cytiva

Biacore S200

Operating Instructions

Original instructions

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1 Introduction

About this chapter

This chapter contains important user information, descriptions of safety notices, intended use of the Biacore™ S200 system, and lists of associated documentation.

In this chapter

Section		See page
1.1	About this manual	5
1.2	Important user information	6
1.3	Associated documentation	8

1.1 About this manual

Purpose of this manual

The *Operating Instructions* provide you with the information needed to install, operate and maintain the product in a safe way.

Typographical conventions

Software items are identified in the text by ***bold italic*** text.

Hardware items are identified in the text by **bold** text.

In electronic format, references in *italics* are clickable hyperlinks.

1.2 Important user information

Read this before operating the product

All users must read the entire *Operating Instructions* before installing, operating or maintaining the product.

Always keep the *Operating Instructions* at hand when operating the product.

Do not operate the product in any other way than described in the user documentation. If you do, you may be exposed to hazards that can lead to personal injury and you may cause damage to the equipment.

Intended use of the product

Biacore S200 is a system for real-time label-free analysis of molecular interactions in laboratory research. Biacore S200 is intended for research use only and shall not be used for diagnostic purposes in any clinical or *in vitro* procedures.

Prerequisites

In order to operate Biacore S200 in the way it is intended:

- The user must read and understand the *Safety instructions* chapter in the *Operating Instructions*.
- The system must be installed according to the instructions in the *Installation* chapter of the *Operating Instructions*.
- The user must have a general understanding of the use of a personal computer running Microsoft ® Windows ® in the version provided with your product.
- The user must be acquainted with the use of general laboratory equipment and with handling of biological materials.

Safety notices

This user documentation contains safety notices (WARNING, CAUTION, and NOTICE) concerning the safe use of the product. See definitions below.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. It is important not to proceed until all stated conditions are met and clearly understood.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. It is important not to proceed until all stated conditions are met and clearly understood.

NOTICE

NOTICE indicates instructions that must be followed to avoid damage to the product or other equipment.

Notes and tips

Note: *A note is used to indicate information that is important for trouble-free and optimal use of the product.*

Tip: *A tip contains useful information that can improve or optimize your procedures.*

1.3 Associated documentation

Introduction

This section describes the user documentation that is delivered with the product, and how to find related literature that can be downloaded or ordered from Cytiva.

User documentation

Operation of the Control and Evaluation Software is described in the *Biacore S200 Software Handbook*.

Sensor surface preparation and general methodology for Biacore applications are described in the *Biacore Sensor Surface Handbook* and the *Biacore Assay Handbook* respectively. Methodology for concentration measurement using Biacore systems is described in the *Biacore Concentration Analysis Handbook*.

Data files, application notes and user documentation on the web

To order or download data files, application notes or user documentation, see the instruction below.

Step	Action
1	Go to *cytiva.com/biacore*.
2	Click ***Biacore S200***.
3	Click ***RELATED DOCUMENTS***.
4	Select to download the chosen literature.

2 Safety instructions

About this chapter

This chapter describes safety precautions, labels and symbols that are attached to the equipment. In addition, the chapter describes emergency and recovery procedures.

Important

WARNING

Before installing, operating or maintaining the product, all users must read and understand the entire contents of this chapter to become aware of the hazards involved.

In this chapter

Section		See page
2.1	Safety precautions	10
2.2	Labels	16
2.3	Emergency procedures	17

2.1 Safety precautions

Introduction

Biacore S200 is powered by mains voltage and handles materials that can be hazardous. Before installing, operating or maintaining the system, you must be aware of the hazards described in this manual.

Follow the instructions to avoid injury to the operator or other personnel, damage to samples or other substances handled by the equipment, to the product, or to other equipment in the area.

The safety precautions in this section are grouped in the following categories:

- General precautions
- Flammable liquids and explosive environment
- Personal protection
- Installing and moving
- Operation
- Maintenance
- Decommissioning

General precautions

WARNING

Only properly trained personnel may operate and maintain the product.

WARNING

Do not operate the Biacore S200 system in any other way than described in the user documentation.

WARNING

Do not use any accessories not supplied or recommended by Cytiva.

WARNING

Protective ground. The product must always be connected to a grounded power outlet.

WARNING

Use only mains cables supplied or approved by Cytiva.

WARNING

Do not block the rear or side panels of the instrument. The power switch must always be easy to access. The power cord must always be easy to disconnect.

Flammable liquids and explosive environment

WARNING

The Biacore S200 system is not intended for use in locations with explosion risks or fire hazards.

WARNING

Liquids marked as flammable must not be used as running buffer or pumped reagents. Any buffer or reagent containing flammable substances must be placed in properly capped vials in the sample rack.

WARNING

Explosion hazard. To avoid building up an explosive atmosphere when using flammable liquids, make sure that the room ventilation meets the local requirements.

Personal protection

WARNING

Always wear appropriate protective clothing and equipment during operation and maintenance of the Biacore S200 system. Use required safety equipment when handling hazardous substances.

WARNING

Liquids in the buffer bottles or tubing may be toxic or flammable or may cause chemical burns or irritation to skin and eyes. Take appropriate precautions in the event of bottle breakage, accidental spillage and insecure fitting of tubings to bottles.

CAUTION

Biacore S200 systems that are used with toxic or hazardous substances shall be marked in accordance with local laws and regulations.

CAUTION

Pinch risk. Take care that fingers are not trapped by moving parts on the instrument.

CAUTION

Accidental breakage of glass bottles may leave sharp fragments and splinters that can cause cuts and abrasions.

Installing and moving

CAUTION

Wear protective shoes with steel toecaps when moving the instrument to protect against falling objects.

CAUTION

Heavy object. Use proper lifting equipment, or use three or more persons when moving the instrument. All lifting and moving must be performed in accordance with local regulations.

CAUTION

Make sure that hands or fingers are not trapped under the instrument when the instrument is lifted or moved.

Operation

WARNING

Handle bottles carefully. Accidental breakage of buffer or water bottles may cause flooding of the bottle tray, and liquid may come into contact with electrical circuits, causing electric shock and/or fire hazards.

WARNING

A fume hood or similar ventilation system shall be installed when flammable or noxious substances are used.

WARNING

Waste liquids may contain hazardous or flammable substances. Take appropriate precautions to avoid spillage of hazardous waste.

CAUTION

Accidental breakage of buffer or water bottles may cause flooding of the bottle tray, and liquid may enter the instrument enclosure. If this happens, disconnect the instrument from the mains power and call your local service representative.

CAUTION

Do not touch the pumps while they are moving.

CAUTION

Ensure that all fluidic tubes are secured and properly connected or sealed at both ends before, during and after operation.

CAUTION

Waste tubes and containers must be secured and sealed to prevent accidental spillage.

CAUTION

Make sure that the waste container has sufficient space for maximum waste volume when the equipment is left unattended.

Maintenance

WARNING

All service and repairs, with the exception of operations explicitly described in the user documentation, must be carried out by personnel authorized by Cytiva. Do not open any covers or replace any parts unless specifically stated in the user documentation.

WARNING

The Biacore S200 system contains mains voltage of up to 240 V AC. Disconnect mains cord before replacing fuses. Do not remove instrument covers.

WARNING

For continued protection from fire hazard, replace only with same type and rating of fuse.

WARNING

If the instrument may be contaminated with biohazards, decontaminate the instrument before performing maintenance on any instrument parts. Contact your local service representative for further information about decontamination procedures.

CAUTION

Always turn off the power before opening the sample compartment.

CAUTION

The sample compartment door swings upwards when released. Do not lean over the instrument when you open the sample compartment door.

Decommissioning

WARNING

Decontaminate the equipment before decommissioning to ensure that hazardous residues are removed.

2.2 Labels

Introduction

This section describes the system label and other safety or regulatory labels that are attached to the product.

System label

The system label is located on the back of the equipment. The system label identifies the equipment and shows electrical data, regulatory compliance, and warning symbols.

Description of symbols on the system label

The following symbols may be present on the system label.

Symbol/text	Meaning
	**Warning!** Read the user documentation before using the system. Do not open any covers or replace parts unless specifically stated in the user documentation.
Code no	Instrument assembly number
Serial no	Instrument serial number
Mfg. Year	Year (YYYY) and month (MM) of manufacture
Voltage **Frequency** **Max Power**	Electrical requirements: • Mains voltage (VAC ~) • Frequency (Hz) • Maximum power (VA)

2.3 Emergency procedures

Introduction

This section describes how to shut down the Biacore S200 system in an emergency situation, and the procedure for restarting the Biacore S200 system.

The section also describes the result in the event of power failure.

NOTICE

Do not use the acute emergency stop procedure unless there is a risk of injury, damage or loss of valuable material. All operations including buffer flow and data collection are stopped immediately.

To stop a run under controlled conditions before it is complete, choose ***Run →Stop Run Sensorgram*** from the menu bar in Biacore S200 Control Software. This will stop both the run and the data collection at the end of the current cycle. A dialog is displayed while the current cycle is finished.

Emergency shutdown

In an emergency situation, follow the steps below to stop the run.

Step	Action
1	Press ***Ctrl-Break (Ctrl-Pause)*** on the keyboard to stop the run and the data collection immediately.
2	In the dialog box that appears, click ***Yes*** if you want to wash the system with running buffer. You should do this if possible. The wash operation takes about 3 minutes.

NOTICE

Do not leave the system in an emergency stop condition. Always follow the restart procedure if possible, to restore the instrument to normal condition.

Power failure

The following table describes the consequences of a power failure.

Power failure to...	will result in...
Biacore S200 instrument	• The run is interrupted immediately. • Data collected up to and including the last cycle completed before the power failure is saved in the result file.
Computer	• The computer shuts down immediately. • Instrument operation continues for a short time (until the internal data buffer is full) and then stops. • Data collected up to and including the last cycle completed before the power failure is saved in the result file, but there is a risk that the result file may be corrupt and cannot be read.

Restart procedure

Follow the steps below to restart the system after an emergency shutdown.

Step	Action
1	Turn on mains power if it is switched off and check that the instrument starts normally.
2	If you need to clean the liquid handling system, eject the sensor chip and insert a maintenance chip. See *Cleaning and disinfecting the flow system, on page 63* for further instructions.

3 System description

About this chapter

This chapter gives an overview of the Biacore S200 system, and a brief description of its function.

In this chapter

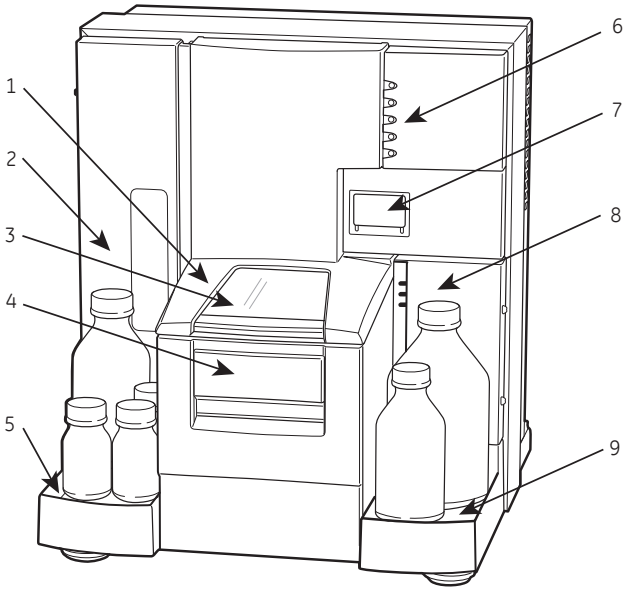
Section		See page
3.1	Biacore S200 instrument components	20
3.2	Indicators and switches	27
3.3	Sample and reagent racks	29
3.4	Sensor chip and flow system	31
3.5	Temperature control	33
3.6	Control system	34

3.1 Biacore S200 instrument components

Overview

The Biacore S200 instrument is a processing unit with liquid handling, sample handling and detection system, controlled from a PC running Biacore S200 Control Software.

The main parts of the instrument are illustrated below.



Part	Function
1	Sample compartment door
2	Left pump compartment door
3	Sample compartment inspection window[1]
4	Rack tray port
5	Buffer tray
6	Status lamps
7	Sensor chip port
8	Right pump compartment door
9	Waste and water tray

[1] Condensation may appear on the window during a temperature change. This is normal, and the condensation should evaporate when the temperature has stabilized.

Bottle trays

The buffer tray on the left of the instrument holds up to four bottles for running buffer. Up to four different buffers can be used.

The waste and water tray on the right of the instrument holds one 2-liter bottle for waste solutions, and one 500 mL bottle for distilled water. Bottles with caps are provided with the system.

The bottle trays are designed to hold standard bottles threaded for screw caps. One 1-liter bottle and three 250 mL bottles with gaskets are provided with the system.

WARNING

Liquids in the buffer bottles or tubing may be toxic or flammable or may cause chemical burns or irritation to skin and eyes. Take appropriate precautions in the event of bottle breakage, accidental spillage and insecure fitting of tubings to bottles.

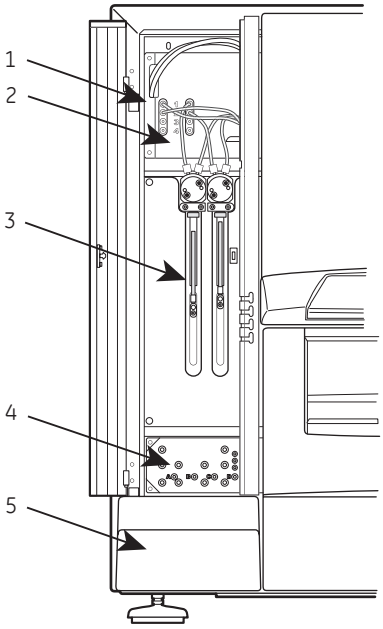
CAUTION

Accidental breakage of buffer or water bottles may cause flooding of the bottle tray, and liquid may enter the instrument enclosure. If this happens, disconnect the instrument from the mains power and call your local service representative.

Left pump compartment

The left pump compartment houses a buffer selector valve, two syringe pumps, and a buffer degasser. To open the pump compartment, press on the inner edge of the door.

The illustration below shows the left pump compartment.



Part	Function
1	Holder for unused buffer tubes
2	Buffer degasser
3	Syringe pump
4	Buffer selector valve
5	Buffer tray

Buffer tubing and selector valve

The buffer tubes, marked **A**, **B**, **C**, and **D**, are connected to the inputs of a buffer selector valve, which determines which of the buffers is used during a run. Buffer selection is controlled from the software. Buffer A is selected by default.

Attach unused buffer tubes to the tubing holder inside the pump compartment door.

Buffer degasser

The gas content of the running buffer is reduced to a low level by a vacuum degasser. This eliminates the need to degas running buffer before use.

The vacuum pump of the degasser operates automatically as soon as the flow system is started.

NOTICE

The buffer tubing should always be connected via the buffer degasser. Do not disconnect tubes from the degasser even if you use degassed buffer.

Right pump compartment

The right pump compartment houses a peristaltic pump for supply of buffer and water to the liquid supply block. To open the pump compartment, press on the inner edge of the door.

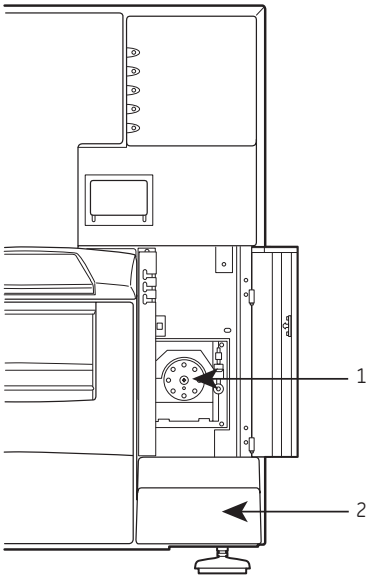
CAUTION

The peristaltic pump may operate at any time during a run or standby. Keep your hands clear of the pump if you open the right pump compartment door during operation.

