Ultraseal ePRO

KBIOSYSTEMS porvair

User Manual

IMPORTANT Read this instruction manual. Failure to follow the instructions in this manual can result in damage to the unit, injury to operating personnel, and poor equipment performance.

CAUTION All internal adjustments and maintenance must be performed by qualified service personnel.

Material in this manual is for informational purposes only. The contents and the product it describes are subject to change without notice. Kbiosystems makes no representations or warranties with respect to this manual. In no event shall Kbiosystems be held liable for any damages, direct or incidental, arising from or related to the use of this manual.

Contents

Safety Considerations

It is Important that the Sealer is installed and operated in such a way that all applicable Heath and Safety requirements are met. It is the user's responsibility to ensure that all relevant Health and Safety Regulations are identified and complied with. Failure to do so, may result in damage to the equipment and could cause personal injury. In particular, the user should study the contents of this guide carefully before handling or operating this equipment.

Under no circumstances will the supplier of this equipment be liable for any incidental, consequential or any special damages of any kind whatsoever, including but not limited to lost profits arising from, or in anyway connected with the use of this equipment or this instruction manual.

WARNING SYMBOLS Used In Accordance With IEC 417

This symbol used alone indicates important operating instructions which reduce the risk of injury or poor performance of the unit.

CAUTION: This symbol, in the context of a CAUTION, indicates a potentially hazardous situation which if not avoided could result in minor to moderate injury or damage to the equipment.

WARNING: This symbol indicates potentially hazardous situations which, if not avoided, could result in serious injury or death.

WARNING: This symbol indicates situations where dangerous voltages exist and potential for electrical shock is present.

CAUTION: Protective Conductor Terminal

CAUTION: HOT SURFACE/HOT AREA, This Instrument is fitted with an internal heater with a Maximum temperature of 200°C when in use.

This symbol indicates a need to use gloves during the indicated procedures. If performing decontamination procedures, use chemically resistant gloves. Use insulated gloves for handling samples and when using liquid nitrogen.

CAUTION: Keep hands clear during priming process to avoid risk of finger entanglement and entrapment.

Before installing, using or maintaining this product, please be sure to read this manual and product warning labels carefully. Failure to follow these instructions may cause this product to malfunction, which could result in injury or damage.

MAINS SWITCH SYMBOLS
I = ON
0 = OFF

Below are important safety precautions that apply to this product:

WARNING: Do not operate this instrument in an atmosphere containing explosive gases.

WARNING: Only approved supplied mains cord set must be used with this instrument. If it is required to use an extension lead, the lead MUST be earthed.

The Sealer is supplied for direct connection to normal 115 / 220 VAC 50 / 60Hz supply, with a variation in supply that gives a voltage range of 108VAC to 250VAC

If you should require to clean the heater block, turn the power off and allow the block to cool to ambient room temperature. You can now access the heater block and clean it.

The Sealer is designed to be operated with a maximum sealing temperature of 200°C

The Ultraseal ePRO should be switched on 5 minutes prior to use when plugged into 230V and 6 minutes when plugged into 110V. This is to enable the set temperature to be reached and to stabilise. The Ultraseal ePRO should only be used in a suitably ventilated area. The use of solvents on the unit is not recommended. Certain components become hot during the correct operation of the equipment. These components are marked with the hot surface symbol due care should be taken to avoid personal injury. Kbiosystems limited accepts no responsibility for the misuse of this equipment.

Please ensure that heater block is at ambient temperature before cleaning and a senior operator carries out the cleaning.

Introduction

The Sealer has been designed for robotic integration, or stand alone sealing, offering a fast effective solution for the heat-sealing of micro well plates for experimentation, storage or transportation.

Heat sealing is now widely considered to be the most effective way of sealing plates for assays, thermal cyclers, storage and shipping. The extensive range of sealing materials now available for our new instrument, gives a permanent or peel-able high integrity seal for most plate material types.

The range includes ultra clear materials for colorimetric or fluorometric assays, along with solvent resistant seals with exceptional low temperature (-80° C) storage characteristics and a breathable gas permeable seal.

The Sealer has a compact footprint saving bench space. It features a serial port allowing RS232 and external foot switch operation for robotic control and a touch screen for manual operation.

Both seal time and temperature are fully adjustable. The unit has built-in sensors to monitor and provide error output warning signals. The unit produces no waste material and seals plates of different heights.

The Sealer is designed to be integrated into robotic platforms from all leading automation companies.

How to Pack the Ultraseal ePro

When unpacking your Sealer, visually inspect the unit for any damage which may have occurred during shipping. Do not use the unit if there is any damage. Check that all components are present. See packing list.

The unit is supplied in a re-usable crate and a transit bracket that must be retained in case the unit requires servicing. To reposition the transit bracket prior to first use, follow the steps given in the manual. The Sealer is a fragile instrument and requires proper packaging for shipping. Inadequate packaging can lead to damage.

Use appropriate PPE and necessary tools available in the facility to remove the unit from the crate properly.

Once the Sealer is on a bench, open the door using a flat screwdriver. Cut and remove the zip tie used to secure the foil feed mechanism.

Kbiosystems accepts no responsibility for any damage incurred during return shipping unless the unit is packed in the same packaging as it was delivered. This equipment must be lifted using the appropriate lifting and carrying equipment available in the facility.

Repositioning the Transit Plate Prior to First Use

The Sealer comes shipped with a transit plate installed internally to protect the instrument from damage during shipping. The transit plate is used to secure the internal foil guide with a cable tie as well as to prevent the plate shuttle from moving.

The transit plate must be retained should the instrument need to be shipped in the future. The transit plate is easily removed and repositioned within the Ultraseal ePro for normal operation via the provided thumb screws.

Figure 1. Unlock front service panel

Using a flat bladed screwdriver or similar object, rotate slot screw, located on the Ultraseal ePro door, approximately 90° CCW. This will unlock and drop-down the front service panel to gain access to the main sealing area and front of the machine.

CAUTION: Machine should be switched off and all power removed from the system.

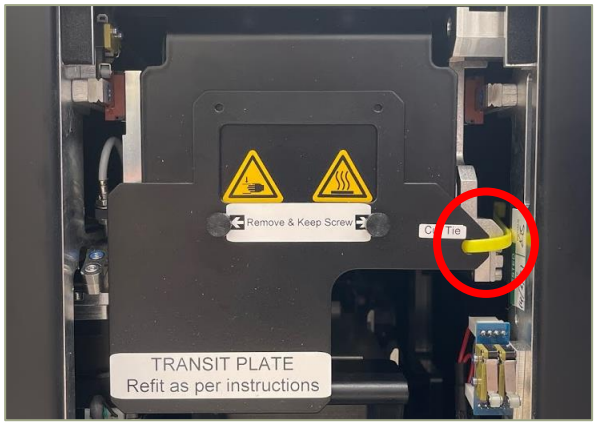


Figure 2. Remove Transit plate and Cable Tie

Cut the exposed cable tie and remove from the unit. If the cable tie (or a portion of the cable tie) falls into the unit, cut it carefully and remove from the unit prior to operation.

