using a "X" or tick mark "✓" in the checkbox.
Complete Not Applicable check boxes to indicate services not delivered, as needed
Complete the Service Review section together with the customer

This checklist should be followed in conjunction with the Agilent 6400 Series Triple Quad LC/MS Installation Manual.

Additional Instruction Notes

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Select pages for required products

System Information

Guidance:

- ❑ Check box if an instrument configuration report is attached instead of completing the table below.

Instrument Information:

Instrument System Name/I.D:	**Instrument Location:** .
Record the list of system component product numbers below.	**List the serial numbers of the components present in the system below**
1.	**1.**
2.	**2.**
3.	**3.**
4.	**4.**
5.	**5.**
6.	**6.**
7.	**7.**
8.	**8.**
9.	**9.**
10.	**10.**

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Installation Checklist

General Preparation

- ❑ Unpack/verify the condition and completeness of shipment. For discrepancies, use the table below.

Product/Part Description	Observation	Action

- ❑ Discuss any specific questions or issues with the customer prior to starting.
- ❑ Discuss any configuration options with the customer prior to starting
- ❑ Check for required service note applicability and firmware updates if connecting to instruments.
- ❑ **Upgrades only** – Ensure with customer that instrument control settings, data, methods etc have been properly saved or archived prior to starting any installation procedures.
- ❑ Assure that all site preparations have been met including electrical, gas, and customer supplied solvent requirements.
- ❑ Unpack and verify condition, as well as completeness, of shipment:
  - ☐ Shipment OK
  - ☐ Shipment damaged or incomplete (please provide the following information):
    1. LC-A or LC-E notified:
    date:_____
    name:_____
    2. DM notified:
    date:_____
    name:_____
    3. Carrier notified:
    date:_____
    name:_____
    4. Record damaged/missing material on rear of this sheet.

Agilent 6400 Series Triple QuadLC/MS

- ❑ Install Triple Quad LC/MS:
  - ☐ Using four people, one at each corner of the instrument, place the Triple Quad LC/MS on a stable bench or table. Make sure adequate space is available to operate and maintain the instrument.
  - ☐ Unbox the rough pump, and connect the vacuum hose to rough pump.
  - ☐ **For Edwards E2M28**
    - ❑ **Section NOT Applicable**
    - ☐ Install the mist filter, oil return kit and make sure the gas ballast is closed.
    - ☐ Connect 3/4" exhaust tubing to the mist filter KF fitting with hose adapter and connect hose to vent.
    - ☐ Connect the spray chamber exhaust tube to the drain bottle 1" fitting.
    - ☐ Connect 3/4" tubing to drain bottle vent fitting and connect to separate vent from pump.
    - ☐ Attach the 1/8" waste line from the Triple Quad LC/MS to the drain bottle 1/4" fitting.

- ☐ **For Agilent MS40+ (qty 2 for 6490)**
  - ❑ **Section NOT Applicable**
  - ☐ Connect 3/4" exhaust tubing to the rough pump KF fitting with hose adapter and connect hose to vent.
  - ☐ Connect the spray chamber exhaust tube to the drain bottle 1" fitting.
  - ☐ Connect 3/4" tubing to drain bottle vent fitting and connect to separate vent from pump.
  - ☐ Attach the 1/8" waste line from the Triple Quad LC/MS to the drain bottle 1/4" fitting.
- ☐ Install RMSN-4 universal gas filter (qty 1 for 6410 and 6430 or qty 2 for 6460 and 6490) from supply to 80-100 psi at the Triple Quad LC/MS drying gas inlet fitting using 1/4" Teflon tubing. Secure gas filter(s) to suitable support with tie wraps.
- ☐ Install RMSN-2 nitrogen gas filter between the 10-30 psi supply and the Triple Quad LC/MS collision cell gas inlet fitting using 1/8" copper tubing. Secure the gas filter to suitable support with tie wraps.
- ☐ Connect rough pump power cord to Triple Quad LC/MS (Main).
- ☐ For 6490, connect rough pump power cord to Main on Pump Expander Module. Connect second rough pump for ion funnel to Auxiliary on Pump Expander Module.
- ☐ Connect Triple Quad LC/MS power cord to outlet.

