



CESI 8000 Plus High Performance Separation-ESI Module

Preinstallation Manual



This document is provided to customers who have purchased SCIEX equipment to use in the operation of such SCIEX equipment. This document is copyright protected and any reproduction of this document or any part of this document is strictly prohibited, except as SCIEX may authorize in writing.

Software that may be described in this document is furnished under a license agreement. It is against the law to copy, modify, or distribute the software on any medium, except as specifically allowed in the license agreement. Furthermore, the license agreement may prohibit the software from being disassembled, reverse engineered, or decompiled for any purpose. Warranties are as stated therein.

Portions of this document may make reference to other manufacturers and/or their products, which may contain parts whose names are registered as trademarks and/or function as trademarks of their respective owners. Any such use is intended only to designate those manufacturers' products as supplied by SCIEX for incorporation into its equipment and does not imply any right and/or license to use or permit others to use such manufacturers' and/or their product names as trademarks.

SCIEX warranties are limited to those express warranties provided at the time of sale or license of its products and are SCIEX's sole and exclusive representations, warranties, and obligations. SCIEX makes no other warranty of any kind whatsoever, expressed or implied, including without limitation, warranties of merchantability or fitness for a particular purpose, whether arising from a statute or otherwise in law or from a course of dealing or usage of trade, all of which are expressly disclaimed, and assumes no responsibility or contingent liability, including indirect or consequential damages, for any use by the purchaser or for any adverse circumstances arising therefrom.

For research use only. Not for use in diagnostic procedures.

AB Sciex is doing business as SCIEX.

The trademarks mentioned herein are the property of AB Sciex Pte. Ltd. or their respective owners.

AB SCIEX™ is being used under license.

© 2016 AB Sciex



AB Sciex LLC
500 Old Connecticut Path
Framingham, Massachusetts 01701
USA

Contents

Chapter 1 Introduction.....	5
Customer Site Planner Responsibilities.....	5
FSE Responsibilities.....	6
During Installation.....	6
Operator Familiarization.....	6
Technical Support.....	6
Chapter 2 Site Planning Checklist.....	7
Customer Information.....	7
Requirements.....	7
Site Layout.....	7
Electrical Requirements.....	8
Ventilation and Waste Collection Requirements.....	8
Environmental Requirements.....	8
BioSafety Requirements.....	9
Customer Preparation.....	9
Mass Spectrometer Requirements.....	9
Solutions and Equipment Requirements.....	9
Mass Spectrometer Information.....	10
Customer Profile.....	10
Comments and Exceptions.....	11
Signoff.....	11
Appendix A Site Requirements.....	12
Site Layout Requirements.....	12
Laboratory Layout and Clearances.....	12
Height Requirements.....	13
Weights and Dimensions.....	13
Electrical Requirements.....	14
Mains Supply Connections.....	14
Mains Supply Fluctuations.....	14
Protective Earth Conductor.....	14
Surge Suppression.....	14
System Electrical Specifications.....	14
Ventilation and Waste Collection Requirements.....	15
Ventilation Requirements.....	15
Waste Collection Requirements.....	15
Environmental Requirements.....	15
BioSafety Requirements.....	16
Customer Preparation Requirements.....	16
Mass Spectrometer Requirements.....	16

Contents

SCIEX Mass Spectrometers.....	16
Thermo Scientific Mass Spectrometers.....	17
Bruker Mass Spectrometers.....	17
Waters Mass Spectrometers.....	17
Customer-Supplied Solutions and Equipment.....	17
Appendix B Equipment Safety Categories.....	19
Appendix C System Specifications.....	20
Instrument Specifications.....	20
Cart Specifications.....	20
Controller Specifications.....	21
Detector Specifications.....	21
(Optional) UV Detector Specifications.....	21
(Optional) Laser Induced Fluorescence (LIF) Detector Specifications.....	22
(Optional) Photo Diode Array (PDA) Detector Specifications.....	22
Revision History.....	24

Introduction

1

This guide is for the site planner, the individual responsible for preparing the facility for the installation of the CESI 8000 Plus system.

