USER GUIDE

applied biosystems by life technologies™

Pathatrix® Auto Instrument

Catalog Number PATHATRIXAUTO

Publication Number 4478019
Revision B

For testing of Food and Environmental samples only.

life technologies™

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Contents

About this guide

IMPORTANT! Before using this product, read and understand the information in the "Safety" appendix in this document.

Revision history

Revision	Date	Description
B	January 2014	• Added additional notes about preparing the Cartridges • Updated maintenance information • Removed unpacking instructions and reference online product insert containing unpacking instructions • Made minor template updates
A	April 2012	Instrument user guide reformatted to a Life Technologies document.

Product information

Pathatrix® Auto system

This user guide provides reference information for the Pathatrix® Auto Instrument and describes how to install, maintain, and troubleshoot the instrument. Refer to the appropriate Pathatrix® Auto protocol for details of sample collection and preparation as well as the relevant test.

The Pathatrix® Auto Instrument is an automated system for high-volume, immuno-magnetic separation of pathogens and spoilage organisms from a wide variety of complex sample matrices found in food, environmental, and bio-threat samples. The instrument uses consumable kits and associated antibody-coated beads (Table 2), and requires common microbiology equipment, supplies, and reagents. Organisms captured on the Pathatrix® beads are detected by such methods as real-time PCR, ELISA, or selective agar plating.

Pathatrix® Auto consumable kits and associated beads (Appendix B) are formatted for individual or pooled samples. The beads are available for capturing one or two organisms, including, but not limited to, *Campylobacter* spp., *Listeria* spp., *Salmonella* spp., *E. coli* O157:H7, and *Cronobacter sakazakii*, as well as a general viral capture.

Equipment and materials

Contents

The components listed in Table 1 are supplied with the Pathatrix® Auto Instrument (Cat. no. PATHATRIXAUTO).

Table 1 Components supplied with the Pathatrix® Auto Instrument

Description	Quantity
Instrument	1 each
Cartridges	5 each
AC Power Cord	1 each
Sample Vessel Holder	1 each
Cartridge Holder	1 each
Elution Vessel Holder	1 each

Materials needed but not supplied

The Pathatrix® Auto Instrument uses common microbiology equipment, supplies, and reagents.

Table 2 Additional required equipment and materials

Description	Supplier	Cat. no.
Target-specific Consumable Kits for Pathatrix® Auto Instrument *Each kit includes sufficient antibody-coated beads and plastic components for 50 tests:* • Antibody-coated Paramagnetic Beads • Pre-sterilized Sample Vessels • Pre-sterilized Elution Vessels • Pre-sterilized Capture Phase Packs • Pre-sterilized Flat-cap Lids	Life Technologies	Various (see Appendix B)
PBS—Phosphate-Buffered Saline 10X, pH 7.4	Life Technologies	AM9625
Pipette (P200) and appropriate filtered tips	Major Laboratory Suppliers	—

Parts of the instrument

The main parts of the Pathatrix® Auto Instrument are as follows:

- Keypad

  The keypad is used to control and operate all functions of the instrument.

- Display

  The display within the keypad shows the run and set options available at any particular time, either in standby mode or during a run. The display is also used to show any technical messages.

- Cartridge

  The cartridge accommodates the sample consumable (including capture phase) when the Pathatrix® Auto run is in progress.

- Power switch and power inlet

  The "On/Off" power switch and power inlet are located at the back of the instrument in the bottom right-hand corner. If the instrument will not be used overnight, we recommend switching off the instrument.

Overview of run cycles

The Pathatrix® Auto Instrument runs with up to 5 Cartridges. Each Cartridge run is independent, so you do not have to start all the Cartridges at the same time.

After a simple sample-loading procedure, the Pathatrix® Auto Instrument can be used to capture pathogens on antibody-coated beads. The steps in the automated run are as follows:

1. Capture

During the Capture cycle, the sample is repeatedly cycled over the antibody-coated Pathatrix® beads that have been immobilized in the capture phase by magnets. Periodically, all liquid is expelled from the capture phase back into the Sample Vessel to ensure thorough mixing of the entire sample. The sample is then drawn back into the capture phase, and the cycling of the sample over the Pathatrix® beads continues.

When the Capture cycle is complete, the valve plunger isolates the capture phase from the Sample Vessel and the Wash cycle starts automatically.

2. Wash

The Wash cycle involves repeated washing of the beads with sterile phosphate-buffered saline (PBS) buffer to remove any remnant sample debris from the capture phase and clean the beads prior to elution. The waste wash solution is then drained back into the Sample Vessel by diverting the flow of liquid using the valve plunger.

Once the Wash cycle is complete, the magnets are automatically released to the "open" position and completely disengage from the capture phase. Then, the Elution cycle starts automatically.

3. Elution

During the Elution cycle, PBS drawn up from the Elution Vessel is repeatedly flushed over the capture phase, and the beads are physically washed off the phase. The resulting bead suspension is expelled from the capture phase and is drained into the Elution Vessel. There is a single magnet located in the Cartridge adjacent to the base of the Elution Vessel. The Pathatrix® beads are drawn out of suspension and accumulate on the side of the Elution Vessel next to the magnet.

