

# Agilent G2585A G6470A to G6495B Upgrade Kit

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Use this guide to upgrade an Agilent G6470A Triple Quadrupole LC/MS to a G6495B Triple Quadrupole LC/MS.



**Agilent Technologies**

## Step 1. Prepare to upgrade

### Step 1. Prepare to upgrade

1 Make sure you have all the parts that you need:

- Upgrade Kit (p/n G2571-68070)
- Ion Funnel Kit

**Table 1** Upgrade Kit parts

Part Number	Description	Quantity
0100-0114	CONNECTOR-MALE 1/4-TBG 1/8-NPT	1
0100-0137	Bulkhead Fitting Retainer,316 SST	1
0380-1858	HEX M/F 4-40	2
0460-1266	Pipe Thread Sealant Tape, 1/4inch Wide	1
0515-0372	SCREW-MACHINE ASSEMBLY M3 × 0.5 9MM-LG	4
0515-0380	Screw-Machine Assembly M4 × 0.710MM-LG	2
0515-0430	Screw-Machine W/Crest-Cup-Cone-Washer Pa	3
0515-0433	Screw-Machine W/Crest-Cup-Cone-Washer Pa	2
0515-1410	SCREW-MACHINE ASSEMBLY M3 × 0.5 20MM-LG	3
0905-1467	O-Ring, 2-155, Fluorocarbon, Black	1
0905-1468	O-Ring 3.487-in-ID 0.103-in-cross-section	1
1460-2571	Canted coil spring	1
G1964-00003	Heat Shield	1
G1964-20012	Source Rod, Top	1
G1964-20013	Source Rod, Bottom	1
G1964-20014	Funnel Housing Rod	2
G1964-20310	Multi Bore Capillary Cap	1
G1964-60335	Capillary Puller Tool	1
G1964-60808	Cable, Ion Funnel Data	1
G1964-60813	Cable, Ion Funnel Power	1
G1964-60816	Cable, Ion Funnel Adapter	1

**Table 1** Upgrade Kit parts (continued)

Part Number	Description	Quantity
G1964-80659	Capillary, 6 × 0.61mm × 90mm, 1G	1
G2571-00272	Support bracket, serial board	1
G2571-60238	Ion Funnel Cover Assembly	1

**Table 2** Ion Funnel Kit parts

Part Number	Description	Quantity
G2571-67354	Front Cover Assy - 6495B (Support Part)	1
G1960-80040	MS40 Rotary Vane Pumps LCMS VERSION	1
G1964-60170	IF Ship Kit, Supplemental	1
G1964-67005	PLX to Ion Funnel Adptr PCA(Support Part)	1
G1964-67200	Funnel Drive Module (Support Part)	1
G2571-60412	Gas Flow Module (35 lpm)	1
G2571-67571	Ion Optics Octopole Assy-6495B (Support)	1
G2571-68085	6470 to 6495B Kit of Parts from SG30	1
G3335-64004	MassHunter Workstation Software	1
5190-6896	LC/MS Methanol 1 liter	3
5190-6897	LC/MS Water 4 liter	1
G1946-85004	ES/APCI Positive Ion Performance Std.	1
G1969-85000	ESI-L Low Concentration Tuning Mix 100ml	1
G1969-85026	HPLC Flushing Solvent	2
G1969-85050	Acetonitrile LC/MS grade 1 L	2
G2453-85060	Formic Acid-Reagent Grade 5mL (5cc)	1
5190-0591	ESI Negative Ion Performance Std	1

## Step 1. Prepare to upgrade

- 2 Turn on the 6470A LC/MS instrument and verify that tune ion abundances are in the expected range for both positive and negative ion modes, in all resolution modes.
- 3 Auto tune the system in both polarities and in all resolution mode.

### CAUTION

Make sure the system passes Autotune or Checktune in all resolutions before you continue.

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- 4 Verify Autotune report and make a record of the tune mass abundance in unit resolution and in both polarities. These values will be used to compare with the G6495B tune mass abundances after the upgrade.
- 5 From the MassHunter Data Acquisition program, vent the instrument.

