

System User Guide

SCIEX 6500+ Systems



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Contents

1 Operational Precautions and Limitations	6
General Safety Information	6
Documentation Symbols and Conventions	6
Regulatory Compliance	7
Australia and New Zealand	7
Canada	7
Europe	8
United States	8
International	8
Electrical Precautions	9
Mains Supply	9
Protective Earth Conductor	10
Chemical Precautions	10
System Safe Fluids	11
Ventilation Precautions	12
Physical Precautions	13
Environmental Precautions	14
Electromagnetic Environment	14
Decommissioning and Disposal	15
Qualified Personnel	16
Laboratory Conditions	16
Safe Environmental Conditions	16
Performance Specifications	17
Equipment Use and Modification	17
 2 Principles of Operation	 19
System Overview	19
Hardware Overview	20
 3 Operating Instructions — Hardware	 24
Start Up the System	24
Syringe Pump	25
Adjust the Integrated Syringe Pump Position	25
Start the Integrated Syringe Pump	29
Stop the Integrated Syringe Pump	30
Diverter Valve	30
Connect the Diverter Valve in Injector Mode	30
Connect the Diverter Valve in Diverter Mode	32

Contents

Mass Spectrometer Calibration Procedure	33
Shut Down and Vent the System	34
Reset the Mass Spectrometer	35
 4 Operating Instructions — User Workflows	36
 5 Service and Maintenance Information	38
Maintenance Overview	38
Maintenance Frequency	39
Recommended Maintenance Schedule	39
Clean the Surfaces	41
Examine the Connections	41
Clean the Vacuum Interface	41
Symptoms of Contamination	43
Required Materials	43
Cleaning Best Practices	45
Routine Cleaning	47
Full Cleaning (Excluding the Q0 Region)	50
Q0 Cleaning (Optional)	61
Empty the Source Exhaust Drain Bottle	67
Replace the Air Filters in the Mass Spectrometer	69
Replace the Interface Heater	71
Remove the Interface Heater	73
Install the Interface Heater	75
Storage and Handling	75
 6 Mass Spectrometer Troubleshooting	76
 A Calibration Ions and Solutions	83
Prepare the Mass Spectrometer to Infuse the Calibration Solution	85
 B Hazardous Substance Information	93
 C Glossary of Symbols	94
 D Glossary of Warnings	100
 Contact Us	102
Addresses	102
Customer Training	102
Online Learning Center	102

SCIEX Support.....	102
Cybersecurity.....	103
Documentation.....	103

Operational Precautions and Limitations

1

Note: Before operating the system, carefully read all of the sections of this guide.

This section contains information about general safety and regulatory compliance. This section gives descriptions of possible hazards and the related warnings for the system, and the precautions that should be obeyed to keep hazards to a minimum.

For information about the symbols and conventions that are used in the laboratory environment, on the system, and in this documentation, refer also to the section: [Glossary of Symbols](#). For site requirements, including mains supply, source exhaust, ventilation, compressed air, nitrogen, and roughing pump requirements, refer to the document: *Site Planning Guide*.

General Safety Information

To prevent personal injury or system damage, read, understand, and obey all of the safety precautions and warnings in this document, the manufacturer chemical safety data sheets (SDSs), and product label information. Labels are shown with internationally recognized symbols. Failure to obey these warnings might result in serious injury.

This safety information is a supplement to federal, state, provincial, and local environmental health and safety (EHS) regulations. The information includes safety information applicable to operation of the system. It does not include every safety procedure that must be done. Ultimately, the user and the organization are responsible for compliance with federal, state, provincial, and local EHS regulations and for maintaining a safe laboratory environment.

Refer to the applicable laboratory reference material and standard operating procedures.

Documentation Symbols and Conventions

The symbols and conventions that follow are used throughout the guide.



DANGER! Danger identifies an action that can cause severe injury or death.



WARNING! Warning identifies an action that can cause personal injury if precautions are not obeyed.

CAUTION: Caution identifies an operation that can cause damage to the system or corruption or loss of data if precautions are not obeyed.

Note: Notes supply important information in a procedure or description.

Tip! Tips supply information that helps to apply the techniques in a procedure or gives a shortcut, but that is not required for the completion of a procedure.

Regulatory Compliance

This system complies with the regulations and standards listed in this section. For dated references, refer to the declaration of conformity included with the system and the individual system components. Applicable labels have been applied to the system.

Australia and New Zealand

- **Electromagnetic Compatibility (EMC):** Radio Communications Act 1992 as implemented in these standards:
 - Electromagnetic Interference—AS/NZS CISPR 11/ EN 55011/ CISPR 11 (Class A). Refer to the section: [Electromagnetic Interference](#).
- **Safety:**
 - AS/NZ 61010-1
 - IEC 61010-2-010
 - IEC 61010-2-061

Canada

- **Electromagnetic Interference (EMI):** CAN/CSA CISPR11. This ISM device complies with Canadian ICES-001. Refer to the section: [Electromagnetic Interference](#).
- **Safety:**
 - CAN/CSA C22.2 No. 61010-1
 - CAN/CSA C22.2 No 61010-2-061
 - CAN/CSA C22.2 No 61010-2-010

Europe

- **Electromagnetic Compatibility (EMC):** Electromagnetic Compatibility Directive 2014/30/EU as implemented in these standards:
 - EN 61326-1
 - EN 55011 (Class A)Refer to the section: [Electromagnetic Compatibility](#).
- **Safety:** Low Voltage Directives 2014/35/EU as implemented in these standards:
 - EN 61010-1
 - EN 61010-2-061
 - EN 61010-2-010
- **Waste Electrical and Electronic Equipment (WEEE):** Waste Electrical and Electronic Equipment Directive 2012/19/EU, as implemented in EN 40519. Refer to the section: [Waste Electrical and Electronic Equipment](#).
- **Packaging and Packaging Waste (PPW):** Packaging and Packaging Waste Directive 94/62/EC
- **RoHS Restriction of Hazardous Substances:** RoHS Directive 2011/65/EU and 2015/863/EU

United States

- **Radio Emissions Interference Regulations:**
 - 47 CFR 15, as implemented in FCC Part 15 (Class A)
- **Safety:** Occupational Safety and Health Regulations, 29 CFR 1910, as implemented in these standards:
 - UL 61010-1
 - UL 61010-2-061
 - UL 61010-2-010

International

- **Electromagnetic Compatibility (EMC):**
 - IEC 61326-1
 - IEC CISPR 11 (Class A)

- IEC 61000-3-2
- IEC 61000-3-3

Refer to the section: [Electromagnetic Compatibility](#).

- **Safety:**
 - IEC 61010-1
 - IEC 61010-2-061
 - IEC 61010-2-010

Electrical Precautions



WARNING! Electrical Shock Hazard. Do not remove the covers. If the covers are removed, then injury or incorrect system operation might occur. Removal of the covers is not required for routine maintenance, inspection, or adjustment. For repairs that require removal of the covers, contact a SCIEX field service employee (FSE).



WARNING! Electrical Shock Hazard. Before fittings or tubing are touched or examined for leaks, turn off the high-voltage power to the ion source. To turn off the high-voltage power, remove the ion source or put the system in Standby state. If the high-voltage power is on and the user touches a liquid leak from the probe fittings or tubing, then an electric shock might occur.

- Obey the required electrical safe work practices.
- Use cable management practices to control electrical cables and decrease the risk of a tripping hazard.

For information about system electrical specifications, refer to the document: *Site Planning Guide*.

Mains Supply

Connect the system to a compatible mains supply as instructed in this guide.



WARNING! Electrical Shock Hazard. Use only qualified personnel for the installation of all of the electrical supplies and fixtures, and make sure that all of the installations adhere to local regulations and safety standards.

Operational Precautions and Limitations



WARNING! Electrical Shock Hazard. Make sure that the system can be disconnected from the mains supply outlet in an emergency. Do not prevent access to the mains supply outlet.



WARNING! Electrical Shock Hazard. Use only the mains supply cables that are supplied with the system. Do not use mains supply cables that are not correctly rated for the operation of this system.

An external line transformer is not required for the mass spectrometer, optional bench, or roughing pump.

Protective Earth Conductor



WARNING! Electrical Shock Hazard. Do not intentionally interrupt the protective earth conductor. Interruption of the protective earth conductor causes an electrical shock hazard.



WARNING! Electrical Shock Hazard. Make sure that a protective earth conductor (grounding cable) is connected between the sample loop and an applicable grounding point at the ion source. This supplementary grounding reinforces the safety configuration specified by SCIEX.

The mains supply must include a protective earth conductor that is correctly installed. The protective earth conductor must be installed or examined by a qualified electrician before the system is connected.

Chemical Precautions



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Before cleaning or maintenance procedures are started, identify if decontamination is required. If radioactive materials, biological agents, or toxic chemicals have been used with the system, then the customer must decontaminate the system before cleaning or maintenance procedures are done.



WARNING! Environmental Hazard. Do not discard system components in municipal waste. To discard components correctly, obey local regulations.



WARNING! Biohazard or Toxic Chemical Hazard. To prevent leaks, connect the drain tubing to the mass spectrometer and the source exhaust drain bottle correctly.

Operational Precautions and Limitations

- Before servicing and regular maintenance, identify the chemicals that have been used in the system. For the health and safety precautions that must be obeyed for a chemical, refer to the safety data sheet (SDS). For storage information, refer to the certificate of analysis. To find a SCIEX SDS or certificate of analysis, go to sciex.com/tech-regulatory.
- Always wear assigned personal protective equipment, which includes powder-free gloves, protective eyewear, and a laboratory coat.

Note: Nitrile or chloroprene gloves are recommended.

- Do work in a well-ventilated area or fume hood.
- When flammable materials, for example, isopropanol and methanol, are in use, do not go near ignition sources.
- Be careful with the use and disposal of chemicals. If the correct procedures for chemical use and disposal are not obeyed, then personal injury can occur.
- If solvent gets into the eyes or on the skin, then flush the solvent away immediately.
- During cleaning, do not let chemicals touch the skin. Wash hands after use.
- Make sure that all of the exhaust hoses are connected correctly and that all of the connections are functioning as designed.
- Collect all of the spent liquids and discard them as hazardous waste.
- Obey all of the local regulations for the storage, use, and disposal of biohazardous, toxic, and radioactive materials.
- Oil-sealed roughing pump: (Recommended) Use a secondary containment tray below the roughing pump.

Note: Secondary containment is not required for the dry roughing pump.

- (Recommended) Use secondary containment trays below the solvent bottles and the waste container to collect potential chemical spills.

System Safe Fluids

The fluids that follow can safely be used with the system. For information about safe cleaning solutions, refer to the section: [Routine Cleaning](#).

CAUTION: Potential System Damage. Do not use other fluids until confirmation is received from SCIEX that the fluid does not cause a hazard. This is not an exhaustive list.

Note: Use only new, freshly prepared LC-MS-grade or better solvents for the LC mobile phases.

- **Organic Solvents**
-

Operational Precautions and Limitations

- LC-MS-grade acetonitrile, up to 100%
- LC-MS-grade methanol, up to 100%
- LC-MS-grade isopropanol, up to 100%
- LC-MS-grade water, up to 100%
- Tetrahydrofuran, up to 100%
- Toluene and other aromatic solvents, up to 100%
- Hexanes, up to 100%
- **Buffers**
 - Ammonium acetate, less than 100 mM
 - Ammonium formate, less than 100 mM
 - Phosphate, less than 1%
- **Acids and Bases**
 - Formic acid, less than 1%
 - Acetic acid, less than 1%
 - Trifluoroacetic acid (TFA), less than 1%
 - Heptafluorobutyric acid (HFBA), less than 1%
 - Ammonia/ammonium hydroxide, less than 1%
 - Phosphoric acid, less than 1%
 - Trimethylamine, less than 1%
 - Triethylamine, less than 1%

Ventilation Precautions

The venting of fumes and disposal of waste must comply with all of the federal, state, provincial, and local health and safety regulations. It is the responsibility of the customer to make sure that the air quality is kept in compliance with local health and safety regulations.

The source exhaust system and roughing pump must be vented to a dedicated laboratory fume hood or an external exhaust system.



WARNING! Fire Hazard. Make sure that the source exhaust system is connected and operates correctly, to prevent the collection of flammable vapor in the ion source.



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. If hazardous, biohazardous, or radioactive materials have been analyzed in the mass spectrometer, then make sure to vent exhaust gases to a dedicated laboratory fume hood or exhaust system, and make sure that the ventilation tubing is attached with clamps. Make sure that the laboratory has the correct air exchange rate for the work done.



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Do not operate the mass spectrometer if the source exhaust drain and roughing pump exhaust hoses are not correctly connected to the laboratory ventilation system. Examine the exhaust tubing regularly to make sure that there are no leaks. The use of mass spectrometers without proper system ventilation might be a health hazard and might result in serious injury.



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Do not use the ion source without knowledge of and training in the correct use, containment, and evacuation of toxic or injurious materials used with the ion source.



WARNING! Puncture Hazard, Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. If the ion source window has cracks or is broken, then do not use the ion source. Contact a SCIEX field service employee (FSE). Toxic or injurious materials that go into the equipment will be in the source exhaust output. Exhaust from equipment should be vented from the room. Obey approved laboratory procedures to discard sharps.

Physical Precautions



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait a minimum of 30 minutes for the temperature of the IonDrive Turbo V ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation.



WARNING! Lifting Hazard. Use a mechanical lifting device to lift and move the mass spectrometer. If the mass spectrometer must be moved manually, then a minimum of six people is required to move it safely. Use established safe lifting procedures. We recommend the use of a professional moving service. For the weights of system components, refer to the document: *Site Planning Guide*.

Environmental Precautions



DANGER! Explosion Hazard. Do not operate the system in an environment that contains explosive gases. The system was not made for operation in an explosive environment.



WARNING! Biohazard. If biohazardous materials have been used with the system, then always obey local regulations for hazard assessment, control, and handling. Neither this system nor any part should be used as a biological containment.



WARNING! Environmental Hazard. Obey approved procedures for the disposal of biohazardous, toxic, radioactive, and electronic waste. The customer is responsible for and must obey local laws and regulations for the disposal of hazardous substances, which include chemicals, waste oils, and electrical components.

CAUTION: Potential Mass Shift. Keep a stable ambient temperature. A temperature change of more than 2 °C (3.5 °F) per hour might have an effect on resolution and mass calibration.

Use qualified personnel for the installation of electrical mains, heating, ventilation, and plumbing supplies and fixtures. Make sure that all of the installations obey the local bylaws and biohazard regulations. For information about the required environmental conditions for the system, refer to the document: *Site Planning Guide*.

When the system is set up, make sure that there is sufficient access space around the equipment.

Electromagnetic Environment

Electromagnetic Compatibility

Basic Electromagnetic Environment: Environment existing at locations characterized by being supplied directly at low voltage from the public mains network.

Performance Criteria A (Criteria A): Equipment shall operate as intended with no degradation of performance and no loss of function during or after the test.

Performance Criteria B (Criteria B): Equipment may experience loss of function (one or more) during the test but shall operate as intended after the test.

Performance Criteria C (Criteria C): LOSS OF FUNCTION is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

The equipment is intended for use in a basic electromagnetic environment.

The permissible performance loss under the electromagnetic immunity conditions is less than 20% change in total ion count (TIC).

Make sure that a compatible electromagnetic environment for the equipment can be maintained so that the device will operate as intended. If the power supply line is subject to high electrical noise, then install a surge protector.

Electromagnetic Interference

Group 1 Equipment: This equipment is classified as industrial, scientific, and medical (ISM) equipment that might use RF energy for internal operation.

Class A Equipment: Equipment which is suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes. [Derived from CISPR 11] Class A equipment shall meet Class A limits.

CAUTION: Potential Radio Interference. This equipment is not intended for use in residential environments and might not supply sufficient protection to radio reception in such environments.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC (Federal Communications Commission) Compliance Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the operator's manual, can cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case you will be required to correct the interference, at your own expense. Changes or modifications not expressly approved by the manufacturer could void your authority to operate the equipment.

Decommissioning and Disposal



WARNING! Environmental Hazard. Obey approved procedures for the disposal of biohazardous, toxic, radioactive, and electronic waste. The customer is responsible for and must obey local laws and regulations for the disposal of hazardous substances, which include chemicals, waste oils, and electrical components.



WARNING! Environmental Hazard. Do not discard system components in municipal waste. To discard components correctly, obey local regulations.

Operational Precautions and Limitations

Before decommissioning, obey local regulations to decontaminate the full system.

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

When the system is removed from service, obey national and local environmental regulations to divide and recycle different materials. Refer to the section: [Storage and Handling](#).

Waste Electrical and Electronic Equipment

Obey local municipal waste ordinances for the correct disposal provisions to decrease the environmental impact of waste, electrical, and electronic equipment (WEEE). To discard this equipment safely, contact a local Customer Service office for complimentary equipment pickup and recycling.

Qualified Personnel

Only qualified SCIEX personnel are permitted to install, examine, and supply servicing for the equipment. After the system has been installed, the field service employee (FSE) uses the document: *Customer Familiarization Checklist* to help the customer become familiar with system operation, cleaning, and basic maintenance. If personnel who are not authorized by SCIEX do maintenance on a system under warranty, then SCIEX is not responsible to repair any damage caused by the servicing.

Only personnel qualified by the manufacturer shall do maintenance on the equipment. A laboratory designate can be familiarized with the qualified maintenance person (QMP) procedures during the installation. A QMP is a person who is aware of the electrical, chemical, burn, and mechanical risks, such as compressed gas and sharp edges, related to servicing laboratory equipment.

Laboratory Conditions

Safe Environmental Conditions

The system is designed to operate safely in these conditions:

- Indoors
- Altitude: Up to 2,000 m (6,562 ft) above sea level
- Ambient temperature: 5 °C (41 °F) to 40 °C (104 °F)
- Relative humidity: 20% to 80%, noncondensing
- Mains supply voltage fluctuations: $\pm 10\%$ of the nominal voltage

- Transient overvoltages: Up to the levels of Overvoltage Category II
- Temporary overvoltages on the mains supply
- Pollution Degree 2

Performance Specifications

The system is designed to meet specifications under these conditions:

- Ambient temperature: 15 °C (59 °F) to 30 °C (86 °F)
Over time, the temperature must stay in a range of 4 °C (7.2 °F), with the rate of the change in temperature not more than 2 °C (3.6 °F) per hour. Ambient temperature fluctuations that are more than the limit might cause mass shifts in spectra.
- Relative humidity: 20% to 80%, noncondensing

Equipment Use and Modification



WARNING! Personal Injury Hazard. If product installation, adjustment, or relocation is required, then contact a SCIEX representative.



WARNING! Electrical Shock Hazard. Do not remove the covers. If the covers are removed, then injury or incorrect system operation might occur. Removal of the covers is not required for routine maintenance, inspection, or adjustment. For repairs that require removal of the covers, contact a SCIEX field service employee (FSE).



WARNING! Personal Injury Hazard. Use only parts that are recommended by SCIEX. The use of parts that are not recommended by SCIEX or the use of parts for a purpose other than their intended purpose can put the user at risk of harm or have a negative effect on system performance.



