



# 2060 Genoseal™

Semi-automatic Heat Sealer for Microplates and Tube Racks

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## Before You Begin

**Read this instruction manual.** Failure to follow the instructions, in this manual, may 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. Spex makes no representations or warranties with respect to this manual. In no event shall Spex be held liable for any damages, direct or incidental, arising from or related to the use of this manual. ©2022 Spex, an Antylia Scientific company. All rights reserved.

## Safety Considerations

It is important that the Genoseal unit is installed and operated in such a way that all applicable health 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 may result in 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 any way connected with the use of this equipment or this instruction manual.

### Warning Symbols Used in Accordance With IEC 417

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

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**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.

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

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

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**Caution:** Protective Conductor Terminal

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**Caution: Hot surface/hot area.** This instrument is fitted with an internal heater with a maximum temperature of 200 °C when in use.

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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.

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

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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 may result in injury or damage.

Main Switch Symbols  
I = ON  
O = OFF

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Below are important safety precautions that apply to this product:

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

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**Warning:** Only approved supplied power cord set must be used with this instrument. If it is required to use an extension cord, the cord must be earthed. The Genoseal is supplied for direct connection to normal 115 / 230 VAC, 50 / 60Hz supply, with a variation in supply that gives a voltage range of 108 VAC to 250 VAC. 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 Genoseal is designed to be operated with a maximum sealing temperature of 200 °C.

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The Genoseal should be switched on 5 minutes prior to use when plugged into 230 V and 6 minutes when plugged into 110 V. This is to enable the set temperature to be reached and to stabilize. The Genoseal 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. Spex accepts no responsibility for the misuse of this equipment.

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

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## Introduction

The Genoseal heat sealer has been designed to seal most types of microplates. Our product utilizes various heat seal films and foils to give either permanent or peelable seals for all common microplate material types (polypropylene, polystyrene, polyethylene). Seal times and seal temperatures are fully adjustable on the product via the control screen. The Genoseal has dual voltage capability, operating on both 110 and 230 VAC supplies without the need for a power transformer.

## Unpacking/Packing the Genoseal

When unpacking your Genoseal, 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. Refer to the packing list.

The unit is supplied in a re-usable crate and a transit bracket (if applicable) that must be retained in case the unit requires servicing. The Genoseal is a precision instrument and requires the proper packaging for shipping. Inadequate packaging can lead to damage. Ensure that all packing foam and ties are removed prior to powering on the unit.

Use appropriate PPE and necessary tools available in the facility to remove the unit from the crate properly. Pack in the same way the unit was originally shipped, with correct foam and crate. If any damage was caused or the original crate that the Genoseal came in is lost, please contact support.

## Principle of Operation

The unsealed plate is placed on the shuttle which extends from the front of the sealer, allowing full access for the user to the system. The drawer unit is manually pushed into the unit. The plate sealing operation will vary based on user settings and set sealing time. (See user interface section for operation.) The drawer and the plate returns to its original start position once the sealing process is complete.

The sealer operates as a stand-alone, manual unit. Each sheet of sealing film is sufficient for sealing one plate to cover the entire plate surface with a fixed length of 125 mm, allowing peelable or automation compatible applications. See Figure 1.

The sealing films are either aluminum or clear laminates and are able to produce permanent, pierceable or peelable 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 1. 384-Well Sealed Plate

## Installation

The unit should be installed on a sturdy bench to avoid any vibration during operation. When locating the unit, there should be enough space allowed for the drawer to move out without obstruction.

## Intended Use

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



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

## Inventory

**Note:** All of the items listed below are available as spare components from Spex.

DESCRIPTION	PART NUMBER
Plate Adapter for PCR 384-Well Format	2060-PA-384
Skirtless Plate Adapter	2060-PA-96
Heat Sealing Film	2061
Plate Weight for Recessed Plates*	2060-WT-RC
Plate Weight for Standard and Rimless Plates*	2060-WT-STD
Plate Locators*	2060-PL

\* Accessories supplied with the Genoseal

## Operating Environment

The Genoseal should be operated in an environment with a temperature range of 10 °C to 30 °C and a non-condensing relative humidity range of 10% to 80%.