CAUTION

Waste tubes and containers shall be secured and sealed to prevent accidental spillage.

The illustration below shows the right pump compartment.



Part	Function
1	Peristaltic pump
2	Waste and water tray

The waste tubes are fitted on the waste bottle cap. Before starting a run, ensure that the tube fittings are tightened and that the waste bottle is empty.

WARNING

Waste liquids may contain hazardous or flammable substances. Take appropriate precautions to avoid spillage of hazardous waste.

NOTICE

The waste bottle and the cap must be of the same type and size as the ones delivered with the system to avoid pressure disturbances in the liquid handling system.

Sample compartment

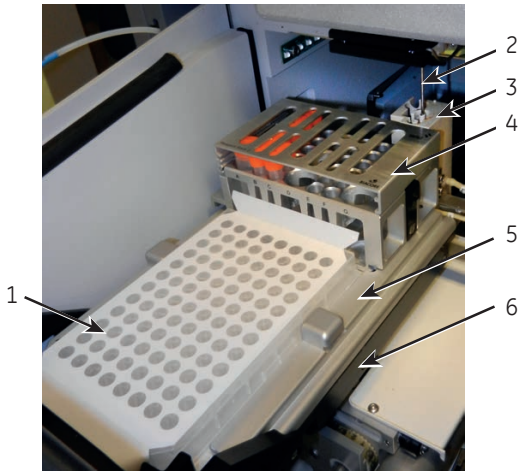
The temperature-controlled sample compartment holds the autosampler and the sample injection unit. The rack tray port on the front of the instrument is controlled from the software.

Illumination of the sample compartment can be switched on and off from the software.

Autosampler

Samples and reagents are held in a microplate and/or rack in the autosampler and are dispensed from there through the injection needle.

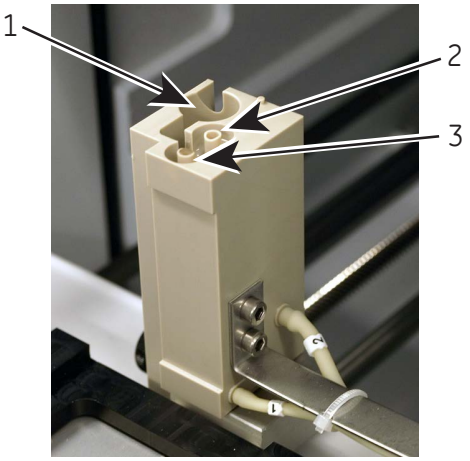
The illustration below shows the autosampler.



Part	Function
1	Sample microplate
2	Injection needle
3	Liquid supply block
4	Reagent rack
5	Rack tray
6	Rack tray carriage

The liquid supply block on the autosampler is used for washing the needle and emptying waste solutions. The peristaltic pump maintains a continuous flow of running buffer and water to the liquid supply block throughout a run, ensuring fresh liquids at all times.

The illustration below shows the liquid supply block on the autosampler.



Part	Function
1	Waste outlet
2	Distilled water
3	Running buffer

Sensor chip port

The sensor chip port is protected by a cover which is controlled through software commands and cannot be opened by hand. See *Insert the sensor chip, on page 45* for further details.

3.2 Indicators and switches

Status indicators

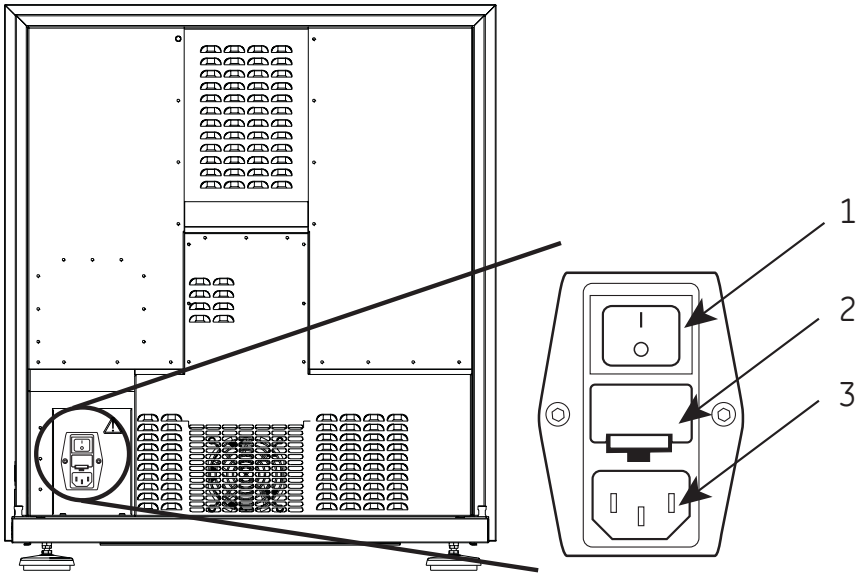
The status indicators on the front panel are described below.

Indicator	Function
ready (green)	Lit when power is on
system (red)	Lit for a few seconds after the power is switched on. If the indicator lights in other circumstances, turn off the instrument and call your Cytiva service representative.
temperature (yellow)	Lit when the temperature at the flow cells is stable at the preset temperature. Flashes when the temperature is not stable.
sensor chip (green)	Lit when a sensor chip is docked and ready. Flashing when a chip is inserted but not docked.
run (green)	Lit when a run is in progress.

Mains power switch

The mains power connector and switch is located on the mains input panel, at the rear right of the instrument.

The illustration below shows the location of the mains power connector and switch.



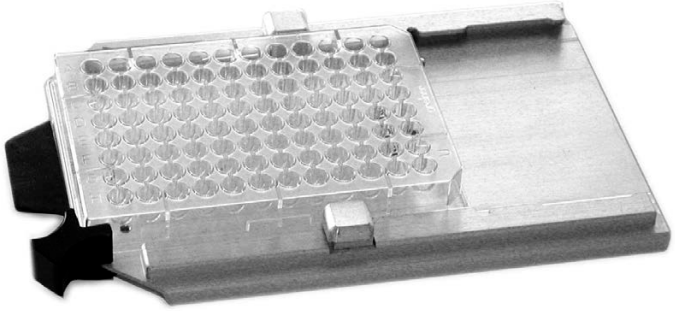
Part	Function
1	Power on/off switch
2	Fuse holder
3	Power connector

Note: *For warning texts, see Section 6.6 Replacing the mains fuses, on page 74.*

3.3 Sample and reagent racks

Sample microplate

Biacore S200 uses standard 96-well and 384-well microplates that are mounted on the rack tray. The microplate is held in position by a spring-loaded catch.



Biacore S200 is designed to accommodate both shallow and deep-well microplates conforming to the Society of Biomolecular Screening (SBS) standard. However, compatibility can only be guaranteed for microplates supplied or approved by Cytiva. For information about compatibility with other microplates, contact your local Cytiva representative.

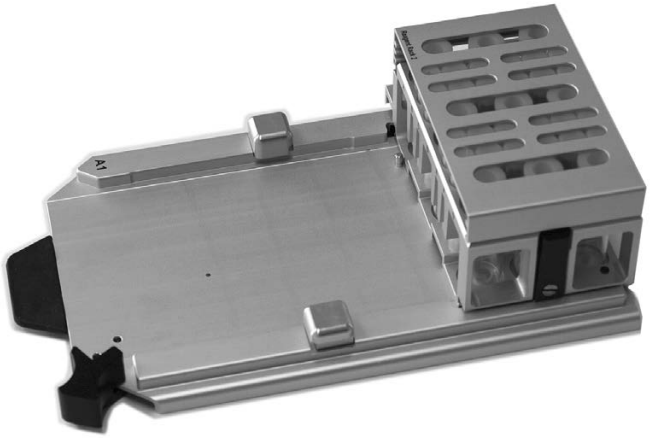
The microplate should be covered with adhesive foil to prevent sample evaporation.

NOTICE

Use only foil supplied by Cytiva. The adhesive substance on the foil is only present between wells. Align the foil with the microplate when attaching it to avoid clogging the needle with adhesive.

Reagent rack

The reagent rack holds reagents and other solutions. The rack slides into the holder on the rack tray and clicks into position. When changing racks, make sure that the rack is correctly mounted and that it is pushed firmly into position. (If you attempt to mount the rack in the wrong orientation, it will not click into position and you will not be able to insert the rack tray into the instrument.)



Combined sample and reagent rack

A combined sample and reagent rack is available. The sample and reagent rack is inserted into the sample compartment in place of the rack tray.

NOTICE

Always use vials with caps supplied by Cytiva. It is important that the injection needle can penetrate the vial caps properly.

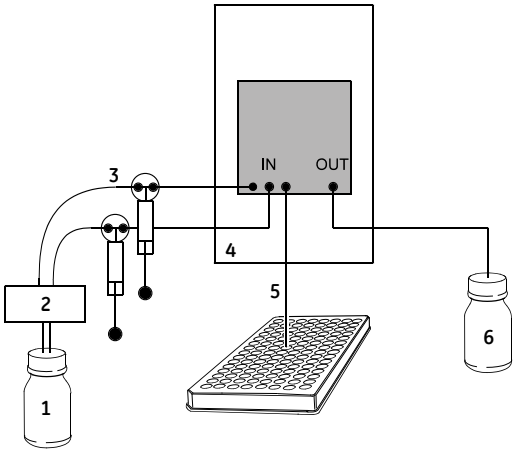
3.4 Sensor chip and flow system

Overview

The liquid handling system comprises two syringe pumps, one peristaltic pump, the IFC (Integrated µ-Fluidic Cartridge), the autosampler with injection needle, and the liquid supply block.

The syringe pumps are used for precision delivery of samples, reagents and running buffer to the sensor chip surface via the IFC. The peristaltic pump supplies buffer and water to the liquid supply block. It also pumps waste solution from the liquid supply block to the waste bottle.

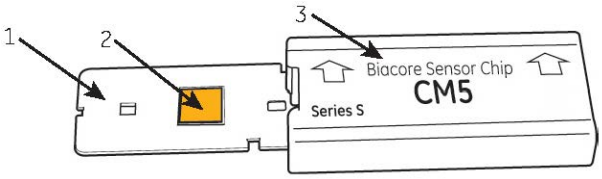
The illustration below shows a simplified diagram of the liquid system showing delivery of samples and running buffer to the IFC.



Part	Function
1	Buffer bottle
2	Degasser
3	Syringe pumps
4	IFC
5	Needle
6	Waste bottle

Sensor chip

The sensor chip is a gold-coated glass slide mounted on a supporting frame. The sensor chip is normally enclosed in a protective cassette. Do not remove the sensor chip from the cassette. The illustration below shows the sensor chip separate from the cassette for illustration purposes.



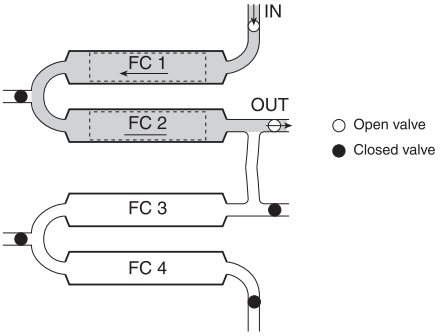
Part	Function
1	Frame
2	Gold-coated glass slide
3	Cassette

IFC (Integrated µ-Fluidic Cartridge)

The IFC consists of a series of micro channels and membrane valves encased in a plastic housing, and serves to control delivery of liquid to the sensor chip surface.

Flow cells

Four separate flow cells are formed when the sensor chip is docked against the IFC. Precision-cast channels in the surface of the IFC define the flow cells on the sensor chip surface. The flow cells are optimized for use in pairs, Fc1+Fc2, Fc3+Fc4. The schematic illustration below shows sample flow through Fc1 and Fc2.



3.5 Temperature control

Introduction

SPR measurements are sensitive to changes in temperature. It is important that a constant temperature is maintained at the sensor chip surface throughout the run.

Analysis temperature

The detection area housing the sensor chip is maintained at a precisely controlled temperature (range 4°C to 45°C, not more than 20°C below ambient temperature). Runs will not start automatically if the temperature at the sensor surface is not stable. You can choose to ignore the condition or wait for the temperature to stabilize. The **Temperature** indicator on the instrument front panel flashes if the analysis temperature is not stable.

Sample compartment temperature

The sample compartment is maintained at a temperature that may be set from 4°C to 45°C, not more than 15°C below ambient temperature.

The sample compartment temperature is set independently of the analysis temperature: injected samples have sufficient time in the needle and IFC to equilibrate to the analysis temperature regardless of sample compartment temperature.

NOTICE

The system does not wait for the sample compartment temperature to stabilize. The **Temperature** indicator and screen display show the analysis temperature, not the sample compartment temperature.

Condensation may occasionally drip from the instrument during long runs at low temperatures, particularly if ambient humidity is high. This is normal and does not affect instrument operation.

3.6 Control system

Biacore S200 Control Software is a complete software for control and supervision of Biacore S200.

Biacore S200 Evaluation Software is a stand-alone software for evaluation of results obtained from Biacore S200. The software is normally installed on the same computer as the Biacore S200 Control Software, although connection to the instrument is not required for using Biacore S200 Evaluation Software.

4 Installation

About this chapter

This chapter describes site requirements and preparations necessary to perform before installation of the Biacore S200 system.

In addition, instructions are included for moving the Biacore S200 system within the lab or to another building.

NOTICE
Biacore S200 is prepared and installed by Cytiva personnel. Contact Cytiva if you require re-installation at a new site.

In this chapter

Section		See page
4.1	Site requirements	36
4.2	Unpacking, assembly and transport	39
4.3	Connections	40

4.1 Site requirements

WARNING

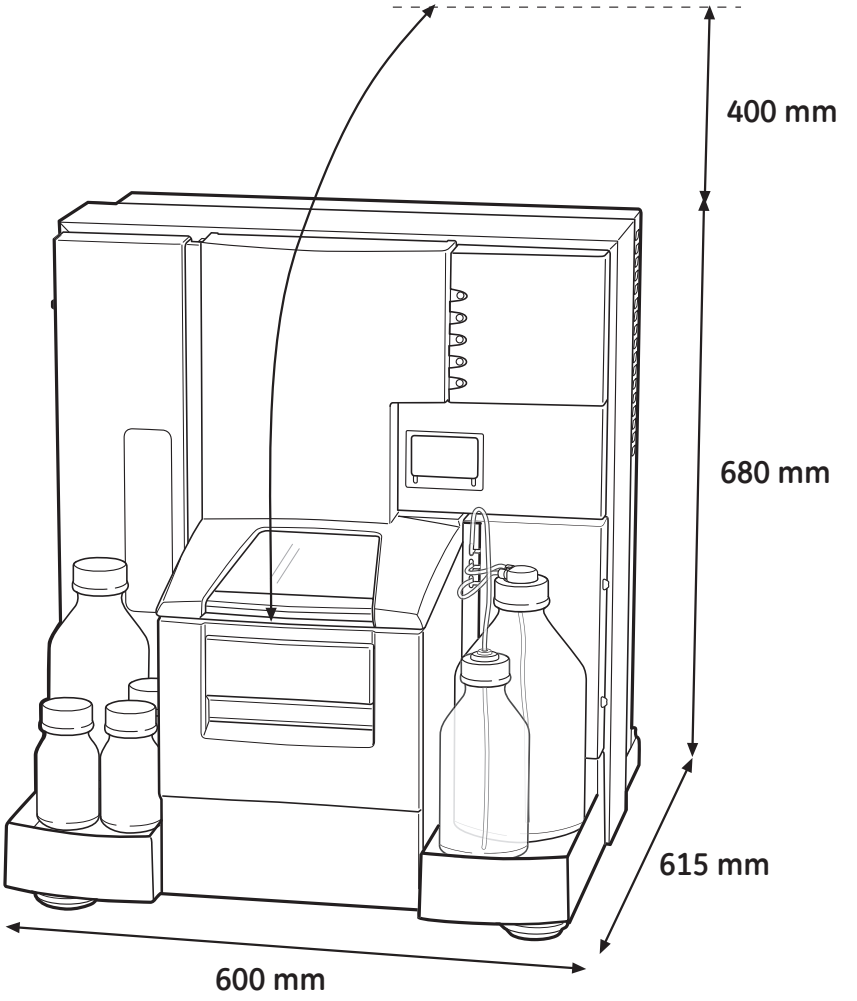
A fume hood or similar ventilation system shall be installed when flammable or noxious substances are used.