WARNING! Lifting Hazard. Use a mechanical lifting device to lift and move the mass spectrometer. If the mass spectrometer must be moved manually, then a minimum of six people is required to move it safely. Use established safe lifting procedures. We recommend the use of a professional moving service. For the weights of system components, refer to the document: *Site Planning Guide*.



WARNING! Crushing Hazard. When heavy objects are moved, wear protective footwear. If a heavy object falls during a move, then personal injury might occur.

Operational Precautions and Limitations

CAUTION: Potential System Damage. Do not use laboratory cleaning solvents or waxes that give off gas near the mass spectrometer. The gas can cause high background noise.

Use the system indoors in a laboratory that complies with the environmental conditions recommended in the document: *Site Planning Guide*.

If the system is used in conditions or an environment that are not approved by the manufacturer, then the performance and protection that is supplied by the equipment might be decreased or lost.

Contact an FSE for information about servicing the system. Unauthorized modification or operation of the system might cause personal injury and equipment damage, and might void the warranty. If the system is operated outside the recommended environmental conditions or with unauthorized modifications, then the acquired data might be inaccurate.

Principles of Operation

2

The system does qualitative and quantitative analysis of chemical species.

This section includes information about the mass spectrometer. For an overview of the ion source, refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.

System Overview



WARNING! Lifting Hazard. Use a mechanical lifting device to lift and move the mass spectrometer. If the mass spectrometer must be moved manually, then a minimum of six people is required to move it safely. Use established safe lifting procedures. We recommend the use of a professional moving service. For the weights of system components, refer to the document: *Site Planning Guide*.

This system is intended for the qualitative and quantitative analysis of chemical species.

The system includes these components:

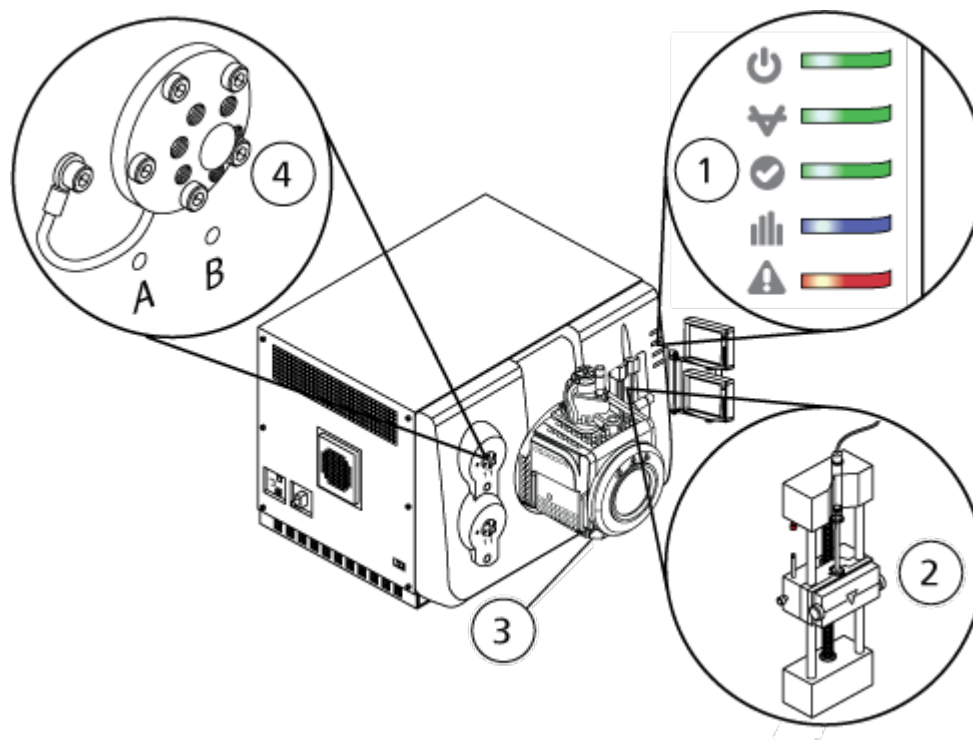
- SCIEX Triple Quad 6500+ mass spectrometer or QTRAP 6500+ mass spectrometer.
- Roughing pumps. These roughing pump configurations are available:
 - Two oil-sealed roughing pumps
 - One dry pump

Note: Do not use the oil-sealed roughing pump and the dry pump on the same mass spectrometer.

- IonDrive Turbo V ion source that uses the TurbolonSpray probe or the atmospheric pressure chemical ionization (APCI) probe. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.
- SCIEX-supplied computer and monitor with the control software for system optimization, acquisition method development, data acquisition, and processing. For computer specifications and requirements, refer to the software documentation.

Hardware Overview

Figure 2-1 Front View



Item	Description	For More Information
1	Panel symbols	Refer to the section: Panel Symbols .
2	Syringe pump	Refer to the section: Adjust the Integrated Syringe Pump Position .
3	Ion source	Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> , available on the ion source documentation USB or DVD or at sciex.com .
4	Diverter valve	Refer to the section: Diverter Valve .

Panel Symbols

The table that follows gives a description of the status LEDs on the mass spectrometer.

Table 2-1 Panel Symbols

LED	Color	Name	Description
	Green	Power	Comes on when power to the system is on.
	Green	Vacuum	Comes on when the system is at the operating vacuum level. Flashes if the vacuum is not at the correct level, that is, during pumpdown and venting.
	Green	Ready	Comes on when the system is in the Ready status. The system must be in the Ready status to operate.
	Blue	Scanning	Flashes during the acquisition of data.
	Red	Fault	Comes on when a system fault is found.

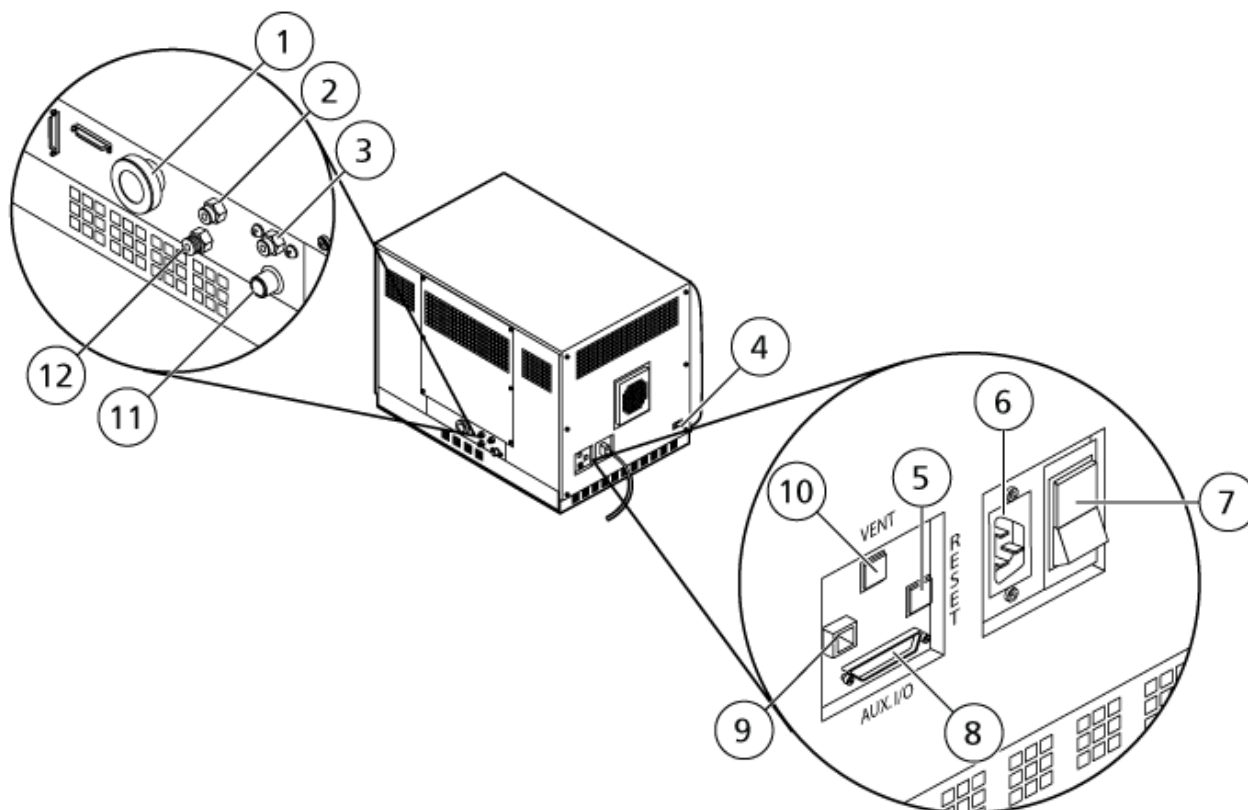
When power to the system is turned on, all of the LEDs come on. The Power LED stays on. The other LEDs flash for 2 seconds and then go off. The Vacuum LED starts to flash. When the system is at the operating vacuum level, the Vacuum LED stays on.

Connections

The figure that follows shows the location of the mass spectrometer connections. The locations of the **RESET** and **VENT** buttons and the mass spectrometer convenience switch are shown.

Principles of Operation

Figure 2-2 Back and Side Views



Item	Description	For More Information
1	Roughing pump vacuum connection	Contact an FSE.
2	Air supply (Gas 1/Gas 2)	Refer to the document: <i>Site Planning Guide</i> . Gas tubing from the Gas 1/Gas 2 supply connects to this port.
3	Source exhaust supply	Refer to the document: <i>Site Planning Guide</i> . Gas tubing from the source exhaust gas supply connects to this port.
4	Source communication connection	Contact an FSE.
5	RESET button	Refer to the section: Reset the Mass Spectrometer .
6	Mains supply connection	Refer to the section: Start Up the System or Shut Down and Vent the System .

Item	Description	For More Information
7	Mass spectrometer convenience switch	Refer to the section: Start Up the System or Shut Down and Vent the System . • Up: Power to the system is on. • Down: Power to the system is off.
8	Aux I/O connection	Refer to the document: <i>Devices Setup Guide</i> or <i>Peripheral Devices Setup Guide</i> .
9	Ethernet connection (connects the mass spectrometer and the computer)	Contact an FSE.
10	VENT button	Refer to the section: Start Up the System or Shut Down and Vent the System .
11	Source exhaust waste (to the source exhaust drain bottle)	Refer to the document: <i>Site Planning Guide</i> .
12	Nitrogen gas supply (gas for the Curtain Gas interface, CAD gas)	Refer to the document: <i>Site Planning Guide</i> . Gas tubing from the nitrogen gas supply connects to this port.

Operating Instructions — Hardware 3



WARNING! Personal Injury Hazard. To use the system safely, obey the instructions in the documentation. If the equipment is used in a manner not specified by SCIEX, then the protection supplied by the equipment might be decreased.

Start Up the System



WARNING! Electrical Shock Hazard. Make sure that the system can be disconnected from the mains supply outlet in an emergency. Do not prevent access to the mains supply outlet.

Note: Before the system is used, read the safety information in the section: [Operational Precautions and Limitations](#).

Prerequisites

- The site requirements supplied in the document: *Site Planning Guide* are met. This document includes information about the requirements for the mains supply and connections, compressed air, nitrogen, roughing pump, ventilation, exhaust, and site clearance. If required, then contact SCIEX for a copy of the document. For contact information, go to scieux.com/contact-us.
- The source exhaust gas, compressed air, and nitrogen gases are correctly connected to the mass spectrometer.
- The 4 L source exhaust drain bottle is correctly connected to the exhaust waste connection of the mass spectrometer and to the laboratory ventilation system.
- The source exhaust hoses are correctly attached to the mass spectrometer, source exhaust drain bottle, and ventilation connections.
- Exhaust hoses from the roughing pumps are connected to the laboratory ventilation system.
- The convenience switch is off and the mains supply cable is connected to the mass spectrometer.
- The mass spectrometer and roughing pump mains supply cables are connected to the 200 VAC to 240 VAC mains supply.
- The Ethernet cable is connected to the mass spectrometer and the computer.

1. Turn on the mass spectrometer convenience switch. Refer to the figure: [Figure 2-2](#).

2. Turn on the computer.
3. Open the control software.

Syringe Pump

Adjust the Integrated Syringe Pump Position



WARNING! Puncture Hazard. Be careful with the handling of the syringe. The tip of the syringe is very sharp. Personal injury might occur.

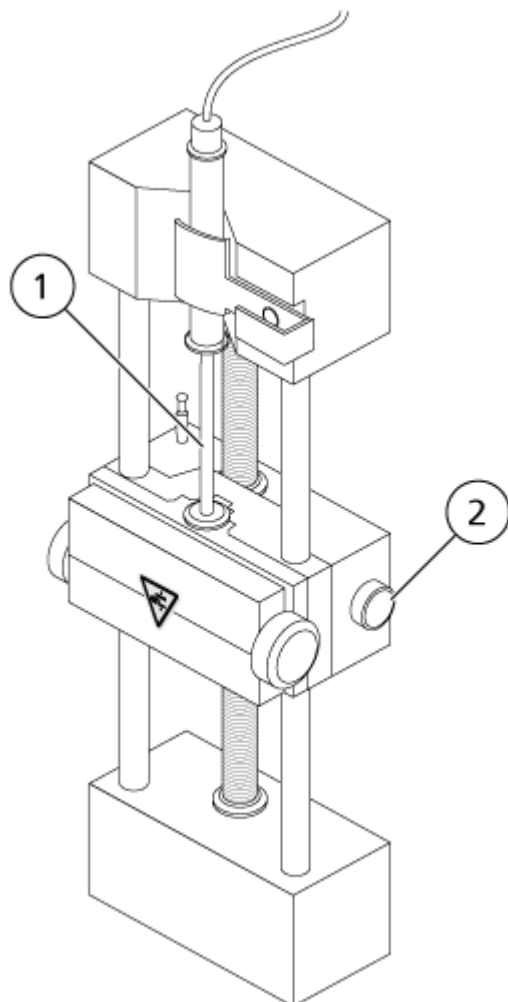


WARNING! Puncture Hazard. To prevent damage to the glass syringe, make sure that the syringe is installed correctly in the syringe pump and that the automatic syringe pump stop is adjusted correctly. If the syringe breaks, then obey the approved safety procedures for sharps disposal.

For the location of the syringe pump on the mass spectrometer, refer to the figure: [Figure 2-1](#).

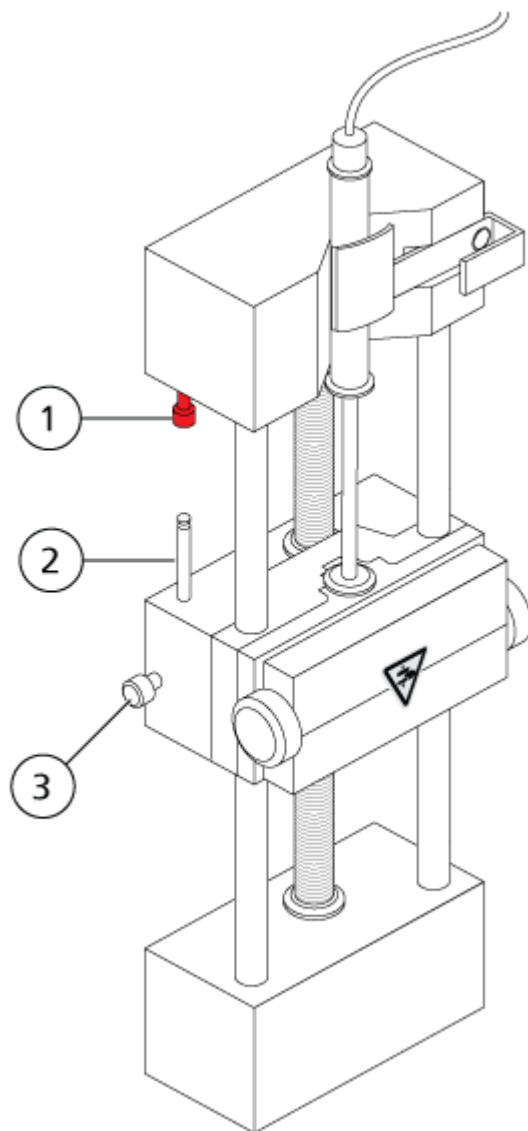
1. Open the syringe cover.
2. Press the Release button on the right side of the syringe pump to lower the base, and then put in the syringe.

Figure 3-1 Lowering the Syringe



Item	Description
1	Syringe plunger
2	Release button. Press to raise or lower the base.

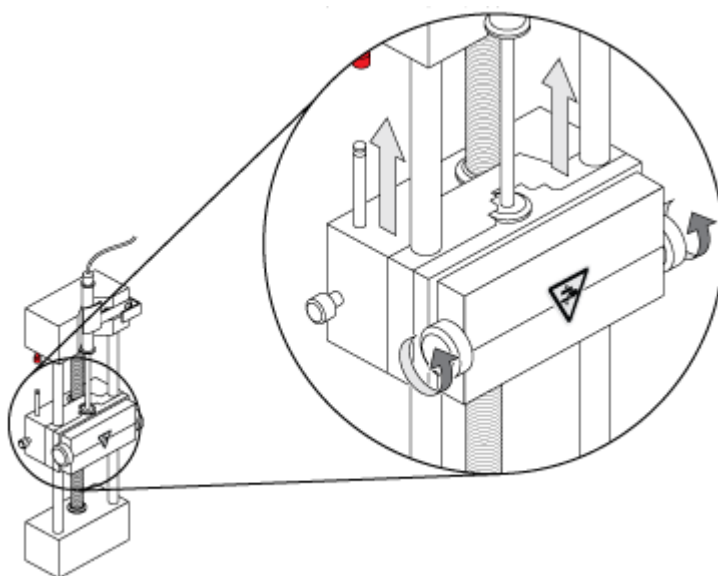
3. Make sure that the end of the syringe is flush with the base and that the shaft of the syringe is in the cutout.
4. Adjust the post so that the syringe stops automatically before the syringe plunger hits the bottom of the glass syringe.

Figure 3-2 Automatic Syringe Stop

Item	Description
1	Automatic syringe stop. After the post hits the automatic syringe stop, the syringe pump stops.
2	Post. To make sure that the syringe plunger does not hit the syringe during sample infusion, adjust the height of the post.
3	Post lock screw. Tighten the screw after the height of the post is adjusted.