The transit plate is secured onto the Sealer with two thumb screws. Unscrew and remove the screws and use caution to not drop the transit plate onto or into the Sealer.

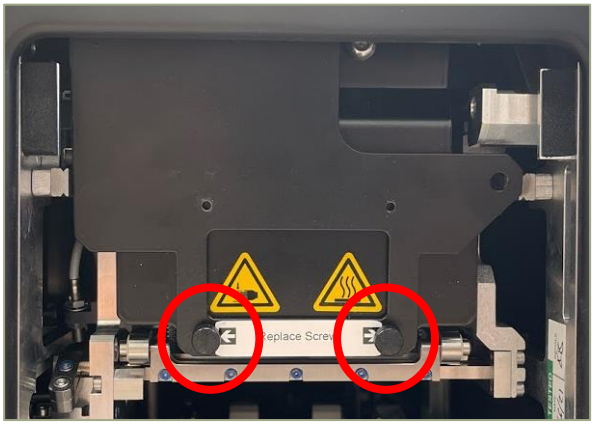


Figure 3. Vertically Flipped and Repositioned Transit Plate

Vertically rotate the transit plate so that the back side of the plate is facing forward. The caution symbols should be visible, and the cable tie hole should be higher and to the right side of the Sealer.

With the transit plate repositioned, use the lower holes in the plate to attach the transit plate back to the Sealer. Be sure to finger tighten the thumb screws so that the plate or screws do not come loose during operation.

Raise the front service panel back in to place and turn the slot screw approximately 90 degrees clockwise to secure the panel in place

Installing the Magnetic Foil Guide

The Magnetic Foil Guide must be installed onto its platform and correctly aligned prior to use, and for proper function of the Sealer.

1. To access the Magnetic Foil Guide platform via the side service panel, use a 2.5 mm Allen key (provided) to remove the 4 screws as shown.

CAUTION: This panel is not interlocked. Machine should be switched off and all power removed from the system before gaining access to side service panel

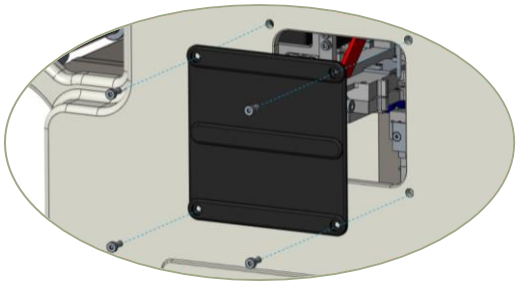


Figure 4. Removal of service panel

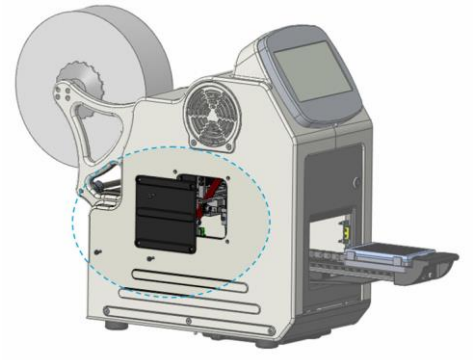


Figure 5. Service panel to access magnetic foil guide

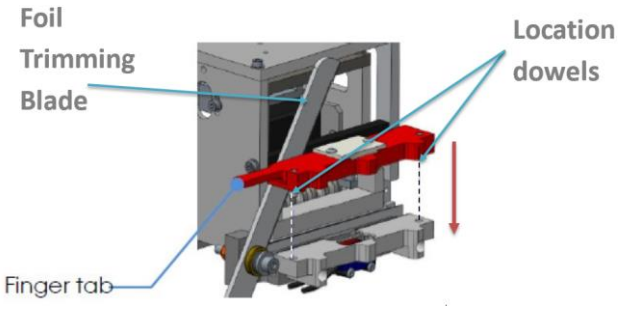


Figure 6. Aligning magnetic foil guide with receiving holes on the platform

2. Hold the finger tab on the Magnetic Foil Guide. Ensure the white reflector is facing up and the long flat edge faces towards the rear of the Sealer. Lower the Magnetic Foil Guide down onto the platform.

3. Ensure that both location dowels at either end of the Magnetic Foil Guide must align with the receiving holes on the platform. The magnet will secure the Foil Guide in place if positioned correctly.

CAUTION: The foil trimming blade is hazardously sharp. Do not extend any part of your hand farther than necessary into the Sealer to place the foil guide onto its platform. HANDLE THE MAGNET FOIL GUIDE WITH THE FINGER TAB.

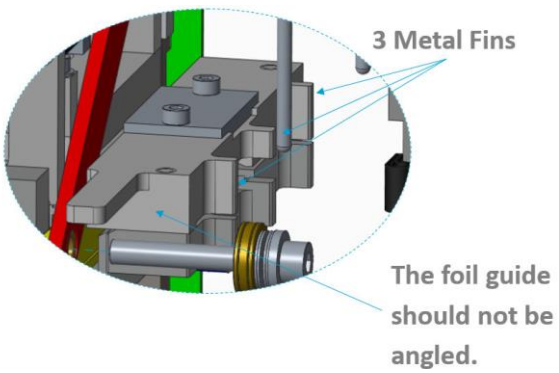


Figure 7. Fin Alignment

Check that the three metal fins on the foil guide align exactly with the corresponding fins on the platform. If they are misaligned, lift the foil guide up using the finger tab and attach again.

Inventory

Note: All parts listed below are available as spare parts. Check that your package contains the following items:

No.	Description	Part Number	Quantity
1	Ultraseal ePro	250-10039	1
2	Instruction Manual	N/A	1
3	Plate Locators	1010-28121-516	1
4	Foil Spool with Clutch assembly	200-10039-028	1
5	96 Well PCR Plate Support Adapter	1010-10039-339	1
6	Excess Foil Removal Tool	5059-10010	1
7	Mains lead U.K	5058-10030	1
8	Mains lead U.S	5058-10031	1
9	Mains lead E.U	5058-10032	1
10	5 Amp anti-surge fuse	5050-10010	2
11	2.5mm Allen Key	2022-10008	1
12	Magnetic Foil Guide	150-10039-539	1
13	Jig Set	150-10039-552	1

Principle Of Operation

The unsealed plate is placed on a shuttle which extends from the front of the sealer, allowing full access with a robotic arm or stacking system. The shuttle is drawn into the unit automatically. The plate sealing operation will vary based on user settings & set sealing time. The shuttle thereafter returns the shuttle and the plate to its original start position.

