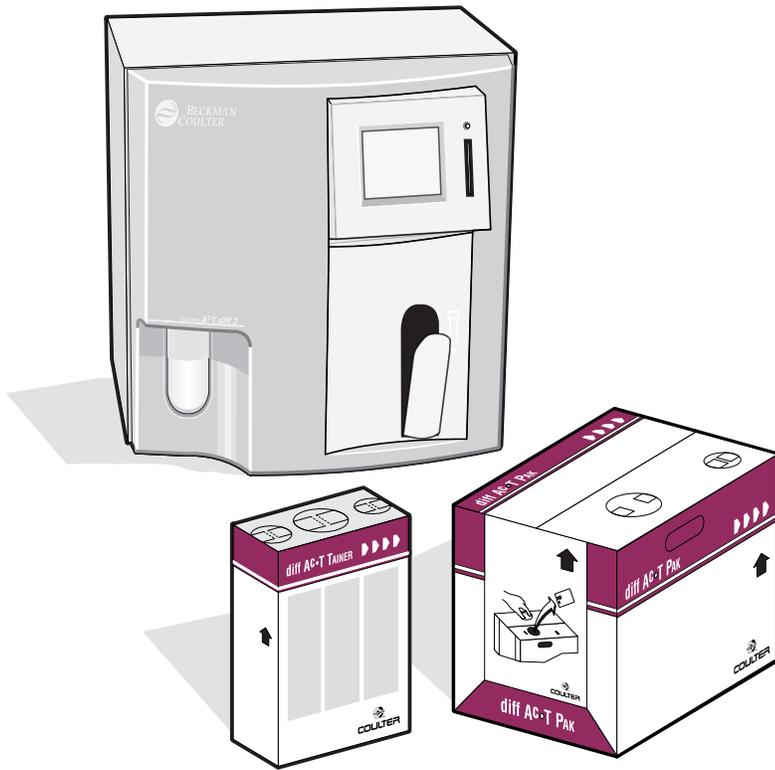


COULTER[®] A^C•T diff 2[™] Analyzer

diff A^C•T Tainer[™] Reagent

diff A^C•T Pak[™] Reagent

Installation and Training Guide



LEGAL NOTICES

READ ALL PRODUCT MANUALS AND CONSULT WITH BECKMAN COULTER-TRAINED PERSONNEL BEFORE ATTEMPTING TO OPERATE INSTRUMENT.

HAZARDS AND OPERATIONAL PRECAUTIONS AND LIMITATIONS

WARNINGS, CAUTIONS, and IMPORTANTS alert you as follows:

- WARNING** - Might cause injury.
- CAUTION** - Might cause damage to the instrument.
- IMPORTANT** - Might cause misleading results.

CAUTION System integrity might be compromised and operational failures might occur if:

- This equipment is used in a manner other than specified. Operate the instrument as instructed in the Product Manuals.
 - You introduce software that is not authorized by Beckman Coulter into your computer. Only operate your system's computer with software authorized by Beckman Coulter.
 - You install software that is not an original copyrighted version. Only use software that is an original copyrighted version to prevent virus contamination.
-

Beckman Coulter, Inc. urges its customers to comply with all national health and safety standards such as the use of barrier protection. This may include, but it is not limited to, protective eyewear, gloves, and suitable laboratory attire when operating or maintaining this or any other automated laboratory analyzer.

WARNING Risk of operator injury if all covers are not secured in place prior to instrument operation or you attempt to replace a part without carefully reading the replacement instructions. Do not attempt to replace any component until you carefully read the instructions for replacing the component.

IMPORTANT If you purchased this product from anyone other than Beckman Coulter or an authorized Beckman Coulter distributor, and, if it is not presently under a Beckman Coulter service maintenance agreement, Beckman Coulter cannot guarantee that the product is fitted with the most current mandatory engineering revisions or that you will receive the most current information bulletins concerning the product. If you purchased this product from a third party and would like further information concerning this topic, call your Beckman Coulter Representative.

Initial Issue, 2/99
Software version 1.0.

This document applies to the latest software listed and higher versions. When a subsequent software version changes the information in this document, a new issue will be released.

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CONTENTS

This introductory section contains the following topics:

- How to use your COULTER® A^C•T diff 2™ Analyzer Manuals
- About the Installation and Training Guide
- Conventions
- Symbols
- Graphics
- Screen Numbers
- Touch Screen Icons
- Icon Tree Overview
- Icon Tree Detail

HOW TO USE YOUR COULTER® A^C•T diff 2™ ANALYZER MANUALS

Use this **Installation and Training Guide** for information about:

- Initially setting up the instrument and printer
- Powering up the instrument
- Customizing the software
- Running controls and samples

Use the **Reference manual** for in-depth information about:

- What the instrument does
- What special requirements the instrument has (for example, space, accessibility, power)
- What methods it uses
- What the instrument specifications are
- How to interface your A^C•T diff 2 analyzer to your laboratory's host computer
- How to safely use the instrument.

Use the **Operator's Guide** for:

- Getting started
- Running your instrument day to day
- Reviewing unusual results, including how to read a result report and what flags mean
- Performing special procedures such as cleaning, replacing, or adjusting instrument components
- Troubleshooting problems with your instrument.

Use the **Operating Summary** for:

- Running your instrument using a quick reference set of procedures
- Verifying frequently used screen icons.

ABOUT THE INSTALLATION AND TRAINING GUIDE

This Installation and Training Guide introduces you to the instrument, instructs you how to install, set up, and use the instrument.

This information is organized as follows:

- Chapter 1, Installing the A^C•T diff 2 Analyzer
Contains the instrument requirements for space, accessibility, ambient operating temperature and humidity, safety precautions, printer requirements, and initial setup and powering on instructions. Also includes information on how to customize the software for your laboratory's use.
- Chapter 2, Learning About the A^C•T diff 2 Analyzer
Contains information on basics of the instrument, how to view sample results, what sample ID options are available, what analyzing modes are available, how to enter target values for cell controls, how to run cell controls, and how to run samples.
- Chapter 3, Operational Overview
Contains answers to the most commonly asked questions covering several topics: sample requirements, instrument setup, daily procedures, special procedures, icons, and results.
- Chapter 4, Component Locations
Contains location illustrations for components in the front, left, and side compartments of the A^C•T diff 2 analyzer.
- Chapter 5, Installation Checklist
Summarizes what you must do when installing the instrument.

CONVENTIONS

This manual uses the following conventions

Bold indicates a screen icon.

Italics font indicates screen text displayed by the instrument.

Instrument refers to the A^C•T diff 2 analyzer.

A Note contains information that is important to remember or helpful in performing a procedure.

SYMBOLS

Safety Symbols

Safety symbols alert you to potentially dangerous conditions. These symbols, together with text, apply to specific procedures and appear as needed throughout this manual.

Symbol	Warning Condition	Action
	Biohazard. Consider all materials (specimens, reagents, controls, and calibrators, and so forth) as being potentially infectious.	Wear standard laboratory attire and follow safe laboratory procedures when handling any material in the laboratory.
	Probe hazard. The probe is sharp and may contain biohazardous materials, including controls and calibrators.	Avoid any unnecessary contact with the probe and probe area.
	Electrical shock hazard. Possibility of electrical shock when instrument is plugged in to the power source.	Before continuing, unplug the A ^C •T diff 2 analyzer from the electrical outlet.

Procedure Symbols

Procedure symbols give direction.

Symbol	Definition	Action
	Go to step number.	Go to the step number that appears after the icon.
	Special Procedures and Troubleshooting	See Special Procedures and Troubleshooting in the Operator's Guide for additional information.

GRAPHICS

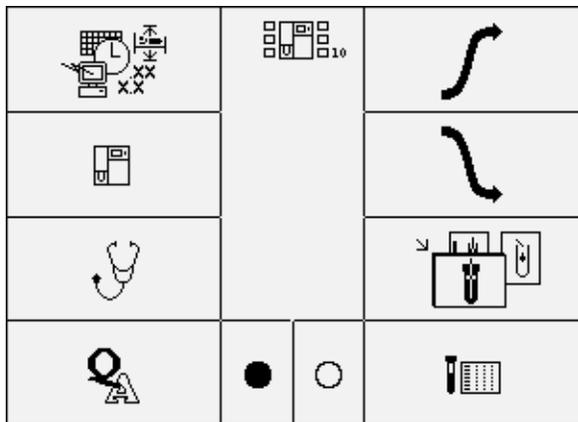
All graphics, including screens and printouts, are for illustration purposes only and must not be used for any other purpose.

SCREEN NUMBERS

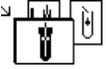
On many of the instrument screens, you will see a number next to the title icon screen. That number is for reference only when troubleshooting. The number does not print on any report.

TOUCH SCREEN ICONS

Main Screen Icons



7495001A

	
Setup	Startup
	
Diluter Functions	Shutdown
	
Diagnostics	Analyzing Mode
	
Quality Assurance	Closed Vial Whole Blood Mode
	
Open Vial Whole Blood Mode	Predilute Mode
	
Darken Screen	Lighten Screen
	
	Sample Results Screen

Setup Screen Icons

WBC MCU RBC MCH HGB MCHC HCT PLT		
LY LY# MO MO# GR GR# RDW MPU		

Units	Transmission
Patient Limits	Calibration Factors
Date/Time	Printers/Profiles
Laboratory ID	Exit
Print Setup Report	

QA (Quality Assurance) Screen Icons

WBC MCU RBC MCH HGB MCHC HCT PLT		
LY LY# MO MO# GR GR# RDW MPU		

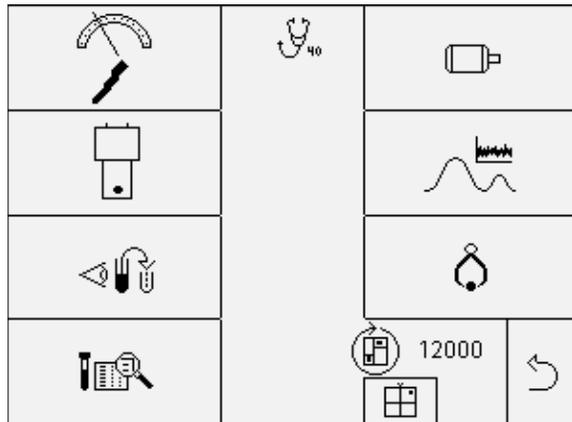
4C PLUS Run	Calibration Assigned Values
4C PLUS Management	Reproducibility Run
4C PLUS Limits	Carryover Run
	Exit

Diluter Functions Screen Icons

	
Wet Prime	Dispense Lytic Reagent
	
Drain Baths	Prime Sweepflow
	
Rinse + Mix	Zap Apertures
	
Dry Prime Lytic Reagent	Clean Baths
	
Dry Prime Diluent	Exit

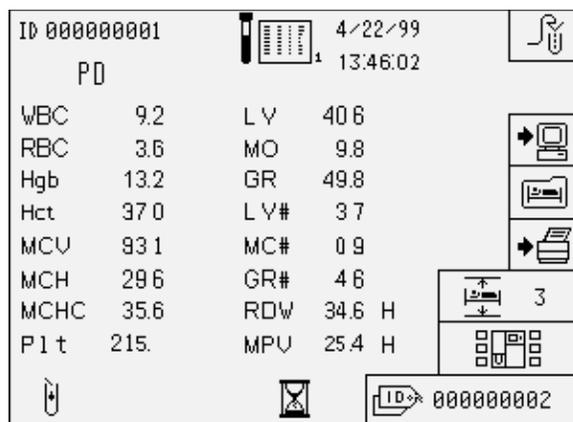
Diagnostic Functions Screen Icons



Voltages/Sensors	Motors*
Solenoids	Pulse Test
Verify Predilute	Latex Calibration
Sample Details	Prepare to Ship
Cycle Counter	Exit

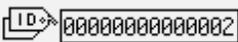
*Do not use this function without proper instruction from your Coulter Representative.

Sample Results Screen Icons



Dispense Diluent	Go to Main Menu
Resend to Host	Next Sample ID
Retrieve Stored Data	In Progress
Print Sample Results	Patient Limits

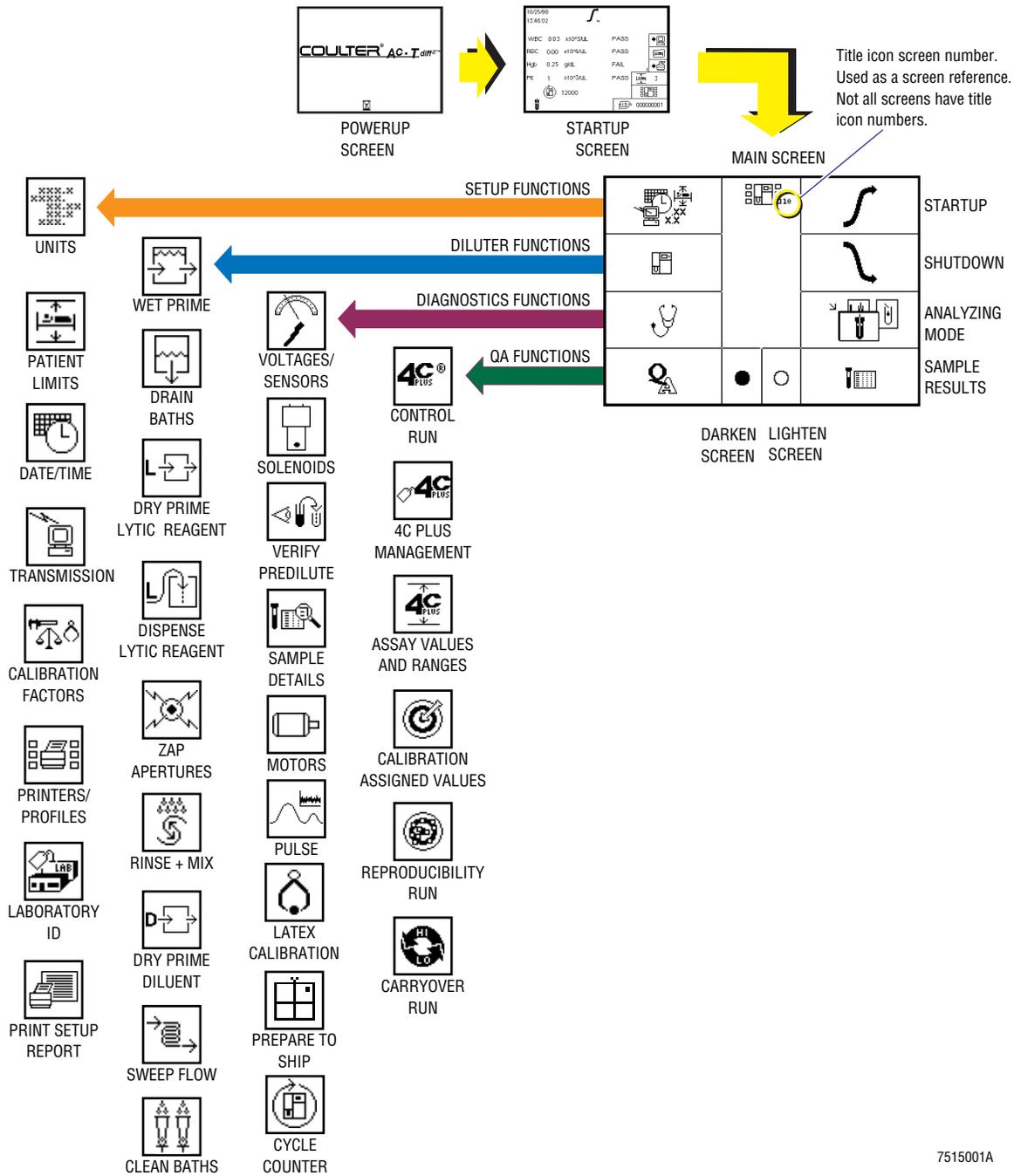
Sample ID Screen Icons

0			
1	2	3	
4	5	6	
7	8	9	

	
Next Sample ID	Delete
	
Exit	Save and Exit

ICON TREE OVERVIEW

Here is an overview of the icon tree. For additional information, see TOUCH SCREEN ICONS and ICON TREE DETAIL.



7515001A

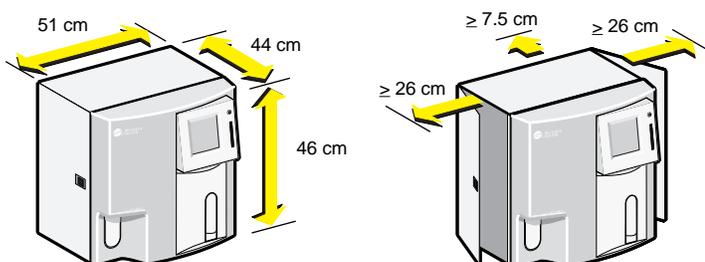
1.2 PREINSTALLATION CHECKS

Ambient Temperature and Humidity

Keep room temperature between 16°C and 35°C (61°F and 95°F) and humidity to between 20 and 85 percent without condensation.

Space and Accessibility Requirements

Check the site for proper space allocation. The AC•T diff 2 analyzer doors require 26 cm (10 in.) to open fully. You must open the left side door fully to install the diff AC•T Tainer reagent in the compartment.



In addition to the space required for the unit itself, arrange for

- Comfortable working height.
- At least 26 cm (10 in.) on each side is the preferred access to perform service procedures.
- At least 7.5 cm (3 in.) behind for cabling and ventilation.

Power Requirements

IMPORTANT Risk of compromising instrument results. If you use an extension cord, you could encounter electrical interference that could affect the instrument's results. Place the instrument close enough to a power outlet so that an extension cord is not necessary.

Check for the availability of a power connector.

- 120/240 Vac
- 50/60 Hz
- 2.5 A
- Single phase with ground.



The power cord must plug directly into the outlet. Do not use an extension cord.

This instrument requires:

- An independent protected circuit: for the printer and for the instrument itself.
- The building outlet to be properly grounded and the electrical panel to be protected against power fluctuations.
- A female receptacle outlet furnishing single-phase input power.
- A ground path capable of carrying the full current of the circuit (confirmed third-wire earth ground).

1.3 SAFETY PRECAUTIONS

Electronic

WARNING Risk of personal injury from electric shock. Electronic components can shock and injure you. To prevent possible injury or shock, do not tamper with the instrument and do not remove any components (covers, doors, panels, and so on) unless otherwise instructed within this document.

Biological

Use care when working with pathogenic materials. A procedure should be available to decontaminate the instrument, provide ventilation, and dispose of waste liquid and sharps. Refer to the following publications for further guidance on decontamination.

- Biohazards Safety Guide, 1974, National Institute of Health.
- Classifications of Etiological Agents on the Basis of Hazards, 3d ed., June 1974, Center for Disease Control, U.S. Public Health Service.

WARNING Risk of personal injury or contamination. If you do not properly shield yourself while using or servicing the instrument, you may become injured or contaminated. To prevent possible injury or biological contamination, you must wear proper laboratory attire, including gloves, a laboratory coat, and eye protection.

Moving Parts

WARNING Risk of personal injury. Operating the instrument with doors and covers open can cause personal injury. When you operate the instrument, be sure all covers and doors are closed.

1.4 PRINTERS

The following printers have been validated for use with your instrument:

- Epson® ticket printer, Models TM-290P M145A and TM-U295P 011 M117A.
- Citizen® roll printer, Model iDP3110.
- Citizen® Dot Matrix Printer, Model GSX-190.
- Canon® Bubble Jet™ Printer, Model BJC®-250.
- Ithaca® PcOS® Series 90 Printer.

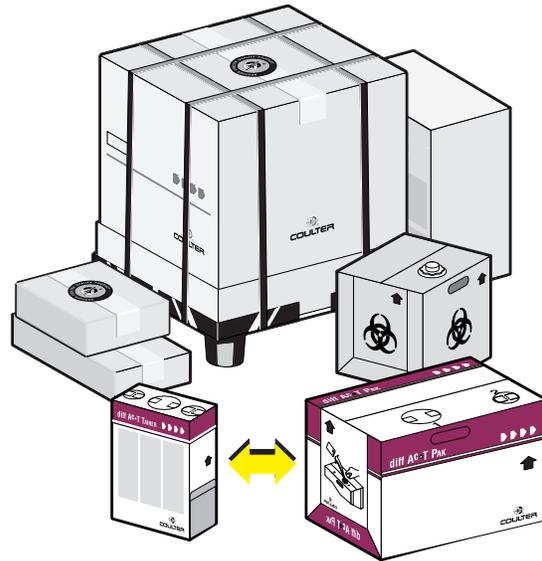
Note: If another printer model is used, it must have Epson LQ510 emulation.

1.5 INITIAL SETUP

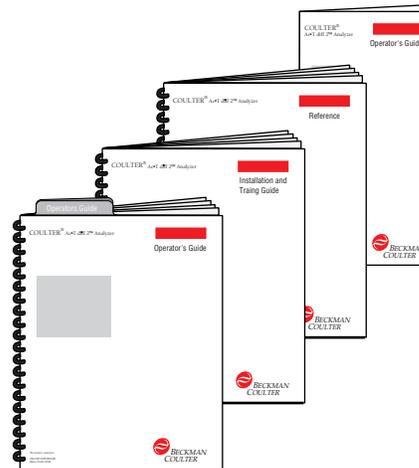
Unpacking and Inspecting the Instrument

- 1 Verify that you received the following boxes:
 - Instrument and parts (largest box)
Note: The instrument weighs 20 kg (44 lb), therefore, you may want to get help removing it from the box.
 - Reagent pickup tubes
 - Product manuals
 - Reagent (diff A^C•T Tainer reagent or diff A^C•T Pak reagent)
 - Empty waste container
 - Printer (optional).

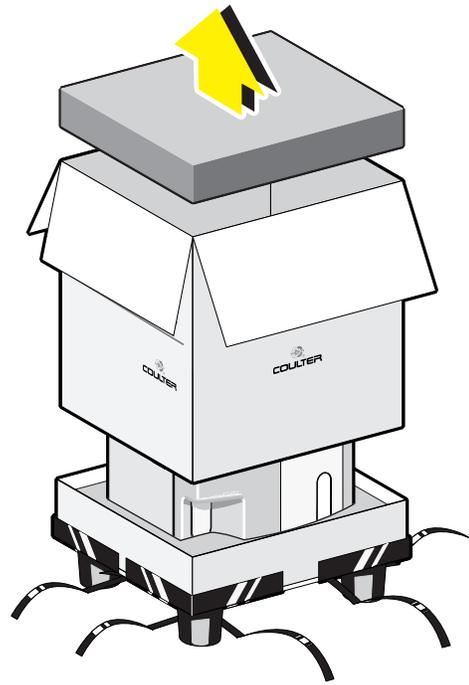
If you did not receive everything, stop and contact your local Coulter Representative.



