INSTRUCTION MANUAL

PX1 PCR Plate Sealer

Catalog #1814000

Visit **bio-rad.com/px1** for more information.

D085137

Bio-Rad Technical Support

For help and technical advice, please contact the Bio-Rad Technical Support department.
In the United States, the Technical Support department is open Monday–Friday, 5:00 AM–5:00 PM, Pacific Time.

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Online technical support and worldwide contact information are available at **bio-rad.com/help-center**.

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Bio-Rad Laboratories Resources

Table 1. Bio-Rad resources and instructions on how to locate what you need.

Resource	How to Contact
Local Bio-Rad Laboratories representatives	Find local information and contacts on the Bio-Rad Laboratories website by selecting your country on the Home page (**www.bio-rad.com**). Find the nearest international office listed on the back of this manual
Technical notes and literature	Go to the Bio-Rad Laboratories website (**www.bio-rad.com**). Type a term in the Search box and select Documents to find links to technical notes, manuals, and other literature
Technical specialists	Bio-Rad Laboratories Technical Support scientists provide our customers with practical advice and expert solutions. To find local Technical Support on the phone, contact your nearest Bio-Rad Laboratories office. For Technical Support in the United States and Canada, call 1-800-424-6723 (toll-free phone), and select the Technical Support option

Writing Conventions and Warning Labels

The writing conventions and warning labels used for the PX1 PCR instrument and its instruction manual are shown in Table 2. On the instrument, they are used to identify hazards or potentially hazardous situations; in the manual, they point out important information that the reader needs to know or might find useful.

Table 2. Information identifiers for the instrument and manual.

Identifier	Meaning
Tip:	Provides helpful instructions, including information explained in further detail elsewhere in this manual.
Note:	Provides important information, including information explained in further detail elsewhere in this manual
WARNING!	Explains crucial information about a topic that may lead to injury to the user, instrument damage, data loss, or the prevention thereof.
Touch X	Touch X using your finger. For example, touch the SEAL button means use your finger to touch the SEAL button on the screen.
	Caution: See manual!—this icon is placed on or near instrument features that can be hazardous if improperly handled. It indicates that the manual contains information pertaining to the hazard and any actions necessary to avoid it. It also identifies warnings in the manual regarding general hazards and any preventive actions necessary.
	Caution: Shock Hazard!—this icon is placed near components or features of the instrument that present an electrical shock hazard. It is also used in the manual to identify warnings regarding shock hazards and any actions necessary to prevent harm.
	Caution: Hot Surface!—this icon is placed on or near surfaces of the instrument that can reach temperatures high enough to cause serious injury or damage. It is also used in this manual to identify warnings regarding hot surface hazards and any preventive actions necessary.

Safety Considerations

The PX1 PCR Plate Sealer has been designed as an easy-to-use instrument for sealing PCR plates. This instrument applies heat and pressure to the sealing film and plate to create an effective seal that retains its integrity during thermal cycling. All users of this instrument are encouraged to read and follow the safety and operating instructions contained in this manual.

Table 3. Conditions for safe use of the PX1 PCR Plate Sealer.

Usage Aspect	Conditions for Safe Use	Usage Aspect	Conditions for Safe Use
Rated input power	100–240 V AC, 50–60 Hz, 840 W max	Relative humidity	Up to 80% (noncondensing)
Overvoltage category	II	Altitude	Up to 2,000 meters above sea level
Environment	Indoor use only	Pollution degree	2
Temperature	18–31°C	Replacement fuses	8 A, 250 V, 5 x 20 mm, Fast Blow (qty 2)

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Only qualified laboratory personnel trained in the safe use of electrical equipment should operate this instrument. Always handle all components of the system with care and with clean, dry hands.

WARNING! The use of this instrument in a manner contrary to the instructions provided, or for purposes other than those for which it is intended, may impair the safety protections afforded by the equipment. Additionally, changes or modifications to this instrument by anyone other than Bio-Rad Laboratories or an authorized agent may cause its safety protection features to malfunction. Bio-Rad Laboratories is not responsible for any injury or damage caused by such use or modification of the instrument.

WARNING! Do not attempt to repair the PX1 PCR Plate Sealer or remove its outer case. There are no user serviceable components or adjustments inside the instrument. Opening the instrument voids all warranties. Contact Bio-Rad Laboratories if you feel your instrument needs service or repair.

WARNING! Use only power cords, accessories, and consumables authorized by Bio-Rad Laboratories for use with this instrument. The use of nonapproved power cords, accessories, or consumables may void the instrument warranty and can create a hazardous situation. Contact Bio-Rad Laboratories for information on authorized power cords, accessories, consumables, and their replacement.

