

# T-Heater 4x4 mini-Cycler



## User Manual

ver 2.0.en

[www.coyotebio.com](http://www.coyotebio.com)

## **Contents of Package**

- One T-Heater 4×4 mini cycler
- One 12 V DC power supply adaptor\*
- One User Manual
- One pack of PCR tubes

\*For mobile applications where AC electricity is not available, an optional rechargeable battery pack or 12 V car battery adapter cable can be requested from your dealer or from us.

## **Specifications**

- Temperature Range: 8~99°C
- Time Range: 1 sec to 60 min
- Maintains at 8 °C after the program completes
- Ramping Speed: Average ramp rates are 2.0 °C/sec, with a maximum rate of 3 °C/sec
- Temperature precision: ±0.2 °C
- Display precision: 0.1 °C
- Sample block temperature evenness: ±0.5 °C
- Temperature of heated lid: 99 °C
- Operation ambient temperature: 8~30°C
- Sample capacity: 16 x 0.2mL PCR tubes
- Memory: 15 programs stored in the front page
- Power Supply: 12V DC
- Control Panel and Display: LCD touch screen and rotary knob
- Dimensions: 200×200×40 mm
- Net Weight : ~2.5 kg

## **Quality Assurance**

The unit carries a one-year warranty against manufacturing defects and other problems under normal operation conditions.

**T-Heater 4x4** mini cycler is compact and easy to use. It is particularly useful as a personal device for PCR small number of samples at one time. It is suitable for mobile applications.

### **Start up**

Connect the unit to 12 V DC power adaptor and plug in the adaptor to the wall outlet. Upon connecting to 12 V DC, switch on the device and the unit enters MENU page.

### **Select a program**

Up to fifteen PCR programs can be stored in the unit. The programs are alphabetically ordered "A" thru "O". The first 5 programs (A thru E) are shown in the first MENU page screen. The next 5 programs are in the second MENU page. By tapping the "↓" key, one can toggle between the three pages. (shown in Fig.1)

The thermal cycle parameters, namely the temperature and the duration of each step (2 in Fig.1) and the number of cycles(3 in Fig. 1), are shown in the MENU page.

To select a program (to edit or to run), just tap the area of the screen where the parameters of the program are shown. Upon tapping, the PROG page appears .

### **Edit a program**

To edit a program, first enter its PROG page (see "Select a program"). In its PROG page, select the parameter to be adjusted by touch the parameter value (1 in Fig.1). Once the parameter is highlighted, the

color changes from red to white, adjust the value by turning the rotary knob clockwise (to increase) or counterclockwise (to decrease) until the desired value is reached. Leaving the knob unchanged for a second, the thermal profile graph display is readjusted to show the new value. Repeat above steps to edit another parameter.

To return to MENU page, tap "↑" key on the screen. Upon leaving PROG page, a reminder appears: "SAVE?". If one taps "No", the new changes is lost. If "Yes" is tapped, the new program is saved.

### **Graphic Display**

The thermal profile of a program is shown graphically in its PROG page. The parameters of each segment are shown on each side of the segment (1,2 in Fig.2). The segments within the bracket are to be cycled, and the number of cycles are shown on the upright corner of the bracket (3 in Fig.2). The segment outside the bracket do not cycle. The current temperature of the sample blocks (No.5 in Fig.2) and the heated lid temperature (No.4 in Fig.2) are shown on the lower left.

### **Heat Lid**

The heated lid can be turned on/off by tapping it to white/gray. While entering the PROGRAM page (see Fig.2), the heated lid starts heating. When the heated lid is turned on, the program starts to run when the heated lid reaches 85°C. When the program completes, it automatically goes to 8°C and the heated lid is turned off. It is recommended to turn off the heated lid when the setting temperature is below ambient. Otherwise, the heated lid has a effect on the upper side of the sample and brings temperature drift to the setting point.

