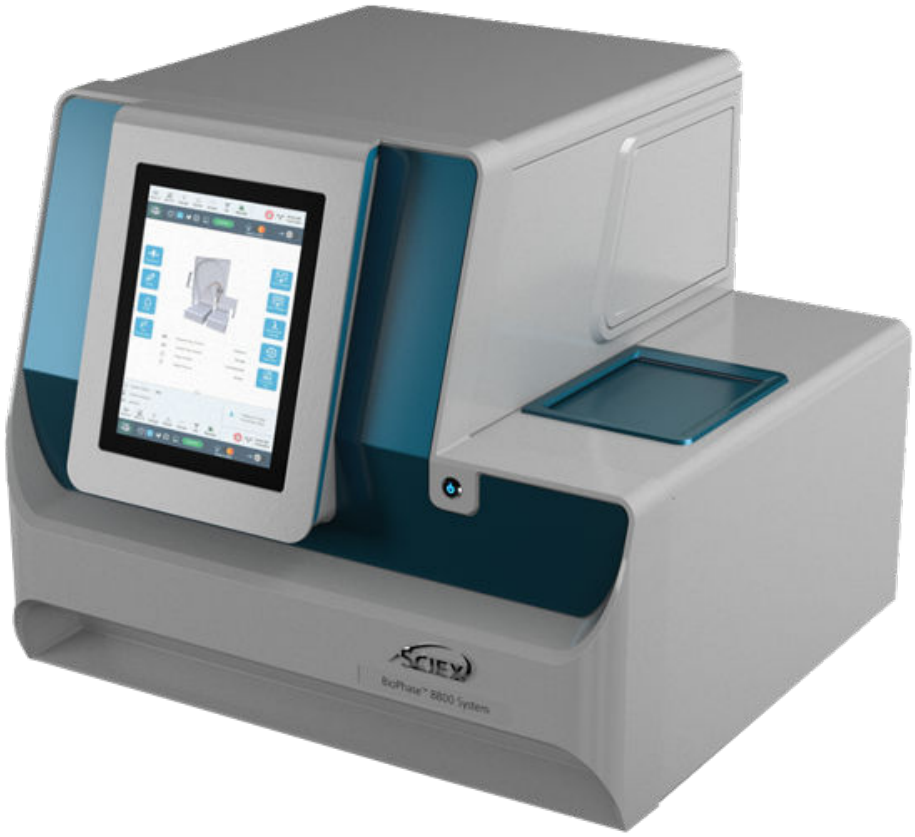
SCIEX
The Power of Precision

BioPhase 8800 System

For BioPhase 8800 Driver for Empower™ Users

Operator Guide



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EC REP

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Contents

Operational Precautions and Limitations 1

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

This section contains general safety-related information and provides regulatory compliance information. It also describes potential hazards and associated warnings for the system and the precautions that should be taken to minimize the hazards.

In addition to this section, for information about the symbols used in the laboratory environment, on the system, and in this documentation, refer to the section: Glossary of Symbols. For site 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 heed these warnings could result in serious injury.

This safety information is intended to supplement federal, state, provincial, and local environmental health and safety (EHS) regulations. It does not cover every safety procedure that should be practiced. 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 correct laboratory reference material and standard operating procedures.

Documentation Symbols and Conventions

The following symbols and conventions are used throughout the guide.

DANGER! Danger signifies an action that leads to severe injury or death.

WARNING! Warning signifies an action that could cause personal injury if precautions are not followed.

CAUTION: Caution signifies an operation that could cause damage to the system or corruption or loss of data if precautions are not followed.

Note: Note emphasizes significant information in a procedure or description.

Tip! Tip provides useful information that helps apply the techniques and procedures in the text for a specific need and provides shortcuts, but is not essential to 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 affixed 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.

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

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:** Machinery Directive 2006/42/EC as implemented in these standards:
  - EN 61010-1
- **Waste Electrical and Electronic Equipment (WEEE):** Waste Electrical and Electronic Equipment Directive 2012/96/EEC, 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

International

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

  Refer to the section: Electromagnetic Compatibility.
- **Safety:**
  - IEC 61010-1

Electrical Precautions

WARNING! Electrical Shock Hazard. Do not remove the covers. Removing the covers might cause injury or malfunctioning of the system. The covers need not be removed for routine maintenance, inspection, or adjustment. Contact a SCIEX Field Service Employee (FSE) for repairs that require the covers to be removed.

- Follow required electrical safe work practices.
- Use cable management practices to control electrical cables. This will decrease the chance 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.

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

WARNING! Electrical Shock Hazard. Make sure that the system can be disconnected from the mains supply in an emergency by disconnecting the mains supply cable from the mains supply inlet at the back of the system. Do not block the back of the system.

Protective Earth Conductor

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

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

Chemical Precautions

WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Identify whether decontamination is required before cleaning or maintenance. 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.

WARNING! Environmental Hazard. Do not dispose of system components in municipal waste. Follow local regulations when disposing of components.

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

  Note: Nitrile or neoprene gloves are recommended.

- Work in a well-ventilated area or fume hood.
- Avoid ignition sources when working with flammable materials, such as isopropanol, methanol, and other flammable solvents.
- Take care in the use and disposal of any chemicals. There is a potential risk of personal injury if correct procedures for handling and disposal of chemicals are not followed.
- Avoid skin contact with chemicals during cleaning, and wash hands after use.
- Collect all spent liquids and dispose of them as hazardous waste.
- Comply with all of the local regulations for the storage, handling, and disposal of biohazardous, toxic, and radioactive materials.

System Safe Fluids

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

CAUTION: Potential System Damage. Do not use organic solvents, such as methanol or acetone, to clean the capillary window. Organic solvents can dissolve the adhesives, leaving residue on the capillary window that might interfere with the detector.

Any substance in a BioPhase 8800 analysis kit, or referenced in an *BioPhase 8800 System Application Guide*, can safely be used with the system. In addition, the following fluids can also be used with the system. To determine compatibility with other chemicals, contact sciex.com/request-support.

- **Acids and Bases**

  The pH range is from 2 to 12.

  - Acetic acid, up to 10%
  - Sodium hydroxide, up to 1 M
  - Hydrochloric acid, up to 1 M
- **Reagents**
  - CE Grade Water

Physical Precautions

WARNING! Lifting Hazard. Use a mechanical lifting device to lift and move the system. If the system must be moved manually, then at least four people are required to move the system safely. Follow established safe lifting procedures. We recommend the use of a professional moving service.

Environmental Precautions

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

Allow access space around the equipment when setting up the system.

WARNING! Biohazard. For biohazardous material use, always comply with local regulations for hazard assessment, control, and handling. This system or any part is not intended to act as a biological containment.

WARNING! Environmental Hazard. Follow established procedures for disposal of biohazardous, toxic, radioactive, and electronic waste. The customer is responsible for disposal of hazardous substances, including chemicals, waste oils, and electrical components, in accordance with local laws and regulations.

Electromagnetic Environment

Electromagnetic Compatibility

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

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

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 11:2009, 5.3] Class A equipment shall meet Class A limits.

CAUTION: Potential Radio Interference. This equipment is not intended for use in residential environments and may not provide adequate 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. Follow established procedures for disposal of biohazardous, toxic, radioactive, and electronic waste. The customer is responsible for disposal of hazardous substances, including chemicals, waste oils, and electrical components, in accordance with local laws and regulations.

Before decommissioning, decontaminate the entire system following local regulations.

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

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

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

Waste Electrical and Electronic Equipment

Follow local municipal waste ordinances for proper disposal provisions to decrease the environmental impact of waste, electrical, and electronic equipment (WEEE). To safely dispose of this equipment, contact a local Customer Service office for complimentary equipment pick-up and recycling.

UV Radiation Precautions

WARNING! Ultraviolet Radiation Hazard. Avoid exposure to direct or reflected UV radiation. Ultraviolet radiation is harmful to the eyes and skin. Do not operate the UV source without required system safety interlocks.

Laser Precautions

This section is applicable for systems that have a laser-induced fluorescence (LIF) detection system.

WARNING! Laser Hazard. Follow all local codes, regulations, standards and internal requirements applicable to laser safety.

WARNING! Laser Hazard. Do not use equipment and controls or complete procedures in a manner different from that documented in this guide. Doing so might result in hazardous laser radiation exposure.

WARNING! Personal Injury Hazard. Do not look directly into the anticipated path of the laser beam or at any specular reflections of the laser beam. Invisible ultraviolet radiation from the laser can cause injury to the eyes.

WARNING! Personal Injury Hazard. Do not remove the outer cover of the laser assembly. If the cover is not present, then exposure to potentially harmful laser radiation is possible.

The LIF detection system contains a Class I laser system in a sealed module. The module contains an embedded Class 3B laser component. The 3B classification means that direct intrabeam viewing of this type of laser is always hazardous to personnel.

The laser assembly contains the laser and several other components in a sealed housing, and has no user-serviceable parts. Service of the laser assembly is restricted to qualified SCIEX Field Service Employees (FSEs). Therefore, the overall laser classification of the system is Class 1, defined as lasers that are safe under reasonably foreseeable conditions of operation.

Qualified Personnel

Only qualified SCIEX personnel shall install, examine, and service the equipment. After installing the system, the Field Service Employee (FSE) uses the *Installation Qualification* to orient the customer on system operation, cleaning, and basic maintenance. SCIEX might not cover the damage to a system under warranty if it is serviced by personnel not authorized by SCIEX.

Laboratory Conditions

Safe Environmental Conditions

The system is designed to operate safely under these conditions:

- Indoors
- Altitude: Up to 2,000 m (6,560 ft) above sea level

- Ambient temperature: 15 °C (59 °F) to 40 °C (104 °F)
- Relative humidity: 20% to 80%, non-condensing
- Mains supply voltage fluctuations: ± 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:

- An ambient temperature of 15 °C to 30 °C (59 °F to 86 °F)

  Over time, the temperature must remain within a range of 4 °C (7.2 °F), with the rate of the change in temperature not exceeding 2 °C (3.6 °F) per hour. Ambient temperature fluctuations exceeding the limits might result in shifts in migration time.
- Relative humidity from 30% to 70%, noncondensing.

Equipment Use and Modification

WARNING! Electrical Shock Hazard. Do not remove the covers. Removing the covers might cause injury or malfunctioning of the system. The covers need not be removed for routine maintenance, inspection, or adjustment. Contact a SCIEX Field Service Employee (FSE) for repairs that require the covers to be removed.

WARNING! Personal Injury Hazard. Use SCIEX-recommended parts only. Use of parts not recommended by SCIEX or use of parts for any purpose other than their intended purpose can put the user at risk of harm or negatively impact system performance.

WARNING! Lifting Hazard. Use a mechanical lifting device to lift and move the system. If the system must be moved manually, then at least four people are required to move the system safely. Follow established safe lifting procedures. We recommend the use of a professional moving service.

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

If the system is used in an environment or in a manner not prescribed by the manufacturer, then the performance and protection provided by the equipment might be impaired.

Contact an FSE for information on servicing the system. Unauthorized modification or operation of the system might cause personal injury and equipment damage, and might void the warranty. Erroneous data might be generated if the system is operated outside the recommended environmental conditions or with unauthorized modifications.

Introduction 2

This guide describes the basic operation, troubleshooting, and maintenance of the BioPhase 8800 system. Read this guide thoroughly before using the product, and operate the product in accordance with the instructions in this guide.

This guide provides safety instructions and precautions to make sure that the user operates the system safely. Obey all Warning and Caution instructions provided in this guide.

Description

The BioPhase 8800 system is an eight-channel capillary electrophoresis system that can do separations for up to 96 samples without user intervention.

The BioPhase 8800 system includes the following components:

- A touchscreen on the front panel
- A UV source and detector
- (Optional) A 488 nm laser and an LIF detection system
- Software to control the system and perform data acquisition, either:
  - BioPhase software. An application for data analysis, the BioPhase Analysis software, is included with BioPhase software,
  - BioPhase 8800 driver for Empower™. Data analysis of data collected with the BioPhase 8800 driver for Empower™ cannot be analyzed with the BioPhase Analysis software.

The system uses pre-assembled cartridges, containing either eight bare-fused silica or eight neutral capillaries.

SCIEX offers analysis kits designed to operate with the BioPhase 8800 system. The kits include reagents and sample and reagent plates.

Related Documentation

This document assumes some knowledge of the Waters Empower™ software. For instructions on general features of the Waters Empower™ software:

- Refer to the documentation supplied with the software.
- Click  on the Empower Start dialog
- Click **Help** in any of the Waters Empower™ software windows.

For detailed instructions on using the Waters Empower™ software for a specific capillary electrophoresis application, refer to the following application guides:

- *Capillary Isoelectric Focusing (cIEF) Analysis Application Guide*
- *CE-SDS Protein Kit Application Guide*
- *RNA 9000 Purity & Integrity Kit Application Guide*

Waters Empower™ Software Terminology for BioPhase Software Users

Users who have used the BioPhase 8800 system with the BioPhase software must become familiar with the Waters Empower™ software terms.

Table 2-1 Waters Empower™ Software Terminology for BioPhase Software Users

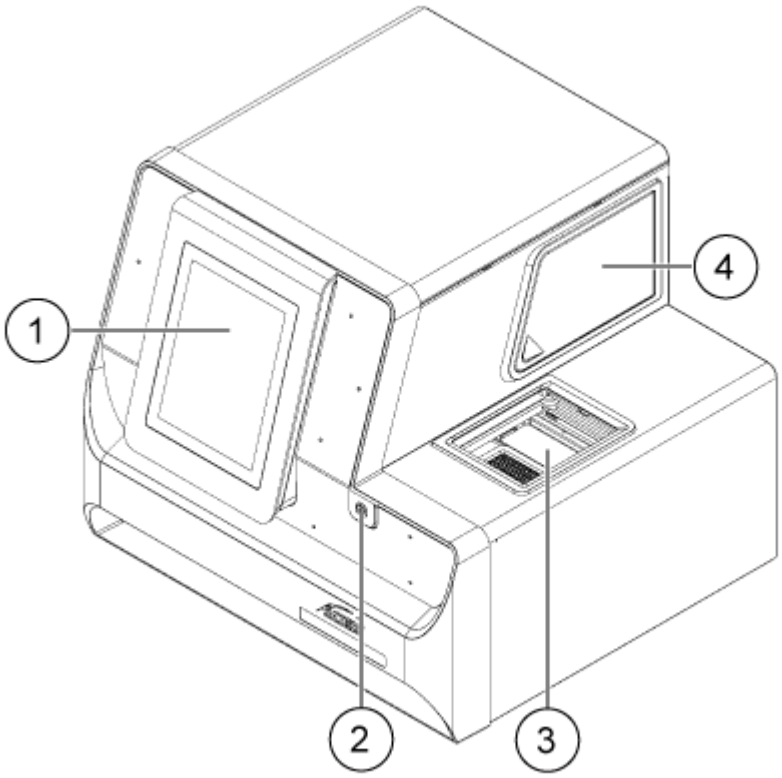
BioPhase Software Term	Waters Empower™ Software Equivalent	Description
No equivalents in BioPhase software	Instrument Method	A method containing system parameters required for data acquisition. Parameters are grouped as general parameters, detector parameters, and a time program.
	Processing Method	A method containing data processing parameters.
	Reporting Method	A method to create a report showing the results of the processing method.
Method	Method Set	A combination of an instrument method, a processing method, and a report method. Processing and report methods are optional.
Sequence	Sample Set Method	A list of samples and associated method sets that is sent to the BioPhase 8800 system for data acquisition. Optionally, the Waters Empower™ software can do post-acquisition data processing and generate reports.

Table 2-1 Waters Empower™ Software Terminology for BioPhase Software Users (continued)

BioPhase Software Term	Waters Empower™ Software Equivalent	Description
Report	Report	A file containing information about the results of the data acquisition. Reports can also include information about the organization generating the data. The layout and appearance of a report can be customized and saved as part of a report template.
Sample inlet plate	Plate	The 96-well plate that holds the samples to be analyzed.
Sample outlet plate	Plate	A plate with 8 troughs that contains the gel or buffer required for the separation.
Regent inlet plate	Plate	The 96-well plate that holds the reagent and rinse solutions.
Regent outlet plate	Plate	A plate with 8 troughs that collects capillary waste.
Computer	LAC/E module	The computer that controls the BioPhase 8800 system.

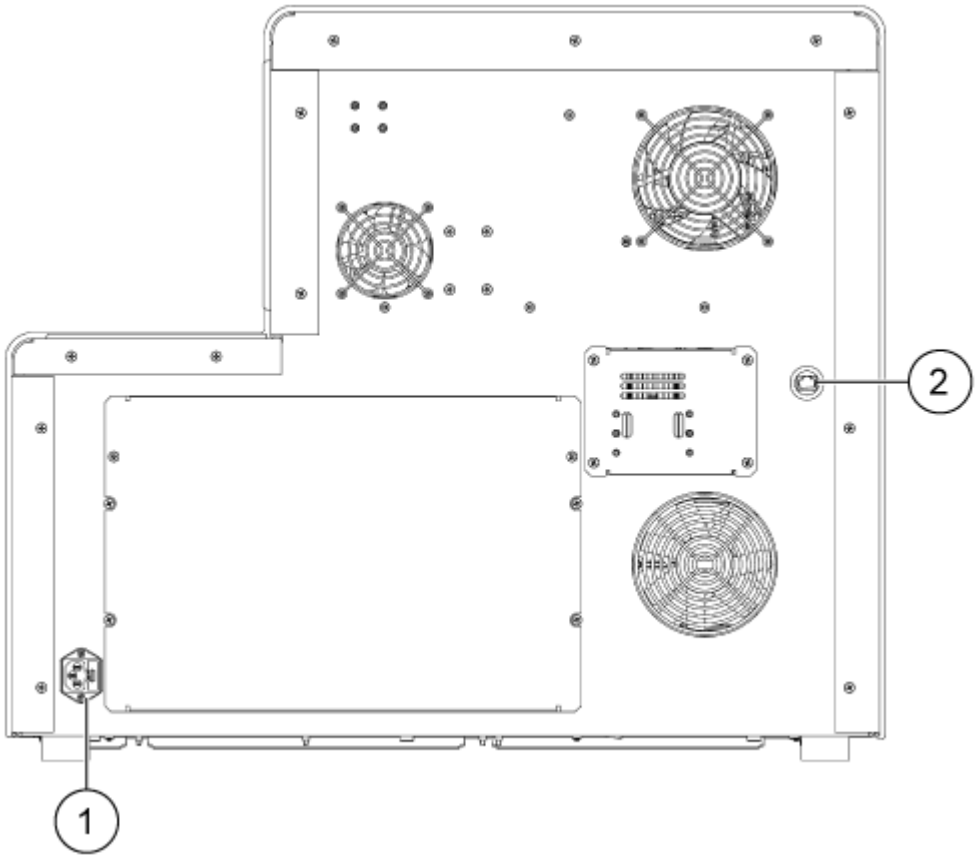
Hardware Overview

Figure 2-1 Front and Side Panel, with Plate Compartment Open



Item	Description
1	Front panel
2	Power button
3	Plate compartment with door open
4	Optics door

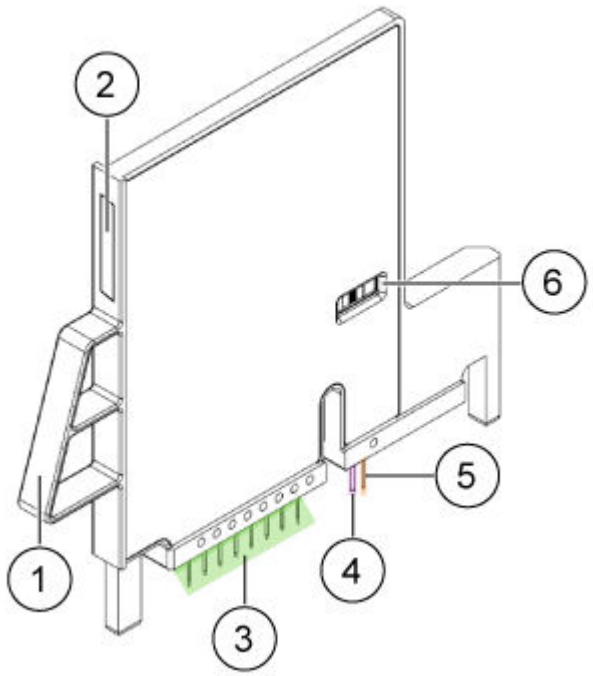
Figure 2-2 Back Panel



Item	Description
1	Mains supply connection and fuse holder
2	RJ-45 network connector

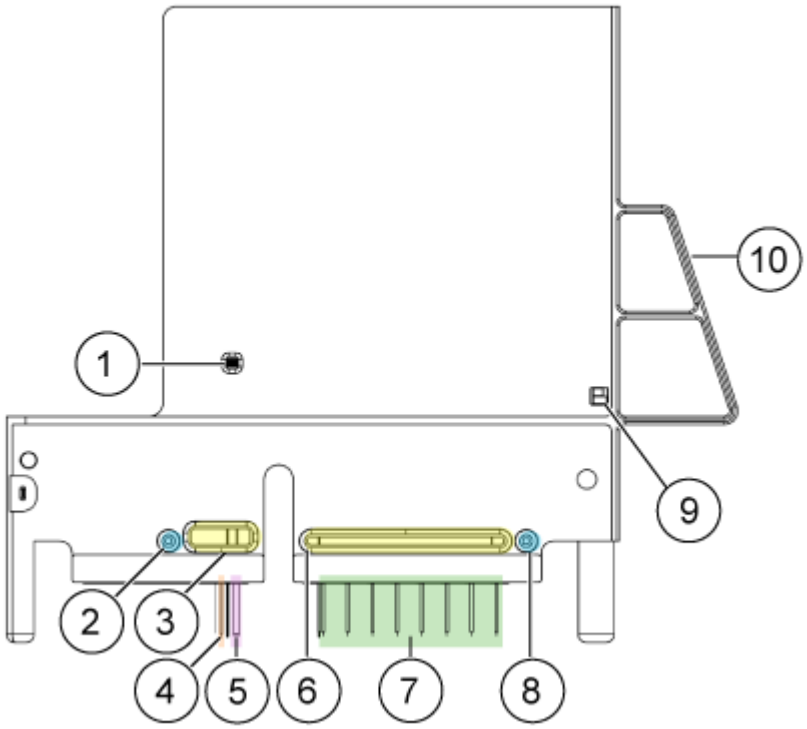
Cartridge

Figure 2-3 Cartridge Front



Item	Description
1	Handle
2	Serial number label
3	Capillary inlets
4	Capillary outlet
5	Electrode
6	Capillary window and aperture

Figure 2-4 Cartridge Back



Item	Description
1	Capillary window and aperture
2	Pressure outlet port
3	Coolant outlet port
4	Electrode
5	Capillary outlet
6	Coolant inlet port
7	Capillary inlets (from left to right, capillaries A to H)
8	Pressure inlet port
9	ID chip
10	Handle

Available Cartridges

The BioPhase 8800 cartridge is available with eight capillaries in the following configurations:

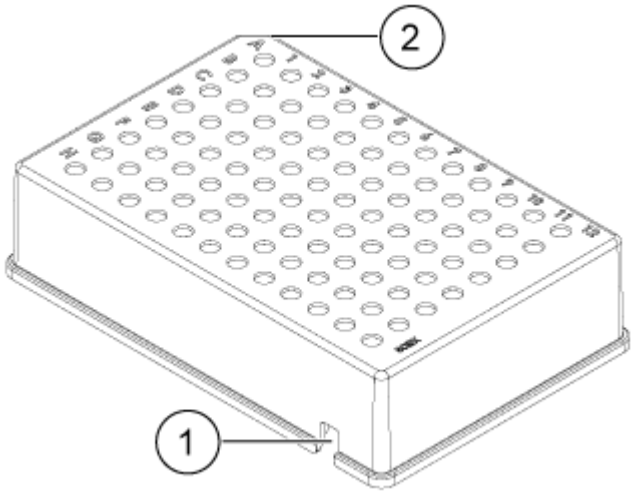
- 50 µm i.d. × 30 cm bare-fused silica capillaries
- 50 µm i.d. × 30 cm neutral capillaries

The Sample Plate

The BioPhase 8800 system uses a 96-well sample plate.

To configure the plate for use in an automated liquid-handling system, refer to the section: Plate Specifications.

