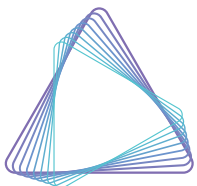
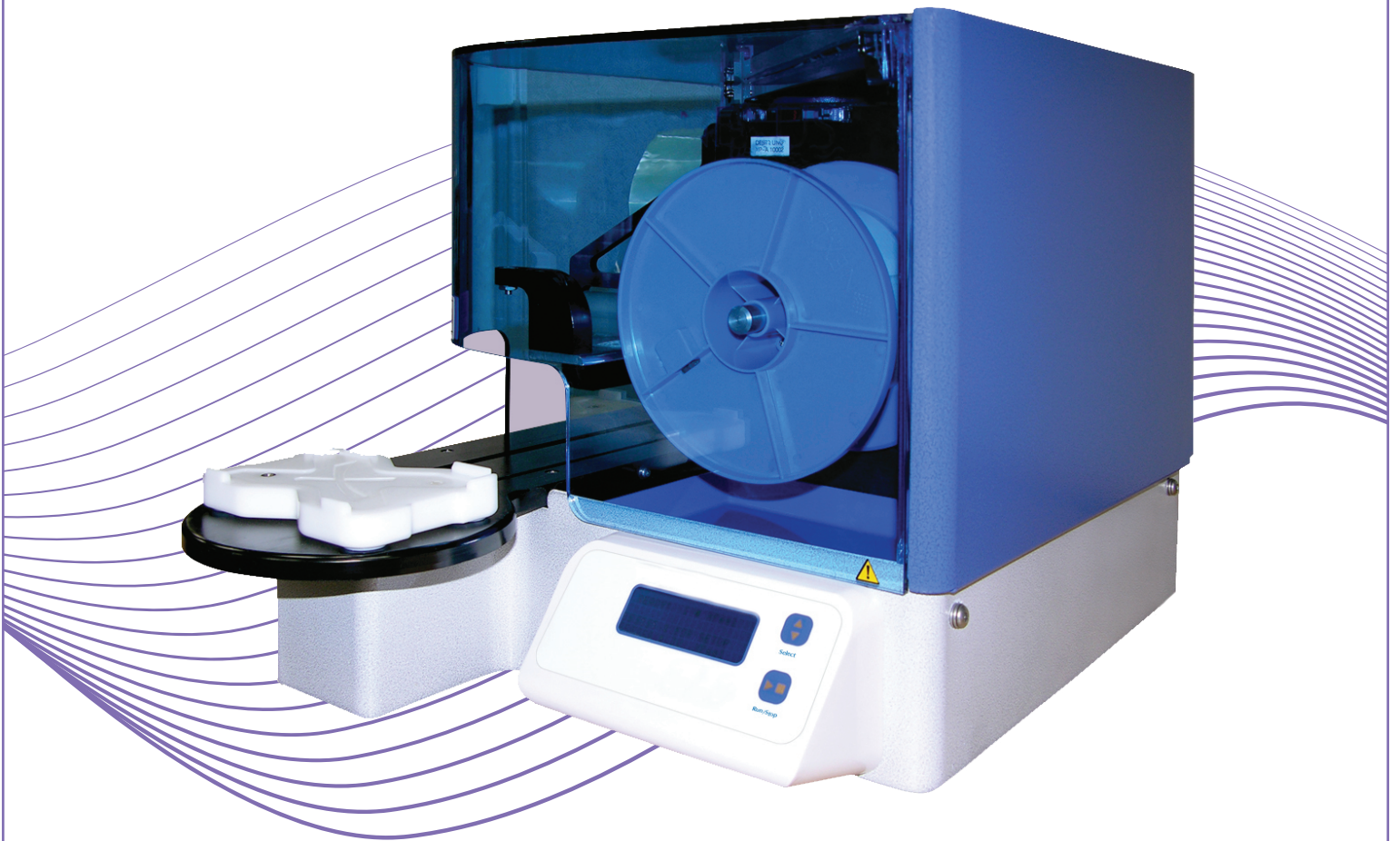


# Automated Plate Seal Remover User Manual



**AZENTA**  
LIFE SCIENCES

---

## Azenta US, Inc.

Information provided within this document is subject to change without notice, and although believed to be accurate, Azenta US, Inc. assumes no responsibility for any errors, omissions, or inaccuracies.

BioStore™, BioWarehouse™, SampleStore™, Strata™, Tube Auditor™, Azenta™, Azenta Life Sciences™, and the Azenta logo are trademarks of Azenta US, Inc.

CryoExchange®, CryoPod®, FrameStar®, FreezerPro®, and IntelliXcap® are registered U.S. trademarks of Azenta US, Inc.

All other trademarks are properties of their respective owners.

© 2021 Azenta US, Inc. All rights reserved. The information included in this manual is proprietary information of Azenta US, Inc. and is provided for the use of Azenta US, Inc. customers only and cannot be used for distribution, reproduction, or sale without the express written permission of Azenta US, Inc.

This technology is subject to United States export Administration Regulations and authorized to the destination only; diversion contrary to U.S. law is prohibited.

Original manual printed in English.

These are the original instructions for the Automated Plate Seal Remover.



**Corporate Headquarters**

2910 Fortune Circle West  
Indianapolis, IN 46241 U.S.A.

**European Union Representative**

Im Leuschnerpark 1B  
64347 Griesheim, Germany

For Technical Support:

Location	Contact Number	Website
North America	+1.888.2.AZENTA (+1.888.229.3682)	<a href="http://www.azenta.com">www.azenta.com</a>
Europe	+44.0.161.777.2000	
Japan	+81.45.4477.5570 (ext. 24)	

## Revision History

Part Number: 440140

Automated Plate Seal Remover User Manual

Revision	ECO Number	Date	Explanation of Changes
Revision AD	62786	9/25/2016	Initial completion of the manual.
Revision AE	87189	7/18/2018	Updates from SIAR 87189.
Revision AF	EC125996	2/25/2021	Updated the manual to add the DoC and space, environmental, and electrical requirements, and to remove cleaner.
Revision AG	EC129509	7/1/2021	Noted drip pad is not included.
Revision AH	EC132461	8/3/2021	Updated branding.

# Table of Contents

---

Automated Plate Seal Remover .....	1
1. Safety .....	7
Explanation of Hazards and Alerts .....	8
Safety Text .....	8
Safety Icons .....	8
Signal Words and Color .....	8
Safety Notices .....	9
Alert Example .....	10
General Safety Considerations .....	11
Safety Features .....	12
Safety Cover .....	12
Interrupting Operation .....	13
Hazardous Waste .....	13
Regulatory Compliance and Declaration of Conformity .....	14
2. Overview .....	15
Using this Manual .....	15
Standard Components .....	16
3. Specifications and Site Requirements .....	18
Specifications .....	18
Unit Dimensions .....	18
Site Requirements .....	20
Space Requirements .....	20
Environmental Requirements .....	20
Electrical Requirements .....	21
Accessory Connections .....	21
Power Requirements and Voltage Configuration .....	22
4. Installation and Removal .....	24
Unpacking and Setup .....	24
Placement of Equipment .....	25
Setting Plate Tray Orientation .....	26
Seal Collection Reel Installation and Removal .....	27
Seal Collection Reel Installation .....	27
Seal Collection Reel Removal .....	28
Automated Plate Seal Remover Tape Installation and Removal .....	28
Automated Plate Seal Remover Tape Installation .....	29
Automated Plate Seal Remover Tape Removal .....	31
Drip Pad Installation and Removal .....	31
Drip Pad Installation .....	32
Drip Pad Removal .....	32
5. Operation .....	33
Theory of Operation .....	33
Quick Start .....	33

System Operation .....	34
Main Screen .....	34
Set Up Screen .....	35
Setting Motion Parameters .....	35
General Settings .....	38
Test Menu .....	40
Automation Interface .....	42
Interface with other Automated Equipment .....	42
Automated Plate Seal Remover External Control .....	43
Electrical Interface .....	43
Communications Protocol .....	43
Commands .....	44
Motor Commands .....	50
Unsolicited Messages from the Automated Plate Seal Remover .....	53
<b>6. Troubleshooting .....</b>	<b>54</b>
Repair Philosophy .....	54
Troubleshooting .....	55
Troubleshooting Table Format .....	55
Corrective Action .....	56
Command Error Codes .....	57
Technical Support .....	59
Contact Information for Azenta Life Sciences .....	59
<b>7. Maintenance .....</b>	<b>60</b>
General Maintenance .....	60
Cleaning .....	60
Blown fuse .....	60
Automated Plate Seal Remover Tape Replacement .....	60
Liquid Contamination .....	60
<b>8. Purchasing Supplies .....</b>	<b>61</b>
<b>9. Appendices .....</b>	<b>62</b>
Appendix A: WEEE Statement (European Union) .....	63

# 1. Safety



## WARNING

### Read the Safety Chapter

Failure to review the Safety chapter and follow the safety warnings can result in death or serious injury.

- All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.
- Follow all applicable safety codes of the facility as well as national and international safety codes.
- Know the facility safety procedures, safety equipment, and contact information.
- Read and understand each procedure before performing it.



## NOTICE

It is the responsibility of each person working on this product to know the applicable regulatory safety codes as well as the facility safety procedures, safety equipment, and contact information.

This product is intended for use by industrial customers and should be serviced only by Azenta Life Sciences or Azenta Life Sciences trained representatives. The service manuals and related materials are provided in English at no charge and are intended for use by experienced technicians. It is the responsibility of the user to obtain and assure the accuracy of any needed translations of manuals. If you require assistance please contact Azenta Life Sciences service department. Contact information can be found at [www.azenta.com](http://www.azenta.com).

If additional safety related upgrades or newly identified hazards associated with the Automated Plate Seal Remover are identified, Azenta Life Sciences Technical Support notifies the owner of record with a Technical Support Bulletin (TSB).

## Explanation of Hazards and Alerts

This manual and this product use industry standard hazard alerts to notify the user of personal or equipment safety hazards. Hazard alerts contain safety text, safety icons, signal words, and color.

### Safety Text

Hazard alert text follows a standard, fixed-order, three-part format.





- Identify the hazard,
- State the consequences if the hazard is not avoided,
- State how to avoid the hazard.

### Safety Icons

- Hazard alerts contain safety icons that graphically identify the hazard.
- The safety icons in this manual conform to ISO 3864 and ANSI Z535 standards.







