ADVIA® 2400
Chemistry System

ADVIA® 2400 Chemistry System

Operator's Guide

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CE

SIEMENS

The ADVIA® 2400 Chemistry system is for *in vitro* diagnostic use.

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If the system is used in a manner not specified by Siemens, the protection provided by the equipment may be impaired. Observe all warning and hazard statements.

The ADVIA Chemistry system is manufactured in Japan for Siemens.

The Universal Rack Handling System is manufactured in Germany for Siemens.

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1 System Overview

Figure 1-1. The ADVIA 2400 Chemistry System

The ADVIA® 2400 Chemistry System is an automated, clinical chemistry analyzer that can run tests on human serum, plasma, or urine in random access and batch modes at a throughput rate of 1800 photometric tests per hour and 600 electrolyte tests per hour.

The ADVIA 2400 Chemistry System is for *in vitro* diagnostic use.

Operating principle

This sequence summarizes a photometric analysis on the Chemistry System:

1. The first reagent (R1) for a test is aspirated from reagent tray 1 and dispensed by the reagent probe into the cuvette in the reaction tray.
2. Samples on the sample tray or rack handler are aspirated and diluted by the dilution probe, then dispensed into cuvettes in the dilution tray.
3. The dilution mixer stirs the diluted sample.
4. The sample probe dispenses the required amount of diluted sample into the RRV cuvettes (the reagent is already in the cuvettes).

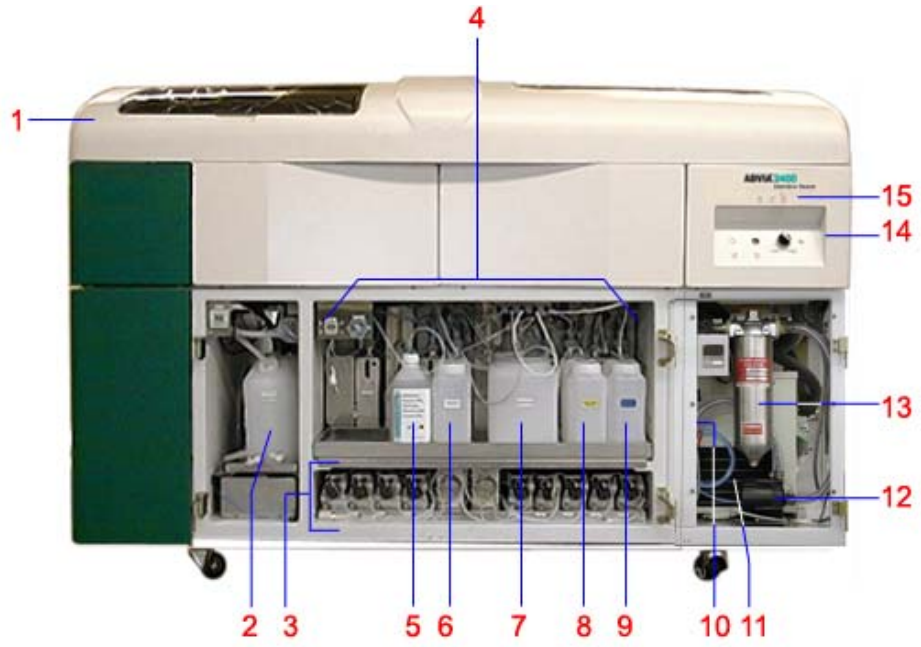
   The system can use the remaining diluted sample in the DTT cuvettes for additional tests on a workorder, a rerun, dilution, or reflex testing.

5. The reaction mixer 1 mixes the first reagent and the sample.
6. The second reagent (R2) for a test is aspirated from reagent tray 2 and dispensed by the reagent probe into the cuvette in the reaction tray.
7. The reaction mixer 2 mixes sample and reagent 1 and reagent 2.
8. The reaction takes place for the amount of time designated in the assay.
9. The spectrophotometer obtains the concentration data every six seconds.

   For each measurement, the RRV moves the cuvettes in front of the spectrophotometer.

10. Cell blank measurements are performed at each wavelength.
11. The RRV cuvettes are washed when measurement is complete.
12. When the analysis is complete, the lamp energy is checked at each wavelength.

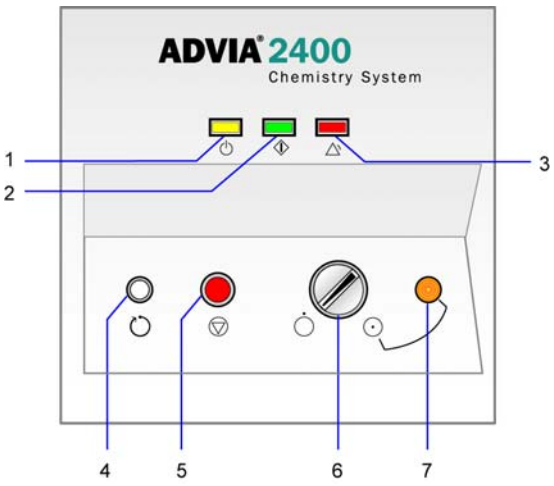
Hardware Overview



1 ISE location	**6** Reaction bath oil bottle	**11** Refrigerator filter
2 Pure water bottle	**7** Isotonic saline diluent bottle	**12** Reaction bath oil pump
3 Horizontal pumps	**8** Cuvette detergent bottle	**13** Reaction bath oil filter
4 Vertical pumps	**9** Cell conditioner bottle	**14** Power panel
5 ISE buffer bottle	**10** Reaction bath oil heater	**15** Display panel

Figure 1-2. Analyzer front view

Display and power panel



1 READY lamp lights when the instrument is ready.

2 START lamp lights when analysis is being performed.

3 ALARM lamp lights when a problem occurs.

4 SYSTEM RESET button resets the computer controlling the instrument (not normally used).

5 EMERGENCY STOP button is pressed to stop the instrument in an emergency.

WARNING

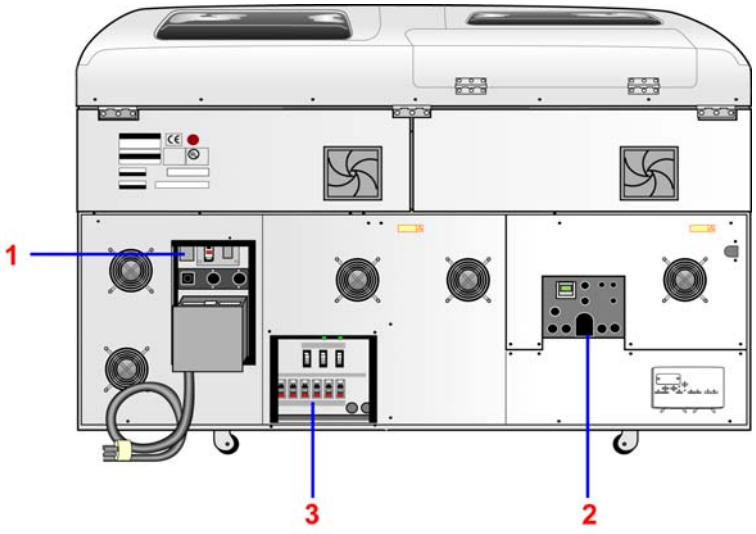
If you stopped the system using the Emergency Stop button, you must perform a Weekly wash (WASH2) prior to processing samples.

6 OPERATE/STANDBY switch turns the analyzer power ON (OPERATE) or OFF (STANDBY).

7 POWER lamp lights when the analyzer power is ON.

Figure 1-3. Power panel

Analyzer back view



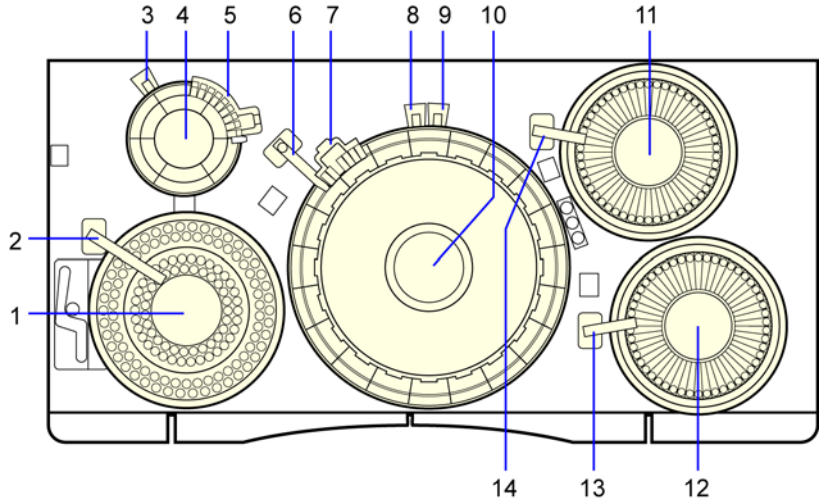
1 Main Power Switch (powers the entire instrument)

2 Water Supply and Drainage Panel

3 Fuse Panel

Figure 1-4. Analyzer rear view

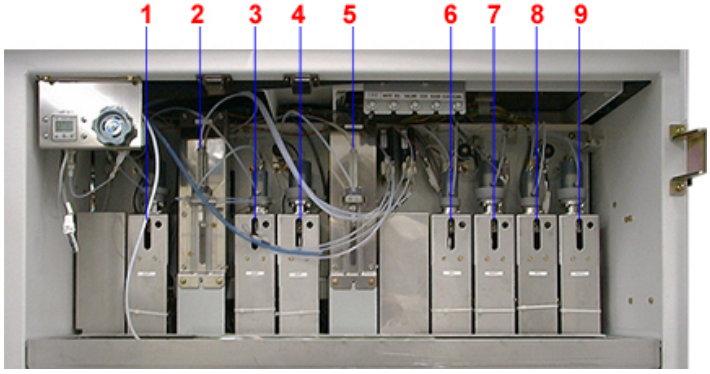
Analyzer top view



1 Sample tray
2 Sample-dilution probe (DPP)
3 Dilution mixer (DMIX)
4 Dilution tray (DTT)
5 Dilution washer (DWUD)
6 Sample probe (SPP)
7 Reaction tray washer (WUD)
8 Reaction mixer 2 (MIXR2)
9 Reaction mixer 1 (MIXR1)
10 Reaction tray (RRV)
11 Reagent tray 2 (RTT2)
12 Reagent tray 1 (RTT1)
13 Reagent probe 1 (RPP1)
14 Reagent probe 2 (RPP2)

Figure 1-5. Analyzer top view

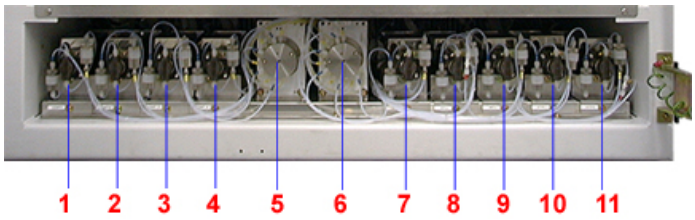
Vertical Pumps



1 Dilution wash pump (DCP)
2 Dilution aspiration pump (DIP)
3 Dilution discharge pump (DOP)
4 Sampling wash pump (SCP)
5 Sampling pump (SP)
6 Reagent dispensing pump 1 (RP1)
7 Reagent wash pump 1 (RWP1)
8 Reagent dispensing pump 2 (RP2)
9 Reagent wash pump 2 (RWP2)

Figure 1-6. Vertical pumps

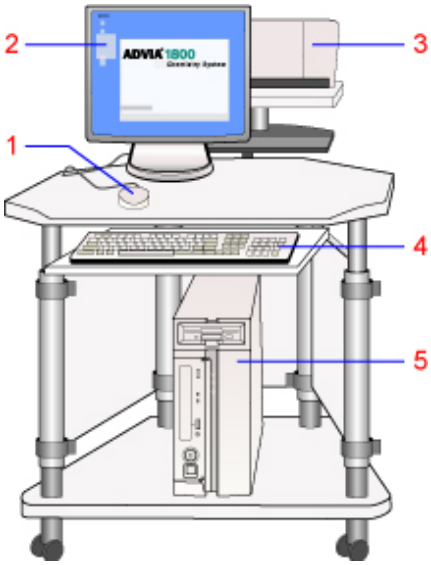
Horizontal Pumps



1 Dilution cuvette wash pump 1 (DWP1)
2 Dilution cuvette wash pump 1 (DWP2)
3 Dilution cuvette wash pump 1 (DWP3)
4 Dilution cuvette wash pump 1 (DWP4)
5 Switching valve (WCV2)
6 Switching valve (WCV1)
7 Reaction cuvette wash pump 1 (WP1)
8 Reaction cuvette wash pump 2 (WP2)
9 Reaction cuvette wash pump 3 (WP3)
10 Reaction cuvette detergent pump 1 (DTP1)
11 Reaction cuvette detergent pump 2 (DTP2)

Figure 1-7. Horizontal pumps

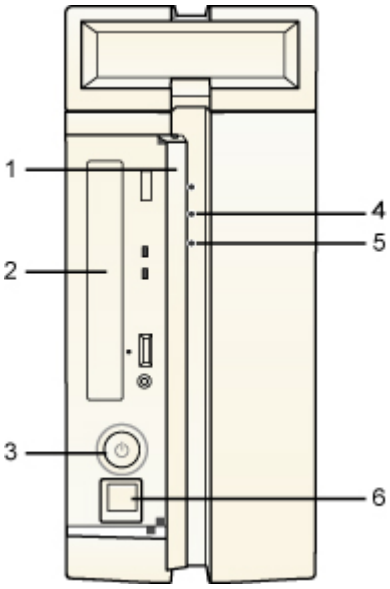
Workstation (front view)



1 Mouse
2 Touch-screen monitor
3 Printer
4 Keyboard
5 Personal computer (PC)

Figure 1-8. Workstation front view

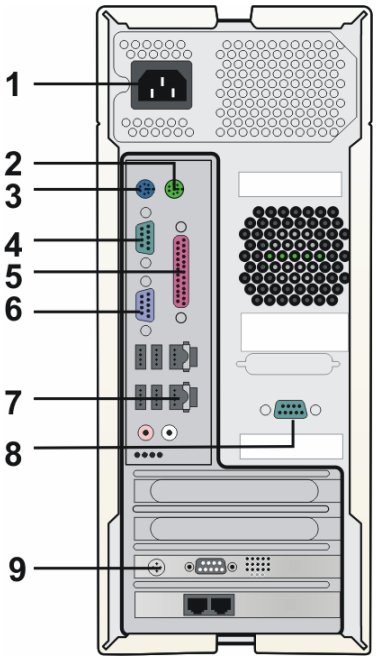
PC (front view)



1 Access door
2 CD-RW drive.
3 PC power switch. Used to turn ON or OFF the power for the personal computer. Normally, it is left ON.
4 PC hard disk drive access lamp. Lights when reading or writing to the PC hard disk.
5 PC power lamp. Lights when the power for the personal computer is ON.
6 USB ports

Figure 1-9. PC front view

PC (back view)



1 PC power connector
2 Mouse connection
3 Keyboard connector
4 Communication port 1 (LIS-TDC)
5 Printer connector
6 LCD monitor connection
7 Analyzer ethernet connection
8 Communication port 2 (URH)
9 Sleep ITF board potentiometer

Figure 1-10. PC back view

Sampling and analysis

Sampling mechanisms

The sample probe (SPP) aspirates sample from the dilution tray (DTT) and dispenses it into reaction tray (RRV) cuvettes for analysis, according to specified conditions. The sampling pump (SP)handles the aspiration and dispensing functions.

Sampling operation

At initialization, the SPP moves (in the up position) to the RRV cuvette, then stops above the wash port. The pumps stop when the SPP is positioned over the RRV cuvettes.

Each sampling cycle consists of these steps:

1. The SPP moves to the aspiration position of the DTT and aspirates the sample.
2. The SPP moves back to the wash port, where deionized water washes the SPP's outside surface.
3. The SPP moves to the RRV and dispenses the sample into a cuvette.
4. The SPP returns to the wash port, where degassed water washes the inside and outside of the SPP.

The SPP is now ready for another cycle.

If an assay is not running, you can operate the unit manually from the Manual Operation window.

Sample probe

1 Sampling probe (SPP)

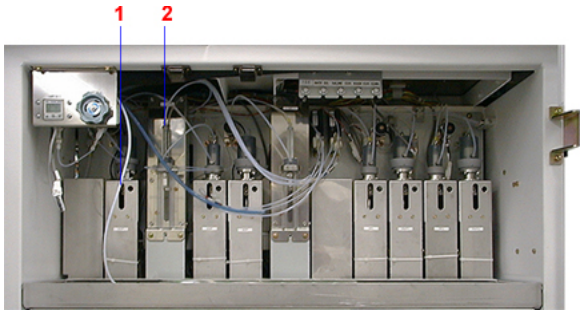
2 Wash port

Figure 1- 11 Sample probe

After aspiration, the SPP is lowered into an RRV cuvette, where it dispenses the sample. The probe's tip is 2 mm deep into the solution, ensuring that no droplet remains on the tip after withdrawal.

NOTE
Unlike the sample-dilution (DPP) and the reagent probes (RPP1 and RPP2), the SPP does not have liquid level sensing. This is because the DTT cuvettes are always the same size.

Sample pump



1 Sampling pump (SP)

2 Sampling wash pump (SCP)

Figure 1- 12 Sample pumps

The sampling pump (SP) withdraws sample from DTT, and also dispenses sample into the RRV cuvettes. The SPP executes both actions. During both actions, the sampling pump valves (SPEV1 and SPEV2) are closed.

After the sample is aspirated, the SPP moves to the wash port, where its outside is washed. Sample probe valve (SPEV2) is open during this process, allowing water to flow over the outside of the SPP.

After the sample is dispensed, the SPP moves back to the wash port, where its inside is washed. Sample probe valve (SPEV1) opens, allowing the SCP to send degassed water through the SPP's inside.

After the wash, the water drains down the wash port.

Clot detection

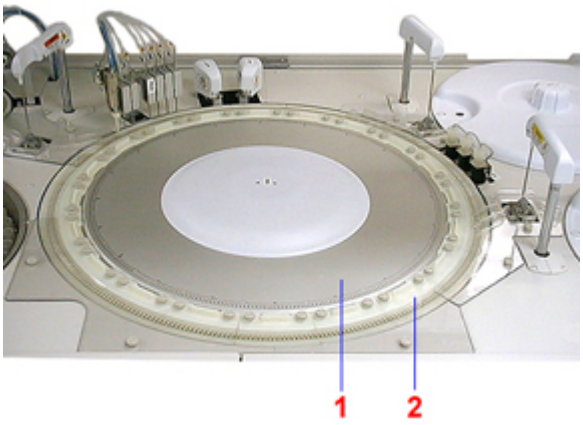
The clot detection system utilizes a pressure transducer to monitor the pressure in the sample dilution probe line (DPP) for a complete obstruction during the sample aspiration and dispensation cycle. Clot detection is available on the DPP line only.

The system monitors the pressure at the transducer at four points during the sampling cycle and will display an error if a predefined limit is exceeded at any of the checkpoints. A fifth check occurs at the start of sampling.

- Clot detection can be toggled on and off.
- Clot detection can be deactivated for calibrator and control materials that are run from the STT or CTT.
- Clot detection is active for samples run from the STT, CTT, rack handler or other LAS device. Clot detection is inactive when the DPP aspirates from the DTT.

The clot detector is active each time the DPP probe enters a sample, even when multiple aspirations are required. If a sample is to be aspirated three times, the DPP will make all three aspirations, even if a clot is detected. This may cause partial results to be reported. When a sample is flagged for a clot, all of the ordered tests for the sample must be rerun.

Reaction tray



1 Reaction tray (RRV)

2 RRV cuvettes (immersed in oil heat bath)

Figure 1- 13 Reaction tray

For each sample assay, the reagent probes (RPP1 and RPP2) dispense reagent into cuvettes in the reaction tray (RRV). Then the sample probe (SPP) dispenses diluted sample into the cuvettes. The mixture is then stirred by the reaction mixers (MIXR1 and MIXR2), producing the desired reaction.

For analysis, the reaction tray rotates the cuvette in front of the spectrophotometer, where the cuvette's absorbance is measured. After analysis, the cuvettes are washed by the reaction washer (WUD).

The RRV contains 340 reusable cuvettes (20 sets of 17 cuvettes).

The RRV cuvettes are immersed in the reaction tank in an oil-heat bath. This keeps the cuvettes at a constant temperature of 37°C for sample analysis.

Reaction tray mixers

1 Mixer 1 (MIXR1)

2 Mixer 1 wash port

3 Mixer 2 (MIXR2)

4 Mixer 2 wash port

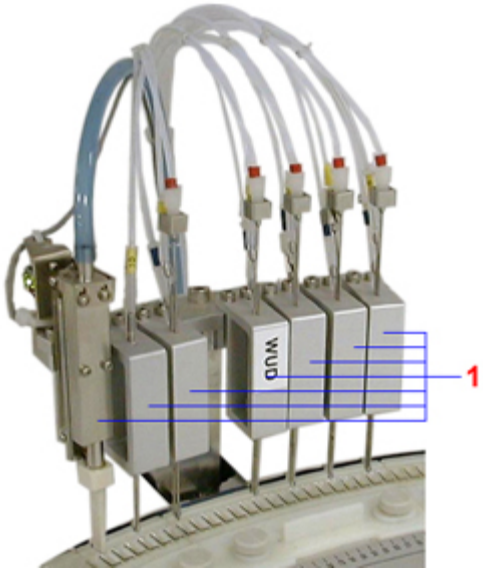
Figure 1-14 Reaction tray mixers

The reaction tray (RRV) mixers (MIXR1 and MIXR2) stir the contents (sample and reagent) of RRV cuvettes brought to their respective mixer positions.

Mixing is performed using a spinning, reciprocating, and vibrating paddle. Strong and weak stirring options are available.

Both mixers are located behind the reaction tray. MIXR1 mixes sample with reagent 1 (R1). MIXR2 mixes sample with reagent 2 (R2).

Reaction tray wash mechanisms



1 Reaction washer (WUD)

Figure 1-15 Reaction tray washer

The reaction washer (WUD) washes reaction tray (RRV) cuvettes after sample analysis is complete. This allows the reuse of cuvettes without the risk of contaminating the next sample.

The WUD has seven nozzles, each performing a stage of the wash. Each nozzle works on a different cuvette, so the WUD washes seven cuvettes simultaneously (the cuvettes are being washed in different stages at the same time).

After a cuvette is washed by one nozzle, it moves to the next until washing is complete. While the RRV rotates, the WUD is in the up position.

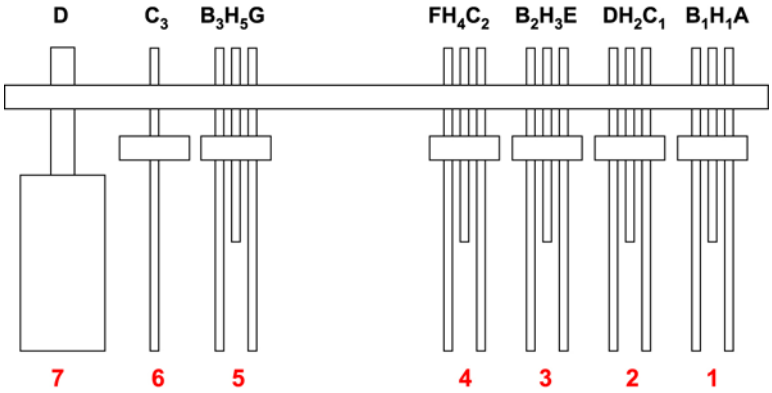
The wash liquids pass through a preheater before they reach the WUD.

Reaction tray washer operation

When initialized, the WUD moves to the up position. If it is already up, it is lowered, then raised.

To advance the cuvettes to the next wash nozzle, the RRV rotates a full-turn.

During each rotation (2-second cycle), the nozzles operate as follows:



Nozzle	Probe	Description
1 First nozzle	**A**	Aspirates reaction liquid.
	B1	Dispenses wash water.
	H1	Absorbs overflow liquid (abnormal conditions).
2 Second nozzle	**C1**	Aspirates wash water.
	D	Dispenses detergent.
	H2	Absorbs overflow liquid (abnormal conditions).
3 Third nozzle	**E**	Aspirates detergent.
	B2	Dispenses wash water.
	H3	Absorbs overflow liquid (abnormal conditions).
4 Fourth nozzle	**C2**	Aspirates wash water.
	F	Dispenses cell conditioner.
	H4	Absorbs overflow liquid (abnormal conditions).
		Note: The fourth (**4**) and fifth (**5**) nozzles are separated by a width of six cuvettes.
5 Fifth nozzle	**G**	Aspirates cell conditioner.
	B3	Dispenses wash water.
	H5	Absorbs overflow liquid (abnormal conditions).
6 Sixth nozzle	**C3**	Aspirates wash water.
7 Seventh nozzle	**D**	

Figure 1-16. Nozzle separation

Reaction tank

1 Reaction tank

2 Three liquid surface level sensors

Figure 1-17 Reaction tank

The reaction tank contains nonreactive oil, which keeps the temperature of the liquid in reaction tray (RRV) cuvettes at a constant 37 °C ±0.1 °C. The temperature is controlled by a heater and a thermostat.

Sample tray

Sample tray

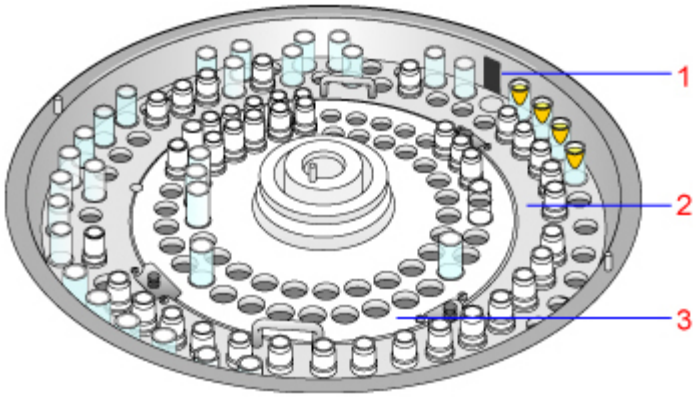
The sample tray holds patient samples, controls, calibrators, and diluents for measurement. The tray rotates to move the samples to the aspiration position.

The sample tray has two sections:

- **STT** (outer section): Used for general samples and reference samples for multipoint calibrations. It has two rows, each with 42 positions (total 84). You can place serum or urine samples into each position.

  A barcode reader identifies samples in the STT. It can interpret barcode formats Code 39, Interleaved 2 of 5, Codabar, and Code 128 format A, B and special characters (. - + / * $ %).

- **CTT** (inner section): Used for calibrators, controls, and special purpose diluents. It has two rows. The outer row has 34 positions and the inner row has 27 positions (total 61). The CTT is water-cooled.



1 Sample Barcode Reader
2 Sample Tray (STT)
3 Sample Tray (CTT)

Figure 1-18. Sample tray

Sample tray operation

At initialization, the tray rotates clockwise until STT position 1 is in the aspiration position.

After you start a run, the sample tray moves clockwise to position 1, then it rotates clockwise to move samples successively to the aspiration position.

If samples are identified by barcode, each sample detected by the barcode reader stops (in turn) in the aspiration position. If samples are identified by position number, they move by position number to the aspiration position. Regardless of the mode, you must enter samples by a workorder, or they are not processed.

Monitor the progress of samples on the sample tray in the Test Result Monitor window.

If an assay is not running, you can operate the unit manually from the Manual Operation window.

Container types

You place sample containers defined in the Order Entry window in the STT and CTT**.** You can use 5-mL, 7-mL, or 10-mL collection tubes or 2-mL sample cups. You have to put the small sample cups into plastic holders before you place them in the tray positions..

The dead volume for the collection tubes is 200 µL, and the dead volume for the sample cups is 50 µL.

You can use barcode labels on collection tubes but not on sample cups.

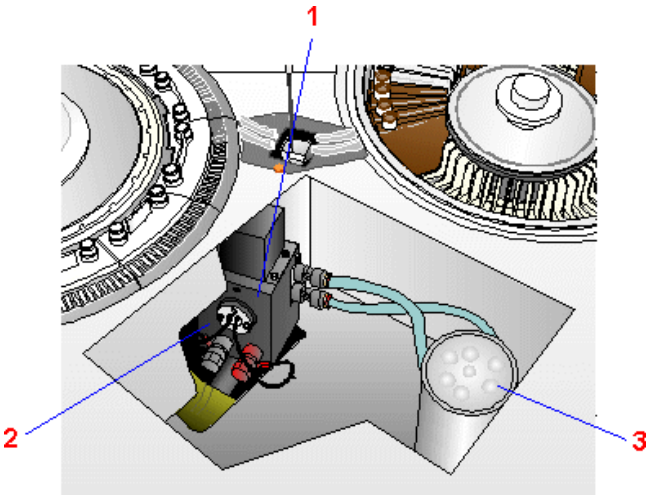
SMP Pause

Use the SMP Pause button at the Operation Panel to temporarily stop sampling so you can add samples to or replace the STT/CTT tray.

NOTES

- The text on the SMP Pause button located on the Operation Panel is gray when inactive and black when active.
- For more information on using the SMP Pause button, refer to the online *Operator's Guide*.

Spectrophotometer



1 Photometer
2 Halogen Lamp
3 Cooling Tank

Figure 1-19. Location of the Spectrophotometer

The spectrophotometer measures the amount of light absorbed at 14 specific wavelengths by liquids contained in reaction cuvettes.

Every six seconds, the reaction tray (RRV) moves cuvettes containing reaction liquid (sample and reagent) in front of a halogen lamp, which sends light through the cuvettes. Each time, a different wavelength is measured.

The photometer then measures the absorbance based on the lamp energy and the optical density of the cuvettes. This process is repeated for as many times and wavelengths as required by the assay conditions.

A cooling tank maintains the lamp temperature.

The system monitors the output energy of the halogen lamp during the cell blank check and after each assay. The operator is alerted if the lamp performance is abnormal.

Use the Lamp Energy Monitor window to ensure that the halogen lamp is functioning normally.

Reagents

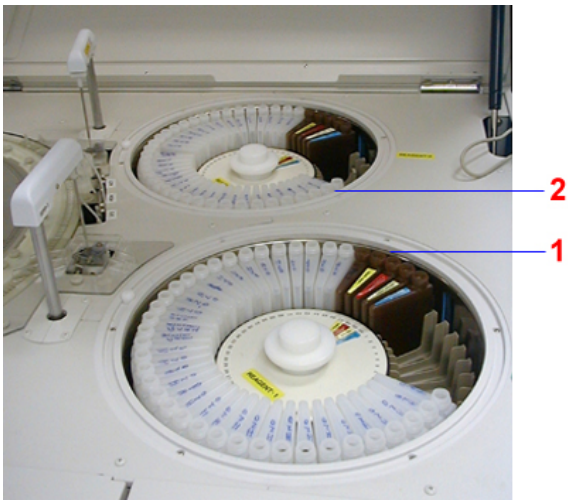
Reagent mechanisms

The reagent probes (RPP1 and RPP2) aspirate reagent from the reagent trays (RTT1 and RTT2) and dispense it into reaction tray (RRV) cuvettes for analysis, according to specified conditions. Reagent pumps (RP1 and RP2) handle the aspiration and dispensing functions.

Reagent trays

Reagent trays 1 and 2 (RTT1 and RTT2) contain reagents used for assays (positions 1-46) and the detergents used for daily washing and contamination prevention (positions 47-

50). The reagent probes (RPP1 and RPP2) aspirate the required reagent and dispense it into the reaction tray (RRV) cuvettes for analysis.



1 Reagent tray 1 (RTT1)

2 Reagent tray 2 (RTT2)

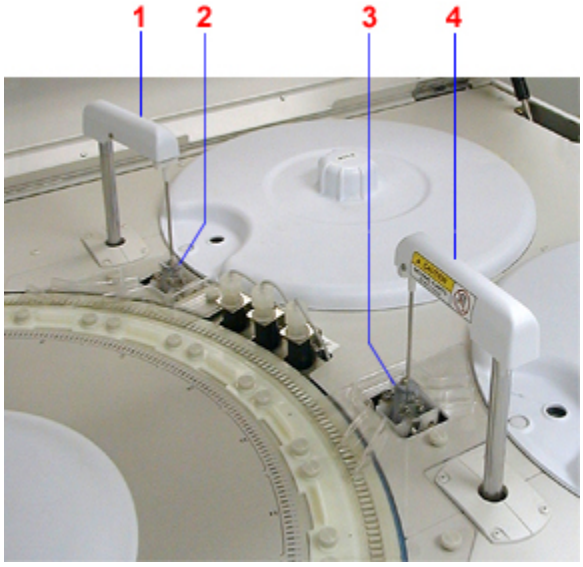
Figure 1-20. Reagent trays

Each tray has 50 positions. RTT1 contains the first reagent (R1); RTT2 contains the second reagent (R2).

You can use any reagent container for more than one test item; a test item may require more than one reagent container.

Each reagent tray has a barcode reader (RBC-1 and RBC-2).

Reagent probes



1 Reagent pump 1 (RP1)

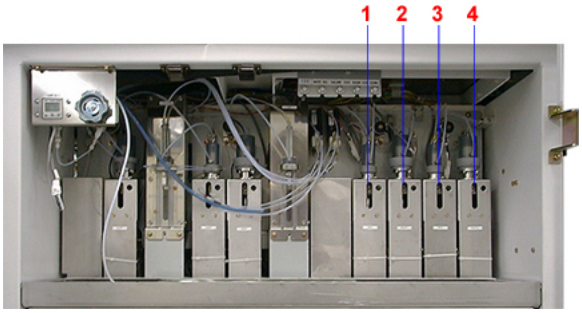
2 Reagent wash pump 1 (RWP1)

3 Reagent pump 2 (RP2)

4 Reagent wash pump 2 (RWP2)

Figure 1-21 Reagent probes

Reagent pumps



1 Reagent pump 1 (RP1)

2 Reagent pump 2 (RP2)

3 Reagent wash pump 1 (RWP1)

4 Reagent wash pump 2 (RWP2)

Figure 1-22 Reagent pumps

The reagent pumps (RP1 and RP2) withdraw reagent from the reagent trays, and also discharge the reagent into the RRV cuvettes. The reagent probes execute both actions. During both actions, the reagent pump valves (RPEV1-1, RPEV2-1, RPEV1-2, and RPEV2-2) are closed.

After the reagent is aspirated, the probes move to the wash ports, where their outsides are washed. RPEV2-1 and RPEV2-2 (wash cup valves for RPP1 and RPP2, respectively) are open during this process. This allows water to flow over the outside of the probes.

After the reagent is dispensed, the probes move back to the wash ports, where their insides are washed. RPEV1-1 and RPEV1-2 (valves for RTT1 and RTT2, respectively) open, allowing the sample and reagent wash pump (SRWP) to send degassed water through the probes' insides.

After the wash, the water drains down the wash port.

Reagent tray operation

At initialization, the trays rotate clockwise until reagent bottle 1 is in the aspiration position.

After you start a run, the reagent trays move clockwise to position 1, then they rotate clockwise or counterclockwise (whichever results in a smaller rotation) to move reagents to the aspiration position. The number of trays and reagents used depends on the specified assay conditions.

To check the reagent volume and number of tests remaining in a container, use the Reagent Inventory window.

Reagent container types

Place reagent containers defined at the Reagent Container Settings window in the reagent trays. The trays can hold 20-mL, 40-mL, or 70-mL wedge-shaped containers.

At this window, you also specify the reagent type (R1 or R2) for each reagent container.

Barcode labels on reagent containers have the test name, expiration date, lot number, and container ID number. You can initiate a barcode scan at the Reagent Inventory window.

RGT Pause button

Use the RGT Pause button to temporarily stop testing, on the analyzer or from a lab automation system, so that reagents can be added or removed at the reagent trays.

NOTES

- **Do not** press the RGT Pause button while a barcode scan is executing.
- The text on the RGT Pause button is gray when inactive and black when active. After the button is selected, the RGT Pause process can take some time. The system will safely complete any tests on samples that have been aspirated.
- For more information on using the RGT Pause button, refer to the online *Operator's Guide* under *Reagent Management*.

