Reference Manual

AutoMate 2500 Family Reference Manual

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Reference Manual
AutoMate 2500 Family Reference Manual
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Trademarks

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Original Instructions

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Revision History

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

Release date	Revision	Description
December 2015	A	AutoMate software version 4.1.5. Additional operational information moved to the AutoMate 2500 Family Reference Manual from the AutoMate 2500 Family IFU.
May 2016	B	List of related documents updated.
October 2016	C	Troubleshooting topic added on Recapper videos to remove a Parafilm jam and exchange the Parafilm roll
April 2017	D	Moved **Tubes** topic to IFU. Updated voltage requirements in Electrical Requirements for AutoMate 1200/2500 and Electrical Requirements for AutoMate 1250/2550. Added topic Compliance Information Added topic Glossary of Symbols Used in AutoMate 2500 Family System Labels Added topic Glossary of Labels Used in AutoMate 2500 Family Systems Added topic Position of Labels on AutoMate Systems

Revision History

Safety Notice

Read all product manuals and consult with Beckman Coulter-trained personnel before you operate the system. Do not perform any procedure before you carefully read all instructions. Always follow the product labels and the recommendation from the manufacturer. For more information, contact Beckman Coulter.

Symbols and Warnings

Alerts for Warning, Caution, Important, Note, and Tip

WARNING

Warning indicates a potentially hazardous situation which, if not avoided, could cause death or serious injury. Warning can indicate the possibility of erroneous data that could cause an incorrect diagnosis.

CAUTION

Caution indicates a potentially hazardous situation which, if not avoided, can cause minor or moderate injury. Caution can also alert against unsafe practices, or indicate the possibility of erroneous data that could cause an incorrect diagnosis.

IMPORTANT

Important indicates important information to follow.

NOTE

Note indicates notable information to follow.

TIP

Tip indicates information to consider.

Symbols Used

The following symbols are used in our documentation.

Symbol	Meaning
	**Biological risk** This symbol warns of biohazardous material or risk of being contaminated.

Symbol	Meaning
	**Caution** This symbol indicates a potential hazard which, if not avoided, could result in minor or moderate injury.
	**Electrical hazard** This symbol denotes an area of the system that should under no circumstances be accessed as an electric shock risk exists.
	**Laser radiation** This symbol warns that a laser is part of the device. To avoid eye injuries do not look directly into the laser beam.
	**Hand injury** This symbol indicates areas where there is a risk of injury to fingers or the hand due to instrument movement.
	Wear Gloves
	Wear Eye Protection
	Disconnect Mains Plug

Safety Instructions

CAUTION

Observe the following safety instructions when working on the system:

Inspect the working environment

To avoid injury, inspect your working environment for edges, corners, or protruding parts before working on the system.

Avoid moving parts

While the system is in operation, do not touch or go close to any moving parts. Close protective guards and covers during operation. Failure to close covers correctly can cause injury or incorrect results.

Disconnect system from the mains when working on electrical cabinet

The electrical cabinet contains live wires even when the main switch is turned off. These wires have visible, yellow markings near all connection points.

Check locking of safety cover position

When lifting safety covers, lock the cover in the raised position before releasing it to avoid injury.

Risk of injury caused by heavy load

During installation, you risk injuring your hands, fingers and back while handling heavy loads. To avoid these risks, carry or transport the system or parts of the system following the specified transportation instructions.

Avoid contact with sample fluid

Avoid direct contact with patient samples, disposable pipette tips, used caps, any machine components that come in contact with sample fluids, and liquid waste. Always wear gloves and other protective gear to protect yourself from infection. Before troubleshooting the system with open doors and covers, remove patient samples. Handle all liquid waste as potentially infectious. Some liquid waste can require special treatment before disposal. Follow your laboratory procedure.

Take measures after contact with sample fluid

If you come into direct contact with sample fluid, thoroughly wash the affected area and consult a physician. Immediately wipe off any contaminants from the system. Clean the system using approved liquid disinfectant. After working on the system, clean your hands thoroughly.

Use non bio-hazardous substitutes only when performing tests

Take protective measures if you have to test the system using patient samples. Use protective equipment for your eyes, nose, and mouth, such as safety glasses or a visor or mask.

Wear protective clothing

Wear protective clothing and follow universal precautions as dictated by local or national regulations (CLSI GP17-A2, ISO15190 or 29CFR 1910.1030).

Biological risks and hand injury when removing samples

If it is necessary to remove a sample tube manually from the robot grippers, take care not to come into contact with the sample.

Contamination by exceeded fill level

Exceeding the maximum fill level can contaminate the device and samples.

Use only input and output drawers for loading and unloading tubes

While the system is running, only use the input and output drawers to load racks and tubes. Do not reach into the system to manually insert or remove tubes while the system is running! If you need to remove tubes manually, for example in case of an error, stop the system first.

Do not enable remote access to the AutoMate 2500 Family PC. Do not install other software on the AutoMate 2500 Family PC.

Do not enable remote access to the AutoMate 2500 Family PC or install any other software! Doing so can disrupt correct operation of the PC and may lead to incorrect patient results.

Safety Recommendations

Avoid problems caused by power failure

To avoid the problems caused by a power failure and to protect sample data, we recommend using a UPS (uninterruptible power supply).

Software restart mandatory after intended or unintended power interruptions

After any intended or unintended power interruption, be sure to restart the software and to perform a complete system initialization.

Equipment damage due to failure to meet power requirements

Before connecting the system to the power line, check that the voltage and frequency ratings of your power line match those indicated on the device label.

Disconnect mains plug

Always disconnect mains plug when working on electronic parts or on parts connected to the power supply.

Read documentation

Read and understand the documentation before operating the system.

Compliance Information

Recycling

This label is required in accordance with the Waste Electrical and Electronic Equipment (WEEE) Directive of the European Union. The presence of this label indicates that:

1. The device was put on the European Market after August 13, 2005
2. The device is not to be disposed of via the municipal waste collection system of any member state of the European Union

Customers must understand and follow all laws regarding the correct decontamination and safe disposal of electrical equipment. For Beckman Coulter products bearing this label, contact your dealer or local Beckman Coulter office for details on the take-back program that facilitates the correct collection, treatment, recovery, recycling and safe disposal of these products.

For the Japan Market:

This system is considered an industrial waste, subject to special controls for infectious waste. Prior to disposal of the system, refer to the "Waste Disposal and Public Cleaning Law" for compliance procedures.