Figure 2-5 Sample Plate

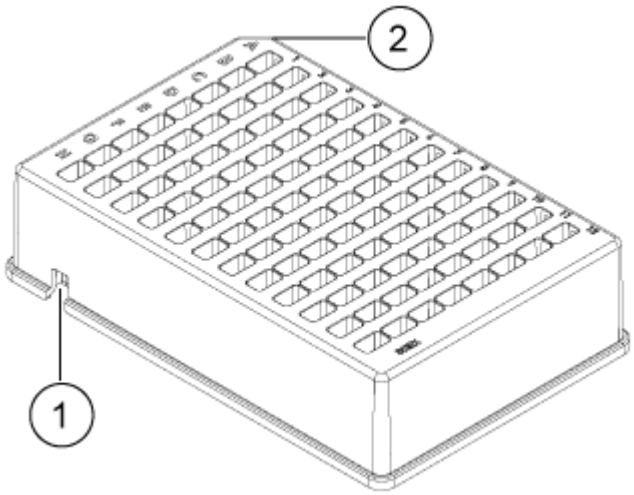


Item	Description
1	Alignment notch
2	Chamfered corner

The Reagent Plate

To configure the plate for use in an automated liquid-handling system, refer to the section: Plate Specifications.

Figure 2-6 Reagent Plate

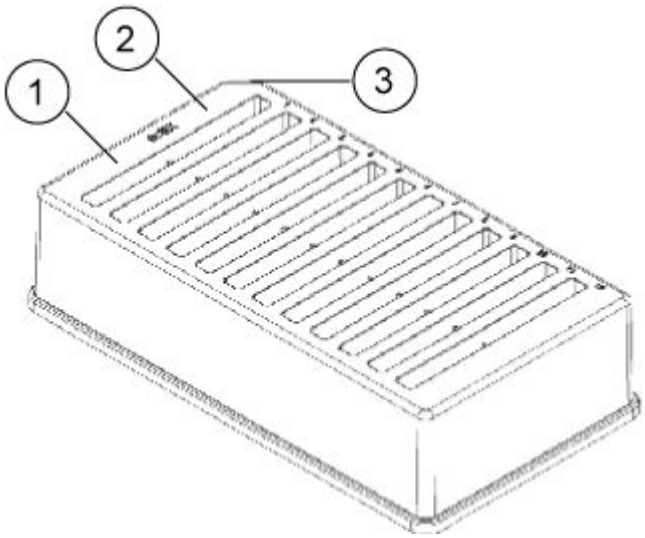


Item	Description
1	Alignment notch
2	Chamfered corner

The Outlet Plate

To configure the plate for use in an automated liquid-handling system, refer to the section: Plate Specifications.

Figure 2-7 Outlet Plate



Item	Description
1	Reagent wells
2	Overflow wells, leave empty
3	Chamfered corner

Theory of Operation

Capillary electrophoresis (CE) is a technology to separate and quantify sample components. In CE methods, analytes migrate through electrolyte solutions under the influence of an electric field. Analytes can be separated according to mobility or partitioning into an alternate phase by noncovalent interactions. Additionally, analytes can be concentrated or *focused* by means of conductivity or pH gradients.

Data acquisition on the BioPhase 8800 system is enabled using the BioPhase 8800 driver for Empower™ in conjunction with the Waters Empower™ software. The Method Editors for BioPhase System software, part of the BioPhase 8800 driver for Empower™, is used to develop instrument and sample set methods.

The UV Detection System

The UV detection system includes an ultraviolet light source, wavelength filters, and a photodiode detector.

The UV source is a deuterium lamp with a wavelength range from 190 nm to 400 nm. Two lenses focus and direct the output of the lamp through one of the wavelength-selecting filters. The beam continues through the aperture in the cartridge and then through the detection window, which is a section of the capillary that has been treated to remove the polyimide coating. The transmitted beam continues to the photodiode. The light signal is converted to an electrical signal, digitized, and then sent to the software for processing.

The filter holder has space for two filters. The BioPhase 8800 system is shipped with two 25 nm bandwidth filters: 220 nm and 280 nm.

The Laser-Induced Fluorescence (LIF) Detection System

The LIF detection system is an optional component.

The LIF detection system uses a solid-state 488 nm laser light source. The excitation light is transmitted from the laser to the capillaries in the cartridge. Substances in the capillary that fluoresce at the laser wavelength are detected. The LIF detector measures and records this fluorescence, which is shown as a peak on the electropherogram. The 520 nm emission filter is provided with the instrument.

Interactions Between the BioPhase 8800 System and the Waters Empower™ Software

The BioPhase 8800 system uses a cartridge that has eight capillaries. The separation occurs in all eight capillaries at the same time.

To do the separation and then save the separation data, the Waters Empower™ software uses the BioPhase 8800 driver for Empower™. When a run starts, the driver uses Empower functions to start the separation for all eight capillaries. The BioPhase 8800 system then does the separation. The progress status and data collected for eight capillaries can be seen in the Trace View window in the Waters Empower™ software.

Data from all eight capillaries is sent to the driver on the Waters Empower™ software acquisition server. The driver either saves the data from the capillaries one capillary at a time or starts a new run. Refer to the section: What Causes a New Run. In summary, the separation is done at the same time but the data is saved to the Empower database one capillary at a time.

This procedure is different from single sample injections done with the Waters Empower™ software, typically for liquid chromatography, which start to save data to the Empower database when the injection starts.

The processing speed of the Waters Empower™ software and the network speed control the length of time required to save the data. On a slow network, an interval between the time that

the separation ends and the time that the data is saved to Empower database can occur. In the Injections, Channels, Results, and other tabs in the Waters Empower™ software Project window, the Date Acquired field shows the time that the data is saved. The result is that the values in the Date Acquired field differ, even though the data was acquired at the same time. This is consistent with the design and function of the Date Acquired field in the Waters Empower™ software.

The interval between the end of the separation and the time that the data is saved has implications when a run is stopped by a user. Refer to the section: Stopping a Run.

Stopping a Run

When a sample set method is running and the system is in a busy state, actions from the BioPhase 8800 driver for Empower™ Direct Control pane are not permitted. If the BioPhase 8800 driver for Empower™ is saving data and the system is in an idle state, Direct Control actions are available but should not be used.

CAUTION: Potential Data Loss. Do not initiate any actions from the BioPhase 8800 driver for Empower™ Direct Control pane during a run, even if the system status is idle. Any actions might interfere with data acquisition.

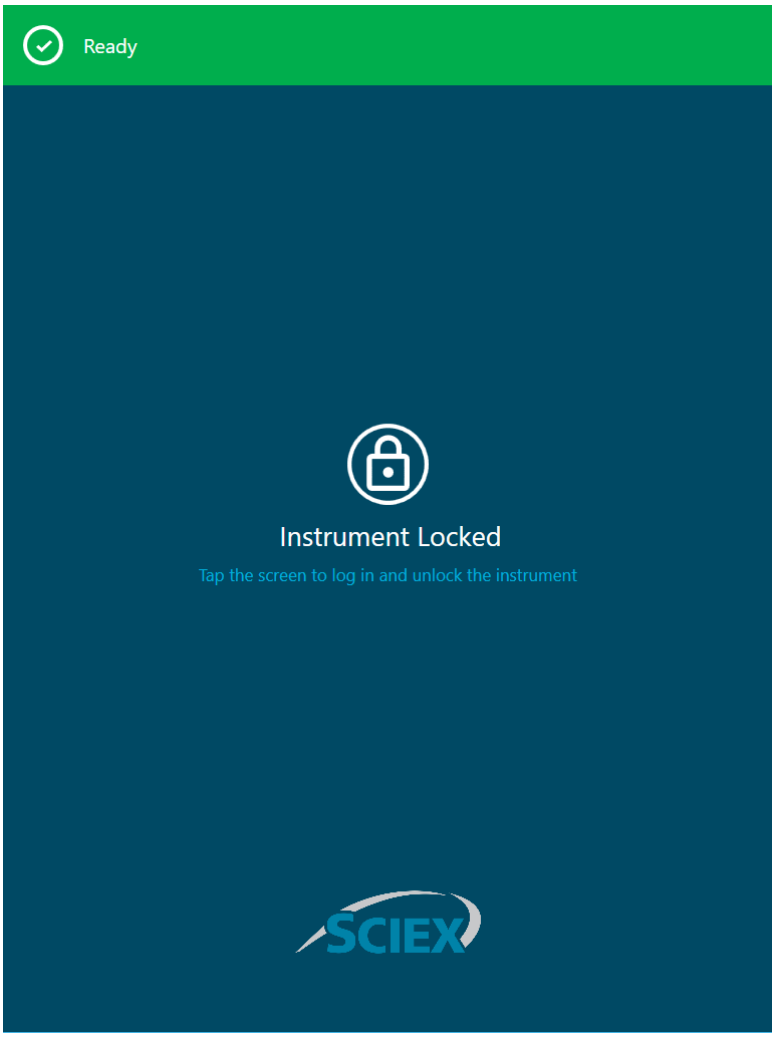
If the run needs to be stopped before it is finished, the data that is saved into the database only includes samples from the second to last row with red text. All of the data from the current row (with red text) is not saved. To make sure that all required data is saved, either:

- Let the sample set method complete. When the method is complete, **Abort** button () changes from red to green ().
- Wait until the data for the required sample is saved and the next injection starts, and then stop the run.

Turn on the System and Log On

1. Press the power button on the front of the system.

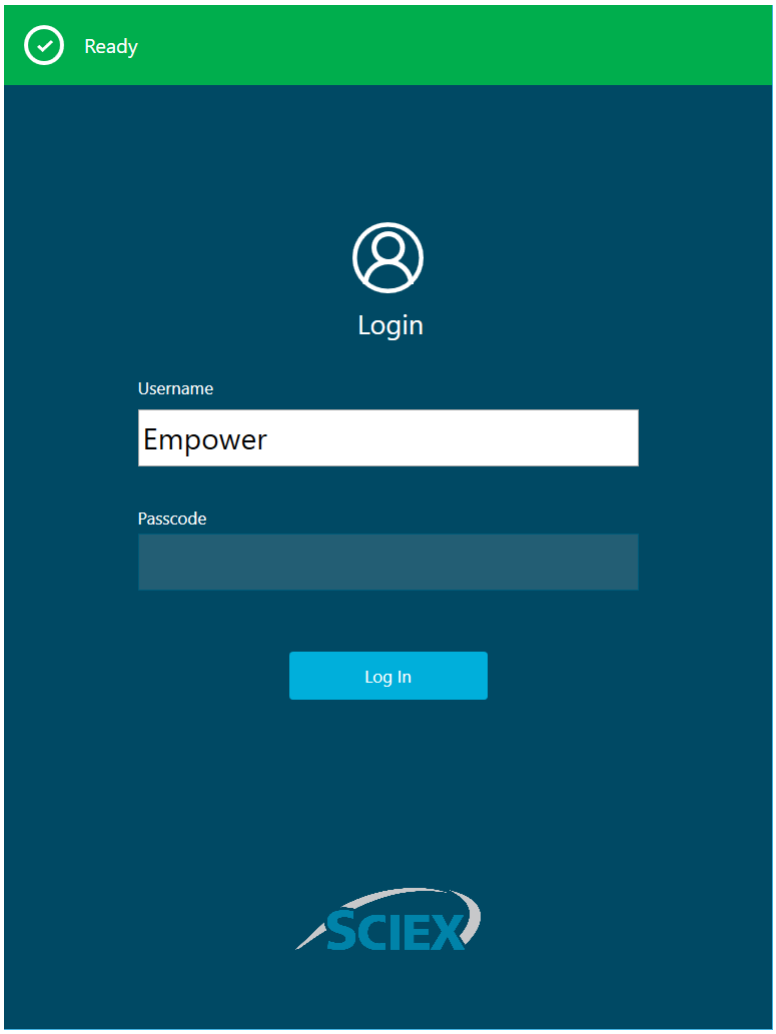
Figure 2-8 Instrument Locked Window



2. On the front panel, touch the screen to unlock the system and view the front panel log-in screen.
3. Touch **Log In**.

Note: If the **Username** field is empty, then type `Empower`.

Figure 2-9 Front Panel Login



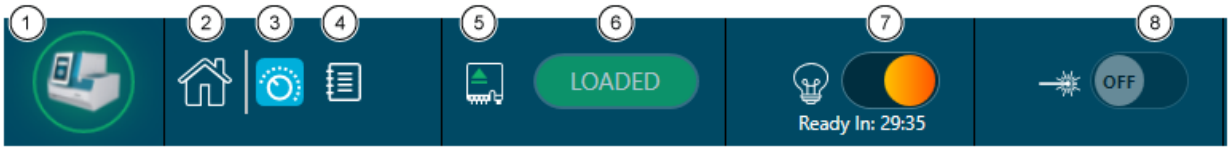
BioPhase 8800 System Front Panel 3

This section describes the ribbon, status panel, and functions available in the front panel home page of BioPhase 8800 system.

Figure 3-1 Front Panel Home Page

Front Panel: Ribbon

Figure 3-2 Ribbon Functions

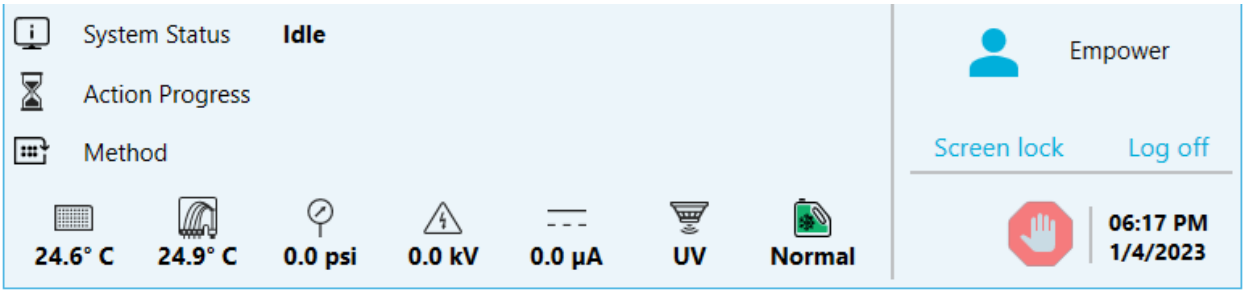


Item	Description
1	Touch to view light sources usage and software version details, and to turn power to the instrument off.
2	Touch to view the home page.
3	Touch to view the Direct Control functions.
4	Touch to view the log.
5	Shows the cartridge status. **Note:** The icon changes to green when the cartridge is loaded.
6	Touch to change the cartridge status to `LOADED` or `EJECTED`.
7	Touch to turn the UV lamp **ON** or **OFF**. **Note:** After the lamp is turned on, a timer counts down from 30 minutes, indicating the time remaining before the lamp is ready.
8	Touch to turn the LIF laser **ON** or **OFF**. **Note:** After the laser is turned on, a timer counts down from 15 minutes, indicating the time remaining before the lamp is ready. The LIF laser button is unavailable if the LIF detection system is not installed on the instrument.

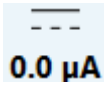
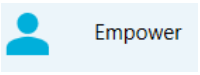
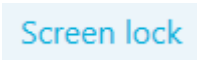
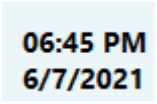
Front Panel: Status

The status panel at the bottom of the front panel shows the system information and status.

Figure 3-3 Front Panel Status



Item	Description
System Status	Shows the system status.
Action Progress	Shows the progress status of the current sample set method.
Method	Shows the instrument method name.
24.8° C	Shows the sample storage temperature.
25.0° C	Shows the cartridge temperature.
0.0 psi	Shows the pressure.
0.0 kV	Shows the voltage of the capillaries.

Item	Description
	Shows the current of the capillary.
	Shows the detector type.
	Shows the coolant level. **Note:** Green indicates an acceptable level, yellow indicates a low level, and red indicates that the coolant is empty. The system will not operate if the icon is red.
	Indicates that an error occurred during the run.
	Indicates that the system is being controlled by the Waters Empower™ software.
	Touch to lock the front panel touchscreen.
	Touch to log off.
	Touch to stop the system. If a sample set method is running, in the Run Samples window in the Waters Empower™ software, click  (**Abort**).
	Shows the current time and date.

Front Panel Functions

Figure 3-4 Front Panel Home Page Buttons

Item	Description
Direct Control	Touch to view the options for manual control of the instrument. Refer to the section: Direct Control. Additional functions are available from the BioPhase 8800 driver for Empower™. Refer to the section: Direct Control in the Waters Empower™ Software.
Log	Touch to view the front panel log. Refer to the section: Log.

Direct Control

This section describes the Direct Control functions on the front panel of the BioPhase 8800 system.

Figure 3-5 Direct Control Window

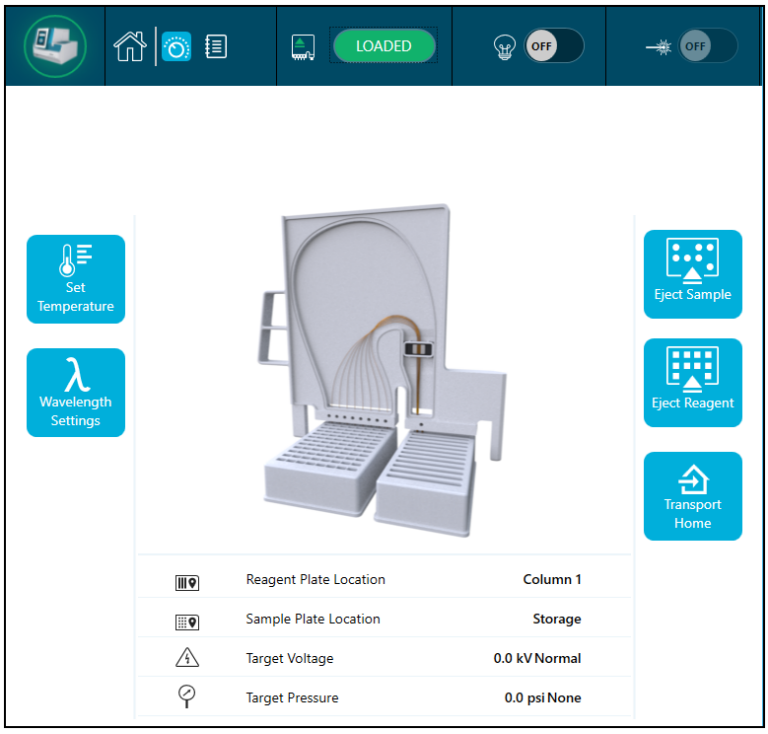
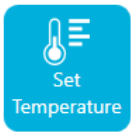


Figure 3-6 Information

	Reagent Plate Location	Column 1
	Sample Plate Location	Storage
	Target Voltage	0.0 kV Normal
	Target Pressure	0.0 psi None

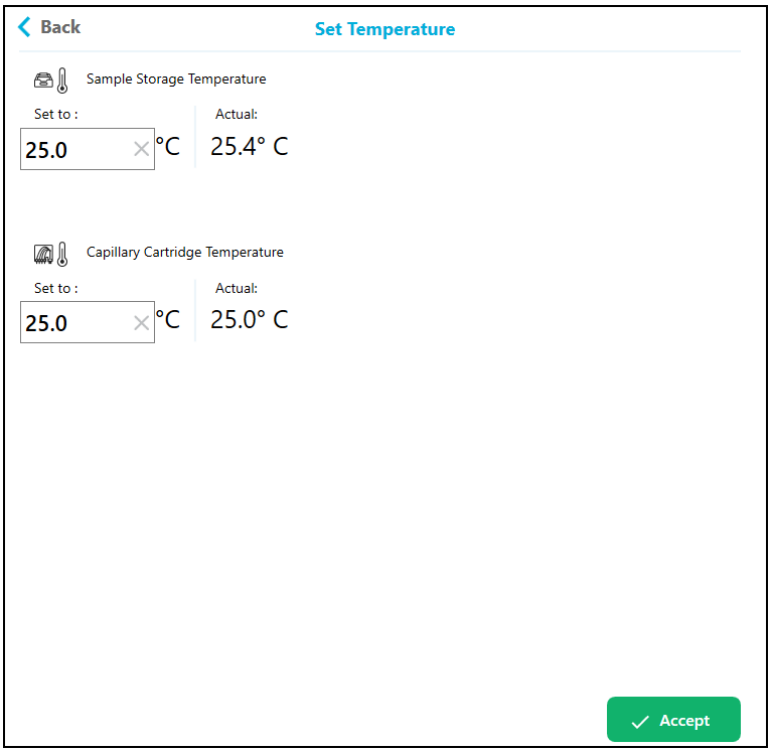
Table 3-1 Direct Control Functions

Item	Description
	Touch to view or edit the temperature parameters. Refer to the section: Set Temperature.
	Touch to view or edit the wavelength settings parameters. Refer to the section: Wavelength Settings.
	Touch to eject the sample plates. Refer to the section: Load or Eject Plates.
	Touch to eject the reagent plates. Refer to the section: Load or Eject Plates.
	Touch to move the reagent and sample plates to the home position. Refer to the section: Transport Home.

Set Temperature

Use the Set Temperature section to adjust the temperature for the sample storage and the capillary cartridge.

Figure 3-7 Set Temperature

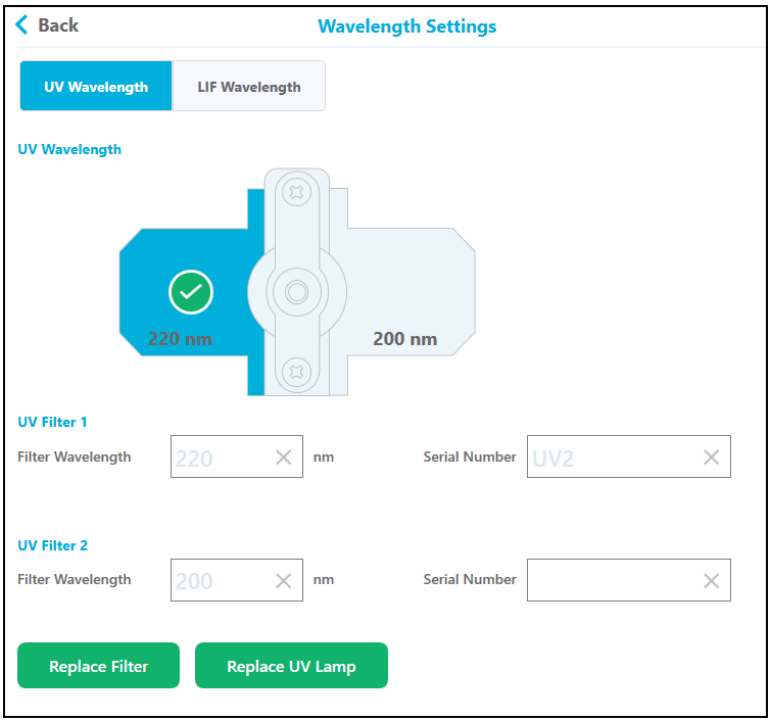


Label	Description
< Back	Touch to return to the Direct Control window.
Sample Storage Temperature	Touch to set the temperature value from 4 °C to 37 °C. The actual temperature is shown in °C on the right.
Capillary Cartridge Temperature	Touch to set the temperature value from 15 °C to 40 °C. The actual temperature is shown in °C on the right.
Accept	Touch to accept all the changes.

Wavelength Settings

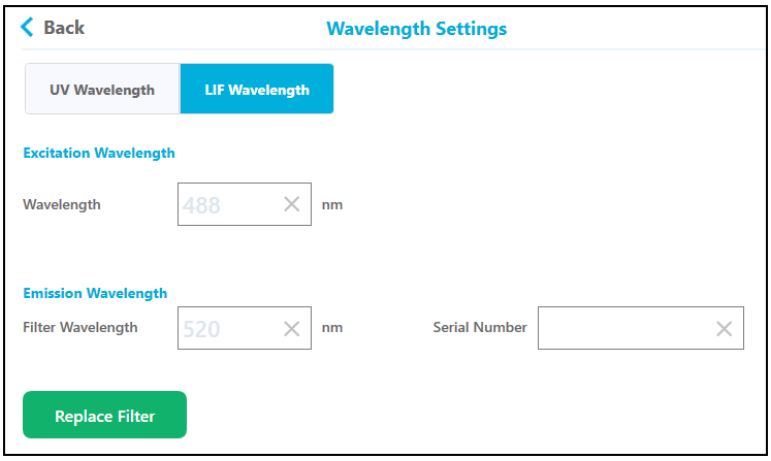
Use the Wavelength Settings section to set the UV and LIF filter wavelength. The user can also replace the UV lamp, UV filter, and LIF filter.