WARNING

Explosion hazard. To avoid building up an explosive atmosphere when using flammable liquids, make sure that the room ventilation meets the local requirements.

Space requirements

The size of the instrument is indicated in the illustration below. At least 20 cm clearance is required on all sides of the instrument to allow adequate air circulation. Space is also required for the PC beside the instrument. The laboratory bench must be stable and able to support the weight of the instrument.



Electrical power requirements

WARNING

Protective ground. The product must always be connected to a grounded power outlet.

WARNING

Use only mains cables supplied or approved by Cytiva.

WARNING

Do not block the rear or side panels of the instrument. The power switch must always be easy to access. The power cord must always be easy to disconnect.

The instrument requires mains power outlets with protective earth as specified in the table below.

Parameter	Specification
Supply voltage	100 to 240 V~
Frequency	50/60 Hz
Maximum power	400 VA
Transient overvoltages	Overvoltage category II

Environmental requirements

The following general requirements must be fulfilled:

- The room must have exhaust ventilation
- The instrument should not be exposed to direct sunlight
- Dust in the atmosphere should be kept to a minimum

The installation site must comply with the following specifications:

Parameter	Specification
Allowed location	Indoor use only
Ambient temperature, operation	18°C to 33°C
Max. relative humidity, operation	80% RH, non-condensing, up to 31°C. Decreasing linearly to 50% RH at 40°C.
Ambient temperature, transportation/ storage	-25°C to 60°C
Altitude, operation	Up to 2000 m
Pollution degree of the intended environment	Pollution degree 2

Avoid placing the system adjacent to heaters or air conditioners.

Condensation may occur in the sample compartment at high ambient humidity. This is normal and does not indicate any malfunction.

4.2 Unpacking, assembly and transport

Unpacking

Biacore S200 will be unpacked by Cytiva personnel.

Check the equipment for any apparent damage before starting installation. Document any damage carefully and contact your Cytiva representative.

Contact Cytiva if you need to re-pack Biacore S200 for storage or transport.

Assembly

Biacore S200 requires no special assembly other than that performed by Cytiva personnel during installation.

Transport

To avoid damage, the optical unit in Biacore S200 must be secured before transport over more than limited distances within the laboratory. Contact Cytiva for assistance.

CAUTION

Heavy object. Use proper lifting equipment, or use three or more persons when moving the instrument. All lifting and moving must be performed in accordance with local regulations.

CAUTION

Wear protective shoes with steel toecaps when moving the instrument to protect against falling objects.

CAUTION

Make sure that hands or fingers are not trapped under the instrument when the instrument is lifted or moved.

4.3 Connections

NOTICE

Do not turn on the mains power switches before all connections are made.

Connect the instrument to the computer

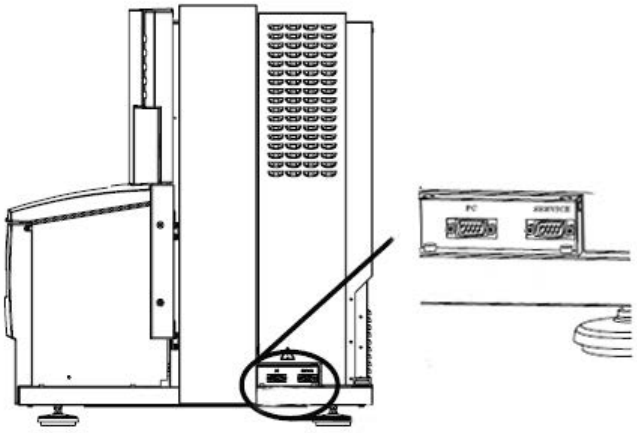
Connect a serial communication cable between the **COM1** (or **IOIOIA**) port of the PC, and the **PC** connector on the rear panel of the instrument.

The **SERVICE** connector is for service purposes only.

NOTICE

Any computer used with the equipment shall comply with IEC 60950 and be installed and used according to the manufacturer's instructions.

The illustration below shows the location of the **PC** connector.



Connect to mains power

Follow the steps below to connect the instrument to a mains power source.

Step	Action
1	Connect the mains power cord delivered with the instrument, to the **MAINS INLET** connector on the rear panel (see *Mains power switch, on page 27*). Connect the other end to a mains outlet with protective earth.
2	Check that any mains voltage selectors on the PC and peripheral equipment are set correctly.
3	Install the PC and peripheral equipment according to the respective instruction manuals.

WARNING

Do not block the rear or side panels of the instrument. The power switch must always be easy to access. The power cord must always be easy to disconnect.

5 Operation

About this chapter

This chapter gives instructions on how to operate the product in a safe way.

In this chapter

Section		See page
5.1	Starting the system	44
5.2	Preparing the instrument	45
5.3	Ejecting the rack tray	49
5.4	Adjusting the rack tray	51
5.5	Preparing samples and reagents	52
5.6	Changing reagent racks	54
5.7	Installing the rack tray	55
5.8	Starting and finishing a run	56

Safety precautions

WARNING
Always wear appropriate protective clothing and equipment during operation and maintenance of the Biacore S200 system. Use required safety equipment when handling hazardous substances.

WARNING
Do not use any accessories not supplied or recommended by Cytiva.

WARNING

Handle bottles carefully. Accidental breakage of buffer or water bottles may cause flooding of the bottle tray, and liquid may come into contact with electrical circuits, causing electric shock and/or fire hazards.

WARNING

Liquids in the buffer bottles or tubing may be toxic or flammable or may cause chemical burns or irritation to skin and eyes. Take appropriate precautions in the event of bottle breakage, accidental spillage and insecure fitting of tubings to bottles.

WARNING

Waste liquids may contain hazardous or flammable substances. Take appropriate precautions to avoid spillage of hazardous waste.

CAUTION

Biacore S200 systems that are used with toxic or hazardous substances shall be marked in accordance with local laws and regulations.

CAUTION

Ensure that all fluidic tubes are secured and properly connected or sealed at both ends before, during and after operation.

CAUTION

Waste tubes and containers shall be secured and sealed to prevent accidental spillage.

CAUTION

Accidental breakage of glass bottles may leave sharp fragments and splinters that can cause cuts and abrasions.

5.1 Starting the system

Follow the steps below to start the system.

Step	Action
1	Switch on the instrument. The status lamps on the front panel light in the following sequence: **a.** All the lamps light for a few seconds and then go out. **b.** The green **Ready** lamp lights. **c.** The yellow **Temperature** lamp flashes to indicate non-stabilized temperature, and then is steadily lit when the temperature at the detection unit is stable. The time required for temperature stabilization depends on the set temperature and ambient temperature. A temperature change of 5°C takes about 1 hour.
2	Switch on the printer and the PC.
3	Start Biacore S200 Control Software from the Windows ***Start*** menu.
4	The software establishes connection with the instrument, which takes about 30 seconds.

5.2 Preparing the instrument

Prepare buffers

NOTICE

Always keep a high standard of hygiene in the solutions used. Prepare fresh buffer before each run.

Using standard buffers

Standard buffers are available from Cytiva as stock solutions[1]. To prepare running buffer, dilute the stock solution with distilled and filtered water. Available buffer solutions include HEPES-buffered saline (HBS) and phosphate-buffered saline (PBS).

Phosphate buffer should not be used for interaction systems that require Ca^{2+}, since calcium phosphate will precipitate at very low concentrations of Ca^{2+}.

Preparing your own buffers

All buffers used in Biacore S200, both as running buffer and for sample and reagent preparation, should be filtered through a 0.22 µm filter.

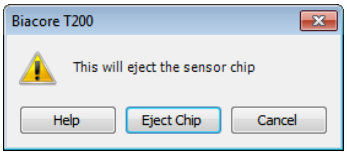
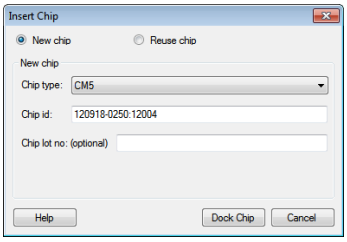
Including a surfactant in the buffer can reduce non-specific adsorption of proteins to the autosampler tube and the IFC channels. Surfactant P20 is available from Cytiva. You may omit surfactant if your sample is detergent-sensitive. However, you may then want to clean the flow system more frequently (see *Cleaning and disinfecting the flow system, on page 63* for more information).

Insert the sensor chip

Before Biacore S200 can be used, a sensor chip must be docked in the instrument. Follow the steps below to dock a sensor chip.

Step	Action
1	Click the ***Insert Chip*** button in the ***Tools*** workspace.

[1] Buffers in 200 mL ready-to-use packs are not recommended for use with Biacore S200.

Step	Action
2	If a sensor chip is already docked, click the ***Eject Chip*** button in the ***Tools*** workspace. Click ***Eject Chip*** in the dialog box that appears. This will empty the flow cells and eject the sensor chip. 
3	The sensor chip port opens automatically when the chip is undocked.
4	If you are using a new chip, choose ***New Chip***. Select the chip type from the list, a ***Chip id*** and an optional lot number. The ***Chip id*** must be unique among the chips that have been used on the instrument. Including the date in the ***Chip id*** helps to ensure a unique value.  If you are re-using a chip that has previously been docked in the instrument, choose ***Reuse chip*** and select the ***Chip id*** from the list. A chip that has been previously used in a different instrument will not be included in the list and must be inserted as a new chip.
5	Insert the sensor chip into the sensor chip port, with the arrows pointing into the instrument.
6	Make sure that the sensor chip is fully inserted.
7	Close the sensor chip port cover. Press gently until it clicks into position.
8	If you need to open the sensor chip port cover at this stage (for example if you have inserted the wrong chip), click ***Cancel***. This will close the ***Insert Chip*** dialog without docking the chip—you can then choose ***Insert Chip*** again to open the port cover.
9	Click ***Dock chip***. A standby flow of running buffer is started automatically when the docking procedure is completed.

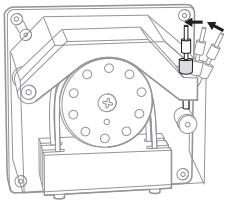
Set up the liquid system

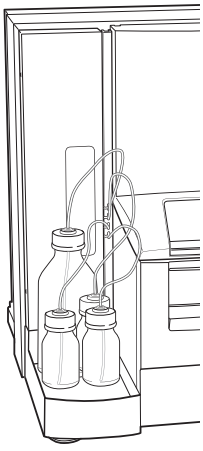
Follow the steps below to set up the liquid system.

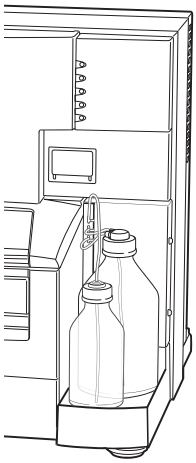
NOTICE

Always use fresh water. Replace water before each run, or at least every 48 hours. Do not run the system without water.

Step	Action
1	Open the right pump compartment door and make sure that the clamp of the peristaltic pump is properly fastened: the lever should be in a vertical position.
2	Fill a suitable bottle with running buffer. Make sure that the bottle is clean before use. Fit a cap with gasket on to the bottle and place it on the buffer tray. Insert the tube marked A through the cap, into the running buffer bottle.
3	If you plan to use more than one buffer, fill up to three additional bottles with the required buffers. Fit caps with gaskets on to the bottles and place them on the buffer tray. Insert the tubes marked **B**, **C** and **D** into the bottles.

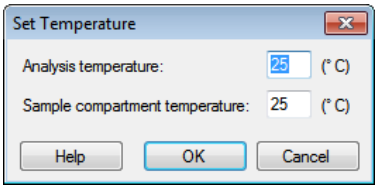




Step	Action
4	Place unused buffer tubing in the holder inside the pump compartment door.
5	Place a 2-liter bottle for waste solution on the waste and water tray. Fit the cap carrying the waste tubes on to the bottle. Tighten the tube fittings by hand. Do not use a smaller bottle for waste.
6	Fill a 500 mL bottle with distilled and filtered water. Fit a cap with gasket and place it on the waste and water tray. Insert the water tube into the water bottle. 
7	Prime the flow system using ***Prime*** or ***MultiPrime*** from the ***Tools*** workspace or using the option in the method, to ensure that the flow system is equilibrated with fresh buffer.

Set the temperature

The temperature at the flow cell is shown in the status window of the Biacore S200 Control Software screen. The flow cell and/or sample compartment temperature can be set either before starting a run or during the run setup procedure.



The system will wait until the temperature has stabilized at the set value before starting the first run cycle. You can choose to ignore the temperature stabilization, but this is not recommended as the signal will not be stable.

5.3 Ejecting the rack tray

Introduction

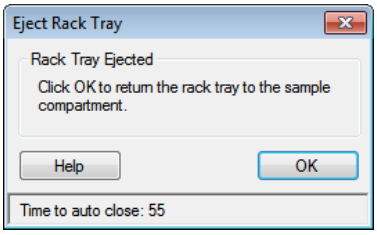
The removable rack tray carries one microplate and one reagent rack, and is mounted on the rack tray carriage in the sample compartment. The combined sample and reagent rack is mounted directly on the rack tray carriage.

The rack tray (or the sample and reagent rack) can be ejected in three situations:

- before a run, when preparing samples and reagents,
- during setup of a run,
- during a manual run.

Ejecting the rack tray before a run

Follow the steps below to eject the rack tray before a run.

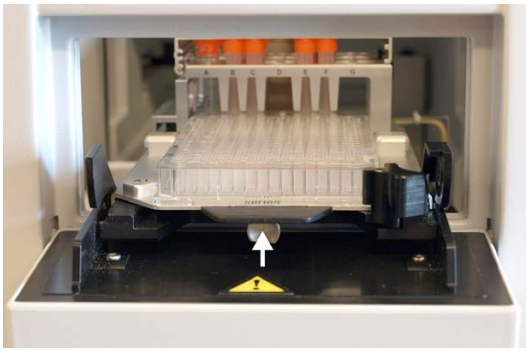
Step	Action
1	Click the ***Eject Rack Tray*** button in the ***Tools*** workspace. *Result:* The rack tray is ejected and the following dialog is displayed: 
2	Click ***OK***. *Result:* The rack tray is moved into the instrument immediately. The rack tray will be moved back into the instrument automatically after the time shown in the dialog.