C-Tick Mark

The C-Tick mark is intended for use on products that comply with the applicable Electromagnetic Compatibility (EMC) standards in the Australian or New Zealand market.

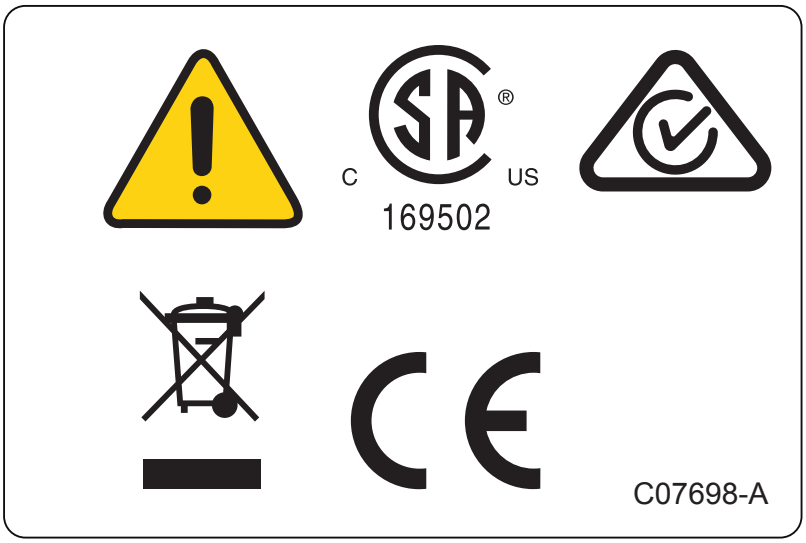
CE Mark

CE marking attests the conformity of the product with the applicable requirements of the relevant European Community harmonization legislation.

CSA Mark

Indicates that the product was tested and has met the certification requirements for electrical, plumbing and/or mechanical products in Canada and the United States.

Figure 1



Intended use

The AutoMate 2500 Family is a series of semi-open pre and post-analytical sample processing and sorting systems. The system automates the process of sorting, decapping, and archiving samples. The tube and cap type and cap color of a sample is identified. Optional features include:

- Aliquot module to create labeled secondary tubes and detect that the sample volume is sufficient for the requested aliquots
- Recapper module to reseal decapped tubes for archiving

Misuse

IMPORTANT

Only use AutoMate 2500 Family systems for the intended use!

Any use of the AutoMate which is not explicitly defined in this manual as compliant with the intended use is regarded as a violation of the intended use. Any use or operation of the AutoMate beyond its intended use will render warranty and liability claims null and void.

Violation of the intended use include:

- Modifications to the system installation or configuration (contact your local Beckman Coulter representative)
- Use of accessories or consumables not approved by Beckman Coulter
- Operation of the system by untrained staff
- Access to the system by untrained staff
- Manipulation of safety devices

- Disregard of the warnings and cautions in this manual
- Disregard of applicable standards, guidelines and other provisions
- Disregard of the service and cleaning instructions in this manual
- Do not enable remote access to the AutoMate 2500 Family PC or install any other software! Doing so can disrupt correct operation of the PC and may lead to incorrect patient results.

Owner's responsibility

The owner is responsible for:

- Maintaining the equipment in optimum condition to prevent equipment failure and possible health hazards. The equipment requires regular maintenance to guarantee technical reliability.
- Providing adequate lighting and ventilation of the operating area.
- Giving equipment operators regular instruction for their responsibilities and ensuring compliance.

Only authorized staff can service the system. Any attempt to repair equipment under warranty will violate that warranty.

NOTE

Operating a system that is unfit for use is considered an infringement of the intended use. The operator assumes liability for personal injury and damage to property resulting from non-compliance with the instructions provided for the product.

Risk Management

The AutoMate System is designed and manufactured on the basis of a risk management analysis in compliance with ISO 14971. The risk management checklist for the AutoMate and the ANSI Z535.4 standard are the basis for all safety labels and instructions and defined sources of danger.

Machine Safety Labels

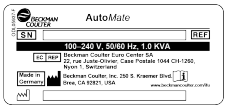
The following sections give you an overview about the different safety relevant labels on the system and their meaning.

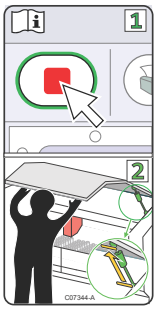
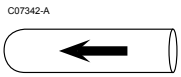
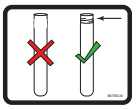
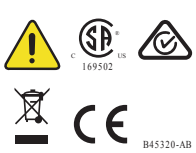
Glossary of Symbols Used in AutoMate 2500 Family System Labels

Symbol	Standard Number And Title Of Standard	Title of Symbol And Symbol Reference Number	Meaning Of Symbol
	IEC 60878. Graphical Symbols for electrical equipment in medical practices.	**Warning; Biological Hazard,** ISO 7010-W009	To warn of a biological hazard.
	ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements.	**Caution,** 5.4.4.	Indicates the need for the user to consult the instructions for use for important cautionary information such as warnings and precautions that cannot, for a variety of reasons , the presented on the medical device itself.
	IEC 60878. Graphical Symbols for electrical equipment in medical practices.	**Warning; Hot surface,** ISO 7010-W017	To warn of a hot surface.
	IEC 60878. Graphical Symbols for electrical equipment in medical practices.	**Warning; Sharp elements,** ISO 7010-W022	To warn of a sharp element.
	IEC 60878. Graphical Symbols for electrical equipment in medical practices.	**Warning; Laser Beam,** ISO 7010-W004	To warn of a laser beam.
	ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements.	**Consult instructions for use,** 5.4.3	Indicates the need for the user to consult the instructions for use.
	ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements.	**Serial Number,** 5.1.7	Indicates the manufacturer's serial number so that a specific medical device can be identified.
	ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements.	**Catalogue Number,** 5.1.4	Indicates the manufacturer's catalogue number so that the medical device can be identified.

Symbol	Standard Number And Title Of Standard	Title of Symbol And Symbol Reference Number	Meaning Of Symbol
	ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements.	**Authorised representative in the European Community,** 5.1.2	Indicates the authorized representative in the European community.
	ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements.	**Manufacturer,** 5.1.1	Indicates the medical device manufacturer as defined in EU Directives 90/385/ EEC, 93/42/EEC and 98/79/EC.
	ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements.	**Date of Manufacture,** 5.1.3	To indicate the date when the medical device was manufactured.