### Signal Words and Color

Signal words inform of the level of hazard.

	<p>Danger indicates a hazardous situation which, if not avoided, <b>will result in death or serious injury</b>.</p> <p>Danger signal word is white on a red background with an iconic exclamation point inside a yellow triangle with black border.</p>
	<p>Warning indicates a hazardous situation which, if not avoided, <b>could result in death or serious injury</b>.</p> <p>Warning signal word is black on an orange background with an iconic exclamation point inside a yellow triangle with black border.</p>
	<p>Caution indicates a hazardous situation or unsafe practice which, if not avoided, <b>may result in minor or moderate personal injury</b>.</p> <p>Caution signal word is black on a yellow background with an iconic exclamation point inside a yellow triangle with black border.</p>
	<p>Indicates a situation or unsafe practice which, if not avoided, <b>may result in equipment damage</b>.</p> <p>Notice signal word is white on blue background with no icon.</p>



## Safety Notices

	Alerts the user to review this manual for important operating information.
	Alerts user to possible harmful exposure to biohazards.
	Identifies the main ground stud (internal to the unit).
	Warns the user to keep their hands clear from the mechanism.
	Identifies areas of potential pinch hazards.
	Designates a suitable terminal for connecting to the chassis.

## Alert Example

The following is an example of a *Warning* hazard alert.

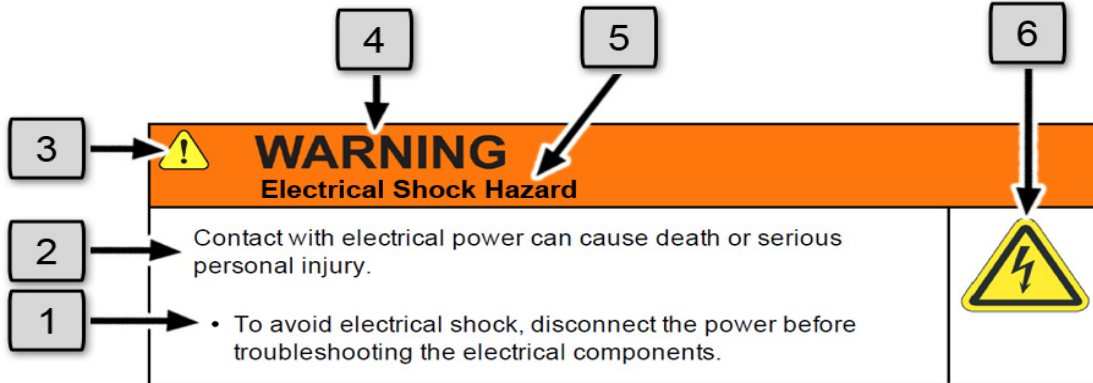








Figure 1-1: Components of a Safety Alert



Number	Description
1.	How to Avoid the Hazard
2.	Source of Hazard and Severity
3.	General Alert Icon
4.	Signal Word
5.	Type of Hazard
6.	Hazard Symbol(s)



## General Safety Considerations

 <b>CAUTION</b> <b>Unauthorized Service</b>	
<p>Personal injury or damage to equipment may result if this product is operated or serviced by unauthorized personnel.</p> <ul style="list-style-type: none"><li>• Only qualified personnel are allowed to transport, assemble, operate, or maintain the Product.</li><li>• Properly qualified personnel are those who have received certified training and have the proper qualifications for their jobs.</li></ul>	

 <b>CAUTION</b> <b>Training and Unauthorized Service</b>	
<p>Personal injury or damage to equipment may result if this product is operated or serviced by untrained or unauthorized personnel.</p> <ul style="list-style-type: none"><li>• Only qualified personnel who have received certified training and have the proper qualifications for their jobs are allowed to transport, assemble, operate, or maintain the product.</li></ul>	

 <b>CAUTION</b> <b>Seismic Restraint</b>	
<p>The use of this product in an earthquake prone environment may cause equipment damage or personal injury.</p> <p>The user is responsible for determining whether the product is used in an earthquake prone environment and installing the appropriate seismic restraints in accordance with local regulations.</p>	

 <b>CAUTION</b> <b>Inappropriate Use</b>	
<p>Use of this product in a manner or for purposes other than for what it is intended may cause equipment damage or personal injury.</p> <ul style="list-style-type: none"><li>• Only use the product for its intended application.</li><li>• Do not modify this product beyond its original design.</li><li>• Always operate this product with the covers in place.</li></ul>	

 <b>CAUTION</b> <b>Damaged Components</b>	
<p>The use of this product when components or cables appear to be damaged may cause equipment malfunction or personal injury.</p> <ul style="list-style-type: none"><li>• Do not use this product if components or cables appear to be damaged.</li><li>• Place the product in a location where it will not get damaged.</li><li>• Route cables and tubing so that they do not become damaged and do not present a personal safety hazard.</li></ul>	

## Safety Features

The Automated Plate Seal Remover has several safety features that have been incorporated into its design to ensure that a user is not exposed to the Automated Plate Seal Remover mechanism or possible hazardous materials.

### Safety Cover

The Automated Plate Seal Remover is equipped with a hinged safety cover. This cover separates the user from the Automated Plate Seal Remover mechanism and possible exposure to hazardous materials.

When the cover is opened the power is immediately interrupted to the Automated Plate Seal Remover mechanism. Two options will be displayed on the screen in [Figure 1-2](#).

- To continue with the Automated Plate Seal Remover process, close the cover, and press **Run/Stop**.
- To reset the Automated Plate Seal Remover, close the cover, and press **Select**.



**Figure 1-2: Safety Cover Options**

---

**NOTE:** The safety cover on/off feature is for emergency use only. To service the equipment the power switch located at the back of the instrument (see [Figure 3-2](#)) must be turned off.

---

## Interrupting Operation


On the lower right side of the control panel is a Run/Stop button. Pressing **Run/Stop** during the Automated Plate Seal Remover process will immediately stop the instrument. See "[Troubleshooting](#)" on [page 54](#).

## Hazardous Waste

The disposable seal collection reel is colored blue to indicate that it must be treated as hazardous waste when disposed of. It is the responsibility of the user to determine a safe disposal procedure that is consistent with the nature of any hazardous material that may be present.

## Regulatory Compliance and Declaration of Conformity

The Automated Plate Seal Remover meets the requirements of the European Union’s Low Voltage Directive 2014/35/EU, Electromagnetic Compatibility Directive 2014/30/EU, and 2011/65/EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment. In accordance with the directives, Azenta Life Sciences has issued a Declaration of Conformity and the Automated Plate Seal Remover has a CE mark affixed.

DOCUMENT NUMBER: <b>225653</b>	TITLE: <b>Declaration of Conformity, Machinery Directive</b>	
REVISION: E	DOCUMENT CLASSIFICATION:	
ECC# EC132455	04-Form, Template or Other	

### DECLARATION OF CONFORMITY

Description: Automated Plate Seal Remover

Function: The Automated Plate Seal Remover product is a bench top, automated microplate seal removal device intended for use in a laboratory environment by trained professional personnel. The substances contained in the microplates are determined by the end user. The manufacturer is not necessarily aware of these substances

Product code: XP-A\_230V

Business name and full address of the manufacturer of the machinery:

Azenta Life Sciences, Northbank, Irlam, Manchester M44 5AY, United Kingdom

Name and address of the person, established in the Community, authorized to compile the relevant technical documentation:

Azenta Life Sciences (Germany) GmbH, Im Leuschnerpark 1B, 64347 Griesheim, Germany

The manufacturer declares:

- That this machinery fulfills all the relevant provisions of Directive 2006/42/EC (Machinery Directive)
  - o EN 12100:2010 Safety of machinery. General principles for design. Risk assessment and risk reduction
  - o ISO/TR 14121-2:2012 ED2 Safety of machinery. Risk assessment. Practical guidance and examples of methods
  - o EN 61010-1:2010+A1:2019. Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements
- That this machinery fulfills all the relevant provisions of Directive 2014/30/EU (EMC Directive)
  - o EN 61326-1:2021 Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements
- That this machinery is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment and amendment 2015/863/EU.
  - o BS EN IEC 63000:2018. Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Year CE Marking Affixed to Product: 2012

Signed for and on the behalf of Azenta Life Sciences:

*Rob Woodward*

[Rob Woodward \(Oct 25, 2021 05:58 GMT+1\)](#)

Print name: Rob Woodward

Position: Senior Vice President, Global Quality Executive Management

Place: Irlam, Manchester

Confidential: The information is confidential and is to be used only in connection with matters authorized by Azenta and no part of it is to be disclosed to others without prior written permission from Azenta.

Date Printed: Saturday, October 23, 2021



This is uncontrolled when printed

PAGE 1 OF 1

## 2. Overview

The Automated Plate Seal Remover system automatically removes seals that are thermally applied to either Polypropylene or Polystyrene microplates. Removed seals are retained within the Automated Plate Seal Remover for disposal at a later time and in a manner consistent with the nature of their contamination. The Automated Plate Seal Remover system has the capacity to remove approximately 400 seals per roll of tape.

### Using this Manual

 <b>WARNING</b> <b>Read the Safety Chapter</b>	
<p>Failure to review the Safety chapter and follow the safety warnings can result in death or serious injury.</p> <ul style="list-style-type: none"><li>• All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.</li><li>• Follow all applicable safety codes of the facility as well as national and international safety codes.</li><li>• Know the facility safety procedures, safety equipment, and contact information.</li><li>• Read and understand each procedure before performing it.</li></ul>	

The Automated Plate Seal Remover is intended for use in a laboratory environment by trained laboratory personnel and should be serviced only by Azenta Life Sciences or Azenta Life Sciences trained representatives. The manuals and related materials are intended for use by trained and experienced technical personnel.

The manufacturer accepts no liability for any other use of the equipment or its individual parts and components. This also applies to service and repair work carried out by unauthorized service personnel. All warranties are declared null and void in the event of non-compliance with these instructions. This also applies to parts not directly affected by any unauthorized repair work.

This manual contains information on safety, specifications, and operation as well as troubleshooting and maintenance of the Automated Plate Seal Remover. If there are any questions regarding this manual or use of this system or to order additional copies of this publication, contact Azenta Life Sciences Service (see [Page 3](#)).