The sealer can operate as a part of an automated system or in stand alone mode. Each roll of sealing film is sufficient for approximately five thousand plates. The cutting system cuts the film to cover the entire plate surface with a variable total length of 119 mm 128 mm allowing peelable or automation compatible applications. See **Figure 8** below.

The rolls of sealing film are either aluminium or clear laminates and are able to produce permanent, pierce-able or peel-able seals with polypropylene, polystyrene, polythene or COC plates.

To keep the size and weight to a minimum, the unit is fully electronic and all parameters such as temperature and time are fully adjustable to ensure a perfect, even seal with different plates and film formats.

User safety has been carefully considered during the design process to eliminate risk of contact with hot surfaces or the internal mechanism during operation.

Figure 8. 384 Well Sealed Plate.

Installation

The machine should be installed on a sturdy bench to avoid any vibration during operation. When locating the machine, there should be enough space allowed for the shuttle to move out without hitting anything or anybody.

CAUTION: Use appropriate lifting and carrying equipment available in the facility during unit movement from one place to another place. Also use any necessary PPE during unit movement

Intended Use

The Sealer is intended to be used for the heat sealing of microplates during experimentation, storage or transportation. This device is not intended to be used as a Medical Device.

Operating Environment

Temperature Range	Operating	10°C to 40°C
	Storage	20°C to 40°C
Relative Humidity	Operating	10% to 80% Non condensing
	Storage	10% to 80% Noncondensing

The Sealer should be operated in an environment with a temperature range between 10°C and 40°C and a noncondensing relative humidity range of 10% to 80%. The unit should be kept at least 100mm from the side of walls, neighbouring units and furniture. The unit should not be placed adjacent to equipment that radiates heat that could impact the operating environment as listed in the table above. The unit should be kept out of draught and air currents as they will have an adverse effect on the temperature stability of the sealing platen. The Sealer will not seal if the temperature is not at the set temperature. So, if the sealing platen is subjected to draught, then the time between cycles may be increased.

The mains plug supplied with this unit is fitted with the following fuse:

Supply	Fuses fitted in plug	Fuses fitted in rear inlet
230 V	13 Ampere	T5AH 250 V
115 V	No fuses	T5AH 250 V

Only refit the correct type of fuse.

- Must be IEC 127 approved for use in EEC countries.
- Must be C.S.A. or UL listed or recognized for use in Canada or the United States of America.

Connecting the Voltage Supply

The Sealer utilizes a standard IEC inlet which is fused and switched.

Note: The equipment will work at a minimum of 108V to account for variation in supply when connected to nominal 115 VAC, and a maximum of 250V when connected to nominal 240 VAC.

RS232

Standard IEC Inlet for mains connection

Figure 9. Connecting Voltage Supply

Insert supplied IEE lead and connect to voltage supply. Switch on the rocker I=0 switch and check all guards are fitted. The display mounted on the front of the unit should illuminate with the Porvair Kbiosystems Logo.

CAUTION: Only approved supplied Mains Supply Cords should be used with the unit.

Foil/Film Loading and Unloading

The different types of foils that can be used include the Easy Peel, Clear Seal, Easy Pierce, and Easy Pierce Strong Foil Heat Seals.

Loading the Sealer with Heat Sealing Film

CAUTION: We recommend that the unit should be cool when loading the film to eliminate possible injury.

The electrical supply must be connected and switched on to allow automated priming of foil once loaded.

1. On power up, once Porvair Kbiosystems splash screen appears and the unit is ready, press the Start Setup button to continue. The Sealer will initialize and default to the home screen. The screen may stay blank for 30 seconds to a minute when first powered up.

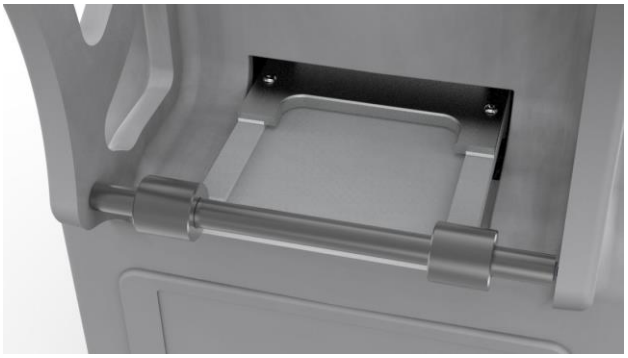
2. To load the foil, allow one turn of the roll of foil. This provides slack to feed through the unit.

3. Navigate to the “Foil load” screen. Press “load” to start the automatic foil engage process.

4. Loop foil under tie bar as shown, and up into the foil feed slot. Continue to manually feed foil until the automated foil retention mechanism takes hold and mechanically pulls the foil into the machine.

CAUTION: Film will automatically feed through the system and the waste trimmed via the trim cycle, waste film must be removed with the tweezers supplied.

5. The Sealer will automatically feed foil into the system until the internal sensors are reached. It will then continue to feed on a predetermined length of foil which is suitable for trimming and easy to reach. Press “trim” which has now replaced the load button. Once the foil has been trimmed, the shuttle will extend from the unit to allow access into the machine and permits you to remove excess cut off length. This will ensure a straight first edge.



6. Once the excess piece of foil has been removed from the machine, press Done to proceed as prompted. The unit will now prime itself ready for the first use.

CAUTION: Keep hands clear during priming process to avoid risk of finger entanglement and entrapment.

7. To unload foil at any time, navigate to the Load Foil Screen and press “Unload”. Foil will feed out from back of machine.

Adjusting The Foil Position

Centralising the foil on the plate

As supplied, the foil is set to be in the centre of the plate. The position may be varied by 2 mm on either side of the centreline.

To make this adjustment, remove the foil and foil spool from the rear of the machine and loosen the stainless-steel nut. This allows you to move the plastic nuts left to right, thus moving the foil left to right. When a satisfactory position is found, tighten the stainless-steel nut and reload the foil.

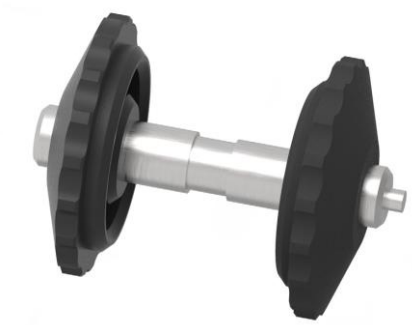


Figure 10. Centralizing of the foil

Seal 3-4 plates to let the foil settle in the centre of the plate and check if the foil is centrally aligned. If this needs further adjustment, remove foil and adjust by loosening the stainless-steel nut from the foil spool and winding the foil spool centrally.

To remove any miss cuts of foil from inside the Sealer:

- Use flat bladed screwdriver or similar object, rotate slot screw located on Sealer door approximately 90° CCW. This will unlock and drop down the front service panel to gain access to the main sealing area and front of the machine.
- Use tweezers provided to remove any miss cuts.