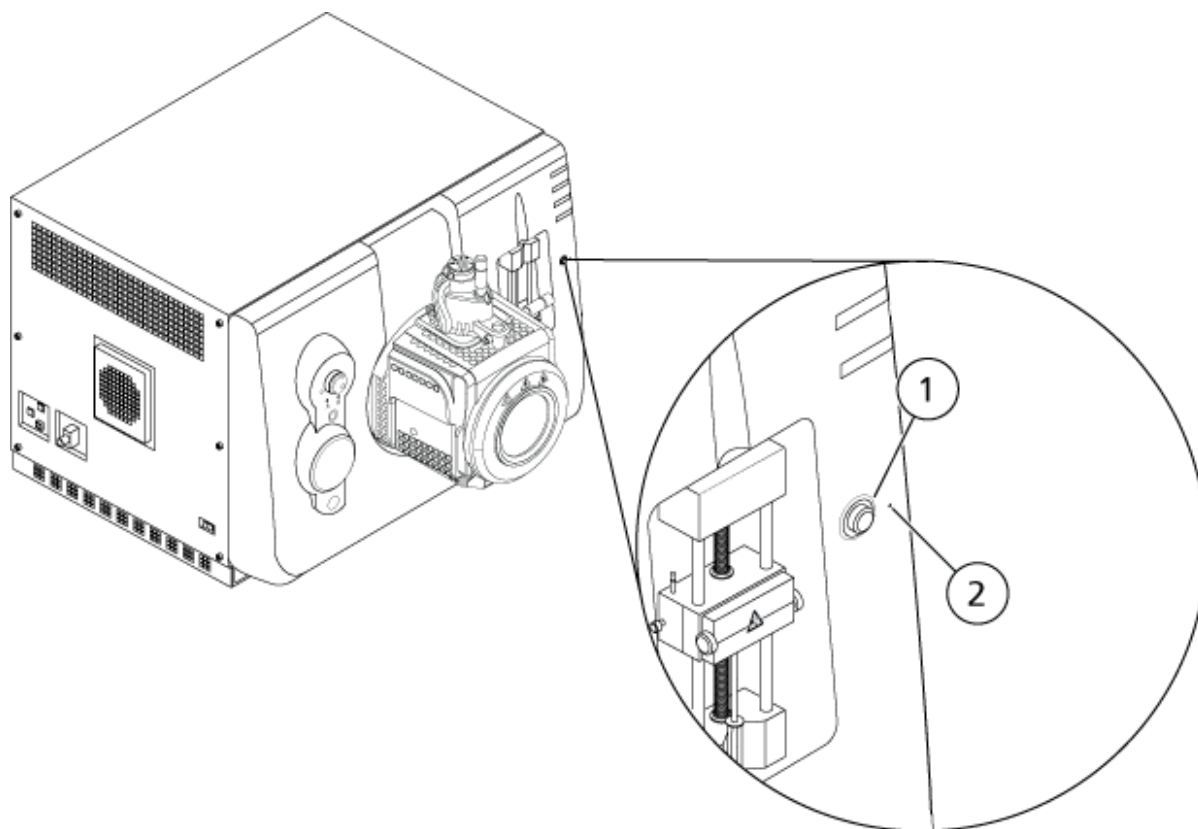
5. Turn the syringe pump screws to attach the syringe.

Figure 3-3 Syringe Pump Screws



6. Make sure that the mass spectrometer and integrated syringe pump are activated in the control software.

Note: To start the flow manually, after the mass spectrometer is in Ready status, on the mass spectrometer, press the button on the right side of the syringe. The LED adjacent to the button flashes when the syringe pump is in use. The syringe pump flow can also be controlled automatically by the control software.

Figure 3-4 Syringe Pump Status LED

Item	Description
1	Syringe pump on and off button
2	Syringe pump status LED

7. Use the control software to start or stop the syringe pump. Refer to the document: *Help*.

Start the Integrated Syringe Pump

1. In the control software, make sure that the syringe pump is enabled and the devices are active. Refer to the document: *Help*.
2. (SCIEX OS software) On the status panel, adjacent to the name of the syringe pump, click  (Direct device control).
The Device Control dialog opens.
3. (Analyst software) On the Navigation bar, in **Tune and Calibrate**, double-click **Manual Tuning**.

4. (Analyst software) In the Tune Method Editor pane, select **Syringe Pump Method**. Make sure that the **Use** check box is selected.
The Integrated Syringe Pump Method Properties tab is shown.
5. Set the these parameters, as required:
 - **Syringe Diameter**
 - **Flow Rate**
 - (SCIEX OS software) **Flow Rate Unit**
 - (Analyst software) **Unit**
6. Click **Start**.
7. (SCIEX OS software) To close the dialog, click the red **X** in the top right corner.

Stop the Integrated Syringe Pump

1. (SCIEX OS software) On the status panel, adjacent to **Syringe**, click **Stop**.
2. (Analyst software) In the Tune Method Editor pane, click **Stop Syringe Pump**.

Diverter Valve

The diverter valve is a two-position, six-port valve. It can be connected in Injector mode or Diverter mode. In Injector mode, it can be configured with a sample loop for sample injection. In Diverter mode, it can be configured to send sample to waste at the start of each LC run.

To use the diverter valve, make sure that it is activated in the control software. Refer to the document: *Help*.

CAUTION: Potential Wrong Result. During a run, do not press the diverter valve button. To do so might result in incorrect data.

Connect the Diverter Valve in Injector Mode

When the valve is in position A, the sample flows through the external loop. When the valve changes to position B, the sample is injected.

- Connect the valve for Injector mode.

Figure 3-5 Diverter Valve: Injector Mode Position A

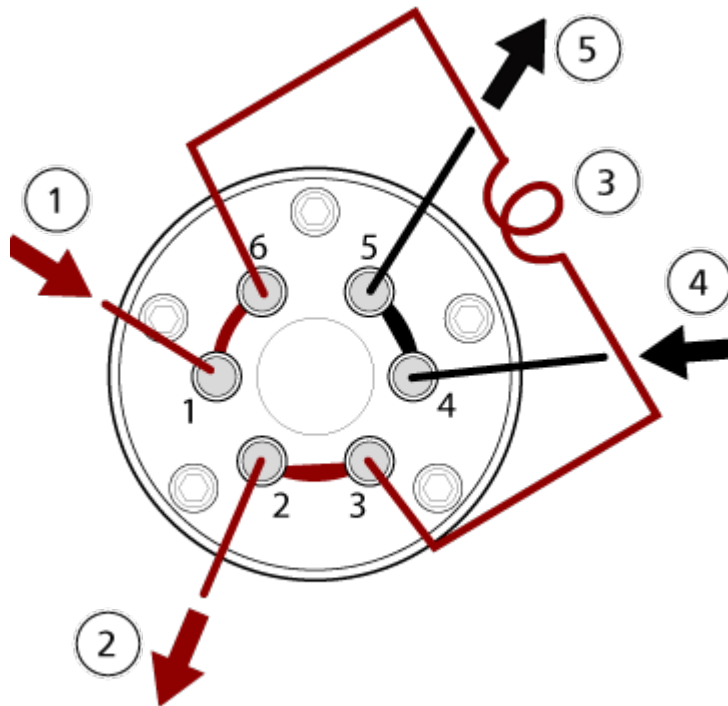
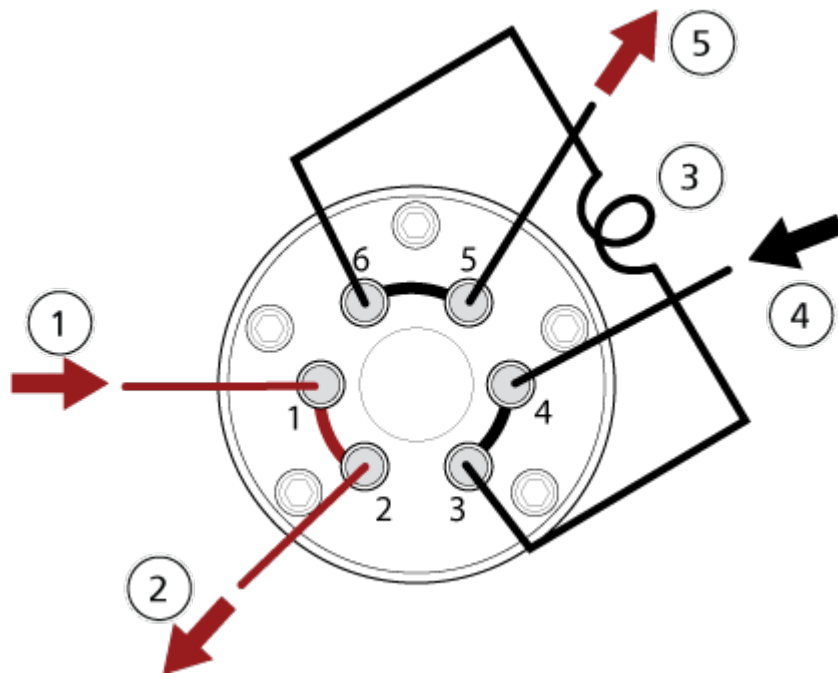


Figure 3-6 Diverter Valve: Injector Mode Position B



Item	Description
1	Sample in
2	Waste out
3	Sample loop (ports 3 and 6)
4	Mobile phase in
5	To the column, or to the mass spectrometer, if a column is not installed

Connect the Diverter Valve in Diverter Mode

When the valve is in position A, the sample flow goes to the mass spectrometer. When the valve changes to position B, the flow goes to waste.

- Connect the valve for Diverter mode.

Figure 3-7 Diverter Valve: Diverter Mode Position A

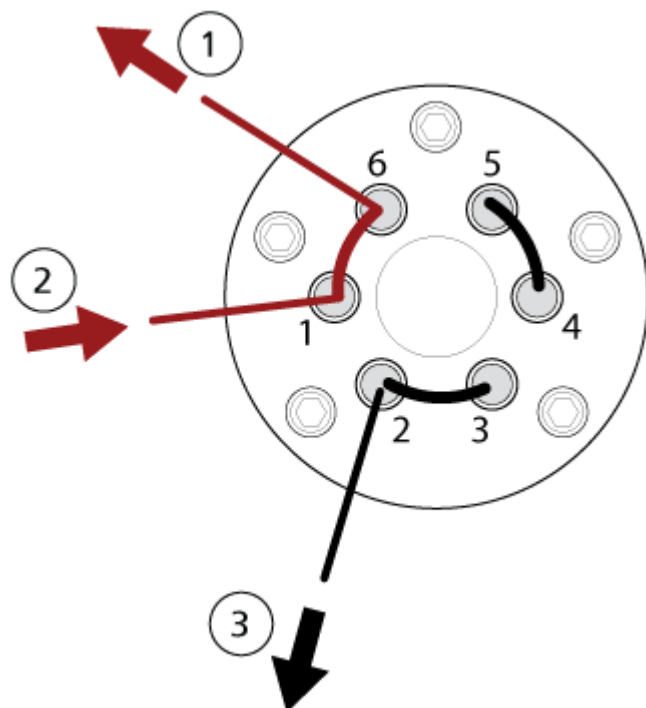
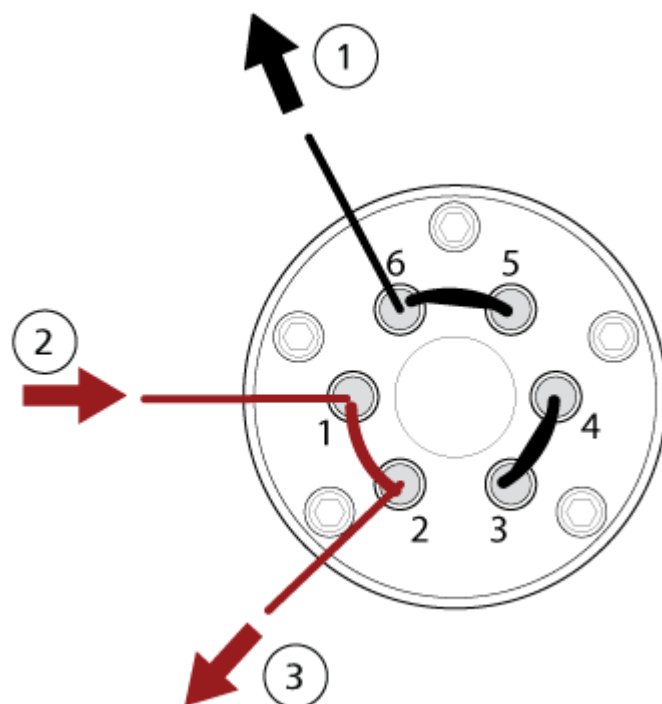


Figure 3-8 Diverter Valve: Diverter Mode Position B



Item	Description
1	To the mass spectrometer
2	From the column
3	Waste out

Mass Spectrometer Calibration Procedure

Mass calibration can change over time. Verify the mass calibration regularly. At installation, the system is mass calibrated and the resolution of the spectral peaks is optimized at unit and high resolution, in positive and negative polarity, to get the best sensitivity and performance of the mass spectrometer. Mass calibration makes sure that the signals from the ionized compounds are recorded at their true m/z values.¹ Compounds of a known purity and mass are used to calibrate the m/z scale. During resolution optimization, the peak width and peak shape are adjusted. Mass spectral resolution is shown as $(m/z)/Width$, where *Width* is the peak width of a spectral peak at a given m/z value.¹ The peak width is usually measured at the points where the intensity is half the peak height.

¹ CLSI Standard C50–A–Vol. 27, No. 24—Mass Spectrometry in the Clinical Laboratory: General Principles and Guidance: Approved Guideline.

Note: As resolution increases, sensitivity decreases. It is important to find a balance between the requirements for sensitivity and resolution.

In the Analyst software, the Instrument Optimization module is used to mass calibrate and optimize the resolution. In the SCIEX OS software, the MS Tune workspace is used to mass calibrate and optimize the resolution. To make sure that the system operation is correct, verify the mass calibration and resolution weekly or after the mass spectrometer is cleaned. Unless the system loses vacuum, the calibration and resolution for a triple quadrupole mass spectrometer is usually stable for three months to six months. If the system loses vacuum, then do a check of the calibration and resolution before the system is used. Refer to the document: *Help*.

CAUTION: Potential Wrong Result. Make sure that the system is calibrated. If the system is not calibrated correctly, then a mass might be identified incorrectly or quantitation might be inaccurate.

For systems that use SCIEX OS software, the recommended solution used for mass calibration and resolution optimization of the SCIEX 6500+ system is MS Tuning Solution A. Alternatively, the PPGs chemical standards kit can be used for mass calibration and resolution optimization. For systems that use the Analyst software, only the PPGs chemical standards kit is supported. Refer to the section: [Calibration Ions and Solutions](#).

Shut Down and Vent the System

Some procedures require that the system be shut down, that is, that the power to the system be turned off. Others require that it be *vented*, that is, that the vacuum pressure be released. Do these steps to shut the system down or release the pressure, as required.

CAUTION: Potential System Damage. Do not turn off the roughing pumps until after the turbo pumps have spun down.

Note: If the input gas supply must be disconnected, then release the pressure in the gas tubing before disconnection.

Tip! If the mass spectrometer will not be used for an extended period, then keep it in Standby status with the ion source installed. If the mass spectrometer must be shut down, then follow these instructions.

1. Complete or stop any ongoing scans.
-

CAUTION: Potential System Damage. Before the system is shut down, turn off the sample flow.

2. Turn off the sample flow to the system.
-

3. If the mass spectrometer is active, then in the control software, deactivate it. Refer to the document: *Help*.
4. Close the control software.
5. If required, then to vent the system, do this:

Note: Vent the system before a full cleaning of the vacuum interface is done, before the Q0 region is cleaned, and before the oil in the oil-sealed roughing pump is replaced. For more information, contact an FSE.

- a. Push and hold the **Vent** button for 3 seconds. Refer to the figure: [Figure 2-2](#).
The Vacuum LED starts to flash more quickly than during pump down. The turbo pump gradually turns less quickly.
 - b. Let the system vent for 15 minutes.
6. Turn off the convenience switch for the mass spectrometer.
 7. Disconnect the mains supply cable for the mass spectrometer from the mains supply outlet.
 8. If the system will be vented, then disconnect the mains supply cable for the roughing pump from the mains supply outlet.

Reset the Mass Spectrometer

1. Stop any scans that are in progress, and then turn off sample flow to the mass spectrometer.
2. In the control software, deactivate the mass spectrometer and devices. Refer to the document: *Help*.
3. Close the control software.
4. Press and hold the **COM Reset** button for five seconds.
A click is heard when the relay closes. After approximately 3 minutes, the mass spectrometer gets to operating pressure.

Operating Instructions — User Workflows

4

After the system is installed and configured, it is ready for use. The table that follows shows the available workflows. For each task, a reference that contains more information is shown.

Table 4-1 User Workflows

Task	Reference
Analyst	
Monitor the system status	<i>Help</i>
Create and submit batches	<i>Help</i>
Monitor and manage samples in the queue	<i>Help</i>
Explore data	<i>Help</i>
Method Developer	
Configure the system	• Configure the mass spectrometer: <i>Help</i> • Create projects and data folders: <i>Help</i> • Configure the LC devices: <i>Help</i>
Tune the mass spectrometer	<i>Help</i>
Create MS methods	<i>Help</i>
Create LC methods	<i>Help</i>
Create processing methods	<i>Help</i>
Administrator	
Set the Windows file permissions	<i>Laboratory Director Guide</i>
Configure the LIMS	<i>Help</i>
Add users to the software and assign roles	<i>Laboratory Director Guide or Help</i>
Archive logs	<i>Help</i>
Reviewer	
Review processed results	<i>Help</i>
Explore data	<i>Help</i>

Table 4-1 User Workflows (continued)

Task	Reference
Review logs	<i>Help</i>

Service and Maintenance Information

5

Regularly clean and do maintenance on the system for optimum performance.



DANGER! Electrical Shock Hazard. Do this procedure only if you are a qualified maintenance person (QMP) or trained SCIEX field service employee (FSE).



WARNING! Electrical Shock Hazard. Do not remove the covers. If the covers are removed, then injury or incorrect system operation might occur. Removal of the covers is not required for routine maintenance, inspection, or adjustment. For repairs that require removal of the covers, contact a SCIEX field service employee (FSE).



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Before cleaning or maintenance procedures are started, identify if decontamination is required. If radioactive materials, biological agents, or toxic chemicals have been used with the system, then the customer must decontaminate the system before cleaning or maintenance procedures are done.

Maintenance Overview

Tip! To make sure that system performance is optimal, do maintenance tasks regularly.

- At intervals, do a general maintenance inspection, and examine all connections, to make sure that system operation is safe. Refer to the section: [Examine the Connections](#).
- Clean the system regularly to keep it in the correct condition for operation.
- During system maintenance, carefully examine the components of the external gas supply system. To make sure that the condition is satisfactory, examine the tubing that is connected to the equipment. Replace tubing that is collapsed or that has cracks or pinches.

For information about maintenance of the ion source, refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.

Maintenance Frequency

How often maintenance should be done on the mass spectrometer and ion source is related to the factors that follow. These factors can cause changes in mass spectrometer performance over time.

- Compounds tested. For example, if insulin, proteins, cannabis, or oligonucleotides are tested, then frequent cleaning is required.
- Cleanliness of the samples and the sample preparation methods.
- Amount of time that the probe is exposed to the sample.
- Total system run time.

Note: For information about tuning frequency, refer to the section: [Calibration Ions and Solutions](#).

To order consumable parts and for basic service and maintenance requirements, refer to the document: *Parts and Equipment Guide*. For all other service and maintenance requirements, contact an FSE.

Recommended Maintenance Schedule

The tables that follow supply a recommended schedule for system cleaning and maintenance.

Note: More maintenance procedures are available in the document: *IonDrive Turbo V Ion Source Operator Guide*.

Note: For information about maintenance of the roughing pump, refer to the documentation that was supplied with the pump.