WARNING! The surfaces inside the instrument drawer are extremely hot when the instrument is operating and will stay hot for up to one hour after the instrument is turned off. Do not put your hand or other body parts inside the unit while it is hot. Do not put any unauthorized objects in the instrument drawer.

WARNING! Know your materials. The PX1 PCR Plate Sealer uses heat and pressure to seal the plate and sealing film together. Some sample materials may be inappropriate for a heat sealing process. For example, materials that are highly volatile or have low flash points may be at risk of exploding or igniting during the sealing process.

WARNING! Risk of splashing. Always wear appropriate protection against splashing. The PX1 PCR Plate Sealer uses heat to fuse the plate and sealing film together. Expansion of air and materials sealed in the sample plate could cause the seal or sealing film to rupture, dispersing the sample material in and around the instrument. This is especially true if the plate is jammed, stuck, or left in the sealing bay for an extended time.

WARNING! The plate, sealing film, plate support block, and sealing frame may be hot after a sealing cycle or if left in the instrument for an extended period of time. Allow the plate and accessories to cool before handling.

WARNING! The display panel is made of glass and contains a liquid crystal substance. If the display is damaged, the glass can break into shards and the liquid crystal substance may leak out. The glass shards are sharp and can cut skin or other soft materials. The liquid crystal substance is toxic. Do not allow glass shards or liquid crystal substance to get in your mouth or eyes. If the substance comes in contact with your skin or clothes, wash it off thoroughly using soap and water. Contact Bio-Rad Laboratories for further instructions and to arrange to have your instrument repaired.

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Regulatory Compliance

This instrument has been tested and found to be in compliance with all applicable requirements of the following safety standards:

- **IEC 61010-1** Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use—Part 1: General Requirements
- **IEC 61010-2-010** Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use—Part 2-010: Particular Requirements for Laboratory Equipment for the heating of material
- **CAN/CSA-C22.2 NO. 61010-1-04 GI1 (R2009)** Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use—Part 1: General Requirements
- **CAN/CSA-C22.2 NO. 61010-2-010-04 (R2009)** Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use—Part 2-010: Particular Requirements for Laboratory Equipment for the Heating of Materials
- **EN 61010-1** Safety Requirements for electrical Equipment for Measurement, Control, and Laboratory Use—Part 1: General Requirements
- **EN 61010-2-010:2003** Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use—Part 2-010: Particular Requirements for Laboratory Equipment for the heating of material
- **UL 61010-1:2004 (R2008)** Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use—Part 1: General Requirements

Electromagnetic Compatibility (EMC)

This instrument has been tested and found to be in compliance with all applicable requirements of the following electromagnetic compatibility standards:

- **IEC 61326-1:2005** Electrical equipment for Measurement, Control, and Laboratory Use—EMC Requirements, Class A
- **EN 61326-1:2006** Electrical equipment for Measurement, Control, and Laboratory Use—EMC Requirements, Class A
- **FCC Part 15, Subpart B, Sections 15.107 and 15.109** as a Class A digital device

EMC Notices

- **Warning:** Changes or modifications to this unit not expressly approved by Bio-Rad Laboratories could void the user's authority to operate the equipment.
- **Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radiofrequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.
- **Note regarding FCC EMC compliance:** Although this instrument has been tested and found to comply with Part 15, Subpart B of the FCC Rules for a Class A digital device, please note that this compliance is voluntary, as the instrument qualifies as an "exempted device" under 47 CFR 15.103(c), in regard to the cited FCC regulations in effect at the time of manufacture.
- **Note regarding Canadian EMC compliance:** Le present appareil numerique n'emet pas de bruits radioelectrique depassant les limites applicables aux appareils numeriques de class A prescrites dans le reglement sur le brouillage radioelectrique edicte par le Ministère des Communications du Canada.

Warranty

The PX1 PCR Plate Sealer and associated accessories are covered by a standard Bio-Rad warranty.
Contact your local Bio-Rad Laboratories office for details of the warranty.

