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USA

OptiMS Thermo MS Adapter
2 of 21

Installation Guide
RUO-IDV-05-3313-A | B86096AA
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</tbody>
</table>
Overview

Note: Refer to the Safety Manual for instructions for safe use of the system.

Bill of Materials

Table 1-1 OptiMS Thermo MS Adapter for Nanospray Flex and Nanospray Flex NG Sources

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>B10249</td>
<td>Adapter</td>
<td>1</td>
</tr>
<tr>
<td>B83710</td>
<td>Adapter mounting bracket</td>
<td>1</td>
</tr>
<tr>
<td>B83380</td>
<td>High-voltage cable</td>
<td>1</td>
</tr>
<tr>
<td>B86096</td>
<td>OptiMS Thermo MS Adapter for Nanospray Flex and Nanospray Flex NG Sources Installation Guide (this document)</td>
<td>1</td>
</tr>
<tr>
<td>B83383</td>
<td>Relay cable</td>
<td>1</td>
</tr>
<tr>
<td>B82395</td>
<td>Thumbscrews</td>
<td>2</td>
</tr>
</tbody>
</table>

Regulatory Compliance

This system complies with the regulations and standards listed in this section. Refer to the Declaration of Conformity included with the system and the individual system components for dated references. Applicable labels have been affixed to the system.

International Standards

The OptiMS Thermo MS Adapter for Nanospray Flex and Nanospray Flex NG Sources has been evaluated as part of the CESI 8000 Plus High Performance Separation-ESI Module and found to be in compliance with the International Electrotechnical Commission standard IEC 61010-1, 2nd edition: 2010 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements.
Decommissioning and Disposal

Before decommissioning, decontaminate the system following local regulations.

When removing the system from service, separate and recycle different materials according to national and local environmental regulations.

**Note:** SCIEX will not accept any system returns without a completed Decontamination Form. Contact an FSE to obtain a copy of the form.

Do not dispose of system components or subassemblies, including computer parts, as unsorted municipal waste.

## Symbols, Indicators, and Labels

### Table 1-2 Labels on the Adapter

<table>
<thead>
<tr>
<th>Label</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="" /></td>
<td>Electrical Shock Hazard.</td>
</tr>
</tbody>
</table>
Install the Adapter

1. Remove the ion sweep cone from the mass spectrometer as instructed by the manufacturer.

2. Install the ion source on the mass spectrometer as instructed by the manufacturer.

3. Pull the ion source drawer all the way out, away from the mass spectrometer inlet (Figure 2-1).

4. If present, remove the direct junction adapter from the mass spectrometer.

5. Using the thumbscrews, install the adapter mounting bracket on the ion source (Figure 2-1). The top of the arm on the adapter mounting bracket should be parallel with the horizontal plane of the XYZ manipulator (refer to Figure 2-2).
6. Perform the initial alignment using the knobs on the XYZ manipulator.
Figure 2-2 Alignment Knobs

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Moves toward the orifice (coarse)</td>
<td>C</td>
<td>Moves vertically</td>
</tr>
<tr>
<td>B</td>
<td>Moves horizontally</td>
<td>D</td>
<td>Moves toward the orifice (fine)</td>
</tr>
</tbody>
</table>

a. Turn knob A (Figure 2-2) to move the stage as far as possible away from the orifice. Make sure the 0 marks are aligned (Figure 2-3).

Figure 2-3 Alignment of Rulers–Knob A
b. Turn knob **B** (Figure 2-2) to line up **14** on the moveable ruler with **0** on the static ruler (Figure 2-4).

![Figure 2-4 Alignment of Rulers–Knob B](image)

c. Turn knob **C** (Figure 2-2) to line up **12** on the moveable ruler with **0** on the static ruler (Figure 2-5).

![Figure 2-5 Alignment of Rulers–Knob C](image)

d. Turn knob **D** (Figure 2-2) to line up **0** on the rotating ring with **5** on the static ruler (Figure 2-6).