Figure 3-8 UV Wavelength



Label	Description
< Back	Touch to return to the Direct Control window.
UV Filter 1	
Filter Wavelength	Touch to set the filter wavelength value, from 200 nm to 400 nm.
Serial Number	Touch to set the serial number.
UV Filter 2	
Filter Wavelength	Touch to set the wavelength value, from 200 nm to 400 nm.
Serial Number	Touch to set the serial number.
Done	After completing the operation, touch **Done** to return to the Direct Control window.
Replace Filter	Refer to the section: Install a UV Filter.
Replace UV Lamp	Refer to the section: Install a UV Lamp.

Figure 3-9 LIF Wavelength

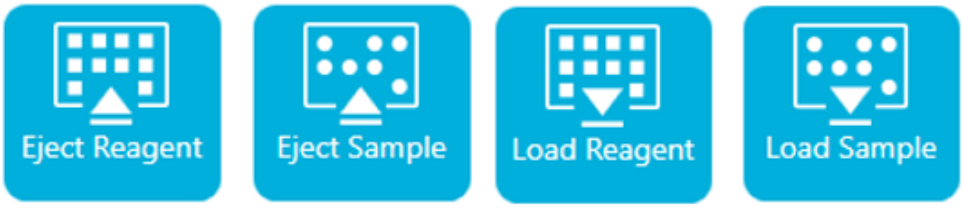


Label	Description
< Back	Touch to return to the Direct Control window.
Excitation Wavelength	
Wavelength	The wavelength is obtained from the laser on the system.
Emission Wavelength	
Filter Wavelength	Touch to set the wavelength from 300 nm to 700 nm.
Serial Number	Touch to set the serial number.
Done	After completing the operation, touch **Done** to return to the Direct Control window.
Replace Filter	Refer to the section: Install the LIF Detector Filters.

Load or Eject Plates

From the Direct Control window, the user can load or eject the sample and reagent plates.

Figure 3-10 Load or Eject the Plates



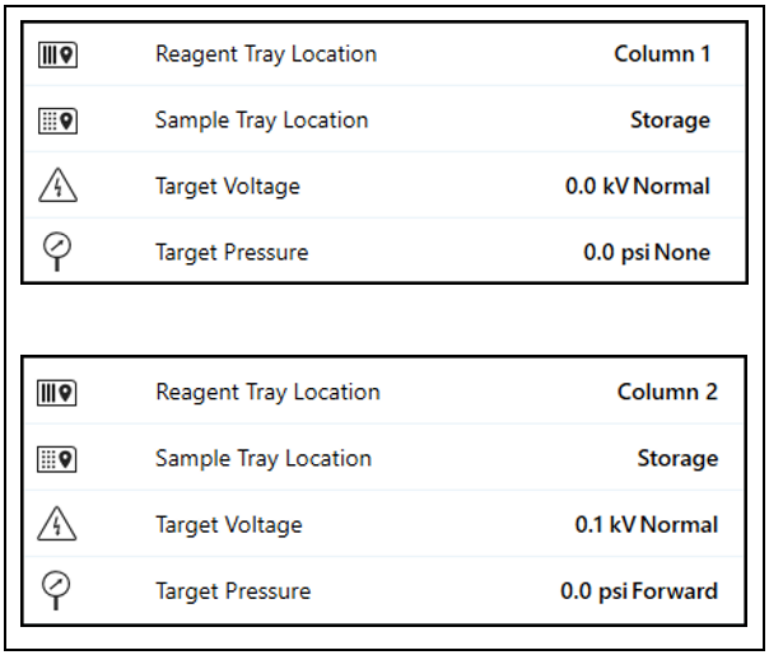
Label	Description
Eject/Load Reagent	Touch to load or eject the reagent plate.
Eject/Load Sample	Touch to load or eject the sample plate.

Note: The icon shows a down arrow when no plate is installed, and changes automatically to an up arrow when a plate is installed.

Transport Home

Use the Transport Home buttton to move the reagent and sample plates to the home position. Touch **Transport Home** to move the reagent plate to the home position (Column 1) and the sample plate to the storage position.

Figure 3-11 Reagent Tray Location



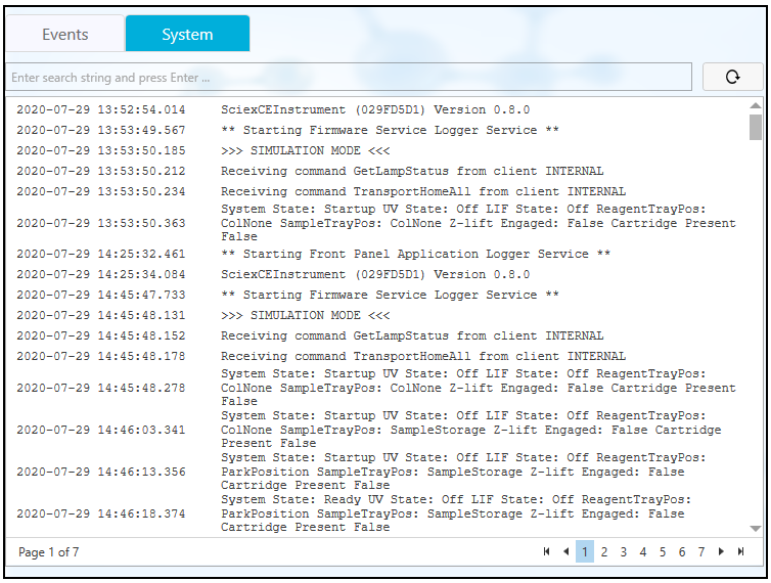
Log

This section describes the front panel log functions.

Figure 3-12 Front Panel Events Tab

Label	Description
Initialize System	Touch to initialize the front panel system. **Note:** The front panel status area shows a red exclamation icon if an error occurs during the run. To re-initialize the system, touch **Initialize System**.
	Touch to remove the log message.

Figure 3-13 Front Panel System Tab



Configure the System for the BioPhase 8800 Driver for Empower™

By default, the BioPhase 8800 system is configured for use with the BioPhase software. Use the following steps to configure the system for the BioPhase 8800 Driver for Empower™.

Note: The username and passcodes given below are the defaults. They might have been changed.

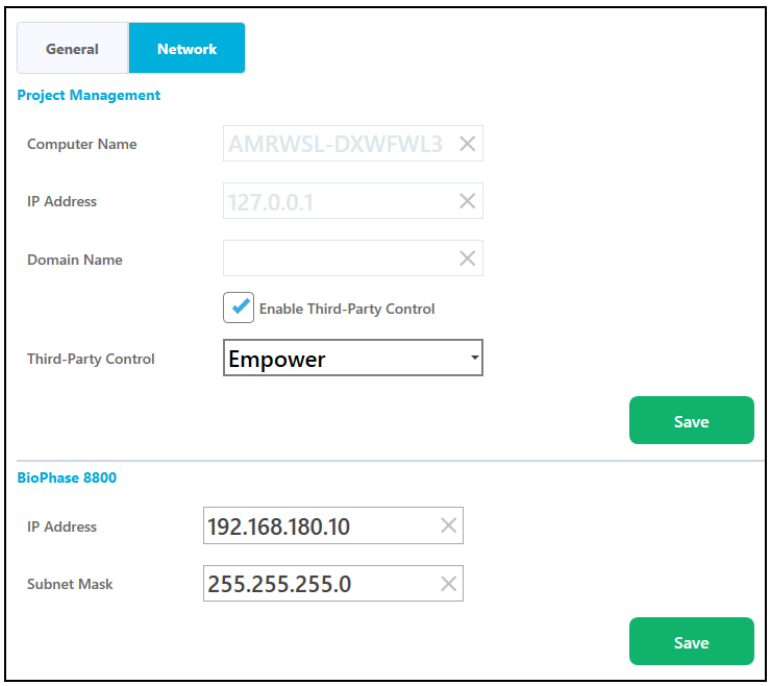
1. On the BioPhase 8800 system front panel, in the Login dialog:
   a. In the **Username** field, type `admin`.
   b. In the **Passcode** field, type `password`.
   c. Touch **Log In**.
2. Touch **Configuration**.
3. Touch **Network**.
4. In Project Management section, do the following.
   a. Select the **Enable Third-Party Control** check box.
   b. In the Third-Party Control list, select **Empower**.
   c. Touch **Save**.
5. In the BioPhase 8800 section, do the following.

a. In the **IP Address** field, type the IP address for the system.
   Use the same IP address used when configuring a node in the Waters Empower™ software. Refer to the section: "Configure the Node" in the document: *Release Notes*.

b. In the **Subnet Mask** field, type `255.255.255.0`.

c. Touch **Save**.

Figure 3-14 Network Settings for the BioPhase 8800 Driver for Empower™



6. Turn off, and then turn on the BioPhase 8800 system.

   a. In the top left corner of the touchscreen, touch the system icon.

   Figure 3-15 BioPhase 8800 System Icon

   b. Touch **Power Off.**

   c. Press the power button on the front of the system.

Direct Control in the Waters Empower™ Software 4

Direct Control Status and Buttons

The status panel at the bottom of the Direct Control pane shows the system information and status.

Figure 4-1 BioPhase 8800 Driver for Empower™ Direct Control Pane

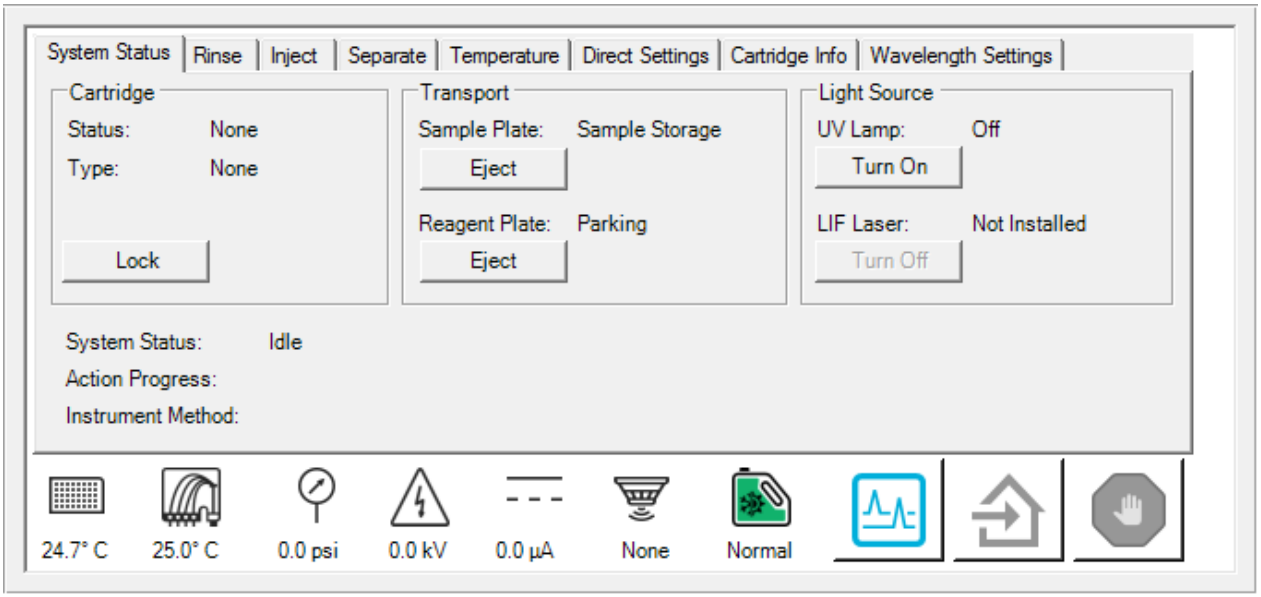
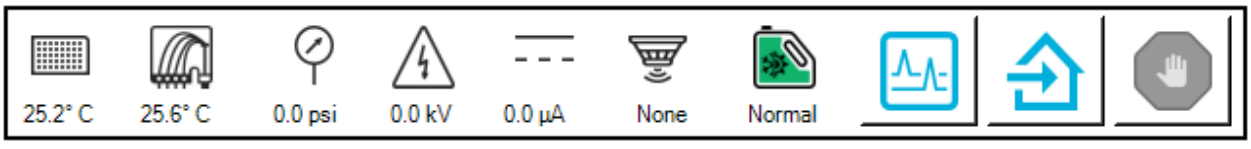
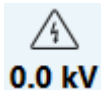
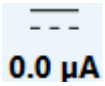


Figure 4-2 Direct Control Status Pane

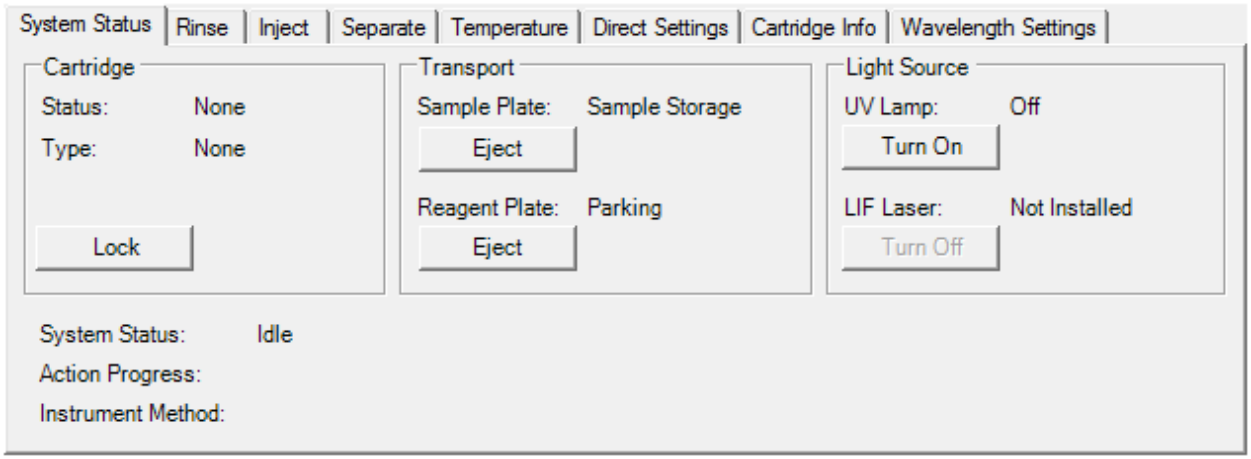


Item	Description
Status Icons	
	Shows the sample storage temperature.

Item	Description
	Shows the cartridge temperature.
	Shows the pressure.
	Shows the voltage of the capillaries.
	Shows the current of the capillaries.
	Shows the detector type.
	Shows the coolant level. **Note:** Green indicates an acceptable level, yellow indicates a low level, and red indicates that the coolant is empty. The system will not operate if the icon is red.
Buttons	
	Click to open the Trace View window.
	Click to move the reagent and sample plates to the home position.
	Click to stop any direct control function. **Note:** This button does not stop a run. To stop a run, in the Run Samples window, click  (**Abort**).

Direct Control: System Status Tab

Figure 4-3 System Status Tab

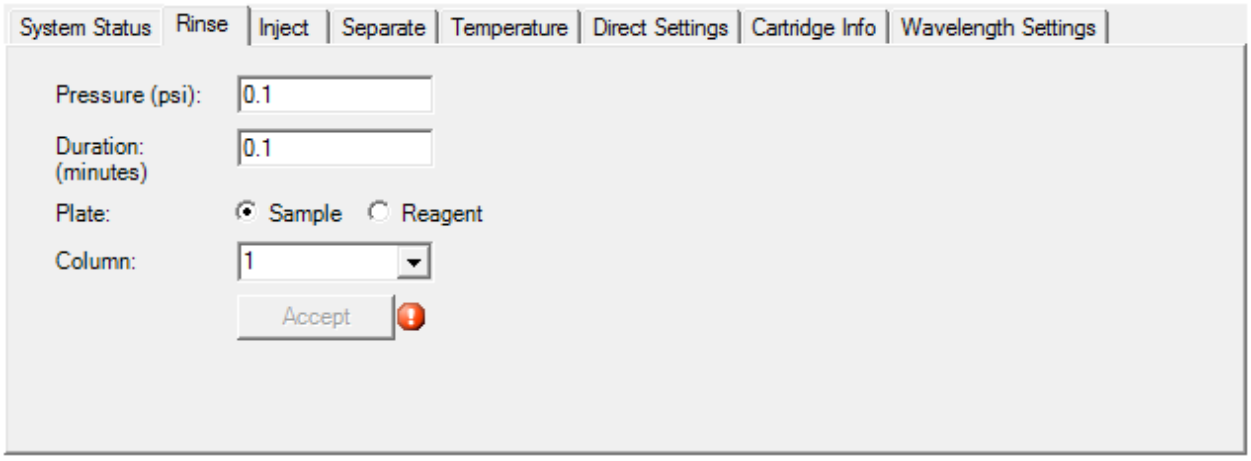


Label	Description
Cartridge	
Status	Shows the status of the cartridge.
Type	Shows the type of cartridge.
Load or **Eject**	Click to lock or eject the cartridge.
Transport	
Sample Plate	Shows the location of the sample plates.
Load or **Eject**	Click to load or eject the sample plates.
Reagent Plate	Shows the location of the reagent plates.
Load or **Eject**	Click to load or eject the reagent plates.
Light Source	
UV Lamp	Shows the status of the UV lamp.
Turn On or **Turn Off**	Click to turn the lamp on or off. **Note:** After the lamp is turned on, a timer counts down from 30 minutes, indicating the time remaining before the lamp is ready.
LIF Laser	If the system has an LIF detector installed, shows the status of the laser.

Label	Description
Turn On or **Turn Off**	Click to turn the laser on or off. **Note:** After the laser is turned on, a timer counts down from 15 minutes, indicating the time remaining before the lamp is ready. The LIF laser button is unavailable if the LIF detection system is not installed on the instrument.
System Status	Shows information about the system status.
Action Progress Status	When a sample set method is running, shows the current action in the instrument method, the elapsed time, and other information about the action.
Method	When a sample set method is running, shows the name of the instrument method.

Direct Control: Rinse Tab

Figure 4-4 Rinse Tab

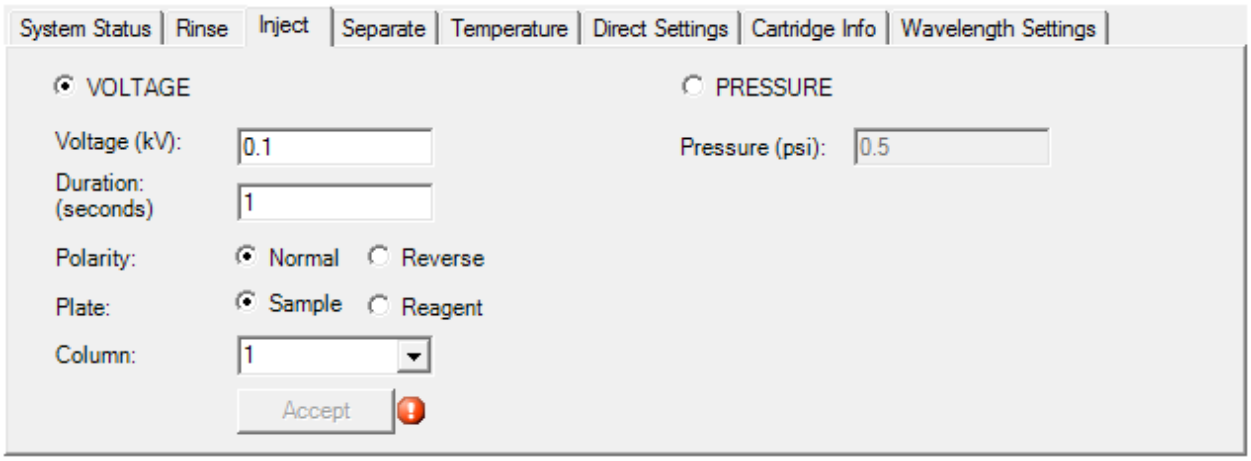


Label	Description
Pressure (psi)	Type the pressure value in psi.
Duration (minutes)	Type the duration of the rinse in minutes.
Plate	Click the plate that contains the rinse solution. The options are **Sample** and **Reagent**.

Label	Description
Column	Click the column that contains the rinse solution. The options are **1** to **12**.
Accept	Click to start the rinse action.

Direct Control: Inject Tab

Figure 4-5 Inject Tab

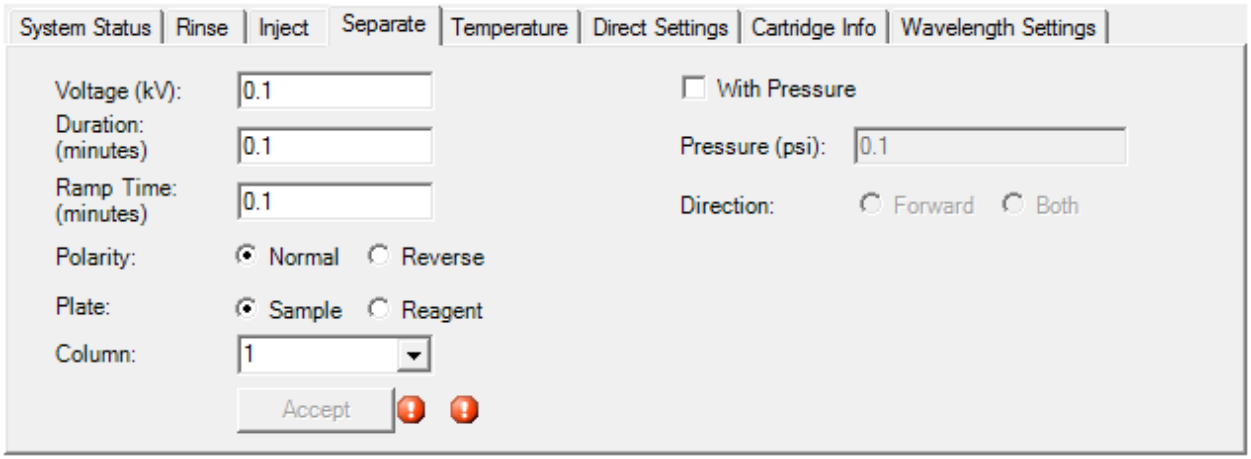


Label	Description
VOLTAGE	Click to select a voltage injection.
Voltage (kV)	Type the voltage for the injection in kV.
Duration (seconds)	Type the duration of the injection in seconds.
Polarity	Click the polarity of the voltage. The options are **Normal** and **Reverse**. **Note:** If **PRESSURE** is selected for the injection, then **Polarity** is not enabled.
Plate	Click the plate that contains the sample to be injected. The options are **Sample** and **Reagent**.

Label	Description
Column	Click the column that contains the sample to be injected. The options are **1** to **12**.
PRESSURE	Click to select a pressure injection.
Pressure (psi)	Type the pressure for the injection in psi.
Accept	Click to start the injection.

Direct Control: Separate Tab

Figure 4-6 Separate Tab

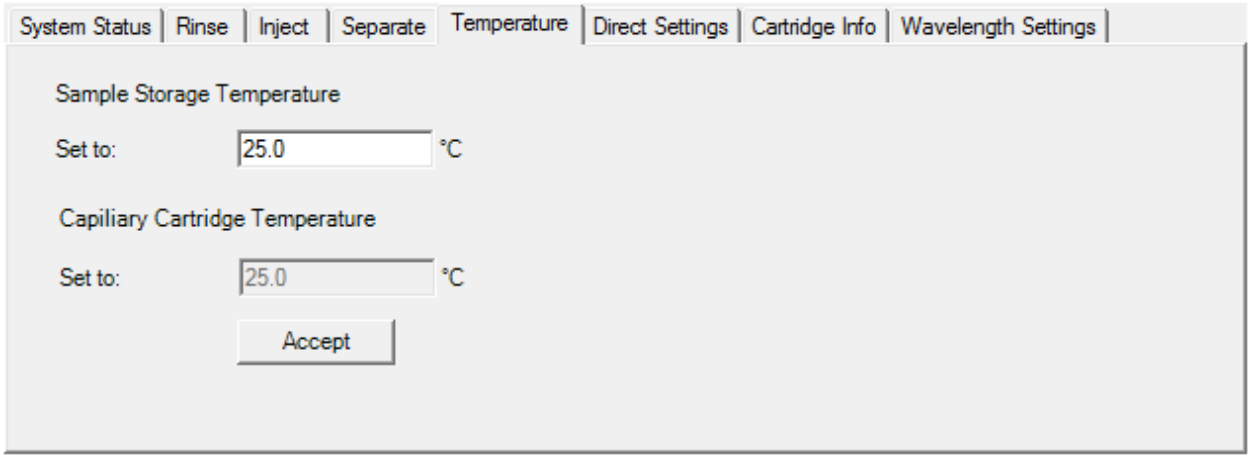


Label	Description
Voltage (kV)	Type the voltage in kV.
Duration (minutes)	Type the duration of the separation in minutes.
Ramp Time (minutes)	Type the ramp time in minutes.
Polarity	Click the polarity of the voltage. Options are **Normal** and **Reverse**.