## Standard Components

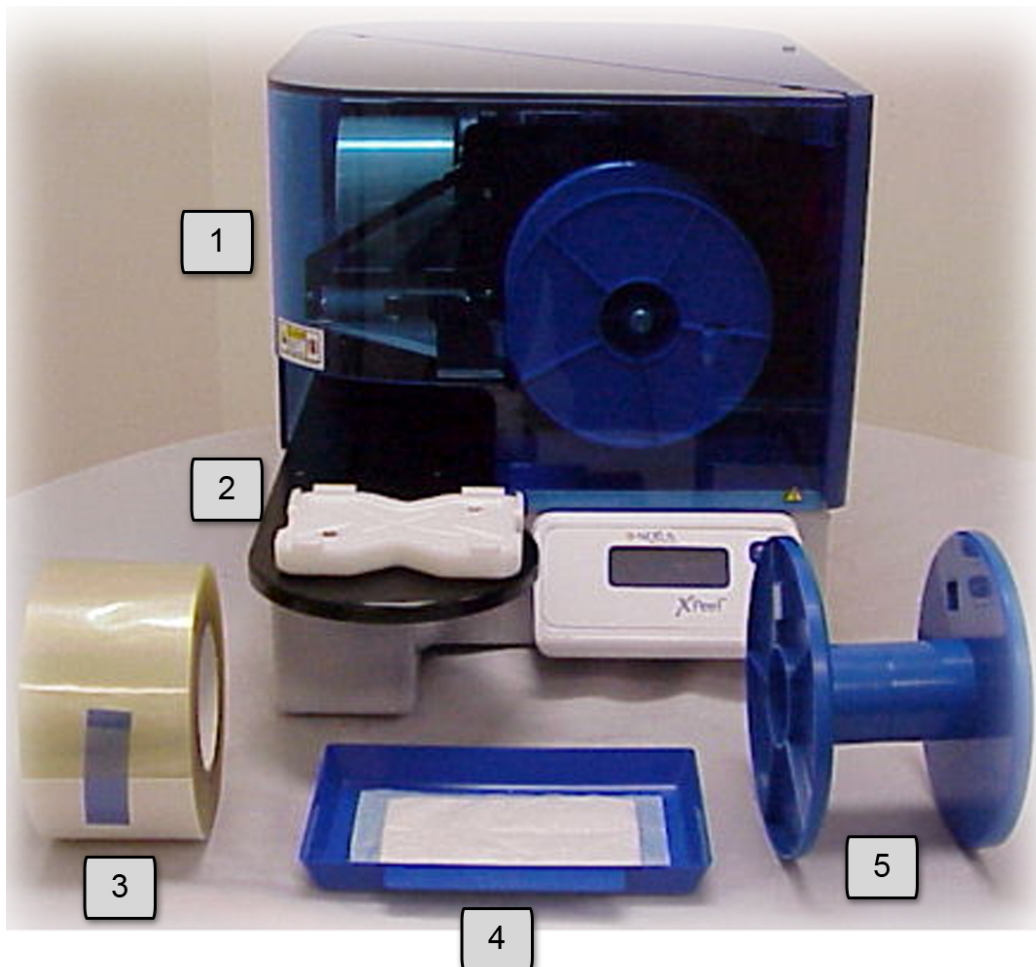


Figure 2-1: Automated Plate Seal Remover Components

Number	Description
1.	Automated Plate Seal Remover System
2.	Plate Tray
3.	Automated Plate Seal Remover Tape



Number	Description
4.	Drip Pan <i>NOTE: Drip pad is not included with the Automated Plate Seal Remover.</i>
5.	Seal Collection Reel

# 3. Specifications and Site Requirements

## Specifications

### Unit Dimensions

Parameter	Specification
Width	14.72 in (37.39 cm)
Depth	25.11 in (63.78 cm)
Height	14.70 in (37.34 cm)

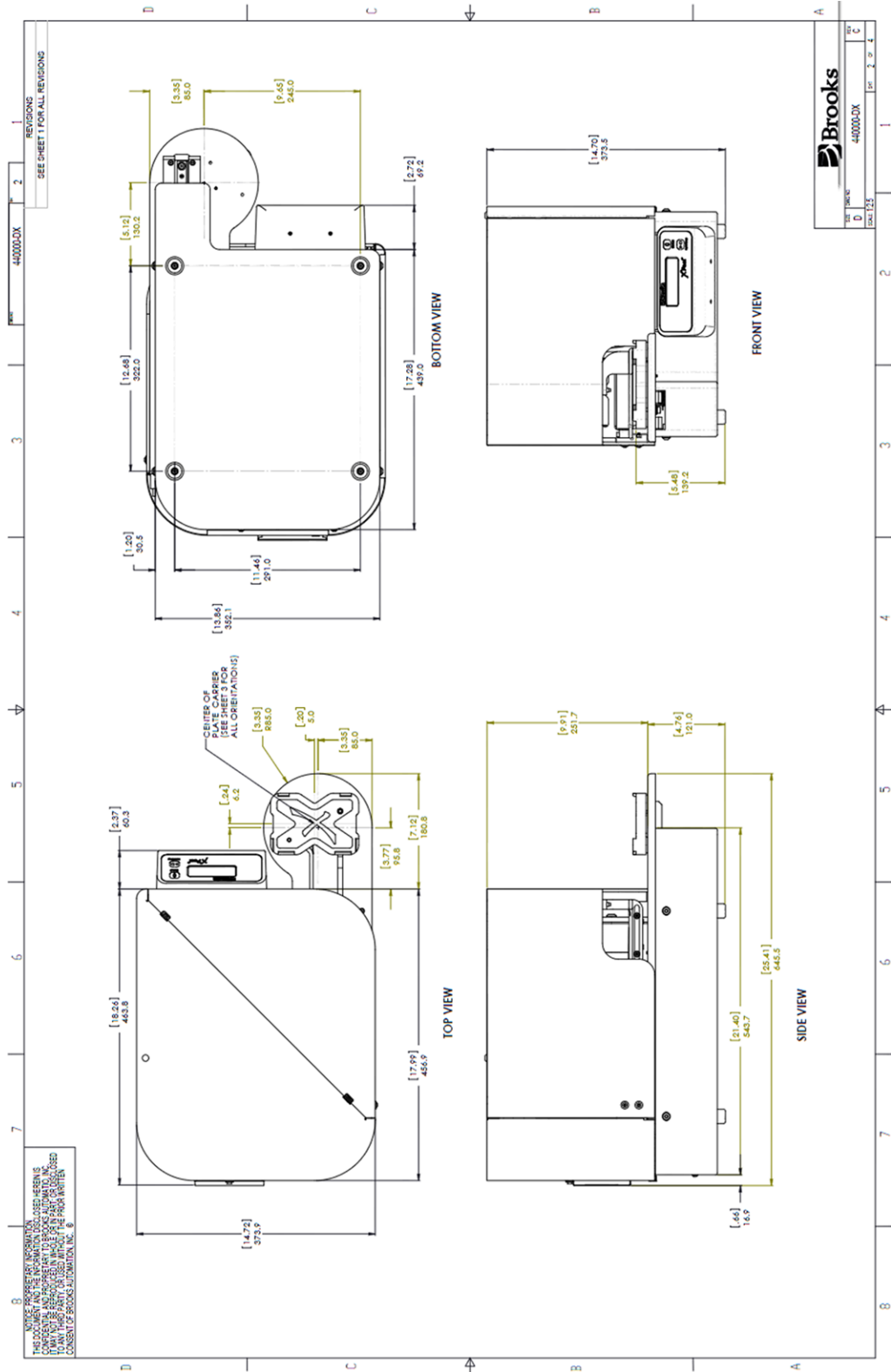


Figure 3-1: Automated Plate Seal Remover Unit Dimensions

## Site Requirements

### Space Requirements

Parameter	Specification
Width	15 in (38.1 cm)
Depth	24 in (60.96 cm)
Height	24 in (60.96 cm)
Additional Clearance	2 in (5.08 cm) behind the system
Weight	76 lbs. (35 kgs)

### Environmental Requirements

Parameter	Specification
Temperature - Transport and Storage	15°C to 40°C (59 - 104 °F)
Temperature - Operation	0°C to 40°C (32 - 104 °F)
Storage Humidity	10 to 70% RH Wet-bulb temperature 39 °C (102 °F) max., no condensation
Relative Humidity	10 to 90% RH Wet bulb temperature 39 °C (102 °F) max., no condensation
Storage Lighting	All external surfaces are resistant to UV-light. Over time UV-light might affect LCD-panels: LCD screens may fade.
IP 20	Protection against small foreign bodies > 2.5 mm (e.g. a screwdriver), and no protection against water
Dust	0.1 mg/m <sup>3</sup> and below (non-conductive levels)
Pollution Degree	For use in Pollution Degree 2 environment  Decontamination treatment with Hydrogen Peroxide Gas needs to be avoided as it will damage the electronic parts.

## Electrical Requirements



The system must only operate with the power supply and frequency specified on the system identification stickers mounted on the side of the device. Operating the system with any other power supply or frequency can result in damage to the equipment.

Parameter	Specification
Supply Voltage	115VAC or 230VAC
Supply Frequency	60Hz for 115 VAC; 50HZ for 230VAC
Current Rating	4A for 115 VAC; 2A for 230VAC

## Accessory Connections

Parameter	Specification
Communication	Serial RS232

## Power Requirements and Voltage Configuration



 <b>CAUTION</b> <b>Electrical Installation</b>	
<p>Improper electrical connection or connection to an improper electrical supply can result in electrical burns or fire and damage to the equipment.</p> <ul style="list-style-type: none"><li>• Always use proper power and proper electrical connections in accordance with the appropriate electrical code.</li><li>• Always connect the unit to a proper electrical ground.</li><li>• Turn off power before servicing.</li><li>• Turn off power before disconnecting or connecting cables.</li></ul> <p>Failure to properly configure the power inlet can permanently damage the Automated Plate Seal Remover.</p>	



**Figure 3-2: Automated Plate Seal Remover Power Source**

The system may be configured for either a 115 Volts or 230 Volt power source. The power configuration must be compatible with both the Automated Plate Seal Remover's power cord and facility's power source.

If the voltage displayed on the fuse panel is incorrect lift the fuse cover tab located on the right side of the panel. Pull the red fuse out of the panel and reinstall it so the proper voltage is displayed through the fuse panel window when the cover is closed. If required, replace only with a 3A fuse.

