Daily maintenance

Inspecting and cleaning the probes

Materials required:

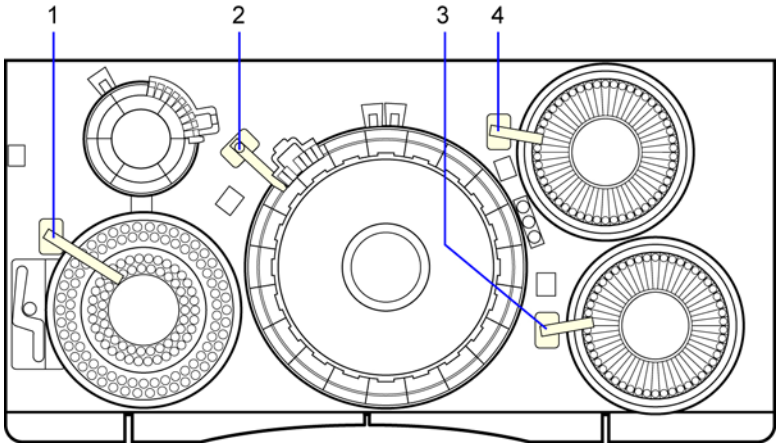
- Phillips screwdriver
- Alcohol prep pad or lint-free towels and 5% bleach solution

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.

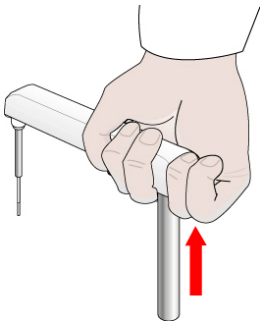


Figure 5-2. Manually adjusting probe

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:

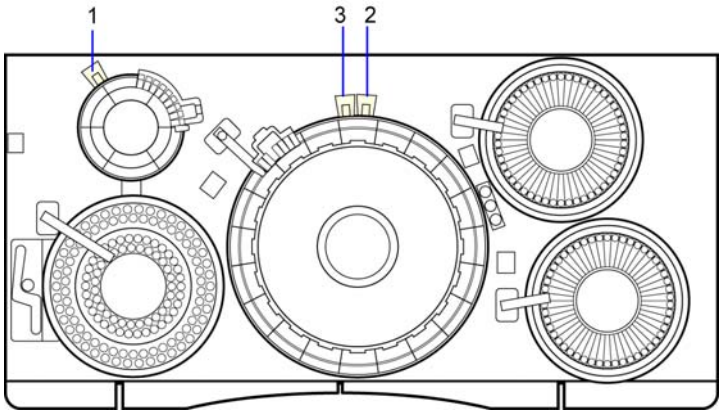
- Lint-free towel
- Deionized water
- Cotton-tipped applicators

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

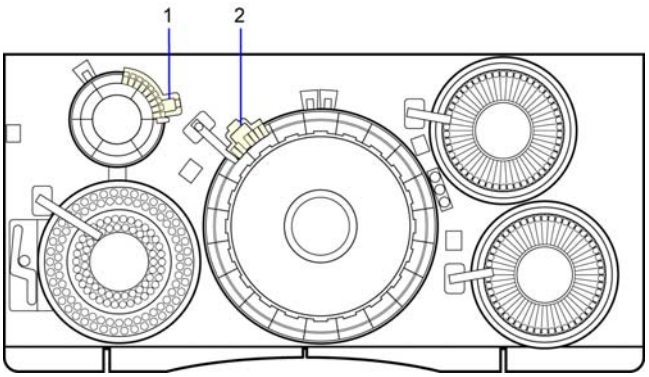
Analyzer mode: READY

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)