CAUTION

The rack tray automatically moves into the instrument a preset time after it has been ejected. The time is set in ***Tools →Preferences***. A timer in the dialog indicates when the rack tray will be automatically moved into the instrument. Make sure no clothing or body parts are trapped as the rack tray moves into the instrument.

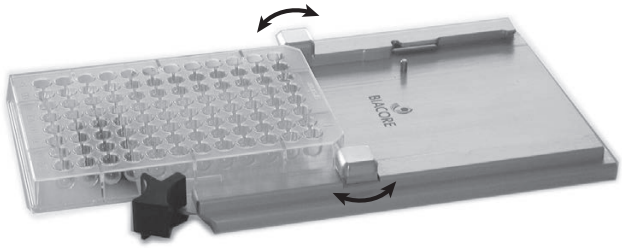
Removing the rack tray or sample and reagent rack

To release the rack tray from the carriage, press the catch under the front edge of the tray. Lift the tray slightly to take it out of the instrument.



5.4 Adjusting the rack tray

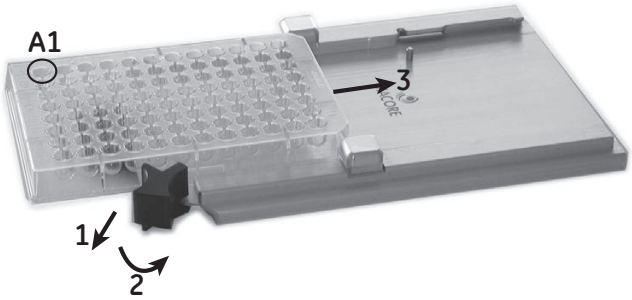
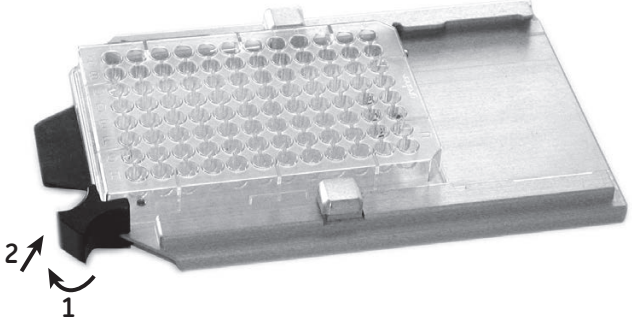
To accommodate some brands of microplates, it may be necessary to adjust the retainers on the rack tray. Contact your Cytiva representative for more information. Follow the steps below to adjust the microplate retainers.

Step	Action
1	Loosen the screws underneath the rack tray and turn the retainers through 90° to accommodate the microplate.
	
2	Tighten the screws again after the adjustment.

5.5 Preparing samples and reagents

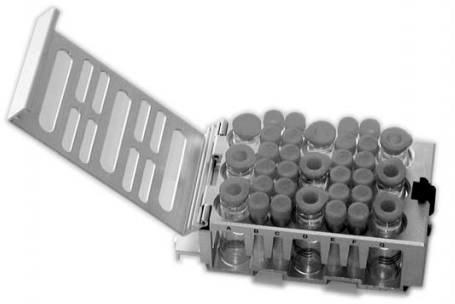
In a microplate

Follow the steps below to prepare samples and reagents in a microplate.

Step	Action
1	Dispense the samples and reagents into the microplate and/or vials. Check that there are no air bubbles trapped at the bottom of the microplate wells. It is particularly easy to trap air bubbles at the bottom of the wells in 384-well microplates.
2	Cover the used sample wells in microplates with recommended adhesive foil, available from Cytiva and cap any vials used. This prevents evaporation from the samples during analysis.
3	Open the catch on the rack tray and slide the microplate onto the rack tray. Place the microplate with well **A1** facing towards the front of the rack tray. 
4	Close the catch and make sure that the microplate is properly seated on the rack tray. 

In a reagent rack

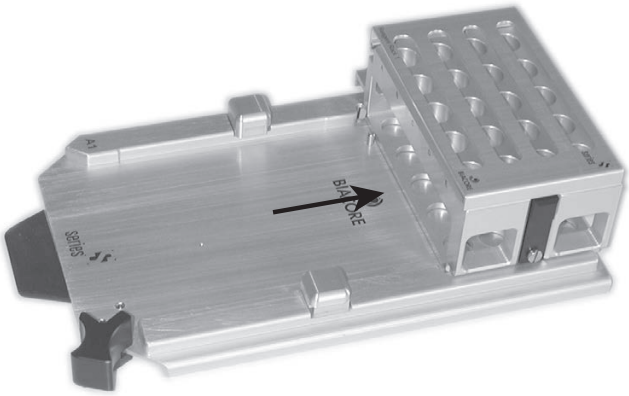
Follow the steps below to prepare samples and reagents in a reagent rack (or sample and reagent rack).

Step	Action
1	Open the cover of the reagent rack, or the sample and reagent rack.
2	Dispense reagents to suitable vials. Cap the vials and place in the reagent rack. Use only caps supplied for use in Biacore S200 by Cytiva. 
3	Close the reagent rack cover and press until it snaps shut. Make sure that the cover is completely closed. 

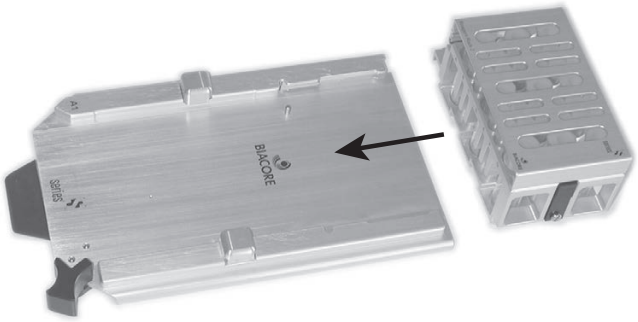
5.6 Changing reagent racks

Follow the steps below to change the reagent rack on the rack tray.

Step	Action
1	Remove the rack from the rack tray by pushing firmly on the rack towards the back of the tray.



2	Slide the new rack into the holder on the rack tray from the back of the tray. Make sure that it is correctly oriented. The rack can only be fully inserted in one orientation.



3	Push the rack until it snaps into position on the rack tray. Make sure that the rack is properly in place. ***Note:*** *If the rack is not correctly mounted, you will not be able to insert the rack tray into the instrument.*

5.7 Installing the rack tray

Follow the steps below to install the rack tray or sample and reagent rack.

Step	Action
1	If the rack tray port is not open when you are ready to install the rack tray, eject the rack tray carriage.
2	Insert the rack tray. Press gently until the rack tray snaps into place.
3	The rack tray carriage automatically moves into the instrument a preset time after it has been ejected. The time is set in ***Tools*** →***Preferences***. Click ***OK*** in the ***Eject Rack Tray*** dialog to move the rack tray into the instrument immediately.

CAUTION

The rack tray automatically moves into the instrument a preset time after it has been ejected. The time is set in ***Tools*** →***Preferences***. A timer in the dialog indicates when the rack tray will be automatically moved into the instrument. Make sure no clothing or body parts are trapped as the rack tray moves into the instrument.

Note: *The rack tray cannot be accessed during an automated run.*

5.8 Starting and finishing a run

Start a run

When docking of the sensor chip is ready, a standby flow of running buffer is started.

For details of how to start a run, refer to the *Biacore S200 Software Handbook*.

Standby mode

When a run is completed, the instrument is automatically placed in standby mode. A continuous low flow of buffer (using buffer tube **A**) is maintained through the flow system to prevent accumulation of buffer residues.

The default standby period is 7 days. Liquid consumption during standby is approximately 65 mL per 24 hours.

NOTICE

As a general recommendation use distilled and filtered water for standby to minimize salt deposits. However, if an immobilized sensor chip is docked and will be used for analysis later, buffer may be used to protect the ligand on the sensor surface.

Wash buffer tubing

Use the maintenance tool ***Wash Buffer Tubing*** when you change from buffers containing substances that tend to adsorb to the tubing, e.g. detergent or serum albumin.

If you have used buffer tubes **B**, **C** or **D** and do not plan to use them in coming runs, run the maintenance tool ***Empty Buffer Tubing*** to wash and empty the buffer tubing, then place unused tubes in the holder in the left pump compartment.

Shutdown

If you want to shut down the instrument completely, see *Section 6.5 Shutting down the system,* for instructions.

6 Maintenance

About this chapter

This chapter summarizes user maintenance procedures. If more extensive service is required, please contact your Cytiva service representative. Complete the appropriate Health and Safety Declaration Form before contacting your local service representative or returning the system for maintenance or service.

Several maintenance operations are performed using software tools with on-screen instructions in English. See *Appendix A Software tool texts, on page 103* for these instructions in your local language.

WARNING

All service and repairs, with the exception of operations explicitly described in the user documentation, must be carried out by personnel authorized by Cytiva. Do not open any covers or replace any parts unless specifically stated in the user documentation.

WARNING

Always wear appropriate protective clothing and equipment during operation and maintenance of the Biacore S200 system. Use required safety equipment when handling hazardous substances.

CAUTION

Pinch risk. Take care that fingers are not trapped by moving parts on the instrument.

In this chapter

Section		See page
6.1	Maintenance preparations	59
6.2	Maintenance summary	60
6.3	User maintenance operations	62
6.4	User service operations	66
6.5	Shutting down the system	72
6.6	Replacing the mains fuses	74

6.1 Maintenance preparations

Important

Make sure that the BIAmaintenance Kit type 2 is available before starting maintenance procedures.

Regular maintenance of Biacore S200 is essential for reliable results. It is important to keep the instrument free from contamination such as microbial growth and adsorbed proteins in the liquid handling system.

Regular checks and maintenance should be done according to the schedules below. You will be reminded of the need for ***Desorb*** and ***Desorb and Sanitize*** procedures via a maintenance scheduler in the Control Software. Do not ignore maintenance reminders.

Safety precautions

WARNING

If the instrument may be contaminated with biohazards, decontaminate the instrument before performing maintenance on any instrument parts. Contact your local service representative for further information about decontamination procedures.

WARNING

Concentrated BIAdisinfectant solution is corrosive. The solution should be diluted shortly before use as described in the Instructions for Use provided with the product.

NOTICE

Some maintenance procedures will destroy the ligand on a prepared sensor chip. Always use the separate Sensor Chip Maintenance that is included in the Maintenance Kit unless otherwise stated.

NOTICE

Do not use BIAdesorb solution 1 at analysis temperatures below 20°C. BIAdesorb solution 1 precipitates at low temperatures.

6.2 Maintenance summary

User maintenance operations

Regular checks and maintenance should be done according to the schedule below.

Interval	Action
Daily/after each run	Empty the waste bottle
Weekly	Inspect tube fittings and pumps for possible leaks
	Clean the flow system (***Desorb***)
Monthly	Clean the instrument cover
	Clean and disinfect the flow system (***Desorb and Sanitize***)
	Inspect the needle and the liquid supply block
	Inspect the sample compartment, look for signs of flooding
	Run ***System Check***

User service operations

Use the software tools listed in the table below for user service operations.

Tool	Description
System Check	Always run ***System Check*** before calling a Cytiva service representative. The results of ***System Check*** may help in diagnosing and solving your problems.
Software Problem Report	Run this tool if you experience problems with Biacore S200 Software which do not have a readily apparent solution.
Flow System Wash	This tool will flush the flow system with buffer at a high flow rate to clear obstructions such as aggregated particles.
Superclean	This tool can be used for extensive cleaning if the ***Desorb and Sanitize*** procedure is not sufficient to clean the flow system.

Required materials

Materials required for user maintenance and service operations are summarized below.

BIAmaintenance Kit type 2

The contents of the kit are listed below.

Solution/item	Specification
BIAdesorb solution 1	0.5% (w/v) sodium dodecyl sulfate (SDS), two bottles of 95 mL
BIAdesorb solution 2	50 mM glycine pH 9.5, two bottles of 95 mL
BIAtest solution	14.9% sucrose in HBS-N buffer with 3 mM EDTA, one bottle of 65 mL
BIAdisinfectant solution (conc.)	Sodium hypochlorite with 8% to 12% active chlorine, three bottles of 10 mL
BIAnormalizing solution	70% (w/w) glycerol, one bottle of 90 mL
HBS-N buffer 10×	One bottle of 50 mL
Sensor Chip Maintenance	One sensor chip

All solutions except BIAdesorb solution 1 should be stored at +4°C to 8°C. BIAdesorb solution 1 should be stored at room temperature.

Additional materials

In addition to the Maintenance Kit you will need the following materials:

- Distilled and filtered water
- 70% (v/v) ethanol
- Clean, lint-free wipes
- Series S Sensor Chip CM5

Preventive maintenance

To ensure correct performance of Biacore S200, preventive maintenance should be done regularly by a qualified Cytiva service representative. During the maintenance visit, worn parts are replaced and all vital modules of the system are tested.

The following components are always replaced:

- IFC
- Opto-interface
- Syringe pumps
- Peristaltic pump tubing

6.3 User maintenance operations

Cleaning the instrument

WARNING

Liquids in the buffer bottles or tubing may be toxic or flammable or may cause chemical burns or irritation to skin and eyes. Take appropriate precautions in the event of bottle breakage, accidental spillage and insecure fitting of tubings to bottles.

If necessary, clean the cover of the processing unit with a moist cloth. Use water or a mild detergent.

The buffer tray and the waste and water tray can be removed for cleaning.

If necessary, clean the waste bottle cap as follows:

Step	Action
1	Unscrew the cap from the waste bottle.
2	Loosen the tube fittings and remove the tubes from the cap.
3	Rinse the cap in deionized water.
4	Re-attach the tubes to the cap and tighten the fittings firmly.

Cleaning before planned maintenance/service

To ensure the protection and safety of service personnel, all equipment and work areas must be clean and free of any hazardous contaminants before a Service Engineer starts maintenance work.

Please complete the checklist in the *On Site Service Health and Safety Declaration Form* or the *Health and Safety Declaration Form for Product Return or Servicing*, depending on whether the instrument is going to be serviced on site or returned for service, respectively.

Health and safety declaration forms

Health and safety declaration forms are available for copying or printing in the *Reference information* chapter of this manual, or on digital media supplied with the user documentation.

Cleaning and disinfecting the flow system

The software supports maintenance tools for cleaning and disinfecting the flow system, and for emptying and washing the buffer tubing.

The table below summarizes the tools provided.

Note: *BIAdesorb solution 1 will precipitate at low temperature and should not be used at analysis or sample compartment temperatures below 20°C. To run* ***Desorb*** *below 20°C, replace BIAdesorb solution 1 with 0.5% lithium dodecyl sulfate in water.*

Tool	Description	Required materials
Desorb	Cleans the flow system. Run once a week, or more often if necessary.[1]	BIAdesorb solution 1 Biadesorb solution 2
Desorb and sanitize	Cleans and disinfects the flow system. Run at least once a week, or more often if necessary.[1]	BIAdesorb solution 1 Biadesorb solution 2 BIAdisinfectant solution HBS buffer
Empty buffer tubing	Washes and empties all buffer tubing. Run whenever you intend to leave buffer tubing unused for an extended period.	70% ethanol BIAdesorb solution 2
Wash buffer tubing	Washes one or all buffer tubes. Run after using buffers containing substances that tend to adsorb to the tubing, e.g. detergent or serum albumin.	BIAdesorb solution 1 Biadesorb solution 2

[1] Use Sensor Chip Maintenance or a used chip for the procedure. The solutions used may damage the ligand on sensor chips used for assays.