When the Elution cycle is complete, the LED lights above each cartridge alternate between **red** and **green**. The operator starts the Drain cycle by pressing the numbered button above each cartridge position.

4. Drain

During the Drain cycle, excess PBS is removed from the Elution Vessel and transferred into the Sample Vessel leaving behind the Pathatrix® beads and a small volume of PBS.

After isolating the Pathatrix® beads, the sample is ready for downstream processing to identify potential pathogens.

Methods

Workflow

Sample loading (page 11)

▼

Pathatrix® Auto run (page 15)

▼

Isolate the Pathatrix® beads (page 16)

Procedural guidelines

- Use aseptic technique and good laboratory practices at all times.
- Take care when handling plates or tubes that contain micro-organisms.
- Avoid generating aerosols, as pathogenic organisms may be present.

Unpacking instructions

Refer to the product insert on the product information page at **www.lifetechnologies.com**.

Installation and set up

IMPORTANT! If the Pathatrix® Auto Instrument has been exposed to cold temperatures (<10°C) during transit, unpack the instrument and allow acclimatization to room temperature (2–24 hours, depending on the environment).

1. Ensure the power switch is in the **Off** position.
2. Plug one end of the power cord into the power inlet of the instrument and the other end of the power cord into the electrical socket.
3. Use the power switch to turn on the instrument. A message, "INITIALIZING PLEASE WAIT," appears on the illuminated display.

Note: Both the power inlet and power switch are located on the back of the Pathatrix® Auto Instrument in the bottom right-hand corner.

4. After approximately 10 seconds, the instrument enters standby mode, and the display reads "PATHATRIX."

   The system is now ready to use, and the Cartridges can be removed from the instrument in preparation for loading the samples.

Overview of the keypad

The keypad consists of the following buttons:

- Arrow buttons left and right, used to scroll between options shown on the display.

  For example, the arrow keys are used to select one of two programs:

  - **Program 1 (P1)**, the Default mode, is used for processing most 10- to 50-mL food and environmental sample types. This is the recommended program in almost all instances.
  - **Program 2 (P2)** is used for processing 10-mL swab or sponge samples for *Listeria* testing. This program is not validated by AOAC, yet. However, using this program, we have observed increased capture efficiency of *Listeria* from environmental samples.

- Numbered buttons 1 through 5, one for each cartridge position.

  For each cartridge position, the numbered buttons can be used to start a run, begin the Drain cycle, or cancel a run during the Capture cycle.

The LED indicator lights next to the numbered buttons signify the following:

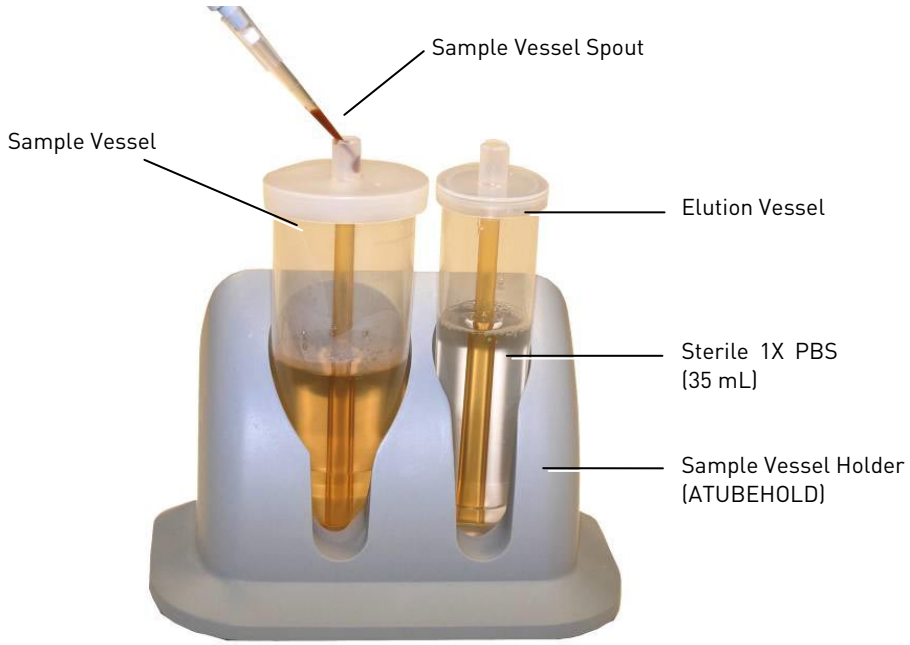
- **Green** LED light indicates that a run is in progress.
- **Red** LED light indicates standby mode or a completed run.
- An alternating **green** and **red** LED light alerts the operator to press the numbered button to start the Drain cycle of the Pathatrix® Auto run.

