

AEROSPRAY[®]

GRAM

MODEL 7322

Applications Manual



SLIDE STAINER/ CYTOCENTRIFUGE

AEROSPRAY® GRAM

SLIDE
STAINER/CYTOCENTRIFUGE

Model 7322

Applications Manual

57-2002-01E

REF

Last Revision 05/10/2023

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Manufactured in the United States of America by:



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SECTION 1 INTRODUCTION

1.1 Aerospray Gram Stainer Overview

Using this Manual

This manual provides instructions to install, operate, and maintain the Aerospray® Gram Stainer/Cytocentrifuge.

The manual is an important part of the product. Read it carefully and completely before setup and first use of the instrument.

If additional accident prevention and environmental protection requirements exist in the country of operation, this manual must be supplemented by appropriate instructions to ensure compliance.

Safety Regulations

This instrument has been built and tested in accordance with safety regulations for electrical control, regulating, and laboratory devices. In order to maintain this condition and ensure safe operation, the operator must observe all the instructions and warnings contained in this manual. For current information about applicable standards, please refer to the CE Declaration of Conformity included with the documents shipped with this device.

NOTE: *This equipment complies with the emission and immunity requirements described in the IEC 61326 series.*

Understanding Warnings

This manual uses three warning levels to alert you to important information as shown in the following examples.



WARNING!

A Warning alerts to the possibility of personal injury, death, or other serious adverse reactions stemming from the use or misuse of this device or its components.



CAUTION:

A Caution alerts to possible problems with the device associated with its use or misuse. Such problems include device malfunction, failure, damage, damage to the sample, or damage to other property. Where applicable, a Caution may include precautions to be taken to avoid the hazard.

NOTE: *A Note reinforces or supplies additional information about a topic.*

Specific Warnings

Pay particular attention to the following safety precautions. If these safety precautions are ignored, injury or damage to the instrument may occur. Each individual precaution is important.



WARNING!

Install the Gram stainer in an area with ventilation in accordance with local regulations.

1.1 Aerospray Gram Stainer Overview

**WARNING!**

Reagents used in the Gram stainer contain moderately hazardous chemicals that require care in handling. Always use appropriate safety measures including gloves and eye protection when handling reagents.

**WARNING!**

Always wear protective clothing and eye protection when using Nozzle Cleaning Solution (diluted SS-029C) or Stain Residue Solvent (SS-230). Dispose of used solution properly.

**WARNING!**

If power is lost while the stainer is running, the lid will remain locked until power is restored. Do not attempt to open the lid while power is off.

**WARNING!**

Electrical shock hazard: Do not open this instrument or attempt internal repairs. Refer servicing to qualified service personnel. Contact ELITechGroup service.

**CAUTION:**

This equipment has been designed and tested to CISPR 11 Class A and FCC Part 15 Class A. In a domestic environment it may cause radio interference, in which case, you may need to take measures to mitigate the interference.

**CAUTION:**

To avoid serious instrument damage, never use reagents other than those supplied by ELITechGroup. Except for deionized or distilled water and approved alcohol, using reagents not supplied by ELITechGroup may void the warranty.

**CAUTION:**

Only spare parts supplied or specified by ELITechGroup should be used. Using non-approved parts may affect the performance and safety features of the instrument. If the equipment is used in a manner not specified by ELITechGroup the protection provided by the equipment may be impaired. If in doubt, contact your ELITechGroup representative.

Functional Description

The Aerospray® Gram stainer is designed to Gram stain specimen smears on microscope slides. A Gram stain aids in the presumptive diagnosis of an illness and gives preliminary classification of the causative agent.

The chemical mechanism of Gram differentiation is based on the differential cell wall permeability to the crystal violet-iodine complex. The Gram stain yields a specimen in which the Gram-positive organisms are colored blue-to-purple and the Gram-negative organisms are colored pink-to-red.

SECTION 1 INTRODUCTION

1.1 Aerospray Gram Stainer Overview

Key Features

The key features of the Aerospray® Gram stainer are:

- Minimized reagent consumption
- Rapid staining
- Barcode scanner for tracking specimens and reagents
- Reagent and specimen traceability
- User traceability
- Administrator password
- Interactive touchscreen display
- Multiple languages
- High volume staining productivity (12 or 30 slides per stain cycle)
- Automatic clean cycle to purge each reagent spray nozzle (except D) with approved alcohol
- Nine operator-selected decolorizer levels
- Separate reservoir, delivery tube, pump, and spray nozzle for each reagent
- Operator-selectable automatic alcohol fixation function to fix specimens
- Reagent and waste level monitoring
- Log files
- Limited programmability

The correct accessory must be used for each function. The Cytopro® Cytocentrifuge Rotor is available as an option offering additional features. See Section 8 for more information.

Intended Use

The Aerospray® Gram stainer is an in vitro diagnostic medical device for professional use only. The Gram stainer has been designed to perform automated Gram staining of pure strain isolate smears and other specimens with microorganisms for in vitro diagnostics with ELITechGroup Gram reagents only.

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INTRODUCTION

1.1 Aerospray Gram Stainer Overview

Table 1: General Specifications

Category	Characteristics
Slide Carousel Capacity	Standard: 12-slide carousel – 1 to 12 Optional: 30-slide carousel – 1 to 30
Carousel Rotation Speed	From 10 to 1,000 rpm (pre-programmed). 100 rpm to 1,000 rpm \pm 5 rpm. 10 rpm to 99 rpm \pm 2 rpm.
Cytocentrifuge Rotor Speed	100 to 2000 rpm (\pm 5%), User Programmable
Reagent Consumption	Refer to Approximate Reagent Consumption Table 4
Operating Time	Refer to Cycle Time, Table 3
Display	7 in. LCD WVGA (800 x 480 pixels) TFT
Touch Screen Controls	Numeric and alpha-numeric programming keys
Drain Connection	Connector on rear panel accepts male connector attached to 3/8" ID vinyl drain tube. 1.8 meters (6 ft.) length supplied
Ventilation	Air is exhausted from the stainer via a female ½ inch SAE pipe thread fitting to allow connection to ventilation systems.
Dimensions Width Height (lid closed) Depth Height (lid open)	57 cm (22 in.) 25 cm (10 in.) 54 cm (21 in.) 58 cm (23 in.)
Weight Weight packed Weight unpacked	~22.3 kg (~49.2 lb) ~17.4 kg (~38.4 lb)
Electrical Requirements	100 to 240 VAC (\pm 10%) @ 50 to 60 Hz
Power Consumption	200 VA
Overcurrent	Fuses (quantity-2): T2A250V
Ambient Temperature Operating Storage	15 to 30 °C (59 to 86 °F) -10 to 50 °C (14 to 122 °F)
Relative Humidity	\leq 80% non-condensing
Altitude	\leq 2000 m (\leq 6562 ft.)

SECTION 1
INTRODUCTION

1.1 Aerospray Gram Stainer Overview

Table 1: General Specifications (continued)

Category	Characteristics
Pollution Degree	2
Heat Dissipation Maximum Average During Staining Average While Idle	150 watts (512 Btu/hour) 30 watts (102 Btu/hour) 12 watts (41 Btu/hour)
Maximum Sound Emission	Adjustable; maximum 60 db (SPL) intensity @1m and <8 db. (Typical-72 db)

Table 2: Performance Specifications

Category	Characteristics
Reagent Spray Nozzles	Each reagent has a separate spray nozzle to dispense the correct amount of reagent.
Reagents <i>NOTE: Use only ELITechGroup reagents, with diluents as specified for ELITechGroup concentrated reagents. REF numbers for this stainer start with one of the following: SS-041 or SS-141.</i>	A - Decolorizer B - Iodine C - Crystal violet D - Deionized or distilled water <i>Note: Deionized or distilled water is not provided by ELITechGroup and must be obtained locally. Water should be filtered (0.2 micron inline filter) to remove bacteria and particulates.</i> E – “Approved” ethanol, methanol, or reagent alcohol <i>Note: Approved ethanol or methanol must be 99.5% pure.</i> <i>Note: Approved reagent alcohol must meet the following specifications:</i> <ul style="list-style-type: none"> • Greater than 90% ethanol • Approximately 10% isopropyl alcohol or methanol • Less than 0.5% water • No ketones
Stain Settings	Nine operator-selected decolorizer levels Three crystal violet and iodine settings: low, medium, and high Fixation settings: off, normal, and high

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INTRODUCTION

1.1 Aerospray Gram Stainer Overview

Table 3: Run Time Sequence

NOTE: Table 3 represents a typical timing sequence for this instrument, presented for general reference only. Actual cycle times may vary.

DECOLORIZER-3			
EVENT SEQUENCE		(SECONDS)	(SECONDS)
		12-Slide	30-Slide
Start-Up		7	7
(1)	Fixation (Pump E) (optional) - Normal	(66)	(69)
1	Crystal Violet (Pump C) - Medium	55.5	58.5
2	Wash (Pump D)	26	39
3	Iodine (Pump B)	49.5	52.5
4	Wash (Pump D)	32	54
5	Decolorizer (Pump A)	53.5	59.5
6	Wash (Pump D)	28.5	46.5
7	High Speed Dry	49	49
		(Minutes)	(Minutes)
Total without alcohol fixation		5.0	6.1
With fixation		6.1	7.25

Table 4: Approximate Reagent Consumption
[(mL) Decolorizer-3]

	12 Slide Carousel	30 Slide Carousel	Clean Cycle
Reagent A Decolorizer	6.04	9.63	0
Reagent B Iodine	6.0	9.0	0
Reagent C Crystal Violet	5.75	8.75	0
Reagent D Deionized or Distilled Water	57.0	108.0	0
Reagent E Alcohol (optional fixation)	3.3 (3.3)	4.95 (4.95)	40.0

SECTION 1
INTRODUCTION

1.1 Aerospray Gram Stainer Overview

Table 5: Carousel and Rotor Information

Only the following slide staining carousels or cytocentrifuge rotor can be used in this instrument. Each should be used following the instructions in this manual or the Cytopro Applications Manual (RP-452).










Rotor/Carousel	Maximum rpm	Maximum Capacity	Maximum Sample Volume
ELITechGroup 12-Slide Carousel (AC-188)	1000 rpm	12 each, 26 mm x 76 mm (1 x 3 inch) microscope slides	N/A
ELITechGroup 30-slide Carousel (AC-189)	1000 rpm	30 each, 26 mm x 76 mm (1 x 3 inch) microscope slides	N/A
Cytopro Cytocentrifuge Rotor (AC-160)	2000 rpm	8 each, standard chambers, plus slides 8 each, Cytopro Magnum chambers, plus slides	Up to 600 μ L* Up to 6 mL*














*Do not overfill cytocentrifuge chambers. See Cytopro Applications Manual or Methods Manual for detailed instructions and warnings.














SECTION 1 INTRODUCTION

1.1 Aerospray Gram Stainer Overview

Table 6: Explanation of Symbols

SYMBOL	STANDARD REFERENCE	STANDARD TITLE	SYMBOL TITLE	SYMBOL MEANING
	IEC 60601- 1 Reference no. Table D1, Symbol 8 (IEC 60417-5032)	Medical electrical equipment — Part 1: General requirements. for basic safety and essential performance	Alternating current	To indicate on the rating plate that the equipment is suitable for alternating current only; to identify relevant terminals
	ISO 15223-1: 2021 Reference no. 5.1.2	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Authorized Representative in the European Community/ European Union	Indicates the authorized representative in the European Community / European Union
	MU600_00_016e V3.0	Information Sheet Obligations Economic Operators CH	Swiss Authorized Representative	Indicates the authorized representative in Switzerland
	ISO 15223-1: 2021 Reference no. 5.1.5. (ISO 7000-2492)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Batch code	Indicates the manufacturer's batch code so that the batch or lot can be identified. Synonyms for “batch code” are “lot number”, “lot code” and “batch number”.
	ISO 15223-1:2021 reference no. 5.4.1 (ISO 7010 – W009)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Warning; Biological hazard	Bio-contamination warning: Use care when operating upper cooling system and initiation needle.
	ISO 15223-1: 2021 Reference no. 5.1.6. (ISO 7000-2493)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Catalogue number Catalog number	Indicates the manufacturer's catalog number so that the medical device can be identified ISO 15223 Catalogue number ISO 7000 Catalog number
	ISO 15223-1: 2021 Reference no. 5.4.4. (ISO 7000-0434A)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Caution	To indicate that caution is necessary when operating the device or control close to where the symbol is placed, or to indicate that the current situation needs operator awareness or operator action in order to avoid undesirable consequences
	EU 2017-746 Reference no. ANNEX V	REGULATION (EU) 2017/746 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2017 on in vitro diagnostic medical devices and repealing Directive 98/79/ EEC and 2010/227/EU	CE marking	(43) ‘CE marking of conformity’ or ‘CE marking’ means a marking by which a manufacturer indicates that a device is in conformity with the applicable requirements set out in this Regulation and other applicable Union harmonization legislation providing for its affixing
	ISO 15223-1:2021 Reference no. 5.4.3. (ISO 7000-1641)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Consult instructions for use or consult electronic instructions for use	Indicates the need for the user to consult the instructions for use

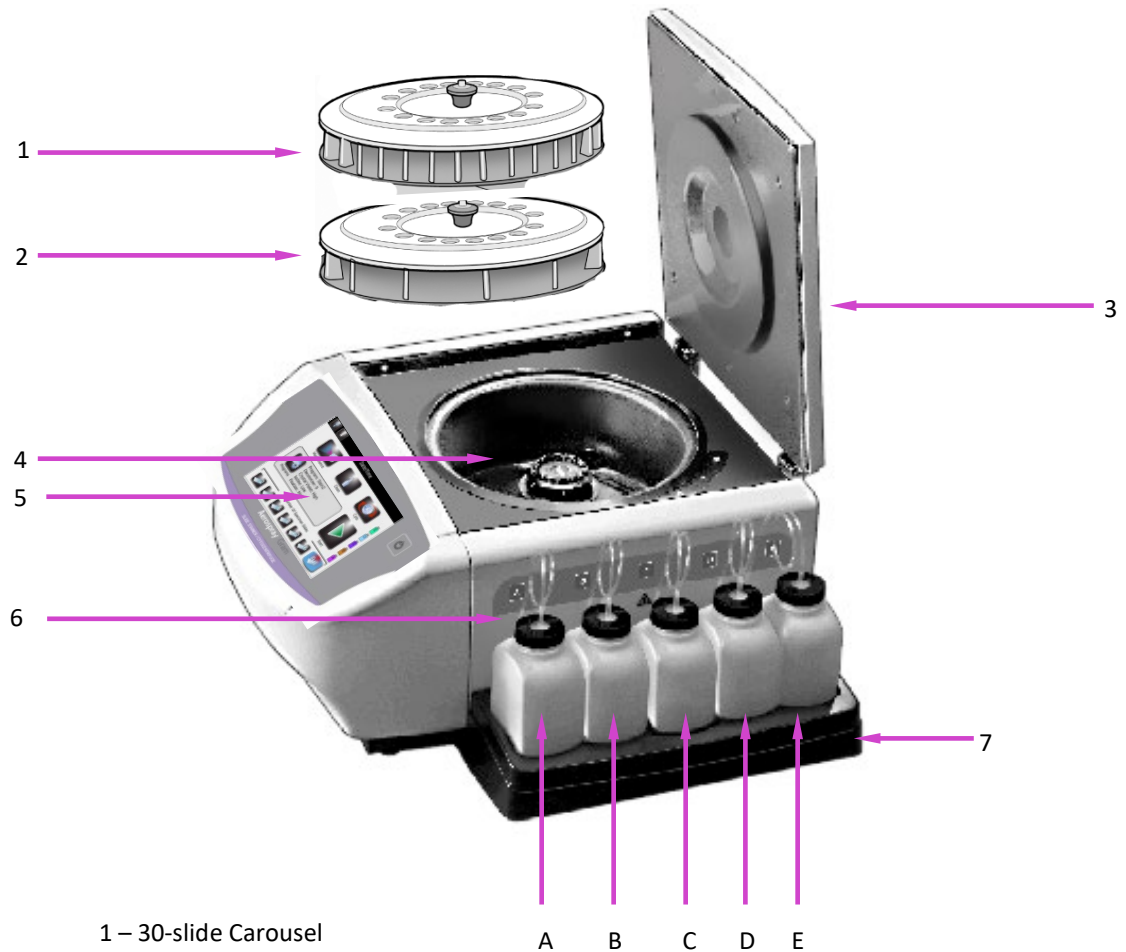
SYMBOL	STANDARD REFERENCE	STANDARD TITLE	SYMBOL TITLE	SYMBOL MEANING
	ISO 15223-1:2021 Reference no. 5.4.2. (ISO 7000-1051)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Do not re-use	Indicates a medical device that is intended for one single use only NOTE: Synonyms for “Do not reuse” are “single use” and “use only once”.
	ISO 15223-1: 2021 Reference no. 5.2.8. (ISO 7000-2606)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Do not use if package is damaged and consult instructions for use	Indicates a medical device that should not be used if the package has been damaged or opened and that the user should consult the instructions for use for additional information
	ISO 15223-1: 2021 Reference no. 5.3.1. (ISO 7000-0621)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Fragile, handle with care	Indicates a medical device that can be broken or damaged if not handled carefully
	IEC 60417-1 Reference no. ISO 7000-5016	Graphical symbols for use on equipment	Fuse	To identify fuse boxes or their location
	IEC-TR-60878 Reference no. ISO 7000-1135	Graphic symbols for use on electrical equipment in a medical practice	General symbol for recover/recyclable	To indicate that the marked item or its material is part of a recovery or recycling process
	ISO 15223-1:2021 Reference no. 5.5.1.	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	In Vitro diagnostic medical device	Indicates a medical device that is intended to be used as an in vitro diagnostic medical device
	ISO 15223-1: 2021 Reference no. 5.3.2. (ISO 7000-0624)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Keep away from sunlight	Indicates a medical device that needs protection from light sources
	ISO 15223-1: 2021 Reference no. 5.1.1. (ISO 7000-3082)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Manufacturer	Indicates the medical device manufacturer
	DIRECTIVE 2012/19/ EU (WEEE)	N/A	Collect separately	Separate collection for waste of electrical and electronic equipment. Do not dispose of battery in municipal waste. The symbol indicates separate collection for battery is required
	DIRECTIVE 2002/96/EC (WEEE)	N/A	Collect separately	Separate collection for waste of electrical and electronic equipment. Do not dispose of battery in municipal waste. The symbol indicates separate collection for battery is required
	N/A	N/A	Open bottle stability	Indicates a reagent is stable after opening for the number of months specified
	ISO 15223-1: 2021 Reference no. 5.1.7. (ISO 7000-2498)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Serial number	Indicates the manufacturer's serial number so that a specific medical device can be identified
	ISO 15223-1: 2021 Reference no. 5.3.7. (ISO 7000-0632)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Temperature limit	Indicates the temperature limits to which the medical device can be safely exposed