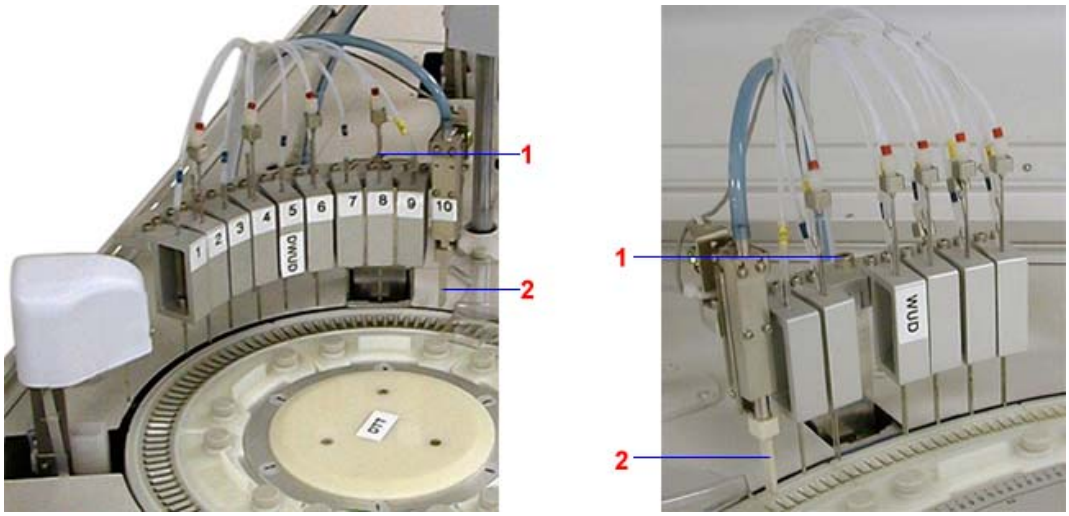
2 Reaction Cuvette Wash Station (WUD)

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.

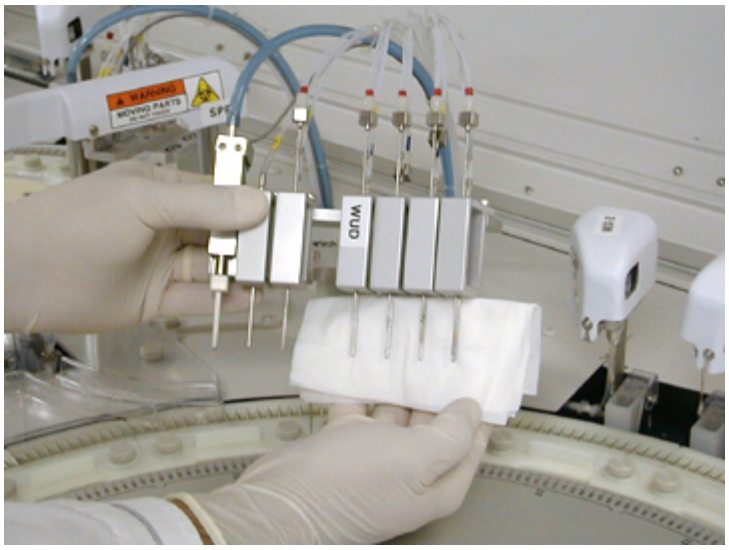


Figure 5-6. Wiping the wash stations with lint-free towels

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

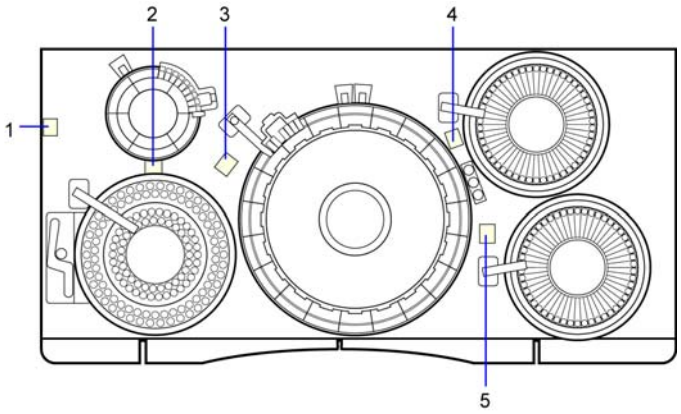
BIOHAZARD

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:

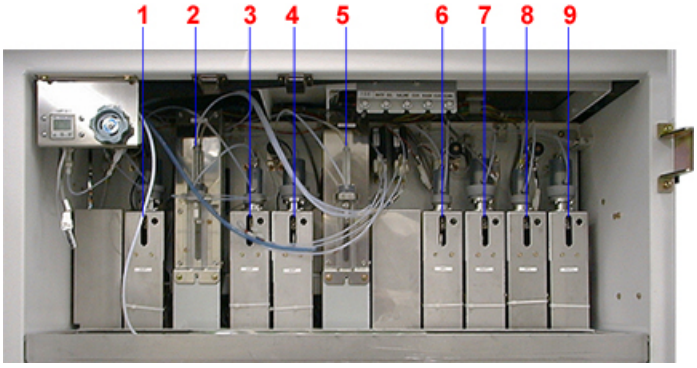
- Lint-free towel

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.

