

Labnet™ MultiGene™ OptiMax Thermal Cycler

Instruction Manual

Catalog Numbers:

TC9610

TC9610-230V



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1.0 Introduction

The Labnet™ MultiGene™ OptiMax is a powerful, reliable, and affordable thermal cycler. It is equipped with a gradient function that enables the user to set a maximum 24°C temperature gradient between the BLOCK #1 to BLOCK #6 (16-well/block).

NOTE: This instrument is licensed for research and development and for uses other than human *in vitro* diagnostics.

1.1 Features

- ▶ Easy-to-operate slide and lever type lid which prevents accidental skin burn.
- ▶ Large LCD panel enhances visibility and ease-of-operation.
- ▶ Graphic display makes programming quick and simple.
- ▶ Simple and easy to use graphical interface.
- ▶ Extended Temperature return function that makes touch down possible.
- ▶ Gradient function enables optimization of annealing temperatures.
- ▶ Preset protocols that make starting amplification easier.
- ▶ Air intake vents on the front and sides and exhaust vents on the rear that reduce heat-based interference with other equipment.
- ▶ Interchangeable blocks.
- ▶ Automatically creates operating history and error logs.
- ▶ Heated lid to prevent condensation.
- ▶ Robust and attractive design.
- ▶ Auto restart after power failure.

2.0 Symbols and Conventions



Electrical warning symbol indicates the presence of a potential hazard which could result in electrical shock.



Indicates a potential risk and alerts you to proceed with caution.



CAUTION: To avoid accidental bodily harming or burning be very careful touching the heated block. It can be very hot after it is used at high temperatures. Allow the metal parts to cool down before handling.

3.0 Safety Information

Before using the Labnet MultiGene OptiMax thermal cycler for the first time, please read this entire instruction manual carefully. To guarantee problem-free, safe operation of the thermal cycler, it is essential to observe the following points.

- ▶ Do not use the machine in a potentially explosive environment or with potentially explosive chemicals.
- ▶ Install the machine in a location free of excessive dust.
- ▶ Avoid placing the machine in direct sunlight.
- ▶ Choose a flat, stable surface capable of withstanding the weight of the machine.
- ▶ Install the machine in room temperature 15°C to 30°C, relative humidity 20% to 80%.
- ▶ DO NOT block the air vents.
- ▶ Keep the side and rear of the machine at least 30 cm from the wall or other machines.
- ▶ Make sure the power source conforms to the required power supply specifications.
- ▶ To avoid electric shock, make sure the machine is plugged into a grounded electrical outlet.
- ▶ Do not allow water or any foreign objects to enter the various openings of the machine.
- ▶ Switch off the machine before cleaning or performing service on the machine, such as replacing the fuses.
- ▶ Repairs should be carried out by authorized service personnel only.

4.0 Specifications

Sample capacity	0.2 mL x 96 tubes
Temperature ranges	4°C to 99.9°C
Temperature accuracy	±0.5°C (at 30°C to 99.9°C)
Temperature uniformity	±0.5°C
Max. temp. increment/decrement rate	4°C/3°C
Gradient temperature	30°C to 99°C (max. temp. difference: 24°C)
Max. lid temperature	60°C to 65°C/100°C to 115°C
Protocol capacity	200 sets
Environmental conditions	15°C to 30°C, 20% to 80% RH
Power supply	100 to 240V AC, 50/60 Hz, 750VA
Dimensions (W x D x H)	9.5 x 9.8 x 16.5 in. (24 x 25 x 42 cm)
Weight	19.8 lbs. (9 kg)

The Labnet™ MultiGene™ OptiMax thermal cycler is designed to be safe at least when operated under the following conditions:

- Indoor use
- Altitude up to 2,000 meters
- Pollution Degree 2

5.0 Controls

The front panel of the Labnet MultiGene OptiMax thermal cycler includes a display panel and keypad which consists of function keys (F1 to F5), alphanumeric keys, directional arrow keys and the ENTER key.

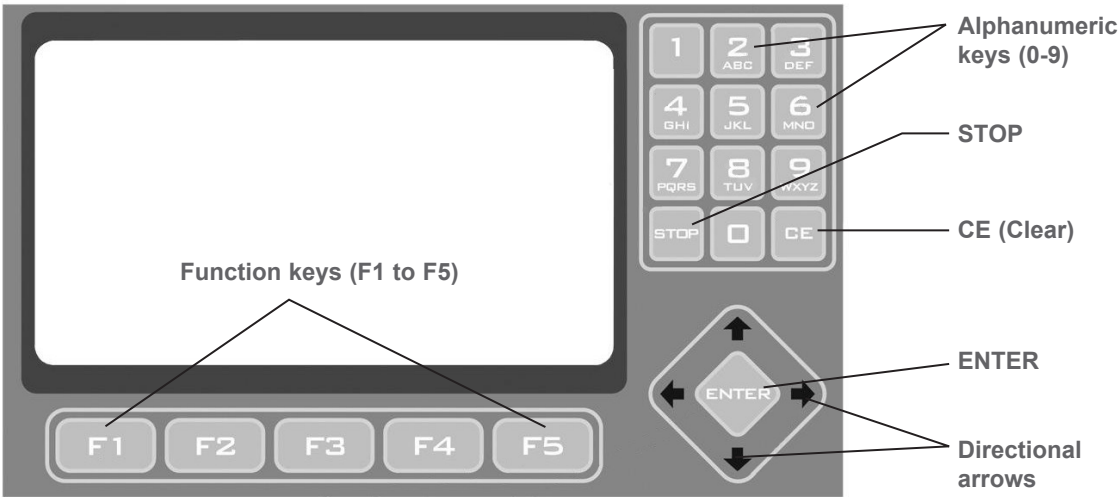


Figure 1. Front panel overview.

Function keys (F1 to F5)	To make selections in screen display. Use the function keys (F1 to F5) to activate the “button” displayed on the screen above the key; for example, F1 for RUN.
Alphanumeric keys (0-9)	Usually used as number keys for the entry of time, temperature, password, and cycle numbers. When entering a user name or protocol name, a small screen will display the letters after pressing the Alphanumeric keys. Press the selected key until the desired letter is highlighted. Press ENTER to select the letter or wait 5 seconds.
STOP	To stop running methods. By pressing STOP, the Protocol currently running will be terminated.
CE (Clear)	To clear any entered information. Pressing the CLEAR key will erase the entry in an input field.
ENTER	For confirming entered information and selecting functions.
Directional arrows	To move cursor and move between pages.

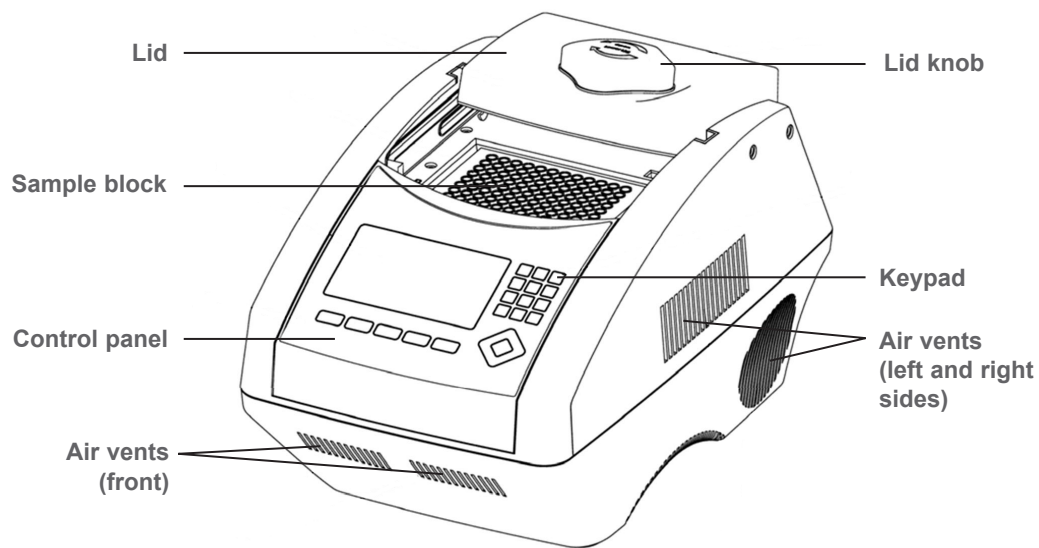


Figure 2. Front view.

