

Product Manual

PCR Thermocycler, Standard

Digital, Precise PCR Optimisation

PLEASE READ THESE INSTRUCTIONS BEFORE USE.

1. Product Description

1.1 Introduction

The PCR Thermocycler features exceptional temperature control and a user-friendly interface, supporting various molecular biology applications.

Its design incorporates a precision Peltier device and a flexible user interface, ensuring optimal operational efficiency and ease of use. This thermocycler boasts exceptional temperature uniformity, critical for consistent and reliable results, enhanced by a high-performance Peltier and independent heating segments. An auxiliary heating mechanism minimises the 'edge effect,' improving temperature uniformity across samples.

It offers a wide touchdown PCR temperature range of -9.9°C to +9.9°C and an extensive PCR time range from -9 minutes 59 seconds to +9 minutes 59 seconds, accommodating diverse experimental requirements. The integration of a colour touch screen with a user-friendly interface facilitates easy program editing, enhancing the user experience.

Accommodating various consumables, the unit is compatible with standard PCR tubes, 8-well PCR strips, and 96-well PCR plates, ensuring flexibility across different experimental setups. It features file customisation and multi-file storage, along with power failure protection and automatic program recovery for seamless work resumption. The hot lid auto-off function enhances safety and energy efficiency.

With its excellent temperature accuracy, the PCR Thermocycler is engineered for molecular biology research needs and finds applications in industries such as drug discovery, agriculture, and the food industry.

1.2 Features

- Precise Temperature Control, User-Friendly Interface
- Power Failure Protection for Uninterrupted Workflow
- Enhanced Temperature Uniformity Across Samples
- Heating Temperature Range of 4°C to 105°C
- Serial Number Traceability

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2. Technical Specifications

Type	PCR Thermocycler, Standard
Digital Display	Yes, Touch Screen
Sample Capacity	96 x 0.2ml PCR Tubes 12 x 0.2ml PCR 8-Strips 1 x 0.2ml 96-well PCR Microplates
User Defined Programs	30 Segments Maximum & 99 Cycles. Storage for 200 Files.
Adaptor Material	Aluminium
Last Run Memory	Yes

Performance Information

Heating Temperature Range	4°C to 105°C
Lid Temperature Range	30°C to 110°C
Temperature Accuracy	± 0.1°C (± 0.3°C at 55°C)
Temperature Uniformity	< 0.3 at 55°C
Maximum Heating or Cooling Rate	5°C Per Second
Permissible Ambient Temperature	10°C to 20°C
Permissible Relative Humidity	≤ 70%
Environment	For indoor use only.

Safety Information

Power Cut-Off Protection	Yes
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Electrical Information

Voltage & Frequency	220V, 50/60 Hz
Power Supply	AC 220V (±10%) 50/60Hz; AC 110V (±10%) 50/60Hz

General Information

Serial Number Traceability	Yes	
Calibration Report	Yes	
Unit Dimensions	280mm W x 370mm D x 250mm H	
Unit Weight	11 kg	
Standards Conformity	EN 61010-1 EN 61010-2-020 EN 61010-2-101	EN 61326-1 EN 61326-2 CE Certified

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3. Safety Precautions

Read the following safety precautions prior to using the PCR Thermocycler. Never use the unit in any manner not specified in this manual.

Personal Protective Equipment & Training

- Wear personal protective equipment during operation.
- Do not use without appropriate training.

Environmental Considerations

- Prepare necessary safety measures before using samples that are toxic, radioactive, or contaminated with pathogenic micro-organisms at your own responsibility.
- Do not operate in a hazardous, explosive, or flammable environment.
- Do not use to mix explosive or highly reactive materials.
- Do not use under water.

Unit Inspection & Operation

- Do not use if showing signs of electrical or mechanical damage. If any damage is found, contact Westlab Pty Ltd immediately.
- Ensure electrical standards of the power source comply. The socket must be earthed (protective ground contact).
- Do not handle the power cord or turn the unit ON/OFF with wet hands.
- Do not allow the power cord to contact the heated mounting plate.
- Use original power supply only.

Installation & Usage

- Install on a flat, stable, and non-slippery surface.
- Ensure attachments are secured properly before operation.
- Do not assemble or disassemble the attachments while the power supply is connected.
- Do not move the unit during operation; only move when at room temperature.
- When closing the lid, do not put hands between the upper cover and the casing.
- The unit emits radio frequency energy and can interfere with radio communications if improperly installed or used, particularly in residential areas, requiring users to correct any interference at their own expense.

Heat Safety

- The surface can become extremely hot during and after operation.
- Do not touch the PCR Thermocycler surface when the temperature is over 50°C.
- Pay attention to residual heat when turning off the unit.