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

Note: If the site preparation tasks are not complete when the SCIEX Field Service Employee (FSE) arrives, then the scheduled installation will be postponed.

Customer Site Planner Responsibilities

Complete the [Site Planning Checklist on page 7](#) in consultation with facilities services personnel (electrical, ventilation, and information technology [IT]), and return it to the FSE before the completion date. Refer to [Signoff on page 11](#).

Note: The FSE will follow up if the checklist is not received prior to the scheduled installation date.

- Verify that adequate space and the required shipping facilities are available. Refer to [Site Layout Requirements on page 12](#).
- Provide all required electrical receptacles. Refer to [Electrical Requirements on page 14](#).
- Provide and install all required vents and ventilation devices. Refer to [Ventilation and Waste Collection Requirements](#) [Ventilation Requirements on page 15](#).
- Verify that the requirements for the operating environment are met. Refer to [Environmental Requirements on page 15](#).
- Verify the mass spectrometer to be used with the system is operational by executing a performance test. Refer to [Mass Spectrometer Requirements on page 16](#).
- Verify that any required additional equipment for the ion source or mass spectrometer is present. Refer to [Mass Spectrometer Requirements on page 16](#).
- Verify that all required solvents and laboratory supplies are available. Refer to [Customer-Supplied Solutions and Equipment on page 17](#).
- When the shipment arrives, inspect the packaging for damage and then contact SCIEX Customer Service or the local FSE to schedule the installation.

FSE Responsibilities

- Review the checklist and discuss outstanding issues with the site planner.
- Unpack and set up the CE equipment sold and supported by SCIEX.
- Test and qualify the system to the specifications in the *Operational Qualification 1*.

During Installation



WARNING! Lifting Hazard. Make sure that at least four people are available to lift the CE system. Follow established safe lifting procedures.

The FSE unpacks the system (with the assistance of customer staff), sets up the system, and then confirms its operation. When the system is installed, the FSE conducts an operational qualification.

Operator Familiarization

During installation, the FSE provides a system and software overview, reviews data, and provides some basic operator familiarization.

Note: Online training is available at sciex.com/education .

Technical Support

SCIEX and its representatives maintain a staff of fully-trained service and technical specialists located throughout the world. They can answer questions about the system or any technical issues that might arise. For more information, visit the SCIEX Web site at sciex.com.

Site Planning Checklist

2

Customer Information

Organization			
Address			
City			
Country			
Telephone		Zip/Postal code	
Site planner contact name		Fax	
E-mail address			

Requirements

Site Layout

Refer to [Site Layout Requirements on page 12](#).

Requirements	Complete
There is adequate lab space to accommodate the equipment.	
If the mass spectrometer inlet is lower or higher than the range of the CESI 8000 Plus cart, a table or stand of the appropriate height for the CESI 8000 Plus system is available.	
Additional personnel are available to help the FSE move the equipment. Four people are recommended.	

Site Planning Checklist

Electrical Requirements

Refer to [Electrical Requirements on page 14](#).

Requirement	Complete	N/A
Installation of electrical supplies and fixtures complies with local regulations and safety standards.		
One branch circuit is provided for the CE components. One AC mains supply outlet is required.		
The mains supply voltage does not fluctuate more than $\pm 10\%$ from the nominal voltage.		
The mains supply includes a correctly installed protective earth conductor.		
A qualified electrician has determined the appropriate AC mains supply configuration based on the system electrical specifications found in System Electrical Specifications on page 14 .		

Ventilation and Waste Collection Requirements

Refer to [Ventilation and Waste Collection Requirements on page 15](#).

Requirement	Complete
Ventilation of the laboratory environment in which the system will be used complies with local regulations and the air exchange rate is appropriate for the work performed.	

Environmental Requirements

Refer to [Environmental Requirements on page 15](#).

Requirement	Complete
The altitude does not exceed 2000 m (6562 ft) above sea level.	
Temperature and humidity requirements have been met.	

BioSafety Requirements

Refer to [BioSafety Requirements on page 16](#).

Requirement	Complete
The site is not designated as BioSafety Level 3 (BSL-3) or BioSafety Level 4 (BSL-4).	

Customer Preparation

Refer to [Customer Preparation Requirements on page 16](#).