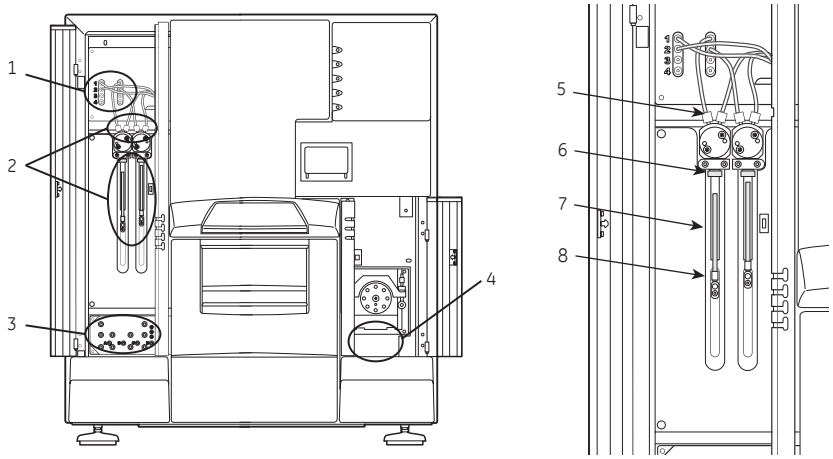
Checking for leaks

Once a week, check that there are no liquid or salt deposits at the following positions (see illustration below):

- Syringe pump: tube fittings, inside the pump barrel, at the plunger drive
- Buffer selector valve: tube fittings
- Degasser: tube fittings
- Peristaltic pump: tube fittings below the pump

If you find leaks at tube fittings, clean with water and tighten the connections.

If you find leaks in either of the syringe pumps, call your Cytiva service representative.



Part	Function
1	Degasser
2	Syringe pumps (see items 5 to 8)
3	Buffer selector valve
4	Peristaltic pump connections
5	Tubing connections
6	Plunger tip
7	Pump barrel
8	Plunger drive

Note: *Condensate water may collect on the drip tray underneath the instrument during long runs with cooling below ambient temperature. This is normal and does not indicate leakage.*

Normalizing the detector

This procedure adjusts the detector response to compensate for slight differences in individual sensor chips. For best performance, run this procedure once for each new chip. The procedure can either be run before immobilization or before the first run using the immobilized chip. Normalization injects BIAnormalizing solution (70% glycerol in water) over the chip surface.

The detector can be normalized either by using the maintenance tool ***Normalize*** before starting a run or during the run setup procedure.

Required solutions: BIAnormalizing solution

NOTICE

Run ***Normalize*** with the sensor chip that will be used for the run. Do not use Sensor Chip Maintenance for this purpose.

6.4 User service operations

Introduction

The software supports test and service tools for ***System Check***, ***Software Problem Report***, ***Flow System Wash***, and ***Superclean***.

System Check

This procedure performs a comprehensive check of system performance, using a standard sucrose solution (BIAtest solution), provided in the Biacore Maintenance Kit.

Use a new Sensor Chip CM5 for this procedure.

Required solutions
BIAtest solution
HBS-N buffer

System Check results

The table below provides some guidelines for interpreting the results of ***System Check***.

Test	Likely cause of failure	Explanation/Action
Reagent pump Water Buffer	Air in injections 1 and 2	The clamp on the upper peristaltic pump was not fastened.
	Air in single injection	Tubing squeezed or not fully inserted into buffer or water.
	Blank injection deviates from baseline	Deposits in the liquid supply block.
Mixing Mix 1 Mix 2 Difference	Leaks in syringe pump or other parts of flow system	Call Cytiva service representative.
	Flow cell leakage too large	Call Cytiva service representative.
Refracto-meter Fc1 Fc2 Fc3 Fc4	Too low values	A new chip was not used. May also result in too large spread in base-line level.
	Too high or too low values	Wrong buffer.

Test	Likely cause of failure	Explanation/Action
Injections Fc1 Fc2 Fc3 Fc4	Leaks in syringe pump or other parts of flow system	Call Cytiva service representative.
	Flow cell leakage too large	Call Cytiva service representative.
Noise	Drifting baseline	A new chip was not used.
		Temperature not stable. Call Cytiva service representative.
Buffer selector Buffer A Buffer B Buffer C Buffer D	Tubing in wrong bottles	Check that the buffer tubes are inserted in the correct bottles.
	Buffer selector not working	Call Cytiva service representative.
	Leaking syringe pump	Call Cytiva service representative.

Superclean

The ***Superclean*** procedure washes the flow system and denatures proteins to increase their solubility. Warm water is used as running buffer to increase the solubility of most biomolecules and salt. Required solutions differ according to whether the flow system is contaminated with proteins or small molecules.

Run the maintenance tool ***Desorb and Sanitize*** followed by ***Superclean*** if you suspect that the ***Desorb and Sanitize*** procedure is not sufficient to clean the flow system. Total run time is about 1.5 hours.

Required solutions	
For cleaning proteins	**For cleaning small molecules**
deionized water at 50°C	deionized water at 50°C
1% acetic acid	1% acetic acid
0.2 M sodium bicarbonate	0.2 M sodium bicarbonate
6 M guanidine-HCl	50%DMSO
10 mM HCl	10% DMSO

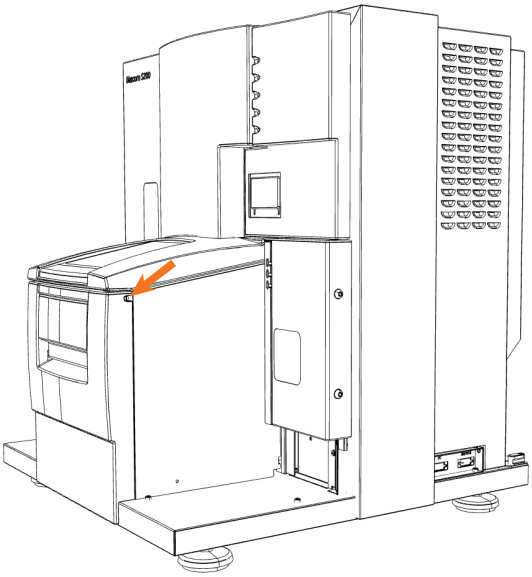
Use Sensor Chip Maintenance or a used chip for the procedure. The solutions used in the ***Superclean*** procedure may damage the ligand on sensor chips used for assays.

Open the sample compartment

> **CAUTION**
> Always turn off the power before opening the sample compartment.

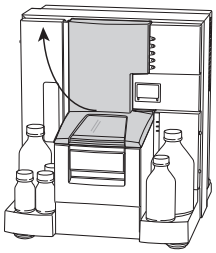
Follow the steps below if you need to access the needle and the liquid supply block for cleaning.

Step	Action
1	Choose ***Tools*** →***Stop Standby*** if the instrument is in ***Standby*** mode.
2	Remove any microplate and reagent rack from the sample compartment. Make sure that the rack tray is fully retracted and the sample compartment is closed.
3	Turn off the mains power to the instrument.
4	Open the sample compartment door: use a flat head screwdriver to turn the lock screw 1/8 turn counter-clockwise.



CAUTION

The sample compartment door swings upwards when released. Do not lean over the instrument when you open the sample compartment door.

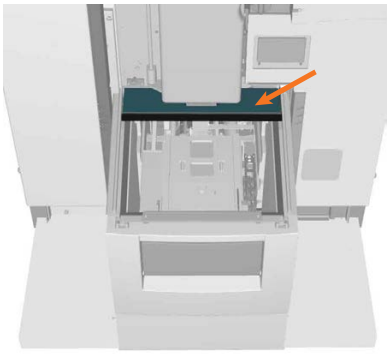


Clean the sample compartment

Follow the steps below to clean the sample compartment.

WARNING

The injection needle is sharp and may penetrate protective gloves. Take particular care if hazardous agents have been used.

Step	Action
1	Open the sample compartment as described in *Open the sample compartment, on page 68*.
2	Remove the insulation plate at the back of the sample compartment (indicated by the arrow in the illustration below). 
3	Remove any spillage from the sample compartment with water or ethanol as required.
4	Dry with a lint-free cloth.
5	If salt residues have accumulated on the needle or liquid supply block, remove them with a damp cloth.

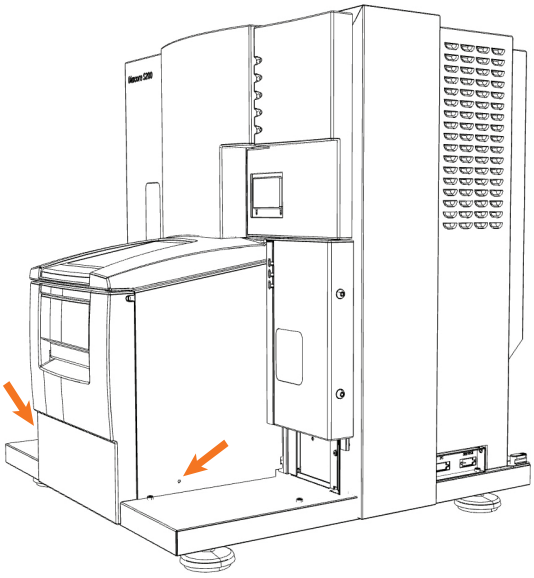
Step	Action
6	Replace the insulation plate at the back of the sample compartment.
7	Pull down the sample compartment door, and close the door by pressing it down until it snaps into position.
8	Start the instrument and the software.
9	Run ***Prime*** to wash the needle and the liquid supply block.

Remove the sample compartment box

If required, the sample compartment box can be removed for better access to the sample compartment.

Follow the steps below to remove the sample compartment box.

Step	Action
1	Open the sample compartment.
2	Pull out the tubing from the water bottle and remove the bottle.
3	Remove the cap from the waste bottle and remove the bottle.
4	Pull out the tubing from the buffer bottles and remove the bottles. Place the tubing ends in the holder inside the left pump compartment.
5	Remove the buffer tray and the waste and water tray.

Step	Action
6	Use two 2.5 mm screwdrivers to press the two catches inside the sample compartment box. Pull the box out from the instrument. 

Replace the sample compartment box

Follow the steps below to replace the sample compartment box.

Step	Action
1	Push the sample compartment box along two guide rails into the instrument. Press until it locks into position.
2	Replace the buffer tray and the waste and water tray.
3	Pull down the sample compartment door. Ensure that no tubing is in the way, then close the door by pressing it onto the sample compartment box.

6.5 Shutting down the system

Introduction

Biacore S200 should normally be left in standby mode when not in use. The instrument maintains a low flow of liquid through the flow system. The maximum unattended standby period is 7 days.

If the instrument is not to be used for a period of about two weeks or more, run the ***Shutdown*** procedure to shut the instrument down completely.

Standby

The instrument enters standby mode automatically at the end of a run. To put the instrument in standby mode manually, choose ***Tools*** →***Standby***.

NOTICE

As a general recommendation use distilled and filtered water for standby to minimize salt deposits. However, if an immobilized sensor chip is docked and will be used for analysis later, buffer may be used to protect the ligand on the sensor surface.

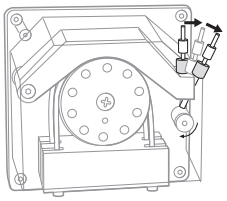
Before leaving the instrument unattended in standby mode:

- Check that there is sufficient water or buffer for the standby period, and that the buffer tube marked **A** is fully inserted into the water bottle. Liquid consumption during standby is approximately 65 mL/24 h.
- Check that the waste bottle is emptied.

Shutdown

Follow the steps below to shut down the instrument completely.

Step	Action
1	Run ***Desorb and Sanitize*** to clean the flow system.
2	Eject the rack tray carriage and remove the rack tray.
3	Prepare a bottle of distilled and filtered water, and a bottle of 70% ethanol. Choose ***Shutdown*** from the ***Tools*** menu. Follow the instructions on the screen. The procedure flushes the flow system and then empties the IFC of liquid. Total run time is about 20 minutes.

Step	Action
4	When instructed, open the right door and open the tube clamp of the peristaltic pump to relieve the pressure on the pump tubing. To completely open the clamp, flip the lever to the right until it touches the compartment wall. 
5	Exit from Biacore S200 Control Software by selecting ***File*** →***Exit*** then ***Exit the software***.
6	Open the sample compartment door and clean the needle and liquid supply block if necessary.
7	Remove bottles, the waste cap assembly and the bottle trays. Seal the loose tubing ends, for instance by wrapping them in plastic bags.

NOTICE

Before re-starting the system, make sure that the tube clamp is properly closed.

Storage conditions

For storage, first perform the ***Shutdown*** procedure to empty and dry the flow system, then clean the outside surfaces of the instrument using a soft cloth and water or a mild detergent. Release the peristaltic pump clamp (see above) before storage.

Maintain normal conditions of temperature and humidity while the system is in storage:

- Temperature: preferably room temperature, not below freezing
- Relative humidity: non-condensing, preferably low humidity

Contact Cytiva if you are uncertain of storage conditions.

6.6 Replacing the mains fuses

WARNING

Disconnect power. Always disconnect power from the instrument before replacing fuses.

WARNING

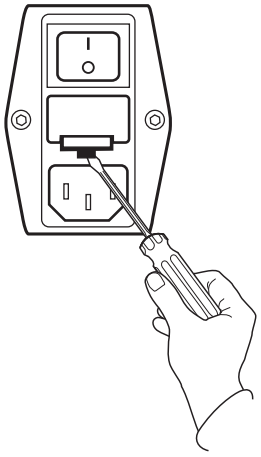
For continued protection from fire hazard, replace only with same type and rating of fuse.

CAUTION

Do not replace the mains fuses if you suspect that there may be a malfunction in the instrument. Contact your Cytiva service representative for advice.

Follow the steps below to replace the mains fuses.

Step	Action
1	Turn off the power to the Biacore S200 instrument.
2	Disconnect the mains cord from the mains power inlet.
3	Insert a small screwdriver under the tab on the fuse drawer cover.



4	Prise open the fuse drawer cover.

Step	Action
5	Replace both fuses. See the instrument product label for fuse ratings.
6	Close the fuse drawer cover and reconnect the mains supply.

7 Troubleshooting

About this chapter

This chapter gives a brief guide to troubleshooting procedures for problems with Biacore S200.

In this chapter

Section		See page
7.1	System-related problems	77
7.2	Assay-related problems	79

7.1 System-related problems

Instrument hygiene

A fundamental requirement for trouble-free operation of Biacore S200 is that the system is kept clean and is maintained regularly according to the following guidelines:

- Always use fresh buffer and distilled water. If you prepare your own buffers, filter buffer and water through a 0.22 µm filter to remove particles. Ready-to-use buffers from Cytiva are filtered.
- Follow the recommended maintenance procedures as described in the *Maintenance* chapter of these *Operating Instructions*. Do not ignore maintenance schedule reminders.
- If the system is used with particularly "sticky" molecules or complex mixtures such as serum, clean the flow system thoroughly after each run.
- Leave the system in standby mode with freshly filtered distilled water or buffer when not in use, or run the ***Shutdown*** procedure to empty the flow system. Do not leave the instrument with liquid standing still in the flow system.
- Do not take the sensor chip out of its protective cassette. Dust or other particles on the sensor chip surface can seriously interfere with detection.

Instrument considerations

- If the PC does not seem to communicate with the instrument, check that the communication cable is properly connected.
- Make sure there is adequate ventilation around at the instrument site.
- Check the accessible tube fittings on the pumps, buffer selector valve and degasser regularly for leaks.
- Make sure the clamp on the peristaltic pump is properly closed at the start of a run. If the clamp is not closed, buffer and water will not be supplied properly to the liquid supply block.