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Equipment Maintenance

- Do not use any damaged beakers, flasks, stirrer bars, or other components.
- Be aware of possible contamination or unwanted chemical reactions.
- If on-site services are needed, please ensure the unit is sterilised and decontaminated beforehand. Provide the service technician with details of any hazardous substances used.
- Vibrations are likely to damage the unit, contact Westlab Pty Ltd if any abnormalities are observed.

Chemical Reactions

- Liquid used should not react dangerously to extra energy produced. This includes extra energy produced through light irradiation and surrounding temperatures.
- Note the possibility of contamination from abrasion of dispersion equipment or rotating accessories.

The safety of the user cannot be guaranteed if the unit:

- Is operated with accessories that are not supplied with the unit.
- Is operated with accessories that are not supplied or recommended by the manufacturer.
- Is operated improperly or contrary to the manufacturer's specifications.

4. Maintenance & Cleaning

Safety Precautions

- Always unplug the power adaptor before cleaning.
- Wear protective gloves and safety glasses while cleaning.
- Ensure that the unit is at room temperature prior to cleaning.

Cleaning Guidelines

- If the unit, rotor, or accessories have been in contact with or contaminated by solutions containing toxic, radioactive, or pathogenic materials, clean them according to the decontamination procedure provided.
- If liquid spills out of the thermocycler, clean and dry with a dry cloth to avoid sample contamination.
- Use a soft and mild cloth.
- After cleaning, ensure all parts are dried thoroughly.

Important Notes

- Repairs by unauthorised personnel may void the product warranty.

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5. Installation

Initial Setup

1. Open the packaging and gently remove the PCR Thermocycler from the box by holding the bottom.
2. Place the unit onto a firm and level surface.
3. Unpack each component.
4. Assemble the components according to the manual for optimal performance.

Important Notices

- Keep the manual with the device and store all packaging for at least two years for warranty purposes.
- If the unit is damaged during unpacking, contact Westlab Pty Ltd immediately.
- When transporting or storing the unit, keep the temperature between -20°C and 55°C with a relative humidity of $\leq 80\%$.

Location & Mounting

- Place the unit on a flat, solid, and level surface with all four feet firmly planted.
- Avoid installing on a slippery surface or a vibration-prone bench.
- Maintain an ambient temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and a relative humidity of $\leq 70\%$. Avoid direct sunlight and temperatures above 30°C .
- Provide a minimum clearance of 300mm from all directions for safe operation. Do not store or place chemicals and dangerous materials within the 300mm.
- Keep the unit away from heat or water to prevent sample temperature errors and unit failure.
- Ensure the unit is placed in an easily accessible, well-ventilated area with no airborne dust with charge, explosive or corrosive gases nearby.

ATTENTION! Danger of death or serious injury from electrical shock. Contact with live components can lead to injury or death.

- Use the supplied adaptor only. Do not put the power supply in contact with liquids or in a condensing environment. Avoid thermal shock.
- All electrical cables and connections must be kept away from moisture or liquids.
- Ensure that the cables and plugs are not damaged, otherwise replace them.
- During use, do not cover the power supply and/or do not place it inside containers.



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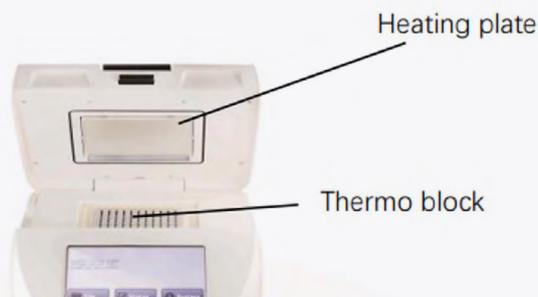
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Connecting the Power Adaptor

1. Ensure the electrical standards of the power source comply with the PCR Thermocycler requirements. Use the original power adaptor only.
2. Connect one side of the power adaptor to the rear of the unit and the other to the power supply as shown in the figure.
3. Ensure the power switch is OFF when connecting the power adaptor.

Installing the Thermo Block

Before powering on the unit, ensure that the thermo block has been installed correctly. Place the thermo block vertically into the main unit and ensure that there is good contact between the block and the main unit. When the heated lid is open, there is a risk of burns from the hot thermo block.