Label	Description
Plate	Click the plate containing the solution for the separation. Options are **Sample** and **Reagent**. **Note:** If **With Pressure** is cleared, then this option is not available.
Column	Click the column containing the solution for the separation. The options are **1** to **12**.
Accept	Click to start the separation.
With Pressure	Select to apply pressure to the capillary while voltage is applied.
Pressure (psi)	Type the pressure in psi. **Note:** If **With Pressure** is cleared, then this option is not available.
Direction	Touch to select the direction for the pressure. Options are **Forward** and **Both**. **Note:** If **With Pressure** is cleared, then this option is not available.

Direct Control: Temperature Tab

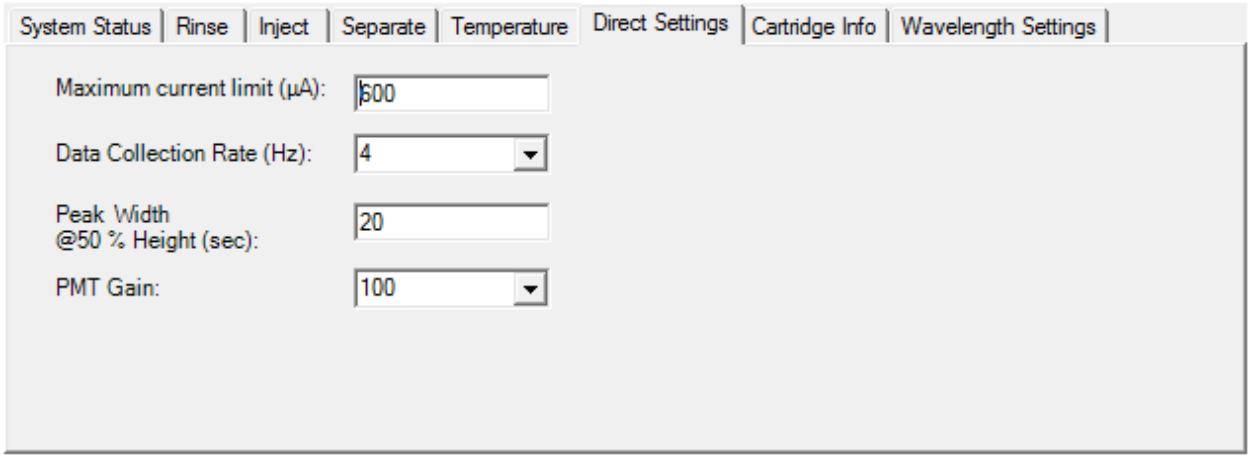
Figure 4-7 Temperature Tab



Label	Description
Sample Storage Temperature	
Set to:	Type the temperature for the sample storage compartment in degrees Celsius.
Capillary Cartridge Temperature	
Set to:	Type the temperature for the capillary cartridge in degrees Celsius.

Direct Control: Direct Settings Tab

Figure 4-8 Direct Settings Tab

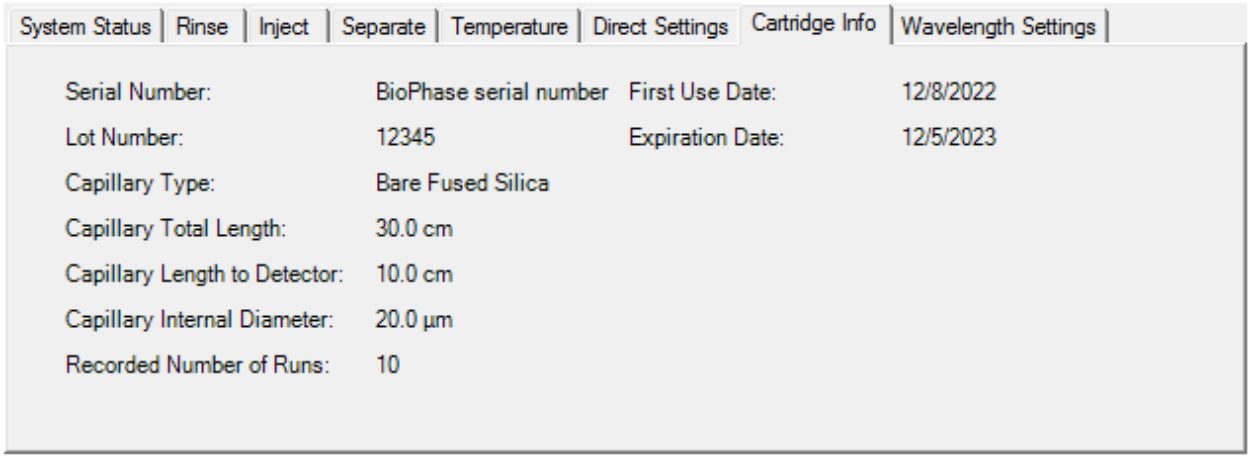


Label	Description
Maximum current limit (µA)	Type the current limit in µA. The maximum current for all capillaries is 600 µA.
Data Collection Rate (Hz)	Select the data collection rate, in Hz, from the list. For UV detection, the options are **1**, **2**, **4**, and **8**. For LIF detection, the options are **2**, **4**, **8**, and **10**. **Note:** Use a lower data collection rate to decrease the baseline noise. Use a higher data collection rate if there are not enough points to accurately identify the peak.
Peak Width @ 50% Height	Type the estimated full width at half maximum (FWHM), in seconds, for the narrowest peaks expected.

Label	Description
PMT Gain	Select the value for PMT gain from the list. The options are **5**, **10**, **100**, and **1000**. **Note:** Use lower values if the sample is expected to have high intensity fluorescence. If the sample is expected to have low intensity fluorescence, then use higher values.

Direct Control: Cartridge Info Tab

Figure 4-9 Cartridge Info Tab

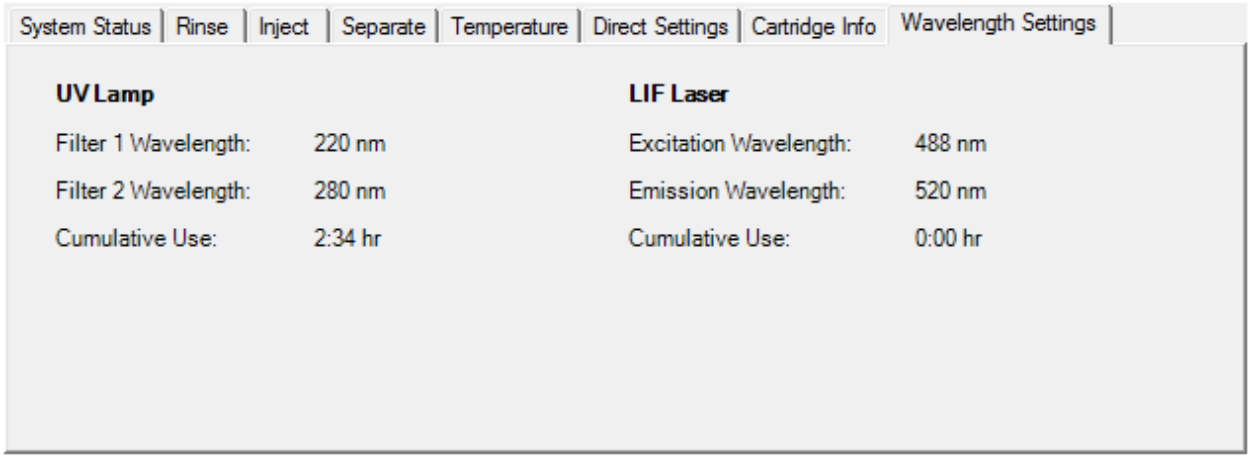


Label	Description
Serial Number	Shows the cartridge serial number.
Lot Number	Shows the cartridge lot number.
Capillary Type	Shows the type of capillary.
Capillary Total Length	Shows the total length of the capillary in cm.
Capillary Length to Detector	Shows the length of the capillary to the detector in cm.
Capillary Internal Diameter	Shows the diameter of the capillary to the detector in µm.
Recorded Number of Runs	Shows the recorded number of runs.

Label	Description
First Use Date	Shows the first date that the cartridge was used.
Expiration Date	Shows the cartridge expiration date.

Direct Control: Wavelength Settings Tab

Figure 4-10 Wavelength Settings Tab



Label	Description
UV Lamp	
Filter 1 Wavelength	Shows the wavelength of the first filter in nm.
Filter 2 Wavelength	Shows the wavelength of the second filter in nm.
Cumulative Use	Shows the number of hours the lamp has been in use.
LIF Laser	
Excitation Wavelength	Shows the excitation wavelength in nm.
Emission Wavelength	Shows the emission wavelength in nm.
Cumulative Use	Shows the number of hours the laser has been in use.

Acquire Data 5

Data acquisition is started from the Waters Empower™ software.

Add a Reagent Set

1. In the Waters Empower™ Software Project window, click **BioPhase 8800** > **BioPhase Instrument Method Editor**.

   The Method Editors for BioPhase System software opens, with the Instrument Method Editor workspace shown.

2. On the ribbon, click  , and then click **Reagent Editor**.
   The reagent editor opens with the Reagent Set Configuration tab shown.

3. To add a new reagent to either of the reagent tables, click  .
   A new row shows in the table.
4. In the **Name** column of the new row, type a name for the new reagent.
5. In the **Viscosity** column of the new row, type the viscosity of the new reagent.
   The default viscosity is 0.89 centipoise.

   Note: To show a tooltip with a list of common viscosity values, hover the mouse over a viscosity value.

6. Click the **Color** column, and then select a color from the list.

   Tip! Select the color of the kit reagent cap.

7. For each additional reagent in the set, repeat steps 3 through 6.
8. (Optional) Click  to delete a reagent from the table.
9. (Optional) Click  to restore a deleted reagent to the table.
10. If the Validation pane is shown, then click the pane to view the errors. Click an error to highlight the location where it occurs, and then make the required change.
    If no errors are present, then the Validation pane is not shown.
11. Save the reagent set.
    a. Click **SAVE AS**.

Note: The **SAVE AS** button is not available if there are errors. Resolve all of the errors in the Validation pane, and then click **SAVE AS**.

b. If the same color is assigned to different reagents, then a message is shown. If the colors should be the same, then click **Yes**.

   This message occurs when the same reagent, such as water, has different names such as "Water Dip 1" and "Water Dip 2".

   The Save Reagent Set dialog opens.

c. Type a name in the **Reagent Set** field.

d. Click **Save**, and then click **OK** to acknowledge the saved reagent set.

Create a New Instrument Method

Instrument methods can also be created by importing a BioPhase software method. Refer to the section: Import a BioPhase Software Method to Create an Instrument Method.

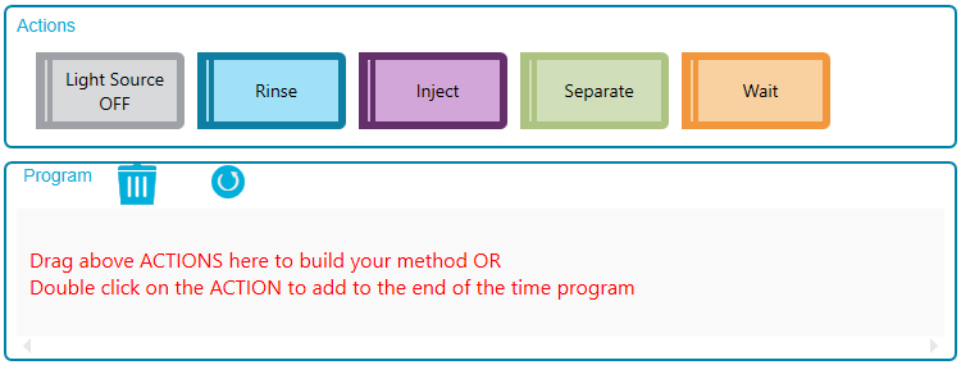
1. In the Waters Empower™ Software Project window, click **BioPhase 8800** > **BioPhase Method Editor**.
   The Method Editors for BioPhase System software opens, with the Instrument Method Editor workspace shown.
2. Click **New Instrument Method**.
   The Instrument Method Editor opens with the Method Settings tab in front.
3. Click the **Reagent Set** list and select the reagent set.
   The Inlet Reagents from Reagent Set and Outlet Reagents from Reagent Set tables are populated.
4. Type or select information in the Method Settings fields.
5. To build the method, open the Method Program tab, and then drag actions to the Program pane.

   Three types of methods can be created:

   - Separation method: A method with an Inject action, which is used to acquire the data for the sample.
   - Conditioning method: A method without an Inject action, which is used to condition the capillary before running a separation method to acquire data.
   - Shutdown method: A method without an Inject action, which is used to clean the capillary to preserve the life span of the cartridge and turn off the light source.

Tip! To add an action to the end of the method, double-click the action. Use the right-click menu to copy, paste, or delete actions from the Program pane.

Figure 5-1 Action and Program Panes



6. Click the actions in the Program pane to edit the action parameters in the Parameters pane.

   If required, additional reagents can be added to the Inlet Reagents from Reagent Set and Outlet Reagents from Reagent Set tables on the Method Settings tab.

   Note: Any changes are not saved to the reagent set. If the new reagents are to be used later, create a new reagent set. Refer to the section: Add a Reagent Set.

7. To edit the locations of the reagents in the reagent plates, do the following:
   a. Open the Reagent Plate Setup tab.
   b. Click **Column** for the reagent and then select the column from the list.

      Each column can only be assigned one reagent.

8. If the Validation pane is shown, then click the pane to view the errors. Click an error to highlight the location where it occurs, and then make the required change.

   If no errors are present, then the Validation pane is not shown.

9. Save the method:
   a. Click **SAVE AS**.

      Note: The **SAVE AS** button is not available if there are errors. Resolve all of the errors in the Validation pane, and then click **SAVE AS**.

      The Save Instrument Method dialog opens.
   b. Type a name in the **Method Name** field.

      Note: The method name must be unique to enable the **Save** button.
   c. (Optional) Type a description for the method in the **Description** field.
   d. Click **Save** and then click **OK** to acknowledge the saved method.

   The method is saved to the Waters Empower™ software database.

10. In the Method Editors for BioPhase System window, click the close box, the × in the top right corner.
    The Method Editors for BioPhase System software closes and the Project window is shown.

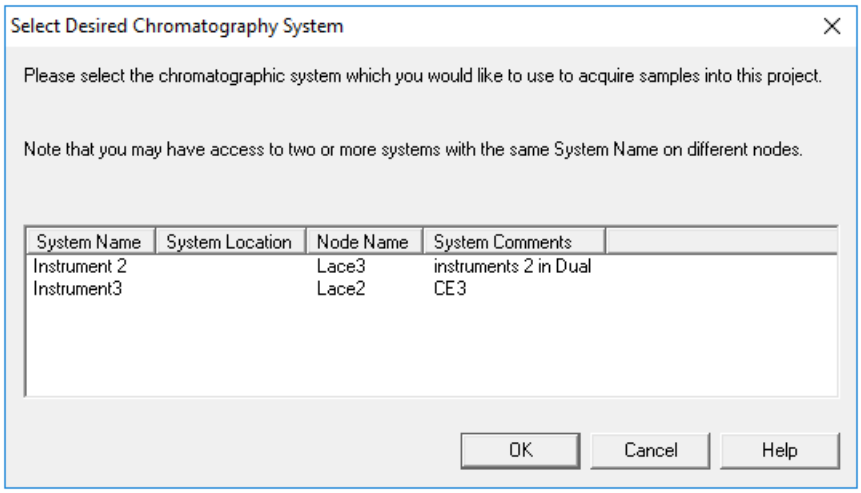
To use the instrument method in the Waters Empower™ software, make sure to add the method to a method set. Refer to the section: Create a Method Set.

Import a BioPhase Software Method to Create an Instrument Method

Use the following steps to import a BioPhase software method and create an instrument method that can be used with the Waters Empower™ software.

1. In the Waters Empower™ Software Project window, click **File** > **New Method** > **Instrument Method**.

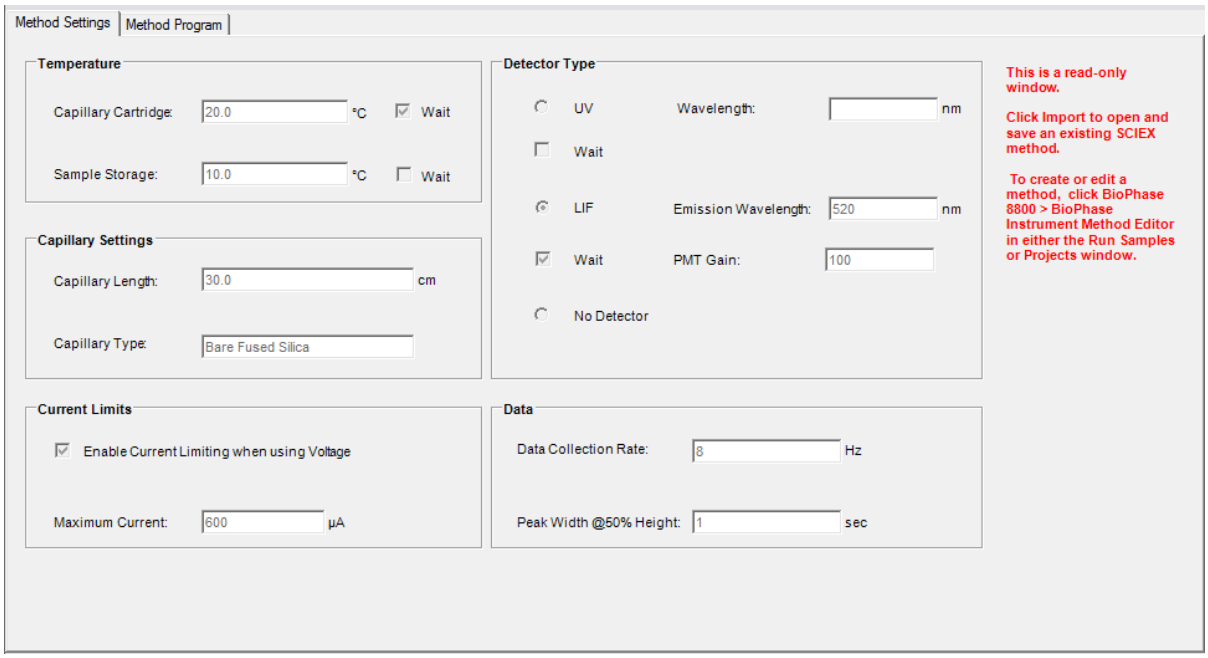
Figure 5-2 Select Desired Chromatography System Dialog



2. Click the system to be used, and then click **OK**.
   The Instrument Method Editor opens.
3. Click **Import**, and then browse to the conditioning method.
   The method opens in the Instrument Method Editor window with the Method Settings tab in front.

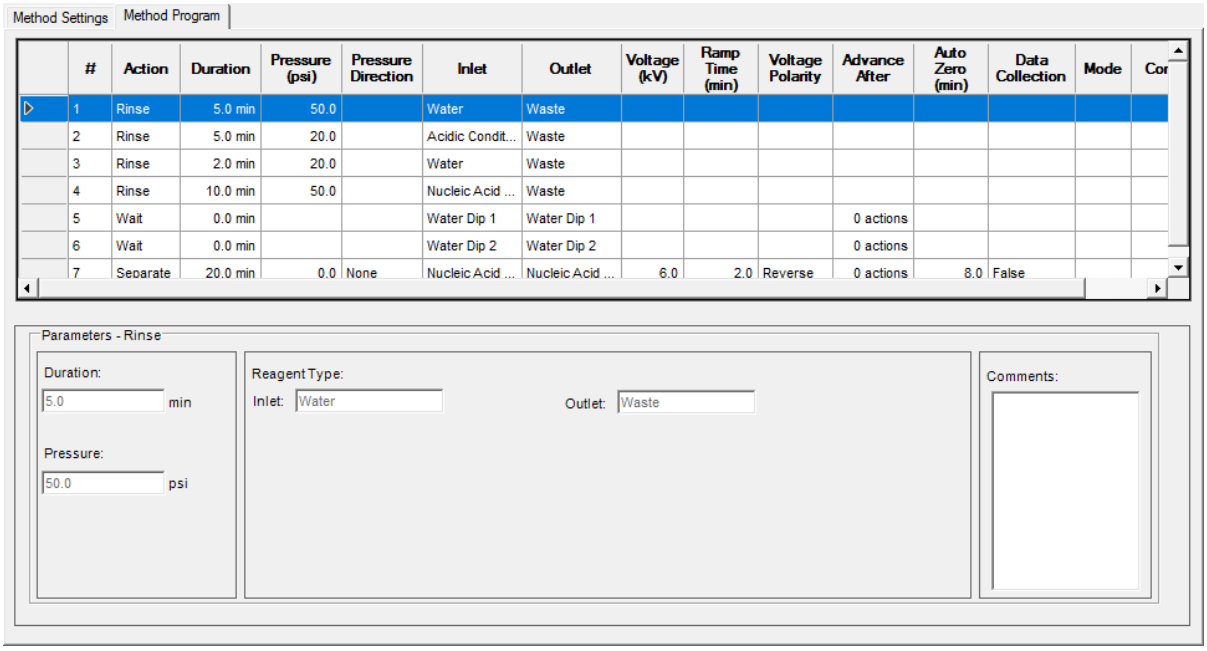
Note: This window is read-only. If changes to the method are required, then save the instrument method, and then edit the method in the Method Editors for BioPhase System software. Refer to the section: "Edit an Existing Instrument Method" in the document: *Software Help*.

Figure 5-3 Method Settings Tab in the Instrument Method Editor



4. (Optional) Open the Method Program tab to see the actions.
5. To see the parameters for an action, click the row in the table.
   The Parameters pane updates to show the parameters.

Figure 5-4 Method Program Tab in the Instrument Method Editor



6. Save the instrument method.

   a. Click **File** > **Save with Method Set**.
   The Save current Instrument Method dialog opens.

   b. In the **Name** field, type a name.

   Note: The name must be less than 30 characters and contain alphanumeric characters, spaces, and the special characters @, _, and %. Although some versions of the Waters Empower™ software accept more than 30 characters and other special characters, if the method is edited in the Method Editors for BioPhase System software, then those characters might cause issues.

   c. (Optional) Click the **Method Comments** field and then type the information.

   d. If prompted, in the Password field, type the Waters Empower™ software password for the current user, and then click **Save**.

   The instrument method and the method set are saved to the current project.

7. Click **File** > **Exit**.

Note: After a method has been imported, the **Import** button in the Instrument Method Editor window is not available unless the window is closed and then opened.

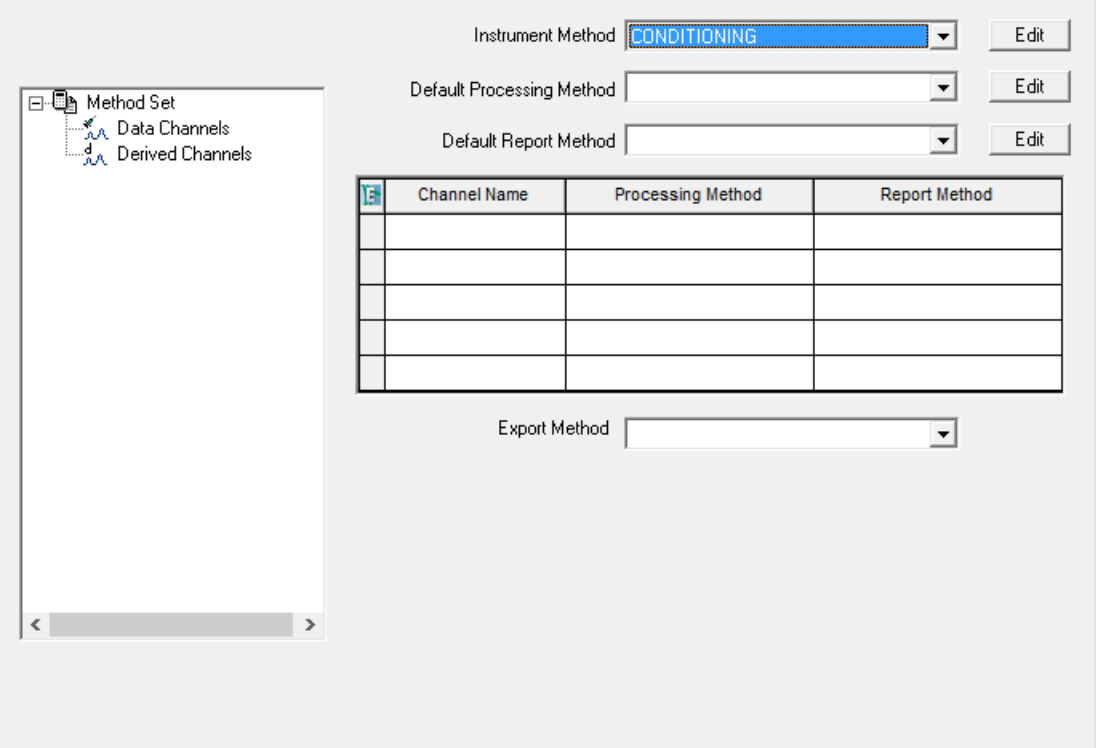
Create a Method Set

For each instrument method, a method set is required.

