SmartSeal Pro™
Automated Thermal Plate Sealer



Model: MS2000

Accuris Instruments

Foreword

Thank you for choosing the Accuris SmartSeal Pro Automated Plate Sealer.

The SmartSeal Pro is designed to provide reliable, consistent, and efficient sealing of microplates for a wide range of laboratory applications. Its automated operation, intuitive touchscreen interface, and integrated air supply provide a streamlined sealing workflow while minimizing the need for external equipment and manual intervention.

This instruction manual provides the information necessary for the proper installation, operation, maintenance, and care of the SmartSeal Pro. Before operating the instrument, please read this manual carefully and become familiar with all safety information, operating procedures, and maintenance requirements.

Proper use and routine maintenance will help ensure reliable performance and extend the service life of the instrument.

Accuris Instruments is committed to providing high-quality laboratory equipment designed to support efficient and reproducible laboratory workflows.

Thank you for choosing Accuris Instruments.

Edited by:	Ross Shamby
Version:	1.0
Date:	5.25.2026

Accuris Instruments

P.O. Box 709, Edison, New Jersey, 08879, USA

Phone: 1-908-769-5555

Important Information

Inspection Upon Receipt

Upon receipt, please inspect the instrument and all accessories against the packing list to ensure that all items are present and undamaged. If any items are missing or damaged, please contact your distributor or the Accuris Instruments division of Benchmark Scientific for assistance.

Read the Manual Thoroughly

Users should fully understand the instrument's operation and safety requirements before use. Please read this manual carefully and become familiar with all operating procedures and safety information before operating the SmartSeal Pro.

User Guidelines and Safety

Operation, maintenance, and servicing of the instrument must be performed in accordance with the guidelines and safety precautions provided in this manual. Improper operation or maintenance may compromise instrument performance and safety and may reduce the service life of the instrument.

This instrument is designed in accordance with the GB 4793.1 safety standard and is intended for indoor use only.
Safety Notice: During normal operation, there may be potential risks of personal injury or biological contamination. To ensure safe operation, carefully observe the following precautions:



WARNING: HOT SURFACE
The heating block reaches high temperatures during operation and may cause burns. Do not touch the heating block while the instrument is operating or until it has cooled to a safe temperature.

To prevent damage to the instrument and ensure proper operation:



- Do not force the door open while the instrument is operating.

- Do not place your hands inside the instrument while the door is open.

Installation Location and Storage



Install the instrument in a well-ventilated, low-humidity environment. Keep the instrument away from liquids, corrosive gases, strong magnetic fields, direct sunlight, intense light, heat sources, and areas with excessive dust.

The ventilation openings in the instrument housing must remain unobstructed. Do not block or cover these openings, as doing so may cause the instrument to overheat.

Turn off the power switch when the instrument is not in use. If the instrument will not be used for an extended period, disconnect it from the power supply. Once the instrument has cooled to room temperature, cover it with a suitable dust cover for storage.

Emergency Power Disconnection



Immediately disconnect the power cord from the instrument and contact Accuris Instruments if any of the following conditions occur:

- Liquid enters the instrument.
- The instrument or its housing becomes damaged.
- A sudden or significant change in instrument performance is observed.

Environmental Requirements

For proper operation, the instrument should be used under the following environmental conditions:

- Ambient temperature: −20°C to 55°C
- Relative humidity: ≤90%
- Barometric pressure: 500–1060 hPa
- Install the instrument in a well-ventilated area.
- Protect the instrument from exposure to corrosive gases.

Chapter 1: Introduction

Introduction

The SmartSeal™ Pro is designed for efficient, reliable, and consistent sealing of standard microplates, deep-well plates, and PCR plates. The instrument can operate as a standalone system or be integrated into automated laboratory workflows. An Ethernet connection and API support enable communication with external automation systems, allowing the SmartSeal Pro to be incorporated into integrated and robotic laboratory workflows.

Features

- **Broad plate compatibility**: Accommodates plate heights from 3 to 63 mm, with adapters available for various plate formats.
- Intuitive operation: Features a 7-inch color touchscreen for easy setup and operation.
- **Programmable sealing protocols**: Allows users to create and save sealing protocols for efficient, reproducible workflows.
- **Built-in electronic vacuum pump**: Eliminates the need for an external air source, simplifying installation and allowing greater flexibility in instrument placement.
- **Automation-ready**: An Ethernet port enables integration with laboratory automation systems.
- **Automatic standby**: Reduces energy consumption and helps extend the service life of the instrument.

What is included:

List	
Automated thermal plate sealer	4 replacement suction cups
2 rolls of sealing material	4 screws (to fix adapters in place)
Adaptors for: deep well plates, and 96-well PCR plates	Hex key tool
Dust cover for film roll	Roll spindle (with two clamp rings)
Power cord	User manual

Chapter 2: Specifications

2.1 Required installation environment

- Ambient temperature: 10°C to 35°C
- Relative humidity: ≤90%
- Barometric pressure: 500–1060 hPa
- Install the instrument in a well-ventilated area.
- Protect the instrument from exposure to corrosive gases.-60 Hz, 2A

Altitude: up to 2000 meters

2.2 Specifications

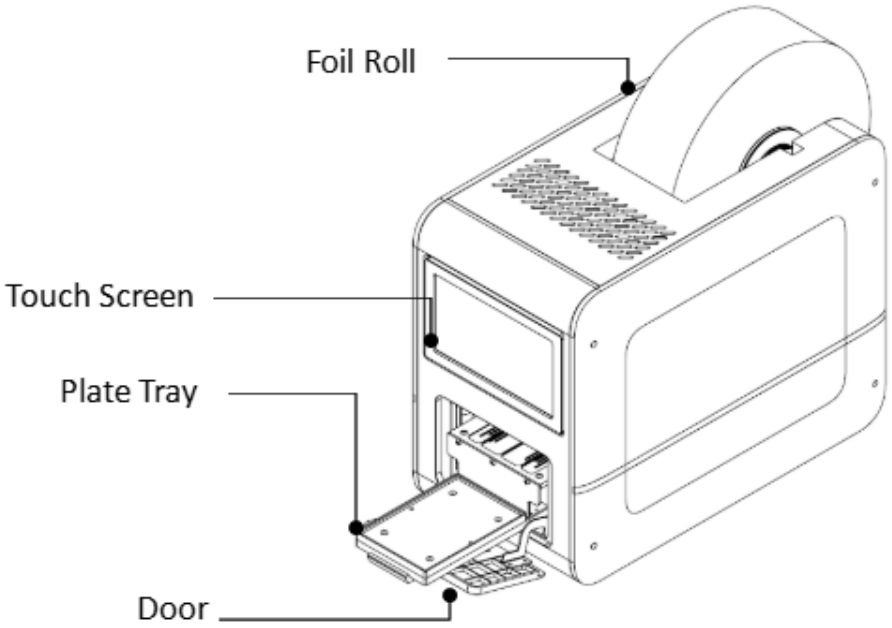
Feature		Description
Model		SmartSeal Pro™
Supported plates		ANSI/SBS standard plates, height range 3-62mm
Supported film rolls	Film type	Easy-peel and pierce able aluminum foil, and clear qPCR heat seal
	Film width	78-82mm
Film sealing temperature	Temperature range	25 - 200 ºC
	Accuracy	± 1 ºC
	Increments of	1 ºC
Pre-heating time		≤5 min
Cycle time		< 20 sec/plate
Sealing Time	Range	0.5~9.9 sec
	Increments of	0.1 sec
Air Source		Built-in Air Source
Connection ports		US, Ethernet port (API available)
Power Supply		AC100-120V, 50/60 Hz
Heating power		300 W
Weight		16 kg/35.2lb
Dimensions		14.2x8.7x18 in. / 36x22x45.7 cm