![Figure 2-6 Alignment of Rulers–Knob D](image)
7. Insert the adapter into the adapter mounting bracket (Figure 2-7) until it sits snugly against the bracket (Figure 2-8). Make sure that the high-voltage cable hangs freely from the adapter, rotating the adapter as needed.

**Figure 2-7 Adapter and Mounting Bracket**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adapter mounting bracket</td>
</tr>
<tr>
<td>2</td>
<td>Adapter</td>
</tr>
<tr>
<td>3</td>
<td>High-voltage cable</td>
</tr>
</tbody>
</table>
8. Push the ion source drawer toward the mass spectrometer orifice.
Install the Cables

1. Insert the single connector on the end of the relay cable (item 4 in Figure 2-10) into the relay port on the CESI 8000 Plus module (labeled I/O) (Figure 2-9).

Figure 2-9 Relay Cable Connections on the CESI 8000 Plus Module

2. Connect the other end of the relay cable to the mass spectrometer. Use the appropriate connector for the model of the mass spectrometer in use (Figure 2-10).
Figure 2-10 Relay Cable

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1    | Connector for:  
• LCQ Deca XP MAX, LTQ-series, and Velos-series ion trap  
• LTQ Orbitrap-series and Orbitrap Velos-series hybrid ion trap-Orbitrap | 3    | Connector for:  
• Orbitrap Fusion Tribrid  
• TSQ Endura triple-stage quadrupole |
| 2    | Connector for:  
• Exactive-series Orbitrap  
• Q Exactive-series hybrid quadrupole-Orbitrap  
• TSQ Quantum-series and TSQ Vantage triple-stage quadrupole | 4    | To CESI 8000 Plus module |

- For Connector 1, insert into the port labeled **Peripheral Control** on the mass spectrometer.
- For Connector 2, insert into the leftmost ports of the **Input** section of the **Peripheral Control** area on the mass spectrometer. The ports are labeled **Digital Start In**.
- For Connector 3, insert the **Peripheral Control** connector on the mass spectrometer.

**WARNING!** Personal Injury Hazard. Route the relay cable where users cannot trip on it.

3. Connect the input cable between the ion source and the CESI 8000 Plus module.
Install the Adapter

a. Insert the high-voltage input cable into the port on the ion source (Figure 2-11).

Figure 2-11 Adapter High-Voltage Input Cable

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ion source port</td>
<td>2</td>
<td>High-voltage input cable</td>
</tr>
</tbody>
</table>

b. Open the door covering the high-voltage panel on the right side panel of the CESI 8000 Plus module (Figure 2-12).

c. Insert the white high-voltage connector in the **Input** port in the CESI 8000 Plus high-voltage panel.

d. Twist the cable 90 degrees clockwise to lock it in place.

e. Insert the red banana plug on the adapter input cable in the red port on the panel (labeled **Input**).
4. Connect the high-voltage output cable (attached to the adapter) to the CESI 8000 Plus module.
   a. Insert the white high-voltage connector in the **Output** port in the CESI 8000 Plus high-voltage panel.
   b. Twist the cable 90 degrees clockwise to lock it in place.
   c. Insert the black banana plug in the black port on the panel (labeled **Output**).
Align the CESI 8000 Plus Module with the Mass Spectrometer

Align the height indicator line on the CESI 8000 Plus module with the OptiMS sprayer tip placed at the MS adapter to prevent hydrodynamic (siphoning) flow within the capillaries.

**CAUTION: Potential System Damage.** Push the ion source drawer all the way toward the mass spectrometer inlet before installing and aligning the adapter. If the sprayer is too close to the ion source inlet, it might be damaged.

1. Move the CESI 8000 Plus cart to approximately 18 cm to 20 cm (7.1 inches to 7.9 inches) from the drawer.

   This allows the coolant tubing on the OptiMS cartridge to extend fully, to avoid bending the capillaries.

2. Adjust the height of the cart by pressing the buttons on the front of the cart until the indicator line on the CESI 8000 Plus module is aligned with the ion source inlet. Do not press the buttons simultaneously.