SYMBOL	STANDARD REFERENCE	STANDARD TITLE	SYMBOL TITLE	SYMBOL MEANING
	ISO 15223-1: 2021 Reference no. 5.1.4. (ISO 7000-2607)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Use by date	Indicates the date after which the medical device is not to be used
	iso_grs_7010_WOO1	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	General warning sign	To signify a general warning
	GHS02	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Eighth Revised Edition	flammable	Medical device contains materials that are flammable. Appropriate caution should be taken
	GHS03	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Eighth Revised Edition	Oxidizing	Medical device contains materials that are oxidizing. Appropriate caution should be taken
	GHS05	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Eighth Revised Edition	Corrosive	Medical device contains materials that are corrosive. Appropriate caution should be taken
	GHS06	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Eighth Revised Edition	Toxic	Medical device contains materials that are toxic. Appropriate caution should be taken
	GHS07	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Eighth Revised Edition	Harmful	Medical device contains materials that are harmful. Appropriate caution should be taken
	GHS08	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Eighth Revised Edition	Health Hazard	Medical device contains materials that are a health hazard. Appropriate caution should be taken
	GHS09	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Eighth Revised Edition	Environmental Hazard	Medical device contains materials that are an environmental hazard. Appropriate caution should be taken
	N/A	Administrative Measure on the Control of Pollution Caused by Electronic Information Products (China)	Environment Friendly Use Period	Indicates the period of time before any RoHS substances are likely to leak out causing harm to the environment.
	N/A	N/A	Do not use pumps	Indicates products are to be used for manual cleaning only. Do not pump the product through instrument.
	ISO 15223-1: 2021 Reference no. 5.3.8. (ISO 7000-2620)	Medical devices — Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements.	Humidity limitation	Indicates the range of humidity t which the medical device can be safely exposed
	N/A	https://www.gov.uk/guidance/using-the-ukca-marking#when-to-use-the-ukca-marking	UKCA Mark	UK product marking that is required for medical devices being placed on the marketing in Great Britain.

SECTION 1
INTRODUCTION

1.2 Instrument Description

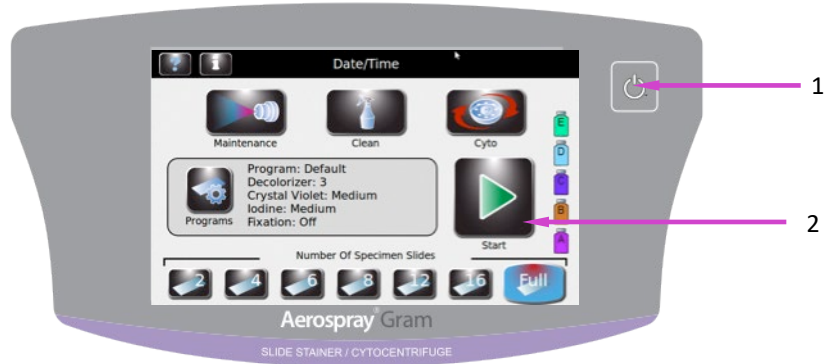
Figure 1: Front and Right Side Panels



- 1 – 30-slide Carousel
- 2 – 12-slide Carousel
- 3 – Lid with Safety Lock
- 4 – Bowl
- 5 – Front Panel with Touch Screen Display
- 6 – Right Side Panel with Label Indicating Reagent Positions:
 - A - Decolorizer
 - B - Iodine
 - C - Crystal Violet
 - D - Deionized or Distilled Water
 - E - Approved Alcohol
- 7 – Reagent Tray

1.2 Instrument Description

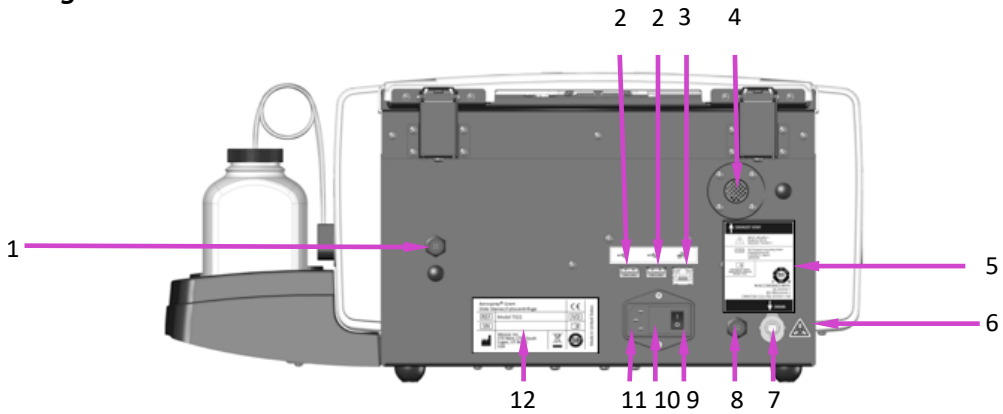
Figure 2: Front Panel and Touchscreen



- 1 – Standby/Ready Button
- 2 – Touch Screen

The front panel features an interactive touchscreen display. Refer to Touchscreen and User Interface (Section 1.3, Table 8) for more information.

Figure 3: Rear Panel

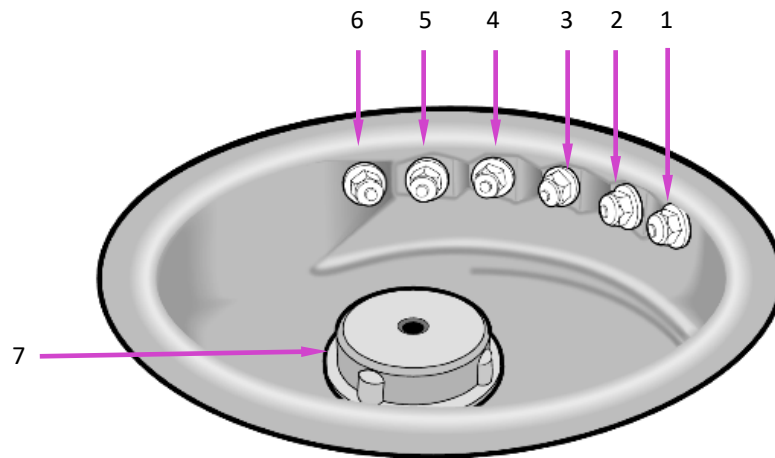


- 1 – Level Detect Connection for Reagent D (deionized or distilled water)
- 2 – USB Ports
- 3 – Network Ethernet Connection
- 4 – Exhaust Vent
- 5 – Rear Panel Label
- 6 – Biohazard Warning Label
- 7 – Waste Tube Connection
- 8 – Level Detection Connection for Waste Container
- 9 – Power Switch
- 10 – Fuse Door
- 11 – Power Cord Connection
- 12 – Model/Serial Number Label

SECTION 1
INTRODUCTION

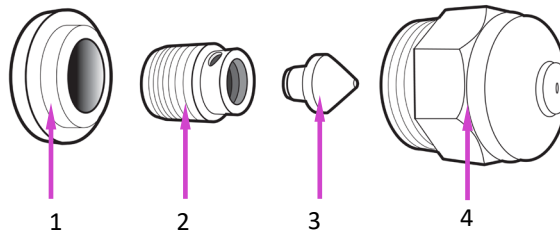
1.2 Instrument Description

Figure 4: Stainer Bowl Components



- 1 – Nozzle D_F (Deionized or Distilled Water, front)
- 2 – Nozzle A (Decolorizer)
- 3 – Nozzle B (Iodine)
- 4 – Nozzle C (Crystal Violet)
- 5 – Nozzle E (Approved Alcohol)
- 6 – Nozzle D_R (Deionized or Distilled Water, rear)
- 7 – Drive Hub

Figure 5: Nozzle Diagram









- 1 – Nozzle Insert
- 2 – Compression Screw
- 3 – Swirl Cone
- 4 – Nozzle Housing

SECTION 1
INTRODUCTION

1.2 Instrument Description


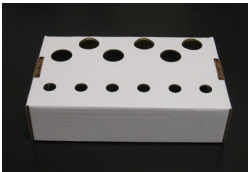
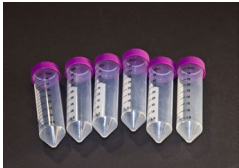
Table 7: Preventive Maintenance Kit

Component	Name	Description
	Manual Priming Tool	Primes air-locked pumps
	Silicon Grease	Lubricates the nozzle threads for easy assembly
	Nozzle Wire	Cleans nozzle housing orifices
	Nozzle Cleaning Strainer	Strains the nozzle parts to prevent them from going down a drain
	Nozzle Tool	Unscrews nozzles from the stainer bowl
	Nozzle Wrench	Disassembles the nozzle
	Nozzle Brush	Cleans nozzles without removing them from the stainer

SECTION 1
INTRODUCTION

1.2 Instrument Description

Table 7: Preventive Maintenance Kit (continued)

Component	Name	Description
	Volume Test Collection Tubes (small tube)	Collects reagents while performing the Volume Test
	Nozzle Maintenance Tube Stand	Holds Nozzle Cleaning Tubes (large tube) and Volume Test Tubes (small tube)
	Nozzle Cleaning Tubes (large tube)	For soaking nozzles in the Nozzle Cleaning Solution

Barcode Reader

An optional barcode reader is available for the Aerospray® Gram Stainer/Cytocentrifuge (Model 7322).

Figure 6: Barcode Reader



Other Parts

Since the following parts are not available from ELITechGroup, they must be obtained locally:

- Approved alcohol
- Deionized or Distilled Water

Empty bottles are available from ELITechGroup.






CAUTION:

ELITechGroup does not provide approved alcohol. It should be purchased locally, observing the recommendations for safety and chemical risk on the Safety Data Sheet (SDS).

1.3 Touchscreen and User Interface

Users control all instrument functions from the interactive touchscreen display.

Table 8: Front Panel/Main Screen Function Keys

Button	Name	Description
	Standby/Ready	With instrument power ON: Blue = Ready Amber = Standby Pressing Standby runs a Clean cycle and places instrument into standby mode The Standby/Ready button also accesses the touchscreen calibration function. Refer to System Setup Menu, (Section 3.1)
	Maintenance	Accesses features for verifying proper nozzle performance and places pumps in a testing sequence. Accesses the line priming, Pattern Test, Volume Test, and B-Line Flush functions
	System Clean/ Carousel Clean	Performs the selected Clean cycle. System Clean (left). Carousel Clean (right).
	Cyto	Enters the Cytocentrifuge mode
	System Information	Shows the system information, including serial number and software version. Allows access to the System Setup features. Refer to System Setup Menu, (Section 3.1).
	Help	Opens the software Help file
	Programs	Allows users to select or edit programs
	Start/Load Slides	Begins a cycle in Stain or Cytocentrifuge mode. The Start button is inactive until a program is created. Refer to Creating a Stain Program (Section 3.1) With Slide Tracking enabled, opens the Scan and Load Slides menu, (Section 3.1)
	Number of Specimen Slides	Selects the number of specimen slides in the carousel. Users staining an odd number of specimen slides should enter the next higher specimen slide number icon

SECTION 1
INTRODUCTION

1.3 Touchscreen and User Interface

Table 8: Front Panel/Main Screen Function Keys (continued)





Button	Name	Description
	Back	Returns to the previous menu
	Stop	Aborts any operation
	OK	Indicates completion of current task
	System Setup	Allows users to modify the software settings. See System Setup menu, (Section 3.1)

Table 9: System Setup Keys

Button	Name	Description
	Stain Programs	Allows users to create, edit, and delete stain programs
	Cyto Programs	Allows users to create, edit, and delete cyto centrifuge programs
	Reagents	Allows users to edit reagent information
	Users	Allows users to create and change user accounts
	QC/Maintenance Tracking	Enables slide tracking, preventive maintenance tracking, and reagent tracking
	Level Detect	Allows users to manage the automatic reagent level detection system
	Language	Allows users to change the display language
	System Log	Allows users to control logging functions
	Network Settings	Allows users to change network settings
	Beeper	Allows users to change audible alerts

1.3 Touchscreen and User Interface

Table 9: System Setup Keys (continued)












Button	Name	Description
	Set Date/Time	Allows users to set the date and time
	Restore Defaults	Restore programming to default settings
	Unselected	Shows an unselected option
	Selected	Shows a selected or enabled option

Table 10: Maintenance Function Keys

Button	Name	Description
	Prime A, B, C, D, E	Primes the selected line
	Prime ABCDE	Primes all lines simultaneously
	Pattern Test	Performs Pattern Test to ensure nozzles are clear of debris and spraying properly
	Volume Test	Performs Volume Test to verify the selected nozzle volume is within the correct range
	B-Line Flush	Performs B-Line Flush function
	60-Sec Prime	Runs the pumps for 1 minute and primes the lines
	QC/PM	Shows the Preventive Maintenance and Quality Control logs (must be enabled from the System Setup menu)

SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.1 Instrument Setup

Unpacking and Installing the Stainer

Follow this sequence if you are using this instrument for the first time. Details about these operations are given in the next three sections.