### CAUTION

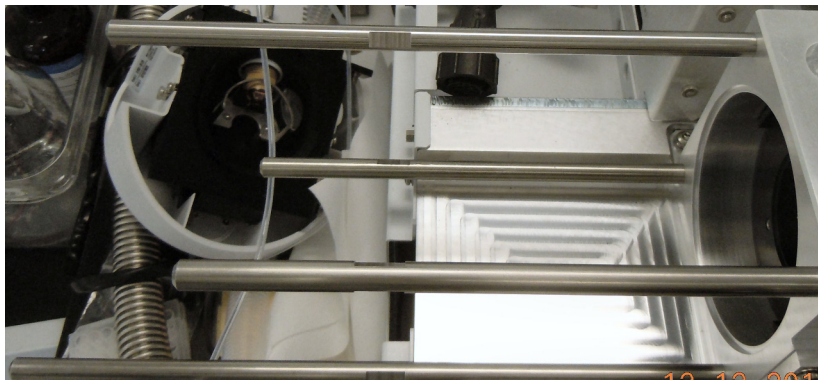
Wait until the Agilent Jet Stream source cools to the touch before you continue. A hot source can burn you.

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## Step 2. Install the Upgrade Kit

Refer to the *6000 Series LC/MS Maintenance Guide* (included on the **TQ LC-MS Resource App** for detailed instructions.

- 1 When the source is cool to the touch, remove the AJS source.
- 2 Remove the Desolvation Chamber.
- 3 Carefully remove the Ion Optics Assembly. Keep the O-ring to re-use in the new G6495B Ion Optics Assembly.
- 4 Install G6495B Ion Optics Octopole Assembly.
  - a Put the O-ring on the Ion Optics Octopole Assembly.
  - a Carefully install the Ion Optics Octopole Assembly to the instrument. Make sure to push the Ion Optics Octopole Assembly all the way in and against the MS1 quadrupole.
- 5 Install the Ion Funnel Top Source Rod and Bottom Short Rod to the Manifold.



**Figure 1** Ion Funnel Top Source Rod and Bottom Short Rod installed to the manifold

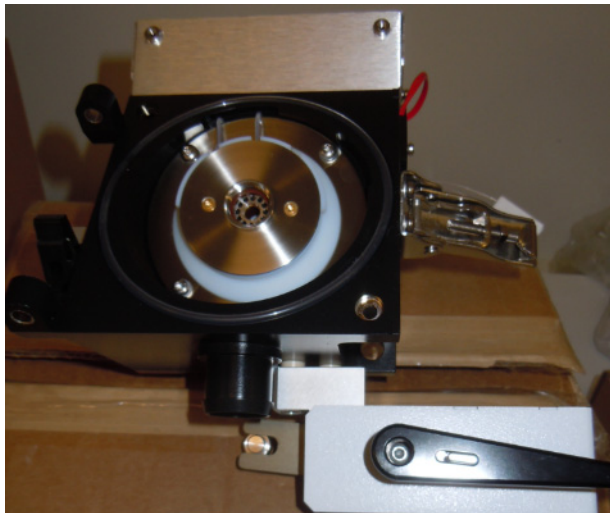
- 6 Remove the Ion Funnel Optics Assembly and Ion Funnel Drive Module from the Upgrade Kit.

