USER MANUAL

TC1000-S

Thermocycler

Before using product, please carefully read this user manual for efficient operation and safety.

Contents

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We can not be responsible to inform at real-time if the outline and specifications of products are subject to change for improvement.

VERSION2.0

2016 August

Safety Reminder

Common safety precautions

Carefully read the following safety precautions for a thorough understanding.

- Follow the instructions and procedures described in this manual to operate the product safely.
- Carefully read all safety messages in this manual and the safety instructions on the product.
- Safety messages are labeled as indicated below. They are in combination with signal words of "WARNING" and "CAUTION" with the safety alert symbol ⚠ to call your attention to items or operations that could be dangerous to you or other persons using this product. The definitions of signal words are as follows:

⚠ WARNING：Personal Danger

Warning notes indicate any condition or practice, which if not strictly observed, could result in personal injury or possible death.

⚠ CAUTION：Possible damage to product

Caution notes indicate any condition or practice, which if not strictly observed or remedied, could result in damage or destruction of the product.

NOTE：Notes indicate an area or subject of special merit, emphasizing either the product's capability or common errors in operation or maintenance.

- Do not operate the product in any manner not described in this User Manual. When in doubt or have any troubles with this product, ASK FOR HELP.
- The precautions described in this User Manual are carefully developed in an attempt to cover all the possible risks. However, it is also important that you are alert for unexpected incidents. Be careful operating this product.

⚠ WARNING

- This product is not explosion-proof. Never use explosive or flammable samples.
- Do not install the product in or near places where inflammable gases are generated or chemicals are stored.

- Do not place dangerous materials within 30cm of the product.
- Prepare all necessary safety measures before using samples that are toxic, radioactive or contaminated with pathogenic micro-organisms. Use of these is at your own responsibility.
- If the product, or accessories that have been contaminated by solutions with toxic, radioactive or pathogenic materials, clean it according to the decontamination procedure.
- If you require service at site, please sterilize and decontaminate the product in advance, and then notify the service center the details of the materials and procedure.
- To avoid electrical shocks, insure hands are dry before handling the power cord or turning on/off the power switch.
- Unauthorized repairs, disassembly, or modifying the product except by our service center are strictly prohibited.
- Do not operate the product in any manner not described in this User Manual.
- This product contains heating components, please avoid scalding injury.

⚠ CAUTION

- This product is suitable for indoor environment
- This product must be located on a firm and level table.
- Ensure the distance with the surrounding and the air circulation of the vent.
- When close the cover, do not put your hands between the upper cover and the casing, preventing the pinch.
- Do not move or relocate the product when it is running.
- If fluid spills out, please promptly clean and dry with a dry cloth to avoid sample contamination.
- When the experimental operation, keep the machine cover open, or arbitrary open the cover will affect the experiment results.
- When the experimental operation, the sudden loss of power will affect the results.
- When in doubt or have any troubles with this product, ASK FOR HELP.
- Vibrations are likely to damage the product, contact our service center if abnormality observed.

1. Introduction

1.1 Intended use

PCR Thermo cycler is widely used in biology, medicine, food industry, forensic science, biotechnology, environmental science, microbiology, clinical diagnosis, epidemiology, genetics, gene chips, genetic testing, gene cloning, and other fields that need gene expression instrument .

Operator should be trained before using the product. Detailed operation, please refer to the **User Manual** below**.**

1.2 Specifications

Specifications	TC1000-S
Sample Capacity	0.2ml PCR tubes×96, 8×12PCR plate or 96 well plate ×1
Heating Temperature Range[℃]	4~105℃
Lid Temperature Range[℃]	30~110.℃
Temperature Display Accuracy[℃]	0.1℃
Temperature Accuracy[℃@55℃]	±0.3℃
Temperature Uniformity[℃@55℃]	< 0.3℃
Max. Heating/Cooling Rate [℃ /sec]	3℃/Sec
Gradient Temperature Setting Range	--
Gradient Range	--
Display	7”800×480mm LCD
Touch Operation	Yes
power-off Protection	Yes
Power Supply	AC 220V（±10%）50/60Hz; AC 110V（±10%）50/60Hz
Dimension[W×D×H]	280×270×250mm
Weight	11kg