ESI with Agilent Jet Stream Technology (for 6460 and 6490 only)

- ❑ **Section NOT Applicable**
- ❑ Remove the ESI with Agilent Jet Stream Technology spray chamber located inside the 6460 chassis around the Q3 electronics location.
- ❑ Install the ESI with Agilent Jet Stream Technology spray chamber:
- ❑ Verify proper adjustment of the nebulizer needle, and then install the nebulizer into the spray chamber.
- ❑ Connect the 1/8" nebulizer gas line from the Triple Quad LC/MS to the nebulizer gas fitting.
- ❑ Connect PEEK tubing from selection valve to nebulizer ZDV fitting.
- ❑ Clean out the calibrant bottle using three rinses with hot water, three rinses with methanol, and one rinse with acetonitrile.
- ❑ Add G1969-85000 ESI-L calibrant to the calibrant bottle.

Agilent G1948B API-ES Source

- ❑ **Section NOT Applicable**
- ❑ Install the API-ES spray chamber:
- ❑ Install nebulizer spacer from shipping kit.
- ❑ Verify proper adjustment of the nebulizer needle, and then install the nebulizer into the spray chamber.
- ❑ Connect the 1/8" nebulizer gas line from the Triple Quad LC/MS to the nebulizer gas fitting.
- ❑ Connect PEEK tubing from selection valve to nebulizer ZDV fitting.
- ❑ Clean out the calibrant bottle using three rinses with hot water, three rinses with methanol, and one rinse with acetonitrile.
- ❑ Add G1969-85000 ESI-L calibrant to the calibrant bottle.

Agilent G1978B MMI Source

- ❑ **Section NOT Applicable**
- ❑ Install the MMI spray chamber:
- ❑ Verify proper adjustment of the nebulizer needle, and then install the nebulizer into the spray chamber.

- ❑ Connect the 1/8" nebulizer gas line from the Triple Quad LC/MS to the nebulizer gas fitting.
- ❑ Connect PEEK tubing from selection valve to nebulizer ZDV fitting.
- ❑ Clean out the calibrant bottle using three rinses with hot water, three rinses with methanol, and one rinse with acetonitrile.
- ❑ Add G1969-85020 MMI-L calibrant to the calibrant bottle

Pump down

- ❑ Pump down the Triple Quad LC/MS:
- ❑ Turn on nitrogen gas supplies.
- ❑ Turn on the Triple Quad LC/MS front power switch to initiate pump down of the Triple Quad LC/MS.

HPLC Installation

- ❑ **Section NOT Applicable**
- ❑ Install the 1100 or 1200 Series LC according to the installation documentation for these products.
- ❑ Install a G1369A LAN Interface card into the LC detector or pump module. For DAD SL, the LAN interface is built into the module main board.
- ❑ Connect a remote start cable between the LC and the Triple Quad LC/MS

Data System and Peripherals

- ❑ **Section NOT Applicable**
- ❑ Install the data system and peripherals:
- ❑ Unpack the PC, monitor, printer, and network hub, and position them on the bench.
- ❑ Install PC and monitor.
- ❑ Verify that a 10base-T compatible LAN interface card is installed in the PC.
- ❑ Install the 10/100base-T hub.
- ❑ Connect PC LAN card, 1100/1200 LC LAN Interface card, and Triple Quad LC/MS Control Card to ports 1-3 on 10/100base-T hub using shielded LAN cables.
- ❑ Install the printer.
- ❑ Turn on the printer, monitor, and PC.
- ❑ Verify configuration of the TCP/IP network protocol on the PC.
- ❑ Reboot the PC.

- ❑ Install Microsoft Office Edition 2007 or Microsoft Excel 2007
- ❑ Install Office 2007 service packs from the installation CD or Internet.
- ❑ Configure macro security for MassHunter Workstation Add-in and allow visual basic access for Microsoft Excel.
- ❑ Check Excel for the MassHunter add-ins (The MassHunter Workstation software should be pre-installed on the shipping PC when ordered together with the instrument as a bundle. If the software is already installed, continue with “Update the MScontrol card firmware.”)
- ❑ If applicable, enable the Compliance software add-on.
- ❑ Run the Instrument Configuration to configure the 6400 Triple Quad LC/MS and the 1100/1200 LC.
- ❑ Copy the Support folder to the computer and copy the checkout methods and worklist to the appropriate folders in the \MassHunter directory.
- ❑ Update the MS control card firmware (**mandatory for 6460 and 6490** to set the country line voltage) and record the entered line voltage

_____ **Volts**

- ❑ Verify the LC firmware.
- ❑ Create a system recovery disk of the installed system if applicable.

