

---

**Note:** The **Infinigen Biotech Inc.** reserves all rights to modify this manual at any time without notice.

---

**Please read this manual carefully before operating Thermal Cyclers !**

## IMPORTANT INFORMATION

### 1. CAUTION

---

**Note:** The column contains important information, please read it carefully. Failure to follow can result in damage or malfunction of the Thermal Cycler.

---

---

**Warning!** This symbol identifies certain cautions to be taken during operation/procedure. Failure to follow the requirements may result in personal injury.

---

### 2. SAFETY PRECAUTION

The following safety precautions should be taken during operation, maintenance, or repair of the Thermal Cycler, to prevent any reduction on safety and affection on operation of the Thermal Cycler *The Infinigen Biotech Inc. shall not be in any way responsible for the consequences resulted from buyer's neglect to the following requirements.*

---

**Note:** The Thermal Cycler is only intended for indoor use and to operation under 2,000-meter elevation.

---

**a) Do not attempt to open the case of machine or touch any parts inside the machine with any tools.**

**b) Grounding**

A.C. power needed to be grounded to prevent any electric shock. Never let the third ground pin hanging loose. If the 3-pin plug is not applicable, it is recommended to consult electrician for appropriate power connection.

**c) Keep Away from Electric Circuits**

Opening Thermal Cycler is strictly prohibited. Any component changing or parameter adjusting inside Thermal Cycler should only be done by certificated professional personnel. Do not change any element while the power is still on.

**d) A.C. Power**

Before turning the power on, always check whether power source matches the required voltage ~100-240V and power output specification, i.e. 600W.

**e) Power Cord**

Only use the power cord issued by manufacture for Thermal Cycler. Don't not attempt to repair any

damaged power line, a damaged power cord must be replaced. The power cord should be kept free from heavy objects during operation. The power cord should also kept away from tripping up people.

**f) Connection**

Hold the 3-pin plug and insert thoroughly to power socket to ensure good contact. When disconnecting, pull the plug not the line.

**g) Operating Environment**

The Thermal Cycler should be placed in a low moisture, dust free, and good ventilation environment where no caustic gas or powerful magnetic interference exist. In addition, Thermal Cycler should be kept distant from wet environment, such as pools and water pipes.

Never cover or obstruct the air vents of the Thermal Cycler, which are designed for ventilation and to prevent the device's interior from overheating. When a single device is running, minimum 30cm distance should be kept between air vents and the nearest object. When 2 or more devices are running simultaneously, a minimum 60 cm distance is needed in between. Do not place the device on a soft surface, which may block the ventilation on the bottom of device.

Hot environment may degrade or failure on of the Thermal Cycler. Therefore, the device should be protected against any kind of heat sources, such as sunlight, ovens, or central heating equipment.

When Thermal Cycler is to be in idol for long period of time, it is recommended to disconnect the power and cover up the device to prevent dust from entering.




---

**Note:** Immediately disconnect the power and contact the distributor or consult certified mechanic for assistance when any of the following occurs.

- Liquid gets into device;
  - The device is sprinkled or drenched;
  - The device malfunctions producing abnormal sound or odor;
  - The device falls down to the floor or outer shell is damaged;
  - Significant changes in the device's performance.
- 

**3. Protection Degree: IP 20**

#### 4. Warning Sign

Icon	Meaning
	High temperature warning: Areas labeled with this warning signs and those described in the manual. Do not touch to avoid getting burned.
	Electric shocks Warning: Operate strictly in accordance to the to avoid electric shock accidents!
	Attention: Important message. Read the message carefully. Failure to do so may cause machine malfunction or damage to the machine.

## WARRANTY AND SERVICE INFORMATION

### 1. Warranty

The Thermal Cycler is warranted for one month starting from date of ship out. Under this warranty The Infinigen Biotech Inc. is obligated to exchange the Thermal Cycler with any defects result in material and manufacture.

The Thermal Cycler is also warranted for thirteen months starting from date of ship out. Under this warranty The Infinigen Biotech Inc.'s obligation shall be limited to repair or exchange (at the Infinigen Biotech Inc.'s option) of the Thermal Cycler proven to be defective as described herein.

The buyer is responsible for freight to the maintenance shop designated by the Infinigen Biotech Inc. as well as the freight cost for all warranty claims. The Infinigen Biotech Inc. will cover the transportation expenses of the freight from maintenance shop back to the buyer (only applicable to domestic freight).

After the warranty is due, the Infinigen Biotech Inc. reserves the right to charge cost for maintenance accordingly.

### 2. Warranty Terms

The above warranty is not applicable to defective devices due to improper usage, abnormal operating conditions, improper application, and unauthorized maintenance or alteration.

The Infinigen Biotech Inc. provides no extension warranties other than those described herein. Any descriptions in sales promotion shall not create an extension warranty.

---

**Note:** Check items included in the package in accordance to the checklist at receive. Contact the distributor when finding any missing or damaged items in the package.

Buyers are requested to fill out the check form and send a photocopy (or via fax) back to the distributor after finishing item checking. The returned form will be filed into Infinigen Biotech Inc.'s archives and maintenance record.

Please store the package and packing materials in a safe place for future uses. The above warranty does not extend to goods damaged due to improper package.

---

## CONTENTS

CHAPTER 1	INSTALLATIONS .....	- 1 -
1.	The AgileCycler Color Touch Thermal Cycler package includes: .....	- 1 -
2.	Normal Operating Conditions .....	- 1 -
3.	Transportation and Storage .....	- 1 -
4.	Parts and Functions .....	- 1 -
5.	Module changing.....	- 4 -
6.	Features.....	- 6 -
7.	Specifications.....	- 7 -
CHAPTER 2	OPERATION GUIDE .....	- 9 -
1.	Power-on Procedure .....	- 9 -
1.1.	Boot .....	- 9 -
1.2.	Warm-up .....	- 10 -
2.	Menu structure .....	- 11 -
3.	File .....	- 12 -
3.1.	Create and edit file .....	- 12 -
3.2.	Print file .....	- 17 -
3.3.	Delete file .....	- 17 -
3.4.	Copy file.....	- 17 -
3.5.	Rename file.....	- 18 -
3.6.	Run file.....	- 18 -
4.	Setting .....	- 19 -
4.1.	Run Setting .....	- 20 -
4.2.	System Setting.....	- 21 -
5.	Tools .....	- 22 -
5.1.	Gradient calculator.....	- 22 -
5.2.	Logs.....	- 23 -
5.3.	Local information .....	- 23 -
6.	Incubate.....	- 24 -

CHAPTER 3	MAINTENANCE & TROUBLESHOOTING.....	- 25 -
1.	Maintenance .....	- 25 -
1.1.	Cleaning.....	- 25 -
1.2.	Replace fuse .....	- 25 -
2.	Troubleshooting .....	- 25 -
2.1.	Dissatisfactory Results.....	- 25 -
2.2.	Self-test hardware and self-diagnosis software.....	- 26 -
3.	Notices.....	- 26 -
3.1.	Power .....	- 26 -
3.2.	LCD touch screen.....	- 26 -
3.3.	Notice on cleaning.....	- 27 -
4.	Error message & solution .....	- 27 -
5.	Cause of the abnormal phenomenon & solution.....	- 28 -

## CHAPTER 1 INSTALLATIONS

### 1. The AgileCycler Color Touch Thermal Cycler package

#### includes:

- AgileCycler Color Touch Thermal Cycler
- Power Cord
- 2 pieces of 8A 250V fuses
- Instruction manual

### 2. Normal Operating Conditions

Ambient temperature: 10°C~30°C

Relative humidity: ≤70%

Power source: 85-264V, 50-60Hz, 600W

---

**Note:** Please check if the above operating conditions are met before turning the power on. Pay special attention to power line's grounding.