Sample aspiration and dilution mechanisms

The sample-dilution probe (DPP) aspirates sample from the sample tray (STT), from a laboratory automation system (LAS), or from the universal rack handler, and dispenses it into cuvettes in the dilution tray (DTT), according to the specified assay conditions. The dilution pumps handle the aspiration and dispensing functions.

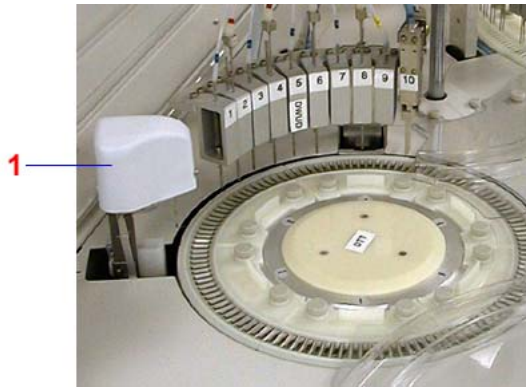
Using these mechanisms, you dispense the following items into the DTT cuvettes:

- sample diluted with standard diluent
- sample diluted with special purpose diluent
- undiluted sample

For more detailed information on how sampling is dispensed, refer to the online *Operator's Guide* under *Hardware Overview – Sample dilution*.

Dilution tray mixer

The dilution tray (DTT) mixer (DMIX) stirs the contents of DTT cuvettes brought to the mixer position. Mixing is performed using a reciprocating rod.



1 Dilution Mixer (DMIX)

Figure 1-23. Dilution tray mixer

Dilution tray mixer operation

At the time of system initialization, the mixer moves to the mixer position, then goes to the down position. If it is already at the mixer position, it is raised, then lowered.

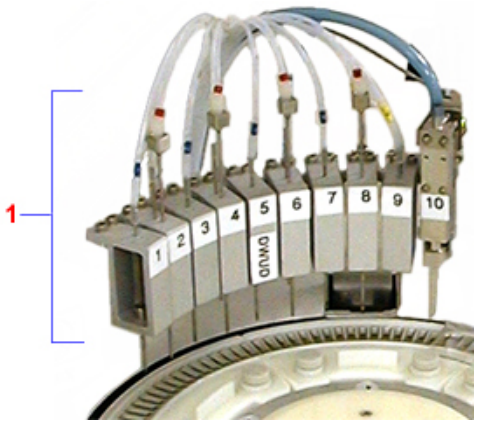
During each 2-second cycle on the DTT:

- The mixer moves up and over to the wash port, where it is washed with deionized water. During this period, the dilution mixer wash valve (DMEV) is open, and (briefly) the mixer rod is on.
- The mixer is raised and moved to the mixer position, where it is lowered into the DTT cuvette. The rod is turned on to mix the sample.
- The mixer is raised from the cuvette and moved back to the wash port. The next cycle begins.

If an assay is not running, you can operate the unit manually at the Manual Operation window.

Dilution tray wash mechanisms

The dilution washer (DWUD) washes dilution tray (DTT) cuvettes after sample analysis is complete, so they can be reused without risk of contaminating the next sample.



1 Dilution Washer (DWUD)

Figure 1-24. Dilution tray wash mechanism

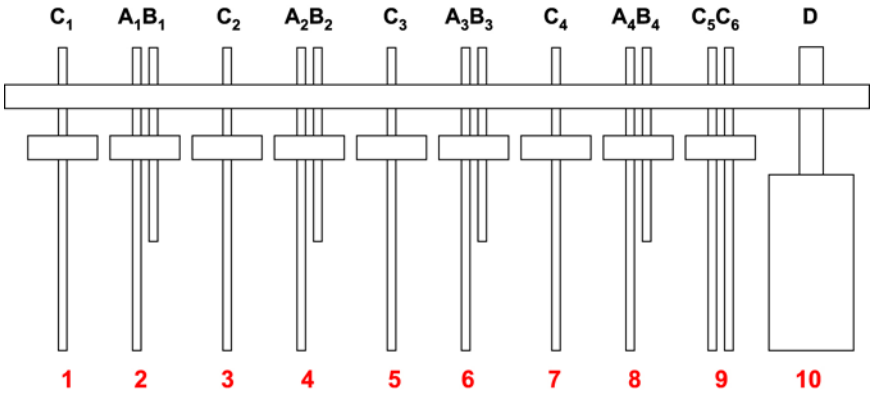
The DWUD has ten nozzles, each performing a stage of the wash. Each nozzle works on a different cuvette, so the DWUD washes ten cuvettes simultaneously. The cuvettes are being washed in different stages at the same time.

After a cuvette is washed by one nozzle, it moves to the next until washing is complete. While the DTT rotates, the DWUD is in the up position.

Dilution tray wash mechanism operation

At initialization, the DWUD moves to the up position. If it is already up, it is lowered, then raised.

During each 2-second cycle on the DTT, the 10 nozzles operate as follows:



Nozzle	Probe	Description
1 First nozzle	**C1**	Aspirates wash water.
2 Second nozzle	**A1**	Dispenses sample and wash water.
	B1	Absorbs overflow liquid (abnormal conditions).
3 Third nozzle	**C2**	Aspirates wash water.
4 Fourth nozzle	**A2**	Dispenses sample and wash water.
	B2	Absorbs overflow liquid (abnormal conditions).
5 Fifth nozzle	**C3**	Aspirates wash water.
6 Sixth nozzle	**A3**	Dispenses sample and wash water.
	B3	Absorbs overflow liquid (abnormal conditions).
7 Seventh nozzle	**C4**	Aspirates wash water.
8 Eighth nozzle	**A4**	Dispenses sample and wash water.
	A5	Absorbs overflow liquid (abnormal conditions).
9 Ninth nozzle	**C5**	Aspirates wash water.
	C6	Aspirates wash water.
10 Tenth nozzle	**D**	Vacuums remaining liquid from cuvette.

Figure 1-25. Nozzle separation

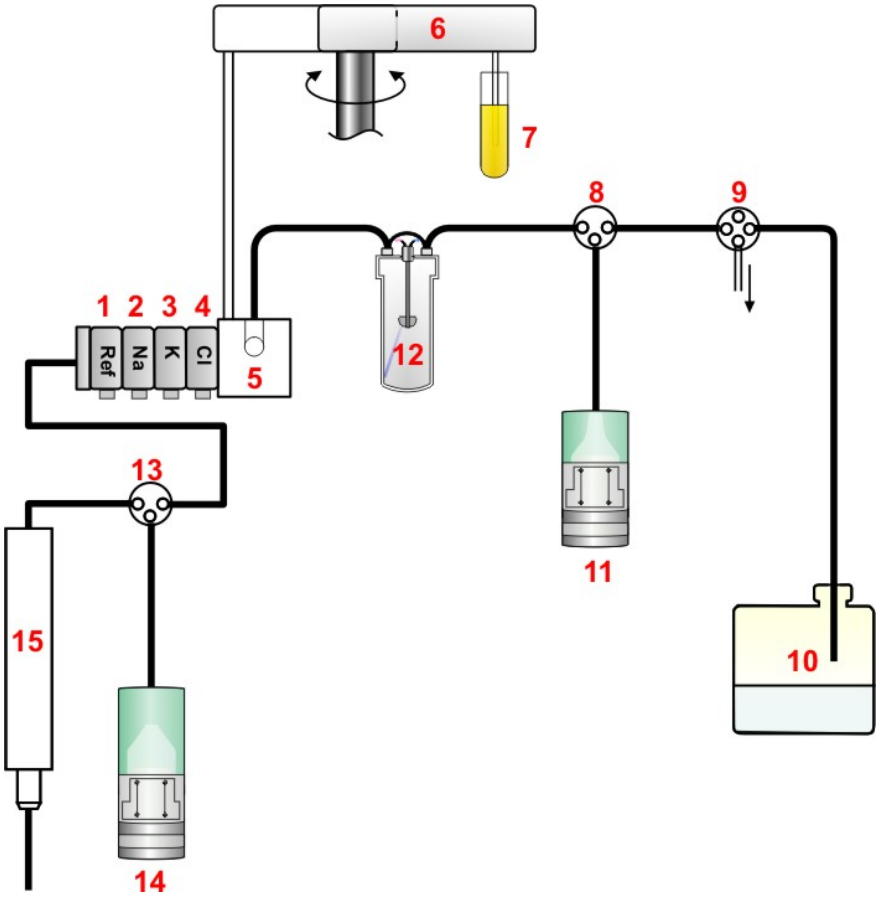
If an assay is not running, you can operate the unit manually at the Manual Operation window.

ISE (electrolyte analyzer)

The ISE measures the amount of sodium (Na), potassium (K), and chloride (Cl) in serum or urine samples through voltage measurement by ion-selective electrodes.

The sample-dilution probe (DPP) aspirates the sample for electrolyte analysis. The electrolyte analysis uses buffer as reagents.

In a two-stage process, the buffer voltage is measured, then the sample voltage is measured. The difference between these voltages, the reference voltage, and the temperatures of the liquids determine the concentration of Na, Cl, and K in the sample.



1	Reference Electrode	**6**	Dilution Probe (DPP)	**11**	Buffer Pump (BP)
2	Na Electrode	**7**	Sample	**12**	Temperature Stabilizer
3	K Electrode	**8**	BPEV	**13**	DPEV
4	Cl Electrode	**9**	ISE Degassing Unit	**14**	DP
5	Mixer	**10**	Buffer Solution	**15**	Waste Block

Figure 1-26. ISE components

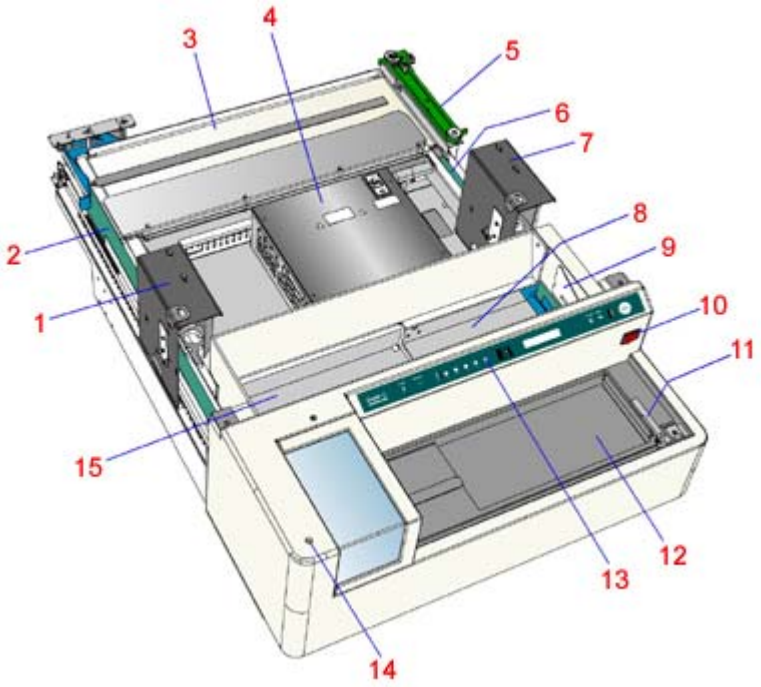
To ensure data accuracy, undiluted sample is aspirated from the sample tray and electrolyte analysis is always performed before photometric sampling.

Universal rack handler – functional description (optional)

The universal rack handler is a separate sample delivery mechanism designed to allow operators to continuously load samples. The operator can load five sample containers into each rack and up to fifteen racks (75 samples) on each rack carrier to improve workflow efficiency. The sample-dilution probe (DPP) aspirates the sample on the rack handler just as it does from the sample tray, from an aspiration position specifically designed for the universal rack handler or another laboratory automation system (LAS).

Use the universal rack handler for routine patient sample analysis only.

Process calibrators, controls, special diluents, and reruns with the onboard sample tray (STT).



1	Laser Station 1 (LS1)	**9**	Outfeed Pusher
2	Conveyor 1	**10**	READY/STANDBY Switch
3	Conveyor 2	**11**	Infeed Pusher Arm
4	Main PCB Chassis	**12**	Infeed Tray
5	Cross Drive	**13**	Display Panel
6	Conveyor 3	**14**	Rack-load Status Indicator
7	Sampling Station (LS2)	**15**	Outfeed Tray
8	Outfeed Buffer		

Figure 1-27. Universal rack handler components

Software Overview

This section of the manual describes the software windows available to configure and run your chemistry system. It does not explain how to use these windows. For detailed information on the use of the windows, refer to the online Operator's Guide.

The software controls most of the functions run by the chemistry system. The software, which runs under the Windows operating system, starts automatically when you turn on the PC.

You start the software from the Startup window, and stop it from the Menu Panel.

After the software has started, the Menu Panel and the Operation Panel appear at the top of your screen.

As long as the software is running, these windows remain in the same position (unlike most Windows XP windows). Use the top display option (Systems(s)) to allow other windows to display on top of the Menu Panel and Operation Panel.

Startup window

The Startup window is the first window you see when you turn on the PC and the last window when you stop the system.

Perform any of the following tasks at this window:

- new start
- restart
- back up and restore system files
- set or clear the system data prior to startup.
- shut down and restart Windows

1. At the Menu Panel, select **System (s)**, then select **Exit (X)**.
2. Select **Yes** when prompted, then select **Yes** when prompted again.

   The **Startup** window appears.

If you select **Cancel**, the Startup window closes, leaving you in Windows (you are not able to perform the above functions). To open the Startup window again, restart Windows.

Operation Panel

This window opens after you start the system software from the Startup window.

Use this window for the following tasks:

- perform routine tasks on the Chemistry system
- check the system status and alarm messages

Buttons

You select buttons on the Operation Panel to perform routine tasks.

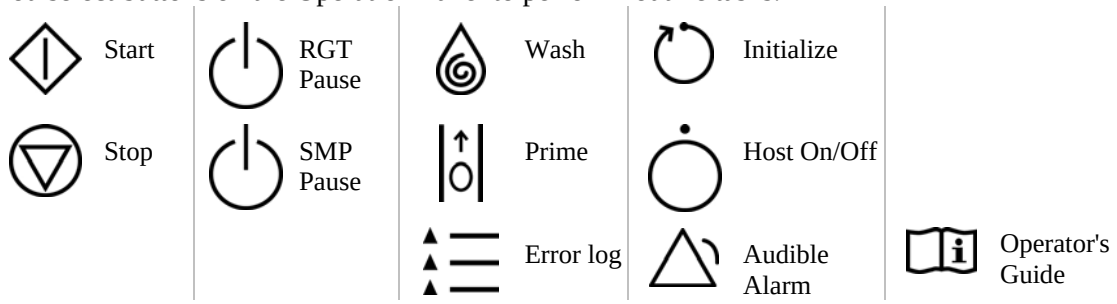
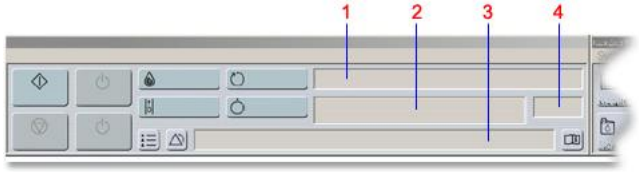


Figure 1-28. Operation Panel buttons

Status and message boxes

The boxes on the right of the Operation Panel provide information on current system conditions.



1	Operating modes	**3**	Alarm message box
2	Load status indicator	**4**	Time remaining indicator

Figure 1-29 Status Message boxes

Other tasks accessed from System(s) on the Operation Panel

Use the System(s) list to perform these tasks. To open the menu, select **System(s)** at the top left of the panel.

Menu Panel

The Menu Panel opens after you start the system software (from the Startup window). The window contains the buttons shown below. Use these buttons to access other menus.

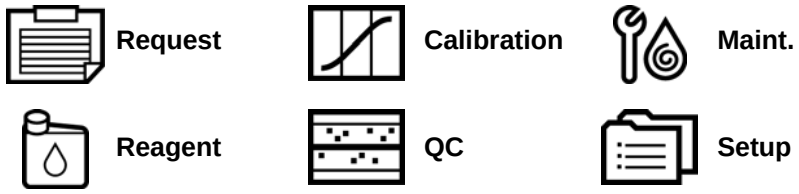


Figure 1-30 Menu Panel

Other tasks accessed from System(s) on the Menu Panel

1. To access the drop-down menu, select **System(S)** at the top left of the window.
2. Perform any of the following tasks:
   - log on at a different access level
   - change the system password
   - display version information, and read or write a memo
   - print the screen
   - log on as a different user
   - exit the system

Logging on at a different access level

Use this procedure to log on as a supervisor or tech_manager (when you start the system, you are automatically logged in as a user). If you are already logged in as supervisor or tech_manager, you can log back in as a user.

1. At the System(S) menu, select **Password**.
2. Enter the new user name (access level) and the corresponding password.

   Or, do not type a password at the Password window to log in as a user.

3. Select **OK**.

   You are now logged in as the new user.

Changing the system password

Use this procedure to change the password for the supervisor ID.

1. At the System menu, select **Change password**.
2. At the Change Password window, enter the old password, then enter the new password.
3. Enter the new password again in the Confirm password box.

   If you are setting the password for the first time, leave the Old password box blank.

4. To change the password, select **Change**.

   The next time someone logs in with this ID, the new password will be required.

Displaying version information and reading or writing a memo

Use this procedure to get information about the files currently in the system software.

1. At the System menu, select **Version info**.

   The Version Information window displays the system version number and other information.

2. To close the window, select **Return**.

Printing the screen

1. At the System menu, select **Screen Print**.

   The entire screen (as it displays on your monitor) prints.

2. Print the screen to the clipboard.

Logging on as a different user

Use this procedure to log on a different user. All results obtained for this operator annotates to the corresponding user code from the User Code Settings window.

1. At the System(S) menu, select **Change User**.
2. In the Please enter password box, enter the user password.

   User passwords assigned in the User Code Settings window are not case sensitive.

3. Select **OK**.

   You are now logged in as the new user.

Exiting the system

Use this procedure to close the system software.

1. At the System(S) menu, select **Exit(x)**.
2. When prompted, select **Yes**, then select **Yes** when prompted again.

   In a few seconds, the Startup window opens. From there, you can restart the software or shut down Windows.

Description of software windows

Menu items followed by 1 asterisk (*****) are only available from the **tech_manager** logon.

Request windows

Select the **Request** button to display the following Request menu items

Order Entry window

Each patient sample must have a workorder that contains a sample number and a request for at least one test.

Workorders can be created at your host computer or at the chemistry system.

Perform any of the following tasks at this window:

- use workorders created at your host computer
- create workorders at the analyzer
- create an individual workorder
- create multiple workorders (batch)
- change an individual workorder
- change multiple workorders (batch)
- create a load list
- create a profile
- instruct the system to use system-assigned position numbers
- configure the Order Entry window

Sample Log window

Perform any of the following tasks at this window:

- view the sample log entries

  The following information is provided for each sample log entry:

Asp Date and Time	External	Type
STT	Sample Id	Rerun
CTT	Description	Results

- search the sample log
- delete a specific sample log entry
- delete all sample log entries
- print a list of the sample log entries
- export the sample log entries

Test Result Monitor window

Use this window to monitor an analysis while it is running.

At the Test Result Monitor window, you can monitor the following:

- **processing status**

  The center of the window resembles the sample tray. The outer ring is the STT tray; the inner ring is the CTT tray. Each tray position is a circle.

  As the run continues, the circles containing samples change color. The colors indicate the current status of each sample. The color codes are displayed at the lower left of the window.

  NOTE

  When running controls, please wait, there is a delay before the color coding updates.

Sample test status color codes

The Test Result Monitor window uses seven color codes to represent sample status, and the seven codes are displayed on the window. The Review/Edit window uses these seven plus an eighth to indicate that a test for the sample was ordered but not completed. Discrepancies in color are due to the windows' displaying different information. For example, a "complete" sample appears as dark blue on the Test Result Monitor window, indicating that sampling is complete, while in the Review/ Edit window the same sample appears as pale blue, indicating that some tests are missing.

No sample (white)

The position number does not contain a sample for this run

Untested (gray)

The run began and a workorder was created for this sample, but the sample was not yet aspirated from the sample tray.

In process (pink)

At the Test Result Monitor window – the sample was aspirated from the sample tray and was added to the dilution tray.

At the Review/Edit window – the sample is being analyzed or is being rerun.

Complete (blue)

At the Test Result Monitor window – the sample has been aspirated

At the Review/Edit window – analysis or the rerun for the sample is complete, and the resultant data is produced.

Pending run (yellow)

The sample was analyzed but it must be reanalyzed. The reanalysis has not yet started.

Being rerun (pink)

The sample is in the process of being reanalyzed.

Not complete (light blue)

The sample is in the process of being reanalyzed.

Rerun completed (green)

The requested rerun for this sample is complete and the resultant data is produced.

Figure 1-31. Sample test status color codes

- **Sample information and system status**

  The button bar at the top of the window displays the Sample Search and Rack or LAS. Sample Info. buttons.

- Press the **Sample Search** button to display a dialog box where you can search for sample information by sample number by STT position (tray number and sample position), or by rack/LAS position (rack number and sample position).

  The search returns a Sample Information window showing the sample number, position number, sample status, and the time remaining to complete the analysis of the sample.

- If a rack handler or laboratory automation system (LAS) is in use, select the **Rack or LAS. Sample Info.** button to display the following sample information in the Rack or LAS. Sample Information window:
- Sample barcode number.
- Sample Status (see the status codes listed on the Test Result Monitor window).
- The time remaining to complete the processing of the sample.

NOTE

If processing has completed or if there are no samples available for processing when you select the **Rack or LAS. Sample Info.** button, the system displays a message that no sample information is available.

The left side of the Test Result Monitor window displays three panels.

- The System Status panel shows the current operating mode of the system.
- The Sample information panel shows the sample number and sample position of the currently selected position on the STT/CTT graphic. If this is a barcode analysis, the barcode number displays, and the position number is 0-00.
- The code panel shows the color codes used in the STT/CTT graphic to represent sample status.

In the middle of the sample tray display, the tray (TT) number for the current run displays in the TT No. list box. If this is a barcode analysis, the TT number is 0.

To view the status of prior tray samples that are still in process, select the down arrow of the TT No. list box, then select the number of the tray you want to view.

Review/Edit window

CAUTION

Tests on the Review/Edit window must be in the same order as they appear in the System Test List window to avoid incorrect positioning of results on the print report. You **must not modify the order** of the test items on the System Test List window after initial setup. If you reposition any test items on the System Test List window, results for samples already run could be associate with the wrong test name.

Perform any of the following tasks at this window:

- review sample results
- configure reruns
- print selected patient results
- transmit selected patient results

Reaction Monitor window

Use this window to observe changes in reaction data. The changes are depicted as a function of time, or of the 98 detection points in an analysis.

In the window, you choose a test and a sample for which you want to display a reaction over time. Once you make your choice, a graph is created. You can choose several plots for the graph.

Perform any of the following tasks at this window:

- Check test reaction data over time
- Show the reaction data
- Check the time courses for all wavelengths
- Check cell blank values
- Change the scale of absorbance graph
- Create a file containing test data
- Print the data list

RealTime Monitor window

The system monitors calibration, control, and patient sample results in real time. Only patient and control sample results can be transmitted to a host computer. Results are reported after the sample analysis is complete.

*Print Report window**

Use this window to print sample data using report layouts created in the Print Format Settings window.

This window is only available from the supervisor logon. To print reports, go to the Review/Edit window and using the Print Report button.

CAUTION

Tests on the Print Report form must be in the same order as they appear in the System Test List window, to avoid incorrect positioning of results on the print report. Do not modify the order of the test names on the System Test List window after the initial setup. Any repositioning of test names on the System Test List window could result in already run being associated with the wrong test name.

*Test Select window**

You select tests in this window for patient and control sample analysis and calibrations.

Use this window for the following tasks:

- Permanently disable ("down") a test.

For example, a test may be downloaded from a host system to analyzers in your lab, but that test is not run on the ADVIA Chemistry System.

- Temporarily disable a test so that the rest of a run can proceed.

For example, if the ALT method runs out of reagent, you can clear that test. The rest of the analyses run normally, but the samples are not assayed for ALT.

- To "down" a test, deselect it from the appropriate Test Table.

NOTE

You can remove tests for calibrators and controls from the current run using the Calibration and Control windows, but they stay selected for subsequent runs.

*Cup/Tube Assign window**

Use this window to assign container types to each of the 84 positions in the STT sample tray. For the current analysis, you can override the settings in the Temp cup/tube select window.

*Statistics window**

Use this window to print statistics related to analysis results.

*Correlation window**

Use this window to create and display correlation charts and the data that displays in the charts.

When needed, use the correlation data to create a real time correction formula in the Analytical Parameters (Chemistry) window (or ISE Parameters of Setting window).

Perform any of the following tasks at this window:

- display charts
- display chart data
- create charts (add data automatically)

  Use this procedure if the measurement data comes from the system

- create charts (add data manually)

  Use this procedure if the measurement data comes from another blood chemistry system

- print charts
- delete charts

Calibration windows

Select **Calibration** to display the following Calibration menu.

View Calibration Curve window

Use the View Calibration Curve window to review the calibration curve data, to restore a calibration, to monitor calibration trends, to obtain a summary of all calibration information and to view RBL and calibration check information.

Calibration/RBL History

The system stores up to 100 curves for each of 2 different reagent lot pairs (R1 and R2), for a total of 200 curves per method. It also stores the data from the most recent "failed" calibration.

Perform any of the following tasks at this window:

- review the calibration history for all methods run on the system
- print the displayed calibration data
- generate a CSV file for displayed calibration data

Sample Select window*

Use this window to select the samples for control sample analysis and calibrations, and to temporarily disable a sample so that the rest of a run can proceed.

For example, if you only want to run ISE calibration on serum samples, disable the ISE calibration urine samples. The run proceeds normally, but it does not include urine samples.

Perform any of the following tasks at this window:

- select samples available for control analysis calibration
- print the settings
- clear the settings

Calibration Setup window*

Use the Calibration Setup window to enter the information required to calibrate each photometric test.

You can request automatic recalibration for each test whenever a new reagent container is loaded or after a user-specified time interval. When a time interval expires, the system recalibrates at the start of the next run.

NOTE
You can run tests with 2 different lots of the same reagent but you cannot calibrate the 2 lots on the system at the same time. You have to calibrate them one at a time. After the system calibrates the lots separately, you can place both reagents back on the system and run tests.

Perform any of the following tasks at this window:

- enter absolute or single-point (STD) calibration methods
- enter multi-standard calibration methods
- print the calibration setup information
- delete the calibration setup information
- configure the automatic calibration feature

Maintenance windows

Select **Maint.** to display the following Maintenance menu.

System Startup/Shutdown Setting window

Perform any of the following tasks at this window:

- perform a system-assisted startup (Start set)
- perform a system-assisted shutdown (Shutdown set)
- perform an automatic startup (Auto start set)

User Maintenance window

Perform any of the following tasks at this window:

- water blank measurement
- cell blank measurement
- batch printing
- filing of measurement data
- save of text file

System Monitor window

Perform any of the following tasks at this window:

- verify operating conditions (daily procedures)
- set the system monitor (system settings)

System Maintenance Monitor window

Perform any of the following tasks at this window:

- enter schedules for maintenance tasks
- monitor the maintenance status of the system
- delete maintenance records

Lamp Energy Monitor window

Perform any of the following tasks at this window:

- check the spectrophotometer lamp energy
- perform offset analog to digital (AD) measurement

ISE Operation window

Use this window to perform various ISE tasks.

There is a display area at the top of the window where you can view the running status.

Perform any of the following tasks at this window:

- buffer prime
- calibration
- wash electrode
- CV check
- interval check
- selectivity check
- final operation
- manual operation
- ISE line wash
- Dilution bowl drain
- initialize
- batch print
- periodic wash
- enter information about each electrode

ISE Monitor window

Perform any of the following tasks at this window:

- monitor and verify calibration data as a function of time, using history graphs
  - monitor serum or urine calibrations
  - monitor calibration trace data
  - display data from past calibrations
  - *monitor selectivity check data
- print the results
- delete calibration trace data
- change y-axis scale
- transfer calibration data to the ISE

* The selectivity check must be performed under the supervision of authorized Siemens service personnel. Please call your local technical support provider or distributor.

Manual Operation window

Perform any of the following tasks at this window:

- operating a unit
- activating or deactivate a unit
- checking unit position values

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Manual operation of units may be necessary when performing maintenance and troubleshooting tasks.

The window contains a graphical image of the analyzer which depicts the operation you are performing.

IMPORTANT
The operating mode must be READY or WAIT for you to run manual operations.

Also, if you cannot perform an operation due to system restrictions, a buzzer goes off and a message displays at the Alarm message box (in the Operation Panel). Select **ALARM** in the Operation Panel for more information and instructions regarding the buzzer.

On-Line Monitor window

Use this window to monitor the exchange of data between the system and the host computer. The monitor displays the data being exchanged and the control signal codes that ensure accurate transmission of information.

You can view up to 300 data items in the window.

*Error Report window**

Use this window to review system status and error messages.

For each message, the following information displays:

No.	Samp.ID	INDEX
Date	Test Name	Safe. No.
Section	Time	Contents
Mode	FNO	Measures

NOTE
While the Error Report window is displayed, it is not updated. To view new messages, you must close the window, and then reopen it.

Reagent windows

Select the **Reagent** button to display the following Reagent menu:

Reagent Inventory window

Use this window to monitor the reagents in the reagent trays (RTT1 and RTT2). The Reagent Inventory window displays the status of all reagents loaded on the reagent trays. The window continuously refreshes with new information, and it updates after each barcode scan.

The Reagent Inventory window automatically opens at start up and remains opened. When using other windows or when you select the X in the upper right corner, the window minimizes to the taskbar at the bottom.

The reagents listed in the window are in alphabetical order.

Perform any of the following tasks at this window:

- monitor reagent positions, number of tests, volumes, and days remaining.
- execute a barcode scan
- deselect a reagent

- print a reagent summary report
- view the Total Test summary
- view the calibration interval review
- pre-calibrate a new reagent lot

CTT Monitor window

Use this window to monitor the amount of liquid in containers on the CTT tray.

Reagent Container Settings window

Use this window to enter and display information for non-barcoded reagent containers and start their Days Remaining counter. This window is updated automatically for barcoded reagents.

This information is used by the Reagent Inventory window.

Perform any of the following tasks at this window:

- set the reagent container type, lot number, and expiration date
- start the Days Remaining counter for non-barcoded reagent containers
- print the settings
- clear the settings

*Active Test List window**

Use the Active Test List window to temporarily deactivate a method, so that method-related alarm messages (for example, missing reagents) are not generated. You would use this function if, for example, for tests that you do not run every day.

After you make your selections, activating or deactivating a method, you must initialize the system for the changes to take effect.

The Active Test List window displays all tests loaded on the system, but the deactivated or unchecked tests are grayed out.

NOTE
At the Active Test List window, you must select all the tests you expect to run. If a test is not selected, the system skips that test. An error message does **not** display in the Alarm message box on the Operation Panel, but is recorded in the error message log.

- Active is checked if the test is active.
- Test Name displays the name and number of the test.
- R1 Pos No displays the position of R1 on the reagent tray.
- R2 Pos No displays the position of R2 on the reagent tray.

*Reagent Information window**

Use this window to review and edit reagent information, such as on-system stability, calibration frequency, and fill volumes for barcoded reagents and to enter information for non-barcoded reagents.

This information is used by the Reagent Inventory and Reagent Container Set windows.

The Reagent Information window lists all tests defined for the system.

- **Assay Name** is the test method name.
- **R-Code** is the reagent code for each Siemens barcoded reagent container or a 5 digit user defined code for non-barcoded reagents.
- **Days Remaining** specifies the on-system reagent stability.
- **Comment** is a user entered remark or reminder.
- **R1** and **R2 Fill Volume** are the fill volume in mL for reagent containers R1 and R2.

NOTE

For user-defined methods, the Assay Name, R-code, Days Remaining and R1-R2 Fill Volume must be entered correctly. R2e is not used.

After system installation, all default information for Siemens-defined methods appears in this window.

*Reagent Barcode Maintenance window**

NOTE

Access to this window is through a tech_manager logon level only. Please contact your technical service provider or distributor in order to change the default settings on this window.

Use this window to maintain barcode information for the reagents in RTT1 and RTT2.

In this window, you can delete specific reagent codes and specific reagent barcodes from the ADVIA reagent barcode database. Only use this function to delete an old reagent code or reagent barcode that may have the same lot number and container number as a new reagent container you want to place on the system. In most circumstances, you do not have to use this functionality.

The barcode maintenance database can store a maximum of 200 reagent codes (assays) and up to 2000 individual reagent barcodes. If the database exceeds the limit of 2000 barcodes, the oldest stored barcode is replaced with the most current barcode.

The reagents are listed in the same order as they display in the System Test List window. The Reagent Barcode and Date Opened on System information for one or more reagents displays when a Reagent Code is selected.

Perform any of the following tasks at this window:

- clear all
- clear reagent code(s)
- clear reagent barcode(s)
- clear specific date
- clear range of dates

QC windows

Select the **QC** button to display the following QC menu.

ADVIA QC window

ADVIA QC provides both real-time and long term evaluation of analyzer and method performance.

To automatically transfer data to this QC manager, at the System Monitor window, in the ADVIA QC Transfer area, select **Yes**.

Perform any of the following tasks at this window:

- collect control results
- calculate and display statistical data
- assess data errors
- identify QC violations
- review control results
- create printed reports
- identify and report events such as lot changes and calibration dates

Real-time QC window

Use this window to review the performance for two controls simultaneously using a Levey-Jennings chart (x-chart) or a twin chart.

NOTE
This window is intended to be used when two controls are run for each test. However, you can still use this window if you are running only one control.

Daily Precision Control window

Use this window to view daily control results.

CAUTION
You **must not modify the order** of the tests on the System Test List window after initial setup. To avoid incorrect positioning of results on the print report, tests on the Daily QC window must be in the same order as they appear in the System Test List and Process Sequence windows. If you reposition any tests on the System Test List window, results for samples already run could be associated with the wrong test name.

NOTE
The maximum number of results displayed in the Daily Precision Control window is 200. When this number is reached, the system deletes the results starting from the first entry and adds new results after the latest entry. The system does not display a message that the maximum number of results was reached.

Perform any of the following tasks at this window:

- view the Levey-Jennings charts (x-charts)
- view the detailed control data information and omit invalid control results

- view the QC summary list
- view the daily QC list
- use daily statistics to establish the Daily QC mean and 1 SD (standard deviation) values
- print the daily x-charts
- delete the daily QC data
- update the QC Cumulative window

The daily mean and fluctuation range (R) for every test in each selected control are saved in the QC cumulative window as a data point for the current day.

IMPORTANT

To avoid losing QC statistics, please observe the following:

- Update the QC Cumulative window before more than 20 daily control samples are run.

  The QC Daily Precision Control window can manage a maximum of 20 results for each control product (level). Only the most current QC data are saved when more than twenty controls are run in a day. (If an additional control sample is run, the oldest control sample is deleted to make room for the new one. Similarly, if multiple repetitions (up to 5) of a control are requested when 20 results have already been stored, the system aspirates the sample multiple times and saves the results as the last ones in the sequence, discarding the same number at the beginning of the sequence.)
- To avoid losing control results, you must perform a QC cumulative save on the QC Daily Precision Control window at the end of each day, and perform a New Start when the system is turned on the next day.
- Do not update the QC Cumulative window more than once each day.
- If you return to the QC Daily Precision Control window after performing a "QC cumulative save," you must not perform another update.

You must not perform an update when there are no daily control data available. The cumulative data point will be deleted for today and no additional control data can be saved for the day.

QC Cumulative window

Use this window to manage the day-to-day (cumulative) QC information.

Perform any of the following tasks at this window:

- specify the time interval you want to review
- view the Levey-Jennings charts (x-r charts)
- view the detailed control data information and omit invalid control results
- view the QC summary list
- use cumulative statistics to establish the Daily QC mean and 1 SD values
- print the cumulative x-r charts
- delete the cumulative QC data

*Control Data Setup window**

Use the Control Data Setup window to manually enter the control mean and 1SD limits for evaluation of the daily and the cumulative control statistics. Typically, you enter values obtained from the package insert of a commercial control.