 <b>CAUTION</b> <b>Electrostatic Discharge</b>	
<p>To prevent the possibility of electrical shock, always plug the Automated Plate Seal Remover's power cord into a grounded power source.</p> <p>Failure to follow proper grounding techniques can cause electrostatic discharge which may damage electronic components.</p> <ul style="list-style-type: none"><li>• Always follow appropriate grounding techniques when working with electronic components and PC boards.</li></ul>	

# 4. Installation and Removal

## Unpacking and Setup

The Automated Plate Seal Remover system is shipped in one container. The container holds the following:

- Automated Plate Seal Remover
- Automated Plate Seal Remover Tape
- Seal Collection Reel
- Drip Pan
- User Manual

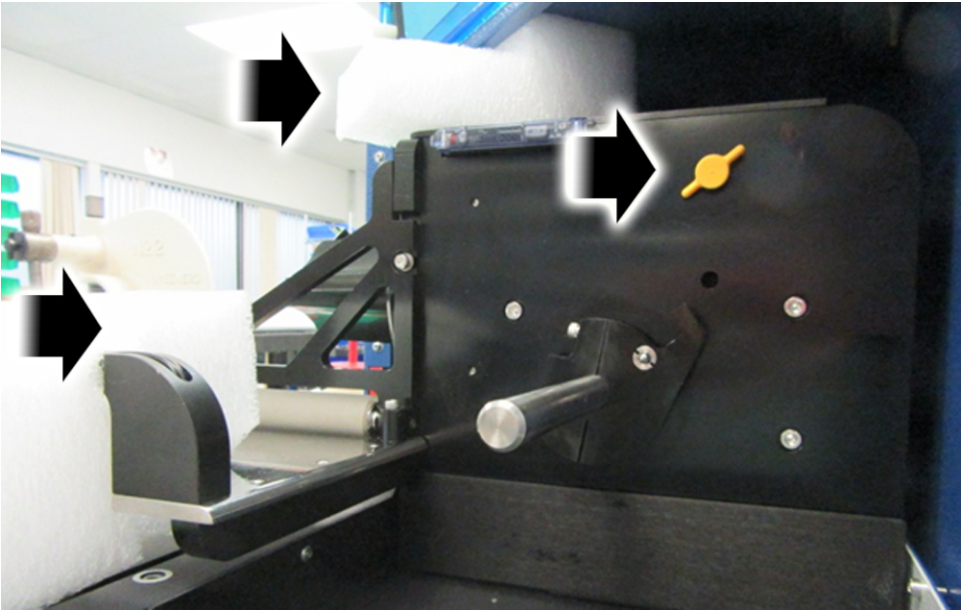
---

**NOTE:** Drip pad is not provided with the Automated Plate Seal Remover system.

---

Normal precautions and reasonable care should be exercised during the unpacking process to avoid damage to the equipment or its components.



Step	Action
1.	<p>Open the Automated Plate Seal Remover plastic cover and carefully remove all foam pads and the screw that holds the elevator.</p> 
2.	<p>Immediately after the unpacking process has been completed inspect all the packed items for any damage that may have occurred during shipping.</p> <p>Notify Azenta Life Sciences immediately if any damage is discovered.</p>

---

**NOTE:** Retain all packing material if equipment damage is found and notify Azenta Life Sciences for instructions.

---

## Placement of Equipment

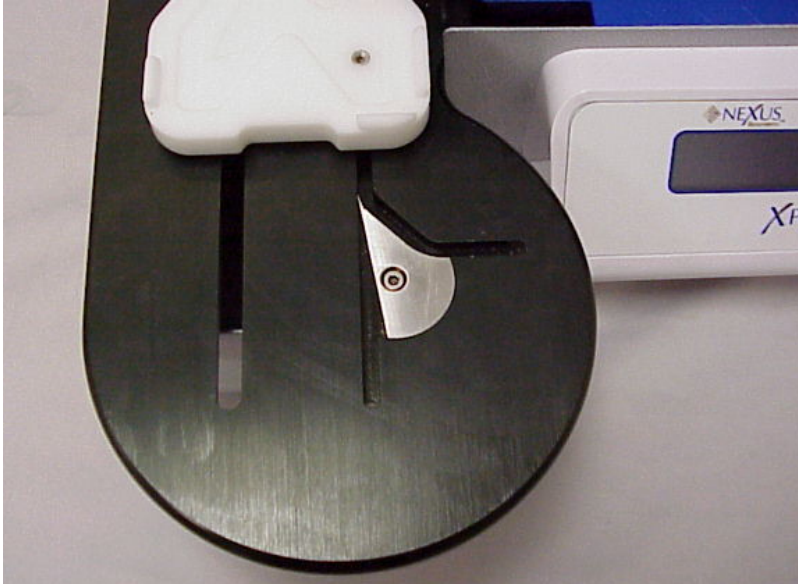
The Automated Plate Seal Remover system requires a clear bench top space approximately 15 inches wide, 24 inches deep and 24 inches high with safety shield raised.

An additional clearance space of 2 inches behind the system is required for proper ventilation of the internal mechanism.

It is recommended that the Automated Plate Seal Remover be positioned on an equipment bench with sufficient surrounding workspace to allow for the placement of multiple microplates during processing.

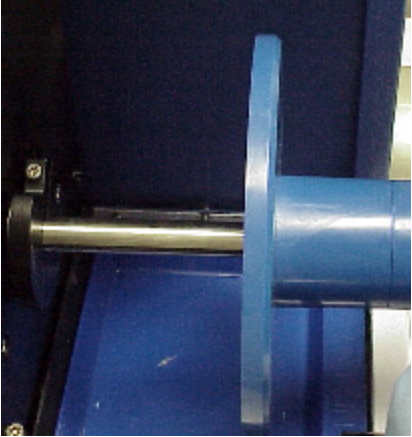
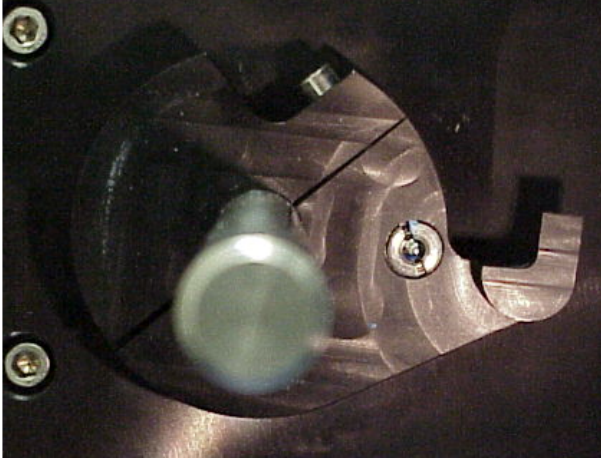
## Setting Plate Tray Orientation

The plate tray orientation is set at the factory to input and output plates in the landscape format. This orientation may be changed to portrait.



Step	Action
1.	<p>Push the plate tray along the track until the plate tray directional track switch is revealed.</p> 
2.	<p>Loosen the set screw. Turn the track switch to the right for portrait. <b>OR</b> Turn the track switch to the left for landscape.</p>
3.	<p>Tighten the set screw. Confirm the proper settings by manually pushing the plate tray back to its starting position.</p>

## Seal Collection Reel Installation and Removal

### Seal Collection Reel Installation



Step	Action
1.	Plug the power cord into an outlet.
2.	Close the cover and turn the power switch ON to home the Automated Plate Seal Remover. The Automated Plate Seal Remover performs homing moves including raising the carriage to its uppermost position.
3.	Turn the power switch OFF and open the safety cover.
4.	<p>Slide the blue seal collection reel onto its drive shaft located on the front of the Automated Plate Seal Remover.</p> 
5.	<p>Push the reel towards the back of the Automated Plate Seal Remover.</p> <p>While pushing the reel, rotate it clockwise until the slot on the face of the reel is fully engaged with the drive tong.</p> 

## Seal Collection Reel Removal

 <b>CAUTION</b> <b>Hazardous Materials</b>	
<p>It may not be appropriate to discard used Seal Collection Reels into the trash. Used Seal Collection Reels may be contaminated with potentially hazardous materials. The safe and proper method of disposal of all used reels is the responsibility of the user.</p>	

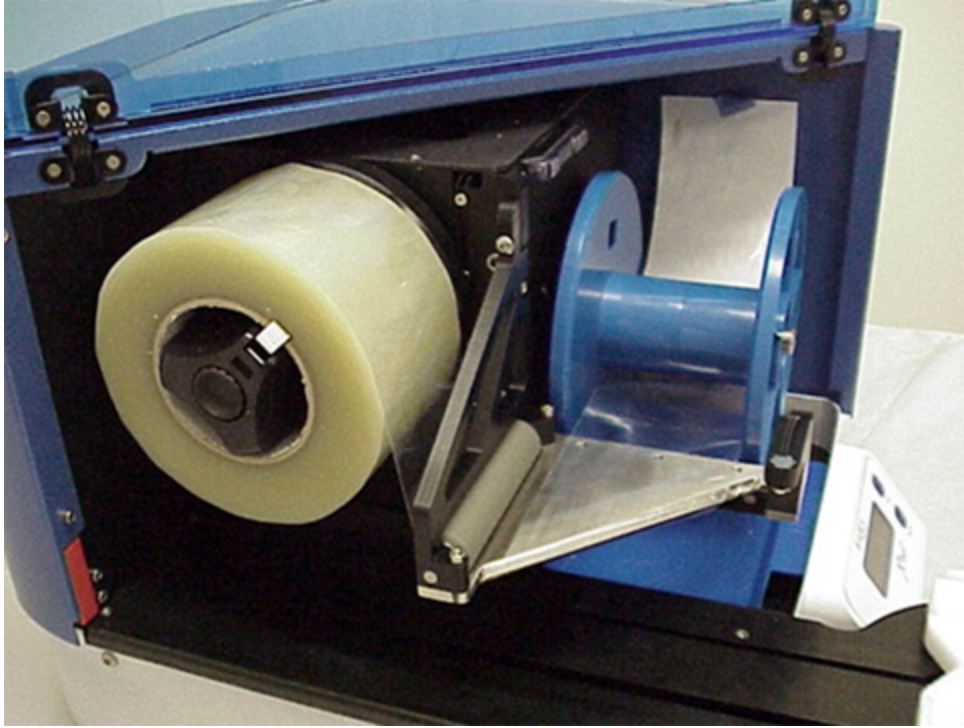
Step	Action
1.	Cut the Automated Plate Seal Remover Tape where it exits the Automated Plate Seal Remover Tape roll, if required.
2.	Push in the seal collection reel and rotate it counterclockwise to disengage the drive tang. Continue rotating the reel counterclockwise until all of the Automated Plate Seal Remover Tape has been collected on the reel.
3.	Remove the reel from the shaft. It may be necessary to dispose of the old reel as hazardous waste depending on how the Automated Plate Seal Remover was used.