---

### 3. Transportation and Storage

Ambient temperature: -20°C~+55°C

Relative humidity: ≤80%

### 4. Parts and Functions

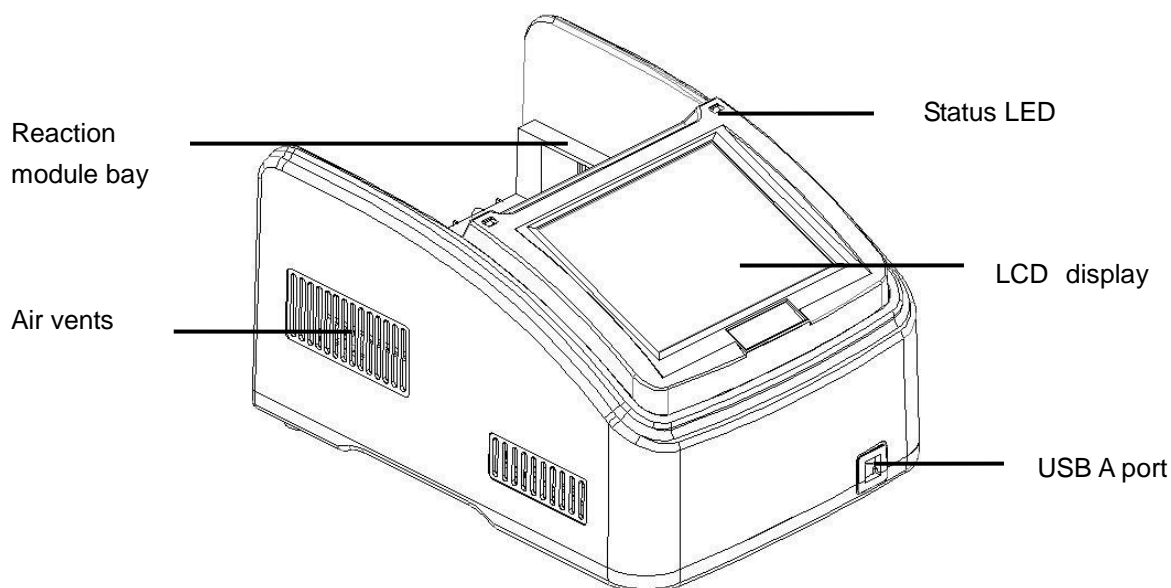


Figure 1. Frontal view of Thermal Cycler.



- Reaction module bay — holds reaction module
- Air vents — allows air circulation
- Status LED — indicates status of reaction module
- LCD display — displays operating status
- USB A port — 2 USB ports, connection for computer mouse and USB devices

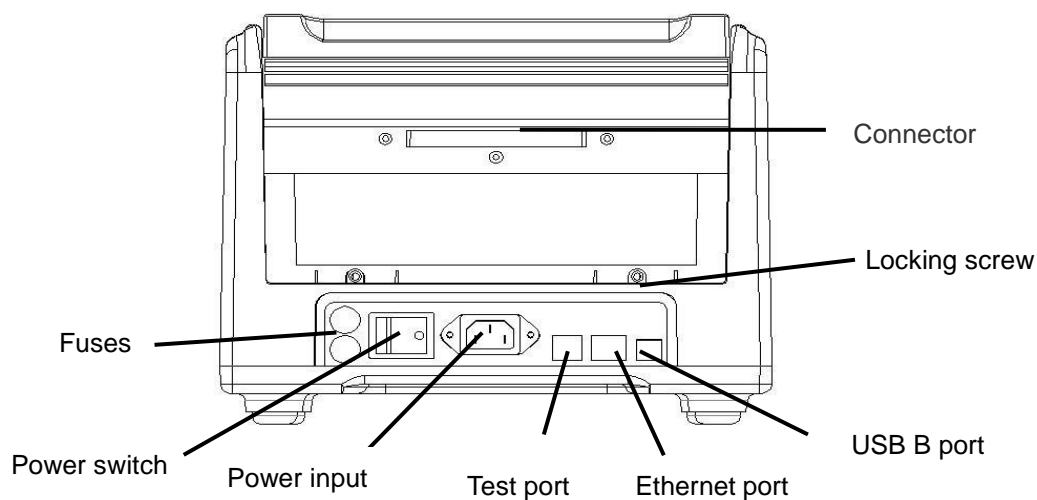


Figure 2. Rear view of thermal cycler.

- Connector — connection between host machine and reaction module
- Locking screw — locks reaction module
- Test port — for service testing only
- Ethernet port — connection to computer
- USB B port — for system debug

---

**Note:** 1 The fuse specifications are: 250V 8A,  $\phi 5 \times 20$ mm. Use only the fuse that meets the above specifications. For certificated fuses, please contact distributor.  
2 For exchanging block, please consult your distributors.

---

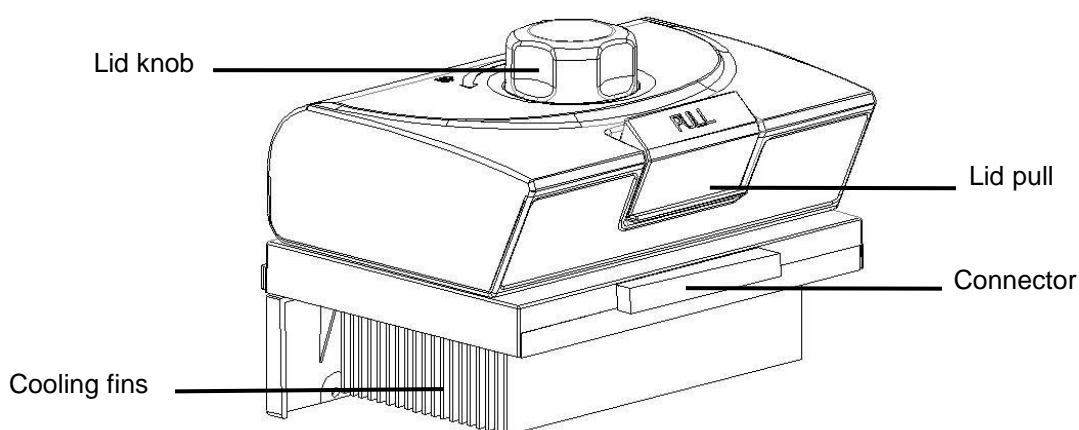


Figure 3. The lid and cooling fins of 96-well reaction module

- Lid knob — to seal Lid
- Lid pull — to open and close lid
- Connector — connection between host machine and reaction module

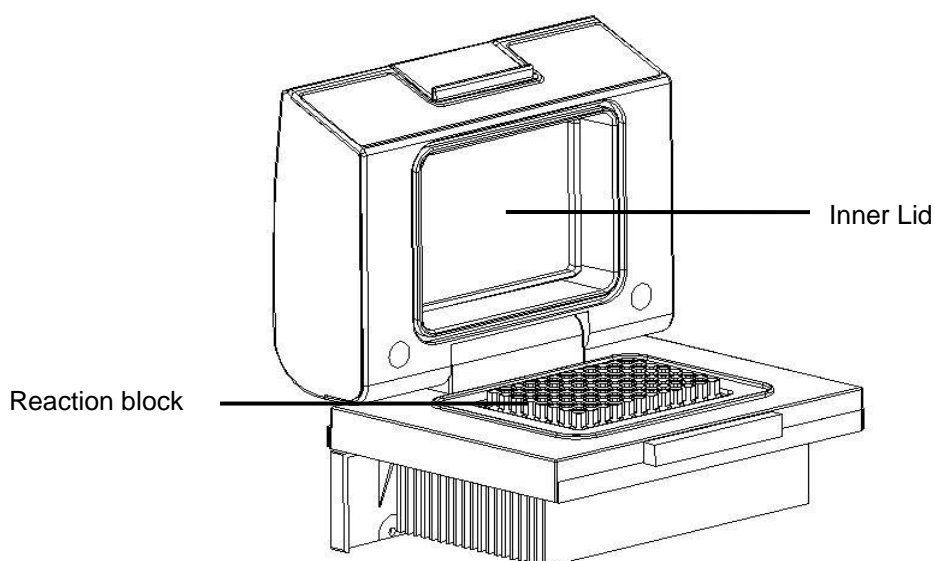


Figure 4. Opening view of a 96-well reaction module

- Reaction block — holds reaction vessels, including tubes and microplates
- Inner lid — applies heat and force to the reaction vessel lids (caps or tape) to produce consistent and successful reactions. Heating the inner lid prevents condensation, while applying force seals the reaction to prevent evaporation.