1.3 Declaration of Conformity

Construction in accordance with the following safety standards:
EN 61010-1
EN 61010-2-020 EN 61010-2-101
Construction in accordance with the following EMC standards:
EN 61326-1/ FCC Part 15 Subpart B/ IECS 001 EN 61326-2-6:2006
Associated EU guidelines:
EMC derective: 2004/108/EC LVD derective: 2006/95/EC
This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Changes or modifications not expressly approved by the party responsible for compliance 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 radio frequency 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.

1.4 Required Operational Conditions

Basic operational conditions

（1） Power: 200V-240V, 50Hz/60Hz

（2） Ambient temperature: 10℃~30℃

（3） Relative humidity:≤70%

（4） No vibration and airflow around

（5） No electric dust, explosive and corrosive gases around

Transport and storage conditions

（1） Storage temperature: -20℃~55℃

（2） Relative humidity: ≤80%

1.5 Installation

This section describes the instructions that you should abide when install the product to ensure your safety and the optimum performance.

⚠ WARNING

- Improper power supply may damage the product.
- Make sure the power source conforms to the required power supply before connecting.

1.5.1 Location

（1） Place the product on a firm, flat and level surface, ensure the four feet of this instrument stand on the counter firmly. Avoid installing on a slippery surface or surface prone to vibration.

（2） Ideal ambient temperature is 20℃±5 ℃, avoid placing the instrument in direct sunlight if temperature exceeds 30℃.

（3） Keep clear of the instrument at least 10cm on both sides and at least 30cm behind it to guarantee the cooling efficiency.

（4） Keep away from heat or water to avoid sample temperature issues.