The unit should be kept out of drafts and air currents, as they will have an adverse effect upon the temperature stability of the sealing plate area. If the sealing plate area is subjected to drafts or air currents, quality or process time may be affected.

The unit should be placed on a secure and stable surface with a minimum of 100 mm (4-inch) clearance on all sides.

## Connecting the Power Supply

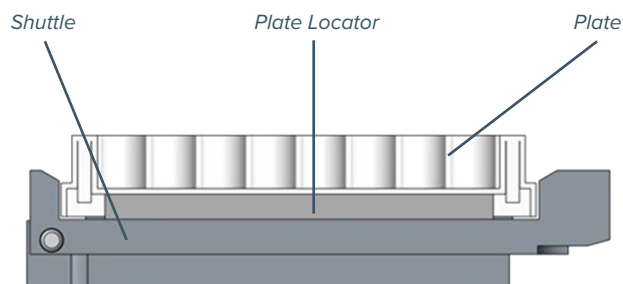
The Genoseal utilizes a standard IEC inlet, which is fused and switched. Plug the IEC Lead in the inlet and switch the Rocker I.O. Switch to the On position ( | ). The display screen should illuminate.

**Note:** The system is self-regulated to sense voltage differences between 100 / 250 VAC.

## Operation Procedure

### Plate Locators and Adapters

Plate locators are used specifically on skirted plates, it allows for the plate skirt to sit around the corresponding locator and support the underneath of the plate. To ensure the correct plate locator is used, check the difference in the bottom of the well distance to the plate skirt base, if there is a difference, the center of the plate can flex when pressed. This means a suitable plate locator needs to be used to take up the difference. Poorly supported wells will result in an uneven seal across the plate surface.



However, if you are using an unskirted plate where the edge of the plate skirt is the same level as the bottom surface of the plate, you will have to use a plate adapter. They support each cell individually and ensure that the seal is even. They are designed to support most plate types.

### How to Begin the Sealing Process

The Genoseal seals microplates by the following method:

1. First set the temperature and sealing time of the unit.
2. Next, select the correct plate locator for the plate you want to seal.
3. Place the unsealed microplate on the top shuttle plate.
4. Place the pre-cut length of film/foil on the microplate and place the foil brass weight on top of the foil on the microplate. Ensure that the foil is centrally placed on the microplate.

**Note:** Some sealing material may curl when heated and the foil brass weight will be required to keep the seal flat before sealing and to prevent the plate from sticking to the heater block. Two types of foil weights are supplied with each Genoseal; one for normal plates (*Figure 2*), and one for plates with high rims and recessed wells (*Figure 3*).

5. The sealing process is started by pressing “seal” on the software. Once pressed, begin by placing the correct plate locator, plate and plate weight as demonstrated on the display. Thirdly, start pushing the drawer fully into the unit, following the instructions on the display. Once the drawer is pushed in it will automatically latch and the screen will display a sealing message. You may now release your grip on the drawer handle. The sealing process will finish itself based on the parameters entered.

6. When the seal has finished, the drawer will automatically open, presenting the plate for removal.

**Note:** Care **MUST** be taken when removing the foil loading tool, **IT WILL BE HOT**. Always hold it by the specified tab as shown in Figures 2 and 3.

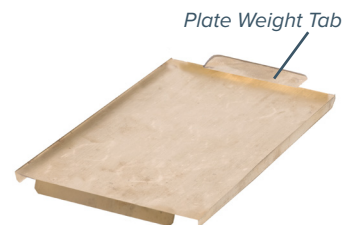


Figure 2. Normal plate weight

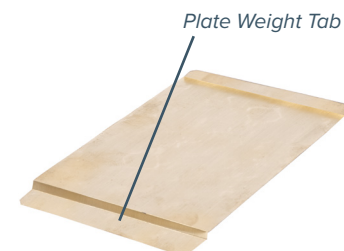


Figure 3. Recessed Plate Weight

## Optimization

The Genoseal 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 resealed. Therefore, a balance has to be achieved, giving an acceptable seal with the minimal plate damage or distortion.