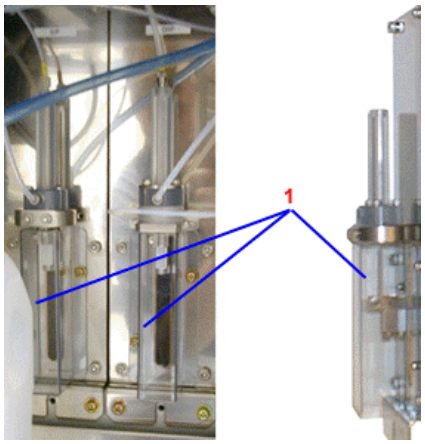


Figure 5-10 Sp and DIP vertical pumps

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.

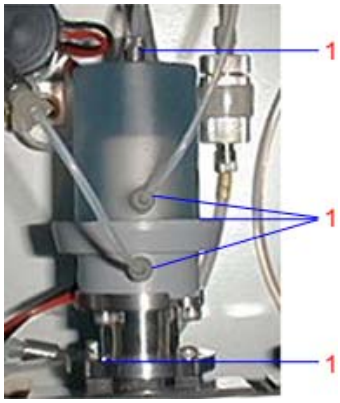
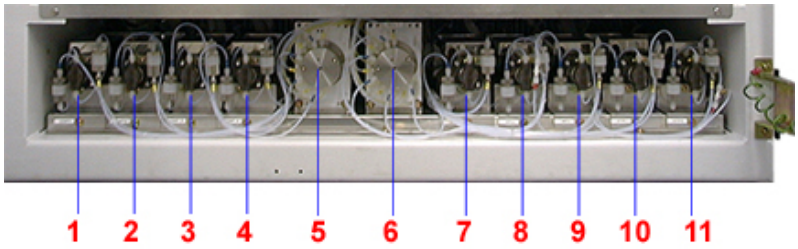


Figure 5-11. Typical vertical pump

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**).

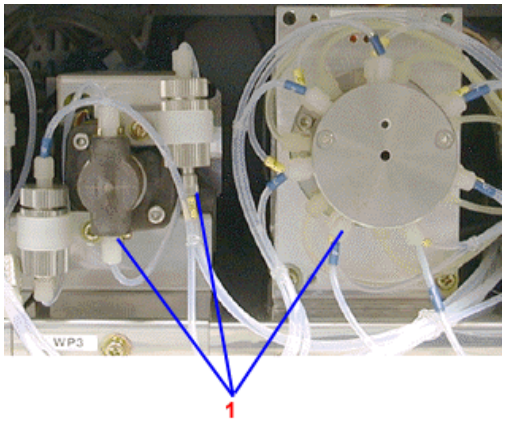


Figure 5-13. Typical horizontal pump

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

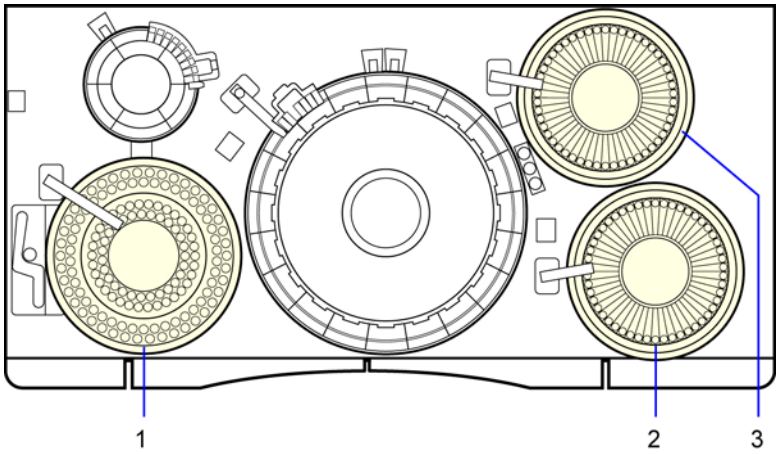
BIOHAZARD

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.