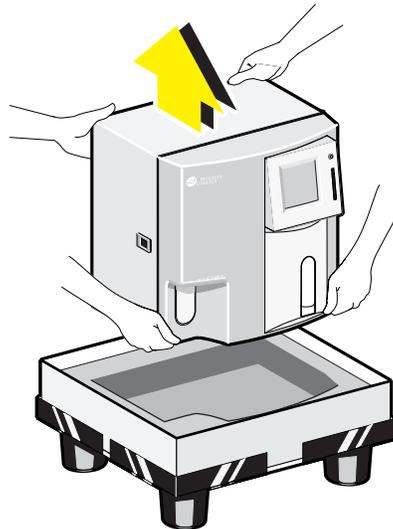
Note: There are four product manuals.



-
- 2** Unpack the instrument:
- a. Cut the metal bands.
 - b. Open the box.
 - c. Remove the packing material. (Keep all packing material in the event you need to ship the instrument.)
 - d. Remove the box.



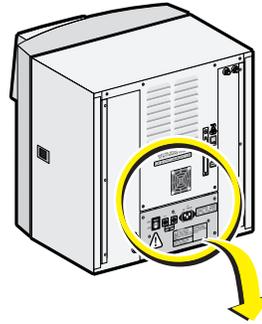
-
- 3** With help from another person, lift the instrument off the pedestal and set it on a countertop.



Reading the Hazard Labels

Before continuing, carefully read the hazard warning labels at the back of the instrument.

Note: If the labels are unclear, contact your local Beckman Coulter Representative.



CAUTION
ELECTRIC SHOCK HAZARD
DO NOT REMOVE COVER
FOR IN VITRO DIAGNOSTIC USE

ELECTRICAL POWER
SUPPLY AC INPUTS
90 - 132v / 198 - 264v

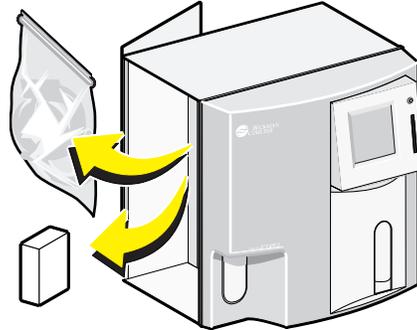
FUSE 3AG
2.5A 250V



WARNING
TO AVOID ELECTRIC SHOCK DISCONNECT POWER CORD PRIOR TO REMOVING OR REPLACING FUSE.
REPLACE FUSE ONLY WITH THE TYPE AND RATING SPECIFIED.
CONNECT ONLY TO A PROPERLY EARTH GROUNDED OUTLET.

Removing the Accessory Kit and Software Kit

- 1 Open the left door of the instrument, and remove the Accessory kit and Software kit (English version).

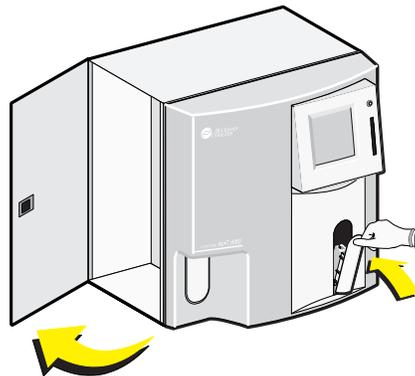


- 2 Set the kits aside for later use.
-

Opening the Front Door

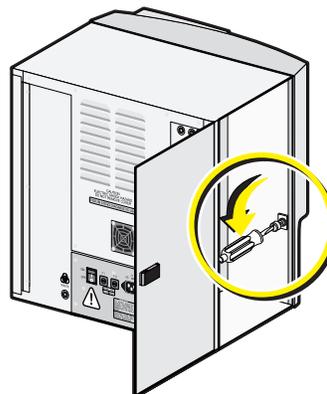
CAUTION Risk of instrument damage. If the instrument's front door is opened when the Cap Pierce door is open, the instrument may be damaged. Before opening the instrument's front door, verify that the Cap Pierce door is closed.

- 1 Verify that the cap pierce door is closed, then open the left side door.

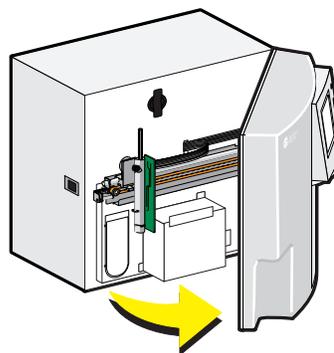


INSTALLING THE AC•T diff 2 ANALYZER
INITIAL SETUP

- 2** Use a regular (flat) screwdriver to loosen the screw that secures the front door.



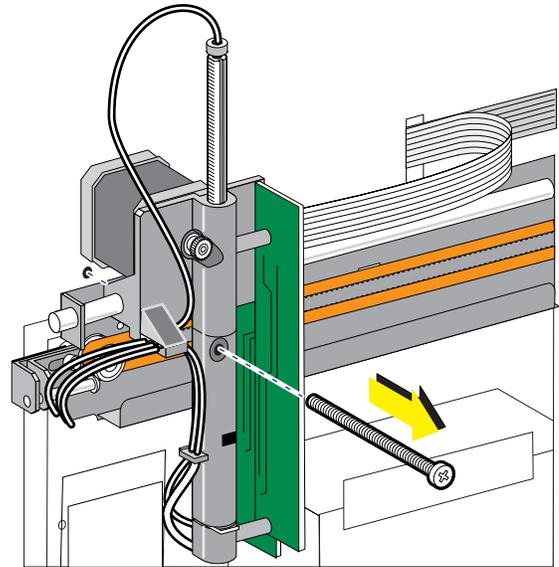
- 3** Pull open the front door.



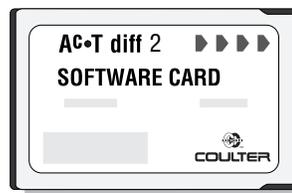
Removing Shipping Materials and Installing the Software Card

- 1 Remove the screw used to secure the probe housing to prevent movement of the probe assembly during shipping:
 - a. Open the front door.
 - b. Locate the black probe assembly.
 - c. Using a screwdriver, remove the screw.

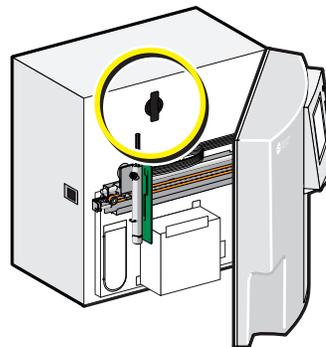
Note: Keep the screw in the event you need to ship the instrument.



- 2 From the Software kit, remove the metallic software card.

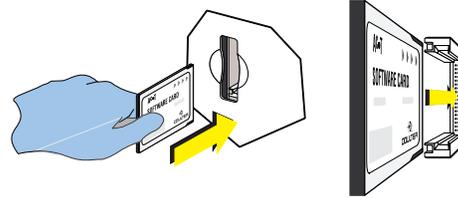


- 3 Locate the software slot.

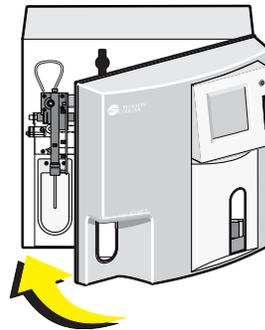


- 4** Insert the software card into the track of the slot, with the card text up and facing right.

Be sure the card is firmly seated in the track before you let go; otherwise, the card could fall inside the instrument. If this happens, call your local Coulter Representative.

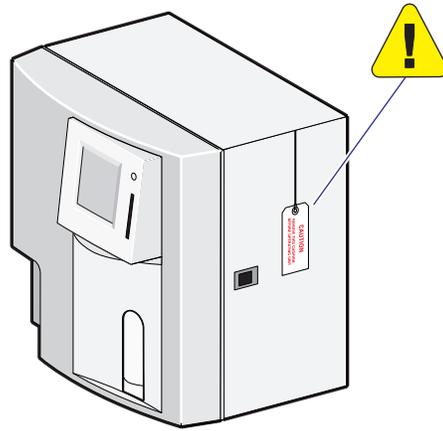


- 5** Close and secure the front door.

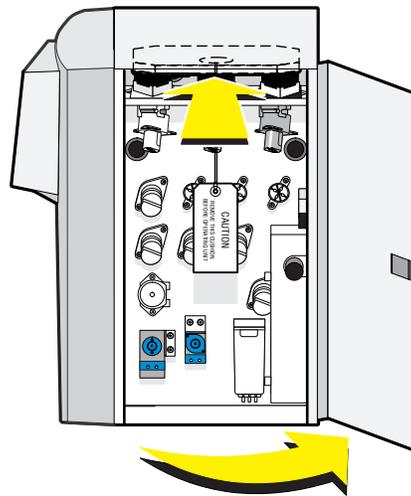


6 Remove the packing material used to secure the pumps. (Keep all packing material in the event you need to ship the instrument.)

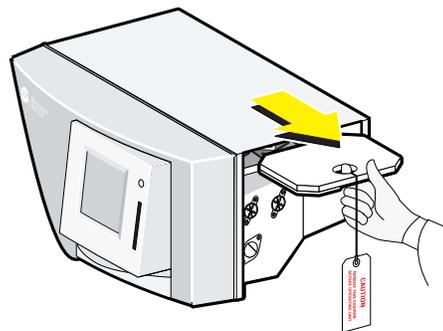
a. Locate the tag by the right compartment door.



b. Open the door and locate the packing material near the top of the instrument.



c. Pull the material out of the instrument.



1.6 CONNECTIONS

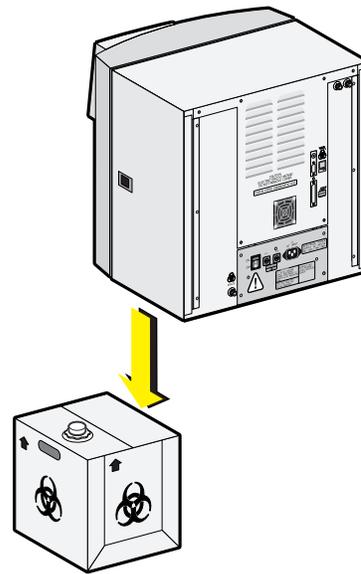
Connecting the Waste Container

The waste container tubing is attached to the fittings used to connect it to the instrument.

Connect the waste container to the instrument **before** connecting the reagents to the instrument.

WARNING Risk of biohazardous material.
Handle and dispose of according to acceptable laboratory standards.

- 1 Place the container on the floor or on a shelf lower than the instrument.

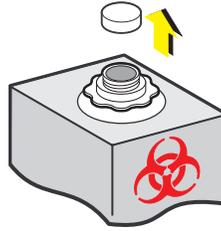


CAUTION Risk of damage to equipment.
Turning the instrument's power on before the instrument is completely set up could damage the instrument. Do not turn the instrument's power on until you have completed connecting the reagent (diff AC•T Pak or diff AC•T Tainer) and the printer.

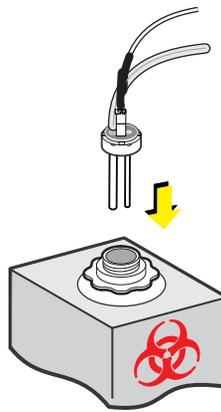
- 2 Remove the waste container tubing from the Installation kit.



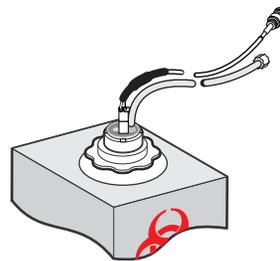
-
- 3** Remove the cap from the waste container and set the cap aside for use when the container is full.



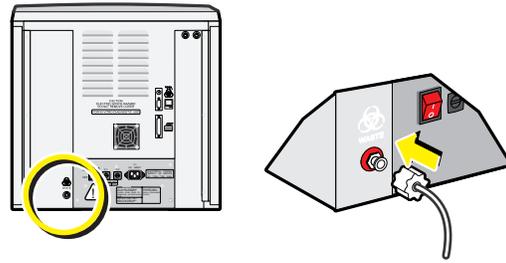
-
- 4** Insert the double-pronged end of the tubing into the waste container.



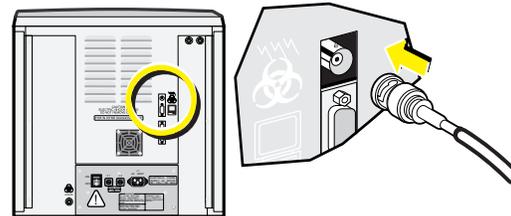
-
- 5** Twist the tubing's cap onto the waste container until properly secured.



- 6** Connect the tubing to the drain fitting at the back of the instrument:
- Locate the red drain fitting, marked **WASTE**, in the lower left corner of the instrument.
 - Plug the waste tubing with the small, clear connector into the red drain fitting and turn the connector clockwise until secure.

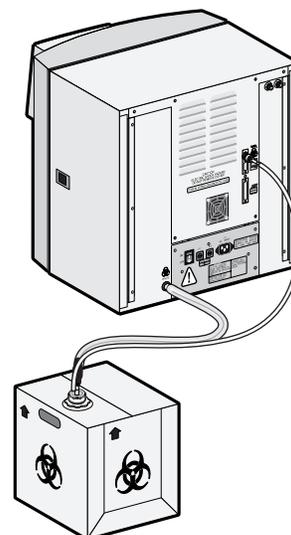


- 7** Connect the wire to the waste alarm connector:
- Locate the alarm connector at the back of the instrument.
 - Connect the wire by pushing in and turning until secure. Be sure to align the wire correctly over the protruding tabs of the alarm connector.



Note: Do not operate the instrument if the waste level sensor is not connected.

- 8** Be sure that the connections you made are correct.



Connecting the Reagents

There are two different reagents for use with this instrument: diff A^C•T Pak and diff A^C•T Tainer reagents. You will use only one reagent, not both; therefore, be sure which reagent you have before you begin connecting the reagent to the instrument.

Connecting the diff A^C•T Pak Reagent



This is the diff A^C•T Pak reagent. If your reagent container looks different than this, DO NOT do this procedure. Refer to the procedure entitled Connecting the diff A^C•T Tainer Reagent.

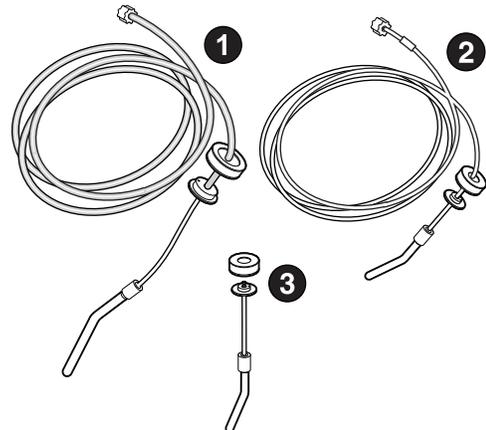
The diff A^C•T Pak reagent tubing is already attached to the fittings used to connect it to the instrument. All you need to do is connect the tubing to the instrument and to the reagent pack.

You can place reagents below the instrument as long as they are no more than 81.08 cm (32 in.) below and you do not use more than the 182.88 cm (6 ft) of tubing provided.

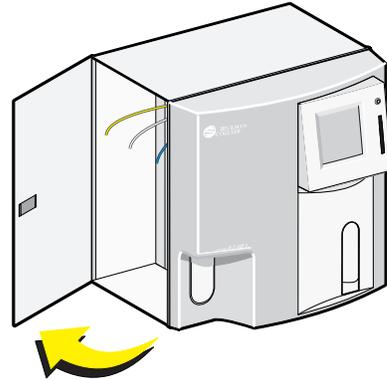
CAUTION Risk of instrument damage. Do not place reagents above the instrument.

CAUTION Risk of damage to equipment. Turning the instrument's power on before the instrument is completely set up could damage the instrument. Do not turn the instrument's power on until you have completed connecting the diff A^C•T Pak reagent and the printer.

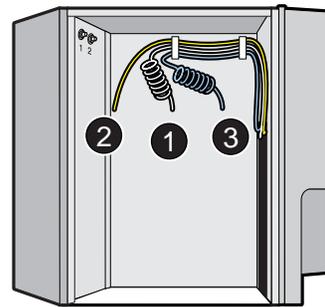
- 1 Remove the three reagent pickup tubes labeled 1, 2, and 3.



-
- 2** Open the left door of the instrument.

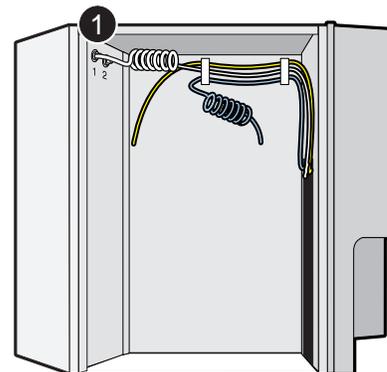


-
- 3** Locate the instrument tubes in the reagent compartment.



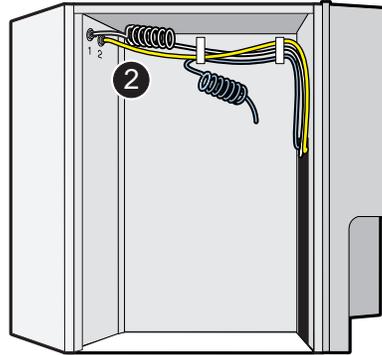
-
- 4** Connect tube 1 to fitting 1 on the inside of the reagent compartment.

Note: Later, you will be instructed to connect tubing from the reagent container to the fitting on the outside of the instrument.



- 5** Connect tube 2 to fitting 2 on the inside of the reagent compartment.

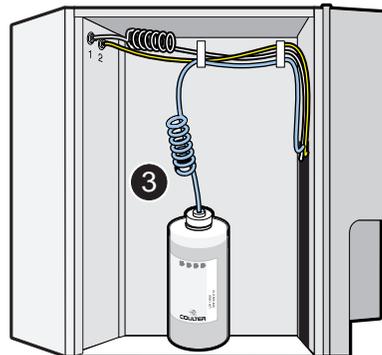
Note: Later, you will be instructed to connect tubing from the reagent container to the fitting on the outside of the instrument.



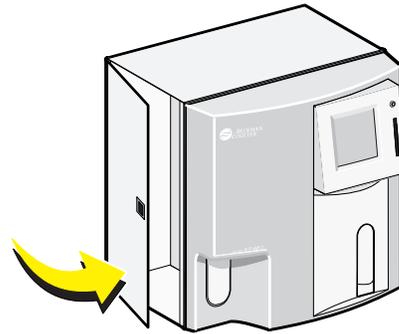
- 6** Insert pickup tube 3 into the AC•T Rinse™ shutdown diluent bottle.



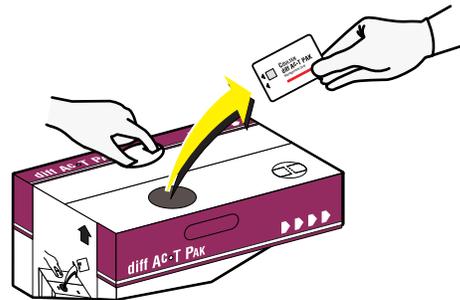
- 7** Attach tube 3 to the AC•T Rinse shutdown diluent bottle, and place the bottle inside the reagent compartment. Tube 3 is now completely connected.



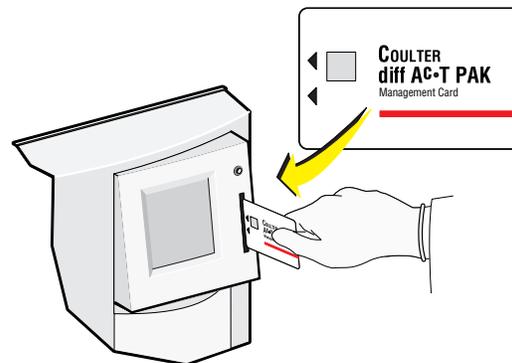
- 8** Close and secure the reagent compartment door.



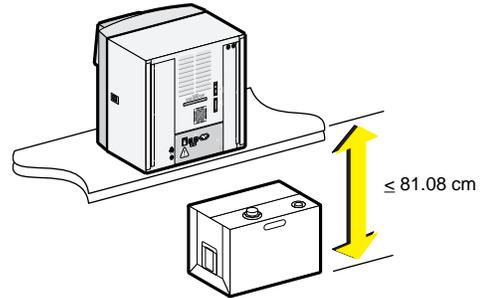
- 9** Remove the diff AC•T Pak reagent management card from the reagent container box:
- Pull the perforated cardboard from the reagent container box.
 - Remove the management card.



- 10** At the front of the instrument, insert the management card from the reagent container into the slot, with the contact side facing the touch screen.

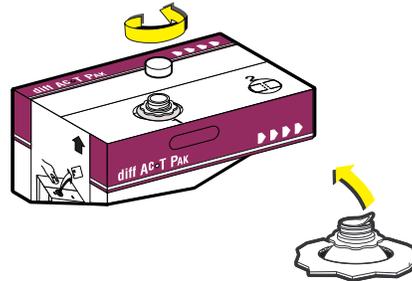


- 11** Place the reagent container on the floor or on a shelf no more than 32 in. (81 cm) below the instrument.



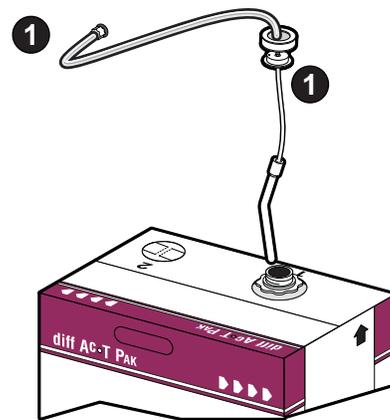
- 12** Prepare to connect reagent pickup tube 1 to the reagent container.

- a. Unscrew the cap from opening 1 on the reagent container box.
- b. Remove the seal to expose the opening

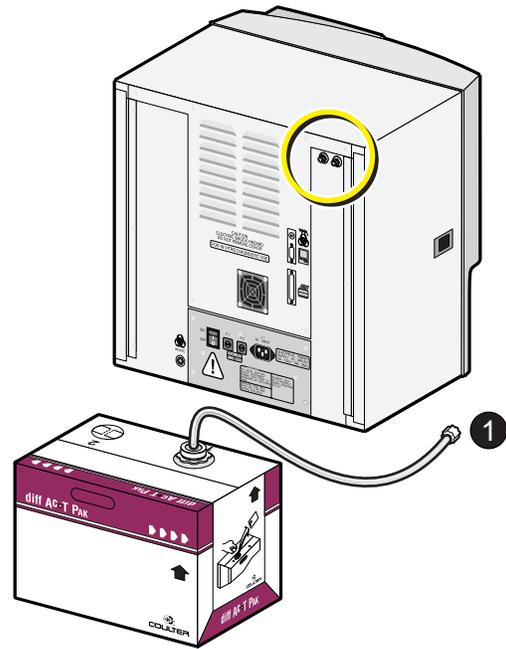


- 13** Connect pickup tube 1 to the reagent container box:

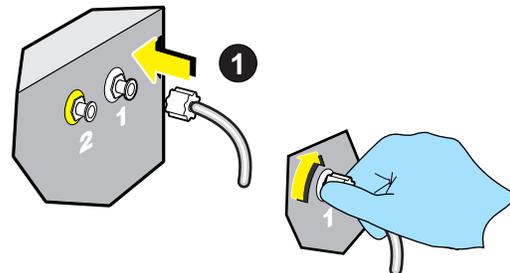
- a. Insert the cap end of pickup tube 1 into opening 1 of the reagent container.
- b. Screw the cap to the box.