Sample loading

Prepare the Pathatrix® Auto consumable

1. Unpackage the Elution and Sample Vessels with lids (from the Pathatrix® Auto consumable kit), and place the Elution and Sample Vessels in the Sample Vessel Holder (Cat. no. ATUBEHOLD; provided with the instrument).
2. Remove the lid of the Elution Vessel and add sterile 1X PBS wash buffer up to the 35-mL line.
3. Remove the lid of the Sample Vessel and add sample.

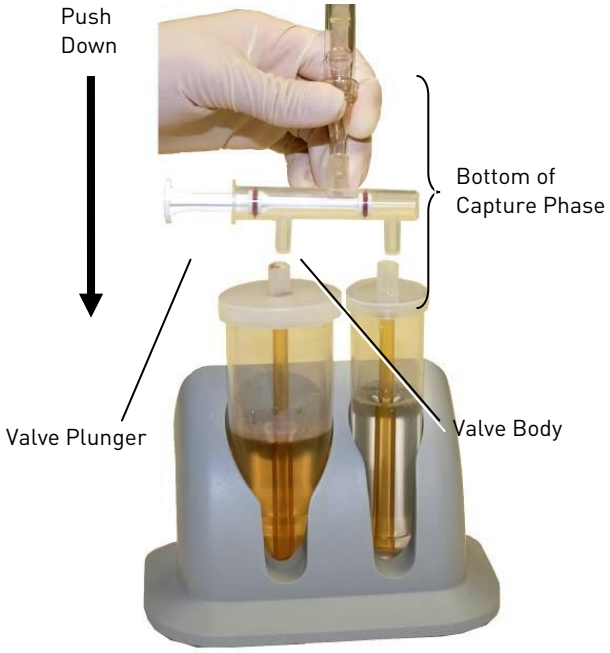
   Note: Refer to the appropriate Pathatrix® Auto protocol for details about sample collection and preparation as well as the relevant test.
4. Replace lids onto the Elution and Sample Vessels.
5. Agitate the vial of Pathatrix® beads to ensure the beads are fully resuspended (e.g., vortex or invert the sealed vial).
6. Add 50 µL of the appropriate Pathatrix® bead suspension to the Sample Vessel through the spout on the lid.



Attach the capture phase

1. Unpackage the capture phase (from the Pathatrix® Auto consumables kit) and attach the capture phase to the Elution and Sample Vessels by inserting the valve body into the spout of the vessel lids with the valve plunger pointing to the left.

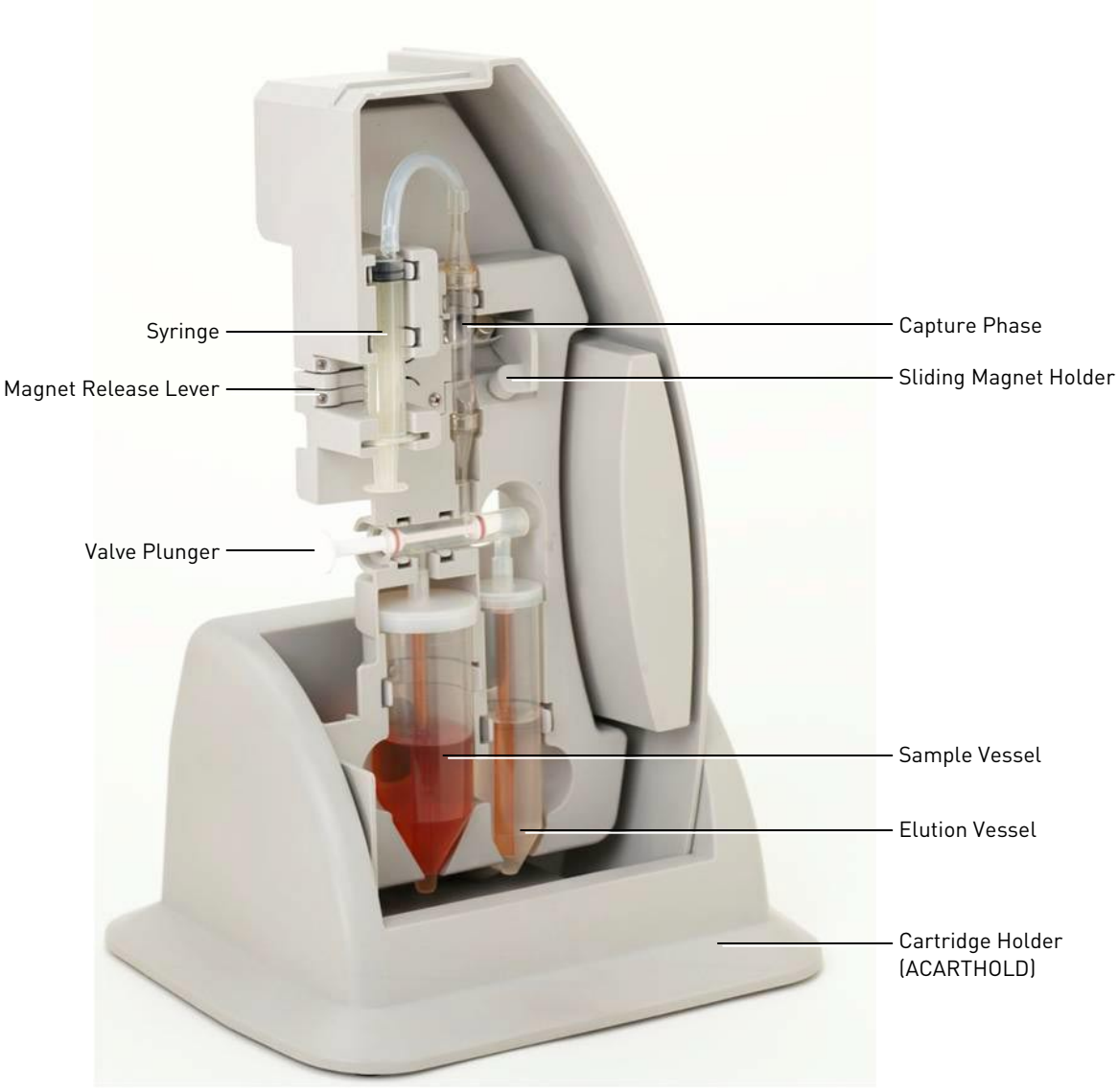
   While handling the assembly, be careful not to rotate, twist, or bend the conical ends of the capture phase, as this may loosen or separate the assembly and create leaks that will affect performance.