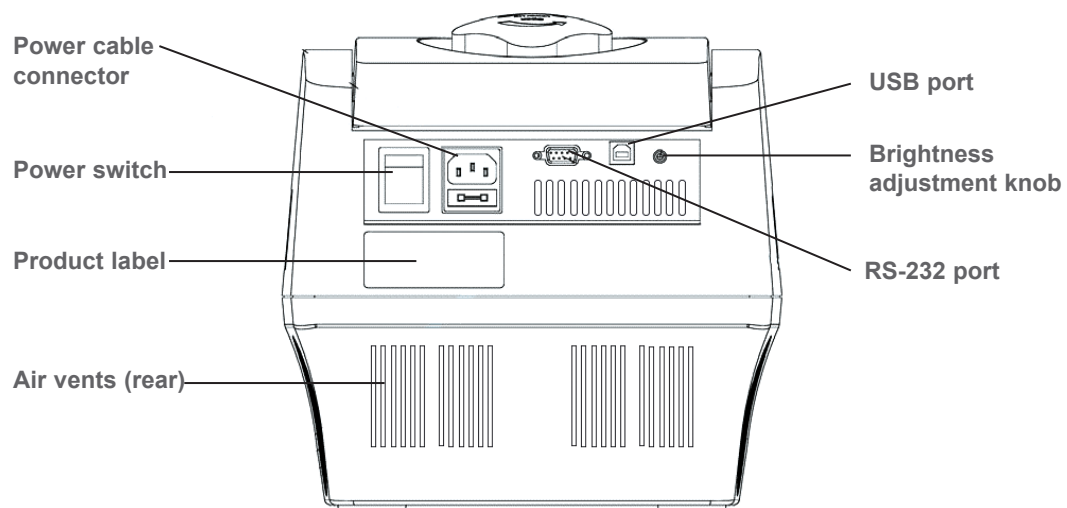


Figure 3. Rear view.

Lid	The lid has a heating pad that is designed to protect against evaporation resulting from the heating of the reaction tube and reaction plate.
Sample block	Section of the unit in which sample tubes and plates are placed.
Control panel	Includes Display and Keypad.
Lid knob	Rotate the lid knob clockwise to lower the heating plate to place pressure on the cap of the tubes. This forces the tubes to sit firmly in the block for better contact. Rotate the lid knob counterclockwise until the lid opens. Only after the lid opens, can users slide the lid to the rear.
Keypad	To enter the various protocols and settings.
Air vents (front)	For air output.
Air vents (left and right sides)	For air output.
Air vents (bottom)	For air intake.
Power cable connector	Power cable socket and fuse.
Power switch	Power On/Off switch.
Product label	Indicates the model name, serial number, power specification, and other important information.
Air vents (rear)	For air output.
USB port	For run summary download to computer.
Brightness adjustment potentiometer	Controls the brightness of the LCD panel. Use Phillips head screwdriver to adjust it.
RS-232 port	For run summary download to computer.

6.0 Getting Started

6.1 Unpacking

Open the Labnet™ MultiGene™ OptiMax thermal cycler package, and confirm that all items listed below are included:

- ▶ Labnet MultiGene OptiMax thermal cycler unit
- ▶ Electric fuses (7A and 3.15A)
- ▶ AC power cord
- ▶ Instruction manual

If there are any items missing, damaged, or incorrect items, please contact your distributor or sales representative immediately.

NOTE: Use 7A fuse in power source 100-120, 50/60Hz countries, while 3.15A fuse is for power source 200-220V, 50/60Hz countries.

6.2 Initial Operation

Place the machine on a steady, flat table. Please keep the machine at least 30 cm from the wall or other machine. Check the power source is compatible with your machine's fuse rating input. Connect the power cord to the power socket in the rear of the machine.

Press the Power On/Off switch to turn on the machine. The screen will show the software version for 10 seconds, and then will enter the User Folder screen. Pressing any key will go to the User Folder screen immediately.

6.3 Heated Lid

The heated lid heats the air in the upper part of the sample vessels at a higher temperature than the reaction mixture. This prevents condensation of the evaporated water vapor on the vessel walls, keeping the concentration unchanged during the heating and cooling cycles. The top also places pressure on the caps of tubes and film on titer plates to prevent vapor loss and cross-contamination of samples.

NOTES:

- ▶ If the thermal cycler is started cold, approximately 2 to 3 minutes will be required before the heated lid is at operating temperature.
- ▶ To avoid heat dissipation, the heated lid should be closed and tightened during a protocol run. Keeping the heated lid open during a protocol run might cause HEATER ERROR, because the heated lid fails to reach the set temperature.
- ▶ To evaporate the condensation water inside the sample block, and to avoid HEATER ERROR, users should turn off the Lid Temperature under the SYSTEM mode before heating the sample block and keeping the lid open.

6.4 Lid Opening/Closing

There are two ways to open the lid: 1) Slide the lid to the rear. This method is recommended for common operations and to prevent the skin burning from the heated lid. 2) Lift up the lid. This method is used to clean up the heating plate of the lid.

Rotate the lid knob clockwise to lower down the heating plate and press down on the cap of the tubes, tighten until you feel resistance. This adjustment will provide better contact between the tube or plates and the block for better performance. Rotate the lid counterclockwise (Figure 4) until the lid opens. Only when the lid opens, the users can slide the lid to the rear (Figure 5). To lift up the lid for the heating plate cleaning (Figures 6-8).

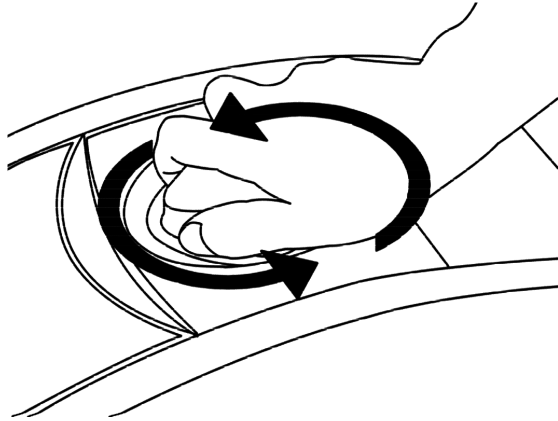


Figure 4. Rotate the lid knob to open the lid.