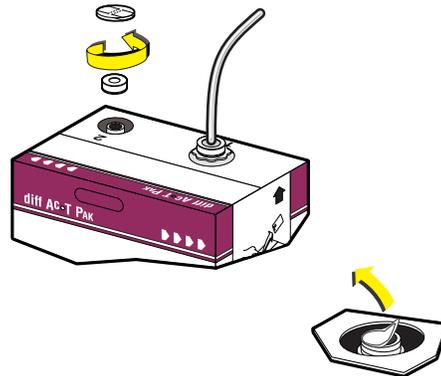
- 14** Now that you have connected pickup tube 1 to the reagent, it is time to connect the reagent tubing to the back of the instrument.



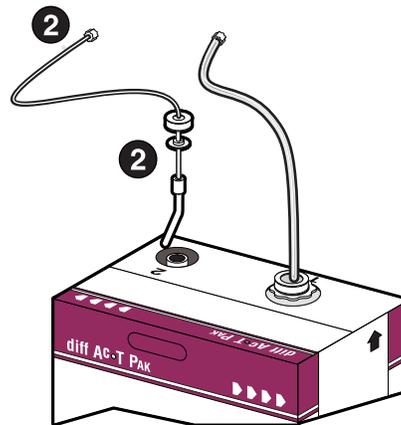
- 15** Connect tube 1 to the back of the instrument.
- a. Insert tube 1 onto fitting 1 at the back of the instrument.
 - b. Turn the connector clockwise until secure.
- Tubes 1 and 3 are now completely connected.



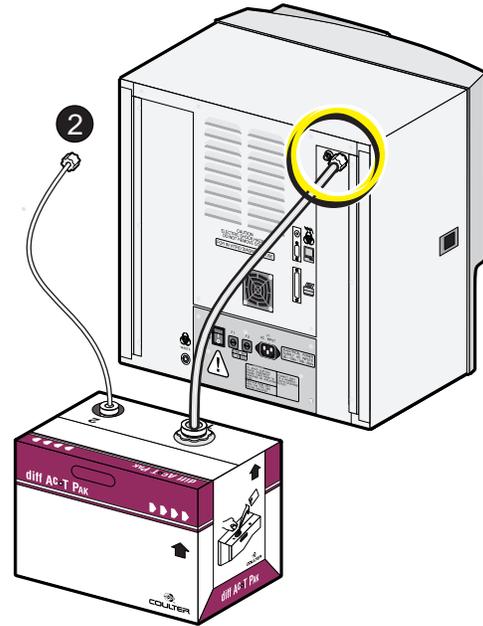
- 16** Prepare to connect reagent pickup tube 2 to the reagent container box:
- Unscrew the cap from opening 2 on the reagent container box.
 - Remove the seal to expose the opening.



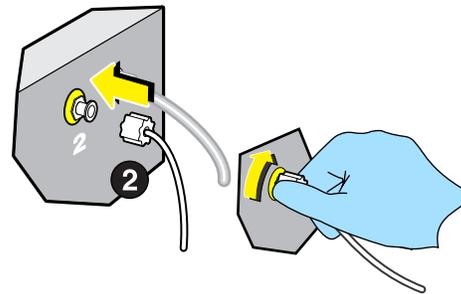
- 17** Connect pickup tube 2 to the reagent container box:
- Insert the cap end of pickup tube 2 into opening 2 of the reagent container.
 - Screw the cap to the box.



- 18** Now that you have connected pickup tube 2 to the reagent, it is time to connect the reagent tubing to the back of the instrument.



- 19** Connect tube 2 to the back of the instrument:
- Insert tube 2 onto fitting 2 at the back of the instrument.
 - Turn the connector clockwise until secure.
- Tubes 1, 2, and 3 are now completely connected



Congratulations, you have successfully connected the diff A^C•T Pak reagent to the instrument!

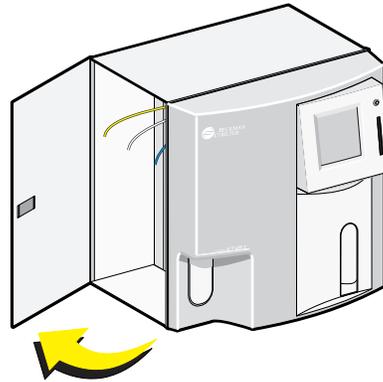
Connecting the diff A^C•T Tainer Reagent



This is the diff A^C•T Tainer reagent. If your reagent container looks different than this, DO NOT do this procedure. Refer to the procedure entitled Connecting the diff A^C•T Pak Reagent.

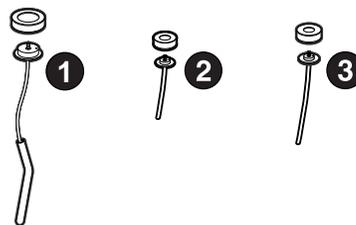
The diff A^C•T Tainer reagent tubing is already attached to the fittings used to connect it to the instrument. All you need to do is connect the tubing to the reagent pack.

CAUTION Risk of damage to equipment.
Turning the instrument's power on before the instrument is completely set up could damage the instrument. Do not turn the instrument's power on until you have completed connecting the diff A^C•T Tainer reagent and the printer.



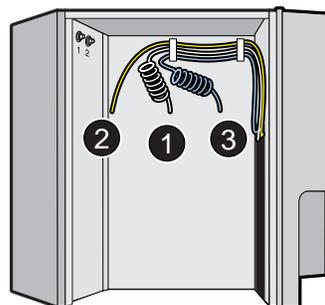
- 1 Open the left door of the instrument.

- 2 Remove the three very short reagent pickup tubes, labeled 1, 2, and 3.

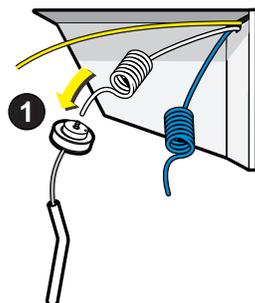


INSTALLING THE A^C•T diff 2 ANALYZER
CONNECTIONS

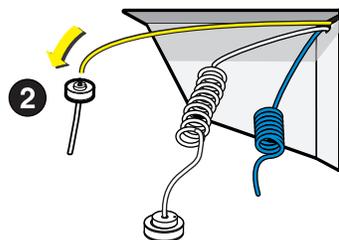
-
- 3** Locate the instrument tubes in the reagent compartment of the instrument.



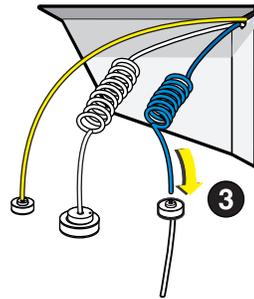
-
- 4** Connect the cap end of pickup tube 1 to the end of instrument tube 1.



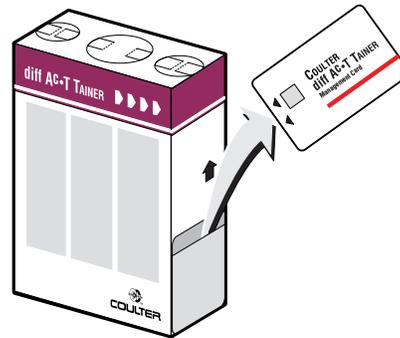
-
- 5** Connect the cap end of pickup tube 2 to the end of instrument tube 2.



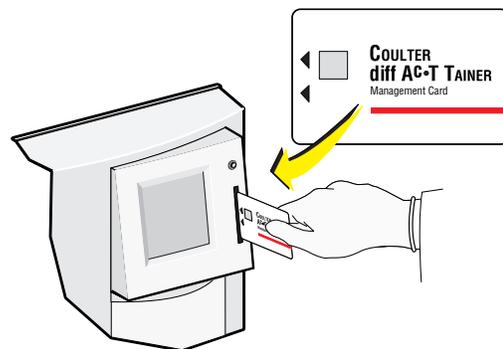
-
- 6 Connect the cap end of pickup tube 3 to the end of instrument tube 3.



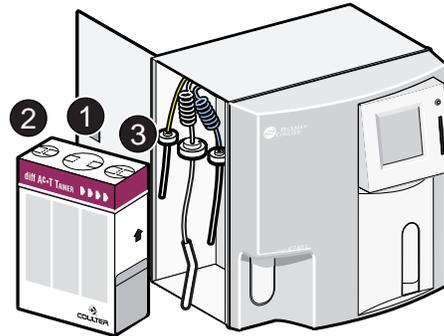
-
- 7 Remove the diff AC•T Tainer reagent management card from the sleeve on the side of the reagent box.



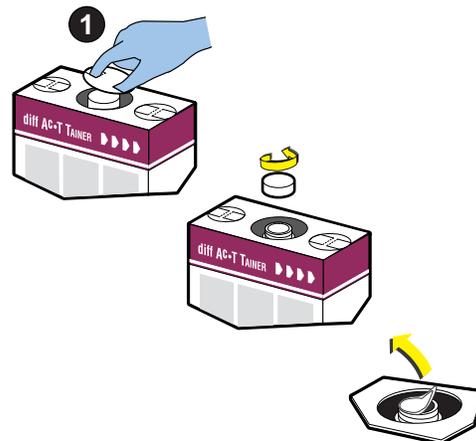
-
- 8 Insert the card at the front of the instrument with the contact side facing the touch screen.



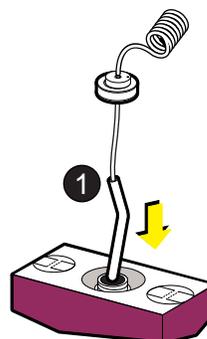
- 9** Prepare to connect the reagent pickup tubes to the instrument:
- Place the reagent on the counter in front of the reagent compartment.
 - Position the reagent so that the small numbers on the top of the reagent box read, from left to right, 2, 1, and 3.



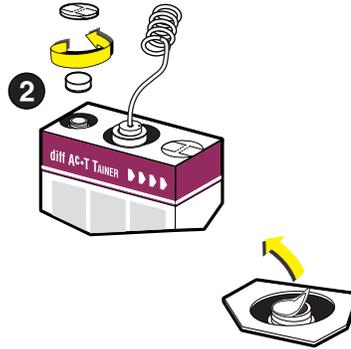
- 10** Connect pickup tube 1:
- Pull the perforated cardboard tab from the reagent container box.
 - Unscrew the cap from the reagent container box.
 - Remove the seal to expose the opening.



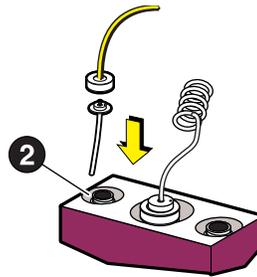
- 11** Insert pickup tube 1 into opening and twist the cap to secure.



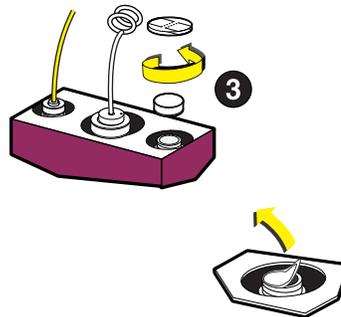
- 12** Connect pickup tube 2 to the reagent:
- Pull the perforated cardboard tab from 2 of the reagent container box.
 - Unscrew the cap from the reagent container box.
 - Remove the seal to expose the opening.



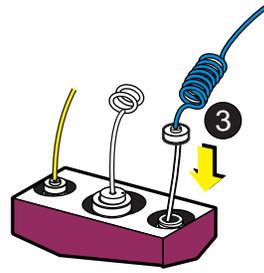
- 13** Insert pickup tube 2 into opening and twist the cap to secure.



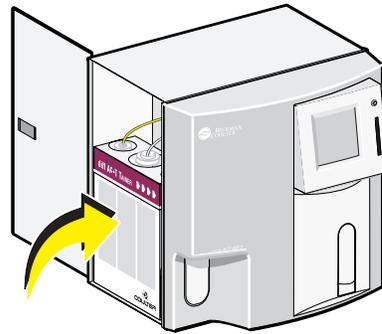
- 14** Connect pickup tube 3.
- Pull the perforated cardboard tab from 3 of the reagent container box.
 - Unscrew the cap from the reagent container box.
 - Remove the seal to expose the opening.



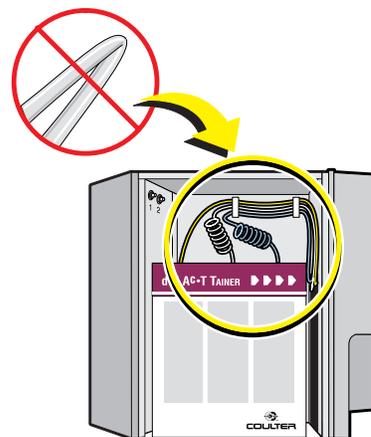
- 15** Insert pickup tube 3 into opening and twist cap to secure.
Note: Pickup tubes 1, 2, and 3 are now connected.



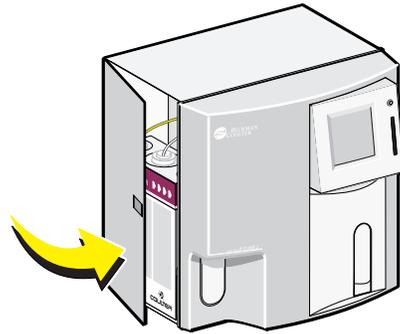
- 16** Place the reagent container, with tubes attached, into the reagent compartment of the instrument.



- 17** Verify that the tubing is not twisted or pinched.



18 Close the compartment door.



Congratulations, you have successfully connected the diff A^C•T Tainer reagent to the instrument!

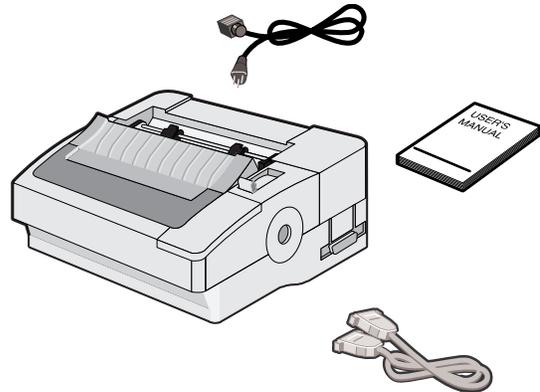
Connecting the Printer

Connect the printer cable to the A^C•T diff 2 analyzer. See your printer manual for further instructions on printer operation.

Note: This procedure illustrates the dot matrix graphic printer. Your printer may be different.

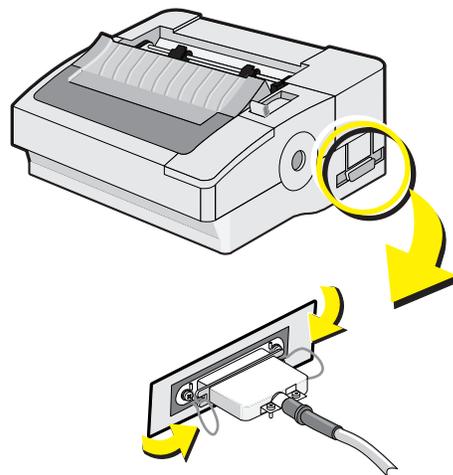
1 From the printer box, remove:

- the printer
- the power cord
- the printer cable
- the printer user's guide.

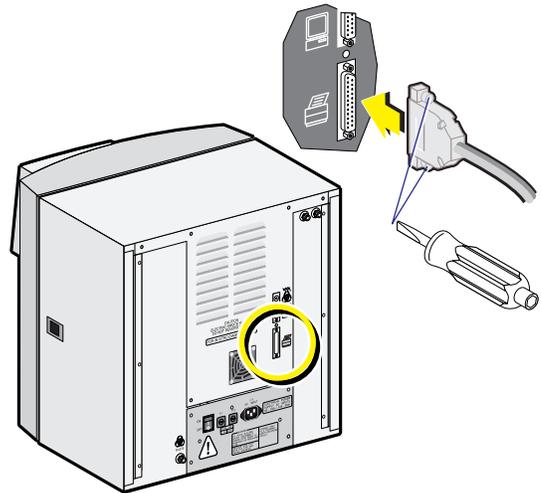


2 Place the printer on the countertop to the right or left of your instrument

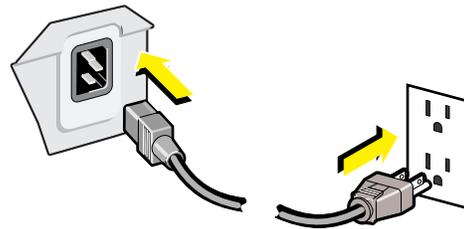
3 Connect the PI end of the printer cable to the printer and secure with the spring clips.



-
- 4** Connect the P2 end to the back of the instrument, next to the printer symbol, and secure by tightening the screws.



-
- 5** Connect the printer power cord to the printer and plug into an electrical outlet.

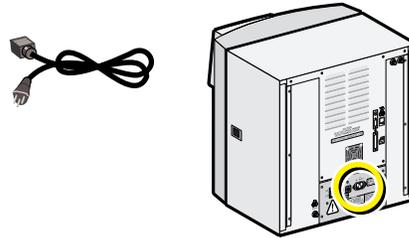


-
- 6** Prepare the printer for printing by installing a ribbon and putting in paper. See the printer manual for details.

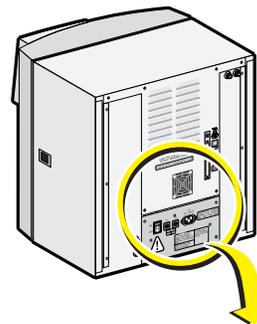
Connecting the Instrument's Power Cord

CAUTION Risk of damage to equipment. Turning the instrument's power on before the instrument is completely set up could damage the instrument. Do not turn the instrument's power on until you have completed connecting the reagent (diff A^C•T Pak or diff A^C•T Tainer) and the printer.

- 1 From the Accessory kit, remove the large black power cord.



- 2 Pay attention to the hazard warning labels on back of the instrument.



CAUTION
ELECTRIC SHOCK HAZARD
DO NOT REMOVE COVER
FOR IN VITRO DIAGNOSTIC USE

FUSE 3AG
2.5A 250V

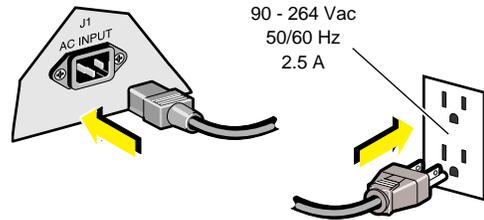
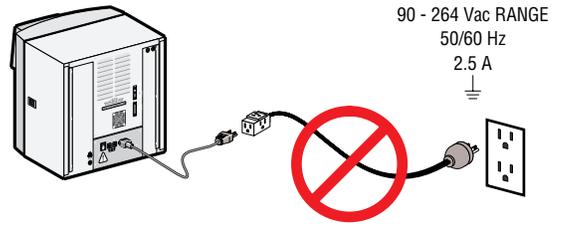
ELECTRICAL POWER
SUPPLY AC INPUTS
90 - 132v / 198 - 264v



WARNING	
TO AVOID ELECTRIC SHOCK DISCONNECT POWER CORD PRIOR TO REMOVING OR REPLACING FUSE.	CONNECT ONLY TO A PROPERLY EARTH GROUNDED OUTLET.
REPLACE FUSE ONLY WITH THE TYPE AND RATING SPECIFIED.	

Note: Do not use an extension cord.

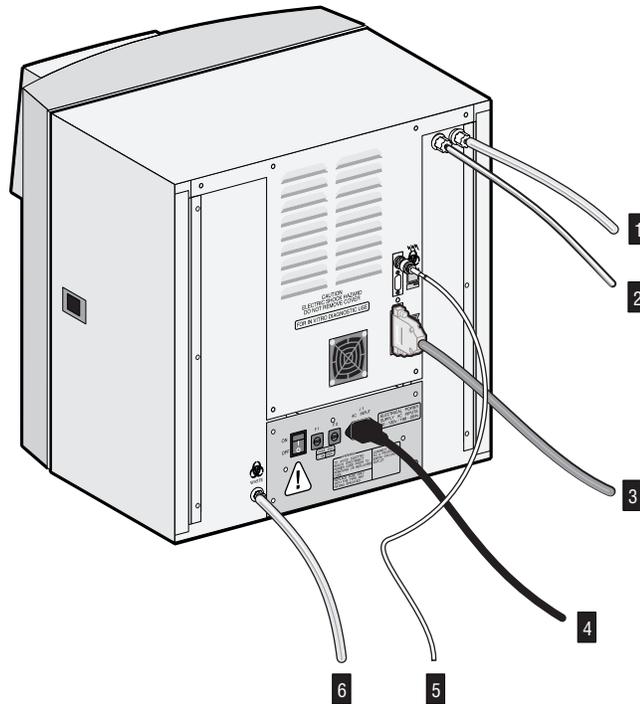
- 3** Connect the power cord:
 - a. Plug the non-pronged end into AC INPUT at the back of the instrument.
 - b. Plug the pronged end into an electrical outlet.



1.7 VERIFYING ALL CONNECTIONS

diff AC•T Pak Reagent Connection Verification

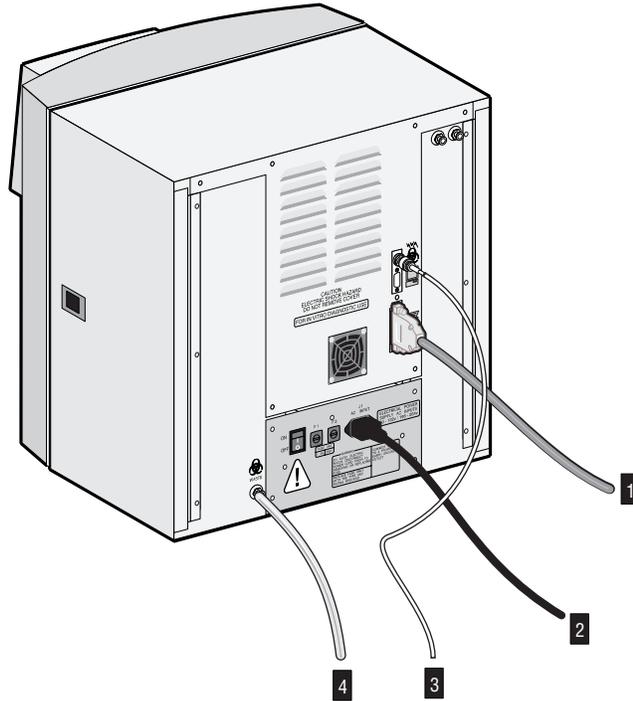
If you connected the diff AC•T Pak reagent to the instrument, be sure the back of the instrument looks like this when all the connections are in place. If you connected the diff AC•T Tainer reagent, see diff AC•T Tainer Reagent Connection Verification.