Buffer considerations

- Make sure that the correct buffer tubing is inserted into the buffer bottle(s). If you are only using one buffer, you should use buffer tubing **A**. The syringe pumps will be empty and the response will be out of range if no buffer is supplied to the flow cell.
- Check that there is sufficient buffer in the buffer bottle(s) and water in the water bottle at the start of a run.

Sample considerations

- Make sure that you have sufficient sample and reagent in the vials and microplate. The volumes specified in the software (see the *Biacore S200 Software Handbook*) are minimum volumes with due consideration for dead volumes in different vials and microplates. Larger volumes may be needed if you have problems with injection of air in sample or reagent injections.

- Use only recommended vials and microplates. Always cap vials and cover microplates with foil, using the products supplied for this purpose by Cytiva.
- Use only recommended caps for vials and adhesive foil for microplates. Sample evaporation from uncovered samples will both affect the sample concentration and reduce the volume, possibly resulting in injection of air. Use of unsuitable adhesive foil may block the autosampler needle with adhesive.

For further help

If you are experiencing instrument-related problems and are unable to identify and/or correct them, run ***System Check***, then contact your Cytiva service representative.

7.2 Assay-related problems

Ligand considerations

Loss of ligand activity on the surface of the sensor chip is a common source of application problems.

- If you cannot immobilize sufficient ligand with retained analyte-binding capacity, try alternative immobilization methods or use a capturing approach. In some cases it may be sufficient to perform immobilization at a milder pH, or to avoid exposure of the ligand to immobilization buffer as far as possible. The immobilization wizard supports dilution of ligand into immobilization buffer immediately before injection, for ligands that do not withstand extended exposure to immobilization conditions.
- Make sure that the ligand withstands regeneration conditions without loss of activity. If you cannot find suitable regeneration conditions, consider using a capturing approach so that you use fresh ligand on the surface for each analysis cycle.
- If you plan to store sensor chips with immobilized ligand for later use, perform control experiments to establish that the ligand retains activity in the storage conditions.
- Make sure you choose the correct flow path for a run. If you inject samples over a flow cell where no ligand is immobilized, you will not see significant binding.

Sample considerations

- Make sure the samples do not precipitate at the concentrations and buffer conditions used. Even micro-precipitation on the surface can seriously disturb the detection (or in the worst case block the flow system), and is generally seen as excessive noise and irregularities in the sensorgrams.
- Where possible, samples should be prepared in running buffer or similar conditions. Drastic changes in buffer composition between running buffer and sample can introduce artefacts that may be difficult to interpret.

For further help

Several Biacore publications provide guidance on design and execution of experiments. Contact Cytiva for more information.

8 Reference information

About this chapter

This chapter lists the technical specifications of Biacore S200. The chapter also includes a chemical resistance guide and Health and Safety Declaration forms for service.

In this chapter

Section		See page
8.1	Specifications	81
8.2	Maintenance tools	84
8.3	Chemical resistance	89
8.4	Recycling information	90
8.5	Regulatory information	91
8.6	Health and Safety Declaration Form	101

8.1 Specifications

General

Parameter	Value
Automation	48 h unattended operation
Limit of detection	Typically below 1 RU (approximately 1 pg/mm^2 for proteins on Sensor Chip CM5)
Sample volume	10 to 425 µL (application dependent)
Sample/reagent capacity	One 384 well or one 96 well microplate + 33 reagent vials, or 78 vials for samples and reagents
Analysis time per sample	Typically 2 to 15 min

Processing unit

Parameter	Value
Dimensions w × d × h (see also *Space requirements, on page 36*)	600 × 615 × 680 mm
Net weight	60 kg
Weight incl. packing	80 kg
Supply voltage	Autorange 100 to 240 V~, protective earthing
Maximum voltage fluctuation	± 10% from the nominal voltage
Frequency	50/60 Hz
Fuses	2 × T4.0AH
Maximum power consumption	400 VA
Analysis temperature	4°C to 45°C, max. 20°C below ambient temperature
Ambient temperature range	18°C to 33°C
Ambient humidity	20% to 80% RH
Altitude	Up to 2000 m

Parameter	Value
Transient overvoltages	Overvoltage category II
Acoustic noise	Not above 70 dB(A)

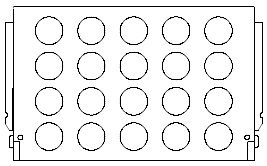
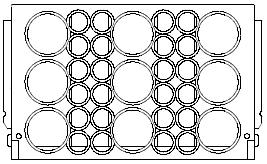
Flow cells

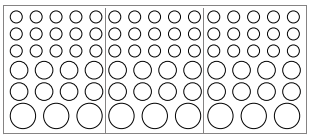
Parameter	Value
Number of flow cells	4
Flow cell height	Approximately 0.04 mm
Flow cell volume	Approximately 0.06 µL

System controller and software

Parameter	Value
PC operating system	Microsoft Windows 7, Windows 8.
Interfacing	Possibilities for import of sample data and export of results, e.g. to LIMS.

Reagent racks

Parameter	Value
Reagent rack, type 1 20 vials, diam. 11 mm (1.5 mL Eppendorf™-type)	
Reagent rack, type 2 9 vials, diam. 16 mm (4.0 mL) 24 vials, diam. 7.5 mm (0.8 mL)	

Parameter	Value
Sample and reagent rack 9 vials, diam. 16 mm (4.0 mL) 24 vials, diam. 11 mm (1.5 mL Eppendorf -type) 45 vials, diam. 7.5 mm (0.8 mL)	

Microplates

Parameter	Value
Microplate formats	96 or 384 shallow or deep-well plates, conforming to SBS standard

Liquid containers

Buffer tray

Parameter	Value
Running buffer	1 × 1 L and 3 × 250 mL, screw caps with gasket

Waste and water tray

Parameter	Value
Waste	2 L (must be of the same type as the one delivered with the system). Special screw cap with two tube fittings.
Water	500 mL, screw cap with gasket

8.2 Maintenance tools

Desorb

English text	Translation
This procedure removes adsorbed material from the flow system.	This procedure removes adsorbed material from the flow system.
Total run time is about 20 minutes.	Total run time is about 20 minutes.
Do not run this procedure below 20°C.	Do not run this procedure below 20°C.
NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.	NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.
Required solutions (from Maintenance Kit): BIAdesorb solution 1 BIAdesorb solution 2	Required solutions (from Maintenance Kit): BIAdesorb solution 1 BIAdesorb solution 2
Running Desorb procedure, please wait.	Running ***Desorb*** procedure, please wait.
The Desorb procedure is completed.	The ***Desorb*** procedure is completed.

Desorb and Sanitize

English text	Translation
This procedure removes adsorbed material and disinfects the flow system.	This procedure removes adsorbed material and disinfects the flow system.
Do not run this procedure below 20°C.	Do not run this procedure below 20°C.
NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.	NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.
The procedure is divided into five steps.	The procedure is divided into five steps.
Total run time is about one hour followed by a recommended standby time of 3-4 hours.	Total run time is about one hour followed by a recommended standby time of 3 to 4 hours.

English text	Translation
Do not abort this procedure after it is started.	Do not abort this procedure after it is started.
Required solutions (from Maintenance Kit): BIAdesorb solution 1: one volume of 25 mL and one volume of 15 mL BIAdesorb solution 2: one volume of 25 mL and one volume of 15 mL BIAdisinfectant solution: one volume of 50 mL and one volume of 30 mL	Required solutions (from Maintenance Kit): BIAdesorb solution 1, about 40 mL BIAdesorb solution 2, about 40 mL BIAdisinfectant solution, about 80 mL
Place 25 mL BIAdesorb Solution 1 on the left hand tray and insert all four pump inlet tubes.	Place 25 mL BIAdesorb solution 1 on the left hand tray and insert all four pump inlet tubes.
Place 15 mL BIAdesorb Solution 1 on the right hand tray and insert the water inlet tube.	Place 15 mL BIAdesorb solution 1 on the right hand tray and insert the water inlet tube.
Running Desorb and Sanitize procedure step 1, please wait.	Running ***Desorb and Sanitize*** procedure step 1, please wait.
Wipe the pump inlet tubes with a moist tissue.	Wipe the pump inlet tubes with a moist tissue.
Place 25 mL BIAdesorb Solution 2 on the left hand tray and insert all four pump inlet tubes. Place 15 mL BIAdesorb Solution 2 on the right hand tray and insert the water inlet tube.	Place 25 mL BIAdesorb solution 2 on the left hand tray and insert all four pump inlet tubes. Place 15 mL BIAdesorb solution 2 on the right hand tray and insert the water inlet tube.
Running Desorb and Sanitize procedure step 2, please wait.	Running ***Desorb and Sanitize*** procedure step 2, please wait.
Wipe the pump inlet tubes with a moist tissue.	Wipe the pump inlet tubes with a moist tissue.
Place 50 mL diluted BIAdisinfectant Solution on the left hand tray and insert all four pump inlet tubes.	Place 50 mL diluted BIAdisinfectant solution on the left hand tray and insert all four pump inlet tubes.
Place 30 mL diluted BIAdisinfectant Solution on the right hand tray and insert the water inlet tube.	Place 30 mL diluted BIAdisinfectant solution on the right hand tray and insert the water inlet tube.
Running Desorb and Sanitize procedure step 3, please wait.	Running ***Desorb and Sanitize*** procedure step 3, please wait.

English text	Translation
Wipe the pump inlet tubes with a moist tissue.	Wipe the pump inlet tubes with a moist tissue.
Place water on the left hand tray and insert all four pump inlet tubes.	Place water on the left hand tray and insert all four pump inlet tubes.
Place water on the right hand tray and insert the water inlet tube.	Place water on the right hand tray and insert the water inlet tube.
Running Desorb and Sanitize procedure step 4, please wait.	Running ***Desorb and Sanitize*** procedure step 4, please wait.
Place tube A in HEPES or TRIS buffer.	Place tube **A** in HEPES or TRIS buffer.
Recommended concentration is 10-50 mmol/L.	Recommended concentration is 10 to 50 mmol/L.
Let tubes B, C and D hang in the air.	Let tubes **B**, **C** and **D** hang in the air.
Running Desorb and Sanitize procedure step 5, please wait.	Running ***Desorb and Sanitize*** procedure step 5, please wait.
The Desorb and Sanitize procedure is completed.	The ***Desorb and Sanitize*** procedure is completed.
Allow the system to run in standby mode for at least 3–4 hours before performing a run.	Allow the system to run in standby mode for at least 3 to 4 hours before performing a run.

Empty Buffer Tubing

English text	Translation
This procedure empties all four buffer selector inlet tubes. The procedure is divided into three steps.	This procedure empties all four buffer selector inlet tubes. The procedure is divided into three steps.
Total run time is about 20 minutes.	Total run time is about 20 minutes.
Required solutions: Deionized water 70% ethanol	Required solutions: Deionized water 70% ethanol
Place a bottle containing deionized water on the left hand plate and insert the four buffer inlet tubes.	Place a bottle containing deionized water on the left hand plate and insert the four buffer inlet tubes.
This step flushes the buffer selector with water.	This step flushes the buffer selector with water.

English text	Translation
Running Empty Buffer Tubing procedure step 1, please wait.	Running ***Empty Buffer Tubing*** procedure step 1, please wait.
Place a bottle containing at least 10 mL 70% ethanol on the left hand plate and insert the four buffer inlet tubes.	Place a bottle containing at least 10 mL 70% ethanol on the left hand plate and insert the four buffer inlet tubes.
Running Empty Buffer Tubing procedure step 2, please wait.	Running ***Empty Buffer Tubing*** procedure step 2, please wait.
Remove the tubes from the ethanol bottle and allow them to hang in the air.	Remove the tubes from the ethanol bottle and allow them to hang in the air.
This step empties the buffer selector of liquid.	This step empties the buffer selector of liquid.
Running Empty Buffer Tubing procedure step 3, please wait.	Running ***Empty Buffer Tubing*** procedure step 3, please wait.
The Empty Buffer Tubing procedure is completed.	The ***Empty Buffer Tubing*** procedure is completed.

Normalize

English text	Translation
Normalizes the signal in all flow cells.	Normalizes the signal in all flow cells.
Total run time is about 9 minutes.	Total run time is about 9 minutes.
NOTE: Do not normalize with the maintenance chip.	NOTE: Do not normalize with the Maintenance Chip.
This procedure normalizes the detector signal. Total run time is about 9 minutes.	This procedure normalizes the detector signal. Total run time is about 9 minutes.
Required solution (from Maintenance Kit): BIAnormalizing solution	Required solution (from Maintenance Kit): BIAnormalizing solution
Normalizing, please wait.	Normalizing, please wait.
The Normalize procedure is completed.	The ***Normalize*** procedure is completed.

Wash Buffer Tubing

English text	Translation
This procedure cleans buffer tubing from adsorbed material, e.g. after using buffer with detergent.	This procedure cleans buffer tubing from adsorbed material, e.g. after using buffer with detergent.
Do not run this procedure below 20°C.	Do not run this procedure below 20°C.
NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.	NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.
Select tubes to wash.	Select tubes to wash.
This procedure removes adsorbed material from the flow system. The procedure is divided into three steps. Total run time is about 30 minutes.	This procedure removes adsorbed material from the flow system. The procedure is divided into three steps. Total run time is about 30[1] minutes.
Do not abort this procedure after it is started.	Do not abort this procedure after it is started.
Required solutions (from Maintenance Kit): BIAdesorb solution 1, about 20 mL BIAdesorb solution 2, about 20 mL	Required solutions (from Maintenance Kit): BIAdesorb solution 1, about 20[1] mL BIAdesorb solution 2, about 20[1] mL
Place 20 mL BIAdesorb Solution 1 on the left hand tray and insert tube A.	Place 20[1] mL BIAdesorb solution 1 on the left hand tray and insert tube A[1].
Wipe the tube with a moist tissue.	Wipe the tube with a moist tissue.
Place 20 mL BIAdesorb Solution 2 on the left hand tray and insert the tube/all four tubes.	Place 20[1] mL BIAdesorb solution 2 on the left hand tray and insert the tube/all four tubes[1].
Place buffer or water on the left hand tray and insert the tube/all four tubes.	Place buffer or water on the left hand tray and insert the tube/all four tubes[1].
NOTE: Remember to put tube A in buffer or water (to be used during standby).	NOTE: Remember to put tube **A** in buffer or water (to be used during standby).
Running Wash Buffer Tubing procedure step 1/2/3, please wait.	Running ***Wash Buffer Tubing*** procedure step 1/2/3, please wait.
The Wash Buffer Tubing procedure is completed.	The ***Wash Buffer Tubing*** procedure is completed.

[1] Times, volumes and tube instructions vary acccording to the tubes selected for wash.

8.3 Chemical resistance

This section gives some general guidelines concerning chemical resistance for Biacore S200 components. Regarding exposure to solutions not covered by these guidelines, contact your Cytiva representative for recommendations.

The flow system and sensor chip are the only parts of Biacore S200 that come into contact with solutions. The guidelines in this section relate to tubing and connectors, selector valves, connector block, IFC and sensor chip. In most analysis situations, the ligand attached to the sensor surface limits the chemical resistance of the system as a whole.

In general, the flow system components withstand long-term exposure to common aqueous buffer solutions used in biochemical laboratories. The table below lists compatibility with other common substances.

Concentrated organic solvents as well as long-term exposure to extremes of pH (<3 and >11) should be avoided. For solutions with short-term compatibility, do not use as running buffer or for injections longer than 10 minutes. Solutions classed as long-term compatible may be used as running buffer.