- Install the drain tube
- Plug in the power cord and switch the power **ON**
- Install all reagent bottles
- Install the barcode reader (optional)
- Prime all reagent lines
- Perform the Clean cycle
- Zero the automated reagent level detect sensors
- Perform the Hub Pattern and Spray Volume tests



CAUTION:

Contact ELITechGroup before installing the instrument if you observe any damage to the packaging or equipment.

- 1 Unpack and inspect the instrument.
- 2 Check that the contents of the boxes match the packing lists for instrument and accessories.
- 3 Open the instrument lid and remove the cardboard tube that protects the hub.

NOTE: *Keep the box and packaging material to repack the instrument if you intend to ship it to the manufacturer for service.*

- 4 Place the instrument on a flat surface, free from dust and vibration and away from direct sunlight.

NOTE: *Position the instrument with the rear panel at least 30 cm (12 in.) from obstructions or hazardous materials.*



CAUTION:

Keep the drain tube straight and as short as possible. The maximum length is 1.8 m (72 in.). The waste container must be positioned lower than the stainer.

SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.1 Instrument Setup

Connecting the Drain Tube and Waste Container



- 1 Insert the waste tube connector into the rear panel receptacle until you hear a click.
- 2 Adjust the tube length to less than 1.8 m (72 in.).

NOTE: Ensure the waste tube has no loops or kinks, and is as straight and as short as possible. Cut off excess tubing as needed.



- 3 Connect the drain tube to the waste container.

If using a waste bottle with level detect (AC-182):

- 4 Connect the waste monitoring cable to the rear panel receptacle.
- 5 Connect the waste monitoring cable to the waste container lid.

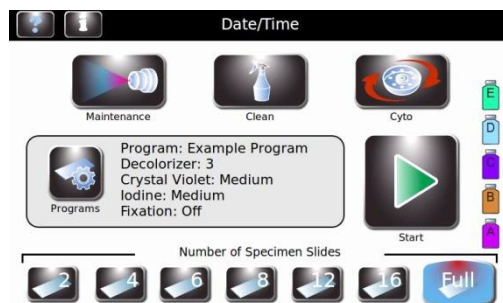
Connecting Power

- 1 Make sure the power switch is **OFF** (O).
- 2 Plug the power cord into the power connector on the rear panel of the instrument.

NOTE:

Use a surge protector to isolate the instrument from spikes and surges.

- 3 Plug the power cord into a properly rated AC electrical outlet.
- 4 Turn the power switch **ON** (I). After a brief delay the Main menu will appear.



SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.1 Instrument Setup

Installing Standard 500 mL Reagent Bottles



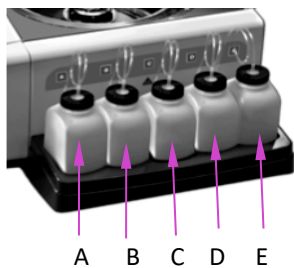
WARNING!

Reagents used in the instrument contain moderately hazardous chemicals that require care in handling. Always handle reagents using appropriate safety measures, including gloves and eye protection.



NOTE: Reagents should be stored according to the conditions specified on their label. After opening, reagents are stable for 90 days unless otherwise indicated by the symbol shown at left.

- 1 Place each 500 mL reagent bottle in the correct position.



- (A) Decolorizer with Counterstain
- (B) Iodine
- (C) Crystal Violet
- (D) Deionized or Distilled Water
- (E) Approved Alcohol

NOTE: See Appendix A for complete identification of all reagents used in this stainer.



CAUTION:

To avoid severe damage, never use reagents containing organic solvents in this instrument, unless supplied by ELITechGroup, or specified in official ELITechGroup formulation instructions.

NOTE: Immediately remove spills in the reagent tray to preserve the accuracy of the reagent level detecting system.

- 2 For all reagents using the standard 500 mL bottles:
 - Open a new bottle of reagent. Use empty 500 mL bottles for reagents D and E.
 - Record the reagent letter on each cap and retain for future use (such as long-term storage).
 - Insert the corresponding dip tube into the reagent bottle and install the ring cap.

SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.1 Instrument Setup

Installing the 5 Liter Reagent Bottle

NOTE: A 5 Liter (L) bottle for reagent D is available. If using the 5 L bottle, install it near the side or back of the instrument not in the instrument tray.



- If using the 5 L bottle, you must replace the standard dip tube with the longer dip tube that comes with the 5 L bottle.

- 1 Cut the existing dip tube just before the standard dip tube coil.
- 2 Connect the 5 L bottle dip tube to the cut end of the existing dip tube.
- 3 Insert the dip tube into the 5 L reagent bottle and install the ring cap.
- 4 Place the 5 L bottle in a vertical position at the same level as the instrument.
- 5 Install reagent detection cable from the 5 L bottle cap to the connector on back of the instrument.
- 6 Refer to Using Reagent Information Tracking (Section 3.1) for more information on tracking reagents manually or using a barcode reader.
- 7 Refer to Modifying Level Detect Functions in Section 3.1 to enable reagent monitoring.

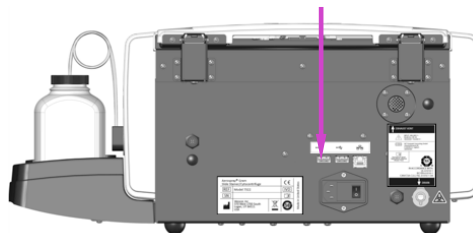
Installing the Barcode Reader



A barcode reader can be connected to the stainer for scanning reagent bottles and specimen slides that contain barcodes. This allows easy reagent and specimen information tracking. If a barcode reader is not installed, reagent and specimen information can be entered manually (Section 3.2).

Installing the Barcode Reader

- 1 Place the barcode reader and stand on a level surface near the stainer.
- 2 Plug the barcode reader into the left USB port on the rear panel of the stainer. See Section 3.2 for instructions on using the barcode reader.



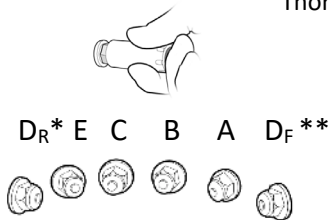
SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.2 Preparing the Stainer for Operation

Priming Procedures

NOTE: The instrument is shipped with alcohol in the reagent lines. For proper performance, this alcohol must be replaced with the correct reagent for each reagent line prior to use.

Thoroughly purge and prime each reagent delivery line using the following instructions.



* D_R = D Rear

**D_F = D Front



- 1 Remove each spray nozzle with the provided nozzle tool by turning counterclockwise.
- 2 Note the location of each nozzle so you can return it to the original position during reassembly.
- 3 Place a carousel on the stainer hub to prevent stain from entering the motor shaft.

CAUTION:

Fluid from priming can flood and damage the motor if the drain tube is not properly installed.



- 4 Press **Maintenance** from the Main menu.



- 5 Press the **A** prime button. Stain should appear within 10 seconds. When properly primed, a steady stream of reagent (no sputtering or breaks) flows from the nozzle receptacle.

- If stain appears, proceed to the next step.
- If stain does not appear within 10 seconds, perform the manual priming procedure in Section 6.3.



CAUTION:

Never operate a dry pump for more than 10 seconds. Operating a dry pump may cause damage to the instrument.

SECTION 2
SETUP AND PREPARATION FOR OPERATION

2.2 Preparing the Stainer for Operation

Priming Procedures (continued)

- 6 Repeat the previous steps for each nozzle, (B, C, D, and E). When the D prime button is pressed, most of the reagent will come out of the D_R position. With nozzles installed, reagent should spray equally from D_R and D_F.



- 7 Press **60-Sec Prime** to prime each reagent line with 200 mL of reagent to remove all of the alcohol from the reagent lines and pumps.

- 8 Choose one of the following:

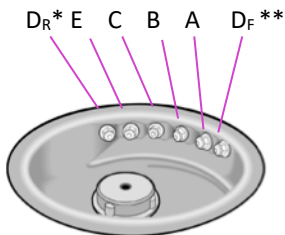


- For initial setup, press **ABCDE** to prime all lines simultaneously.



- To prime individual lines, press the appropriate individual prime button (A, B, C, D, E).

The pumps will run for 1 minute and prime the selected lines.



* D_R = D Rear
**D_F = D Front

- 9 Return the nozzles to their original positions and tighten clockwise with the nozzle tool.

- 10 With the nozzles installed, repeat Steps 5 and 6. A fine cone of spray should come from each nozzle.

- 11 After verifying nozzle performance, run the Clean cycle (see below).

SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.2 Preparing the Stainer for Operation

The Clean Cycle

NOTE: The Clean cycle uses 40 mL of alcohol divided equally among nozzles A, B, C and E to clean the carousel and stainer bowl after staining. Pressing Standby/Ready performs the same function.

- 1 Place an empty carousel in the instrument and close the lid.



CAUTION:

Never place any carousel loaded with specimens in the instrument for a Clean cycle (including placing the instrument in standby mode). Specimens will be damaged if they contact reagents sprayed from the nozzles when you press Clean or Standby.



- 2 Press **Clean**.



NOTE: Pressing Stop during the Clean cycle causes the Incomplete Clean message to be displayed. Press Clean to complete the interrupted cycle.

CLEAN INTERRUPTED

Clean Cycle Canceled

- 3 Open the lid and remove the carousel when the Clean cycle is complete.
- 4 Spray the interior of the bowl with 70 to 100% methanol or ethanol. Wipe the stainer bowl dry with paper towels.

NOTE: Perform the Storing the Instrument procedure (Section 5.2), if the instrument will remain idle for more than 1 week.

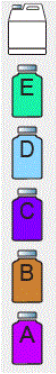
Performing Tests

You must perform the Pattern Test and Volume Test before using the instrument. See Section 6, Nozzle Maintenance and Performance.

SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.2 Preparing the Stainer for Operation

Reagent Level Monitoring



Reagent Level Detect monitors reagent levels and alerts you when the reagent is running low, or when the waste container is full (when using the waste container with level detect). You can turn reagent and waste container monitoring ON or OFF from the Level Detect menu. The system default is ON for reagent monitoring and OFF for waste container monitoring.

NOTE: The instrument must be installed on a flat, level surface for accurate monitoring of the reagents.

Disable the Level Detect function for any line not using the standard 500 mL bottle, except Line D. Line D features a level detection option for the 5 L external bottle.



CAUTION:

This system is designed to warn you when the reagent level is getting low. The instrument will continue running through these warnings. The user must monitor and replenish the reagent before running a stain cycle.

Enabling/Disabling Reagent Level Detect



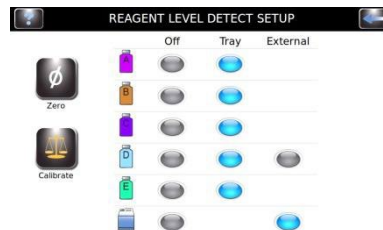
1 Press **Information** from the Main menu.



2 Press **System Setup**.



3 Press **Level Detect**. The display shows:



4 Press **Tray** to enable, or **OFF** to disable a reagent line. Functions are grey when unselected, blue when selected. Press **External** to enable the external level detect for the D reagent line (when using the 5 L bottle). Press **External** to enable level detect for the waste bottle.



5 When finished, press **Back** to exit to System Setup menu.

SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.2 Preparing the Stainer for Operation

Zeroing the Reagent Level Sensors

The Level Detect function must be zeroed at initial setup, when the stainer is moved, or if the level detect is not reporting correctly. If zeroing does not correct the problem, recalibrate the Level Detect function (Section 7.3).



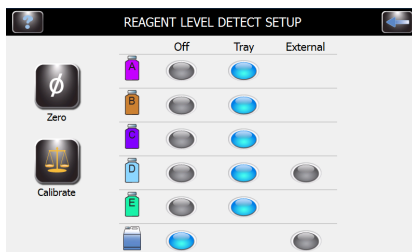
1 Press **Information**.



2 Press **System Setup**.



3 Press **Level Detect** to enter the Reagent Level Detect Setup menu:



NOTE: The stainer should be turned ON for at least 30 minutes before zeroing to stabilize level sensors. The instrument can be used during this time.



4 Press **Zero**. The display shows:



SECTION 2 SETUP AND PREPARATION FOR OPERATION

2.2 Preparing the Stainer for Operation



- 5 Remove all reagent bottles and press **Start**. The display shows:

REAGENT LEVEL DETECT ZERO

Zeroing...
Please Wait

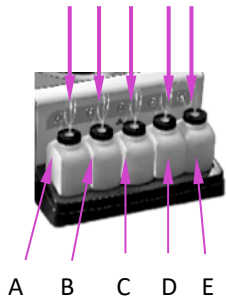
NOTE: Vibrations or bumps to the instrument or lab bench can cause inaccuracies in zeroing or calibration.



- 6 After zeroing, press **OK**. Press the **Back** button to exit to the System Setup menu.



- 7 Return the reagent bottles to their correct positions in the tray.



NOTE: For accurate reagent level detection and calibration, dip tubes must follow their pre-formed coiled shapes.

SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.1 System Setup Menu

Many software settings can be controlled from the System Setup menu, including:

- Creating, editing, and deleting stain programs
- Creating, editing, and deleting cytoentrifuge programs
- Tracking reagent information
- Managing user accounts
- Enabling tracking features for slides, preventive maintenance, and reagents
- Managing reagent level sensing
- Changing the display language
- Viewing and exporting the system log
- Changing beeper settings
- Setting the date and time
- Restoring default settings

Accessing the System Setup Menu



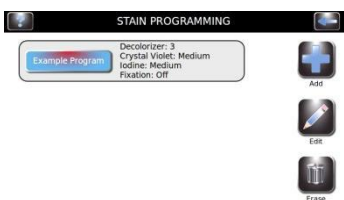
- 1 Press **System Information** from the Main menu.



- 2 Press **System Setup**.



Creating a Stain Program



- 1 From System Setup, press **Stain Programs**.
- 2 Press **Add**.
- 3 Enter a program name in the Program Name field.
- 4 Adjust the settings (see Adjusting the Decolorizer Level on the next page).
- 5 Press **Save**.

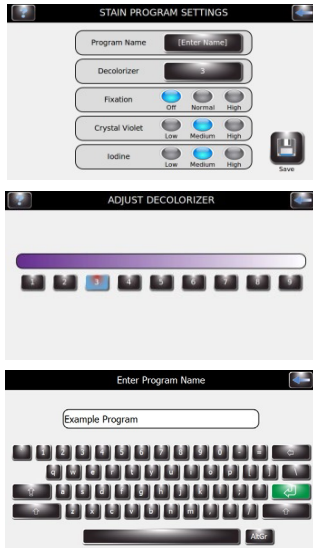
Editing a Stain Program or Adjusting Level Settings



- 1 From System Setup, press **Stain Programs**.
- 2 Select the program to be modified.
- 3 Press **Edit**.
- 4 Adjust the settings (see Adjusting the Decolorizer Level on the next page).
- 5 Press **Save**.

SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.1 System Setup Menu



Adjusting the Decolorizer Level:

- 1 From Adjust Settings menu, select **Decolorizer**.
- 2 Select the desired decolorizer level (1-9).
 - Select the desired fixation level.
 - Select the desired crystal violet level.
 - Select the desired iodine level.
- 3 Press **Save**.
- 4 Refer to Performing a Stain cycle (Section 4) to begin staining specimens.

Changing the Program Name:

- 1 From Adjust Settings menu, select **Program Name**.
- 2 Enter the program name.
- 3 Press **Enter**.

Administrator and User Accounts

You can create one Administrator account and multiple (up to 50) user accounts. The Administrator controls access to the system by adding and editing user accounts. Users cannot edit System Settings unless permitted by the Administrator.



Creating an Administrator Account

- 1 From System Setup, select **Users**.
- 2 Select **Lock System Setup Access**.
- 3 Enter a password for the Administrator account (at least 4 characters).
- 4 Re-enter the password to confirm.

Creating User Accounts

- 1 Select **System Setup**.
- 2 Enter the Administrator password.
- 3 Press **Users**.
- 4 Select **Enable Global Login**.
- 5 Select **Add User**.
- 6 Enter a user name.
- 7 Press **Enter**.



SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.1 System Setup Menu



8 Enter a numeric passcode (at least 4 numbers) for the user account. Repeat steps 5-7 for each reagent.

9 Press **Enter**.

10 Re-enter the same passcode to confirm.

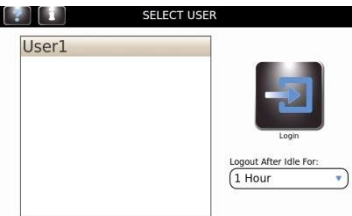
11 Press **Enter**.



Managing User Access

On the Manage Users screen, the Administrator has several options to manage user access to the instrument.

- Enable Global Login allows users to log in to the instrument. Users will log out manually or automatically (with user-selectable time options). See User Login/Logout below.
- Enable Run Login requires the current user to enter a password to run a Stain or Cytocentrifuge cycle. Global Login must be enabled to use this option.
- User System Access enables complete control of the instrument, including changing the System Setup options. This option can be controlled on an individual user basis, if Global Login is enabled.



User Login/Logout

With System Access locked and Global Login enabled, users must log in to use the stainer:

1 Select **User ID** and **Select Logout** time after idle from the drop-down menu.

2 Press **Login**.

3 Enter the correct passcode for the selected user and press **Enter**.

4 The stainer returns to the Main menu and is ready for programming and staining.

5 Once Login is complete, the stainer advances to the Main screen. A Logout button and the user name appears at the top right of the Main screen.



SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

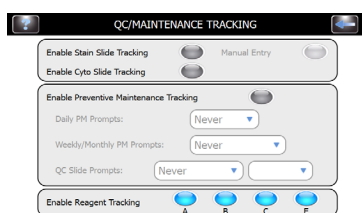
3.1 System Setup Menu

Using Reagent Information Tracking

You can enter reagent information to help track reagent usage and expiration. Reagent information includes reference number, expiration date, lot number, date and time the reagent was last installed.



- 1 From System Setup, select **QC/Maintenance Tracking**.
- 2 Select **Enable Reagent Tracking** by choosing reagent A, B, C, or E. This enables reagent lot number and expiration date tracking.
- 3 Select **Back** to return to System Setup.
- 4 Select **Reagents**.
- 5 Select **Change** next to the appropriate reagent.
- 6 Scan the reagent bottle barcodes (Section 3.2) or manually enter the reagent information in the correct fields.
- 7 Select **Save** for each reagent.



NOTE: You can record D Reagent (water) service date information but not reagent name or lot number.

SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

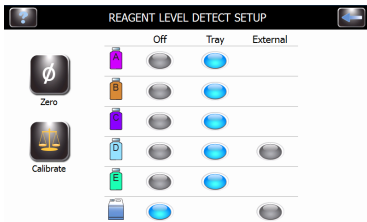
3.1 System Setup Menu

Modifying Level Detect Functions

The Level Detect function alerts you when the reagent is running low, or when the waste container is almost full. You can turn reagent and waste container monitoring ON and OFF from the System Setup screen. The system defaults to ON for reagent monitoring and to OFF for waste container monitoring. See Section 2.2 for complete instructions.



- 1 From System Setup, select **Level Detect**.



- 2 Select the reagent monitoring options to be modified.
 - To disable monitoring, select **OFF** next to the appropriate reagents.
 - To enable monitoring, select **Tray** next to the appropriate reagents.
 - Press **External** if you are using a 5 L bottle for reagent D.
 - To monitor the waste container, select **External**.

Changing User Language



- 1 From System Setup, press **Language**.
- 2 Select the software language from the list on the left.



- 3 Select **OK**.

Setting the Date and Time



- 1 From System Setup, press **Set Date/Time**.
- 2 Choose **12** for a 12-hour clock or **24** for a 24-hour clock.
- 3 Use the up and down arrows to modify the time and date.



- 4 Press **Save**.

SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.1 System Setup Menu

System Log

The instrument records all login, logout, stain or cytocentrifuge cycles, setting changes, maintenance functions and specimen identification (if enabled).



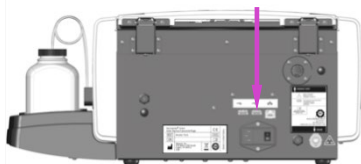
Accessing Logs

- 1 From System Setup, press **System Log**.
- 2 Use navigation arrows to scroll through the log.



Exporting Logs

- 1 From System Setup, Press **System Log**.
- 2 Plug a Flash Drive into the right USB port.
- 3 Press **Export**.



Date/Time	User	Type	Status
2013-03-20 11:09:03		System	System Settings Accessed
2013-03-20 09:12:38		Stain Cycle	Complete
2013-03-20 09:11:57		Stain Cycle	Info Slides: 2/32
2013-03-20 09:11:56		Stain Cycle	Slides (M) aaaaaaa
2013-03-20 09:11:50		Stain Cycle	Levels Reagent A Expired, Reagent B Expired, Reagent C Expired, Reagent E Expired.
2013-03-20 09:11:46		Stain Cycle	Reagents A: REF: 50-0424; Exp: 12-Dec-2013; Lot: 322485; Ser: 22-Feb-2013 1441; B: REF: L
2013-03-20 09:11:37		Stain Cycle	Stand Prep: Sample Program, Deck B, CV: Med; ID: Med; Fix: Off
2013-03-18 10:46:05		System	System Settings Accessed

Week 12, 2013

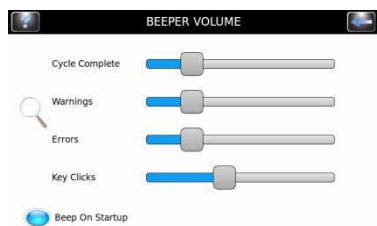
Export

NOTE: The log files are exported to the Flash Drive for access to a CSV file in spreadsheet software programs.

Controlling Beeper Alerts



- 1 From System Setup, select **Beeper**.
- 2 Use the sliders to modify the beeper volume for Cycle Complete, Warnings, Errors, or Key Clicks.
- 3 Select **Beep On Startup** to turn the audible startup alert ON or OFF.



SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.1 System Setup Menu

QC/Maintenance Tracking

Under system default settings, The following QC/Maintenance Tracking options are disabled:

- Enable Stain Slide Tracking
- Enable Cyto Slide Tracking
- Enable Manual Entry
- Enable Preventive Maintenance Tracking
- Enable Reagent Tracking

Enable Stain Slide Tracking

To activate Stain Slide Tracking, use the following steps:

- 1 From System Setup, Press **QC/Maintenance Tracking**.
- 2 Press **Enable Stain Slide Tracking**.

NOTE: Selecting *Enable Stain Slide Tracking* changes the Start button on the Main menu to “Load Slides.”

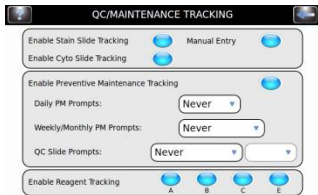
- 3 Press **Back** twice to return to the main screen. Verify that the Start Button on the main screen reads “Load Slides.”

- 4 Press **Load Slides**. The Scan and Load Slides menu appears.

- 5 Enter slide information.

- a. If using the barcode reader, scan the specimen slides that contain barcodes. See Scanning Slides with the Barcode Reader (Section 3.2) for complete instructions.
- b. If entering specimen information manually, see Recording Specimen and Reagent Information (Section 3.2).

- 6 See Section 4 for remaining steps for running a stain cycle.



SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.1 System Setup Menu

Enable Cyto Slide Tracking

Allows slide tracking in cytocentrifuge mode. See the Cytopro Applications Manual for complete information.

Enable Manual Entry

If selected, allows manual entry of slide information using the keypad (limited to 24 characters).

Enable Preventive Maintenance Tracking

To activate the tracking prompts for Preventive Maintenance Tracking, use the following steps:



- 1 From System Setup, select **QC/Maintenance Tracking**.



- 2 Select **Enable Preventive Maintenance Tracking**.

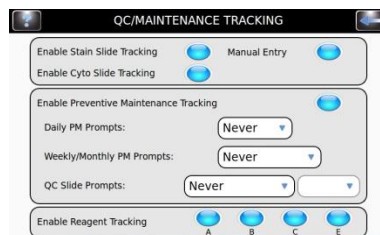
- 3 Enter the information for the Daily, Weekly, and QC Slide prompts in corresponding fields. See Using the Preventive Maintenance Log in Section 5.1.

Enable Reagent Tracking

To activate Reagent Tracking:



- 1 From System Setup, select **QC/Maintenance Tracking**.



- 2 Select **Enable Reagent Tracking**.

- 3 Select the reagent—A, B, C, E—to be tracked.

SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.1 System Setup Menu

Restoring Software Defaults

- 1 From System Setup, select **Restore Defaults**.



CAUTION:

Restoring the system defaults will remove all personal settings.

- Restoring *System* Settings will delete all user names and passwords as well as all stain and cytocentrifuge programs.
- Restoring *Stain* Settings will delete all stain programs and restore the default program.
- Restoring *Cytocentrifuge* Settings will delete all cytocentrifuge programs and restore the default program.

- 2 Select the settings you would like to restore to factory defaults: System Settings, Stain Settings, or Cytocentrifuge Settings.



- 3 Press **Restore**.



- 4 The display returns to the Main menu.

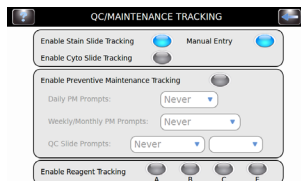
SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.2 Recording Specimen and Reagent Information

Scanning Slides with the Barcode Reader



- 1 From System Setup select **QC/Maintenance Tracking**.



- 2 Select **Enable Stain Slide Tracking**.

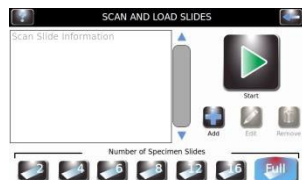
NOTE: Selecting *Enable Stain Slide Tracking* changes the *Start* button on the *Main* menu to "Load Slides." See *Scanning Slides with the Barcode Reader* (Section 3.2).



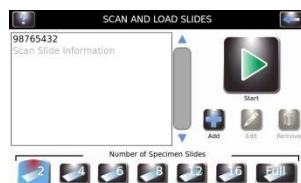
- 3 Press **Back** twice to return to the Main menu.



- 4 Press **Load Slides** on the Main menu. The Scan and Load Slides menu will appear.



- 5 Scan the barcode of each slide in the batch and load into the carousel according to instructions in Section 4.1.



- 6 Verify that each barcode appears on the Scan and Load Slides menu.



- 7 When you have completed preparations to stain, (Section 4) press **Start**.

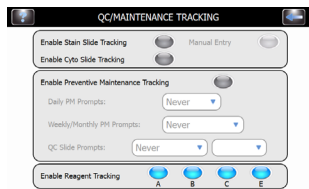
SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.2 Recording Specimen and Reagent Information

Scanning Reagent Bottles with the Barcode Reader



- 1 From System Setup select **QC/Maintenance Tracking**.



- 2 Select **Enable Reagent Tracking** for each desired reagent (A, B, C, E).



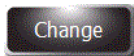
- 3 Press **Back** to return to the System Setup menu.



- 4 Press **Reagents** to reveal the Reagent Information screen.

REF	Expiration Date	Lot Number	Serviced Date/Time
SS-041A	2014-12-28	9876544	Serviced Date/Time
SS-041B	2014-12-28	8765432	Serviced Date/Time
SS-041C	2104-12-28	98765432	Serviced Date/Time
SS-MeOH	2014-12-28	9878676543	Serviced Date/Time

- 5 Select the desired Reagent (A, B, C, D, E) and press **Change**.



- 6 Scan the barcode of each enabled reagent bottle.



- 7 Verify that the barcode appears on the Scan and Load Slides menu.

SECTION 3 CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

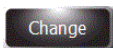
3.2 Recording Specimen and Reagent Information

Scanning Reagent Bottles with the Barcode Reader (continued)



8 Press **Save**

9 Repeat steps 3-8 for each reagent bottle that is enabled in QC Maintenance Tracking.



NOTE: You can access Reagent Information by pressing the bottle icons on the right side of the Main menu. This takes you directly to Reagent Information menu, where you can scan or manually enter reagent information by pressing **Change**.

Manually Entering Specimen Information

With Stain Slide Tracking and Manual Entry enabled in the QC Maintenance menu:



1 Press **Load Slides** on the Main menu.



2 Press **Add** to reveal the keypad.



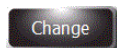
3 Enter slide information (maximum of 24 characters) and press **Enter**.



4 To change or delete the entry, select the entry on the display and press **Edit** or **Remove**.

5 Load slides and run stain cycle as shown in Section 4.1

Manually Entering Reagent Information



1 Press **Reagents** from the System Setup menu, or press the reagent status icon on the Main menu to reveal the Reagent Information menu.

2 Select the desired reagent and press **Change**.



3 Press the desired field (Reagent REF, Expiration Date, Lot Number, or Service Date/Time); enter the information on the keypad and Press **Enter**.

NOTE: Reagent REF number must be a valid ELITechGroup REF number for the selected reagent. Incorrect entries will generate an error message.



4 When you have entered all the information press **Save**.

SECTION 3

CONTROLLING AND CUSTOMIZING STAINER FUNCTIONS

3.3 The Help Menu

The Help menu is a comprehensive onscreen help function that provides detailed information on the following subjects:

Basic Operation

- Loading the Carousel
- Correct Reagents and Locations
- Nozzle Volumes
- Nozzle Spray Pattern

Selecting a Stain Program

- Setting Up Stain Programs
- System Setup Help
- Setting Up Stain Programs
- Setting Up Cyto Programs
- Setting Up Users
- Setting Up Level Monitoring System
- Setting Instrument Language
- Setting the Date and Time
- Instrument Logging
- Setting Up Network Setting
- Setting Instrument Beeps
- Calibrating Touch Screen
- Restoring Instrument Defaults

Maintenance Functions

- Pattern Tests
- Volume Tests
- B-Line Flush
- 60-Second Prime

Cleaning the Instrument

Cytocentrifuge Use

Setting Up Cyto Programs

Using Help



1 Press **Help** to access the help function.

2 Select the desired topic.



3 Use the direction arrows to navigate.



4 Press **Exit** to return to the Main menu.

SECTION 4 OPERATING THE AEROSPRAY GRAM

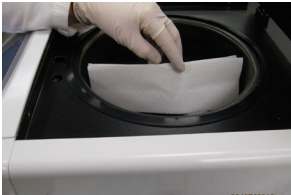
4.1 Operating Instructions

Suggested Staining Protocol

- Hub Pattern Test (once per day).
- If slide tracking is enabled, scan or enter slide information.
- Load slides into the carousel. Use blocking slides if needed.
- Place loaded carousel into the stainer and close the lid.
- Check reagent and waste levels.
- If slide tracking is not enabled, enter the number of slides on the Main menu.
- Select or verify desired stain program.
- Perform a stain cycle.
- Unload the carousel.

Performing a Hub Pattern Test

Use the Hub Pattern Test to ensure the nozzles are clear of debris and spraying properly.



- 1 From the Maintenance menu, Select **Pattern Test**.
- 2 Hold a sheet of white paper towel near the drive hub, squarely facing the target nozzle.
- 3 Select the corresponding prime button.
- 4 Check the quality of the pattern. If the pattern is not correct, refer to Nozzle Maintenance and Performance (Section 6).



Figure 7: Correct Hub Pattern Test Result



Figure 8: Incorrect Hub Pattern Test Result



NOTE: If not staining immediately after Hub Pattern Test, it is recommended to run a clean cycle to prevent concentrated reagent from sitting in the lines for extended periods of time.

NOTE: If the Hub Pattern Test result is incorrect, clean the nozzle orifice with the nozzle brush provided in the Nozzle Maintenance Kit.

SECTION 4 OPERATING THE AEROSPRAY GRAM

4.1 Operating Instructions

Loading the Carousel



CAUTION:

Never load chipped or cracked slides into the instrument. Slides in poor condition may break during the staining cycle. If a slide breaks in the bowl, refer to Cleaning Broken Slides, Section 5.4.