Glossary of Labels Used On AutoMate 2500 Family Systems

Label	Meaning Of Label	Figure Callout[1]
 www.beckmancoulter.com/ifu	Consult the Instructions For Use. The instructions for use can be obtained by contacting your local Beckman Coulter representative or obtained electronically at: www.beckmancoulter.com/ifu	(19)
	Caution - risk of injury from moving parts.	(1,5)
	Warning; Hot Surface. Consult the instructions for use.	(13)
	Warning; Sharp Element.	(6) [2]
	Warning; Biological Hazard.	(4) [2]
	AutoMate Name Rating Plate. Conveys information regarding the specific AutoMate 2500 Family System.	(8)

Label	Meaning Of Label	Figure Callout[1]
	Warning; Biological Hazard. Caution - risk of injury from moving parts. Consult the Instructions For Use.	(2,10-12,17,23)
	Normal working pressure of compressor is 6 bar / 87 psi.	(3)[3]
	Do not rotate manually.	(7) [2]
	Stop the system before opening protective covers. When lifting a protective cover, make sure that it locks in the raised position before releasing it.	(14)
	Fully extend drawers before accessing trays to prevent contact with moving parts.	(18)
	Tube direction.	(21) [3]
	Screw cap secondary tubes only!	(22) [4]
	Laser Radiation, Class 2 Laser Product. Do not stare into beam.	(15,16,20)
	Compliance label. Refer to Compliance Information for details.	(9)

[1] The numbers detailed in **Figure Callout** correspond with the callout numbers displayed in the figure within Position of Labels on AutoMate Systems.

[2] These labels are only present on **AutoMate 2500 Family Systems** with the optional **Recapper** module installed.

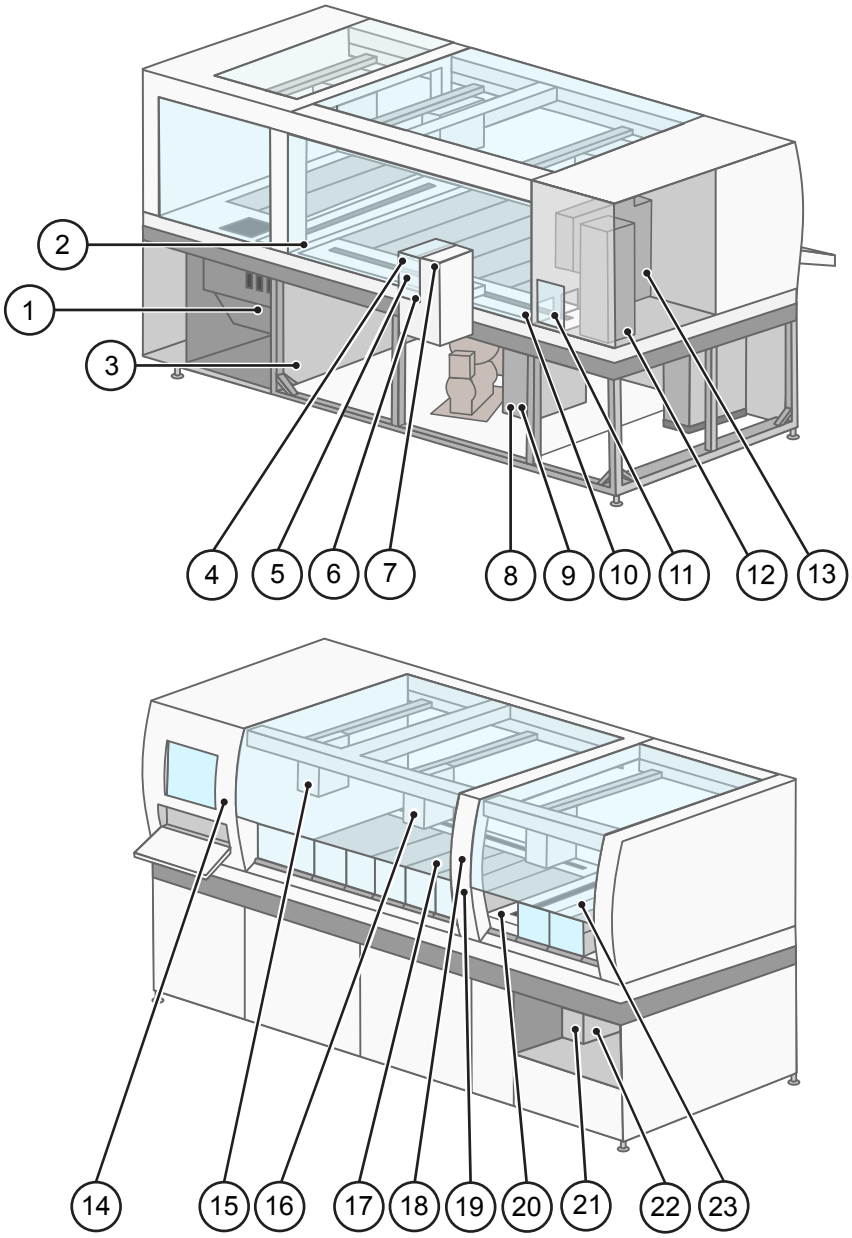
[3] These labels are only present on **Automate 1250** and **AutoMate 2550** Systems.

[4] This label is only present on **Automate 1250** and **AutoMate 2550** Systems which have been refitted according to **MOD 11564: AutoMate 2500 Family Screw Cap Secondary Tubes**.

Position of Labels on AutoMate 2500 Family Systems

The Figure shows the positions of labels on the rear (top image) and front (bottom image) of the AutoMate 2500 Family Systems. The numbers in the figure correspond with each label listed in the Glossary of Labels on AutoMate 2500 Family Systems.

Figure 2



Introduction

About this Manual

This manual provides additional information on the AutoMate 2500 Family system hardware and software, as well as its safe operation.

The recent version of the AutoMate 2500 Family Reference Manual is available for download on www.beckmancoulter.com. If you open the page for the first time, you need to select your region and your country (only necessary when accessing the website for the first time).

Click **Support**>**Technical Documents**.

Select Market Segment **Diagnostics**, Product Line **Automation**, Product Series **AutoMate**, Product **AutoMate 2500 Family Systems**. Download the AutoMate 2500 Family Reference Manual.

Purpose and Target Group

This manual is addressed to operating staff. Operating staff roles include:

- Physicians
- Chemists and biologists
- Trained laboratory staff

All operating staff must be trained to use Beckman Coulter products on behalf of the owner. These persons must be authorized by the owner for the fulfillment of their tasks.