You can also obtain the control mean and 1SD values from the actual control results using the Daily Precision Control and QC Cumulative windows, and then allow the system to load them automatically into the Control Data Setup window. For example: use the procedures to enter data for a pool of patient samples you want to run as a control.

Perform any of the following tasks at this window:

- enter the mean and 1SD values
- print control data registration information
- delete control data registration information
- copy control data registration information

*Sample Select window**

Use this window to select the samples for control sample analysis and calibrations, and to temporarily disable a sample so that the rest of a run can proceed.

For example, if you only want to run ISE calibration on serum samples, disable the ISE calibration urine samples. The run proceeds normally, but it does not include urine samples.

Perform any of the following tasks at this window:

- select samples available for control analysis calibration
- print the settings
- clear the settings

*QC Sample Definition window**

Use the QC Sample Definition window for the following tasks:

- entering the information required to run samples of up to 26 control products
- requesting an automatic run of control(s) after a user-specified number of samples are processed

Perform any of the following tasks at this window:

- enter the sample information for a control
- configure the automatic control feature
- print the control sample information

Setup windows

NOTE
You must log on as a supervisor, tech_manager, or service to access window under the Setup button.

System Specification Settings window*

Use this window to enter settings related to the system configuration.

You can enter or change settings for the areas listed below:

- Settings that take effect after the next New Start
  - basic system composition
  - basic system operation
- Settings that take effect after startup operation from READY state
  - sample containers
  - reagent bottles
- Serum indices specifications

  The settings below are related to serum information items (serum indices), which are involved in creating workorders. If the serum indices for each sample are not selected in the Order Entry window, select one of these settings:
  - Request. item range
  - Compulsory item analysis
  - Not handled
- Set the system monitor
- Set system parameters
- Basic system composition

  These settings allow you to customize general components of the system:
  - ISE
  - Sample bar code
  - Concentrated waste
  - Sample delivery
  - On-line
  - Reagent bar code
- Basic system operation

  These settings are used for retesting of samples
  - Auto. retest
  - Manual retest
- Sample containers

  The settings below specify the sample containers used by the system. You can specify up to 9 container types.

CAUTION
Normal operation and the volume of sample aspirated depends on the specifications you enter here. Incorrect settings may damage the probes and nozzles.

- Type
- Container diameters
- LLS sensitivity
- Container name
- Container heights
- Liq volume judge

- Reagent bottles

  The settings below specify the reagent bottles used by the system. These settings are used in the Reagent Inventory, Reagent Container Set, and Lamp Energy Monitor windows.

CAUTION

Incorrect settings may result in abnormal data.

- Type
- Bottle section
- Container name
- LLS sensitivity

*Analytical Parameters (Chemistry) window**

Use this window to set up chemistry methods.

Siemens methods are predefined when the system is received. For predefined methods, only expected values, rerun conditions, and correction formulas should be modified.

You can define new methods. The system can store up to 100 chemistry methods in this window (including predefined methods).

In the Analy.Cond.No. box, choose a method, or enter a new method number.

For the selected analytical condition, you can set up:

- normal and abnormal values
- reanalysis conditions
- correction formulas
- sub-analytical conditions
- test liquid parameters
- calculation methods
- CTT positions
- to print methods
- to clear methods
- to copy methods

System Test List window

Perform any of the following tasks at this window:

- Add tests that are used regularly by your system. The tests on the list appear on other windows
- Assign a reagent tray position number for non-barcoded reagents or a reagent code (R-Code) for barcoded reagents

CAUTION

To avoid incorrect reporting of results at the Review and Edit, the Daily QC windows, and the Print Report form, you **must not modify the order** of the test items on the System Test List window after initial setup. If you reposition any test items on the

System Test List window, results for samples already run could be associated with the wrong test name.

Perform any of the following tasks at this window:

- add tests to list
- remove tests from list
- set the test processing order

  Analysis order oet window

  Use this window to set the order in which tests on the list run. To run tests in the order they displays at the System Test List window, you do not need to use this window.
- print test list items
- assign reagent codes or position numbers

*Analytical Parameters (Serum) window**

Use this window to set the parameters for evaluating the serum indices (lipemia, hemolysis, and icterus).

Perform any of the following tasks at this window:

- define up to five different flagging levels of concern for each serum indices
- select a test item to perform the serum indices analyses
- enter the factor values required to calculate the serum indices result values

NOTE
Operation of the serum indices feature is controlled in the Serum set area of the System Specifications Set window.

*Process Sequence window**

CAUTION
To avoid having quality control data reported for the wrong tests, **do not switch Process Sequence numbers** after control results have been accumulated. Patient results are also affected.

Use this window to set the order in which:

- tests display at windows such as Order Entry, Test Select, and Real-Time QC
- tests print

Only tests set up in the windows listed below can be arranged at the Process Sequence window:

- System Test List
- Analytical Parameters (Serum)
- ISE Parameter Settings
- Ratio Parameters

*Ratio Parameters window**

Use this window to create up to 20 ratios with two test items in each. The ratio can contain 2 tests.

*Contamination Settings window**

Use this window to set the conditions for preventing contamination of reagent probes and reaction tray cuvettes.

Each condition specifies an action to be taken if a specific interferer contaminates a specific receptor. You can set up to 100 conditions each for reagent probes and RRV cuvettes.

Perform any of the following tasks at this window:

- set conditions for avoiding reagent probe contamination
- set conditions for avoiding RRV cuvette contamination
- set conditions for anti-contamination detergent
- print the conditions
- clear the conditions

*Ctrl/Cal Sample Setup window**

Perform any of the following tasks at this window:

- get or view measurement times, container types and comments for control and calibration samples

  The settings are available in the Calibration Setup, QC Sample Definition, and ISE Parameter Settings windows for entering sample tray information.
- determine the tests set to run on a given position.

*User Code Settings window**

Use this window to enter a user code, user name, and user password for up to 50 operators who are authorized to use the chemistry system.

Perform any of the following tasks at this window:

- create/change entries for an authorized user
- delete the user code entries for a specific user
- delete all user code entries
- print a list of the user code entries

*New Test Definition window**

Use this window to set up new tests, calibration definitions, sample container definitions, and QC sample definitions. The New Test Definition window provides easy step-by-step procedures.

*ISE Parameter Settings window**

Use this window to set the analysis parameters for ISE measurement of Na, Cl, and K electrolytes.

Perform any of the following tasks at this window:

- enter settings for individual electrolytes (Na, Cl, and K)
- enter settings for all electrolytes
- check CTT settings

*Print Form Settings window**

Use this window to design or edit a print form for sample results. When you print reports from the Print Report or the Review/Edit window, you will select a print form created here.

There are two sample report formats provided:

- A Patient Chart report (Chart.frm) is formatted for a single sample.
- A Consolidated report (Consolid.frm) is formatted for multiple samples.

You create or edit each print form by placing design elements, such as free-text, sample attributes, and result data (for example, test name, result value, and flags) on a form page that has the same dimensions and orientation as the printed page. A grid overlays the form page. This helps you to position precisely the design elements.

Perform any of the following tasks at this window:

- start a new print form or open an existing one
- create or edit a print form
- view the print preview
- print the print form

*Online Settings window**

Use this window to setup the communications between the system and a host computer.

NOTE
Refer to the publication titled *LIS Interface Guide* for detailed information about this communications protocol.

Perform any of the following tasks at this window:

- set the communication parameters that control the exchange of messages between the system and your host computer
- test the serial port
- select the types of sample results and workorders you want transmitted
- select each test to be transmitted, and assign a host computer test number
- set up the Data Clean check to automatically validate results before transmission

*Alarm Buzzer Settings window**

Use this window to determine when and how the alarm buzzer sounds to alert the operator to status changes and system errors.

- set an alarm buzzer for a system error
- set an alarm buzzer for a status change
- print alarm buzzer settings
- delete alarm buzzer settings

NOTE
Please contact your local technical support provider or distributor before changing the default settings on this window.

*System Parameters Settings window**

Use this window to enter or change system parameters, which define the system processing environment.

Perform any of the following tasks at this window:

- define and edit system parameters
- view system parameters
- print system parameters

*Reflex Test Settings window**

Use this window to define reflex testing for reagent methods. You can define up to three reflex tests for any given test method based on a set of user defined conditions. When all conditions are true, the specified reflex tests are added to a sample workorder. The system tracks the workorder as a pending rerun until the reflex tests are completed. Reflex tests display in the Prev. val. column in the Review/Edit window.

To define reflex testing for a given method, you must list the reagent in the System Test List window.

Other Tasks

Use the System(S) menu in the top left corner to perform the following tasks:

- change the Top display option
- log on at a different access level

  Use this procedure to log on as a tech_manager or a supervisor (when you start the system, you are automatically logged on as a user). If you are already logged on as a tech_manger or supervisor, you can log back on as a user.
- change the system password

  Use this procedure to change the password for the supervisor ID.
- display version information and read or write a memo (see Version Information window below)

  Use this procedure to get information about the files currently in the software.
- print the screen
- log on a different user

  Use this procedure to log on a different user. All results obtained for this operator will be annotated with the corresponding user code from the User Code Settings window.
- exit the system

  Use this procedure to close the software.

Version Information window

Use this window to display version information for files listed below and currently in the software. Select one of the options in the lower left corner of the window.

ADVIA o.p.

This option displays information on the program files in the system.

Column	Description
Group	Indicates the type of program. Programs related to the overall system are in the System group. Other programs are part of groups corresponding to their Menu Panel buttons (for example, Request, Calib.).
Process	Brief description of the program's function (often the name of the window it opens).
Version	The version of the program being used in this version of the software (does not have to match).
File name	The name of the program file. A .EXE extension indicates the file is a program.
File date/time	The date the program file was created or last modified.
Size	The size (in bytes) of the program file.

Controller

This option displays information on the data tables in the system.

Column	Description
File name	The name and path of the table. A .TBL extension indicates the file is a table.
Version	The version of the program that is being used in this version of the software (does not have to match).
Explanation	Brief description of the file.

Safety Message

This option displays information on safety message files in the system.

Column	Description
File name	The name of the file. A .MSG extension indicates the file is a message.
File date/time	The date the file was created or last modified.
Size	The size (in bytes) of the file.
Explanation	Brief description of the file's function.
Version information	The version of the file being used in this version of the software (does not have to match).

Etc.

This option displays information on other files in the system, generally text files shown for informational purposes.

Column	Description
File name	The name and path of the file. A .TXT extension indicates the file is a text file.
File date/time	The date the file was created or last modified.
Size	The size (in bytes) of the file.
Explanation	Brief description of the file's function.
Version information	The version of the file being used in this version of the software (does not have to match).

Memo

Use this window to write or display memos about the system.

At the Memo window, you can do the following:

- read a memo
- write or edit a memo
- print a memo
- clear a memo

Using online help

The online Operator's Guide viewer has three functional areas: top (navigation toolbar), left (navigation frame), and right (content frame).

Use the navigation toolbar to access the table of contents, index, search, glossary, and print functions. The following are descriptions of the different areas of the online help.

- Select **Contents** tab and a table of contents displays.
- Select a given subject and a cascading list of relevant subtopics open. Then select a subtopic to display it in the content frame.
- Select **Index** and a searchable keyword index displays.

Enter the first few letters of the term you want to search for in the input box. The index scrolls automatically to the first occurrence of the input text string. Associated help topics for the selected keyword are displayed in the bottom frame. Select a topic name to display it in the content frame.

- Select the **Search** tab.

The search interface is displayed. Enter the word you want to search for in the input box and select the  button. The function searches the entire help database for any occurrence of the word. This may take a few seconds. Help topics which contain an instance of the word are displayed in the bottom frame. Select a topic name to display it in the content frame.

- Select **Glossary**. A glossary of relevant terms displays. Select any word in the list to display its definition in the bottom frame.
- Select the **Print** tab to print information displayed in the content frame. To print the contents of a popup, right-select in the popup and select Print from the menu. If a large image is partially displayed in the content frame, you must enlarge the viewer to display the full image before it can be printed properly.

Viewing the content

Help topics display in a content frame. Some topics, including reference documents and images, appear in a second window. Navigation from these windows, including minimizing, maximizing and closing, use standard Windows conventions.

Some popups display partially outside the viewer content frame. In this case, to view the entire popup, select and drag the lower-right corner of the viewer window to enlarge it and view the complete popup.

Topics have hyperlinks (displayed in teal) or shaded hotspots embedded in text or illustrations that link to displays of related or more detailed information.

- Select teal text to activate hyperlinks.

The hyperlink is bold when the mouse pointer is over it. Hyperlinks using a cascading menu point to additional links. Graphics may have hotspots (shaded green or tabs) that are more detail information, such as a table of values.

- Select the back arrow  on the toolbar to return to the previously viewed topic or the forward arrow  to navigate to the topic that was displayed prior to going back.
- To make a popup go away, select outside the popup window.
- Select the viewer back arrow to return to the main content area from a reference document (such as PDF files).

NOTE

Your help viewer can resize, but it is recommended that the viewer stay in its default size.

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2 Operating the System

Start the System

Logging on

There are 4 access levels to the system software:

Level	Password	Comment
user	no	Intended for routine operation
supervisor	yes	Access to some system setup and advanced maintenance features
tech_manager	yes	Access to most system setup and advanced maintenance features You have to contact your technical service provider or distributor in order to change the default settings on these windows.
service	yes	Access for Siemens service personnel

You are automatically logged on at the user level during startup. No operator is required.

If you log on at the supervisor or tech_manager levels, when done, you should log on to the user level (no password required).

Starting the system

1. After the power is applied and the Windows operating system is loaded, the ADVIA Chemistry system Startup window displays.
2. Turn on the optional universal rack handler:
   - For the rack handler, set the control panel Standby/On switch to **| (ON)**.

     The ready indicator is green.
   - For the universal rack handler, set the display panel Ready/Standby switch to READY.

     The power indicator is green.
3. At the analyzer power panel, set the Operate/Standby switch (**1**) to **Operate**.

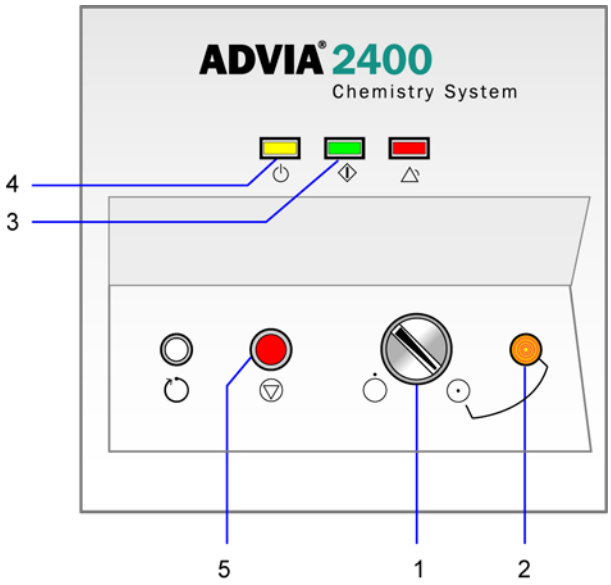

Figure 2-1. Power panel at Startup

The power indicator (**2**) is on, and the Start (**4**) and Ready (**3**) indicators start flashing when the communication to the PC is established.

4. At the Startup window, do the following:
   a. In the Please enter password box, enter the user password.

      User passwords assigned in the User Code Settings window are not case sensitive.

   b. Select New Start or Re-start, then select **OK**.

      After a few minutes, the Menu Panel and the Operation Panel open.

CAUTION

Make sure that all probes and mixers are free to move without obstruction and that all analyzer covers are in place to avoid possible injury and damage to the analyzer

5. When the Start and the Ready indicators are off, and the Initialize button on the Operation Panel activates (turns black), select **Initialize**.
6. At the Windows desktop, double-select the rack handler icon.
7. Log on as **supervisor** or **tech_manager**, if required.

Performing a system-assisted startup (Start set)

1. Verify that sufficient system reagents and wash solutions are available for the startup you want to run.
2. At the Menu Panel, select **Maint**. then select **System Startup/Shutdown Settings**.
3. In the Mode set list, select **Start set**.

4. Verify the selections for the startup you want to run.

   If no startup is defined or you want to change an existing one, proceed as follows:

   a. For each of the Proc. set, Set1, Set2, or Set3, you can select one of the following:

      (1) In the PRIME list, select the prime you want run or select **NONE**.

      A Prime is required only if you replenish a system reagent or replace a related component.

      (2) Select the check box next to each wash you want to perform.

      (3) Select **WASH3** for the startup wash.

      (4) If you want to run Cell blank, select the check box next to Cell blank.

      Run Cell blank weekly.

   b. Select **Save**.

   c. To confirm, select **Yes**.

5. In the Select wash routine area, select **Startup**.
6. In the Proc.set list, select the startup setting (Set1, Set2, or Set3) you want to run.
7. Select **Start**.
8. To confirm, select **Yes**.

   The current operating mode displays in the System mode box, and the time remaining to complete the startup displays in the Time until end box. If a cell blank is run, the system prompts you to save the results. When done, the system enters the Ready mode.

9. To halt the startup, do the following:

   a. At the System Startup/Shutdown Settings window, select **Stop**.

   b. In the Select wash routine area, select **Cancel**.

   c. At the Operation Panel, select **Stop**.

Checking the analyzer

1. Inspect the following components:

   NOTE

   If any of the components require maintenance, refer to the Maintenance Section of this guide or to the online Help for step-by-step procedures.

   - probes
   - mixing rods
   - dilution-cuvette washers (DWUD)
   - reaction-cuvette washers (WUD)
   - probe wash cups
   - cuvette covers
   - pumps for leaks

2. Verifying system operating conditions.

   a. At the Menu Panel, select **Maint.**, then select **System Monitor**.

      Normal and abnormal indicators are listed below.

   b. If there are abnormal indicators, take the appropriate corrective action.

NOTE

If you see an abnormal condition, check the Error Report window for more information.

Operating condition	Normal indicator	Abnormal indicator and corrective action
RRV Bath Temp. Temperature status of the heating bath fluid in the reaction tray. The normal temperature range is 37.0 ± 0.5°C. A temperature exceeding 50°C with the thermostat on is overheated.	OK	**NG** Check the level of heating bath fluid and replenish it, if needed.
RRV Bath Control Circuit control that keeps the reaction (RRV) bath temperature in range.	OK	**NG** Check the level of bath oil and replenish, if needed.
RRV Bath Circ. Flow rate status of the heating bath fluid. The status is determined by the flow rate in the RRV Bath Circ. field.	OK	**NG** Make sure that there is a sufficient supply of bath oil. If needed, add more oil to the reaction bath oil bottle.
RRV Bath Circ. Rate Flow rate of the heating bath fluid, in mL/minute. A flow rate <2000 mL/minute or >6000 mL/minute is considered abnormal.	3000 - 5000 mL/min.	**<3000 or >5000 mL/min.** Fill the incubation bath oil bottle with more oil. Adjust the flow regulator valve. Make sure the bath oil is circulating properly in the constant temperature bath.
RRV Oil Level Status of the quantity of heating bath fluid. Insufficient liquid is detected by liquid level sensors in the bath. If insufficient liquid is detected, more oil is pumped into the bath.	OK	**NG** Check the level of heating bath fluid and replenish it, if needed. Check the bath oil bottle.
Oil Bottle Level Status of the quantity of heating bath fluid in the bottle. Insufficient liquid is detected by a liquid level sensor in the bottle.	OK	**NG** Fill the incubation bath oil bottle with more oil. Make sure the liquid level sensors are positioned correctly.
Wash vol. Status of the water volume of the deionized water bottle. Insufficient liquid is detected by the deionized water bottle level sensor.	OK	**NG** Fill the pure-water (deionized) bottle. Deionizers produce less water at colder temperatures. If the temperature is lower than normal, a supply problem may exist. Also, check your exterior water supply to confirm that it is adequately supplying the internal water bottle.

Operating condition	Normal indicator	Abnormal indicator and corrective action
Diluent vol. Indicates the status of the liquid volume of diluent (saline solution). Insufficient liquid is detected by a liquid level sensor in the bottle.	OK	**NG** Fill the diluent bottle with 0.9% saline solution. Make sure the sensor is in the proper position.
Cuv. Wash Vol. Status of the liquid volume of cuvette wash solution. Insufficient liquid is detected by a liquid level sensor in the bottle.	OK	**NG** Fill the cuvette wash solution bottle. Make sure the sensor is in the proper position.
Cuv. Cond. Vol. Status of the liquid volume of cuvette conditioner. Insufficient liquid is detected by a liquid level sensor in the bottle.	OK	**NG** Fill the cuvette conditioner bottle. Make sure the sensor is in the proper position.
Conc.wast.tank (if installed) Status of the volume of the optional concentrated waste tank. A sensor monitors whether the tank is filled with waste.	OK	**NG** Empty the concentrated waste tank. If there is still a problem, check the tubes for obstructions.
Waste tank Status of the volume of the optional waste tank. A sensor monitors whether the tank is filled with waste.	OK	**NG** Verify that the waste tubes are free of obstructions. If the problem persists, contact your local support provider or distributor.

3. Checking the availability of the reagents and wash solutions.
   a. Visually check the system reagents.
   b. Perform a prime after replacing any system ancillary reagents.
   c. At the Operation Panel, select **Prime**.
   d. Select **PRIME 2**, then select **Execute**.
   e. Visually check the ISE reagents.
   f. Perform a prime after replacing the ISE Buffer:
      (1) At the Menu Panel, select **Maint.**, then select **ISE Operation**.
      (2) In the Times box of the Bufferprime area, type the number of prime cycles you want (**20** is recommended).
      (3) Select **Execute**.
   g. Visually check the controls and calibrators on the calibrator/control tray.
   h. Visually check the wash solutions.
   i. Visually check the lamp coolant level.
   j. Check the method reagents in the reagent trays:
      (1) At the Menu Panel, select **Reagent**, then select **Reagent Inventory**.

(2) At the Reagent Inventory window, determine if any reagents need replenishing.

(3) Replace any expired reagents.

IMPORTANT
Do not move reagent containers on RTT1 or RTT2 after a barcode scan has been performed. This can cause erroneous results.

If the operator accidentally switches barcoded reagents (R1 reagent is loaded on RTT-2 and R2 reagent is loaded on RTT-1) and performs a reagent barcode scan, and error message displays to alert the operator.

- Replace barcoded reagent containers as follows:

  1. Place the reagent container(s) in any empty position.
  2. For multiple reagent methods, place R1 on reagent tray 1, and place R2 on reagent tray 2.
  3. Load multiple containers for each reagent on one tray.

  A maximum of 8 reagents can be loaded for the same method.

- Replace nonbarcoded reagent containers as follows:

  1. Place the reagent container(s) in the same position.
  2. For multiple reagent methods, place R1 on reagent tray 1, and place R2 on reagent tray.

     You can load more than one container for each reagent. You must specify the reagent at the System Test List window.
  3. After replacing the reagent(s), you must establish the correct on-system stability.

     a. Minimize the Reagent Inventory window.

     b. At the Menu Panel, select **Reagent**, then select **Reagent Container Settings**.

     c. At the Reagent Container Settings window, locate the replaced nonbarcoded reagent.

     d. Enter the correct reagent Exp. date in the form YYYYMMDD.

     e. Select the **O** (Open) button to open the replaced reagent container and initialize the Days Remaining counter.

     NOTE
     If you replace only 1 of the reagents of a 2-reagent method and the replaced reagent has a new lot number, the system alerts you that a reagent pair **does not** exist. You should change both reagents at the same time. If the 2 reagents that you replaced have new lot numbers, you must re-calibrate the new set of reagents before you continue to run samples.

(1) At the Menu Panel, select **Reagent**, then select **Reagent Inventory**.

(2) Execute a Barcode Scan at the Reagent Inventory window.

(3) Evaluate calibration status.

4. Perform a start-up wash.

Set up of daily washes

WASH 3 or Startup wash, 26 minutes

CTT position 51	DI water (tube)
RTT1 position 50	DI water (70-mL container)
RTT2 position 50	DI water (70-mL container)

WASH 2 or Shutdown wash, 38 minutes

CTT position 15	ISE detergent (cup)
CTT position 16	DI water (tube)
CTT position 49	10% cuvette wash (tube)
CTT position 50	DI water (tube)
RTT1 position 49	10% cuvette wash (70-mL container)
RTT1 position 50	DI water (70-mL container)
RTT2 position 49	10% cuvette wash (70-mL container)
RTT2 position 50	DI water (70-mL container)

Weekly wash set up

Same as WASH 2, except replace the 10% cuvette wash with 5% reagent probe wash in both the CTT and RTT positions.

Times required to perform prime, washes, and cell blank

Typical times

Operation	Cycles	Time (minutes)
PRIME1	5	1:40
WASH1	1	9:10
WASH2	2	38
WASH3	1	26
Cell blank	NA	14

Times for combined operations during startup and shutdown

Startup

- PRIME1 + WASH3 = 28 minutes
- PRIME1 + WASH3 + Cell blank = 42 minutes

Shutdown

- WASH2 + System End + Power OFF = 39 minutes

Automatic startup

- PRIME1 + WASH3 = 28 minutes
- PRIME1 +WASH3 + Cell blank (wait for CB Temp) = 72 minutes
- PRIME1 + WASH3 + Cell blank (no wait for CB TEMP) = 42 minutes

Daily Operation

Using workorders

Using host computer workorders

1. Create the workorders at your host computer.

   Each patient sample must have a workorder that contains a sample number and at least one test request.

   NOTE

   Stop here if you do not want to download workorders manually from the host computer before operation.

   Instead, use the Automatic item select feature in the Automatic transfer area on the Online Settings window.

2. Download workorders to the chemistry system:

   a. At the Menu Panel, select **Request**, then select **Order Entry**.

   b. Select **Host request**.

   c. In the Entry format area, select the means for identifying the first workorder in step 2e.

   d. In the Last no. entry format area, select the means for identifying the last workorder in step 2f.

   e. In the Start no. box, identify the first workorder you want downloaded.

   f. In the Last no. box, identify the last workorder you want downloaded or enter the number of workorders you want downloaded.

   g. Select **Execute**.

   After the workorders are downloaded, you can manage them in the same way as the system workorders.

   If a workorder already exists for the sample, the host workorder is used. See managing host and system workorders for details.

Creating workorders at the analyzer

1. At the Menu Panel, select **Request**, then select **Order Entry**.
2. Select **Routine** or **Interr**.
3. In the Posi.no. boxes, enter the sample position number.

4. In the Samp.no. box, enter the sample identification number.
5. Verify that the System Dilution Mode, Container Type, Sample Type, Dil. factor, Sex, and Blood collection date entries are correct.
6. As needed, provide entries for Comment and Age.
7. Order tests by any of the following methods:
   - In the Test table, select each test or ratio you want to run.
   - In the Test-tbl no. box, enter the number of each test you want, then press the period (.) key.
   - In the Profiles area, select each profile you want to run.
8. To de-select all tests, select **Delete Tests**.
9. To confirm, select **Yes**.
10. To erase all entries, select **Batch Func**.
11. To confirm, select **Yes**.
12. Select **Enter**.

    The Number of workorder box increments. Automatic incrementing is assigned using the Entry Setup window. If autoincrement is on, a new workorder displays with the next sample number and position number incremented.

13. You can create another workorder or select **Exit** to leave.

If necessary, select **New** to clear the window for entry of the next workorder.

Creating multiple workorders

1. At the Menu Panel, select **Request** then select **Order Entry**.
2. Enter information for the first sample:

   NOTE

   Enter only those items you want replicated.

   a. Select New located above the Enter.

   b. Select Routine or Interr.

   c. In the Posi.no. boxes, enter the starting sample position number (Tray and Cup numbers).

   d. In the Samp.no. box, enter the starting sample identification number.

   e. Verify that the System Dilution Mode, Container type, Sample type, Dil. factor, Sex, and Blood collection date entries are correct.

   f. As needed, provide entries for Comment and Age.

   g. Order tests by any of the following methods:

      - In the Test table, select each test or ratio you want to run.
      - In the Test-tbl no. box, enter the number of the test you want followed by a period (.).
      - In the Profiles area, select each profile you want to run.

3. Select **Batch Entry**.
4. Select **Samp.no.**, **Posi.no**., or **Batch entry** button, then enter corresponding information in the selected box.
5. Select **Execute**.

NOTE
The Posi.no. and Samp.no. fields increment by the number of workorders requested from Batch Entry.

Deleting or changing test selectivity for multiple workorders

1. At the Menu Panel, select **Request** then select **Order Entry**.
2. Select **Batch Func**.
3. Perform any of the following tasks at the window:
   - To erase workorders, select **Delete workorder**.
   - To change the test selectivity, select **Test correct**.
4. In the Entry format area, select the means of identifying the first workorder in step 6.
5. In the Last no. entry format area, select the means of determining the last workorder in step 7.
6. In the Start no. box, identify the first workorder you want changed.
7. In the Last no. box, identify the last workorder you want changed or type the number of workorders you want changed.
8. If Testcorrect was selected in step 3, select **Test Table**.
   - To add a test, select it.
     The check mark must appear bold.
   - To delete a test, double-select it. The check mark must appear dim.
9. Select **Return**.
10. Select **Execute**.

Creating a profile

1. At the Menu Panel, select **Request**, then select **Order Entry**.
2. Select **Create Profile**.
3. In the Profile set no. box, enter the profile number (1 to 150).
4. In the Comment box, enter appropriate text.

   Because the first 8 characters are used to identify the profile on the Order Entry window, you can use these characters for the profile name, and the remaining space for any additional information.

5. Select **Test table**.
6. Select each test you want in the profile, then select **Return**.

   Select buttons below the Test table to get more tests.

7. Select **Execute**.

Creating a load list

NOTE
A load list contains only workorders that have position numbers. To include workorders currently without position numbers, use Creating List.

1. At the Menu Panel, select **Request**, then select **Order Entry**.
2. Select **Create List**.
3. Select **All** or, if you want to specify a range of position numbers, select **Posi.no**.
4. If you selected **Posi.no.**, define the tray and cup position.
   a. In the Last no. entry format area, select the means of determining the last sample in step 4c.
   b. In the Start no. box, enter the position number for the first sample in the load list.
   c. In the Last no. box, enter the position number for the last sample in the load list or type the number of samples you want in the load list.
5. Select **Execute**.

   The system creates the load list and displays it at the **Worksheet** window.

6. To print the load list, select **Print**.

Loading patient samples

Loading patient samples on the STT

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

LASER WARNING

Do not stare into the beam.

NOTES

- Before starting a run, you must load control and calibrator samples on the onboard sampler.
- To load patient samples while the system is sampling, select the SMP Pause button at the Operation Panel or on the analyzer.

1. Remove the sample tray evaporation cover.
2. Remove any completed samples and dispose of them in accordance with laboratory procedure.
3. Make sure that on the Operation Panel, the Load Status Indicator line is green and that SAMPLE LOAD OK displays
4. Load samples while the sample tray is in the sampler, or remove the tray.

   To remove the sample tray, release the safety latches at position numbers 49 and 70, then grasp the sample tray by its handles and lift it out of the sampler well.

5. Loading the samples.

   a. When using barcode labels:

      - Clean and properly position barcode labels on the sample tube.
      - Make labels face outward and visible through the slot in the sample-tube holder.
      - Labels on tubes loaded in the inner ring (positions 43 through 84) must be visible between the sample-tube holders in the outside ring.

   b. When not using barcode labels, you must load each sample into the sample position number entered on the workorder.

   c. Load sample cups into a plastic adapter.

      This adapter can hold two cup sizes. If the cup does not fit, remove the adapter and try the other end.

   d. Using barcode labels with a sample cup, insert the sample cup into a sample tube that has the correct label.

   You can use Ezee Nest cups in primary sample tubes.

CAUTION

Make sure that all sample containers (including tube-cup combinations) are defined at the System Specification Settings window to avoid probe crashes.

6. Replace the sample tray if it was removed in step 3 and press down on the locking pins to secure the tray.
7. Replace the sample tray evaporation cover.

CAUTION

Seat the STT cover within the two alignment pins. The dilution probe access holes must be at the back, and the arrow labels must be aligned next to each other to avoid probe crashes.

Loading patient samples on the optional universal rack handler

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

LASER WARNING

Only field personnel trained by
Siemens should access laser assemblies.

IMPORTANT

Define container types for use on either the universal rack handler (LAS) or the onboard sample tray (STT).

When you use the same sample rack on the rack handler and on an ADVIA Centaur system, select allowable tube sizes from the table below. You must use the same tube size for every tube in a rack.

Tube Type	Size	Manufacturer	Description
Ht+Sample cup Hitachi	13 x 38	Hitachi	Conical bottom in 16 x 15 round bottom holder
Small transfer	12 x 75	Various	Round bottom
Large transfer	16 x 100	Various	Round bottom

Because the aspiration positions for the rack handler and the sample tray may be at different heights, each container type must be defined separately in each sampling mode, LAS, or STT. That is, if the same container is to be used on the rack handler and the sample tray, it has to be defined as two different container types, one for LAS and one for STT. The system defaults to container set #1 when a container is not specified with the host workorder.

NOTE

If you are running patient samples on the onboard sample tray, you must load the samples before starting the run. On the optional universal rack handler, load the rack carrier on the infeed tray and push the Start/Pause switch to start the run. Control and calibrator samples must be loaded on the onboard sampler (STT).

1. If the rack handler is not turned on, set the rack handler READY/STANDBY switch to **READY**.

2. At the Windows desktop, double-select the rack handler icon.

   You must use barcode labels to identify each sample. (Position numbers cannot be used.) Properly affix each barcode label and make it visible through the slot in the rack.

Figure 2-2. Loading sample onto rack

3. Load the racks with the sample tubes and slide the loaded racks onto the rack carrier.

CAUTION

You must have a unique barcode label on each rack to avoid universal rack handler user errors.

If you use the same sample rack on the rack handler and on an ADVIA Centaur system with the same ID labels but different series numbers (2, 3, 4), the rack handler reads the barcodes as duplicate rack IDs. This can cause software errors.

4. Load racks onto the carrier.
5. Lift the carrier by the handle and place it on the infeed tray
6. Push the Start/Pause switch to start the rack handler.

CAUTION

If for any reason you must remove the carriers manually from the system, do not push the carriers back into the outfeed buffer.

When the top cover is raised and the infeed pusher arm is in the up position, avoid injury by bending over and coming into contact with the pusher arm.

7. For continuous loading of new rack carriers, push the Start/Pause switch and hold it for ten seconds until the rack handler status display reads Continuous feed.

   When the barcode reads a label, the corresponding sample indicator turns green.

   The sample indicator turns red if the sample tube is detected, but the barcode label cannot be read. If the sample tube is not detected, the sample indicator will not glow green or red.

Urgent samples and manual reruns are run from the onboard sampler (STT)

1. Verify that a workorder or rerun request exists for each STT sample.
2. At the Operation Panel, select **Pause**.

   The operation mode changes to Pause Shift, then to Pause. A short delay may occur while the analyzer changes operational states.

3. Load samples on the STT.
4. At the Operation Panel, select **Start**.
5. Complete the Start Conditions window and start the run.

   Make sure to select the **Analyze box** for the onboard sampler.

   After aspirating the STT samples, the system resumes sampling from the rack handler if racks are available, or it will enter the Watch mode while waiting for the next rack.

Starting the run

 **WARNING**

If the system was stopped using the Emergency Stop button, you must perform a Weekly wash (WASH2) prior to processing samples.

1. In the Operation Panel, select **Start**.

   The Start Conditions window displays.

2. Perform any of the following tasks on this window:
   - run calibrators and reagent baselines (RBL)
   - run control samples

   You cannot run multipoint calibrations, while you are running patient samples from the STT tray.

   Run patient samples:

   - from the STT
   - from the optional universal rack handler or external transport

3. To begin the run, select **Start**.

Running calibrators and reagent baselines (RBL)

1. Select **Multipnt.smp. Analyze**, then select **TT No. 98** or **99** to select the STT tray number.
2. Select **One-pnt.smp. Analyze**.

   You can select both calibration types.

3. Select **Ordinary calib**. or **Special calib**.
4. To remove any tests you do not want calibrated in this run, select **Temp.item select**.
5. To remove any calibrators you do not want used in this run, select **Temp.sample select**.