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Table of Contents

Bio-Rad Laboratories Resources 3
Writing Conventions and Warning Labels 3
Safety Considerations 3
Regulatory Compliance 5
Warranty 5

Chapter 1: Introduction 7
Unpacking the PX1 PCR Plate Sealer 7
Instrument Overview 7
Setting Up the System 8

Chapter 2: Using the PX1 PCR Plate Sealer 9
Home Screen Overview 9
Basic Sealing Instructions 9
Optimizing Heat Sealing 11
Storing and Using Sealing Protocols 12
Set Auto Shutdown 12

Chapter 3: PX1 PCR Plate Sealer Maintenance 13
Cleaning Outer Instrument Parts 13
Cleaning the Platen 13
Cleaning the Drawer 14
Removing the Drawer 14
Replacing the Drawer 14

Chapter 4: Error Messages and Replacing Fuses 15
Error Messages 15
Replacing Fuses 16

Chapter 5: Compatible PCR Plastics and Heat Seals 17
Heat Sealing Film Comparison Chart 17
Suggested Sealing Guidelines for Heat Seals 17

Ordering Information 18

1. Introduction

The Bio-Rad PX1 PCR Plate Sealer is designed to deliver consistent and reliable microplate sealing that withstands the stresses of thermal cycling. The PX1 Plate Sealer virtually eliminates sample evaporation from the PCR experimental workflow.

Unpacking the PX1 PCR Plate Sealer

The PX1 PCR Plate Sealer includes the following components:

- PX1 PCR Plate Sealer instrument
- Plate support block
- Sealing frame
- PX1 instruction manual
- Power cord

Remove all packing materials and store them for future use. If any items are missing or damaged, contact your local Bio-Rad office.

Instrument Overview

Front panel (Figure 1)—the front panel of the PX1 PCR Plate Sealer includes the following components:

- **Touch screen user interface**—consisting of a full color screen for complete control of PX1 functions
- **Motorized drawer**—used to insert the plate and seal
- **LED light**—indicates instrument status. Green indicates the instrument is either actively heating or maintaining a set temperature. Orange indicates the instrument has automatically shut down after a user-programmable amount of time

Fig. 1. Front panel.

Back panel (Figure 2)—the back panel of the PX1 PCR Plate Sealer includes the following components:

- Ventilation slots
- Fuse drawer
- Power switch
- Power connection

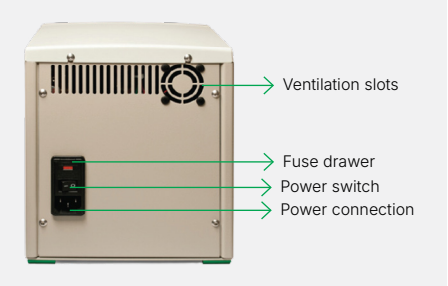

Fig. 2. Back panel.

Platen (Figure 3)—the metal platen is precisely heated to the programmed temperature. During sealing, the platen is lowered to efficiently seal a plate using heat and pressure.

Fig. 3. Platen.

PX1 accessories

- **Plate support block (Figure 4)** — reversible 96/384-well plate support block
- **Sealing frame (Figure 5)** — helps hold seals in place during sealing

If desired, a stylus (not included) can be used for touch screen control. Use only styluses with a tip radius 0.8 mm or larger that are made from a material no harder than an HB (#2) pencil lead.

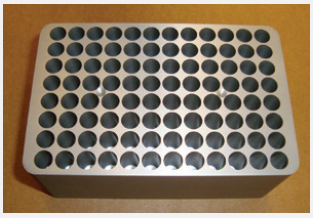

Fig. 4. Plate support block.

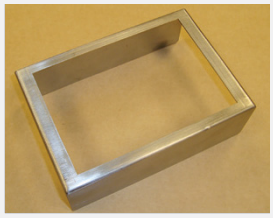

Fig. 5. Sealing frame.

Setting Up the System

WARNING! Before operating the PX1 Plate Sealer, be sure to read the safety specifications and operating requirements at the beginning of the manual.

1. Place the PX1 Plate Sealer on a flat, dry surface. The instrument requires the following clearances to ensure adequate airflow:
   - 10.2 cm (4.0 in) of clearance behind instrument
   - 17.8 cm (7.0 in) of clearance above instrument
   - 16.5 cm (6.5 in) of clearance in front of instrument
   - The PX1 Plate Sealer may be placed against another object or wall on either or both sides
2. Insert the supplied power cord into the power connection.
3. Turn on the PX1 Plate Sealer using the power switch on the back of the instrument.
   - The heater will remain off the first time the instrument is turned on. In all future boot ups, the instrument will automatically begin heating to the last set temperature once the plate support block has been removed
   - Press the power switch on the back panel of the PX1 Plate Sealer to power down the system

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2. Using the PX1 PCR Plate Sealer

Home Screen Overview

The home screen (Figure 6) displays important heat sealing information.