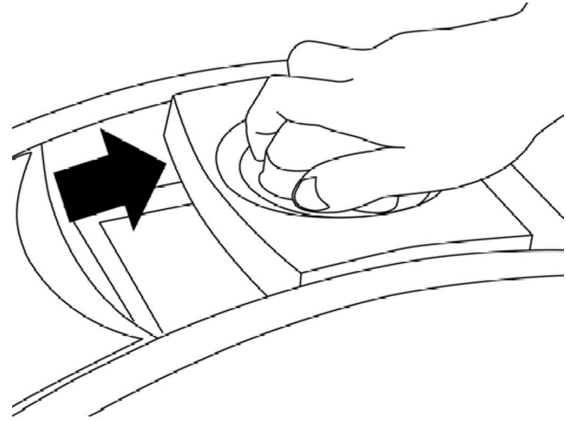


Figure 5. Slide the lid backward to access the block.



Figure 6. Slide the lid to align the lid hinge with the notches of the top case.

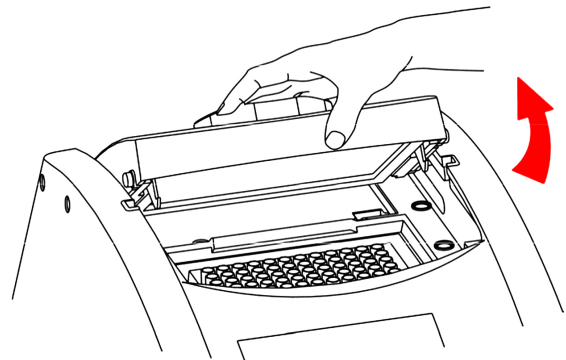


Figure 7. Lift the lid.



Figure 8. Rest the lid in a vertical position.

6.5 Function Map

The User Screen includes 5 function options:

1. OPEN folders under selected User folder
2. NEW (Create) a User
3. EDIT a User
4. DELETE a User
5. SYSTEM

Once a user folder is selected and the password is approved, users can:

- ▶ RUN a Protocol
- ▶ NEW (Create) a protocol
- ▶ EDIT (VIEW) a Protocol
- ▶ DELETE a Protocol

The function map is shown in Figure 9. Various functions, including Gradient, can be added to the selected/created Protocol.

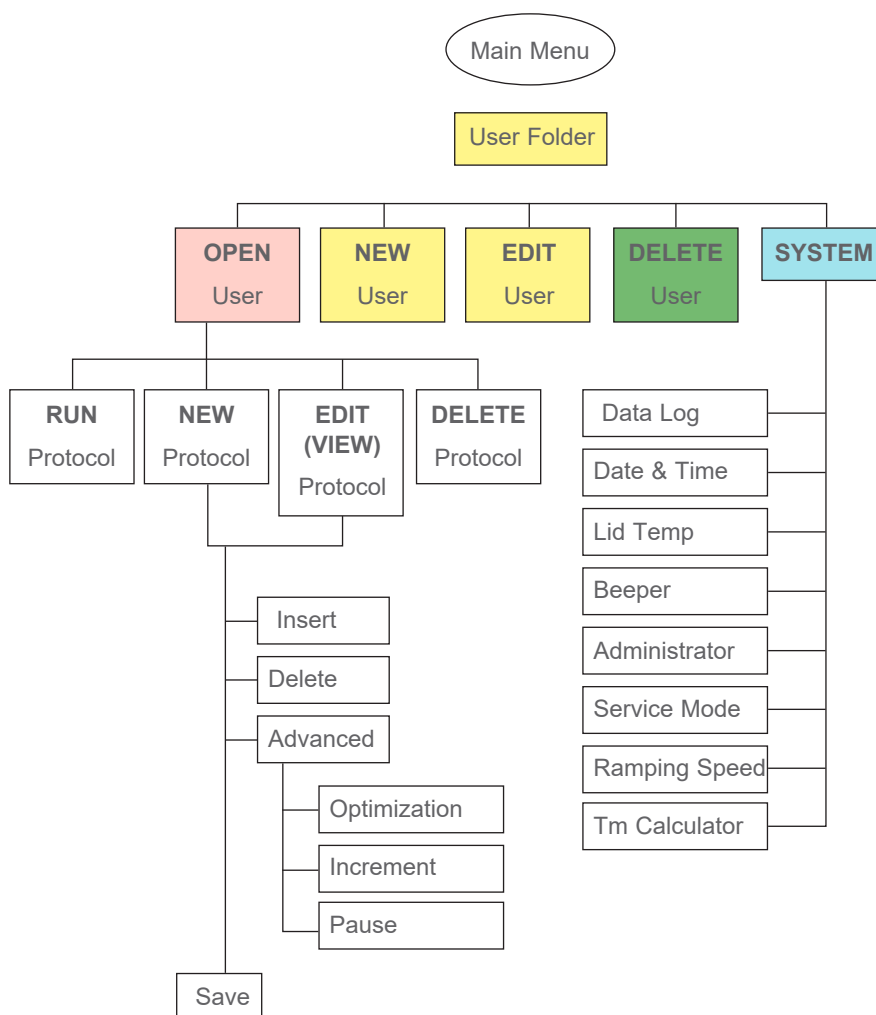


Figure 9. Operation flowchart.

6.6 Key Entry System

The alphanumeric keys are assigned multiple characters, selectable by repeatedly pressing the key to cycle through the available characters. After a very short period of time, if users don't continue to press the key, the highlighted character or number will automatically be entered into the name of a newly created or edited Protocol (or User).

Key Representation	Key No.
0, space, +, =, <, >, &, (,), %	0
1, ., , , -, ? , ' , # , : , ; , /	1
A, B, C, a, b, c, 2	2
D, E, F, d, e, f, 3	3
G, H, I, g, h, i, 4	4
J, K, L, j, k, l, 5	5
M, N, O, m, n, o, 6	6
P, Q, R, S, p, q, r, s, 7	7
T, U, V, t, u, v, 8	8
W, X, Y, Z, w, x, y, z, 9	9

6.7 Loading the Reaction Vessel

For the optimal performance of the MultiGene thermal cycler, we recommend Labnet tubes and plates. The recommended sample volume for 0.2 mL tubes or 96-well microplates is 5-100 µL. If using the heated lid with full skirted 96-well microplates it is highly recommended to use a silicone compression mat.

NOTE: To avoid deformation of the sample tubes or strips, it's important to load at least one tube in each of the four corners and at least four tubes in the center of the block, as this will distribute the pressure evenly throughout the surface.

7.0 User Folder Management

After the unit is turned on, the initial screen which contains software version and manufacturer's name will show up for 10 seconds, and then will enter User Folder screen. Pressing any key will go to User Folder screen immediately.

Directory — USER FOLDERS 8/21/2022 11:00

User folder name — [PRESET]
[PUBLIC]
Lab
Mike
Susan
Jeff

Date and time —

Status bar — Select a user folder

OPEN NEW EDIT DELETE SYSTEM

F 1 F 2 F 3 F 4 F 5

Users can use the Function Keys (F1-F4) above to view, create, edit, and delete the User folders. F5:SYSTEM is used for system settings.

NOTES:

- ▶ The [PRESET] and [PUBLIC] folders are pre-registered folders which require no Personal Identification Number (PIN) to enter.
- ▶ The [PRESET] folder includes some frequently-used Protocols defined by the vendor, while the [PUBLIC] folder is open to all users.

7.1 Viewing a User Folder

All Protocols are stored inside the User folders. Use the directional arrow keys to select a User folder. Press F1:OPEN to view the names of all Protocols inside the selected folder. To view the contents of the User, you will need to enter the 4-digit Personal Identification Number (PIN) as shown in the screen below. After the PIN is entered, press F1:ACCEPT or the ENTER key to confirm the PIN. To run a Protocol, see Section 8.1.