1.5.2 Connection of the power cord and grounding

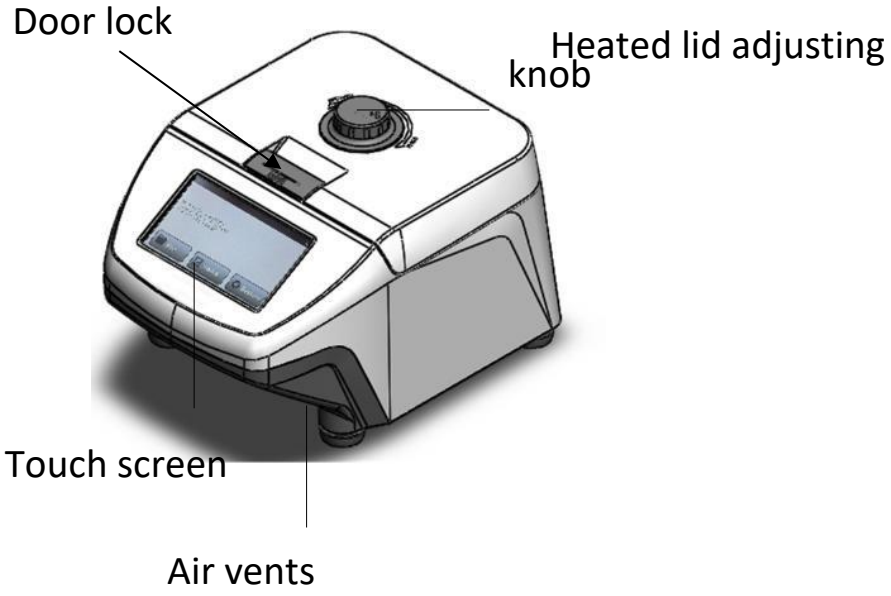
⚠ WARNING

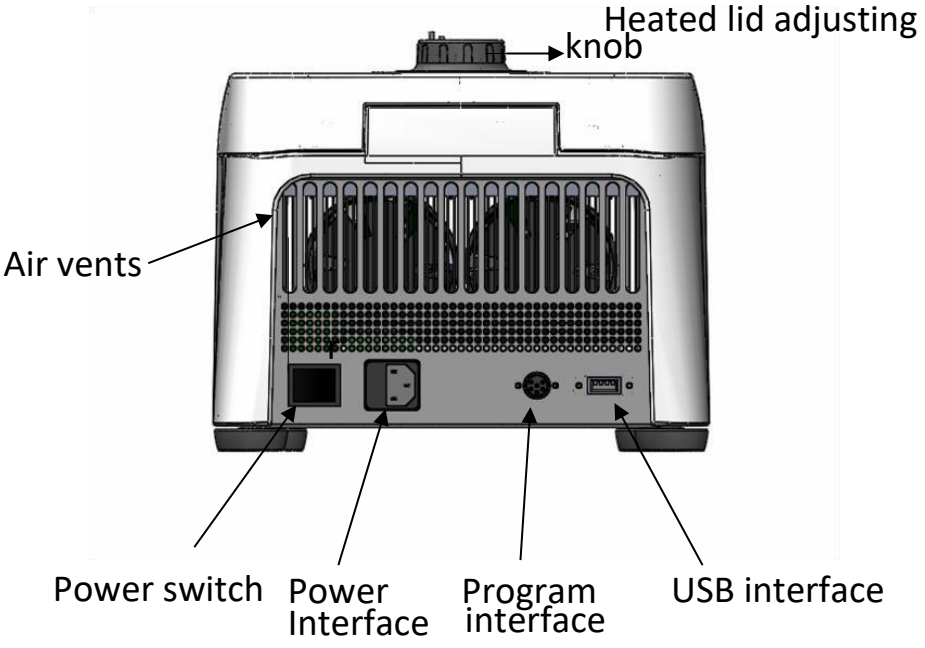
- To avoid electrical shocks, ensure your hands are dry when touching the power cord.
- This jinstrument must be grounded properly.

An minimum 10A outlet providing a sufficient ground is required, and this must meet local safety requirements.

2. Structure

2.1 Structure introduction





Heated lid adjusting knob: Adjust the height of heated lid to accommodate different reaction tubes.

LCD touch screen: Parameters setting and display

Door lock: Open or lock the cover

Air vents: Ventilation

Power switch: Turn on /off the power

Power interface: Connect the power cord

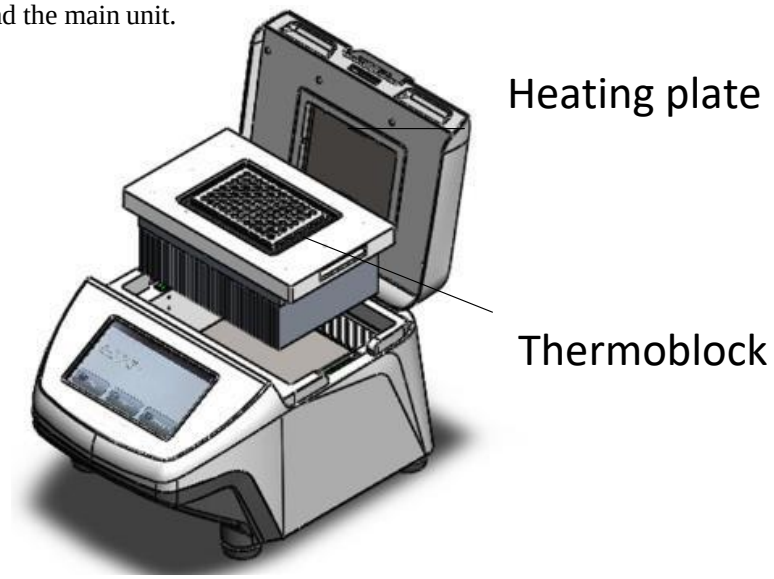
Program Interface: For service

USB Interface: For service

2.2 Installing the thermo block

Before power on, please make sure the thermo block has been installed correctly.

Installing methods: Put the thermo block vertically into the main unit and ensure good contact between the Thermo block and the main unit.



Heating plate: Heat for the heated lid

Thermo block: Load the sample tubes or a PCR plate

CAUTION!