## Step 2. Install the Upgrade Kit



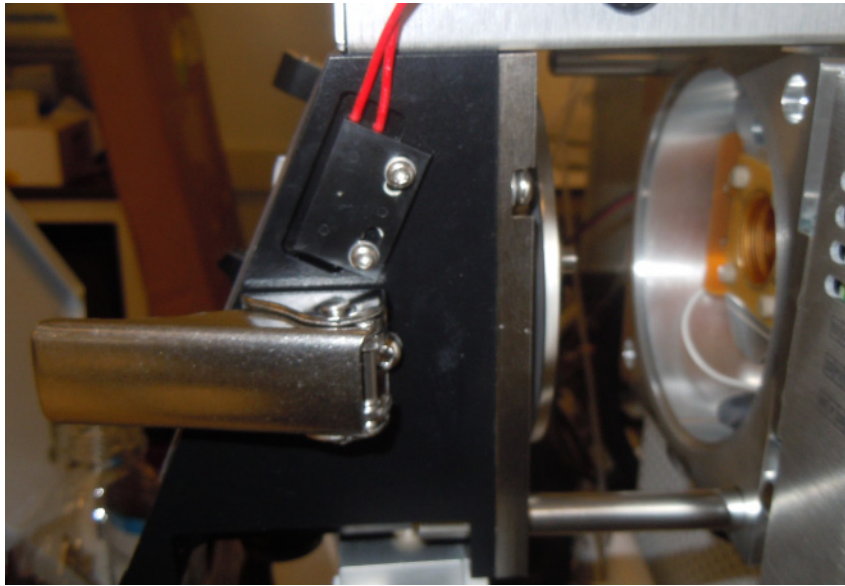
**Figure 2** Ion Funnel Optics Assembly and Ion Funnel Drive Module

- 7 Install the Ion Funnel Drive Module onto the Ion Funnel Assembly.
- 8 Carefully insert the Ion Funnel Assembly and its drive module to the manifold.
- 9 Remove the G6495B Desolvation Chamber with Gate Valve from the Upgrade Kit.



**Figure 3** G6495B Desolvation Chamber with Gate Valve

- 10 Install the new Desolvation Chamber into the instrument.

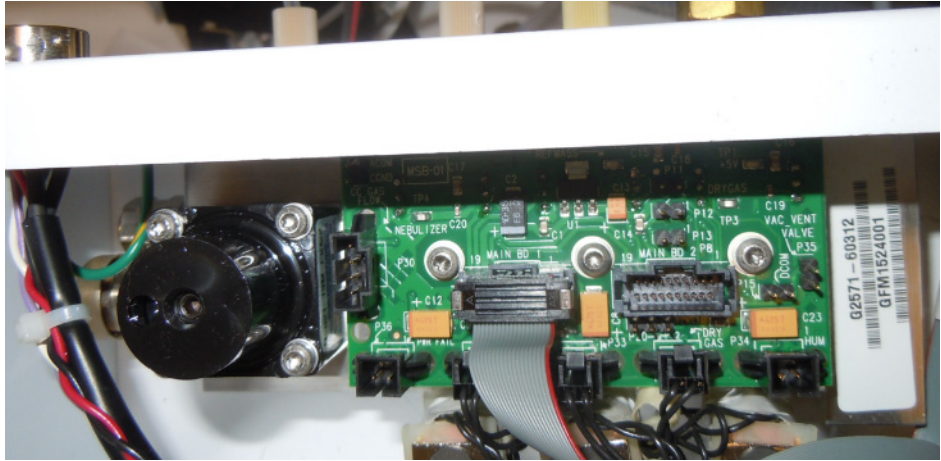


**Figure 4** Desolvation Chamber installed

**11** Replace the Gas Flow Control Module:

- a** Open the Electronic Top Cover.
- b** Remove the original Gas Flow Control Module.
- c** Install the new Gas Flow Control Module.

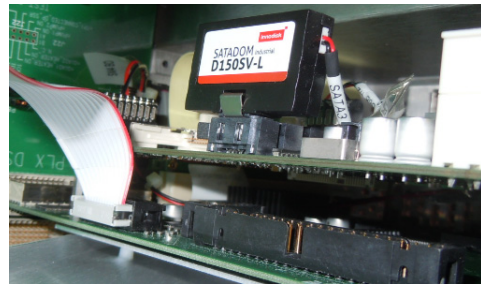
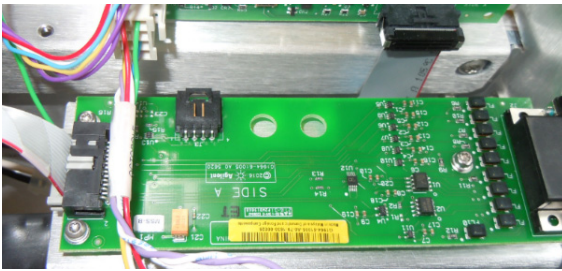
## Step 2. Install the Upgrade Kit