Table 5-1 Mass Spectrometer Maintenance Tasks

Component	Frequency	Task	For More Information
System	Daily	Examine for leaks	Refer to the section: Examine the Connections .
Curtain plate	Daily	Clean	Refer to the section: Clean the Curtain Plate . If routine cleaning does not increase the sensitivity, then full cleaning is required. Refer to the section: Use the SCIEX Cleaning Solution to Clean the Curtain Plate .

Service and Maintenance Information

Table 5-1 Mass Spectrometer Maintenance Tasks (continued)

Component	Frequency	Task	For More Information
Oil-sealed roughing pump ² : Roughing pump oil	Weekly	Examine the level	Refer to the documentation that was supplied with the pump, or contact the local FSE.
Oil-sealed roughing pump ² : Roughing pump oil	Every 2 years, or as required	Replace	Refer to the documentation that was supplied with the pump, or contact the local FSE.
Oil-sealed roughing pump ² : Roughing pump oil	As required	Refill	Refer to the documentation that was supplied with the pump, or contact the local FSE.
Orifice plate (front)	As required	Clean	Refer to the section: Clean the Front of the Orifice Plate .
Orifice plate (front and back)	As required	Clean	Refer to the section: Use the SCIEX Cleaning Solution to Clean the Orifice Plate .
Mass spectrometer air filter	As required	Replace	Refer to the section: Replace the Air Filters in the Mass Spectrometer .
IonDrive QJet ion guide and IQ0 lens	As required	Clean	Refer to the section: Clean the IonDrive QJet Ion Guide .
Q0 rod set and IQ1 lens	As required	Clean	Refer to the section: Q0 Cleaning (Optional) . To find out if cleaning of the Q0 region is required, refer to the section: Verify Q0 Region Operation .
System surfaces	As required	Clean	Refer to the section: Clean the Surfaces .
Source exhaust drain bottle	As required	Empty	Refer to the section: Empty the Source Exhaust Drain Bottle .
Interface heater	As required	Replace	Contact an FSE.
Mass spectrometer cooling fan filter	As required	Replace	Refer to the section: Replace the Air Filters in the Mass Spectrometer .

For tasks that are done as required, obey these guidelines:

² This procedure is not applicable for the dry pump.

- Clean the mass spectrometer surfaces when they become dirty or after a spill.
- Empty the source exhaust drain bottle before it becomes full.
- If system sensitivity decreases, then clean the orifice plate, IonDrive QJet ion guide, and Q0 region.

Tip! Clean the Q0 region regularly to keep the impact of charging, a significant loss of sensitivity of the ions of interest over a short period of time, on the quadrupoles and lenses to a minimum. Refer to the section: [Q0 Cleaning \(Optional\)](#)

- Oil-sealed roughing pump: When the oil level is below the minimum, add oil.
- Examine all of the exhaust connections at regular intervals to make sure that the integrity is satisfactory, and that the exhaust is removed from the customer laboratory.

Clean the Surfaces

Clean the external surfaces of the mass spectrometer after a spill or when they become dirty.

CAUTION: Potential System Damage. Use only the recommended cleaning methods and materials.

1. Wipe the external surfaces with a soft cloth dampened with warm, soapy water.
2. Wipe the external surfaces with a soft cloth dampened with water to remove the soap residue.

Examine the Connections

- Examine these connections to make sure that they are tight and that there is no leakage:
 - Connections on the source exhaust tubing from the mass spectrometer to the drain bottle for the source exhaust and from the drain bottle to the vent.
 - Connections on the vacuum hose from the roughing pump to the vent.
 - Gas tubing connections at the back of the system, and at the pressure regulators and gas generators.

Clean the Vacuum Interface

Examine the front-end components for contamination, and then clean them.

Regular cleaning supplies these benefits:

Service and Maintenance Information

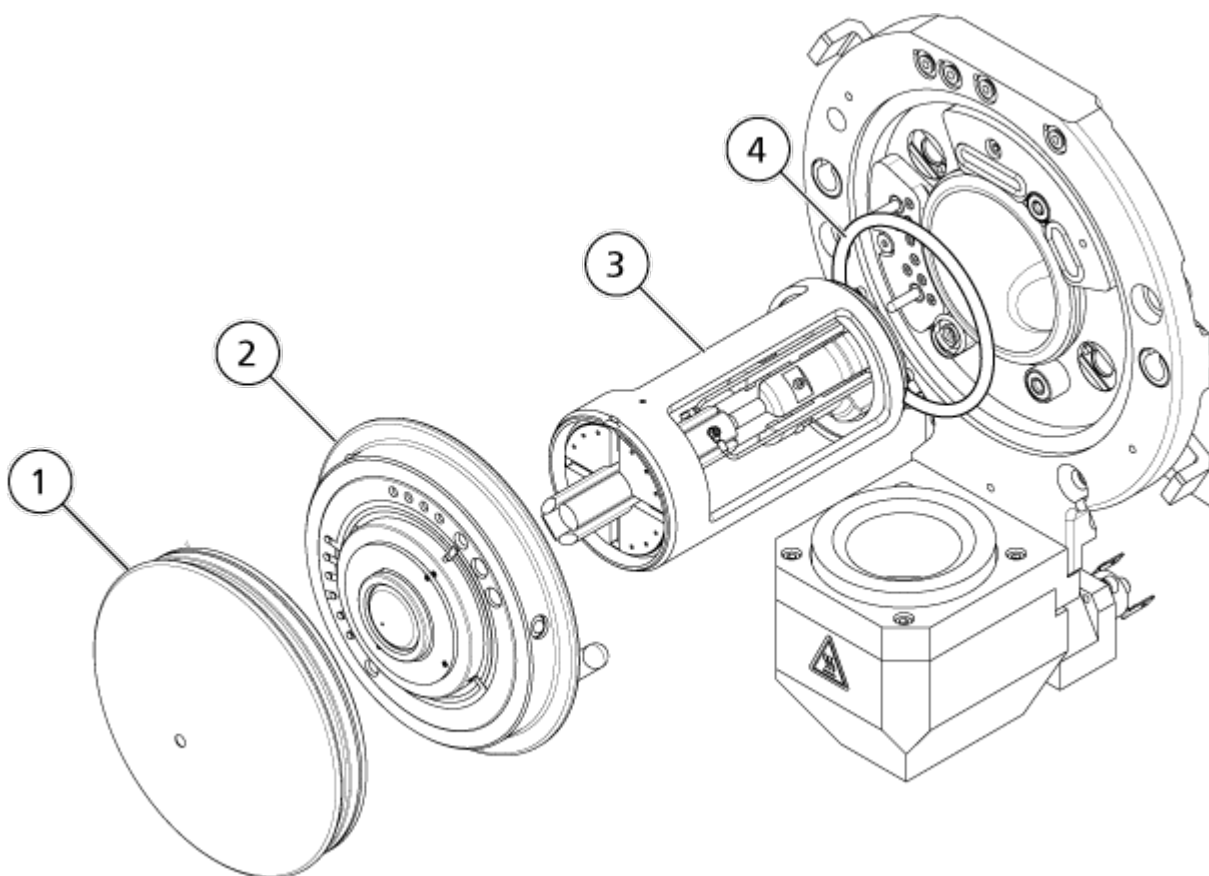
- Minimizes unscheduled mass spectrometer downtime.
- Keeps optimum sensitivity.
- Helps to prevent the requirement for more extensive cleaning, which might require a service visit.

To prevent system contamination, do a routine cleaning, which cleans as far as the front of the orifice plate, every day. If sensitivity issues occur, then the system might be contaminated, and a full cleaning might be required.

This section gives instructions for routine and full cleaning. Routine cleaning is done under vacuum. Full cleaning is done under atmospheric pressure, after the mass spectrometer is vented.

If a full cleaning and advanced cleaning of the IonDrive QJet ion guide does not resolve issues, then a service visit might be required.

Figure 5-1 Vacuum Interface Components



Item	Description
1	Curtain plate
2	Orifice plate
3	IonDrive QJet ion guide
4	O-ring

Symptoms of Contamination

The system might be contaminated if one of the issues that follow occur:

- Significant loss in sensitivity
- Increased background noise
- Peaks that are not part of the sample in full scan or survey scan methods

If these issues occur, then clean the vacuum interface.

Required Materials

Note: U.S. customers can call 877-740-2129 for ordering information and inquiries. International customers can visit sciex.com/contact-us.

Routine Cleaning

These materials are required to do routine cleaning:

- Powder-free gloves, nitrile or chloroprene recommended
- Protective eyewear
- Laboratory coat
- New LC-MS-grade water

Note: Old water can contain contaminants.

- Cleaning solution, either:
 - 100% LC-MS-grade methanol
 - 100% LC-MS-grade isopropanol (2-propanol)

Note: As an alternative, for parts that are fully removed from the mass spectrometer, use SCIEX Cleaning Powder. Refer to the section: [Full Cleaning \(Excluding the Q0 Region\)](#).

Service and Maintenance Information

- Clean 1 L or 500 mL glass beaker to prepare cleaning solutions
- 1 L beaker to collect used solvent
- Organic waste container
- Lint-free wipes. Refer to the section: [Tools and Supplies Available from the Manufacturer](#).
- (Optional) Polyester (poly) swabs. Refer to the section: [Tools and Supplies Available from the Manufacturer](#).

Full Cleaning



WARNING! Compressed Gas Hazard. When compressed gas is in use, obey local regulations. Make sure that the gas stream is not pointed at the operator.

These materials are required to do a full cleaning:

- Powder-free gloves, nitrile or chloroprene recommended
- Protective eyewear
- Laboratory coat
- For advanced cleaning of the IonDrive QJet ion guide:
 - 1.5 mm hex key
 - Circlip pliers
 - SCIEX cleaning solution, made with the SCIEX Cleaning Powder, newly prepared. Refer to the section: [Tools and Supplies Available from the Manufacturer](#).

Note: Use SCIEX cleaning solution only to clean parts that are removed from the mass spectrometer.

- A separate supply of clean dry air (CDA) or nitrogen
- A source of cold tap water that flows

Note: Because the hot water tank might be contaminated, we do not recommend the use of warm water.

- New 18 M Ω de-ionized (DI) water or ultra-pure LC-MS-grade water

Note: Old water can contain contaminants.

- SCIEX cleaning solution, made with the SCIEX Cleaning Powder, newly prepared. Refer to the section: [Tools and Supplies Available from the Manufacturer](#).

Note: Use SCIEX cleaning solution only to clean parts that are removed from the mass spectrometer.

- Stir stick
- Lubricant-free blow gun
- 4 L beaker
- 500 mL beaker

Q0 Cleaning

- Q0 cleaning tool. Refer to the section: [Tools and Supplies Available from the Manufacturer](#).
- LC-MS-grade methanol
- A separate supply of clean dry air (CDA) or nitrogen

Tools and Supplies Available from the Manufacturer

Note: For part numbers, refer to the document: *Parts and Equipment Guide*.

- Small poly swab, thermally bonded. Also available in the Cleaning kit.
- Lint-free wipe (11 cm x 21 cm, 4.3 inches x 8.3 inches). Also available in the Cleaning kit.
- Q0 cleaning tool for cleaning the Q0 rod set. Also available in the Cleaning kit.
- Straight custom brush. Also available in the Cleaning kit.
- Cleaning kit. Contains the small poly swab, lint-free wipes, Q0 cleaning tool, tapered custom brush, and SCIEX Cleaning Powder.

Cleaning Best Practices



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Before cleaning or maintenance procedures are started, identify if decontamination is required. If radioactive materials, biological agents, or toxic chemicals have been used with the system, then the customer must decontaminate the system before cleaning or maintenance procedures are done.



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait a minimum of 30 minutes for the temperature of the IonDrive Turbo V ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation.

Service and Maintenance Information



WARNING! Toxic Chemical Hazard. To use, keep, stow, and discard chemicals safely, refer to the chemical product safety data sheets. Obey all of the recommended safety procedures.



WARNING! Environmental Hazard. Do not discard system components in municipal waste. To discard components correctly, obey local regulations.

- Before removal of the ion source, wait until the temperature decreases.
 - Always wear clean, powder-free gloves, nitrile or chloprene recommended, for the cleaning procedures.
 - After the mass spectrometer components are cleaned, and before reassembly, put on a new, clean pair of gloves.
 - Do not use cleaning supplies other than those identified in this procedure.
 - If possible, then prepare cleaning solutions immediately before cleaning starts.
 - Prepare and stow all of the organic solutions and organic-containing solutions in clean glassware only. Never use plastic bottles. Contamination can leach from plastic bottles and cause more contamination in the mass spectrometer.
 - To prevent contamination of the cleaning solution, pour the solution on the wipe or swab.
 - Make sure that only the center area of the wipe touches the mass spectrometer surface. Fibers from cut edges can cause contamination.
-

Tip! Wrap the wipe around a thermally-bonded poly swab.

Figure 5-2 How to Fold the Wipe



- To prevent cross-contamination, discard the wipe or swab after it has touched the surface once.
 - If required, then use multiple wipes to clean larger parts of the vacuum interface, such as the curtain plate, multiple times.
 - Only dampen the wipe or swab with a small amount of water or cleaning solution. Water might cause deterioration of the wipe, and thus contamination of the mass spectrometer.
 - Do not rub the wipe across the aperture. Clean around the aperture so that fibers from the wipes do not go into the mass spectrometer.
-

- Do not put the brush in the aperture on the curtain plate, orifice plate, or IQ0 lens.

Routine Cleaning

These warnings are applicable to all of the procedures in this section.



DANGER! Electrical Shock Hazard. Do this procedure only if you are a qualified maintenance person (QMP) or trained SCIEX field service employee (FSE).



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Before cleaning or maintenance procedures are started, identify if decontamination is required. If radioactive materials, biological agents, or toxic chemicals have been used with the system, then the customer must decontaminate the system before cleaning or maintenance procedures are done.



WARNING! Toxic Chemical Hazard. To use, keep, stow, and discard chemicals safely, refer to the chemical product safety data sheets. Obey all of the recommended safety procedures.



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait for the temperature of the ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation. For cooling times for different ion sources, refer to the table.

Table 5-2 Cooling Times

Ion Source	Cooling Time (minutes)
IonDrive Turbo V ion source	90



WARNING! Environmental Hazard. Do not discard system components in municipal waste. To discard components correctly, obey local regulations.

For routine cleaning, clean the curtain plate and the front of the orifice plate. Routine cleaning can be done while the mass spectrometer is under vacuum.

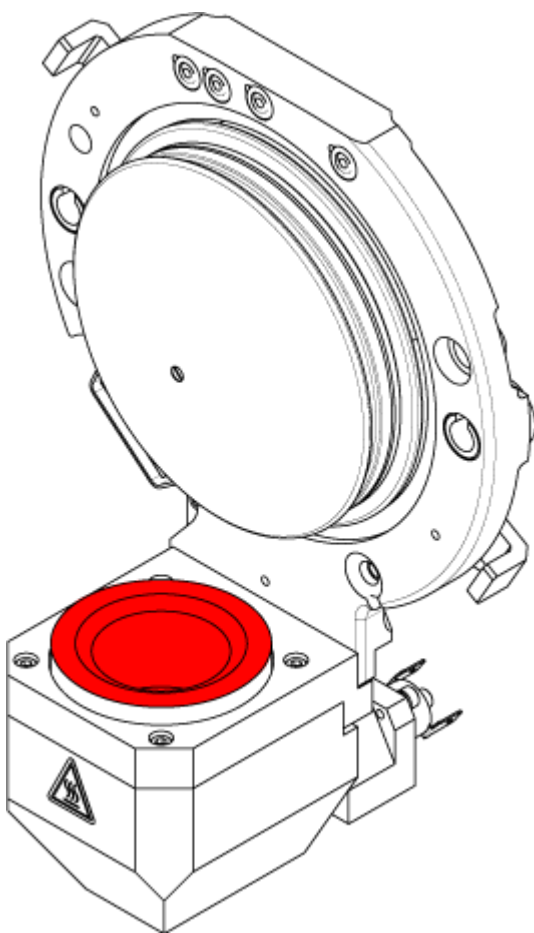
Prepare the Mass Spectrometer



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait a minimum of 30 minutes for the temperature of the IonDrive Turbo V ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation.

CAUTION: Potential System Damage. Do not let anything fall in the source drain when the ion source is removed.

Figure 5-3 Source Drain on the Vacuum Interface



-
1. Deactivate the mass spectrometer and any devices. Refer to the document: *Help*.
 2. Remove the ion source. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.

When the ion source is not in use, keep it in a safe location to prevent damage.

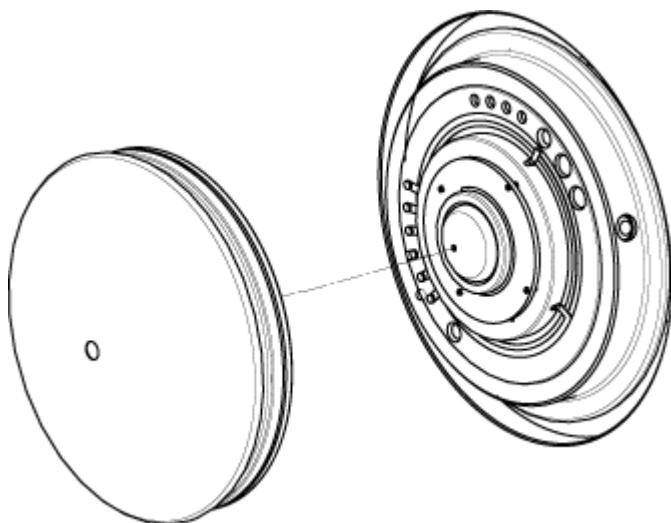
Clean the Curtain Plate

CAUTION: Potential System Damage. When the curtain plate or orifice plate is put on a surface, do not let the aperture tip touch the surface. Make sure that the conical side of the curtain plate points up.

CAUTION: Potential System Damage. To prevent damage to the aperture, do not put a wire or metal brush in the aperture on the curtain plate, orifice plate, interface heater, IQ0 lens, or IQ00 lens.

1. Pull the curtain plate straight off the vacuum interface, and then put the curtain plate conical side up on a clean, stable surface.

Figure 5-4 Curtain Plate Removal



The curtain plate is held in position by three ball spring latches on the orifice plate.

Tip! If the curtain plate does not immediately disconnect from the orifice plate, then turn the curtain plate a small amount, less than 90 degrees, to release the ball spring latches.

2. Dampen a lint-free wipe with LC-MS-grade water, and then clean both sides of the curtain plate.
-

Note: If required, then use multiple wipes.

3. Do step 2 again with 100% LC-MS-grade isopropanol or 100% LC-MS-grade methanol.
 4. Use a dampened wipe or small poly swab to clean the aperture.
 5. Wait until the curtain plate is dry.
-

Service and Maintenance Information

6. Examine the curtain plate for solvent stains or lint. Use a clean, slightly damp, lint-free wipe to remove residue.

Note: If spotting or filming continues, then the solvent might be contaminated.

Clean the Front of the Orifice Plate

CAUTION: Potential System Damage. Do not remove the interface heater to clean the surface of the orifice plate. Frequent removal of the interface heater can cause damage. Surface cleaning of the interface heater is sufficient for routine cleaning.