Chapter 3: Instrument Overview

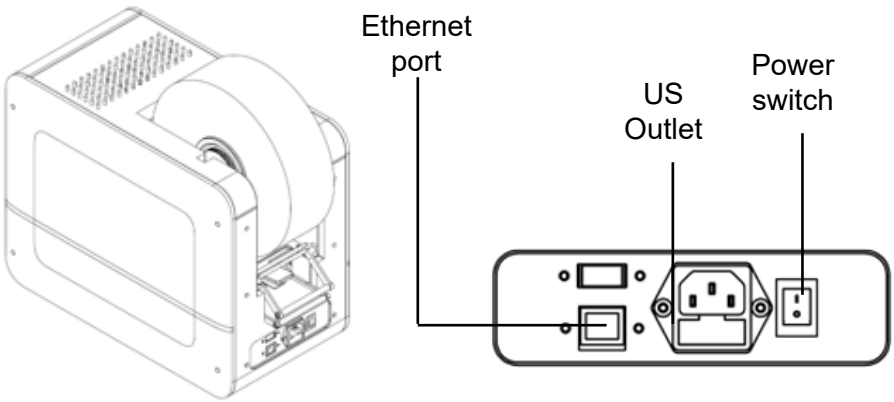
3.1 Instrument structure

This chapter describes the structural components and configuration of the instrument. Prior to initial operation, users should review this chapter thoroughly to become familiar with the instrument layout and key assemblies.

Front/Top view

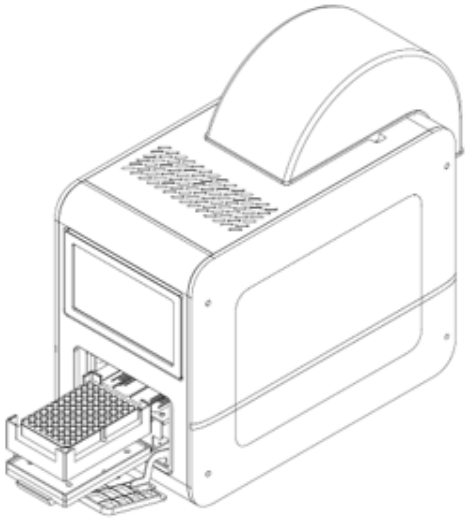


Back view

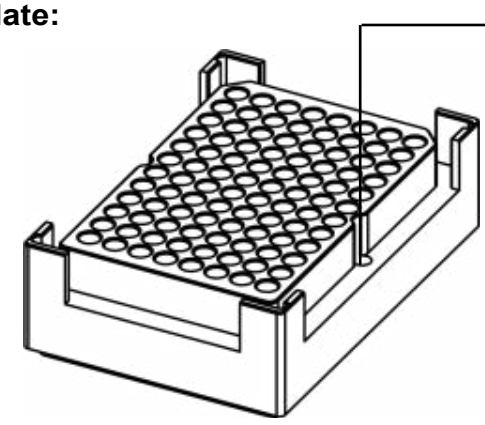


Adapters

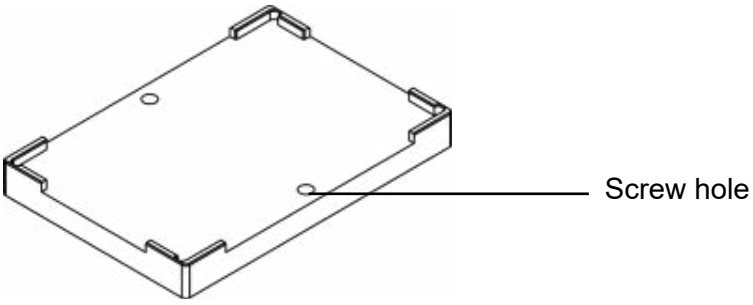
Please confirm the sealing foil type and plate height before operating the instrument. For plates with a height of less than 35 mm, the included plate adapter must be installed.
Installing the Plate Adapter
Place the adapter onto the plate tray and align the mounting holes. Insert the two screws into the corresponding holes and tighten them securely using the supplied hex key, as shown in the figure below.



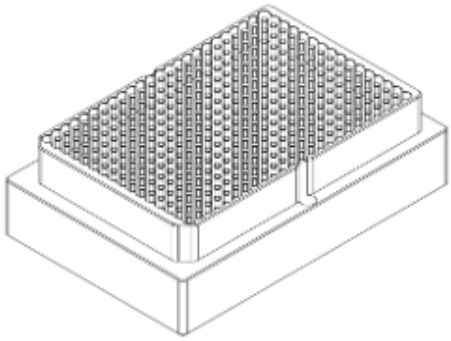
Adapter for 96 well PCR plate:



Adapter for plates <35mm in height:



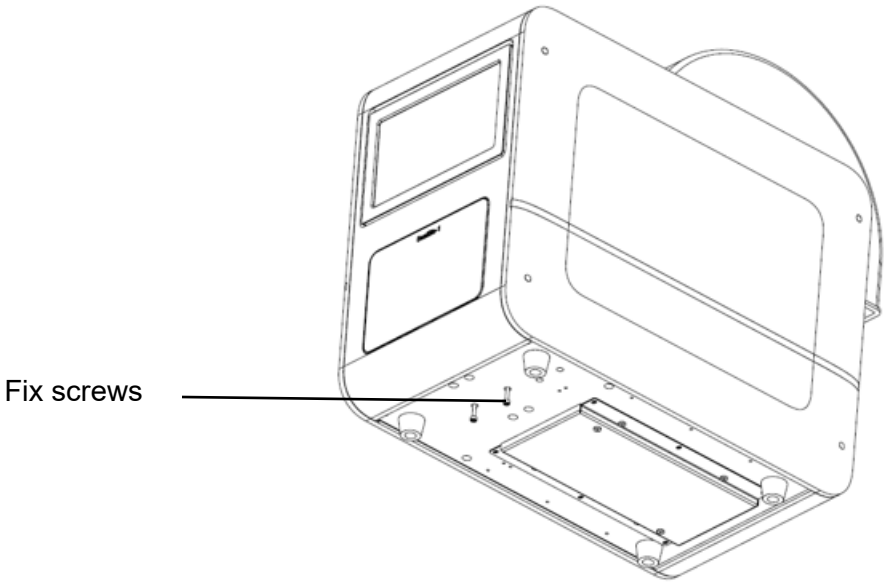
Adapter for 384 well PCR plate (optional):



Chapter 4: Instrument Setup

4.1 Installment

Using the supplied hex key, loosen and remove the two retaining screws from the bottom plate.



4.2 Installment Check

Environment:

1. Indoor use, only.
2. Temperature: 10°C to 35°C.
3. Relative humidity: less tja 80%, no condensation.
4. Atmospheric pressure: 86.0 kPa ~ 106.0 kPa.
5. Power supply: AC100-120V, 6A, 50/60 Hz.
6. Ensure that the power outlet is properly grounded and easily accessible.
7. Maintain a minimum clearance of 10 cm (4 in.) between the back of the instrument and the wall.