The operator is responsible for the user maintenance procedures.

Information and Documentation Obligations

Comply with these documentation obligations:

- This manual must always be accessible to all operators of the system.
- Before operating the AutoMate system, all operators must read and understand this manual.
- All operators must observe the safety precautions in this manual.
- All operators must be adequately informed about the modules of the AutoMate and their principle of operation.

Definitions of Terms and Abbreviations Used in this Documentation

AU	Analyzer Unit
BTU	British Thermal Unit, energy unit, 1 BTU = 1,055 Joule

LIS	Laboratory Information System
MSDS	Material Safety Data Sheets
MTP	Microtiter Plates
Rack ID	The bar code identifying the rack, typically a four-digit number Bar code type: "NW-7 with checksum" (also referred to as "Codabar with checksum")
Sample	Tube containing a specific material like serum, urine or others to perform the tests on
TTP	Thermal Transfer Printing
TTU	Tube Transfer Unit
UPS	Uninterruptible Power Supply

EC Declaration by the Manufacturer

The AutoMate conforms to the following EU product directives:

- 2006/42/EC concerning Machinery
- 2006/95/EC concerning Low Voltage Equipment
- 2004/108/EC concerning Electromagnetic Compatibility

CE

CHAPTER 1

System Overview

System Features

The AutoMate 2500 Family system has the following features:

Standard:

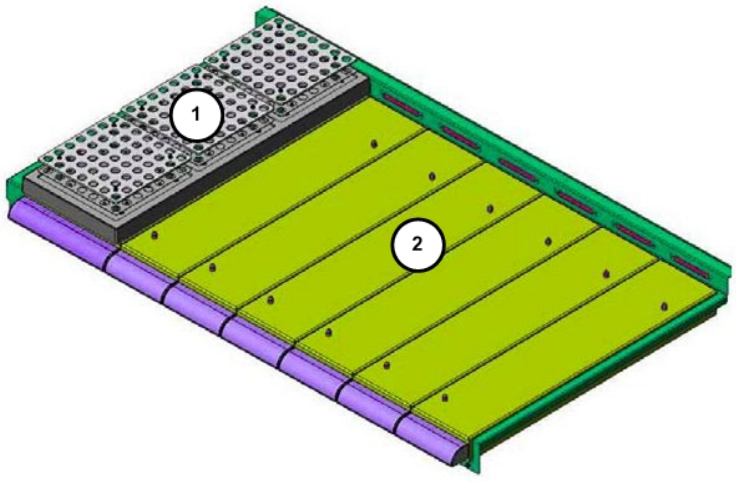
- Sample input for up to 300 sample tubes. Continuous sample reloading even during operation.*
- Bar code readers integrated in robot 1 and robot 2 read all standard bar code labels.
- Tube inspection unit can identify sample tube type, size, and cap color. Read-through label volume detection determines the liquid level and calculates the sample volume.
- Decapper can decap all standard primary tube closures including screw caps and rubber caps.
- Sample conveyor belt can handle various standard tube sizes and types at the same time.
- Output area can hold up to 1,080 sample tubes on six independent output drawers, which the operator can access any time.

Optional:

- Aliquotter uses disposable pipette tips to avoid cross-contamination. One primary tube can create up to seven aliquots in secondary containers, depending on the primary sample volume. Secondary sample tubes are labeled. The operator can define the bar code label format to use.
- Recapper can recap all standard primary and secondary containers for archiving.

Input and Output Area

Figure 1.1 Input (1) and output (2) areas of the AutoMate system

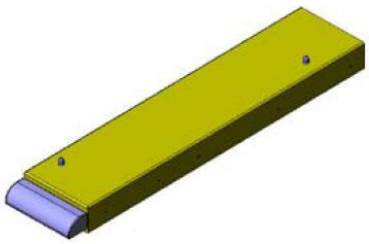


* You can use an output drawer as an input drawer to increase sample tube processing to up to 150 tubes per drawer. Contact your Beckman Coulter representative for more information.

Figure 1.2 Input rack loaded

The aliquotter produces secondary containers with bar code labels. These tubes are sorted to the output area. A customizable combination of base frames and racks are located on drawers for automatic and manual workplaces. This system allows for accurate sample tube processing. Base frames and racks can be exchanged on the drawers quickly.

Figure 1.3 Drawer (6x)



Base Frame and Rack Types

A base frame is the mechanical interface between the drawer beneath and the rack on top. It can accommodate different types of racks.

Figure 1.4 Base frame with positioning guides for racks (for example AU NE tray)

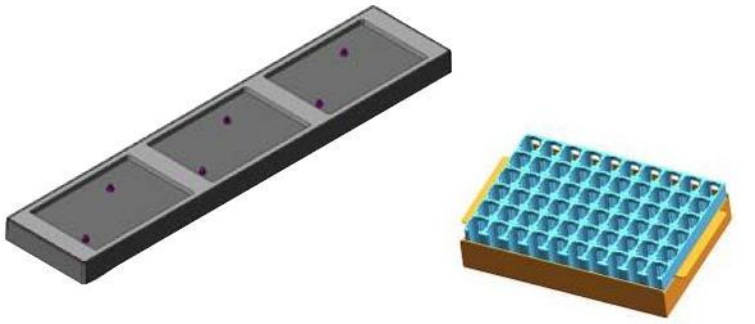
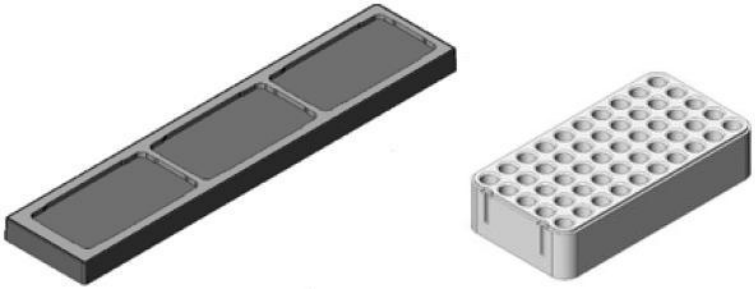


Figure 1.5 Base frame without positioning guides to be used only with racks (for example 50-position rack)

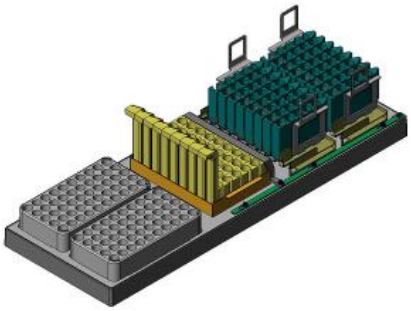


Several standard racks are available:

- Input sample racks
- Racks to be placed directly on an analyzer
- AutoMate trays to integrate a batch of analyzer racks
- Racks for archiving
- Racks for manual workbenches (standard)
- Racks for disposable tips to prevent cross-contamination
- MTPs (option)

Different racks can be used in combination, such as an input base frame for two 50 position racks, one Centaur tray and two Aero trays:

Figure 1.6 Input base frame for two 50 position racks, one Centaur tray and two Aero trays



MTPs are also an option.