Another optimization factor to be taken into account 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 pre-set and cannot be adjusted. 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 temperature and time 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

## Sealing PCR Plates - No Skirt, Half Skirt

An adapter will be required to seal plates which have well bottoms protruding past the plate skirt as well as plates with no skirt. This is available from Spex.



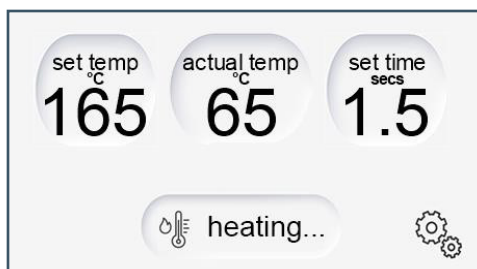
## User Interface



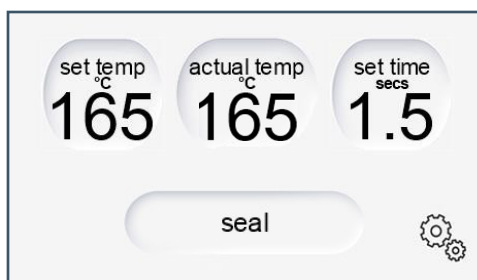
Plug in the system to turn the power on. Once the system is turned on, the Spex logo is displayed. The home screen appears as shown to the left. If the system is in ECO mode, it will prompt you to wake it.



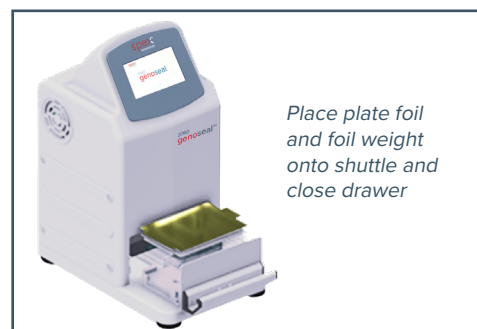
This screen will show upon power up. It will instruct you to close the drawer to home the system and enable the unit to be ready to seal, simply push the drawer in.



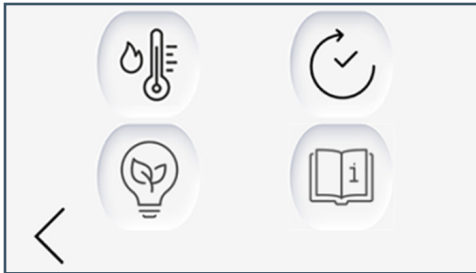
The screen will then show the sealing time, heater set temperature and heater actual temperature along with the active status of the heater block, cooling or heating depending on the temperature.



This is the main sealing screen. Here, you will see the main button to press "seal" and begin the sealing process. Once you press this, you will be prompted on how to complete the sealing procedure. Firstly, place the correct plate adapter onto the shuttle, followed by the plate and plate weight.



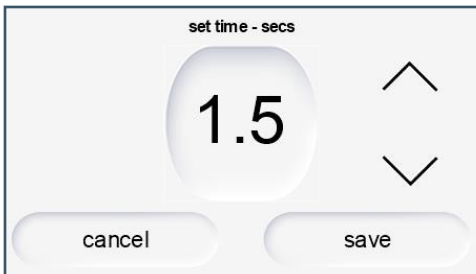
This screen will show once you press the seal button, it will prompt you to ensure that the sealing plate is ready to be sealed, including the correct plate support, the corresponding plate, the correct foil, and finally the corresponding plate weight. Once all of these have been checked, you can manually push the drawer in to begin the sealing process. Once this is complete, the automated spring will return the drawer back out.



This screen will allow you to select the settings that control the sealing time, temperature, ECO time and scan a copy of the user manual through the QR code displayed. After clicking settings, you will be shown this screen, simply click the o



To adjust the set temperature of the heater block and control the temperature that the Genoseal seals at, click the first option showing a thermometer. Here you can adjust the temperature up or down with the arrows on the right side of the display. Once satisfied with the set temperature, press "save".