CAUTION: Potential System Damage. To prevent damage to the aperture, do not put a wire or metal brush in the aperture on the curtain plate, orifice plate, interface heater, IQ0 lens, or IQ00 lens.

Note: Do not use SCIEX Cleaning Powder to clean the orifice plate while it is installed on the mass spectrometer.

1. Dampen a poly swab with LC-MS-grade water, and then wipe the front of the orifice plate and the interface heater.
2. Do step 1 again with the isopropanol or methanol.
3. Wait until the orifice plate is dry.
4. Examine the orifice plate for solvent stains or lint. Use a clean, moist, lint-free wipe to remove residue.

Note: If spotting or filming continues, then the solvent might be contaminated.

Put the Mass Spectrometer Back in Service

1. Install the curtain plate.
2. Install the ion source on the mass spectrometer. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.
To tighten the ion source in position, turn the source latches down into the locking position.
3. If the mass spectrometer is connected to the LC system, then install all of the connections to the LC system.
4. Activate the mass spectrometer and any devices. Refer to the document: *Help*.

Full Cleaning (Excluding the Q0 Region)

The warnings that follow are applicable to all of the procedures in this section.



DANGER! Electrical Shock Hazard. Do this procedure only if you are a qualified maintenance person (QMP) or trained SCIEX field service employee (FSE).



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Before cleaning or maintenance procedures are started, identify if decontamination is required. If radioactive materials, biological agents, or toxic chemicals have been used with the system, then the customer must decontaminate the system before cleaning or maintenance procedures are done.



WARNING! Toxic Chemical Hazard. To use, keep, stow, and discard chemicals safely, refer to the chemical product safety data sheets. Obey all of the recommended safety procedures.



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait for the temperature of the ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation. For cooling times for different ion sources, refer to the table.

Table 5-3 Cooling Times

Ion Source	Cooling Time (minutes)
IonDrive Turbo V ion source	90



WARNING! Electrical Shock Hazard. Before fittings or tubing are touched or examined for leaks, turn off the high-voltage power to the ion source. To turn off the high-voltage power, remove the ion source or put the system in Standby state. If the high-voltage power is on and the user touches a liquid leak from the probe fittings or tubing, then an electric shock might occur.



WARNING! Environmental Hazard. Do not discard system components in municipal waste. To discard components correctly, obey local regulations.

If sensitivity loss or charging (a significant loss of sensitivity over a short period of time) continues to occur in the ions of interest after routine cleaning, then clean the curtain plate, orifice plate, and IonDrive QJet ion guide.

Before these components are cleaned, find if the contamination has extended to the Q0 region. Refer to the section: [Verify Q0 Region Operation](#). If it does, then the Q0 region must also be cleaned.

Note: Do not clean the Q0 region unless there is evidence of contamination in this region.

Service and Maintenance Information

For full cleaning, clean the curtain plate, orifice plate, and IonDrive QJet ion guide while the mass spectrometer is at atmospheric pressure (vented). Complete these tasks in the order that follows:

1. [Prepare the SCIEX Cleaning Solution.](#)
2. [Prepare the Mass Spectrometer.](#)
3. [Use the SCIEX Cleaning Solution to Clean the Curtain Plate.](#)
4. [Use the SCIEX Cleaning Solution to Clean the Orifice Plate.](#)
5. [Do a Basic Cleaning of the IonDrive QJet Ion Guide](#) or [Do an Advanced Cleaning of the IonDrive QJet Ion Guide.](#)
6. [Put the Mass Spectrometer Back in Service.](#)
7. [Verify Q0 Region Operation.](#)

Verify Q0 Region Operation



WARNING! Electrical Shock Hazard. Before fittings or tubing are touched or examined for leaks, turn off the high-voltage power to the ion source. To turn off the high-voltage power, remove the ion source or put the system in Standby state. If the high-voltage power is on and the user touches a liquid leak from the probe fittings or tubing, then an electric shock might occur.

- Change polarity, scan for several minutes, and then change back to the initial polarity. For example, when a positive mode experiment is run, change to negative mode.

Table 5-4 Effects of Polarity Change on Sensitivity

Result	Recommended Action
Sensitivity improves temporarily, and then begins to decrease gradually. Q0 region contamination is suspected.	Clean the curtain plate, orifice plate, and IonDrive QJet ion guide, and then clean the Q0 region.
Sensitivity is the same after the polarity change. Q0 region contamination is not suspected.	Clean the curtain plate, orifice plate, and IonDrive QJet ion guide only.

Prepare the SCIEX Cleaning Solution



WARNING! Causes serious eye irritation. Causes skin irritation. Might cause respiratory irritation. Might form combustible dust concentrations in air.

1. In a 4 L beaker, mix one packet of newly opened SCIEX Cleaning Powder with 1.5 L of DI water (18.2 MΩ·cm) at ambient temperature (approximately 21 °C, 69.8 °F).

Note: A full cleaning usually requires a minimum of two packets of the SCIEX Cleaning Powder and 3.0 L of water.

2. Use a stir stick to mix the solution until the powder is dissolved.

Tip! If a magnetic bead and mixing plate are available, then put the bead in the beaker, and then put the beaker on the mixing plate. Mix the solution until the powder is dissolved, and then remove the bead from the beaker.

3. Remove the stir stick from the beaker.

Note: The prepared cleaning solution can be used for 8 hours. After 8 hours, discard the cleaning solution. If required, then prepare new cleaning solution.

Prepare the Mass Spectrometer



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait for the temperature of the ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation. For cooling times for different ion sources, refer to the table.

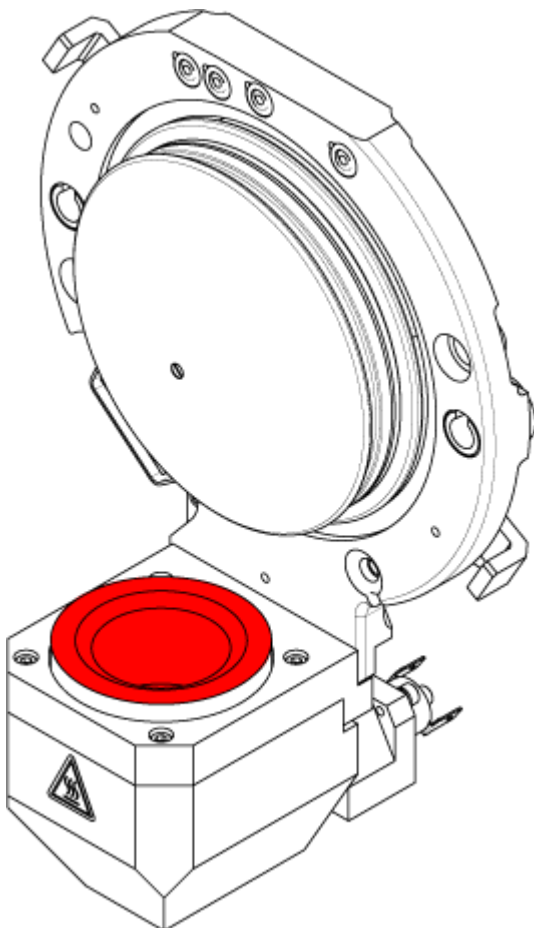
Table 5-5 Cooling Times

Ion Source	Cooling Time (minutes)
IonDrive Turbo V ion source	90

CAUTION: Potential System Contamination. Do not force venting. To do so can cause contaminants to enter the mass spectrometer.

CAUTION: Potential System Damage. Do not let anything fall in the source drain when the ion source is removed.

Figure 5-5 Source Drain on the Vacuum Interface



1. Shut down the system.

Note: Make sure that the gas flows are stopped.

2. Wait a minimum of 25 minutes for the mass spectrometer to vent naturally.
3. Disconnect the mains supply cables of the mass spectrometer and roughing pump from the mains supply outlet.
4. Remove the ion source. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.
When the ion source is not in use, keep it in a safe location to prevent damage.

Use the SCIEX Cleaning Solution to Clean the Curtain Plate

CAUTION: Potential System Damage. When the curtain plate or orifice plate is put on a surface, do not let the aperture tip touch the surface. Make sure that the conical side of the curtain plate points up.

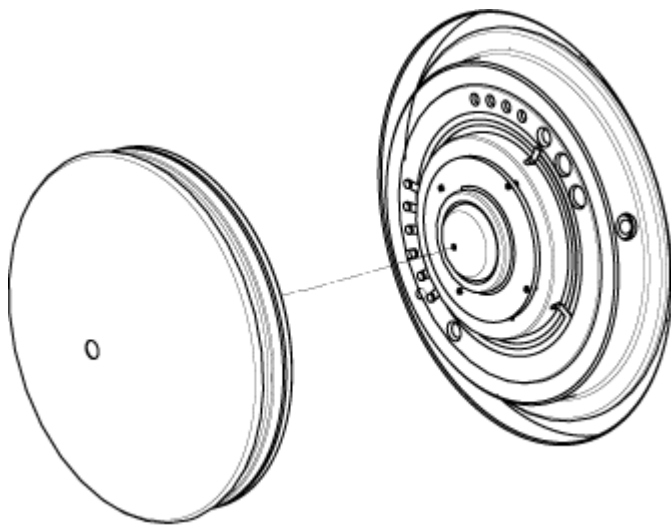
CAUTION: Potential System Damage. To prevent damage to the aperture, do not put a wire or metal brush in the aperture on the curtain plate, orifice plate, interface heater, IQ0 lens, or IQ00 lens.

Note: To use LC-MS-grade methanol or LC-MS-grade isopropanol to clean the curtain plate, refer to the section: [Clean the Curtain Plate](#).

Note: To prevent residue on parts, do not let the parts air-dry. Rinse parts immediately after cleaning, and then blow them dry with nitrogen immediately after rinsing.

1. Pull the curtain plate straight off the vacuum interface, and then put the curtain plate conical side up on a clean, stable surface.

Figure 5-6 Curtain Plate Removal



The curtain plate is held in position by three ball spring latches on the orifice plate.

Tip! If the curtain plate does not immediately disconnect from the orifice plate, then turn the curtain plate a small amount, less than 90 degrees, to release the ball spring latches.

2. Soak a clean, lint-free wipe in the cleaning solution, and then clean both sides of the curtain plate.

Service and Maintenance Information

Note: If required, then use multiple wipes.

3. Do step 2 two more times.
4. Rinse the curtain plate under cold, flowing tap water for 3 minutes.
5. Rinse the curtain plate in flowing DI or LC-MS-grade water for 1 minute.
6. Use the lubricant-free blow gun to dry the curtain plate until no water droplets can be seen.

Use the SCIEX Cleaning Solution to Clean the Orifice Plate

CAUTION: Potential System Damage. When the curtain plate or orifice plate is put on a surface, do not let the aperture tip touch the surface. Make sure that the conical side of the curtain plate points up.

CAUTION: Potential System Damage. To prevent damage to the aperture, do not put a wire or metal brush in the aperture on the curtain plate, orifice plate, interface heater, IQ0 lens, or IQ00 lens.

Note: To prevent residue on parts, do not let the parts air-dry. Rinse parts immediately after cleaning, and then blow them dry with nitrogen immediately after rinsing.

1. At the same time, hold the orifice plate with one hand and use the other hand to release the spring latches at the 4 o'clock and 10 o'clock positions. Then remove the orifice plate and put it, conical side up, on a clean, stable surface.

Figure 5-7 Orifice Plate Removal

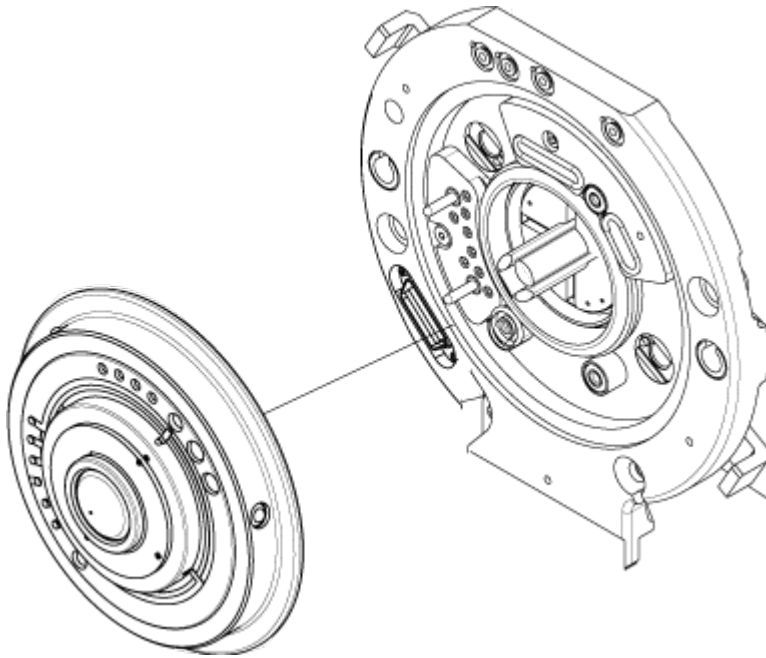
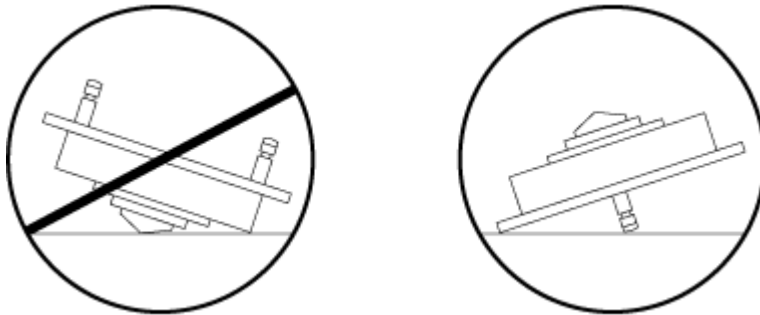


Figure 5-8 Orifice Plate Resting Position



CAUTION: Potential System Damage. During removal, hold the orifice plate tightly. If the orifice plate falls, then damage might occur.

2. Soak a clean, lint-free wipe in the cleaning solution, and then clean the front and back surfaces of the orifice plate.

Note: If required, then use multiple wipes.

3. Do step 2 two more times.
4. Rinse the orifice plate under cold, flowing tap water for 3 minutes.
5. Rinse the orifice plate in flowing DI or LC-MS-grade water for 1 minute.

Service and Maintenance Information

6. Use the lubricant-free blow gun to dry the orifice plate until no water droplets can be seen.
7. Examine the aperture.

If there is residue in the aperture or the aperture is not circular, then contact SCIEX support for guidance.

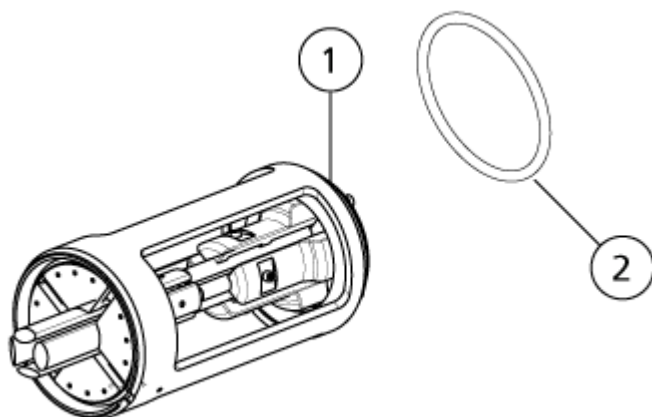
Clean the IonDrive QJet Ion Guide

Do a basic cleaning procedure regularly to clean the IonDrive QJet ion guide. If this procedure does not resolve contamination issues, then refer to the section: [Do an Advanced Cleaning of the IonDrive QJet Ion Guide](#).

Do a Basic Cleaning of the IonDrive QJet Ion Guide

1. Remove the ion guide and then put it on a clean, stable surface.
2. Remove the O-ring from the back of the ion guide.

Figure 5-9 IonDrive QJet Ion Guide and O-Ring



Item	Description
1	IQ0 lens
2	O-ring

3. Hold the ion guide over a 500 mL beaker (or equivalent), with the IQ0 lens side down, and then pour LC-MS-grade water over and through it.
4. Invert the ion guide, and then do step 3 again.
5. Do step 3 and step 4 again with methanol.
6. Wait until the ion guide is dry.

7. Examine the ion guide for solvent stains or lint, and then remove residue with a clean, slightly damp, lint-free wipe.

Note: If spotting or filming continues, then the solvent might be contaminated.

8. To clean the O-ring, pull the O-ring gently through a lint-free wipe that has been slightly dampened with methanol or isopropanol.
9. Install the O-ring on the back of the ion guide.

Do an Advanced Cleaning of the IonDrive QJet Ion Guide

Do this procedure when the basic cleaning does not resolve contamination problems.

1. Remove the ion guide, and then put it on a clean, stable surface.
2. Remove the O-ring from the back of the ion guide.

CAUTION: Potential System Damage. Be careful not to make scratches on the IQ0 lens.

3. Remove the two 1.5 mm hex screws that attach the IQ0 lens to the ion guide.
4. Use the circlip pliers to remove the IQ0 lens from the ion guide.
5. Put cold tap water over and through the ion guide to rinse it.
6. Soak the brush in the cleaning solution.

CAUTION: Potential System Damage. Do not let the metal handle of the brush touch the rods, and do not bend the brush handle.

7. Put the brush in the center of the ion guide, and then apply a large amount of the cleaning solution.
8. Clean for 1 minute.

Note: To prevent contamination of the cleaning solution, do not soak the ion guide in the cleaning solution.

9. Do step 6 to step 8 again until all of the surface has been cleaned.
 10. Use a brush to clean the non-metal parts of the ion guide.
 11. Put cold tap water over and through the ion guide for 1 minute and brush with the soapy brush.
 12. Put cold tap water over and through the ion guide for 3 minutes. Rinse any soap from the gloves.
 13. Make sure that all of the residue has been rinsed away.
 14. Look for signs of water beading on the surface to make sure that the ion guide is clean.
-

Service and Maintenance Information

15. Put LC-MS-grade water over and through the ion guide for 1 minute.



WARNING! Toxic Chemical Hazard. Use a fume hood to pour or evaporate the solvents. Refer to the chemical product safety data sheets, and obey all of the recommended safety procedures when the chemicals are used, stowed, and discarded.

16. Under a fume hood, put 100 mL to 200 mL of isopropanol or methanol over the ion guide. Make sure that isopropanol or methanol is fully applied to the surface. Catch any waste, and then discard it in the specified waste container.

Isopropanol and methanol facilitate drying.



WARNING! Compressed Gas Hazard. When compressed gas is in use, obey local regulations. Make sure that the gas stream is not pointed at the operator.

17. Use clean dry air (CDA) or nitrogen to dry the ion guide. Make sure to remove all droplets.

Note: Gas generators do not have sufficient flow to displace remaining droplets.

18. Clean any spots that remain on the ion guide with a lint-free wipe dampened with isopropanol or methanol.
19. Do step 10 to step 18 to clean the IQ0 lens.
20. To clean the O-ring, pull it carefully through a lint-free wipe slightly dampened with isopropanol or methanol.
21. Install the O-ring and IQ0 lens on the ion guide.