---

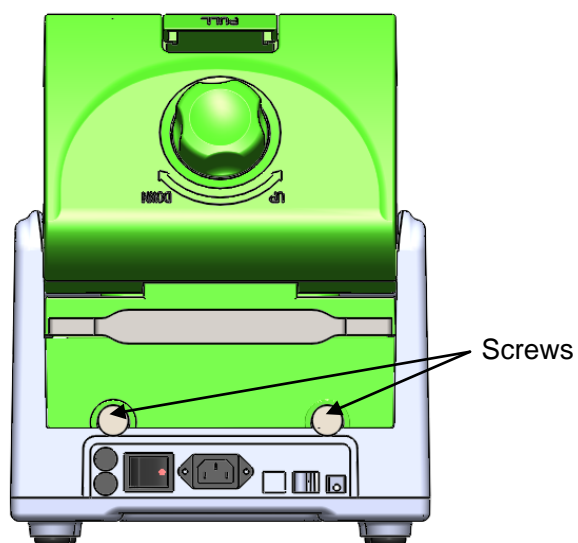
**Warning!** After a run, the heated inner lid can remain hot. Use caution when opening and close the lid.

---

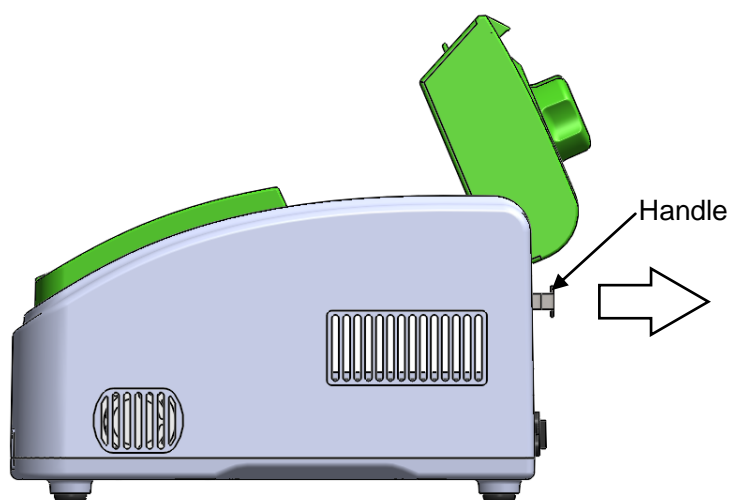
## 5. Module changing

- 
- Note:**
- 1 Make sure the power is off before module changing
  - 2 Maintain module temperature as close as the ambient temperature.
- 

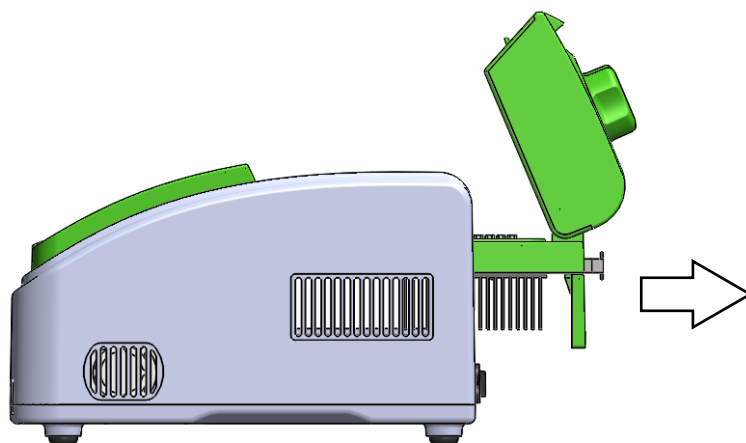
**Step 1** Open PCR lid and remove the 2 screws on the back of PCR by turning counterclockwise



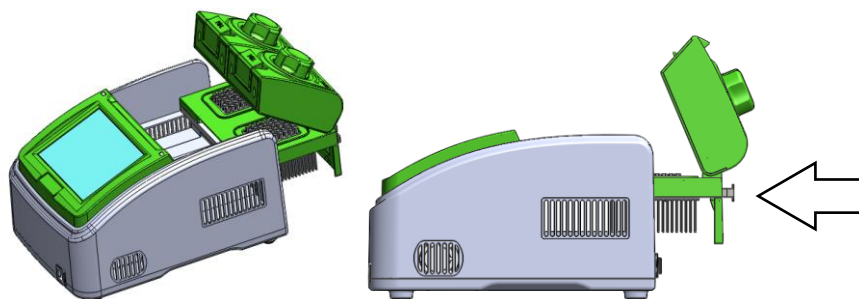
**Step 2** Extract module by pulling the handle outwards.



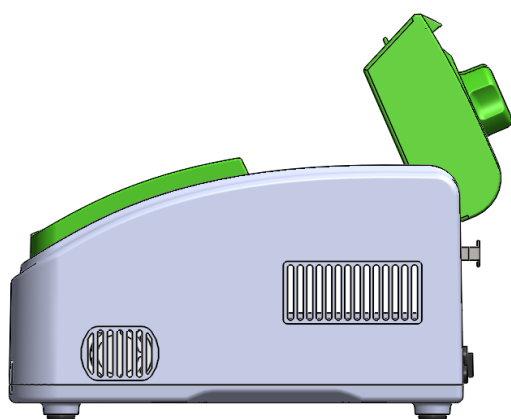
**Step 3** Before being completely extracted, hold the module to prevent it from falling off.



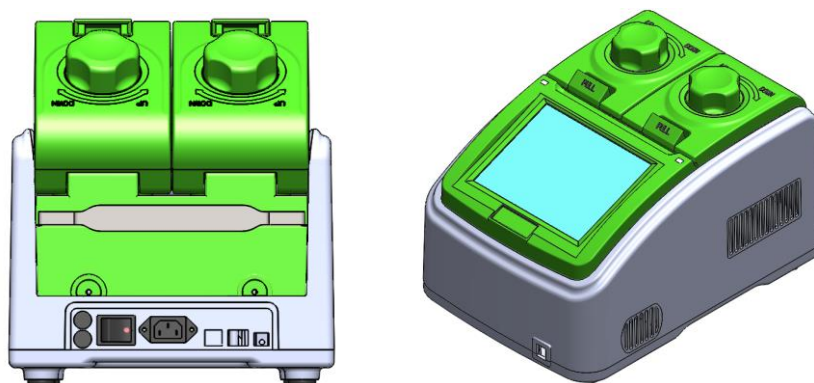
**Step 4** Insert new module as shown after removing its cover.



**Step 5** Push new module inwards completely to insure a fixed connection between the module and machine.



**Step 6** Tighten the 2 screws and close PCR lid after inserting new module.



## 6. Features

1. Each thermal block has 4 independent temperature control sensors and 8 peltier heating units to ensure accurate and uniform temperature across block surface, and provide users for replicate previous condition set-up.
2. 8" TFT color touch-screen with graphical display provides easy use for setting up and monitoring.
3. The actual and target temperatures can be viewed and displayed graphically in real time.
4. 30 thermal cyclers can be simultaneously linked to one PC via LAN, which eliminates troubles of setting up and programming each thermal cycler.
5. Max. temperature gradient 30°C.
6. Applicable with the following 0.2ml tube models: non-skirted, semi and fully skirted plated.
7. Compatible with devices such as Mouse and Keyboard and capable to transfer data and perform software updates via USB Drive.

## 7. Specifications

Catalogue Number	AC-96	AC-60	AC-48X2	AC-48N30	AC-384
Sample Capacity	96x0.2ml	60 x 0.5ml	2 x 48 x 0.2ml	48 x 0.2 ml + 30 x 0.5 ml	384well
Temperature Range	0~100°C				4~100°C
Maximum ramp rate	5°C/s				3.0°C/s
Average ramp rate	3°C/s				2.0°C/s
Uniformity	≤ ±0.2°C				≤ ±0.3°C
Accuracy	≤ ±0.1°C				≤ ±0.2°C
Display Resolution	0.1°C				0.1°C
Ramping Rate Adjustable	0.1~5°C				0.1~3.0°C
Gradient Uniformity	≤±0.2°C				≤±0.3°C
Gradient Accuracy	≤±0.2°C				≤±0.3°C
Gradient Temp. Range	30~100°C				30~100°C
Gradient Span	1~30°C				1~24°C
Temperature Control	Block\Tube				
Hot Lid Temperature	30~110°C				
Over-temperature cut-out	Yes				
Number of Programs	10000 +(USB FLASH)+intuitive “drag and drop” program creation.				
End of program alarm	Yes(can be disabled)				
Max. No. of Step	30				
Max. No. of Cycle of each step	99				
Time Increment/Decrement	1 Sec ~ 9 Min 59 Sec				
Temp. Increment/Decrement	0.1~9.9°C				
Auto-start on power failure	Yes				
Connection to PC control software	Yes				
Gradient calculator	Yes				
Password protection	Yes				
User level	Yes				

Hold at 4°C	Yes
Printing	Yes
Wireless blue tooth	Yes
LAN to computer	Yes
LCD	8 inch, 800x600 pixels, TFT
Real time temperature sensor feedback	Yes
Communication	USB2.0 , LAN
Noise emission	Very low
Dimensions	38cmx24cmx26cm (LxWxH)
Weight	8.5kg
Power Supply	85~264VAC , 47~63Hz , 600 W

## CHAPTER 2 OPERATION GUIDE

---

**Warning!** Please turn off the power immediately and contact your distributor when any abnormal sound or display appears after power-on, or when failure alarm and display are found during device's self-testing process

---

**Note:** When sample number is less than available conical holes, sample tubes should be evenly placed over the block to ensure the stable coverage and even temperature fluctuation distribution in blocks.