Software installation check

- *The instrument is equipped with an integrated Android-based touchscreen system.*
- *The instrument software supports offline updates.*

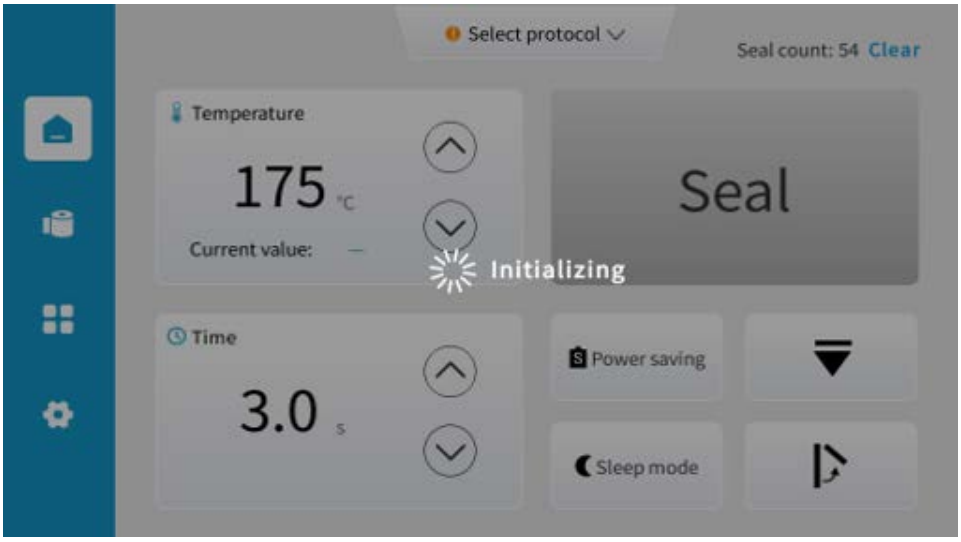
4.3 Power connection

Place the instrument on a stable, level laboratory bench. Connect the power cord to the instrument and a compatible AC 100–120 V power outlet. Turn on the power switch located on the back of the instrument. The instrument will automatically begin the startup process.

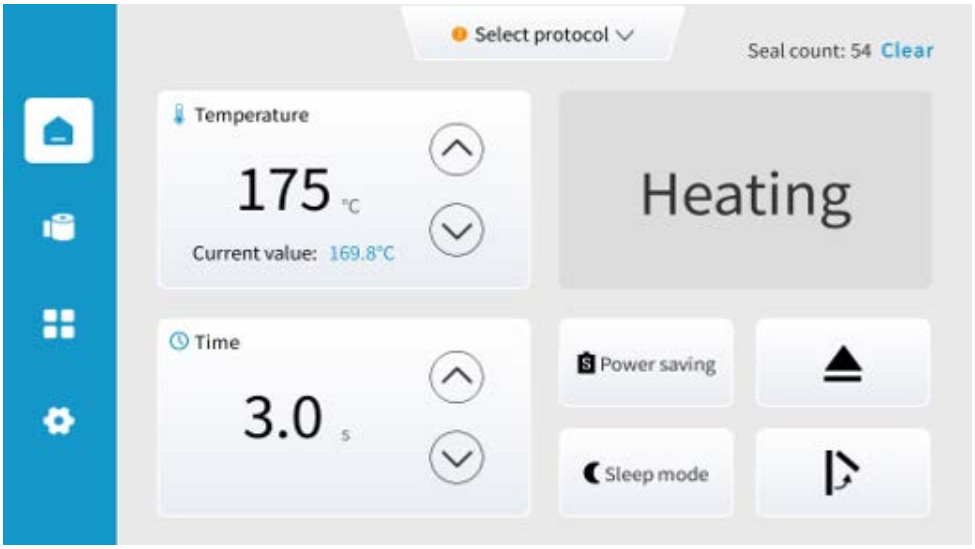
Chapter 5: Instrument Operation

5.1 Instrument start-up

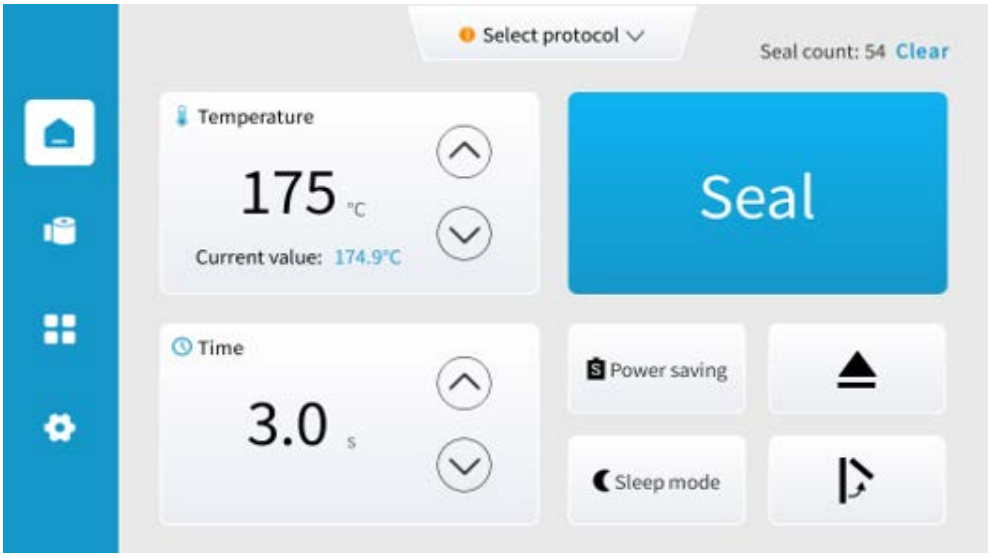
After the instrument has been installed, turn on the power switch. The instrument will automatically begin the self-check and calibration process, as shown below. If an error occurs during startup, refer to Chapter 6 – Troubleshooting for additional information.



After the self-check is complete, the instrument will display the Home screen and begin heating to the preset temperature. The Seal button will remain inactive until the instrument reaches the preset temperature.



NOTE: The Seal button will remain inactive if the door is closed or if sealing foil is not loaded. Once the foil is properly loaded and the instrument reaches the preset temperature, the Seal button will become active.



5.2 Home Page

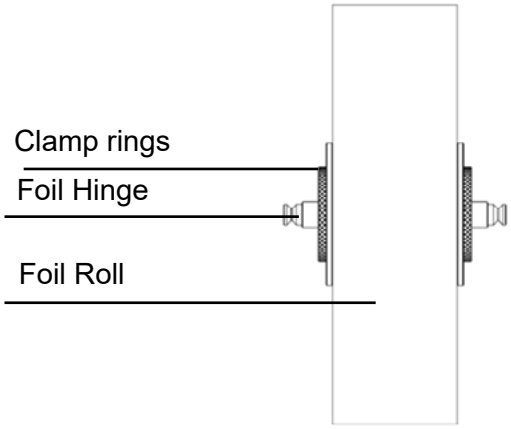
Home page key functions:

Name	Mode	Function
Protocol list	Pull-down menu	A list of protocols to choose
Clear	Keys	Click to clear foil roll number
Temperature	Keys	Click to change sealing temperature
Power saving	Keys	Click to save power (temperature will remain in 50 º)
Sleep mode	Keys	Click to enter sleep mode, temperature control module will stop working
	Keys	Click to increase sealing temperature
	Keys	Click to decrease sealing temperature
	Keys	Click to open instrument’s door
	Keys	Click to close instrument’s door
	Keys	Click to adjust screen angle
	Keys	Click to enter home page
	Keys	Click to load/unload foil
	Keys	Click to enter protocol page
	Keys	Click to enter setting’s page

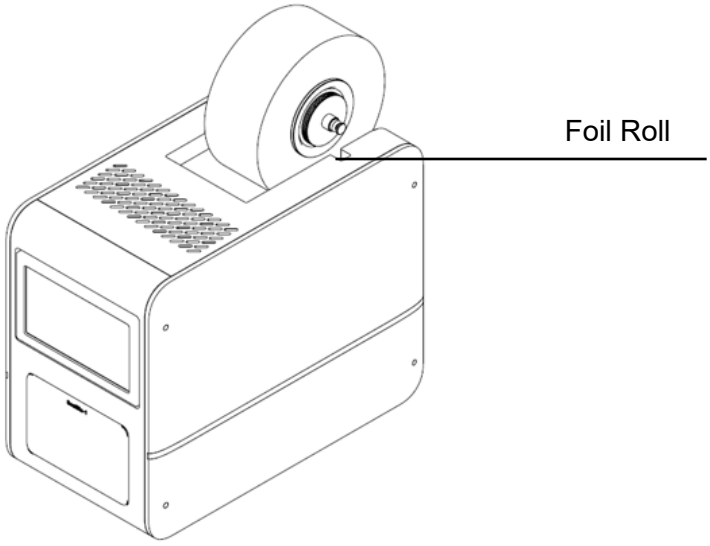
5.3 Loading/Unloading the Sealing Film Roll