6. Operation



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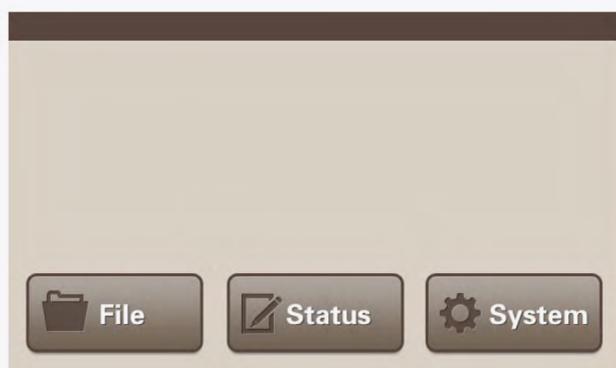
The Heated Lid

1. Before closing the heated lid and starting the program, ensure that the thermo block is loaded with sample tubes or a PCR plate.
2. To adjust the height of the heated lid to accommodate different reaction tubes, rotate the heated lid adjusting knob clockwise to lower the heating plate or counterclockwise to raise it.
3. When closing the heated lid, do not place your fingers between the heated lid and the thermocycler.



Powering ON

4. Turn on the power switch and the unit will emit a 'beep' sound indicating that the power is on.
5. The unit will begin a self-inspection process, which will take approximately 1 to 2 minutes.
6. When the self-inspection has completed, 'Test Pass!' will show on the screen and you can proceed to the next steps. If not, turn off the unit and contact Westlab Pty Ltd immediately.



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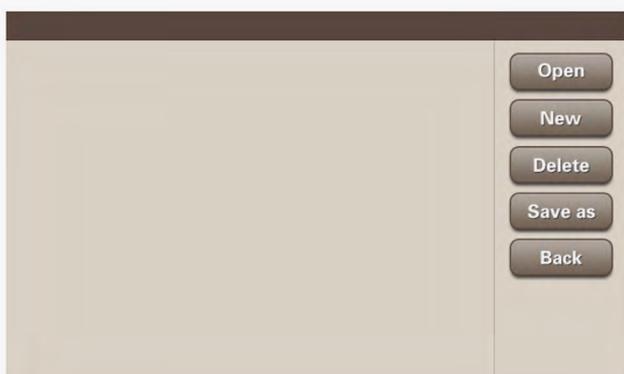
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7. Once the inspection has been successful, click the 'File' button to access the file management interface for creating or editing files, or running programs.
8. Click the 'Status' button to directly access the program execution interface.
9. Click the 'System' button to access the system settings interface.

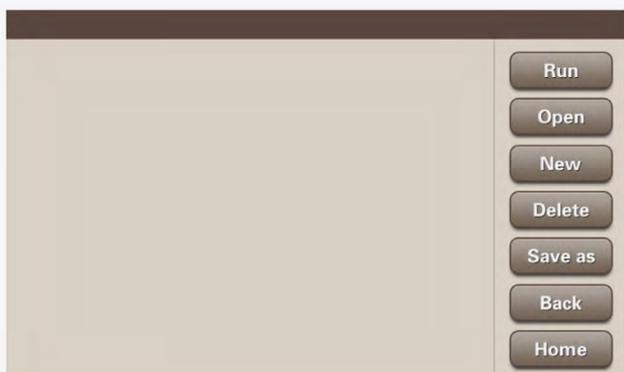
File Management

10. Click the 'File' button to access the following interface.
 - a. **Open:** Opens a folder. Select the target folder and click 'Open' to open it.
 - b. **New:** Creates a new folder. Click 'New' to input the desired file name using the keyboard, then press the Enter.
 - c. **Delete:** Delete a folder. Select a folder and click the 'Delete' button. An attention notice will pop up; select Yes to delete the folder or No to cancel the delete operation.
 - d. **Save as:** Saves a folder with a new name. Select the folder, click 'Save as' and enter the new folder name using the on-screen keyboard, and press the Enter.
 - e. **Back:** Returns to the main menu.



Create An Experiment Method

11. Select a folder (which will turn blue when selected), and click the 'Open' button, or double-click the folder to enter.
 - a. **Run:** Execute the program defined in the selected file.
 - b. **Open:** Open the selected file to edit the program.
 - c. **New:** Create a new file to define a new program.
 - d. **Delete:** Delete the selected file.
 - e. **Save as:** Save a file with a new name. Select the file, click 'Save as', enter the new file name using the on-screen keyboard, and press the Enter.
 - f. **Back:** Returns to the previous interface level.
 - g. **Home:** Return to the main menu.



NOTE: When creating or saving a file, ensure that you are in the selected folder. Click the 'New' or 'Open' buttons to create a new file or edit a selected file, respectively.

12. To create a new file, click the 'New' button and input the file name using the on-screen keyboard. Press 'Enter' to create the new file. Press the 'ESC' button to cancel the new file creation.
13. To edit a selected file, select the target file, click the 'Open' button, and access the program edit interface.