   To run only a reagent baseline (RBL) or blank rate, select only the blank solution.

Running control samples

1. Select **Control smp. Analyze**.
2. To remove any tests you do not want run on the controls, select **Temp.item select**.
3. To remove any controls you do not want used in this run, select **Temp.sample select**.

From STT

1. Make sure the samples are loaded.
2. In the Ordinary sample area, next to Routine smp, select **Analyze**.

   This activates other fields.

3. To specify how the samples are identified, in the Ordinary sample area, next to Analyze mode, select **Barcode** or **Cup posi.**

   If you select Barcode, the system scans the entire STT tray for barcodes.

   You can choose to scan for a single tray position or for a range of positions as follows:

   a. In the boxes to the right of Analyze, enter the range of positions you want to scan.

      For example: If you enter **50** and **60**. The system scans for barcodes within this range and will aspirate only from positions at which it found barcodes.

   b. If you want the system to aspirate sample from a specific position or specific range of positions, select **Cup posi**.

   c. Enter the tray number.

   d. In the boxes to the right of Analyze, enter the position or range of positions from where you want the system to aspirate samples.

4. Select **Temp.cup/tube select** to change container types and select samples for priority processing.

   You can select more than one position at a time and to assign the same container type to all.

5. To begin the run, select **Start**.

From the optional universal rack handler or external transport

1. Select the second **General smp. Analyze** box (below Out side analyze).
2. To begin the run, select **Start**.
3. Load the racks on the rack handler or the universal rack handler.

Running an interrupt (STAT) sample

Running an interrupt sample when sampling is in progress (START)-SMP LOAD NG

1. Download or create the sample workorder and select **Interr**. (interrupt) option on the workorder.

   NOTE

   You can also select the priority using the Cup/Tube Assign window if the sample is already on the sample tray and already has a workorder.

2. At the Operation Panel, select **Pause** to halt sampling.
3. Load the new sample on the sample tray (STT).
4. At the Operation Panel, select **Start** to resume sampling.

Running an interrupt sample when sampling has stopped (STOP)-SMP LOAD OK

1. Select Interr. (interrupt) option on the sample workorder.
2. Load the sample on the sample tray (STT).

   NOTE

   Priority can be set using workorder Interr. designation and the Cup/Tube Assign or Sample confirmation window that displays after reading the barcoded samples.

3. To begin sampling, at the Operation Panel, select **Start**.

Monitoring an analysis while it is running

1. At the Menu Panel, select **Request**, then select **Test Result Monitor**.
2. Monitor any of the following at this window:
   - processing status
   - sample information and system status
   - result data information

   When the run is complete, the operating mode display becomes END, then returns to READY if you ran the samples from the STT. The system returns to WAIT if you ran samples from the rack handler or lab automation system.

3. Close the window.

Processing status

The center of the window resembles the sample tray. The outer ring is the STT tray and the inner ring is the CTT tray. Each tray position is a circle.

As the run continues, the circles containing samples change color. The colors indicate the current status of each sample. The color codes are displayed at the lower-left of the window.

For additional information about the color codes see page 44.

Sample information and system status

The button bar at the top of the window displays the Sample Search and Rack or LAS. Sample Info. buttons.

- Select **Sample Search** to display a dialog box where you can search for sample information by sample number by STT position (tray number and sample position), or by rack/LAS position (rack number and sample position).

  The search returns a Sample Information window showing the sample number, position number, sample status, and the time remaining to complete the analysis of the sample.
- If a rack handler or laboratory automation system (LAS) is in use, select the **Rack** or **LAS. Sample Info.** button to display the following sample information in the Rack or LAS. Sample Information window:
  - Sample barcode number.
  - Sample status (see the status codes listed on the Test Result Monitor window).
  - The time remaining to complete the processing of the sample.

  NOTE

  If processing has completed or if there are no samples available for processing when you select the Rack or LAS. Sample Info. button, the system displays a message that no sample information is available.

The left side of the Test Result Monitor window displays three panels.

- The System Status panel shows the current operating mode of the system.
- The Sample information panel shows the sample number and sample position of the currently selected position on the STT/CTT graphic. If this is a barcode analysis, the barcode number displays, and the position number is 0-00.
- The code panel shows the color codes used in the STT/CTT graphic to represent sample status.

In the middle of the sample tray display, the tray (TT) number for the current run displays in the TT No. list box. If this is a barcode analysis, the TT number is 0.

To view the status of prior tray samples that are still in process, select the down arrow of the TT No. list box, then select the number of the tray you want to view.

Monitoring samples loaded on the optional universal rack handler

1. At the universal rack handler Operation Panel window, select **View** on the menu bar, then select **Rack Handler Operation Monitor** or press **F8**.

   Perform any of the following tasks at the Rack Handler Operation Monitor window:

   - follow the progress of each rack through the rack handler
   - locate racks that contain sample tubes with non-read labels
   - find a specific rack or tube currently on the rack handler
   - skip un-sampled racks
   - clear rack ID numbers where non-read ID samples occurs
   - edit non-read tube IDs

   Perform the following tasks at the universal rack handler:

- enter a sample ID for non-read labels at the Edit Non-Read Tube ID window
- obtain a summary of the current rack handler activity at the Data Monitor window
- view and print all the racks/samples processed by the rack handler on a day-by-day basis at the Review Data window

2. Use the Review/Edit window on the ADVIA software to determine when results are available.

Using the Sample Log

1. At the Menu Panel, select **Request**, then select **Sample Log**.
2. Perform any of the following tasks at this window:
   - view the sample log entries
   - search the sample log
   - delete a specific sample log entry
   - delete all sample log entries
   - print a list of the sample log entries
   - export the sample log entries
3. Close the window.

Viewing the sample log entries

1. In the list box, select the file containing the sample log entries you want displayed.

   The file for the current day is selected automatically.

2. Select the types of sample entries you want to display:
   - Select **ALL** to view all sample entries.
   - Select **Routine/Ctl** to view patient and control sample entries.
   - Select **Routine Only** to view patient sample entries.

   The following information is provided for each sample log entry:

Asp Date and Time	External	Type
STT	SampleID	Rerun
CTT	Description	Results

3. To view entries for recently aspirated samples, select **Update**.

Searching the sample log

1. Select the search condition(s) you want and enter the applicable information:

   Sample ID: Enter the sample identification. Search is case sensitive (C0101 is not the same as c0101).

   Asp. Date: Enter the aspiration date using the format YYYYMMDD where YYYY is the year (2006), MM is the month (01 to 12), and DD is the day (01 to 31).

Asp. Time: Enter the aspiration time using the format HH:MM:SS where HH is the hour (00 to 24), MM are the minutes (00 to 60), and SS are the seconds (00 to 60). You can enter an approximate aspiration time (for example, 14:00:00), but the time entry must be complete (that is, 14:00 causes an error, it should be 14:00:00).

2. Select **Execute**.

Deleting a specific sample log entry

1. Select the sample log entry you want to delete.
2. Select **Clear**.
3. To confirm, select **Yes**.

Deleting all sample log entries

1. Select **All Clear**.
2. When the All Clear dialog box opens, do one of the following:
   - If you want to delete all entries for a specific day, select **Day**.

     In the list box, select the file containing the sample log entries you want to delete. The file for the current day is selected automatically.
   - If you want to delete the entire sample log, select **All**.
3. Select **OK**.
4. To confirm, select **Yes**.

Printing a list of the sample log entries

1. At the File menu, select **Print Setup**.
2. Verify that all printing options are correct, then select OK.
3. Select **Print Log Summary**.
4. Verify that the aspiration dates and times represent the range of sample log entries you want printed.

   Change an aspiration date using the format YYYYMMDD where YYYY is the year (2006), MM is the month (01 to 12), and DD is the day (01 to 31).

   Change an aspiration time using the format HH:MM:SS where HH is the hour (00 to 24), MM are the minutes (00 to 60), and SS are the seconds (00 to 60).

5. Select **Print**.

Exporting the sample log entries

You can export the current sample log file in ASCII format for use by another program such as Microsoft Excel.

1. At the File menu, select **Export**.
2. Select or create the folder in which you want to save the file.
3. In the File name box, type the file name you want.

   The sample log file name is entered by default.

4. In the Save as type list, select the file format.

   The CSV (comma separated values) file format is selected by default.

5. In the Deliminator list, select the character used to separate sample log data items.
6. Select **Save**.

Reviewing the calibration results

- Use the View Calibration Curve window to review the calibration details for photometric methods.
- Use the ISE Monitor to review the calibration details for electrolyte methods.

See Checking ISE Calibration for information about the criteria used to accept or reject the ISE calibration.

Reviewing the sample results

Sample results can be reviewed on and report from the RealTime Monitor and Review/Edit windows.

Reporting results

The system prints calibration, control, and patient sample results. Only patient and control sample results are transmitted to a host computer.

Results are reported automatically as the sample analysis is complete and results become available, or the operator can manually select results to report in batches.

Real-time reporting

- During operation, the System set area of the System Monitor window manages the printing of the sample results (usually for laboratory purposes).
- The Automatic transfer area of the Online Settings window manages the real-time transmission of the control and patient samples to a host computer.
- Use the Data Clean feature of the Online Settings window to prevent the transmission of questionable sample results. The Transfer Results List dialog box of the Review/Edit window indicates which samples failed this data check and were not transmitted.

Batch transmission to a host computer

Use the Review/Edit window to transmit selected patient results. The data clean feature is available to check the sample results for problems.

Printing sample data

The Print report window is only available from the supervisor logon. To print reports, go to the Review/Edit window and use the Print report button.

CAUTION

Tests on the Print Report form must be in the same order as they appear at the System Test List window, to avoid incorrect positioning of results on the print report. Do not modify the order of the test names at the System Test list window after the initial setup. Any repositioning of test names on the System Test list window could result in associating already-run tests with the wrong test name.

1. At the Menu Panel, select **Request**, then select **Review/Edit**.
2. At the Review/Edit window, select the **Print Report** button.
3. At the Print Report window, select a Sample Type(T) and File Data(F).
   a. If you select Archive in the File Data (F) field, the Filing File Name (I) field is activated.
   b. Select the **Open** button.
   c. Select a file name at the Open window.
4. In the Specification range (R) field, select the **arrow** in the field and select **Input Range** or **All** from the list.
5. In the Number entry format (N) field, select the **arrow** in the field and select a format from the list.
6. In the Last no. entry format (E) field, select the **arrow** in the field and select a format from the list.
7. In the Report Form File (O) field, select a print format for the report.
   a. Select the **Op**en button.

      The Open window displays, defaulting to the ETC folder.

      Two sample report formats are available:

      - the Chart.frm file is formatted for a single sample.
      - the Consoled.frm file is formatted for multiple samples.

      Customer defined print formats also display in the folder.
   b. At the Open window, select a file name for the report format.
   c. Select **Open**.
8. Enter a start number in the Start number (S) field and a last number in the Last number (L) field.

9. To print the report, select the **Print** button.
10. Close the window.

Batch Printing

Use the Review/Edit or Print Report windows to print selected patient results.

The Print Format Settings window can create up to ten report layouts.

Shutting down the ADVIA Chemistry system

NOTE
When an automatic shutdown is performed, a "1903 system error ... Shut down the system and reboot it." message is generated to the system log. Ignore this message.

1. At the System(S) drop-down list of the Menu Panel, select **Exit**.
2. When the confirmation message box displays, select **Yes**.
3. When the second confirmation message box displays, select **Yes**.

   After a brief delay, the Startup window displays.
4. Select **Shutdown**.

   After a brief delay, the message box opens to allow you to turn off the computer.
5. At the power panel, set the Operate/Standby switch (**1**) to **Standby**.

   The power indicator (**2**) is off.

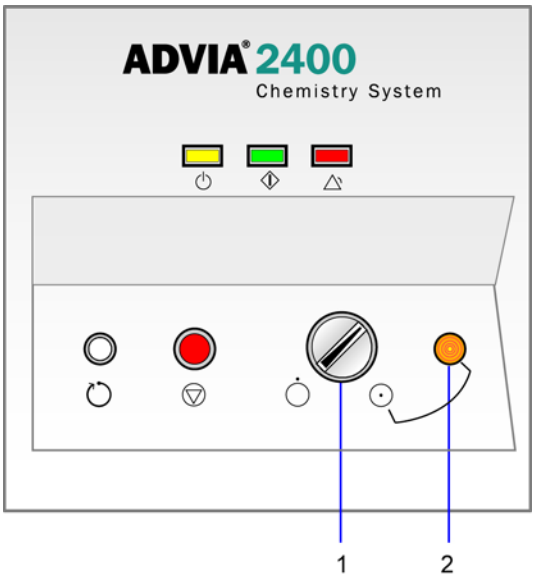

Figure 2-3. Power panel at Shut down

Examples of shutdown settings

The following examples demonstrate some common scenarios that you can implement with the Shutdown Set feature of the System Startup/Shutdown Settings window.

System available during the night

To have both the computer and analyzer available for night emergencies, use the following:

System p.s.	Power OFF check box is cleared (no check mark).
System	Select **Not do**.
PRIME	Select **None**.
WASH1	Do check box is cleared (no check mark).
WASH2	Do check box is selected (check mark present).
WASH3	Do check box is cleared (no check mark).

Automatic startup from the Sleep state

In the Sleep state, the Power Panel Operate/Standby switch (**1**) remains set to **OPERATE**. However, electrical power is supplied only to the necessary components, and the Power indicator (**2**) is off.

To place system in the SLEEP state, use the following:

System p.s.	Power OFF check box is selected (check mark present).
System	Select **System end**.
PRIME	Select **None**.
WASH1	Do check box is cleared (no check mark).
WASH2	Do check box is selected (check mark present).
WASH3	Do check box is cleared (no check mark).

Automatic startup with analyzer power kept ON

To keep analyzer power on until the automatic start up, use the following:

System p.s.	Power OFF check box is cleared (no check mark).
System	Select **Not do**.
PRIME	Select **None**.
WASH1	Do check box is cleared (no check mark).
WASH2	Do check box is selected (check mark present).
WASH3	Do check box is cleared (no check mark).

NOTE
If System is set to Not do, you must select **System end** in the System list before the automatic startup setting time occurs. Otherwise, the automatic startup does not occur.

In this case, you cannot shut down Windows even if you select **Shutdown** on the [ADVIA] Startup window. Additionally, the CRT screen saver does not operate.

Performing a system-assisted shutdown (Shutdown set)

1. Verify that sufficient system reagents and wash solutions are available for the startup you want to run.
2. At the Menu Panel, select **Maint.**, then select **System Startup/Shutdown Settings**.
3. In the Mode set list, select **Shutdown set**.
4. Verify the selections for the shutdown you want to run.

   If no shutdown is defined or you want to change an existing one, proceed as follows:

   a. For each of the Proc. set, Set1, Set2, or Set3, you can select one of the following:

      (1) In the System p.s. area, if you want the system to turn off analyzer power after the shutdown is completed, check the box next to Power OFF.

      (2) In the System end area, select the software shutdown mode you want.

      (3) In the PRIME area, select the prime you want to run or select **NONE**.

      A Prime is required only if a system reagent is replenished or a related component is replaced.

      (4) Select the check box next to each wash you want to perform.

      Select **WASH2** for the shutdown wash.

   b. Select **Save**.

   c. To confirm, select **Yes**.

5. In the Select wash routine area, select **Shutdown**.
6. In the Proc.set list, select the shutdown setting (Set1, Set2, or Set3) you want to run.
7. Verify that the system is in Ready mode.
8. In the Start selected routine area, select **Yes**.

   The current operating mode displays in the System mode box, and the time remaining to complete the shutdown displays in the Time until end box.

9. To halt the shutdown, do the following:

   a. At the System Startup/Shutdown Settings window, select **Stop**.

   b. In the Start instructions area, select **Cancel**.

   c. At the Operation Panel, select **Stop**.

NOTE
To avoid entering the Wait state and not shutting down properly, **do not use** the **Exit** command from the System(S) menu on the Menu Panel.

Additional Operating Instructions

To avoid errors or interruptions during operation, please read the following before using the Chemistry System.

Switching Process Sequence and System Test List numbers

To avoid having quality control data reported for the wrong tests, **do not switch Process Sequence Numbers** after control results have been accumulated. Patient results are also affected.

To avoid incorrect reporting of results at the Review and Edit, the Daily QC windows, and the Print Report form, **you must not modify the order of the test items** at the System Test List window after initial setup. If you reposition any test items at the System Test List window, results for samples already run could be associated with the wrong test name.

Loading the reagent trays

CAUTION

Make sure that each reagent container (wedge) is loaded on the correct reagent tray to avoid erroneous results when using reagent containers without a barcode. Reagent Tray 1 (RTT-1) is the front tray, while Reagent Tray 2 (RTT-2) is the rear tray.

The operator is alerted to this problem by the QC results.

Corrective action is to reload the reagents on the correct trays.

Updating the Cumulative QC

Update the QC Cumulative window before more than 200 daily control samples are run.

The QC Daily Precision Control window can manage a maximum of 200 results for each control product (level). If an additional control sample is run, the current 200th result (Px200) is overwritten by the new control result. Similarly, if multiple repetitions of a control are requested, the system aspirates only one sample and its result replaces the existing 200th result (Px200).

To avoid losing control results, you must perform a "QC cumulative save" at the QC Daily Precision Control window at the end of each day, and perform a New Start when the system is turned on the next day.

Do not update the QC Cumulative window more than once each day.

If you return to the QC Daily Precision Control window after performing a "QC cumulative save," you must not perform another update.

Specifically, **you must not select Yes** when prompted by "Add daily data to QC cumulative data." If Yes is selected and there is no daily control data available, the cumulative data point will be deleted for the day and no additional control data can be saved for the day.

Running automatic calibration

Controls requested at the Start Conditions window are run before the automatic calibration samples.

You can use the Auto Calibration Setting dialog box at the Calibration Setup window to request automatic calibration after a specific time interval or after a new reagent container is loaded. If the calibration interval expires while the system is not running samples, the automatic calibration is performed at the beginning of the next run.

However, if the calibration interval has expired and controls are requested at the Start Conditions window, the controls are run before the automatic calibration.

At the start of a run, calibration and control samples are run using the following priority order:

1. Manual calibrations requested at the Start Conditions window
2. Manual controls requested at the Start Conditions window
3. Automatic calibrations requested on the Auto Calibration Setting dialog box
4. Automatic controls requested on the Auto Control Setting dialog box

Using multiple reagent containers for the same test

You can use multiple, barcode-labeled reagent containers for the same test by loading the reagent containers on Reagent Tray 1 (RTT-1) or Reagent Tray 2 (RTT-2).

After the reagent barcode labels are read, the reagent container with the lowest reagent tray number for each test is used first. If that reagent container is empty, the reagent container with the next lowest reagent tray number is used.

Before performing a reagent barcode read or a reagent reset, you should remove any empty reagent containers from the reagent tray.

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3 Calibration

Calibration overview

When to calibrate

Refer to the ADVIA Chemistry system methods documentation for the calibration and the reagent blank/rate recommendations.

Setting up the calibration

- Use the Calibration Setup window to set up calibration for the photometric methods.
- Absolute and single-point calibration samples are aspirated from the calibrator/control tray (CTT), while multipoint calibration samples are aspirated from the sample tray (STT). The blank solution (water) used to run the reagent blanks/rates is typically assigned to CTT-1.
- For IgA, IgG, and IgM methods only: Use the Multi-Standards Set Calculator to determine standard values. Refer to the IgA, IgG, and IgM method sheets for instructions about setting standard values and calibrator handling and preparation.

  NOTE

  If you are running IgA_2, IgG_2, or IgM_2, this does not apply.
- For multi-point calibration methods, simplified calibration is available after a valid multi-point calibration is performed.
- Use the ISE Parameter Settings window to set up calibration for the electrolyte methods.

  ISE Calibration samples are aspirated from the calibrator/control tray (CTT):

  serum - low cal, CTT-11; high cal, CTT-12

  urine - low cal, CTT-13; high cal, CTT-14

Entering absolute or single-point (STD) calibration methods

1. At the Calibration Setup window, in the Proc. Test No. list area, locate the applicable method.
2. In the Blk posi. Box for the method, enter the cup position for the blank solution on the calibrator/control tray (CTT).
3. In the STD posi. Box, enter the cup position for the calibrator on the calibrator/control tray (CTT).
4. In the Coeff (FV) box, enter the applicable value.

NOTE

Do not enter the factor values in the View Calibration Curve window at this time. These values may not be saved. Instead, enter the factor values at the Calibration Setup window.

5. Select **Ctrl/Cal Setup**.
6. Locate the cup positions occupied by the blank solution and the calibrator.
7. For each item, do the following:
   a. At the container Type, select the correct tube or sample cup.
   b. In the Meas. Times box, enter the number of aspirations you want taken.
   c. In the Comment box, enter the applicable text that describes the blank or calibrator.
   d. Close the winnow.
8. At the window button menu, select **Save**.
9. To confirm, select **Yes**.

Entering multi-standard calibration methods

1. At the Calibration Setup window, in the Proc. Test No. list area, locate the applicable method.

   Multipoint calibration methods are identified by a Setting button in the MSTD column of the Procec.test no. list.

2. To view the Multi Standard Setup window, select **Setting**.
3. In the TT no. area, select **98** or **99**.
4. In the Posi. Box of the Blank row, enter the cup position for the blank solution.
5. For each standard do the following:
   a. Using the information in the calibrator package insert, enter the Lot No., Lot Name, and Exp. Date.
   b. In the Posi. box, enter the cup position of the standard.

      This is the location of the calibrator on the tray.

   c. In the Coeff (FV) box, enter the analyte concentration in the standard.

      You can get this information from the calibrator package insert or calculate the value using the standard calculator available on the Method Directory. This directory may already be loaded with the Operator's Guide. From the table of contents on your left, select **Methods**, then select **Methods Directory**.

      NOTE

      Do not enter the factor values in the View Calibration Curve window at this time. These values may not be saved. Instead, enter the factor values in the Calibration Setup window.

   d. Select **Return**.
   e. At the Calibration Setup window, select **Save**.

How to calibrate a multi-standard method

1. At the Analytical Parameter (Chemistry) window, in the Standard Setting area, select **Multipoint Cal Setting**.
2. When the Multi-Standards Set window opens, verify that all the parameter information is already pre-defined.
3. If this is not the case, enter method-specific values from the method's parameter sheet.

   NOTE

   The parameters for each method are available on the Method Directory. This directory may already be loaded with the Operator's Guide. From the table of contents on your left, select **Methods**, then select **Methods Directory**.
4. Add the test name to the System Test List window.
5. Add the test to the Process Sequence window.
6. At the Calibration Setup window, select **Setting** and enter the multi-standard calibration information into the Multi Standard Setup window.
7. Select **Return**.
8. At the Calibration Setup window, select **Save** before continuing.
9. At the Calibration Setup window, select **Ctrl/Cal Setup** and define Meas.time and Container Type.
10. Select **Save**.
11. At the Test Select window, select the test.
12. At the Sample Select window, select the calibrators.

Running calibration

- Use the Start Conditions window to request a calibration run. If needed, you can run the calibration samples followed by controls and patient samples as appropriate. You can limit calibration to selected calibration samples or to selected methods.

  For example, if you want to run only a reagent blank or blank rate, select only the blank solution.
- The Ordinary calibration meas. list at the Test Select window determines which tests are available to calibrate. The Sample Select window determines which calibrators are available.
- Use the ISE Operation window to manually request an ISE calibration for maintenance or troubleshooting purposes.
- Use the Calibration Setup window to automatically perform calibration after a user-specified time interval.
- The Auto calibration meas. and Auto calib. control samp. meas. lists on the Test Select window determine which tests are available for calibration and control, respectively. The Sample Select window determines which calibrators and controls are available.

Reviewing the calibration

NOTE
For detailed information on how to use the View Calibration Curve and ISE Monitor windows, refer to the online Operator's Guide.

- Use the View Calibration Curve window to review the calibration of photometric methods.
- Use the ISE Monitor window to review the calibration of electrolyte methods.

Calibration/RBL History Window

Use the Calibration/RBL History window to review the calibration history for all methods that are run at the system and to create CSV files.

1. At the Menu Panel, select **Calibration**, then select **Calibration/RBL History**.
2. To print a Calibration/RBL History, select **Print**.
3. Customizing data that is displayed
   a. Select **Select**.
   b. In the Test Name field, select the type of test, then select the test name below.

      NOTE
      To view the calibration history for all photometric methods in a specific date range, select **Photometric** from the Test Name drop down menu.

   c. Enter a Start Date.
   d. Enter an End Date.
   e. Select **Search**.

      The results are displayed.
4. Creating a CSV file:
   a. Customize the data displayed at the Calibration/RBL History window.
   b. To create a CSV file, select Create CSV.
   c. Browse and select a folder where you want to save the CSV file.
   d. Select **Save**.
   e. To print a Calibration/RBL History, select **Print**.
   f. Close the window.

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4 Quality Control

Quality control overview

When to run control samples

Refer to the ADVIA Chemistry system methods documentation for the quality control recommendations.

Setting up quality control

- Use the QC Sample Definition window to define each of the 26 controls that can reside on the calibrator/control tray (CTT).
- Use the Control Data Setup window to enter the control average and standard deviation (SD) data for each control.

Running the control samples

- Use the Start Conditions window to request control samples. You can run control samples alone, after calibration, or before patient samples. You can request to run only specific control samples or selected methods.
- The Ordinary control samp. meas. list on the Test Select window determines which tests are available to run. The Sample Select window determines which controls are available.
- Use the QC Sample Definition window to automatically run controls after a specified number of assays.
- The Auto control samp. meas. list on the Test Select window determines which tests are available to run. The Sample Select window determines which controls are available.

ADVIA QC window

Use this window to view both real-time and long term evaluation of analyzer and method performance.

Perform any of the following tasks at this window:

- collect control results.
- calculate and display statistical data.
- assess data errors.
- identify QC violations.
- review control results.
- create printed reports.
- identify and report events such as lot changes and calibration dates.

1. At the Menu Panel, select **QC** then select **ADVIA QC**.

Reviewing the control results at different windows

In addition to the ADVIA QC you can use the following windows for reviewing QC:

- Use the Real-Time QC window to review control performance during the day.
- Use the Daily Precision Control window to review the control results at the end of the day, and then to update the cumulative statistics.
- Use the QC Cumulative window to evaluate long-term trends in control performance.

If control results fail to meet the laboratory's established criteria for acceptability, re-evaluate all patient test results obtained in the unacceptable test run to determine if patient test results were adversely affected.

The laboratory should take and document appropriate corrective actions, which may include recalibration, before reporting patient results.

Verify that the controls and reagents were prepared properly and have not expired.

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5 Maintenance

Maintenance schedule

Perform maintenance procedures at the recommended frequency to maintain the operating efficiency of your analyzer. Procedures marked with an * may require more frequent performance (described in each procedure).

WARNING

The maintenance procedures described in this document are to be performed ONLY by Siemens-trained users. Some of these procedures require the top cover be opened and the probe splash shields removed, exposing the user to biohazard materials and moving parts.

CAUTION

To avoid reporting faulty data, deterioration of reproducibility, or damage to the ISE module and its parts, follow the precautions listed below:

- Immediately clean up any spills or leaks. Repair the source of leaks.
- Do not leave the chloride electrode wet pack open. The electrode dries and becomes inactive.
- Always condition electrodes before first use.

Daily

Clean the probes.
Clean the mixing rods.
Check reagents and system solutions.
Clean the reaction and dilution cuvette washers.
Inspect the cuvette splash covers
Inspect the probe wash cups
Inspect the pumps.
Wipe condensation from the reagent trays.
Perform startup wash.
Perform shutdown or modified shutdown wash.*****
Perform additional ISE wash.*****
Record ISE slopes

Weekly

Perform the weekly wash.*****
Check the lamp coolant level.
Perform lamp energy check.
Perform cuvette blank (cell blank) measurement.
Clean the exterior analyzer panels.

Monthly

Clean the turntable interiors.
Clean or replace reagent containers (47-50).
Clean the dilution bottle.
Clean the cuvette wash bottle.
Clean the chiller filter.

Every 2 Months

Clean the dilution tray cuvettes.
Clean and replenish the cuvette conditioner bottle.

Every 3 Months

Replace the lamp.
Wash the ISE electrode lines.*****

Every 4 Months

Clean the ancillary reagent bottle filters.
Clean the pure-water bottle filters.
Replace the reaction and dilution cuvettes.

As required

Back up system files.
Replace probes.
Replenish the RRV-bath oil bottle.
Perform preventive cleaning of the wash station lines.
Wash all ISE lines (if contaminated).
Condition the ISE electrodes.
Replace ISE electrodes.
Clean the ISE dilution bowl and waste nozzle.
Recover from a power failure.

Daily maintenance

Inspecting and cleaning the probes

Materials required:

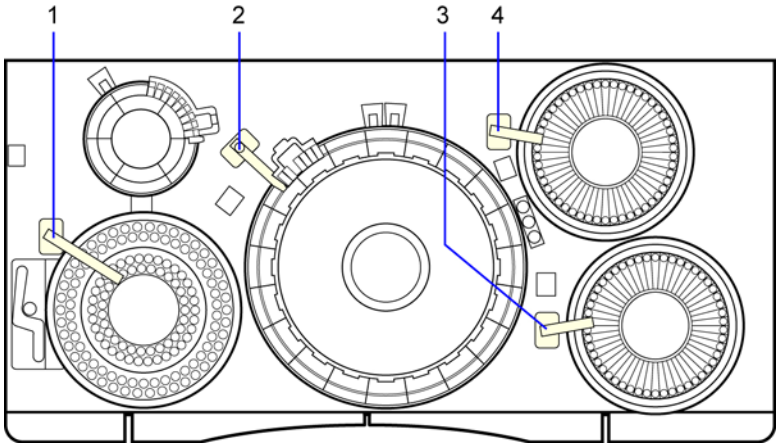
- Phillips screwdriver
- Alcohol prep pad or lint-free towels and 5% bleach solution

Time: 10 minutes
Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

1. Visually inspect each probe daily.



1 Dilution Probe (DPP)
2 Sample Probe (SPP)
3 Reagent Probe 1 (RPP1)
4 Reagent Probe 2 (RPP2)

Figure 5-1 Location of probes

- Replace any clogged probes. See *Replacing the Probes* in the online Operator's Guide.
- Clean all probes daily (proceed to step 2).

TIP

Perform the Shutdown Wash and Weekly Wash as scheduled, to prevent the probes from clogging.

2. Clean each probe using one of the 3 methods described below:

Cleaning the probes using automatic advance probe motion

1. At the Menu Panel, select **Maint**, then select **Manual Operation**.
2. At the Manual Operation window, double-select the **code** for the probe you want to move as follows:

Probe	Code
dilution probe	3.DPPLR
sample probe	16.SPPLR
Reagent probe 1	37.RPPLR-1
Reagent probe 2	49.RPPLR-2

3. Select **Move** the number of times necessary to move the probe to the accessible location, then select **Exit** to close the probe window.

Probe	Accessible Location
Dilution probe (DPP)	Over the sample tray (STT) OR over the ISE
Sample probe (SPP)	Over the dilution tray (DTT)
Reagent probe 1 (RPP1)	Over reagent tray 1 (RTT1)
Reagent probe 2 (RPP2)	Over reagent tray 2 (RTT2)

4. Place a lint-free towel under the probe.
5. Using prep pads or lint-free towels and 5% bleach solution, wipe the probe, then wipe with water.

CAUTION

To avoid bending the probes, do not use excessive force while cleaning,.

NOTE

Verify that the probe ends do not contain any imperfections, which could cause contamination. Replace probes as necessary. Refer to the online Operator's Guide for this procedure.

6. Close the Manual Operation window, then select **Yes** when prompted.
7. At the Operation Panel, select **Initialize** to return all probes to the home position (over the wash cups).
8. After cleaning, ensure that no threads or fibers are left on the probes.
9. Verify the analyzer mode is READY before performing any further actions.

Cleaning the probes using manual probe motion

1. Put the system in Standby mode.

CAUTION

If you are performing this procedure with the power off, manually support (lift) the probe to avoid damaging the probe tip. Be careful not to strike the probe against other components on the analyzer.

2. Lift and manually rotate the probe arm to an accessible location.

   The movement may feel a bit awkward and tight.

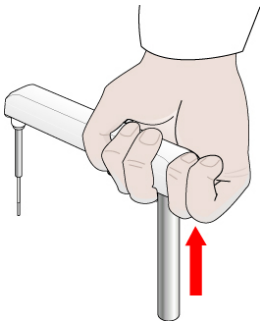


Figure 5-2. Manually adjusting probe

Probe	Accessible Location
Dilution probe (DPP)	Over the sample tray (STT) OR over the ISE
Sample probe (SPP)	Over the dilution tray (DTT)
Reagent probe 1 (RPP1)	Over reagent tray 1 (RTT1)
Reagent probe 2 (RPP2)	Over reagent tray 2 (RTT2)

3. Place a lint-free towel under the probe.
4. Wipe the probe with prep pads, then wipe3 with water.

 **CAUTION**

To avoid bending the probes, do not use excessive force while cleaning .

5. Manually move the probe in position over the probe wash cup but not into the wash port.
6. At the Operation Panel, select Initialize to return all probes to the home position (over the wash cups).
7. Ensure that no threads or fibers are left on the probes.
8. Verify the analyzer mode is READY before performing any further actions.

Probe cleaning procedure (optional method)

IMPORTANT

You can use this procedure only after you remove the wash covers.

1. Select **Maint**.
2. Select **User Maintenance**.
3. At the User Maintenance window, in the Position Probe for Routine Cleaning area, select **Start**, then select **Yes** when prompted.
4. Wipe the probe with prep pads or lint-free towels and 5% bleach solution.

5. Check the alignment of the probe to the cuvette.

   If the probe is not centered over the cuvette, call your local technical support provider or distributor.

6. Close the User Maintenance window, then select **Yes** when prompted.
7. At the Operation Panel, select **Initialize** to return all probes to the home position (over the wash cups).
8. Verify that the analyzer mode is READY, before performing any further actions.

Inspecting and cleaning the mixing rods and mixer wash cups

Materials required:

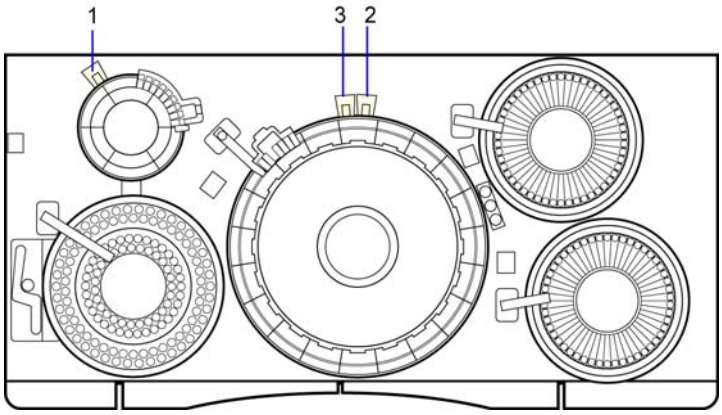
- Lint-free towel
- Deionized water
- Cotton-tipped applicators

Time: 5 minutes

Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.



1 Dilution Mixer
2 Reagent Mixer1
3 Reagent Mixer2

Figure 5-3. Mixing rods

1. Visually inspect each mixing rod and mixer wash cup for cleanliness.
2. Clean any dirty mixing rods or wash cups to avoid contamination of the mixers, which results in carryover:

   a. With the instrument in the READY state, visually verify each mixing rod is at its upper limit.

   b. Using lint-free towels moistened with deionized water, wipe the mixing rod.

CAUTION

Do not use excessive force while cleaning, to avoid bending the mixing rods.

3. Inspect the mixing wash cups for cleanliness, then clean if dirty:

   a. Pour deionized water into the mixer wash cup.

b. With lint-free towels and cotton-tipped applicators, clean the mixer wash cup.

CAUTION

Do not apply excessive force while cleaning, to avoid damaging the sensor.

4. Ensure that no threads or fibers are left on the mixing rods after cleaning.

   NOTE

   If an overflow error message displays, water is probably on the sensor. Dry the sensor.

