Addendum to the Waters Micromass Q-Tof Premier Mass Spectrometer Operator's Guide

715001174/Revision A

Copyright notice

The information in this document is subject to change without notice and should not be construed as a commitment by Waters Corporation. Waters Corporation assumes no responsibility for any errors that may appear in this document. This document is believed to be complete and accurate at the time of publication. In no event shall Waters Corporation be liable for incidental or consequential damages in connection with, or arising from, its use.

Waters Corporation
34 Maple Street
Milford, MA 01757
USA

Trademarks

Micromass and Waters are registered trademarks, and MassLynx and Q-Tof Premier are trademarks of Waters Corporation.

Other trademarks or registered trademarks are the sole property of their respective owners.

Customer comments

Please contact us if you have questions, suggestions for improvements, or find errors in this document. Your comments will help us improve the quality, accuracy, and organization of our documentation.

You can reach us at tech_comm@waters.com.

Addendum to the Waters Micromass Q-Tof Premier Mass Spectrometer Operator's Guide

This addendum details changes that have been made to the Waters Micromass Q-Tof Premier Mass Spectrometer Operator's Guide (71500089402 Revision B).

Contents:

Safety Information

Add the following sub-sections to this section:

Solvent Leakage Hazard

Warning: To confirm the integrity of the source exhaust system, the items identified in Chapter 8, in sections “Replacing the LockSpray modular source enclosure, probe adjustment flange, and source option O-rings” and “Replacing the APPI lamp drive assembly O-rings”, must be renewed at intervals not exceeding one year.

The system has been designed to be robust and leak-tight. Waters recommends that you perform a hazard analysis, assuming a maximum leak into the laboratory atmosphere of 10% LC eluent.

The items identified in Appendix D “Materials of Construction and Compliant Solvents” may be exposed to solvent; you must evaluate the safety issues involved if the solvents used in your application differ from the solvents normally used with these items.

Risque de fuite de solvant

Avertissement: Afin de vérifier l'intégrité du système d'évacuation source, les éléments identifiés dans le chapitre 8, dans les sections “Replacing the LockSpray modular source enclosure, probe adjustment flange, and source option O-rings” et “Replacing the APPI lamp drive assembly O-rings”, doivent être renouvelés à des intervalles inférieurs à un an.

Le système a été conçu pour être robuste et étanche. Waters recommande que vous exécutiez une analyse de risque, en considérant une fuite maximum de 10% de l'éluant chromatographique dans l'atmosphère du laboratoire.

Les articles identifiés dans l’Appendice D “Materials of Construction and Compliant Solvents” peuvent être mis au contact de solvants; si les solvants utilisés dans votre application diffèrent des solvants normalement employés avec ces articles, vous devez évaluer les problèmes de sécurité liés à leur utilisation.

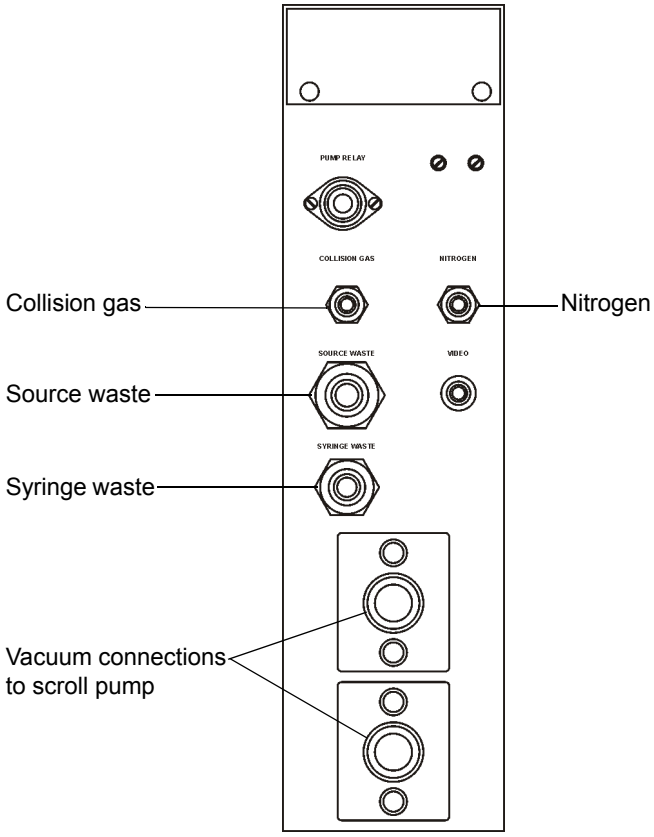
Chapter 1 Instrument Description

Rear panel

Gas connections

Delete the existing "Gas connections on rear panel" figure and replace with the following:

Gas connections on rear panel:



Delete the "Exhausts", "Source waste and LC waste" and "Connecting the waste bottle" sections and replace with the following:

Source waste

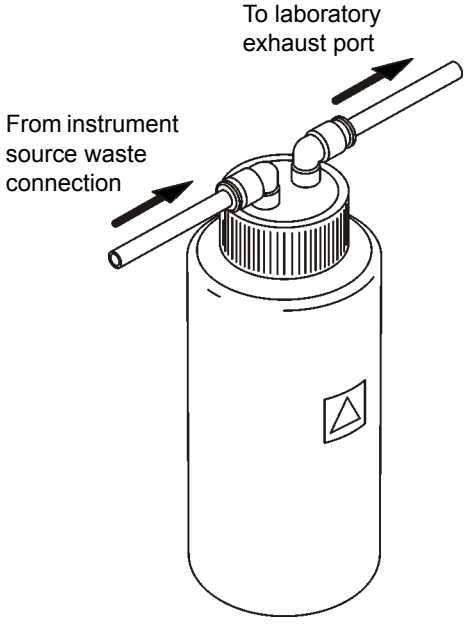
Warning: LC solvents and analytes may be carried in the nitrogen exhaust, which must be vented via the nitrogen exhaust waste bottle and laboratory exhaust system. The laboratory exhaust system must provide a minimum vacuum of 2 millibar below atmospheric pressure (negative pressure).

Warning: To avoid the build-up of hazardous gases, do not place the nitrogen exhaust waste bottle in an enclosed cabinet.

This connection carries the nitrogen gas from the source; it is connected to a nitrogen exhaust waste bottle which, in turn, is connected to the laboratory exhaust system. The nitrogen exhaust waste bottle must be located in an area where it is visible, so that you can monitor and empty it, and then perform a leak test on it, at regular intervals.

See also: "Emptying the nitrogen exhaust waste bottle".

Nitrogen exhaust waste bottle:



Syringe waste

Liquid spilled into the syringe pump drains from this connection.

Chapter 7 APCI, APPI and ESCi

IonSabre APCI operation

Installing IonSABRE LockSpray

To install IonSABRE LockSpray:

Add the following before step 6:

Caution: To avoid damage, do not apply any force to the source enclosure door while the door is open.

Add the following before step 10:

Caution: When refitting the LockSpray motor assembly, the securing thumbscrews must each be sequentially tightened a small amount until they are all fully tight; this ensures that the LockSpray motor assembly is uniformly seated on the source enclosure.

APPI and dual APPI operation

Delete the above title and replace with:

APPI and dual APPI/APCI operation

To install APPI/dual APPI:

Delete the above title and replace with:

To install APPI/dual APPI/APCI:

Add the following before step 6:

Caution: To avoid damage, do not apply any force to the source enclosure door while the door is open.

Add the following before step 10:

Caution: The securing thumbscrews must each be sequentially tightened a small amount until they are all fully tight; this ensures that the APPI lamp drive assembly is uniformly seated on the source enclosure.

ESCi operation

Add the following before step 3:

Caution: To avoid damage, do not apply any force to the source enclosure door while the door is open.

Add the following before step 8:

Caution: When refitting the LockSpray motor assembly, the securing thumbscrews must each be sequentially tightened a small amount until they are all fully tight; this ensures that the LockSpray motor assembly is uniformly seated on the source enclosure.

Chapter 8 Preventative Maintenance

Maintenance schedule

Add the following to the "Maintenance schedule" table:

Procedure	Frequency
Replace the LockSpray modular source enclosure, probe adjustment flange, and source option O-rings.	Annually.
Replace the APPI lamp drive assembly O-rings.	Annually.
Empty the nitrogen exhaust bottle.	As required.

Add the following section after the "Safety and handling" section:

Replacing the LockSpray modular source enclosure, probe adjustment flange, and source option O-rings

Warning: To confirm the integrity of the source exhaust system, the O-rings listed below must be renewed at intervals not exceeding one year.

To confirm the integrity of the source exhaust system, the following O-rings must be renewed at intervals not exceeding one year:

- Source enclosure door O-ring
- Source enclosure door glass O-ring
- Source enclosure housing O-ring
- Source enclosure side flange O-ring
- Probe adjustment flange O-ring

Note: To complete this procedure, you will be required to perform a pressure test on the source, as described in the Waters Micromass Source Pressure Test Unit Operator's Guide.