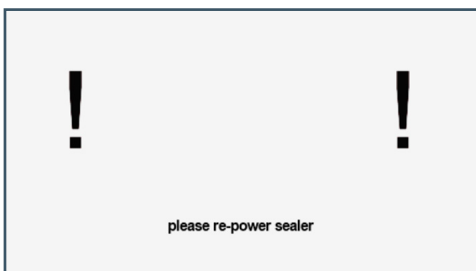
You can also adjust the sealing time by pressing the stopwatch icon on the settings screen. Press it and adjust it using the arrows on the right side of the display. Once satisfied with the set sealing time, press "save". If you want to keep the time unchanged, press "cancel".



To access the eco-mode timer, press the icon that shows the flower in a light bulb icon from the settings screen. This will enable you to set a time limit for how long the unit is not in use before automatically turning off the heaters and going into eco-mode. Use this screen similar to how you set the temperature and time.



This will show you the QR code which is scannable with any QR code scannable smart phones or QR scanners for a desktop view. It will load a PDF in your default PDF viewer.



If the unit encounters an error at any stage, it will display an error screen prompting you to power cycle the machine or reset it. (Error screens may vary.)

## Specifications of 2060 Genoseal

Power Supply	115 / 230 VAC, 50 / 60 Hz
Power Consumption	600 watts nominal
Fuse Rating	5 amp anti-surge (T5AH 250 V)
Internal Heaters	4 x 100 watts (sealing plate)
Minimum Plate Height	9 mm
Maximum Plate Height	54 mm
Maximum Sealing Temperature	200 °C
Protection	IP20
Cycle Time (approx.)	10 to 12 seconds (based on a 2 second seal)
Dimensions (depth x width x height)	12.13 in x 8.1 in x 15.3 in (308 mm x 205 mm x 389 mm)
Unit Weight	19.8 lb (9 kg)

## Troubleshooting

If the problem with the Genoseal unit persists after the below actions have been carried out, contact Spex for further investigation.

PROBLEM	ACTION
Genoseal will not power up after switching on	Check fuse
Foil will not seal properly on a microplate	1. Check seal temperature and time and reset if necessary 2. Ensure the correct height of plate locators are being used
“Error up switch” is displayed on the screen after a seal is run	Ensure the correct plate locator/combination is being used and restart the machine
Poor plate seal in middle of plate	Check if plate supports are required. If required, contact Spex
The unit fails to respond to commands	Restart the machine

If the problem with the Genoseal persists after the above actions have been carried out, contact Spex for further investigation.

## Service and Repairs

For all requirements for service and repairs please contact: Spex at +1.732.549.7144.

**Note:** For any spare components, please refer to the inventory list and contact Spex for pricing information.

## Regulatory Information

### CE Declaration of Conformity

As detailed under the European Machinery Directive 89/392/EEC (amended by 91/368/EEC) and under the UK legislation. The supply of Machinery (Safety) Regulations 1992 (SI 1992/3073). As detailed under The Electromagnetic Compatibility Directive 89/336/EEC (amended by 91/263/EEC and 92/31/EEC and the UK legislation, the Electromagnetic Compatibility Regulations 1992. As detailed under The European Low Voltage Directive 73/23/EEC (amended by 93/68/EEC) and the UK legislation, The Electrical Equipment (Safety) Regulations 1994.

The Declaration of Conformity is provided for the following equipment:

2060 Genoseal

Serial Number: To be included

Transposed Harmonized Standards

BSEN 12100-1 Safety machines: concepts

General: principles for design; basic terminology and methodology

BSEN 12100-2 Safety of machines: basic concepts, general principles for design; technical principles BSEN 61010 Safety requirements for electrical Equipment for measurement, control and laboratory use BSEN 60204 safety of Machinery; electrical equipment of machines (section 19).

BSEN 50081-2 Electromagnetic Compatibility; generic emission standard, industrial environment.

BSEN 61000-6-2 Electromagnetic compatibility (EMC) Generic standard, immunity for industrial environments.

Other Standards: BS5378 safety signs and colors.