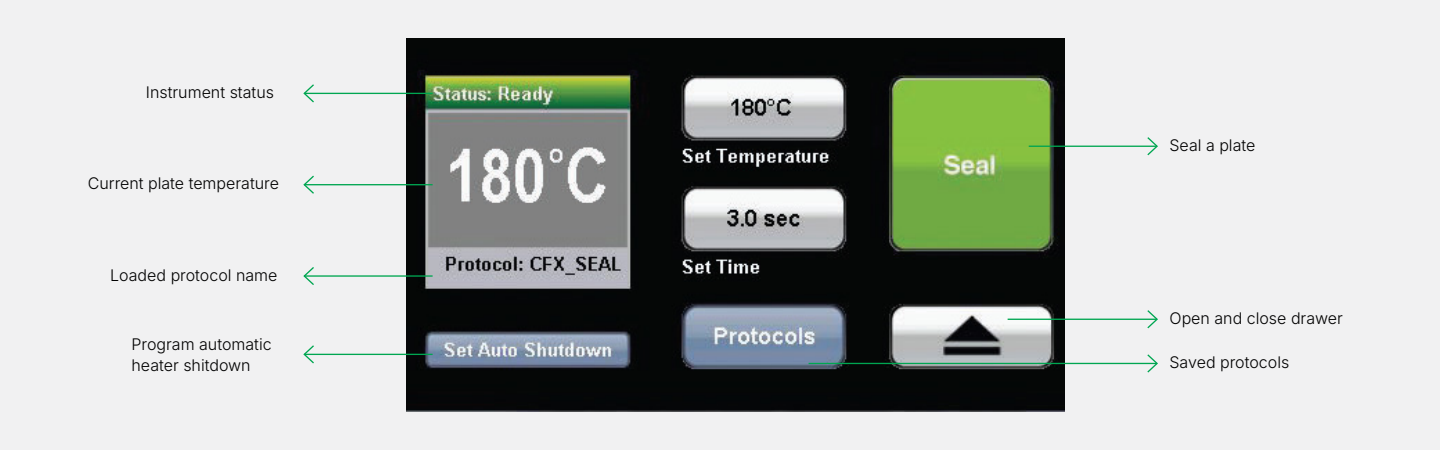


Fig. 6. PX1 home screen.

Basic Sealing Instructions

1 Remove the plate support block and sealing frame when the instrument is turned on (Figure 7). Touch the button to open the drawer and ensure that both the plate support block and sealing frame are removed from the instrument. Once removed, touch **OK**. The instrument will automatically begin heating to the last set temperature.

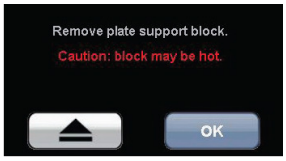


Fig. 7. Remove support block.

WARNING! Burn Hazard! Do not leave the plate support block or sealing frame in the heated instrument. They may become hot and pose a hazard to the user and experimental samples.

2 Modify seal temperature and time

- On the home screen touch **Set Temperature**
  Enter desired seal temperature between 100 and 190°C. Touch **OK**
  - The platen automatically begins to heat to the new set temperature. If the set temperature is lower than the current platen temperature, the heater will remain off and the platen will cool passively
  - The **Off** button on the numeric keypad will turn the heater off
- On the home screen touch **Set Time**
  Enter desired sealing time between 0.5 and 10 seconds. Touch **OK**

Note: Suggested sealing parameters are provided in Chapter 5 and in Bio-Rad heat seal packaging. Refer to the Optimizing Heat Sealing section for instructions on optimizing these parameters.

3 Seal the plate (Figure 8).

A. Determine correct side of the reversible 96/384well plate support block to use (A).
   - 96-well plates, side with the 96 recesses up
   - 384-well plates, flat side up

WARNING! Using the incorrect side of the plate support block may result in poor sealing and may possibly damage the instrument.

B. Touch ⏏ to open the drawer. Place plate support block in the drawer (B).

C. Place PCR plate in plate support block (C).

D. Place seal on plate (D). The yellow sticker on the Bio-Rad heat seal bag identifies the sealing surface.

E. Some seals (including Permanent Clear Heat Seal and Peelable Foil Heat Seal) require the sealing frame to hold the seal in place. If required, place sealing frame on top of seal, aligning frame sides with outer grooves on the drawer guides (E).

F. Touch **Seal** when the set temperature has been reached and the seal button is green. The drawer will close and the plate will be sealed. When sealing is complete, the drawer will automatically open and the plate can be removed

WARNING! The plate and seal remain hot for a few seconds after sealing. Use caution when removing the plates

Tip: Keep the plate support block and sealing frame outside the instrument between sealings so they do not become hot. Alternatively, the drawer can be kept open to prevent the block and frame from heating up.