CAUTION:

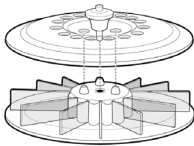
Keep small ferrous metal objects away from the lab bench. These objects can be attracted to the magnets on the bottom of the carousel and cause damage if spun free during instrument operation.



CAUTION:

Load slides in balanced pairs. If staining an odd number of slides, use a blank slide to balance the carousel.

NOTE: Load the carousel with similar specimens for a similar level of staining. There is no guarantee of staining performance when dissimilar specimens are used.



- 1 Remove the carousel from the bowl and place it on a solid, level surface.

- 2 Remove the carousel lid by pressing the button and lifting the lid.



- 3 If Slide Tracking is enabled, select **Load Slides**.

- If using the barcode reader, scan each specimen slide barcode before loading it into the carousel. Slide Tracking must be enabled from the System Setup menu. See Enable Stain Slide Tracking in Section 3.1.
- If entering slide information manually, follow the instructions in Section 3.2.

- 4 Insert the slides into the carousel with the first slide in position 1.

- Load slides in balanced pairs (directly opposite one another) to balance the carousel. If staining an odd number of slides, use a blank slide to balance the carousel.
- If there are empty slots in the carousel, use blocking slides to prevent overspray (see below).

SECTION 4
OPERATING THE AEROSPRAY GRAM

4.1 Operating Instructions

Loading the Carousel (continued)

- If using a 12-slide carousel, load slides with the labels toward the *outer* rim of the carousel.
- If using a 30-slide carousel, load slides with the labels toward the *center* of the carousel.
- Always load slides with the specimen facing clockwise.
- Always place the first slide in position 1, the second in position 2, and so on.

NOTE: A warning will sound during the staining cycle if the carousel is unbalanced.

Figure 9: Loading a 12-Slide Carousel (Slide Labels Toward Outer Rim)

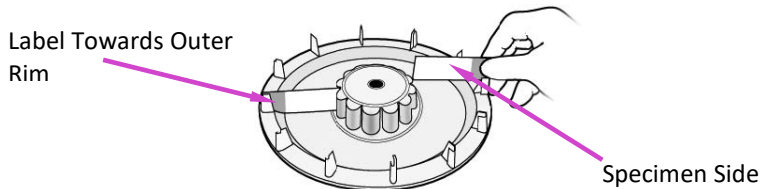
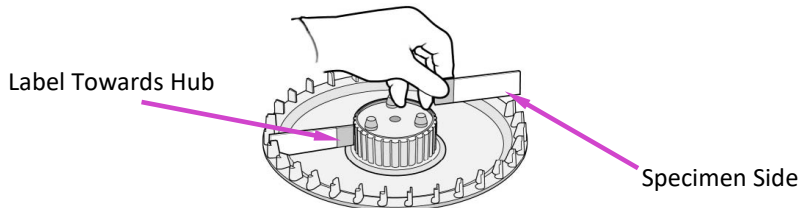
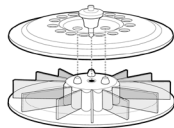


Figure 10: Loading a 30-Slide Carousel (Slide Labels Toward Center)



- 5 Replace the carousel lid by pressing the button and lowering the lid over the indexing posts.

Figure 11: Reattaching the Carousel Lid



- 6 Release the button and press the lid handle until it is firmly closed and locked.

SECTION 4 OPERATING THE AEROSPRAY GRAM

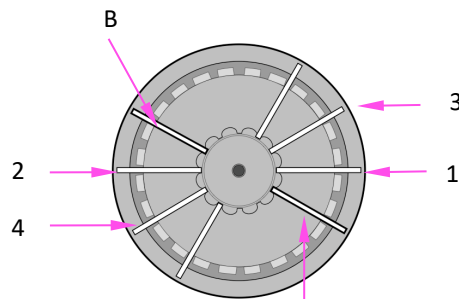
4.1 Operating Instructions

Using Blocking Slides

If the carousel is not full, blank slides should be used as blocking slides. Blocking slides prevent overspray of reagents onto the specimen slides. Overspray can cause slides to become over-decolorized.

- Place a blocking slide in front of position 1 and 2.

Figure 12: Using Blocking Slides



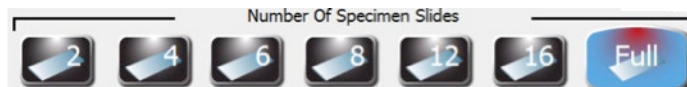
- B – Blocking Slide
- 1 – Slide Position 1
- 2 – Slide Position 2
- 3 – Slide Position 3
- 4 – Slide Position 4

Performing a Stain Cycle



- 1 Insert a carousel with specimen slides and close the instrument lid.
- 2 If you have not enabled Slide Tracking, select the number of slides to be stained. Slide selection defaults to full carousel at the end of the run, after pressing Stop, or selecting a number greater than the full carousel default.

NOTE: To stain an odd number of specimen slides, select the next higher number listed on the display. For example: to stain 3 slides, select 4. To stain 7 slides select 8, etc.



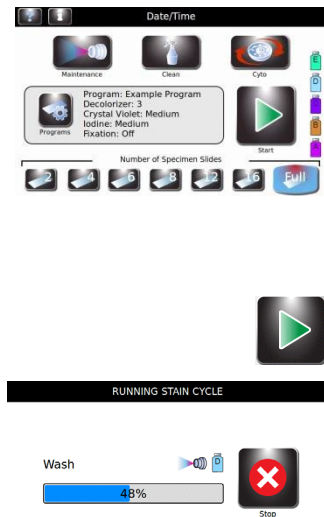
If you are using the optional barcode reader, the number of slides is programmed automatically. See Enable Stain Slide Tracking in Section 3.1.

NOTE: Do not count blocking slides as part of the total number of slides.

SECTION 4 OPERATING THE AEROSPRAY GRAM

4.1 Operating Instructions

Performing a Stain Cycle (continued)



- 3 If you have created a stain program, and it appears on the display, proceed to Step 4. If the desired program does not appear on the display, select **Programs**. Then select the desired program and proceed to Step 4.

NOTE: No special collection, pre-treatment, or storage conditions are required for specimen types. Specimens that are normally manually Gram stained can be stained with the Aerospray Gram Stainer. Adjust stain settings to maximize staining quality for each specimen type (see Section 3.1).

- 4 Select **Start**. The display shows the progress of the program, and a signal tone (if enabled) indicates the end of the cycle.

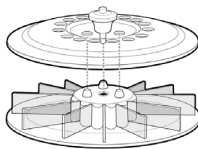
NOTE: Use the emergency Stop button when required, for example, if there is abnormal vibration or noise. This will abort the staining cycle.

Unloading the Carousel



WARNING!
Treat slides in accordance with good laboratory practices and local regulations.

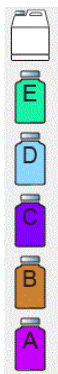
- 1 Remove the carousel from the bowl and place it on a solid, level surface.



- 2 Remove the carousel lid by pressing the button and lifting the lid.
- 3 Carefully remove each slide and read the Gram results using a microscope.

SECTION 4 OPERATING THE AEROSPRAY GRAM

4.1 Operating Instructions



Monitoring Reagent and Waste Levels

If enabled, the stainer displays the approximate reagent and waste container levels and other information.



CAUTION:

You must monitor the reagent and waste container levels on the display (if enabled) and by direct inspection of the bottles. The monitor will show the approximate level of each reagent. This can be compared to the actual level in the bottles.

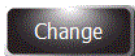
- Never allow a reagent to run dry. When the reagent level is near empty, replace the reagent bottle with a new one (see below).
- Never allow the waste container level to go above the maximum safety level.

Table 11: Reagent Level Detect Display Symbols (Reagent A shown)

	Reagent unselected in Level Detect
	Reagent Bottle Full
	Reagent Bottle 2/3 Full
	Reagent Bottle 1/3 Full
	Reagent Bottle Empty
	Measurement Error (such as external bottle unplugged)
	Reagent has exceeded expiration date (enabled from QC Maintenance menu)
	Waste bottle empty
	Waste bottle error
	Waste bottle full (such as external bottle unplugged)

SECTION 4 OPERATING THE AEROSPRAY GRAM

4.1 Operating Instructions



NOTE: You can access the Reagent Information menu by pressing the bottle icons on the right side of the Main menu. Press **Change** to scan or manually enter reagent information.

NOTE: Do not put residual reagent from a used bottle into a new bottle. This can lead to an accumulation of residue on the slides and may be a source of contamination.



WARNING!

Reagents used in the instrument contain moderately hazardous chemicals that require care in handling. Always use appropriate safety measures, including gloves and eye protection, when handling reagents.

Replacing a Reagent Bottle

- 1 Remove the empty reagent bottle from the tray but do not disconnect the dip tube.
- 2 Open the new bottle and record the letter on the cap for future use such as long-term storage.
- 3 Place the new bottle in the tray.
- 4 Open the Reagent Information menu by pressing the reagent bottle icon on the right side of the Main menu.
- 5 Select the desired reagent and press **Change**.



- 6 If you are using reagent tracking, scan the barcode, or manually enter the reagent REF, expiration date and lot number in the Using Reagent Information Tracking menu (Section 3.1).
- 7 Unscrew the cap and remove the dip tube from the empty bottle.
- 8 Insert the dip tube into the new reagent bottle and screw on the cap.

Emptying the Waste Container

The Reagent Level Detect function, automatically monitors the waste level and indicates when the waste container should be emptied. It is still necessary to check waste levels visually to ensure the waste container does not overfill.



CAUTION:

Dispose of collected waste according to local statutes and safety requirements.



- 1 Unscrew the cap from the full waste container.
- 2 Discard the waste according to local regulations.
- 3 Reinstall the cap on the empty waste container.

SECTION 5 PREVENTIVE MAINTENANCE AND SAFETY

5.1 Preventive Maintenance

The system provides a Preventive Maintenance Log for tracking the most recent maintenance activities. See Enable Preventive Maintenance Tracking in Section 3 and Using the Preventive Maintenance Log (Section 5.1). Also use Preventative Maintenance Chart SS-125.

Daily Maintenance/Quality Control (QC)

At end of each shift or if instrument will be idle for more than 8 hours:

- 1 Run a CLEAN cycle. Leave instrument in CLEAN TO REPRIME mode.
- 2 Possibly, also, use a spray bottle filled with methanol and spray the front of each nozzle and clean each nozzle orifice with nozzle brush.
- 3 Possibly, also, spray the stainer bowl and exterior case using methanol. Wipe clean with a paper towel.
- 4 Initial completion of daily procedure on Preventative Maintenance (PM) chart.
- 5 Before instrument use, press CLEAN to reprime reagent lines. Run a SPRAY PATTERN test to verify nozzle performance prior to staining. Should any pattern appear abnormal repeat step 2 to clean nozzle orifice.

NOTE: If not staining immediately after Spray Pattern Test, it is recommended to run a clean cycle to prevent concentrated reagent from sitting in the lines for extended periods of time.

NOTE: The suggested frequency of daily, weekly, and monthly maintenance is considered to be a maximum level. Field experience suggests that the more the Aerospray Slide Stainer is used the less frequently it requires preventative maintenance.

Weekly Maintenance

- 1 Perform SPRAY VOLUME test as described in User's manual. Record volume collected from each nozzle on PM chart.
- 2 If volume trends lower or spray pattern is abnormal, disassemble and clean affected nozzle(s). Do not mix or interchange nozzles or nozzle parts. Always return nozzles to same location in stainer. Repeat SPRAY PATTERN and SPRAY VOLUME tests on cleaned nozzle(s).
- 3 Wipe down nozzles, carousel tray, and carousel lid using methanol spray bottle and/or SS-029C Nozzle Cleaning Solution with a paper towel.
- 4 Slowly pour 200-300 mL of water into instrument drain to prevent build up of paper fibers, precipitates, etc. Verify drain is flowing properly and not allowing fluid to back up in bowl or flow out of air vent on case back.
- 5 Initial completion of weekly PM.

NOTE: The suggested frequency of daily, weekly, and monthly maintenance is considered to be a maximum level. Field experience suggests that the more the Aerospray Slide Stainer is used the less frequently it requires preventative maintenance.

SECTION 5 PREVENTIVE MAINTENANCE AND SAFETY

5.1 Preventive Maintenance

Monthly Maintenance

The screenshot shows the 'PREVENTIVE MAINTENANCE LOG' interface. It contains three main sections: 'Hub Pattern' with a table for recording results, 'Nozzle Volume' with a table for recording volume measurements, and 'Maintenance' with a table for recording tasks. A 'Record Maintenance' button is located at the bottom.

- 1 Disassemble and manually clean all nozzles. Refer to Nozzle Disassembly and Cleaning (Section 6.1).
- 2 Remove Pick-up Tube from Reagent B (Iodine) bottle (Section 6.5). Then:
 - A. Flush 500mL DI water through the line.
 - B. Flush 100mL SS-029C through the line. Block flow at nozzle holder with a gloved finger for a few seconds during flushing. Stop flushing just before 100mL is gone. Soak in line (1 hour to overnight as practical).
 - C. Flush SS-029C out of line with 500mL of DI water.
 - D. Reinstall Reagent B (Iodine) and flush 100 mL through the line to remove water.
- 3 Reinstall nozzles. Perform Spray Pattern and Spray volume tests. Record results from Spray Volume test on Preventative Maintenance chart. Disinfect reusable bottles with a 1/10 dilution of bleach. Rinse with deionized water. Initial completion in Preventative Maintenance Chart.

NOTE: The suggested frequency of daily, weekly, and monthly maintenance is considered to be a maximum level. Field experience suggests that the more the Aerospray Slide Stainer is used the less frequently it requires preventative maintenance.

Using the Preventive Maintenance Log

With Preventive Maintenance Tracking enabled, the PM Log provides a convenient and structured means of recording important maintenance and QC functions. The system allows you to set up timely prompts that require response by the user. See Enable Preventive Maintenance Tracking (Section 3.1).



Record Maintenance

The screenshot shows the 'RECORD MAINTENANCE TASK' interface. It has a 'Maintenance Task' section with a dropdown menu set to 'Not Completed'. Below are three toggle switches for 'Disinfect Reusable Bottles', 'Drain Check', and 'Manual Nozzle Cleaning'. A 'Save' button is at the bottom right.

This screenshot is identical to the previous one, but the dropdown menu is now set to 'Acceptable', and the 'Save' button is highlighted.



- 1 From the Maintenance menu, press **QC/PM** to open the PM Log.
- 2 Press **Record Maintenance**.
PM Task entry options:
 - QC SLIDE Staining (Drop Down Menu)
 - Not Completed
 - Acceptable
 - Unacceptable
 - Inconclusive
 - Disinfect Reusable Bottles
 - Completed (Select/Deselect)
 - Drain Check
 - Completed (Select/Deselect)
 - Manual Nozzle Cleaning
 - Completed (Select/Deselect)

Press **Save** to record entries.

SECTION 5 PREVENTIVE MAINTENANCE AND SAFETY

5.2 Storing the Instrument

If the instrument is inactive for more than one week, you may want to perform the long-term storage procedure. This will prevent nozzles from clogging when the machine is reactivated.

Preparing for Long-Term Storage

- 1 With the carousel removed, remove and clean the nozzles. Be sure to hold parts in tubes that correctly indicate their position.
- 2 Unscrew the cap and remove the dip tube from the bottles.
- 3 Place the end of the dip tube in a bottle of approved alcohol.
- 4 Flush at least 250 mL of approved alcohol through the reagent line by priming all lines simultaneously. Leave the alcohol in the line.



CAUTION:

Leave alcohol in the reagent lines during storage. Allowing reagent lines to run dry can damage the instrument.



CAUTION:

Do not subject the instrument to freezing temperatures. Freezing of aqueous fluids in the lines may cause damage to the instrument.

- 5 Flush the bowl with water.
- 6 Return nozzles to their original positions

Preparing for Operation after Storage

Follow the Setup and Preparation for Operation instructions in Section 2.

SECTION 5 PREVENTIVE MAINTENANCE AND SAFETY

5.3 Replacing Fuses



WARNING!

To prevent the risk of fire, the main fuses should only be replaced with fuses of the same type and rating. Recurring fuse failure indicates serious internal problems, if this occurs, contact ELITechGroup.