USER FOLDERS>Mike8/21/202211:00

Please enter PIN:

Enter PIN and press ACCEPT, Press ACCEPT if not PIN protected.

ACCEPTEXIT

F 1

F 2

F 3

F 4

F 5

7.2 Creating a New User Folder

Under User Folder screen, press F2:NEW to create a new User folder. After entering the new User name, press F1:ACCEPT to accept the new User folder name. The MultiGene thermal cycler will prompt you to enter a 4 digit PIN. Press F1:ACCEPT to save the new folder name and PIN.

User folder name: 12 characters max.

User folder no.: 50

7.3 Editing a User Folder

Under the User Folder screen, use the directional arrow keys to select a User folder. Press F3:EDIT to edit the User name. A PIN is required to edit the User folder name. After editing the User folder name, press F1:ACCEPT to save the edited User name.

7.4 Deleting a User Folder

Use the directional arrow keys to select a User folder. Press F4:DELETE to delete the selected User folder. You are required to enter the PIN, and press F1:ACCEPT or ENTER. The screen will prompt "Do you want to delete". Press F1:ACCEPT to confirm the deletion. Press F5:EXIT to abort the deletion.

NOTE: User folders which contain any protocols can't be deleted except by the administrator.

8.0 Protocol Management

After entering the selected User folder, users can press F1-F4 keys to Run, New (Create), Edit (View), and Delete a selected Protocol as shown below.

Mike>PROTOCOL 8/21/2022 11:00

PROTOCOL	DATE	TIME
Touchdown	07/25/11	09:10:20
Lab	07/28/11	03:25:30

Please select a protocol and press

RUN

NEW

EDIT

DELETE

EXIT

F 1

F 2

F 3

F 4

F 5

8.1 Running a Protocol

1. Press F1:RUN to run the selected Protocol under the User folder screen. The screen will show as below.

Mike>Lab>RUN 8/21/2022 11:00

1 Tmp

3 Tmp

25 Cyc

2 Tmp 1 Cyc

Temp	94.0	94.0	55.0	72.	72.00	4.00
Time	5:00	0:30	0:30	0	10:00	∞

Mode:1 (1-2) Volume: 50ul (5-100ul)

1:Tube Control 2:Block Control

START

EXIT

F 1

F 2

F 3

F 4

F 5

2. Users are required to select a Temperature Control Mode before running the Protocol.

- **Mode 1 (Tube Control):** Enables system operation with simulated temperature control. If Mode 1 is selected, users are required to input the sample volume: 5-100 μ L. In this mode, the temperature control is based on Block temperature and an algorithm which estimates the sample temperature based on the block temperature and the sample volume. Recommended for more accurate temperature control.
- **Mode 2 (Block Control):** Enables system operation with maximum temperature control based on the actual Block temperature. Recommended for normal operation.

3. Press F1:START to run the Protocol.

NOTES:

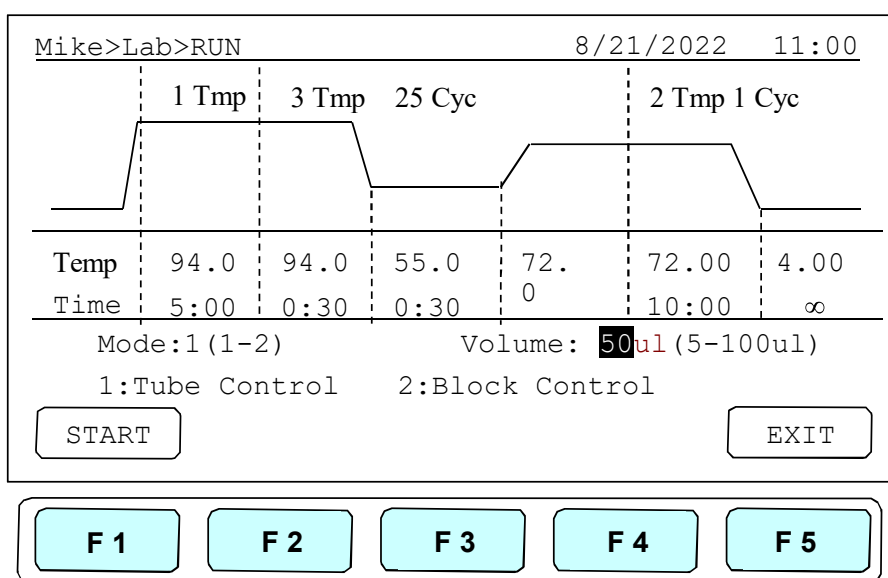
- ▶ The highlighted temperature (Temp) value represents the current block temperature during Protocol running. The highlighted time (Time) value below represents the remaining running time in the temperature segment. Once the countdown is completed, the highlighted section will continue to move to the next temperature or cycle segment and start counting down the time.
- ▶ The lid temperature will flash on the status bar when the Protocol starts and remain on until it reaches 50°C. When the lid reaches 50°C “HOT!” will appear in the right hand corner and remain until the temperature falls below 40°C. The sample block will start to heat up when the lid temperature reaches its set temperature.

8.2 Pause a Protocol

While the Protocol is running, press F1:PAUSE to pause the running Protocol for 10 minutes. The Protocol will continue after the Pause stops. The Protocol won't be paused until the set temperature is achieved. To resume running the Protocol, press F1:RESUME.

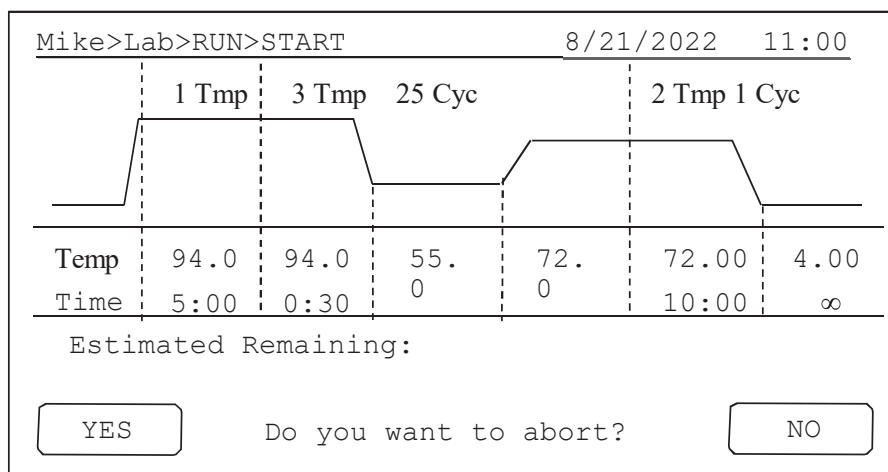
8.3 Viewing Running Protocol Information

Press F2:INFO during operation to view the Protocol information screen as shown below. Press F5:RETURN to return to the running Protocol screen. If F5:RETURN is not pressed the Protocol information screen will return to the running Protocol screen in 3 minutes.



8.4 Terminating a Protocol

1. Press F5:EXIT or STOP key in the bottom-left side of the Alphanumeric keypad to terminate a running protocol.
2. A message will display, “Do you want to abort?” as shown below.
3. Press F1:YES or STOP key again to terminate the Protocol. Press F5:NO to return to the running Protocol.
4. The display screen will return to Protocol screen.