Passivate the 1200 Series LC (for 6490 only)

- ❑ **Section NOT Applicable**
- ❑ Follow the procedures set in Service Note 0110-086 (for an alternate procedure, see Service Note 1200-022).

Condition the 1100/1200 Series LC

- ❑ **Section NOT Applicable**
- ❑ With the column disconnected, use the flushing solvent (p/n G1969-85026) to flush the system overnight at 0.5 ml/min.
- ❑ After flushing overnight with the flushing solvent, flush the system with 100% isopropanol at 1 ml/min for 30 min.
- ❑ Connect the SB-C18 Rapid Resolution checkout column, and then flush the system through the column with 100% methanol for 1 hour at 1 ml/min.
- ❑ Prepare the checkout solvent by mixing water with 5 mM formic acid and setting to channel A. Connect channel B to acetonitrile. Flush the system 70:30 acetonitrile:water with 5 mM formic acid through the checkout column for 1 hour at 0.5 ml/min.

Preparing Performance Evaluation Samples

- ❑ Use the 5ng/µL positive ion (reserpine) standard (G1946-85004), and dilute to 500fg/µl using the mobile phase checkout solvent.
- ❑ Verify for each method that the total injection volume is 2µl effectively making the reserpine sample checkout 1 pg/µl (on column).

Agilent 6490 Triple Quad LC/MS Sensitivity Verification (using ESI w/AJST)

- ❑ **Section NOT Applicable**
- ❑ Perform an Autotune.
- ❑ Verify that the Collision Cell gas flow rate produces a high vacuum gauge reading in the range of 5.2 to 5.8 x 10e-5 Torr.
- ❑ Load the '**6490 ESI_AJT Pos MRM Reserpine Checkout.m**' checkout method and verify acquisition parameters.
- ❑ Load the background scan method '**6490 ESI_AJT Pos MS2 Scan.m**' method and verify acquisition parameters.
- ❑ Place the vials into the LC autosampler:
  - ❑ Position #1: An empty, uncapped vial
  - ❑ Position #2: Solvent blank
  - ❑ Position #3: Reserpine Sample (500 fg/µl)

- ❑ Load the '**6490 ESI_AJT Pos MRM Checkout.wkl'** worklist.
- ❑ Run the worklist.
- ❑ Calculate the signal-to-noise results. Confirm RMS signal-to-1x noise is 10,000:1 or greater (using Quadratic/Cubic Savitzky-Golay with 11 pts function width).

Agilent 6460 Triple Quad LC/MS Sensitivity Verification (using ESI w/AJST)

- ❑ **Section NOT Applicable**
- ❑ Perform an Autotune.
- ❑ Verify that the Collision Cell gas flow rate produces a high vacuum gauge reading in the range of 1.9 to 2.3 x 10e-5 Torr.
- ❑ Load the '**6460 ESI_AJT Pos MRM Reserpine Checkout.**m' checkout method and verify acquisition parameters.
- ❑ Load the background scan method '**6460 ESI_AJT Pos MS2 Scan.**m' method and verify acquisition parameters.
- ❑ Place the vials into the LC autosampler:
  - ❑ Position #1: An empty, uncapped vial
  - ❑ Position #2: Solvent blank
  - ❑ Position #3: Reserpine Sample (500 fg/µL)
- ❑ Load the '**6460 ESI_AJT Pos MRM Checkout.wkl'** worklist.
- ❑ Run the worklist.
- ❑ Calculate the signal-to-noise results. Confirm RMS signal-to-1x noise is 1,000:1 or greater (using Quadratic/Cubic Savitzky-Golay with 11 pts function width).

Agilent 6400 Series Triple Quad LC/MS Sensitivity Verification (using ESI)