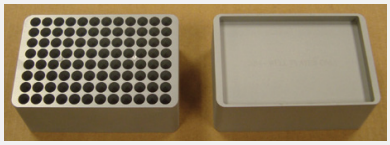
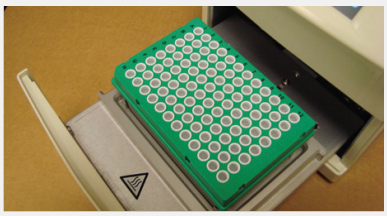


Fig. 8. A, Determine correct plate support block side.

B, Place plate support block in drawer.



C, Place plate in plate support block.

D, Place seal on plate (seal side down).

E, Add sealing frame if necessary.

Optimizing Heat Sealing

Sealing optimization is a crucial step to ensure a high-quality seal. Sealing a plate for too long or at too high a temperature can result in oversealing and potentially affect the quality of data in optical assays, including qPCR. Undersealing a plate may permit sample evaporation.

Tip: Optimize sealing conditions using an empty plate.

1. Seal an empty plate with the recommended sealing parameters listed in Chapter 5.
2. Carefully examine the entire seal and plate surface. Look for even sealing around each individual well and across the entire plate (Figure 9).
3. Make sure well rims are not significantly deformed.

Note: Minimizing well deformation is especially important for qPCR assays. Significant well deformation could affect optical readings.

4. If using a peelable seal, peel off the seal and examine the adhesive patterns where the wells contacted the seal. Look for uniform circular imprints across the entire seal (Figure 10).
5. Optional: fill a sample plate with a colored liquid such as 0.01% bromophenol blue solution. Examine sample volumes to ensure pipetting accuracy. Seal the plate. Thermal cycle the plate and examine all wells for signs of evaporation (Figure 11).
6. Save optimized sealing protocol so that it can be easily accessed for future experiments. Refer to Storing and Using Sealing Protocols section for detailed instructions.

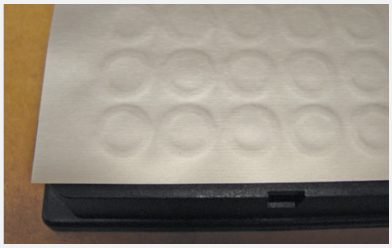


Fig. 9. Impressions should have uniform width around individual wells and across entire plate.

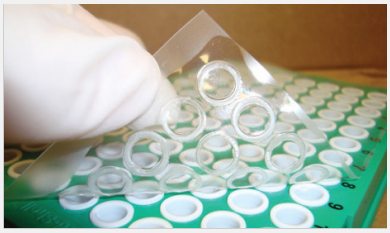


Fig. 10. Uniform and complete circles demonstrate good sealing.

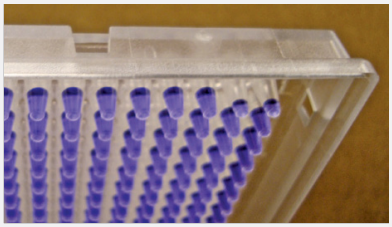


Fig. 11. Examine sample volumes after cycling. In this demo, corner wells were poorly sealed to demonstrate sample evaporation.

Storing and Using Sealing Protocols

Storing Protocols

1. Touch **Protocols** on the home screen (Figure 6).
2. A screen displaying a table of saved protocols is displayed (Figure 12). View additional protocols by touching the ▲ and ▼ arrows.
3. Touch the protocol you would like to edit or replace with a new sealing protocol.
4. Touch **Edit**. A screen displaying the protocol name, temperature, and time appears.
5. Touch the parameter you wish to modify and use the keypad to make the desired changes. Touch **OK** to save the changes or **Cancel** to revert back to previously saved protocol.

Fig. 12. Protocols window.

Using saved protocols

1. Touch **Protocols** on the home screen.
2. A screen displaying a table of saved protocols is displayed. View additional protocols by touching the ▲ and ▼ arrows.
3. Touch the protocol you would like to use.
4. Touch **Load**. The protocol name, temperature, and time appear on the home screen and the platen automatically starts heating to the desired temperature.

Set Auto Shutdown

The Set Auto Shutdown function allows you to customize the duration of time an idle instrument remains at the set temperature prior to automatically shutting down.

1. Touch **Set Auto Shutdown** on the home screen (Figure 6).
2. Enter the time the idle instrument should remain at the set temperature before automatically shutting down. Times can range from 30 minutes to 3 hours.
   - If the instrument has received no user input for this set amount of time, the heater and screen will automatically shut off and the LED light will change from green to orange
   - Touch the screen to bring the instrument out of Auto Shutdown mode. The instrument will automatically begin heating to the last set temperature
   - Changes made to the Auto Shutdown setting are saved when the main power is shut off

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3. PX1 PCR Plate Sealer Maintenance

Periodically remove any debris, dirt, or residues that might interfere with proper instrument function or present a chemical, biological, or radiological hazard. For instructions on handling and cleaning radioactive or biohazardous materials, consult the guidelines for radiation safety and biosafety provided by your institution.