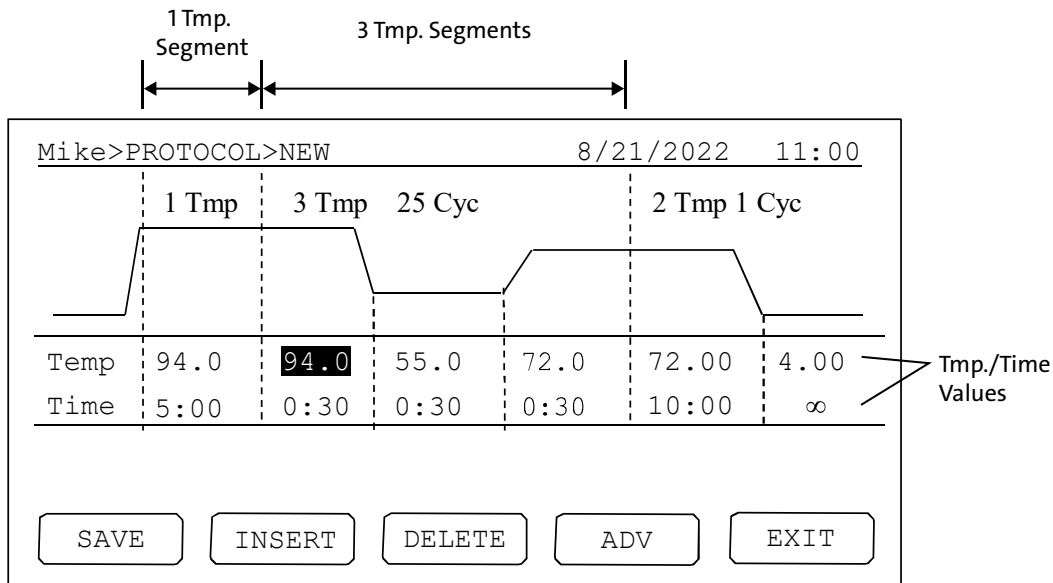


9.0 Creating a New Protocol

A new Protocol can be created by going to the User folder and selecting and editing a basic Protocol format, and then assigning it a new name.

1. Select User name on the User screen. Press F1:OPEN or ENTER.
2. Key in PIN to enter the User's folder.
3. Press F2:NEW to create a new Protocol by using a standard template, shown below.

NOTE: Users can create a new Protocol under the Public folder without a PIN. Users can edit a new Protocol inside the Preset folder, but cannot not save these changes to the original Protocol settings.



9.1 Changing Temperature/Time Values

1. Press the directional arrows to move the cursor to the temperature or time settings required to be changed.
2. Enter your desired values and press the settings.

The temperature and time ranges are shown below.

Temperature range: 4°C to 99.9°C

Time range (minute:second): 00:01 to 99:59 (99:99 = ∞)

9.2 Inserting/Deleting Temperature Segment

Temperature Segment can be inserted or deleted by selecting F2:INSERT or F3:DELETE. The inserted or deleted temperature segment is dependent upon the location on the temperature segment where the cursor is positioned. If the cursor is positioned inside the first multi-temperature/time segment, pressing F2/F3 will insert/delete the whole Multi-Temperature Cycle. If the cursor is located in any other Multi-Temperature/Time segment only the selected segment will be inserted/deleted.

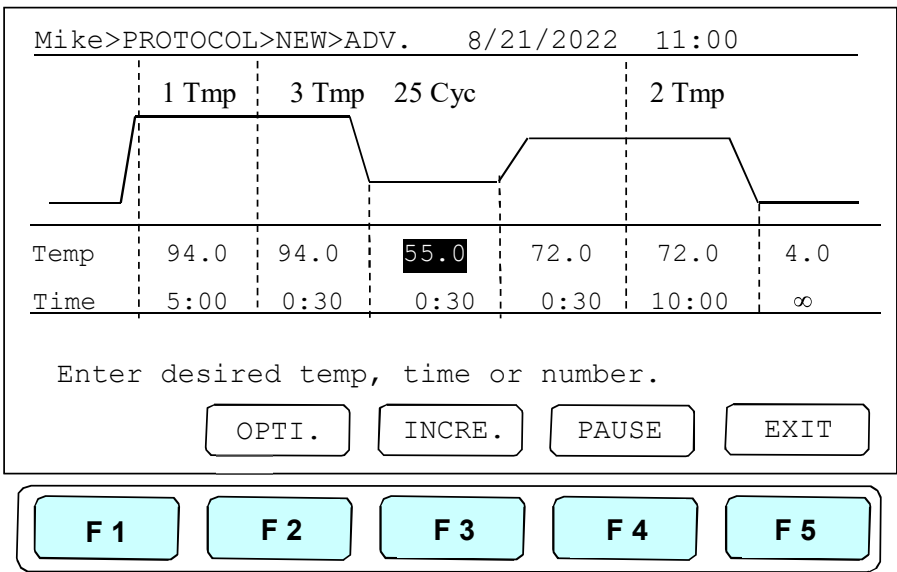
9.3 Changing Temperature Segment Count (Temp) and Cycle Count (Cyc)

The Temperature Segment Count (Temp) can be modified by entering a new value (1 to 20) in the first Temperature position and pressing ENTER. When the Temperature Segment Count is larger than one, the temperature Cycle Count (Cyc) will appear. The Multi-Temperature Segment will cycle during this segment. The maximum temperature segment per protocol is 12 segments. The temperature segment count and cycle count ranges are shown below.

- **Temperature segment count (temp.) range:** 1 to 20 cycle
- **Count (Cyc) range:** 1 to 99

9.4 Advanced Settings

Users can set up the following advanced functions: 1) Optimization, 2) Temperature/Time Increment/Decrement, 3) Pause. F4:ADVANCE button, is used to enter these settings. The screen below will be displayed.



9.4.1 Optimization Temperature Setting

- 1. To enter an Optimization Temperature setting, place your cursor on the desired Temperature Segment. Select F2:OPTI to enter the screen below.
- 2. The temperatures of all BLOCK offset are based on BLOCK #1. If you press F2:AUTO to set gradient temperature, each BLOCK will automatically add 4°C based on the preceding BLOCK. Prior to pressing F3:AVG. users need to enter BLOCK #6 setting, and the screen will show the calculated temperature gradient from BLOCK #1 to BLOCK #6 as show in Figure 10. This reflects the variation of the temperature from BLOCK #1 (coolest) to BLOCK #6 (hottest).
- 3. All temperatures are based on BLOCK #1, and users can move the cursor to press any higher temperature (Range: 0.1°C to 24.0°C) on BLOCK #2 to BLOCK #6.
- 4. Press F5:EXIT to confirm the settings. Press F1:OFF to re-enter the settings. A capital letter and High-temperature value; "G70.0", will appear on the Temperature Segment graph and Low-temperature value will be shown on the Temp value of the section.

To remove the Optimization Temperature setting, place your cursor in the same temperature segment with "G" Gradient Temperature symbol. Press F2:OPTI again. The screen will show each BLOCK temperature settings. Press F1:OFF to clear the Optimization Temperature setting. Press F5:EXIT will delete the Gradient Temperature setting and its symbol.