Note: A method set can also include processing, report, and export methods. To create those methods, refer to the documentation supplied with the Waters Empower™ software.

1. In the Waters Empower™ Software Project window, click **File** > **New Method** > **Method Set**.
2. In the message, click **No**.
   The Method Set Editor window opens.
3. In the **Instrument Method** list, select the instrument method. Do not make any other changes.

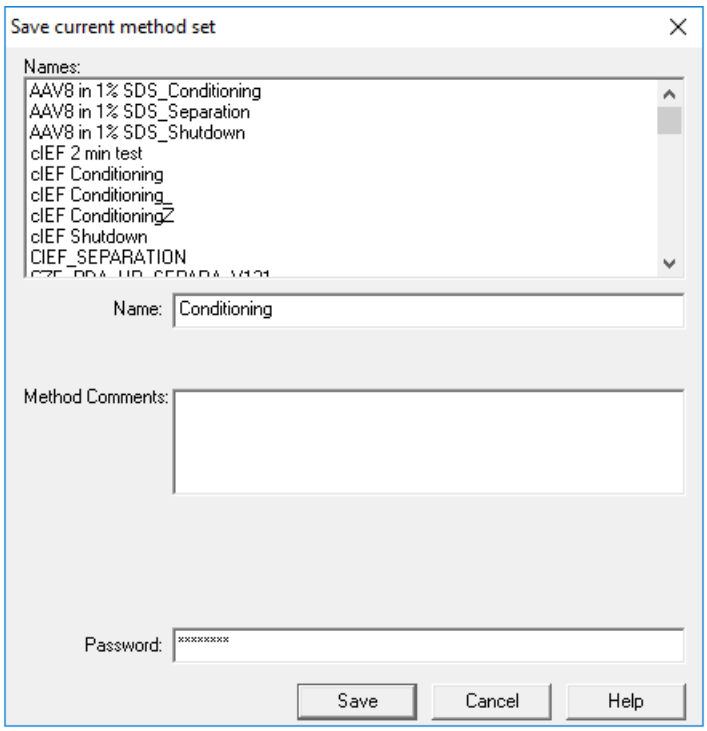
Figure 5-5 Method Set Editor Window



4. Save the method set.
   a. Click **File** > **Save**.
   b. In the **Name** field, type a name for the method set.
   c. (Optional) Type information in the **Method Comments** field.

d. If prompted, in the **Password** field, type the Waters Empower™ software password for the current user and then click **Save**.

Figure 5-6 Save current method set Dialog



The method set is saved to the current project.

Create the Sample Set Method

A sample set method is a list of samples and associated method sets that is sent to the BioPhase 8800 system for data acquisition.

Note: A sample set method can also be created with the Waters Empower™ software, but only the Method Editors for BioPhase System software can create the plate layouts and validate the sample set method for use with the BioPhase 8800 system.

Create the Sample Set Method

Note: A sample set method requires method sets. Make sure that any required instrument method is part of a method set.

The arrangement of the samples and method sets in the sample set method influences the duration of data acquisition. Refer to the section: Tips for Setting Up the Sample Set Method.

1. In the Waters Empower™ Software Run Samples window, click **BioPhase 8800** > **BioPhase Sample Set Editor**.

   The Method Editors for BioPhase System software opens, with the Sample Set Method Editor workspace shown.

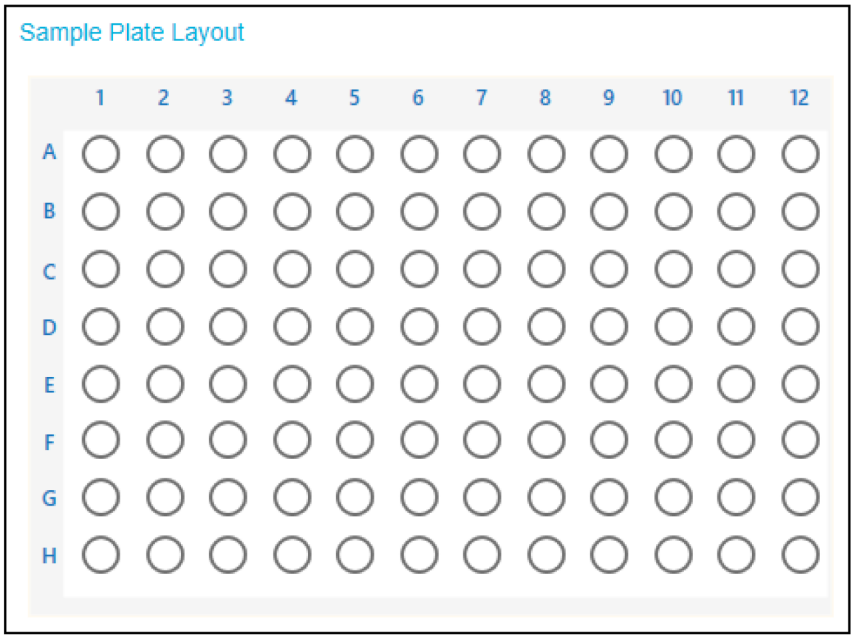
2. Click **New Sample Set Method**.
   The Sample Set Method Editor opens with the Sample Plate Setup tab shown.

3. In first row of the Sample Set Summary table, click the **Method Set Name** cell and then select the appropriate conditioning method.

4. In the Sample Plate Layout pane, select the wells where the sample will be added.

   - Click an individual well.
   - To select all of the wells in a column, click the column number.

   Figure 5-7 Sample Plate Layout Pane



   The Sample Plate Layout updates to show the selected wells.

5. If required, to delete a well from the sample set method, right-click the row in the Sample Set Summary table and then select **Delete Row**.

   To delete all wells, click **NEW** and then create a new sample set method.

6. Add the required sample information to the Sample Set Summary table. In the rows with samples, do the following:

Tip! The required information can also be added by pasting information copied from Excel. Click the **Plate/Well** cell and then press **Ctrl-V** to paste information from Excel. The copied text should contain the well, the sample name, and the method set name. If the method set is not present in the Empower database, then the method set cell in the sample set table is blank after pasting.

a. In the **Sample Name** cell, type a name for the sample.

b. Click the **Method Set Name** cell, and then select the appropriate separation method from the list.

Tip! Select the method for the first sample row, and then right-click and select **Apply method to all samples in column** to assign the method to all of the samples in the column.

7. Repeat the previous step until all of the samples have been assigned a method set.
8. Click the **Sample Set Method** cell in the last row and select the appropriate shutdown method.

Figure 5-8 Sample Set Summary Table

Sample Set Summary

Column	# of Injs	Plate/Well	Sample Name	Method Name	Run Time (Minutes)
				CE SDS Conditioning	37.0
1	1	1:A,1	Washington	Low pH Sample Buffer	61.5
1	1	1:B,1	Hoover	Low pH Sample Buffer	61.5
1	1	1:C,1	Polk	Low pH Sample Buffer	61.5
1	1	1:D,1	Coolidge	Low pH Sample Buffer	61.5
1	1	1:E,1	Jackson	Low pH Sample Buffer	61.5
1	1	1:F,1	Eisenhower	Low pH Sample Buffer	61.5
1	1	1:G,1	Kennedy	Low pH Sample Buffer	61.5
1	1	1:H,1	Truman	Low pH Sample Buffer	61.5
				CD SDS Shutdown	27.0

9. If the Validation pane is shown, then click the pane to view the errors. Click an error to highlight the location where it occurs, and then make the required change.

   If no errors are present, then the Validation pane is not shown.

10. Save the sample set method.

    a. Click **SAVE AS**.

    Note: The **SAVE AS** button is not available if there are errors. Resolve all of the errors in the Validation pane, and then click **SAVE AS**.

    The Save Sample Set dialog opens.

b. Type a name in the **Sample Set Name** field.

Note: The name must be less than 30 characters and contain alphanumeric characters, spaces, and the special characters @, _, and %. Although some versions of the Waters Empower™ software accept more than 30 characters and other special characters, if the method is edited in the Method Editors for BioPhase System software, then those characters might cause issues.

c. (Optional) Type information in the **Description** field.

d. Click **Save**, and then click **OK** to acknowledge the saved method.

The sample set method is saved to the Waters Empower™ software database.

11. To view, save, or print the plate layouts:
    a. Open the Plate Layouts tab.
    b. (Optional) Click **PRINT**.
    The Print Preview window opens.
    c. As required, click the buttons to print or save the plate layouts.
    Refer to the section: "Print Preview Dialog" in the document: *Software Help System*.
    d. Click the close box, the × in the top right corner.
    The Print Preview dialog closes.
12. In the Method Editors for BioPhase System window, click the close box, the × in the top right corner.
    The Method Editors for BioPhase System software closes and the Run Samples window is shown.

Tips for Setting Up the Sample Set Method

The order of the samples in the sample set method influences the number of runs and thus the required time. The BioPhase 8800 system is designed to acquire data from all eight capillaries at the same time, regardless of the method set that is assigned to each well. If a different method set is assigned to each well in a column, then there will be eight separate runs.

Use the following recommendations to minimize the time required to run a sample set method.

- To prevent starting a new run, group samples that have the same method set in the same column (or columns). If more than one method set is in use, then put the samples using the same method set in adjacent wells.
- To minimize the required sample volume, do not assign more than one method set per column.

What Causes a New Run

A new run occurs if the current sample well:

- Is in a different column on the plate.
- Is the same well as the previous run.
- Is before the well in the previous run. For instance, the previous sample well was D1 and the current sample well is A1.
- Has a different method set than the previous run

The following example illustrates how the software determines when to initiate another run. It assumes that well A1 is the first well in the sample set method.

1. After any conditioning, the sample set method instructs the BioPhase 8800 system to inject sample from all eight wells in column 1 (well A1 through well H1), and then uses the method set assigned to well A1 to acquire data.
2. The software saves the data for well A1 and holds the data for wells B1 to H1 in memory.
3. The software evaluates the next row in the sample set method.
    - If the well is B1 and the method set is:
        - The same as for A1, then the data for well B1 is saved and then the software evaluates the next row in the sample set method. This step is repeated until either data for the entire column is saved, or the next well contains a different method set.
        - Different than for A1, then the data in memory is deleted, and a new run is started. Sample is injected from all eight wells in column 1.
    - If the well is not B1:
        - If the well is A1 (a replicate), then the data in memory is deleted, and a new run is started. Sample is injected from all eight wells in column 1.
        - If the well is in column 1 and the method set is:
            - The same as for A1, then the data in memory is saved and the software evaluates the next row in the sample set method.
            - Different than for A1, then the data in memory is deleted, and a new run is started. Sample is injected from all eight wells in column 1.
        - If the well is not in column 1, the data in memory is deleted, and then a new run is started. Sample is injected from all eight wells in the column where the well is located.
4. After the run is complete, the software saves the data for the current well. Then it evaluates the next row in the sample set method as described previously, except that the well is the next well in the column, not B1. Refer to step: 3.

Prepare the BioPhase 8800 System

Use the procedures in this section to prepare the BioPhase 8800 system to acquire data.

The procedures in this section assume that the system has already been properly installed and initialized.

Tip! To save time, turn on the light source 30 minutes before starting the run so it can warm up.

Load the Reagent Inlet and Outlet Plates

Note: To prevent air bubbles, do not shake or vigorously mix the buffer. Air bubbles might cause issues with the separation.

1. Add the reagents to the reagent inlet and outlet plates according to the reagent plate layout.

   Use the volumes in the following table.

   Note: For the outlet plate, make sure that the chamfered corner is on the upper right, and then fill only the wells on the left side of the plate. The wells on the right side are for overflow and must be empty.

   Table 5-1 Reagents for the Reagent Inlet and Outlet Plates

Plate	Reagent
Inlet plate	800 µL per well
Outlet plate	• 2.8 mL per well of reagent for separation or wait actions • 1.5 mL per well of CE Grade Water for waste positions

2. Put a film cover on the plates.

   CAUTION: Potential System Damage. Do not use a heated plate sealer to apply the seal. The heat might damage the surface of the plates, which might cause issues with the pressure system.

   Note: Only X-Pierce film from USA Scientific is validated. If a different film is used, then test it before use.

3. Put the plates in a swinging-bucket rotor, and then spin them for 4 min at 30 *g*. Make sure that the buckets are balanced.

   CAUTION: Potential Wrong Result. Do not load the plates in the system without spinning them to remove air bubbles. The presence of air bubbles might cause the separation to fail.

4. Make sure that there are no air bubbles present in the plates. If air bubbles are present, then spin the plates again at a higher relative centrifugal force (RCF).

For the reagent plate, the maximum RCF is 1,000 *g*. For the sample plate, the maximum RCF is 375 *g*.

5. On the front panel, touch **Eject Reagent**.

Figure 5-9 Eject Reagent Button

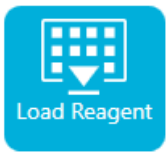
The plate compartment opens.

6. Remove the film cover from the plates.

CAUTION: Potential System Damage. Do not load plates in the system before removing the film cover. The presence of the film cover during a run might damage the capillary tips.

7. If the plate compartment already contains reagent plates, then remove the reagent plates.
8. Align the notch in the reagent inlet plate with the tab, and then put the plate in the plate carrier. Refer to the figure: Figure 2-6.
9. Make sure that the chamfered corner of the reagent outlet plate is in the top left, and then put the plate in the back of the plate carrier. Refer to the figure: Figure 2-7.
10. Touch **Load Reagent**.

Figure 5-10 Load Reagent Button



The plate compartment closes.

Load the Sample Inlet and Outlet Plates

1. Add the samples to the sample inlet plate according to the sample plate layout.

   The minimum sample volume is 50 µL. The maximum sample volume is 200 µL.

   The recommended sample volume varies by application. Refer to the specific *Application Guide*.

2. To prevent damage to the capillary, if there are columns where not every well has sample, then add between 100 µL and 200 µL of sample buffer to each empty well.

If a column has no samples, then the wells can be left empty.

3. Add the reagents to the sample outlet plate according to the sample plate layout.
   The maximum volume is 2.0 mL.

   The recommended volume varies by application. Refer to the specific *Application Guide*.

   Note: For the outlet plate, make sure that the chamfered corner is on the upper right, and then fill only the wells on the left side of the plate. The wells on the right side are for overflow and must be empty.

4. Put a film cover on the plates.

   CAUTION: Potential System Damage. Do not use a heated plate sealer to apply the seal. The heat might damage the surface of the plates, which might cause issues with the pressure system.

   Note: Only X-Pierce film from USA Scientific is validated. If a different film is used, then test it before use.

5. Put the plates in a swinging-bucket rotor, and then spin them for 4 min at 30 *g*. Make sure that the buckets are balanced.

   CAUTION: Potential Wrong Result. Do not load the plates in the system without spinning them to remove air bubbles. The presence of air bubbles might cause the separation to fail.

6. Make sure that there are no air bubbles present in the plates. If air bubbles are present, then spin the plates again at a higher relative centrifugal force (RCF).
   For the reagent plate, the maximum RCF is 1,000 *g*. For the sample plate, the maximum RCF is 375 *g*.

7. On the front panel, touch **Eject Sample**.

   Figure 5-11 Eject Sample Button

   The plate compartment opens.

8. Remove the film cover from the plates.

CAUTION: Potential System Damage. Do not load plates in the system before removing the film cover. The presence of the film cover during a run might damage the capillary tips.

9. If the plate compartment already contains sample plates, then remove the sample plates.
10. Orient the sample plate so that the alignment notch in the plate aligns with the tab, and then put the plate in the plate carrier. Refer to the figure: Figure 2-5.
11. Orient the sample outlet plate so that the chamfered corner is in the upper left, and then put the plate in the back of the plate carrier. Refer to the figure: Figure 2-7.
12. Touch **Load Sample**.

Figure 5-12 Load Sample Button

The plate compartment closes.

Examine the Capillary Cartridge

WARNING! Puncture Hazard. Be careful when handling the cartridge. The tips of the capillaries are extremely sharp.

CAUTION: Potential System Damage. Do not let the separation gel or other reagents crystallize on the electrodes, capillary ends, cartridge seals, or cartridge body. Electrolyte salt crystals or precipitate can cause plugged capillaries, improper pressure sealing, errors when injecting samples, arcing, or current leakage.

1. Examine the electrodes, capillary tips, cartridge seals, and cartridge body interface before use.
2. If there is liquid on the outside of the cartridge, then clean the cartridge with a damp lint-free laboratory wipe. After cleaning, make sure to dry the cartridge.

Note: Do not use soap or detergent to clean the cartridge.

3. If the capillary tips are blocked, then do this:
   a. Use CE Grade Water to clean the capillary inlets.
   b. Use a lint-free laboratory wipe to wipe the capillary inlets carefully in an outward direction.

4. Use a magnifying glass to examine both sides of the capillary window. If lint or other particles are present, then use short bursts of electronics-grade compressed air to remove them. Do not use water or other liquids to clean the capillary window.

   CAUTION: Potential System Damage. Do not use organic solvents, such as methanol or acetone, to clean the capillary window. Organic solvents can dissolve the adhesives, leaving residue on the capillary window that might interfere with the detector.

5. Moisten a lint-free laboratory wipe or cotton swab with ethanol or isopropyl alcohol, and then wipe the surface of the chip. Let the chip air dry before installing the cartridge.

Install the Cartridge

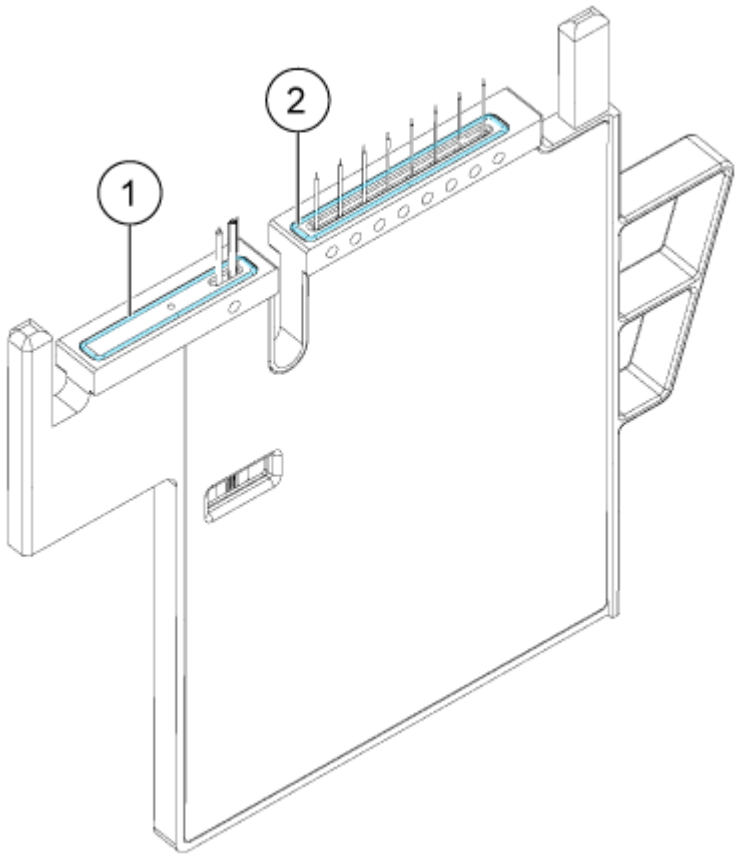
WARNING! Puncture Hazard. Be careful when handling the cartridge. The tips of the capillaries are extremely sharp.

WARNING! Pinching Hazard. When opening the front panel, be careful not to put fingers to the left of the front panel.

CAUTION: Potential System Damage. Make sure that the reagent plates are installed in the system before installing the cartridge. Failure to do so might damage the cartridge.

1. If the cartridge was stored in the refrigerator, then let the cartridge equilibrate to room temperature for approximately 30 min to prevent condensation in the system.
2. Remove the cartridge from the wetting tray.
3. Use a disposable laboratory wipe to dry the cartridge body to prevent arcing.
4. Turn the bottom of the cartridge up.
5. Use a disposable lint-free laboratory wipe to very gently dry the area where the capillaries and electrodes emerge from the cartridge. Do not disturb the seals.

Figure 5-13 Bottom of the Cartridge



Item	Description
1	Outlet plate seal
2	Inlet plate seal

6. If the reagent plates are not installed in the system, then install them. Refer to the section: Load the Reagent Inlet and Outlet Plates.
7. Open the front panel, and then put the cartridge in the system.
8. Close the front panel, and then touch **EJECTED** to lock the cartridge.

Figure 5-14 EJECTED Button

If the cartridge run life has been exceeded, then a warning message is added to the front panel log. To view the warning message, touch on the front panel status area. The cartridge can still be used or a new one can be installed.

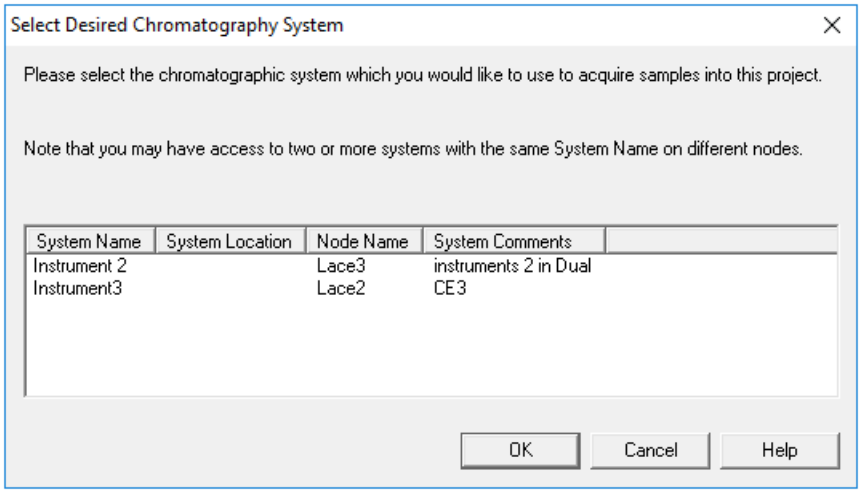
The system moves the reagent plate so that the capillaries are in position over column 1, and then raises the plate so that the capillary ends are immersed in CE Grade Water.

9. Examine the coolant level on the front panel. If required, add coolant into the fill port on the system.
   Refer to the section: Add Capillary Cartridge Coolant.

Start the Sample Set Method

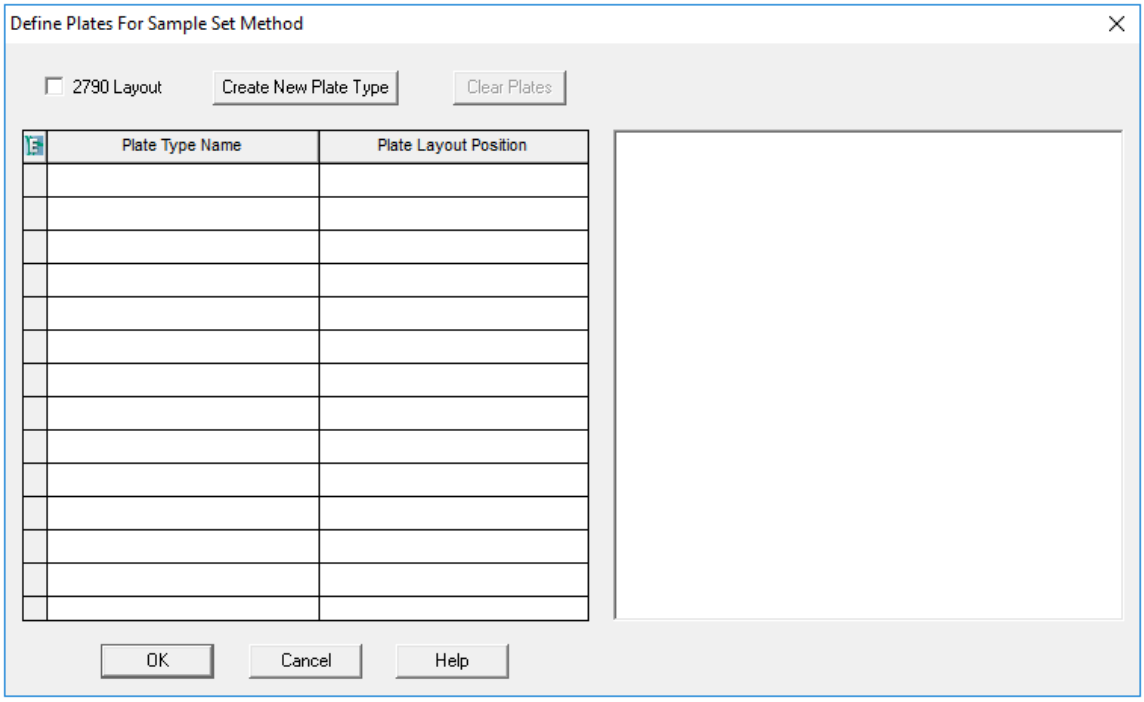
1. Load the cartridge and the plates. Refer to the section: Prepare the BioPhase 8800 System.
2. In the Waters Empower™ software Project window, click **Tools** > **Run Samples**.