Cleaning Outer Instrument Parts

Turn off and unplug instrument. Allow instrument to cool for at least one hour.

External Casing

1. Use a damp cloth or tissue to clean spills off the outside of the case. Use a 10% bleach solution or 70% ethanol solution for decontamination.
2. Allow casing to dry completely before rebooting the instrument.

Touch Screen

1. Gently clean the screen with any approved LCD cleaning agent.
2. Allow screen to dry completely before rebooting the instrument.

External ventilation slots

Remove dust and debris with a soft brush, damp cloth, or vacuum cleaner.

Cleaning the Platen

The platen (Figure 3) was designed with a nonstick surface to facilitate cleaning. This feature makes it easy to remove seals accidently placed upside down during sealing.

1. Turn off and unplug the instrument.
2. Wait at least one hour for the instrument to completely cool.

Caution! The platen may retain heat for more than one hour.
Bio-Rad recommends cleaning the platen when the drawer remains on its tracks. If this is too difficult, see the Removing the Drawer section.

3. If removing an upside down seal, gently pull the seal off the platen once the platen has fully cooled.
4. Wipe the platen with a paper towel or lint-free wipe dampened slightly with water. Any adhesive or melted plastic on the platen should easily wipe away.

Note: Never use abrasives or sharp-edged objects to clean the platen as they may damage the nonstick surface.

5. Allow the instrument to dry.

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Cleaning the Drawer

Use a damp cloth to clean up spills inside the drawer. Decontamination procedures should use a 70% ethanol or 10% bleach solution. Use a silicone-based grease to lubricate the rails on the bottom of the tray if necessary after cleaning. Lithium- and molybdenum-based greases should be avoided as they may react with the silicone-based grease.

Removing the Drawer

Use a damp cloth to clean up spills inside the drawer. Decontamination procedures should use a 70% ethanol or 10% bleach solution. Use a silicone-based grease to lubricate the rails on the bottom of the tray if necessary after cleaning. Lithium- and molybdenum-based greases should be avoided as they may react with the silicone-based grease.

1. Turn off and unplug the instrument.
2. Allow the instrument to cool for at least one hour before removing the drawer.

WARNING! Burn Hazard: The platen can remain hot longer than an hour and can burn the user if touched when hot. Allow the instrument to cool completely before performing any maintenance.

3. Manually open the drawer.
4. Reach under the bottom of the open drawer (Figure 14) and push both tabs to the left. Figure 15 shows the underside of the drawer. (Black tabs should be pushed to the left when the instrument faces up.)
5. While pushing both tabs to the left, pull the drawer off the tracks. The tracks will extend slightly as the drawer is pulled. Avoid touching the rails because the grease may be removed.The rails can be wiped with a soft dry cloth. Decontamination procedures should use a 70% ethanol or 10% bleach solution. If a liquid decontamination agent is used, the tracks should be lubricated using a silicone-based grease. Lithium- and molybdenum-based greases should be avoided as they may react with the silicone-based grease.

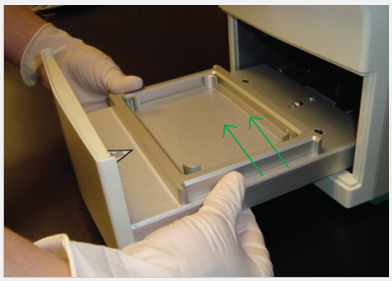

Fig. 14. Top of the drawer. Arrows indicate the direction to push the release tabs to remove the drawer.

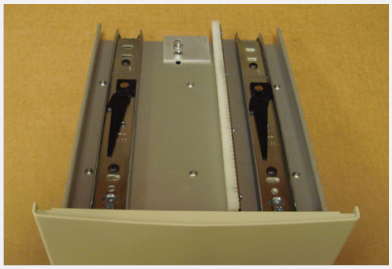

Fig. 15. Underside of the drawer. The black tabs (arrows) can be pushed to release the drawer from the tracks.

Replacing the Drawer

1. Make sure the drawer tracks are fully extended (Figure 16).
2. Place metal prongs on the rear of the drawer inside the black ends of the tracks (Figure 17).
3. Manually push the drawer in all the way to the closed position. If the drawer appears crooked, ensure rails are properly seated on the tracks before forcing the drawer in completely.