Risk of burns from the hot surface.

Risk of burns form hot thermo block and hot heating plate when the heated lid is open.

2.3 Initial steps

Before the PCR thermo cycler is commissioned for the first time, ensure that the following requirements are met:

(1) The device is correctly connected.

(2) The device is free of damage.
(3) Free circulation of air around the ventilation slots.

Before power on, please ensure:
(1)The power supply is consistent with the instrument required voltage.
(2)Make sure the power cord is securely plugged into a power outlet.
(3)Power cord grounding reliable.

2.4 Power on

(1)Turn on the power switch, the instrument will issue a "beep" sound, indicating that power is on.
(2)instrument starts a self-inspection which will takes about 1-2 minutes, please be patient.

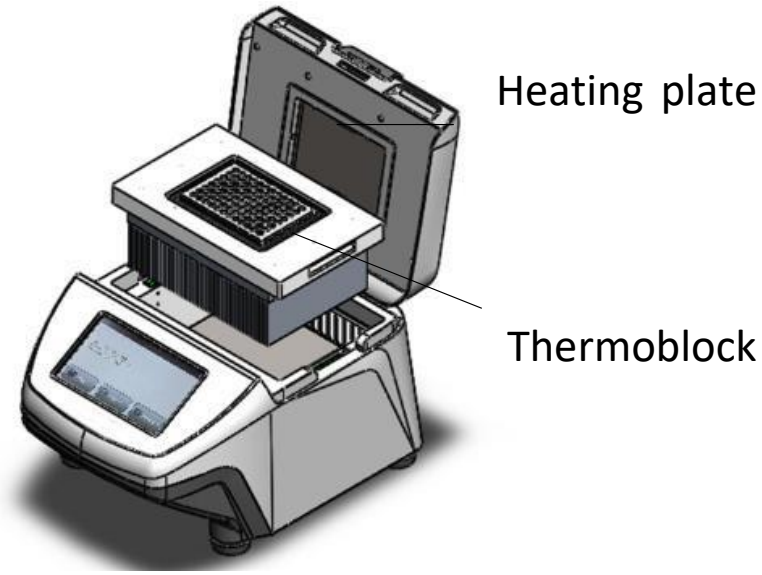
NOTE:
When the self-inspection passed, “TEST pass!”will be shown on the display, you can go on next steps.
If not, please turn off the power immediately and contact the manufacturer immediately.

2.5 Heated lid

NOTE:

(1) Before close the heated lid, please make sure thermoblock loaded with sample tubes or a PCR plate.

(2) Before start the program, please make sure the heated lid is closed. Heated lid adjusting knob