Optimization temperature ranges

- Temperature setting range: 30.0°C to 99.0°C
- Temperature difference: 0.1°C to 24.0°C

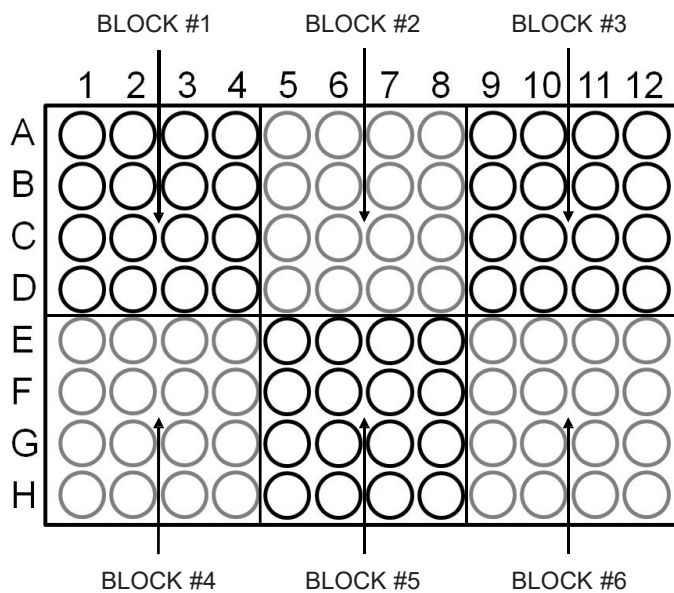


Figure 10. Block layout of 96-well model.

Mike>PROTOCOL>NEW>OPTI
8/21/2022
11:00

Block	#1	#2	#3
	50.0	54.0	58.0

Block	#4	#5	#6
	62.0	66.0	70.0

All Offset is base on BLOCK #1

OFF
AUTO
AVG.
EXIT

F 1
F 2
F 3
F 4
F 5

9.4.2 Incremental/Decremental Temperature and Time Settings

To increase or decrease the dwell time or temperature after each repeat you must have more than one cycle repeat (i.e., 55°C and a dwell time 40 seconds, you could decrement the second step by 5 seconds. The second step would be 55°C and a dwell time of 35 seconds).

1. Place the cursor at the Temperature or Time values. Press F3:INCRE.
2. Select increment/decremental values. The screen will ask to input the increment values. Press F3 + or F4 to choose increment or decrement.
3. Enter your desired values, and press ENTER. The graph will show the increment/decrement values.
4. To accept the values, press F1:ACCEPT. Or, to re-enter the values, press F2:CLEAR.

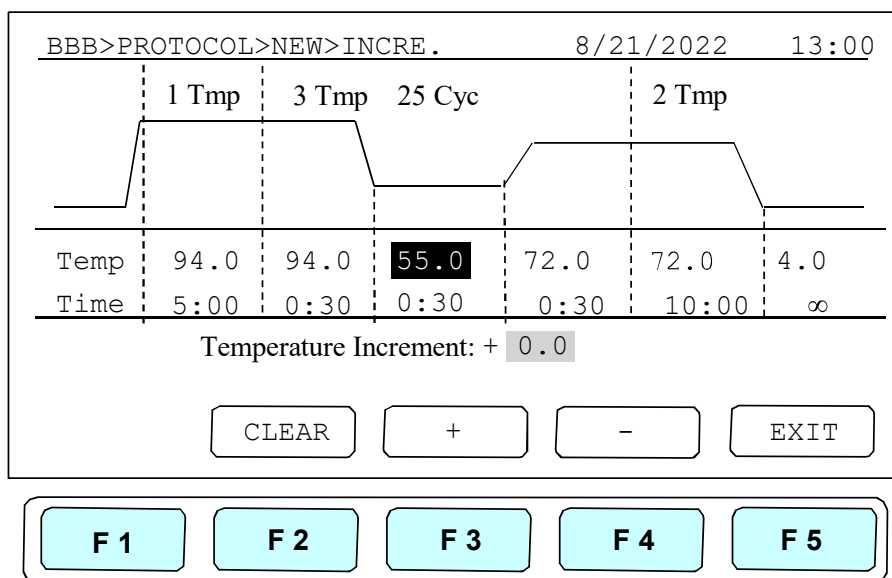
To remove the Incremental/Decremental Temperature and Time settings, place the cursor in the temperature segment with Incremental/Decremental Temperature and Time values. Press F2:CLEAR to clear the values. Pressing F1:ACCEPT will remove the incremental/Decremental Temperature setting and its symbol.

Temperature Increment

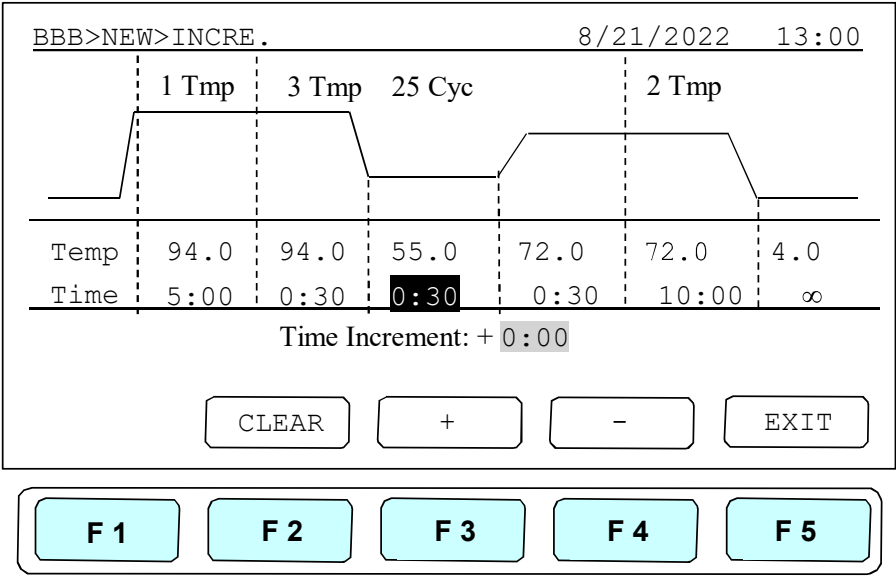
- Max. Temperature incremental value: $\pm 9.9^{\circ}\text{C}$
- Max. Time incremental value (minute:second): $\pm 9:59$

NOTES:

- Temperature limits 4.0°C to 99.9°C. DO NOT exceed.
- Only Multi-cycle segments will have incremental/decremental time or temperature function.



Time Increment



9.4.3 Pause Setting

Position your cursor on the desired temperature segment. Press F4:PAUSE to add a pause action during operation. Pause will appear on the Temperature Segment graph. The Pause will last for 10 minutes, then the Protocol will resume the operation. To remove the Pause setting, place the cursor under "P." Pause symbol. Press F4:PAUSE again to remove the Pause setting and its symbol.

9.5 Saving a Protocol

After all settings are entered, press F1:SAVE to store the protocol. Screen will Prompt "Please enter protocol name". A Protocol name is required to be entered.

Max. Protocol name: 12 characters.

10.0 Editing (Viewing) a Protocol

An editing Protocol can be saved under a new name (newly created Protocol) or under the same name (edited Protocol). Under the User's Folder, choose the Protocol to be edited. Select F3:EDIT to edit the selected Protocol. This displays the existing Protocol and enables editing of the temperature segment and numerical values as shown below.

Refer to Section 9 Creating a New Protocol to edit the temperature segment and numerical values, and other advanced functions.

Press F1:SAVE to save the edited Protocol under the original name or F2:SAVE A to as a new protocol.

A>Mike>EDIT8/21/202211:00

Program name:A

Key0 (0+=<>&()%)

Key1 (1.,-?'#:/)

Maximum: 12 characters

SAVE

SAVE AS

CLEAR

EXIT

F1

F2

F3

F4

F5

11.0 Deleting a Protocol

1. An existing Protocol can be deleted under a User's Folder.
2. Under the User's Folder screen, choose a Protocol. Select F4:DELETE to delete the selected Protocol.
3. If F4:DELETE is selected, the screen will prompt you "Are you sure you want to delete?" To confirm the deletion, press F1:YES. To abort the deletion, press F5:NO.