---

**Note:** In order to guarantee that the heated lid is seamlessly sealed with the sample tubes and firm contacts between tubes and conical holes, please apply light pressure onto the lid's flanks when closing.

---

### 1. Power-on Procedure

#### 1.1.Boot

Connect power cord to the back of instrument then plug into power source and switch to "-". When instrument is on, a buzzer should be heard and **Boot** screen (Figure 5) will appear on LCD screen. The operating system then goes to **Self-Test** screen (Figure 6). During this phase, the LCD screen will display instrument model and company LOGO. **Home** screen (Figure 7) will be shown when starting up phase is completed.

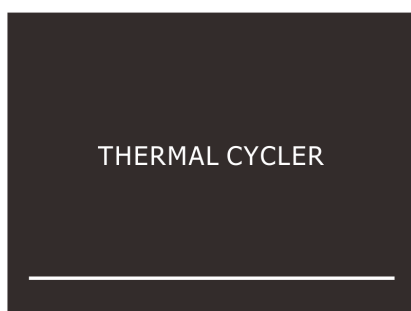


Figure 5. boot screen



Figure 6. self-test screen



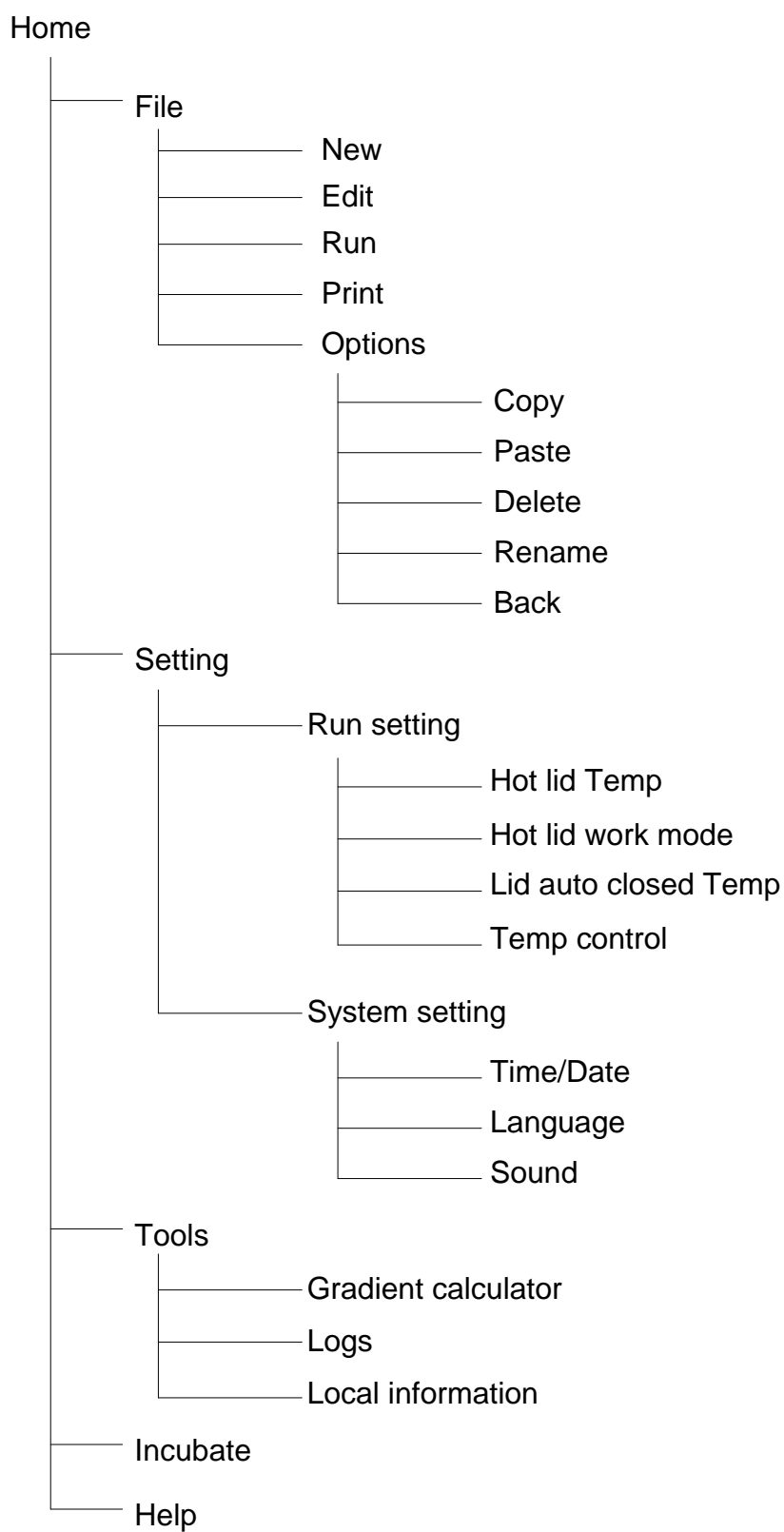


Figure 7. home screen

## 1.2. Warm-up

In standby modes the instrument will pre-heat the **Block** and **Hot Lid**. Please refer to **(Run Setting)** for setting instructions of **Hot Lid work mode**. The default **Hot Lid** pre-heating procedure is carried out once the power is on, and the default temperature is 105 ° C.

## 2. Menu structure



### 3. File

**File** is composed by **Temperature Step** and **Cycle Step**. Each **File** can contain up to 30 **Steps**. **Temperature Step** contains **Temperature**, **Time**, **Gradient**, **Ramp Rate**, **Temperature Increment** and **Time Extend**. The maximum cycle in **Cycle Step** is 99.

#### 3.1. Create and edit file

In the **Home** screen (Figure 7), touch **“File”** button to enter **File Library** screen (Figure 8).

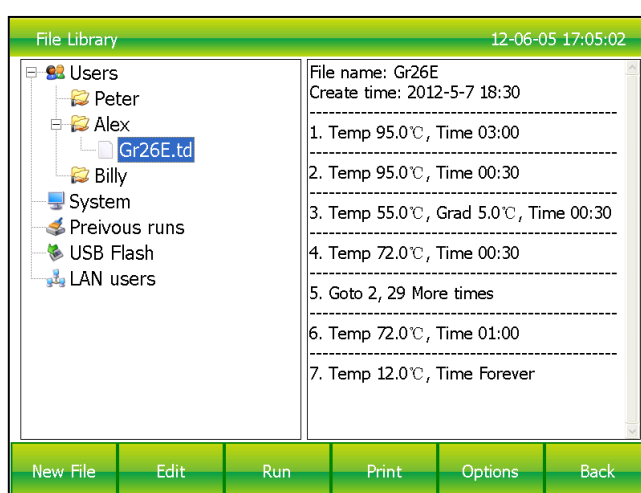


Figure 8. File Library

#### 1). Change Target Temperature and Hold Time

- From a new file

Touch **“New File”** button in the **File Library** screen (Fig. 8) to create new file (Fig. 9).