To remove the source enclosure from the instrument:

Warning: The source components may be contaminated with biohazardous and/or toxic materials. Always wear nitrile gloves while performing this procedure.

Warning: The source may be hot; to avoid burns, take great care while working with this component.

1. Remove the probe from the source.

   See also: "To remove the probe from the source:" on page 8-6.

   Caution: To avoid damage, do not apply any force to the source enclosure door while it is open.

2. Unfasten the source enclosure door's securing clips and open the door.
3. Remove the currently-fitted modular source option or blank side flange from the source enclosure.

   See also: "To change the source configuration:" on page 1-12, steps 1 to 4.

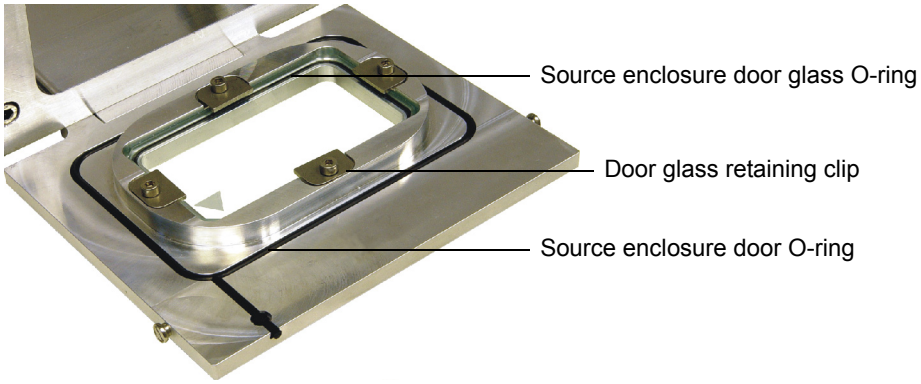
4. Remove the source enclosure from the instrument.

   See also: "To remove the ion source and ion block:" on page 8-9, steps 1 to 4.

To remove the source enclosure and probe adjustment flange O-rings:

Warning: The source components may be contaminated with biohazardous and/or toxic materials. Always wear nitrile gloves while performing this procedure.

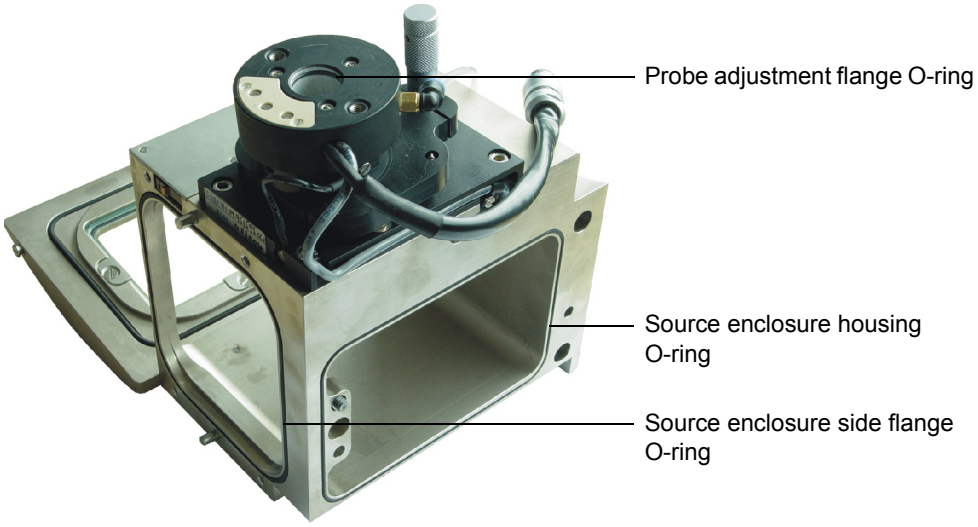
Source enclosure door:



Caution: To avoid damage, do not use a metal tool to remove any of the O-rings.

1. Carefully remove the source enclosure door O-ring from the source enclosure door.
2. Use a hex (Allen) key to remove the four bolts securing the source enclosure door glass retaining clips to the source enclosure door.
3. Remove the four source enclosure door glass retaining clips from the source enclosure door.
4. Remove the source enclosure door glass from the source enclosure door.
5. Carefully remove the source enclosure door glass O-ring from the source enclosure door.

Probe adjustment flange, and source enclosure side flange and housing O-rings:



6. Carefully remove the probe adjustment flange O-ring from the probe adjustment flange.
7. Carefully remove the source enclosure side flange O-ring.
8. Carefully remove the source enclosure housing O-ring.