- ❑ **Section NOT Applicable**
- ❑ Perform an Autotune.
- ❑ Verify that the Collision Cell gas flow rate produces a high vacuum gauge reading in the range of 1.9 to 2.3 x 10e-5 Torr for 6410 with 2573,6430, and 6460 or 2.7 to 3.3 x 10e-5 Torr for 6410.
- ❑ Load the '**6400 ESI Pos MRM Reserpine Checkout.**m' checkout method and verify acquisition parameters.
- ❑ Load the background scan method '**6400 ESI Pos MS2 Scan.**m' method and verify acquisition parameters.
- ❑ Place the vials into the LC autosampler:
  - ❑ Position #1: An empty, uncapped vial
  - ❑ Position #2: Solvent blank
  - ❑ Position #3: Reserpine Sample (500 fg/µL)
- ❑ Load the '**6400 ESI Pos MRM Checkout.wkl'** worklist.
- ❑ Run the worklist.
- ❑ Calculate the signal-to-noise results. Confirm RMS signal-to-1x noise (using Quadratic/Cubic Savitzky-Golay with 11 pts function width) are greater as follows:
  - ❑ 300:1 for 6410 with 2573 (installed new), 6430, or 6460 with standard ESI
  - ❑ 150:1 for 6410 (standard single turbo configuration)

G1978B Multimode Source (for 6410 and 6430)

- ❑ **Section NOT Applicable**
- ❑ Perform an Autotune.
- ❑ Verify that the Collision Cell gas flow rate produces a high vacuum gauge reading in the range of 1.9 to 2.3 x 10e-5 Torr for 6410 with 2573 and 6430, or 2.7 to 3.3 x 10e-5 Torr for 6410.
- ❑ Load the '**MMI-ES Pos MRM Reserpine Checkout.m'** checkout method and verify acquisition parameters.
- ❑ Load the background scan method '**MMI-ES Pos MS2 Scan.m'** method and verify acquisition parameters.
- ❑ Place the vials into the LC autosampler:
    - ❑ Position #1: An empty, uncapped vial
    - ❑ Position #2: Solvent blank
    - ❑ Position #3: Reserpine Sample (500 fg/µL)
- ❑ Load the '**MMI-ES Pos Reserpine Checkout.wkl'** worklist.
- ❑ Run the worklist.
- ❑ Calculate the signal-to-noise results. Confirm RMS signal-to-1x noise (using Quadratic/Cubic Savitzky-Golay with 11 pts function width) are greater as follows:
    - ❑ 300:1 for 6410 with 2573 (installed new), or 6430
    - ❑ 150:1 for 6410 (standard single turbo configuration)

G4240B HPLC-Chip Cube Source

- ❑ **Section NOT Applicable**
- ❑ Contact Product Support is installing with 6490 to assure use of "B" source assembly.
- ❑ Perform an Autotune.
- ❑ Verify that the Collision Cell gas flow rate produces a high vacuum gauge reading in the range of 1.9 to 2.3 x 10e-5 Torr for 6410 with 2573, 6430, and 6460.
- ❑ Configure and condition the capillary and nano flow HPLC systems according to their instructions. Prepare the HAS standards and corresponding mobile phase.
- ❑ Load the '**6400 HPLC-Chip HSA Checkout.m'** checkout method and verify acquisition parameters.
- ❑ Place the vials into the LC autosampler:
    - ❑ Position #P1-D1: Solvent blank
    - ❑ Position #P1-F5 100 fmol/µL
    - ❑ Position #P1-F6: 10 fmol/µL
    - ❑ Position #P1-F7: 1 fmol/µL
    - ❑ Position #P1-F8: 100 amol/µL

- ❑ Load the '**HSA-MRM-Checkout.wkl'** worklist.
- ❑ Run the worklist.
- ❑ Calculate the signal-to-noise results. Confirm RMS signal-to-1x noise (using Quadratic/Cubic Savitzky-Golay with 11 pts function width) is greater as follows for 100 amol/µL in the 575.50 to 937.50 transition range, (noise defined from 0.5 to 3.0 minutes) is 300:1.

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Agilent 6400 Series Triple Quad LC/MS Installation Checklist

Service Review

- ❑ Attach available reports/printouts to this documentation.
- ❑ Record the time/date of installation or upgrade completion in the customer's records/logbook.
- ❑ Complete the Service Review Comments section below if there are additional comments.
- ❑ Review the installation/upgrade with the customer.
- ❑ Explain Agilent warranty for instruments.
- ❑ Explain how to use manuals, guides, online help.
- ❑ Explain how to get self-help, FAQs from the web.
- ❑ Explain how to log an instrument service call, support services available.
- ❑ Advise customer of additional instrument training options.
- ❑ 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.

Service Engineer Comments (optional):

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

Service Completion

Service Request number…… Date service completed……

Agilent Signature…… Customer Signature……

Total no. of pages for this document: …….

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

Select pages for required products