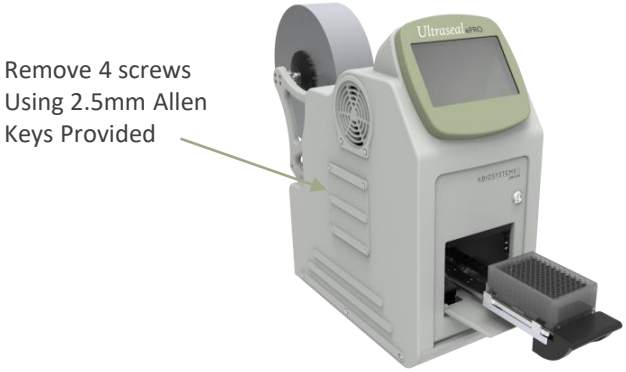


Figure 11. Removal of service panel

To gain further access to the machine via side service panel, use a 2.5 mm Allen key (provided) and remove the 4 screws as shown. Remove panel to reveal magnetic foil guide.

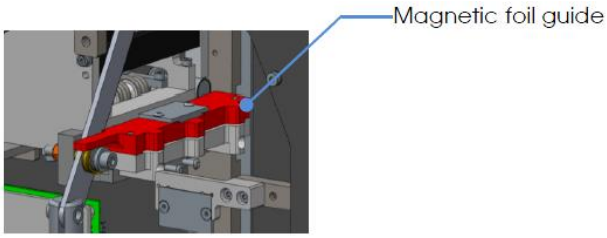


Figure 12. Magnetic Foil Guide

Remove magnetic foil guide using the finger tab and get rid of any sliver or miss cuts of foil.

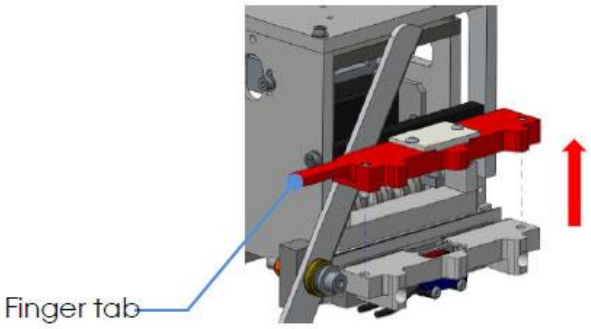


Figure 13. Finger Trap

Replace magnetic foil guide squarely in position on two location dowels. Replace service panel.

CAUTION: This panel is not interlocked. Machine should be switched off and all power removed from the system before gaining access to side service panel.

Operation Procedure and Optimisation

The Sealer has been designed to reliably seal plates of different heights and different plastics, using a variety of films, to give a seal with varying properties. These components will require different sealing conditions.

The quality and strength of the seal created between the sealing film will vary with different conditions. In general, increasing either the sealing temperature or duration of seal, gives a stronger, more complete seal. However, over-sealing on a regular basis is not recommended, as applying more heat can cause excessive damage to the plate being sealed. This in turn, would reduce the number of times a particular plate can be sealed. Therefore, a balance must be achieved, that gives an acceptable seal with the minimal plate damage or distortion.

Another optimisation factor to be considered, is the surface area of the plate. A plate with thin raised rims around each well, will have a reduced surface area, compared to a plate with wide raised rims. This would mean that less heat is needed to seal the thin rim plate in comparison to the wide rim.

The pressure that the heater plate exerts during sealing is adjustable using the **Force** setting on the home screen.

Alternatively, the **Distance** setting can be used to control the amount of downward travel the heat-sealing plate moves from the detected top of the plate independent. Plates that do not have any raised rims are not usually suitable for heat-sealing.

Temperature and Time Setting

The following table gives a guideline as to the sealing time and temperature for different materials.

Plate Material	Temperature Setting (°C)	Time Setting (Seconds)
Polystyrene	145 to 165	2 to 5
Polypropylene	150 to 175	2 to 5
Polyethylene	150 to 170	2 to 5

An adaptor will be required to seal plates which have well bottoms protruding past the plate skirt. This is available from Kbiosystems Limited.

Commands, Indications and Warnings.

The Sealer is software controlled, employing micro processor control. All commands, indications and warnings are effected via the control screen.

Setting the Sealing Operation

With a plate in position on the shuttle, the ‘Start’ segment is pressed to start the sealing operation. If the sealing plate is not up to temperature, the display will show that it is ‘Heating’ and the actual temperature compared to the set temperature.

The display flashes ‘Sealing’ during the operation and returns to the Home screen after sealing the plate and priming foil. The instrument is now ready for the next operation.

If there are any issues during the sealing operation, such as no plate present, a warning will be displayed.

User Interface

Initial Set Up

Plug in the system to turn the power ON. Once the system is turned ON, Kbiosystems logo is displayed.

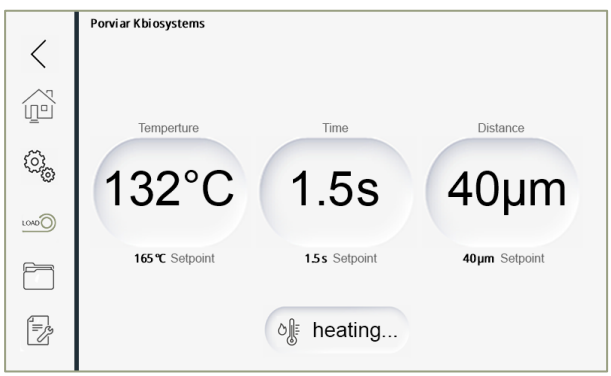
Select Start to initiate the setup process of the plate sealer. The screen is as shown.

Main Screen

The main screen or home screen displays the setpoint temperature, time and distance or force of the set program on the plate sealer

The various options available on the main screen are:

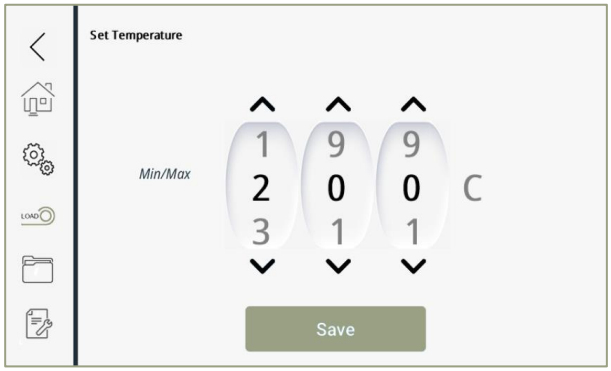
1. The vertical panel on the left is the navigation bar that provides access to all functions of the unit.
2. You can change the temperature, time and distance or force from the main screen.
3. You can start the program you have set for the operation. The navigation bar on the display has the following options:
4. Home
5. Settings
6. Foil Load/Unload
7. Programs
8. Service



You can change the setpoint temperature from Home screen as given below. The minimum setpoint temperature is 35°C and maximum setpoint temperature is 199°C at 1°C adjustable temperature interval.