Requirement	Complete
Up to two customers have been identified for familiarization.	
A mass spectrometer will be available during the installation.	

Mass Spectrometer Requirements

Refer to [Mass Spectrometer Requirements on page 16](#).

Requirement	Complete
A performance test has been performed on the mass spectrometer and a printout of the results is attached.	
Any required equipment for the ion source or mass spectrometer is available at the site.	

Solutions and Equipment Requirements

Refer to [Customer-Supplied Solutions and Equipment on page 17](#).

Requirement	Complete	N/A
All of the required solutions and bottles are available.		

Mass Spectrometer Information

Mass spectrometer manufacturer	
Mass spectrometer model	
Mass spectrometer serial number	
Software version	
Firmware version	
Ion source model	

Customer Profile

(Optional) To allow the FSE to provide site-specific training, enter the following information.

Number of operators		
Years of experience with mass spectrometry		
Years of experience with capillary electrophoresis		
CESI applications to be performed		
Will the CESI 8000 Plus system be used stand-alone?		
If the system will be used stand-alone, which detectors will be used?		
PDA	LIF	UV

Comments and Exceptions

Signoff

Site planner contact name		Completion date (yyyy-mm-dd)	
I acknowledge that all of the installation requirements, as specified in this document, have been met.			
FSE name		Return date (yyyy-mm-dd)	
FSE e-mail			

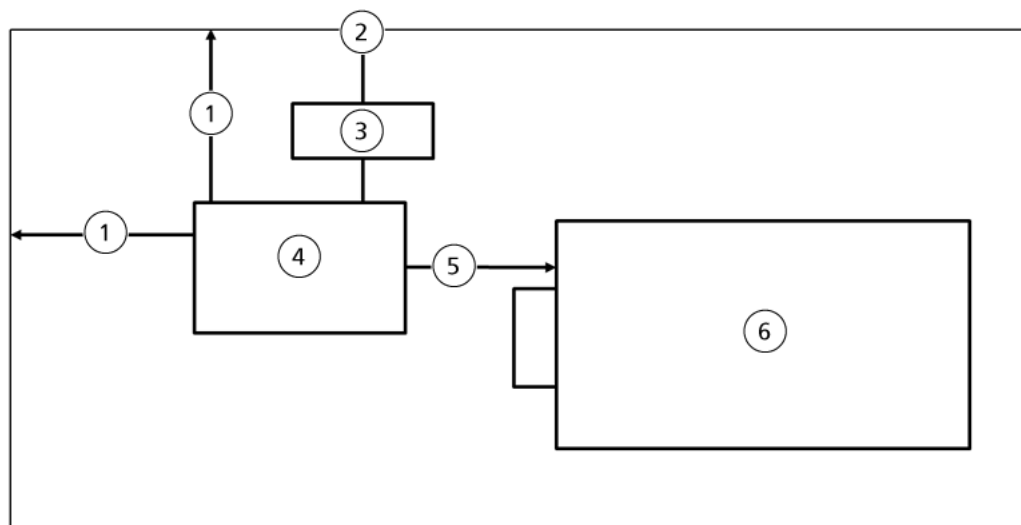
Site Layout Requirements

Laboratory Layout and Clearances

[Return to checklist.](#)

- The floor is smooth and level so that the mobile cart does not roll.
- The location allows at least 10.2 cm (4 inches) on all sides of the system.
- The location is away from heaters or cooling ducts, and not in direct sunlight.
- The location is away from vibrating equipment, such as refrigerators or centrifuges.
- For configurations where the CESI 8000 Plus controller is connected to the mass spectrometer acquisition computer with a 4.3 m (14 feet) cable, the maximum distance between the controller and the acquisition computer is 4 m (13 feet).

Figure A-1 Suggested Laboratory Layout



Item	Description
1	Distance to wall, minimum 10.2 cm (4 inches)
2	Mains supply
3	Surge suppressor
4	CESI 8000 Plus cart with controller and CESI 8000 Plus system
5	Distance determined at installation, approximately 10 cm (4 inches) (see note below)
6	Mass spectrometer

Height Requirements

The alignment mark on the outside of the CESI 8000 Plus system is 36 cm (14 inches) from the bottom of the system. This mark must be vertically aligned with the mass spectrometer inlet. To align the two systems, the height of the cart provided with the CESI 8000 Plus system is adjustable.