- 1** Diluent tube
- 2** Lytic reagent tube
- 3** Printer cable
- 4** Power cord
- 5** Waste sensor tube
- 6** Waste tube

diff A^C•T Tainer Reagent Connection Verification

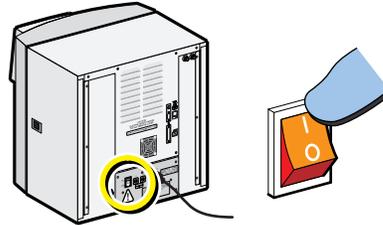
If you connected the diff A^C•T Tainer reagent to the instrument, be sure the back of the instrument looks like this when all the connections are in place. If you connected the diff A^C•T Pak reagent, see diff A^C•T Pak Reagent Connection Verification.



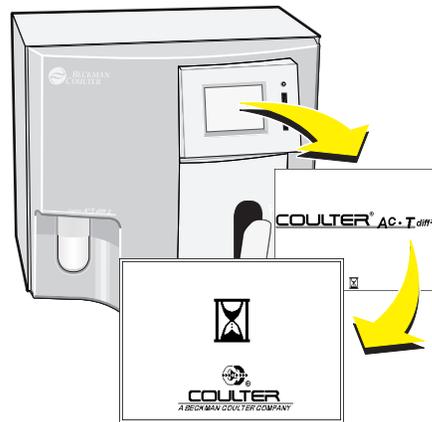
- 1** Printer cable
- 2** Power cord
- 3** Waste sensor tube
- 4** Waste tube

1.8 POWERING UP THE AC•T diff 2 ANALYZER

- 1 At the back of the instrument, press the on button to turn instrument on.



- 2 The instrument performs its startup process. You will see various screen displays on the touch screen.

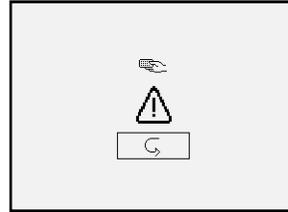


- 3 If the reagent management card warning appears, remove the card, reinsert it, and touch the **Continue** icon. Be sure the card is properly oriented with contact side facing the touch screen.

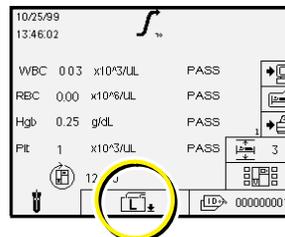
Note: Be sure you connected the reagent using the proper procedure.

- The diff AC•T Pak reagent requires that Connecting the diff AC•T Pak Reagent procedure in Chapter 1 be done.
- The diff AC•T Tainer reagent requires that Connecting the diff AC•T Tainer Reagent procedure in Chapter 1 be done.

If the warning continues to appear, contact your Beckman Coulter Representative.



- 4 If the letter **L** appears at the bottom of the screen, touch the **L** to continue. The instrument primes the lytic reagent.

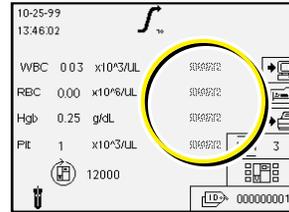


- 5 If the diluent does not prime, the **Diluent Empty** icon appears:
- Turn the instrument off.
 - Wait briefly then turn instrument on.
 - If the problem persists, check the reagents and the reservoir.

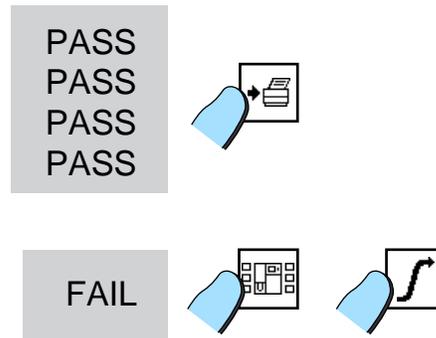
Refer to Table 6.5 in the Operator's Guide for additional information.



- 6 Next, the instrument performs a background check and indicates a *PASS* or *FAIL* message for each parameter.



- 7 If *PASS* appears for all parameters, print the results by touching the **Print** icon.
If *FAIL* appears for any parameter, do **Startup** again:
- Touch the **Main Screen** icon.
 - Touch the **Startup** icon. The instrument goes through the startup process again.
 - Allow the instrument to complete the startup routine.
 - If *FAIL* appears for any parameter, repeat steps a through c.
 - If, after repeating steps a through c two times, *FAIL* appears for any parameter, contact your local Coulter Representative.
 - If *PASS* appears for all parameters, print the results as described above.



- 8 After the startup report prints, touch the **Main Screen** icon to continue.



1.9 CUSTOMIZING THE SOFTWARE

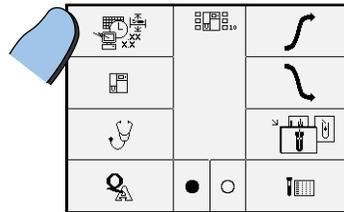
The main screen should now appear on the touch screen display. Since this is the first time you have used the instrument, you must customize the software. This includes:

- Setting the correct date and time
- Entering your IQAP participant number, if applicable
- Entering your elevation
- Selecting the format for reporting units
- Setting patient limits

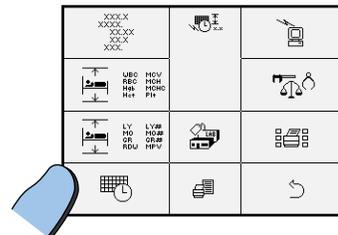
Verify all manually entered data on the screen.

Setting the Date and Time

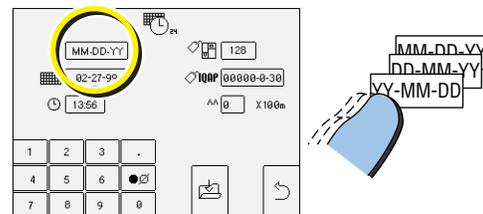
- 1 At the Main screen, touch the **Setup** icon.



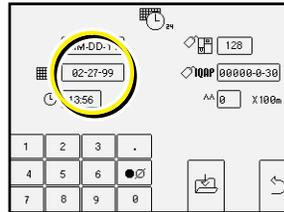
- 2 At the Setup screen, touch the **Date/Time** icon.



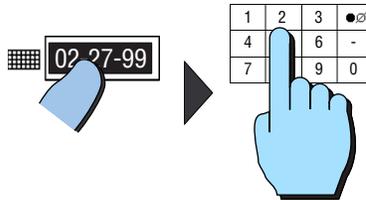
- 3 Change the date format by repeatedly touching the date field until the correct format appears.



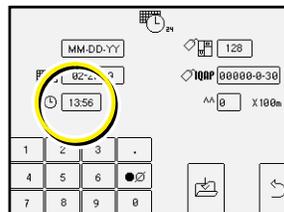
4 Change the date:



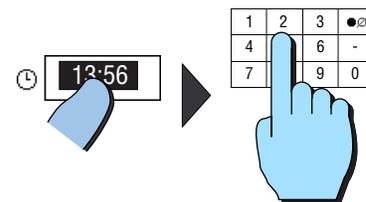
- a. Touch the date field.
- b. Touch the correct numbers on the keypad to enter the current date. Use a dash to separate the month, day, and year.



5 Change the time:



- a. Touch the time, which appears in 24 hour format.
- b. Touch the correct numbers on the keypad to enter the current time. Use a dash to separate hours and minutes. For example, to enter 1:00 P.M., you would touch **13-00**.
- c. Verify that the corrected time is displayed.



Entering Your IQAP Number

The Coulter Interlaboratory Quality Assurance Program (IQAP) is a program that compares your laboratory's 4C PLUS cell control results with the control results of other COULTER A^C•T diff 2 analyzers' control results.

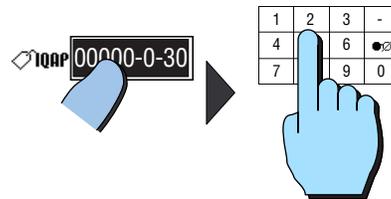
If your laboratory does not currently participate in the IQAP program, touch the **Save and Exit** icon to save the date and time changes you made above. If you would like more information on IQAP participation, call your local Coulter Representative or fill out and return an enrollment form.

If your laboratory participates in the Coulter's IQAP program, you now need to enter your participant number. You only have to enter the number one time unless your participant number changes.

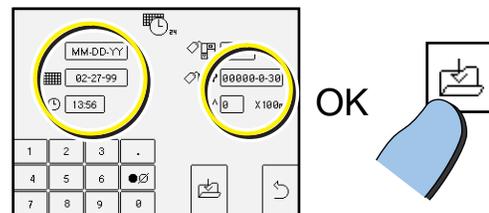
Note: It is very important that you enter your IQAP number into the instrument; otherwise, your IQAP data cannot be processed automatically.

1 Enter your IQAP participant number:

- a. At the date/time screen, touch the **IQAP Identification** field.
- b. Touch the correct numbers on the keypad. Use a dash to separate the numbers as needed.



2 Save the new date, time, and IQAP participant number by touching the **Save and Exit** icon.

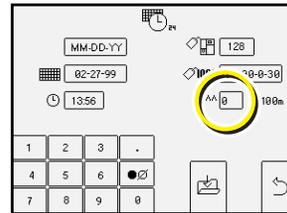


Entering Your Elevation

To assure optimum performance at various elevations, your instrument can be customized for your specific altitude.

1 Enter your altitude:

- At the date/time screen, touch the **Altitude** field.



- At the keypad, enter your altitude in 100 m increments.

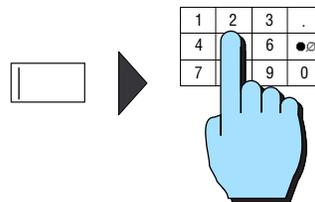
Note: To convert feet into meters, multiply feet by 0.3048. Then divide that number by 100 and enter it at the keypad.

For example, if your altitude is 1000 feet, calculate:

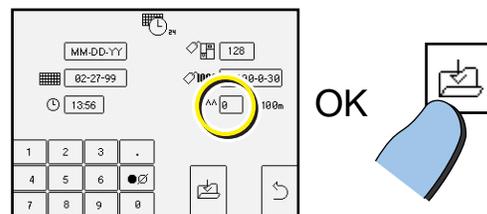
$$(1000 \times 0.3048)/100 = 3.048$$

At the keypad, you would enter 3 in the **Altitude** field.

Note: Round to the nearest whole number by rounding up for anything .5 or greater and down for anything .4 or less. For example, for 1.5, you would enter 2; for 1.4, you would enter 1.



2 Save your input by touching the **Save and Exit** icon.



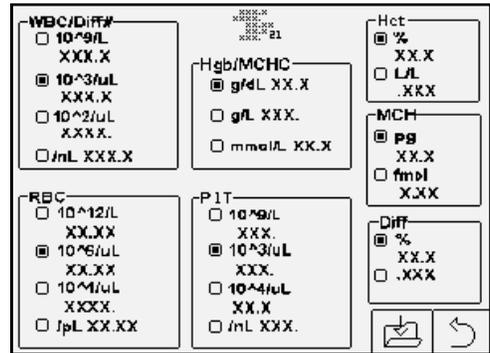
Changing the Reporting Units

Reporting units determine the format in which the units will display, such as where the decimal point is placed in a sample result.

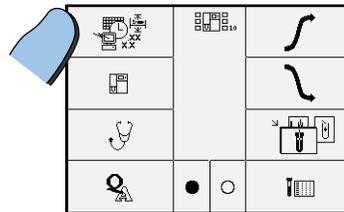
As shown in the illustration, the instrument's default reporting units are:

WBC/Diff#	x 10 ³ /μL
RBC	x 10 ⁶ /μL
Hgb/MCHC	g/dL
PLT	x 10 ³ /μL
Hct	%
MCH	pg
Diff	%

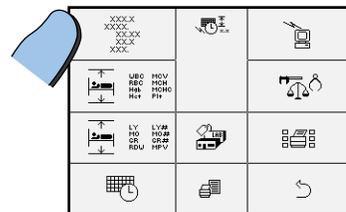
If you want to change the reporting units for your instrument, follow this procedure.



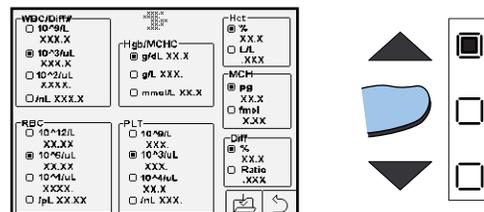
- 1 At the Main screen, touch the **Setup** icon.



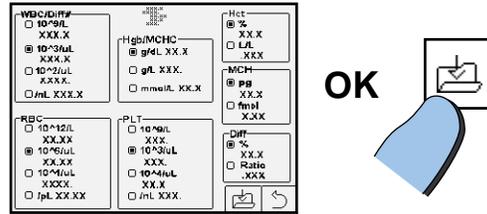
- 2 At the Setup screen, touch the **Units** icon.



- 3 Select the reporting unit formats you want to use by touching the unit on the screen. The square darkens next to your selection.



- 4** Save the unit formats by touching the **Save and Exit** icon.

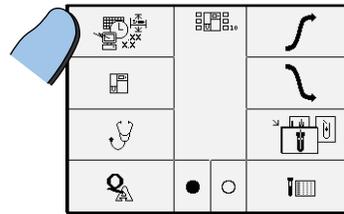


Setting Patient Limits

Patient limits are the high and low limits that you set for your patients. The AC•T diff 2 analyzer flags any parameter value above (H) or below (L) these limits.

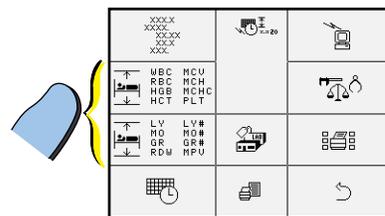
You can customize and select up to three reference ranges (1, 2, or 3) for flagging sample results.

- 1** At the Main screen, touch the **Setup** icon.

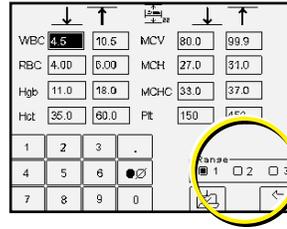


- 2** At the Setup screen, touch one of the **Patient Limits** icons.

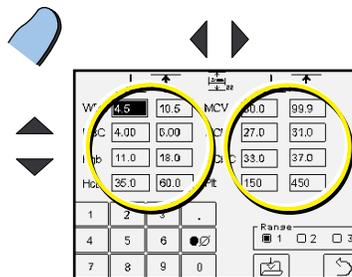
Note: This screen has two icons for patient limits. Choose the icon that reflects the parameters you want to set up.



- 3 Select the appropriate range (1, 2, or 3).



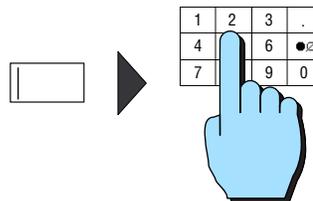
- 4 Select the limit to be changed by touching the limit.



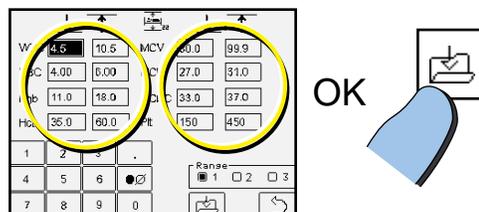
- 5 Enter the desired value for the parameter by touching the numbers on the keypad.

Note: When changing limits, be sure that the low is lower than the high and that the high is higher than the low; otherwise, your entry will not be accepted.

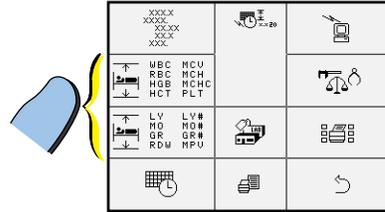
Repeat this procedure for each patient limit that you want to change.



- 6 After setting the patient limits, save them by touching the **Save and Exit** icon.



- 7 Repeat steps 1 through 6 for the other **Patient Limits** icon.

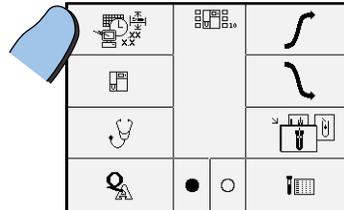


1.10 PRINT OPTIONS

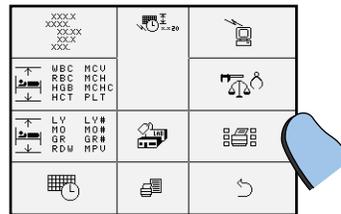
Setting Autoprint

If you want sample results to automatically print when you run a sample, turn autoprint ON.

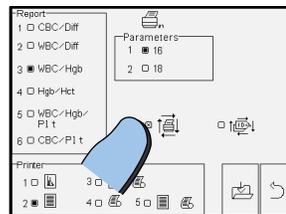
- 1 At the Main screen, touch the **Setup** icon.



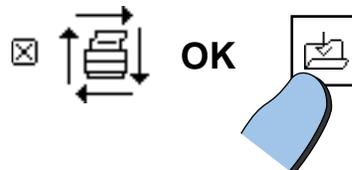
- 2 At the setup screen, touch the **Printers/Profiles** icon.



- 3 At the Printers/Profiles screen, touch the **Autoprint** icon. An x appears in the square when the option is selected. Touching the icon again turns Autoprint off. See Selecting the Printer Type for the available printer settings.



- 4 Save your selection by touching the **Save and Exit** icon.



Setting Patient Report Options

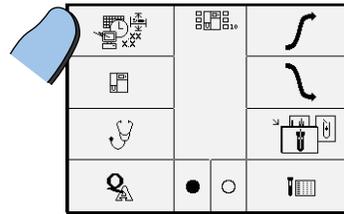
Six patient report options are available as the print profile for patient samples:

- 1 - CBC/Diff** (all 16 or 18 parameters, as selected at the parameters box)
- 2 - WBC/Diff** (WBC, LY%, LY#, MO%, MO#, GR%, GR#)
- 3 - WBC/Hgb** (WBC, Hgb)
- 4 - Hgb/Hct** (Hgb, Hct)
- 5 - WBC/Hgb/Plt** (WBC, Hgb, Plt)
- 6 - CBC/Plt** (WBC, RBC, Hgb, Hct, MCV, MCH, MCHC, Plt)

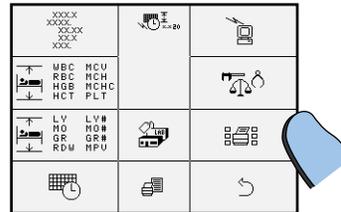
The default setting is **1 - CBC/Diff**. If you want to select a different setting, follow this procedure.

- 1** At the Main screen, touch the **Setup** icon.

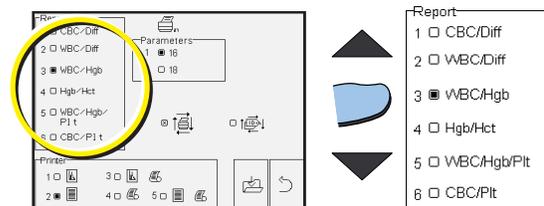
Note: If you are continuing from Setting Autoprint, go to step 3.



- 2** At the setup screen, touch the **Printers/Profiles** icon.



- 3** At the Printers/Profiles screen, touch the number of the report option you want. The square darkens next to your choice.



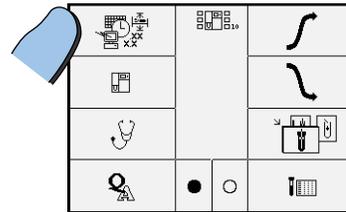
- 4 Save your selection by touching the **Save and Exit** icon.



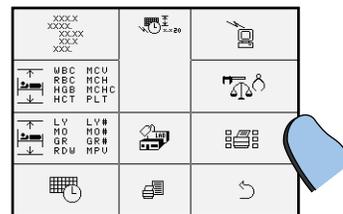
Selecting the Printer Type

Two types of printers are available from which to choose: a graphic printer or a non-graphic printer. The graphic printer prints histograms; the non-graphic printer, either a ticket or a roll printer, does not print histograms.

- 1 At the Main screen, touch the **Setup** icon.
 Note: If you are continuing from Setting Patient Report options, go to step 3.



- 2 At the setup screen, touch the **Printers/Profiles** icon.



3 Touch the number next to the printer you want to choose:

1 = Canon Bubble Jet and Citizen 190 graphic printers. This is the only selection that allows for printing of stored patient results and control graph reports.

2 = Ithaca Ticket Printer

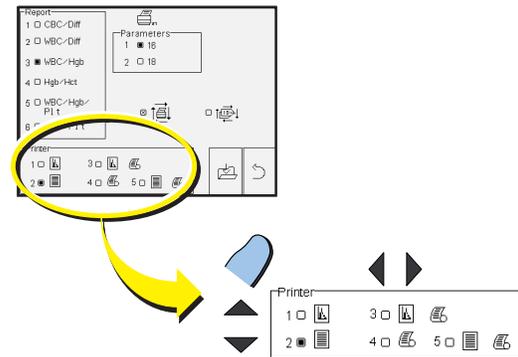
3 = Ithaca graphical roll (histograms)

4 = Ithaca roll (no histograms)

5 = Citizen Roll and Epson Ticket Printers, Canon Bubble Jet and Citizen 190 printers. **Note:** When using the Canon or Epson graphic printers, you can print reports without histograms.

The square darkens next to your selection.

- If you want to select the parameter options, go to Setting the Number of Printed Parameters.
- If you do not want to select the parameter options, save your printer selection by touching the **Save and Exit** icon.

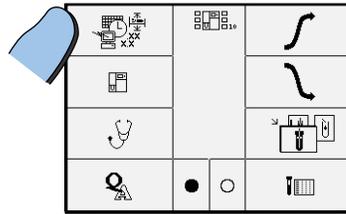


Setting the Number of Printed Parameters

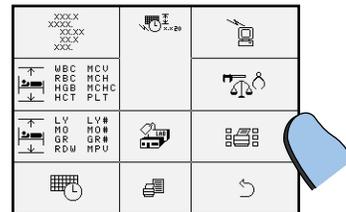
You can select 16 or 18 parameters for printing.

- The 16 parameter option includes: WBC, LY#, LY%, MO#, MO%, GR#, GR%, RBC, Hgb, Hct, MCV, MCH, MCHC, Plt, RDW, and MPV.
- The 18 parameter option includes the 16 listed above, plus Pct and PDW. Pct and PDW are derived parameters not intended for diagnostic use. The system uses the PDW value as an internal check on the reported platelet parameters, Plt and MPV.

1 At the Main Screen, touch the **Setup** icon.

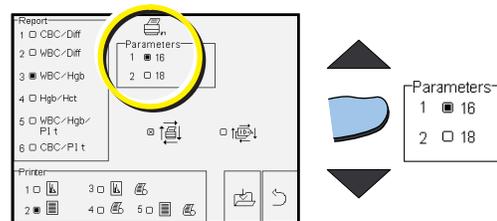


2 At the Setup screen, touch the **Printers/Profiles** icon.



3 Select the maximum number of parameters by touching:

- 1 for 16
- 2 for 18.