   To clear the alarm message, on the Operation Panel, select the alarm icon.

Checking reagents and system solutions

Refer to page 73, *Checking the availability of the reagents and wash solutions*, in the Operating the System section in this manual or, for more detail, refer to the online Operator's Guide.

Inspecting and cleaning the reaction (WUD) and dilution (DWUD) cuvette washers

Materials required:

- Lint-free towel
- Alcohol prep pads or lint-free towels and 5% bleach solution
- 4-mm hex wrench

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 10 minutes

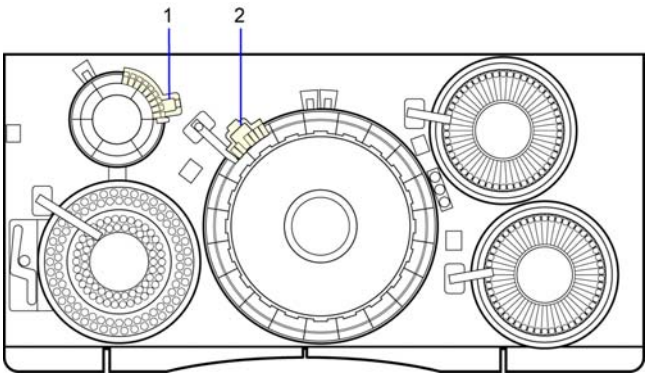
Analyzer mode: READY

1. Inspect the exterior of the reaction cuvette washer (WUD) and dilution cuvette washer (DWUD) tubing for cleanliness.
2. Check the WUD and DWUD for leaks.

   TIP

   Perform this inspection in addition to the startup, shutdown, and weekly washes, to keep the WUD and DWUD from clogging.

   In the event of a clog, call your local technical support provider or distributor for assistance.



1 Dilution Cuvette Wash Station (DWUD)

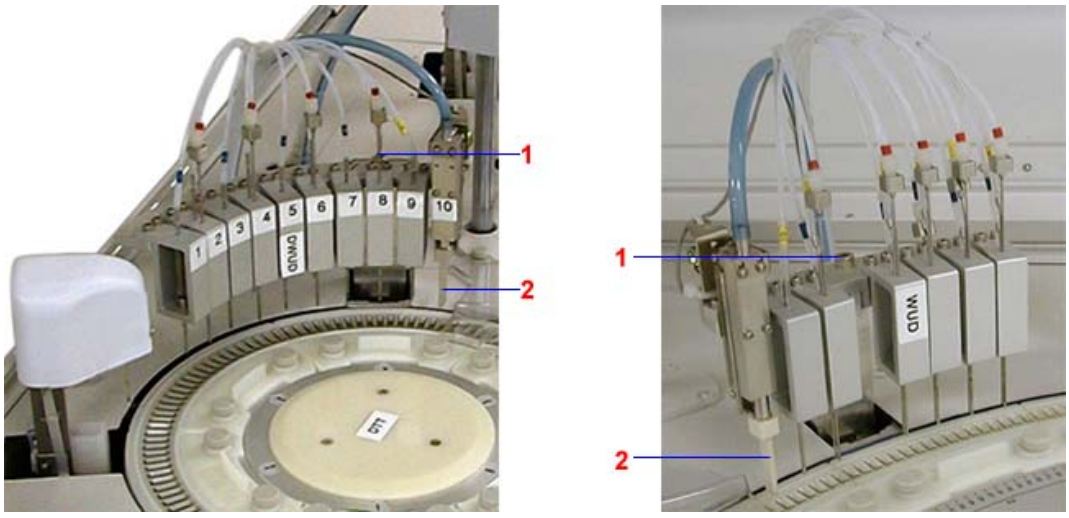
2 Reaction Cuvette Wash Station (WUD)

Figure 5-4. Cuvette wash stations

3. Remove the wash head:
   a. Cover nearby cuvettes with lint-free toweling to protect them from dust.
   b. Loosen the retaining screw (**1**) with a 4-mm hex wrench.
   c. Lift the wash head from the wash station assembly.

CAUTION

Ensure that the tubes remain connected to the ports. Use care not to crimp the tubing.



Dilution cuvette wash station (DWUD)

Reaction cuvette wash station (WUD)

Figure 5-5. DWUD and WUD wash stations

4. Look for signs of wear or damage to the drying nozzle (**2**).

   If wear or damage is present, call your local technical support provider or distributor.

5. Witith prep pads or lint-free towels soaked in 5% bleach solution, wipe eachwash head nozzle and inspect the pipet and tubing for clogs. If clogs are present,manually dislodge them by feeding the wire stylet, found in the maintenance toolkit, through the pipet or tube. Check that the three pipes in each nozzle move smoothly against the spring tension.

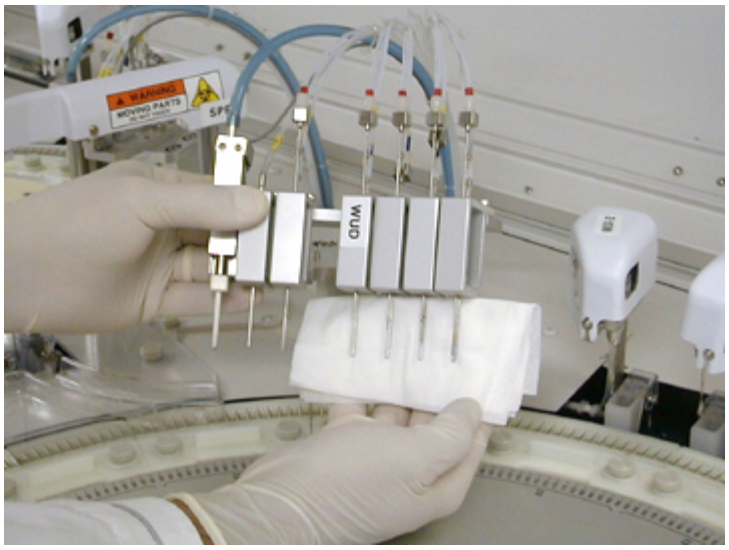


Figure 5-6. Wiping the wash stations with lint-free towels

6. Reinstall the wash head:
   a. Replace the wash head using the alignment pins located on either side of the retaining screw, then tighten the 4-mm hex screw.
   b. Ensure that all tubes are securely connected.
   c. Remove the toweling.
   d. Ensure that each nozzle is centered above the corresponding cuvette.
7. At the Operation Panel, select Initialize and verify the the DWUD and WUD are in the up position and that the analyzer is in READY mode.
8. Verify the wash head nozzles are correctly centered in the cuvettes:
   a. At the Menu Panel, select **Maint**, then select **Manual Operation**.

      For additional information concerning the Manual Operation window, refer to the Manual Operation window in the online Operator's Guide.
   b. At he Manual Operation window, double-select **14.DWUD** or **23.WUD**.
   c. Select **Move** to slightly lower the washer nozzles, then verify that they are correctly positioned.

      If not, call your local technical support provider or distributor.
   d. Verify the nozzles are correctly centered.
   e. At the DWUD or WUD window, select **Init**., then select **Exit** to raise the washer nozzles.
9. At the Operation Panel, select **Initialize**, then verify the DWUD and the WUD are in the up position and the instrument is in the READY state.

Inspecting and cleaning the cuvette splash covers

Materials required:

- Lint-free towel
- Deionized water

Time: 5 minutes

Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

NOTE

Cuvette covers are installed around the probes to prevent water and reagent from entering the dilution and reaction cuvettes.

1. Inspect the cuvette covers for spills and splattering.

   If there is any splattering is on the cuvette covers (**1**), proceed to step 2.

Figure 5-7. Cuvette covers

2. Using lint-free towels moistened with deionized water, wipe down the covers.

WARNING

Do not touch probes or mixing rods, to avoid contamination.

3. If splattering is extensive or enters the cuvettes, call your local technical support provider or distributor.

Inspecting and cleaning the probe wash cups

Materials required:

- Phillips screwdriver
- Lint-free towel
- Deionized water

Time: 5 minutes

Analyzer mode: READY

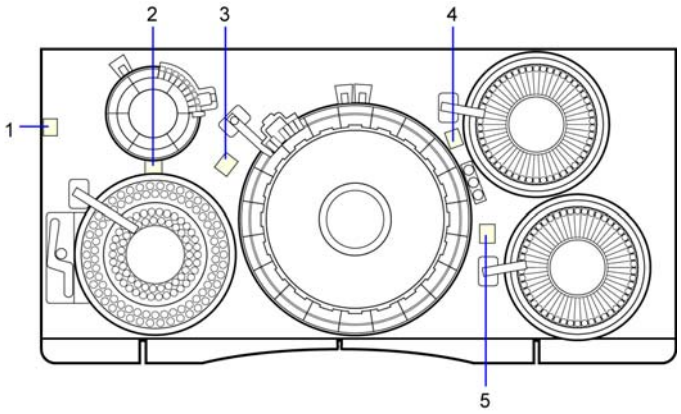
BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

NOTE

Keep the probe wash cups clean to ensure proper cleaning of the probe.

Clean any wash cups that fail the daily visual inspection for cleanliness.



1 Dilution Probe Wash Port 2 (LAS)
2 Dilution Probe Wash Port 1
3 Sample Probe Wash Port
4 Reagent Probe 2 Wash Port
5 Reagent Probe 1 Wash Port

Figure 5-8. Wash ports

1. Visually inspect each probe wash cup for cleanliness.

   If any of the probe wash cups appear dirty, clean them as described in the following steps.

2. At the Menu Panel, select **Maint**, then select **User Maintenance**.
3. At the User Maintenance window area labeled Probe posi.adjust., select **Position adjust start**.

   All probes move to the cuvette positions, allowing access to the wash ports. The operating mode display on the Operation panel indicates that the instrument is in the WAIT state. For additional information, see the User Maintenance window in the online Operators Guide.

4. Pour deionized water into the wash cups and overflow sensor unit, then clean and dry these areas with lint-free towels.

CAUTION

Do not apply excessive force while cleaning the overflow sensor, to avoid damaging it. If an overflow error message appears, there is probably water on the sensor. Dry the sensor.

   To clear the alarm message, on the Operation Panel, select the alarm icon.

5. At the Operation Panel, select **Initialize** to return the system to READY mode.

Checking pumps for leaks

A decrease in liquid flow or the presence of air bubbles in the lines may be due to a leaking pump. Inspect the pumps for leaks daily to identify potential problems.

Materials required:

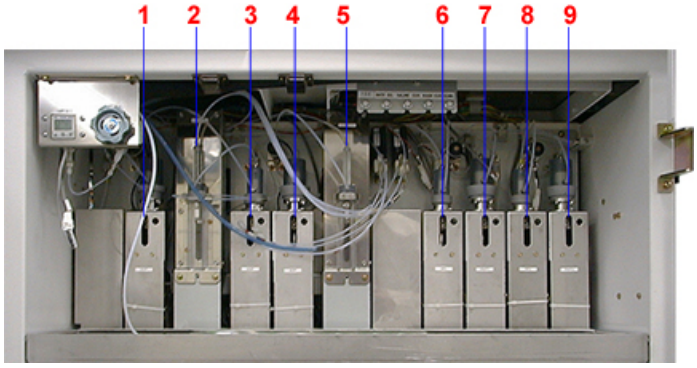
- Lint-free towel

Time: 10 minutes

Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.



1 DCP
2 DIP
3 DOP
4 SCP
5 SP
6 RP-1
7 RWP-1
8 RP-2
9 RWP-2

Figure 5-9 Vertical pumps

Checking the SP and DIP vertical pumps for leaks

Liquid leaking from the seal on the sampling pump (SP) or the dilution aspiration pump (DIP) flows to the drive lever unit. If the drive lever unit is wet, the pump seal must be replaced.

1. Closely inspect the plastic cylinder (**1**) for moisture.

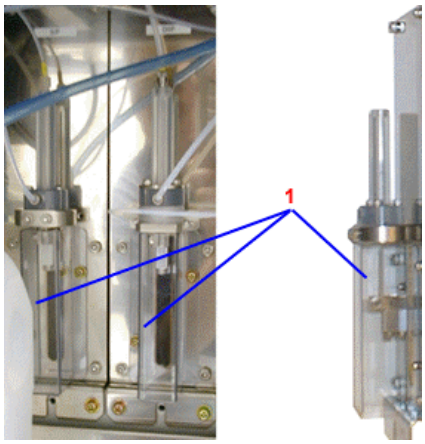


Figure 5-10 Sp and DIP vertical pumps

2. To replace the pump seal if the drive lever unit is wet, call your local technical support provider or distributor.

Checking other vertical pumps for leaks

Use this procedure to test for leaks from other vertical pumps: the sampling wash pump (SCP), dilution wash pump (DCP), dilution discharge pump (DOP), reagent dispensing pumps (RP1 and RP2), and reagent wash pumps (RWP1 and RWP2).

1. To determine if any of these pumps are leaking, inspect the upper portion (**1**) (cylinders, L-ring holders, tubes and fittings) of the vertical pumps.

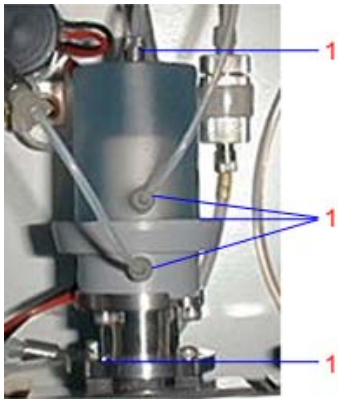
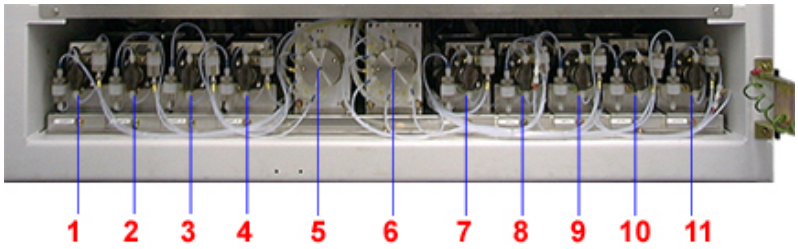


Figure 5-11. Typical vertical pump

2. If the pump is leaking, you must replace the pump seal. To replace the pump seal, call your local technical support provider or distributor.

Checking the horizontal pumps for leaks

Horizontal pumps consist of the dilution cuvette wash pumps, DWP1, DWP2, DWP3 and DWP4; the reaction cuvette wash pumps, WP1, WP2, and WP3; and reaction cuvette detergent pumps DTP1 and DTP2).



1	DWP1	**5**	WCV2	**9**	WP3
2	DWP2	**6**	WCV1	**10**	DTP1
3	DWP3	**7**	WP1	**11**	DTP2
4	DWP4	**8**	WP2		

Figure 5-12. Horizontal pumps

There are two types of horizontal pumps, those with double seals and those with a single seal. The method of checking for leaks is the same for both:

1. To determine if any of these pumps are leaking, inspect the front portion (**1**).

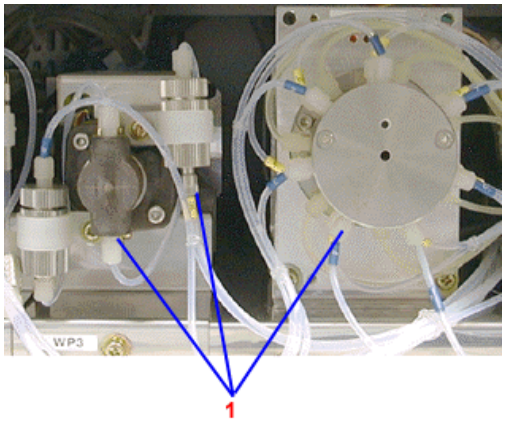


Figure 5-13. Typical horizontal pump

2. If there is a leak, the seal(s) must be replaced. To replace the seals, call your local technical support provider or distributor.

Performing the startup wash (WASH3)

Materials required:

- Deionized water

Time: 26 minutes

Analyzer mode: READY

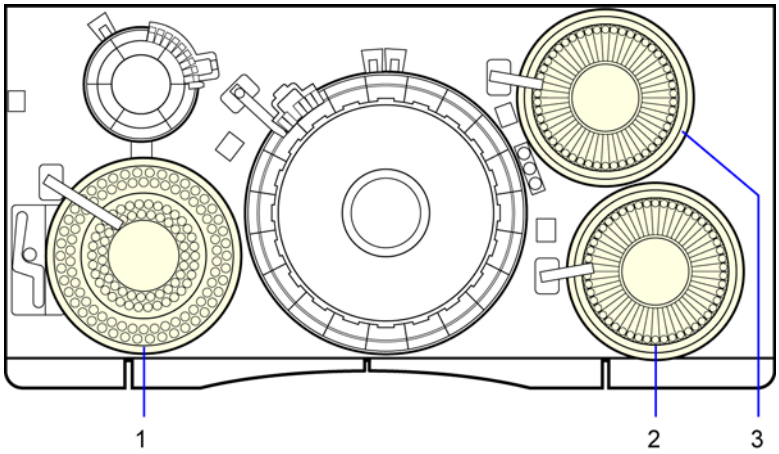
BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

The daily startup wash rinses the probe lines, reaction cuvettes and dilution cuvettes.

NOTE

Laboratories running the system more than 8 hours per day are advised to **perform this procedure once per shift**.



Location	Position	Wash Solution
1	CTT-15	ISE Detergent Solution
1	CTT-16	Deionized water
1	CTT-49	10% Cuvette Wash Solution (Daily) 5% Reagent Probe Wash 3 (Weekly)
1	CTT-50	Deionized water
1	CTT-51	Deionized water
2	RTT1-47	Reagent Probe Wash 1
2	RTT1-48	Reagent Probe Wash 2
2	RTT1-49	10% Cuvette Wash Solution (Daily) 5% Reagent Probe Wash 3 (Weekly)
2	RTT1-50	Deionized water
3	RTT2-47	Reagent Probe Wash 1
3	RTT2-48	Reagent Probe Wash 2
3	RTT2-49	10% Cuvette Wash Solution (Daily) 5% Reagent Probe Wash 3 (Weekly)
3	RTT2-50	Deionized water

Figure 5-14. Location of wash solutions on the CTT and RTT trays

1. At the Operation Panel, select **Wash**.
2. Ensure the 10-mL tube at CTT (**1**) position #51 contains DI water.

   TIP

   By choosing CTT position #50 for WASH 2 and CTT position #51 for WASH 3, you only need to refill the CTT container once.
3. Ensure the container at RTT1 (**2**) and RTT2 (**3**) position #50 contains DI water.

NOTE

At your laboratory's discretion, you may use other positions for the washes on each of the trays, but you must change the entries for the alternate positions in the appropriate fields on the WASH Set window.

4. At the WASH Set window, define the WASH3 container positions as follows:
   a. Select **WASH3**.
   b. Select **1** for Cycles.
   c. Type **51** in the CTT cup position 1st time field.
   d. Type **50** in the RTT1 and RTT2 bottle position 1st time field.
5. Select **Execute**.

Performing the shutdown wash

Materials required:

- 10% solution of Cuvette Wash Solution (REF 00195330, PN B01-4178-01)
- Deionized water
- ISE Detergent (REF 01307361, PN B01-4174-01)

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 38 minutes

Analyzer mode: READY

The daily shutdown wash uses a detergent to clean the probe lines, reaction and dilution cuvettes, and ISE components.

NOTE

Laboratories running only urine samples or those running the system more than 8 hours per day are advised to perform the Weekly wash procedure in place of this Shutdown wash procedure.

For location of washes on the CTT and RTT trays, refer to Figure 5-14.

1. At the Operation Panel, select **Wash**.
2. Ensure the 10-mL tube at CTT (**1**) position #49 contains a 10% solution of Cuvette Wash Solution, the cup at CTT position #16 contains pure water and the cup at CTT position 15 contains ISE detergent.
3. Ensure the bottle at RTT1 (**2**) and RTT2 (**3**) position #49 contains a 10% solution of Cuvette Wash Solution.
4. Ensure the 10-mL tube at CTT (**1**) position #50 contains DI water.
5. Ensure the bottle at RTT1 (**2**) and RTT2 (**3**) position # 50 contains DI water.

   NOTE

   At your laboratory's discretion, you may use other positions for the washes on each of the trays, but you must change the entries for the alternate positions in the appropriate fields on the WASH Set window.

6. At the WASH Set window, define the WASH2 container positions as follows:
   a. Select **WASH2**.
   b. Select **2** for Cycles.
   c. Enter **49** in the CTT cup position 1st time field and **50** in the CTT cup position 2nd time field.
   d. Enter **49** in the RTT1 and RTT2 cup positions 1st time fields and **50** in the RTT1 and RTT2 cup positions 2nd time fields.
   e. Select **Execute**.

Performing additional ISE electrode washes

Materials required:

- ISE Detergent Solution (REF 01307361, PN B01-4174-01)

Time: 5 minutes

Analyzer mode: Manual operation

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

ISE Detergent Solution is automatically run through the ISE module as part of the shutdown wash procedure (WASH2). Manually perform additional ISE washes (described in the following procedure) **once per shift under either of the following conditions**:

- Dialysis samples are run routinely.
- The system is run more than 8 hours per day.

NOTE

Do NOT perform the ISE electrode wash more than 3 times per day (once as part of the shutdown wash and twice on a per shift basis). Pour fresh ISE Detergent into a cup, not a tube, before each wash, from the CTT.

1. At the Menu Panel, select **Maint.**, then select **ISE Operation**.
2. In the Period.wash area, select **OFF**, then select **Set**.
3. At the Wash Electrode area, type the position number of the ISE Detergent container in the Detergent posi. field.
4. In the Container field, select the type of container for the wash solution.

   The recommended type of container is **6 : 2mlCUP/Adp.**

5. Pour ISE Detergent Solution in the container and place it in the CTT position entered in step 3.
6. In the Wash Electrode area, select **Execute**, then select **Yes** when prompted.
7. At the ISE Operation window, in the Period.wash area, select **ON**, then select **Set**.
8. Close the window, then select **Yes** when prompted.

Recording ISE slopes

Once a day, record the slopes from a successful ISE calibration on the Maintenance Log. The slopes are provided on the ISE Monitor, RBL/Calibration History, and RealTime Monitor windows following a successful calibration.

Weekly maintenance

Performing the weekly wash

Materials required:

- 5% solution of Reagent Probe Wash 3 (REF 03164495, PN B01-4183-01)
- ISE Wash (REF 01307361, PN B01-4174-01)
- Deionized water

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 38 minutes

Analyzer mode: READY

Laboratories running the system more than 8 hours per day or running large numbers of dialysis or urine samples are advised to perform this Weekly wash procedure **Daily**, in place of the Shutdown wash procedure. The Weekly Wash is the same as the Daily Shutdown Wash, except that a 5% solution of reagent probe wash 3 is substituted for 10% cuvette wash solution.

NOTES

The daily shutdown wash does not need to be performed on the day you perform the weekly wash. When performing weekly maintenance, be sure to perform the procedures in the following sequence:

1. Weekly wash (this procedure)
2. Lamp energy check
3. Cuvette blank measurement

For location of washes on the CTT and RTT trays, refer to Figure 5-14.

1. At the Operation Panel, select **Wash**.
2. Ensure the 10-mL tube at CTT position #49 contains a 5% solution of Reagent Probe Wash 3, the cup at CTT position #15 contains ISE Detergent, and a 10-mL tube of pure water is at CTT position #16
3. Ensure the bottle at RTT1 and RTT2 position #49 contains a 5% solution of Reagent Probe Wash 3.
4. Ensure the bottle at RTT1 and RTT2 position #50 contains DI water.

   NOTE

   At your laboratory's discretion, you may use other positions for the washes on each of the trays, but you must change the entries for the alternate positions in the appropriate fields on the WASH Set window.
5. At the WASH Set window, define the WASH2 container positions as follows:
   a. Select **WASH2**.
   b. Select **2** for Cycles (the default setting).
   c. Type **49** in the CTT cup position 1st time field and **50** in the CTT cup position 2nd time field.

d. Type **49** in the RTT1 and RTT2 cup positions 1st time fields and **50** in the RTT1 and RTT2 cup positions 2nd time fields.

6. Select **Execute**.
7. After the wash, check the lamp energy and run the cell blank measurement test.

NOTE

Perform the lamp energy check and cuvette blank measurement only once a week, even if the weekly wash is run daily.

Checking and replenishing the lamp coolant

Materials required:

- Lamp coolant additive (REF 04533710, PN B01-4496-51)
- Deionized water

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 5 minutes

Analyzer mode: READY

The lamp is cooled by circulating liquid coolant. As the volume of coolant decreases, the heat of the lamp increases.

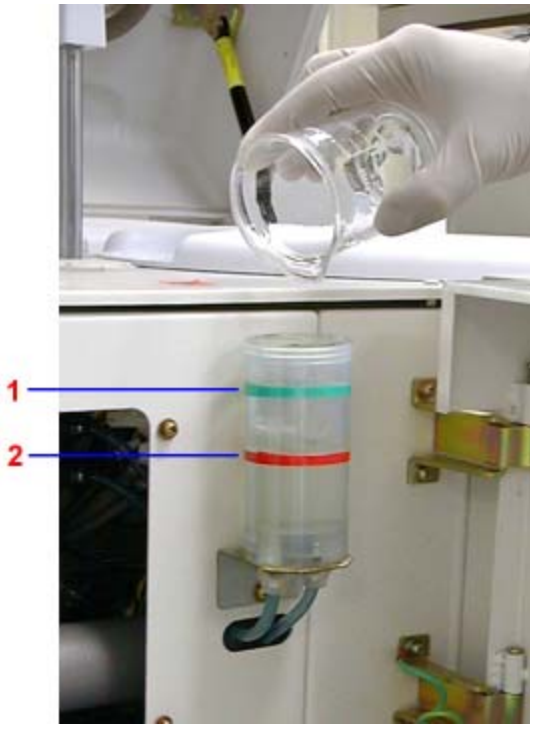
NOTE

Check the lamp coolant level daily and whenever the system generates a lamp coolant warning and turns off the lamp.

1. Open the upper right front door to gain access to the lamp coolant reservoir.
2. Check the fluid level in the reservoir.

   If the level is between the lower and upper marks, proceed to step 4.

3. If the reservoir fluid level is less than 5 cm, add coolant as follows:
   a. Turn the reservoir cover counterclockwise to remove it.
   b. Fill the reservoir to the 9-cm mark with a 5% solution of Lamp Coolant Additive (REF 04533710, PN B01-4496-51) in deionized water.



1 Upper Mark (Green Line)
2 Lower Mark (Red Line)

Figure 5-15. Reservoir levels Upper and Lower

c. Replace the reservoir cover. Do not over tighten.

4. Replace the lamp access cover.

NOTE
If adding coolant does not clear the lamp coolant warning, call your local technical support provider or distributor.

Checking lamp energy

NOTES
Check the lamp energy after cleaning or replacing cuvettes, and after replacing the lamp.

When completing weekly maintenance, be sure to perform the procedures in the following sequence:

1. Weekly wash
2. Lamp energy check (this procedure)
3. Cuvette blank measurement

Materials required:

No materials required

Time: 15 minutes

Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

IMPORTANT
Do not touch or turn the reaction tray at any time during the lamp energy check procedure. The reaction tray should turn freely. If the reaction tray is shifted, repeat the procedure, since a shift could result in an erroneous lamp energy reading.

1. At the Menu Panel, select **Maint**, then select **Lamp Energy Monitor**.

   The Lamp Energy Monitor window displays.

2. Ensure the bottle at position #50 in Reagent Tray 1 (RTT1) contains deionized water.
3. Select **Check Energy**.

   The Lamp Energy Monitor dialog box displays.

4. Type **50** in the RTT1 bottle posi. field, then select **3: 70 mL** for the Container field.
5. Select **Meas. Start**.
   - The reagent probe aspirates deionized water from RTT1 and dispenses it into reaction cuvette #1.
   - The reaction disk rotates until cuvette #1 is in the detection position.
   - The Operation window displays Lumi.Check and then WAIT.

   NOTE
   Perform steps 6 - 10 while in the WAIT state.

6. At the Lamp Energy Monitor window, in the Luminous Energy Check area, enter the settings:
   a. Type **1000** in the Meas. times field.

      Enter the number of times to measure the lamp energy (normal setting: 1000).

   b. Type **100** in the Meas. cycle field.

      Enter the time (in µs) to elapse after each lamp energy measurement (normal setting: 100).

   c. Select **AD**.
   d. Select **Auto.**
7. Select **Meas. Energy**.

   The message, "Execute the lamp energy check?" displays.

8. Select **OK**.
9. On the Lamp Energy Monitor window, select **Collect Data**.
10. Calculate the scatter plot:
    a. Note the value of the 340-nm AD count field.
    b. Add 50 to the 340-nm AD count and type the sum in the top field to the left of the graph, then select **Enter**.
    c. Subtract 50 from the 340-nm AD count (**noted in step 10 a**) and type the difference in the bottom field, to the left of the graph, then press **Enter**.

The lamp energy displays as a scatter plot.

- If the points are mostly within ±40 of the center, the lamp is normal.
- Otherwise replace the lamp

11. **Only** if you replaced the lamp or a cuvette segment, select **Regist Data**, then select **OK** in the Registration window.

    If not, proceed to step 12.

    NOTE

    The system uses the data from the lamp energy data registration as the comparison standard for the next calculation of the attenuation ratio.

12. Exit the Lamp Energy Monitor window, then select **Initialize** to switch the system from the WAIT state to the READY state.
13. Run cell blank measurement.

Reading lamp energy data

1. Execute the lamp energy check and acquire the data.
   - A graph displays at the window.
   - The lamp energy check data displays to the left of the graph.
2. Select a wavelength for which to display data.
3. Display the voltage or the AD value.
4. (Optional) Change the vertical scale of the graph.

Measuring cuvette blanks

When performing weekly maintenance, be sure to perform the procedures in the following sequence:

1. Weekly wash
2. Lamp energy check
3. Cuvette blank measurement (this procedure)

Materials required:

- No materials required

Time: 20 minutes

Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

Reaction cuvettes undergo changes in absorption with use. After the weekly wash, perform the cuvette blank measurement to determine the change. The cuvette blank is only run weekly, even if your lab runs the Weekly Wash as a daily procedure.

1. At the Menu Panel, select **Maint**, then select **User Maintenance**.
2. In the Cell blank meas.check area, select **Start CB**.

   The measured cuvette blank values for 221 cuvettes and a list of abnormal cells are printed in approximately 15 minutes.

3. To save the data, select **Yes**.
4. Evaluate the results:
   - 17 cuvette cells are in each cuvette set. Replace cuvette sets when 4 or more cells in a set are flagged abnormal.

     NOTE
     An abnormal cuvette is defined as any cuvette with an **H**, **L**, or **N** flag.

   - If all the cells fail, replace the lamp.
5. If required, reprint the results.
6. Retain the statistical results and abnormal cell blank list printout with laboratory records.

Cell blank measurement results

Printed data

The printed data is the OD (optical density) value X 1000. Each cell has two values and a mean value.

Abnormal cuvettes

A list containing abnormal cuvettes is printed as part of the cell blank. The list contains marks indicating abnormality. Cuvettes on the list are not used for analysis. Abnormal cuvettes have the following characteristics:

- Cuvettes exceeding the cell standard value (set in the System Parameters System window) are marked "H" or "L."
- Cuvettes exceeding the cell breakup limit value (set in the System Parameters Settings window) are marked "N."
- Cuvettes exceeding the skip absorbance value (set in the System Parameters Settings window) are skipped (marked **E**), and therefore not used for analysis.
- Cuvettes exceeding the lamp energy voltage limits are skipped (marked U or D), and therefore not used for analysis.
- Abnormal cuvettes remain registered as abnormal until a future measurement determines that they can be used.

Reference value

The reference value (the average value of the measurements of all cuvettes) remains the same until the next measurement.

Cleaning the analyzer and rack handler exterior panels

Materials required:

- Lint-free towel
- 10% solution of bleach (5% sodium hypochlorite) and water

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 10 minutes

Analyzer mode: READY

1. Put the analyzer and rack handler (if applicable) in Standby mode.
2. Turn off the 30-A power switch at the back of the system.

WARNING

Turn off the main power switch at the back of the analyzer, to avoid catching the toweling in the cooling fans.

3. Close the analyzer cover.
4. Prepare a 10% solution of bleach and DI water.
5. Dampen lint-free towels with the solution and wipe the following exterior surfaces:
   - top cover
   - side panels
   - front panel
   - bear panel
6. Using deionized water, wipe the exteriors again.
7. Turn on the 30-A power switch at the back of the system.
8. Return the system to the Operating mode and the rack handler to the ON mode (if applicable).

Monthly maintenance

Cleaning the turntable interiors (STT/CTT and RTT)

Materials required:

- Phillips screwdriver
- Lint-free towels

Time: 10 minutes

Analyzer mode: READY

BIOHAZARD

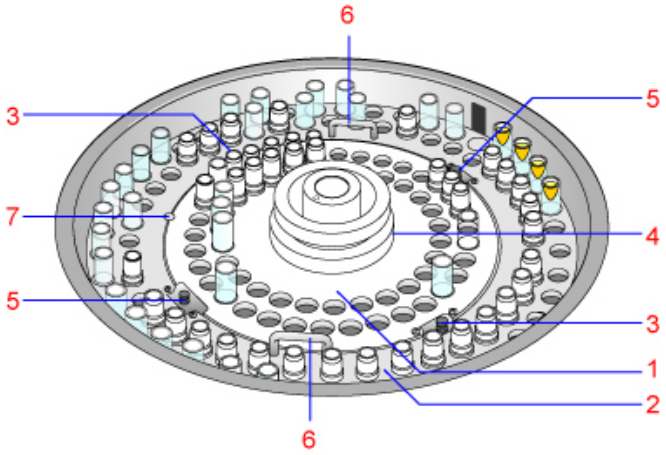
Wear personal protective equipment.
Use universal precautions.

NOTE

Use the 2 procedures that follow to clean inside the STT/CTT housing and the RTT1 and RTT2 refrigerated housing to remove accumulated sample, reagent, dust, and other materials.

Cleaning the inside of the STT/CTT housing

1. Remove the Calibrator/Control Tray loader (CTT):
   a. Lift the standard cover from the loaders..
   b. Pull up on the two Nylatch fasteners (**3**) securing the CTT Tray loader in place.
   c. Lift out tray loader by the center handle (**4**).
2. Remove the Sample Tray loader (STT):
   a. Lift the Sample Tray evaporation cover.
   b. Pull up the two fasteners (**5**) securing the STT Tray loader in place.
   c. Lift out the STT tray by the two metal handles.
3. Using lint-free towels, wipe the interior of the STT and CTT housings.



1 CTT Tray
2 STT Tray
3 CTT Nylatch Fasteners - 2 places
4 CTT Handle
5 STT Nylatch Fasteners - 2 places
6 STT Handles - 2 places
7 Locator Screw

Figure 5-16. Components of CTT and STT trays

4. Replace the CTT and STT tray and covers.
    a. Orient each tray loader to the locator screw (**7**).
    b. Ensure the tray loaders are securely in position, then push the fasteners (**3** and **5**) in place.
    c. Replace the STT evaporation cover.
    d. Replace the CTT cover.

Cleaning the inside of the reagent tray refrigerated housing

1. Remove Reagent tray loader 1 (RTT1):
    a. Lift and remove the cover from the reagent tray.
    b. Loosen the white knob by turning it counterclockwise.
    c. Lift the loader out of the refrigerated housing.
2. Using lint-free towels, wipe the interior of the refrigerated housing and clean the glass window of the reagent bar code reader.
3. Replace the reagent tray loader.
    a. Ensure that it is securely in position.
    b. Tighten the white center knob.
    c. Replace the covers, aligning the hole in the cover with the locating pin.
4. Repeat steps 1-3 for RTT2.

Cleaning or replacing the wash solution reagent containers (47 – 50)

Materials required:

- 5 reagent wedges, empty, 70-mL (optional)
- Probe Wash 1
- Probe Wash 2
- 10% Cuvette Wash solution
- 5% Probe Wash solution

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 10 minutes

Analyzer mode: READY

1. Remove the wash solution reagent containers from RTT1 and RTT2, positions 47 – 50.
2. Replace the containers with new ones or clean the old containers with DI water.
3. Refill the containers with fresh solutions as specified in the table below.