1. Tap on Temperature on the display. The following screen appears.

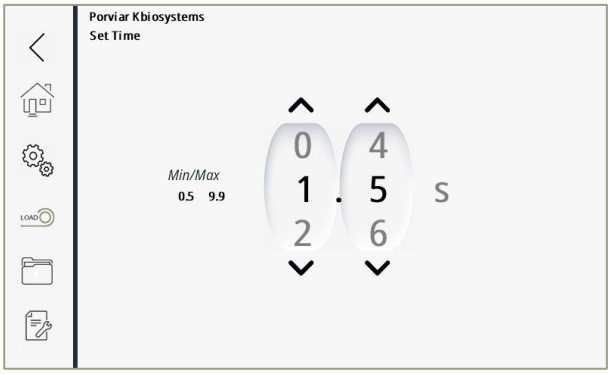
Note: If you close the window without saving the changes, you will receive an unsaved changes screen



To change the setpoint time on the Home screen, follow the steps given below. The minimum time interval is 0.5 seconds and maximum time interval is 9.9 seconds. The time interval can be adjustable in 0.1 second intervals.

1. Tap on Time on the display. The following screen appears.

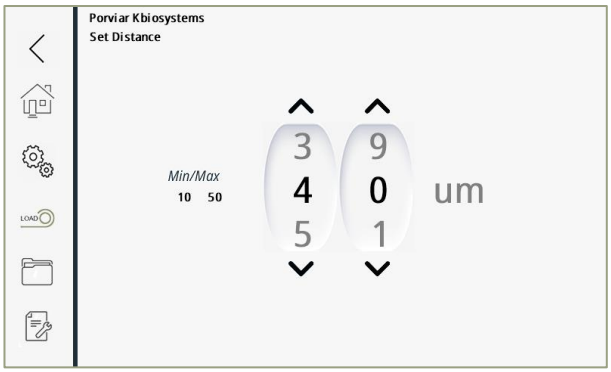
2. Change the setpoint time by tapping or pressing the up/down arrows.



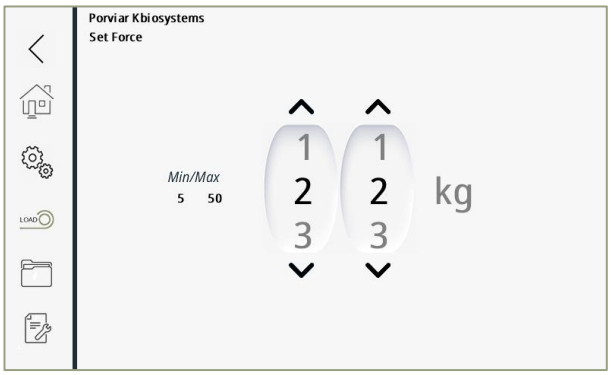
User Interface

To change the setpoint mode (Distance/Force depending on the mode the unit is set to) on the Home screen, follow the steps given below. The minimum sealing distance is 10 µm and maximum sealing distance is 50 µm with increments of 1 µm.

1. If you wish to set Distance as setpoint mode, tap on Distance on the display. The following screen appears:



2. If you wish to set Force as setpoint mode, tap on Force on the display. The following screen appears. The minimum sealing force you can apply is 5 kg and maximum sealing force is 50 kg with adjustable force of 1 kg increments. This setting may need to be re-entered if the unit loses power.

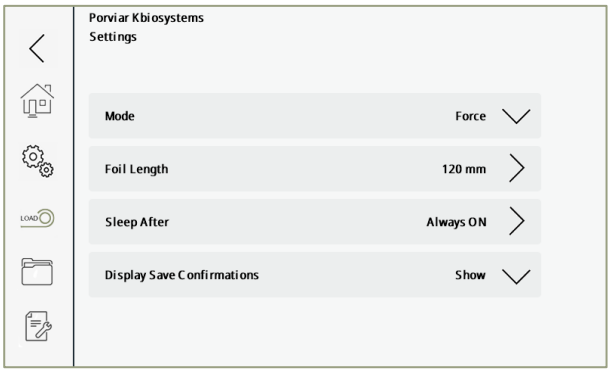


3. Change the setpoint mode (distance/force) by tapping or pressing the up / down arrows.

The second tab on the navigation panel is the Settings icon. The following screen is displayed when you select the Settings icon. This screen allows you to configure or edit the type of mode, foil length, and sleep after time interval.

The mode settings allows you to toggle between Distance or Force. The distance is measured in Micrometer (µm) and Force is measured in Kilograms (Kg). To change the mode settings:

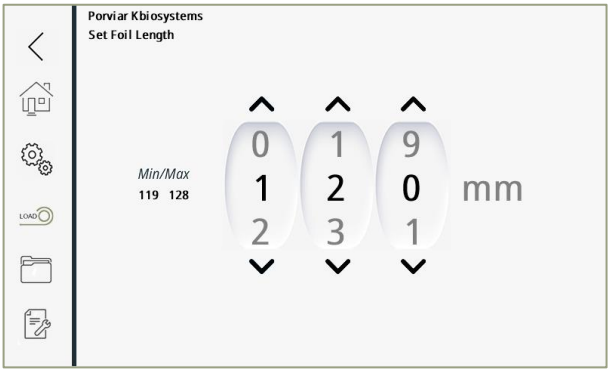
1. Tap on to select Force/Distance from the drop down and press save.



The foil length allows to set a minimum foil length 119 mm and a maximum foil length of 128 mm in increments of 1 mm.

To set the desired foil length:

1. Tap on Foil Length from Settings.
2. Select the length of the foil.
3. Click save and you will receive a confirmation message that your settings have been saved.
4. Click OK. The foil length is configured.



Eco Mode

The Eco mode is a power saver setting that allows the user to set a time (in hours) for the system to be active. The system goes into sleep mode after the selected time expires. The heater will reduce to a set temperature to save electricity. Select Wake or any navigation button on the left to return to the home page. This setting may need to be re-entered if the unit loses power

User Interface

Loading/Unloading a Foil

The third tab on the navigation panel is the Foil Load icon. The following screen will be displayed when you select the icon. The loading/unloading allows you to load a new foil or unload an existing foil.