- 1 Power **OFF** the instrument.
- 2 Disconnect the power cord from the power outlet and the rear panel of the instrument.
- 3 Open the fuse cover by inserting a screwdriver in the slot on the right side of the cover and gently prying the cover out.
- 4 Pull the fuse holder out to inspect the fuses.
- 5 Replace the fuses if necessary.
- 6 Push the fuse holder in.
- 7 Close the fuse cover.
- 8 Reconnect the main power cord to rear panel of the instrument and to the power outlet.
- 9 Power **ON** the instrument.

SECTION 5 PREVENTIVE MAINTENANCE AND SAFETY

5.4 Cleaning the Stainer and Carousels



WARNING!

All cleaning procedures should be performed in an area with ventilation in accordance with local regulations by authorized trained personnel wearing appropriate protection equipment.

- 1 Clean the outside of the instrument with alcohol.
- 2 Clean the carousel and lid with alcohol.

NOTE: Freshly prepared (< 24 hours old) 10% bleach solution can be used as well. The 10% bleach solution helps clean the stained areas.

Cleaning Liquid Spills

Remove any liquid spilled on the instrument immediately to avoid damage to the equipment.



WARNING!

If potentially infectious liquid is spilled on the instrument, the instrument must be disinfected in accordance with all applicable local regulations. Refer to **Decontaminating the Stainer and Carousels (below)** for instructions.

Cleaning Broken Slides

You must take stringent precautions if a slide breaks inside the instrument during a staining cycle, especially if the instrument has been processing dangerous pathogens. Always use protective gloves, safety glasses, and forceps when removing broken glass from inside the instrument.

- Glass shards embedded in the walls of the bowl can cause serious cuts and pose a risk of infection.
- Always remove embedded shards with a scraper before attempting to remove loose glass.
- Use a vacuum or adhesive tape to pick up loose glass inside the stainer bowl.

SECTION 5 PREVENTIVE MAINTENANCE AND SAFETY

5.5 Decontaminating the Stainer and Carousels

All parts of the instrument that come into contact with biological specimens, patient specimens, positive control specimens, or hazardous material must be treated as potentially infectious.

Before the instrument is returned for service, all outer surfaces must be decontaminated. The operating authority must complete a disinfection declaration, otherwise the instrument may be rejected by the distributor or service center or quarantined by customs authorities.



WARNING!

Reagents used with the instrument contain moderately hazardous chemicals that require care in handling. Always use appropriate safety measures including gloves and eye protection, when handling reagents.



WARNING!

Authorized, trained personnel wearing appropriate protection equipment should perform the decontamination procedure in an area with ventilation in accordance with local regulations.



WARNING!

Prior to decontaminating, disconnect the instrument from the main power supply to avoid any risk of fire and explosion.



WARNING!

The decontamination procedure and the disinfectants must comply with the local applicable regulations.

Solutions for Decontaminating the Instrument

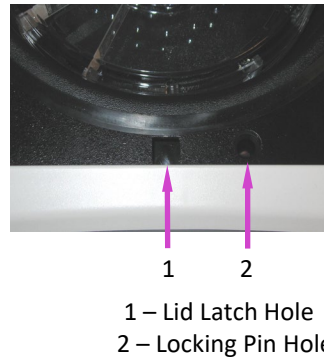
The outer surfaces of the instrument should be decontaminated using a decontaminating solution such as:

- 70% ethanol or methanol
- Mild detergent
- 10% bleach solution (< 24 hours old)
- Decontamination Solution (REF: SS-133)

SECTION 5 PREVENTIVE MAINTENANCE AND SAFETY

5.5 Decontaminating the Stainer and Carousels

Figure 13: Lid Latch and Locking Pin Hole Locations



Decontaminating the Instrument

- 1 Prepare a suitable container for all disposables.
- 2 Cover the lid latch and locking-pin holes with waterproof tape to protect the interior (Figure 13).
- 3 Place the Gram stainer in an area with ventilation in accordance with local regulations.
- 4 Spray the inner bowl and inner lid with a decontaminating solution such as REF: SS-133.
- 5 Repeat the spray treatment every 2 or 3 minutes for a total of 20 minutes. Do not allow cleaning solutions to dry on the instrument surfaces.
- 6 Rinse the inner bowl and lid thoroughly with water.
- 7 Spray and wipe the exterior surfaces with decontamination solution such as REF: SS-133.



CAUTION:

Do not flood the display panel with excessive moisture. Any moisture that seeps through could damage the internal electronics.

- 8 Repeat the spray treatment of exterior surfaces every 2 or 3 minutes for a total of 20 minutes. Do not allow cleaning/decontamination solutions to dry on the instrument surfaces.
- 9 Wipe surfaces thoroughly with a cloth soaked in water until you have removed all decontamination solution.
- 10 Immerse or generously spray the carousel and lid with decontaminating solution. Allow the solution to react for 20 minutes.
- 11 Thoroughly rinse the carousel and lid with deionized or distilled water.

SECTION 5
PREVENTIVE MAINTENANCE AND SAFETY

5.5 Decontaminating the Stainer and Carousels

Decontaminating the Reagent D Bottle

- 1 Fill the reagent D (deionized or distilled water) bottle with a fresh (< 24 hours old) 10% bleach solution.
- 2 Allow the bleach solution to react in the bottle for 10 minutes.
- 3 Rinse the bottle thoroughly with tap water.
- 4 Rinse the bottle thoroughly with deionized or distilled water.

SECTION 5 PREVENTIVE MAINTENANCE AND SAFETY

5.6 Shipping or Disposing of the Stainer or Carousels

Shipping the Instrument



WARNING!

You must disinfect the carousel before returning it to ELITechGroup. The operating authority must complete a disinfection declaration, otherwise the distributor or service center may not accept the instrument; or customs authorities may hold it.



CAUTION:

Shipping the rotor without decontaminating it according to these instructions is dangerous to service personnel. You will be charged additional fees for decontamination performed by ELITechGroup.



CAUTION:

Ship the instrument in a container comparable to its original packaging.

Disinfection Declaration

The operating authority must print and complete the disinfection declaration (obtained from ELITechGroup Customer Service).

Attach the declaration to the top of the instrument package before sending the package to ELITechGroup.

Disposing of the Instrument

This device should be completely decontaminated and disposed of as follows:



Under WEEE Directive 2012/19/EU , this equipment cannot be disposed of in a normal landfill. Instead, the equipment must be disposed of either by:

- 1 Routing to an authorized local facility approved for handling hazardous materials.

OR

- 2 Returning the equipment to ELITechGroup or an authorized distributor.

SECTION 6 NOZZLE MAINTENANCE AND PERFORMANCE

6.1 Nozzle Disassembly and Cleaning

Nozzle maintenance requires the Nozzle Maintenance Kit and prepared Nozzle Cleaning Solution (diluted SS-029C) or Stain Residue Solvent (SS-230)..



WARNING!

Do not run Stain Residue Solvent (SS-230) through stainer as serious damage could result. This solvent is for the cleaning of nozzles, carousels and bowls for Aerospray slide strainers. SS-230 should not be used for line flush.



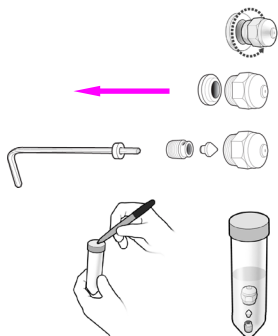
WARNING!

Always wear protective clothing and eye protection when using Nozzle Cleaning Solution (diluted SS-029C) or Stain Residue Solvent (SS-230). Dispose of used solution properly.

NOTE: If the compression screw cannot be easily loosened, use light penetrating oil and a 5/8-in. wrench to loosen the nozzle.

NOTE: Do not mix or interchange nozzles or nozzle parts. Always return nozzles to the same location in stainer.

Nozzle Disassembly

- 
- 1 Remove the nozzle using the nozzle tool from the Nozzle Maintenance Kit.
 - 2 Disassemble the nozzle. See Figure 5: Nozzle Diagram in Section 1.
 - 3 Place the nozzle parts in a 50 mL conical tube that has been clearly marked with the correct nozzle position.
 - 4 Repeat Steps 1 through 3 for each nozzle.

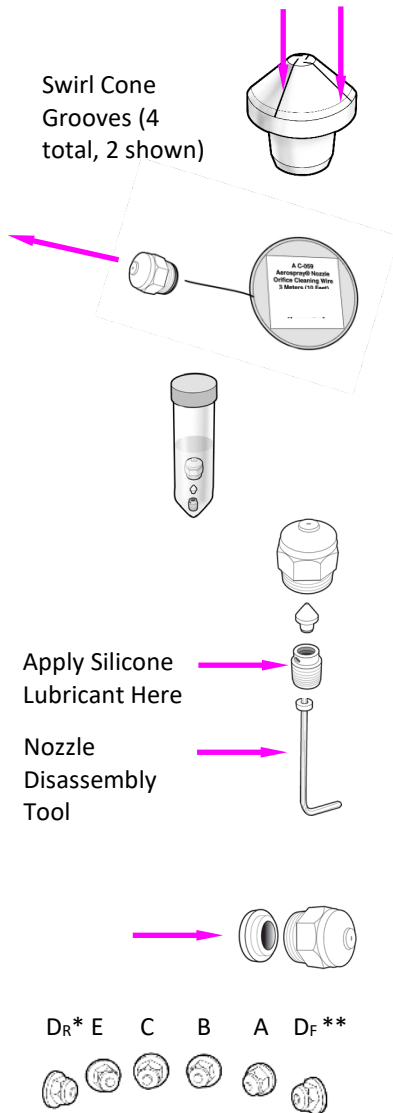
Nozzle Cleaning



- 1 Fill each 50 mL tube with 25 mL of prepared Nozzle Cleaning Solution (SS-029C) and cap the tube.
 - 2 Gently invert the tube at least ten times to ensure all parts come in contact with the Nozzle Cleaning Solution.
 - 3 Place the tube in the correctly marked position in the provided tube stand. Soak the parts as long as possible.
- NOTE:** Soak nozzle parts for at least 15 minutes. Parts can be soaked in Nozzle Cleaning Solution overnight.
- 4 Repeat steps 1 through 3 for each nozzle.

SECTION 6 NOZZLE MAINTENANCE AND PERFORMANCE

6.2 Nozzle Reassembly



- 1 Hold your thumb or a strainer over the end of the tube to keep the nozzle parts in the tube. Pour out the liquid used to clean the nozzle parts.
 - 2 Inspect the nozzle parts. Remove any material in the swirl cone grooves by sliding a piece of paper along each of the 4 grooves.
 - 3 Thread the nozzle orifice cleaning wire (REF: AC-059) through the back of the disassembled nozzle housing.
 - 4 Place the nozzle parts back into the tube and rinse them with water.
 - 5 Rinse the parts again with alcohol.
 - 6 Apply a small amount of silicone lubricant (REF: AC-103) to the compression screw threads.
 - 7 Reassemble the nozzle by placing the compression screw on the nozzle disassembly tool, then inserting the swirl cone into the compression screw.
- NOTE:** Hold all the parts in a vertical position during reassembly.
- 8 Reinstall the nozzle housing over the swirl cone and compression screw.
 - 9 Reinstall the nozzle insert.
 - 10 Return the assembled nozzle to its original position in the instrument.
 - 11 Repeat Steps 1 through 10 for each nozzle.
 - 12 Perform a Hub Pattern Test (Section 4).
 - 13 Perform a Volume Test (Section 6.4).

NOTE: You must perform the Hub Pattern Test and Volume Test before operating the instrument. If the results are incorrect, manually prime the instrument. If not staining immediately after Hub Pattern and Volume Test, it is recommended to run a clean cycle to prevent concentrated reagent from sitting in the lines for extended periods of time.

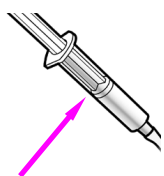
SECTION 6 NOZZLE MAINTENANCE AND PERFORMANCE

6.3 Manual Priming

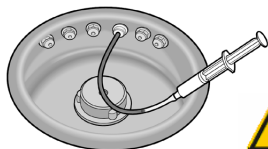
- 1 Remove the carousel from the bowl.
- 2 Remove the nozzle connected to the line to be manually primed.
- 3 Insert the priming tool nozzle adapter (included in the Nozzle Maintenance Kit) into the nozzle holder.



- 4 Turn the nozzle adapter clockwise to install the adapter into the holder.
- 5 Withdraw the priming tool plunger halfway to create a vacuum. Hold the plunger in position.



- 6 Press **Maintenance** from the Main menu.
- 7 Press **Volume Test**.
- 8 Press the desired prime button to start the reagent pump.
- 9 Run the reagent into the tube until the fluid is free of bubbles, then press **Stop**.



WARNING!
Do not pull the plunger completely out of the priming tool. Pulling the plunger out of the tool may result in splashing or spraying of reagents. Do not push the plunger in while it is connected to the nozzle holder.

- 10 Turn the nozzle adapter counterclockwise to remove it from the nozzle holder.



- 11 Discard the collected fluid into the stainer bowl.
- 12 Reinstall the nozzle.
- 13 Perform the Hub Pattern Test.
- 14 Perform the Volume Test.

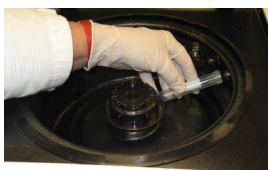
NOTE: If not staining immediately after Hub Pattern and Volume Test, it is recommended to run a clean cycle to prevent concentrated reagent from sitting in the lines for extended periods of time.

SECTION 6 NOZZLE MAINTENANCE AND PERFORMANCE

6.4 Performing the Volume Test

The Volume Test requires the Nozzle Maintenance Kit.

NOTE: The Volume Test must be performed weekly.



- 1 From the Maintenance menu, select **Volume Test**.
- 2 Hold a Volume Test tube (small tube) in place so that selected nozzle is covered.
- 3 Press the corresponding reagent button to collect the reagent.
- 4 Remove and cap the tube.
- 5 Record the nozzle position on the tube.
- 6 Place the tube in the appropriate position in the tube stand.
- 7 Repeat Steps 2 through 7 for each nozzle.
- 8 Compare collected nozzle volumes with the following table.

Table 12: Volume Test Tolerances

Nozzle/Reagent Line	Minimum	Maximum
A	10 mL	12 mL
B, C, D _F , D _R , E	9 mL	11 mL

NOTE: The stainer normally functions correctly if nozzle volumes are slightly higher or lower than the specified range. It is important that the B and C nozzle volumes are similar, (typically within 1 mL). Spray volumes < 7.5 mL or > 12.5 mL indicate serious problems with the nozzles or reagent delivery lines.



- If the volume is within the tolerance range, go to Step 10.
- If the volume is outside the tolerance range:
 - a. Clear the nozzle orifice with the nozzle brush found in the maintenance kit.
 - b. If necessary, remove the nozzle and perform the Nozzle Cleaning procedure (Section 6.1).
 - c. If the problem persists, replace the nozzle.

NOTE: If the problem persists after you have replaced the nozzle, contact ELITechGroup. If not staining immediately after Volume Test, it is recommended to run a clean cycle to prevent concentrated reagent from sitting in the lines for extended periods of time.

SECTION 6

NOZZLE MAINTENANCE AND PERFORMANCE

6.4 Performing the Volume Test

- 9 Prepare the Maintenance Kit for future use:
 - Empty the contents of the tubes into the stainer bowl.
 - Rinse the tubes with water.
 - Put the tubes back into their original place in the Maintenance Kit or tube stand.

- 10 Select **Back** twice to return to the Main menu.

SECTION 6 NOZZLE MAINTENANCE AND PERFORMANCE

6.5 Flushing the B-Line

This procedure requires the Nozzle Maintenance kit, and is recommended monthly and when troubleshooting a staining issue.

NOTE: This procedure requires a minimum of 1 hour.

NOTE: A carousel must be in place during the procedure or the instrument will generate an error and abort the procedure.