Figure 1.7 Microtiter plate

A camera captures digital images to identify tube type, cap size, cap color (optional), and sample volume (optional).

The system is controlled by software that runs on embedded Microsoft Windows. Use the touch screen or the keyboard below the monitor to operate the software.

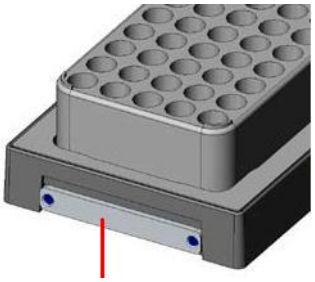
NOTE

For detailed information on base frames, racks, and trays, contact your Beckman Coulter representative.

Base Frame Coding

Each base frame has a unique code to identify it. The codes are generated by seven magnets located at the rear of each base frame. The AutoMate system automatically detects a base frame when placed on a drawer. You can place base frames on any drawer. You can swap base frames between different AutoMate Family systems, adding to the flexibility of the system.

Figure 1.8 Base frame coding



Magnets encoding the base frame are located behind this cover.

Sample Processing

Sample ID Processing

Bar code IDs identify sample tubes in the system. Sample tubes that are not labeled with a bar code are automatically placed onto an error rack.

In AutoMate Family systems with an aliquotter, the system can print bar code labels using the information from the primary tube. The printer labels secondary containers before they are placed on conveyor belt 2 after the primary tube.

Overview of Sample Processing

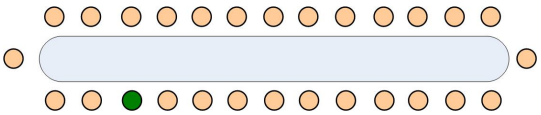
1 Load empty racks onto the output drawers.

2 Place all tubes to be distributed onto racks in the input area.

3 Start processing. The gripper of robot 1 picks up the first tube.

4 The bar code reader in robot 1 identifies the tube. Bar code labels contain the sample ID and sample type information.

5 Robot 1 places the tube in a tube holder on conveyor belt 1.



The system shows the tube as a colored dot on the conveyor belt on screen.

Different colors represent the tube status. The combination of fill color and border color of the dots indicates the status. Double-click to select a sample tube at its position on screen when the AutoMate is stopped and view detailed information about the tube.

Tube Processing

1 The tube inspection unit identifies the tube and cap type by shape and color. The volume level is detected and the tube volume is calculated.

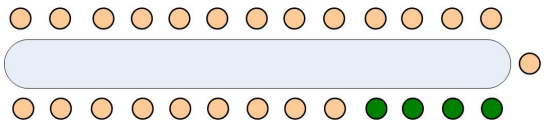
The system is configured with these parameters used in the lab:

— Tube type
— Tube dimensions
— Cap color (optional)

2 The AutoMate system sends a query to the LIS with the tube information identified. The LIS replies with processing instructions: on which rack to place the tube, the number of secondary containers to fill (up to seven) and decapping and recapping instructions.

3 Conveyor belt 1 transports the tube to the decapper. If instructed by the LIS, the sample tube is decapped. AutoMate 2500 and 2550 systems have a double decapper for higher throughput. The caps are dropped into a disposable waste bag for safe disposal and to minimize the risk of contamination.

4 Conveyor belt 1 continues to transport the tube to robot 2 (positions marked green):



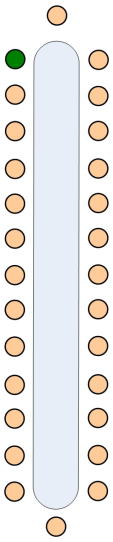
Robot 2 places each tube on its target rack. If instructed by the LIS, robot 2 places tubes onto conveyor belt 2 for aliquoting.

NOTE

When a tube is placed at its target destination, the AutoMate system sends a status record to the LIS.

Processing Aliquots

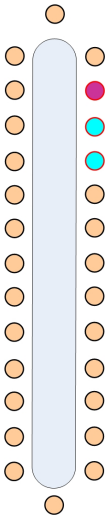
1 Robot 2 places a primary tube into a tube holder at the place position on conveyor belt 2.



The printer prepares a label with the sample ID and adheres it to an empty secondary container from the tube drawer. These bar code labels have the same ID as the primary tube*.

Conveyor belt 2 transports the primary tube to the position where the tube lift places the prepared secondary containers after the primary tube.

Example: One primary sample (magenta) followed by two secondary containers (light blue) .



2 Robot 3 aliquots the sample from the primary to the secondary containers. The aliquot volume of each secondary container is determined by the LIS (or Sorting-Drive**).

* A Beckman Coulter representative can change this setting for you. You can print labels with any bar code or no bar code at all.

** Sorting-Drive is data management software for use in clinical laboratories.

Robot 3 uses a disposable pipette tip for each aliquot to prevent cross-contamination. After aliquoting, conveyor belt 2 moves the tubes to the pick up position of robot 2. Robot 2 places the tubes on their destination racks. Tubes that require further processing are placed on an input rack. A Beckman Coulter representative can configure the sorting destinations, such as buffer rack or conveyor belt 1.