-
- 4** Save your choice by touching the **Save and Exit** icon.



Adding Your Laboratory Information to the Report Header

Do this procedure if you want to have your laboratory's information, such as name and address, print on the patient sample reports and the setup reports. The information will not print on control reports. You can enter up to 4 lines of text, 34 characters per line.

Note: If you are using the ticket printer, it is recommended that you enter only three lines of text, as the fourth line prints outside the box on the ticket.

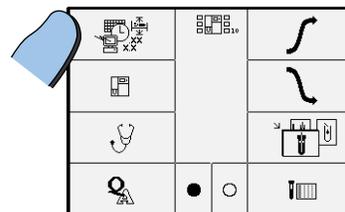
ASCII Characters Available

There are several characters available in the ASCII character set for your use. To get to the character or letter you want to use, you may have to touch **▶▶** or **◀◀** many times.

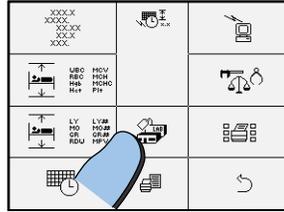
The following is a list of the characters in the order that they appear from left to right when you touch **▶▶**. You can also access the characters in the reverse order, beginning with Z, by touching **◀◀** first.

! " # \$ % & ' () * + , - . / 0 1 2 5 6 7 8 9 : ; < = >
? @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

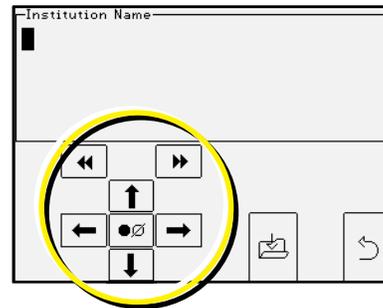
-
- 1** At the Main screen, touch the **Setup** icon.



- 2 At the Setup screen, touch the **Laboratory ID** icon.

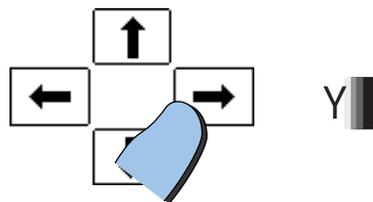


- 3 Touch **▶▶** or **◀◀** to scroll through the characters until the letter or character you want appears, such as Y in this example.

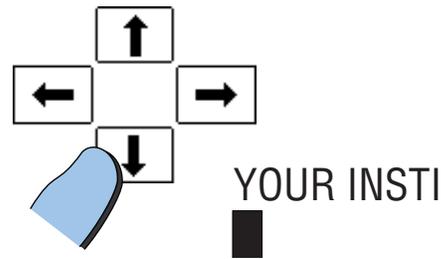


- 4 Advance to the next character position by touching **→**.

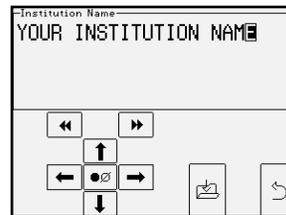
Note: The example shows Y as the character; your choice may be different.



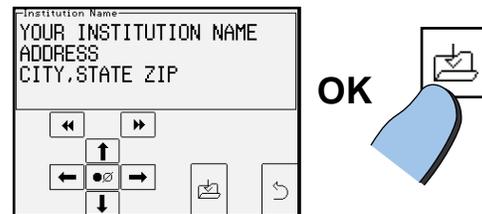
- 5** Move the cursor to the next line, if desired.
Note: You can enter a maximum of 4 lines of 34 characters each.



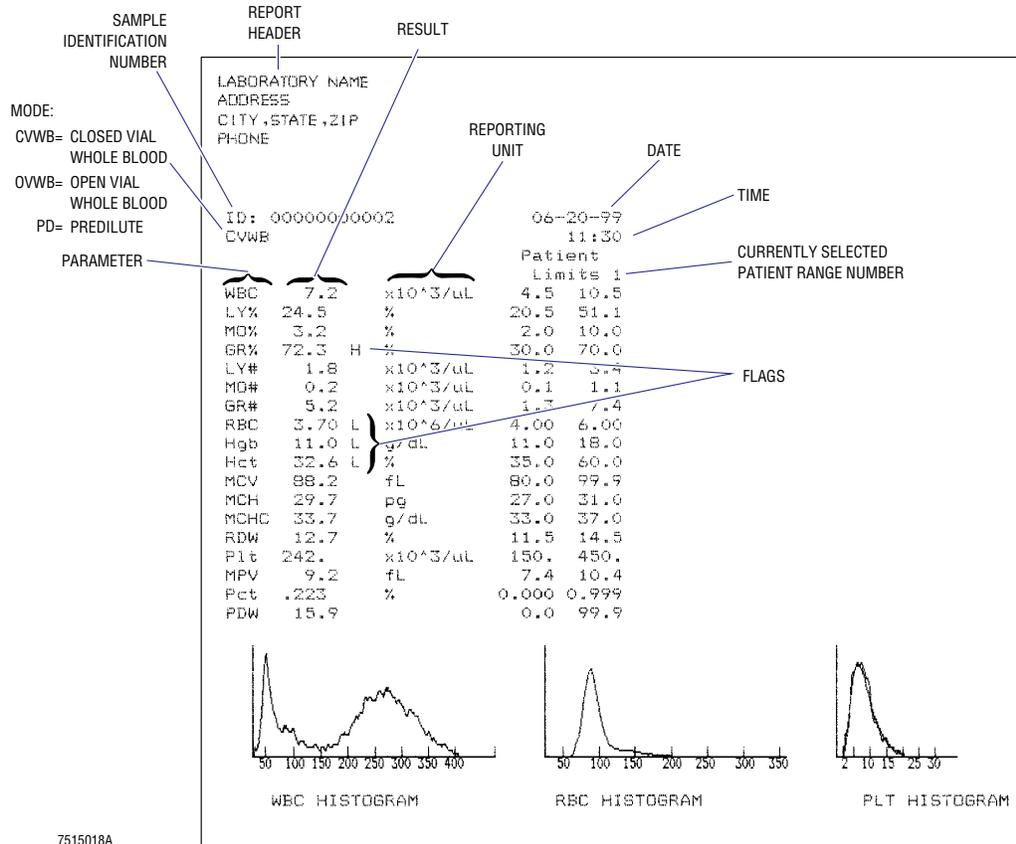
- 6** Repeat steps 4 and 5 until you have entered your laboratory's information.



- 7** Save the information by touching the **Save and Exit** icon.



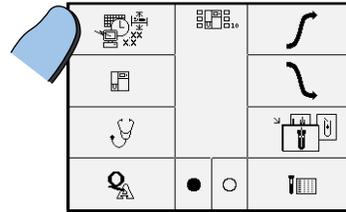
Below is an example of a sample report. Notice the report header where the laboratory ID information appears.



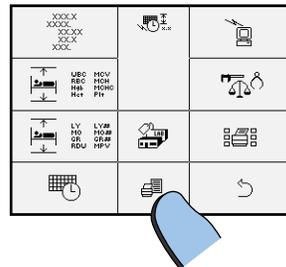
Printing Customized Values

When you finish customizing your software, print and save the customized values. Reprint them whenever you change the setup of your A^C•T diff 2 analyzer.

- 1** At the Main screen, touch the **Setup** icon.



- 2** Be sure that your printer is ready to print. At the Setup screen, touch the **Print** icon.
Note: This screen also prints the factory-set calibration factors.

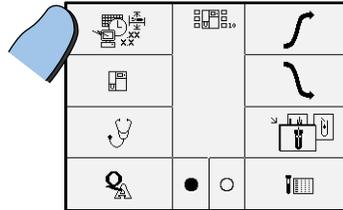


1.11 SETTING THE SAMPLE ID TO AUTOSEQUENCE

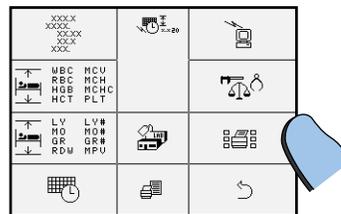
Autosequencing automatically increments the sample ID by one after running a sample. A maximum of 9 digits is used with the autosequenced sample ID. If autosequencing is not selected, you have to manually enter the sample ID (up to 14 digits).

- 1 At the Main screen, touch the **Setup** icon.

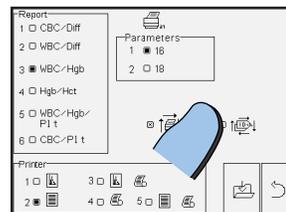
Note: If you are continuing from setting Patient Report Options, go to step 3.



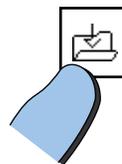
- 2 At the Setup screen, touch the **Printers/Profiles** icon.



- 3 At the Printers/Profiles screen, touch the **Autosequence** icon. An x appears in the square when autosequencing is on. Touching the icon again turns Autosequence off.



- 4 Save your selection by touching the **Save and Exit** icon.



1.12 DAILY PROCEDURES

Shutdown

If you consistently run less than five patient samples per day, you can perform Shutdown every other day. See Routine Procedures in your Operator's Guide for instructions on how to perform Shutdown.

Other Procedures

See the Operator's Guide for information on daily running of the instrument.

1.13 CALIBRATION

Coulter calibrates the A^C•T diff 2 analyzer at the factory before shipment, and the calibration data is provided with the instrument documentation.

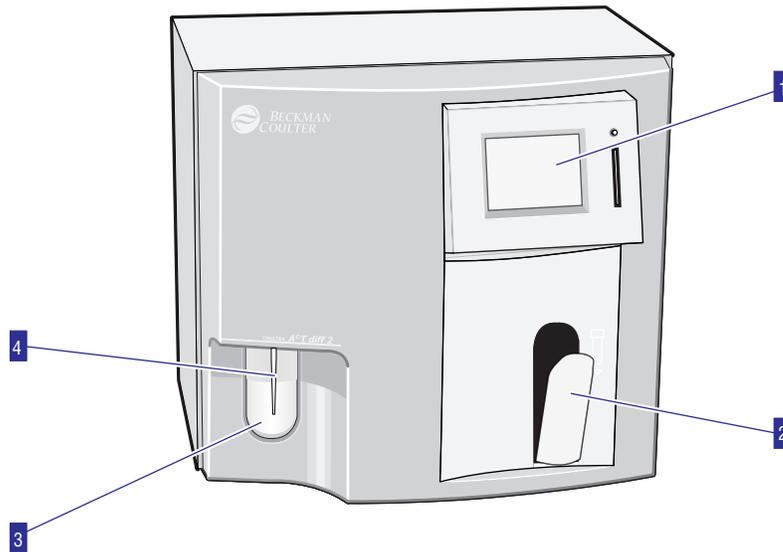
If calibration should become necessary, follow the procedures in Chapter 5 of the Operator's Guide.

2.1 INTRODUCING THE INSTRUMENT

The COULTER AC•T diff 2 analyzer is a quantitative, automated hematology analyzer and leukocyte differential counter. You can run blood specimens in the Closed Vial Whole Blood, Open Vial Whole Blood, or Predilute analyzing mode.

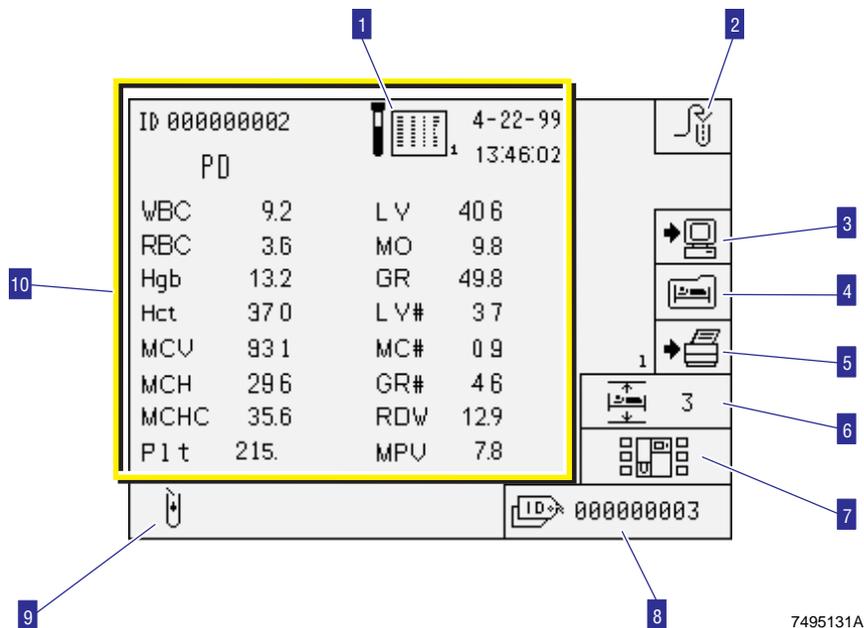
You interact with the AC•T diff 2 analyzer in the following ways:

- 1** By touching an icon on the screen to initiate an action.
- 2** By presenting a blood specimen to the tube holder for Closed Vial Whole Blood mode.
- 3** By pressing the aspirate switch.
- 4** By inserting the probe into the tube or vial for Open Vial Whole Blood or Predilute mode.



2.2 VIEWING THE SAMPLE RESULTS SCREEN

- 1** Sample Results screen indicator.
- 2** Touch to dispense diluent for a prediluted sample (only visible if you are in Predilute Mode).
- 3** Retransmit to Host (if Host is enabled).
- 4** Patient data storage.
- 5** Touch to print sample results. (The number corresponding to the currently selected patient report format will be displayed next to the print button. See Setting Patient Report Options in Heading 1.10 for information on patient report formats.)
- 6** Patient range.
- 7** Touch to access Main screen special procedures.
- 8** Touch to change the next ID number if this number is not the one you want to use.
- 9** Current Analyzing Mode Indicator.
- 10** Results of last sample.



2.3 REVIEWING SAMPLE RESULTS

- 1** Sample Identification number of the results on this screen.
- 2** Date and time of the sample analysis for the sample on this screen.
- 3** Flags indicating that the result is outside of patient limits or is questionable. Review the results according to your laboratory's protocol. See Table 9.4 in the Special Procedures and Troubleshooting section of the Operator's Guide.
- 4** Results of this sample.
- 5** Parameter names:

WBC White Blood Cell or leukocyte count

RBC Red Blood Cell or erythrocyte count

Hgb Hemoglobin concentration

Hct Hematocrit (relative volume of erythrocytes)

MCV Mean Corpuscular (erythrocyte) Volume

MCH Mean Corpuscular (erythrocyte) Hemoglobin

MCHC Mean Corpuscular (erythrocyte) Hemoglobin Concentration

Plt Platelet or thrombocyte count

MPV Mean Platelet Volume

RDW Red Cell Distribution Width

LY Lymphocyte percent or ratio

MO Mononuclear cell percent or ratio

GR Granulocyte percent or ratio

LY# Lymphocyte number

MO# Mononuclear cell number

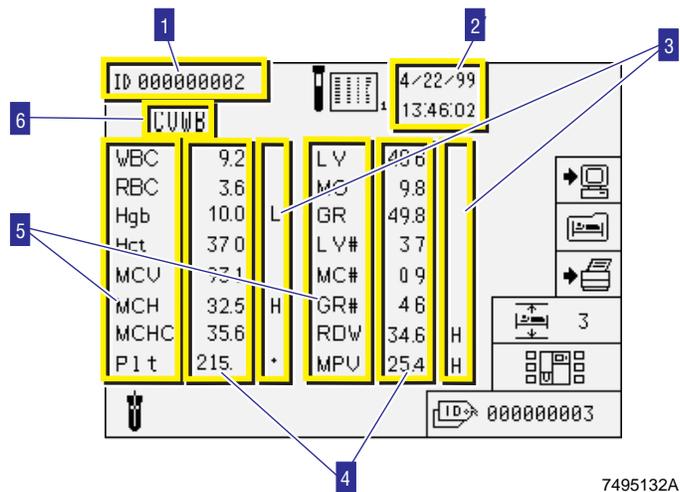
GR# Granulocyte number

- 6** Analyzing mode of this sample:

CVWB Closed Vial Whole Blood sample

OVWB Open Vial Whole Blood sample

PD Prediluted blood sample.



2.4 SAMPLE IDs

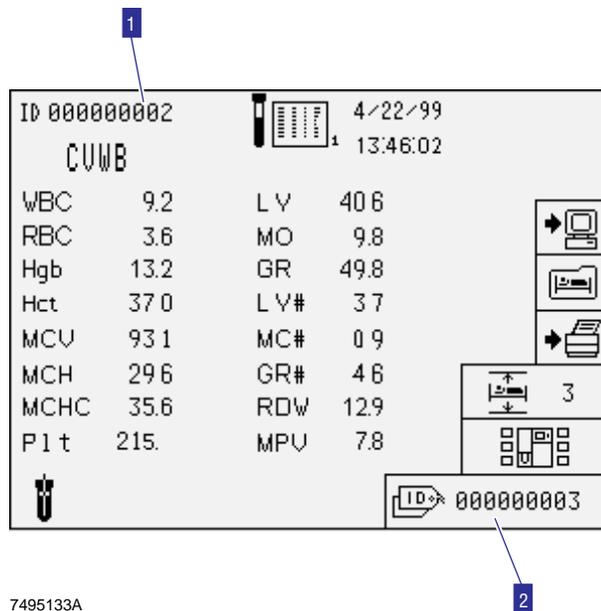
The AC•T diff 2 analyzer provides two methods of assigning sample ID numbers: autosequencing and manual entry.

Autosequenced Sample ID

When configured to autosequence, the AC•T diff 2 analyzer automatically assigns the sample ID. The number increments by 1 each time you run a sample. When the ID reaches 999999999, the sample ID begins again at 000000001.

When using autosequencing, leading zeros are automatically added to the ID number.

The sample screen displays two numbers.

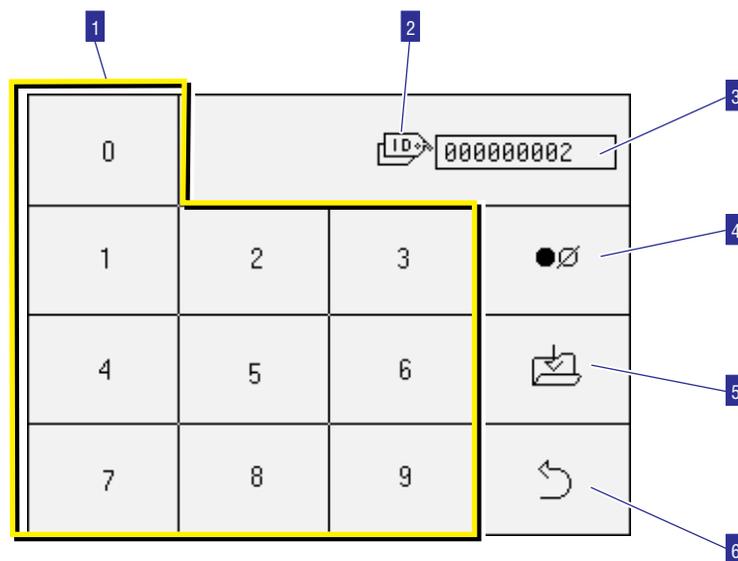


- 1** Indicates the sample ID for the sample results currently displayed on the screen.
- 2** Indicates the sample ID for the next sample to be analyzed.
 - If you want this number as the ID for the next sample to be analyzed, no action is required by you. When you analyze the next sample, the instrument automatically assigns this number.
 - If you do not want this number as the ID for the next sample, manually enter the ID number. See Manually Entered Sample ID for information.

Manually Entered Sample ID

If the autosequencing option is not selected, you must manually enter the sample ID number. Unlike autosequencing, leading zeros do not appear in the sample ID unless entered.

- 1 Keypad.
- 2 ID number screen title.
- 3 ID for the next sample run.
- 4 Touch to erase the ID number (one digit at a time) if you enter it incorrectly.
- 5 Touch to save the ID number displayed to make it the next sample ID number and to exit screen. If autosequencing is disabled, you must enter an ID to run the next sample.
- 6 Touch to return to the Sample Results screen without saving the ID number. The instrument will not cycle if ID is not entered.



Note: When in the Open Vial Whole Blood mode, the probe will not descend until you manually enter a sample ID. When in the Closed Vial Whole Blood mode, if the ID is not entered, a warning is displayed and the tube holder door opens.

2.5 SETTING ANALYZING MODES

- 1 The analyzing mode for the next patient sample appears in the lower left corner of the screen. It is one of the following:



Closed Vial Whole Blood mode

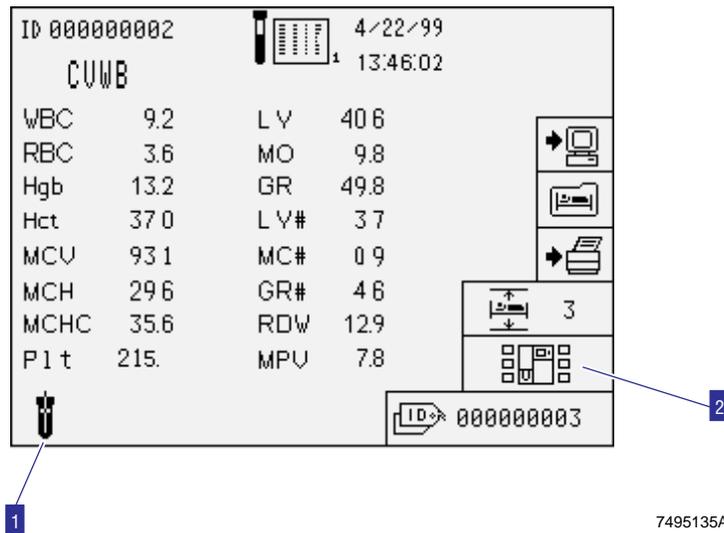


Open Vial Whole Blood mode

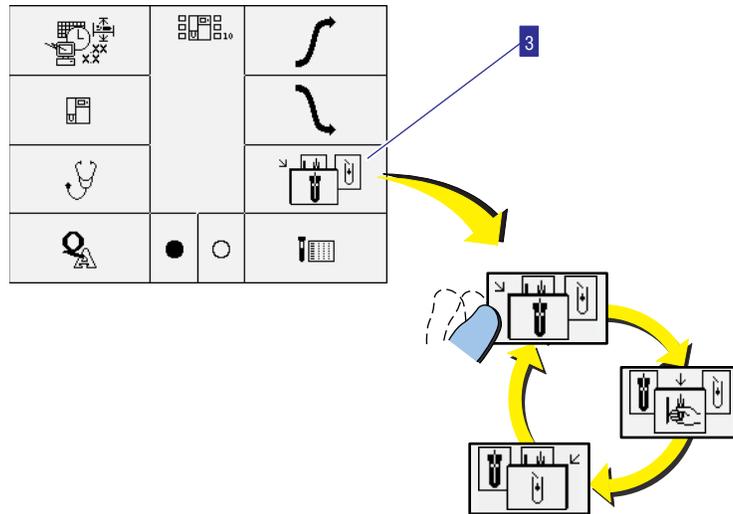


Predilute mode

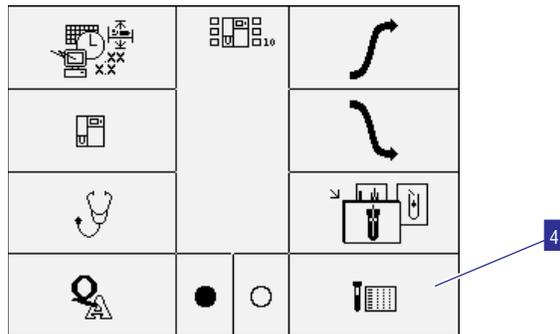
- 2 To change the analyzing mode, touch the **Go to Main Screen** icon to access special functions.