Figure 5-15 Select Desired Chromatography System Dialog



3. Click the system to be used, and then click **OK**.
   The Run Samples window opens.
4. Configure the plate type.
   a. Click **Edit** > **Plates**.

Figure 5-16 Define Plates for Sample Set Method Dialog



Note: If the dialog does not look like the preceding figure, then clear the **2790 Layout** check box.

b. Click the **Plate Type Name** cell, and then select **ANSI-96well2mL**.
The dialog updates with an image of the plate and buttons for the plate sequencing mode.

c. Click the **Plate Layout Position** cell, and then type `1`.

d. Click  to indicate the order in which the wells are accessed during the run.

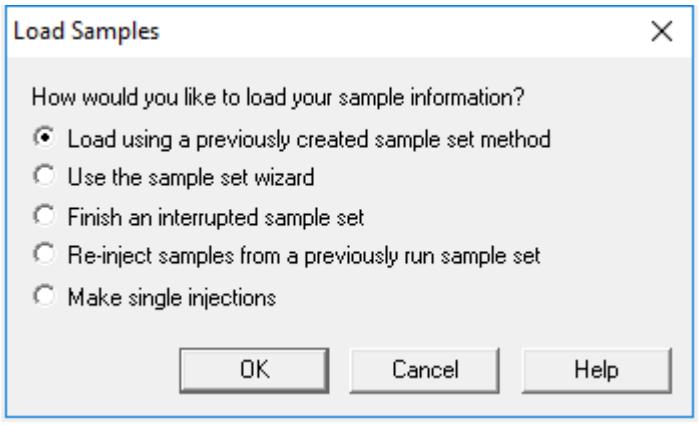
e. Click **OK** to save the changes, and then close the dialog.

Tip! To permanently configure the plate type, click **Customize** > **Defaults**, click **Plates**, do steps 4.b through 4.e, and then click **OK**.

In the Sample Set Method table, the heading for the **Vials** column changes to **Plate/Well**.

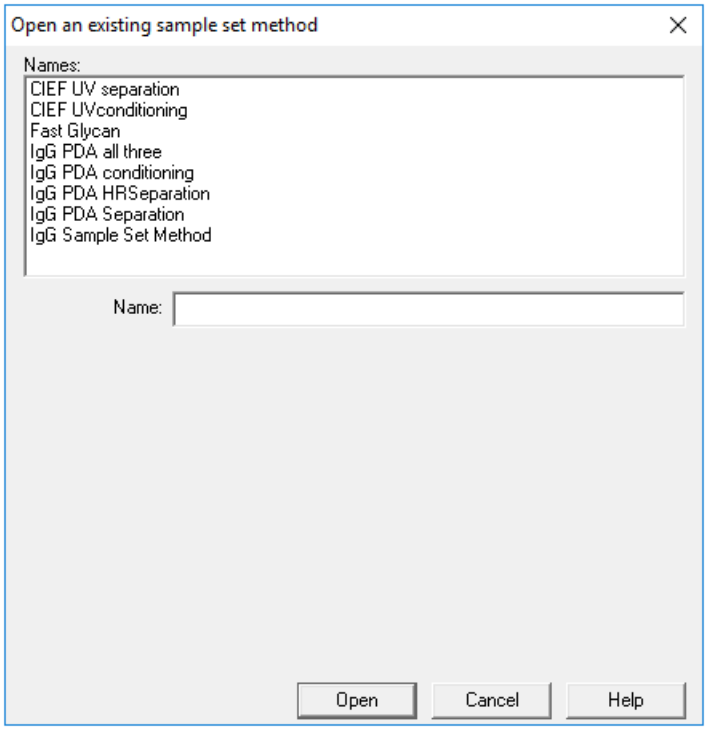
5. Click  (**Load Sample Set**).

Figure 5-17 Load Samples Dialog



6. Click **Load using a previously created sample set method**, and then click **OK**.

Figure 5-18 Open an existing sample set method Dialog



7. Click the sample set method in the list, and then click **Open**.
   The sample set method opens in the Samples tab.
8. (Optional) Configure the table to show only the columns that are relevant for the BioPhase 8800 system.

a. Right-click, and then select **Table Properties**.
The Table Properties dialog opens.

b. Click **Hide All**, and then clear the check boxes for **Plate/Well**, **# of Injs**, **SampleName**, **Function**, and **Method Set / Report or Export Method**.

c. Click **OK**.

The table updates to show the selected columns.

Figure 5-19 Samples Tab

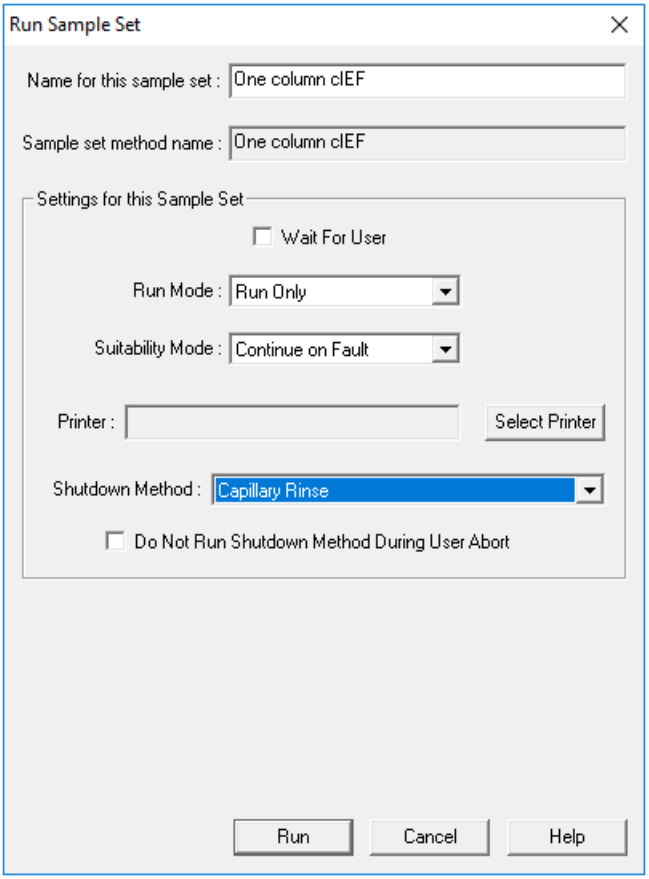
Sample Set Method: RNA 9000 Kit Sample Set Method

	Plate/Well	# of Injs	SampleName	Function	Method Set / Report or Export Method
1				Condition Column	Conditioning Method RNA 9000
2	1:A,1	1	Smith	Inject Samples	Separation Method RNA 9000
3	1:B,1	1	Jones	Inject Samples	Separation Method RNA 9000
4	1:C,1	1	Wang	Inject Samples	Separation Method RNA 9000
5	1:D,1	1	Lee	Inject Samples	Separation Method RNA 9000
6	1:E,1	1	Chavez	Inject Samples	Separation Method RNA 9000
7	1:F,1	1	Robles	Inject Samples	Separation Method RNA 9000
8	1:G,1	1	Jensen	Inject Samples	Separation Method RNA 9000
9	1:H,1	1	Andersen	Inject Samples	Separation Method RNA 9000
10	1:A,2	1	Smith	Inject Samples	Separation Method RNA 9000
11	1:B,2	1	Jones	Inject Samples	Separation Method RNA 9000
12	1:C,2	1	Wang	Inject Samples	Separation Method RNA 9000
13	1:D,2	1	Lee	Inject Samples	Separation Method RNA 9000
14	1:E,2	1	Chavez	Inject Samples	Separation Method RNA 9000
15	1:F,2	1	Robles	Inject Samples	Separation Method RNA 9000
16	1:G,2	1	Jensen	Inject Samples	Separation Method RNA 9000
17	1:H,2	1	Andersen	Inject Samples	Separation Method RNA 9000
18	1:A,3	1	Smith	Inject Samples	Separation Method RNA 9000

9. Review the sample set method. If any changes are required, then edit the method in the Method Editors for BioPhase System software. Any changes to the instrument methods or method sets automatically propagate to the sample set method.

10. In the Waters Empower™ Software Project window, click  (**Start**).

Figure 5-20 Run Sample Set Dialog



11. If required, edit the information in the Run Sample Set dialog.
    a. If required, edit the **Name for this sample set** field.
    b. Click **Shutdown Method**, and then select an instrument method which rinses the capillaries.

    Note: For the rinse solution, make sure to use a solution that is compatible with the capillaries in use.

    If the system encounters an error during a run, then it executes this instrument method, and then stops the run.
    c. If required, select **Do Not Run Shutdown Method During User Abort**.
    d. Click **Run**.

    The run starts. During the run, the text in the row in the Sample Set Method window for the sample being acquired is red.

CAUTION: Potential Data Loss. Do not initiate any actions from the BioPhase 8800 driver for Empower™ Direct Control pane during a run, even if the system status is idle. Any actions might interfere with data acquisition.

Monitor the Run in the Waters Empower™ Software

Use this procedure to monitor the progress of the sample set method, and then, if required, pause or stop it.

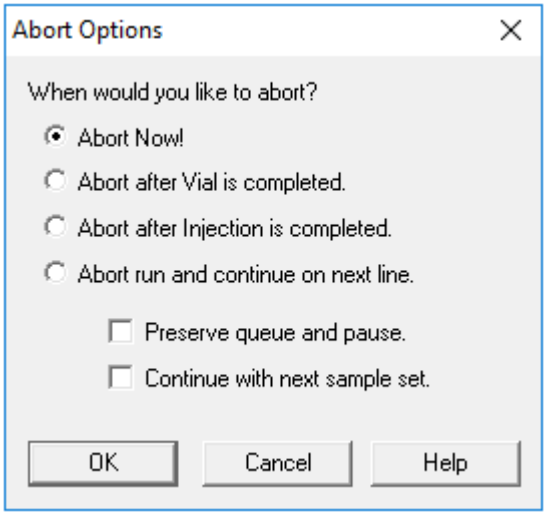
Note: Most of the panes in the Waters Empower™ software are designed for chromatography. Use the following steps to monitor the progress of the capillary electrophoresis separation and disregard information in the Time Remaining and Solvent Required panes.

1. If a problem is detected, to stop the run, click  (**Abort**).

CAUTION: Potential Data Loss. Do not stop the run until all of the data is saved. The data is saved when the sample set method is on the next row.

Note: Do not use the **Stop** button in the Direct Control pane. That button only operates on functions initiated from the Direct Control pane.

Figure 5-21 Abort Options Dialog

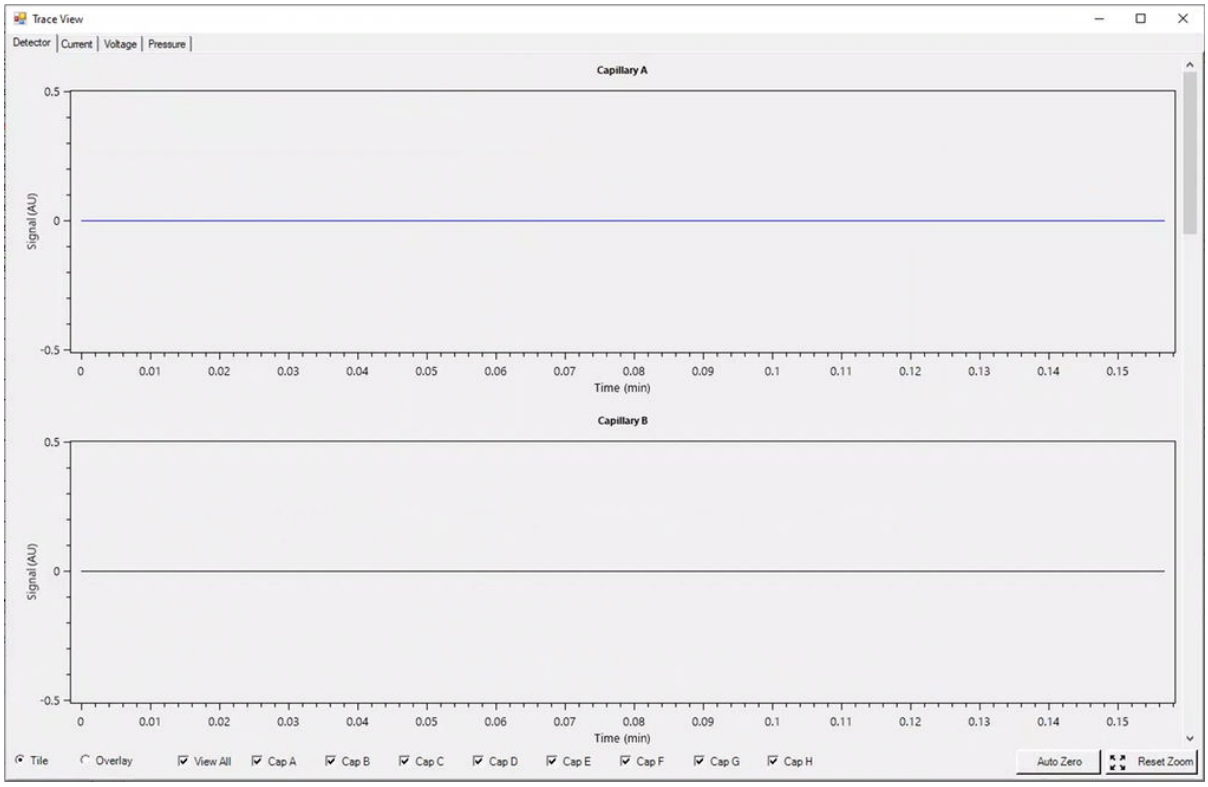


CAUTION: Potential System Damage. If the run is stopped, then use the conditioning method to rinse the capillaries before using the cartridge again. If the capillaries are not rinsed, electrolyte salt crystals or precipitate can accumulate and might cause plugged capillaries, improper pressure sealing, errors when injecting samples, arcing, or current leakage.

When the run ends, the text in all of the rows in the Sample Set Method window is red.

2. To view the data while it is acquired, in the Direct Control pane, click  (**Monitor**). The Trace View window opens, and then the data is shown.

Figure 5-22 Trace View Window



3. If required, do any of the following:

   - To view current, voltage, or pressure, open the applicable tab in the top left.
   - To view one graph with the data for all of the capillaries, in the bottom left click **Overlay**.
   - To view data for specific capillaries, select or clear the check boxes at the bottom of the window to select the capillaries of interest.

- To view the time and detector values for any point on a trace, click the trace at the position of interest.
- To zoom in on the data, make sure that **Overlay** is selected, and then drag to select the area to zoom. The mouse scroll wheel can also be used to zoom.
- To return the data to the original dimensions, in the bottom right click **Reset Zoom**.
- To view a different area of a zoomed plot, right-click the X- or Y-axis and then drag.

4. If required, at the bottom right click **Auto Zero**.
   The detector signal is set to zero.
5. Wait until the **Abort** button () changes from red to green ().
   There might be a delay between data acquisition and when all of the data is saved. The green button indicates when all of the data is saved.
6. As required, dispose of samples and reagents. Refer to the section: "Waste Disposal" in the document: *Application Guide*.
7. As required, store the cartridge. Refer to the section: Store the Cartridge After the Run.

Store the Cartridge After the Run

WARNING! Puncture Hazard. Be careful when handling the cartridge. The tips of the capillaries are extremely sharp.

Store the Cartridge for Less than Three Days

1. If the sample set method does not include a shutdown method, then use the shutdown method to clean the capillary.
2. Store the cartridge for up to three days in the system with the capillary ends immersed in CE Grade Water.

Note: If the cartridge has not been used for three hours or longer, then run the conditioning method before doing a separation.

Store the Cartridge for More than Three Days

1. If the sequence or sample set method does not include a shutdown method, then use the shutdown method to clean the capillary.
2. On the ribbon on the BioPhase 8800 system front panel, touch 

(**Loaded**) and then wait for about one minute.
   Waiting lets the coolant return to the coolant reservoir before the cartridge is removed.

3. Remove the cartridge from the system, and then store it upright in the cartridge box at 2 °C to 8 °C with the capillary ends immersed in CE Grade Water.

Note: Replace the CE Grade Water in the tray regularly to avoid microbial growth in the tray.

Prepare the Cartridge After Storage

- If the cartridge has not been used for more than a day, or if it has been stored for an extended time, then use the conditioning method to condition the capillary.

Note: To prevent arcing, and before installing the cartridge in the system, carefully wipe off any water from around the electrodes and cartridge body.

Maintenance 6

WARNING! Ionizing Radiation Hazard, Biohazard, or Toxic Chemical Hazard. Identify whether decontamination is required before cleaning or maintenance. 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.

Clean the Surfaces

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

Required Materials
• Soft cloth

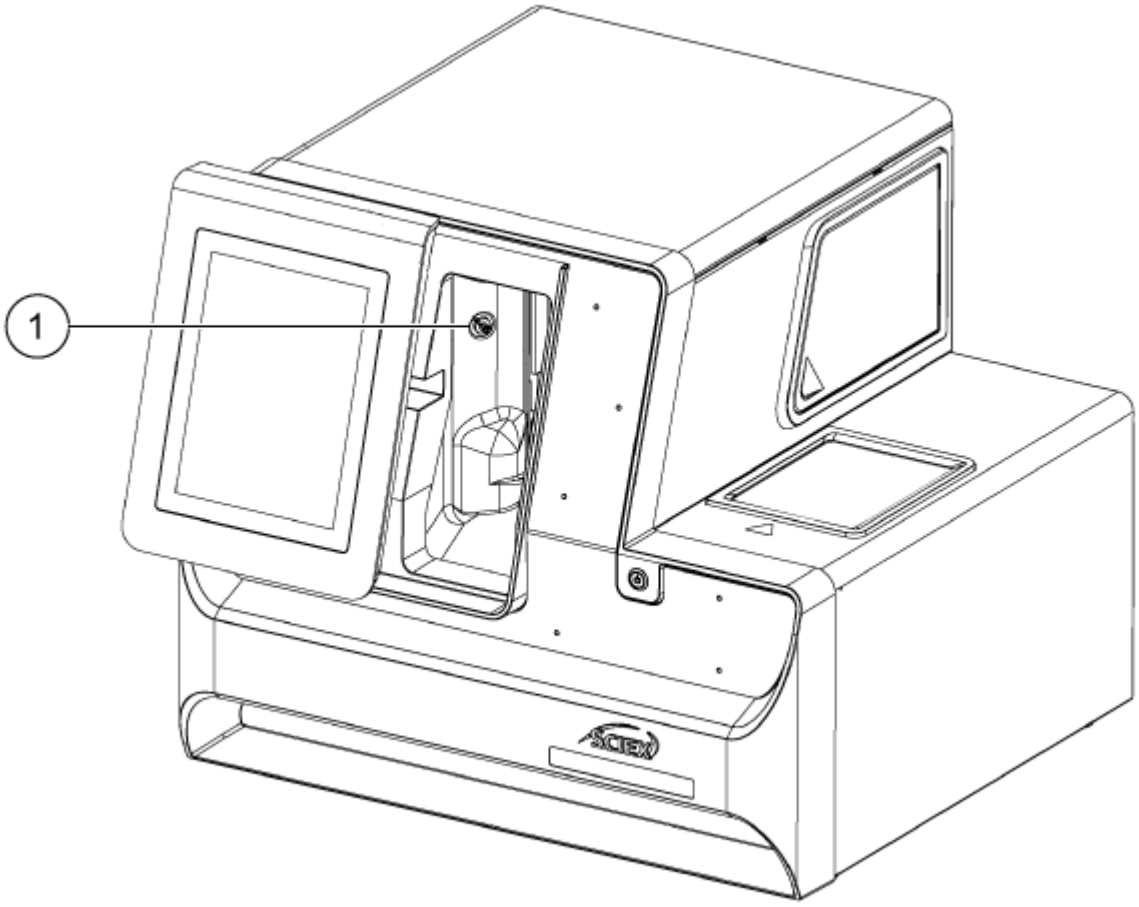
1. Use a soft, damp cloth to clean the surfaces of the system.
2. Use a soft, dry cloth to remove any moisture from the surfaces.

Add Capillary Cartridge Coolant

Required Materials
• Capillary cartridge coolant (PN 359976) • Fill tool (PN 144647)

1. Examine the level of the coolant on the BioPhase 8800 system front panel.
   If the cartridge coolant level is red, then add coolant.
2. Move the panel to the left to get access to the coolant fill port.
3. Attach the fill tool to the port.
4. Hold up the end of the syringe and slowly fill the syringe with coolant while monitoring the indicator until the required fill level is reached.
5. Let the syringe drain.
6. Repeat steps 4and 5 until the cartridge coolant level is green.

Figure 6-1 Coolant Fill Port



Item	Description
1	Coolant fill port

Clean the Sample Lid and the Plate Compartment Cover

Remove and examine the sample lid at regular intervals. If required, then clean the sample lid and plate compartment cover.

Required Materials
• Wet cloth • Dry cloth • (Optional) Laboratory tissues

1. On the front panel, touch **Eject Sample** or **Eject Reagent**.
   The plate compartment cover opens automatically to show the plate compartment.

   Figure 6-2 Plate Compartment Open

2. If plates are installed, then remove them.
3. Remove the plate compartment cover and sample lid.
   a. Press down on the notch at the front of the white plate compartment cover to dislodge it from the blue sliding door.
   b. Pull the plate compartment cover far enough forward to remove it.

   The sample lid rests in the plate compartment cover.

Figure 6-3 Plate Compartment Cover Partially Forward, Notch Circled in Red

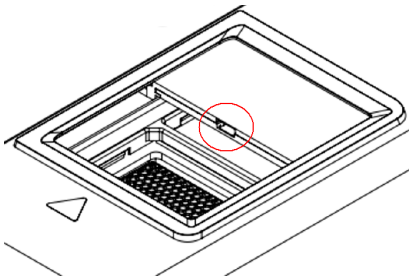
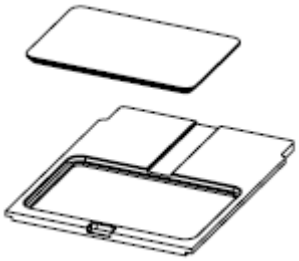
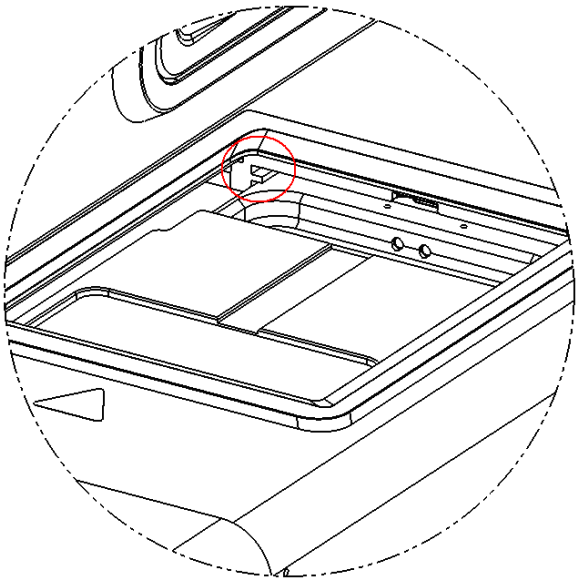


Figure 6-4 Sample Lid, Top, and Plate Compartment Cover, Bottom



4. Use a wet cloth or laboratory tissue to clean the bottom of the sample lid and the plate compartment cover.
5. Install the sample lid on the plate compartment cover, and then install the lid and cover in the slot in the plate compartment. Push the lid and cover in until they click in place.