The cart can be used with mass spectrometers with inlets that are located between 105 cm (41 inches) and 148 cm (58 inches) from the floor. If the height of the inlet is outside of this range, the customer must provide a table or stand for the CESI 8000 Plus system.

Weights and Dimensions

Refer to the following table for weights and dimensions and make sure that the system can be moved to the installation site. Make sure that the installation site can accommodate the equipment dimensions, weight, and associated clearance.

Equipment	Height	Width	Depth	Weight
CESI 8000 Plus system	99.1 cm (39 inches) (cover open)	63.5 cm	72.4 cm	85.3 kg
	73.1 cm (29 inches) (cover closed)	(25 inches)	(28.5 inches)	(188 lbs)
CESI 8000 Plus cart	66.6 cm to 111.8 cm (27 inches to 44 inches)	9.1 cm (36 inches)	73.7 cm (29 inches)	69.0 kg (152 lbs)

Electrical Requirements

[Return to checklist.](#)



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.

Mains Supply Connections



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

Mains Supply Fluctuations

In areas where the mains supply is subject to voltage fluctuations exceeding $\pm 10\%$ of the nominal value (100 VAC to 240 VAC), a power conditioner is required. High or low voltages can adversely affect the electronic components of the CE system.

Protective Earth Conductor



WARNING! Electrical Shock Hazard. Do not intentionally interrupt the protective earth conductor. Any interruption of the protective earth conductor creates an electrical shock hazard.

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

Surge Suppression

The CESI 8000 Plus system must be plugged into a high capacity electrical surge suppressor, to protect the system from voltage spikes and power surges. The maximum current is the sum of the maximum current ratings for all components.

System Electrical Specifications

Note: Specifications are subject to change without notice.

Table A-1 CESI 8000 Plus Module Electrical Specifications

Specification	Value
Nominal input voltage	Instrument: 100 VAC to 240 VAC Cart: 100 VAC to 240 VAC
Frequency	50 Hz or 60 Hz
Maximum input current	Instrument: 5 A

Power Consumption

Supply voltage must not exceed 10% of nominal.

Ventilation and Waste Collection Requirements

[Return to checklist.](#)

Ventilation Requirements



WARNING! Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Be sure to use the system in a well-ventilated laboratory environment in compliance with local regulations and with appropriate air exchange for the work performed.

Waste Collection Requirements



WARNING! Biohazard, Toxic Chemical Hazard. Follow local directives when disposing of chemicals, vials and caps, and the remains of the prepared samples, if applicable. They might contain regulated compounds and biohazardous agents.

Environmental Requirements

- Altitude not exceeding 2000 m (6562 feet) above sea level
- An ambient temperature of 15 °C to 30 °C (59 °F to 86 °F)

Site Requirements

- Relative humidity from 20% to 60%, non-condensing

BioSafety Requirements

The site must not be designated BioSafety Level 3 (BSL-3) or BioSafety Level 4 (BSL-4). SCIEX does not install, service, or repair SCIEX systems in areas designated BSL-3 or BSL-4.

Customer Preparation Requirements

[Return to checklist.](#)

After the system has been installed, an FSE will work with up to two operators in basic system operation.

Operators should:

- Know how to operate the mass spectrometer and be willing to operate it during the installation.
- Be available for the entire training period.

Mass Spectrometer Requirements

[Return to checklist.](#)

Before the CESI 8000 Plus system can be installed, the mass spectrometer must be operational. To demonstrate this, a performance test should be performed and a printout of the results attached to this document.

For some mass spectrometers, additional equipment is required, refer to the appropriate section below.

SCIEX Mass Spectrometers

For the OptiMS Adapter for SCIEX NanoSpray III source (PN B07363), all systems require the NanoSpray[®] III ion source retrofit kit (PN 5030793), purchased from SCIEX.

Make sure that the required orifice plate for the NanoSpray[®] ion source is present (refer to the following table).