NOTE: Protocols in the Preset Protocols Folder can't be deleted, while Protocols in the Public Folder can be deleted by any user if not password protected.

MIKE>PROTOCOL8/21/202211:00

PROTOCOL	DATE	TIME
Touchdown	07/25/11	09:10:20
Lab	07/28/11	03:25:30

Are you sure you want to delete?

YES

NO

F1

F2

F3

F4

F5

12.0 System Setup

System Setup contains 8 functions:

1. Data Log: Contain the history of the latest-run Protocol.
2. Date & Time: Change the Date and Time settings.
3. Lid Temperature: Choose the preferred lid temperature as default setting during running a Protocol.
4. Beeper: Turn on/off the audible beep.
5. Administrator: Delete unwanted Usernames and their Protocols.
6. Service Mode: Reserved for Service engineers.
7. Ramping Speed: Choose the High Ramping Speed or Low Ramping Speed.
8. Tm Calculator: Press A, T, C, and G number of sequence, to get the Tm value.

SYSTEM8/21/202211:00

Data Log

Date&Time

Lid

Temperature

Beeper

Administrator

Service Mode

Press Enter or F1 to select your System.

SELECT

EXIT

F 1

F 2

F 3

F 4

F 5

12.1 Date & Time

Users can change the date type, default date, and time of this unit by selecting Date & Time screen under SYSTEM screen.

NOTE: Remember to press F1:ACCEPT to store your settings.

SYSTEM>DATE&TIME8/21/202211:00

Data TYPE: 2

(1. Y/M/D 2.M/D/ 3.D/M/Y

Default Date : 08/21/11

Default Time : 11:00:33

Press F1 to save your settings

ACCEPT

EXIT

F 1

F 2

F 3

F 4

F 5

12.2 Lid Temperature

Users can change the temperature of lid of this unit by selecting Lid Temperature screen under SYSTEM screen.

NOTE: Remember to press F1:ACCEPT to store your settings. Two temperature segments: 60°C to 65°C and 100°C to 115°C are available.

SYSTEM>LID TEMPERATURE8/21/202211:00

Lid Temperature Function: 1
(1:ON 2:OFF)

Lid Temperature: 105 °
(60--65), (100--115) °C

Press F1 to save your settings

ACCEPTEXIT

F1F2F3F4F5

12.3 Beeper

Users can turn ON or OFF the sound of this unit by selecting the Beeper screen under SYSTEM screen. **NOTE:** Remember to press F1:ACCEPT to store your settings.

SYSTEM>BEEPER8/21/202211:00

Beeper Function: 2
(1:ON 2:OFF)

Press F1 to save your settings

ACCEPTEXIT

F1F2F3F4F5

12.4 Administrator

The password of Administrator is "9610". The Administrator of this unit has rights to delete any User Folder and any Protocols inside a User's Folder.

12.5 Service Mode

Only authorized service personnel have the password to enter Service Mode and perform necessary maintenance and repairs.

12.6 Ramping Speed

Users can choose the Ramping Speed. High Ramping Speed heating rate about 4°C/sec and cooling rate about 3°C/sec. Low Ramping Speed heating rate about 3°C/sec and cooling rate about 2°C/sec. **NOTE:** Remember to press F1:SAVE to store your settings.

SYSTEM>RAMPING SPEED8/21/202211:00

Ramping Speed:1

1 : High Ramping Speed

2 : Low Ramping Speed

Press F1 to save your settings

SAVEEXIT

F1F2F3F4F5

12.7 Tm Calculator

Users can press the number of the bases of A, T, C and G in the sequence, then press F1:RUN to get the Tm value of the sequence.

SYSTEM>TM CALCULATOR8/21/202211:00

A =0

T =0

C =0

G =0

Press F1 to Calculate

RUNEXIT

F1F2F3F4F5

13.0 Maintenance and Troubleshooting

13.1 Cleaning the Unit

Please ensure that no liquid is spilled onto or into the unit. In addition, periodically wipe it clean of dust and other residue that comes with normal operation of the unit. Use a soft, lint-free cloth and deionized water. Air vents should be vacuumed to remove dust.

13.2 Cleaning the Heated Lid

Make sure the Labnet MultiGene thermal cycler is unplugged and cooled down. To clean the heated lid, slide the lid back on the tracks until the front black pins align with the two slots, taking care that the Rolleiflex cable is clear. Lift the lid from the front, (be careful of sharp edges) and flip up. Use mild detergents to clean material from the lid. A cotton free wipe dipped in 70% ethanol will help remove and residue from sealing tape. Make sure the lid is dry prior to lowering it into the tracks. Once the lid is secure in the tracks make sure the lid easily slides forward.

13.3 Replacing a Fuse

The fuse is located in the power socket module, just below the power connector. If the unit does not turn on when the power switch is turned on, then replace the fuse. To replace the fuse:

- ▶ Disconnect the power cord from the unit.
- ▶ Remove the fuse drawer with a small-blade screwdriver.
- ▶ Pull the fuse out of the fuse socket and replace the fuses with one having the correct current rating.
- ▶ For 100-120V operation: Use 7.0A, 5 x 20 mm, glass tube.
- ▶ For 220-240V operation: Use 3.15A, 5 x 20 mm, glass tube.
- ▶ Reinsert fuse into the fuse socket. Reinsert the fuse drawer.

13.4 Changing the Thermal Block

- ▶ Slide the lid to the furthest point back.
- ▶ Remove the two plastic plugs and the two screws holding the face plate.
- ▶ Flip the face plate forward to gain access to the block.
- ▶ Remove the two screws holding the heating block.
- ▶ Gently slide the thermal block forward. Once it is clear of the frame, remove it from the unit.
- ▶ Slide the new block into place, and connect the plug.
- ▶ Gently slide the block until the two screw holes are lined up.
- ▶ Replace the two screws and plugs.
- ▶ Shut the face panel, and secure it with two screws.