1				
	2	3	4	
A	91.8°C 2:00	55.0°C 1:20	94.0°C 1:20	* 7
B	91.8°C 2:00	94.0°C 2:00	55.0°C 2:00	*42
C	91.8°C 1:20	55.0°C 1:20	94.0°C 2:00	*35
D	91.8°C 2:00	94.0°C 1:20	55.0°C 1:20	* 7
E	91.8°C 1:20	94.0°C 1:20	55.0°C 2:00	* 7
				↓

Fig. 1, MENU page screen

- 1 Program Number
- 2 Parameter Value
- 3 Cycle Number
- 4 Next Page

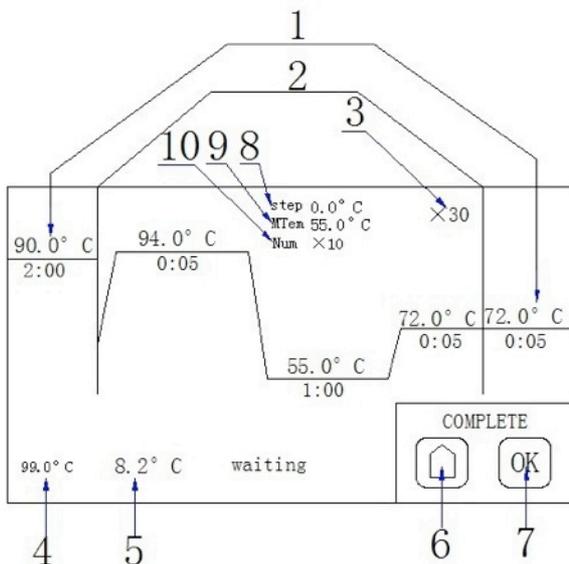
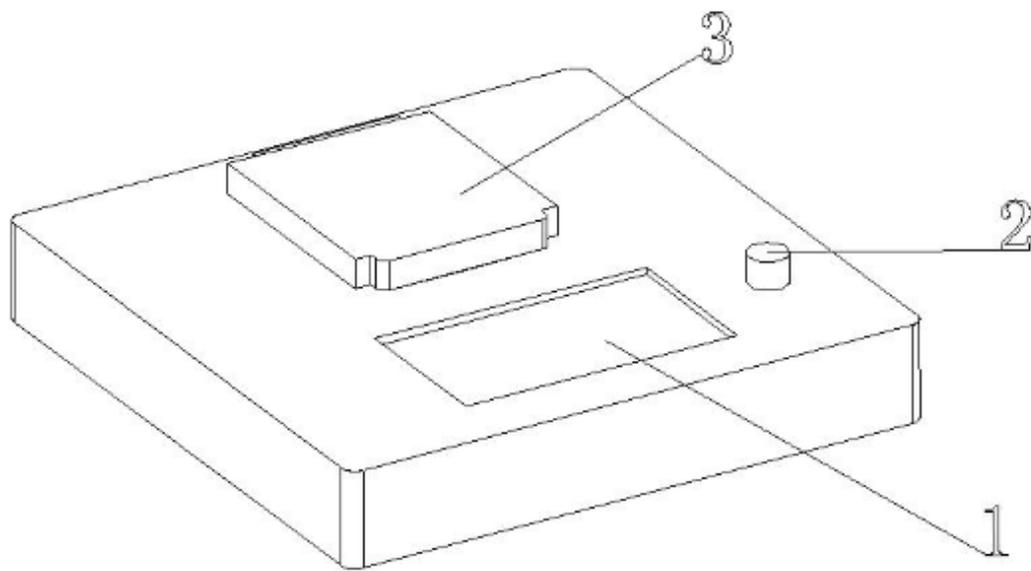