When you want to load a foil, the instrument senses no foil. To load a foil:

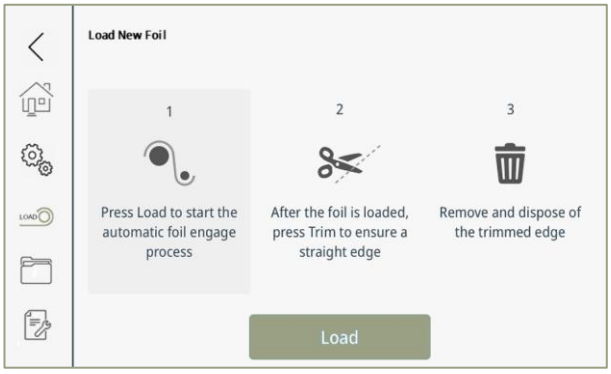
1. Proceed and the following screen appears describing the process to load a new foil:

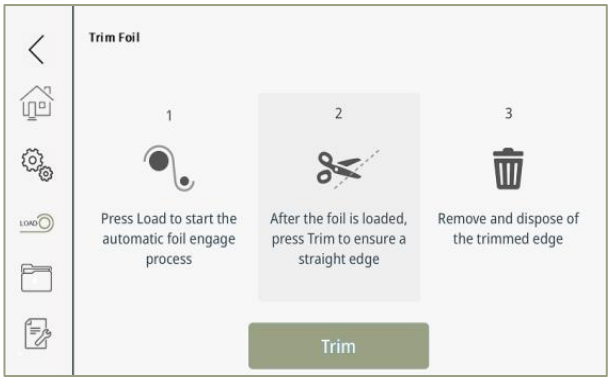
2. Select load and the machine starts automatic foil engage process.

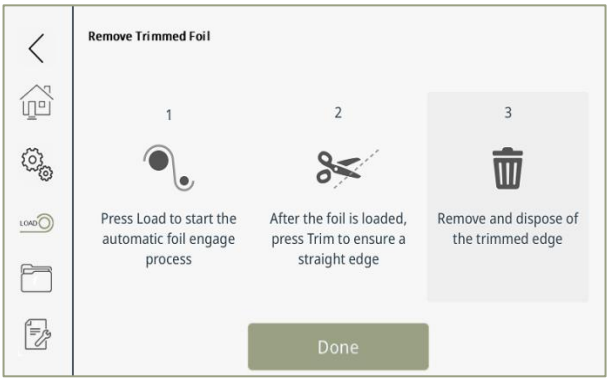
3. Once the foil is ingested, select trim to ensure a straight edge.

4. Remove the trimmed section of foil and select done. Dispose the trimmed edge.

The machine will present unload here once you have loaded the unit. When you want to unload a foil, press unload to eject the foil. Machine ejects foil and displays load page.







Sleep Timer

Sleep after is the idle time out that the unit is unattended. This allows you to set time duration for the unit to go into sleep mode due to the unproductive time that a unit is not being used. The minimum sleep after time you can set is for 1 hour and the maximum time for the unit to be in sleep after mode is 24 hours. To set or change the sleep after time:

1. Tap on to configure the sleep after time.

2. Select the duration that you wish to configure. Select duration that you wish to configure, a value of 0 will disable the sleep feature.

3. Click save and you will receive a confirmation message that your settings have been saved.

4. Click OK. The sleep after time is set.

Programs

The programs tab allows you to view, edit and create the load parameters of a program.

User Interface

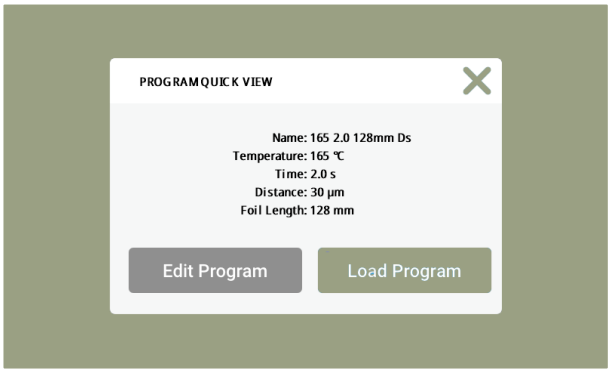
Viewing a Program

1. Select Programs from the navigation menu and a list of configured programs are displayed.

2. Select the eye icon for a quick program view of the program details.

3. You may load or edit the program as required.

Note: If there are no programs created, click create new to create a program.



Create New Program

This enables you to create a new program.

1. Select create new on the Programs screen.

2. Tap on the Name field to enter the name using the keypad.

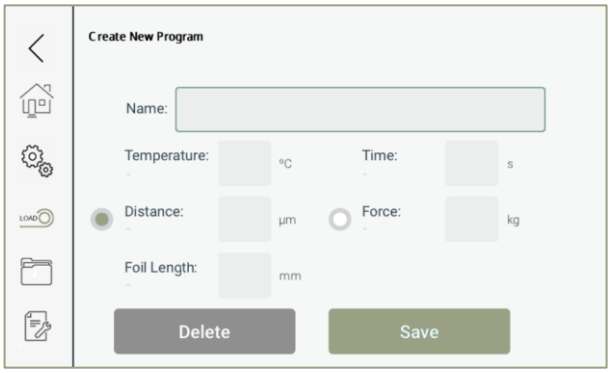
3. Enter the temperature and time within the range specified on the screen. Choose distance or force as mode depending on your choice. Enter the values within the range given on the display.

Note: If you enter a value that is not within the range given, the field in which the incorrect value is entered is highlighted.

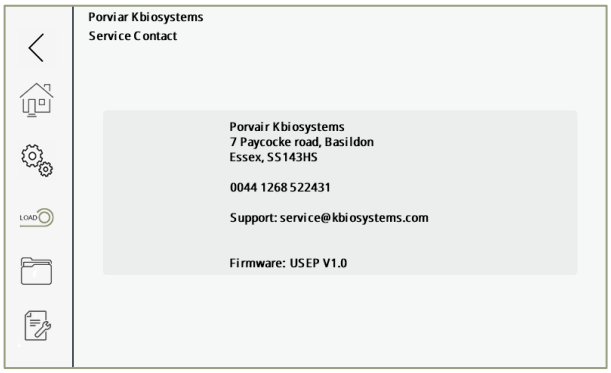
The pencil icon allows you to edit an existing program.

1. Select the program you want to edit. The edit program screen is displayed.

2. Make the required changes and click Save. Click Delete if you want to delete a program.



Select the service icon if you require any assistance or support. For contact details, see the following screen.



Ultraseal ePro Host Communication Protocol

Serial Port Setup

Baud rate	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

All communications via ASCII.

Cable

Connection is via a straight cable – not a null-modem cable.

PC (9-way female) Ultraseal ePro (9-way female)

Pin 2 <----------> Pin 2
Pin 3 <----------> Pin 3
Pin 5<----------> Pin 5

Message Response time

The unit responds to each message within 150 milliseconds.

System Initialisation

The system will only initialise once the init command has been sent.

PC sends **I<cr>**
Sealer replies: ok<cr>

Status Message

PC sends **?<cr>**
Sealer replies: <status byte><cr>

The status byte is a hexadecimal value represented in ASCII, i.e. the characters "ff" means 0xff hex.