Fig. 16. Fully extended tracks.

Fig. 17. Replace the drawer. Align the two sets of prongs on the back end of the drawer with black ends of the tracks.

4. Error Messages and Replacing Fuses

Error Messages

The PX1 Plate Sealer performs a series of tests to ensure the instrument is functioning properly. If any issues are detected, the instrument will display an error message.

In some cases, the user will be instructed to perform a function to clear the error. After performing this function, touch **OK**. If the error clears, the user may continue to use the instrument.

In many cases, restarting the instrument will allow the PX1 Plate Sealer to reset to its normal working conditions and automatically clear the issue. If the error persists, please contact Bio-Rad technical support for assistance.

Error Message	Explanation
Drawer blockage. Remove object. If issue continues, restart instrument.	The drawer is unable to open or close. Carefully remove any obstructions and touch **OK**. If error persists, restart the instrument. This error may also occur if the drawer is not fully pushed onto the tracks. If this appears to be the case, manually push the drawer in all the way.
Drawer hardware issue. Restart instrument. If issue continues, contact Bio-Rad.	The motor failed to open or close the drawer. As a safety precaution, power to the heater is shut down. Restart the instrument. If the error is cleared, the PX1 Plate Sealer will automatically heat to the set temperature.
Platen hardware issue. Restart instrument. If issue continues, contact Bio-Rad.	The motor failed to raise or lower the platen. As a safety precaution, power to the heater is shut down. Restart the instrument. If the error is cleared, the PX1 Plate Sealer will automatically heat to the set temperature.
Sensor failure. Restart instrument. If issue continues, contact Bio-Rad.	The sensor that detects the platen temperature is not functioning properly. As a safety precaution, the heater has been turned off. Restart the instrument. If the error is cleared, the PX1 Plate Sealer will automatically heat to the set temperature.
Drawer took too long. If issue continues, restart instrument.	The drawer has not opened or closed within a set amount of time. Make sure nothing is preventing the drawer from opening or closing properly and touch **OK**. If error persists, restart the instrument.
Platen overheated. Restart instrument. If issue continues, contact Bio-Rad.	The platen overheated. Restart the instrument. As a safety precaution, the heater has been turned off. Manually set the desired temperature and the platen will begin to heat.
System did not reach temperature. Restart instrument. If issue continues, contact Bio-Rad.	The platen failed to reach target temperature in the allotted time. As a safety precaution, the heater has been turned off. Restart the instrument.
System overheated. Restart instrument. If issue continues, contact Bio-Rad.	The internal temperature of the PX1 Plate Sealer has exceeded a safe limit. Power to the heater is shut down. Allow instrument to cool and then restart. **Note:** the temperature has been set to OFF. Manually set the desired temperature and the platen will begin to heat.
Push drawer in. If issue continues, restart instrument.	Drawer may be overextended. Manually push the drawer in and touch **OK**. If error persists, restart the instrument.
Platen not initialized. Restart instrument. If issue continues, contact Bio-Rad.	The platen did not raise properly. Restart the instrument to initialize the platen.
Platen blockage. Remove object. If issue continues, restart instrument.	Platen failed to raise or lower because of a blockage. Carefully remove blockage and touch **OK**. Ensure the plate was placed on the correct side of the plate support block (for example, 384-well plates placed only on the flat side of the block and 96-well plates placed only on the side with 96 recesses).

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Replacing Fuses

Fuses will blow in the case of an electrical fault or a severe power surge. This process protects the user and instrument from electrical hazards. Although fuses should never need to be replaced, some institutions prefer to replace fuses on a regular basis to maintain uninterrupted operation.

If the PX1 Plate Sealer does not turn on, first confirm the power cord is in a functioning power source within the instrument specifications. If the cord and AC power source are fully functional, use the directions below to determine if the fuses are intact.

WARNING! To prevent electrical shock, always turn off and unplug the instrument before checking the fuses.

WARNING! The fuses and other protection features have been designed not to fail over the life of the instrument. If the fuses fail more than once, there may be an electrical fault in the instrument. If this occurs, contact Bio-Rad customer support for assistance.

Directions to Replace a Fuse (Figure 18)

1. Turn off and unplug the instrument. Remove power cord from the instrument.
2. Use a sturdy blunt object to gently pry open the fuse cover (A).
3. Use a small coin to unseat the fuse carrier (B).
4. Remove both fuses from the fuse carrier and inspect. If the wire is no longer intact, the fuse is blown (C).
5. If either fuse is blown, install two new fuses (8 A, 250 V, 5 x 20 mm, Fast Blow) into the fuse carrier (see Table 2).
6. Reinstall the fuse carrier using firm pressure to ensure it is fully seated.
7. Close the fuse cove.
8. Reconnect the power cord and turn on the instrument.