Solution	Concentration	Compatibility
Acetonitrile	50%	Short term
Dimethyl formamide (DMF)	50%	Short term
Dimethyl sulfoxide (DMSO)	50% 10%	Short term Long term
Ethanol	70% 10%	Short term Long term
Ethylene glycol	100%	Short term
Formic acid	70%	Short term
Formamide	40%	Long term

8.4 Recycling information

Introduction

This section contains information about the decommissioning of the product.

CAUTION

Always use appropriate personal protective equipment when decommissioning the equipment.

Decontamination

The product must be decontaminated before decommissioning. All local regulations must be followed with regard to scrapping of the equipment.

Disposal of the product

When taking the product out of service, the different materials must be separated and recycled according to national and local environmental regulations.

Disposal of batteries

Waste batteries and accumulators must not be disposed of as unsorted municipal waste and must be collected separately. Follow applicable local regulations for recycling of batteries and accumulators.

Disposal of electrical components

Waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of the equipment.

8.5 Regulatory information

Introduction

This section lists the regulations and standards that apply to the product.

In this section

Section		See page
8.5.1	Contact information	92
8.5.2	European Union and European Economic Area	93
8.5.3	Eurasian Economic Union Евразийский экономический союз	94
8.5.4	Regulations for North America	96
8.5.5	Regulatory statements	97
8.5.6	Declaration of Hazardous Substances (DoHS)	98
8.5.7	Other regulations and standards	100

8.5.1 Contact information

Contact information for support

To find local contact information for support and sending troubleshooting reports, visit *cytiva.com/contact*.

Manufacturing information

The table below summarizes the required manufacturing information.

Requirement	Information
Name and address of manufacturer	Cytiva Sweden AB Björkgatan 30 SE 751 84 Uppsala Sweden
Telephone number of manufacturer	+ 46 771 400 600

8.5.2 European Union and European Economic Area

Introduction

This section describes regulatory information for the European Union and European Economic Area that applies to the equipment.

Conformity with EU Directives

See the EU Declaration of Conformity for the directives and regulations that apply for the CE marking.

If not included with the product, a copy of the EU Declaration of Conformity is available on request.

CE marking

The CE marking and the corresponding EU Declaration of Conformity is valid for the instrument when it is:

- used according to the *Operating Instructions* or user manuals, and
- used in the same state as it was delivered, except for alterations described in the *Operating Instructions* or user manuals.

8.5.3 Eurasian Economic Union Евразийский экономический союз

This section describes the information that applies to the product in the Eurasian Economic Union (the Russian Federation, the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, and the Kyrgyz Republic).

Introduction

This section provides information in accordance with the requirements of the Technical Regulations of the Customs Union and (or) the Eurasian Economic Union.

Введение

В данном разделе приведена информация согласно требованиям Технических регламентов Таможенного союза и (или) Евразийского экономического союза.

Manufacturer and importer information

The following table provides summary information about the manufacturer and importer, in accordance with the requirements of the Technical Regulations of the Customs Union and (or) the Eurasian Economic Union.

Requirement	Information
Name, address and telephone number of manufacturer	See *Manufacturing information*
Importer and/or company for obtaining information about importer	LLC Global Life Sciences Solutions Rus Russian Federation, 123112 Presnenskaya nab., 10, fl. 12, pr. III, room 6 Telephone: + 7 495 739 6931 Fax nr: + 7 495 739 6932 E-mail: *rucis@cytiva.com*

Информация о производителе и импортере

В следующей таблице приводится сводная информация о производителе и импортере, согласно требованиям Технических регламентов Таможенного союза и (или) Евразийского экономического союза.

Требование	Информация
Наименование, адрес и номер телефона производителя	См. *Информацию об изготовлении*

Требование	Информация
Импортер и/или лицо для получения информации об импортере	ООО "Глобал Лайф Сайэнсиз Солюшнз Рус" Российская Федерация, 123112 Пресненская наб., д. 10, эт. 12, пом. III, ком. 6 Телефон: + 7 495 739 6931 Факс: + 7 495 739 6932 Адрес электронной почты: *rucis@cytiva.com*

Description of symbol on the system label
Описание обозначения на этикетке системы

This Eurasian compliance mark indicates that the product is approved for use on the markets of the Member States of the Customs Union of the Eurasian Economic Union

Данный знак о Евразийском соответствии указывает, что изделие одобрено для использования на рынках государств-членов Таможенного союза Евразийского экономического союза

8.5.4 Regulations for North America

Introduction

This section describes the information that applies to the product in the USA and Canada.

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.

Note: *The user is cautioned that any changes or modifications not expressly approved by Cytiva could void the user's authority to operate the equipment.*

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 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

8.5.5 Regulatory statements

Introduction

This section shows regulatory statements that apply to regional requirements.

EMC emission, CISPR 11: Group 1, Class A statement

NOTICE

This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

South Korea

Regulatory information to comply with the Korean technical regulations.

NOTICE

Class A equipment (equipment for business use).

This equipment has been evaluated for its suitability for use in a business environment.

When used in a residential environment, there is a concern of radio interference.

주의

A급 기기 (업무용 방송통신 기자재)

이 기기는 업무용환경에서 사용할 목적으로 적합성평가를 받은 기기

로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

8.5.6 Declaration of Hazardous Substances (DoHS)

This section describes the information that applies to the product in China.

根据 SJ/T11364-2014《电子电气产品有害物质限制使用标识要求》特提供如下有关污染控制方面的信息。

The following product pollution control information is provided according to SJ/T11364-2014 Marking for Restriction of Hazardous Substances caused by electrical and electronic products.

电子信息产品污染控制标志说明
Explanation of Pollution Control Label

该标志表明本产品含有超过中国标准 GB/T 26572《电子电气产品中限用物质的限量要求》中限量的有害物质。标志中的数字为本产品的环保使用期，表明本产品在正常使用的条件下，有毒有害物质不会发生外泄或突变，用户使用本产品不会对环境造成严重污染或对其人身、财产造成严重损害的期限。单位为年。

为保证所申明的环保使用期限，应按产品手册中所规定的环境条件和方法进行正常使用，并严格遵守产品维修手册中规定的定期维修和保养要求。

产品中的消耗件和某些零部件可能有其单独的环保使用期限标志，并且其环保使用期限有可能比整个产品本身的环保使用期限短。应到期按产品维修程序更换那些消耗件和零部件，以保证所申明的整个产品的环保使用期限。

本产品在使用寿命结束时不可作为普通生活垃圾处理，应被单独收集妥善处理。

This symbol indicates the product contains hazardous materials in excess of the limits established by the Chinese standard GB/T 26572 Requirements of concentration limits for certain restricted substances in electrical and electronic products. The number in the symbol is the Environment-friendly Use Period (EFUP), which indicates the period during which the hazardous substances contained in electrical and electronic products will not leak or mutate under normal operating conditions so that the use of such electrical and electronic products will not result in any severe environmental pollution, any bodily injury or damage to any assets. The unit of the period is “Year”.

In order to maintain the declared EFUP, the product shall be operated normally according to the instructions and environmental conditions as defined in the product manual, and periodic maintenance schedules specified in Product Maintenance Procedures shall be followed strictly.

Consumables or certain parts may have their own label with an EFUP value less than the product. Periodic replacement of those consumables or parts to maintain the declared EFUP shall be done in accordance with the Product Maintenance Procedures.

This product must not be disposed of as unsorted municipal waste, and must be collected separately and handled properly after decommissioning.

有害物质的名称及含量
Name and Concentration of Hazardous Substances

产品中有害物质的名称及含量
Table of Hazardous Substances' Name and Concentration

部件名称 Component name	有害物质 Hazardous substance					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
29136649	X	0	X	0	0	0

0: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

- 此表所列数据为发布时所能获得的最佳信息.

0: Indicates that this hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.

X: Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572

- Data listed in the table represents best information available at the time of publication.

8.5.7 Other regulations and standards

Introduction

This section describes the standards that apply to the product.

Regulatory compliance of connected equipment

Any equipment connected to Biacore S200 should meet the safety requirements of IEC/EN/UL/CSA 61010-1, IEC/EN/UL/CSA 60950-1, or other relevant national safety regulations and standards. The equipment should be installed and used according to the manufacturer's instructions. Within EU, connected equipment must be CE marked.

8.6 Health and Safety Declaration Form

On site service

cytiva

On Site Service Health & Safety Declaration Form

Service Ticket #:	

To make the mutual protection and safety of Cytiva service personnel and our customers, all equipment and work areas must be clean and free of any hazardous contaminants before a Service Engineer starts a repair. To avoid delays in the servicing of your equipment, complete this checklist and present it to the Service Engineer upon arrival. Equipment and/or work areas not sufficiently cleaned, accessible and safe for an engineer may lead to delays in servicing the equipment and could be subject to additional charges.

Yes	No	Review the actions below and answer "Yes" or "No". Provide explanation for any "No" answers in box below.
○	○	**Instrument has been cleaned of hazardous substances**. Rinse tubing or piping, wipe down scanner surfaces, or otherwise make sure removal of any dangerous residue. Make sure the area around the instrument is clean. If radioactivity has been used, perform a wipe test or other suitable survey.
○	○	**Adequate space and clearance is provided to allow safe access** for instrument service, repair or installation. In some cases this may require customer to move equipment from normal operating location prior to Cytiva arrival.
○	○	**Consumables, such as columns or gels, have been removed or isolated from the instrument and from any area that may impede access to the instrument.**
○	○	**All buffer / waste vessels are labeled. Excess containers have been removed from the area to provide access.**
Provide explanation for any "No" answers here:		

Equipment type / Product No:		Serial No:	

I hereby confirm that the equipment specified above has been cleaned to remove any hazardous substances and that the area has been made safe and accessible.

Name:		Company or institution:	
Position or job title:		Date (YYYY/MM/DD):	
Signed:			

Product return or servicing

cytiva

Health & Safety Declaration Form for Product Return or Servicing

Return authorization number:		*and/or* **Service Ticket/Request:**	

To make sure the mutual protection and safety of Cytiva personnel, our customers, transportation personnel and our environment, all equipment must be clean and free of any hazardous contaminants before shipping to Cytiva. To avoid delays in the processing of your equipment, complete this checklist and include it with your return.

1. Note that items will NOT be accepted for servicing or return without this form
2. Equipment which is not sufficiently cleaned prior to return to Cytiva may lead to delays in servicing the equipment and could be subject to additional charges
3. Visible contamination will be assumed hazardous and additional cleaning and decontamination charges will be applied

Yes	No	Specify if the equipment has been in contact with any of the following:	
◯	◯	Radioactivity (specify)	
◯	◯	Infectious or hazardous biological substances (specify)	
◯	◯	Other Hazardous Chemicals (specify)	

Equipment must be decontaminated prior to service / return. Provide a telephone number where Cytiva can contact you for additional information concerning the system / equipment.

Telephone No:		
Liquid and/or gas in equipment is:	☐	**Water**
	☐	**Ethanol**
	☐	**None, empty**
	☐	**Argon, Helium, Nitrogen**
	☐	**Liquid Nitrogen**
	Other, specify	

Equipment type / Product No:		**Serial No:**	

I hereby confirm that the equipment specified above has been cleaned to remove any hazardous substances and that the area has been made safe and accessible.

Name:		**Company or institution:**	
Position or job title:		**Date (YYYY/MM/DD)**	
Signed:			

For local office contact information, visit cytiva.com/contact.
28980027 AD 04/2020

To receive a return authorization number or service number, call local technical support or customer service.

Appendix A
Software tool texts

The on-screen instructions in the maintenance, test and service software tools are given in English. Translations to other languages are provided in the local language versions of these *Operating Instructions*.

In this chapter

Section		See page
A.1	Maintenance tools	104
A.2	Test tools	109
A.3	Service tools	110

A.1 Maintenance tools

Desorb

English text	Translation
This procedure removes adsorbed material from the flow system.	This procedure removes adsorbed material from the flow system.
Total run time is about 20 minutes.	Total run time is about 20 minutes.
Do not run this procedure below 20°C.	Do not run this procedure below 20°C.
NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.	NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.
Required solutions (from Maintenance Kit): BIAdesorb solution 1 BIAdesorb solution 2	Required solutions (from Maintenance Kit): BIAdesorb solution 1 BIAdesorb solution 2
Running Desorb procedure, please wait.	Running ***Desorb*** procedure, please wait.
The Desorb procedure is completed.	The ***Desorb*** procedure is completed.

Desorb and Sanitize

English text	Translation
This procedure removes adsorbed material and disinfects the flow system.	This procedure removes adsorbed material and disinfects the flow system.
Do not run this procedure below 20°C.	Do not run this procedure below 20°C.
NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.	NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.
The procedure is divided into five steps.	The procedure is divided into five steps.
Total run time is about one hour followed by a recommended standby time of 3-4 hours.	Total run time is about one hour followed by a recommended standby time of 3 to 4 hours.

English text	Translation
Do not abort this procedure after it is started.	Do not abort this procedure after it is started.
Required solutions (from Maintenance Kit): BIAdesorb solution 1: one volume of 25 mL and one volume of 15 mL BIAdesorb solution 2: one volume of 25 mL and one volume of 15 mL BIAdisinfectant solution: one volume of 50 mL and one volume of 30 mL	Required solutions (from Maintenance Kit): BIAdesorb solution 1, about 40 mL BIAdesorb solution 2, about 40 mL BIAdisinfectant solution, about 80 mL
Place 25 mL BIAdesorb Solution 1 on the left hand tray and insert all four pump inlet tubes.	Place 25 mL BIAdesorb solution 1 on the left hand tray and insert all four pump inlet tubes.
Place 15 mL BIAdesorb Solution 1 on the right hand tray and insert the water inlet tube.	Place 15 mL BIAdesorb solution 1 on the right hand tray and insert the water inlet tube.
Running Desorb and Sanitize procedure step 1, please wait.	Running ***Desorb and Sanitize*** procedure step 1, please wait.
Wipe the pump inlet tubes with a moist tissue.	Wipe the pump inlet tubes with a moist tissue.
Place 25 mL BIAdesorb Solution 2 on the left hand tray and insert all four pump inlet tubes. Place 15 mL BIAdesorb Solution 2 on the right hand tray and insert the water inlet tube.	Place 25 mL BIAdesorb solution 2 on the left hand tray and insert all four pump inlet tubes. Place 15 mL BIAdesorb solution 2 on the right hand tray and insert the water inlet tube.
Running Desorb and Sanitize procedure step 2, please wait.	Running ***Desorb and Sanitize*** procedure step 2, please wait.
Wipe the pump inlet tubes with a moist tissue.	Wipe the pump inlet tubes with a moist tissue.
Place 50 mL diluted BIAdisinfectant Solution on the left hand tray and insert all four pump inlet tubes.	Place 50 mL diluted BIAdisinfectant solution on the left hand tray and insert all four pump inlet tubes.
Place 30 mL diluted BIAdisinfectant Solution on the right hand tray and insert the water inlet tube.	Place 30 mL diluted BIAdisinfectant solution on the right hand tray and insert the water inlet tube.
Running Desorb and Sanitize procedure step 3, please wait.	Running ***Desorb and Sanitize*** procedure step 3, please wait.