2. Ensure that the lids on the Elution and Sample Vessels are fastened securely. The assembled consumable is now ready to be inserted into the Cartridge.

Load the Cartridge into the instrument

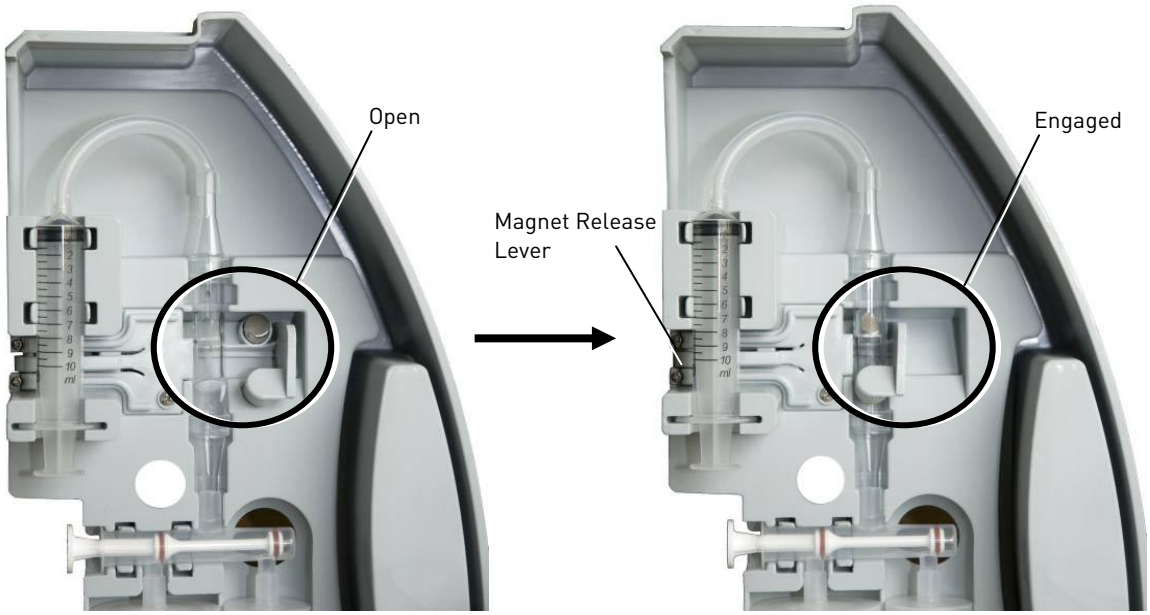
1. Remove Cartridge from the instrument and place in Cartridge Holder (Cat. no. ACARTHOLD) provided with the instrument.
2. Remove the assembled consumable from the Sample Vessel Holder by lifting the Elution and Sample Vessels.
3. Insert consumable into the Cartridge starting at the bottom (Elution and Sample Vessels) and moving upwards.
4. Push firmly on each part of the consumable (e.g., Elution Vessel, Sample Vessel, valve, capture phase, and syringe) to ensure that the entire consumable is held securely within the molded recess of the Cartridge.



5. Slide the magnet holder to the left until it locks into the “engaged” position to place the magnets against the capture phase.
6. Press the magnet release lever on the side of the Cartridge to verify that the kit is positioned correctly and that the magnet can freely disengage from the capture phase.

IMPORTANT! If the magnet slider is hard to close or does not release cleanly when the release button is pressed, carefully reposition the capture phase and repeat this step. Failure to ensure smooth release will cause magnetic beads to remain captured and reduce overall performance.