Figure 6-5 Slot in Plate Compartment, Circled in Red



6. Install the plates that were removed in step 1.
7. On the front panel, touch **Load Sample** or **Load Reagent**.

Install a UV Filter

The UV detector is supplied with two filters: 220 nm and 280 nm. If a different filter is necessary, one or both of the filters can be replaced. Refer to the table: Table 7-1.

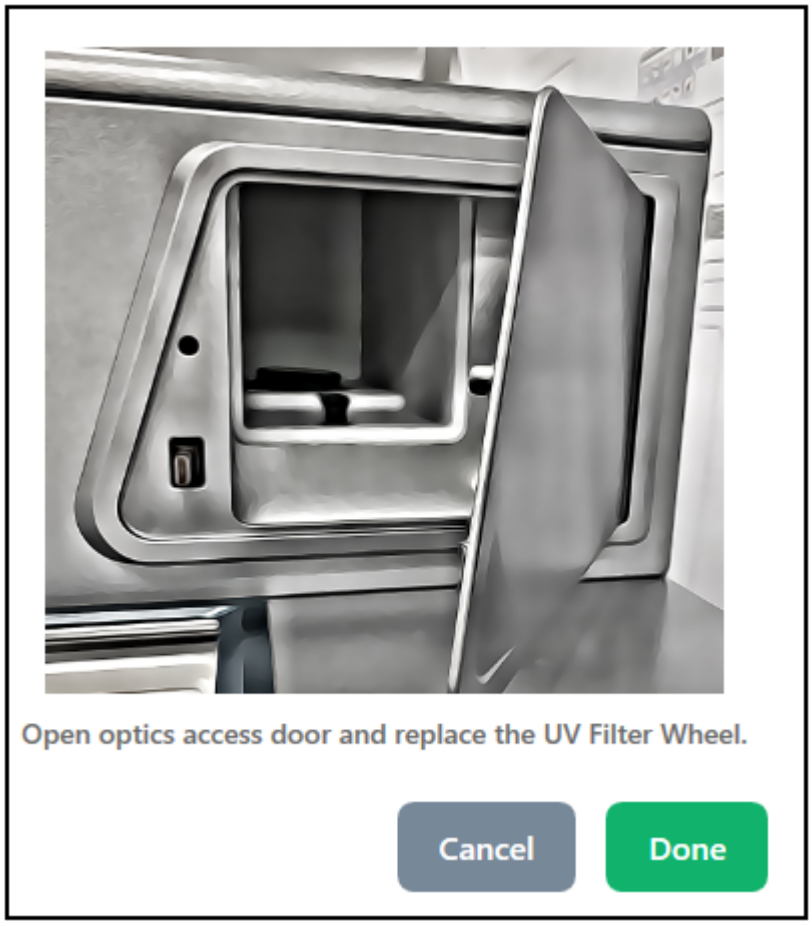
Required Materials
• Filter • Powder-free gloves

1. On the front panel, do the following:
   a. Touch **Direct Control** to open the Direct Control window.
   b. Touch **Wavelength Settings**.

Figure 6-6 Wavelength Settings Button

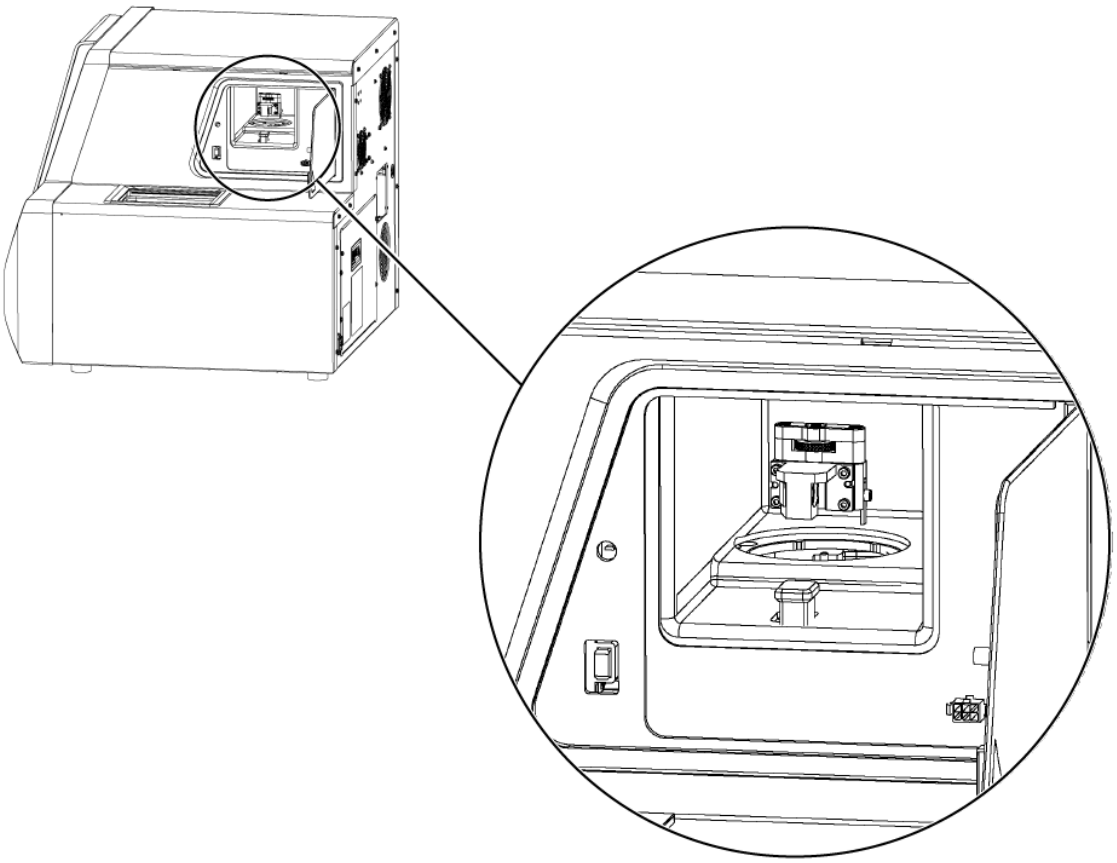
   c. Touch **Replace Filter** to replace the filter. The **Replace Filter** button is unavailable if **UV Filter 1** and **UV Filter 2** values are not entered.
   The touchscreen updates to show an image and instructions.

Figure 6-7 Access Door for the Optics Compartment



2. On the system, push in the lower left corner to unlock and pull open the access door for the optics compartment.

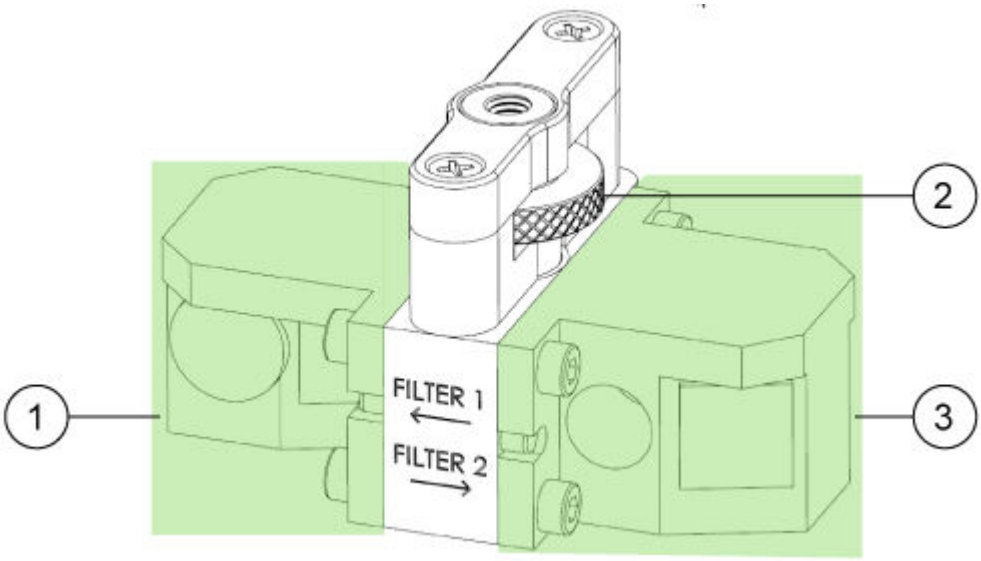
Figure 6-8 Opening the Access Door for the Optics Compartment



CAUTION: Potential Data Loss. Do not open the access door for the optics compartment during a run. If the door opens, then the voltage system and light source turn off and the separation might be compromised.

3. Remove the round cover and the filter assembly.
4. Turn the thumbscrew counterclockwise to loosen it, and then remove the filter assembly.

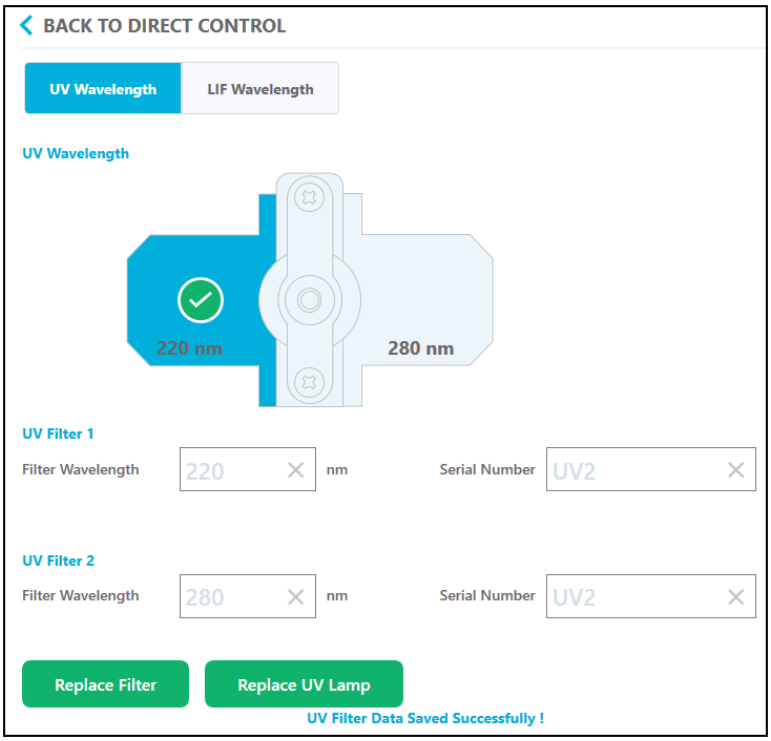
Figure 6-9 UV Filter Assembly



Item	Description
1	UV filter 1
2	Thumbscrew
3	UV filter 2

5. Install the filter assembly.
6. Turn the thumbscrew clockwise to tighten it.
7. Install the round cover.
8. Close the access door for the optics compartment.
9. On the front panel, touch **Done**.
10. On the front panel, update the filter information:
    a. Type a UV wavelength and serial number for UV filter 1.
    b. Type a UV wavelength and serial number for UV filter 2.
    c. Touch **Done**.
    The UV filter data has been changed successfully.

Figure 6-10 UV Filter Assembly Saved Changes



Install a UV Lamp

The UV lamp is used by the UV detector. If the baseline is excessively noisy or the lamp will not illuminate, it might be necessary to replace the lamp.

Required Materials
• UV lamp • Powder-free gloves

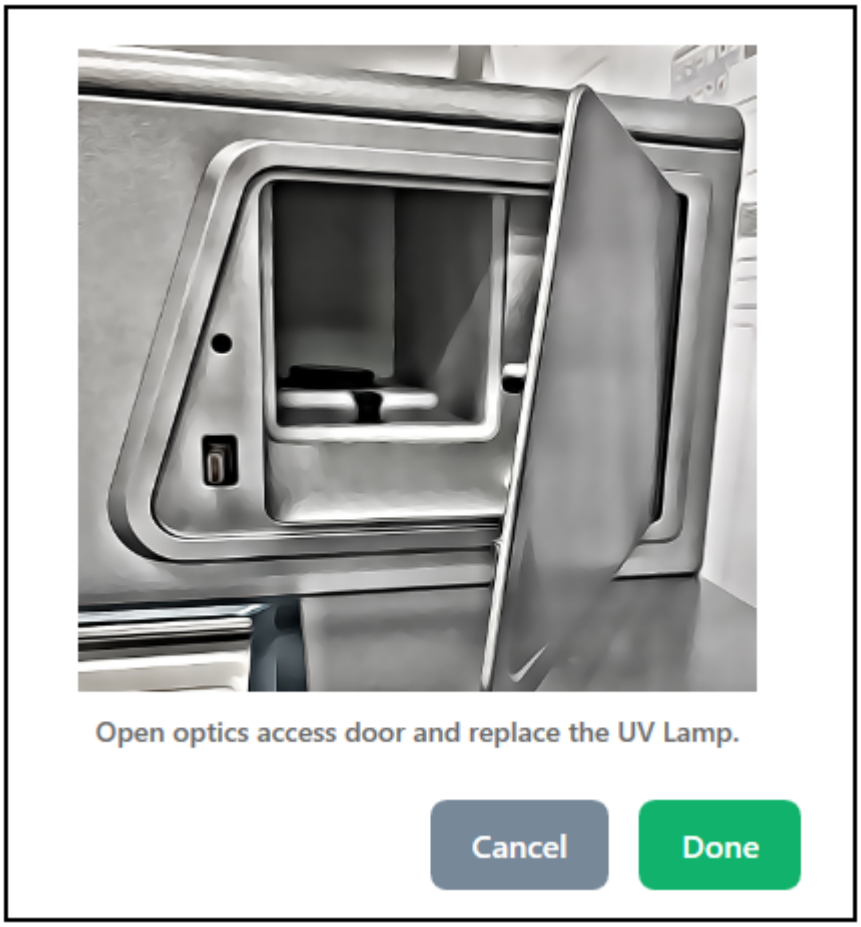
WARNING! Hot Surface Hazard. Before replacing a lamp, allow sufficient time for the lamp to cool thoroughly. A hot lamp will cause burns.

1. On the front panel, do the following:
   a. Touch **Direct Control** to open the Direct Control screen.
   b. Touch **Wavelength Settings**.

Figure 6-11 Wavelength Settings Button

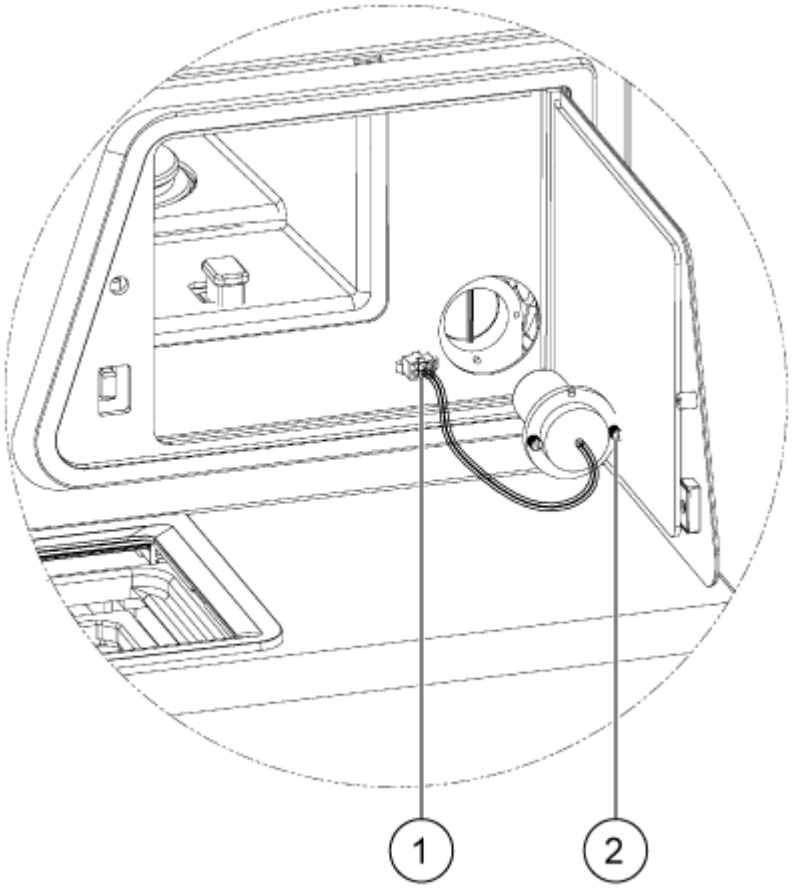
c. Touch **Replace UV Lamp** to replace the UV lamp.
A window opens with an image and instructions.

Figure 6-12 Access Door for the Optics Compartment



2. On the instrument, push in the lower left corner to unlock and pull open the access door for the optics compartment.
A safety interlock turns off power to the lamp when the access door is opened.

Figure 6-13 UV Lamp Replacement



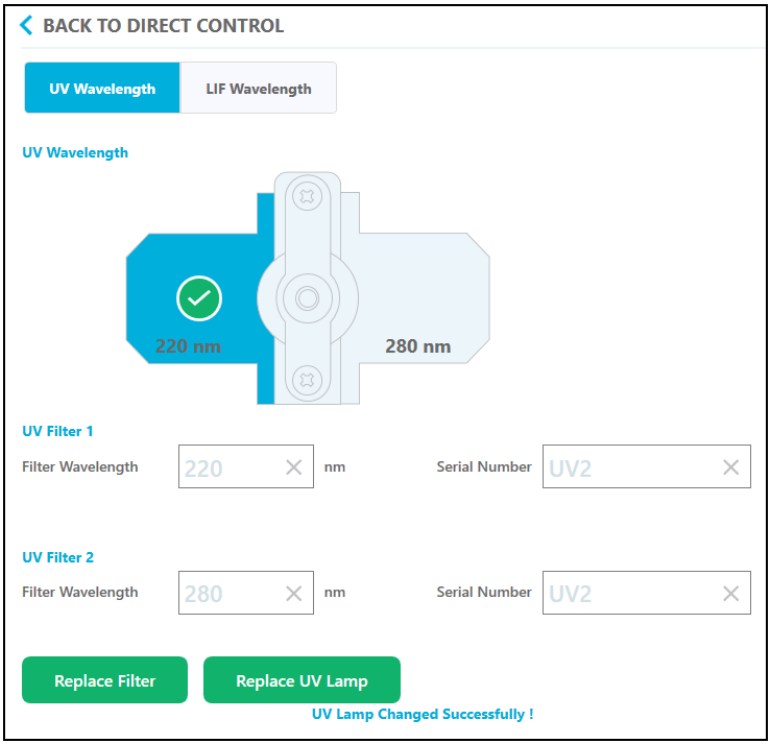
Item	Description
1	Lamp plug
2	Thumbscrew

3. Wait for the lamp to cool before removing it.
4. Press the side tabs of the connector to disconnect it from the panel.
5. Loosen the captive thumbscrews and press the connector latching tab.
6. Remove the lamp.
7. Install the new lamp, aligning the pin with the notch.
8. Tighten the captive thumbscrews.
9. Install the connector.
10. Close the access door for the optics compartment.

A safety interlock turns on power to the lamp when the access door is closed.

11. On the front panel, touch **Done**.
    The UV lamp has been changed successfully.

Figure 6-14 UV Lamp Changed



12. If required, touch the **UV Lamp** button on the ribbon.
    The lamp turns on and the timer counts down to indicate the remaining time before the lamp is ready.

Install the LIF Detector Filters

The LIF detector is supplied with two filters: a notch filter that blocks light at 488 nm and an emission filter that transmits light at 520 nm. The filters are installed in a filter holder. If a new filter is required, then the full filter holder must be purchased.

Required Materials
• Filter holder (PN 5066941) • Powder-free gloves

1. On the front panel, do the following:

a. Touch **Direct Control** to open the Direct Control screen.

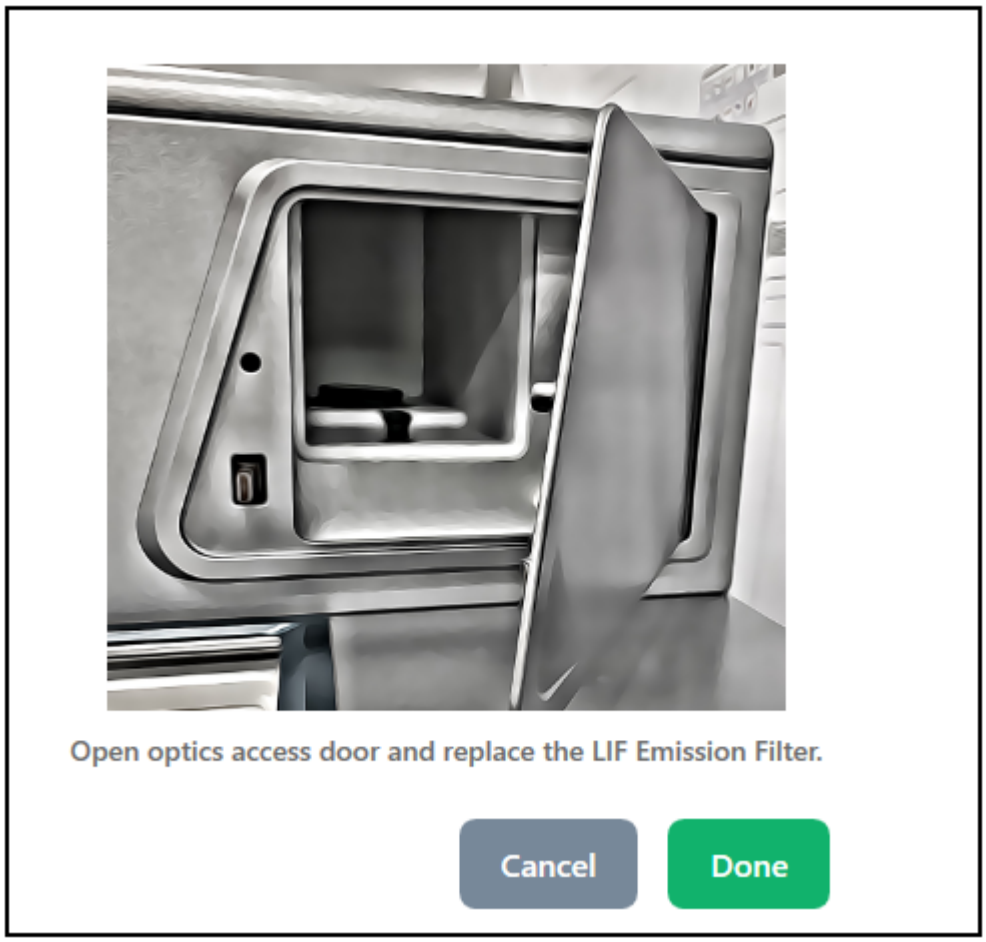
b. Touch **Wavelength Settings**.

Figure 6-15 Wavelength Settings Button

c. Touch **LIF Wavelength**.

d. Touch **Replace Filter**.
A window opens with an image and instructions.

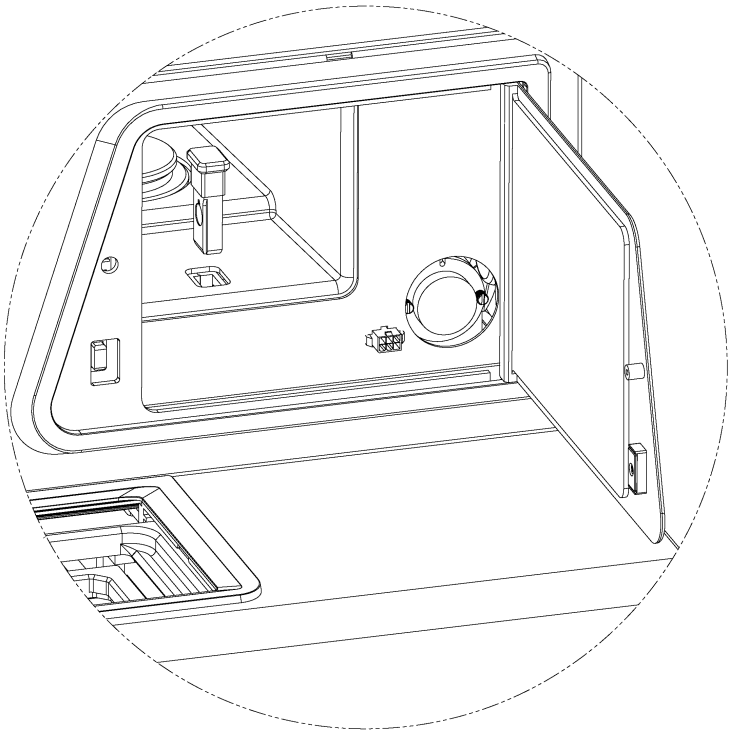
Figure 6-16 Access Door for the Optics Compartment



2. On the instrument, push in the lower left corner to unlock and pull open the access door for the optics compartment.
   A safety interlock turns off power to the laser when the access door is opened.