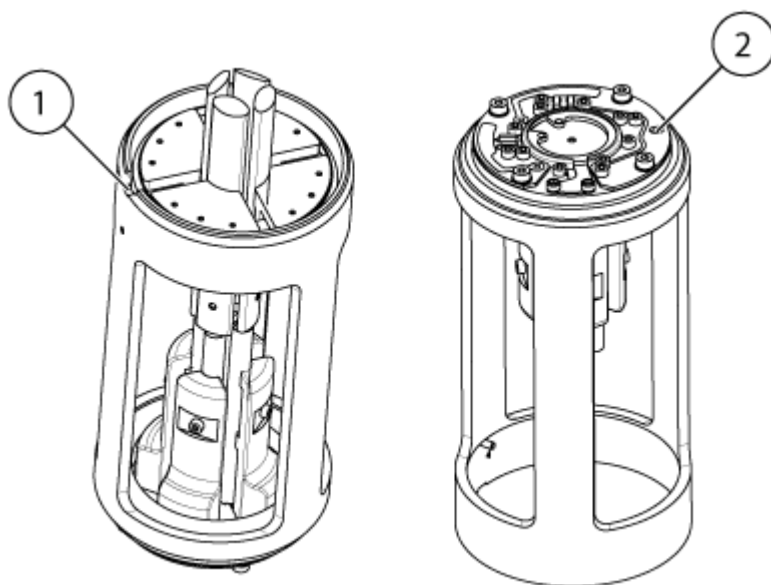
Put the Mass Spectrometer Back in Service

1. Align the locator pin in the mass spectrometer with the hole in the ion guide, and then install the ion guide. Push the ion guide until resistance is felt. If it is correctly installed, then it will pop out slightly when released.

The notch at the front of the ion guide aligns with the hole at the back.

Note: If the ion guide is not correctly installed, then pull it out slightly, turn it slightly, and try again.

Figure 5-10 IonDrive QJet Ion Guide



Item	Name
1	Notch
2	Hole for the locator pin

2. Install the orifice plate:
 - a. Make sure that the sealing O-ring is on the interface. When the orifice plate is installed, the O-ring touches the ceramic body of the orifice plate.
 - b. Align the pins on the orifice plate with the related holes in the mass spectrometer.
 - c. To install the orifice plate, push it into position until two clicks are heard.
3. Install the curtain plate.
4. Install the ion source. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.
5. Start up the mass spectrometer. Refer to the section: [Start Up the System](#).

Note: If the gas tubing is not connected or the gas flows are stopped, then make sure that the gas tubing is connected correctly and that the gas flows are started.

Q0 Cleaning (Optional)

The warnings that follow apply to all procedures in this section.

Service and Maintenance Information



DANGER! Electrical Shock Hazard. Do this procedure only if you are a qualified maintenance person (QMP) or trained SCIEX field service employee (FSE).



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait for the temperature of the ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation. For cooling times for different ion sources, refer to the table.

Table 5-6 Cooling Times

Ion Source	Cooling Time (minutes)
IonDrive Turbo V ion source	90



WARNING! Toxic Chemical Hazard. To use, keep, stow, and discard chemicals safely, refer to the chemical product safety data sheets. Obey all of the recommended safety procedures.



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Before cleaning or maintenance procedures are started, identify if decontamination is required. If radioactive materials, biological agents, or toxic chemicals have been used with the system, then the customer must decontaminate the system before cleaning or maintenance procedures are done.



WARNING! Environmental Hazard. Do not discard system components in municipal waste. To discard components correctly, obey local regulations.

Tip! Clean the Q0 region regularly to keep the impact of charging, a significant loss of sensitivity of the ions of interest over a short period of time, on the quadrupoles and lenses to a minimum. Refer to the section: [Q0 Cleaning \(Optional\)](#)

If the Q0 region is contaminated, then it can be cleaned. The mass spectrometer must be at atmospheric pressure and the other front-end components must be removed.

Note: To find if the region is contaminated, do the Q0 test. Refer to the section: [Verify Q0 Region Operation](#).

Complete these tasks in this order:

1. [Prepare the Mass Spectrometer.](#)
 2. [Prepare the Q0 Cleaning Tool.](#)
-

3. [Clean the Tip of the Rods.](#)
4. [Clean Beyond the Tip Area.](#)
5. [Put the Mass Spectrometer Back in Service.](#)

Prepare the Mass Spectrometer



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait for the temperature of the ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation. For cooling times for different ion sources, refer to the table.

Table 5-7 Cooling Times

Ion Source	Cooling Time (minutes)
IonDrive Turbo V ion source	90

CAUTION: Potential System Contamination. Do not force venting. To do so can cause contaminants to enter the mass spectrometer.

1. Shut down the system. Refer to the section: [Shut Down and Vent the System](#). Wait for a minimum of 25 minutes for the mass spectrometer to vent naturally, and then disconnect the mains supply cables of the mass spectrometer and roughing pump from the mains supply outlet.

2. Remove the ion source. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.

When the ion source is not in use, stow it to protect it from damage and to maintain operating integrity.

CAUTION: Potential System Damage. When the curtain plate or orifice plate is put on a surface, do not let the aperture tip touch the surface. Make sure that the conical side of the curtain plate points up.

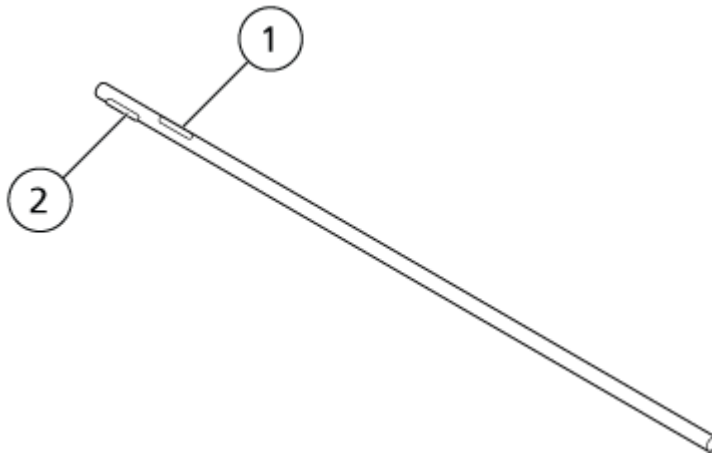
3. Remove the curtain plate, orifice plate, and IonDrive QJet ion guide, and then put them on a clean, stable surface. Make sure that the conical side of the curtain plate and orifice plate is facing upwards.

Prepare the Q0 Cleaning Tool

Note: Clean Q0 in two steps, to avoid the contaminants being pushed in to the IQ1 lens or through to the other side.

1. Dampen a wipe with methanol, and then clean the outside surface of the Q0 cleaning tool.

Figure 5-11 Q0 Cleaning Tool



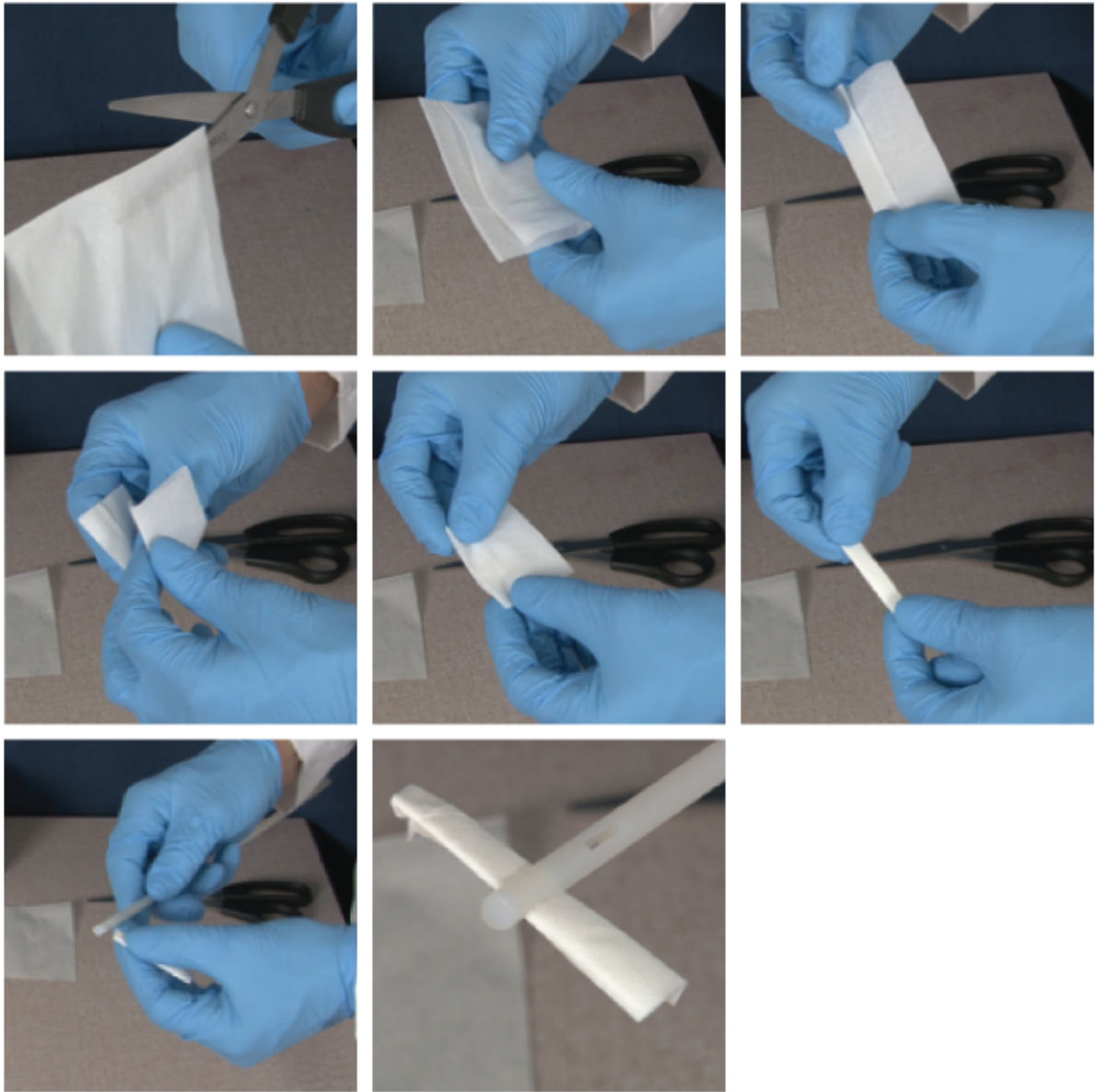
Item	Description
1	Bottom eyelet
2	Top eyelet

2. Let the Q0 cleaning tool dry.

CAUTION: Potential System Damage. Prepare the wipe correctly, to make sure that it is held tightly in the eyelet of the cleaning tool, and to prevent it from falling off during use.

3. Follow these steps to prepare the tool:
 - a. Cut a wipe in half on the fold.
 - b. Fold the wipe so the cut edge is on the inside. The folded wipe must be about 5.7 cm (2.25 inches) long.
 - c. Put the wipe through the top eyelet.

Figure 5-12 Prepare the Q0 Cleaning Tool



CAUTION: Potential System Damage. If water is used, then do not dampen the wipes excessively. Excessive moisture can cause the wipes to fall apart in the chamber.

4. Dampen the wipe slightly with cleaning solution.
5. Blot the wipe with a dry wipe to remove excess moisture.
6. Flatten the wipes for easy insertion into Q0.

Clean the Tip of the Rods

CAUTION: Potential System Damage. During cleaning, do not force the rods apart.

1. Put the Q0 cleaning tool between the Q0 rods approximately 2.5 cm (1 inch) deep.
 2. To make sure that the wipe does not become a wad and the tool is easy to remove, turn the Q0 cleaning tool two full turns, clockwise.
 3. Slowly pull the tool out of the Q0 rod set. Do not push the tool more in to the Q0 rod set.
 4. Remove the contaminated wipe from the Q0 cleaning tool, and then obey standard laboratory operating procedures to discard the wipe.
 5. Put a clean wipe, dampened with LC-MS-grade methanol, in the Q0 cleaning tool.
 6. Do step 1 to step 4 a minimum of one more time.
-

Note: If severe contamination is suspected, then more cleaning might be required.

7. Remove the contaminated wipe from the Q0 cleaning tool and then dispose of it according to standard laboratory operating procedures.

Clean Beyond the Tip Area

CAUTION: Potential System Damage. To avoid striking the IQ1 lens, do not force the Q0 cleaning tool past the shield in the Q0 rod set. Resistance will be felt when the tool touches the shield.

1. Put a clean wipe, dampened with cleaning solution, on the tip area.
 2. Push the Q0 cleaning tool between the Q0 rods until resistance is felt when it contacts the shield.
 3. Slowly turn the Q0 cleaning tool as it is pulled out of the mass spectrometer. This makes sure that the wipe does not become a wad and the tool is easy to remove.
 4. Remove the contaminated wipe from the Q0 cleaning tool, and then obey standard laboratory operating procedures to discard the wipe.
 5. Put a clean wipe, dampened with LC-MS-grade methanol, in the Q0 cleaning tool.
 6. Do step 2 to step 4 again.
 7. Wait until the Q0 region is dry.
 8. (Optional) Dry the Q0 region, while it is still wet, with a flow of clean air or nitrogen.
 9. Continue with the section: [Put the Mass Spectrometer Back in Service](#).
-

Empty the Source Exhaust Drain Bottle



DANGER! Electrical Shock Hazard. Do this procedure only if you are a qualified maintenance person (QMP) or trained SCIEX field service employee (FSE).



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait a minimum of 30 minutes for the temperature of the IonDrive Turbo V ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation.



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Put hazardous materials in correctly labeled waste containers, and obey local regulations to discard them.



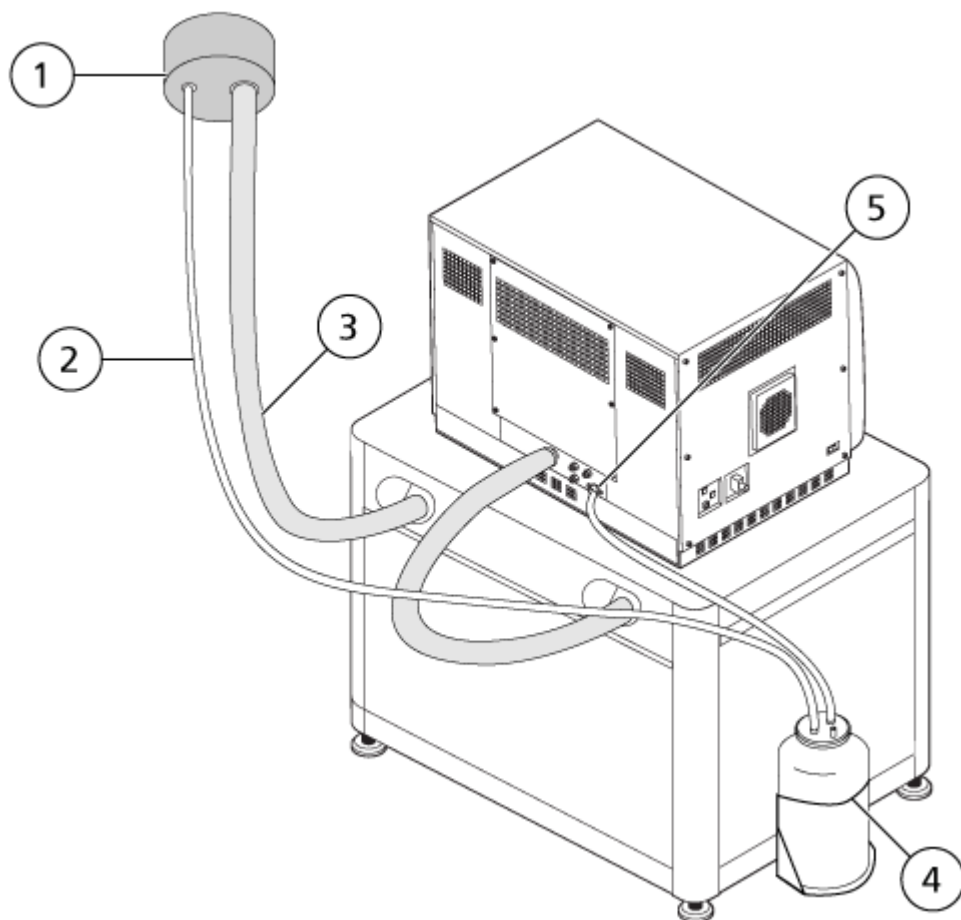
WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. If hazardous, biohazardous, or radioactive materials have been analyzed in the mass spectrometer, then make sure to vent exhaust gases to a dedicated laboratory fume hood or exhaust system, and make sure that the ventilation tubing is attached with clamps. Make sure that the laboratory has the correct air exchange rate for the work done.

Note: Make sure that there are no kinks, sags, or twists in the source waste tubing.

Examine the source exhaust drain bottle regularly, and empty it before it becomes full. Also examine the bottle and the fitting for leaks, and if required, then tighten connections or replace components. Do the steps in this procedure to empty the bottle.

1. Remove the ion source. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.
2. Loosen the clamps that connect the hoses to the cap of the source exhaust drain bottle.

Figure 5-13 Source Exhaust Drain Bottle (Oil-Sealed Roughing Pump Configuration)



Item	Description
1	Connection to vent
2	Source exhaust drain tubing: 2.5 cm (1 inch) inner diameter (i.d.)
3	Roughing pump exhaust hose: 3.2 cm (1.25 inches) i.d.
4	Source exhaust drain bottle To prevent spillage, make sure that the bottle is correctly installed.
5	Source exhaust connection to the mass spectrometer: 1.6 cm (0.625 inch) i.d.

Note: Hose clamps attach the source exhaust hose to the drain bottle, mass spectrometer, and laboratory vent.

3. If applicable, then lift the drain bottle out of the holder.

4. Disconnect the hoses from the cap.
5. Remove the cap from the drain bottle.
6. Empty the drain bottle, and then obey laboratory procedures and local waste regulations to discard the waste.
7. Install the cap on the bottle, and then put the bottle in the holder.
8. Attach the hoses to the cap, and then attach them tightly with clamps.