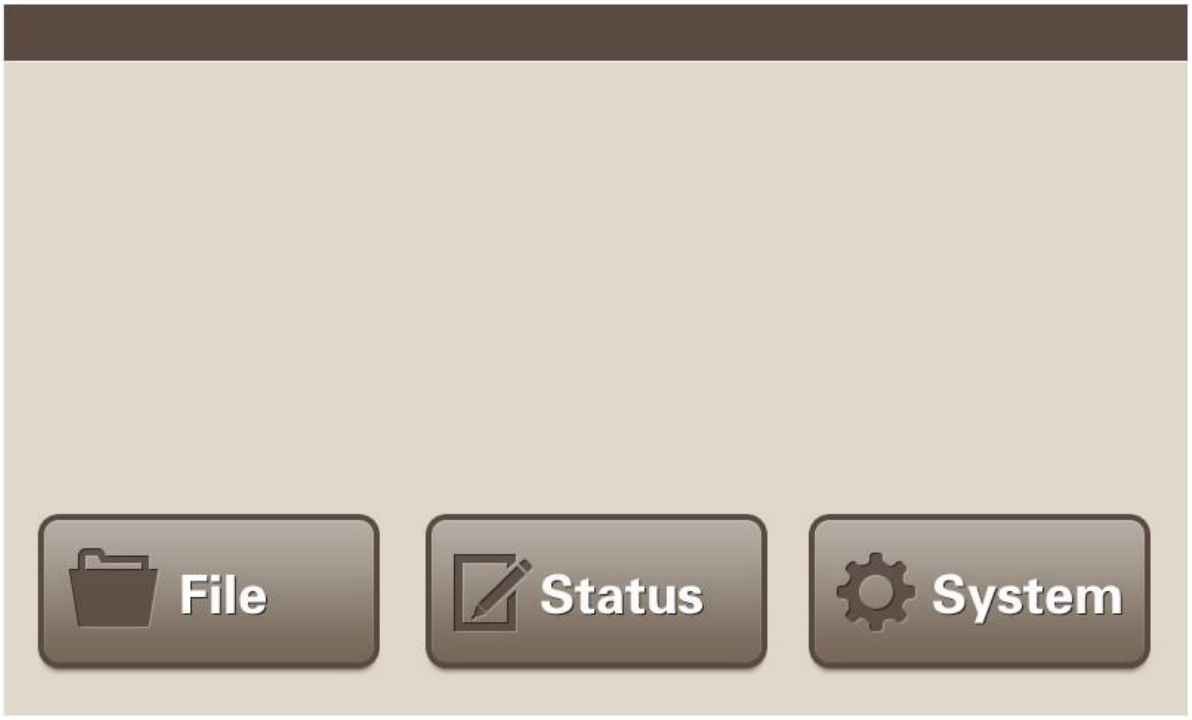


Heated lid adjusting knob: Adjust the height of heated lid to accommodate different reaction tubes. Rotate it clockwise, the heating plate will down, rotate it counterclockwise, the heating plate will be lift up.

CAUTION!

When you close the heated lid, do not place your fingers between the heated lid and the machine, which will cause a hand nipping.

3. Operation Manual



When successfully pass the self- inspection, you can:

(1) Click “File” button to enter the file management interface to create e file, edit the file, run a program, etc.

(2) Click “Status” button to enter program executing interface directly.

(3) Click “System” button to enter the system setting interface.

3.1 File Management

Click “File” button, you can enter the interface below.

Open: Open a folder. Choose the target folder, click “Open” to open the folder.

New: Create a folder. Click “New”, input the file name through the keyboard, then press the Enter key.

Delete: Delete the folder. Select a folder, click the “Delete” button. Attention will pop up, you can select Yes to delete the folder. Otherwise, click the No button, cancel the delete order.

Save as: Save folder as a new name. Select the folder, click the “Save as” button, enter the new folder name through the pop-up keyboard, press the Enter key.

Back: Return to the main menu.

3.1.1 Create an experiment method

Select a folder (which will turn to blue color), click “Open” button, you can enter the interface below.

Run: Execute the program defined in the selected file.

Open: Open the selected file to edit the program.

New: Create a new file to define a new program.

Delete: Delete the selected file.

Save as: Rename the selected file.

Back: Return to up level interface.

Home: Return to main menu.

NOTE:

When you want to create or save a file, you need to do it in a selected folder.

By clicking “New” or” Open” button, you can create a new file or edit a selected file.

(1) Create a new file. Click “New” button, input the file name via the pop-up keyboard, press “Enter” key, the new file will be created. If you press “ESC” key, you can cancel the new file creation.

(2) Edit a selected file. Select the target file, click “Open” button, and enter the program edit interface.

3.1.2 Program Settings

Click any area of the red block into Configure interface(check part 3.1.4).