Warning: The O-rings may be contaminated with biohazardous and/or toxic materials. Ensure that they are correctly disposed of according to local environmental regulations.

9. Dispose of the O-rings in accordance with local environmental regulations.

To fit the replacement source enclosure and probe adjustment flange O-rings:

Warning: The source components may be contaminated with biohazardous and/or toxic materials. Always wear nitrile gloves while performing this procedure.

1. Ensure that all the grooves for the O-rings are free from dirt and hairs.

   Tip: If contamination is present, use an appropriate solvent, applied to a lint-free cloth, to carefully clean the grooves.

2. Fit the new source enclosure housing O-ring to the source enclosure.
3. Fit the new source enclosure side flange O-ring to the source enclosure.
4. Fit the new probe adjustment flange O-ring to the probe adjustment flange.
5. Fit the new source enclosure door glass O-ring to the source enclosure door.
6. Fit the source enclosure door glass to the source enclosure door.
7. Fit the four source enclosure door glass retaining clips to the source enclosure door.
8. Use a hex (Allen) key to fit and tighten the four bolts securing the source enclosure door glass retaining clips to the source enclosure door.

   Caution: Ensure that the source enclosure door O-ring tail is correctly located in its groove when fitting the O-ring to the source enclosure door.

9. Fit the new source enclosure door O-ring to the source enclosure door.
10. Ensuring that the wires to the microswitch do not become trapped between the source enclosure and the pumping block, fit the source enclosure to the pumping block.

    Caution: The source enclosure and source option securing screws must each be sequentially tightened a small amount until they are all fully tight; this ensures that the source enclosure is uniformly seated on the pumping block.

11. Tighten the three captive source enclosure securing screws.
12. Fit the required modular source option or blank side flange to the source enclosure, and tighten the four source option securing screws.

13. Connect the appropriate gas and electrical supplies to the module.
14. Close the source enclosure door and fasten the securing clips.
15. Install the ESI or APCI probe, as required.
16. Start up the instrument.

    See also: “Starting the Q-Tof Premier” on page A-2.

    Warning: To confirm the integrity of the source exhaust system, a source pressure test must be performed, as described in the Waters Micromass Source Pressure Test Unit Operator’s Guide.

17. Perform a source pressure test.

Add the following section after the “Replacing the LockSpray modular source enclosure, probe adjustment flange, and source option O-rings” section:

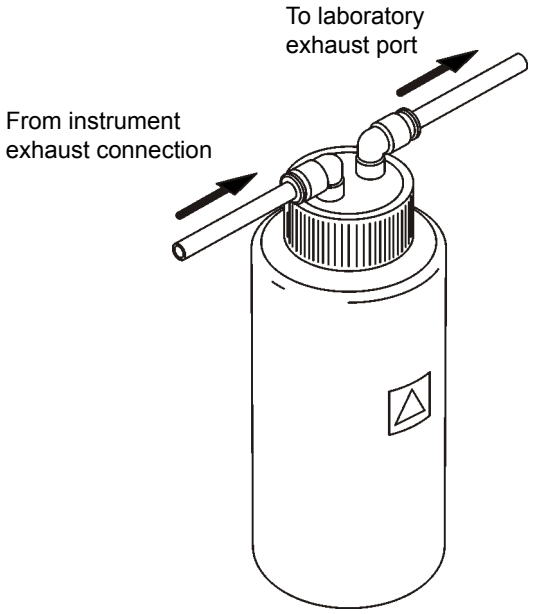
Emptying the nitrogen exhaust waste bottle

Warning: The waste liquid in the nitrogen exhaust waste bottle comprises LC solvents and analytes. Always wear nitrile gloves while handling the nitrogen exhaust waste bottle, and ensure that the waste liquid is correctly disposed of according to local environmental regulations.

The nitrogen exhaust waste bottle in the nitrogen exhaust line must be emptied before it is completely full.

See also: Chapter 1, “Source waste”.

Nitrogen exhaust waste bottle:



To empty the nitrogen exhaust waste bottle:

1. In the MassLynx™ Tune window, click Press for Standby and confirm that the adjacent instrument status indicator shows red.
2. In the MassLynx Tune window, click  to stop the nitrogen flow.
3. Disconnect the instrument exhaust and laboratory exhaust system lines from the nitrogen exhaust waste bottle.
4. Dispose of the waste liquid in accordance with local environmental regulations.
5. Connect the instrument exhaust and laboratory exhaust system lines to the nitrogen exhaust waste bottle.
6. In the MassLynx Tune window, click  to start the nitrogen flow.
7. In the Source page, set Desolvation (l/hr) to 1200.
8. Set Cone (l/hr) to 300.