Replace the Air Filters in the Mass Spectrometer



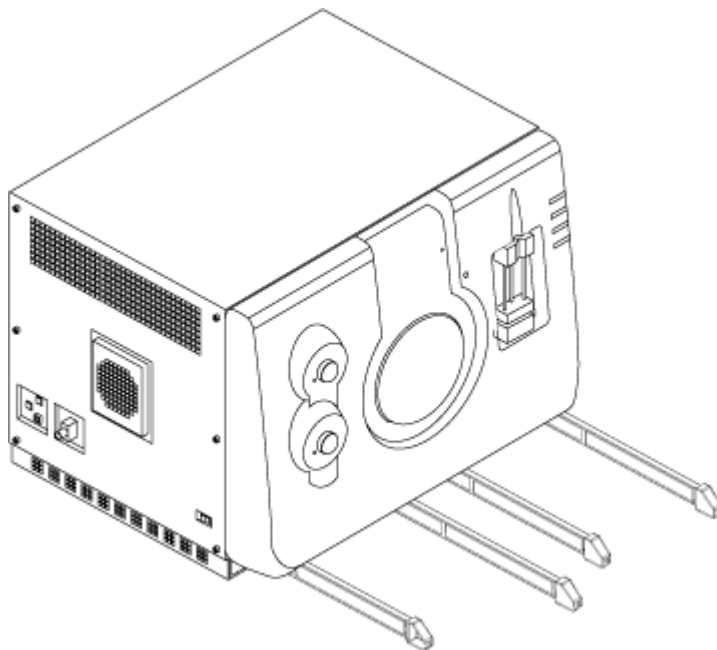
DANGER! Electrical Shock Hazard. Do this procedure only if you are a qualified maintenance person (QMP) or trained SCIEX field service employee (FSE).

The mass spectrometer uses four air filters, which are found at the base of the chassis. Examine the air filters in the mass spectrometer every 6 months. If the air filters are dirty, then clean or replace them.

Prerequisite Procedures
• Shut down the system. Refer to the section: Shut Down and Vent the System.

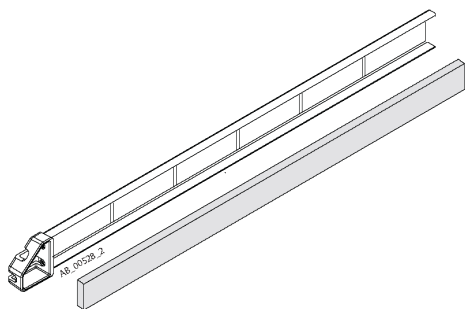
1. Pull the filters out from the front of the mass spectrometer chassis.

Figure 5-14 Location of the Air Filters in the Mass Spectrometer



2. Remove the air filter.

Figure 5-15 Mass Spectrometer Air Filter



3. Carefully install the foam in the air filter holder, and then install the air filter in the mass spectrometer.
The air filter can be installed in any direction.

Replace the Interface Heater



DANGER! Electrical Shock Hazard. Do this procedure only if you are a qualified maintenance person (QMP) or trained SCIEX field service employee (FSE).



WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Before cleaning or maintenance procedures are started, identify if decontamination is required. If radioactive materials, biological agents, or toxic chemicals have been used with the system, then the customer must decontaminate the system before cleaning or maintenance procedures are done.



WARNING! Environmental Hazard. Do not discard system components in municipal waste. To discard components correctly, obey local regulations.



WARNING! Hot Surface Hazard. Before maintenance procedures are started, wait for the temperature of the ion source to decrease sufficiently to prevent a burn hazard. Some surfaces of the ion source and vacuum interface become hot during operation. For cooling times for different ion sources, refer to the table.

Table 5-8 Cooling Times

Ion Source	Cooling Time (minutes)
IonDrive Turbo V ion source	90

Prerequisite Procedures

- Vent and shut down the system. Refer to the section: [Shut Down and Vent the System](#).
- Remove the ion source. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*. When the ion source is not in use, keep it in a safe location to prevent damage.
- Remove the curtain plate and the orifice plate.

Required Materials

- Orifice plate interface heater kit
- Small flat-bladed screwdriver
- Powder-free gloves, nitrile or chloroprene recommended

Figure 5-16 Orifice Plate with the Removable Interface Heater

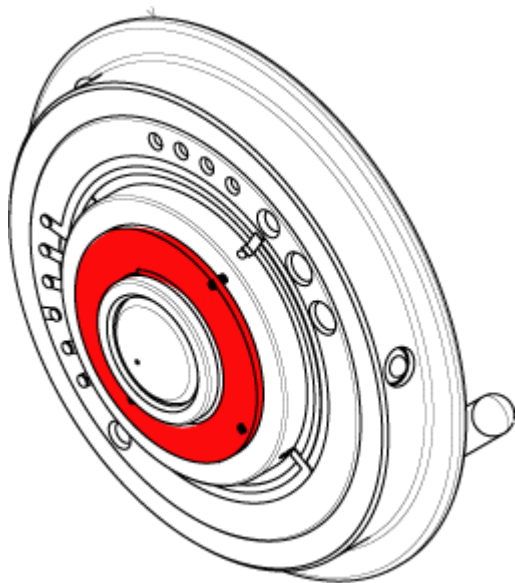
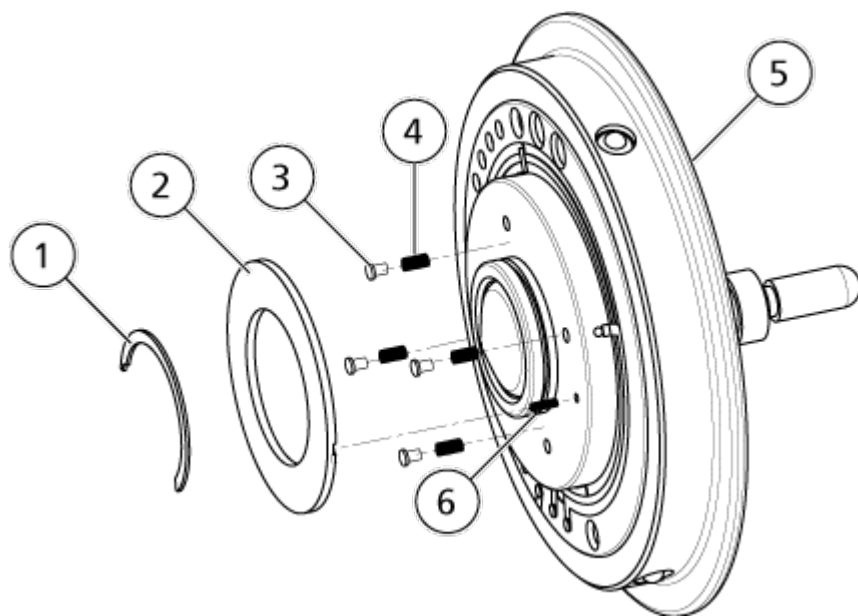


Figure 5-17 Interface Heater Components



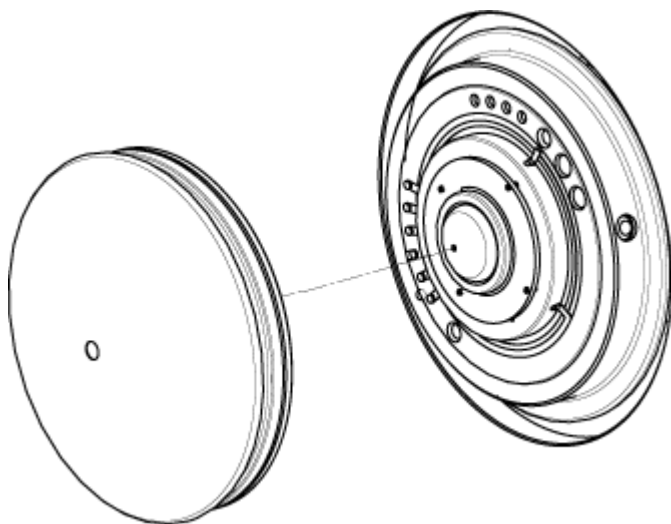
Item	Name	Description
1	Retaining clip	Holds the heater unit in position.

Item	Name	Description
2	Heater	Supplies heat to both the gas for the Curtain Gas interface and the apertures for the curtain plate and orifice plate.
3	Pin buttons (4)	Holds the heater springs in position.
4	Heater springs (4)	Holds the heater in a sprung setting.
5	Orifice plate	Supplies a division between atmosphere and the pressure of the differentially pumped interface.
6	Alignment spring	Helps to align the heater with the orifice plate.

Remove the Interface Heater

1. Pull the curtain plate straight off the vacuum interface, and then put the curtain plate conical side up on a clean, stable surface.

Figure 5-18 Curtain Plate Removal



The curtain plate is held in position by three ball spring latches on the orifice plate.

Tip! If the curtain plate does not immediately disconnect from the orifice plate, then turn the curtain plate a small amount, less than 90 degrees, to release the ball spring latches.

2. At the same time, hold the orifice plate with one hand and use the other hand to release the spring latches at the 4 o'clock and 10 o'clock positions. Then remove the orifice plate and put it, conical side up, on a clean, stable surface.

Figure 5-19 Orifice Plate Removal

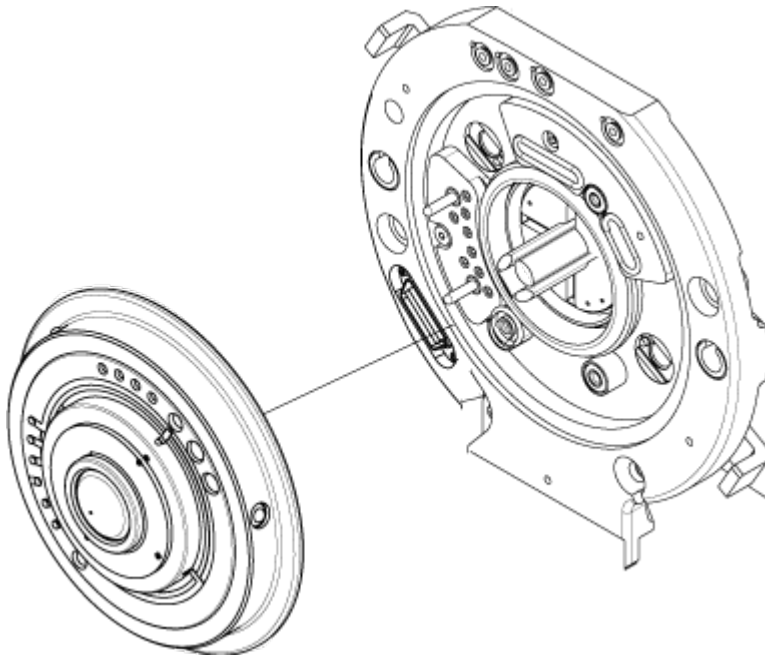
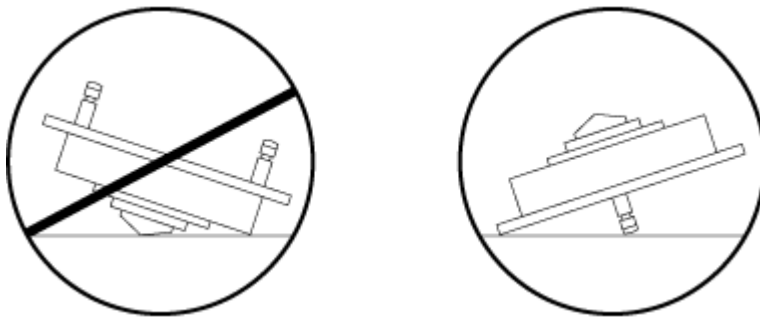


Figure 5-20 Orifice Plate Resting Position



CAUTION: Potential System Damage. During removal, hold the orifice plate tightly. If the orifice plate falls, then damage might occur.

3. To remove the interface heater from the center of the orifice plate, gently lift and then push the retaining clip with a small flat-bladed screwdriver until the clip pops off.

The heater is on four pin buttons and springs. It has another alignment spring for positioning.

4. Lift the heater off the orifice plate, and then remove the pin buttons and springs.

Install the Interface Heater

1. Remove the packaging from the new heater components.
2. Put each pin button with one of the four heater springs.
3. Put the heater springs and pin buttons in the four evenly spaced holes on the orifice plate.
4. Put the alignment spring in the positioning hole on the orifice plate.
5. Put the heater on the pin buttons. Align the alignment spring with the small positioning notch on the edge of the heater.
6. Carefully apply pressure equally, and push in the heater.
7. Push the retaining clip into position.
8. Install the orifice plate.
9. Install the curtain plate.
10. Install the ion source. Refer to the document: *IonDrive Turbo V Ion Source Operator Guide*.
11. Start up the mass spectrometer. Refer to the section: [Start Up the System](#).

Storage and Handling



WARNING! Environmental Hazard. Do not discard system components in municipal waste. To discard components correctly, obey local regulations.

If the mass spectrometer must be put into storage for a long time or prepared for shipping, then contact a SCIEX FSE for decommissioning information. To disconnect power from the mass spectrometer, remove the mains supply connector from the mains supply.

Note: The ion source and mass spectrometer must be transported and kept at a temperature between $-30\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$ ($-22\text{ }^{\circ}\text{F}$ to $140\text{ }^{\circ}\text{F}$) and relative humidity not more than 99%, non-condensing. Stow the system at an altitude not more than 2,000 m (6,562 ft) above sea level.

Mass Spectrometer Troubleshooting 6

This section contains information for troubleshooting basic system issues. Some activities can only be done by a SCIEX-trained qualified maintenance person (QMP) in the laboratory. For advanced troubleshooting, contact a SCIEX field service employee (FSE).

Table 6-1 System Issues

Symptom	Possible Cause	Corrective Action
The IonDrive QJet ion guide is very dirty or frequently becomes dirty.	The flow rate of the gas for the Curtain Gas interface is too low.	Examine the setting for the gas for the Curtain Gas interface. If required, then increase it.
A system fault occurred because the vacuum pressure is too high.	1. Oil-sealed roughing pump: The oil level is too low. 2. There is a leak. 3. The incorrect orifice plate is installed.	1. Oil-sealed roughing pump: Refer to the document that comes with the pump. 2. Examine the connections between mass spectrometer and the roughing pump. Make sure that all of the clamps are fully tight. If the leaks persist, then contact an FSE. 3. Install the correct orifice plate.
The mass spectrometer does not pump down to the required base pressure.	There is a leak in the area of the orifice plate.	1. Remove the orifice plate, and then examine it for cracks. If the orifice plate has cracks, then replace it. 2. Examine all off the vacuum connections and vacuum seals for leaks. If a leak is found, then replace the applicable component.

Table 6-1 System Issues (continued)

Symptom	Possible Cause	Corrective Action
The mass spectrometer requires too much time to pump down correctly. Note: The pressure gets to the base pressure only when the aperture in the orifice plate is blocked. When the aperture is not blocked, the mass spectrometer base pressure increases quickly and the mass spectrometer goes into pumpdown mode.	1. The turbo pump controller is defective. The turbo pump controller shows that power consumption is 35 W. Typical power consumption is 100 W. 2. The orifice plate is not sealed correctly.	1. Replace the turbo pump controller. Contact an FSE. 2. Do these steps to seal the orifice plate correctly: a. Press and hold the orifice plate in position to seal it. b. If the orifice plate is not sealed, then remove and install it again. c. If the orifice plate cannot be sealed correctly, then replace it.
A system fault occurred because the temperature of a system module is too high.	1. The air filter in the mass spectrometer is blocked. 2. The ambient temperature is too high.	1. Refer to the section: Replace the Air Filters in the Mass Spectrometer. 2. Adjust the ambient temperature. Note: For the ambient temperature specifications, refer to the document: <i>Site Planning Guide</i>.
The mass spectrometer is in Fault status because of the ion source.	1. The probe is not installed. 2. The probe is not connected correctly.	1. Install the probe. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i>. 2. Remove and then install the probe. Tighten the retaining ring fully. Make sure that the latches on the ion source are locked.

Mass Spectrometer Troubleshooting

Table 6-1 System Issues (continued)

Symptom	Possible Cause	Corrective Action
		Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .
The control software shows that the APCI probe is in use, but the ESI probe is installed.	The F3 fuse is blown.	Contact an FSE.
The spray is not stable.	The electrode is blocked.	Clean or replace the electrode. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .
The interface heater is not Ready.	The interface heater is defective.	Refer to the section: Replace the Interface Heater .
The mass spectrometer resolution is unsatisfactory.	The mass spectrometer is not tuned.	Use the control software to optimize the mass spectrometer. Refer to the document: <i>Help</i> .
Arcing or sparks occur.	The position of the corona discharge needle is incorrect.	If the ESI probe is in use, then turn the corona discharge needle in the direction of the curtain plate and away from the stream of heater gas. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .

Table 6-2 Sensitivity Is Decreased (Performance Has Decreased)

Possible Cause	Corrective Action
The ion source parameters are not optimized.	Optimize the ion source parameters. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .
A failure occurred in the ion source heater.	Make sure that the temperature of the ion source heater increases to the set temperature. If it does not, then contact the local QMP or FSE. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .

Table 6-2 Sensitivity Is Decreased (Performance Has Decreased) (continued)

Possible Cause	Corrective Action
The mass spectrometer is not optimized.	Use the control software to optimize the mass spectrometer. Refer to the document: <i>Help</i> .
The curtain plate is dirty.	Clean the curtain plate. Refer to the sections: Clean the Curtain Plate or Use the SCIEX Cleaning Solution to Clean the Curtain Plate .
The orifice plate is dirty.	Clean the orifice plate. Refer to the sections: Clean the Front of the Orifice Plate or Use the SCIEX Cleaning Solution to Clean the Orifice Plate .
The IonDrive QJet ion guide or IQ0 lens is dirty.	Clean the IonDrive QJet ion guide and IQ0 lens. Refer to the section: Clean the IonDrive QJet Ion Guide .
The Q0 region is dirty.	Clean the Q0 region. Refer to the section: Q0 Cleaning (Optional) . Do a test for contamination of the Q0 region. Refer to the section: Verify Q0 Region Operation .
The front end of the mass spectrometer is dirty.	Clean the front end of the mass spectrometer frequently. Refer to the section: Clean the Vacuum Interface .
The syringe or sample line has a leak.	Examine the syringe or sample line for leaks. Repair any leaks that are found. Make sure that all of the fittings are the correct type and size.
The sample was not prepared correctly, the sample concentration is not correct, or the quality of the sample has decreased.	Use a new sample. Prepare the sample again, and make sure that the concentration is correct.
The probe is not installed correctly.	Remove and install the probe. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> . Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .
The ion source is not installed correctly or it is faulty.	Remove and install the ion source. Make sure that the latches are down. If this does not correct the issue, then install and optimize an alternative ion source. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .

Mass Spectrometer Troubleshooting

Table 6-2 Sensitivity Is Decreased (Performance Has Decreased) (continued)

Possible Cause	Corrective Action
One or more of the O-rings on the vacuum interface is missing.	If the O-rings are on the ion source, then install them on the vacuum interface. If they are missing, then replace them.
There is an issue with the LC system or connections.	Troubleshoot the LC system.
The declustering potential (DP) is not optimized.	Optimize the DP.
The electrode is dirty or blocked.	Replace the electrode. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .

Table 6-3 No Signal or Signal Is Unstable

Possible Cause	Corrective Action
The sample tubing is blocked.	Replace the sample tubing. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .

Table 6-4 Background Noise Issues

Possible Cause	Corrective Action
The ion source temperature, spray voltage, or flow rate for ion source gas 2 (heater gas) is too high.	Optimize the ion source parameters. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .
The syringe or sample tubing is dirty.	Clean or replace the syringe or sample tubing. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i> .
The curtain plate is dirty.	Clean the curtain plate. Refer to the sections: Clean the Curtain Plate or Use the SCIEX Cleaning Solution to Clean the Curtain Plate .
The orifice plate is dirty.	Clean the orifice plate. Refer to the sections: Clean the Front of the Orifice Plate or Use the SCIEX Cleaning Solution to Clean the Orifice Plate .
The IonDrive QJet ion guide or IQ0 lens is dirty.	Do a full cleaning of the front-end components of the mass spectrometer. Refer to the section: Clean the IonDrive QJet Ion Guide .