- 3 Touch the **Analyzing Mode** icon until the one you want appears.



- 4 Touch the **Sample Results** icon to return to the Sample Results screen.

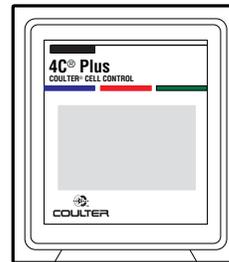


2.6 ENTERING VALUES FOR 4C[®] PLUS CELL CONTROL

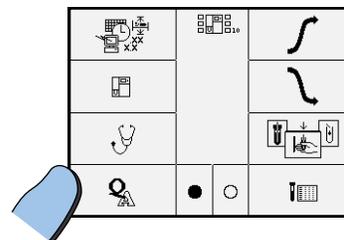
Before running controls, the values from the TABLE OF EXPECTED RESULTS in the assay sheet must be entered and saved into the instrument for each lot of controls.

IMPORTANT Risk of misleading results if improper target values are entered. If you are not using 4C PLUS cell control, DO NOT do this procedure.

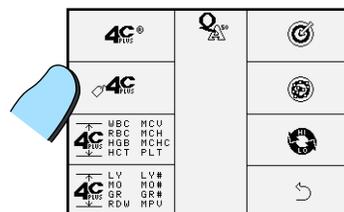
- 1** Be sure you have the 4C PLUS cell control.



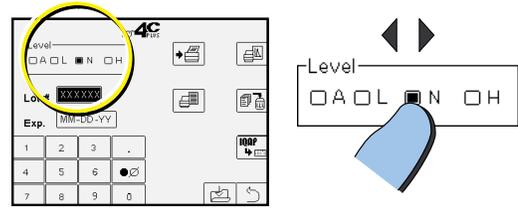
- 2** At the Main screen, touch the **QA** icon.



- 3** At the QA screen, touch the **4C Management** icon.



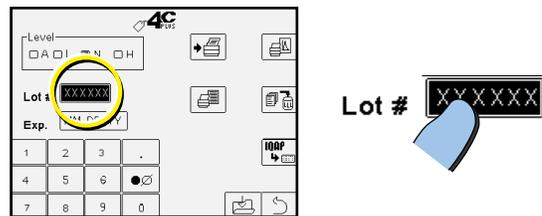
- 4 Select the cell control level (**L**, **N**, or **H**) by touching the level indicator.
- **A** = all (Not for use when entering the lot number or expiration date.)
 - **L** = low
 - **N** = normal
 - **H** = high



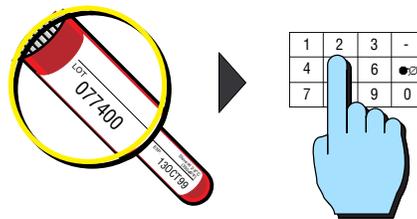
The square darkens next to your selection.

Note: If controls have been previously analyzed on the instrument, the information should be printed and then deleted. See Deleting 4C PLUS Cell Control Files before proceeding.

- 5 Enter the lot number:
- Touch the Lot# field.

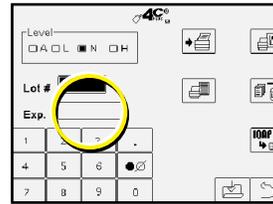


- Enter the lot number located on the vial (up to 6 digits), including zeros if applicable.



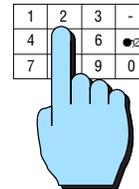
6 Enter the expiration date:

a. Touch the Exp. field.



b. Enter the expiration date (up to 6 digits) in MMDDYY format. Use a dash to separate the month from the day and the day from the year.

For example, to enter October 13, 1998, you would press 10-13-98 at the keypad.



7 Print the information you entered by touching the **Print** icon.

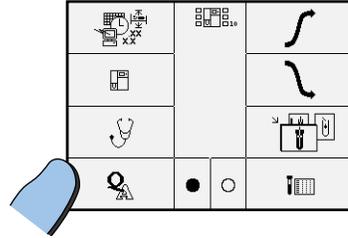


8 Repeat steps 4 through 7 for each additional level of control.

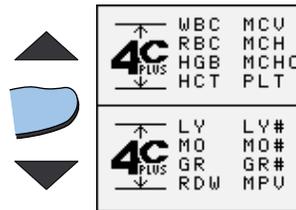
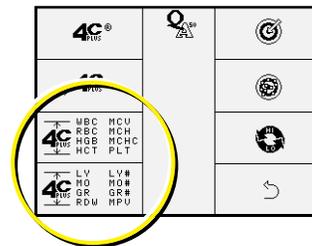
9 Save the information by touching the **Save and Exit** icon.



10 At the Main screen, touch the **QA** icon.

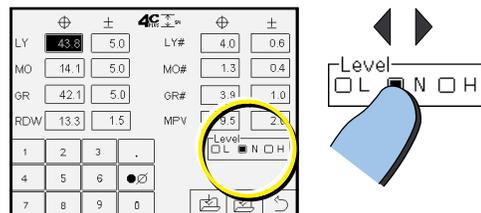


11 Touch a **4C PLUS Limits** icon.
 There are two of these icons; each contains different parameters.



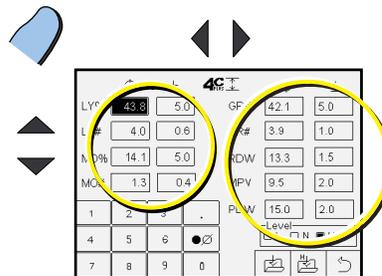
12 Select the range by touching:

- **L** for low
- **N** for normal, or
- **H** for high.

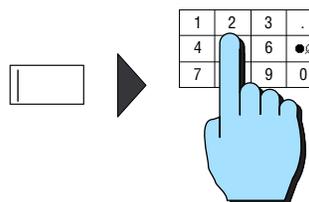


13 Enter the values:

- a. Touch the field where you want to enter values.

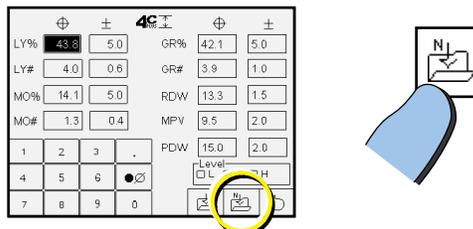


- b. At the keypad, enter the values from the TABLE OF EXPECTED RESULTS supplied with your control material.



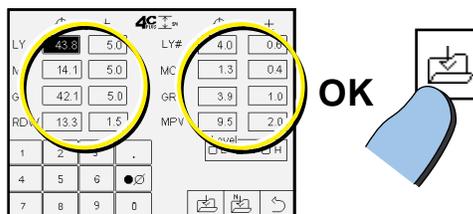
14 You can save the values as you are entering them by touching the **Save and Continue** icon.

Note: L, N, or H appears above this icon to reflect the control level.



15 Repeat steps 12 through 14 until the target values for all levels are entered.

16 If values are okay, touch the **Save and Exit** icon.



2.7 RUNNING CONTROLS

The control for the AC•T diff 2 analyzer is 4C PLUS cell control.

IMPORTANT Risk of existing data in the database not being flagged using new values or ranges. If the Expected Values or Range is edited and saved when the control database is not empty, samples run after the change will be flagged according to the edited values; however, the data already in the database will not be reflagged based on the new values or ranges. The new values will be printed with the control summary data. Be sure to edit/save Expected Values or Ranges only when the control database is empty.

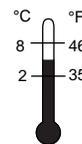
Running COULTER 4C PLUS Cell Control



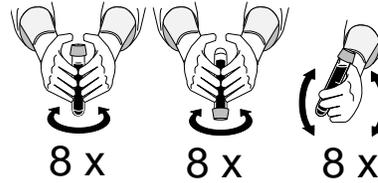
IMPORTANT Risk of misleading results. Only run 4C PLUS cell control in the QA function. Running 4C PLUS cell control in any other mode or function can cause wrong results.

- 1 Be sure the 4C PLUS cell control information and values have been correctly entered from the TABLE OF EXPECTED RESULTS in the assay sheet. For information on how to enter the values, see Heading 2.6, ENTERING VALUES FOR 4C® PLUS CELL CONTROL in this manual.

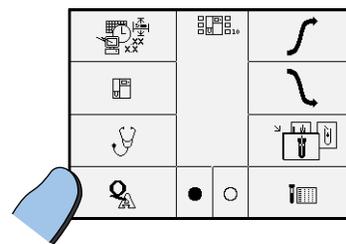
- 2 Ensure that 4C PLUS cell control is not past its expiration date and that it is at the correct storage temperature.



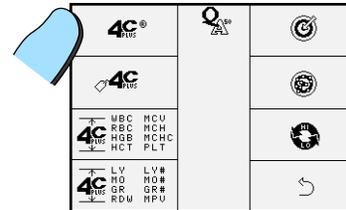
- 3** After warming at room temperature, mix each control gently according to instructions in the cell control package insert.
 Inspect the vial contents to ensure that all cells are uniformly distributed; if not, repeat this step.



- 4** At the Main screen, touch the **QA** icon.

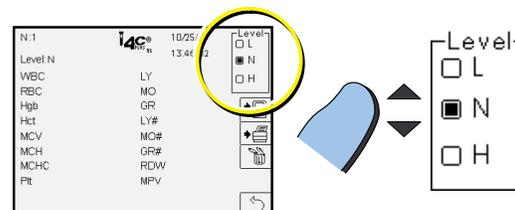


- 5** At the QA screen, touch the **4C PLUS Run** icon.



- 6** Select the correct control level:

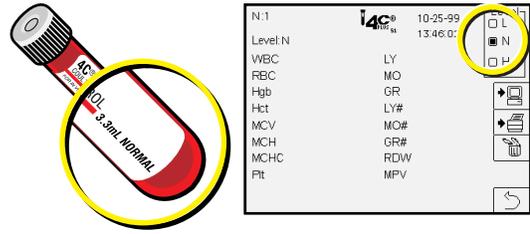
- L** - for low
- N** - for normal
- H** - for high



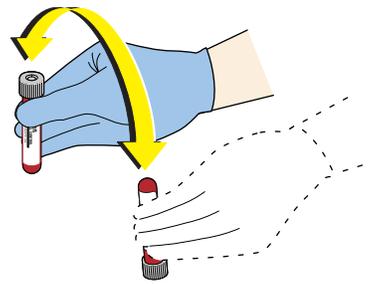
The square darkens next to your selection.
 If the selected control level has expired, the **Control Expired** icon appears in the lower left corner of the screen.



- 7 Make sure that the level of control you are testing matches the one selected (L, N, or H).



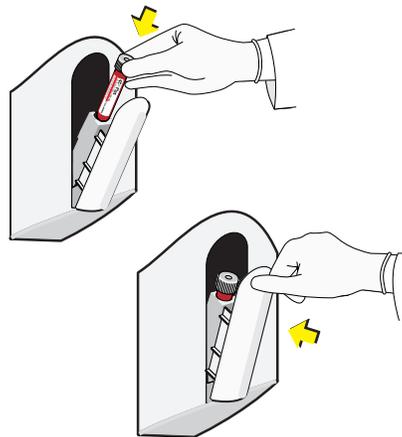
- 8 Invert the tube once or twice prior to cycling.



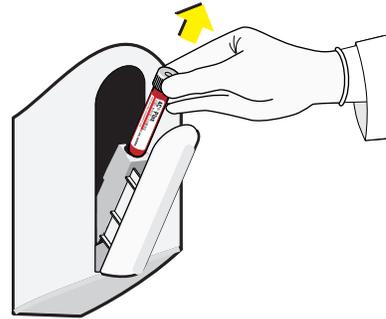
IMPORTANT Risk of misleading results if Cap Pierce Station door is open before the sample analysis is completed. Do not open the door. The door will open automatically.

- 9 Place the well-mixed sample in the tube holder at the Cap Pierce Station and close the door.

Note: If the door is inadvertently closed after it has opened automatically, or if it is closed at a screen where samples are not run, you can open the door by returning to the Main Menu screen and then touching the **Sample Results** icon. After opening the door, return to the Main menu then proceed to step 4 of Running Controls.

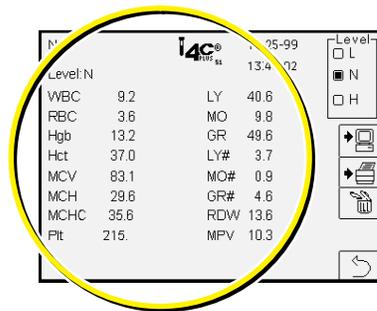


- 10** When the tube holder door opens, remove the tube.

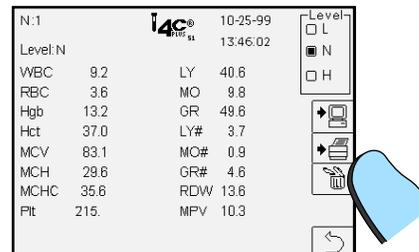


- 11** Results appear on the screen.

- Unless non-numeric results occur for one or more parameters, the control results are automatically stored.



- If Autoprint is off, you can manually print the results.
- To manually reject these results, touch the **Trash** icon.
- See Special Procedures and Troubleshooting in the Operator's Guide for information on reviewing results.
- If results are not within the expected range, rerun the control starting at step 7.



If results are still out of range, see the Special Procedures and Troubleshooting in the Operator's Guide.

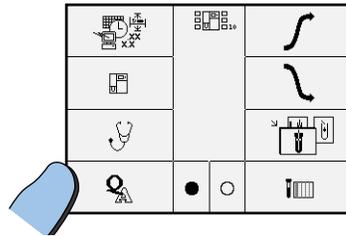
12 Repeat steps 6 through 11 for each required control level.

13 If the results are within the expected range, you are finished running controls. If you do all of the above steps and the results still do not meet your performance expectations, call your local Beckman Coulter Representative.

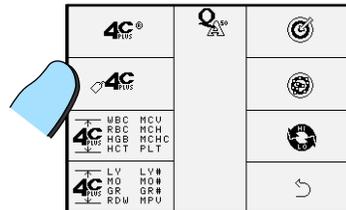
14 Return the cell control vial to the refrigerator.

Printing Stored 4C PLUS Cell Control Results

1 At the Main screen, touch the **QA** icon.



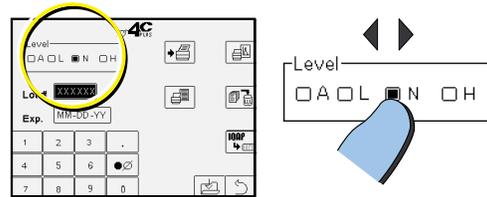
2 At the QA screen, touch the **4C PLUS Management** icon.



3 Select the control level you want to print:

- A** = all
- L** = low
- N** = normal
- H** = high.

The square darkens next to your selection.



4 Touch the **Print** icon for the data you want:

- a. Touch the **Print Assay** icon to print the assay values currently in the system.
Note: If you have a ticket printer you cannot select the **A** level for this function.
- b. Touch the **Print Summary** icon to print a summary of the control data.
Note: If you have a ticket printer you cannot select the **A** level for this function.
- c. If you have a graphic printer, touch the **Graph** icon to print a Levey-Jennings graph of the control data.



Downloading 4C PLUS Cell Control Results for IQAP

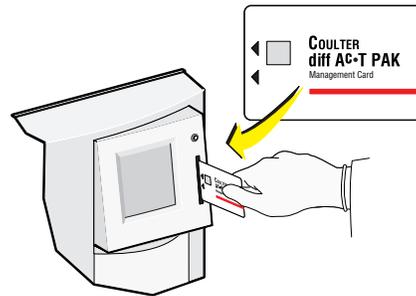
Stored control results can be returned to Coulter for inclusion in the IQAP program. Submit your IQAP data to Coulter each month after completing your last set of controls. For additional information on the IQAP program, see the Reference manual.

Save used reagent management cards to use for this procedure. The card is old if you see this warning on your instrument.

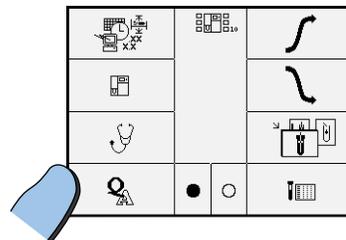


Apply the IQAP identification label to an old reagent management card, using care not to cover up the microchip (gold square).

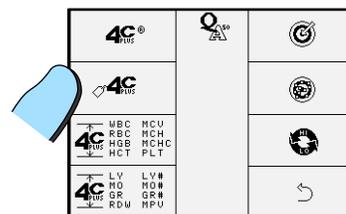
- 1 Remove the current reagent management card and insert an old reagent management card into the instrument.



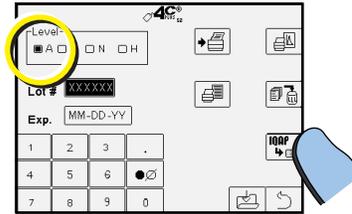
- 2 At the Main screen, touch the **QA** icon.



- 3 At the QA screen, touch the **4C PLUS Management** icon.



-
- 4** At the 4C PLUS Management screen:
- Select **A** for all levels of control.
 - Touch the **IQAP** icon to download (send) the data onto the card.



-
- 5** Touch the **Print** icon to print the control summaries. Keep a copy of the control file data, if possible, for your records.
- Note:** If you are unable to download the data, submit your control data using a form approved by Coulter's IQAP department.



-
- 6** Place the following items into the mailer:
- Reagent card with stored control data and attached label
 - Copy of the control data.

Return the mailer to Coulter's IQAP department. **Note:** At the time of enrollment in Coulter's IQAP program, you were supplied with pre-addressed mailers and self-adhesive return labels with your IQAP number.

-
- 7** Print a hard copy of the results for your records. See Printing Stored 4C PLUS Cell Control Results.

-
- 8** After printing and downloading, delete the control data stored in the instrument. See Deleting 4C PLUS Cell Control Files.

Deleting 4C PLUS Cell Control Files



indicates that one or more of your 4C PLUS cell control files are full and the instrument cannot store any additional control information. If you want to delete existing control files, follow this procedure. Prior to entering new cell control lot information, delete existing control files.

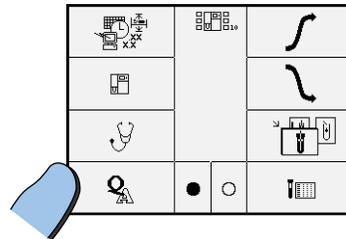
Once deleted, the control files cannot be recovered. Therefore, be sure that you have all the control information you need before deleting anything.

- 1 If your laboratory is an IQAP participant, download all the control results before proceeding to step 2. See Downloading 4C PLUS Cell Control Results for IQAP in this chapter for details.

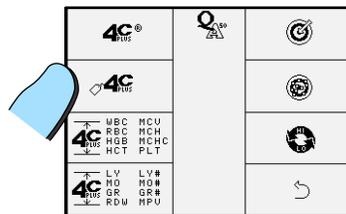
If your laboratory is not an IQAP participant, go to step 2.



- 2 At the Main screen, touch the **QA** icon.



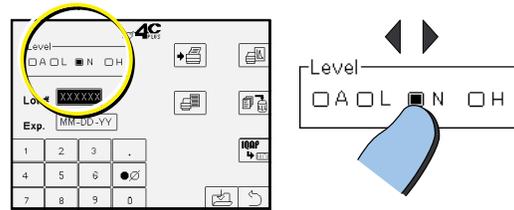
- 3 At the QA screen, touch the **4C PLUS Management** icon.



4 Select the control level you want to print.

- A** = all
- L** = low
- N** = normal
- H** = high

The square darkens next to your selection.



5 Print any control summaries or graphs needed for your records.

- Touch the **Print Summary** icon to print a summary.
- Touch the **Print Graph** icon to print a graph.



6 Touch the **Trash** icon to delete the control files for the level of control you selected in step 4.



7 The Delete Confirmation screen appears.

- Touch the **Trash** icon to delete.
- Touch the **Return** icon to return to the previous screen without deleting.



2.8 RUNNING SAMPLES

When the AC•T diff 2 analyzer is set to the correct analyzing mode (Closed Vial Whole Blood, Open Vial Whole Blood, or Predilute), and you have verified the sample ID, you are ready to run samples.

You can analyze and print sample results with an associated range (**1**, **2**, or **3**). You can also elect to print sample results using the instrument's linearity range (**0**). **Results print with the reference range based on the range selected when the sample was run.**

To ensure that the blood specimen is analyzed correctly, you must set the instrument to the correct analyzing mode.

When storing samples:

- Do not refrigerate samples for Platelet and differential counts.
- If you do not need Platelet or differential results, you can store whole-blood specimens drawn in a salt of EDTA at 2 to 8°C.
- Warm samples to room temperature before you cycle them.

To record the sample results correctly, you must ensure that the ID number is correct.

IMPORTANT Risk of misleading results. Running a blood sample in an incorrect analyzing mode can cause wrong results. Only run a whole blood sample in a whole blood mode.

Coulter suggests that:

- You analyze a whole blood sample within 24 hours of collection.
- You analyze samples at the system's operating temperature (16-35°C).
- You warm samples to room temperature before you analyze them.
- If flags appear for a sample, you refer to Table 6.4 in the Operator's Guide.

Whole Blood Samples

You can run whole blood samples in the Closed Vial Whole Blood (CVWB) mode or the Open Vial Whole Blood (OVWB) mode. When running samples in the CVWB mode, you leave the cap on the sample tube. When running samples in the OVWB mode, you remove the cap from the sample tube.

Note: You can run open vial samples in the Closed Vial Whole Blood mode. For instructions, refer to the Operator's Guide.

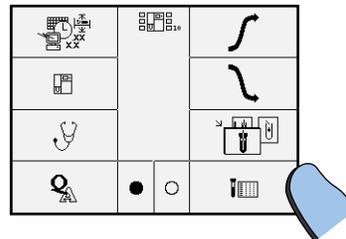
Sample Analysis: Closed Vial Whole Blood Mode



- 1 At the Main screen, select **Closed Vial Whole Blood** mode.

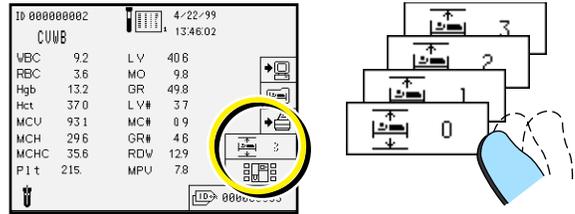


- 2 At the Main screen, touch the **Sample Results Screen** icon.