Loading the sealing film roll:

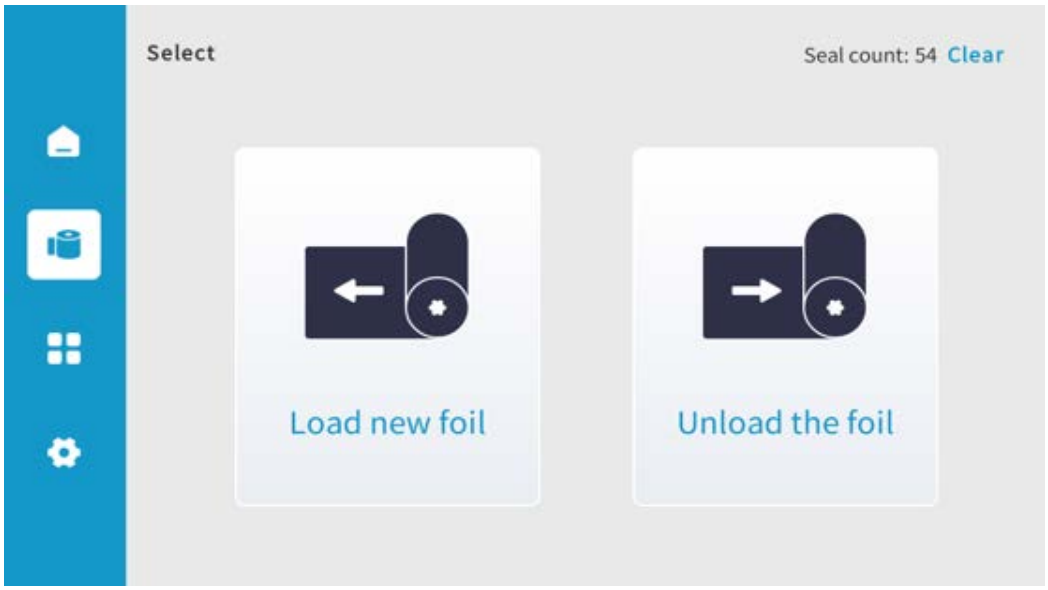
- Loosen the clamp ring on one end of the spindle. Remove the clamp ring and the adjacent black plastic ring.
- Slide the sealing film roll onto the spindle, then reinstall the black plastic ring followed by the clamp ring.
- Adjust the clamp rings so that the film roll is centered on the spindle. Visually confirm that the exposed portions of the spindle are approximately equal on both sides of the roll, then securely tighten the clamp rings.



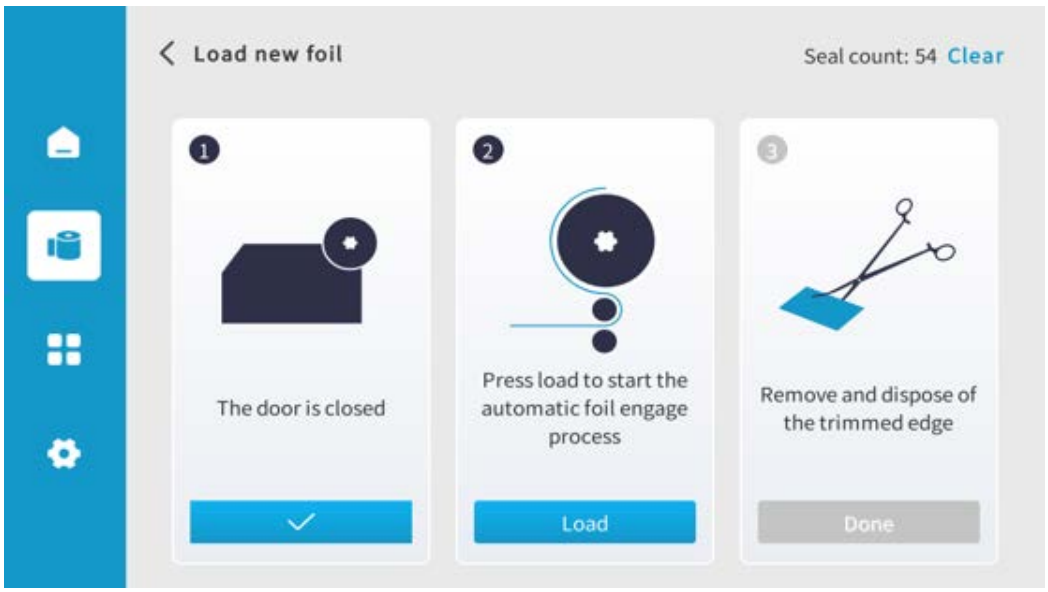
- Place the sealing film roll into the instrument by positioning the spindle securely within the designated grooves. Orient the roll so that the sealing film feeds from underneath the roll toward the rear of the instrument.



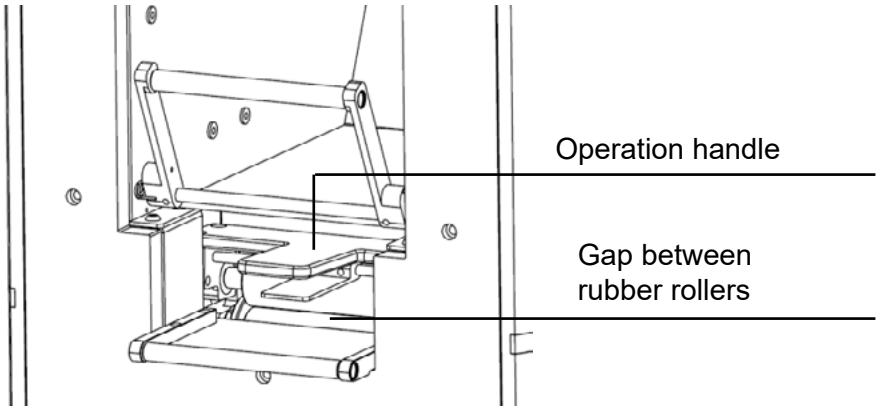
 Click to load/unload the foil.