Program Settings

- **Back:** Return to the folder interface.
- **Edit:** Select the STEP you want to edit from the blue block area, then click the Edit button to enter the temperature setting interface.
- **Run:** Execute the program (refer to the Running Interface section for details).
- **Save:** Save the program.
- **Insert:** Create a new STEP.
- **Delete:** Delete the selected STEP.
- **Arrow Button:** Scroll backward (left arrow) or forward (right arrow).



Temperature Settings

- **Temp:** The temperature of this STEP.
- **Time:** The execution time for this STEP (0 to 99 minutes and 59 seconds).
- **Goto:** Move to the STEP set in this program after the current STEP execution is complete.

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- **Cycle:** Set the number of times needed to repeat.
- **+Temp/c:** Temperature modification value for each cycle, can be positive or negative (-4°C to +4°C). For example, if Temp L is 50°C and Temp H is 60°C, setting "0.1°C" in Temp/c at Item 3 will increase both Temp L and Temp H by 0.1°C each cycle. After 30 cycles, Temp L will reach 53°C and Temp H will reach 63°C.
- **+Time/c:** Time modification value for each cycle, can be positive or negative (-120 seconds to +120 seconds). For example, if Time is 60 seconds, setting "1 second" in Time/c at Item 3 will increase the Time by 1 second each cycle. After 30 cycles, the running time for Item 3 will reach 90 seconds.



Configuration Settings

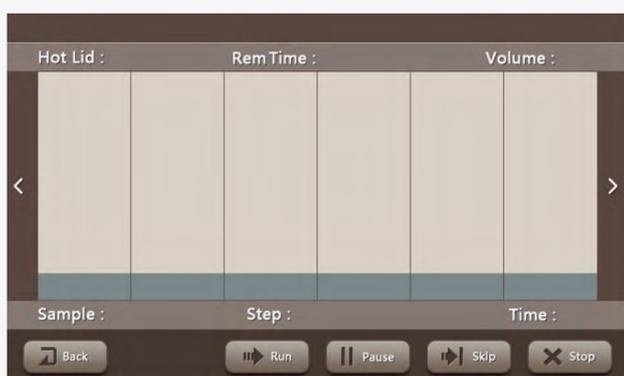
- **Heated Lid:** Closed by default.
 - The heated lid setting range is 30°C to 110°C. Please do not exceed this range.
 - Clicking 'Off' will close the heated lid. However, closing the heated lid may impact the experiment result.
 - The heated lid will also close itself when the block temperature is below 30°C.
- **Control Mode:** Default is Block. In general, the block mode should meet most experimental needs.
- **Sample Volume:** Please enter the actual reaction system volume based on your specific experiment.
- **Back:** Return to the previous interface level.
- **Home:** Return to the main menu.



Running Interface

When the program is finished or stopped, the instrument will emit two 'beep' sounds. Clicking the 'Back' button will return you to the main menu.

- **Hot Lid:** Temperature of the heated lid.
- **Rem Time:** Remaining time of the current program.
- **Volume:** Sample volume.
- **Sample:** Temperature of the sample.
- **Step:** Current step to be run.
- **Time:** Running time.
- **Run:** Start running the program.
- **Pause:** Pause the program.
- **Skip:** Skip the current step.
- **Stop:** Stop the program.
- **Back:** Return to the previous interface level.



Normal PCR Program Settings

1. **Initial denaturation:** 95°C, 5 minutes: In column Item 1, enter 95 in 'Temp' and 0500 in 'Time'. This step is complete.
 - a. **Input skills:** Time is displayed in min:sec format. For example, 5 minutes is entered as 0500, and 5 minutes 30 seconds is entered as 0530.
2. **Denaturation 95°C, 30 seconds:** Click 'Add' to create Item 2. Enter 95 in 'Temp' and 0030 in 'Time'. This step is complete.
3. **Primer annealing:** 55°C, 30 seconds: Click 'Add' to create Item 3. Enter 55 in 'Temp' and 0030 in 'Time'. This step is complete.
4. **Extension:** 72°C, 30 seconds, repeat 30 times from step 2 to step 4: Click 'Add' to create Item 4. Enter 72 in 'Temp', 30 in 'Time', 02 in 'Goto', and 30 in 'Cycle'. This step is complete. After step 4 is finished, it will go to step 2 and run 30 cycles.
5. **Continue extension:** 72°C, 10 minutes: Click 'Add' to create Item 5. Enter 72 in 'Temp' and 1000 in 'Time'. This step is complete.
6. Click Save.