English text	Translation
Wipe the pump inlet tubes with a moist tissue.	Wipe the pump inlet tubes with a moist tissue.
Place water on the left hand tray and insert all four pump inlet tubes.	Place water on the left hand tray and insert all four pump inlet tubes.
Place water on the right hand tray and insert the water inlet tube.	Place water on the right hand tray and insert the water inlet tube.
Running Desorb and Sanitize procedure step 4, please wait.	Running ***Desorb and Sanitize*** procedure step 4, please wait.
Place tube A in HEPES or TRIS buffer.	Place tube **A** in HEPES or TRIS buffer.
Recommended concentration is 10-50 mmol/L.	Recommended concentration is 10 to 50 mmol/L.
Let tubes B, C and D hang in the air.	Let tubes **B**, **C** and **D** hang in the air.
Running Desorb and Sanitize procedure step 5, please wait.	Running ***Desorb and Sanitize*** procedure step 5, please wait.
The Desorb and Sanitize procedure is completed.	The ***Desorb and Sanitize*** procedure is completed.
Allow the system to run in standby mode for at least 3–4 hours before performing a run.	Allow the system to run in standby mode for at least 3 to 4 hours before performing a run.

Empty Buffer Tubing

English text	Translation
This procedure empties all four buffer selector inlet tubes. The procedure is divided into three steps.	This procedure empties all four buffer selector inlet tubes. The procedure is divided into three steps.
Total run time is about 20 minutes.	Total run time is about 20 minutes.
Required solutions: Deionized water 70% ethanol	Required solutions: Deionized water 70% ethanol
Place a bottle containing deionized water on the left hand plate and insert the four buffer inlet tubes.	Place a bottle containing deionized water on the left hand plate and insert the four buffer inlet tubes.
This step flushes the buffer selector with water.	This step flushes the buffer selector with water.

English text	Translation
Running Empty Buffer Tubing procedure step 1, please wait.	Running ***Empty Buffer Tubing*** procedure step 1, please wait.
Place a bottle containing at least 10 mL 70% ethanol on the left hand plate and insert the four buffer inlet tubes.	Place a bottle containing at least 10 mL 70% ethanol on the left hand plate and insert the four buffer inlet tubes.
Running Empty Buffer Tubing procedure step 2, please wait.	Running ***Empty Buffer Tubing*** procedure step 2, please wait.
Remove the tubes from the ethanol bottle and allow them to hang in the air.	Remove the tubes from the ethanol bottle and allow them to hang in the air.
This step empties the buffer selector of liquid.	This step empties the buffer selector of liquid.
Running Empty Buffer Tubing procedure step 3, please wait.	Running ***Empty Buffer Tubing*** procedure step 3, please wait.
The Empty Buffer Tubing procedure is completed.	The ***Empty Buffer Tubing*** procedure is completed.

Normalize

English text	Translation
Normalizes the signal in all flow cells.	Normalizes the signal in all flow cells.
Total run time is about 9 minutes.	Total run time is about 9 minutes.
NOTE: Do not normalize with the maintenance chip.	NOTE: Do not normalize with the Maintenance Chip.
This procedure normalizes the detector signal. Total run time is about 9 minutes.	This procedure normalizes the detector signal. Total run time is about 9 minutes.
Required solution (from Maintenance Kit): BIAnormalizing solution	Required solution (from Maintenance Kit): BIAnormalizing solution
Normalizing, please wait.	Normalizing, please wait.
The Normalize procedure is completed.	The ***Normalize*** procedure is completed.

Wash Buffer Tubing

English text	Translation
This procedure cleans buffer tubing from adsorbed material, e.g. after using buffer with detergent.	This procedure cleans buffer tubing from adsorbed material, e.g. after using buffer with detergent.
Do not run this procedure below 20°C.	Do not run this procedure below 20°C.
NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.	NOTE: Use the Maintenance Chip or a used chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.
Select tubes to wash.	Select tubes to wash.
This procedure removes adsorbed material from the flow system. The procedure is divided into three steps. Total run time is about 30 minutes.	This procedure removes adsorbed material from the flow system. The procedure is divided into three steps. Total run time is about 30[1] minutes.
Do not abort this procedure after it is started.	Do not abort this procedure after it is started.
Required solutions (from Maintenance Kit): BIAdesorb solution 1, about 20 mL BIAdesorb solution 2, about 20 mL	Required solutions (from Maintenance Kit): BIAdesorb solution 1, about 20[1] mL BIAdesorb solution 2, about 20[1] mL
Place 20 mL BIAdesorb Solution 1 on the left hand tray and insert tube A.	Place 20[1] mL BIAdesorb solution 1 on the left hand tray and insert tube A[1].
Wipe the tube with a moist tissue.	Wipe the tube with a moist tissue.
Place 20 mL BIAdesorb Solution 2 on the left hand tray and insert the tube/all four tubes.	Place 20[1] mL BIAdesorb solution 2 on the left hand tray and insert the tube/all four tubes[1].
Place buffer or water on the left hand tray and insert the tube/all four tubes.	Place buffer or water on the left hand tray and insert the tube/all four tubes[1].
NOTE: Remember to put tube A in buffer or water (to be used during standby).	NOTE: Remember to put tube **A** in buffer or water (to be used during standby).
Running Wash Buffer Tubing procedure step 1/2/3, please wait.	Running ***Wash Buffer Tubing*** procedure step 1/2/3, please wait.
The Wash Buffer Tubing procedure is completed.	The ***Wash Buffer Tubing*** procedure is completed.

[1] Times, volumes and tube instructions vary acccording to the tubes selected for wash.

A.2 Test tools

System Check

English text	Translation
This procedure checks for leakage and tests pumps, injections, noise and buffer selector.	This procedure checks for leakage and tests pumps, injections, noise and buffer selector.
Total run time is about 70 minutes.	Total run time is about 70 minutes.
This procedure should be run at 25°C with a new Sensor Chip CM5 and with HBS-N as running buffer. Choose Close if you need to change the sensor chip, reset the temperature or change running buffer.	This procedure should be run at 25°C with a new Sensor Chip CM5 and with HBS-N as running buffer. Choose ***Close*** if you need to change the sensor chip, reset the temperature or change running buffer.
Select test(s) to run.	Select test(s) to run.
Reagent pumps and blank injection. Tests if the peristaltic pump is in order and that a sample injection with buffer from the reagent supply block is all right.	Reagent pumps and blank injection. Tests if the peristaltic pump is in order and that a sample injection with buffer from the reagent supply block is all right.
Mix Tests performance of the mixing.	Mix Tests performance of the mixing.
Refractometer performance Tests if the refractometer gives correct responses.	Refractometer performance Tests if the refractometer gives correct responses.
Injections Tests performance of the injections.	Injections Tests performance of the injections.
Noise Tests if noise is too high.	Noise Tests if noise is too high.
If the buffer selector shall be tested (test F), put tube B,C and D in water.	If the buffer selector shall be tested (test F), put tube **B**,**C** and **D** in water.
If all inlet tubes are not intended to be used after System Check, don't forget to run Empty Buffer Tubing after the test.	If all inlet tubes are not intended to be used after ***System Check***, don't forget to run ***Empty Buffer Tubing*** after the test.

A.3 Service tools

Software Problem Report

This tool does not involve any instrument operation.

Flow System Wash

English text	Translation
This procedure washes the flow system with buffer at a high flow rate to clear any obstructions.	This procedure washes the flow system with buffer at a high flow rate to clear any obstructions.
Total run time is about 4 minutes.	Total run time is about 4 minutes.
Running Flow System Wash, please wait.	Running ***Flow System Wash***, please wait.
The Flow System Wash procedure is completed.	The ***Flow System Wash*** procedure is completed.

Superclean

English text	Translation
This procedure is for extensive cleaning of the liquid handling system. For best result run Desorb prior to Superclean.	This procedure is for extensive cleaning of the liquid handling system. For best result run ***Desorb*** prior to ***Superclean***.
Total run time is about 80 minutes.	Total run time is about 80 minutes.
NOTE: Use the Maintenance Chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.	NOTE: Use the Maintenance Chip for this procedure. The ligand on the sensor chip may be damaged by the solutions used.
This procedure cleans the flow system. Total run time is about 80 minutes.	This procedure cleans the flow system. Total run time is about 80 minutes.
Put tube A in filtered deionized warm water (40-50°C).	Put tube A in filtered deionized warm water (40°C to 50°C).

English text	Translation
Required solutions: 1% acetic acid 0.2 M sodium bicarbonate 6 M guanidine-HCl (or 50% DMSO) 10 mM HCl (or 10% DMSO) If small molecule assays are run, exchange the last two wash solutions for DMSO solutions.	Required solutions: 1% acetic acid 0.2 M sodium bicarbonate 6 M guanidine-HCl (or 50% DMSO) 10 mM HCl (or 10% DMSO) If small molecule assays are run, exchange the last two wash solutions for DMSO solutions.
Running Superclean procedure, please wait.	Running ***Superclean*** procedure, please wait.
The Superclean procedure is completed.	The ***Superclean*** procedure is completed.

Appendix B
Technical description

About this appendix

This appendix gives a brief description of technical aspects of Biacore S200.

In this chapter

Section		See page
B.1	Detection principle	113
B.2	Buffer and sample handling	115

B.1 Detection principle

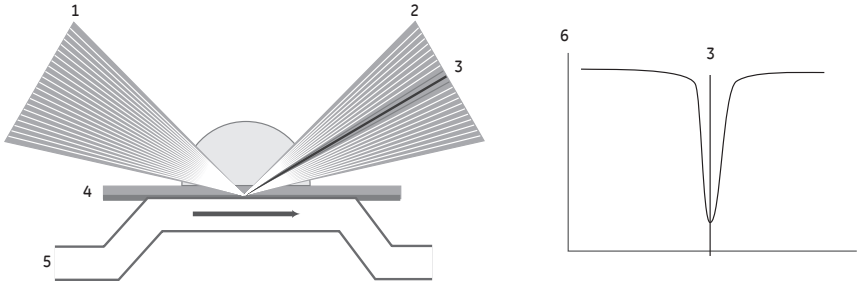
Surface plasmon resonance

Biacore S200 exploits the phenomenon of surface plasmon resonance (SPR) to detect and measure analyte. SPR is a phenomenon that occurs in thin conducting films at an interface between media of different refractive index.

Under conditions of total internal reflection, the light leaks an electric field intensity called an evanescent wave field across the interface into the medium of lower refractive index, without actually losing net energy.

The amplitude of the evanescent field wave decreases exponentially with distance from the surface, and the effective penetration depth is about half the wavelength of the incident light.

At a certain combination of angle of incidence and energy (wavelength), the incident light excites plasmons (electron charge density waves) in the gold film. As a result, a characteristic absorption of energy via the evanescent wave field occurs and SPR is seen as a drop in the intensity of the reflected light (illustrated below).



Item	Explanation
1	Incident light
2	Reflected light
3	SPR angle
4	Sensor chip
5	Flow cell
6	Plot of reflected light intensity against angle of reflection

Because the evanescent wave field penetrates the solution, conditions for this resonance effect are sensitive to the refractive index of the solution within the effective penetration depth of the evanescent field. Changes in solute concentration at the surface of the sensor chip cause changes in the refractive index of the solution, which is measured as a changes in the SPR angle.

Note: *The reduced intensity of reflected light is not caused by light absorption in the sample in the conventional (transmission spectroscopy) sense. The light used to generate the signal is totally internally reflected inside the optical unit, and it is the evanescent wave that penetrates the sample. Consequently, measurements can be made on turbid or even opaque solutions, without interference from conventional light absorption or scattering by the sample.*

What SPR measures

In the configuration used in Biacore S200, the SPR response is a measure of the refractive index of the solution within the penetration distance of the evanescent field wave. This distance (about 300 nm) is small in relation to the height of the flow cell, so that SPR effectively measures the refractive index at the surface of the sensor chip.

The refractive index of the solution varies with the solute content. When the detecting molecule is attached to the sensor chip or when analyte binds to the detecting molecule, the solute concentration at the sensor chip surface increases, leading to a change in the SPR signal.

The response measured in Biacore S200 is related to the mass of analyte bound and is largely independent of the nature of the analyte. Refractive index contributions for different solutes are additive, so that the amount of detecting molecule attached and the amount of analyte bound can both be measured with the same detection principle.

B.2 Buffer and sample handling

Flow system

Two high performance syringe pumps and one peristaltic pump handle the distribution of buffer and water to the IFC and the liquid supply block.

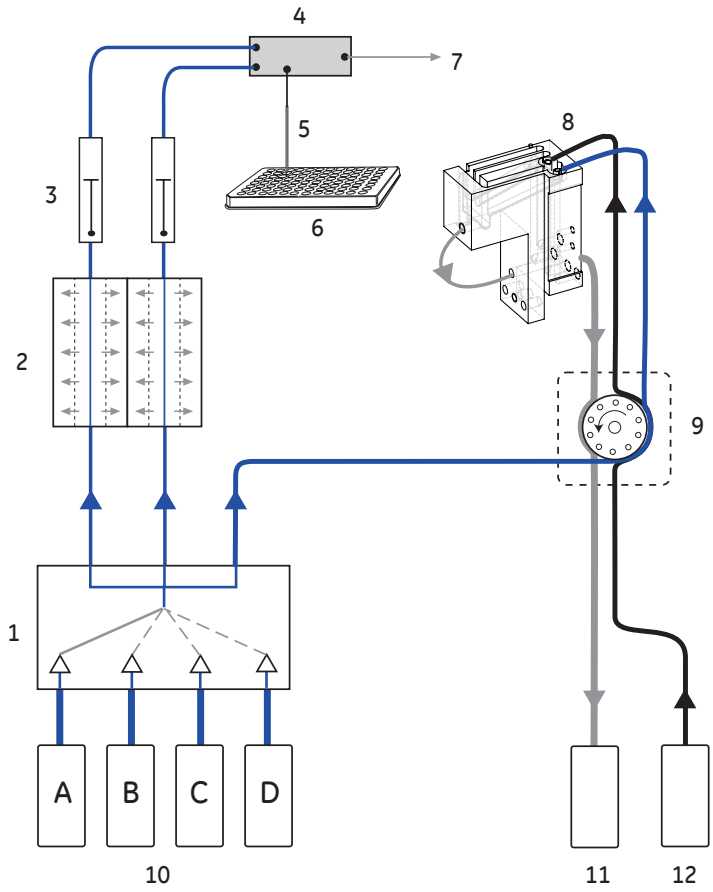
One syringe pump maintains a low flow of buffer through the IFC. The second syringe pump is used for aspiration of samples and reagents, and precision delivery to the sensor chip surface via the IFC. The system switches automatically between these pumps as required.

The peristaltic pump continuously supplies buffer and water to the liquid supply block. The buffer supplied to the liquid supply block is used for washing the injection needle. The buffer flow also helps keeping the liquid supply block clear of precipitated buffer.

Water supplied to the liquid supply block is used for rinsing the needle and the liquid supply block itself.

Effluent from the IFC and the liquid supply block is conveyed to the waste bottle.

The flow system is illustrated schematically below.



Part	Function
1	Buffer selector valve
2	Buffer degasser
3	Syringe pumps
4	IFC
5	Injection needle
6	Sample microplate
7	To waste
8	Liquid supply block
9	Peristaltic pump
10	Buffer bottles

Part	Function
11	Waste bottle
12	Water bottle

Buffer degasser

The degasser consists of independent vacuum chambers, each containing membrane tubing, which is permeable to small gas molecules.

Each of the two buffer tubes from the selector valve is connected to a separate vacuum chamber. A vacuum pump maintains a low pressure in the vacuum chambers, thereby drawing gas molecules through the membrane tubing.

Valves in the degasser switch pump input between the vacuum chambers and atmosphere. This keeps the pump clean and increases the service life of the degasser. An active carbon filter provides added protection for the vacuum pump.

Cooling unit

A maintenance-free cooling unit based on Peltier elements is located behind the sample compartment. Contact your Cytiva service representative if the sample compartment warms up in spite of a low temperature setting.

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