## Automated Plate Seal Remover Tape Installation and Removal

 <b>CAUTION</b>	
<p>Azenta Life Sciences Automated Plate Seal Remover Tape is specially formulated to have the highest possible adhesion while retaining the property of being easy to de-reel. This allows the mechanism to pull the tape with enough force to peel a plate seal without breaking the tape.</p> <p>Do not attempt to use a different tape as it can damage the mechanism and will void the warranty</p>	

## Automated Plate Seal Remover Tape Installation

Step	Action
1.	Turn the power switch OFF and open the safety cover.
2.	<p>Slide the Automated Plate Seal Remover Tape roll onto the black supply reel located on the left side of the Automated Plate Seal Remover.</p> <p>The roll must be positioned so that the adhesive side of the tape is facing down and the roll is rotating clockwise when the tape is unwound from the roll.</p> <p>The supply reel must rotate when the tape roll is rotated.</p> <p>The tension screw in the center of the supply reel can be adjusted slightly if required.</p> <div data-bbox="321 640 1170 1010" data-label="Image"> </div>
3.	<p>Pull 1 ft of Automated Plate Seal Remover Tape from the supply reel.</p> <p>Position the Automated Plate Seal Remover Tape under the angled tape guide.</p> <div data-bbox="321 1163 1354 1793" data-label="Image"> </div>

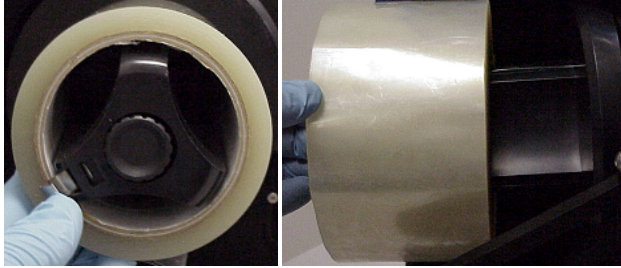
Step	Action
4.	Carefully lift and twist the Automated Plate Seal Remover Tape until it cross above the tape guide ar a right angle.
5.	Thread the loose end of the Automated Plate Seal Remover Tape under the seal collection reel.
6.	Wrap the Automated Plate Seal Remover Tape counterclockwise one turn, so the adhesive firmly attaches to the hub of the reel. The paper leader may be left in place.
7.	<p>When the Automated Plate Seal Remover is turned on, it autmatically advances a small amount of tape.</p> 

---

**NOTE:** To facilitate the installation of the Automated Plate Seal Remover Tape, it is recommended that this process is performed before installing the drip pad. The Automated Plate Seal Remover Tape is extremely sticky and may adhere to the pad and damage it.



---

## Automated Plate Seal Remover Tape Removal


Step	Action
1.	Roll and cut the tape while it is still on the roll.
2.	<p>Push in the metal lock and remove the roll from the black supply hub.</p> 

## Drip Pad Installation and Removal

Sealed plates often have droplets of moisture on the underside of the seal. This is especially true if the plates have just been through some form of mixing process. It is recommended that plates be centrifuged prior to unsealing. When this is not practical, you can use the drip tray and pad to catch and control liquid from the removed seals.

 <b>CAUTION</b> <b>Hazardous Materials</b>	
Do not discard used drip pads and trays in the trash. Used drip pads and trays may be contaminated with potentially hazardous materials. The safe and proper method of disposal of all used pads and trays is the responsibility of the user.	

## Drip Pad Installation

Step	Action
1.	<p>Place a drip pad in the blue plastic drip tray.</p> <p>Make sure the tray is directly under the seal collection reel.</p> 
2.	<p>Close the cover and turn the power switch ON.</p> <p>After the homing moves are complete, the Automated Plate Seal Remover is ready for use.</p>

## Drip Pad Removal

Step	Action
1.	Lift the blue tray from under the collection reel.
2.	Remove and dispose of the drip pad and drip tray as hazardous waste.



# 5. Operation

## Theory of Operation

The Automated Plate Seal Remover applies a specially developed adhesive tape called Automated Plate Seal Remover Tape™ to the leading edge of a microplate seal. After a few seconds the Automated Plate Seal Remover Tape is removed while more Automated Plate Seal Remover Tape is applied to the remainder of the seal. This process results in the transfer of the microplate seal to the Automated Plate Seal Remover Tape, which is then collected on a second reel. During the Automated Plate Seal Remover process the seal is inverted and directed away from the plate at a 90-degree angle to prevent contamination of the exposed samples.

## Quick Start

Step	Action
1.	Turn the power switch ON. The power switch is located in the fuse station on the back of the Automated Plate Seal Remover (see <a href="#">Figure 3-2</a> ).  Wait for the system to home and display a READY message.
2.	Place a sealed microplate on the plate station.
3.	Press <b>Run/Stop</b> to instruct the Automated Plate Seal Remover mechanism to either raise or lower.

## System Operation



**Figure 5-1: Automated Plate Seal Remover Main Screen**

The control panel consists of two command buttons and a status display window (Figure 5-1). When the system's power switch is activated on the back of the Automated Plate Seal Remover a brief message is displayed detailing the hardware and software versions of the system and instructions to restore the original factory settings.

### Main Screen

The *Main screen* displays a **READY** message to confirm that the Automated Plate Seal Remover system is fully functional. If the Automated Plate Seal Remover Tape capacity is at 30 seals or less, a message alerts the operator to this condition. See Figure 5-1.

### To Automated Plate Seal Remover

Press the **Run/Stop**. The Automated Plate Seal Remover automatically moves the microplate on the plate tray to the Automated Plate Seal Remover Tape dispensing location and removes the seal.

When the task is complete, the plate tray returns to the starting location.

### Setup Options

Press **Select**. The display screen automatically shows the available setup options.

### Restore Factory Settings

The Automated Plate Seal Remover comes preset with parameters that are appropriate to most users.

To restore the Automated Plate Seal Remover to its factory settings:

Step	Action
1.	Turn the power switch OFF and wait 10 seconds.
2.	Turn the power switch ON.
3.	Press <b>Select</b> when a message appears displaying the system hardware and software versions. The system automatically resets.

## Set Up Screen

The *Set Up* screen displays the options available to customize the Automated Plate Seal Remover settings to maximize its performance for various plate and seal types.

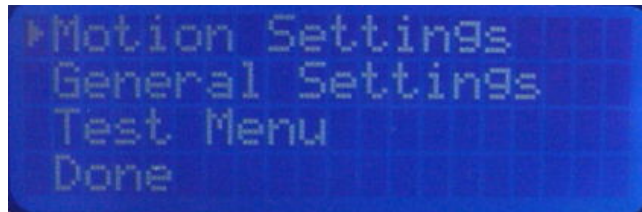


Figure 5-2: Set Up Screen

## Setting Motion Parameters

The factory default settings are sufficient for the majority of plate/seal combinations. In some cases however, it may be possible to improve performance by choosing different operational parameters.

On the *Set Up* screen, press **Select** to move the display arrow next to this option and press **Run/Stop** to access the *Motion Settings* screen.

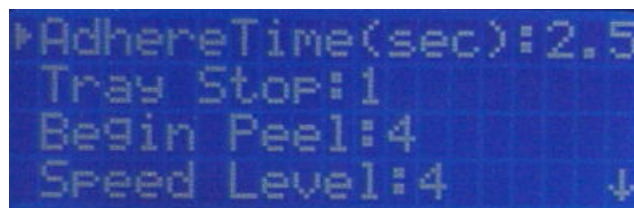


Figure 5-3: Motion Settings Screen

## Adhere Time

The *Adhere Time* is the length of time that the Automated Plate Seal Remover Tape is pressed against the seal before the Automated Plate Seal Remover process is started. Seals that are unusually difficult to remove will require a longer *Adhere Time*. This, of course will affect the overall rate of seal removal. 2.5 seconds will work with most plate/seal combinations.

Press **Select** to move the screen arrow next to the *Adhere Time* setting.

Press **Run/Stop** to display the optional times of 2.5, 5.0, 7.5 and 10 seconds.

## Tray Stop

*Tray Stop* refers to the plate tray orientation options. It has no effect on performance, but it may make interface to a robot more convenient. When the conveyor guide is in the landscape format, the plate's angle may be varied to better interface with other plate handling automation systems.

When the arrow is next to *Tray Stop*, press **Run/Stop** to display 1 = Zero angle, 2 = 22 degrees angle or 3 = 45 degrees angle.

## Begin Peel

Adjusting the *Begin Peel* position can correct for variation in plate type and seal position. The *Begin Peel* position is typically determined by experimentation using a sample of the plate type and seal to be processed. Removal of difficult seal types can be improved by ensuring that the pressure roller contacts the leading edge of the seal at the *Begin Peel* position. This can be especially effective on adhesive-backed (not heat sealed) seals.

Step	Action
1.	Press <b>Select</b> to move the screen arrow next to the <i>Begin Peel</i> setting.
2.	Press <b>Run/Stop</b> . The plate tray moves the plate to the indicated position (1-7) on the screen. Continue pressing <b>Run/Stop</b> until the plate is at the correct position from removal of the seal.
3.	Verify the correct position by running several test-sealed plates. Try with different speeds and adhere times.  Repeat the process as necessary.

## Speed Level

The speed of seal removal is controlled by the rotational speed of the seal collection reel. This rate of rotation can be adjusted through a scale of 1-5. The most effective speed level is one in which any

liquid that may be present on the underside of the seal remains adherent to the seal during its removal. Many seals are more easily removed at higher speeds.

Press **Select** to move the screen arrow next to the *Speed Level* setting.

Press **Run/Stop** to select the rate of seal removal that best prevents splattering during seal removal.

## Saving New Settings

When any of the above settings are changed, the new settings can be saved or ignored. *Save* stores the changes in the Automated Plate Seal Remover memory chip. *Ignore* restores all settings back to the last save.



Figure 5-4: Save or Ignore Settings

Step	Action
1.	Press <b>Select</b> until a DONE message appears on the screen.
2.	Press <b>Run/Stop</b> to display the <i>Save/Ignore</i> screen.
3.	Press <b>Select</b> to move the screen arrow between the two options.
4.	Press <b>Run/Stop</b> to make the selection. The <i>Main screen</i> appears on the display and the Automated Plate Seal Remover is ready to use.