Back: Return to folder interface

Edit: Selecting the STEP which you want to do edit from area of blue block , then click the Edit button into the temperature setting interface(check part 3.1.3）

Run: Run the program(check part 3.1.5)

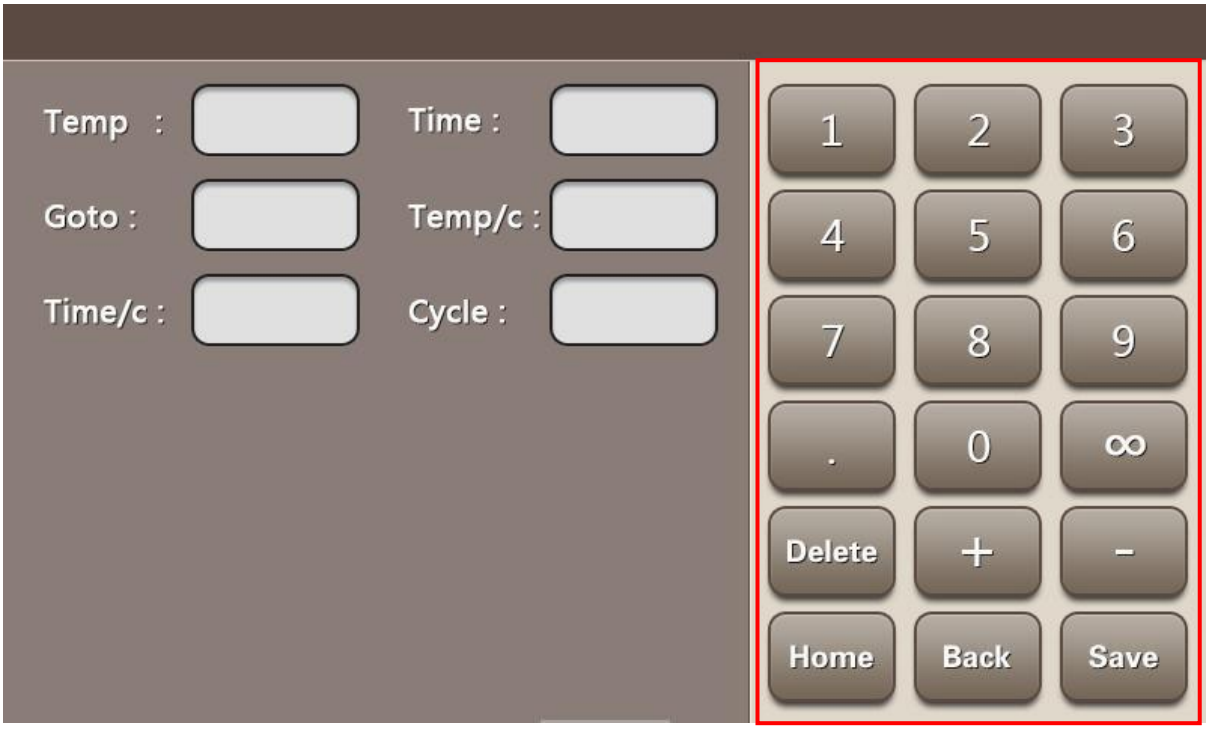
Save: Save the program

Insert: Create a new STEP

Delete: Delete the selected STEP

Arrow button: Scroll backward (left arrow)/forward (light arrow)

3.1.3 Temperature Settings (TC1000-S)



Input Parameters (Red Block)

Temp: The temperature of this STEP.

Time: The execution time for this STEP (0 ~ 99min59s).

Goto: Go to the STEP set in this program after the current STEP execution complete

Cycle: Set the times needed to repeat.

+Temp/c: Temperature modify value for each cycle, could be plus or minus（range-4℃ ~4℃）

For example, when the TempL is 50℃, the TempH is 60℃, if you set "0.1℃"in Temp/c at Item3, then every time, the program running to Item3, the TempL and TempH will both increase 0.1℃. After 30 cycles, the TempL will reach to 53℃, and the TempH will reach to 63℃.

+Time/c: Time modify value for each cycle, could be plus or minus(range -120~120s)

For example, when the Time is 60s, if you set "1s"in Time/c at Item3, then every time, the program running to Item3, the Time will increase 1. After 30 cycles, the Item 3 running time will reach to 90s.

3.1.4 Configure setting

Heated lid: Open by default, and the default temperature is 105 ℃. If needed, you also can set the temperature of the heated lid

NOTE:

(1) The heated lid setting range is 30-110℃. Please don't exceed the parameters setting range.