7. Reset the magnet into the “engaged” position.



8. Remove the assembled Cartridge from the Cartridge Holder.
9. Align the Cartridge with the grey guide slots at the desired position on the instrument and push the Cartridge forward until it clicks into position.

Pathatrix® Auto run

Note: The Pathatrix® Auto Instrument runs with up to 5 Cartridges.

- Each Cartridge run is independent, so you do not have to start all the Cartridges at the same time.
- All active Cartridges must be running the same program (P1 or P2*).

Run

1. For most 10- to 50-mL samples, start the run by pressing the numbered button located immediately above each Cartridge position. This will start P1.

   Note: The LED light next to the button changes from **red** to **green** to indicate that the run is in progress.

2. In approximately 15 minutes (P1), the LED light above the Cartridge position alternates between **red** and **green**, indicating that the Elution cycle of the run is complete.
3. Start the Drain cycle by pressing the numbered button above each Cartridge position.

Cancel

Use the following procedure to halt the Pathatrix® Auto Capture cycle for a particular sample (e.g., if you need to confirm the addition of beads or elution buffer):

1. Press and hold the numbered button for that Cartridge position for 5 seconds.
2. A message appears on the display asking if you wish to "CANCEL TEST" for the sample in that particular Cartridge position:
   - Press the left arrow button for "YES" to stop the run,

     or
   - Press the right arrow button for "NO," which allows the run to proceed as normal.

* P2 has not been validated by the AOAC. For more details about using P2, see the Pathatrix® Auto protocols for *Listeria*.

Isolate the Pathatrix® beads

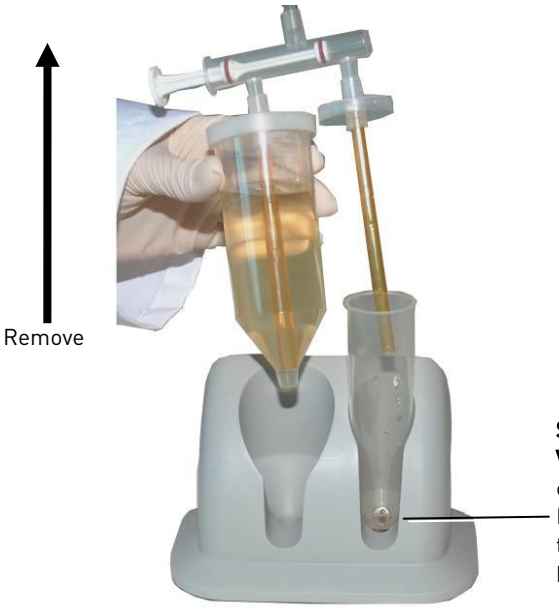
Remove the used consumable

1. In approximately 1 minute, the LED light above the Cartridge position illuminates at a constant **red**, indicating that the Drain cycle is complete and the run has ended.
2. Remove the Cartridge from the Pathatrix® Auto Instrument and place into the Cartridge Holder.
3. Starting from the top (syringe) and moving downwards, remove the entire consumable from the Cartridge and place into the Sample Vessel Holder.

   IMPORTANT! To prevent spills, firmly hold the Elution and Samples Vessels when transferring the consumables from the Cartridge to the Sample Vessel Holder.

4. Release the cap from the Elution Vessel.
5. Discard the used consumable, including the Sample Vessel and capture phase, as potential biohazardous waste.

   Note: Save the Elution Vessel. The Sample Vessel Holder and the Elution Vessel Holder contain magnets that will be next to the base of each Elution Vessel. This magnet keeps the beads out of suspension prior to the final re-suspension step.



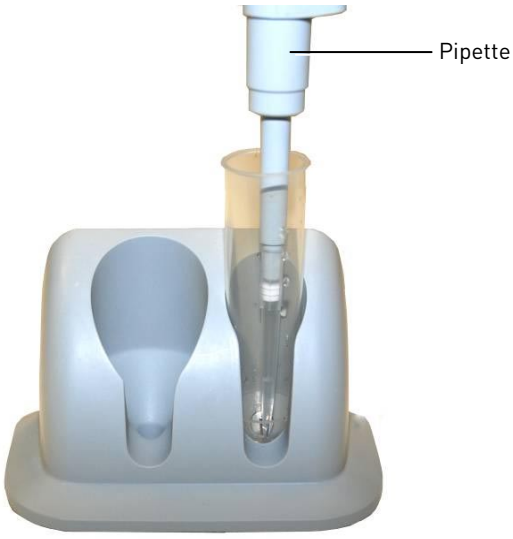
Resuspend the beads for analysis

1. Remove the Elution Vessel from the holder.
2. Resuspend the Pathatrix® beads in the PBS remaining in the Elution Vessel by pipetting up and down.

   Note: Appropriate aliquots of the Pathatrix® bead suspension can now be analyzed using the chosen pathogen detection method (e.g., real-time PCR, ELISA, or selective agar plates).