- 1 Remove nozzle B.
- 2 From the Maintenance menu, press **B-Line Flush**.
- 3 Load 500 mL of deionized or distilled water into the B-line. **DO NOT RUN STAIN RESIDUE SOLVENT (SS-230) THROUGH STAINER.**
- 4 Insert an empty carousel and close the lid.



- 5 Press **Start**. Follow the prompts on the display to complete the B-line flush. The instrument will pump approximately 400 mL of water through the B-line. A status bar will indicate progress.
- 6 When the flush is complete, remove the remaining water.
- 7 Load 200 mL of the prepared Nozzle Cleaning Solution in the B-line.
- 8 Press **Start**. The instrument will pump approximately 100 mL of the prepared Nozzle Cleaning Solution through the B-line and will start a 1-hour countdown timer.
- 9 Wait for the timer to complete, or allow the instrument to remain idle up to a maximum of 12 hours.

NOTE: You can still use the Cytocentrifuge mode during this time by selecting *Cyto*.

- 10 Load 500 mL of deionized or distilled water in the B-line.
- 11 Press **Start**. The instrument will pump approximately 400 mL of water through the B-line. A status bar will indicate progress.
- 12 When the flush is complete, remove the remaining water.
- 13 Load at least 200 mL of iodine into the B-line.
- 14 Press **Start**. The instrument will pump approximately 200 mL of iodine through the B-line.
- 15 Reinstall nozzle B.
- 16 Press **Continue**. The stainer cleans and primes the lines and returns to the Main menu.

SECTION 6 NOZZLE MAINTENANCE AND PERFORMANCE

6.6 Performing the Slide Pattern Test

This test can differentiate poor staining results from sample preparation problems, or nozzle obstructions. Perform the Slide Pattern test when a Hub Pattern test produces a normal result, but staining is still inadequate.

- 1 Place a 1 x 3 inch (2.5 x 7.6 cm) piece of paper in positions 1 and 2 of the carousel, with a blocking slide in front of positions 1 and 2.

- 2 Load the carousel into the stainer and close the lid.



- 3 From the Main menu, select **Maintenance**.



- 4 Press **Pattern Test**.

- 5 Press the corresponding prime button for the reagent line to be tested.

- 6 Remove the paper slides.

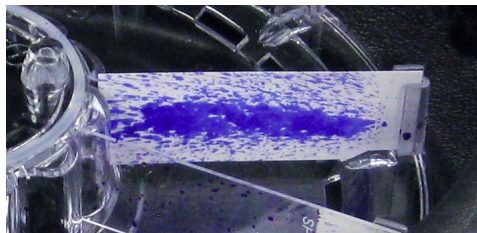
- 7 Repeat Steps 1 through 6 for each reagent line.

- 8 Examine the paper slides for each reagent. The pattern on the slide should be uniform, without any continuous lines or streaks.

Figure 14: Correct Slide Pattern Test Result



Figure 15: Incorrect Slide Pattern Test Result



- 9 If the result is incorrect, clear the nozzle blockage using the nozzle brush, or disassemble and clean the nozzle.

NOTE: If not staining immediately after Slide Pattern Test, it is recommended to run a clean cycle to prevent concentrated reagent from sitting in the lines for extended periods of time.

SECTION 7 SOLVING PROBLEMS

7.1 Troubleshooting

This section helps you identify and solve routine problems with the stainer. More difficult problems may require technical service. Contact your ELITechGroup representative for assistance.



WARNING!

Due to the electrical shock hazard, do not open this instrument or attempt internal repairs. Refer servicing to qualified service personnel. Contact your dealer or ELITechGroup Service.

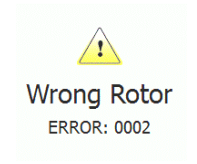
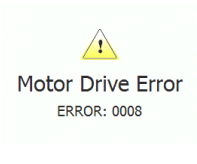

Table 13: General Troubleshooting and Diagnosis

Problem	Solution
There is no power to the stainer when the power switch is turned ON.	<p>Check the facility outlet and the power cord connection.</p> <p>Check the fuses. Refer to the Replacing Fuses procedure.</p> <p> CAUTION: Fuse failure may indicate a serious internal problem.</p>
Strange information shows on the display, and/or erratic stainer operation.	<p>Switch the stainer OFF, wait 10 to 20 seconds, then switch power ON again. If problem recurs, install a computer-type surge suppressor to protect the instrument from power line transients. If possible, connect the stainer to a power circuit that is not shared by centrifuges, refrigerators, air conditioners, or other motorized equipment.</p> <p>If the above steps do not solve the problem, consult the Aerospray Service Manual, or contact your dealer or ELITechGroup for assistance.</p>
A reagent line will not prime when power is ON and you press the prime button.	Follow the procedures in Section 6.3 for priming reagent pumps.
A reagent line will not prime, even with the priming tool (Section 6.3).	Press the priming button and listen carefully for the sound of the pump. If you can hear the pump, try the priming tool again. If the problem is not solved or if you cannot hear the pump there may be an internal problem. Contact your dealer or ELITechGroup for assistance.
Stainer bowl fills with reagent after use.	A small puddle of stain around the drain inlet or the bottom of the bowl is normal. If the bowl is filling with a large quantity of stain, check the external drain tube for blockage. Make sure the drain tube is properly connected and running continuously down toward the lab drain or vented waste container, with no loops, rises, or obstructions. Make sure the end of the tube is not submerged. This can prevent proper drainage. The internal drain may need to be cleaned or replaced. See the Aerospray Service Manual, or contact your dealer or ELITechGroup Service.

SECTION 7 SOLVING PROBLEMS

7.1 Troubleshooting

Table 13: General Troubleshooting and Diagnosis (continued)

Problem	Solution
<p>Stain is leaking onto the counter.</p>	<p>Check all external reagent lines for visible signs of cracks or loose fittings.</p> <p>Make sure the drain outlet is not blocked.</p> <p>Make sure the drain tube is securely attached to the drain port and that the tubing is not cracked or deformed.</p> <p>Reagent leaks may indicate an internal problem (see Section 7.3). See the Aerospray Service Manual, or contact your dealer or ELITechGroup for further assistance.</p>
<p>Error messages on the screen.</p> <div style="text-align: center; margin: 10px 0;">  </div> <div style="text-align: center; margin: 10px 0;">  </div> <div style="text-align: center; margin: 10px 0;">  </div>	<p>If the display shows Lid Not Shut: Verify that the lid is fully closed and latched. If the Lid Not Shut indication remains, contact ELITechGroup for assistance.</p> <p>If the display shows Wrong Rotor after pressing Start: Make sure the slide carousel is properly loaded on the drive hub. In staining mode, the instrument detects whether the staining carousel is present before proceeding. In cytocentrifuge mode, the instrument will stop if it senses the staining carousel. After verifying the carousel is correctly loaded, press Start. If the display still shows Wrong Rotor, there may be an internal problem. Check for missing carousel magnets.</p> <p>The microprocessor monitors carousel rotation during a staining cycle. The display shows an error message if the rotation is not within the specified range.</p> <p>If the display shows Motor Drive Error: Check the stainer bowl for interference: Turn the hub or carousel by hand; it should turn freely.</p> <p>Drive motor or electronic component malfunctions require servicing of internal components. Contact your dealer or ELITechGroup for assistance.</p> <p>If the display shows Rotor Imbalance, make certain the Cytopro rotor is balanced, or the staining carousel is seated correctly on the hub.</p> <p>See Electronic Failure (below).</p>

SECTION 7
SOLVING PROBLEMS

7.1 Troubleshooting

Table 13: General Troubleshooting and Diagnosis (continued)

Problem	Solution
<p>The stainer fails to spray reagent during a staining cycle and/or continues to run after the cycle should be complete.</p>	<p>To allow programmed staining of partial loads, the stainer monitors the position of the carousel as it rotates in the bowl. In normal operation, stain is sprayed only in the correct position. This causes the actual cycle time to vary, depending on the position of the carousel at the beginning of the cycle. However, if the cycle continues for an abnormally long period, or if the bar graph and percentage complete icon do not change after 1 minute, it may indicate an electronic problem or an internal problem. To determine this, press Stop.</p> <p>If the cycle stops: this indicates a problem with the carousel position sensor. Consult the Aerospray Service Manual, or contact your dealer or ELITechGroup for assistance.</p> <p>If the cycle continues: this indicates an electronic problem (see below).</p>
<p>Abnormal staining on entire surface of all slides.</p>	<p>Check the reagent level on the display and/or in the reagent bottles.</p> <p>Make sure the external reagent dip tubes are securely attached to each bottle (Section 2.1).</p> <p>Open the lid and verify that each reagent pump is primed, by pressing the corresponding prime button. The nozzle should immediately spray a fine mist of reagent. There should be no sputtering or hissing sounds, which indicate air in the reagent lines.</p> <p>Watch the external tubes for air bubbles. Air bubbles indicate inadequate priming or possibly an air or reagent leak in the system. Air in any reagent line will cause poor staining. Refer to Section 6.6 for more information.</p> <p>Check nozzle performance using the Slide Pattern (Section 6.6) and Volume Tests (Section 6.4). If necessary, clean nozzle(s) using the procedures in Section 6.1.</p> <p>Verify that each reagent dip tube vent hole is clear.</p>

SECTION 7
SOLVING PROBLEMS

7.1 Troubleshooting

Table 13: General Troubleshooting and Diagnosis (continued)

Problem	Solution
Abnormal staining on entire surface of all slides (continued).	<p>When staining a full carousel (7 or more slides for the 12-slide carousel or 17 or more for the 30- slide carousel), make certain you have not programmed the stainer for fewer slides.</p> <p>If staining a partial load, load the slides in the correct positions as indicated by the markings on the carousel (see Section 4.1).</p>
Abnormal staining on entire surface of some slides, while other slides from the same carousel appear normal.	<p>Make certain that all position magnets are still attached to the bottom of the carousel. Make certain you have not programmed the stainer for fewer slides than you have loaded.</p> <p>If you program the stainer for a partial load, load the slides in the correct positions as indicated by the markings on the carousel (see Section 4.1).</p> <p>Verify that each reagent pump is primed by opening the lid and pressing the corresponding prime button. The nozzle should immediately spray a fine mist of reagent. There should be no sputtering or hissing sounds to indicate the presence of air in the reagent lines (see Section 7.3).</p>
Streaks or bands of discoloration on one or more slides.	<p>Check the level of the Reagent D bottle. Check Reagent D spray volume according to Section 6.4.</p> <p>Check nozzle spray pattern according to the procedures in Section 6.6. This type of discoloration is usually caused by a piece of debris or reagent precipitate clogging the spray nozzle orifice.</p> <p>Clean any nozzle that exhibits a poor spray pattern.</p>
Specimens are washing off slides.	<p>If you are heat-fixing slides: make sure you are using adequate heat. Try fixing some slides with alcohol, in addition to heat, to verify the fixation step.</p> <p>Try to make your smears as thin as possible for a given specimen, to minimize fixation problems.</p> <p>Always use clean, premium quality slides.</p> <p>If you are using the instrument's alcohol fixation function, make sure that High or Normal fixation is activated.</p>

SECTION 7
SOLVING PROBLEMS

7.1 Troubleshooting

Table 13: General Troubleshooting and Diagnosis (continued)

Problem	Solution
Specimens are washing off slides (continued).	<p>If using Normal fixation, switch to High to apply more alcohol.</p> <p>Check the alcohol (Reagent E) level in the bottle or on the display.</p> <p>Check the alcohol (Reagent E) hub pattern and spray volume (see Sections 4.1 and 6.4).</p>
Electronic Failure	<p>An electronic failure would appear as an obvious malfunction such as a scrambled or totally inoperative display panel.</p> <p>Transient voltages coming through the power lines may cause the stainer to “lose its place.”</p> <p>If this occurs, switch the main power OFF for 10-20 seconds and then back ON to reset the instrument.</p> <p>If the problem recurs, install a computer-type surge protector to isolate the instrument.</p> <p>If possible, connect the stainer to a power circuit not shared by centrifuges, refrigerators, air conditioners, or other motorized equipment.</p> <p>For more obscure electronic problems, monitor the stainer through a complete staining cycle to determine if the operating sequence is correct. Do this by running the stainer while watching the display and listening to the pumps.</p> <p>Ensure that each event occurs according to the operating sequence, shown in Table 3 in Section 1.</p> <p>If the problem recurs, contact your dealer or ELITechGroup for assistance.</p>

SECTION 7 SOLVING PROBLEMS

7.2 Abnormal Staining Results

Smear Separation or Cell Loss

Possible causes for losing smears from the slide surface during a staining cycle:

- Improper fixation
- Wet smears
- Thick smears
- Dirty slides

Under-Decolorization

Insufficient decolorization of specimens will result in excessive or partial Gram-positive appearance in the smear's Gram-negative bacteria, due to incomplete removal of the crystal violet-iodine complex. Possible causes for under-decolorization include:

- Incorrect decolorizer setting
- Inadequate decolorizer application
- Over-application of crystal violet and/or iodine
- Thick smears
- Inadequate water delivery

Over-Decolorization

This is typically due to incorrect decolorizer setting. An incomplete application of the crystal violet primary stain or iodine mordant would also cause over-decolorization, but is less likely to occur. Possible causes of over-decolorization include:

- Incorrect decolorizer setting
- Inadequate crystal violet or iodine application
- Clogged or dirty spray nozzles
- Over application of crystal violet and/or iodine
- Degraded iodine
- Old or weak cultures
- Thick or clumped smears

Old or Weak Cultures

Most bacterial cultures will deteriorate rapidly after 24 to 48 hours and become more difficult to properly stain. Use fresh (< 24 hours old) cultures whenever possible.

NOTE: Always check instrument nozzle performance before making instrument adjustments (see Section 6). Adjusting staining attributes before checking for mechanical problems can mask reagent delivery problems.

SECTION 7 SOLVING PROBLEMS

7.3 Instrument Malfunction

Air or Reagent Leaks

Repriming the instrument is usually unnecessary unless a reagent bottle runs completely dry.

An air leak is usually to blame if a smooth and continuous liquid spray fails to come from the nozzles. Carefully inspect all components in the external reagent delivery lines. Look for loose connections, cracks, or breaks that might allow air to be drawn in when the pump operates. Replace any defective part or assembly.

An internal leak may cause fluid to leak from the line when the pump is not running. If an abnormal liquid spray still occurs after all the external reagent delivery line components have been verified, the instrument may require service.

A reagent line leak between the pump outlet and the nozzle will cause fluid to leak into the interior of the stainer housing and ultimately onto the counter. If you observe this, the instrument will require service. Contact your dealer or ELITechGroup for assistance.



Reagent Delivery Lines



WARNING!

A break or malfunction in the reagent delivery system can potentially release up to 1000 mL of highly flammable anhydrous alcohol in and around the instrument. If this occurs, carefully shut off the power to the instrument and consult the SDS for information in handling alcohol spills. Do not use the instrument again until any leaks are repaired.



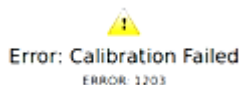
WARNING!

Electrical shock hazard—do not open this instrument or attempt internal repairs. Refer servicing to qualified service personnel. Contact your dealer or ELITechGroup Service.

SECTION 7 SOLVING PROBLEMS

7.3 Instrument Malfunction

Reagent Level Detect System Errors



Reagent A-E Not Calibrated

During the second part of calibration, if no bottles are detected, the display shows an error message.

Calibrate again, making sure that the reagent bottles are inserted in those tray positions that have been enabled in the level detection system.

LD (Level Detection) Unstable

If movement was detected on bottles while calibrating/zeroing, the display shows an error message.

NOTE:

While zeroing or calibrating, do not bump the instrument or lab bench. Ensure that no nearby equipment vibrations can be transmitted to the stainer.

SECTION 7 SOLVING PROBLEMS

7.3 Instrument Malfunction

Calibrating the Reagent Level Detect System

If the Reagent Level Detect System is reporting incorrectly and zeroing (Section 2.2) does not correct the problem, calibrate the system as follows:



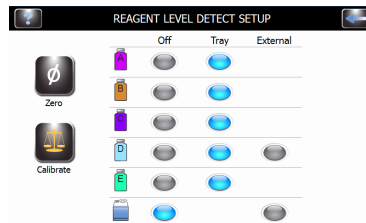
- 1 Press **System Information** from the Main menu.