Bit Values

Bit 0	No foil
Bit 1	Error
Bit 2	Busy
Bit 3	Not at seal temperature
Bit 4	Plate not present
Bit 5	Not initialised
Bit 6	Force sensor activated
Bit 7	Park Mode

When checking the communication using, for example HyperTerminal, the responses to the status message inquiry are hexadecimal values which when converted to binary values allow the status to be interpreted. For example, when
The Unit is heating or cooling and fso not at the sealing temperature, the response is 08. In binary this is 1000.

Taking the bit values from 0-7 from the right bits 3 is at 1. The status is 'not at seal temperature' as listed above.

Seal Plate Command

PC sends **S<cr>**
Sealer replies: ok<cr>

If the sealing operation has commenced

or err<cr>

If it is unable to seal the plate.

The Sealer will not seal the plate if the following conditions exist:

Bit 0	No foil
Bit 1	Error
Bit 2	Busy
Bit 3	Not at seal Temperature

Ultraseal ePro Host Communication Protocol – Continued

Error Message

PC sends	**E<cr>**
Sealer replies:	##<cr> where ## is a decimal value represented in ASCII, i.e. the characters "01“ means error

Error Numbers

ERROR - VERTICAL_SHUTTLE_DOWN	1
ERROR - HEATER_UP	2
ERROR - SHUTTLE_IN	3
ERROR - CUTTER	4
ERROR – THERMOCOUPLE	5
ERROR – OVERHEATING	6
ERROR - NO_FOIL	7
ERROR - NO_PLATE	8
ERROR - FORCE_SENSOR	9

Sealing Temperature message

PC sends	**A###<cr> where ### is a 3-digit decimal number represented in ASCII,i.e the string A180<cr> sets the sealing temperature to 180 deg C.**
Sealer replies:	ok<cr>

Sealing Time message

PC sends	**B##<cr> where ## is a 2 digit decimal number represented in ASCII, i.e. the string B25<cr> sets the sealing time to 2.5 seconds.**
Sealer replies:	ok<cr>

To read back the actual temperature value

PC sends	**C<cr>where ### is a 3-digit decimal number represented in ASCII, i.e. the string 170<cr> means the current set point is 170 degrees centigrade.**
Sealer replies:	###<cr>

To read back sealing time

PC sends	**D<cr>**
Sealer replies:	##<cr> where ## is a 2-digit decimal number represented in ASCII in units of 10ths of a second i.e. the string 25<cr> means the current sealing time is 2.5 seconds.

To read back sealing temperature actual value

PC sends	**F<cr>**
Sealer replies:	###<cr> where ### is a 3-digit decimal number represented in ASCII, i.e. the string 170<cr> means the actual value is 170 degrees centigrade.

To enable Force sensor sealing

PC sends	**FS=1<cr>**
Sealer replies:	ok<cr>

To disable Force sensor sealing

PC sends	**FS=0<cr>**
Sealer replies:	ok<cr>

Ultraseal ePro Host Communication Protocol – Continued

To set sealing force pressure

PC sends	**PS=50<cr> Where pressure is in 1 Kilo increments (range 5-50Kg)**
Sealer replies:	ok<cr>

To read sealing force pressure

PC sends	**PS<cr>**
Sealer replies:	##<cr> where ## is a 2-digit decimal number represented in ASCII

To set seal length

PC sends	**L=120<cr> Where length is 1mm increments (range 119-128mm)**
Sealer replies:	ok<cr >

To read seal length

PC sends	**SL<cr>**
Sealer replies:	# ##<cr> where ### is a 3-digit decimal number represented in ASCII

To read back drive on distance

PC sends	**DO<cr>**
Sealer replies:	###<cr> where ### is a decimal number represented in ASCII the distance the drive on will move i.e. the string 25<cr> means the current drive on is 0.25mm

To set the drive on distance

PC sends	**DO=##<cr> where ## is a decimal number represented in ASCII the distance the drive on will move i.e. the string DO=25<cr> sets the current drive on to 0.25mm**
Sealer replies:	ok<cr>

To move the plate shuttle inside the Ultraseal ePro

PC sends	**SI<cr>**
Sealer replies:	ok<cr>

To move the plate shuttle out to the load position

PC sends	**SO<cr>**
Sealer replies:	ok<cr>

To read the current software version for the Ultraseal ePro

PC sends	**V<cr>**
Sealer replies:	Ultraseal ePro_Version: V_1.033G_GPBuild_Date: 15_01_2019_14:11

Specifications of Ultraseal ePro

Specifications	
Power Supply	110 VAC / 240VAC 50/60Hz
Maximum Power Consumption	378W at 110v / 60Hz, 500W at 240V / 50Hz, 8W Eco Mode
Fuse Rating	5 Amp anti-surge (T5AH 250V)
Internal Heaters	4 x 100 Watts (Sealing Plate)
Dimensions (mm)	232 x 518 x 506 (W x H x D)
Weight	25 Kg
Minimum Operating Ambient Temperature	10°C
Maximum Operating Ambient Temperature	40°C
Minimum Sealing Plate Height	7 mm
Maximum Sealing Plate Height	46 mm
Maximum Sealing Temperature	199°C
Protection	IP20 (per IEC 60529)
Fire Retardancy	Plastic Case & Trays ECCEN 6073
Pollution Degree	2
Overvoltage Category	II
Altitude	Up to 2000m

Maintenance

Before using any cleaning or decontamination method, other than that recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the unit.

In case of radioactive spillage's, Porvair Kbiosystems, recommend that you use a proprietary cleaning agent and follow the manufacturer's instructions. You may clean the Sealer cover, with a cloth dipped in water or ethanol, methanol or formaldehyde may also be used.

The unit should not be immersed in solvents.

Do not use acetone or abrasive cleaners.

Cleaning the Heater Block

The 'Teflon' coated heater block should only be cleaned with a clean dry cloth when the unit is switched off and the heater block has cooled down to ambient temperature.

Any plastic which has melted onto the block during operation, should be solid at ambient temperature and can be removed with a clean dry cloth. Take care not to damage the surface of the heater block.

Do not use any abrasive materials to clean the heater block as this will damage the non-stick coating.

Troubleshooting

Note: This equipment should only be dismantled by a trained personnel. Removing the main cover exposes potentially lethal mains voltages.

The Sealer has been designed to give long term reliability with the minimum of maintenance.

Should a problem occur with the sealing, an initial inspection of the component may identify its cause and the necessary action to be taken. The following list highlights potential faults and the course of action to take.