3. Remove an aliquot of the resuspended Pathatrix® beads for biochemical analysis on selective agar plates. (Refer to your specific Pathatrix® Auto protocol for experimental details about plating samples.)
4. Follow the next steps to obtain samples for PCR or ELISA:
   a. Cap the Elution Vessel with a Flat Cap Lid from the Pathatrix® Auto consumables kit, and place the Elution Vessel containing the remaining Pathatrix® bead suspension into the Elution Vessel Holder (or Sample Vessel Holder).
   b. Let Elution Vessel stand for approximately 1 minute to allow capture of the beads next to the magnet in the holder.
   c. Remove lid and remove any residual PBS wash buffer using a pipette (or disposable plastic Pasteur pipette).

      IMPORTANT! Leave the Elution Vessel in the holder and take care not to displace any beads from the magnet.



   d. Remove Elution Vessel from the holder, and resuspend beads in the appropriate amount of reaction or lysis buffer for your PCR or ELISA. (Refer to your specific Pathatrix® Auto protocol for experimental details about downstream assays.)

Store samples

The bead suspension may be retained for later testing, if necessary.

PCR, ELISA, and Direct Plating: Transfer bead suspension to a microcentrifuge tube, and store *away* from magnets at 2 to 8°C for up to 24 hours.

Note: After sample testing, dispose of the Elution Vessel and unused sample as potential biohazardous waste.

Clean and maintain the instrument

Clean

In the event of a liquid spill onto the surface of the instrument, turn off the power before wiping the instrument with a damp cloth soaked in weak detergent or disinfectant. We do not recommend using harsh chemicals and/or abrasive cleaning agents, which may lead to permanent damage to the instrument.

Maintenance

Between 18–24 months from the initial purchase, replacement of cartridges may be required depending upon usage requirements. The Pathatrix Auto Instrument is serviced by sending the unit to Life Technologies for depot repair. Service contracts are sold by Life Technologies to cover repair and loaner instruments during the repair process. Customers should not attempt to carry out any instrument maintenance by themselves. In the unlikely event an instrument suffers a malfunction or failure, contact Life Technologies Technical Support (visit **www.lifetechnologies.com/support** or email **foodsafety@lifetech.com**).

Troubleshooting

If troubleshooting does not resolve the problem, contact Life Technologies Technical Support (foodsafety@lifetech.com).

Observation	Recommended actions
Display reads "Magnet Not Engaged"	Check that the magnet slider on the Cartridge has been correctly locked in the engaged position.
After the Wash cycle, the LED light remains **green** (instead of alternating between **red** and **green**). A clicking sound may be audible.	The magnet slider in the Cartridge has not been released: 1. Push on the front of the Cartridge with a firm pressure in the direction indicated to manually release the Sliding Magnet Holder. Excessive force is NOT required.  2. Listen for a single, clearly audible "click." 3. Continue with the normal protocol when the LED lights alternate between **red** and **green**, indicating that the final Drain cycle is ready to start.
Display does not illuminate when instrument is turned on	• Check that the power switch is illuminated. • Check the power outlet is turned on. • Check the power cord is plugged into the instrument properly.

Appendix A Technical specifications

Technical specifications of the Pathatrix® Auto Instrument

Specifications		
Input voltage	100–240 V ~AC (±10% of the nominal voltage) Transient voltages typically present on the main supply. Note: The normal level of transient over-voltages is impulse withstanding (over-voltage) category II of IEC 60364-4-443 50–60 Hz FUSE T2AH250V 60 VA	
Dimensions (W x D x H)	418 mm (16.5 in.) x 276 mm (10.9 in.) x 470 mm (18.5 in.)	
Environmental conditions	Weight	25 kg (55 lb.)
	Use	Indoor use only
	Elevation	Up to 2000 m
	Temperature	5ºC to 40ºC
	Humidity	Maximum relative humidity 80% for temperature up to 31ºC decreasing to 50%
	IP Rating	IP22

Appendix B Additional products and services

Additional parts for the Pathatrix® Auto Instrument

Description	Cat. no.	Quantity
Pathatrix® Auto Cartridge—Single	ACART	1 cartridge
Pathatrix® Auto Cartridge—Set of 5	ACART5	5 cartridges
Pathatrix® Auto Cartridge Holder	ACARTHOLD	1 holder
Pathatrix® Auto Cartridge Rack	ACARTRACK	1 rack
Pathatrix® Auto Sample Vessel Holder	ATUBEHOLD	1 holder
Pathatrix® Auto Elution Vessel Holder	ATUBERACK	1 rack