Warning: To confirm the integrity of the source exhaust system, the following leak test must be performed.

Caution: To avoid damage to the instrument, Snoop® (or equivalent) leak detector liquid must only be used only for the purpose described in the following step; it must not be used on any other part of the instrument.

9. Use Snoop (or equivalent) leak detector liquid to ensure that there are no leaks at the instrument exhaust and laboratory exhaust system line connections.

Cleaning the Source components

To remove the sample cone:

Add the following before step 5:

Caution: To avoid damage, do not apply any force to the source enclosure door when it is open.

Fitting the ion block and ion source enclosure

To fit the ion block and source enclosure:

Delete step 5 and replace with:

5. Ensuring that the wires to the microswitch do not become trapped between the source enclosure and the pumping block, fit the source enclosure to the pumping block.

Add the following before step 6:

Caution: The source enclosure securing screws must each be sequentially tightened a small amount until they are all fully tight; this ensures that the source enclosure is uniformly seated on the pumping block.

Fitting the sample cone:

Add the following after step 11:

12. Start-up the instrument.

Warning: To confirm the integrity of the source exhaust system, if any O-ring detailed in "Replacing the LockSpray modular source enclosure, probe adjustment flange, and source option O-rings" has been replaced, you must perform a source pressure test as described in the Waters Micromass Source Pressure Test Unit Operator's Guide.

13. If any O-ring detailed in "Replacing the LockSpray modular source enclosure, probe adjustment flange, and source option O-rings" has been replaced, perform a source pressure test.

Replacing the ion block cartridge heater

To refit the ion block:

Delete step 7 and replace with:

7. Ensuring that the wires to the microswitch do not become trapped between the source enclosure and the pumping block, fit the source enclosure to the pumping block.

Add the following before step 8:

Caution: The securing screws must each be sequentially tightened a small amount until they are all fully tight; this ensures that the source enclosure is uniformly seated on the pumping block.

Replacing the ESI probe capillary

Installing the new capillary

To install the new capillary:

Delete step 22 and replace with:

22. Refit the probe to the instrument.

Delete step 25 and replace with:

25. Use the probe adjuster knob to adjust the capillary so that the capillary protrudes approximately 0.5 mm from the end of the probe.
26. While infusing a known compound, tune the capillary length to the position that gives the best sensitivity.

Maintaining the APPI lamp

Changing the lamp bulb

Delete this section and replace with the following:

Changing the UV lamp bulb

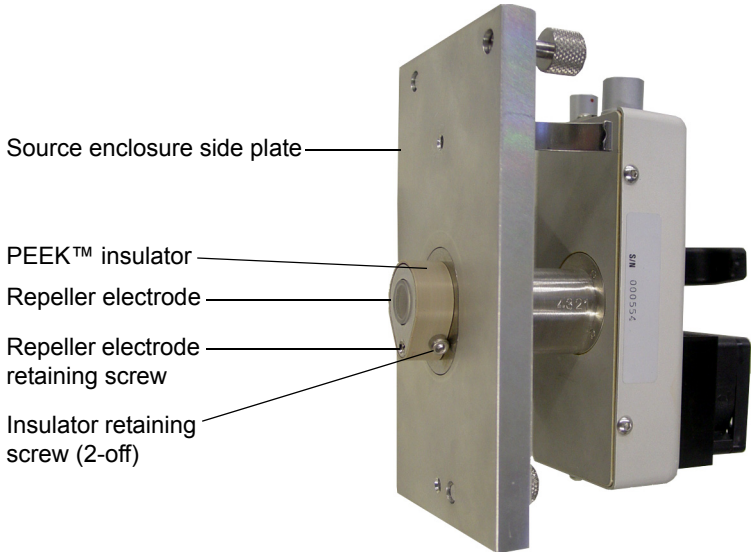
To change the UV lamp bulb:

Warning: The probe and source may be contaminated with biologically hazardous materials. Wear nitrile gloves at all times while handling the components.

Warning: To avoid electric shock, ensure that the instrument is in standby while working with the instrument's front access door open.