RTT1/2 Position	Wash Solution
47	Probe Wash 1
48	Probe Wash 2
49	10% Cuvette Wash
50	DI Water

Cuvette wash and cuvette conditioner usage

CTT and RTT

Solution	Approximate Volume Used During Wash 2	Number of Aspirations	Total number of WUD cycles for Wash2
10% Cuvette Wash	DPP = 3.6 mL RPP1 = 29 mL RPP2 = 29 mL	DPP = 0.36 mL RPP1 = 2.9 mL RPP2 = 2.9 mL	1220 (approx)

System solutions

Solution	Dilution by system	Volume dispensed per WUD cycle	Volume of undiluted solution used per WUD cycle	Total volume used for Wash2 undiluted
Cuvette Wash	1:10 with water	600 µL	60 µL	44 ml
Cuvette Conditioner	1:40 with water	600 µL	15 µL	11 ml

NOTE
The total volume of cuvette wash and cuvette conditioner used by the system can vary slightly from the volumes provided in the tables above. This is normal behavior.

Cleaning and replenishing the dilution bottle

Materials required:

- Deionized Water
- Physiological saline (0.9% NaCl)

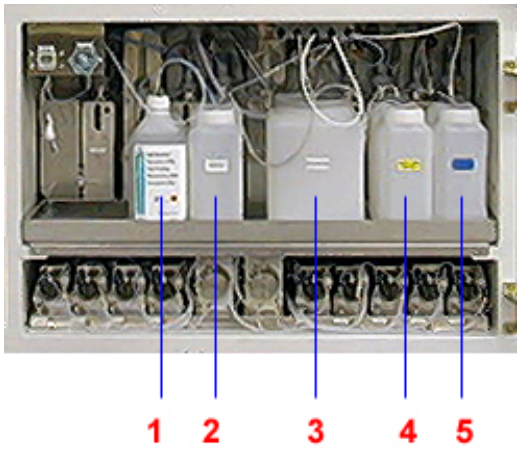
Time: 10 minutes

Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

NOTE
The dilution bottle may be cleaned when it is refilled, but must be cleaned at least once a month.



1 ISE buffer bottle
2 RRV (Reaction) bath oil
3 Isotonic saline diluent bottle
4 Cuvette detergent bottle
5 Cell conditioner bottle

Figure 5-17. Isotonic Saline diluent bottle

1. Lift the cover from the saline diluent bottle (**3**), and remove the bottle.

CAUTION
Note the bottle position on the shelf, to avoid mixing up the fluid bottles.

2. Empty the remaining contents of the bottle.
3. Rinse the bottle with deionized water and drain well.
4. Refill the bottle with 0.9% saline diluent.
5. Replace the bottle in the same position on the shelf in the cabinet.
6. Replace the cover of the diluent bottle.

   NOTE
   Make sure that the Teflon tube and filter holder are located at the bottom of the dilution bottle.

7. Prime the fluid lines:

   NOTE
   If you are cleaning the detergent or cell conditioner bottles at this time, you can prime all the fluid lines at once.

   a. At the Operation Panel, select **Prime**.
   b. At the PRIME Settings dialog box, select **Prime 2**, then type **10** or more in each of the number of times fields.
   c. Select **Execute**.

Cleaning and replenishing the cuvette wash bottle

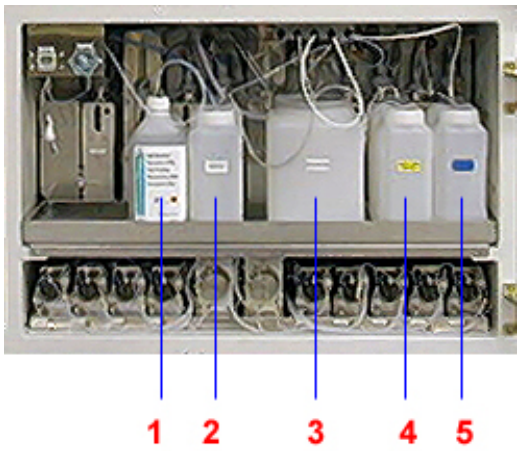
Materials required:

- Deionized water
- Cuvette detergent (wash solution)

Time: 10 minutes

Analyzer mode: READY

BIOHAZARD
Wear personal protective equipment.
Use universal precautions.



1 ISE buffer bottle
2 RRV (Reaction) bath oil
3 Isotonic saline diluent bottle
4 Cuvette detergent bottle
5 Cell conditioner bottle

Figure 5-18. Cuvette wash bottle

NOTE
The cuvette wash bottle may be cleaned when it is refilled, but must be cleaned at least once a month.

1. Unscrew the filter cap at the front top of the cuvette wash bottle (**4**), then pull up the tube with the filter.
2. Disconnect the cuvette wash bottle level sensor connector, then turn it counter-clockwise and pull it out.
3. Remove the bottle.

CAUTION
Make a note of the bottle position on the shelf, to avoid mixing up the fluid bottles.

4. Empty the remaining contents of the bottle.
5. Rinse the bottle with deionized water and drain well.

CAUTION
Ensure that the level sensor connector does not get wet, to avoid damaging it.

6. Refill the bottle with cuvette wash solution.
7. Return the bottle to the same position on the shelf in the cabinet.
8. Connect the cuvette wash bottle level sensor connector, then push the connector in and turn it clockwise.
9. Insert the filter and hose, then fasten the cap.

   NOTE
   Make sure that the filter holder is located at the bottom of the bottle.

10. Prime the fluid lines:

    NOTE

If you are cleaning other bottles, wait to perform this step for all fluid lines.

a. At the Operation Panel, select the **Prime** button.

b. At the PRIME Settings dialog box, select **Prime 2** and then type **10** or more for the number of times in all fields.

c. Select **Execute**.

Cleaning the chiller filter

Materials required:

- Vacuum cleaner

Time: 10 minutes
Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

NOTE
Access the chiller filter (located on the right inside bottom shelf of the analyzer cabinet) through the panel door on the right side of the analyzer.

1. On the right side of the analyzer, push and release the panel door to gain access to the chiller unit.
2. Locate the filter and slide it out of the analyzer.
3. Using a vacuum cleaner, remove the dust from the filter.
4. If the filter requires further cleaning, perform the following steps:
   a. Wash the filter under running water.
   b. Dry the filter before replacing it.
5. Slide the filter back in place and close the panel on the right side of the cabinet.

Every 2 months maintenance

Cleaning the dilution tray cuvettes

Materials required:

- 2-liter beaker
- Probe Wash 3 solution (REF 03164495, PN B01-4183-01)
- Deionized water

Time: 15 minutes (replacement)
10 hours (immersion)
Analyzer mode: Off

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

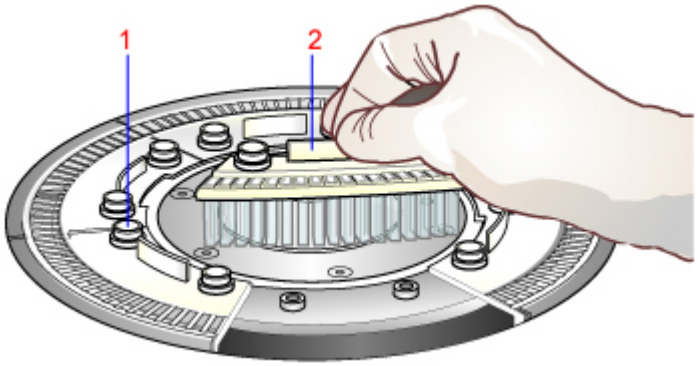


Figure 5-19. Components of dilution tray cuvette

1. Prepare 1.5 liters of 5% Probe Wash 3 solution diluted with deionized water.
2. Remove the 6 cuvette segments on the dilution tray (DTT).
   a. Unfasten the 2 thumbscrews (**1**) on each section.
   b. Grasp the cuvette section by the tab (**2**) and lift it from the tray.
   c. To remove the cuvettes under the dilution washer (DWUD) and splash cover, turn the tray by hand until the cuvettes are clear.
3. Immerse the cuvette segments in 5% Probe Wash 3 solution.
   a. Ensure no air bubbles are in the cuvettes.
   b. Allow the cuvettes to soak for at least 10 hours.
4. Wash the cuvettes under running water, then rinse them in deionized water.
5. Drain the water from the cuvettes.
6. Install the cuvette segments on the dilution tray (DTT) and fasten the thumbscrews by hand.
7. At the Operation Panel, select **Initialize**.

NOTE

Verify that the Operating mode field displays READY before performing any further actions.

8. At the Operation Panel, select **WASH**.
9. Perform the daily shutdown wash routine, then verify the operation.

Cleaning and replenishing the cuvette conditioner bottle

Materials required:

- Deionized water
- Cuvette conditioner

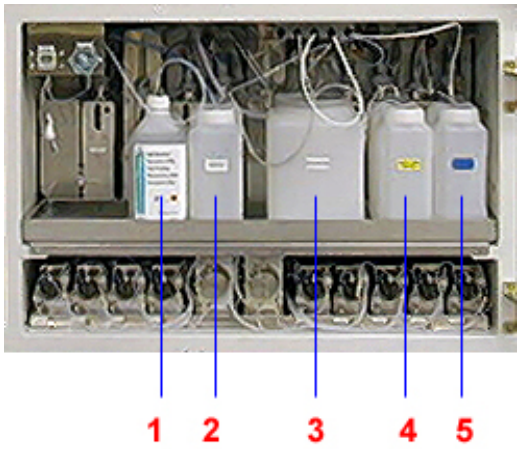
Time: 10 minutes
Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

NOTE

The cuvette conditioner bottle may be cleaned when it is refilled, but must be cleaned at least once every 2 months.



1 ISE buffer bottle
2 RRV (Reaction) bath oil
3 Isotonic saline diluent bottle
4 Cuvette detergent bottle
5 Cell conditioner bottle

Figure 5-20. Cuvette conditioner bottle

1. Open the filter cap at the front of the cuvette conditioner bottle (**5**), and pull up the tube with the filter.
2. Disconnect the cuvette conditioner bottle level sensor connector.
3. Turn the connector counter-clockwise and pull it out.
4. Remove the bottle.

CAUTION

Make a note of the bottle position on the shelf, to avoid mixing up the fluid bottles.

5. Empty any remaining contents of the bottle.
6. Rinse the bottle with deionized water and drain well.

CAUTION

Ensure that the level-sensor connector does not get wet to avoid damaging it.

7. Refill the bottle with cuvette conditioner.
8. Return the bottle to the same position on the shelf in the cabinet.
9. Connect the cuvette-conditioner bottle level sensor connector, then push the connector in and turn clockwise.
10. Insert the filter and hose, then fasten the cap.

    NOTE

    Make sure that the filter holder is located at the bottom of the bottle.

11. Prime the fluid lines:

    NOTE

    If you are cleaning other bottles, wait to perform this step for all fluid lines.

    a. At the Operation Panel, select **Prime**.

    b. At the Prime Settings dialog box, select **Prime 2** and type **10** for the Number of times in all fields.

    c. Select **Execute**.

Every 3 months maintenance

Replacing the lamp

Materials required:

- Halogen lamp, 12 V/50 W
  (REF 02127928, PN 073-0099-01)

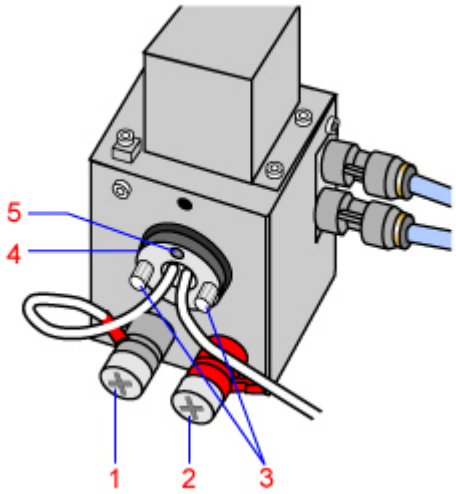
Time: 60 minutes
Analyzer mode: OFF

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

You must replace the lamp under the following conditions:

- quarterly
- after approximately 2000 hours of use
- if the system warns that lamp energy is out of range
- if the weekly Checking Lamp Energy procedure indicates the A-D points are outside the ±40 range of the scatter plot center line
- if the ATTENU(%) for any of the 14 wavelengths on the Lamp Check Energy window falls below 80%



1 Lead Wire Connector
2 Lead Wire Connector
3 Lamp Screws
4 Lamp Plate
5 Alignment Hole and Pin

Figure 5-21. Components of the lamp

1. Put the system in Standby mode.
2. Lift and remove the access panel in front of the Rotating Reaction Tray to expose the lamp housing.

WARNING

The lamp housing is **hot**. Allow it to cool down (approximately 10 minutes) before touching any components, to avoid burns.

3. Loosen the lead wire connectors (**1** and **2**), then remove the wires.

4. Unfasten the lamp screws (**3**) on the plate (**4**) and remove the halogen lamp from the housing.

CAUTION

Be careful not to drop the screws.

5. When installing the new lamp, align the hole to the locating pin (**5**).

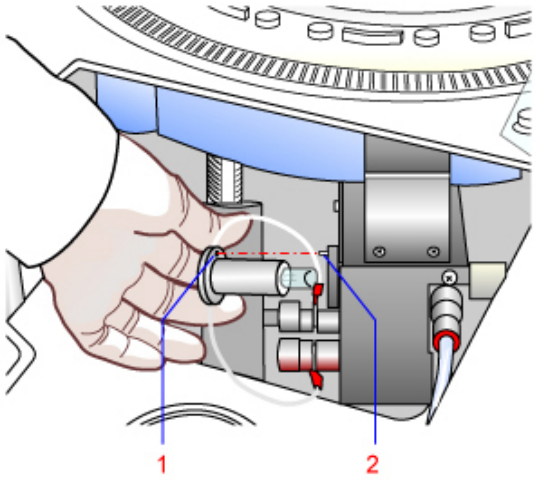


Figure 5-22. Locating pin

CAUTION

Do not touch the glass portion of the lamp, to avoid damaging it. If the lamp is dirty, clean it using lint-free toweling moistened with 5% bleach solution.

6. Install the lamp screws.
7. Install the lead wires and fasten the knobs.
8. Replace the access panel.
9. Return the system to Operating mode.
10. Wait 40 minutes for the lamp to stabilize.
11. Check the lamp energy (see the *Weekly Maintenance* section).
12. Perform the cell blank measurement test.

    NOTE

    Siemens recommends the assays on the system be calibrated after the lamp is replaced.

13. Run controls to verify that all assays are within the laboratory's established control ranges.

Washing the ISE electrodes lines

Materials required:

- Dummy electrode with o-ring and cap (REF 05938765, PN 073-0342-01)
- ISE detergent solution (REF 01307361, B01-4174-01)

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

Time: 25 minutes
Analyzer mode: Manual operation

1. At the Menu Panel, select **Maint.**, then select **ISE Operation**.
2. Remove the Na, K, Cl, and Ref electrodes and install the dummy electrode.
3. Install the dummy electrode (**2**) in place of the 4 electrodes removed in step 2.
4. Secure the dummy electrode in place by positioning the retaining bracket (**3**) over the electrode, then tightening the thumbscrew (**4**).

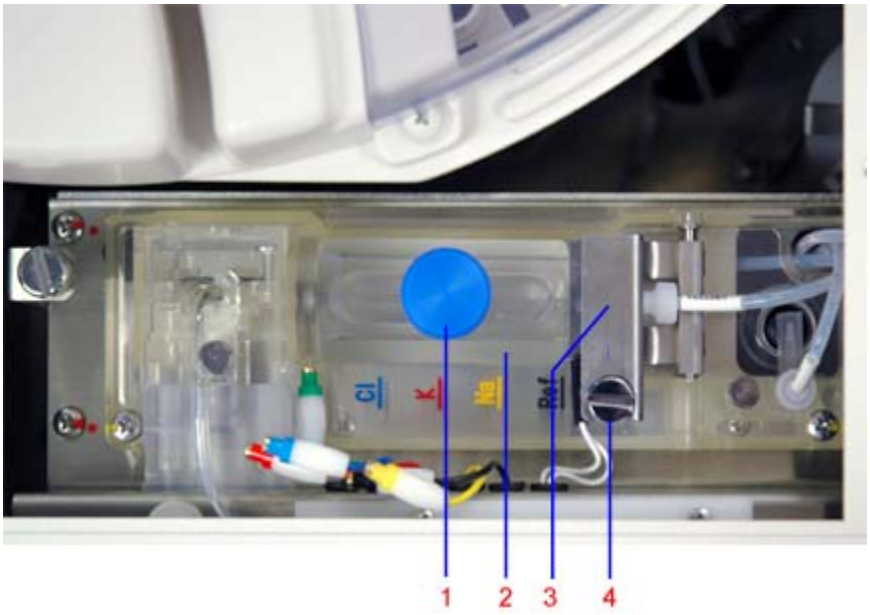


Figure 5-23 Replacing the electrodes with a dummy electrode

WARNING

ISE detergent is a sodium hypochlorite solution. When handling bleach, wear protective clothing, gloves, and safety glasses. It is harmful if swallowed and may cause eye or skin irritation. In case of skin or eye contact, flush with large amounts of water.

5. Remove the cap (**1**) from the dummy electrode and pour approximately 5 mL of ISE detergent solution into the dummy electrode.

CAUTION

Be sure to tighten the cap on the dummy electrode. If the cap is loose or defective, the ISE detergent solution may leak into the module and cause damage.

6. Replace and tighten the cap.
7. At the ISE Operation window, select **Execute (STEP-1)**.

   The message "Line Wash 1 Running" and the approximate amount of time remaining displays. You cannot stop this operation. If you must stop, press the **SYSTEM STOP** button on the analyzer display panel.

   This step takes about 17 minutes.

8. When step 1 of the wash completes, replace the dummy electrode with the original Na, K, Cl, and Ref electrodes.
9. At the ISE Operation window, in the ISE line wash area, select **Execute (STEP-2)**

   The wash starts and buffer prime is performed 10 times. The message "Line Wash 2 Running" and the approximate amount of time remaining displays.

10. Verify no leaks or bubbles exist and that the buffer is going to the waste during the priming cycle.
11. At the ISE Operation window, next to the Initialize button, select **Execute**.
12. Perform calibration and run controls.

Every 4 months maintenance

Cleaning the ancillary reagent bottle filters

Materials required:

- Filters (REF 08602474, PN 073-0033-01) order one set per bottle

Time: 20 minutes
Analyzer mode: OFF

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

Use this procedure to clean the filters in the following bottles

- RRV (reaction) bath oil
- Diluent
- Cuvette wash
- Conditioner

1. Open the filter cap at the front of each bottle and pull up the filter line.
2. Unfasten the connector at the end of the line.

   NOTE

   If any of the filters are ripped or damaged, replace them with new filters.
3. Remove the filter and inspect it for particles or dirt.
4. If dirty, clean the filters:
   a. Place the filters in a beaker filled with a fresh 10% solution of water and household bleach.
   b. After 30 minutes, remove the filters.
   c. Rinse them in deionized water.
   d. Replace them into their respective holders.
5. Fasten the connector.
6. Using a pad soaked in 5% bleach solution, clean the outside surfaces of the filter holders and hoses.
7. Insert the filter hoses into the bottles, then fasten the caps.
8. At the Operation Panel, select **Prime**.
9. At the Prime Set dialog box, select **Prime 2.**
10. Type **10** or more for the number of times in all fields, then select **Execute**.

Cleaning the pure-water bottle filter

Materials required:

- Ten 10R filters (REF 01160530, PN 073-0035-01)
- One 18R filter (REF 01448895, PN 073-0034-01)
- Hex wrench

Time: 15 minutes
Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Clogged filters create an insufficient flow rate and produce air bubbles.

NOTE

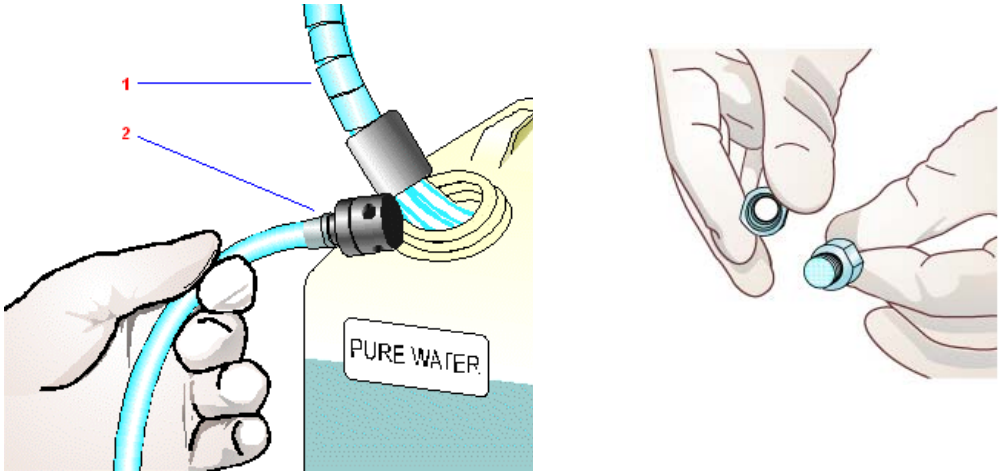
A set of filters is included in the supplies kit. To avoid system down-time, replace the filter with the one in the kit, resume operation, and then clean and store the removed filter for the next scheduled maintenance.

1 Pure-water bottle

Figure 5-24. Pure-water bottle

1. Ensure that the instrument is in READY mode.
2. Remove the silicon return hose (**1**) from the top front of the pure water bottle.

   The filter is contained in a metal filter holder attached to the end of the return hose.



1 Silicon Return Line
2 Metal Filter Holder

Figure 5-25. Pure-water bottle lines and filter

3. Using pliers if necessary, unfasten the filter holder from the end of the return hose and remove the filter.

NOTE

If the filter is ripped or damaged, replace it with a new filter (18R).

WARNING

Household bleach is 5% or 6% sodium hypochlorite. When handling bleach, which can be used as a cleaning and antiviral agent, wear protective clothing, gloves, and safety glasses. It is harmful if swallowed and may cause eye or skin irritation.

4. To clean the 18R filter:
   a. Place the filter in a beaker filled with a freshly made 10% solution of household bleach and water.
   b. After 30 minutes, remove the filter and rinse it with deionized water and replace onto the filters.
5. Remove the ten small 10R Teflon filter hoses from the top front of the water bottle.

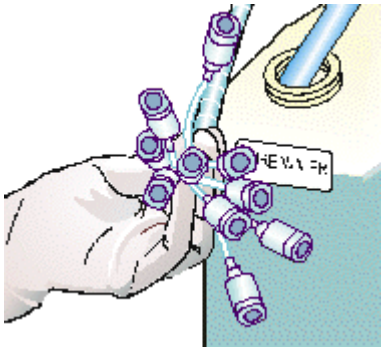


Figure 5-26. 10R filters

CAUTION

To assist with removal as well as to avoid crimping these thin filter hoses, remove only 3 or 4 hoses from the water bottle at a time.

6. First unfasten the filter holder from the end of each tube, and then remove the filter.
7. To clean the 10R filter:
   a. Place the filter in a beaker filled with a freshly made 10% solution of household bleach and water.
   b. After 30 minutes, remove the filter and rinse it with deionized water and replace onto the filters.

CAUTION

Ensure that the filters are properly positioned with the filter holder to avoid filter shift.

8. Using a lint-free towel soaked in 5% bleach solution, clean the outside surfaces of the filter holder and hose.
9. Insert the silicon filter hose into the water bottle.
10. Insert the ten Teflon filter hoses in the tank, 3 or 4 at a time.
11. Prime the lines:
    a. At the Operation Panel, select the **Prime** button.
    b. In the PRIME Set dialog box, select **PRIME 2** and type **10** or more for the number of times in all fields.
    c. Select **Execute**.

Replacing the reaction and dilution cuvettes

Materials required:

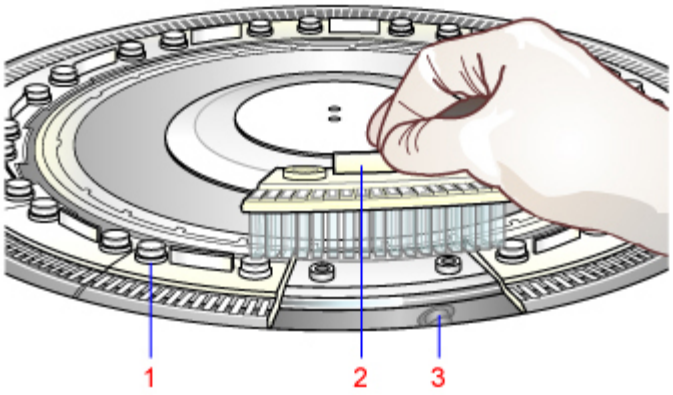
- 13 sets of reaction cuvettes (sample cell RRV, single cuvette set, REF 05024992, PN 073-0023-02)
- 6 sets of dilution cuvettes (sample cell DTT, single cuvette set, REF 05049669, PN 073-0022-01)

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 20 minutes
Analyzer mode: OFF

Replace the 20 sets of reaction (RRV) cuvettes and 6 sets of dilution (DTT) cuvettes once every four months.



1 Thumbscrew
2 Tab
3 Detector Unit

Figure 5-27. Reaction and dilution cuvette components

1. Put the system in Standby Mode.

WARNING

Failure to put the analyzer into Standby mode will result in the RRV bath oil over-filling. Excess RRV bath oil can damage the spectrophotometer when the RRV cuvettes are reinstalled.

Turn off the power before removing or replacing cuvettes, to allow the RRV to move freely.

2. Remove the 13 cuvette sets on the reaction tray (RRV).
   a. Unfasten the 2 thumbscrews (**1**) on each set.

CAUTION

Be careful not to get RRV bath oil inside the cuvette. If you do, allow the cuvette to dry overnight.

CAUTION

Be careful not to drop the cuvette set screws into other components of the instrument. **Do not** remove the cuvette if it is in front of the detector (**3**).

   b. Hold the cuvette set by the tab (**2**) and lift it from the tray.
   c. To remove the cuvette sets located by the detector unit or under the cuvette wash station (WUD), rotate the reaction tray by hand until the cuvettes are in an accessible location.
3. Inspect the reaction bath oil in the RRV bath ring.
   - If particulate matter is found, remove it with a transfer pipette or other similar device.
   - If the contamination is more drastic, such as a WUD overflow causing large quantities of liquid to float on the oil, then discontinue this procedure and call your local technical support provider or distributor.
4. Install the new cuvette sets on the RRV and fasten the set screws.

CAUTION

Do not touch or scratch the cuvette surfaces or wipe the cuvette interior, to avoid damaging the cuvettes.

5. Remove the 6 cuvette sets on the dilution tray (DTT).
    a. Unfasten the 2 thumbscrews (**1**) on each section.
    b. Hold the cuvette section by the tab (**2**) and lift it from the tray.
    c. To remove the cuvettes under the dilution washer (DWUD) or cuvette splash cover, rotate the dilution tray by hand until the cuvettes are clear.
6. Install the new cuvette sets on the DTT and fasten the set screws by hand.
7. Return the system to Operating mode.
8. Perform the daily Shutdown wash (WASH2) routine and verify the operation.
9. Perform the lamp energy check procedure.
10. Perform the cell blank measurement, and if the cell blank run was completed successfully, save the results.

As required maintenance

Backing up system files

The system software consists of the operating system, data processing software, and user-specific system and data files. Back up the system files to a USB Memory Stick or a formatted CD / CD-RW / DVD disc whenever you make any configuration or parameter changes. The Restoring System Files procedure follows this procedure.

Materials required:

USB memory stick or CD-RW disc or DVD-RW disc

Time: 10 minutes
Analyzer mode: READY

1. Use an indelible marker to write **System back up** with the current date on a disc label.
2. If the disc is not formatted, format the disk as follows:
   a. Place a blank CDRW or a blank DVDRW into the CD/DVD drive.
   b. Select the **Drag-to-Disc** icon located to the left of the time display in the lower right corner of the window.
   c. On the Drag-to-Disc popup window, right-select the disc.
   d. Select **Format disc**.
   e. Select **Full format**.
   f. Select **OK**.
   g. When prompted, select **Yes**.
3. At the Startup window, select **Back-up**.
4. At the ADVIA Backup window, select **Make a Backup Copy**.
5. Select the Target Files to be backed up from the following options:
   - **System Files** - Approximately 30 MB of disk space is required.
   - **Data Files** - Disk space required is dependent on the amount of data stored on the C:/ drive. A new CD holds approximately 650 MB.
6. Verify that the backup name is the current date.

   NOTE

   The system names the backup automatically, which consists of a yyyymmdd format. Accept the destination folder default for the DVD disk drive letter (usually D:) or select **Browse** to choose a different destination. If a recordable disk is not available, then the backup can be stored on the partitioned storage drive (D:).
7. Select **Execute**.
8. At the Backup window, select **OK** to confirm the copy.

   NOTE

   If an error window displays, reformat the disk and try again.
9. When the file copy completes, at the Backup window, select **OK**.

Restoring system files

1. Insert the CD or the DVD containing the backup files into the CD drive.

   NOTES

   - When restoring backed-up data files (in the Data subfolder under the A002 folder), select the **Delete Data Files** checkbox at the ADVIA Backup window. This deletes any current data files on the PC hard drive before the backed up system and data files are restored.
   - If the current data files are needed, perform a backup before restoring previous files. The restore feature restores all files (system and/or data files) that were previously backed up. If this is the case, close the ADVIA Backup window and perform Backing up system files (see above).

2. At the Startup window, select **Back-up**.
3. At the ADVIA Backup window, select **Restore a Backup Copy**, then browse to the source folder that contains the backup files to restore and select **Execute**.
4. At the Restore confirmation window, select **OK**.

   If the disk contains all the backed up files required for the restore procedure, the copy function begins.

5. If the backed up files are on more than one disk, select **Continue**.
6. At the ADVIA Backup window, select **Exit**, select **Restore**, then select **OK**.
7. At the ADVIA Backup window, select **Cancel**.
8. Reboot the PC.

Replacing the SPP, RPP1, and RPP2 probes

Materials required:

- Probes:

  DPP (without crash detection),
  REF 003975051, PN 073-0223-01

  DPP (with crash detection),

  REF 02030495, PN 073-0611-01

  SPP-(REF 03975051, PN 073-0223-01)

  RPP1,2-(REF 0551684, PN 073-0224-01)
- Phillips screwdriver
- Pliers
- Lint-free towels

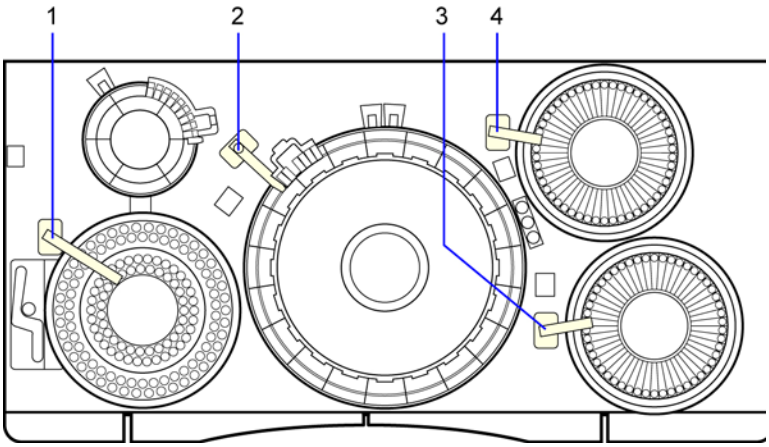
Time: 10 minutes
Analyzer mode: STANDBY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

NOTE

Use this procedure to replace SPP and RPP probes **not** equipped with crash detection. For dilution probes (DPP) equipped with crash detection, refer to *Replacing DPP probes - with crash detection*.



1 Dilution Probe (DPP)
2 Sample Probe (SPP)
3 Reagent Probe 1 (RPP1)
4 Reagent Probe 2 (RPP2)

Figure 5-28. Probes

Remove the probe

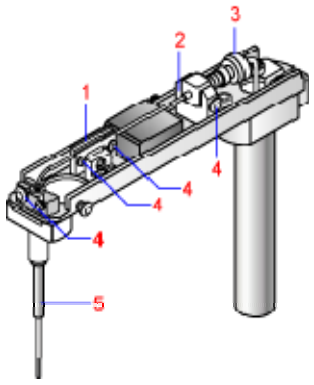
1. Put the system in Standby mode.

   CAUTION
   To keep from damaging the probe tip when the power is off, you must manually support the probe and be careful not to strike it against anything on the analyzer.

2. Cover the cuvettes, wash cups, and other analyzer surfaces with lint-free towels to catch any screws that might fall.
3. Lift and manually rotate the probe to an accessible location.

Probe	Accessible Location
Sample probe (SPP)	Over the dilution tray (DTT)
Reagent probe 1 (RPP1)	Over reagent tray 1 (RTT1)
Reagent probe 2 (RPP2)	Over reagent tray 2 (RTT2)

4. Loosen but do not remove the setscrews on each side of the probe cover. Lift the cover off the probe.
5. Using pliers or your fingers, loosen the knurled fitting (**3**) counterclockwise, then unfasten and remove it by hand.
6. Loosen but do not remove setscrews (**4**).
7. Lift the old probe and discard.



1 Terminal 2
2 Joint Holder
3 Joint Connector
4 Philips Screws (4 places)
5 Probe Tube

Figure 5-29. Probe without cover

Install a new probe

1. Slowly insert the new probe (**5)** through the guide hole (**7**) until the flange (**8**) is seated against terminal 1 (**6**).
2. Verify that the probe is correctly positioned in terminal 2 (**1**) and the joint holder (**2**).
3. Tighten the setscrews while maintaining the probe position in terminal 2 and the joint holder.
4. Finger-tighten the joint connector.

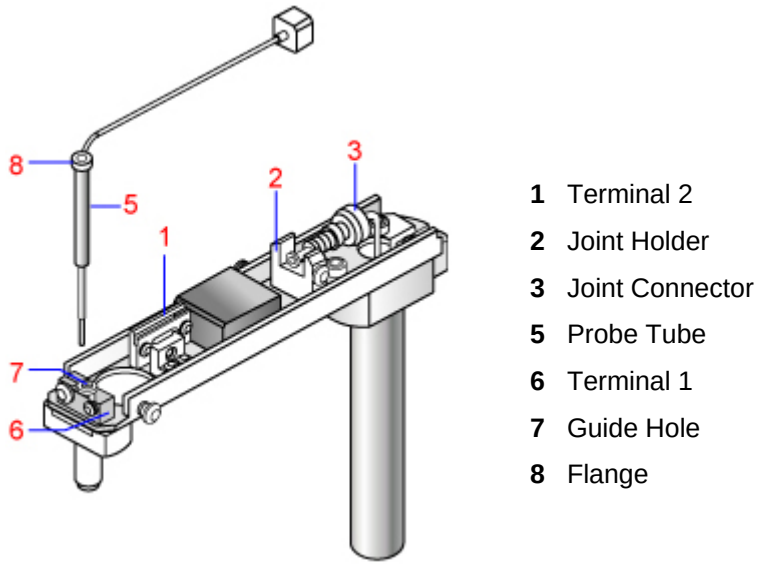


Figure 5-30. Installing new probe

CAUTION

To avoid damaging the threads or introducing leaks or air bubbles, do not cross thread or force the knurled fitting in too far.

5. Replace the probe-arm cover and tighten the two probe cover screws.
6. Lift up the probe arm to the end of its travel. Manually rotate the probe over the probe wash cup but not within the wash port.
7. Put the system in Operating mode.
8. At the Menu Panel, select **Maint.**, then select **User maint.** In the Probe posi.adjust area, select **Position adjust start**.

   All probes (DPP, SPP, RPP1, and RPP2) move over cuvettes.

9. Ensure that the probe is perpendicular to the arm and centered over the cuvette. If not, call your local technical support provider or distributor.
10. At the Operation Panel, select **Initialize** to return the probes back to home (over the wash cups).

11. At the Operation Panel, select **PRIME**, then select **PRIME 2,** then **Execute** to ensure proper water flow through the probe.