Selected consumable kits for use with the Pathatrix® Auto Instrument

Description*	Cat. no.	Quantity
Pathatrix® *Campylobacter* spp.—Overnight Format	APC50	50 tests
Pathatrix® DUAL (*Listeria*/*Salmonella* spp.)—Overnight Format	APD50	50 tests
Pathatrix® *Listeria* spp.—Overnight Format	APL50	50 tests
Pathatrix® *Salmonella* spp.—Overnight Format	APS50	50 tests
Pathatrix® Cationic/General Viral Capture—Same Day Format	APCAT50	50 tests
Pathatrix® *E. coli* O157:H7—Same Day Format	APE50SD	50 tests
Pathatrix® *Cronobacter* spp.—Same Day Format	APSAK50	50 tests
Pathatrix® *Salmonella* spp.—Same Day Format	APS50SD	50 tests
Pathatrix® 5 Pooling *E. coli* O157:H7	APE250SDP	50 tests (250 samples)
Pathatrix® 10 Pooling *E. coli* O157:H7	APE500SDP	50 tests (500 samples)
Pathatrix® 5 Pooling *Salmonella* spp.	APS250P	50 tests (250 samples)
Pathatrix® 10 Pooling *Salmonella* spp.	APS500P	50 tests (500 samples)
Pathatrix® 5 Pooling *Listeria* spp.	APL250P	50 tests (250 samples)
Pathatrix® 5 Pooling DUAL *E. coli*/*Salmonella*	APDES250P	50 tests (250 samples)
Pathatrix® 5 Pooling *Cronobacter* spp.	APSAK250P	50 tests (250 samples)
Pathatrix® 10 Pooling *Cronobacter* spp.	APSAK500P	50 tests (500 samples)

*For a complete list of current products, visit **www.lifetechnologies.com**.

Related products for downstream analysis of samples

Description*	Cat. no.	Quantity
MicroSEQ® *Salmonella* spp. Detection Kit	4403930	1 kit
MicroSEQ® *Listeria* spp. Detection Kit	4427410	1 kit
MicroSEQ® *Listeria monocytogenes* Detection Kit	4403874	1 kit
MicroSEQ® *E. coli* O157:H7 Detection Kit	4427409	1 kit
TaqMan® *Cronobacter sakazakii* Detection Kit	4382492	1 kit

*For a complete list of current products, visit **www.lifetechnologies.com**.

Appendix C Safety

WARNING! GENERAL SAFETY. Using this product in a manner not specified in the user documentation may result in personal injury or damage to the instrument or device. Ensure that anyone using this product has received instructions in general safety practices for laboratories and the safety information provided in this document.

- Before using an instrument or device, read and understand the safety information provided in the user documentation provided by the manufacturer of the instrument or device.
- Before handling chemicals, read and understand all applicable Safety Data Sheets (SDSs) and use appropriate personal protective equipment (gloves, gowns, eye protection, etc.). To obtain SDSs, see the "Documentation and Support" section in this document.

Symbols on this instrument

Symbols may be found on the instrument to warn against potential hazards or convey important safety information. In this document, the symbol is used along with user attention words described in the "About This Guide" section to highlight important safety information. The following table gives the meaning of these symbols.

Symbol	English	Français
	Caution, risk of danger Consult the manual for further safety information.	Attention, risque de danger Consulter le manuel pour d'autres renseignements de sécurité.
	Protective conductor terminal (main ground)	Borne de conducteur de protection (mise à la terre principale)

Conformity mark	Description
	Indicates conformity with safety requirements for Canada and U.S.A.
	Indicates conformity with European Union requirements for safety and electromagnetic compatibility.

Instrument safety

General

CAUTION! Do not remove instrument protective covers. If you remove the protective instrument panels or disable interlock devices, you may be exposed to serious hazards including, but not limited to, severe electrical shock, laser exposure, crushing, or chemical exposure.

CAUTION! Solvents and Pressurized fluids. Wear eye protection when working with any pressurized fluids. Use caution when working with any polymeric tubing that is under pressure:

- Extinguish any nearby flames if you use flammable solvents.
- Do not use polymeric tubing that has been severely stressed or kinked.
- Do not use polymeric tubing with tetrahydrofuran or nitric and sulfuric acids.
- Be aware that methylene chloride and dimethyl sulfoxide cause polymeric tubing to swell and greatly reduce the rupture pressure of the tubing.
- Be aware that high solvent flow rates (~40mL/min) may cause a static charge to build up on the surface of the tubing and electrical sparks may result.

Physical injury

CAUTION! Moving and Lifting Injury.

- Improper lifting can cause painful and permanent back injury.
- Things to consider before lifting or moving the instrument or accessories:
- Depending on the weight, moving or lifting may require two or more persons.
- If you decide to lift or move the instrument after it has been installed, do not attempt to do so without the assistance of others, the use of appropriate moving equipment, and proper lifting techniques.
- Ensure you have a secure, comfortable grip on the instrument or accessory.
- Make sure that the path from where the object is to where it is being moved is clear of obstructions.
- Do not lift an object and twist your torso at the same time. Keep your spine in a good neutral position while lifting with your legs.
- Participants should coordinate lift and move intentions with each other before lifting and carrying.
- For smaller packages, rather than lifting the object from the packing box, carefully tilt the box on its side and hold it stationary while someone else slides the contents out of the box.