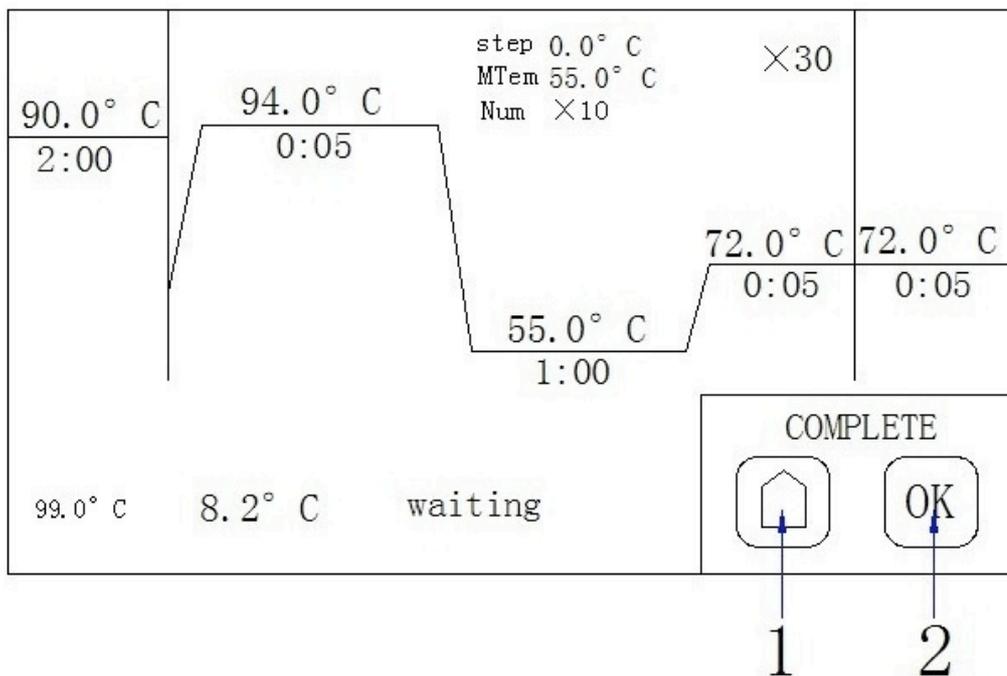
Fig. 2, PROGRAM page screen

- 1 Parameter Value
- 2 Cycle Bracket
- 3 Cycle Number
- 4 Temperature of The Heated Lid
- 5 Current Temperature of Block
- 6 Back Key
- 7 START Key
- 8 Temperature Decrement of Each Step
- 9 Maximum/ Initial Temperature of the first Step
- 10 Number of Step Down Cycles



**Fig. 3, Front View**

- 1 Touch Screen**
- 2 Rotary Knob**
- 3 Heated Lid**



**Fig. 4, PROGRAM page screen after completion**

- 1 Home Key**
- 2 OK Key**

## **Run a program**

Once a program is selected, the screen shows the PROG page (see "Select a program"), and the heating lid starts to work. By tapping the "START" key (7 in Fig.2) on the screen, the thermal cycling program starts, and the program shows the "waiting" mode until the heated lid reaches 85°C. The horizontal line flashes when the current segment is running.

After completion of a program, both the "HOME" (1 in Fig.4) and "OK" keys (2 in Fig.4) appear on the screen. Tap "OK" key to terminate the run. Or tap "HOME" key to return the MENU page without saving the changes of the parameters. Notice that the block automatically cools down to 8 °C until new program starts.

## **Pause and force quit a program**

At any time during a program, one can tap the "||" key to pause the program. The block temperature remains at the current temperature (see 5 in Fig.2) and the timer stops counting. To resume the run, tap the "START" key.

To force quit a program and return to MENU page, pause the program first and then, tap the "■" key to stop the program.

## **Step Down**

Three parameters can be set up to start Step Down function. Press "step"(8 in Fig.2) to set temperature decrement (minimum 0.5°C) of each step. When "step" displays 0, it means no Step Down function is selected. Press "MTem" to set the maximum temperature for the first step cycle. Press "Num" to set the number of steps.

## **Cautions**

The unit should avoid contacting with strong acid or alkaline and most of the organic solvents. In case of accident contact, clean the chemicals immediately. Salt solutions also slowly corrode metal parts and therefore, should be avoided as well. The unit is not water resistant. Absolutely no immersion of the unit in water!

Only use the provided electric power adaptor provided; using a different power adaptor may cause permanent damage to the device.

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