(2) If click "off", the heated lid will close. But closing the heated lid may impact the experiment result.

(3) When the block temperature is below 15 ℃, the headed lid will also close itself.

Control mode: default tube, you can also choose Block

NOTE:

The recommended setting model is the tube model. Because when you choose block, that means the sensor measures the temperature of the aluminum block. If you choose tube, the temperature is calculated temperature of the liquid. Relatively speaking, tube is more intelligent and accurate.

Sample Volume: Please fill in the real reaction system according to the actual situation

Back: Return to up level interface

Home: Return to main menu.

3.1.5 Running Interface

Run：Running **Pause**：
Pausing the program
Skip：Skipping the step which running

Stop：Stopping the program

Back: Return to up level interface

When the program is finished or being stopped, click the Back button can return to the main menu.

3.1.6 Normal PCR program setting

⑴ Initial denaturation: 95℃, 5 minutes: In column Item1, input 95 in “Temp”, input 500 in “Time”, this STEP completes.

Input skills:

Time is displayed in min: sec format. For example if you want 5 minute then input 500, if you want 5 minutes 30 seconds then input 530.

⑵ Denaturation 95℃: 30 seconds: Click “Add” button to create Item2. Input 95 in “Temp”, input 30 in “Time”, this STEP completes.

⑶ Primer annealing: 55℃ 30 seconds :Click “Add” button to create Item3. Input 55 in “Temp”, input 30 in “Time”, this STEP completes.

⑷ Extension:72℃ 30 seconds, from step2 to step4 repeat 30 times：Click “Add” button to create Item4. Input 72 in “Temp”, input 30 in “Time”, input 02 in “Goto”, input 30 in “Cycle”, this STEP completes. when step 4 was finished, it will go to step 2, then run 30 cycles .

⑸ Continue extension: 72℃ 10 minutes: Click “Add” button to create Item5. Input 72 in “Temp”, input 1000 in “Time”. This STEP completes.

⑹ Click Save.

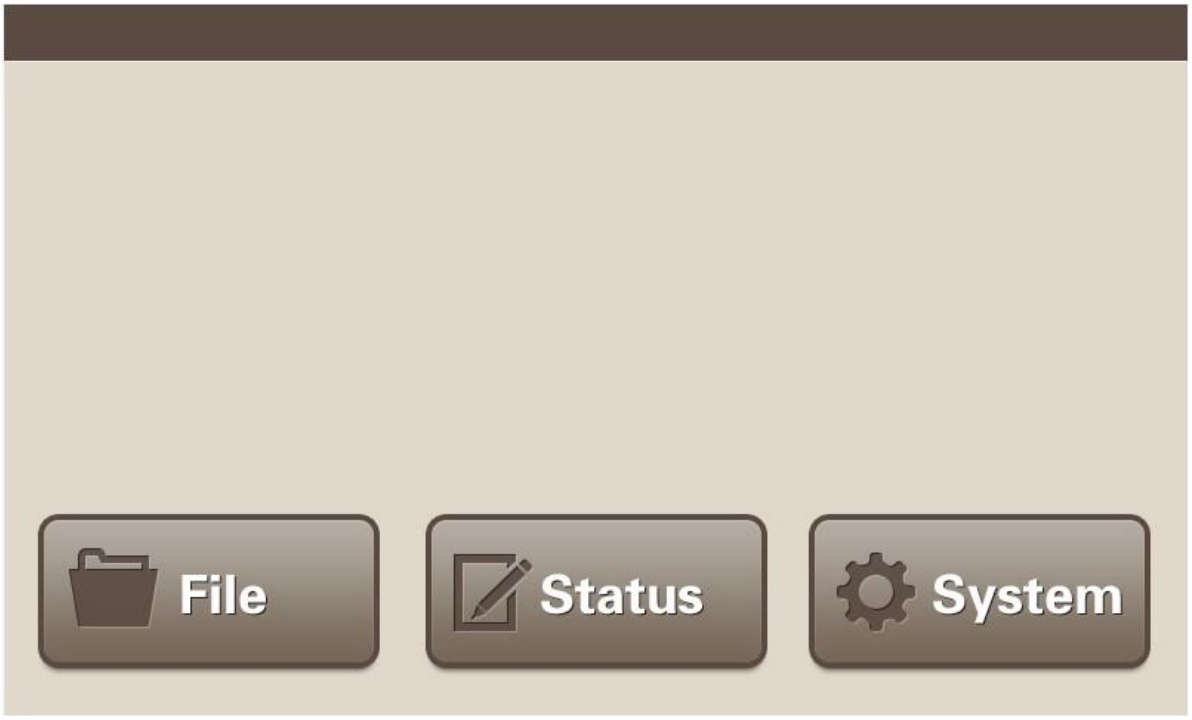
After all the above STEPs, the Normal PCR program setting is completed. After 95℃ initial denaturation 5minutes, running (2)-(5) PCR cycles 30 times, at last continue extension at 72℃ in 10 minutes.