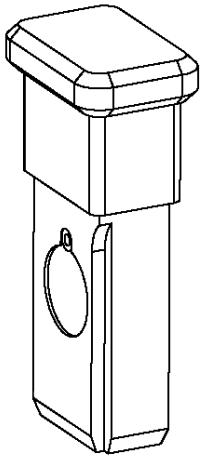
CAUTION: Potential Data Loss. Do not open the access door for the optics compartment during a run. If the door opens, then the voltage system and light source turn off and the separation might be compromised.

Figure 6-17 Remove the LIF Filter Holder



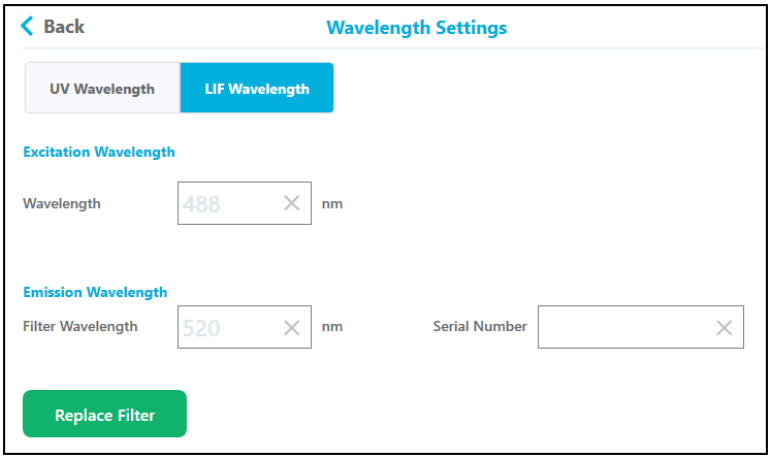
3. Remove the filter and holder.
4. Install a new filter and holder.

Figure 6-18 LIF Filter Holder



5. Touch **Done**.
6. On the front panel, update the LIF filter information:
   a. Type a filter wavelength and serial number for the LIF emission filter.
   b. Touch **Done**.
   The LIF filter has been changed successfully.

Figure 6-19 LIF Wavelength



Replace the Fuse

WARNING! Fire Hazard or Electrical Shock Hazard. Before replacing fuses, turn off the system and disconnect it from the mains supply. Replace a fuse only with a fuse of the correct type and rating. Failure to follow these guidelines might result in fire, electric shock, or instrument malfunction.

Required Materials
• 10 A 250 V fuse, marked T10A250V • Small, flat-bladed screwdriver

1. Turn off the system.
2. Disconnect the mains supply cable from the mains supply outlet and from the back of the system.
3. Use a small flat-bladed screwdriver to remove the fuse holder located above the connector for the mains supply cable.
4. Remove the fuse from the fuse-carrier assembly.
5. Install the fuse in the fuse-carrier assembly, and then install the assembly in the system.
6. Connect the mains supply cable to the back of the system and the mains supply outlet.
7. Turn on the system.
8. On the Windows desktop, open the BioPhase software and then log on to the software.
9. If the system does not operate normally, or if the fuse blows again, then contact sciex.com/request-support.

Order Parts 7

- Order parts from SCIEX in any of the following ways:
  - **Telephone:** (877) 740-2129, Option 1 (toll-free, United States only), or go to sciex.com/contact-us to find a local office.
  - **E-mail:** Sales.Americas@sciex.com
  - **Fax:** (800) 343-1346
  - **Internet:** For customers in the United States, United Kingdom, and Germany order from store.sciex.com.

Cartridges and Parts

Part Number	Description
359976	Capillary cartridge coolant, 450 mL
5080311	BioPhase Chemistry Plate Kit (4 sample plates, 4 reagent plates, 8 outlet plates)
5080313	BioPhase sample plates (20 plates)
5080314	BioPhase reagent plates (20 plates)
5080315	BioPhase outlet plates (20 plates)
5080121	Cartridge, 8 capillaries, 30 cm long, 360 µm o.d., 50 µm i.d., bare-fused silica capillary
5080119	Cartridge, 8 capillaries, 30 cm long, 360 µm o.d., neutral capillary

Table 7-1 Filters

Part Number	Description
5085153	UV filter assembly with 220 nm and 280 nm filters
5066890	UV filter, 220 nm
5072643	UV filter, 280 nm
5085159	LIF filter holder with 520 nm filter
5085178	LIF filter holder with 560 nm filter

Table 7-1 Filters (continued)

Part Number	Description
5085177	LIF filter holder with 600 nm filter

Table 7-2 Lamp

Part Number	Description
5065163	Deuterium lamp

System Specifications A

Instrument Specifications

Dimensions (H × W × D)	72 cm x 62 cm x 69 cm (28.2 in. × 24.4 in. × 27.2 in.)
Weight	90.9 kg (200 lb)
Electrical	Power requirement: 100 VAC to 240 VAC, 10 A, 50 Hz or 60 Hz, Class I Power consumption: Supply voltage must not exceed 10% of nominal Fuses: • T10 A • 250 V Installation (overvoltage) category: Category II
Working environment	Altitude: ≤ 2,000 m (6,562 ft) above sea level Humidity: < 70% (noncondensing) at 30 °C Temperature: 15 °C to 30 °C (59 °F to 86 °F) recommended
Maximum heat dissipation	600 W (2,047 BTU/hr) under steady-state conditions
Maximum sound pressure	70 dB Maximum pressure at 1 m: 66 dB

Detector Specifications

UV Detector Specifications

Table A-1 UV Detector Specifications

Available filters	220 nm and 280 nm
Filter bandwidth	25 nm nominal

Table A-1 UV Detector Specifications (continued)

UV source	33 W pre-aligned deuterium lamp
UV source lifetime	1,000 hours

(Optional) LIF Detector Specifications

Table A-2 LIF Detector Specifications

Baseline drift	< 0.2 RFU/hr
Baseline noise	< 0.005 RFU peak to peak
Dynamic range (at a setting of 1,000)	> 10^4
Default filters	488 nm notch filter (to block excitation wavelength) and 520 nm bandpass filter
Laser	3 mW, 488 nm solid state
Laser life span	10,000 hours
RFU range	0 RFU to 1,000 RFU
Sensitivity	1 × 10^{11} M sodium fluorescein with signal-to-noise > 2
Wavelength range for optics	Excitation: 488 nm Detection: 500 nm to 750 nm (filter dependent)

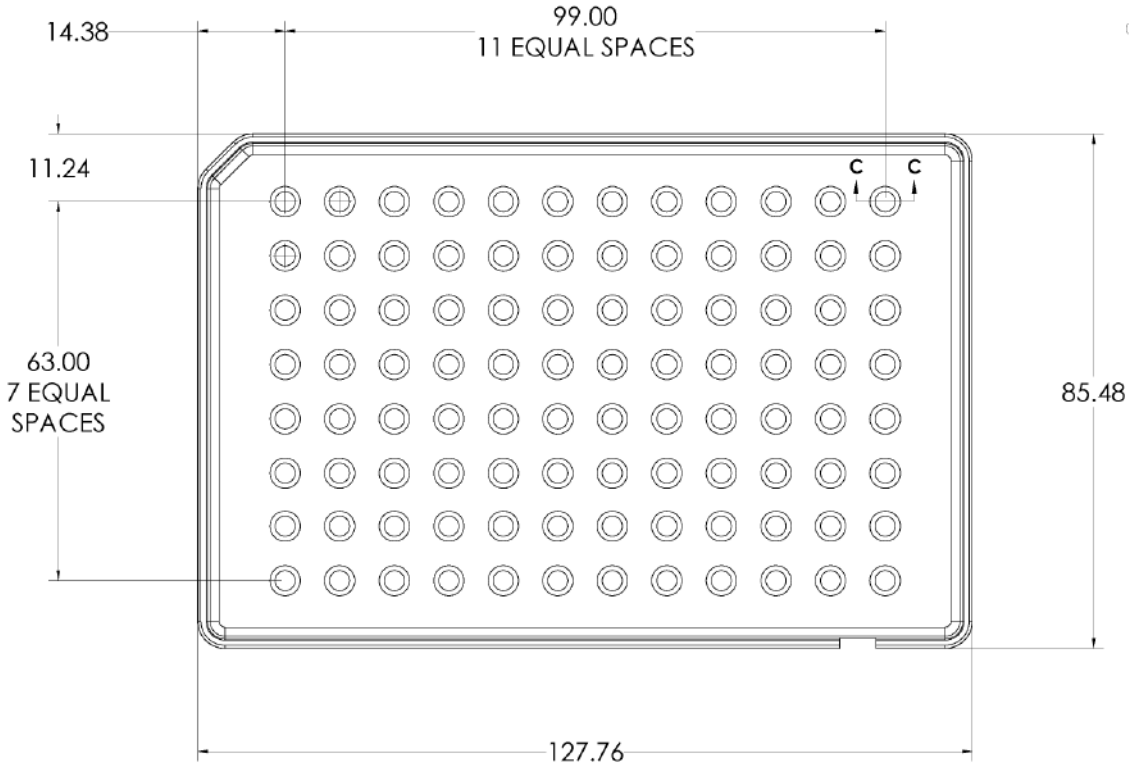
Plate Specifications

This section describes how to configure the liquid-handling system to operate with the sample, reagent, and outlet plates.

Sample Plate Specifications

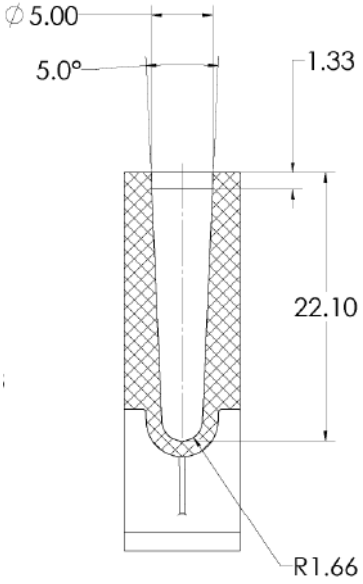
To configure the liquid-handling system to operate with the sample plates, use the dimensions in the following figures. The sample plate conforms to ANSI Society for Laboratory Automation and Screening (SLAS) standards.

Figure A-1 Sample Plate Dimensions



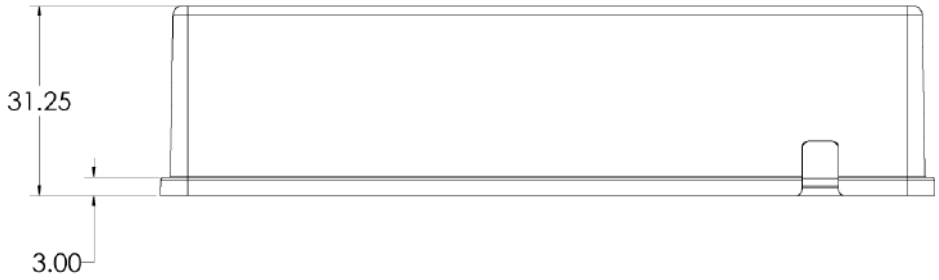
Dimension	Value
Left edge to center of well A1	14.38 mm
Top edge to center of well A1	11.24 mm
Length at base	127.76 mm
Width at base	85.48 mm

Figure A-2 Sample Plate Well Cross-Section Dimensions



Dimension	Value
Well depth	22.10 mm
Well size at opening	5.00 mm
Pitch between wells	9.00 mm

Figure A-3 Sample Plate Side View Dimensions

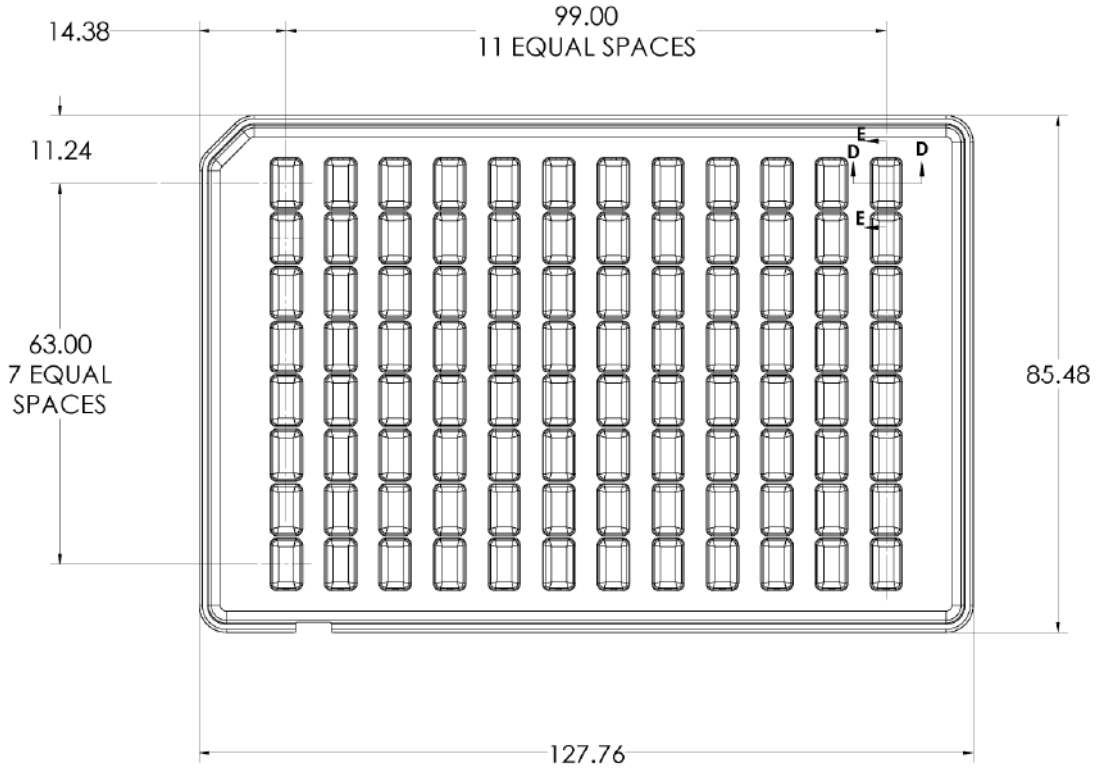


Dimension	Value
Overall height	31.25 mm

Reagent Plate Specifications

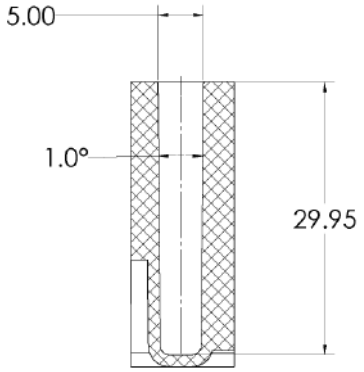
To configure the liquid-handling system to operate with the reagent plates, use the dimensions in the following figures.

Figure A-4 Reagent Plate Dimensions



Dimension	Value
Left edge to center of well A1	14.38 mm
Top edge to center of well A1	11.24 mm
Length at base	127.76 mm
Width at base	85.48 mm

Figure A-5 Reagent Plate Well Cross-Section Dimensions



Dimension	Value
Well depth	29.95 mm
Well size at opening	5.00 × 8.27 mm
Pitch between wells	9.00 mm

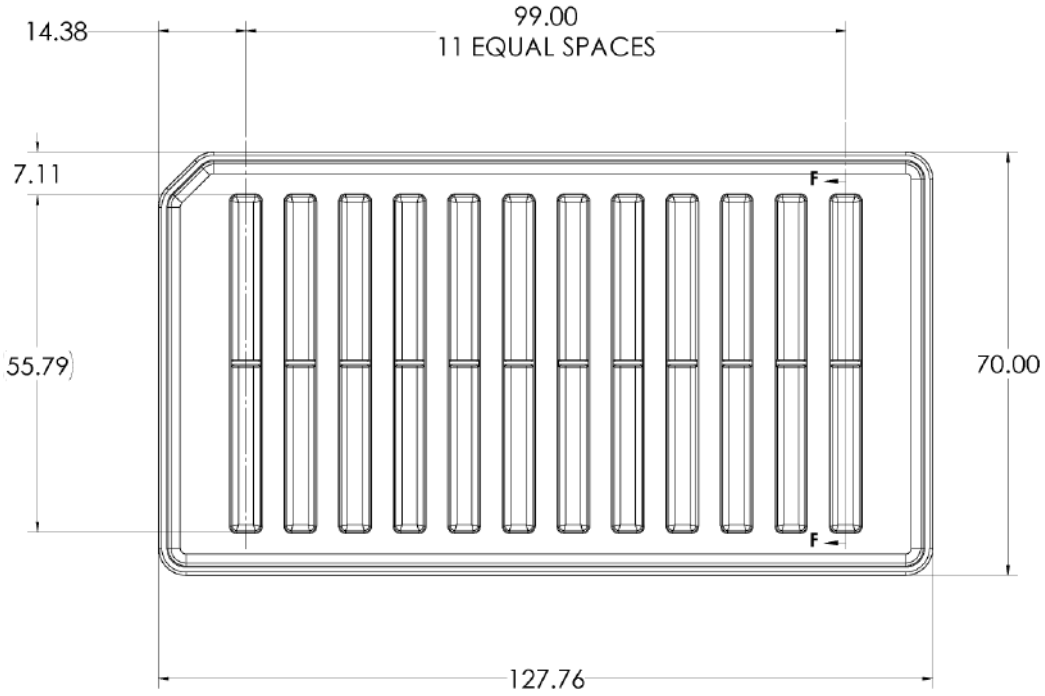
Figure A-6 Reagent Plate Side View Dimensions

Dimension	Value
Overall height	31.25 mm

Outlet Plate Specifications

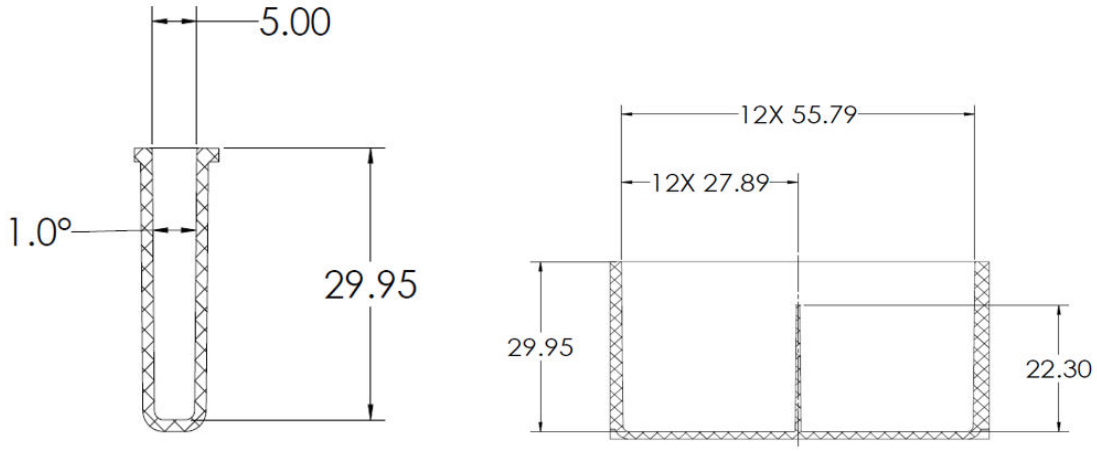
To configure the liquid-handling system to operate with the outlet plates, use the dimensions in the following figures.

Figure A-7 Outlet Plate Dimensions



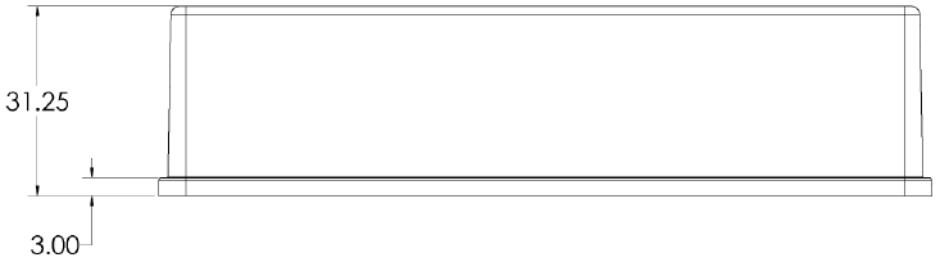
Dimension	Value
Left edge to center of column 1	14.38 mm
Top edge to top edge of well	7.11 mm
Length at base	127.76 mm
Width at base	70.00 mm

Figure A-8 Outlet Plate Well Cross-Section and Side-Section Dimensions



Dimension	Value
Well depth	29.95 mm
Well size at opening	5.00 × 55.79 mm
Pitch between wells	9.00 mm

Figure A-9 Outlet Plate Side View Dimensions



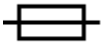
Dimension	Value
Overall height	31.25 mm

Glossary of Symbols B

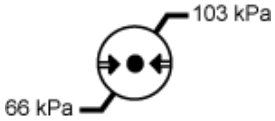
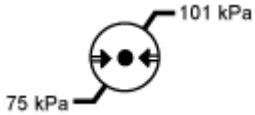
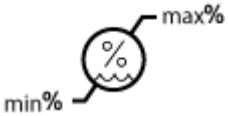
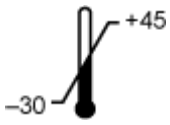
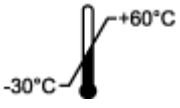
Note: Not all of the symbols in the following table are applicable to every instrument.

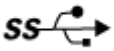
Symbol	Description
	Australian Regulatory Compliance Mark. Indicates that the product complies with Australian Communications Media Authority (ACMA) EMC Requirements.
	Alternating current
A	Amperes (current)
	Asphyxiation Hazard
EC REP	Authorized representative in the European community
	Biohazard
CE	CE Marking of Conformity
C US	cCSAus mark. Indicates electrical safety certification for Canada and USA.
REF	Catalog number

Symbol	Description
	Caution. Consult the instructions for information about a possible hazard. **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 indicate 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 it 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

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

Symbol	Description
	Pressurized Gas Hazard
	Protective Earth (ground)
	Puncture Hazard
	Reactive Chemical Hazard
SN	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
	Ultraviolet Radiation Hazard
	United Kingdom Conformity Assessment Mark
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 C

Note: If any of the labels used to identify a component become detached, then contact a Field Service Employee (FSE).

Label	Translation (if applicable)
EN61326—1, EN61326—2-6, CLASS A, GROUP 1, ISM EQUIPMENT	EN61326—1, EN61326—2-6, CLASS A, GROUP 1, ISM EQUIPMENT
FCC Compliance. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.	FCC Compliance. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.	FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.
WARNING: Lifting Hazard. FOUR PERSONS REQUIRED TO LIFT THIS EQUIPMENT.	WARNING: Lifting Hazard. FOUR PERSONS REQUIRED TO LIFT THIS EQUIPMENT.
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.
WARNING: CANCER AND REPRODUCTIVE HARM. www.P65Warnings.ca.gov	WARNING: CANCER AND REPRODUCTIVE HARM. www.P65Warnings.ca.gov

Contact Us

Customer Training

- In North America: NA.CustomerTraining@sciex.com
- In Europe: Europe.CustomerTraining@sciex.com
- Outside the EU and North America, visit sciex.com/education for contact information.

Online Learning Center

- SCIEX Now Learning Hub

Purchase Supplies and Reagents

Reorder SCIEX supplies and reagents online at store.sciex.com. To set up an order, use the account number, found on the quote, order confirmation, or shipping documents. Currently, customers in the United States, United Kingdom, and Germany have access to the online store, but access will be extended to other countries in the future. For customers in other countries, contact a local SCIEX representative.

SCIEX 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 website at sciex.com or contact us in one of the following ways:

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

CyberSecurity

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

Documentation

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

To view this document electronically, Adobe Acrobat Reader is required. To download the latest version, go to https://get.adobe.com/reader.

Contact Us

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

To find hardware product documentation, refer to the documentation that comes with the system or component.

The latest versions of the documentation are available on the SCIEX website, at sciex.com/customer-documents.

Note: To request a free, printed version of this document, contact sciex.com/contact-us.