14.0 Troubleshooting

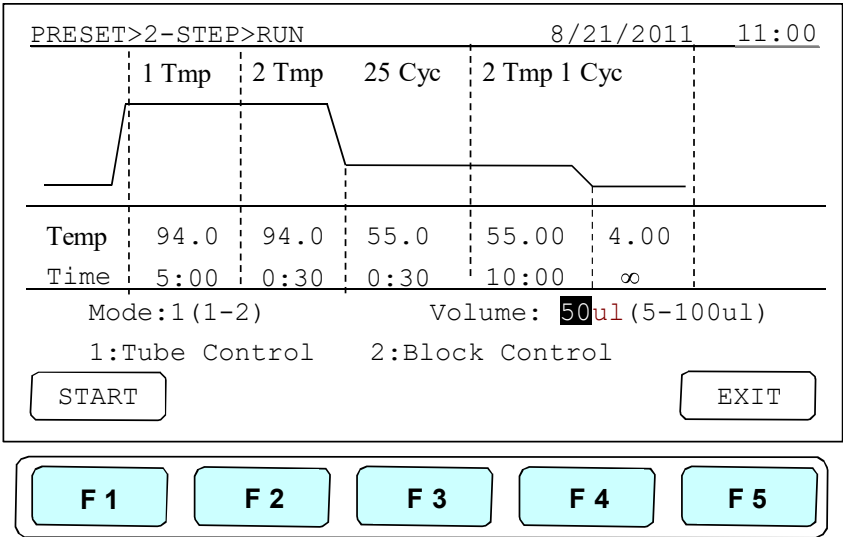
Problem	Cause	Solution
The display is Off even when power is switched On.	Power is not reaching the system.	Check power source voltage.
	Power cord is not plugged into the socket properly.	Reconnect the power cord.
	Power fuse is blown out.	Replace the power fuse.
	Block fuse is blown out.	Return the unit for service.
Can't reach 4°C.	Operating temperature environment may be unsuitable.	Operate the unit in an environment temperature between 15°C to 30°C.
	Electronic cooling element may be damaged or aged.	Return the unit for service.
Cycle time is too long.	Operating environment temperature may be unsuitable.	Operate the system in a temperature environment between 15°C to 30°C.
	Electronic cooling element may be damaged or aged.	Return the unit for service.
	Faulty temp. sensor.	Return the unit for service.
Lid heater does not work.	Lid heater is set to Off.	Check Lid Temperature setting in the System Mode.
	Lid sensor problem.	Return the unit for service.
No key entry sound.	Sound may currently be set to Off.	Check Beeper setting in the System Mode.
	Faulty keys or keypad wiring.	Return the unit for service.
The display goes off.	Faulty backlight.	Check the LCD contrast.
	Faulty LCD panel.	Return the unit for service.
Display is too dark or light.	Backlight brightness is not adjusted properly.	Adjust Display Brightness Potentiometer.
Lid will not close.	Foreign matter, between lid heater and sample block.	Shut off the system. Remove the foreign object or matter.
	Faulty lid lock mechanism.	Return the unit for service.
Error message appears.	Refer to list of error messages.	Check the nature of the error, and take the suggested actions.

14.1 Error Messages

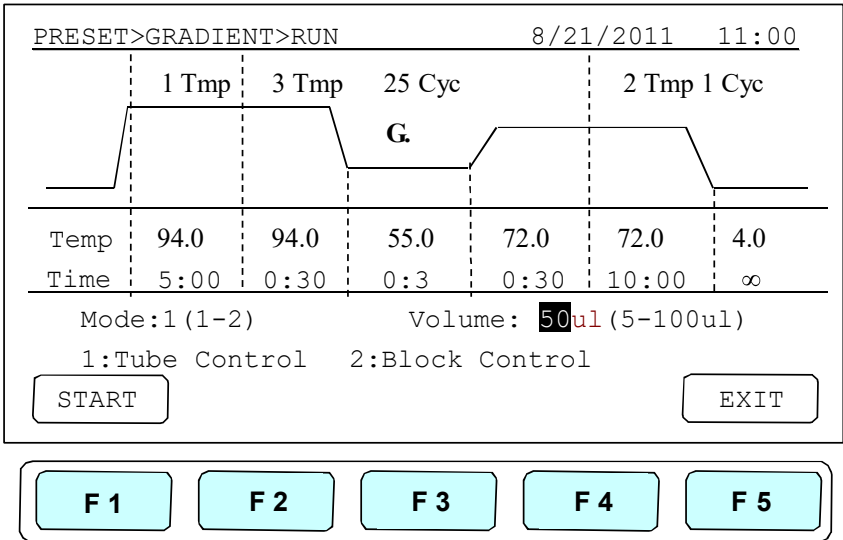
Message	Cause	Solution
HEATER ERROR!	▶ Lid temperature sensor problem. ▶ Lid temperature exceeds 132°C. ▶ Lid temperature can't reach the set temperature.	Reboot the unit.
BLOCK ERROR!	▶ Block temperature sensor or heating element problems. ▶ The unit can't reach the set temperature because the room temperature is too high. ▶ The block temperature exceeds 108°C.	Cool down the room temperature. Reboot the unit.
ROOM ERROR!	▶ Room temperature sensor problem.	Reboot the unit
ROOM >30°C	▶ The room temperature exceeds 30°C. ▶ Two running units are too close to each other.	Cool down the room temperature. Reboot the unit. Remove any objects blocking the vents. Keep two running units at least 30 cm from each other.

Appendix: Protocols in Default Folder

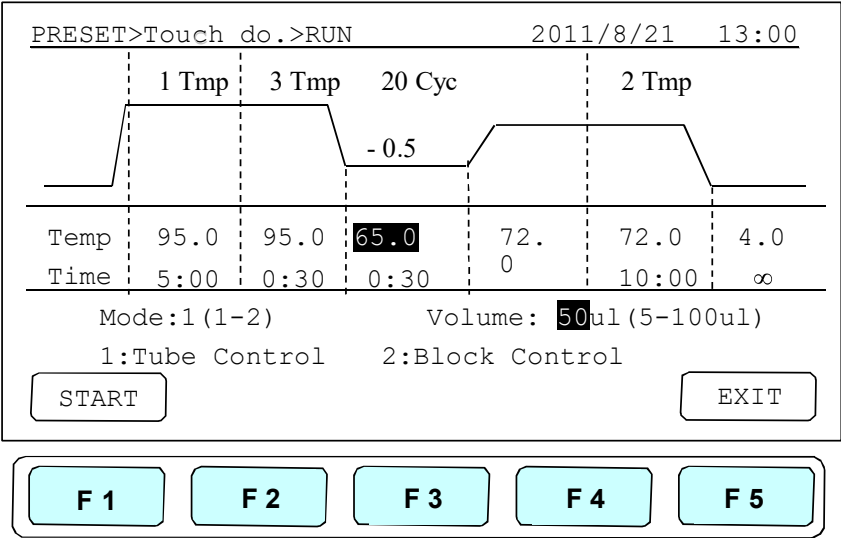
2-Step



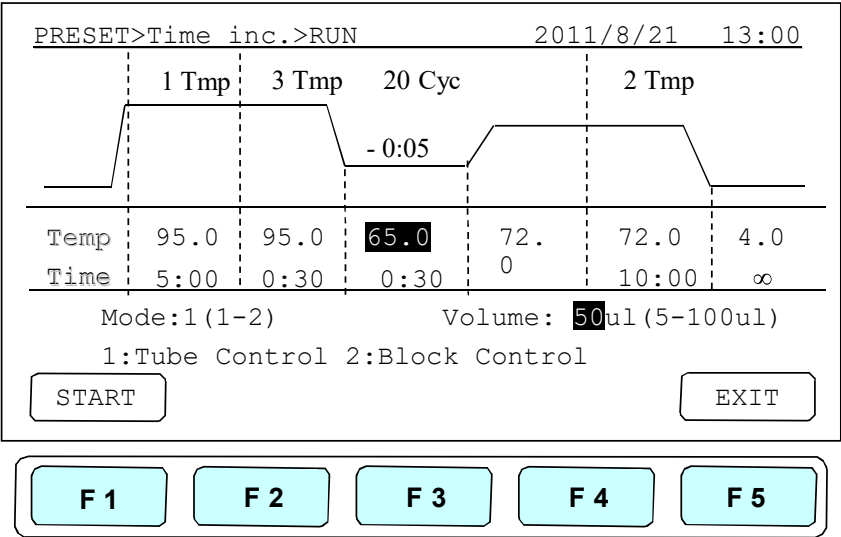
Gradient



► Touch Down



► Time Increment



15.0 Limited Warranty

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For your reference, make a note of the serial and model number, date of purchase, and supplier here.

Serial No. _____ Date Purchased _____
Model No. _____ Supplier _____

16.0 Equipment Disposal



According to Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE), this product is marked with the crossed-out wheeled bin and must not be disposed of with domestic waste.

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