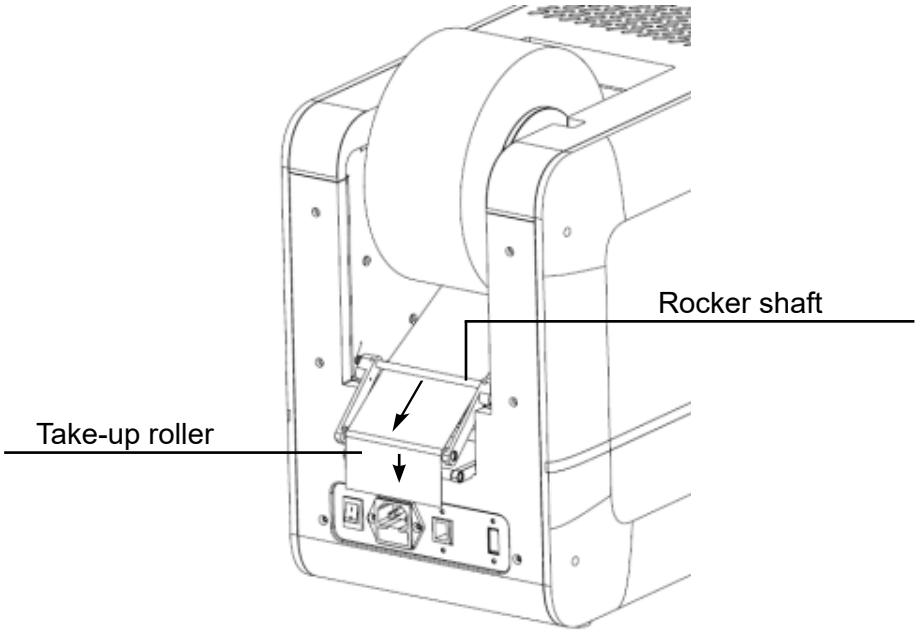
Click ‘Load New Foil’ to go to the loading page. There are steps:



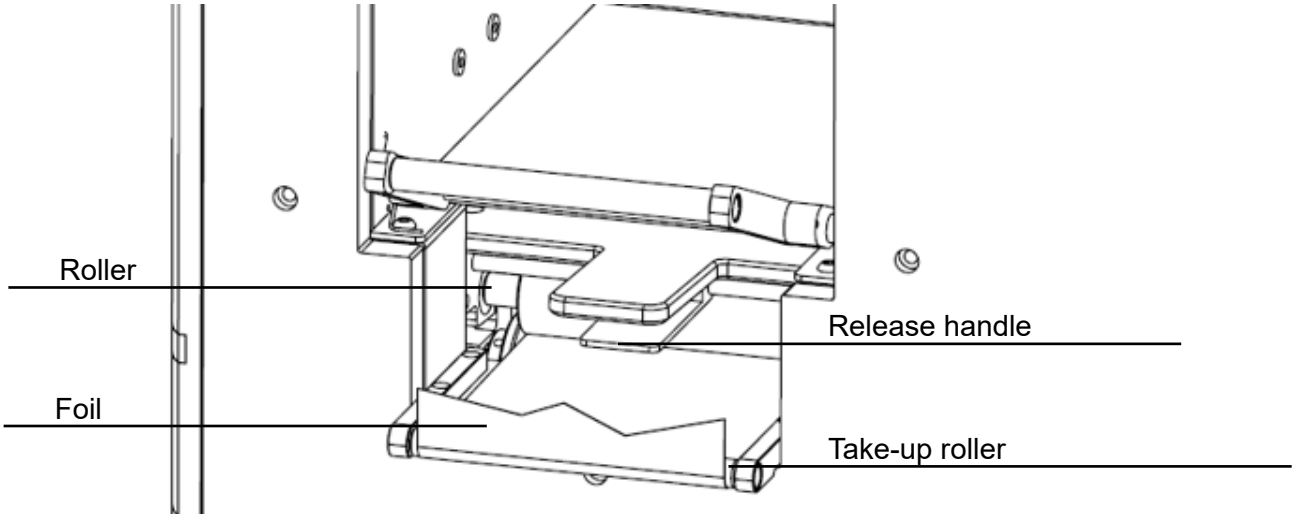
1. Press (1) to close the door (1 on the figure above). Then, lift the operation handle located at the rear of the instrument until it clicks into place. This will create a gap between the rubber rollers through which the sealing film can be fed.



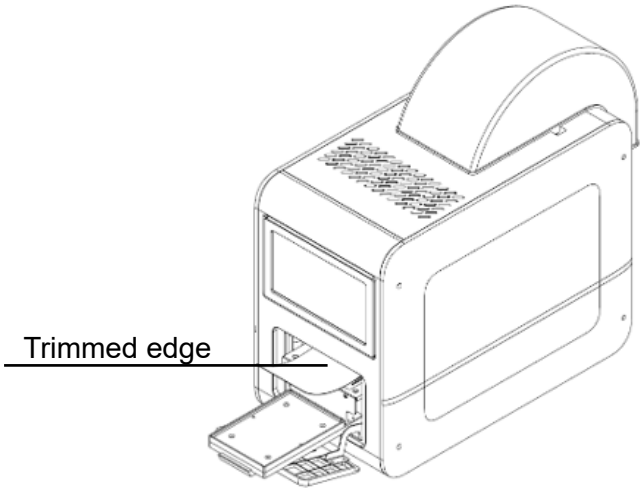
2. Pass the foil paper under the rocker shaft and over the winding up roller.



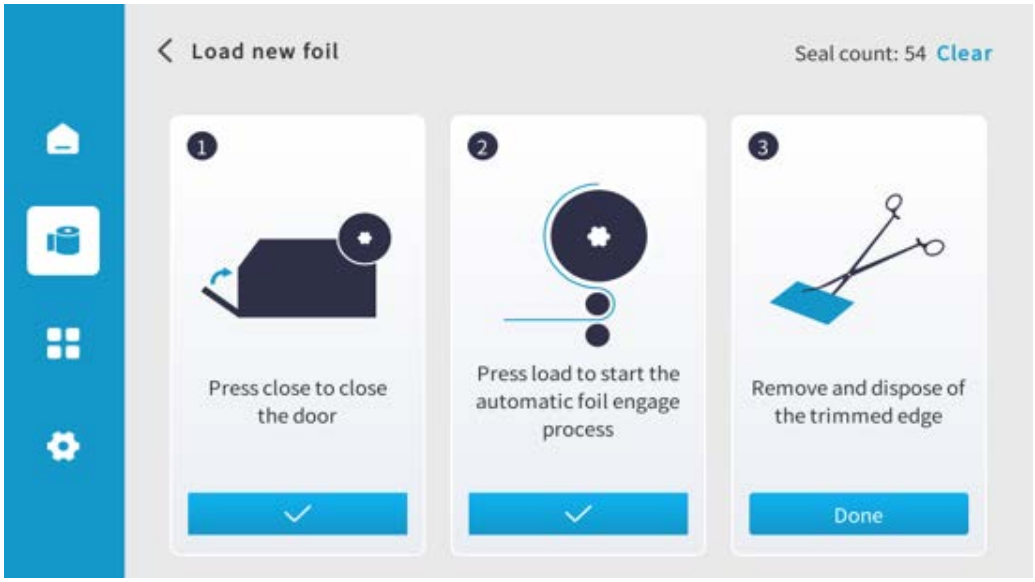
3. Next, pass the foil underneath the wind down roller and direct it inside the instrument towards the two rubber rollers. Insert the foil into the gap between the rubber rollers a couple of inches. Once it is inserted, push upward on the Release Handle. You should hear a click and the foil will be held tightly between the rollers.



4. Press (2) on the touchscreen to begin the automatic sealing film engagement process. The instrument will advance and cut the film according to the preset length. Carefully remove the trimmed section of film. Note: If no sealing film is dispensed after pressing (2), the film may not be securely held between the rubber rollers. Return to the Load Foil screen and close the door. Repeat the film-loading procedure, lifting the Operation Handle to create a gap between the rollers. Insert the film between the rollers, then lift the Release Handle until it clicks into place and the film is securely held between the rollers. Confirm that the film does not slip before proceeding.