**Figure 5** Gas Flow Control Module

### 12 Install the PLX to Ion Funnel Adapter PCA:

- a Attach the PLX to Ion Funnel Adapter PCA to the bracket.
- b Insert the Adapter PCA and bracket in the slot of the instrument wall.
- c Attach one end of the ribbon cable to the PLX PCA near the bus board. Attach the other end of the ribbon cable to the Adapter PCA.



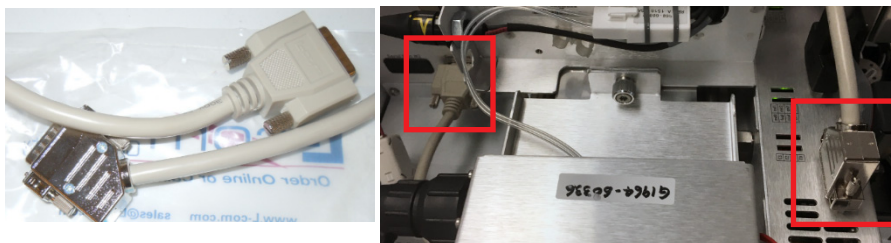
**Figure 6** PLX to Ion Funnel Adapter

### 13 Connect the Ion Funnel Data Cable:

- a Remove the Ion Funnel Data Cable from the Upgrade Kit.
- b Attach one end of the Ion Funnel Data Cable to the Adapter PCA at serial port # 1.
- c Attach the other end to the Ion Funnel Drive Module.



## Step 2. Install the Upgrade Kit



**Figure 7** Ion Funnel Data Cable

### 14 Install the Ion Funnel Power Cable:

- a Remove the Ion Funnel Power Cable from the Upgrade Kit.
- b Attach one end of the Ion Funnel Power Cable to the Ion Funnel Drive Module.
- c Attach the other end to the Smart card.



**Figure 8** Ion Funnel Power Cable

- 15 Verify that all upgrade parts are installed correctly, then turn on the system and let system pump down overnight.
- 16 After the system pumps down, run Autotune in all resolution modes and in both polarities.
- 17 Verify and record tune abundance of all masses in all resolution modes.

### Step 3. Verify the upgrade

- 1 Collect tune abundance data from the instrument from before (6470A) and after (6495B) the upgrade.
- 2 Calculate the ratio of the 6495B/6470A tune abundances in unit resolution at  $m/z$  622 and  $m/z$  602. Check that the ratio shows an improvement of the G6495B over the G6470A by a factor of four.

Typical tune abundance improvement factors achieved under default tune conditions are as shown in [Table 3](#) and [Table 4](#). Further enhancement of high  $m/z$  ions (> 1,000) can be achieved by increasing funnel RF voltages and by optimizing drying gas temperature and drying gas flow values.

**Table 3** Expected tune abundance improvement factor under default tune conditions (average of MS1 and MS2 in unit resolution mode) – **Positive Mode**

$m/z$ (POS mode)	Expected improvement factor
118	$7.0 \pm 2.0$
322	$9.0 \pm 2.0$
622	$10.0 \pm 2.0$
922	$7.0 \pm 2.0$
1522	$4.0 \pm 1.5$
2122	$2.0 \pm 1.0$

**Table 4** Expected tune abundance improvement factor under default tune conditions (average of MS1 and MS2 in unit resolution mode) – **Negative Mode**

$m/z$ (NEG mode)	Expected improvement factor
113	$4.0 \pm 1.0$
302	$10.0 \pm 3.0$
602	$9.0 \pm 3.0$
1034	$4.0 \pm 1.0$
1634	$1.5 \pm 0.5$
2234	$1.0 \pm 0.5$



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## **In this book**

This book contains instructions to upgrade a G6470A Triple Quadrupole LC/MS to a G6495B Triple Quadrupole LC/MS instrument.

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