- 2 Press **System Setup**.



- 3 Press **Level Detect**.



- 4 Press **Calibrate**. Follow the display prompts.



7.3 Instrument Malfunction

Calibrating the Reagent Level Detect System (continued)



- 5 Remove all reagent bottles and press **Start**. The display shows:

REAGENT LEVEL DETECT ZERO

Zeroing...
Please Wait

NOTE: Any vibrations or bumps to the instrument or lab bench can cause inaccuracies in zeroing or calibration.

NOTE: Calibration requires full, unopened (caps and seals in place) 500 mL bottles of reagent, placed in the correct tray positions (due to different densities of each reagent type).



- 6 Place the correct reagent bottles in all **enabled** positions, and press **Start**. The display shows:

REAGENT LEVEL DETECT CALIBRATE

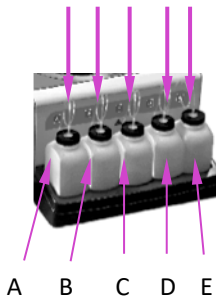
Calibrating...
Please Wait

NOTE: The calibration function ignores any disabled reagent line.



- 7 Press **OK**. Press **Back** twice to return to the Main menu.

- 8 Return the reagent bottles to the tray as indicated in Section 2.1 to prepare for staining.



NOTE: For accurate reagent level detection and calibration, dip tubes must follow their pre-formed coiled shapes.

SECTION 7 SOLVING PROBLEMS

7.4 Calibrating the Touchscreen



- 1 Select and hold **Standby/Ready** for 5 seconds. A calibration screen with a target appears.
- 2 Select the center of the target with a finger, stylus, or similar tool. Another target will appear in a different location.
- 3 Continue to press the center of the targets until you have pressed all the targets (five total). After the fifth target is pressed, the instrument will save the touch screen calibration and return to the Main menu.

SECTION 7 SOLVING PROBLEMS

7.5 Customer Service

ELITechGroup's Service Department will help you resolve any questions about the operation or performance of your Aerospray Stainer/Cytocentrifuge.

Customers in the United States should contact us by telephone. Outside the U.S., our authorized dealers offer full local service and support.

**ELITECHGROUP INC.**

370 West 1700 South
Logan, Utah 84321 USA

Telephone:

800 453 2725 (*United States & Canada*)
(+1) 435 752 6011 (*International calls*)

Fax:

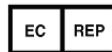
(+1) 435 752 4127

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SECTION 8 CYTOPRO® CYTOCENTRIFUGE

8.1 Cytopro Cytocentrifuge Information

Functional Description

The Cytopro Cytocentrifuge rotor allows rapid sedimentation of specimen cells onto microscope slides for staining or other purposes. Up to eight disposable/reusable sample chamber assemblies with absorbent pads and glass microscope slides can be loaded into the Cytocentrifuge rotor.

Cytocentrifuge and staining functions are independent of one another.

The Cytopro rotor reduces cell loss during collection and prevents accidental damage to the collected specimen. The rotor is sealed to control aerosol release during cytocentrifugation.

Key Features

Adding the Cytopro Cytocentrifuge rotor transforms the stainer into a standard cytocentrifuge with:

- Single, Dual, and Cytopro Magnum chambers
- Reusable or disposable, chambers (single and dual)
- Holds Eight slides and chambers
- User-programmable memory locations for settings (speed, acceleration rate, and time)
- Easy switching between staining and cytocentrifuge modes
- Autoclavable rotor

NOTE: Pressing *Cyto* brings up the *Cytocentrifuge mode*. Pressing *Back* returns to *stain mode*.



WARNING!

The Cytopro rotor lid, rotor gaskets and related components are intended to be part of biosafety system as specified in international and national biosafety guidelines. They cannot be relied on as the only means of safeguarding workers and the environment when handling pathogenic microorganisms.

Intended Use

The Cytopro Cytocentrifuge rotor is an in vitro diagnostic medical device for professional use only. It is an accessory for fixing biological cell suspensions on glass microscope slides for cytological examination.

The Cytocentrifuge rotor can be used with the following cell suspensions:

- Bronchoalveolar liquid (BAL)
- Cerebrospinal fluid (CSF)
- Urine
- Synovial fluid
- Others

Complete information on the Cytopro Cytocentrifuge is available from ELITechGroup. Instructions for use are available in the Cytopro Rotor (AC-160) Series 2 User Manual.

Critical Reagent Components

The following information identifies the critical chemicals of each reagent used in this instrument.

Reagent(s)	Critical Components
SS-041A and SS-041A-EU, Gram Reagent A Decolorizer with Safranin contains:	55-65% Isopropyl Alcohol 35-45% Methyl Alcohol <1% Safranin
SS-041AF and SS-041AF-EU, Gram Reagent A Decolorizer with Fuchsin contains:	55-65% Isopropyl Alcohol 35-45% Methyl Alcohol 0.1-0.2% Basic Fuchsin
SS-141A Gram Reagent A Safranin Concentrate when diluted with isopropanol/methanol as directed contains:	55-65% Isopropyl Alcohol 35-45% Methyl Alcohol <1% Safranin
SS-141AF Gram Reagent A Fuchsin Concentrate when diluted with isopropanol/methanol as directed contains:	55-65% Isopropyl Alcohol 35-45% Methyl Alcohol 0.1-0.2% Basic Fuchsin
SS-041AA and SS-041AA-EU, Gram Reagent A Decolorizer with Acetone and Safranin contains:	70% to 80% Isopropyl Alcohol 20% to 30% Acetone <1% Safranin
SS-041AAF and SS-041AAF-EU, Gram Reagent A Decolorizer with Acetone and Fuchsin contains:	70% to 80% Isopropyl Alcohol 20% to 30% Acetone 0.1-0.2% Basic Fuchsin
SS-141A Gram Reagent A Safranin Concentrate when diluted with isopropanol/acetone as directed contains:	70% to 80% Isopropyl Alcohol 20% to 30% Acetone <1% Safranin
SS-141A Gram Reagent A Safranin Concentrate contains:	25-30% Deionized Water 5-10% Safranin
SS-141AF Gram Reagent A Fuchsin Concentrate when diluted with isopropanol/acetone as directed contains:	70% to 80% Isopropyl Alcohol 20% to 30% Acetone 0.1-0.2% Basic Fuchsin
SS-141AF Gram Reagent A Fuchsin Concentrate contains:	25-30% Deionized Water 2-4% Basic Fuchsin
SS-041B and SS-041B-EU, Gram Reagent B Iodine contains:	92-98% Deionized water <1% Iodine <1% Potassium Iodide
SS-141B Gram Iodine Concentrate when diluted as directed contains:	92-98% Deionized water <1% Iodine <1% Potassium Iodide

APPENDIX A

Critical Reagent Components

Reagent(s)	Critical Components
SS-141B Gram Iodine Concentrate contains:	60-70% Deionized Water 5-10% Potassium Iodide 2.5-5% Iodine
SS-041C and SS-041C-EU, Gram Reagent C, Crystal Violet contains:	95-99% Deionized water 0.1-0.2% Crystal Violet
SS-141C Gram Crystal Violet Concentrate when diluted as directed contains:	95-99% Deionized water 0.1-0.2% Crystal Violet
SS-141C Gram Reagent C Crystal Violet Concentrate contains:	45-55% Deionized Water <5% Crystal Violet
SS-MeOH Methanol contains:	≥99.5% Methyl Alcohol, Anhydrous
SS-029 Nozzle Cleaning Solution contains:	40-50% Methyl Alcohol 1-5% Oxalic Acid
SS-029C, SS-029CG Nozzle Cleaning Solution Concentrate:	95-99% Deionized Water 1-5% Oxalic Acid
SS-230 Aerospray Stain Residue Solvent contains:	70-85% Dimethyl sulfoxide
SS-133 Decontamination Solution Concentrate contains:	<30% Germicidal Detergent >70% Deionized Water
SS-133 Decontamination Solution when diluted as directed contains:	<2% Germicidal Detergent >98% Deionized Water

APPENDIX B

Stain Information

Stain Description

The stains listed in this manual are for use with the Aerospray Hematology Stat Slide Stainer/Cytocentrifuge for use by medical professionals to stain specimens as a step of standard laboratory practice in diagnosing disease.

Stain Composition

Critical components of stains and cleaning solutions used with this instrument are listed in Appendix A.

Storage and Shelf Life

Stains and cleaning solutions are stable up to the expiration date indicated on the label.

Stains and cleaning solutions should be stored 15 – 30 °C unless otherwise stated on the label.

Once opened, stains are stable for 90 days on board the instrument.

Hazards and Precautions

The stains and cleaning solutions used with the Aerospray Hematology Stat Slide Stainer/Cytocentrifuge have been classified according to the following standards:

- Globally Harmonized System (GHS) United States Classification
- Regulation (EC) 1272/2008 Classification, Labelling and Packaging of Substances and Mixtures (CLP)

Information for each stain and cleaning solution regarding signal words, hazard classification, hazard pictograms, hazard and precautions statements can be found in the applicable Safety Data Sheet (SDS) for each stain or cleaning solution as well as the product labeling.

SDS for all stains and cleaning solutions can be requested from ELITechGroup technical service or can be obtained by accessing the following website:

<https://ebs.elitechgroup.com/SDS/>

APPENDIX C

Accessories and Supplies

Only replacement parts supplied by ELITechGroup should be used in this instrument. Use of non-approved parts may affect the performance and safety features of this product.

ACCESSORIES	REFERENCE NUMBER
Cytopro® Rotor.....	AC-160
Aerospray® 12-Slide Carousel.....	AC-188
Aerospray® 30-Slide Carousel.....	AC-189
Gram Stain Control Slides, Qty 50	SS-250
Gram Stain Control Slides, Qty 10	SS-250SAM

STAINS AND CLEANING SOLUTION	REFERENCE NUMBER
Aerospray® Nozzle Cleaning Solution, 355mL	SS-029
Aerospray® Nozzle Clean Solution concentrate, 250mL	SS-029C or SS-029C-EU
Aerospray® Gram Reagent A, Decolorizer with Safranin, 500mL.....	SS-041A or SS-041A-EU
Aerospray® Gram Reagent A, Decolorizer with Acetone and Safranin 500mL	SS-041AA or SS-041AA-EU
Aerospray® Gram Reagent A, Decolorizer with Fuchsin, 500mL.....	SS-041AF or SS-041AF-EU
Aerospray® Gram Reagent A, Decolorizer with Acetone and Fuchsin, 500mL...	SS-041AAF or SS-041AAF-EU
Aerospray® Gram Reagent B, Iodine, 500mL	SS-041B or SS-041B-EU
Aerospray® Gram Reagent C, Crystal Violet, 500mL	SS-041C or SS-041C-EU
Aerospray® Gram Reagent A, Safranin Concentrate, 210mL	SS-141A
Aerospray® Gram Reagent A, Fuchsin Concentrate, 135mL	SS-141AF
Aerospray® Gram Reagent B, Iodine Concentrate, 500mL.....	SS-141B
Aerospray® Gram Reagent C Crystal Violet Concentrate, 135mL	SS-141C
Aerospray® Reagent-Grade Methanol, 500mL.....	SS-MeOH

SUPPLIES	REFERENCE NUMBER
Nozzle Tool	AC-034
Nozzle Hex Wrench	AC-035
5 L Space-Saver Container w/cap (For Concentrate Reagents).....	AC-038
Drain tube, 1.8 meters (6 feet) long	AC-041
500 mL bottle with cap (pack of 5 bottles).....	AC-043-05
5 L Reagent Bottle Assembly (for Reagent D) (without level detect).....	AC-072
Nozzle Orifice Cleaning Wire	AC-059
Reagent Pump Priming Tool	AC-069
Aerospray®/Cytopro® Safety Shield	AC-110
10 L Waste Container (without level detect).....	AC-170
1D Barcode Scanner	AC-181
10 L Waste Container (with level detect)	AC-182
5 L Bottle Assembly (with level detect)	AC-183
Nozzle Maintenance Kit.....	AC-184
2D Barcode Scanner	AC-185
Decontamination Solution Concentrate.....	SS-133
O-Ring/Nozzle Thread Grease (3 grams)	SS-103
Preventive Maintenance Chart, pad of 24 sheets	SS-125

Reagents with the EU suffix are manufactured in Europe and are available in the European market.
Contact ELITechGroup for a complete list of replacement parts.

APPENDIX D Cleaning Solutions

ELITechGroup Inc. offers several cleaning solutions for the Aerospray Stainer/ Cytocentrifuge family. The following products are available to keep your Aerospray running safely and optimally.

SS-029 and SS-029C/SS-029C-EU Aerospray® Nozzle Cleaning Solution

Aerospray Nozzle Cleaning Solution (SS-029) and Aerospray Nozzle Cleaning Solution Concentrate (SS-029C/SS-029C-EU) when diluted as recommended should be used for cleaning the instrument. Specifically for:

- General cleaning
- Nozzle cleaning
- Instrument interior and exterior cleaning
- Carousel cleaning

The Aerospray Nozzle Cleaning Solution may be purged through the instrument pumps without causing damage to the instrument.

Dilution instructions for the Aerospray Nozzle Cleaning Solution Concentrate (SS-029C/SS-029C-EU) can be found by referring the instructions in **DOC-00123**.

SS-133 Decontamination Solution Concentrate

Decontamination Solution Concentrate (SS-133) when diluted as recommended should be used for decontamination of the inner and outer surfaces before the instrument is returned to ELITechGroup Inc. for Service or when instrument will be prepared for long-term storage.

SS-222 Aerospray® Line Cleaner

Aerospray Line Cleaner (SS-222) may be used if needed or if recommended by ELITechGroup Inc. service personnel to clean out the stainer lines.

Aerospray Line Cleaner can be purged through pumps without causing damage to the instrument.

Contact ELITechGroup technical service for more information.

APPENDIX D

Cleaning Solutions

SS-230/SS-230-EU Aerospray® Stain Residue Solvent

The Aerospray Stain Residue Solvent (SS-230/SS-230-EU) is for exterior cleaning of the nozzles, carousels, and bowls of Aerospray Slide Stainers. The Aerospray Stain Residue Solvent can be used as a cosmetic cleaner for the outside of the instrument, sinks, floors, counter tops, etc.



WARNING!

Do not run Aerospray Stain Residue Solvent (SS-230/SS-230-EU) through stainer pumps as serious damage will result to the instrument. This solvent is for the exterior cleaning of nozzles, carousels and bowls for Aerospray slide stainers only.

Cleaning Carousels

1. Remove carousel from instrument.
2. Remove lid.
3. Pour a small amount of SS-230 Aerospray Stain Residue Solvent (~5-10 ml) on the carousel and the lid.
4. Lightly scrub the carousel with a paper towel or brush over all fouled areas. Rinse lid and carousel with water, methanol, and/or spray the top of the lid and run a carousel clean cycle.
5. Repeat as necessary.

All other Cleaning

1. Test the use of SS-230 Aerospray Stain Residue Solvent on a small non-conspicuous area of the surface to be cleaned to ensure compatibility.
2. Lightly scrub area to be cleaned with a paper towel.
3. Rinse the area cleaned with deionized water or methanol and wipe dry.

SS-266/SS-266-EU Aerospray® PM Cleaning Solution

Aerospray PM Cleaning Solution (SS-266/SS-266-EU) can be used for cleaning the instrument when performing preventive maintenance on the instrument. The Aerospray PM Cleaning Solution is recommended for nozzle cleaning especially for nozzles that have stubborn contamination.

The Aerospray PM Cleaning Solution may be purged through the instrument pumps without causing damage to the instrument.

See Section 5 of this manual for information on preventive maintenance procedures.

SS-MeOH Aerospray® Reagent Grade Methanol

Aerospray Reagent Grade Methanol (SS-MeOH) can be used for general exterior and internal cleaning of the instrument and pumps. Refer to the relevant sections in this manual for its applicable use.

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