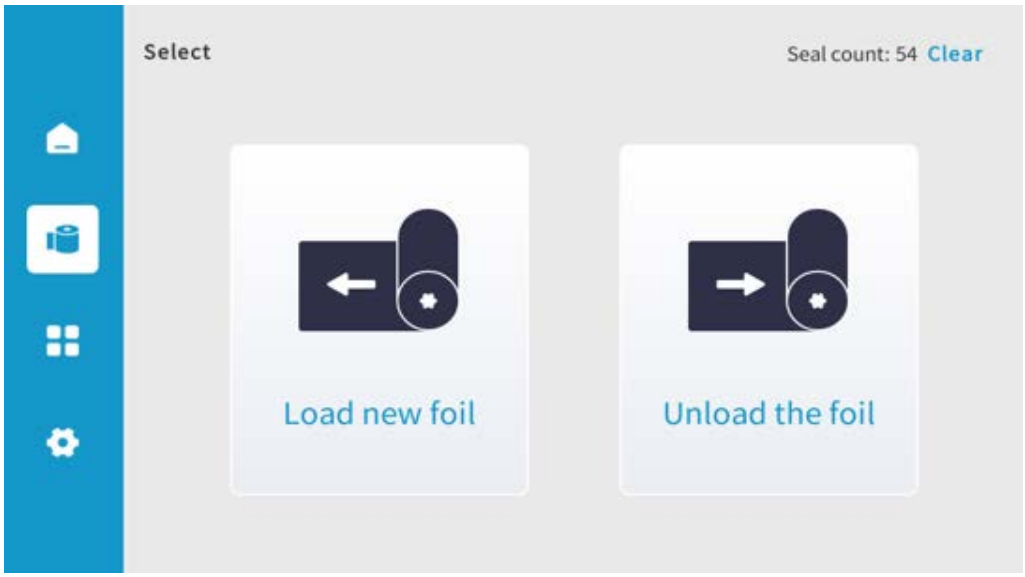


5. After removing the trimmed section of sealing film, press Complete. The instrument will return to the Home screen.

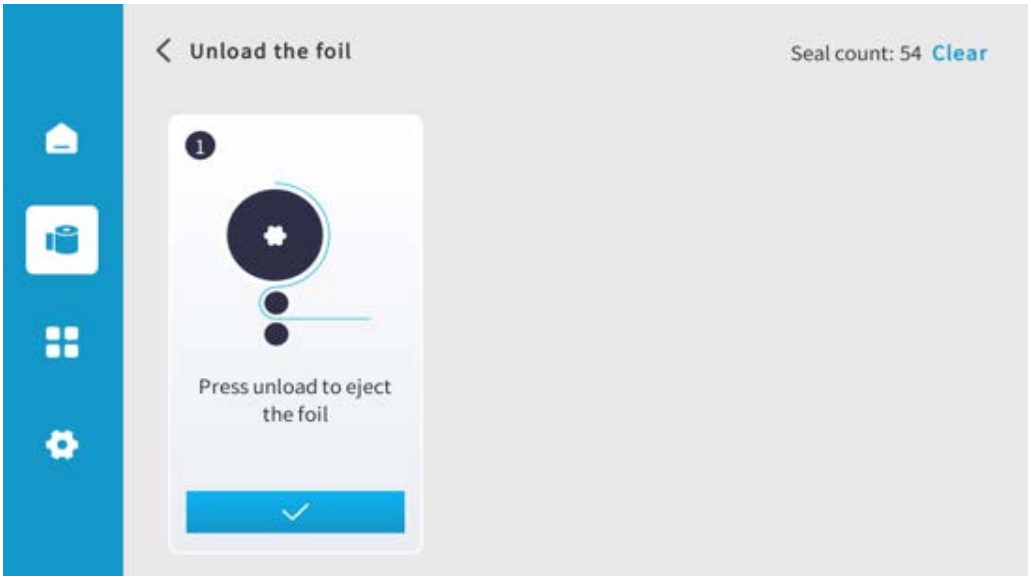


5.4 Unloading the foil

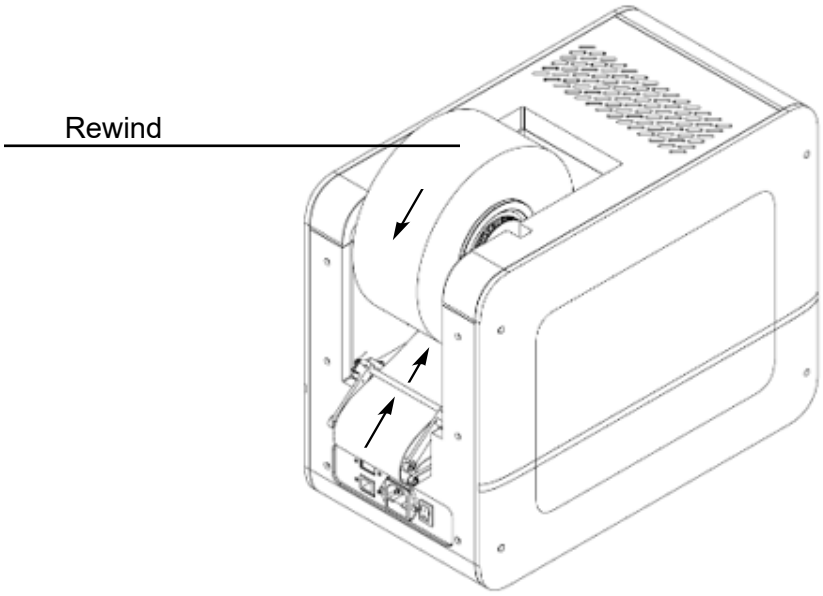
Press Unload Foil to open the Foil Unloading screen.



Press Unload to release the sealing film. If necessary, lift the Operation Handle to create a gap between the rubber rollers, then carefully remove the sealing film from between the rollers.

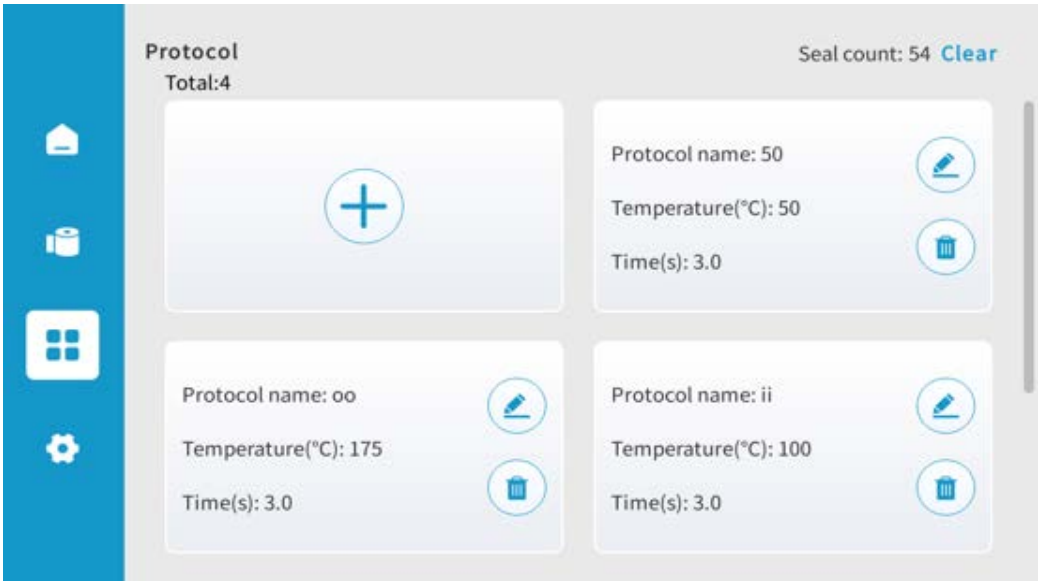


Roll the film manually to rewind the foil paper.