## General Settings

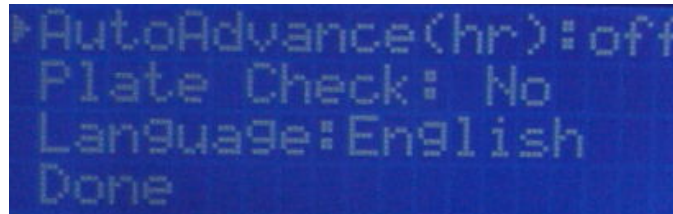


Figure 5-5: General Settings Screen

Step	Action
1.	On the <i>Set Up</i> screen , press <b>Select</b> to move the display arrow next to <i>General Settings</i> .
2.	Press <b>Run/Stop</b> to display the <i>General Settings</i> screen.

## Auto Advance

A small amount of Automated Plate Seal Remover Tape is exposed to the air while the Automated Plate Seal Remover is waiting for the next plate. The system can be set to automatically advance the Automated Plate Seal Remover Tape prior to starting the Automated Plate Seal Remover process. This is to ensure that fresh tape is always available for Automated Plate Seal Remover jobs. The types of seals being processed and the temperature and humidity of the lab will dictate how long the Automated Plate Seal Remover Tape can remain exposed and still be effective. The maximum time that the tape is exposed may be adjusted as follows:

Step	Action
1.	Press <b>Select</b> to move the screen arrow next to <i>Auto Advance</i> .
2.	Press <b>Run/Stop</b> to choose between, off, 2, 10 or 24 hrs.

## Plate Check

When the *Plate Check* setting is set to Yes, The Automated Plate Seal Remover process is prevented from taking place if there is no plate detected on the plate tray.

**NOTE:** Some types of seals, plates and plate seal combinations are not suitable for use in the Automated Plate Seal Remover. Samples of seals, plates and sealed plates should be tested to verify that the application of the Plate Check system properly detects the presence or absence of a specific seal/plate type.

Step	Action
1.	Press <b>Select</b> to move the screen arrow next to <i>Plate Check</i> .
2.	Press <b>Run/Stop</b> to choose between No (Plate Check disabled) and Yes (Plate Check Enabled).

## Language

The display can be set for either English or German.

Step	Action
1.	Press <b>Select</b> to move the screen arrow next to <i>Language</i> .
2.	Press <b>Run/Stop</b> to choose between English or German.

## Test Menu

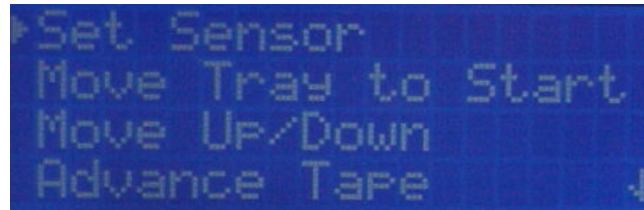


Figure 5-6: Text Menu

Step	Action
1.	On the <i>Set Up</i> screen , press <b>Select</b> to move the display arrow next to <i>Test Menu</i> .
2.	Press <b>Run/Stop</b> to display the <i>Test Menu</i> screen.

## Set Sensor

The seal detection sensor is primarily used when the Automated Plate Seal Remover is being controlled remotely and provides feedback to ensure that the seal has been removed.

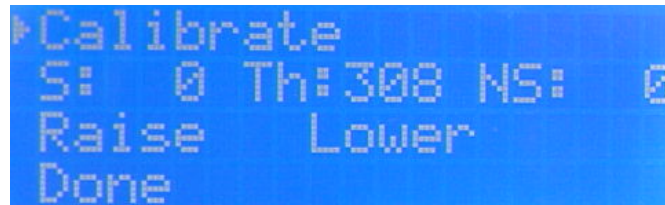


Figure 5-7: Seal Detection Sensor Calibration

To calibrate the seal detection sensor threshold value:

Step	Action
1.	Press <b>Select</b> to move the display arrow next to <i>Set Sensor</i> .
2.	Press <b>Run/Stop</b> to display the <i>Calibration</i> screen. The seal detection sensor threshold value can be set for a seal present or not present.
3.	Press <b>Select</b> to move the display arrow up to <i>Calibrate</i> .
4.	Place a sealed plated on the plate station and press <b>Run/Stop</b> .



Step	Action
5.	<p>After the sealed plate is read, un-sealed and read again, three sensor values will be displayed on the screen.</p> <ul style="list-style-type: none"> <li>• The first value S (Seal) is for a sealed plate.</li> <li>• The second value Th (Threshold) is the calculated value for the change in seal status.</li> <li>• The third value NS (No Seal) is for an un-sealed plate.</li> </ul> <p><b>NOTE:</b> <i>If more than one type of sealed plate is to be use in the Automated Plate Seal Remover record the S, Th and NS values for each type. Determine the most effective threshold values for all plate types and adjust the threshold value as outlined below. For multiple plate types, a threshold value nearer the S (seal) value may give the best results</i></p>
6.	<p>To adjust the threshold value, press <b>Select</b> to move the display arrow to <i>Raise</i> or <i>Lower</i> .</p> <p>Press <b>Run/Stop</b> to make the adjustment.</p> <p>Follow the instructions in <a href="#">"Saving New Settings" on page 37</a> to save the new threshold setting.</p>

---

**NOTE:** Some types of seals, plates and plate seal combinations are not suitable for use in the Automated Plate Seal Remover. Samples of seals, plates and sealed plates should be tested to verify that the seal is completely removed and that the sensor properly detects the presence or absence of the seal to verify its removal.

---

### Move Tray to Start

Step	Action
1.	Press <b>Select</b> to move the display arrow next to <i>Move Tray</i> .
2.	Press <b>Run/Stop</b> to instruct the plate tray to move to the set starting location for the Automated Plate Seal Remover process.

---

**NOTE:** Generally only used in testing the Automated Plate Seal Remover in case of a suspected problem.

---

## Move Up/Down

Step	Action
1.	Press <b>Select</b> to move the display arrow next to <i>Move Up/Down</i> .
2.	Press <b>Run/Stop</b> to instruct the Automated Plate Seal Remover mechanism to either raise or lower.

---

**NOTE:** Generally only used in testing the Automated Plate Seal Remover in case of a suspected problem.

---

## Advance Tape

Step	Action
1.	Press <b>Select</b> to move the display arrow next to <i>Advance Tape</i> .
2.	Press <b>Run/Stop</b> to advance the Automated Plate Seal Remover Tape within the system.

---

**NOTE:** Generally only used in testing the Automated Plate Seal Remover in case of a suspected problem.

---

# Automation Interface

## Interface with other Automated Equipment

A serial port (RS232) located on the rear of the Automated Plate Seal Remover allows the system to be operated remotely by a robot or automated plate-handling system. The interface allows a cycle to be initiated, parameters to be set, and provides feedback about the de-sealing quality and remaining tape capacity. Refer to "[Automated Plate Seal Remover External Control](#)" on the facing page for a complete listing of the serial command set.

The Automated Plate Seal Remover should be configured in portrait, landscape, or landscape with an angle, by using the front panel controls. See "[Tray Stop](#)" on page 36.

---

**NOTE:** The system should be firmly located on a table relative to the robot. Special brackets are available to provide a secure mounting.

---

## Automated Plate Seal Remover External Control

The following defines the RS-232 interface and communication specification used to control the Azenta Life Sciences Automated Plate Seal Remover instrument. This interface facilitates the transfer of a plate to and from an external robot or plate handling system. It also allows external control of the Automated Plate Seal Remover. At a minimum, the external equipment is expected to transmit the command to desal a plate (Automated Plate Seal Remover) and to recognize that the process has been completed (ready). Commands are also provided to give information about the relative success of the operation, the amount of tape remaining, and other functions that may be used within a more elegant robotic control system.

There are several variables, which are saved on the EEPROM of the Automated Plate Seal Remover. These values persist even when power is removed. These variables can only be set and saved manually from the Automated Plate Seal Remover front panel.

### Electrical Interface

- An RS-232 serial port (DB-9 connector) on the back of the Automated Plate Seal Remover instrument is connected to a PC controlling the external equipment.
- The port's settings are: 9600,n,8,1, no hardware handshaking.
- A three-wire connection (GND, TXD and RXD signals) is all that is required.
- Since connection of the GND signals might result in the interconnection of chassis of the two systems, appropriate attention is required in choosing equipment location, power connections and grounding methods.

### Communications Protocol

- All messages are ASCII text and will be preceded by a \* and end with a carriage return and line feed (<CR><LF>)
- All commands and response messages are transmitted in all lower case. Any upper case shown in the command or response line refers to parameters that must be entered or error/status codes that are returned. For the purpose of this document, commands that the Automated Plate Seal Remover can receive over the serial port are in bold. Responses that are sent by the Automated Plate Seal Remover are in italics.
- If the last message from the Automated Plate Seal Remover is the 'ready'(see description below) response then it is ready to receive a command. The controlling system needs to be able to determine what the course of action should be (i.e. send a new command; deal with an error state, etc.). If the Automated Plate Seal Remover is busy, it will ignore the serial port until the 'ready' response is sent. No messages will be buffered while the Automated Plate Seal Remover is busy.
- Upon powering up, the Automated Plate Seal Remover will broadcast several messages and should then be in a ready state. See the topic on unsolicited messages for more details. If a motion command is received, the Automated Plate Seal Remover will respond immediately with an 'ack' and then 'ready' when the process is completed.

## Commands

### Status Request:

**Command:**

```
*stat<CR><LF>
```

**Response:**

```
*ready:XX,XX,XX<CR><LF>
```

Where the 'XX' fields refer to the three possible error codes from the error table that occurred during the previous Automated Plate Seal Remover motion. The error codes will remain in the ready response until another motion command is made or until a restart command is sent. A single commanded action may accumulate up to three errors. Since they are logged as they occur (left to right), any error code may appear in any error field. Successful completion of any motion command will clear all three error codes back to 00.

The message `*ready:XX,XX,XX<CR><LF>` is only sent when operation has halted and the Automated Plate Seal Remover is ready to receive new commands.

A typical response would be:

```
*ready:00,00,00<CR><LF>
```

This means there were no errors on the previous run (see the error chart at the end of this specification).