Model	NanoSpray [®] III Ion Source Part Number	Orifice Plate Part Number
SCIEX Triple Quad [™] 5500 system	5028129	1033731
QTRAP [®] 5500 system		
TripleTOF [®] 4600, 5600, and 5600+ systems		
TripleTOF [®] 6600 system	5029154	1033731

Model	NanoSpray [®] III Ion Source Part Number	Orifice Plate Part Number
SCIEX Triple Quad [™] 6500 and 6500+ systems	5028138	5018950
QTRAP [®] 6500 and 6500+ systems		

Thermo Scientific Mass Spectrometers

For the OptiMS Adapter for Thermo Nanospray II MS Sources (PN B07366), make sure the additional required equipment is present (refer to the following table).

Model	Ion Source	Additional Required Equipment
LCQ Deca XP MAX, LTQ series and the TSQ series systems	Nanospray II ion source	Ion MAX adapter
LCQ Deca XP and LCQ Advantage XP systems	Nanospray II ion source	Adapter ring

For the OptiMS Thermo MS Adapter for Nanospray Flex and Nanospray Flex NG Sources (PN B83386), no additional equipment is required.

Bruker Mass Spectrometers

The OptiMS Bruker MS Adapter for Bruker Mass Spectrometers (PN B86099) requires the NanoElectrospray capillary cap set (PN 212915), purchased from Bruker.

For Bruker mass spectrometers that are close to the ground, the CESI 8000 Plus system requires a low table or stand (refer to [Height Requirements on page 13](#)).

Waters Mass Spectrometers

No additional equipment from Waters is required for the OptiMS Waters MS Adapter for NanoLockSpray and NanoFlow Ion Sources (PN B85211).

Customer-Supplied Solutions and Equipment

[Return to checklist.](#)



WARNING! Toxic Chemical Hazard. Refer to the chemical product *Safety Data Sheets* and follow all of the recommended safety procedures when handling, storing, and disposing of chemicals.

General Equipment

- Powder-free gloves (neoprene or nitrile recommended)

Site Requirements

- Lint-free wipes
- Safety glasses
- Laboratory coat
- Pipettors (2 μ L, 10 μ L, 20 μ L, 100 or 200 μ L, and 1 mL) and appropriate tips
- pH meter
- Benchtop centrifuge

Glassware and Consumables

- Glass bottles (20 mL, 100 mL)
- 20 mL glass vial
- 0.5 mL centrifuge tube
- 50 mL volumetric flask

Reagents

- 1.0 N NaOH (Sigma PN 319511 or equivalent)
- 0.1 N HCl (Sigma PN 84428 or equivalent)
- 0.1 N NaOH (PN 338424 or equivalent)
- 7.5 M ammonium acetate (Sigma PN A2706)
- Glacial acetic acid (Sigma PN A6283 or equivalent)
- Methanol (Fisher PN A454 or equivalent)
- Double-deionized (DDI) water (MS grade water filtered through 0.2 μ m filter and with resistance above 18 megaohms)

Equipment Safety Categories

B

Description	Category
Equipment pollution degree	Pollution Degree 2

Note: Environments with a Pollution Degree 2 rating include laboratories and sales and commercial areas.

For more information, refer to the International Electrotechnical Commission standards IEC 61010-1 and IEC 60364.

System Specifications



Instrument Specifications

Dimensions (H × W × D)	99.1 cm (cover open), 73.7 cm (cover closed) × 63.5 cm × 72.4 cm (39 inches (cover open), 29 inches (cover closed) × 25 inches × 28.5 inches)
Weight	85.3 kg (188 pounds)
Electrical	Power requirement: 100 VAC to 240 VAC, 5.0 A, 50 Hz or 60 Hz Power consumption: supply voltage must not exceed 10% of nominal Fuses: <ul style="list-style-type: none">• 8.0 A slow blow; 1/4 inch (2 ea.); 100 VAC to 120 VAC• 6.3 A time delay; 20 mm (2 ea.); 200 VAC to 240 VAC Installation (overvoltage) category: Category II
I/O	TTL: 2 Contact closures: 2
Working environment	Altitude: ≤2000 m (6562 feet) above sea level Humidity: 20% to 60%, non-condensing Temperature: 15 °C to 30 °C (59 °F to 86 °F)
Maximum heat dissipation	400 Watts (1024 BTU/hr) , under steady-state conditions
Maximum sound pressure	<70 dB