NOTE

Make sure that no water is leaking from the knurled fitting.

Replacing DPP probes equipped with crash detection

Materials required:

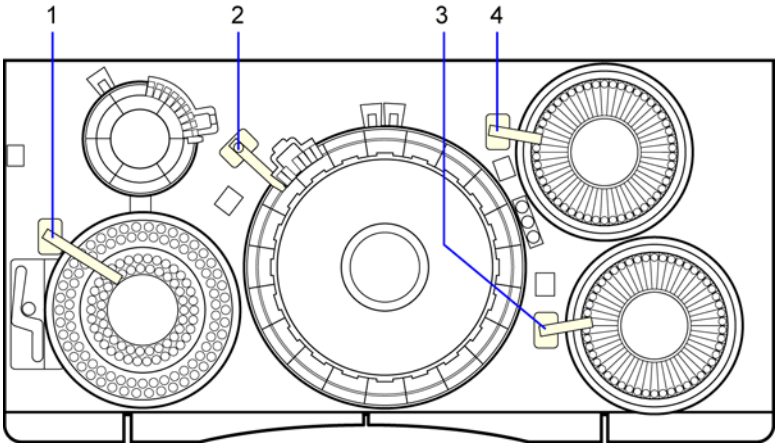
- Probes:

  DPP-equipped for crash detection (REF 02030495, PN 073-0611-01)
- Phillips screwdriver
- Pliers
- Lint-free towels

Time: 10 minutes
Analyzer mode: STANDBY

BIOHAZARD

Wear personal protective equipment. Use universal precautions.



1 Dilution Probe (DPP)
2 Sample Probe (SPP)
3 Reagent Probe 1 (RPP1)
4 Reagent Probe 2 (RPP2)

Figure 5-31. Dilution probe location

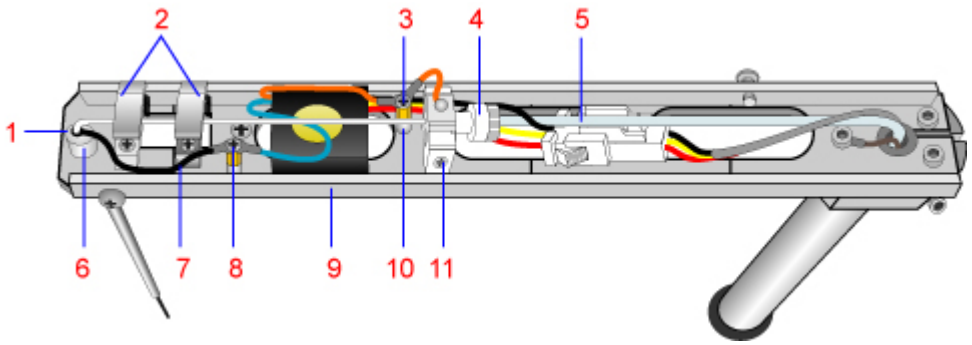
Removing the DPP probe

1. Put the system in Standby mode.

CAUTION

Manually support the probe and be careful not to strike it against anything on the analyzer, to avoid damaging the probe tip when the power is off.

2. Cover the cuvettes, wash cups, and other analyzer surfaces with lint-free towels to catch any screws that may fall.
3. Lift and manually rotate the probe over the sample tray, either over the sample tray or over the ISE.
4. Loosen but do not remove the screws on each side of the probe cover.
5. Lift the cover off the probe arm.



1	Probe	**7**	Black Wire
2	Spring Clips	**8**	Wire Lock Screw
3	Probe Wire Screw	**9**	Probe Arm
4	Joint Connector	**10**	Probe Wire Post
5	Probe Tubing	**11**	Joint Holder (and Locking Screw)
6	Probe Guide		

Figure 5-32. DPP probe without cover

6. Using pliers, if necessary, gently loosen the probe joint connector (**4**), then slide it back on the tubing (**5**) approximately 1 cm.
7. Gently flex and pull back on the tubing (**5**) to remove it from the end of the probe body.

CAUTION

Be careful not to damage the flare end or kink the tube.

8. Loosen but do not remove the locking screw (**11**).
9. Loosen but do not remove the probe wire screw (**3**), then remove the orange probe wire from the post (**10**).

CAUTION

Do **not** force the wire or bend excessively, to avoid breaking the wire off of the probe body mount.

10. Securely hold the probe arm (**9**) and open the 2 spring clips (**2**) by grasping each at the side closest to the black wire (**7**) going to the probe (**1**) and gently raising each to an open, locked position.

CAUTION

There is some spring resistance when attempting to open the clips. Do not allow the probe arm to swing side to side when opening the clips.

11. Loosen but do not remove the wire lock screw (**8**).
12. Remove the black wire (**7**) from the post coming from the probe (**1**), but leave the other blue wire attached.
13. Gently lift the probe (**1**) up through the probe guide (**6**), then carefully remove it from the probe arm (**9**).

14. Discard the old probe.

Install the new probe

1. Carefully insert the new probe (**1**) into the probe guide (**6**).
2. Lower the probe fully into the guide so that the rear tube fitting rests in the joint holder (**11**).
3. While holding down the rear tube fitting, tighten the locking screw at the joint holder (**11**).
4. Carefully close each spring clip (**2**) over the probe.

CAUTION

Do **not** allow the clips to snap on the probe shaft, to avoid damaging the probe.

5. Reconnect the black wire (**7**) under the wire lock screw (**8**) and tighten the screw.

   To prevent damaging the wire, avoid flexing the wire more than necessary.

CAUTION

If the screw does not fully tighten, or the standoff spins, tighten the screw on the probe arm base until the standoff no longer spins; otherwise the liquid-level-sensing capability may be adversely affected.

6. Reconnect the orange probe and preamp wires to the post (**10**).
7. Carefully flex the tubing (**5**) and slip the flared end into the probe joint holder (**11**).
8. Slide the knurled nut of the joint connector (**4**) into the joint holder (**11**) and carefully tighten until snug.

CAUTION

Do not cross thread or force the joint connector in too far, to avoid damaging the threads or introducing leaks or air bubbles.

9. Replace the probe arm cover and tighten the 2 probe cover screws.
10. Lift up the probe arm (9) to the end of its travel, then manually lift and rotate the probe over the probe wash cup but not within the wash port.
11. Put the system in Operating mode.

Priming the system

1. At the Menu Panel, select **Maint.**, then select **User maint**. (For additional details, refer to Using the User Maintenance window.).
2. At the User Maintenance window, in the Position Probes for Routine Cleaning area, select **Start**, then select **Yes** when prompted.
3. Ensure that the probe is perpendicular to the arm and centered over the cuvette.

4. If not centered, call your local technical support provider or distributor.
5. At the Operation Panel, select **Initialize** to return the probes back to home (over the wash cups).
6. At the Operation Panel, select **Prime**, **PRIME 2**, and then **Execute** to ensure proper water flow through the probe.

NOTE

Make sure that no water is leaking from the joint connector (4).

Replenishing the RRV (reaction) bath oil bottle

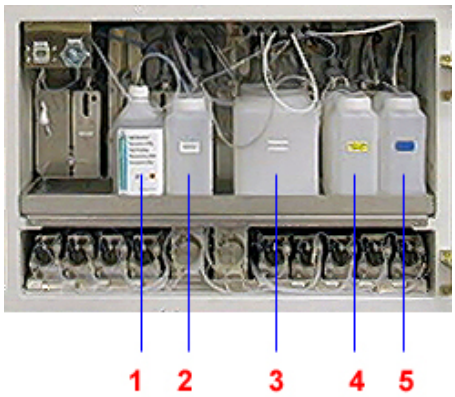
Materials required:

- RRV (reaction) bath oil (REF 09323099, PN B01-4180-01)

Time: 10 minutes
Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment. Use universal precautions.



1 ISE buffer bottle
2 RRV (Reaction) bath oil bottle
3 Isotonic saline diluent bottle
4 Cuvette detergent bottle
5 Cell conditioner bottle

Figure 5-33. RRV bath oil bottle

CAUTION

Do not attempt to clean the RRV bath oil bottle (**1**) with water; RRV bath oil and water do not mix.

1. Unscrew the filter cap (**3**) at the front of the RRV bath oil bottle (**1**), then pull up the tube with the filter.
2. Disconnect the RRV bath oil bottle level sensor connector (**2**), then turn the connector counter-clockwise and pull it out.

CAUTION

Make a note of the bottle position on the shelf, to avoid mixing up the fluid bottles.

3. Remove the RRV bath oil bottle (**1**).

CAUTION

Ensure that level-sensor connector (**2**) does not get wet, to avoid damaging it.

4. Refill the bottle with RRV (reaction) bath oil.
5. Replace the bottle on the shelf in the cabinet.
6. Connect the RRV bath oil bottle level sensor connector (**2**) by pushing the connector in and turning it clockwise.
7. Insert the filter and tube, then fasten the cap.

   NOTE

   Make sure that the filter holder is located at the bottom of the bottle.

Preventive cleaning of the wash station lines

Materials required:

- 5 reagent containers, empty, 70-mL (optional)
- Probe Wash 1
- Probe Wash 2
- 10% Cuvette Wash solution
- 5% Probe Wash 3 solution
- 70-mL reagent container (REF 06397121, PN 073-0373-02)
- Wash solution labels (REF 00153468, PN 073-0406-02)
- Deionized water

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 45 minutes
Analyzer mode: READY

If you experience a problem with clogs in the wash station aspiration nozzles and lines, use this procedure to clean the WUD and DWUD wash station aspiration nozzles and lines.

1. Prepare either of the following wash solutions:

WARNING

Probe Wash 3 contains 4.5% potassium hydroxide and 2% sodium hypochlorite. Avoid contact with skin and eyes. Probe Wash 3 is a corrosive material that can cause burns. Wear suitable protective clothing, gloves and eye/face protection. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Household bleach is 5% sodium hypochlorite. When handling bleach, which can be used as a cleaning and antiviral agent, wear protective clothing, gloves, and safety glasses. It is harmful if swallowed and may cause eye or skin irritation.

Use household bleach that is free of heavy metals, such as Clorox.

- **Preferred Solution** – Prepare a 10% solution of Probe Wash 3 by diluting 1 part of Probe Wash 3 with 9 parts of distilled or deionized water. The minimum recommended volume is 100 mL Probe Wash 3 plus 900 mL of distilled or deionized water.
- **Alternate Solution** – Prepare a 20% solution of household bleach by diluting 1 part of bleach with 4 parts of distilled or deionized water. The prepared solution is

stable for one week when stored at room temperature. Minimum recommended volume is 200 mL bleach plus 800 mL of deionized distilled water.

NOTE
The remainder of this procedure describes the steps to clean the WUD and DWUD wash stations. Perform the entire procedure for the WUD lines and nozzles, then repeat the entire procedure for the DWUD lines and nozzles. The various parts are described as the "DWUD/WUD," meaning one or the other, depending on which is being cleaned at the time, and does not mean both simultaneously.

2. Prepare the WUD/DWUD for cleaning:
   a. With the system in READY mode, log on as **supervisor**.
   b. Place paper towels on top of the RRV and DTT cuvettes directly under the WUD/DWUD nozzles as a precaution.
   c. Using a 4-mm hex wrench, loosen the captive screw (**1**) that secures the WUD/DWUD wash head to the WUD/DWUD mechanism.

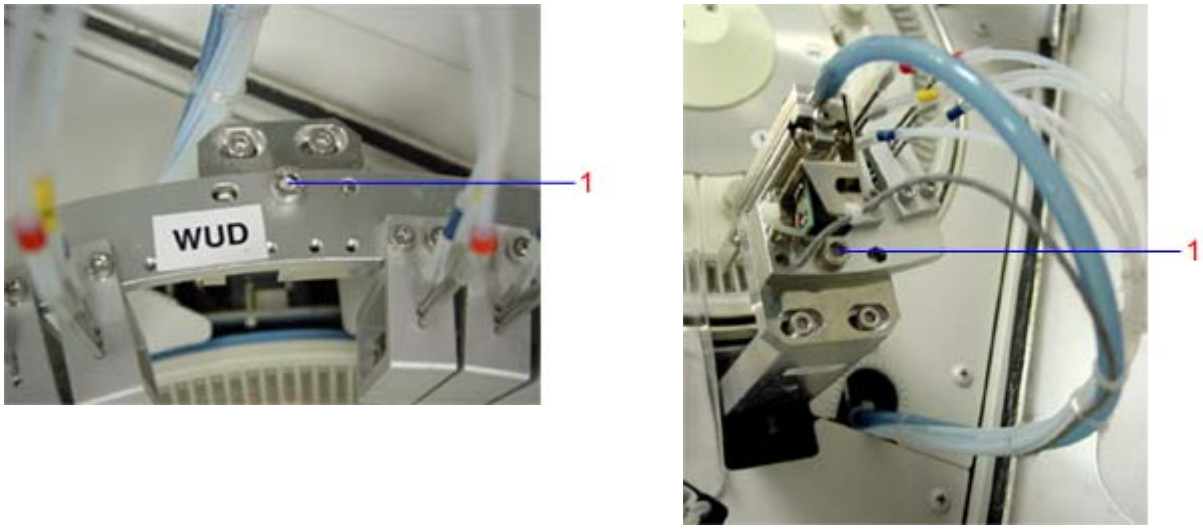


Figure 5-34. WUD and DWUD captive screw

   d. Lift up the WUD/DWUD wash head and place it in a shallow plastic tray on top of the paper towels.

      NOTE
      Use a shallow tray for washing the nozzles. A tray with a depth of 35 – 40 mm is most suitable. Trays with higher sides may require additional wash solution.

   e. Place the dryer nozzle outside the tray (**1**) and all the other nozzles inside the tray.

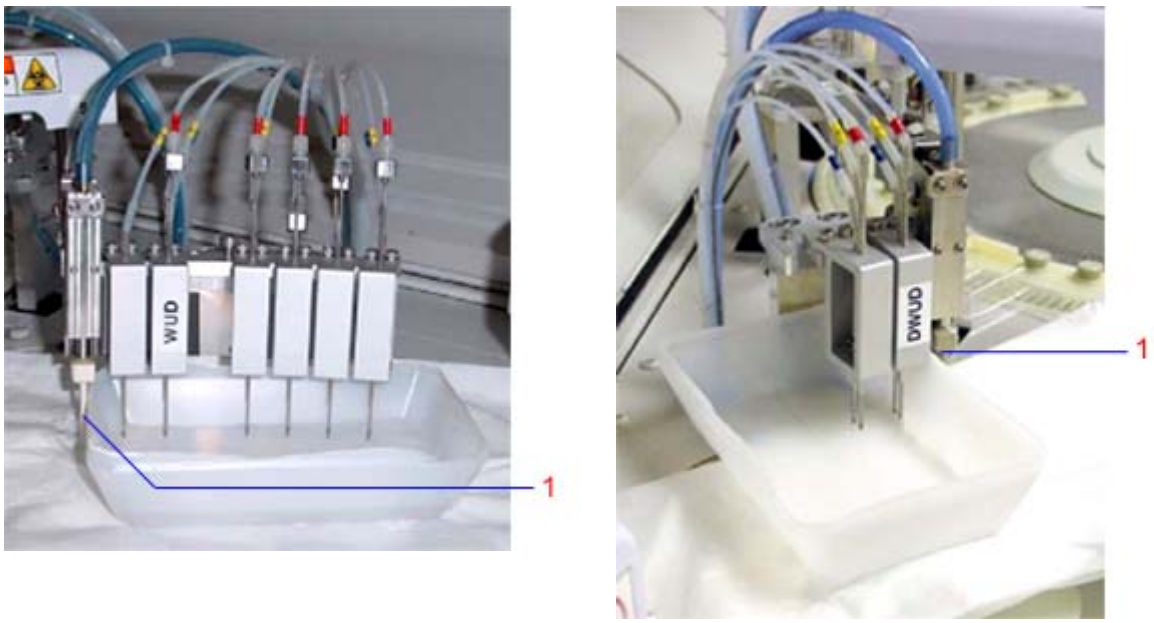


Figure 5-35. WUD and DWUD dryer nozzle

f. Fill the tray with deionized water, being careful not to overflow the tray.

g. Pour enough deionized water into the tray so that the center nozzles (yellow-labeled overflow nozzle) are in liquid.

3. At the Menu Panel, select **Maint.**, then select **JEOL Maintenance**.

   NOTE

   If the JEOL Maintenance option is not listed on the Maint. menu, call your local support provider for access to this menu option.

4. At the JEOL Maintenance window, in the Univers. sequence start area, type **1** in the Sequence field and **1** in the Number of times field, then select **Start**.

5. Select **Yes** at the confirmation window to start the procedure.
   - UNIVERSAL displays as the operation mode.
   - One sequence takes about 65 – 70 seconds.
   - This sequence activates the appropriate devices so all the WUD/DWUD aspiration nozzles and overflow nozzles are pulling vacuum.
   - The overflow lines (short nozzles) aspirate air after a short while as the liquid in the container lowers. Add more liquid as necessary to flush out the overflow lines.

6. When the operation mode returns to READY, lift the WUD/DWUD wash head out of the tray and temporally place it on top of the WUD/DWUD assembly.

7. Remove and empty the tray, then place it back on paper toweling under the WUD/DWUD nozzles.

8. Place the WUD/DWUD wash head into the tray and fill the tray with 10% Probe Wash 3 solution (preferred) or 20% bleach solution (alternate).

9. Pour enough wash solution into the tray, so the center nozzle (yellow-labeled overflow nozzle) is in liquid, without overflowing the tray.
10. Repeat steps 4 and 5, to clean the WUD/DWUD lines with the 10% Probe Wash 3 or 20% bleach solution.
11. Repeat steps 4 and 5 until the lines are cleaned thoroughly.

    NOTE

    As an aid to cleaning the aspiration lines, manually lift the WUD/DWUD wash head in and out of the cleaning solution to introduce air into the lines.
12. When the operation mode returns to READY, lift the WUD/DWUD wash head out of the tray and temporally place it on top of the WUD/DWUD assembly.
13. Using a lint-free cloth, carefully clean the stainless steel nozzles of the WUD/DWUD wash head.
14. Remove, empty, and rinse the tray to remove any residual cleaning solution, then place it back on paper toweling under the WUD/DWUD nozzles.
15. Place the WUD/DWUD wash head into the tray, then fill the tray with deionized water.
16. Repeat steps 4 and 5 to flush out the cleaning solution with deionized water.
17. Repeat this sequence twice as many times as the sequence was run with the cleaning solution, to ensure that no residual cleaning solution is left in the lines.

    NOTE

    A colored food dye may be added to the rinse water as a visual aid, to verify the blue and yellow aspiration lines are not clogged and are working properly.
18. When the operation mode returns to READY, move the WUD/DWUD wash head on top of the WUD/DWUD assembly and secure it by tightening the 4-mm captive hex screw.
19. Remove the tray and paper towels from the system.
20. Repeat this procedure from step 2 for the other wash head, if needed, and then proceed to step 21.
21. Exit the JEOL Maintenance window.
22. Run a Startup Wash (WASH3) procedure on the system, then verify proper hydraulic operation and mechanical alignment of the WUD/DWUD assemblies during the Startup Wash.
23. Run your laboratory’s quality control material and verify the results are within acceptable ranges.

Washing all the ISE lines

Materials required:

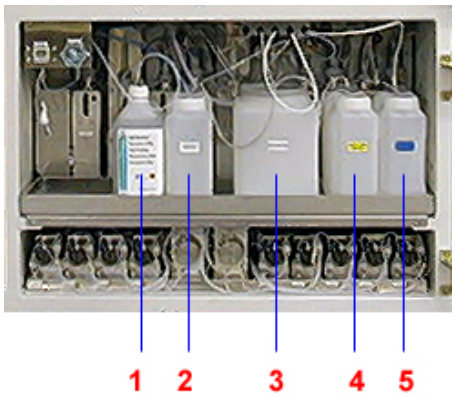
- 2 clean, empty buffer bottles
- Probe Wash 3 solution
- Dummy electrode
- Phillips head screwdriver

Time: 15 minutes
Analyzer mode: Manual operation

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

1. At the Menu Panel, select **Maint.**, then select **ISE Operation**.
2. In the Period.wash area, select **OFF**, then select **Set**.
3. Open the front doors and replace the buffer solution (**1**) with another buffer bottle containing 500 mL of deionized water.



1 ISE buffer bottle
2 RRV (Reaction) bath oil bottle
3 Isotonic saline diluent bottle
4 Cuvette detergent bottle
5 Cell conditioner bottle

Figurer 5-36. Location of ISE Buffer bottle

4. Loosen the thumb screw and lift the ISE cover.
5. Disconnect the electrode connectors.
6. Remove the thumbscrew (**1**) to release the plate that secures the electrodes and the block containing the electrode.

Figure 5-37. ISE electrode plate thumbscrew

7. Remove the electrodes and replace it with the dummy electrode.
8. At the ISE Operation window, in the Bufferprime area, type **50** in the Times field.

9. Select **Execute**
10. When prompted, select **Yes** to execute buffer prime.

Washing the lines

1. Remove the buffer bottle with the deionized water and replace it with a bottle filled with a solution of 475 mL of deionized water and 25 mL probe wash 3 solution.
2. At the ISE Operation window, in the Bufferprime area, enter **50** in the Times field.
3. Select **Execute**.
4. When prompted, select **Yes** to execute the buffer prime.

Rinsing the lines

1. Replace the probe wash 3 solution bottle with a bottle of deionized water.
2. In the Bufferprime area, enter **50** in the Times field, then select **Execute**.
3. Remove the dummy electrode.
4. Reinstall the Na, K, and Cl electrodes.
5. In the Initialize area, select **Execute**.
6. Before reinstalling the buffer-solution bottle, thoroughly rinse the buffer bottle cap, float switch, and tube with deionized water and dry completely.
7. Install the buffer bottle or replace it if the volume is low.

Priming and initializing the ISE module

1. At the ISE Operation window, in the Bufferprime area, enter **15** in the Times field.
2. To prime the line with buffer, select **Execute**, then select **Yes**.
3. When the priming is finished, verify that the electrodes are not leaking.
4. At the ISE Operation window, select **Exit**, then select **Yes**.
5. Run 10 pooled serum samples, or do an ISE CV check.
6. Perform calibration and run controls.

Conditioning the ISE Na and K electrodes

Materials required:

- 10 mL of serum pool
- 30 mL of ISE Buffer (REF 03463190, PN B01-4171-51)
- 2-mL or 3-mL plastic, disposable pipette

Time: 5 minutes (preparation)
24 hours (immersion)
Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

NOTES

- The Cl electrode does not require conditioning.
- If the slope of the electrode is in the range of 46 – 49 (Na or K) and the Daily Maintenance Log entries for the electrode shows it is trending down, then perform this procedure.
- If the slope is low and a trend is not observed, verify that all other ISE maintenance is current before performing this procedure.

1. Prepare a 1:4 dilution of pool serum using ISE buffer solution.
2. Remove the new electrode from its case.

   NOTE

   The ion electrode contains an inner solution, which can be confirmed by shaking the electrode. This solution decreases little by little with time. If you do not feel any response in your shaking, measure its weight. If the electrode weighs less than 9 g, do not use it.

3. Remove the sponge from the bottom of the electrode case and place the electrode to be conditioned back into the case.
4. Using a dropper or pipette, add 0.5 mL of pool serum into the flow path of the electrode.

   Be sure to apply the serum thoroughly.
5. Add buffer solution, prepared in step 1, to the case. Cover the entire electrode with the solution.

   Allow the electrode to condition overnight.
6. When conditioning is complete, remove the electrode, wash it with deionized water, and dry it thoroughly

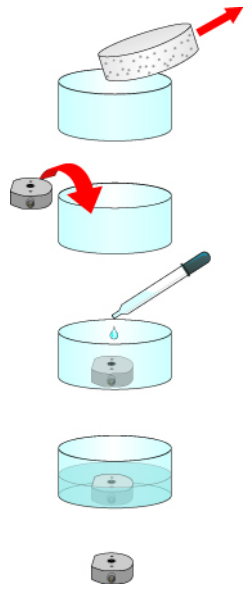


Figure 5-38. Soaking the electrode

WARNING

To prevent infection, by contacting serum directly, wear suitable protective gloves when you remove the electrode from the solution.

NOTE

High-concentrated salt water is used as a preservation solution to maintain electrode performance. When the electrode package is opened, wash the electrode with sufficient water and wipe well before use. Small amounts of salt on the electrode may cause rust on the electrode connector.

NOTE

Storing the reference electrode:

a. Remove the reference electrode from the ISE module.

b. Rinse the reference electrode with deionized water.

c. Place it into an appropriate container.

d. Cover the reference electrode with reference electrode filling solution.

e. Cover the container and store at -18 to 4.5 °C (0 to 40 °F).

f. Rinse the reference electrode with deionized water prior to the next use.

7. Replace the electrodes on the instrument with the newly conditioned ones.
8. Calibration is performed as part of the electrode replacement.
9. If the calibration fails, repeat the calibration.
10. If data continues to be unstable after electrode conditioning, perform an electrode wash, then perform calibration.

Replacing ISE electrodes

Materials required:

Electrodes

- Cl (REF 07097504, PN 073-0049-01)
- K (REF 06135445, PN 073-0050-01)
- Na (REF 03092699, PN 073-0051-01)
- Reference (REF 00311764, PN 073-0653-01
- O-rings, 3 (REF 09955206, PN 073-0071-01)
- Philips screwdriver

BIOHAZARD

Wear personal protective equipment. Use universal precautions.

Time: 5 minutes
Analyzer mode: Manual operation

Replace the Na, K, and the Cl electrodes if the slope is incorrect or calibration continuously fails.

The acceptable ISE slope is between 45.0 and 63.0. Slopes outside of this range are flagged as shown in the table. A flagged slope fails the calibration. The slope limits are defined at the ISE Parameter Settings window.

Mark	ISE Slope Range
H	> 65.0
h	63.1 to 65.0
l	38.0 - 44.9
L	< 38.0

Replace the reference electrode when the reference electrode value is <500.

Checking the reference electrode value

1. At the Menu Panel, select **Maint.**, then select **ISE Monitor**.
2. At the ISE Monitor window, at the bottom of the Calib.monitor: Serum area, check the value of the Ref. electrode field.
3. If the Ref. electrode value is **less than 500.0**, replace the reference electrode.

Removing electrodes

1. At the Menu Panel, select **Maint.**, then select **ISE Operation**.
2. In the Period. wash area, select **OFF**, then select **Set**.
3. Using a Phillips screwdriver, remove the screws (**1**, see Figure 5-1) that secure the DPP shield to the analyzer panel.
4. Push the DPP shield to the right and slowly lift the DPP shield until it reaches approximately a 90° angle, then gently lift the tab of the DPP shield and remove.
5. Loosen the thumb screw and lift the ISE cover.
6. Disconnect the electrode connectors.
7. Remove the thumbscrew (**1**) to release the plate that secures the electrodes and the block containing the electrode. (See Figure 5-37.)
8. Remove the electrode to replace.

Installing electrodes

NOTE
Make sure the K and Na electrodes are conditioned. When the Cl and Ref electrodes are taken out of their packaging, they are wet. Wipe the Cl electrode thoroughly, and wash the Ref electrode using water.

NOTE
To store the reference electrode, refer to Storing the Reference Electrode on page 169.

1. Assemble the new electrodes in the correct order:
2. Set the electrodes in place, paying careful attention not to leave a space between them.

   Make sure there is an 0-ring between each electrode and that the ridges on the side of each electrode fits into the depressions on the side of the electrode next to it.

3. Tighten the thumbscrew while holding down each electrode with the retaining plate.

4. Insert the electrode connectors.

CAUTION

If a space exists between the electrode connections, the plate retaining the electrodes cannot close. If you cannot close it, move each electrode left and right little-by-little. **Do not** force the electrode. Fasten the thumbscrew tightly. If the retaining plate loosens during measurement, liquid could leak, causing a problem with the instrument.

Priming the ISEs

1. At the ISE Operation window, select **Execute** to the right of the word Initialize.
2. Select **Yes** when prompted to execute.
3. In the Bufferprime area, enter **3** into the Times field.
4. Select **Execute**, then select **Yes** when prompted to execute buffer prime.
5. Verify the liquid is discharged smoothly from the dilution bowl during priming.
6. If the liquid is increasing without being discharged, a leak exists, an electrode is incorrectly positioned, or a clog is in the drain system. If the liquid increases, immediately stop the instrument.

   IMPORTANT

   If clogging occurs, the most probable cause is that the flow path is clogged inside the electrode. Remove the Na and K electrodes, and check them by transmitted light to see whether the flow path is clogged or not. You cannot do this for the Cl electrode because of its construction. When in doubt, even if you cannot find a problem, try replacing the electrode.
7. Mount the stainless steel cover on the top of the ISE unit by sliding it inside and fasten the screw retaining the cover.

   NOTE

   When sliding it, be careful not to scratch the tubes or dilution bowl. When fastening the screw, verify that the cover is not caught in the groove and is not loose.
8. Reinstall the cover and tighten the screws.
9. Replace the DPP shield and secure it in place with the Phillips screw.
10. At the ISE Operation window, in the Initialize area, select **Execute,** then select **Yes**.

    NOTE

    The ISE wash is automatically turned on.
11. After initialization is complete, select **Exit,** then select **Yes**.

Calibrating the ISEs

1. At the Operation Panel, select **Initialize**.
2. At the Menu Panel, select **Maint.**, then select **ISE Operation**.
3. At the ISE Operation window, in the Calibration area, select **Execute**.
4. When prompted, select **Yes** to execute calibration.

5. If the calibration fails, repeat calibration again and if data continues to be unstable, perform an electrode wash.

   NOTE

   The electrodes may have to stabilize on the system before a successful calibration is achieved.

6. At the ISE Operation window, select the **Electrode Info** button and enter the new electrode information.

Storing the reference electrode

1. Remove the reference electrode from the ISE module.
2. Rinse the electrode with deionized water.
3. Place it into an appropriate container.
4. Cover the reference electrode with reference electrode filling solution.
5. Cover the container and store at 2 - 40°C (35.6 - 104°F).
6. When ready to use, rinse the electrode with deionized water.

   NOTE

   If the electrode is stored cold, allow time for it to equilibrate to room temperature before use.

Cleaning the dilution bowl and waste-drain nozzle

Materials required:

- Cotton stick
- Deionized water
- Household bleach
- Toothpick
- Philips screwdriver

Time: 45 minutes
Analyzer mode: READY

BIOHAZARD

Wear personal protective equipment.
Use universal precautions.

Cleaning the dilution bowl

1. At the Menu Panel, select **Maint.**, then select **ISE Operation**.
2. At the ISE Operation window, in the Period.wash area, select **OFF**, then select **Set**.
3. Using a Phillips screwdriver, remove the screws (**1**, see Figure 5-1) that secure the DPP shield to the analyzer panel.
4. Push the DPP shield to the right and slowly lift the DPP shield until it reaches approximately a 90° angle, then gently lift the tab of the DPP shield and remove.
5. Loosen the thumb screws, then remove the ISE cover.
6. Loosen the screw retaining the stainless steel cover at the top of the ISE unit, and remove that cover by sliding it toward you.
7. At the ISE Operation window, next to Final operation, type **16** in the field next to Pure water position.

8. Select container 1 setting for 10-mL tube.
9. Fill a 10-mL tube with deionized water and place it on the CTT tray in position 16.
10. At the ISE Operation window, in the Final operation area, select **Execute.**

    Water is dispensed into the ISE module.

11. To dissolve the crystals attached to the liquid-supply nozzle, let it stand for about five minutes.
12. At the ISE Operation window, in the Dil Bowl drain area, select **Execute**.

    The water in the dilution bowl drains.

13. Wipe up any water or dirty parts around the liquid-supply nozzle (**1**) using a damp cotton stick or similar material.

Figure 5-39. Location of the liquid-supply nozzle

14. At the ISE Operation window, enter **5** in the Bufferprime Times box, then select **Execute**.
15. When prompted, select **Yes** to execute a buffer prime.

Cleaning the waste-drain nozzle

CAUTION

Be careful not to scratch the nozzle. Damaging the nozzle may cause inaccurate results.

1. Using a blunt object such as a pipette, carefully scrape the crystals that are attached to the waste-drain nozzle (**1**).

Figure 5-40. Location of waste-drain nozzle

2. At the ISE Operation window, enter **5** in the Bufferprime Times box, then select **Execute**.

   IMPORTANT
   Verify that no buffer collects in the wash block. Buffer that remains in the wash block may clog the drain.

Maintaining the ISE unit after the dilution bowl and waste-drain nozzle are clean

1. Replace the stainless steel cover of the ISE unit by sliding it into place, then secure it with the retaining screw.

CAUTION
When sliding the cover, be careful not to scratch the tubes and dilution bowl. Also, when fastening the screw, verify that the cover is not caught in the groove and is not loose.

2. Reinstall the splash cover and the DPP probe shield.
3. At the ISE Operation window, in the Initialize area, select **Execute**.
4. When prompted, select **Yes** to execute.
5. At the ISE Operation window, in the Period.wash area, select **ON**, then select **Set**.
6. At the ISE Operation window, select **Exit**.
7. Perform calibration and run controls.

Recovering from a power failure

Preparing the system for an expected power outage

If you know in advance of an upcoming power outage:

1. Turn off the workstation and analyzer power by performing the normal shutdown operation.
2. If you expect the power supply to be off for a long period of time, refrigerate the reagents.

3. When the power returns, perform the normal startup operation.

Preparing the system for power return (if power was unexpectedly lost while system was on)

While the electrical power is still off, do the following:

1. Turn off the workstation power switch.
2. At the power panel, set the **Operate/Standby switch** to Standby.

When the electric power returns, do the following:

1. Turn on the workstation power switch.
2. When the Startup window opens, turn the **Operate/Standby switch** to Operate.
3. Select the **system reset** button on the analyzer unit power supply panel.
4. At the Startup window, enter a password.
5. Select **Re-Start**, then select **OK**.
6. If possible, repeat the task that you were performing prior to the power failure and verify that the data was stored.
7. If reagent was dispensed, you must perform a Weekly WASH2 before resuming operation.

Recovering from an unexpected power outage (after power returns, when power was unexpectedly lost while system was on)

1. If the Startup window is open, select **Shutdown** and perform the normal shutdown operation.
2. Turn off the workstation power and turn the Operate/Standby switch on the analyzer to **Standby**.
3. Wait approximately 20 seconds.
4. Perform the normal startup operation and open the Startup window.
5. At the Startup window, enter a password.
6. Select **Re-Start**, then select **OK**.
7. If possible, repeat the task prior to the power failure and verify that the data was stored.
8. If reagent was dispensed, you must perform a Weekly WASH2 before resuming operation.

6 Troubleshooting

For probable causes and solutions of the events listed below, refer to the Troubleshooting section of the online Operator's Guide:

- System error messages

  NOTE

  The error message log on the analyzer also has information to guide you through resolving error messages.

- Sample dilution (checking DPP waveform)
- Reagents (RPP reagent detection)

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7 File Management

Saving the error log to a test file

You can create a text file to save to a CD or on the hard drive on the PC. These files are useful for troubleshooting, keeping track of analytical parameter (chemistry) settings for user defined methods, or for emailing. You can use any system window with a print button with this procedure:

Capturing the error report:

1. Verify that the analyzer is in READY or WAIT mode.
2. Turn the printer off.
3. At the Operation Panel, select the **Error Report** icon.
4. On the Error report window, select **Extend**.
5. Select **Print**.
6. On the print window, select **All**.
7. Select **Execute**.
8. Delete the print job as follows:
    a. At the Windows taskbar, select **Start**, then select **Settings**.
    b. Select **Printers and Faxes**.
    c. At the Printers and Faxes window, right-select the printer marked with a checkmark (default printer)
    d. Select **Cancel All Documents**.
    e. When prompted, select **Yes**.
    f. Close the Printer and the Printer and Fax windows.
9. Turn the printer on.
10. Copy the file to a CD or a DVD as follows:
    a. Place a formatted CD or DVD into the CD/DVD drive.

        NOTE
        Close any CD/DVD popup windows that open after a disk is placed into the CD/DVD drive.

    b. Select the **Drag-to-Disc** icon located to the left of the time display in the lower-right corner of the window.
    c. Use Windows Explorer to find the C:\A002\Work folder and locate the file named sfytwork.txt.
    d. Right-select **sfytwork.txt** then, holding down the mouse button, drag the file to the Drag-to-Disc window and release the button.