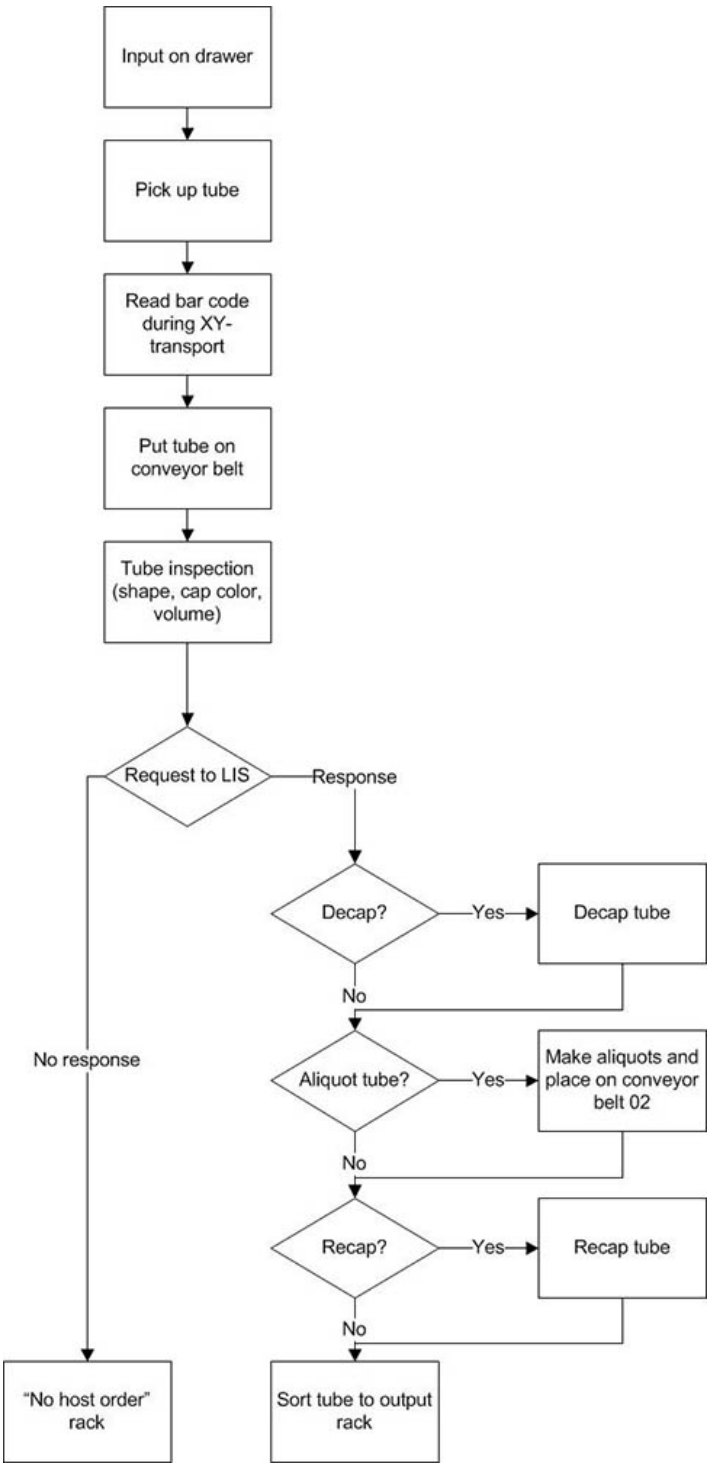
NOTE

The AutoMate system sends the workplace number and position of each tube to the LIS.

3 If a recapper is installed, the tube can be recapped with adhesive film.

Overview of Sample Processing Steps

Figure 1.9



NOTE

If a tube is marked as an error tube, no request is sent to the LIS. The AutoMate system sends the tube to the error rack without further communication.

Technical Specifications

Technical Specifications: AutoMate 1200/2500

Figure 1.10 Dimensions (from left): Front view, side view without recapper, side view with recapper

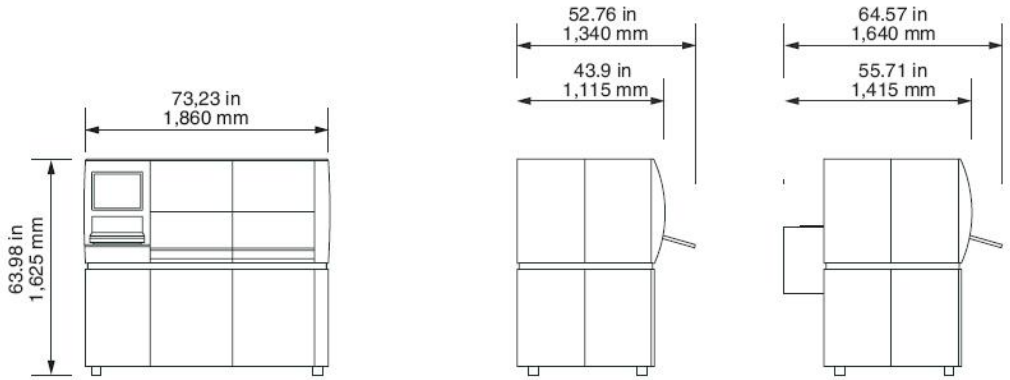
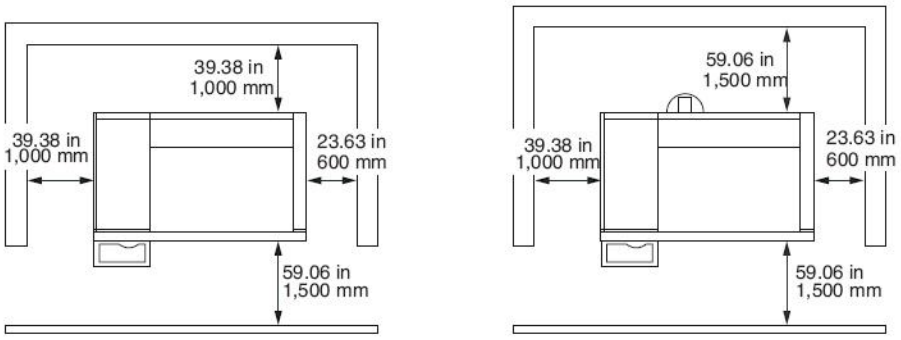


Figure 1.11 Outline (from left) without recapper, outline with recapper



Packing Dimensions

W x H x D 2,200 x 1,760 x 1,470 mm (86.6 x 69.3 x 57.9 in)

Weight

Net weight: 480 kg (1,058 lbs)

Gross weight: 730 kg (1,610 lbs) including packaging

Environmental Requirements

Table 1.1 Environmental requirements

	AutoMate 1200	AutoMate 2500
Altitude	Must not exceed 2,000 m (6,562 ft)	Must not exceed 2,000 m (6,562 ft)
Ambient temperature	+18°C to +32°C (64°F to 89°F)	+18°C to +32°C (64°F to 89°F)
Ambient humidity	40 to 80% relative humidity, no condensation	40 to 80% relative humidity, no condensation
Transport and storage temperature	-20°C to +60°C (-4°F to 140°F)	-20°C to +60°C (-4°F to 140°F)
Transport and storage humidity	10 to 95 % relative humidity, no condensation	10 to 95 % relative humidity, no condensation
Location	Indoor use only; no direct sunlight or severe drafts. A level floor that does not vibrate	Indoor use only; no direct sunlight or severe drafts. A level floor that does not vibrate
Pollution degree	2	2

System Output

Table 1.2 System output

	AutoMate 1200	AutoMate 2500
Water	None	None
Noise	LpA ≤ 65 dB(A) (DIN EN ISO 3746 / DIN EN ISO 11204)	LpA ≤ 65 dB(A) (DIN EN ISO 3746 / DIN EN ISO 11204)
Average heat output	1,030 BTU/h	1,030 BTU/h

Electrical Requirements

The line voltage must be free of power surges (overvoltage category II), power changes, and loss of power for the protection of the electronic circuits.