Table 6-4 Background Noise Issues (continued)

Possible Cause	Corrective Action
The Q0 region is dirty.	Clean the Q0 region. Refer to the section: Q0 Cleaning (Optional) .
The mobile phase is contaminated.	Replace the mobile phase.
The ion source is contaminated.	1. Make sure that the ion source parameters are correct. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i>. 2. Make sure that the solvent is LC-MS-grade. 3. Clean the electrode. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i>. 4. Condition (<i>bake</i>) the ion source: a. Move the probe to the farthest position from the aperture, vertically and horizontally. b. Infuse or inject 50:50 methanol:water with a pump flow rate of 1 mL/min. c. In the control software, set the temperature to 650, ion source gas 1 to 60, and ion source gas 2 to 60. d. Set the gas for the Curtain Gas interface to 45 or 50. e. Operate the system for a minimum of 2 hours. For best results, we recommend that the procedure be done overnight. 5. Replace the ion source electrode or probe. Refer to the document: <i>IonDrive Turbo V Ion Source Operator Guide</i>. 6. Make sure that the concentration of the sample is correct. 7. Clean the ion source more frequently.

Mass Spectrometer Troubleshooting

For sales, technical assistance, or service, contact an FSE or visit the SCIEX website at sciex.com for contact information.

Calibration Ions and Solutions

A

CAUTION: Potential Wrong Result. Do not use expired solutions or solutions that have not been stowed at the indicated storage temperature.

Note: Immediately after use, put a cap on the bottle and then keep it at 2 °C to 8 °C. Refer to the information on the label. Refer to the section: [Hazardous Substance Information](#).

Suggested Tuning Solution

- MS Tuning Solution A, available in the MS Tuning Solution A kit, PN 5324566, or the solutions given in the table that follows.

Table A-1 Alternative Tuning Solutions

System	Q1 and Q3		LIT
	Positive	Negative	Positive and Negative
Triple quadrupole system	POS PPG, 2e–7 M	NEG PPG, 3e–5 M	N/A
Linear ion trap system	POS PPG, 2e–7 M	NEG PPG, 3e–5 M	ES Tuning Solution (1:100 dilution)

Tuning Frequency

Scan Type	Calibration Frequency	Resolution Optimization Frequency
Q1 and Q3	3 months to 6 months	3 months to 6 months
LIT	3 months to 6 months	3 months to 6 months

Calibration Ions and Solutions

Table A-2 Q1, Q3, and LIT Scans for SCIEX 6500+ Systems with MS Tuning Solution A

Polarity	Masses							
Low-Mass								
Positive	69.045	118.086	252.181	477.209	619.284	829.539	923.422	N/A
Negative	68.996	118.993	265.148	475.195	617.269	827.525	921.407	N/A
High-Mass								
Positive	69.045	118.086	252.181	477.209	619.284	829.539	923.422	1524.744
Negative	68.996	118.993	265.148	475.195	617.269	827.525	921.407	1522.730

Table A-3 Q1 and Q3 Scans with POS PPG, 2e–7 M and NEG PPG, 3e–5 M Tuning Solutions

Polarity	Masses							
Low Mass								
Positive	59.05	175.13	500.38	616.46	906.67	N/A	N/A	N/A
Negative	45.00	411.26	585.39	933.64	N/A	N/A	N/A	N/A
High Mass								
Positive	59.05	175.13	500.38	616.46	906.67	1,254.93	1,545.13	1,952.43
Negative	45.00	411.26	585.39	933.64	1,223.85	1,572.10	1,863.31	1,979.39

Table A-4 LIT Scans with ES Tuning Solution (1:100 dilution)

Polarity	Masses				
Low Mass					
Positive	118.09	322.05	622.03	922.01	N/A

Table A-4 LIT Scans with ES Tuning Solution (1:100 dilution) (continued)

Polarity	Masses				
Negative	112.99	431.98	601.98	N/A	N/A
High Mass					
Positive	118.09	322.05	622.03	922.01	1,521.97
Negative	112.99	431.98	601.98	1,033.99	1,633.95

Prepare the Mass Spectrometer to Infuse the Calibration Solution

Required Materials

- 1 mL Luer-Lok syringe, glass
- Needle
- Red PEEK-clad fused-silica tubing (0.005" i.d.)
- Syringe adapter
- 1/16" finger-tight fitting
- LC-MS-grade water
- Lint-free wipe
- One of these tuning solution kits:
 - MS Tuning Solution A kit:

Calibration Ions and Solutions

Required Materials

- MS Wash Solvent
- MS Tuning Solution A
- PPGs Chemical Standards kit

Note: Shake the bottles before use. Slight precipitation or inhomogeneity might occur if the solution is kept at refrigerated temperatures for extended periods of time.



WARNING! Electrical Shock Hazard. Before fittings or tubing are touched or examined for leaks, turn off the high-voltage power to the ion source. To turn off the high-voltage power, remove the ion source or put the system in Standby state. If the high-voltage power is on and the user touches a liquid leak from the probe fittings or tubing, then an electric shock might occur.

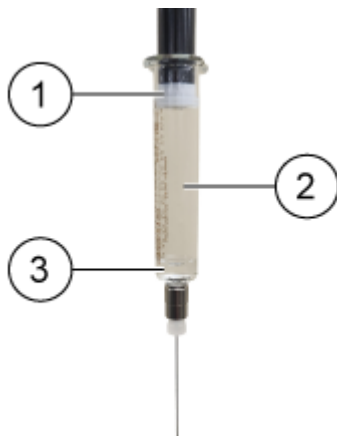
CAUTION: Potential Wrong Result. To prevent peaks that Interfere or background noise because of the high sensitivity of the mass spectrometer, make sure to use dedicated tubing and a dedicated syringe with the MS Tuning Solution A and MS Wash Solvent. This prevents possible solution interaction with the metal tips that are used in other syringe fittings.

1. Let all solutions go to ambient temperature.
2. Rinse the plunger:
If the syringe has been used before, then this step can be ignored.
 - a. Remove the plunger from the syringe, and then rinse it with LC-MS-grade water.
 - b. Use the lint-free wipe to fully dry the plunger.
 - c. Examine the plunger for dirt or debris. If dirt or debris are found, then do these steps again.
3. Connect the syringe and needle.
4. Rinse the syringe and needle. Use the guidelines that are given in the table that follows.

	Rinse Solution	Number of Washes	Volume of Rinse Solution Used For Each Wash (mL)
When the syringe and needle have not been used before or used with other solutions.	First three washes: Wash solvent	3	1
	Next three washes: Tuning solution	3	1
When the syringe and needle have only been used with the tuning solution.	Tuning solution	1	1

- Fill the syringe with rinse solution.
During filling, do not put the tip of the needle further in the rinse solution than is required.
- Remove the syringe from the rinse solution, and then pull the plunger to fill the remaining space in the syringe with air. This makes an air gap between the rinse solution and the plunger.

Figure A-1 Example of an Air Gap



Calibration Ions and Solutions

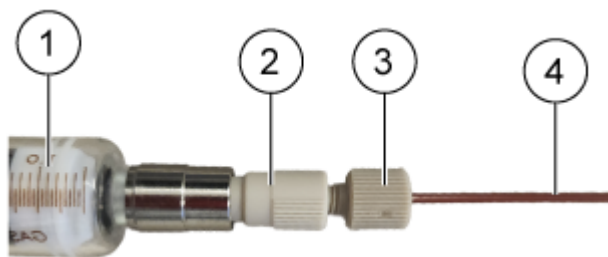
Item	Description
1	Plunger
2	Air gap
3	Rinse solution

- c. Invert the syringe fully. Do this two more times.
Make sure that the liquid washes the all of the interior surfaces of the syringe.
- d. Point the syringe into an applicable chemical waste container, and then push the plunger until the syringe is empty.
5. Fill the syringe with the tuning solution.
6. Immediately after the syringe is filled, install the bottle cap on the bottle, and then tighten the cap to make sure that the bottle is correctly closed. Keep the bottle as specified in the document: *Certificate of Analysis*.

Note: The document: *Certificate of Analysis* is available at sciex.com/tech-regulatory.

7. Connect the tubing to the syringe:

Figure A-2 Connect the Syringe to the Tubing



Item	Description
1	Syringe
2	Syringe adapter
3	Fitting
4	Tubing

- Disconnect the needle from the syringe, and then connect the syringe adapter.
- Put the tubing in the fitting, and then connect the fitting to the syringe. Tighten the fitting to the syringe until it is finger tight.
- Connect the other end of the tubing to the ion source inlet.

During calibration, the use of a grounding union is not recommended.

Figure A-3 Syringe Tubing Connections for Calibration



8. Set up the system for infusion with the syringe pump. Refer to the document: *Help*.
9. (SCIEX OS software) Open the SCIEX OS software, and then open the MS Tune workspace. Obey the onscreen instructions. To do tuning and see examples of expected spectra, refer to the document: *Help*.

Note: Make sure to select the correct flow rate and syringe diameter.

If the background noise is too high or if unknown peaks are seen during tuning, then do step 4 again. If the issue persists, then contact a SCIEX field service employee.

10. (Analyst software) Open the Analyst software, and then open the Instrument Optimization module. Obey the onscreen instructions. Refer to the document: *Help*.

Note: Make sure to select the correct flow rate and syringe diameter.

11. After calibration is complete, disconnect the syringe and tubing from the mass spectrometer.
If an LC system is used, then make sure to connect the tubing from the LC system to the diverter valve, and then to the ion source. Refer to the section: [Connect the Diverter Valve in Injector Mode](#).
12. (Optional) Clean the tubing:
If the syringe and tubing are only used with the tuning solution, then this step can be ignored.
- Disconnect the tubing from the syringe, and then connect the needle.
 - Fill the syringe with wash solvent.
During filling, do not put the tip of the needle further in the wash solvent than is required.
 - Disconnect the needle, and then connect the tubing.
 - Point the tubing into an applicable chemical waste container, and then push the plunger until the syringe is empty.
 - Disconnect the tubing from the syringe, and then connect the needle.
13. Rinse the syringe and needle with the wash solvent:
If step [12](#) was ignored, then disconnect the tubing from the syringe, and then connect the needle to the syringe.
- Fill the syringe until approximately half-full with wash solvent.
During filling, do not put the tip of the needle further in the wash solvent than is required.
 - Remove the syringe from the wash solvent, and then pull the plunger to fill the remaining space in the syringe with air. This makes an air gap between the wash solvent and the plunger.
 - Invert the syringe fully. Do this two more times.
 - Point the syringe into an applicable chemical waste container, and then push the plunger until the syringe is empty.

Calibration Ions and Solutions

14. Install the bottle cap on the wash solvent bottle, and then tighten it to make sure that the bottle is correctly closed. Keep the bottle as specified in the document: *Certificate of Analysis*.

Hazardous Substance Information

B

Classification according to OSHA Hazard Communication Standard (29 CFR 1910.1200)

The information that follows must be noted and the related safety measures must be obeyed. For more information, refer to the related safety data sheets (SDS). The SDS are available on request or can be downloaded from our website, at sciex.com/tech-regulatory.

MS Wash Solvent



DANGER!

H225 - Highly flammable liquid and vapor

H302 - Harmful if swallowed

H319 - Causes serious eye irritation

MS Tuning Solution A



DANGER!

H225 - Highly flammable liquid and vapor

H302 - Harmful if swallowed

H319 - Causes serious eye irritation

Glossary of Symbols

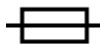
C

Note: Not all of the symbols in this table are applicable to every system.

Symbol	Description
	Australian Regulatory Compliance Mark. Indicates that the product complies with Australian Communications Media Authority (ACMA) EMC and Electrical Safety Requirements.
	Alternating current
A	Amperes (current)
	Asphyxiation Hazard
	Authorized representative in the European community
	Biohazard
	CE Marking of Conformity
	cCSAus mark. Indicates electrical safety certification for Canada and USA.
	Catalog number
	Caution. Consult the instructions for information about a possible hazard.

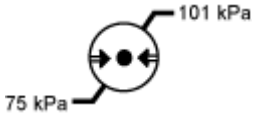
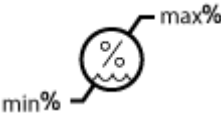
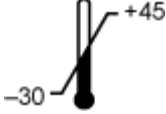
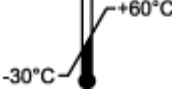
Symbol	Description
	Note: In SCiEX documentation, this symbol identifies a personal injury hazard.
	China RoHS Caution Label. The electronic information product contains certain toxic or hazardous substances. The center number is the Environmentally Friendly Use Period (EFUP) date, and indicates the number of calendar years the product can be in operation. Upon the expiration of the EFUP, the product must be immediately recycled. The circling arrows show the product is recyclable. The date code on the label or product indicates the date of manufacture.
	China RoHS logo. The device does not contain toxic and hazardous substances or elements above the maximum concentration values and the device is an environmentally-friendly product that can be recycled and reused.
	Consult instructions for use.
	Crushing Hazard
	cTUVus mark for TUV Rheinland of North America
	Data Matrix symbol that can be scanned by a barcode reader to obtain a unique device identifier (UDI)
	Environmental Hazard
	Ethernet connection

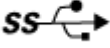
Glossary of Symbols

Symbol	Description
	Explosion Hazard
	Eye Injury Hazard
	Fire Hazard
	Flammable Chemical Hazard
	Fragile
	Fuse
Hz	Hertz
	International safety symbol Caution, risk of electric shock (ISO 3864), also known as High Voltage symbol If the main cover must be removed, then contact a SCIEX representative to prevent electric shock.
	Hot Surface Hazard
	In Vitro Diagnostic Device
	Ionizing Radiation Hazard

Symbol	Description
	Keep dry. Do not expose to rain. Relative humidity must not exceed 99%.
	Keep upright.
	Lacerate/Sever Hazard
	Laser Radiation Hazard
	Lifting Hazard
	Magnetic Hazard
	Manufacturer
	Moving Parts Hazard
	Pacemaker Hazard. No access to people with pacemakers.
	Pinching Hazard

Glossary of Symbols

Symbol	Description
	Pressurized Gas Hazard
	Protective Earth (ground)
	Puncture Hazard
	Reactive Chemical Hazard
	Serial number
	Toxic Chemical Hazard
	Transport and store the system within 66 kPa to 103 kPa.
	Transport and store the system within 75 kPa to 101 kPa.
	Transport and store the system within the specified minimum (min) and maximum (max) levels of relative humidity, noncondensing.
	Transport and store the system within -30 °C to +45 °C.
	Transport and store the system within -30 °C to +60 °C.

Symbol	Description
	USB 2.0 connection
	USB 3.0 connection
	USB 3.2 connection
	Ultraviolet Radiation Hazard
	United Kingdom Conformity Assessment Mark
UKRP	United Kingdom Responsible Person
VA	Volt Ampere (apparent power)
V	Volts (voltage)
	WEEE. Do not dispose of equipment as unsorted municipal waste. Environmental Hazard
W	Watts (power)
	yyyy-mm-dd Date of manufacture

Glossary of Warnings

D

Note: If a label that is used to identify a component becomes detached, then contact a SCIEX field service employee (FSE).

Label	Translation (if applicable)
FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.	FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.
HANDLE WITH CARE WARNING 50g SHOCK INDICATOR ROUGH HANDLING WILL CHANGE INDICATOR TO RED If indicator is RED, note on the bill of lading, inspection may be warranted	HANDLE WITH CARE WARNING 50g SHOCK INDICATOR ROUGH HANDLING WILL CHANGE INDICATOR TO RED If indicator is RED, note on the bill of lading, inspection may be warranted Note: If the indicator is tripped, then this container has been dropped or otherwise mishandled. Make a note on the Bill of Lading and then check for damage. Any claims for shock damage require a notation.
IMPORTANT! RECORD ANY VISIBLE CRATE DAMAGE INCLUDING TRIPPED "IMPACT INDICATOR" OR "TILT INDICATOR" ON THE WAYBILL BEFORE ACCEPTING SHIPMENT AND NOTIFY YOUR LOCAL AB SCIEX CUSTOMER SUPPORT ENGINEER IMMEDIATELY. DO NOT UNCRATE. CONTACT YOUR LOCAL CUSTOMER SUPPORT ENGINEER FOR UNCRATING AND INSTALLATION.	IMPORTANT! RECORD ANY VISIBLE CRATE DAMAGE INCLUDING TRIPPED "IMPACT INDICATOR" OR "TILT INDICATOR" ON THE WAYBILL BEFORE ACCEPTING SHIPMENT AND NOTIFY YOUR LOCAL AB SCIEX CUSTOMER SUPPORT ENGINEER IMMEDIATELY. DO NOT UNCRATE. CONTACT YOUR LOCAL CUSTOMER SUPPORT ENGINEER FOR UNCRATING AND INSTALLATION.
MINIMUM OF SIX PERSONS REQUIRED TO SAFELY LIFT THIS EQUIPMENT	MINIMUM OF SIX PERSONS REQUIRED TO SAFELY LIFT THIS EQUIPMENT

Label	Translation (if applicable)
TIP & TELL	Tilt Indicator Note: Indicates if the container was tipped or mishandled. Write on the Bill of Lading and inspect for damage. Any claims for tipping require a notation.
TiltWatch PLUS ShockWatch	Tilt Indicator Note: Indicates if the container was tipped or mishandled. Write on the Bill of Lading and inspect for damage. Any claims for tipping require a notation.
WARNING: DO NOT OPERATE WITHOUT FIRST ENSURING BOTTLE CAP IS SECURED.	WARNING: DO NOT OPERATE WITHOUT FIRST ENSURING BOTTLE CAP IS SECURED. Note: This warning is attached to the source exhaust drain bottle.
WARNING: NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.	WARNING: NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL. Note: Consult instructions for use.

Contact Us

Addresses



Made in Singapore
AB Sciex Pte. Ltd.
Blk33, #04-06 Marsiling Industrial Estate Road 3
Woodlands Central Industrial Estate, Singapore 739256

SCIEX Headquarters

AB Sciex LLC
250 Forest Street
Marlborough, MA 01752
USA

Customer Training

- Global: sciex.com/contact-us

Online Learning Center

- [SCIEX Now Learning Hub](#)

SCIEX Support

SCIEX and its representatives have a global staff of fully-trained service and technical specialists. They can supply answers to questions about the system or any technical issues that might occur. For more information, go to the SCIEX website at sciex.com or use one of the links that follow to contact us.

- sciex.com/contact-us
- sciex.com/request-support

For systems sold in Korea: for adverse event reporting, contact the Korea Medical Devices Safety Information Agency. (NIDS, 080-080-4183).

Cybersecurity

For the latest guidance on cybersecurity for SCiEX products, visit sciex.com/productsecurity.

Documentation

This version of the document supersedes all of the previous versions of this document.

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To find software product documentation, refer to the release notes or software installation guide that comes with the software.

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