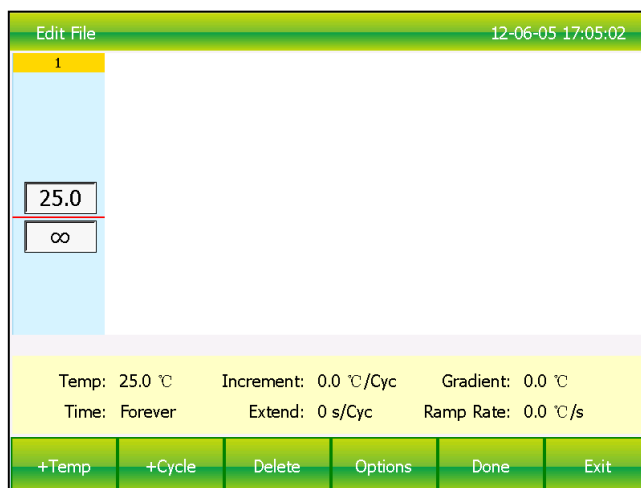


Figure 9. Create a new file

In the **New File** screen, touch “**+Temp**” button to add a **Temperature Step**, touch “**+Cycle**” button to add **Cycle Step (GOTO step)**, use the pop-up numeric keypad to enter a new value for the target temperature or hold time.

- From an existing file

Select a file in the **File Library** screen (Fig. 8), touch “**Edit**” button to modify selected files.

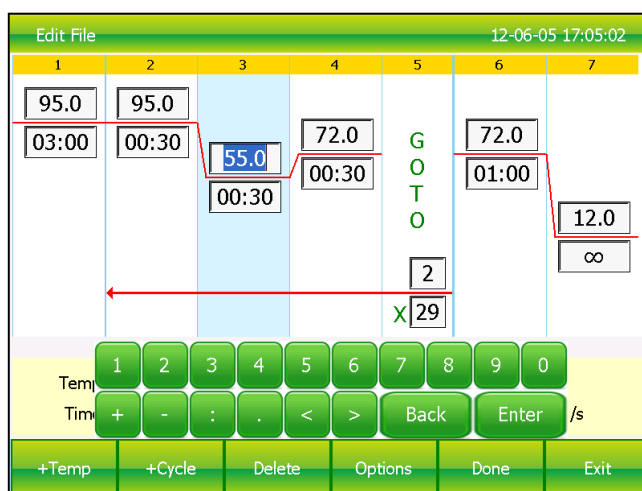


Figure 10. Edit an old file

In the **Edit File** screen (Fig. 10), select a desired step by touching anywhere in the step. Change a time or temperature by touching the desired field and entering a value using the pop-up numeric keypad. To enter an infinite hold, fill time field with 00:00.

## 2). Edit Step

Select a desired step, touch **Options** button to enter **Step Options** screen (Figure 11).

Parameters can be edited by selecting among **Gradient**, **Ramp Rate**, **Temperature Increment** or **Time Extend**. Table 1 lists the parameters for temperature and gradient steps with the limits of those parameters.

After entering **Gradient** values the gradient distribution table (Figure 11) will be shown at bottom of the screen. Touch “**OK**” to save changes and return **Edit File** screen (Figure 12).

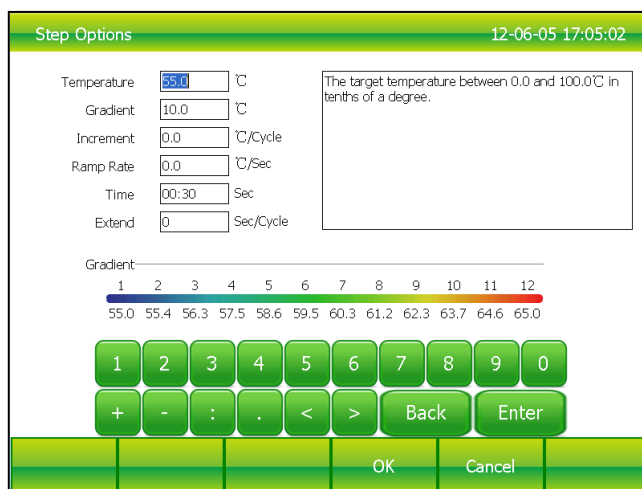


Figure 11. Set the Gradient

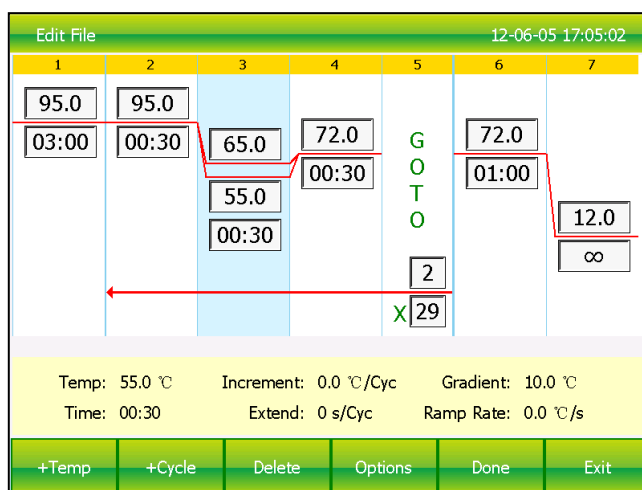


Figure 12. Gradient on Step 3

Table 1. List of parameters for temperature and gradient steps

Parameter	Ranges	Description
Temperature	<b>Temperature in °C:</b> The target temperature between 0.0 and 100.0°C in tenths of a degree	Instructs the thermal cycler to ramp to the target temperature.
	<b>Hold time:</b> The hold time between 1 sec and 59min 59 sec in the format of min : sec. To enter an infinite hold, touch 0 button, the symbol ∞ (infinite) will come out.	
Gradient range	<b>Lower:</b> The lower temperature in the gradient. Enter a number between 30.0 and 99.9°C in tenths of a degree.	Instructs the thermal cycler to ramp to the target temperature gradient across the block and hold that temperature gradient

	<p><b>Upper:</b> The upper temperature in the gradient. The max. temperature is 100.0°C. Enter a temperature within 30.0°C of the lower temperature.</p> <p><b>Hold time:</b> The hold time between 1 sec and 59min 59 sec in the format of min : sec. To enter an infinite hold, touch 0 button, the symbol ∞ (infinite) will come out.</p>	for the specified amount of time.
<b>Increment</b>	A temperature from -9.9°C to 9.9°C per cycle in tenths of a degree.	Applies only to a temperature step. Instructs the thermal cycler to increment (change) the target temperature of a step with each cycle, where a positive number increases the temperature and a negative number decreases the temperature.
<b>Ramp rate</b>	A number from 0.1 to 5°C per sec	Applies only to a temperature step. Instructs the thermal cycler to ramp to the target temperature at the specified ramp rate in that step.
<b>Time</b>	A time from 1 sec to 59 min 59 sec	Instructs the thermal cycler to hold the temperature for the specified amount of time.
<b>Extend</b>	A time from -9 min 59 sec to 9min 59 sec per cycle.	Applies to both temperature and gradient steps. Instructs the thermal cycler to extend the hold time with each cycle. A positive number increases the hold time and a negative number decreases the hold time.

### 3). Insert a Step

Insert a step if a new temperature, Cycle (GOTO), or gradient step is needed. Follow these instructions to insert a step to the right of a preexisting step.

- I. Touch a step to the left where the new step will be inserted.

II. Touch the “**+Temp**” button to insert a step or the “**+Cycle**” button to insert a Cycle (GOTO)

III. Touch the time or temperature field to edit the parameter in the new step, or touch the step or times field to edit the parameter in the new Cycle (GOTO).

4). Delete a Step

To permanently remove a step from file.

- I. Select the step to be deleted.
- II. Touch “**Delete**” button to delete the selected step.

5). Remove or add a temperature gradient

Select a step in “**Edit file**” screen and touch the “**Options**” button to enter **Step Options** screen. Touch “Cancel” button to remove a temperature gradient, or fill the Step Options and touch “**OK**” button to add a temperature gradient.