3 Touch the **Patient Range** icon until the desired range (**1**, **2**, or **3**) appears.

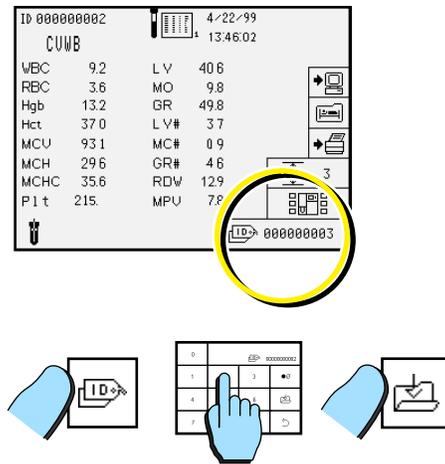
Note: **0** is not a patient range; it is the instrument's linearity limit.



4 Verify that the sample ID is correct:

- If autosequencing is on, the sample ID number automatically increments by 1.
- If autosequencing is off, manually enter the sample ID and touch the **Save** icon. Be careful not to duplicate an existing sample ID number that may have been previously used.

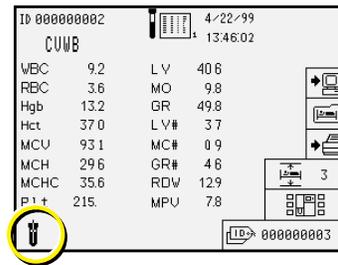
Note: If you are running samples in the closed vial mode, the tube holder door will open. If the door is closed without an ID having been entered or if the ID error warning displays, the door opens. Acknowledge the error, enter an ID or go to the ID screen and close the door.



5 Mix the sample according to your laboratory's protocol.



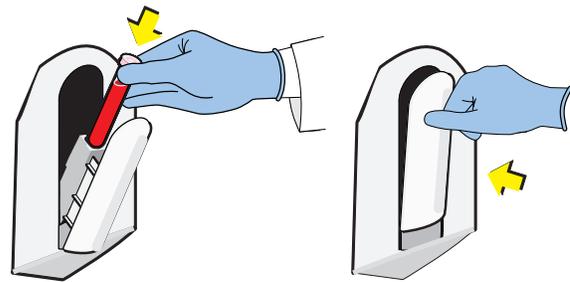
- 6** Be sure you are in the **Closed Vial Whole Blood** mode.



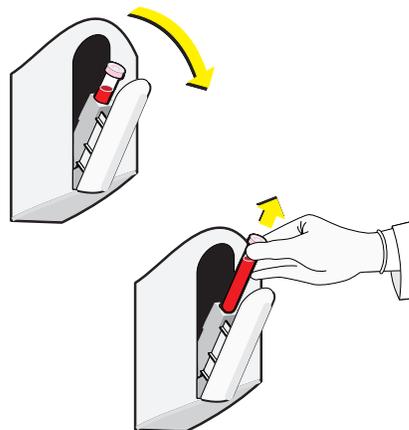
IMPORTANT Risk of misleading results if Cap Pierce Station door is open before the sample analysis is completed. Do not open the door. The door will open automatically.

- 7** Place the well-mixed sample in the tube holder at the Cap Pierce Station and close the door.

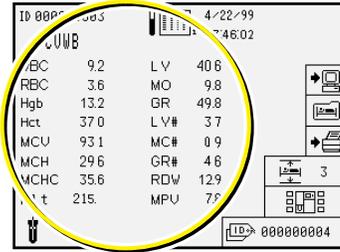
Note: If the door is inadvertently closed after it has opened automatically, or if it is closed at a screen where samples are not run, you can open the door by touching the **Main Menu** icon and then the **Sample Results** icon.



- 8** When the tube holder door opens, remove the tube.



- 9 The sample results are automatically saved by the instrument and the results appear on the screen.

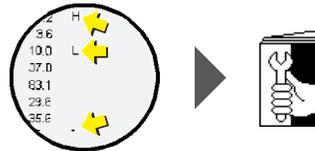


- 10 Print the results:
- If Autoprint is on, the results print automatically.
 - If Autoprint is off, touch the **Print** icon.

If the printout is illegible, unclear, or incomplete, correct the printer problem and reprint.



- 11 If flags appear, see Special Procedures and Troubleshooting in the Operator's Guide.



- 12 If autosequence is on, the instrument is ready to run the next sample.
 If autosequence is off, you must manually enter an ID number before the tube holder door opens for the next sample.

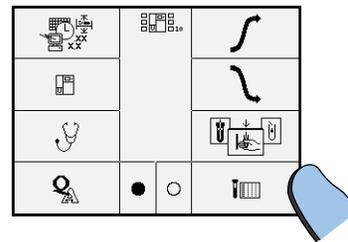
Sample Analysis: Open Vial Whole Blood Mode



- 1** At the Main screen, select **Open Vial Whole Blood** mode.

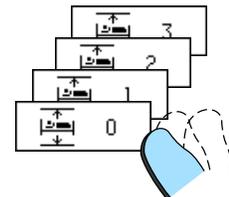
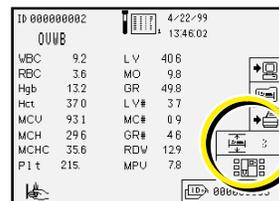


- 2** At the Main screen, touch the **Sample Results Screen** icon.



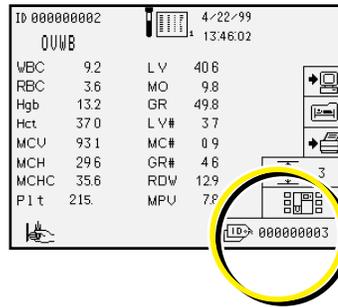
- 3** Touch the **Patient Range** icon until the desired range (**1**, **2**, or **3**) appears.

Note: **0** is not a patient range; it is the instrument's linearity limit.

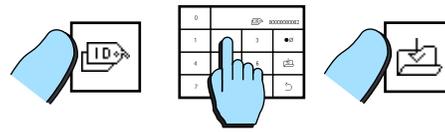


4 Verify that the sample ID is correct:

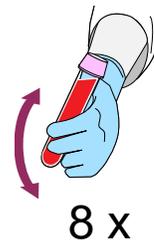
- If autosequencing is on, the sample ID number automatically increments by 1.
- If autosequencing is off, manually enter the sample ID and touch the **Save** icon. Be careful not to duplicate an existing sample ID number that may have been previously autoincremented.



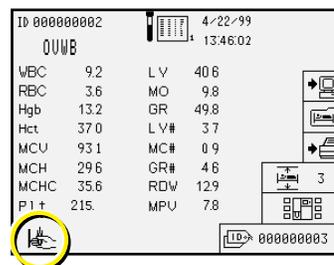
Note: If autosequencing is off, the probe does not descend until you manually enter and save the next ID.



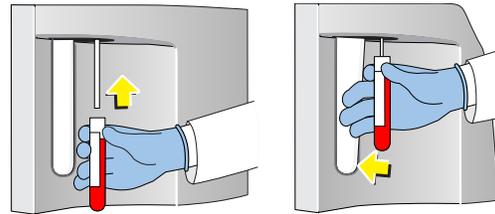
5 Mix the sample according to your laboratory's protocol, and place a lint-free tissue over the top and remove the cap.



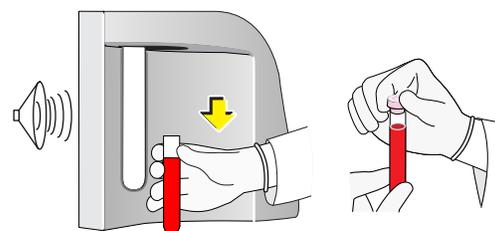
6 Be sure you are in the **Open Vial Whole Blood** mode.



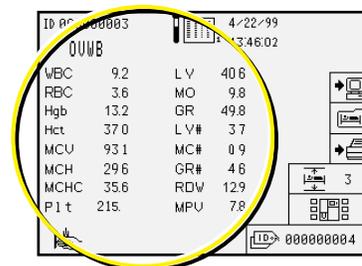
- 7 Present the well-mixed sample to the probe so that the tip is well into the tube, and press the aspirate switch.



- 8 When you hear the beep, remove the sample, and put the cap back on the tube.



- 9 The sample results are automatically saved by the instrument, and the results appear on the screen.

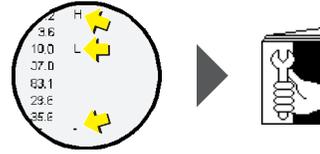


- 10 Print the results:
- If Autoprint is on, the results print automatically.
 - If Autoprint is off, touch the **Print** icon.

If the printout is illegible, unclear, or incomplete, correct the printer problem and reprint.



-
- 11** If flags appear, see Special Procedures and Troubleshooting in the Operator's Guide.



-
- 12** If autosequence is on, the instrument is ready to run the next sample.
If autosequence is off, you must manually enter an ID number before the probe descends for the next sample.

Prediluted Blood Samples

If it is your laboratory's procedure to collect specimens for hematology via capillary collection into a microcollection device, you may run the specimen in the whole blood mode. However, the Predilute mode should be used if the specimen collected cannot be directly aspirated in a whole blood mode.

The Predilute mode dispenses 1580 μL of diluent into an empty tube or receptacle where 20 μL of capillary blood will be added, thereby diluting it, to create an adequate amount of sample volume for the instrument to aspirate for analysis.

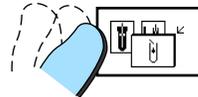
IMPORTANT Risk of misleading results. Running a blood sample in an incorrect analyzing mode can cause wrong results. Only run prediluted blood in the Predilute mode.

Coulter suggests that:

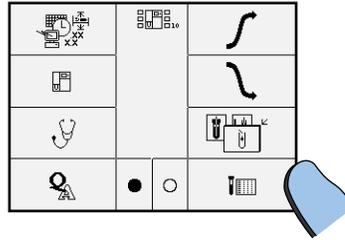
- You analyze prediluted specimens for CBC within 4 hours of collection/preparation.
- You analyze prediluted specimens for diff within 1 hour of collection/preparation.
- You allow a prediluted sample to stabilize in the predispensed diluent for at least 5 minutes.
- If flags appear, you refer to Special Procedures and Troubleshooting in the Operator's Guide.
- You analyze at system operating temperature (16-35°C).
- Each laboratory evaluate predilute stability based on their sample population and specimen collection techniques or methods.

Note: Prediluted samples require analysis in the Open Vial mode.

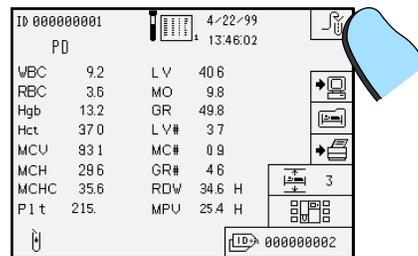
-
- 1** At the Main screen, select the **Predilute** mode.



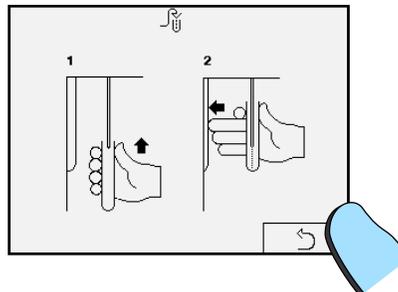
- 2 At the Main screen, touch the **Sample Results Screen** icon.
- If preparing prediluted samples, do steps 3 through 5.
 - If dilutions are already prepared, go to step 7.



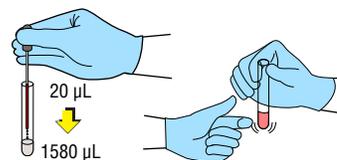
- 3 Touch the **Dispense Diluent** icon.
 The aspiration probe then retracts into the instrument and descends again.



- 4 Present an empty tube to the probe and press the aspirate switch to dispense 1580 μ L of diluent into the empty tube.
 When all your samples are prepared, touch the **Exit** icon to return to the Sample Results Screen.

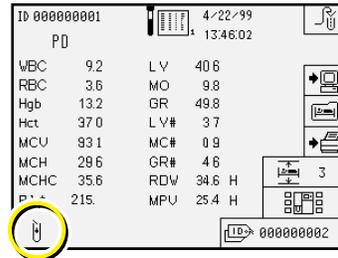


- 5 Prepare the sample for analysis:
- Add 20 μ L of blood specimen to the diluent in the tube.
 - Mix the sample according to your laboratory's protocol.
 - Wait at least 5 minutes before running the sample.

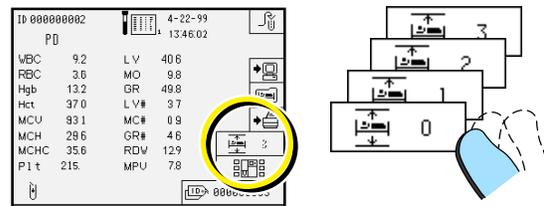


6 Repeat steps 3 through 5 for each sample.

7 Be sure you are in the **Predilute** mode.

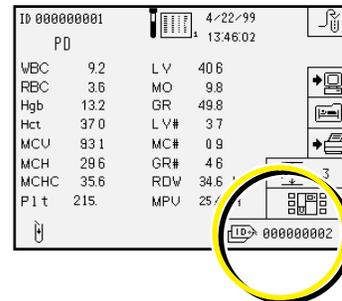


8 Touch the **Patient Range** icon until the desired range (**1**, **2**, or **3**) appears.
Note: **0** is not a patient range; it is the instrument's linearity limit.



9 Verify that the sample ID is correct:

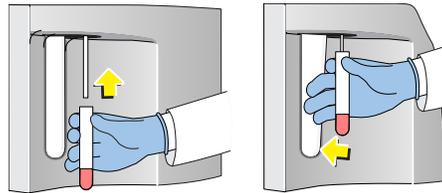
- If autosequencing is on, the sample ID number automatically increments by 1.
- If autosequencing is off, manually enter the sample ID and touch the **Save** icon. Be careful not to duplicate an existing sample ID number that may have been previously autoincremented.



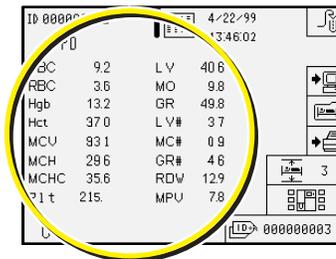
Note: If autosequencing is off, the probe does not descend until you manually enter and save the next ID.



- 10** Present the well-mixed, prediluted sample to the probe and press the aspirate switch. When you hear the beep, remove the sample.



- 11** The AC•T diff 2 analyzer displays the sample results on the screen and automatically saves them.

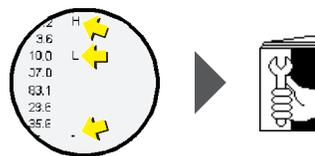


- 12** Print the results:

- If Autoprint is off, touch the **Print** icon.
- If Autoprint is on, the results print automatically.



- 13** If flags appear, see Special Procedures and Troubleshooting in the Operator's Guide.

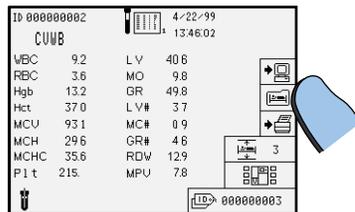


- 14** If autosequence is on, the instrument is ready to run the next sample. If autosequence is off, you must manually enter an ID number before the probe descends for the next sample.

Printing Stored Sample Results for Viewing

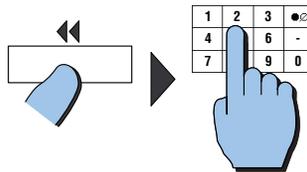
This function is available for use with the graphic printer only, which is printer option 1. See Selecting the Printer Type in Chapter 1.

- 1 From the Sample Results screen, touch the **Retrieve Stored Data** icon.

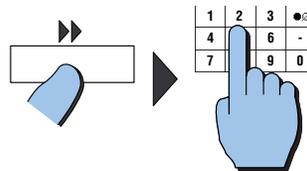


- 2 Enter the date range of the samples you want to review.

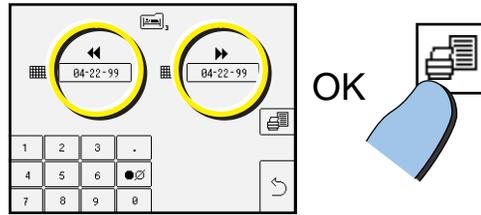
- a. Enter the beginning date of the sample results you want. Use dashes to separate the month, day, and year (MM-DD-YY).



- b. Enter the ending date of the sample results you want. Use dashes to separate the month, day, and year (MM-DD-YY).



- Print the results by touching the **Print** icon. The **In Progress** icon appears on the screen during printing.



A report prints similar to that shown here. The report reflects only the sample data saved for only the date range that you entered.

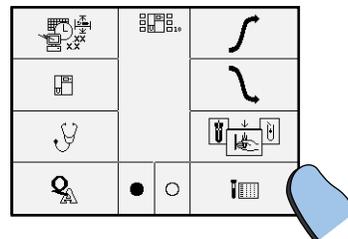
Note: In case of multiple samples with the same sample ID#, use the date and time to differentiate the runs.

ID	Date	Time	Mode	WBC	LY	NO	GB	LY%	WBC	GB%
				$\times 10^3/\mu\text{L}$	%	%	%	$\times 10^3/\mu\text{L}$	$\times 10^3/\mu\text{L}$	$\times 10^3/\mu\text{L}$
00000561	04-22-99	09:33	WB	4.6	38.6	4.8	56.6	1.8	0.2	2.6
00000562	04-22-99	09:33	WB	4.9	33.7	7.6	56.7	1.7	0.4	2.8
00000571	04-22-99	09:37	WB	6.0	41.5	8.0	59.5	2.5	0.5	3.0
00000571	04-22-99	09:39	WB	4.8	34.1	7.1	55.8	1.7	0.3	2.7
00000571	04-22-99	09:43	WB	4.1	41.3	7.7	51.0	2.5	0.5	3.1
00000571	04-22-99	09:45	WB	6.1	49.8	7.9	51.3	2.5	0.6	3.1
00000581	04-22-99	09:47	WB	4.7	25.8	10.0	58.2	1.4	0.5	2.8
00000582	04-22-99	09:49	WB	4.8	31.4	10.3	58.3	1.5	0.5	2.8
00000591	04-22-99	09:52	WB	6.2	30.4	8.1	61.5	1.9	0.5	3.8
00000592	04-22-99	09:54	WB	6.2	30.1	8.2	61.7	1.9	0.5	3.8
00000601	04-22-99	09:56	WB	7.5	24.5	7.6	68.1	1.8	0.6	5.1
00000602	04-22-99	09:58	WB	7.6	24.6	8.1	67.2	1.9	0.6	5.1
00000611	04-22-99	10:00	WB	4.3 *	27.9 *	6.3 *	55.8 *	1.2 *	0.3 *	2.8 *
00000612	04-22-99	10:02	WB	4.3 L	30.4	6.9	62.7	1.3	0.3	2.7
00000621	04-22-99	10:05	WB	5.3	26.9	6.8	66.5	1.4	0.3	3.5
00000632	04-22-99	10:07	WB	5.4	27.5	6.1	65.4	1.5	0.3	3.6
00000641	04-22-99	10:09	WB	4.9	31.8	6.9	53.3	1.0	0.3	3.6
00000642	04-22-99	10:11	WB	4.8	37.8	7.2	55.0	1.6	0.3	3.6
00000641	04-22-99	10:13	WB	3.3 L	24.9	7.1	68.0	0.8 L	0.3	2.2
00000642	04-22-99	10:15	WB	3.5 L	26.2	7.8	64.0	0.9 L	0.3	2.3
00000651	04-22-99	10:18	WB	8.4	36.6	7.5	55.9	3.1	0.6	4.7
00000652	04-22-99	10:20	WB	8.4	35.7	7.9	54.4	3.0	0.7	4.7

Reprinting Last Sample Results

You can print sample results with its associated range (**0**, **1**, **2**, or **3**). Results print based on the range selected when the sample was run.

- At the Main screen, touch the **Sample Results** icon.



- 2** Touch the **Print** icon to print.

Note: The new range will not flag or print for the last sample; only for future samples.



3.1 SAMPLE REQUIREMENTS

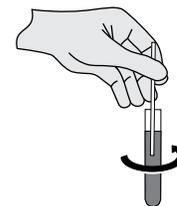
- *How should I collect samples for the A^C•T diff 2 analyzer?*
Collect venous or capillary samples in a salt of EDTA and draw them via syringe, fingerstick, or collection tube. Follow the directions on the manufacturer’s package insert to ensure sample integrity. Properly inspect all collection devices before use.

Collect 20 µL capillary samples in nonanticoagulated pipettes and predilute directly into diluent.

Tips for quality capillary sample collection:

- Warm finger or puncture area to ease blood flow.
- Clean area on and around puncture site thoroughly with alcohol to remove unwanted debris.
- Hold puncture site below heart level to improve blood flow.
- Wipe first drop of blood away and begin filling collection device once drops form at puncture site.
- Do not squeeze puncture site too hard or tissue fluid may contaminate the sample.

- *How can I detect a clotted sample?*
Look at the samples and use a wooden applicator stick or toothpick to check for fibrin strands or clots.



IMPORTANT Improper mixing can cause wrong results. Mix sample gently and thoroughly.

- *How should I mix whole blood samples for analysis?*
Mix sample at least 8 times by hand inversion:

Gently turn capped sample

- Upside down
- Back straight up.

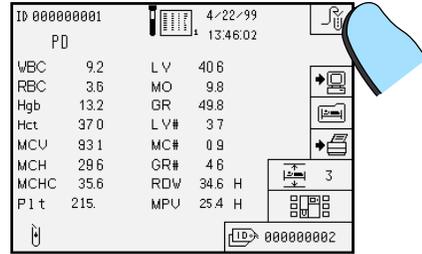
or use a mechanical mixer for at least 5 minutes.



- How should I run prediluted samples for analysis?

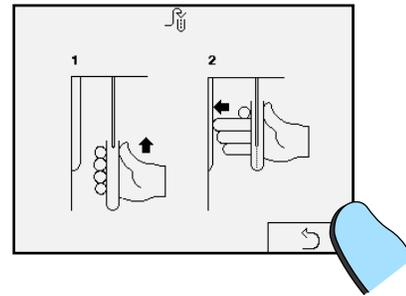
1. Set the analyzing mode to **Predilute**. (See Heading 2.5, SETTING ANALYZING MODES in this manual.)

2. Return to the Sample Results screen and touch the **Dispense** icon.

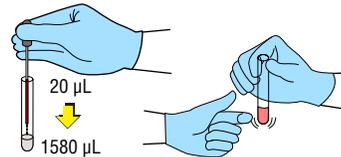


3. Present an empty tube to the probe and press the aspirate switch to dispense 1580 μ L of diluent into the empty tube.

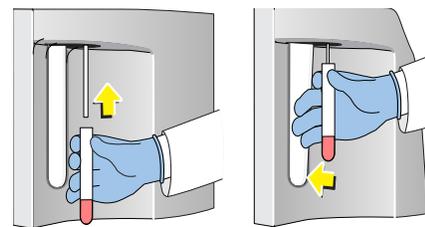
If you have no more samples to prepare, touch the **Exit** icon to return to the Sample Results screen.