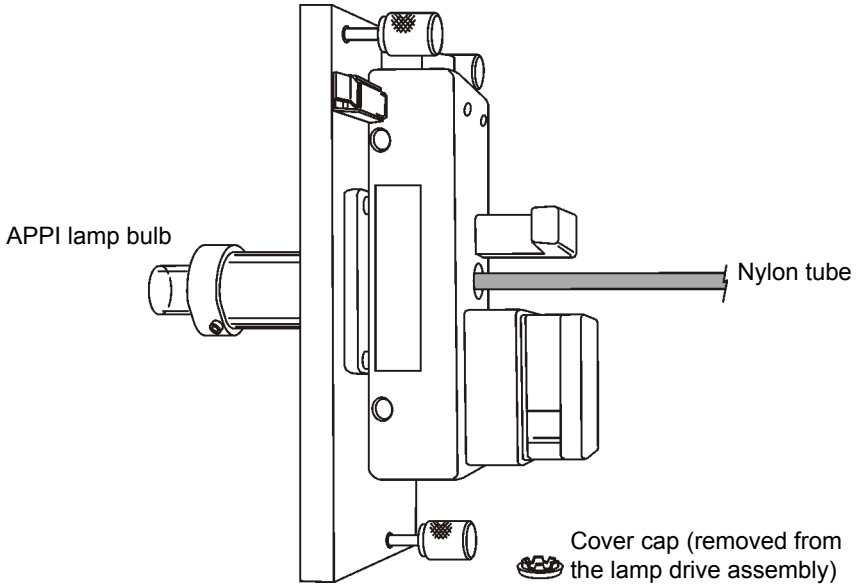
Warning: The probe and source may be hot. To avoid burns, take great care while working with the instrument's front access door open.

APPI lamp drive assembly:



1. On the MassLynx Tune window, click  , and confirm that the instrument status indicator is red.
2. Wait for three minutes for the desolvation gas to cool the probe and source.
3. Click  to stop the nitrogen flow.
4. Remove the APPI lamp drive assembly from the source enclosure.
5. Remove the repeller electrode retaining screw.
6. Remove the repeller electrode from the PEEK insulator.
7. Remove the cover cap from the back of the lamp drive assembly.

Changing the UV lamp bulb:



Caution: To avoid breaking the bulb, do not use a screwdriver to push the bulb out of the lamp drive assembly.

8. Insert an appropriate tool (for example, a length of 4-mm nylon tube) through the back of the lamp drive assembly, and push the bulb forward.
9. Withdraw the bulb from the lamp drive assembly.
10. Insert the new bulb into the lamp drive assembly.
11. Refit the cover cap to the lamp drive assembly.
12. Fit the repeller electrode to the PEEK insulator.
13. Fit and tighten the repeller electrode retaining screw.
14. Fully retract the lamp's mounting shaft in the APPI lamp drive assembly.

Warning: To confirm the integrity of the source exhaust system, you must perform a pressure test on the source, as described in the Waters Micromass Source Pressure Test Unit Operator's Guide.

15. Fit the APPI lamp drive assembly to the source enclosure and perform a source pressure test.

Cleaning the lamp window

The transmission of the high-energy photons responsible for APPI relies on the cleanliness of the magnesium fluoride lamp window. The window should be cleaned to keep the surface clear of contamination and avoid reduced sensitivity.

To clean the lamp window:

Warning: The probe and source may be contaminated with biologically hazardous materials. Wear nitrile gloves at all times while handling the components.

Warning: To avoid electric shock, ensure that the instrument is in standby while working with the instrument's front access door open.

Warning: The probe and source may be hot. To avoid burns, take great care while working with the instrument's front access door open.

1. On the MassLynx Tune window, click  , and confirm that the instrument status indicator is red.
2. Wait for three minutes for the desolvation gas to cool the probe and source.
3. Click  to stop the nitrogen flow.

Caution: To avoid damage, do not apply any force to the source enclosure door while it is open.

4. Open the instrument's front access door.
5. Unfasten the source enclosure door's securing clips, and open the door.
6. Use methanol or isopropyl alcohol, applied to a lint-free cloth, to carefully clean the lamp window.
7. Close the source enclosure door, and fasten the securing clips.

Replacing the APPI lamp drive assembly O-rings

Warning: To confirm the integrity of the source exhaust system, the APPI lamp drive assembly O-rings listed below must be renewed at intervals not exceeding one year, as described in this section.

The following APPI lamp drive assembly O-rings must be renewed at intervals not exceeding one year:

- Lamp bulb sealing O-ring
- Mounting shaft O-rings
- Lamp mounting flange O-ring

Note: To complete this procedure, you will be required to perform a pressure test on the source, as described in the Waters Micromass Source Pressure Test Unit Operator's Guide.