CAUTION! Moving Parts. Moving parts can crush, pinch and cut. Keep hands clear of moving parts while operating the instrument. Disconnect power before servicing.

Electrical

WARNING! Fuse Installation. Before installing the instrument, verify that the fuses are properly installed and the fuse voltage matches the supply voltage. Replace fuses only with the type and rating specified for the unit. Improper fuses can damage the instrument wiring system and cause a fire.

WARNING! Ensure appropriate electrical supply. For safe operation of the instrument:

- Plug the system into a properly grounded receptacle with adequate current capacity.
- Ensure the electrical supply is of suitable voltage.
- Never operate the instrument with the ground disconnected. Grounding continuity is required for safe operation of the instrument.

WARNING! Power Supply Line Cords. Use properly configured and approved line cords for the power supply in your facility.

WARNING! Disconnecting Power. To fully disconnect power either detach or unplug the power cord, positioning the instrument such that the power cord is accessible.

Cleaning and decontamination

WARNING! Cleaning and Decontamination.

- If hazardous materials are spilled onto the instrument, the instrument should be appropriately decontaminated.
- Using cleaning or decontamination methods other than those recommended by the manufacturer may compromise the safety or quality of the instrument.
- Care should be taken to not use decontamination or cleaning agents which would cause a hazard as a result of a reaction with parts of the equipment or with material contained in it.
- For the protection of others, ensure the instrument is properly decontaminated prior to having the instrument serviced at your facility or before sending the instrument for repair, maintenance, trade-in, disposal, or termination of a loan. Decontamination forms may be requested from customer service.

Safety and electromagnetic compatibility (EMC) standards

The instrument design and manufacture complies with the standards and requirements for safety and electromagnetic compatibility as noted in the following table:

Reference	Description
UL 61010-1 CSA C22.2 No. 61010-1	*Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

Chemical safety

WARNING! GENERAL CHEMICAL HANDLING. To minimize hazards, ensure laboratory personnel read and practice the general safety guidelines for chemical usage, storage, and waste provided below, and consult the relevant SDS for specific precautions and instructions:

- Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. To obtain SDSs, see the "Documentation and Support" section in this document.
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing).
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood).
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer's cleanup procedures as recommended in the SDS.
- Ensure that the waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.
- **IMPORTANT!** Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

Biological hazard safety

WARNING! Potential Biohazard. Depending on the samples used on this instrument, the surface may be considered a biohazard. Use appropriate decontamination methods when working with biohazards.

WARNING! BIOHAZARD. Biological samples such as tissues, body fluids, infectious agents, and blood of humans and other animals have the potential to transmit infectious diseases. All work should be conducted in properly equipped facilities using the appropriate safety equipment (for example, physical containment devices). Safety equipment also may include items for personal protection, such as gloves, coats, gowns, shoe covers, boots, respirators, face shields, safety glasses, or goggles. Individuals should be trained according to applicable regulatory and company/ institution requirements before working with potentially biohazardous materials. Follow all applicable local, state/provincial, and/or national regulations. The following references provide general guidelines when handling biological samples in laboratory environment.

- U.S. Department of Health and Human Services, Biosafety in Microbiological and Biomedical Laboratories (BMBL), 5th Edition, HHS Publication No. (CDC) 21-1112, Revised December 2009; found at: **www.cdc.gov/biosafety/publications/bmbl5/BMBL.pdf**
- World Health Organization, Laboratory Biosafety Manual, 3rd Edition, WHO/CDS/CSR/LYO/2004.11; found at: **www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf**

Documentation and support

Obtaining SDSs

Safety Data Sheets (SDSs) are available from **www.lifetechnologies.com/support**

For the SDSs of chemicals not distributed by Life Technologies, contact the chemical manufacturer.

Obtaining support

For the latest services and support information for all locations, go to:

www.lifetechnologies.com/support

At the website, you can:

- Access worldwide telephone and fax numbers to contact Technical Support and Sales facilities
- Search through frequently asked questions (FAQs)
- Submit a question directly to Technical Support (**techsupport@lifetech.com**)
- Search for user documents, SDSs, vector maps and sequences, application notes, formulations, handbooks, certificates of analysis, citations, and other product support documents
- Obtain information about customer training
- Download software updates and patches

Food Safety support

Website: **www.lifetechnologies.com/foodsafety**

Support email: **foodsafety@lifetech.com**

Phone number in North America: 1-800-500-6855

Phone number outside of North America: Visit **www.lifetechnologies.com/support**, select the link for phone support, and select the appropriate country from the dropdown menu.

Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale found on Life Technologies' website at **www.lifetechnologies.com/termsandconditions**. If you have any questions, please contact Life Technologies at **www.lifetechnologies.com/support**.

Headquarters
5791 Van Allen Way | Carlsbad, CA 92008 USA | Phone +1 760 603 7200 | Toll Free in USA 800 955 6288
For support visit **lifetechnologies.com/support** or email **techsupport@lifetech.com**

lifetechnologies.com

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