Cart Specifications

Dimensions (W × D)	91.4 cm × 73.7 cm (36 inches × 29 inches)
Height	Adjustable from 68.6 cm to 111.8 cm (27 inches to 44 inches)
Weight	69.0 kg (152 pounds)

Electrical	120 VAC at 60 Hz, optional 230 VAC at 50 Hz
Supports	136.0 kg (300 pounds)

Controller Specifications

The CESI 8000 Plus High Performance Separation-ESI Module includes a controller, with the specifications below.

Note: Specifications are subject to change without notice.

CPU	Lenovo PC with 3.1 GHz processor
Memory	4 GB
Hard drive	300 GB or larger
CD/DVD RW	Required
USB ports	5 open ports (one each for license key, mass spec, keyboard, mouse, and GPIB cable)
Monitor	Size: 22 inch Resolution: 1680 × 1050 Color: True Color
Keyboard and mouse	Microsoft compatible
Interface	USB cable (National Instruments) 2 serial ports 2 Ethernet ports
Operating system	Microsoft Windows 7 Professional (32-bit) with Service Pack 1
Software	CESI 8000 software version 10.1 (includes 32 Karat software version 10.1)

Detector Specifications

(Optional) UV Detector Specifications

Available filters	214 nm Positions for 6 additional filters
Filter bandwidth	10 nm nominal

System Specifications

Filter dimensions	Diameter: 1.27 cm (0.5 inches) Thickness: 5 mm (0.2 inches)
UV source	30 W pre-aligned deuterium lamp
UV source lifetime	1000 hours

(Optional) Laser Induced Fluorescence (LIF) Detector Specifications

Baseline drift	<0.2 RFU per hour
Baseline noise	<0.005 RFU peak to peak, for an OPCAL with probe guide/lens
Dynamic range (at a setting of 1000)	>10 ⁴
Filters (optional)	For 488 nm laser: 488 nm notch filter and 520 nm bandpass filter For user-supplied lasers: Two filters are required: a laser filter to block stray laser light and an emission filter to select the wavelength of the emitted light. Filter dimensions must be: <ul style="list-style-type: none">• Outer diameter: 0.500 inch (+0.000 inch, -0.010 inch)• Thickness: ≤ 0.350 inches (for >1 filter in a channel, total thickness ≤ 0.350 inches)
Laser	3 mW, 488 nm solid state
Relative fluorescence units (RFU) range	0 RFU to 1000 RFU
Sensitivity	1 × 10 ¹¹ M sodium fluorescein with signal-to-noise >2
Wavelength range for optics	Excitation: 300 nm to 700 nm Detection: 350 nm to 750 nm

(Optional) Photo Diode Array (PDA) Detector Specifications

Bandwidth	6 mm minimum (absorbance averaging)
Detector type	256 element diode array
Detector wavelength accuracy	2 nm
Detector wavelength range	190 nm to 600 nm
Scan collection frequency	0.5 Hz to 32 Hz

System Specifications

UV source	30 W pre-aligned deuterium lamp
UV source lifetime	1000 hours

Revision History

Document Number	Reason for Change	Date
B11953AA	First release of document. Covers CESI 8000 software version 10.1 (includes 32 Karat software) and CESI 8000 firmware version 10.1.	December 2013
B11953AB	Numerous updates and corrections made. Added page for SCIEX Separations.	January 2014
B11953AC	Updates to Computer Specifications.	September 2015
RUO-IDV-05-3315-A B11953AD	Applied new template. Re-branded. Added required equipment for different mass spectrometers. Added tables for customer profile and mass spectrometer information. Added detector specifications.	June 2016
RUO-IDV-05-3315-B B11953AE	Added required equipment for Bruker and Waters mass spectrometers. Added requirements for mass spectrometer performance test. Added requirements for system height. Added ventilation and waste collection requirements.	August 2016