Table 1.3 Electrical requirements

	AutoMate 1200	AutoMate 2500
Electrical consumption	360 W (system fully loaded)	480 W (system fully loaded)
System current (SC)	1.5 A (system fully loaded)	2.2 A (system fully loaded)
Voltage	100-240 VAC [±10%]	100-240 VAC [±10%]
Frequency	50 / 60 Hz [±1%]	50 / 60 Hz [±1%]
Power line	16 A (Europe) or 20 A (North America)	16 A (Europe) or 20 A (North America)

Technical Specifications: AutoMate 1250/2550

Figure 1.12 Dimensions (from left): Front view, side view without recapper, side view with recapper

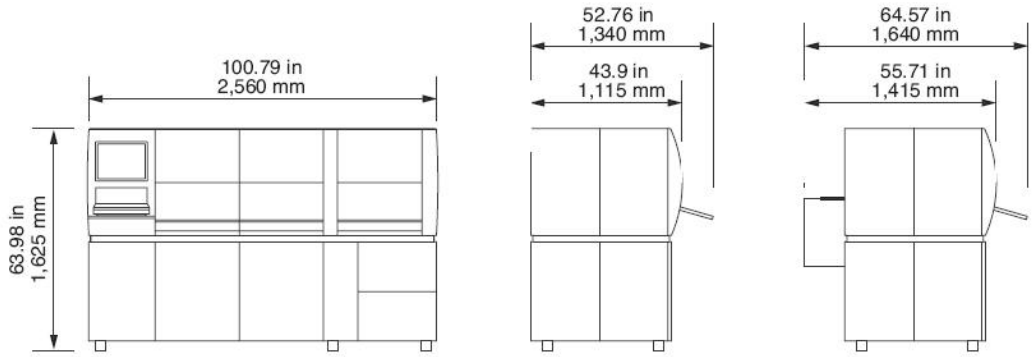
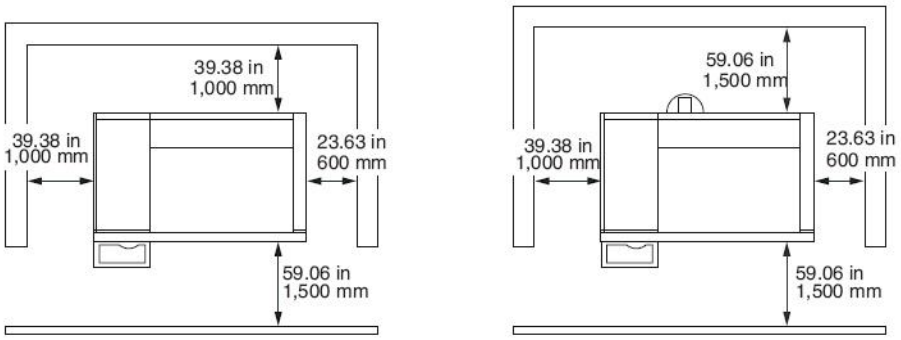


Figure 1.13 Outline (from left) without recapper, outline with recapper



Packing Dimensions

W x H x D: 3,000 x 2,150 x 1,500 mm (118.1 X 84.6 x 59.1 in)

Weight

Net weight: 720 kg (1,590 lbs)

Gross weight: 1040 kg (2,290 lbs) including packaging

Environmental Requirements

Table 1.4 Environmental requirements

	AutoMate 1250	AutoMate 2550
Altitude	Must not exceed 2,000 m (6,562 ft)	Must not exceed 2,000 m (6,562 ft)
Ambient temperature	+18°C to +32°C (64°F to 89°F)	+18°C to +32 °C (64°F to 89°F)
Ambient humidity	40 to 80% relative humidity, no condensation	40 to 80% relative humidity, no condensation
Transport and storage temperature	-20°C to +60°C (-4°F to 140°F)	-20°C to +60 °C (-4°F to 140°F)
Transport and storage humidity	10 to 95 % relative humidity, no condensation	10 to 95 % relative humidity, no condensation
Location	Indoor use only; no direct sunlight or severe drafts. A level floor that does not vibrate	Indoor use only; no direct sunlight or severe drafts. A level floor that does not vibrate
Pollution degree	2	2

System Output

Table 1.5 System output

	AutoMate 1250	AutoMate 2550
Water	None	None
Noise	LpA ≤ 65 dB(A) (DIN EN ISO 3746 / DIN EN ISO 11204)	LpA ≤ 65 dB(A) (DIN EN ISO 3746 / DIN EN ISO 11204)
Average heat output	1,480 BTU/h	1,480 BTU/h

Compressed Air Requirements

- Type (compressor type dependent on local power specification)

- Flow volume: 50 l/min
- Pressure: Maximum 8 bar (116 PSI)

Electrical Requirements

The line voltage must be free of power surges (overvoltage category II), power changes, and loss of power for the protection of the electronic circuits.