6). Save file

When editing is completed, touch “**Done**” to enter **Save File** screen (Figure 13) and touch “**Browse**” button to set file saving path. Then touch “**File Name**” button to name file and finally touch “**Save**” button to save file and return **File Library** screen (Figure 14)

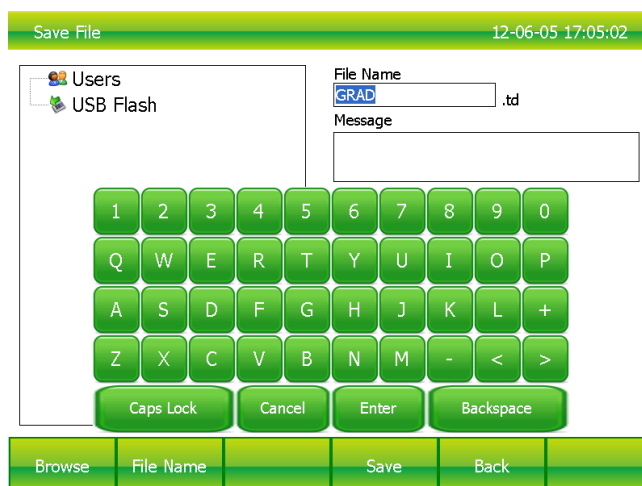


Figure 13. Name file and select the path

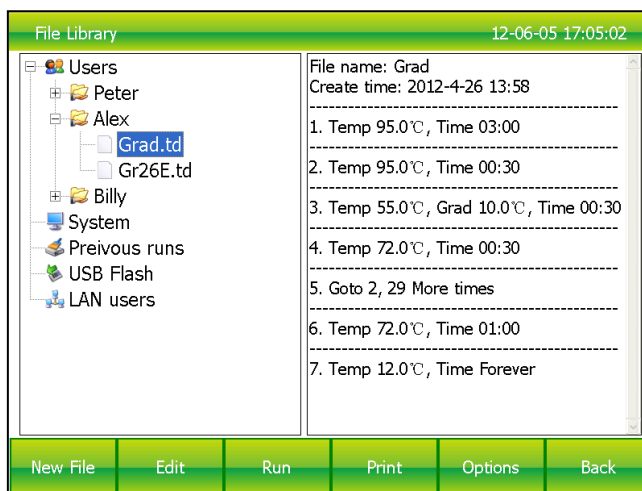


Figure 14. New file in the library.

### 3.2. Print file

Touch **“Print”** button to print selected file. The Instrument will connect to Bluetooth printer automatically when the printer is on.

### 3.3. Delete file

Touch **“Options”** button in the **File Library** screen (Figure 8) to select the file to delete and the query dialog window will pop up when touching **“Delete”** button. When confirm a deleting, touch **“Yes”** button (Figure 15). To prevent any files being mistakenly deleted, only one delete per time is allowed.

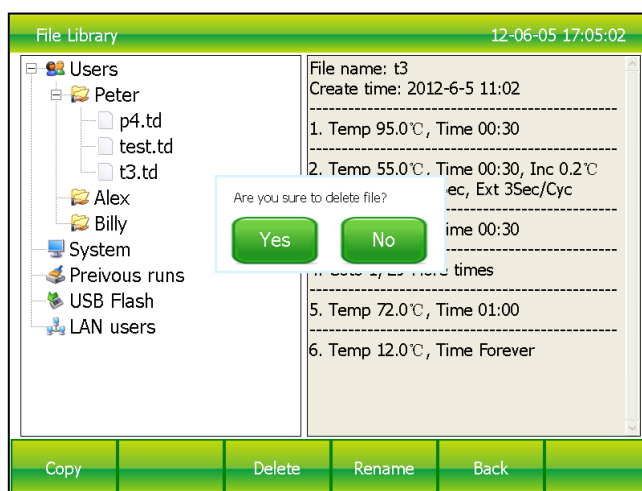


Figure 15. Delete a file

### 3.4. Copy file

Touch **“Options”** button in the **File Library** screen (Figure 8) to select files and touch **“copy”** button. Then enter the file path and touch **“Paste”** button to finish copy.



### 3.5. Rename file

Touch “Options” button in the **File Library** screen (Figure 8) and select file. Then touch “Rename” button and enter new file name in the dialog window to rename files.

### 3.6. Run file

Select the file needed in the **File Library** screen (Figure 8) and touch “Run” button to enter the **Run File Setup** screen (Figure 16).

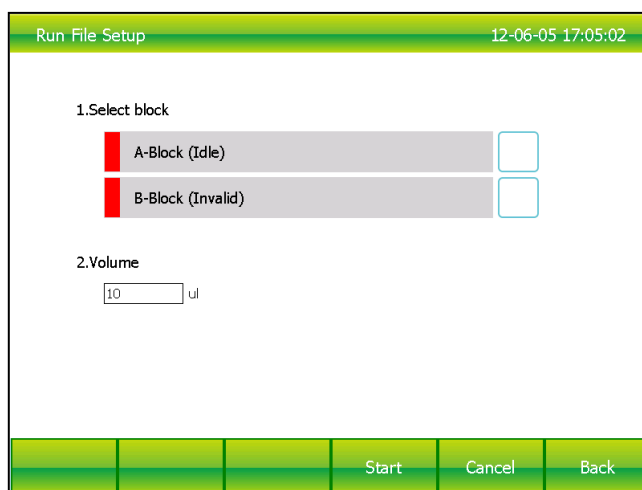


Figure 16. Run file setup

Then select the **Block** and enter volume (**not necessary to be in block temperature control mode**). Touch **Start**, enter the **File Running** screen (Figure 17).

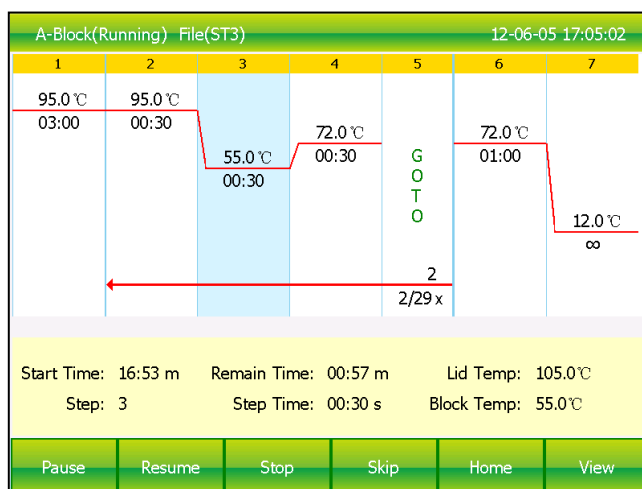


Figure 17. File running.

1) Parameters

- Start Time — system time when file starts to run.
- Remain Time — remaining time for the experiment.
- Lid Temp — current hot lid temperature.
- Step — current step.
- Step Time — current step time.
- Block Temp — current block temperature.

2) Pause

Touch **“Pause”** button to pause running file and touch **“Resume”** button to restore running.

3) Stop

Touch **“Stop”** button to stop a running file.

4) Skip

Touch **“Skip”** button to jump to next step.

5) Go to other screen

Touch **“Home”** button to return **Home** screen.

Touch **“View”** button to enter the **Navigation** screen (Figure19).

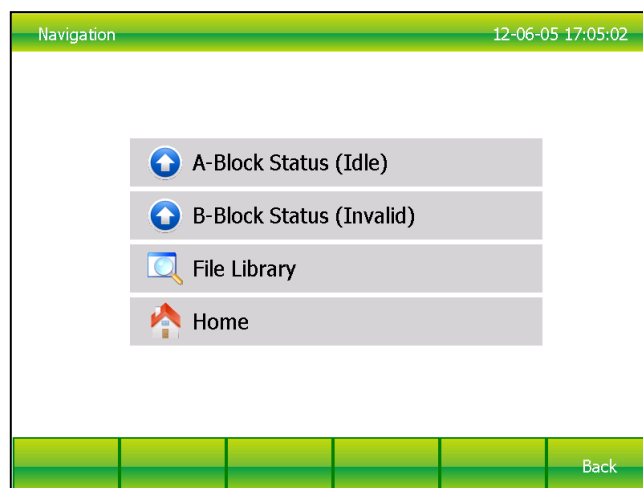


Figure 18. The **navigation** screen.

## 4. Setting

Touch **“Setting”** button in the **Home** screen to enter the **Setting** screen (Figure 19).