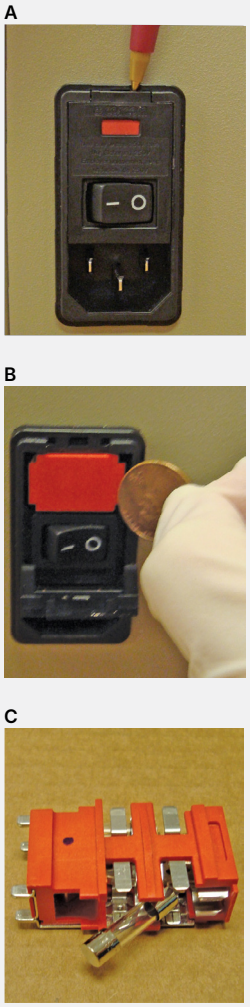

Fig. 18. Replacing the fuse.

5. Compatible PCR Plastics and Heat Seals

Table 4. Heat sealing film comparison chart.

Product	Catalog Number	Key Features	Compatibility
Optically Clear Heat Seal	1814030	• Validated for real-time PCR • Peelable	PP, PE,* PS
Permanent Clear Heat seal	1814035	• Strongest Bio-Rad heat sealing option • Ideal for water bath cycling • Validated for real-time PCR	PP
Pierceable Foil Heat Seal	1814040	• Validated for use with the QX200™, QX200 AutoDG™, QX600™, and QX600™ AutoDG Droplet Digital™ PCR Systems • Validated for PCR	PP, PS*
Peelable Foil Heat Seal	1814045	• Ideal for sample storage • Validated for PCR	PP, COC*

* Limited and variable compatibility based on plastic composition.
COC, cyclic olefin copolymer; PE, polyethylene; PP, polypropylene; PS, polystyrene.

Table 5. Suggested sealing guidelines for heat seals. Use these sealing times and temperatures for initial plate sealing. Optimize sealing parameters if necessary.

PCR Plate	Catalog Number	Number of Wells	Well Color	Optically Clear Heat Seal	Permanent Clear Heat Seal	Pierceable Foil Heat Seal	Peelable Foil Heat Seal
				Temp°C, sec			
Hard-Shell™ 384-well standard	HSP3xxx	384	Clear White	175, 3 167, 3	175, 3 167, 3	170, 3 170, 3	185, 4 185, 3
Hard-Shell 384-well 480	HSR4xxx	384	Clear White	175, 3 167, 3	175, 3 167, 3	170, 3 170, 3	185, 4 185, 3
Hard-Shell low-profile 96-well skirted	HSP9xxx	96	Clear White	185, 3 180, 3	180, 3 180, 3	175, 3 175, 3	180, 3 185, 5
Hard-Shell high- profile 96-well semi-skirted	HSS9xxx	96	Clear White	170, 3 185, 3	165, 3 180, 3	170, 3 175, 3	185, 3 185, 3
Multiplate low-profile 96-well unskirted	MLL9xxx	96	Clear White	180, 3 180, 3	180, 3 160, 3	175, 3 175, 3	185, 5 185, 3
Multiplate high-profile 96-well unskirted	MLP9xxx	96	Clear White	175, 3 170, 3	150, 3 165, 3	175, 3 175, 3	185, 3 185, 3
iQ 96-well	2239441	96	Clear	180, 3	180, 3	185, 3	185, 5
twin.tec semi-skirted 96-well plate	Eppendorf 951020362	96	Clear	—	—	180, 5	—

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Ordering Information

Catalog #	Description
PX1 PCR Plate Sealer	
1814000	PX1 PCR Plate Sealer, includes Plate Sealer instrument, dual 96/384-well plate support block, sealing frame, power cord
Heat Seal Films and Foils	
1814030	Optically Clear Heat Seal, pkg of 100, optically clear seals for PCR and real-time PCR applications
1814035	Permanent Clear Heat Seal, pkg of 100, nonpeelable, nonpierceable clear seals for PCR, water bath cycling, and sample disposal
1814040	Pierceable Foil Heat Seal, pkg of 100, foil seals for PCR and QX200/QX100 Droplet Digital PCR (ddPCR™) applications
1814045	Peelable Foil Heat Seal, pkg of 100, laminate/foil peelable seals for PCR and sample storage
Accessories	
1814080	Sealing frame, sealing aid for select sealing films
1814085	Plate support block, for both 96- and 384-well plates

Visit **bio-rad.com/px1** for more information.

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