4. Add the 20 μ L blood specimen to the diluent in the tube and tap the tube to mix. Wait 5 minutes.



5. Present the well-mixed, prediluted sample to the probe and press the aspirate switch to run the sample.



- How soon should I run samples for analysis on the AC•T diff 2 analyzer?

Coulter suggests that:

- You run whole blood specimens within 24 hours of collection.
- You run prediluted specimens for CBC within 4 hours of collection.
- You run prediluted specimens for diff within 1 hour of collection/preparation.
- You allow a prediluted sample to stabilize in the predisposed diluent for at least 5 minutes.
- If flags appear for whole blood or prediluted samples, refer to Table 6.4 in the Operator's Guide.
- You run samples at ambient operating temperature (16-35°C).
- Each laboratory evaluate predilute stability based on their sample population and specimen collection techniques or methods.

3.2 INSTRUMENT SETUP

- *How do I replace the reagents?* See Replacing Reagents in Chapter 6 of the Operator's Guide.
- *How do I prepare the printer for operation?* Make sure that:

 - Printer power is on.
 - Printer online button is lit.
 - Adequate paper supply exists.
 - Printer ribbon is not worn.
 - Printer cable is properly connected.

Refer to your printer's user manual for specific instructions.
- *How do I set up for Automatic Print?* See Setting Autoprint in Chapter 1 of this manual.
- *How do I customize the instrument setup?* See Setting the Date and Time in Chapter 1 of this manual.
- *How do I set up (or change) Date and Time?* See Installing the Instrument in Chapter 1 of this manual.
- *How do I change Patient Limits?* See Setting Patient Limits in Chapter 1 of this manual.
- *How do I change Parameter Reporting Units?* See Changing the Reporting Units in Chapter 1 of this manual.
- *How do I set up Quality Control?* See Heading 2.7, RUNNING CONTROLS in this manual.
- *How do I store patient results?* The instrument automatically saves the patient results after the sample is analyzed. See Storing Patient Results in the Operator's Guide.
- *How do I view stored patient results?* See Printing Stored Sample Results for Viewing in Chapter 2 of this manual.
- *How do I store control results?* If none of the results are suppressed, the instrument automatically saves the control results after the control is run. See Storing 4C PLUS Cell Control Results in the Operator's Guide for additional information.

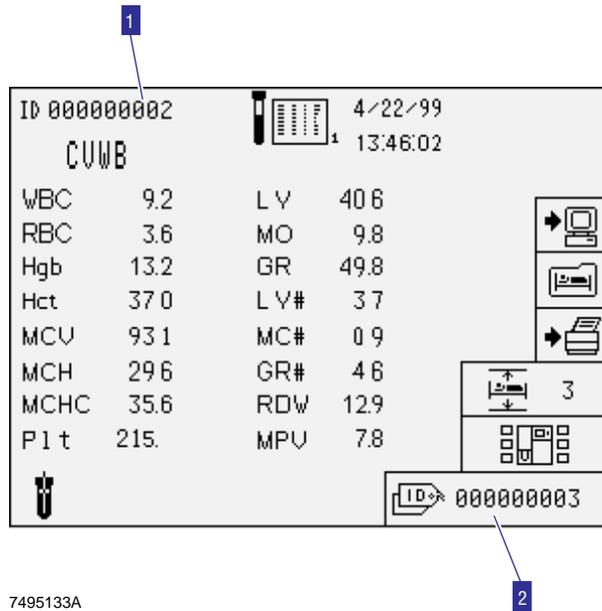
3.3 DAILY PROCEDURES

- What daily procedures do I need to know for routine operation of my AC•T diff 2 analyzer?
- How do I change the Sample ID number?
- How does the AC•T diff 2 analyzer automatically assign Sample ID numbers?

- Startup/Shutdown
- How to Run 4C PLUS cell control
- How to Run Whole Blood Samples
- How to Run Prediluted Samples
- How to Handle Flagged Results
- How to Save Patient Results.

See Manually Entered Sample ID in Chapter 2 of this manual.

If autosequence is selected, the AC•T diff 2 analyzer automatically increases the current sample identification number **1** by 1 to produce the next ID number **2** if autosequencing has been enabled from the Printer/Profiles screen. Autosequencing is the default selection.



- How do I perform Shutdown on the AC•T diff 2 analyzer?
- How do I perform Startup on the AC•T diff 2 analyzer?

See Shutdown in Chapter 1 of this manual.

See Startup (Power already on) in the Operating Summary for additional information.

- *How do I run Quality Controls on the A^C•T diff 2 analyzer?* Refer to the package insert in the controls package or follow your laboratory's procedure for quality controls.

Do:

- Follow instructions on package insert.
- Mix by hand only. Do not use a mechanical mixer.
- Label with date opened.
- Place back in refrigerator within 30 minutes.

Do not:

- Warm in microwave.
- Store in freezer.
- Use past expiration date.
- Store upside down.

- *How do I run samples on the A^C•T diff 2 analyzer?* See Heading 2.8, RUNNING SAMPLES in this manual.
- *How do I handle flagged results on the A^C•T diff 2 analyzer?* See What Flags Mean in the Operator's Guide.
- *What information should I keep in my laboratory logbook?* Coulter recommends you keep a laboratory logbook of the following information to facilitate smooth inspections:
 - Record daily startup.
 - Record control results.
 - Record reagent lot number and expiration date.
 - Record all maintenance and service procedures performed.
 - Record troubleshooting and corrective action taken.
 - A printout of all the setup information, such as settings and calibration factors.

3.4 SPECIAL PROCEDURES

- *What general and preventive maintenance procedures am I required to perform on my instrument?*

You are responsible for general and preventive maintenance on your AC•T diff 2 analyzer. A maintenance chart and step-by-step instructions for performing this maintenance are in the Special Procedures and Troubleshooting section of the Operator's Guide. The procedures include:

- Replacing tubing
- Replacing fuses
- Replacing the waste container
- Replacing the reagents
- Replacing the vacuum isolator chamber
- Adjusting the vacuum
- Cleaning the baths
- Replacing the probe wipe
- Replacing filters
- Replacing check valves.

- *How do I know how many cycles my instrument has completed?*

The cycle count appears on the Startup Results screen; the number prints on the Startup report.

- *How do I submit my IQAP results to Coulter?*

See Downloading 4C PLUS Cell Control Results for IQAP in Chapter 2 of this manual.

3.5 LOG SHEETS

See Appendix B of the Reference manual.

3.6 SUMMARY OF ICONS

This section summarizes the common screen icons you will see when you are running the instrument. Use this section as a quick reference tool only.

	Closed Vial Whole Blood Mode		Diluter Functions
	Open Vial Whole Blood Mode		Continue
	Predilute Mode		Print
	Analyzing Mode		Exit
	In Progress		Next Sample ID
	Main Screen		Save and Exit
	Startup		Dispense Diluent
	Shutdown		Delete
	Sample Results		Darken Screen
	Diagnostics		Lighten Screen
	Setup		Retrieve Stored Data
	Quality Assurance		4C PLUS Run
	Reproducibility Run		Carryover Run
	Calibration Assigned Values		

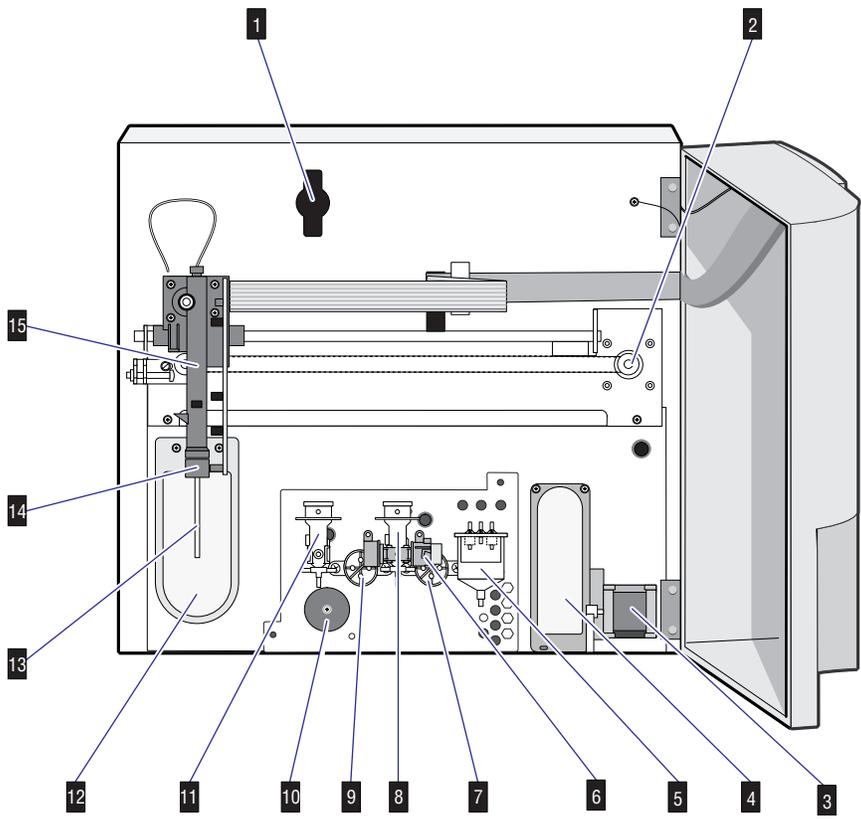
3.7 SUMMARY OF RESULTS

When reviewing patient results, you may see a flag next to a result. See Special Procedures and Troubleshooting in the Operator's Guide for information on reviewing flagged results.

- H** = High patient limit
- L** = Low patient limit
- *** = Review Results
- X** = One of the aperture alert criteria was not met
- = 2 of 3 count periods voteout
- +++++** = Parameter out of operating range
- XXXXX** = Aperture alert
-** = Incomplete Computation
- +** = Parameter out of linear range
- 1,2,3,4,M** = Differential parameters failed internal regional size distributional criteria at one specific region (1,2,3, or 4) or multiple regions (M).

ID	00000002	4-22-99
	CUM8	13:46:02
WBC	9.5	V 406
RBC	3.8	M/D 9.8
Hgb	11.0	L G 49.8
Hct	37.0	L 3.7
MCV	95.1	M# 0.9
MCH	31.5	H G# 4.6
MCHC	35.6	F/DW 12.9
P1 t	215	PU 7.8

4.1 COMPONENTS IN INSIDE FRONT OF INSTRUMENT



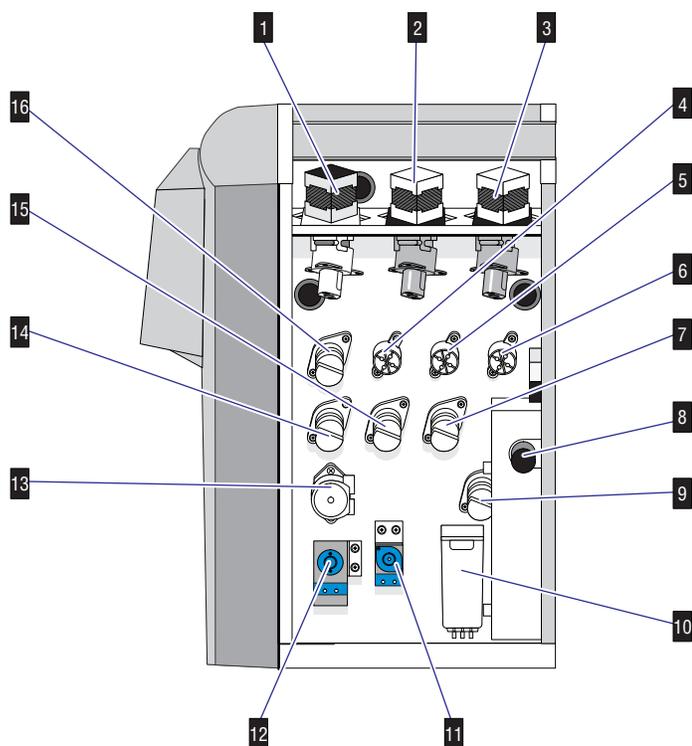
- | | |
|------------------------------------|--|
| 1 Software Card Slot | 8 Sweepflow Spool |
| 2 Horizontal Traverse Motor | 9 RBC Bath |
| 3 Vacuum Isolator Chamber | 10 Aspirate Switch |
| 4 Hgb Lamp | 11 Probe |
| 5 LV17† | 12 Probe Wipe Block |
| 6 WBC Bath | 13 Horizontal Traverse Assembly |
| 7 LV16‡ | |

†LV17 On = Opens/Off = Closes count path from WBC bath;
 ‡LV16 On = Opens/Off = Closes count path from RBC bath

COMPONENT LOCATIONS

COMPONENTS IN INSIDE RIGHT OF INSTRUMENT

4.2 COMPONENTS IN INSIDE RIGHT OF INSTRUMENT



1 Sample Pump (50 μ L)

2 Diluent Pump (100 μ L)

3 Lyse Pump (100 μ L)

4 LV13

5 LV10

6 LV11

7 LV12

8 Vacuum Adjust Knob

9 LV18

10 Diluent Reservoir

11 Diluent Reservoir Pump

12 Waste/Rinse Pump

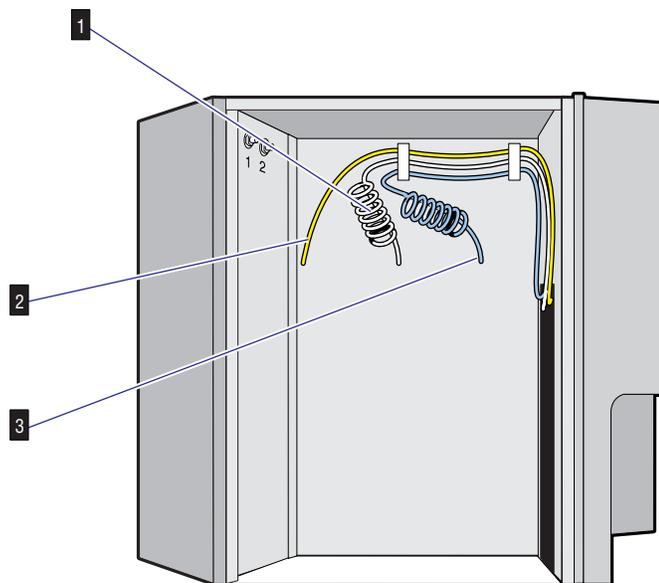
13 Clenz[®] Reagent Pump

14 LV7

15 LV15

16 LV8

4.3 COMPONENTS IN INSIDE LEFT OF INSTRUMENT



- 1** Connection for reagent pickup tube 1
- 2** Connection for reagent pickup tube 2
- 3** Connection for reagent pickup tube 3

COMPONENT LOCATIONS

COMPONENTS IN INSIDE LEFT OF INSTRUMENT

5.1 INSTALLATION CHECKLIST

General

- ✓ Within 6 feet of an electrical outlet
- ✓ On stable countertop at a comfortable working height with proper working space
- ✓ In a room between 16°C and 35°C (61°F and 95°F) and <85% humidity, without condensation

Power Requirements

- ✓ 120/240 Vac, 50/60 Hz, 1.5 A
- ✓ Female receptacle outlet with single-phase input power and ground
- ✓ Independent protected circuit for instrument and printer
- ✓ Building outlet properly grounded and electrical panel protected against power fluctuations
- ✓ Confirmed third-wire earth ground capable of carrying full current of circuit

Cartons Received

- ✓ Not damaged

Setup

- ✓ All hazard warning labels on instrument were clear
- ✓ Remove screw from probe assembly
- ✓ Remove all packing material from pumps

Connections

- ✓ Biohazard waste container tubing properly connected to container and to instrument
- ✓ Biohazard waste container located on floor or shelf lower than instrument
- ✓ Reagent pickup tubes properly connected to tubing in reagent compartment and to reagent container
- ✓ Reagent management card removed from reagent container
- ✓ Reagent container placed in instrument's reagent compartment
- ✓ Reagent management card inserted into slot on the outside of the front door of the instrument
- ✓ Instrument's power cord connected to instrument and plugged into electrical outlet
- ✓ Printer located next to instrument
- ✓ Printer's gray cable connected to instrument and to printer.
- ✓ Printer's power cord plugged into electrical outlet (90 - 264 Vac range, 50/60 Hz, and 1.5 A)

Installation and Customization

- ✓ Software card (not the reagent card) firmly seated in card slot inside front of instrument
- ✓ Instrument turned ON via switch in back of instrument
- ✓ All startup parameters indicate *PASS*
- ✓ Date and time set
- ✓ IQAP number entered
- ✓ Reporting units selected
- ✓ Patient limits set
- ✓ Autoprint set, if desired
- ✓ Report options selected
- ✓ Print options selected, including parameters (16 or 18)
- ✓ Report header customized with your laboratory information
- ✓ All customized settings printed and filed

5.2 TRAINING CHECKLIST

General

- ✓ Describe the intended use of the instrument, including which parameters are analyzed, displayed, and printed.
- ✓ Review all manuals and reference materials as needed:
 - Reference manual
 - Operator's Guide
 - Operating Summary
 - Installation and Training Guide
 - Basic Concepts of Quality Control
 - IQAP manual

Sample Handling

- ✓ Review the requirements for specimen collection, sample handling, storage, and mixing for both venous and microcollection samples.

Instrument Components

Identify and locate the following instrument components:

- ✓ On/Off switch
- ✓ Reagent Management card and slot
- ✓ Software card and slot
- ✓ Touch screen
- ✓ Reagent compartment
- ✓ Probe/wipe assembly
- ✓ Aspirate switch
- ✓ Closed Vial sampling station
- ✓ Pumps (6)
- ✓ Diluter assembly
- ✓ Bath assembly and shield
- ✓ Vacuum adjust knob
- ✓ Fluid filters
- ✓ Baths: WBC and RBC
- ✓ Vacuum isolator chamber
- ✓ Diluent reservoir
- ✓ Printer

Sample Handling

Identify the following icons:

- ✓ Main screen
- ✓ Setup screen
- ✓ Diagnostic Functions screen
- ✓ Diluter Functions screen
- ✓ QA screen
- ✓ Sample Results screen
- ✓ Sample ID screen
- ✓ Startup
- ✓ Shutdown
- ✓ Screen contrast

Reagents

- ✓ Reagent
 - Function
 - Replacement
 - Management card
- ✓ Reagent management card
 - Function
 - Using for IQAP data download
 - Where to insert
- ✓ Reagent stability
 - Open vial
 - Closed vial
- ✓ Waste container, if applicable
 - Location
 - Replacement

Software Customization

Review and assist as needed.

- ✓ Set date
- ✓ Set time
- ✓ Set patient limits
- ✓ Select reporting units
- ✓ Select printer option
- ✓ Enter elevation (altitude)
- ✓ Enter laboratory ID for report header
- ✓ Set transmission configuration
- ✓ Enter IQAP participant number
- ✓ Print and file all customized values

Calibration

- ✓ Review instrument's pre-calibration status
- ✓ Review recommendations and frequency
- ✓ Locate and discuss procedure for future use

INSTALLATION AND TRAINING CHECKLISTS

TRAINING CHECKLIST

Controls

Review and assist as needed.

- ✓ Importance of quality control
- ✓ Control handling techniques
- ✓ Running controls
- ✓ Stability
 - Open vial
 - Closed vial
- ✓ Entering values for 4C PLUS cell control
- ✓ Control file storage limits
- ✓ Printing stored control results
- ✓ Downloading control results for IQAP
- ✓ Deleting control files

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IQAP

- ✓ Explain IQAP program
- ✓ Enroll customer with IQAP department
- ✓ Explain IQAP process

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System Operation Overview

- ✓ Sample flow
- ✓ Sample aspiration (size)
- ✓ Closed Vial Whole Blood and Open Vial Whole Blood vs. Prediluted Blood vs. QC
- ✓ Sample dilution
- ✓ Probe wipe
- ✓ Results (displayed/printed)
- ✓ Sample storage (limits)
- ✓ Printer operation

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Daily Procedures

Review and assist as needed.

- ✓ Startup procedure and background tests
- ✓ Review sample screen (touch screen)
- ✓ Summarize icons and use
- ✓ Screen numbers
- ✓ Sample ID (manual vs. auto)
- ✓ Analyzing modes (restate modes and icons)
- ✓ Opening the front door

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Special Procedures

Review and assist as needed.

- ✓ General maintenance
- ✓ Cycle counter
- ✓ Spare parts
- ✓ Cleaning procedures:
 - Zap
 - Bleach
- ✓ Reagent replacement
- ✓ Waste container replacement
- ✓ Diluent filter replacement
- ✓ Check valve replacement
- ✓ Probe wipe:
- ✓ Cleaning
- ✓ Replacement
- ✓ Preparing to ship the instrument

Servicing the Instrument

- ✓ Telephone troubleshooting availability and its importance for minimizing downtime
- ✓ Importance of "general maintenance"
- ✓ Service procedures and expectations

Paperwork

- ✓ Log sheets (Locate in Reference manual and discuss)
- ✓ Purpose of documenting daily procedures, controls, reagents, and maintenance
- ✓ System Identification Label (Sys.ID):
 - Complete and attach
 - Importance of using label when contacting Beckman Coulter, Inc.
- ✓ Ensure customer service telephone number is clearly noted
- ✓ Complete this training checklist (Installer and Customer) and keep in Laboratory Log Book
- ✓ Attach a copy of control results (all levels) to this checklist
- ✓ Attach copy of customized values to this checklist
- ✓ Complete a Training Certificate (if applicable) and leave with customer
- ✓ Review Factory Calibration data

Install date: _____	Training date: _____
Operator:	Beckman Coulter Representative:
Name: _____ (Print)	Name: _____ (Print)
Title: _____	
Signature: _____	Signature: _____

Thank you for purchasing the COULTER® AC•T diff 2™ analyzer.

INSTALLATION AND TRAINING CHECKLISTS
TRAINING CHECKLIST

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COULTER A^C•T diff 2 Analyzer Documentation

- Reference
PN 4237515
(*Black binding)
Use and Function • Installation • Operation Principles • Specifications/Characteristics • Precautions/Hazards • Host Transmission Specifications • Log Sheets • References • Glossary • Abbreviations • Index
- Operator's Guide
PN 4237495
(*Red binding)
Routine Procedures • Cell Controls • Running Samples • Reviewing Results • Calibration • Service and Maintenance • References • Glossary • Abbreviations • Index
- Operating Summary
PN 4237516
Overview of daily procedures and screen icons.
- Installation and Training Guide
diff A^C•T Tainer Reagent
diff A^C•T Pak Reagent
PN 4237517
Installing the A^C•T diff 2 Analyzer • Learning About the A^C•T diff 2 Analyzer • Questions and Answers • Component Locations • Installation and Training Checklists

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