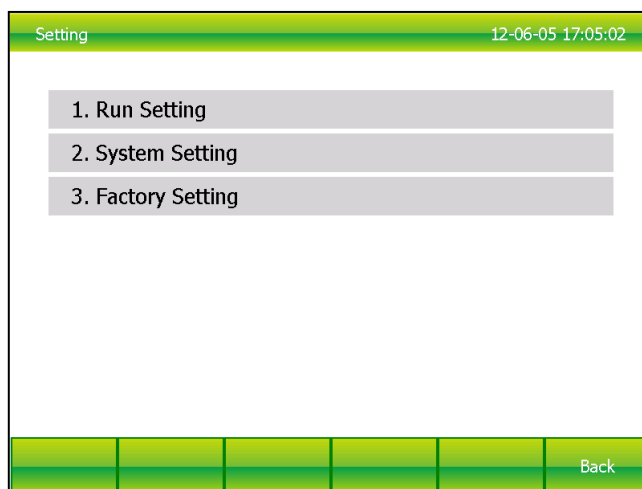


Figure 19. Setting menu

### 4.1.Run Setting

Select the “Run Setting” button in the **Setting** screen (Figure 19) to enter the **Run Setting** screen (Figure 20).

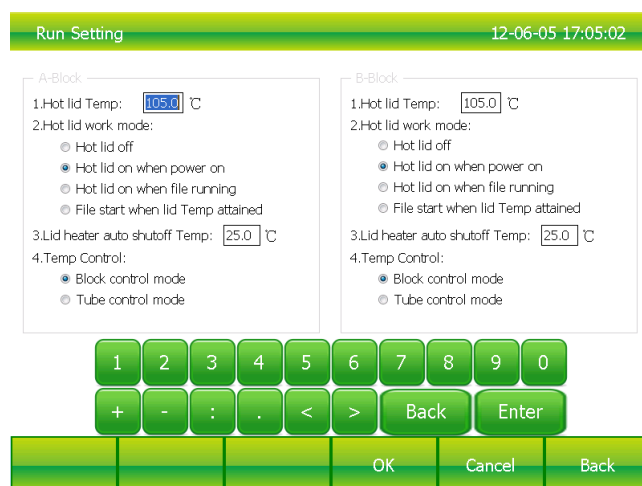


Figure 20. Run parameter setting

1) Hot lid temperature setting

Hot lid temperature setting range is 30-110°C and system default temperature is 105°C.

2) Hot lid work mode setting

In total are 4 working modes and default mode is that the hot lid will be on when power is on.

3) Lid heater auto shutoff temperature

The range of lid heater auto shutoff Temp is 0-100°C and system default is 25°C.

When the block is running an infinite hold at a temperature which is lower than the

specified auto shutoff temperature, the lid heater will turn off and the lid temperature will stay at block temperature.

---

**Note: Lid Temperature**

The adjustable heated lid of AgileCycler allows user to control the lid temperature and force. When AgileCycler is running, the heated lid maintains the temperature specified by the file being run. Without a heated lid, water can be lost from the reagents to condensation, concentrating the reactants in the tube or plate. However, if the temperature of heated lid is too high, the sample temperature might rise above the target temperature. Therefore, pay attention to the setting of lid temperature could make your experiment result more reproducible.

---

#### 4) Temp control mode

The temp control mode contains “block control mode” and “tube control mode”. The “block control mode” is suitable for performing normal PCR and the “tube control mode” is for experiments that require higher environment conditions. The system default is “block control mode”.

## 4.2. System Setting

Select “**System Setting**” button in the **Setting** screen (Figure 19) to enter the **System Setting** screen (Figure 21).

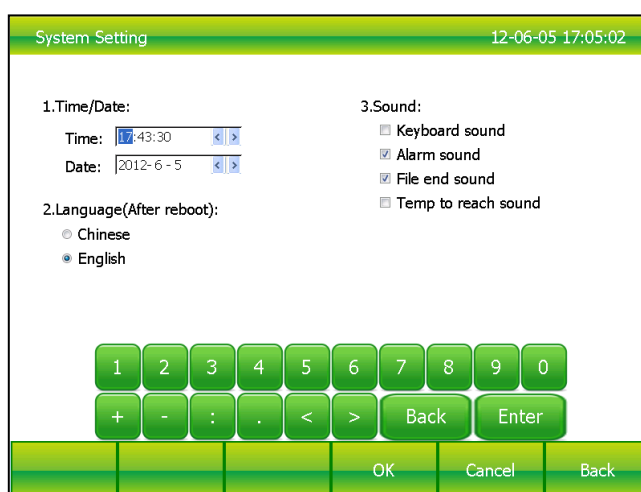


Figure 21. System parameter setting.

#### 1) Time and date

System time and date setting

#### 2) Language

System supports English only.

### 3) Sounds

- Keyboard sound — sound when touch button.
- Alarm sound — sound when system error occurs.
- File end sound — sound when File running is complete.
- Temp sound — sound when the target temperature is reached.

## 5. Tools

Touch “Tool” button in the Home screen to enter Tools screen (Figure23).

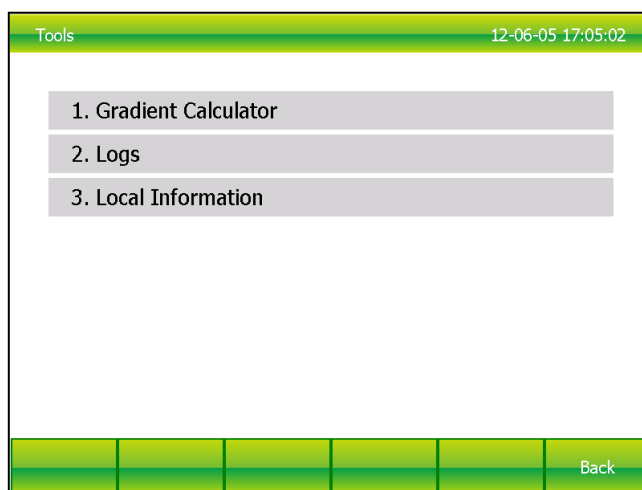


Figure 22. Tools menu

### 5.1.Gradient calculator

The temperature value for each column is shown after entering the block target temperature and gradient range (Figure 23).

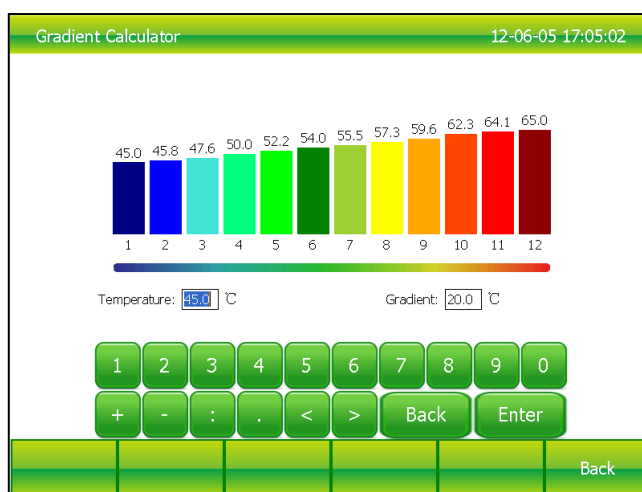


Figure 23. Gradient calculator

## 5.2.Logs

System logs name, running starting time, and times of test for each file. Maximum 1000 logs can be recorded and the system will remove older logs once the capacity is excess (Figure 24).

Logs			12-06-05 17:05:02
Log files	Start time	Source files	
Log77	2012-6-5 18:01	ST3.TD	
Log76	2012-6-5 17:37	Grad.td	
Log75	2012-6-5 15:41	GrADf.td	
Log74	2012-6-5 14:12	t3.td	
Log73	2012-6-5 14:12	t3.td	
Log72	2012-6-5 14:07	t3.td	
Log71	2012-6-5 14:00	t3.td	
Log70	2012-6-5 13:29	t3.td	
Log69	2012-6-5 13:22	t3.td	
Log68	2012-6-5 12:49	t3.td	
Log67	2012-6-5 11:44	t3.td	
Log66	2012-6-5 11:33	t3.td	
Log65	2012-6-5 11:25	t3.td	
Log64	2012-6-5 11:05	t3.td	
Log63	2012-6-5 10:32	t3.td	
Log62	2012-6-5 10:24	t3.td	
Log61	2012-6-5 10:22	t2.td	
Log60	2012-6-5 10:20	t1.td	
Log59	2012-6-5 10:12	t1.td	
Log58	2012-6-5 10:07	TCH-DOWN.TD	

Page 1 of 4, 77 records, Total times:77

PgUp PgDn Back

Figure 25. Local information.