   **Note:** If the cart cannot move to its lowest height or if it becomes locked in place, then the cart must be re-programmed. Refer to "CESI Mobile Cart Homing Procedure" in the *User Manual.*

---

**Figure 3-1 Alignment of the CESI 8000 Plus Module and Ion Source Inlet**

3. Step down on the locking lever on each of the wheels on the cart.
4. Install the OptiMS cartridge in the CESI 8000 Plus module. Refer to "OptiMS Cartridge Installation into CESI 8000" in the User Manual for instructions.

5. Install the sprayer tip in the adapter.
   a. Remove the protective sleeve from the sprayer tip of the OptiMS cartridge (Figure 3-2).
   b. While holding the body of the adapter to prevent it from moving towards the inlet, insert the sprayer into the adapter (Figure 3-3), aligning the arrow on the OptiMS cartridge with the unlock position on the adapter.
c. Push the sprayer into the adapter and then twist counterclockwise to lock it into place (Figure 3-4).

Figure 3-4 Sprayer in Locked Position on Adapter

6. Position the sprayer tip relative to the ion source inlet.

**CAUTION: Potential System Damage. Do not move the sprayer tip too close to the ion source inlet. If the sprayer tip is less than 2 mm from the inlet, capillary rinse solution might be aspirated into the mass spectrometer resulting in damage to the system.**

a. While watching the position of the sprayer tip on the monitor, slowly turn knob A (shown in Figure 2-2 on page 8) clockwise to move the sprayer tip forward.

b. Move the sprayer tip until it is between approximately 2 mm to 4 mm from the ion source inlet.

Figure 3-5 Sprayer Tip at Ion Source Inlet
Test the Connection to the Mass Spectrometer

This section describes how to verify the CESI 8000 Plus High Performance Separation-ESI Module and the mass spectrometer can communicate.

**WARNING!** Electrical Shock Hazard. Do not touch the adapter when it is connected to the CESI 8000 Plus module and the separation voltage is on.

Establish Communication Between the CESI 8000 Plus Module and the Mass Spectrometer

Refer to "Establishing Communication Between CESI 8000 Controller and Thermo MS" in the *User Manual* for instructions on setting up communication.

Tune the Sprayer Position and ESI Voltage

Before performing a CESI-MS separation, it is critical to optimize the position of the OptiMS sprayer tip in front of the ion source inlet to determine the proper ESI voltage. If the sprayer tip is too close to the MS inlet (less than 2 mm), then accidental suction of rinsing solutions into the mass spectrometer might occur. If the sprayer tip is too far from the ion source inlet, then a higher ESI voltage is required, which might lead to undesired fragmentation of analytes.

Refer to "Fine Tuning Sprayer Tip Position for Thermo Scientific MS" in the *User Manual* for instructions.

Perform a Test Separation

For an OptiMS Silica Surface cartridge, refer to "Using a Thermo Scientific MS with the CESI 8000" in the *User Manual* for detailed instructions for performing a separation with a beta-galactosidase test mixture.

For a Neutral OptiMS cartridge, refer to the *Neutral OptiMS Cartridge Instruction Guide* for detailed instructions for performing a test separation.
If one or both systems are to be moved, then it is best to disconnect the CESI 8000 Plus module from the mass spectrometer.

1. If necessary, prepare the OptiMS cartridge for storage and then remove it. Refer to "Cartridge Removal and Instrument Shutdown" in the User Manual.
2. Disconnect both of the high-voltage cables from the high-voltage panel on the CESI 8000 Plus module.
3. Lower the cart as much as possible.
4. Disconnect the high-voltage input cable from the mass spectrometer.
5. Disconnect the relay cable from the mass spectrometer.
6. Turn off the CESI 8000 Plus module and then unplug the power cord for the cart.
7. Lift up the locking lever on each of the cart wheels and then roll the cart away from the mass spectrometer.
8. Remove the adapter from the ion source. If necessary, remove the adapter mounting bracket as well.
9. Store the high-voltage input cable, the adapter, the adapter mounting bracket and thumbscrews, and the relay cable in a safe place.
## Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Reason for Change</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>First release.</td>
<td>March 2016</td>
</tr>
</tbody>
</table>