To remove the APPI lamp drive assembly O-rings:

Warning: The probe and source may be contaminated with biologically hazardous materials. Wear nitrile gloves at all times while handling the components.

Warning: To avoid electric shock, ensure that the instrument is in standby before commencing this procedure.

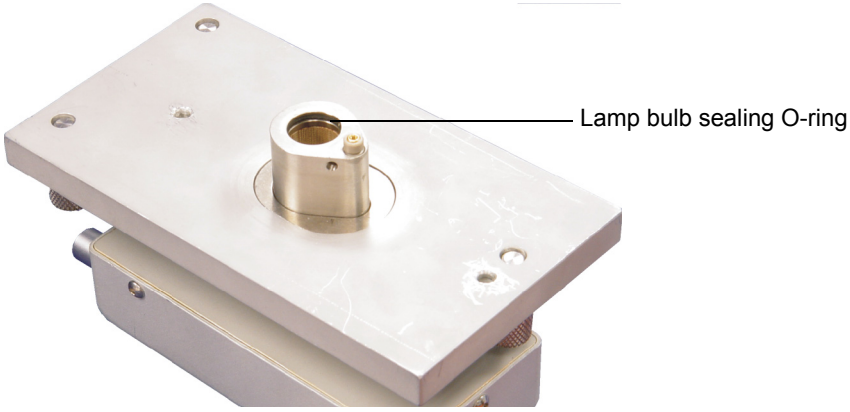
1. Remove the lamp bulb.

   See also: "To change the UV lamp bulb".

2. Use a 2.5-mm hex (Allen) key to remove the two insulator retaining screws.
3. Remove the PEEK insulator from the mounting shaft.

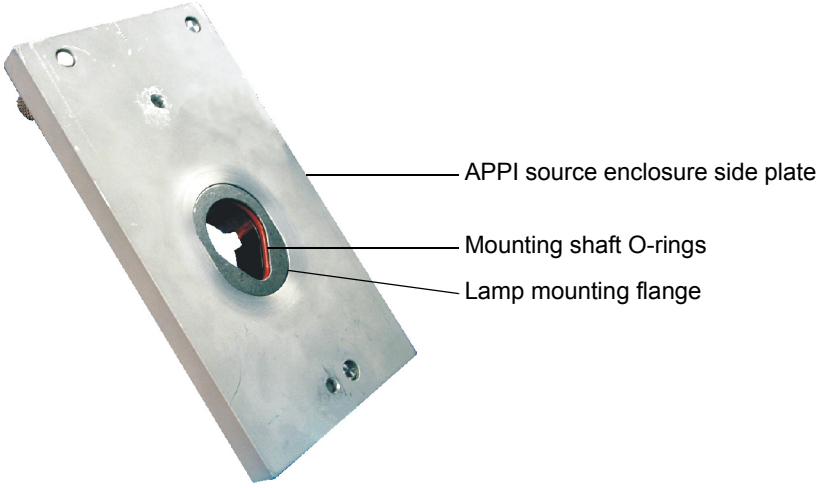
   Caution: To avoid damage, do not use a metal tool to remove any of the O-rings.
4. Carefully remove the lamp bulb sealing O-ring from inside the end of the mounting shaft.

   Lamp bulb sealing O-ring:



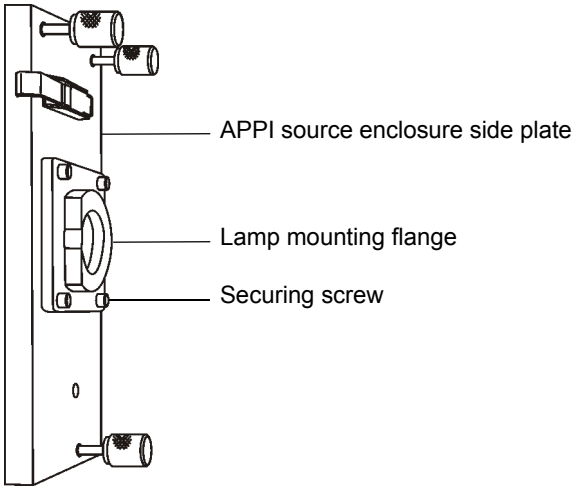
5. Extract the mounting shaft from the APPI source enclosure side plate.
6. Carefully remove the mounting shaft O-rings from inside the lamp mounting flange aperture.