Table 1.6 Electrical requirements

	AutoMate 1250	AutoMate 2550
Electrical consumption	360 W (system fully loaded) 920 W (system fully loaded and air compressor running)	480 W (system fully loaded) 1040 W (system fully loaded and air compressor running)
System current (SC)	1.5 A (system fully loaded)	2.2 A (system fully loaded)
SC and air compressor	4.0 A	4.7 A
Air compressor start current	10.0 A (~300 ms) (approx. 10 times/hour if system is fully loaded)	10.0 A (~300 ms) (approx. 10 times/hour if system is fully loaded)
Voltage	100-240 VAC [±10%]	100-240 VAC [±10%]
Frequency	50 / 60 Hz [±1%]	50 / 60 Hz [±1%]
Power Line	System and compressor, each 16 A (Europe) or 20 A (North America)	System and compressor, each 16 A (Europe) or 20 A (North America)

Throughput and Configuration Specifications

Throughput

	AutoMate 1200	AutoMate 1250	AutoMate 2500	AutoMate 2550
Sorting throughput	800 tubes/h	800 tubes/h	1,200 tubes/h	1,200 tubes/h
Aliquot throughput (ratio of primary to secondary tubes 1:1, volume transfer 300 µl)		Up to 600 tubes/h (primary and secondary)		Up to 600 tubes/h (primary and secondary)

	AutoMate 1200	AutoMate 1250	AutoMate 2500	AutoMate 2550
Aliquot throughput with 10 % aliquoted to a secondary tube		780 primary and secondary tubes/h		870 primary and secondary tubes/h

Input and Output Configuration

- Almost unlimited configuration capability of input and output areas, for example drawer width.
- Use racks for automatic and manual processing on one system.
- Define multiple archive racks.
- Use MTPs rail

Decapper

The camera system in the tube inspection unit identifies different cap types for automated decapping. The system can process mixed sample loads with different cap types.

Recapper

The recapper seals open tubes with Parafilm™ for in-house transport and archiving. The recapper is an option available for purchase.

Read Through Label Volume Detection (RTL)

RTL determines the level of sample fluid through up to three layers of labels and calculates the volume.

Pump System

Systems with an aliquot module (AutoMate 1250 and AutoMate 2550) have a pump system for aliquoting.

Table 1.8 Accuracy of pump

Volume (µl)	CV * (%)	Accuracy (±%)
≥ 30	25	15
≥ 50	10	10
≥ 200	3	5

*CV: Coefficient of Variance

Bar Code Label Format for Primary and Secondary Tubes

The system supports the following bar code label formats. You can use different formats in combination.

- Codabar (NW7)
- Code39
- Code93
- Code128
- EAN
- EAN128
- UPC
- 2 of 5 interleaved

The system supports these characters: A to Z, a to z, 0 to 9 and hyphen (-).

Bar Code Label Design

Label size

Standard size:	40 mm x 30 mm
Optional size:	40 mm x 20 mm

Other sizes may require adjustments to the printer. Contact your Beckman Coulter representative for support.

One label roll contains 5,500 labels

Bar code label layout

You can modify the layout. You can use different layouts for different purposes, such as depending on primary tube information or tube destination. Six different default print formats are available.

UTF8 code supported

The AutoMate 2500 Family systems support UTF8 encoding. You can print bar code labels with character sets such as Simplified Chinese.

Figure 1.14 Examples of different bar code label layouts

NOTE

When printing and affixing bar code labels, confirm that:

- Labels are affixed firmly and do not protrude from the tube.

- Labels are positioned correctly.
- Labels are legible, the text is not smudged.

CHAPTER 2

Run the System

Workplace Types

Different types of workplaces are available in the system for various purposes.

Type	Description
Input	Workplace for sample tubes that enter the system.
Distribution	Workplace for primary and secondary sample tubes that leave the system. Distribution workplace is the most frequently used type in the system.
Inactive	Setting to deactivate a workplace temporarily
Archive	Workplace that contains customer defined racks of samples to be archived. To use an archive rack, enter a unique designation (number, letter, or date) to start distributing to this rack. Information on tube positions and rack number are sent to the LIS for storage and subsequent retrieval.
Error	If a problem occurs with a sample tube before or during a distribution, this tube goes to an error workplace.
Carbon Tip Supply	**NOTE** The following information applies only to systems with an aliquot module. Workplace on the aliquot module that contains pipette tips. Pipette tips are used to aliquot samples from a primary tube to up to seven secondary tubes.
Clone	Workplace that contains MTPs. No secondary tubes are created when using this type.

Microtiter Plates (MTPs)

Microtiter Plates Dimensions

MTPs are plastic sample holders used in biology or chemistry research facilities. MTPs have been standardized by the Society for Biomolecular Screening (SBS) since 1996. We provide MTPs with 96 sample wells arranged in a 2:3 rectangular matrix.

Different well layouts are available. AutoMate 2500 Family systems can process MTPs with the following dimensions.

Diameter	>=6.3 mm
Height	<= 22 mm
Shape	Parallel or nearly parallel sides and rounded or flat bottom

CHAPTER 3

Troubleshooting

Recapper: Remove a Parafilm Jam, Replace the Parafilm Roll

The IFU instructs you how to remove a Parafilm jam and replace the Parafilm roll. In addition, two series of troubleshooting videos are installed on the AutoMate PC to help you with these tasks.

- On WindowsXP operating systems, the videos are in `D:\Recapper videos`
- On Windows 10 operating systems, the videos are in `This PC > Videos > Recapper videos`

The first time you open a video, you must configure Windows Media Player. Select **Recommended settings** and **Finish**.

APPENDIX A

AutoMate 2500 Family Documents

Related Documents

Your Beckman Coulter documentation can be found on our website at www.beckmancoulter.com.

- AutoMate 2500 Family Instructions for Use
- AutoMate 2500 Family Reference Manual
- ISB Instructions for Use
- Sorting-Drive Client Instructions for Use
- iPAW Instructions for Use
- Sorting-Drive Reference Manual

Glossary

Aliquot — The method to create a full or a partial set of secondary tubes from the primary tube.

Aliquot Tube — The tubes into which a sample is divided to run the sample on more than one instrument

at the same time, or for storage.

AutoMate 2500 Family —

Beckman Coulter laboratory automation product line for sorting and aliquoting samples.

LIS — Laboratory Information System.

Primary tube — The tube that arrives from the customer. The tube is labeled with a unique barcode and entered into the LIS. Every tube that enters the system (i.e. is placed on an input rack) is treated as a primary tube.

Rack — A framework for holding sample tubes.

Sample — A biological specimen of serum, whole blood, urine, plasma, or cerebrospinal fluid for use in chemistry, immunoassay, hematology or coagulation tests.

Secondary Tube — Tube into which a portion of a sample is transferred so that the system can process the sample on more than one analyzer at the same time, or send a portion to storage.

Test order — Analysis performed on a specimen, e.g. HIV or hepatitis. This data is stored in the LIS and provided to Sorting Drive/iPAW.

Test Volume — The test volume is the amount of sample required to run the test on an instrument.

WP-Id. — Workplace ID. Output destination on the AutoMate 2500 and iPAW instruments.

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