### Version Request

**Command:**

```
*version<CR><LF>
```

The 'version' command returns the Automated Plate Seal Remover firmware version.

**Response:**

```
*2.4<CR><LF>
```

```
*ready:07,00,00<CR><LF>
```

(In this example there had been an "out of tape" error in a previous run)

## Reset Request

### Command:

```
*reset<CR><LF>
```

The 'reset' command causes the spool to advance a few inches to fresh tape, and the elevator and conveyor axes to return to the home and ready for plate pick up position. Variables like error codes and tape remaining will be preserved. A good use for the reset command is to ensure that fresh tape is presented after a long period of inactivity. (See also; \*restart command)

### Acknowledgment:

```
*ack<CR><LF>
```

The Automated Plate Seal Remover immediately sends an 'ack' (acknowledgment).

The commanded action will now be attempted. A ready message will be sent upon completion.

### Response:

```
*ready:XX,XX,XX<CR><LF>
```

## Restart Request

### Command:

```
*restart<CR><LF>
```

The 'restart' command causes the Automated Plate Seal Remover to restart; the same as turning the power off and back on. After acknowledgment and the command action, the Automated Plate Seal Remover will broadcast the same unsolicited messages as the initial power up. This command will reset all internal variables and error codes. The EEPROM saved setup parameters will not be lost. If the cover is opened or if there has been an interlock system failure, the 'ready' response will be sent with the appropriate error code, but will require operator intervention.

### Acknowledgment:

```
*ack<CR><LF>
```

### Normal Response:

```
*poweron<CR><LF>
```

```
*homing<CR><LF>
```

\*ready:XX,XX,XX<CR><LF>

## Automated Plate Seal Remover Request:

### Command:

\*xpeel:AB<CR><LF>

The variable 'A' refers to the set of parameters: 1-9

The 'xpeel' operation has a number of parameters that can be selected to achieve better performance on difficult or unusual seal types. For most seals the default and fastest settings will give good performance. In an automated environment it may be advisable to be more conservative, or to provide for a retry at slower settings when the Automated Plate Seal Remover detects that a seal is not removed. Refer to the manual for techniques in determining proper set up parameters.

Parameter sets 1-8 are fixed; parameter set 9 can be set and saved manually by the user.

Set Number	Begin Peel Location	Speed
Set 1	Default -2 mm	fast
Set 2	Default -2 mm	slow
Set 3	Default	fast
Set 4	Default	slow
Set 5	Default +2 mm	fast
Set 6	Default +2 mm	slow
Set 7	Default +4 mm	fast
Set 8	Default +4 mm	slow
Set 9	custom	custom

The second term, variable 'B,' refers to adhere time in seconds

- 1=2.5 seconds
- 2=5 seconds
- 3=7.5 seconds
- 4=10 seconds

A typical command would be:

\*xpeel:41<CR><LF>

This command is a request for the Automated Plate Seal Remover to move the conveyor to the default starting position for adhesion, move the elevator down, wait 2.5 seconds adhere time, Automated Plate Seal Remover with a slow speed, and finally return the plate to the user. The 'xpeel' command is to be issued only after a sealed plate is placed on the conveyor.

**Acknowledgment:**

\*ack:<CR><LF>

**Normal Response:**

\*ready:00,00,00<CR><LF>

## Seal Check Request

**Command:**

\*sealcheck<CR><LF>

The 'sealcheck' command causes the conveyor to place the plate under the reflective seal detection sensor and the elevator to move down to the proper sensing elevation. The sensor status is then recorded. The elevator and conveyor axes then return to the home and ready for plate pick up position. Since this action only checks the plate at one location, a better indicator is the error code that will be generated during a normal desealing operation where the plate is scanned over most of its length. The 'sealcheck' command is useful, however, to verify that the sensor parameters are set correctly to detect a particular seal type.

**Acknowledgment:**

\*ack<CR><LF>

**Response:**

\*ready:XX,00,00<CR><LF> (XX=04 if seal detected, XX=00 if no seal present)

## Tape Remaining Request

**Command:**

\*tapeleft<CR><LF>

The Automated Plate Seal Remover calculates the amount of tape remaining on the supply spool by comparing the travel of the conveyor to the rotation of both the supply and take-up spools. After a completed 'XPeel' operation, a 'tapeleft' command can be issued to verify the amount of tape left as well as the space remaining on the take-up spool. These calculations are not perfectly accurate but they will provide sufficient warning to avoid running out of tape unexpectedly.

**Response:**

```
*tape:SS,TT<CR><LF>
```

```
*ready:XX,00,00<CR><LF>
```

Where 'SS' times 10 is the number of "deseals" remaining on the supply spool and 'TT' times 10 is the number of "deseals" that can be held on the space remaining on the take-up spool. The space remaining on the take-up spool is generally only a concern when unusually thick seals are being removed.

**Example:**

```
*tape:11,13<CR><LF>
```

Means that approximately 110 Automated Plate Seal Remover operations remain on the supply spool and 130 operations will still fit on the take-up spool.

On power up the number of "deseals" remaining on the supply spool and the number of "deseals" that can be held on the take-up spool, are unknown until an Automated Plate Seal Remover motion is completed. In this case the value 99 will be returned for SS and TT. For example:

```
*tape:99,99<CR><LF>
```

## Plate Check On/Off Request

**Command:**

```
*platecheck<CR><LF>
```

Where the variable A refers to y or n. This command sets the plate check parameter to yes or no.

**Example:**

```
*platecheck:n<CR><LF>
```

**Acknowledgment:**

```
*ack<CR><LF>
```



**Response:**

\*ready:00,00,00<CR><LF> (Error fields will contain errors from previous motion command)

## Status of Seal Detected Sensor Threshold Request

**Command:**

```
*sealstat<CR><LF>
```

This command reports the threshold value of the seal detected sensor.

**Example:**

```
*sealstat<CR><LF>
```

**Acknowledgment:**

```
*ack<CR><LF>
```

**Response:**

```
*seal:257
```

\* ready:00,00,00<CR><LF> (Error fields will contain errors from previous motion command)

## Setting the Seal Detected Threshold Value Request (higher than threshold)

Setting the seal detected threshold value for the seal present if higher than threshold.

**Command:**

```
*sealhigher:XXX<CR><LF>
```

Where XXX refers to the 3 digit threshold value. This command sets the seal detected threshold so that during Automated Plate Seal Remover operation, sensor readings higher than this value represents an un-removed seal and will result in an error 04, "seal not removed", message.

**Example:**

```
*sealhigher:300<CR><LF>
```

**Acknowledgment:**

```
*ack<CR><LF>
```

**Response:**

```
*seal:300
```

```
* ready:00,00,00<CR><LF> (Error fields will contain errors from previous motion command)
```

## Setting the Seal Detected Threshold Value Request (lower than threshold)

Setting the seal detected threshold value for the seal present if lower than threshold.

**Command:**

```
*sealower:XXX<CR><LF>
```

Where XXX refers to the 3 digit threshold value. This command sets the seal detected threshold so that during an Automated Plate Seal Remover, sensor readings lower than this value represents an unremoved seal and will result in an error 04, "seal not removed", message.

**Example:**

```
*sealower:300<CR><LF>
```

**Acknowledgement:**

```
*ack<CR><LF>
```

**Response:**

```
*seal:300
```

```
* ready:00,00,00<CR><LF> (Error fields will contain errors from previous motion command)
```

For a list of command error codes, see ["Command Error Codes" on page 57](#).

## Motor Commands

The following five commands cause the (3) motors (conveyor, elevator, spool) to move individually:

## Move Conveyor Out Request

### Command:

```
*moveout<CR><LF>
```

The 'moveout' command causes the conveyor to move out towards the user 7mm each time the command is called. When the conveyor reaches it's fully extended home position no movement occurs.

### Acknowledgement:

```
*ack<CR><LF>
```

### Normal Response:

```
*ready:00,00,00<CR><LF>
```

## Move Conveyor In Request

### Command:

```
*movein<CR><LF>
```

The 'movein' command causes the conveyor to move in to the default 'begin peel' position.

### Acknowledgement:

```
*ack<CR><LF>
```

### Normal Response:

```
*ready:00,00,00<CR><LF>
```

## Move Elevator Down Request

### Command:

```
*movedown<CR><LF>
```

The 'movedown' command causes the elevator to move down until it is stopped by a plate or reaches its lower limit. The plate check option is disabled for this command.

**Acknowledgement:**

```
*ack<CR><LF>
```

**Normal Response:**

```
*ready:00,00,00<CR><LF>
```

## Move Elevator Up Request

**Command:**

```
*moveup<CR><LF>
```

The 'moveup' command causes the elevator to move up approximately 1.5mm each time the command is called until the elevator reaches its full up home position.

**Acknowledgement:**

```
*ack<CR><LF>
```

**Normal Response:**

```
*ready:00,00,00<CR><LF>
```

## Move Spool Request

**Command:**

```
*movespool<CR><LF>
```

The 'movespool' command causes the spool to advance approximately 10mm of tape.

**Acknowledgement:**

```
*ack<CR><LF>
```

**Normal Response:**

```
*ready:00,00,00<CR><LF>
```

For a list of command error codes, see ["Command Error Codes" on page 57](#).

## Unsolicited Messages from the Automated Plate Seal Remover

The following is a summary of messages that the Automated Plate Seal Remover will send on its own, without any prompting, over the serial port.

On normal startup, the following three status messages will be sent:

```
*poweron<CR><LF>
```

```
*homing<CR><LF>
```

```
*ready:00,00,00<CR><LF> (This is only sent if the system started up successfully)
```

During manual operation of the Automated Plate Seal Remover, it will send the following when either of the two front panel buttons is pressed:

```
*manual<CR><LF>
```

This will be followed by a string that represents one of two commanded actions.

```
*xpeel<CR><LF>
```

**OR**

```
*setup<CR><LF>
```

When the Automated Plate Seal Remover movement has completed, it will send:

```
*ready:00,00,00<CR><LF>
```

# 6. Troubleshooting

## Repair Philosophy

Refer to this *Troubleshooting* chapter for diagnostic procedures. If these procedures are not adequate to determine the source of the problem, refer to the Automated Plate Seal Remover operational procedures for in-depth descriptions of how the product should operate.

Once the failed unit has been identified, a Field Replaceable Unit (FRU) can be ordered. The FRU is shipped with directions for removing the failed unit from the Automated Plate Seal Remover and installing the new unit.