5.5 Protocol

Click to enter ‘Protocol’ page

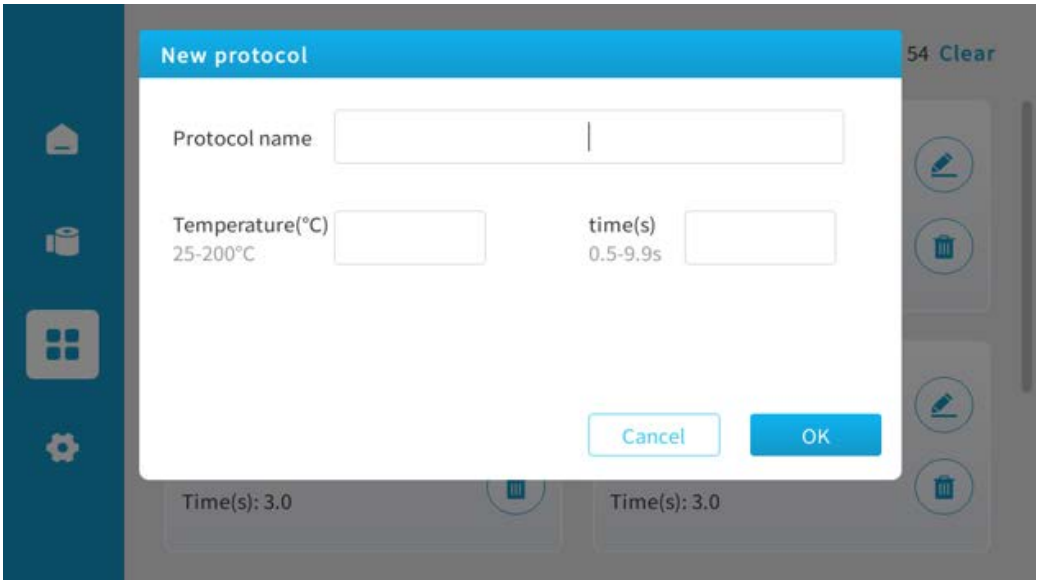


Protocol page display key:

Name	Mode	Function
	Key	Click to add a new protocol
	Key	Click to edit a protocol
	Key	Click to delete a protocol

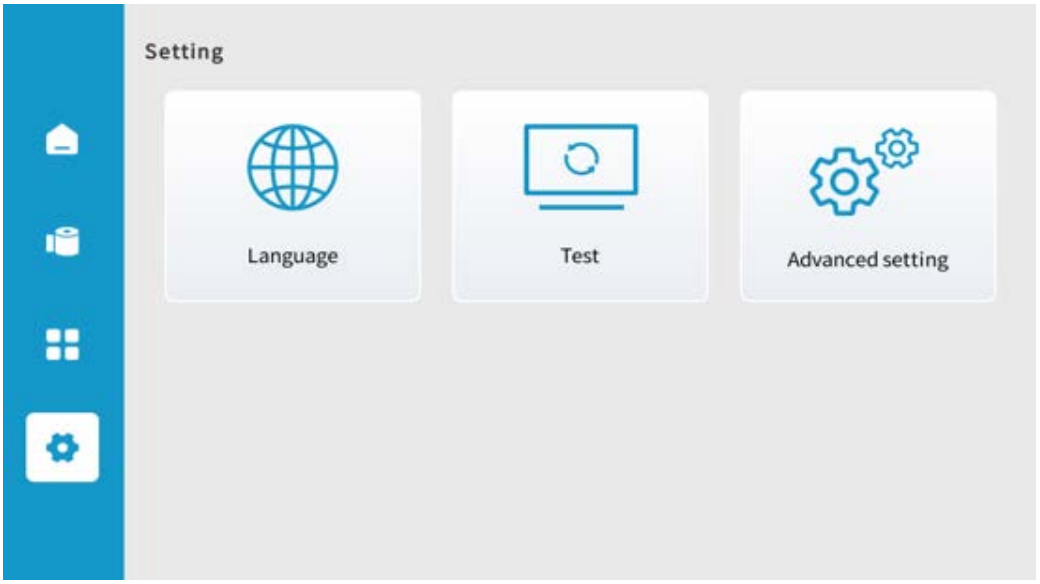
The selected protocol in the ’Run’ page cannot be deleted or edited.

Click Create New Protocol. Enter the protocol name, sealing temperature, and sealing time, then press OK to save the protocol.



5.6 Settings

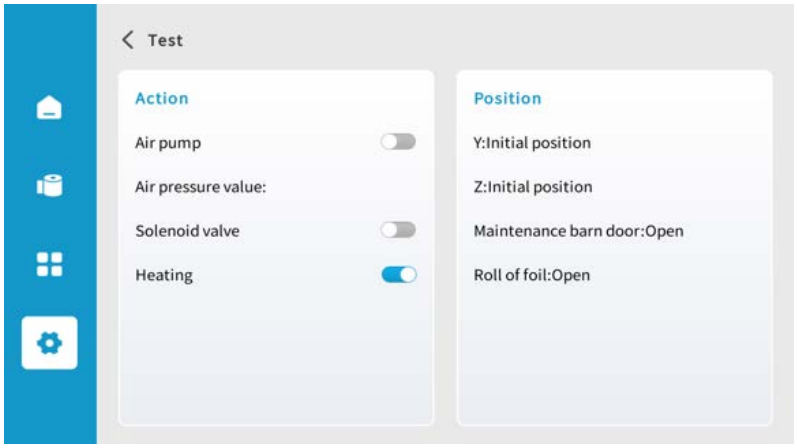
Click to enter ‘Protocol’ page



This page contains Language, Test, and Advanced Settings options. A password is required to access the Test and Advanced Settings menus. These settings are intended primarily for service and diagnostic purposes and typically do not require adjustment during normal operation.

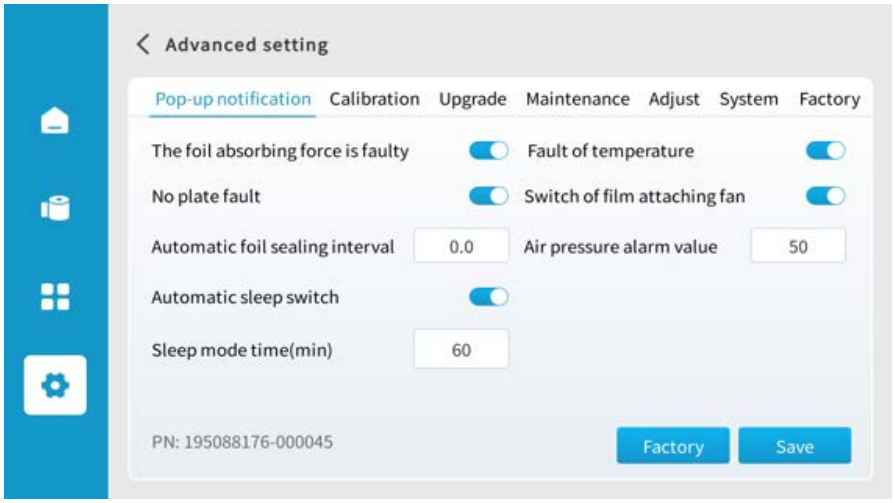
For assistance with these settings, please contact Accuris Instruments Technical Support at info@accuris-usa.com or +1-908-769-5555.

Press Test to open the Test Settings screen.



Name	Mode	Function
Air pump	Key	Click to open or close air pump. Air pressure value shows when the pump is open.
Solenoid valve	Key	Click to open or close solenoid valve
Heating	Key	Click to open/close heating module
Y	Text	Displays the current position of the Y-axis motor, including the initial position and the limit position (maximum travel position).
Z	Text	Displays the current position of the Z-axis motor, including the initial position and the limit position (maximum travel position).
Maintenance Access Door	Text	Displays if maintenance door is open
Roll foil	Text	Shows if foil roll is installed

Click ‘Advanced Setting’ to go to the advanced setting page.