Fault	Cause	Action
Display is blank when powered on	Sealer still initializing	Wait for up to minute
Doesn't cut properly	Cutting die setting problem	Call for service
No foil error.	No foil	Reload foil
Unit doesn't seal properly	Time or temperature setting incorrect.	Change sealing parameters.
Poor sealing	Unsuitable plate. No plate support or incorrect plate support.	Fit correct plate support. If no improvement call for service.
Display shows shuttle error in/out	Foil jammed in machine.	Remove foil. If none found, call for service
External fuse blows fuse life	Fuse life has expired	Replace and if it fails again call for service.
Display shows error not up.	Faulty Switch	Call for service.
Unit fails to power up	Fuse has blown	Turn machine on. Replace Fuse and if it fails again call for service.
The display shows 'thermocouple error'	Faulty thermocouple	Call for service.

Preparing For Shipment

Transit Plate

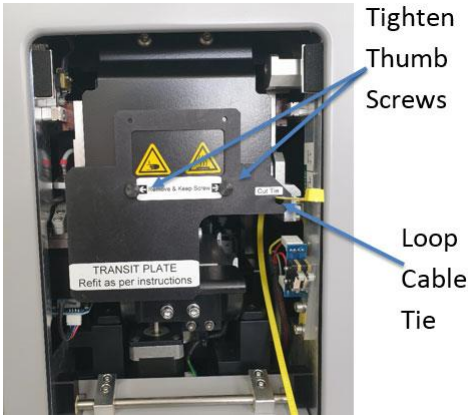
The Sealer is shipped with a transit plate installed internally to protect the instrument from damage during shipping. The transit plate is stowed within the Sealer for normal operation and is positioned convenient for shipping via thumb screws and a cable-tie to secure foil guide to the transit plate, once in position. Positioning the transit plate should only be done with power removed from the Sealer and having given it enough time for the heat platen to completely cool. The transit plate must be positioned, and cable tie must be used to secure the movable foil guide to protect the instrument during shipping.

Preparing For Shipment – Continued

CAUTION: This panel is not interlocked. Machine should be switched off and all power removed from the system before gaining access to the front service panel.

Use flat bladed screwdriver or similar object, rotate slot screw located on the Sealer door, approximately 90° CCW. This will unlock and drop the front service panel down to gain access to the main sealing area and front of the machine.

Make sure the movable foil guide is slides forward towards the front of the instrument. If it is not, reach into the Sealer and draw it forward. The transit plate is secured onto the Sealer with two thumb screws. Unscrew and remove the screws. Do not drop the transit plate or thumb screws into the Sealer.



Flip the transit plate vertically such that the other side of the plate is facing forward and the cable tie hole aligns to allow you to secure the movable foil guide to the transit plate with a cable tie.

Slightly bend the provided cable tie, and feed through the unit. If the cable tie (or a portion of the cable tie) falls into the unit, carefully retrieve it and remove from the unit prior to operation. Make sure the cable tie is securing the foil to the transit plate to prevent damage during transport.

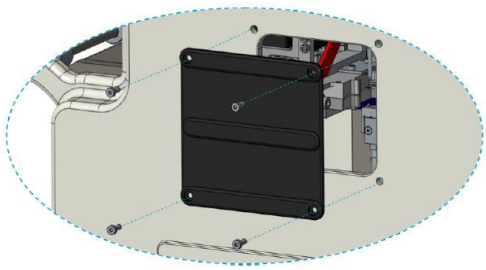
Raise the front service panel back in to place and turn the slot screw approximately 90 degrees clockwise to secure the panel in place.

Magnetic Foil Guide

The Magnetic foil guide should also be removed prior to shipping to prevent internal damage to the Sealer from it coming loose. To do this, the side service panel must be removed. Turn off the system before you remove the magnetic foil guide.

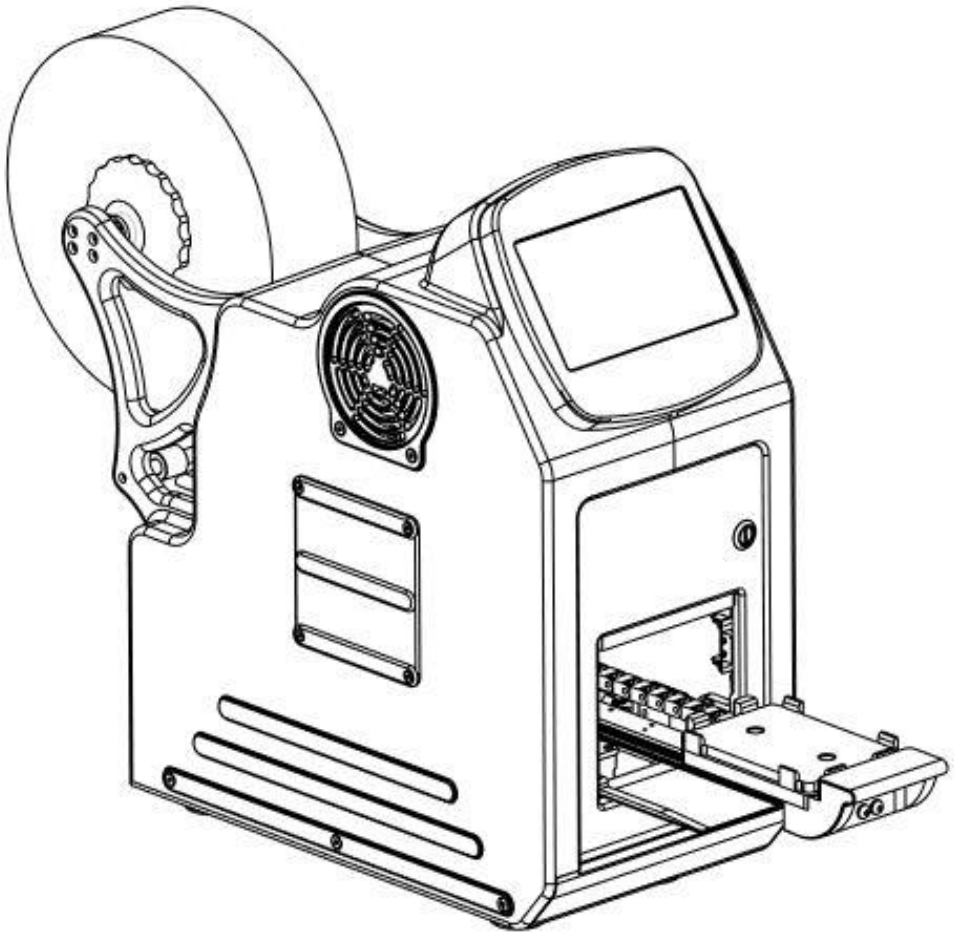
Remove 4 screws
Using 2.5mm Allen
Keys Provided

To gain further access to the machine via the side service panel, use 2.5mm Allen key and remove the 4 screws as shown. Remove panel to reveal the magnetic foil guide.



CAUTION: This panel is not interlocked. Machine should be switched off and all power removed from the system before gaining access to side service panel.

Dimensions Of Unit



Height (mm)	Width (mm)	Length (mm)	Total Weight (Kg)
518	232	506	25