A series of FRUs, may have been identified for the Automated Plate Seal Remover to simplify repair procedures in the field. Some of these FRUs may comprise a complete assembly. A number of alternatives are available for obtaining replacement FRUs and other parts to repair the Automated Plate Seal Remover. The following service options are available:

- Facilitated on-site repair via a Service Sales Order utilizing Azenta Life Sciences's Field Service personnel and factory authorized repair parts
- Advanced Exchange Units can be established for all major systems
- Azenta Life Sciences's Factory Repair Services
- Azenta Life Sciences spare parts can be ordered from Azenta Life Sciences Technical Support on both a priority and non priority basis

[See "Technical Support" on page 59](#) for more information or quotes.

## Troubleshooting

Successful troubleshooting involves gathering enough information and asking enough questions to define the problem using a single statement of how the system is supposed to operate and how the system is operating improperly.

Create a simple problem statement using the steps below:

- Observe and list the symptoms of the problem.
- Determine what is happening that is different from what should happen.
- Determine the items that have the problem and those that do not.
- Determine when the problem first occurred and how often it occurs.
- Determine the state of the system when the problem occurred or occurs.
- Investigate the symptoms and reduce the list to the single primary symptom..
- List the possible causes of the symptom.
- Reduce the list of causes based on what is happening and what is supposed to happen.
- Troubleshoot the probable causes.

### Troubleshooting Table Format

Troubleshooting tables use a 3-column format to divide and resolve the problem.

**Problem** column shows the fault.

- If the system recognizes a fault, the host may be sent an error code.
- If the system does not recognize a fault, the system still may have errors in its error files.

**Possible Cause** column lists the probable causes of the problem.

**Corrective Action** column lists recommended actions to correct the problem.

Example of a troubleshooting table:

Problem	Corrective Action

## Corrective Action

The following are various conditions that could occur and intervention methods that should be attempted before contacting Azenta Life Sciences for assistance.

Problem	Corrective Action
No display	<p>Check the power source. Make sure the Automated Plate Seal Remover power switch is on.</p> <p>Verify that the voltage selector is set for the correct line voltage. See <a href="#">"Power Requirements and Voltage Configuration" on page 22.</a></p> <p>Check fuse in fuse panel (see <a href="#">Figure 3-2</a>).</p>
Stop Pressed message	<p>Open the safety cover and inspect the Automated Plate Seal Remover Tape roll and seal collection real to ensure that the tape is not jammed.</p> <p>Remove any microplate(s) that may be in the system.</p> <p>Close the safety cover and click the <b>Select</b> button to choose reset. Press the <b>Run/Stop</b> button to continue.</p> <p>There should be an audible click when the cover is closed. If not, check the magnetic interlock switch near the rear of the cover.</p> <p>Cycle power. Turn off for at least 20 seconds and turn back on.</p> 
Microplate seal was torn or not removed by the Automated Plate Seal Remover system	<p>Try different settings for Adhere time, Begin Peel and Speed Level.</p> <p>Not all types and combinations of plates and seals are compatible with the Automated Plate Seal Remover system, consider using a different plate type, seal type or a different sealing device.</p> <p>Check seal to make sure it is free of moisture. Automated Plate Seal Remover Tape generally works well in the presence of solvents but will not adhere to a damp surface.</p>
Liquid splatter during seal removal	<p>Adjust speed level. See <a href="#">"Speed Level" on page 37</a> for instructions.</p>
Automated Plate Seal Remover Tape is loose on supply drum or sagging below the metal peeling plate	<p>Open the safety cover.</p> <p>Turn the black friction clutch knob at the center of the black tape drum clockwise to increase tape tension.</p>



Problem	Corrective Action
The tape remaining indicator is inaccurate	<ol style="list-style-type: none"> <li>1. Since the count is determined by comparing the rotation of the two spools, the tape remaining number is only an approximation. Full Automated Plate Seal Remover Tape rolls will vary in diameter so the tape remaining will be least accurate with full rolls. As the tape supply gets near empty the accuracy of the indication will improve.</li> <li>2. Be sure that the Automated Plate Seal Remover Tape roll fits snugly on the supply mandrel. If the supply mandrel does not turn with the spool the tape remaining number will vary widely. A few layers of masking tape applied across the inside of the Automated Plate Seal Remover Tape roll may help when the friction knob must be set unusually tight.</li> </ol>
The Automated Plate Seal Remover stalls in operation	<ol style="list-style-type: none"> <li>1. Check the line voltage. It should be 115 or 230VAC +/-10% during operation. (Japan units 100VAC +/-10%).</li> <li>2. Check the supply roll tension. Loosen the black friction clutch knob if required.</li> <li>3. Clean any residue from the tape path.</li> </ol>

## Command Error Codes

Error Code	Definition
00	No error
01	Conveyor motor stalled
02	Elevator motor stalled
03	Take up spool stalled
04	Seal not removed
05	Illegal Command
06	No Plate found (Error only given if plate check option set to Yes)
07	Out of tape, or tape broke
08	Parameters not saved
09	Stop button pressed while running
10	Seal Sensor unplugged or broke
20	Less than 30 seals left on the supply roll
21	Room for less than 30 seals on take up spool
51	Emergency Stop: Power relay is not settable- i.e. cover open, or hardware problem
52	Circuitry Fault Detected: Remove Power

If an error code 01, 02, or 03 (any motor stall) occurred, the system will be ready to accept commands. Controlling software can try certain commands again, but it will need a way to handle each error. A 'reset' command may be needed to restore the system to the home and ready for plate pick up position.

If an error code is >03 and < 09, the system is ready to accept commands and in the home and ready for plate pick up position.

If error codes 09 or 51 occurred, operator intervention is required.

If error code 52 occurs, the system will be disabled until power is removed. After power is restored the controlling software can try the command again. If error code 52 continues to occur, the system is unable to verify the door interlock circuitry and requires service. (A low line voltage condition can sometimes cause this problem. Check line voltage.)

---

## Technical Support

---

**NOTE:** The operator must contact their specific Value Added Reseller for technical support.

---

Before contacting Azenta Life Sciences, please perform the following items:

- Check for solutions in "[Troubleshooting](#)" on page 1.
- Determine conditions and steps to recreate the problem.
- Consider if it is appropriate to involve the local laboratory, database, and network administrators.
- Determine the system type, model number, and serial number of the Azenta Life Sciences Automated Plate Seal Remover.
- Determine the software versions.
- Record any error messages.

### Contact Information for Azenta Life Sciences

For the Automated Plate Seal Remover, use the following contact information when troubleshooting:

Location	Azenta Service Contact Number	Website
North America	+1.800.379.7221	
Europe	+44.161.777.2107	<a href="https://www.azenta.com/">https://www.azenta.com/</a>
Japan	+81.45.4477.5570 (ext. 24)	

Technical Support Customer Care: <https://www.azenta.com/contact-us>

# 7. Maintenance



## General Maintenance

### Cleaning

Unplug the power cord before cleaning. The exterior surfaces can be cleaned with mild detergent and water. Internally, the components along the tape path need to be cleaned periodically to remove residue, ideally with a surface-safe adhesive remover. The user should first apply the adhesive remover to a paper towel, then use the paper towel to wipe down the pressure roller followed by the metal surfaces in the tape path.

### Blown fuse

Unplug the power cord and access fuse through the fuse panel located on the back of the instrument. Use a small blade or screwdriver to lift the cover.

### Automated Plate Seal Remover Tape Replacement

To replace the Automated Plate Seal Remover Tape roll, the seal collection reel, and the drip pad see the instructions in ["Installation and Removal" on page 24](#) of this manual.

### Liquid Contamination

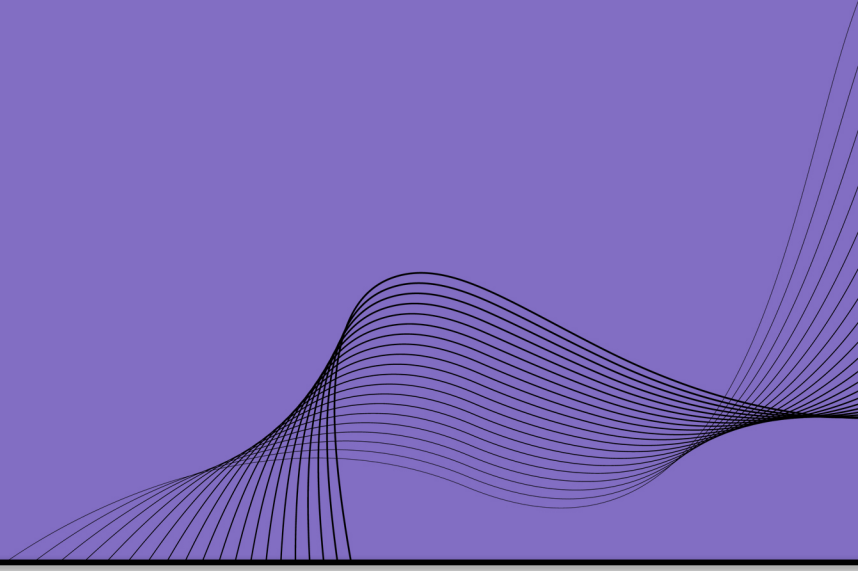
All liquid spills should be removed with an absorbent cloth or paper towel. Do not use harsh chemical or solvents on the Automated Plate Seal Remover. Solvent damage is not covered by the warranty.

## 8. Purchasing Supplies



Additional supplies of Automated Plate Seal Remover Tape can only be ordered directly from Azenta Life Sciences. The Automated Plate Seal Remover Tape comes complete with drip pan and take-up reels. It is available in single packs or in a more economical 5 or 10 pack. To contact Azenta Life Sciences, see ["Technical Support" on page 59](#).

# 9. Appendices



The following chapter contains the appendices for this manual.

## Appendix A: WEEE Statement (European Union)



The symbol above indicates that Waste Electrical and Electronic Equipment (WEEE) is not to be disposed of as unsorted municipal waste. Equipment marked with this symbol is to be collected separately.

The objectives of this program are to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally. Specific treatment of WEEE is indispensable in order to avoid the dispersion of pollutants into the recycled material or waste stream. Such treatment is the most effective means of protecting the customer's environment.

The waste collection, reuse, recycling, and recovery programs available to Azenta Life Sciences's customers, vary by customer location. Please contact the responsible body (e.g., your laboratory manager) for information about local requirements.