The keys functions are listed below:

Name	Mode	Function
Insufficient Vacuum Pressure	Key	The “Absorbing Failed” message will appear when the air pressure reaches the preset alarm threshold.
Temperature error	Key	Alarm will sound when temperature is too high.
No plate error	Key	“No plate” error will appear when plate is not placed.
Automatic foil sealing interval	Input box	interval between two sealing operations. Default value is 0.
Air pressure alarm value	Input box	Default: 50
Automatic sleep mode	Key	Instrument is set to “sleep” mode and the heating module will turn off.
Sleep time	Input box	Input duration of the “sleep” mode
Power saving mode	Key	Go to power saving mode according to sleep mode. Heating will remain at 50 ºC.
Power saving time	Input box	Sets the waiting time before the instrument automatically enters Power Saving Mode.
Film attaching fan	Key	Open/close the fan while sealing.

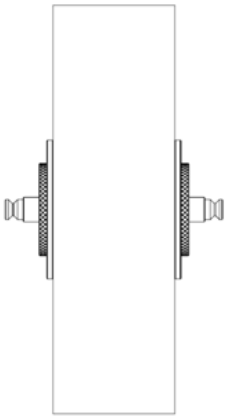
5.7 Settings

Before Sealing:

- Centering the sealing film roll

After installing the sealing film roll, perform 3–4 test seals to confirm that the film is properly centered. If the film shows significant deviation from the center, adjust the roll position. Check that the clamp rings are positioned correctly on the spindle.

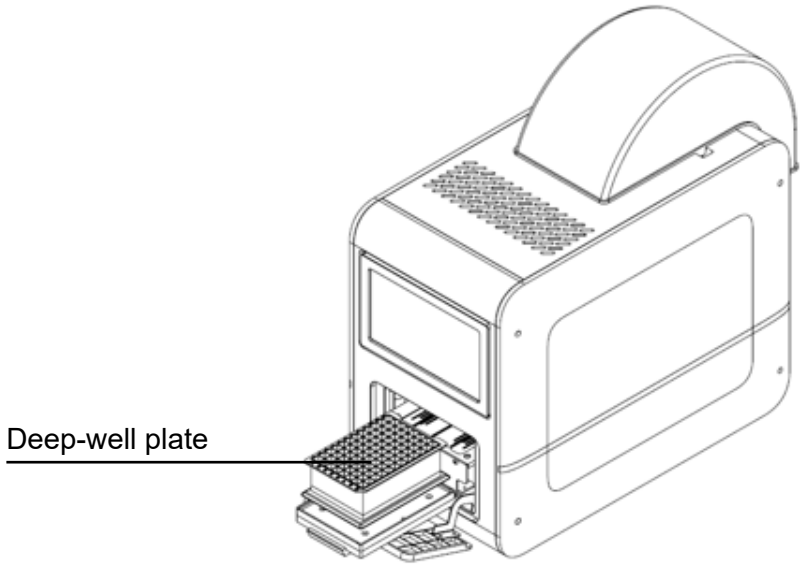
If adjustment is required, loosen the clamp rings and reposition them along the threaded portion of the spindle until the film roll is centered and the exposed portions of the spindle are approximately equal on both sides. Once properly centered, securely tighten the clamp rings.

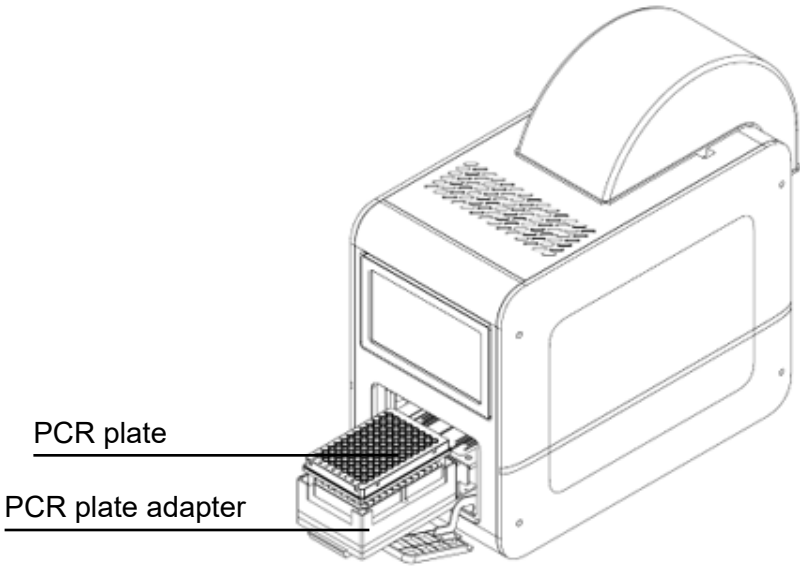


- Sealing process (before sealing, please confirm that the steps below are all completed).

Number	Step
1	Confirm the plate type and height, and install or remove the appropriate plate adapter, as required
2	Connect the instrument to an appropriate power supply
3	Confirm that the sealing film roll is properly installed and centered
4	Initialize the Instrument
5	Confirm that the sealing parameters are set correctly
6	Confirm that the instrument has reached the preset sealing temperature

Place the plate on the tray or plate adapter. Confirm that the plate is properly positioned and sits level and securely on the tray or adapter.





Set the desired sealing parameters, then press Seal to begin the sealing process.

Once sealing is complete, the drawer will automatically open and present the sealed plate. Carefully remove the plate from the tray.

Chapter 6: Product Maintenance

6.1 Maintenance tools

The following tools and supplies may be required for routine maintenance:
Allen wrench set (1.5–6 mm), Phillips screwdrivers (large, medium, and small), small tweezers, clean container, clean gauze, cotton swabs, cleaning brush, protective gloves, and 75% alcohol.

6.2 Daily maintenance

1. Power Off the Instrument

Prolonged exposure to high temperatures may accelerate the aging of internal components. If the instrument will not be used for more than 8 hours, turn off the instrument and disconnect it from the power supply to help extend its service life.

2. Clean the Tray and Plate Adapter

Keep the instrument clean and free of residual liquids or stains. If liquid is present on the tray or plate adapter, absorb it with laboratory tissue, then wipe the area with a clean, soft cloth. Apply 75% alcohol to a clean cloth and wipe the surface to clean and disinfect it.

3. Clean the Heating Plate

Residue or stains on the heating plate may affect sealing performance. Before cleaning, turn off the instrument, disconnect it from the power supply, and allow the heating plate to cool completely to room temperature. Clean the heating plate as described above.

4. Cover the Instrument

Once the instrument has cooled completely, cover it with the supplied dust cover.

Chapter 6: Troubleshooting

No.	Error	Potential cause	Solution
1	Screen Does Not Display Content After Power-On	Disconnected power	Check the power
		Damaged switch	Change switch
		Damaged fuse	Change fuse
		Other	Contact distributor
2	Touch screen not working	Damaged screen	Contact distributor
		Others	Contact distributor
3	Displayed Temperature Does Not Match the Actual Temperature	Damaged temperature sensor	Contact distributor
		Other	Contact distributor
4	Device not heating	Damaged heating circuit	Contact distributor
		Other	Contact distributor
5	Failed to Feed Sealing Film	Rubber bulb damaged	Contact distributor
		Vacuum pump damaged	Contact distributor
		Gas pipe leakage	Contact distributor
6		Damaged blade	Contact distributor
		Failed cutting	Contact distributor
7	Inaccurate curring interval	Roll is not centered	Contact distributor
		Other	Contact distributor
8	Abnormal sound during operation	Rail is not installed correctly	Contact distributor
		Damaged motor	Contact distributor
		Gear or lead screw worn out or Other	Contact distributor
9	Edge of sealing film is uneven	Foil roll not centered	Install the foil again

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PO Box 709
Edison, NJ 08818
USA

Email: info@accuris-usa.com Ph: 908-769-5555

www.benchmarkscientific.com www.accuris-usa.com