After completing the above steps, the Normal PCR program setting is finished. It includes an initial denaturation at 95°C for 5 minutes, followed by running PCR cycles 30 times from steps 2 to 5, and finally, a continuation of extension at 72°C for 10 minutes.

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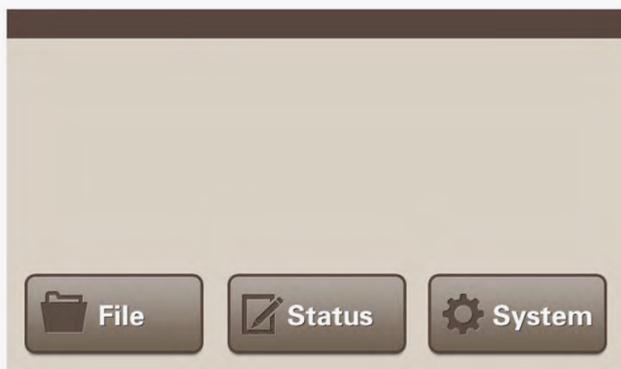
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NOTE: Different units may have their own temperature control features and biological experiments can be influenced by various factors. A program that runs successfully in one instrument may not yield the same results in another. Please adjust the program according to the specifications of the instrument to achieve the desired outcome.

Quick Operation

Clicking 'Status' will enter the program running interface. The system will default to executing the last program that was run.



System Settings

Click 'System' in the main menu to enter the system setting interface below:

- **SN (Serial Number):** Each product has its own serial number.
- **Test Info:** Displays information about the self-test.
- **Auto Test:** Allows you to perform a self-test again. The result will be shown in the Test Info. When the self-test passes, the 'TEST pass' will be displayed.
- **Date:** Allows you to input or adjust the current date. Click it and enter the date using the keyboard. For example, to input April 2th 2019, enter 20190402.
- **Time:** Allows you to input or adjust the current time. Click it and enter the time using the keyboard. For example, to input 13:40:48, enter 134048.
- **Key Sound:** Allows you to enable or disable the key sound.
- **En/中:** Switch the font between Chinese and English.
- **Home:** Returns to the main menu.



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7. Troubleshooting

If you notice any abnormal sounds, display anomalies, failure alerts, or failed self-tests when powering on, please turn off the power and contact the Westlab Pty Ltd immediately.

For assistance, please contact our technical support team at 1800 358 101.

Error	Issue	Solution
Unit cannot be powered on	The power supply is unplugged	1. Check whether the power supply is unplugged 2. Check whether the fuse is broken or loose
	Other	Contact Westlab Pty Ltd on 1800 358 101.
Self-test, connect -- error	The thermo block is not installed	Install the thermo block
	The thermo block is incorrectly installed	1. Power off the unit 2. Re-install the thermo block 3. Power on the unit
	Other	Contact Westlab Pty Ltd on 1800 358 101.
Self-test, Sensor1, Sensor2, Sensor3 -- error	Thermo block sensor is damaged or incorrectly installed	1. Power off the unit 2. Re-install the thermo block 3. Power on the unit Contact Westlab Pty Ltd on 1800 358 101.
		Contact Westlab Pty Ltd on 1800 358 101.
Self-test, fan sensor -- error	Damaged or incorrectly installed	1. Power off the unit 2. Re-install the thermo block Power on the unit Contact Westlab Pty Ltd on 1800 358 101.
		Contact Westlab Pty Ltd on 1800 358 101.
Self-test, cap sensor -- error	Heated lid is damaged or incorrectly installed	Contact Westlab Pty Ltd on 1800 358 101.
Self-test, TE1 Ref, TE2 Ref, TE3 Ref -- error	Ventilation holes are blocked	Clear the blockage from the ventilation holes.
	Cooling chip is damaged	Contact Westlab Pty Ltd on 1800 358 101.
Self-test, TE1 Heat, TE2 Heat, TE3 Heat -- error	Heating part of the heated lid is damaged	Contact Westlab Pty Ltd on 1800 358 101.

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Heated lid cannot heat	The heated lid is closed at the system setting interface	Open the heated lid and set a temperature.
	The heated lid is damaged	Contact Westlab Pty Ltd on 1800 358 101.
The reagent in the reaction tube evaporates	The heated lid is closed	Open the heated lid and set a temperature.
	The reaction tube was placed unevenly	Try to place the reaction tube symmetrically.
	The cap of the reaction tube is not tightly fitted	Fit the cap tightly before placing into the thermocycler.

8. Product Recycling

In the case that the product is to be disposed of, the relevant legal regulations are to be observed.



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