Mounting shaft O-rings:



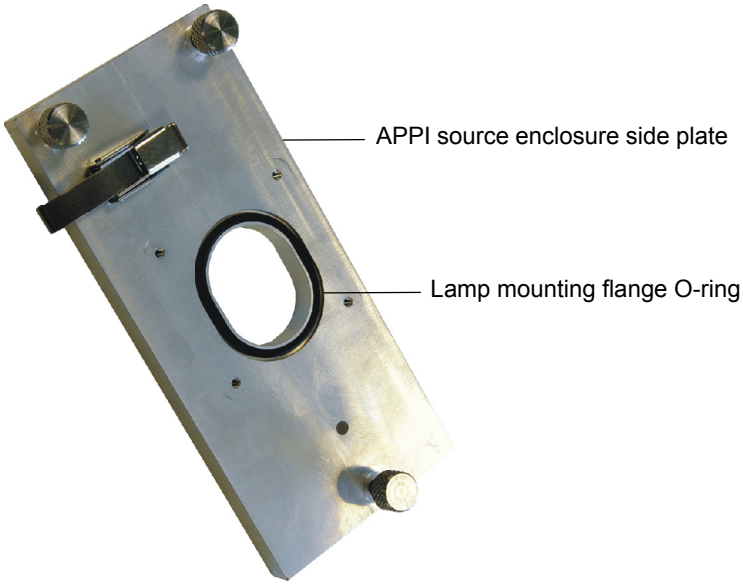
7. Use a 2.5-mm hex (Allen) key to unscrew the four captive lamp mounting flange securing screws.

Lamp mounting flange:



8. Remove the lamp mounting flange from the APPI source enclosure side plate.
9. Carefully remove the lamp mounting flange O-ring from the APPI source enclosure side plate.

Lamp mounting flange O-ring:



Warning: The O-rings may be contaminated with biohazardous and/or toxic materials. Ensure that they are correctly disposed of according to local environmental regulations.

10. Dispose of the O-rings in accordance with local environmental regulations.

To fit the new APPI lamp drive assembly O-rings:

1. Ensure that all the grooves for the O-rings are free from dirt and hairs.

   Tip: If contamination is present, use an appropriate solvent, applied to a lint-free cloth, to carefully clean the grooves.

2. Fit the new lamp mounting flange O-ring to the APPI source enclosure side plate.
3. Fit the lamp mounting flange to the APPI source enclosure side plate.
4. Use a 2.5-mm hex (Allen) key to tighten the four captive lamp mounting flange securing screws.

Caution: Take care not to damage the APPI lamp drive assembly mounting shaft O-rings when fitting them to the lamp mounting flange.

5. Fit the APPI lamp drive assembly mounting shaft O-rings to the lamp mounting flange.

   Tip: To fit each mounting shaft O-ring, first seat the O-ring in the small radius at the bottom of the groove in the source enclosure side plate, then use a suitable tool, having a circular cross-section, to "roll" the remainder of the O-ring in the groove.

6. Insert the mounting shaft in the lamp mounting flange.
7. Fit the lamp bulb sealing O-ring to the mounting shaft.
8. Fit the PEEK insulator to the mounting shaft.
9. Fit and tighten the two insulator retaining screws.
10. Insert the new bulb into the lamp drive assembly.
11. Refit the cover cap to the lamp drive assembly.
12. Fit the repeller electrode to the PEEK insulator.
13. Fit and tighten the repeller electrode retaining screw.
14. Fully retract the lamp's mounting shaft in the APPI lamp drive assembly.
15. Fit the APPI lamp drive assembly onto the right side of the source enclosure.

    Caution: The securing thumbscrews must each be sequentially tightened a small amount until they are all fully tight; this ensures that the APPI lamp drive assembly is uniformly seated on the source enclosure.

16. Fit and tighten the three securing thumbscrews.
17. Close the source enclosure door and fasten the door securing clips.
18. Connect the APPI drive cable (part number 4170075CC1), between the APPI lamp drive assembly APPI electrical connection and the APPI connector on the instrument front panel.

19. Connect the HT cable (part number M955286BC1), between the APPI lamp drive assembly's HV electrical connection and the HV connector on the instrument front panel.

Warning: To confirm the integrity of the source exhaust system, you must perform a pressure test on the source, as described in the Waters Micromass Source Pressure Test Unit Operator's Guide.

20. Perform a pressure test on the source.

Appendix D Materials of Construction and Compliant Solvents

Items exposed to solvent

Add the following to the table "Items exposed to solvent":

Item	Material
APPI lamp drive assembly:	
Mounting shaft	Stainless steel
Repeller electrode	Stainless steel
Insulator	PEEK
Lamp window	Magnesium fluoride