NOTE:

Because the instrument of different brands has its own temperature control features (including: heating and cooling speed, stability, volatility, etc), and the biological experiments are inherently uncertain, vulnerable to outside influence, so although a program can run successfully in one instrument, it does not mean you can get the same result in another instrument. Please adjust the program to suit different instruments in order to achieve the ideal state.

3.2 Quick Operation

Click “Status”, can enter the program running interface. The system default execute the last running program.



3.3 System setting

Click the “system” in the main menu, enter the system setting interface below.

SN：Serial number. Each product has its own SN number

Test Info： Show the information of the self-test

Auto Test：Self test again. The item can be shown in the Test Info. When the self test passed, the TEST

pass will be shown in the window.

Date: Can input or adjust the current data. Click it, enter the number in the keyboard. When you want to input 2014, October 15th, you just need to input 20141015

Time：Can input or adjust the current time. Click it, enter the time in the keyboard. When you want to input 13:40:48, just input the number 134048

KEY Sound： Can open or close the key sound.

TSC: LCD screen calibration

OK: Confirm the input

Back: Return to up level interface

Home: Return to main menu.

4. Trouble Shooting

Caution:

When Power on, if you find the phenomenon of abnormal sound, abnormal display, failure alerts, fail in self-test, etc, please turn off the power and contact the manufacturer immediately.

Item	Symptom	Reason	Methods
1	Instruments can't be power on	The power line is unplugged	(1) Check whether the power line is unplugged (2) Check whether the fuse is broken or loose.
		Others	Contact the manufacturer
2	Self-test, Connect --error	The thermoblock is not installed	Install the thermoblock
		The thermoblock is not contact well with the main unit.	Power off, Install the thermoblock again, then power on.
		Others	Contact the manufacturer
3	Self-test, Sensor1, Sensor2 , Sensor3 --error	Thermoblock sensor damaged or bad contacted	Power off, Install the thermoblock again, then power on.
			Contact the manufacturer
4	Self-test, Fan Sensor --error	Heat sink damaged or bad contacted	Power off, Install the thermoblock again, then power on.
			Contact the manufacturer
5	Self-test, Cap Sensor –error	Heated lid damaged or bad contacted	Contact the manufacturer
6	Self-test, TE1 Ref, TE2 Ref, TE3 Ref--error	Ventilation holes are blocked	Clear blockage of ventilation holes
		Cooling chip damaged	Contact the manufacturer

7	Self-test, TE1 Heat, TE2 Heat , TE3 Heat --error	Heating parts of the thermoblock damaged.	Contact the manufacturer
8	Self-test, Cap Heat -- error	Heating part of Heated lid damaged	Contact the manufacturer
9	Heated lid cannot heat	The heated lid is closed at the system setting interface.	Open the heated lid, Set a temperature.
		The heated lid damaged	Contact the manufacturer
10	The reagent in the reaction tube evaporates	The heated lid is closed	Open the heated lid, Set a temperature.
		The reaction tube was placed unevenly	Try to place symmetrically
		The cap of the reaction tube is not tight fit	Fit tightly before put into the instrument