## 5.3.Local information

Show the IP address and block type (Figure 25).

Local Information		12-06-05 17:05:02
IP address:	192.168.55.101	
Block type:	96x0.2ml	

Back

Figure 24. Run logs.

## 6. Incubate

Touch “**Incubate**” button in the **Home** screen to enter **Incubate Setup** screen (Figure 26).

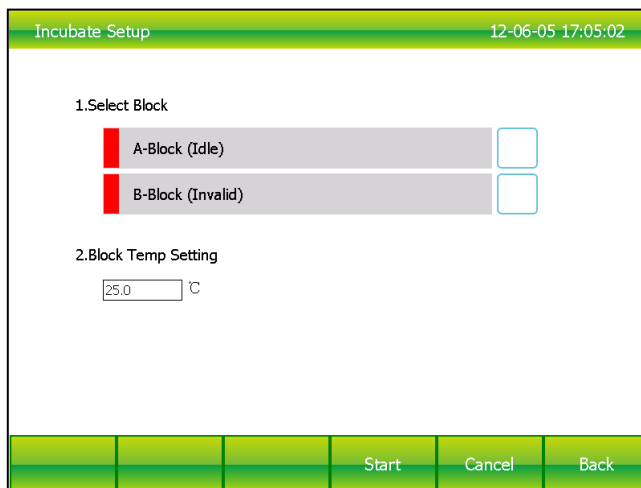


Figure 26. Incubate setup

Incubation function maintains steady block temperature for unlimited period. First, select the desired blocks in the **Incubate Setup** screen (Figure 26) and enter block temperature, then touch “**Start**” button to enter **Incubate Running** screen (Figure 27).

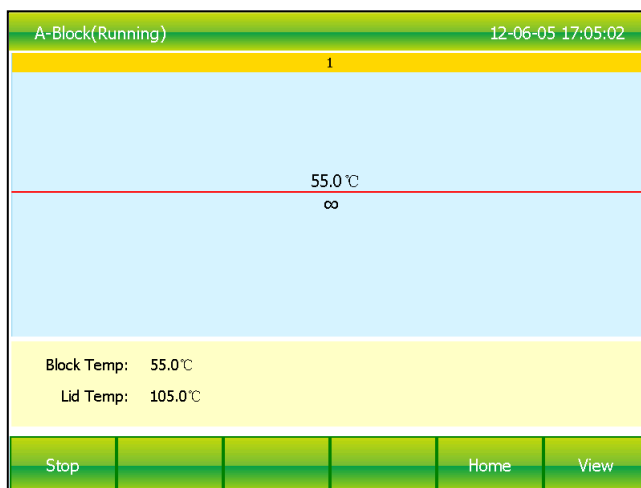


Figure 27. Incubate running

## CHAPTER 3 MAINTENANCE & TROUBLESHOOTING

### 1. Maintenance

#### 1.1. Cleaning

- Clean the holes on reaction block with neutral soap solution (Do not use any solvent contains alkali, alcohol or organic solution)
- Spaces near the left, right air vents and under the machine should be always kept free. It is important to clean the dust around air vents regularly.
- Clean reaction block regularly and remove any residue inside cavities to prevent any affects to the temperature control. (soft cloth advised).
- Soft cloth can also be used to scrub the dirty spots of the machine surface.

---

**Warning!** Turn off the power during cleaning.

Corrosive solvent is not allowed for cleaning the surface.

---

#### 1.2. Replace fuse

The machine has two fuses. Once damaged, please replace damaged fuses with following steps.

- 1) Turn off the machine and unplug power source.
- 2) Unscrew the fuse box with flat screwdriver and replace the damaged fuses with new 8A 250V fuses. After replacement, screw back in the fuses box.



Attention: please contact your local distributors when encountering any problem replacing fuses.

---

### 2. Troubleshooting

#### 2.1. Dissatisfactory Results

Biological, programmatic and hardware problems may contribute to any unsatisfied results of experiment. In order to distinguish the hardware problems from other possible



problems, the machine is equipped with built-in self-test hardware and self-diagnosis software. Below is the detailed description. According to the experiences, most problems are related to biological and programmatic factors.

- 1) Incorrect or insufficient reactants.
- 2) The temperature is too high or too low. It is suggested to set the temp. within range of 90-95°C for 40 seconds. The duration can be adjusted in accordance with reaction volume.
- 3) "Annealing" temperature is too high or too low. It is better to between 55-70 ° C and 20 to 30 chains.
- 4) The reactant concentration is too high or too low.
- 5) Lack of special treatment during preparations.
- 6) Time and temperature programming are not appropriate.
- 7) Sample temperature is slightly too low and the block temperature is slightly too high.
- 8) Check whether the PCR tubes are well placed. Smearing little mineral oil on the surface of holes will increase the thermal conductivity.

## **2.2. Self-test hardware and self-diagnosis software**

The machine will run the self-test program when booting.

## **3. Notices**

### **3.1. Power**

- 1) No special requirements for the power source. Any AC power source within range of 85V~264V is applicable. However, to prevent from causing any damage to the machine, it is better to apply low voltage fluctuation power sources, otherwise, power source regulator should be applied.
- 2) It is strictly prohibited to terminate a running experiment by cutting off the power. Doing so will be very harmful to the machine.

### **3.2. LCD touch screen**

Do not UV sterilize the LCD screen to prevent causing any damage. Avoid any bump or scratch to the LCD screen while using.

### 3.3. Notice on cleaning

Please avoid any liquid getting inside the machine while cleaning reaction block. Due to the possible usage of radioactive substance during experiment, please carefully handle cleaning.

Please do not operate and use the machine in moisture or hot environment.



**Attention :** Please do read the Notices carefully to prevent causing any damage to the machine.

## 4. Error message & solution

No.	error message	Cause and solution
1	File name empty	Null character can not be used for file name
2	Same file name, Please re-name	Do not support multiple files with same file names
3	Module sensor 1 short circuit	Hardware problem, contact certified mechanic for repair
4	Module sensor 1 open circuit	Hardware problem, contact certified mechanic for repair
5	Module sensor 2 short circuit	Hardware problem, contact certified mechanic for repair
6	Module sensor 2 open circuit	Hardware problem, contact certified mechanic for repair
7	Module sensor 3 short circuit	Hardware problem, contact certified mechanic for repair
8	Module sensor 3 open circuit	Hardware problem, contact certified mechanic for repair
9	Module sensor 4 short circuit	Hardware problem, contact certified mechanic for repair
10	Module sensor 4 open circuit	Hardware problem, contact certified mechanic for repair
11	Radiator sensor short circuit	Hardware problem, contact certified mechanic for repair
12	Radiator sensor open circuit	Hardware problem, contact certified mechanic for repair
13	lid sensor short circuit	Hardware problem, contact certified mechanic for repair
14	lid sensor open circuit	Hardware problem, contact certified mechanic for repair
15	Power output short circuit	Hardware problem, contact certified mechanic

		for repair
16	Block temperature too high	Air flow vent is blocked or circuit problem or need repair
17	Block temperature too low	Environmental temperature is too low or circuit problem or need repair
18	Heat Sink temperature too high	Air flow vent is blocked or fan problem or need repair
19	Heat Sink temperature too low	Environmental temperature is too low or circuit problem or need repair
20	Hot Lid temperature too high	circuit problem or need repair

## 5. Cause of the abnormal phenomenon & solution

No.	Description of problem	Cause and solution
1	No display after booting	Check whether the plug is inserted correctly and check the power output. Please turn off the machine and disconnect the plug to check the fuse.
2	After power on, the machine start running the program	The power was shut down before the previous program is completed
3	The fan runs fast some time, slows down some time	Normal, The fan is for cooling the heating pump not for reaching the targeted temperature
4	Slight pat or squeak sound while machine is running	Normal. The sounds are from the power switch mechanism when quick cooling or heating is needed.
5	Slow increasing or decreasing temp.	Check the settings of heating and cooling rate and check whether the fan is operating normally
6	Wrong display appeared one LCD screen	Caused by electrostatic pulse or power surge, please turn off and then turn on the machine. It will not affect program running.



Please contact the local distributor in time if the above problems can't be solved.