11. Verify that the data was saved to the CD or DVD as follows:
    a. Select the Drag-to-Disc popup window.
    b. Press **Alt V** to view the contents on the disk.
12. Use Windows Explorer to find the C:\A002\Work folder and locate the file named sfytwork.txt. and delete the file.

For other windows (System Test List, Contamination Set Window, Analytical Parameters), follow the same procedure except when in Windows Explorer, select the "modified" heading of the title bar in the work folder. This puts the file that is created at the top of the list. Each window creates its own file with a unique file name.

You can view saved files by opening the file with Microsoft Word, Wordpad or Notepad. When necessary, email the file or save for future reference.

Saving the test data from the User Maintenance window

You can create a file that has test results only. ISE data, absorbance data, and other reaction parameters are saved in this type of file. You can open the file using a spread sheet program such as Microsoft Excel. You can save the file to a diskette, CD or to the system PC hard drive.

Saving test data

1. Verify that the analyzer is in READY or WAIT mode.
2. Insert a formatted CD or DVD into the CD/DVD ROM drive.
3. Select the **Drag-to-Disc** icon located to the left of the time display in the lower-right corner of the window.
4. Select **Request**, then select **Review/Edit** and make a note of which patient samples to save.

   Saving by order number works best but you can also use a sample ID.

5. Select **Maint.**, then select **User Maintenance**.
6. In the Save of Text File area at this window complete the selections:
   a. **Sample** type: Select routine sample or control sample then check the date box displays "today" or the date that the test results is filed under.
   b. Output type: Select the CSV or sequential file radio button.
   c. Save **range:** Select Order number and enter range of samples to save as determined in step 2.
7. Select **Save**.
8. Select **Yes**.
9. In the **Save of Text File** dialog box make the following selections:
   a. Select the appropriate drive letter in the Save in list box.
   b. Enter the file name in File Name box.

10. Select **Save**.

    You can save Control sample data by following steps 3-7. Select the control sample, date, and enter the control sample number (PAxx-PZxx).

11. Verify that the data was saved to the CD or DVD as follows:

    a. Select the **Drag-to-Disc** popup window.

    b. Press **Alt V** to view the contents on the disk.

Saving reaction data in CSV format

This procedure creates a file that contains test results, cell blank data, absorbance data, and other reaction parameters. You can view this file, when saved with a .CSV file extension using a spreadsheet program such as Microsoft Excel. If saved in text format, you can view it using Microsoft Wordpad.

You can save files created using this procedure to a DVD or CD on your PC.

1. Verify that the analyzer is in READY or WAIT mode.
2. Place a formatted CD or DVD into the DVD/CD-RW drive on your PC.
3. Select the **Drag-to-Disc** icon located to the left of the time display in the lower-right corner of the window.
4. Select **Request**, then **Review/Edit** and make a note of the filing date of the samples you want to save.

   Saving by order number works best but you can use sample.

   Based on when you performed a New Start, the system stores data for 7 filing dates. After that the data with the oldest filing date is deleted.

5. Select **Request**, then **Reaction Monitor**.
6. Select the **Create Data File** button.
7. Make the following selections in Create Data File dialog box:
   - **Sample type**
   - **Date**
   - **Test**—the test number is the process sequence number for each test. It is the number that displays next to the test name at the Order Entry Window. Enter the test numbers separated by commas or use a hyphen, for example, 1,3,5,6-11.
   - **First Data** or **Rerun Data**
   - **Wavelength**. Generally only calculated wavelength is selected.
   - **Range of preservation**. Specify the order numbers or sample IDs.
8. Select **Execute**.
9. In the Saving data file window, make the following selections:
   - Select the CD/DVD drive in the Save in: list box.
   - Name the file in the File name: field with a .csv extension (for example, TP_938.CSV).
   - Select **Save**.

10. Verify that the data was saved to the CD or DVD as follows:
    a. Select the **Drag-to-Disc** popup window.
    b. Press **Alt V** to view the contents on the disk.

NOTE
Use Microsoft Excel to open the saved *.CSV file. Or, you can open an unformatted .csv file in a text editor, such as Notepad.

Saving a data archive from User Maintenance window

This procedure creates a file that you can view using the filing option under the today button at the Review/Edit Window and the Reaction Monitor window of the ADVIA Chemistry System. This file is essentially an archive of all the data that the system stores on each sample that is run. ISE data is included.

Only general samples and control data is saved. General samples include patient, interrupt, and STAT samples.

IMPORTANT
To view the archived data, the System Test List and Process Sequence List must be same as when the archive was created. The system stores 7 filing dates of data. The most efficient way to use this feature is to save all 7 filing dates at one time (weekly) and create a system backup at the same time.

1. Verify that the analyzer is in READY or WAIT mode.
2. Place a formatted CD or DVD into the DVD/CD-RW drive on your PC.
3. Select **Request**, then select **Review/Edit** and note the filing date of the samples to save.

   The system stores data for 7 filing dates based on when a New Start is performed. After that the data with the oldest filing date is deleted.

4. Select **Maint.**, then select **User Maintenance**.
5. In the Archive of Test Results area, select a sample type (patient or control) and select **Reaction Data**.
6. Select in the date box and select the date of the samples you want to save.
7. Select the **Drag-to-Disc** icon located to the left of the time display in the lower right corner of the window.
8. Select **Save**.

   The File Save Menu box opens.

9. Select the CD/DVD drive from the Save in list dialog box and select if you are saving patient or control data.
   - The file name automatically fills in.
   - Patient data is saved with an .idt file extension.
   - Control data is saved with an .pdt file extension.
10. Select **Save** in the File Save dialog box.

11. Use Windows Explorer to verify that the data was saved to the CD or DVD:

Viewing data that was previously archived

1. Verify that the analyzer is in READY or WAIT mode.
2. Place the data CD or DVD into the DVD/CD-RW drive on your PC.
3. Select **Request**, then select **Review/Edit**.
4. Select **Archive** from the filing option in the pull down menu.
   The Filing button becomes active.
5. Select the **Filing** button and select the CD/DVD.
6. Select on the file date of the data to view.
7. Follow the same steps to view the reaction data at the Reaction Monitor window.

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8 System Setup

Calibrating the touch screen monitor

Use this procedure to calibrate the touch screen at your workstation.

Calibrating the touch screen

1. Right-select the **touch-screen** icon at the bottom right of the screen.
2. Select **Align**.
3. Select the targets that display at the screen.
4. Select the check mark.
5. The touch screen is calibrated.

Configuring serum indices

Use the following procedure to obtain the same flagging levels used by Siemens when evaluating method serum intereferences

- Use the Qualit. set button in the Analytical Parameters (Serum) window to set the five different flagging levels for each serum index.
- Use the Item (Test) and Factor boxes in the Analytical Parameters (Serum) window to designate the test for the determination of serum indices.
- Use the Serum indices area on the System Specifications Set window to determine when the serum blank assay is run.

Refer to the *System Configuration* section of the online *Operator's Guide* for further information.

Connecting to your host computer

1. Have your laboratory computer professional connect the host computer as described in the publication titled *LIS Interface Guide*.
2. Use the Online Settings window to enter the communication parameters.

   Use the Online settings window to determine which sample results and workorders to transmit.

   This feature allows you to transmit results when they are available. This is called "real-time transmission."

   If you do not want to use real-time transmission, you can always transmit the results as a batch using the Review/Edit window.

Similarly, you can download workorders at any time as a batch using the Order Entry window.

3. Use the Item Setting dialog box at the Online Setting window to determine which test results to transmit and to assign host test numbers.
4. Use the Data Clean Setting dialog box at the Online Settings window to have the system automatically validate the sample results before they are transmitted.

   Use the Transfer Results List dialog box of the Review/Edit to review the data clean report for each sample.
5. In the System basic composition area at the System Specification Settings window, select **Avail**.
6. In the During-operation system set area of the System Monitor window, select **Do** for the Online option.
7. Use the Host button in the Operation Panel to disconnect from or reconnect to the host computer.

Cup/Tube Assignment

Assign container types to each of the 84 positions in the STT sample tray. For the current analysis, you can override the settings in the Temp cup/tube select window.

1. Log on as **supervisor**.
2. At the Menu Panel, select **Request**, then select **Cup/Tube Assign**.
3. At the Cup/Tube Assign window, assign the containers as follows:
   a. Select the arrow in the Status/Container field for a position.
   b. From the list, select a container type to assign it to the position.

      Container Types are defined in the System Specifications Settings window.

      If you want to specify the container type in the workorder, keep the Status/Container set to 0:Priority requested (the other Status/Container values have priority over the workorder settings).

CAUTION

When sliding the cover, be careful not to scratch the tubes and dilution bowl. Also, when fastening the screw, verify that the cover is not caught in the groove and is not loose.

   c. As an option, you can select I for priority analysis of the sample at this position.
   d. Repeat for other STT positions as needed.
4. To save the changes you made, select **Save**.
5. When prompted, select **Yes**..
6. To save your changes and close the window, select **Exit**.
7. When prompted, select **Yes**.

Setting up the ISE

This section describes the steps required if the present configuration for the electrolyte analyzer (ISE) is ever lost or requires modification.

Activating the ISE

1. Set the ELA switch in the power supply distribution chassis panel (on the back of the analyzer) to the ON position.
2. At the Systems Specifications Settings window, set the Electrolyte option to Avail.
3. At the System Monitor window, set the electrolyte option to Operate.

Setting up ISE parameters

Perform any of the following tasks at the ISE Parameter settings window:

- enter ISE parameters
- Setup Calibration information
- enter Normal value set
- define wash and prime settings
- define Rerun conditions
- define Real time correction formula

1. At the Process Sequence window, set the processing and print order for electrolyte tests (124 – 126).
2. At the QC Sample Definition window, add electrolyte tests to existing controls or define additional controls for the tests.
3. At the Test Select window, select electrolyte tests to run on routine sample, controls, and calibrators.
4. At the Sample Select window, select CTT position numbers that are set for calibrators and controls.
5. At the Control Data Registration window, enter the applicable mean and standard deviation from the product package insert.

ISE calibration

Verify that the CTT position setting at the ISE Parameter Settings window agrees with the actual positions where you place the ISE standard on the CTT. Run the ISE calibration using one of the following modes:

- Start button (single point calibration)
- ISE Operation window

Use the ISE Monitor window to review the calibration

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Appendix A – Safety Information

Warning and hazard statements

Biohazard warning

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended by the Clinical and Laboratory Standards Institute (formerly NCCLS) in Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition. 2005. CLSI Document M29-A3. This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

Electrical warning

ELECTRICAL WARNING

To avoid exposure to shock hazards and/or damage to the instrument while performing this procedure, power off the analyzer before proceeding.

Laser warning

LASER WARNING

To avoid damage to the eyes, never look directly at the laser beam or at its reflection from a shiny surface. All field service procedures must be followed precisely. Only Siemens-trained field service personnel should perform procedures related to laser assemblies.

CAUTION

The use of optical instruments with this product will increase eye hazard.

For more safety information and laser specifications, refer to the Regulatory Compliance section in this guide.

Household bleach warning

WARNING

Household bleach is 5% or 6% sodium hypochlorite. When handling bleach, which can be used as a cleaning and antiviral agent, wear protective clothing, gloves, and safety glasses. It is harmful if swallowed and may cause eye or skin irritation.

Use household bleach that is free of heavy metals, such as Clorox.

To prepare a 10% solution of household bleach, dilute one part of bleach with nine parts of clean distilled water, or clean deionized water. The prepared solution is stable for one week when stored at room temperature.

To prepare a 25% solution of household bleach, dilute one part of bleach with three parts of clean distilled water, or clean deionized water. The prepared solution is stable for one week when stored at room temperature.

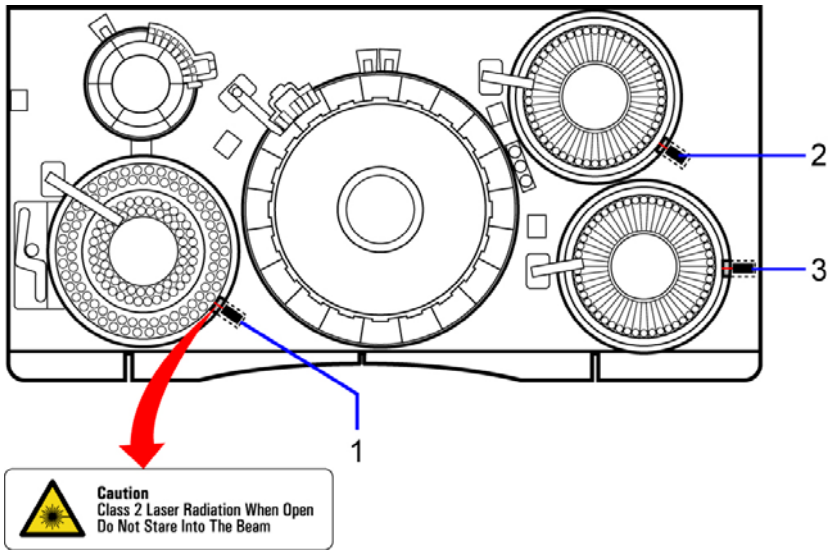
Regulatory compliance

Laser information

The chemistry system complies with CDRH laser radiation Class 1 and EN-60825-1 laser radiation Class II.

In compliance with EN-60825-1, the analyzer sample tray (STT) barcode reader is classified as a Class II laser device having a maximum power output of ≤ 1.2 mW at a wavelength of 670 nm, a pulse duration of 127 ns, and 4.78 mr units of beam divergence.

The analyzer reagent tray barcode readers (RTT1, RTT2) are classified as Class I LED devices having a maximum power output of ≤ 25.5 mW at a wavelength of 655 nm, and a pulse duration of 200 ns.



1 Sample Barcode Reader (STT)
2 Reagent Barcode Reader (RTT2)
3 Reagent Barcode Reader (RTT1)

Appendix B – Warranty and Support Information

Limited Instrument Warranty and Service Delivery Policy

Siemens and its authorized distributors may provide customers who acquire new Siemens instruments with a limited warranty either in a specific agreement or in standard language on their invoices. This limited warranty is designed to protect customers from the cost associated with repairing instruments that exhibit malfunctions due to defects in materials and/or workmanship during the warranty period.

Siemens, at its election, will provide warranty service either by providing repair service of the instrument on site, or by exchanging the defective instrument or component, subject to the limitations and exclusions set forth in Replacement of Parts and Warranty and Service Exclusions, repairs, replacements or exchanges of instruments or components provided during the warranty or any additional service period, will not extend the warranty or service period beyond the initially agreed upon period.

When the customer calls for service, the Siemens representative or authorized distributor will inform the customer of the type of service available for the customer's instrument, and will instruct the customer as to how to obtain that service.

CAUTION

Please observe the warning and hazard statements appearing throughout the online operator's guide. If the ADVIA 2400 Chemistry system is used in a manner not specified by Siemens, the protection provided by the equipment may be impaired.

Warranty period

The limited warranty period generally commences upon installation of the original instrument at the customer's location and extends for a period of one year thereafter, unless otherwise specifically agreed to by and between Siemens (or its authorized distributors) and customer in a writing signed by duly authorized representatives of both parties (sales representatives are generally not authorized representatives of Siemens for these purposes).

Additional service period

The customers, with some exceptions, may purchase additional service coverage beyond any initial warranty period as part of the original instrument acquisition for second or subsequent years beyond the original installation date. The customer's original Purchase Invoice or appropriate Agreement Addendum must indicate the term in months for additional service coverage.

Service calls

Service during normal hours

The customer may obtain service for instruments during normal business hours by contacting the nearest Siemens technical support provider or authorized distributor.

Extent of a service call

Warranty or service calls generally include onsite repair or exchange of instruments or components, travel to the location of the instrument, and onsite labor during normal business hours. A warranty or service call is initiated by the customer by following the instructions on how to obtain service for the customer's instrument. The service call is considered complete when any defects in material or workmanship have been corrected by repair or replacement and the instrument conforms to the applicable specifications. When service is complete, the customer will receive a copy of the documentation detailing all work performed by the Siemens representative or authorized distributor.

Service outside normal hours

Customers, with some exceptions, may also request service to be delivered or an exchange to be initiated outside normal business hours, including evenings, weekend days, or nationally observed holidays, by contacting the nearest Siemens location or authorized distributor. Service performed outside normal hours is subject to a surcharge unless the customer has in place a service product option that provides service at the time/s requested.

Replacement of parts

In performing service, Siemens or its authorized distributors will provide appropriate parts to repair the instrument, or will arrange for the exchange of the instrument or affected parts, at no charge with the exception of certain parts or subassemblies that are considered Customer Replaceable Items. Customer replaceable items include, but are not limited to, the following items: lamps, electrodes or sensors (which are covered by a separate warranty), reagents, calibrators, controls, paper, and pens. Consult the appropriate system operator's guide for a complete list of customer replaceable items for any specific model of instrument.

Warranty and service exclusions

The following exclusions are in addition to any exclusions provided for in any written warranty or service agreement.

If any of the following events occur, the warranty or service provisions do not apply:

1. Repairs or modifications have been made to the instrument by someone other than an authorized Siemens representative.
2. The instrument has been operated using accessories and supplies other than Siemens brand accessories, or consumable supplies and/or reagents not having the same grade, quality, and composition as defined in the system operator's manuals.

3. Siemens has notified customers of a change that improves the performance or reliability of their instrument and customer has not agreed to retrofit or make design changes to the instrument.
4. Customer did not purchase the instrument from Siemens or one of its authorized distributors.
5. The instrument has not been installed within 90 days of shipment to the customer's facility unless otherwise specified.
6. The customer has not performed appropriate customer maintenance procedures, as outlined in the system operator's manuals.
7. The instrument has been misused or used for a purpose for which it was not intended.
8. The instrument has been damaged in transit to the customer or damaged by the customer while moving or relocating it without supervision by a Siemens representative.
9. Damage was caused by floods, earthquakes, tornados, hurricanes, or other natural or man-made disasters.
10. Damage was caused by Acts of War, vandalism, sabotage, arson, or civil commotion.
11. Damage was caused by electrical surges or voltages exceeding the tolerances outlined in the system operator's manuals.
12. Damage was caused by water from any source external to the instrument.
13. The customer has purchased an alternative agreement whose terms of warranty or service supersede these provisions.

Siemens or its authorized distributors will invoice customers, at current standard labor and parts rates, for instruments repaired to correct damage or malfunctions due to any of the reasons listed above.

OTHER THAN AS STATED ABOVE, THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED WITH RESPECT TO THE INSTRUMENT, ITS SALE TO THE CUSTOMER, ITS LEASE TO THE CUSTOMER, OR THE SALE OF THE INSTRUMENT TO THE CUSTOMER AT THE EXPIRATION OR TERMINATION OF THE LEASE AGREEMENT.

SIEMENS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. SIEMENS LIABILITY FOR BREACH OF ANY WARRANTY OR SERVICE AGREEMENT SHALL BE LIMITED ONLY TO THE REPAIR OR REPLACEMENT OF DEFECTIVE EQUIPMENT AND SHALL NOT INCLUDE ANY DAMAGES OF ANY KIND, WHETHER DIRECT, INDIRECT, INCIDENTAL, CONTINGENT, OR CONSEQUENTIAL. SIEMENS SHALL NOT BE LIABLE FOR DELAY FROM ANY CAUSE IN PROVIDING REPAIR OR EXCHANGE SERVICE.

ANY LIMITATIONS OR OTHER PROVISIONS NOT CONSISTENT WITH APPLICABLE LAW IN PARTICULAR JURISDICTIONS OR A SPECIFIC WRITTEN AGREEMENT DO NOT APPLY TO CUSTOMERS IN THOSE JURISDICTIONS OR SUBJECT TO THOSE AGREEMENTS.

Design changes and retrofitting of instruments

Siemens reserves the right to change the design or construction of specific models of instruments at any time without incurring any obligation to make such changes available to individual customers or instruments. If Siemens notifies customers of a change that improves the performance or reliability of their instrument, and requests to retrofit that instrument, the customer must agree to allow Siemens or an authorized distributor, at Siemens expense, to retrofit components or make design changes, which will not adversely affect the instrument's performance characteristics.

OSHA requirements

When service is required at a customer location, the customer must provide the Siemens representative with adequate facilities that comply with the regulations of the Secretary of Labor under the Occupational Safety and Health Act (OSHA) of 1970, as amended.

Software License

No title or ownership of software is transferred to the customer. The software component of this Siemens system and any of its modules are merely licensed to the customer for its own use on such system.

Any software (including documentation) provided for the system contains proprietary information constituting valuable trade secrets and is protected by federal copyright law.

The software may not be disclosed, in whole or in part, to third parties or duplicated in any form or medium except as necessary for program execution and archival storage.

Prior to change of ownership, Siemens must be contacted by the original customer to establish terms for the transfer of the software license.

ADVIA Contact information

If you are located in the United States, you can contact the **Customer Service Department** by calling toll free: 1-877-229-3711.

If you are located outside the United States, please contact the Siemens office nearest you.

Siemens Worldwide

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輸入

Appendix C – Customer replaceable parts

Description	PN	REF	Location
Adapter, STT (6PC/PKG)	073-0002-01	08192071	Sample tray
Bottle, plastic, saline	073-0423-01	03136041	
Cover, CTT	073-0948-01	06143936	
Cover, RTT1	073-0870-01	06527904	
Cover, STT	073-0949-01	00735246	
Cuvette (DDT) 1x20	073-0022-01	05049669	Dilution tray
Cuvette, (RRV) 1x17	073-0023-02	05024992	Reaction tray
Electrode cover, ISE	094-0032-01	04227385	
Electrode-Cl, ISE	073-0049-01	07097504	
Electrode-K, ISE	073-0050-01	06135445	
Electrode-Na, ISE	073-0051-01	03092699	
Filter 10-R	073-0033-01	08602474	Water tank, cuvette conditioner, saline, and wash bottles
Filter, 18-R	073-0034-01	01448895	Pure-water bottle
Filter set, LWP	094-0037-01	04872841	
Guide sample cup STT/CTT	073-0346-01	08056461	
ISE, cell base assembly	094-0024-01	07096842	
ISE, dummy electrode	073-0646-01	05938765	
ISE, ground assembly	094-B015-01	04412484	
ISE, screw, probe guide	094-0089-01	06616737	
ISE, screw, seal retainer	094-0090-01	01467717	
ISE, screw, waste nozzle	094-0091-01	05094109	
Lamp, Halogen 12V / 50W	073-0099-01	02127928	
O-ring No. 1, (Black), ISE	073-0071-01	09955206	
Probe, SPP (New Design	073-0223-01	03975051	SPP
Probe DPP w/ Crash Detection	073-0611-01	02030495	DPP
Probe, reagent	073-0612-01	03824053	RPP1 and RPP2
Reagent container, empty, 20-mL	073-0372-02	03765863	
Reagent container, empty, 70-mL, white	073-0373-02	06397121	
Reagent container, empty, 70-mL, brown	073-0152-02	08213370	
Reagent Container Adapter, 20-mLfor 40-mL slot	073-0159-01	02404085	

Description	PN	REF	Location
Reagent Container Adapter, 20-mL for 70-mL slot	073-0936-01	05249323	
Reference Electrode, ISE	073-0653-01	0311764	
Sample cup (1000/PKG)	073-0157-02	01390706	
Screw, thumb, cuvettes, 4x6	073 0384-01	07199951	
Screw, thumb, 3x6	073-0385-01	02291299	
Shield, DPP	073-0951-01	04457097	
Splash cover, RPP1	073-0859-01	02122926	
Splash cover, RPP2	073-0860-01	08425947	
Splash cover, SPP	073-0861-01	03102155	
Splash cover, CTT/STT	073-0950-01	08176645	
Waste bottle	073-0383-01	09457923	

Appendix D – Specifications

Specifications – all

Item	Description
Method	
Measurement method	Open discrete
	Single-line, simultaneous, multi-item measurement. Full random access.
Process	
Throughput rate	2400 tests/hour
Biochemistry	1800 tests/hour
Electrolyte	600 tests/hour
Sample throughput rate	Maximum 1800 samples/hour
Simultaneous measurement item	Maximum 103 items Normally 50 (main system) + 3 (ISE)
Sample	
Measurement sample	Blood serum, plasma, urine (method dependent), and CSF
Containers Cups	5-mL (13 x 75 mm), 7 –mL (13 x 100 mm), 10-mL (16 x 100 mm) collection tubes; dead volume for collection tubes is 200 µL
	1-mL sample cup (STT only), Hitachi 2-mL sample cups, and Ez Nest 2-mL sample cups in 7-mL (16 x 75 mm) collection tubes (URH) or STT sample adapter; dead volume for sample cups is 50 µL.
Trays	
STT	Used for general samples and calibrators for multipoint calibration assays
	Two lines (outer and inner) of 42 samples each Total positions in STT tray: 84
	Sample barcode (13 digits): Code 39, Codabar, and Interleaved 2 of 5, Code 128 format A, B and special characters (. - + / * $ %)
CTT	Used for calibrators, controls, and diluents
	Two lines, 34 samples in outer line and 27 samples in inner line. Total positions in CTT tray: 61
	Liquid contents on CTT tray are cooled to between 6 °C and 14 °C
URH	Universal rack handler 5 position rack
Original sample volume	2 to 30 µL (0.1 µL increments)
Assay sample volume (after dilution)	1 to 25 µL (0.1 µL increments)
Reassay	
Container	Dilution tray (DTT) cuvette

Item	Description
Minimum sampling volume	2 μL (0.1 μL increments)
Special dilution	Diluted sample can be rediluted directly from tray.
Dilution	
Dilution tray (DTT)	Turntable system
Number of cuvettes	120 (6 sets of 20 cuvettes)
Maximum sample volume	300 μL
Dilution cuvette dead volume	35 μL
Dilution ratio	From 1 to 1:5625 (1:75 x 1:75)
Reaction cuvette material	Plastic
Reagent	
Dispensing system	2-reagent capability, 2-probe system
Trays	Two trays, each holding 50 containers
	Multiple reagent pack loads – 5 reagents per method with automatic rollover upon depletion
	Reagents on each tray are cooled to between 6 °C and 14 °C
Container capacity	20 or 70 mL. (40 mL with adapter)
Refrigerator	Recirculated liquid
Reagent volume/item	10 to 100 μL (0.1 μL increments)
Dilution reagent volume	10 to 100 μL (0.1 μL increments)
Reagent inventory	Computed by the liquid-level sensing
Barcode	Interleaved 2 of 5. JSCLA standard.
Reaction	
Reaction tray (RRV)	Turntable system
Number of cuvettes	340 (20 sets of 17 cuvettes)
RRV cuvette material	Plastic
Reaction liquid volume	60 to 180 mL
Stirring system	Rotation and reciprocation
	Strong and weak stirring options are available.
	Stirring immediately after additions of R1 and sample and R2
	Mixer 1 is used for R1; Mixer 2 is used for R2.
Reaction times	3, 4, 5, 10 minutes
	Extended reaction times: 15 & 21 minutes
Reaction temperature	37°C
	Temperature regulation: ±0.1°C
Reaction tank	Inert liquid circulation system

Item	Description
Assay	
Measurement point	41 detection points/14 seconds in 10 minute reaction
Photometer	Concavity diffraction grating, rear spectroscopy system
Measurement wavelength	14 fixed wavelengths (340, 410, 451, 478, 505, 545, 571, 596, 658, 694, 751, 805, 845, and 884 nm), 1 or 2 wavelength calculation
Light source	12V, 50W halogen lamp, cooled by forced water circulation
Assay method	Colorimetric assays • Endpoint assays (EPA) • Reaction rate assays (RRA) • 2-point rate assays (2PA) • 3-item simultaneous measurement (parameter independent) • Prozone checking (antigen excess check) • Substrate depletion check with point forwarding option • Sample blank correction
Reassay mechanism	Automatic or manual (selectable)
Automatic correction	Blood serum blank, cell blank, measurement point change, sample volume change in reassay
ISE	
Method	Na, K, Cl ion selective electrolyte assay Dilution measurement method
Analysis item	Simultaneous 3 item measurement of Na, K, and Cl
Electrode	Na: Crown ether membrane K: Crown ether membrane Cl: Super-layer solid molecule orientation membrane ref: Sealed silver/silver chloride electrode
Throughput rate	Maximum of 600 tests/hour (200 samples/hour) for serum samples
Sample volume	22 μL
Dilution ratio	1:33 (approximate)
Reagent volume	Buffer: 2.7 mL/sample
Maintenance	
Automatic maintenance	Automatic startup and automatic shutdown by timer for weekly maintenance
Dimensions	
Analyzer dimensions	1340(h) x 1711(w) x 934(d) mm (52.8 x 68.44 x 37.36 in.)
Weight	630 kg (1389 lb.)

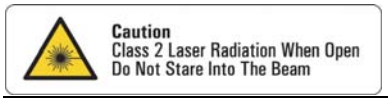
Item	Description
Vacuum pump dimensions	546(h) x 340(w) x 500(d) mm (21.5 x 13.4 x 19.7 in.)
Computer dimensions	366(h) x 221(w) x 421(d) mm (14.4 x 8.7 x 16.6 in.)
Monitor dimensions	422(h) x 417(w) x 447(d) mm (16.6 x 16.4 x 17.6 in.)
Optional universal rack handler dimensions	1126(h) x 730(w) x 1022(d) mm (44.33 x 28.74 x 40.24 in.)
Weight	80.7 kg (178 lb)
Environment	The ADVIA 2400 Chemistry system is for indoor use at an altitude of up to 2000 meters with a pollution degree of 2.
Electrical requirements	• The system, with or without the rack handler, conforms to Installation/Overvoltage Category II. • Space around the system must be sufficient to allow for ventilation. • Environment should be free of corrosive gas, significant vibration, and electrical disturbances, such as electromagnetic and electrostatic induction. • The system should be placed on a level floor (1/200 gradient or less) that is capable of supporting a load of 600 kg (1323 lb). • The average acoustic noise output from the analyzer is <70 dba with the top cover open. • A 3-kVA power source, single-phase, 2-pole, 3-wire configuration with Class III grounding • The following input voltages can be tapped:100 115 200, 220, 230, or 240 VAC at 50/60 Hz. • Main supply voltage fluctuations not to exceed ± 10 percent of the nominal voltage. Maximum current draw at in-rush is 26 amps at 115 VAC or 14 amps at 220 VAC. • For the optional universal rack handler, the requirements are 110 Vac 50/60 Hz, 0.6 A. • Facility Switch Box: Should contain a circuit breaker and knife switch with one of the following ratings: 200 volts 15 amps, 220 volts 14 amps, 230 volts 13 amps, and 240 volts 13 amps • Switch box should be located less than 5 m (15 feet) from the system and easily accessible. • Facility Supply Wiring: UL listed cord for external wiring in US and Canada. (Must be CSA certified in Canada.) Rated 300 volts or more, and 70°C or more Size AWG # 14 or more (OD 13 to 18 mm), 3-wire configuration that has a protective ground wire with covering material colored with green and yellow stripe. Circuit breaker - 15 or 20 amps.

Item	Description
Cooling/ventilation requirements	• Ventilation sufficient to maintain +18°C to +30°C (+64° to +86°F) operating temperature • The maximum temperature change the system can accommodate is 2°C/hour. • System is for indoor use at an altitude of up to 2000 meters with a pollution degree of 2. • Maximum relative humidity allowable with system operating is 40% to 70% with no condensation. • Heat output: **Power off** mode: 0 287 kW 979.3 Btu/hr 246.8 kCal/hr **Ready** mode: 1.110 kW 3787.0 Btu/hr 954.4 kcal/hr **Auto** mode: 1.635 kW 5579.0 Btu/hr 1406.0 kCal/hr
Water requirements	Deionized (or demineralized) water from a nonpressurized water reservoir with a 40 liter/hour capability
Drain requirements	Minimum of 40 liters (10.6 gallons) per hour If the local laboratory practices and/or applicable environmental regulations prohibit the inclusion of concentrated waste into the laboratory's drain, an optional concentrated waste bottle must be ordered.

Appendix E – Symbols

Explanations of symbols associated with the ADVIA 2400 system

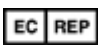
Warning and caution symbols

 	These symbols are used for both caution and warning. **WARNING** indicates the risk of personal injury or loss of life. **CAUTION** indicates the possibility of damage to or destruction of equipment.
 **CAUTION**	When this symbol appears on the system without additional information, you must consult the instructions for use.
	This symbol indicates a moving component that can cause injury.
	This symbol alerts you to a potential electrical hazard.
	This symbol alerts you to the risk of exposure to lasers.
	The onboard sampler is equipped with a laser barcode reader. When covers are opened, there is a risk of radiation exposure. Do not stare into the beam.
	This symbol alerts you to a potential biohazard. Biohazard labels are also placed on the sample and dilution probes, which are exposed to the sample during the analysis.
	This symbol indicates the presence of a part emitting high temperature.
Caution - Laser radiation when open and interlocks defeated. Do not stare into beam	

System operation symbols

	Start symbol
	Standby symbol
	Some parts of the system are on
	Some parts of the system are off
	Alarm symbol
	Stop button
	Reset button
	Prime button
	Error log
	Indicates consult online instructions
	Operator's guide
	Wash button
	I indicates closed circuit or On.
	O indicates open circuit or Off.

System rating label symbols

	Date of manufacture of the product
	Name and location of the product manufacturer.
	Manufacturer's authorized representative within the European community

CE	Product complies with the applicable directives of the European Union
c UL us LABORATORY EQUIPMEI 43MA	On the Universal Rack Handler this symbol indicates that the product is UL approved for safety in the United States and Canada. On the analyzer, this symbol indicates that the product is UL approved for safety in the United States.
Rev.	Revision letter of a part or product
SN	Serial number of part or product
REF	Number used for ordering a part or product
IVD	An *in vitro* diagnostic device
Class 1 Laser Product This equipment conforms to provisions of US 21 CFR 1040.10	Product is a Class 1 laser product under the provisions of 21 CFR 1040.10.
	The WEEE symbol indicates that this equipment is classified as Waste Electrical and Electronic Equipment under the European WEEE Directive. It must be recycled or disposed of in accordance with applicable local requirements.
	This system contains toxic or hazardous substances or elements. The environmental protection use period for this system is 50 years. The system can be used safely during its environmental protection use period, after which it should be recycled immediately.

Hardware component symbols

	Indicates the location of the lamp.
	Universal Rack Handling System
	Analyzer
	Computer monitor
CPU	Computer workstation
VAC-G	Vacuum pump pressure gage

RTT-1	Reagent tray 1
RTT-2	Reagent tray 2
CTT	Controls and calibrators tray
STT	Sample tray
	Use these arrow symbols to align the tray covers.

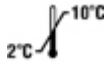
Ancillary reagent symbols

DI H2O	Deionized water symbol on the reagent and sample trays
10%CW	10% cuvette wash
PW1	Probe wash 1
PW2	Probe wash 2
ISE Det	ISE detergent

Connector symbols

0.9% Sal	Isotonic saline diluent connector
IBO	Incubation bath oil connector
CW	Cuvette wash connector
CCon	Cuvette conditioner connector
ISE	ISE buffer connector
D-SEN 1	Strong concentrated drain bottle sensor connector
D-SEN 2	Concentrated drain bottle sensor connector

System packaging label symbols

	Contents of the package is fragile.
	Packaging is recyclable.
	Expiration date for the package
	Lot number of the package.
	Minimum and maximum storage temperature for the package The specified range may vary.
	Contents of the package should be protected from heat and light.
	Product or container should be oriented in the direction of the arrows.
	Package is printed with soy ink.
	Contents of the package must not be frozen.
	Number of tests available from the contents of this package
	Packaging materials can be or are recovered and recycled.

Original manufacturer of main analytical console JCA-BM2400

JEOL Ltd.
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Akishima Tokyo 196 - 8558 Japan

Tel: 81-42-542-2303
Fax: 81-42-542-3132

Manufacturer of ADVIA 2400 System:

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511 Benedict Avenue
Tarrytown, NY 10591 - 5097 USA

Tel: 914-524-3001
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