WARNINGS:
Max temperature recommended= 450°C
Max timer settings: 99:59:59 hours
Max speed settings=1500 RPM
Touching the heated surface will cause severe burns.
Use Extreme Caution at all times.

HOT PLATE/STIRRER FEATURES:

TIMER
Max timer settings: 99:59:59 hours
AUTO OFF function= the heater and stirrer will turn off at the end of any count down timer setting. At zero an alarm will sound, it will beep five times to indicate the time is out.

ALARMS
OVER TEMPERATURE ALARM= Activates at 455°C. After alarm sounds the heater will be automatically shut off. It will turn on when the plate has cooled down to 450°C again. The over temperature alarm may also come on if a very large sample is placed on the unit and a probe temperature is set.

STIRRER
A stir bar is used in the solution and couples with the motor driven magnet and couples with the motor driven magnet and stirs the solution.

FRONT PANEL
When the unit is turned on, they display will show the actual plate surface temperature. If a probe is used it will display the probe temperature as well.

The HOT PLATE LED will indicate that a temperature over 50°C has been reached.

The OVER TEMPERATURE ALARM LED indicates a temperature over 455°C.
HOT PLATE/STIRRER BUTTONS

"HEAT OFF" button: Touching and releasing the HEAT OFF key will turn off the heater.

"STIR OFF" button: Touching and releasing the STIR OFF key will turn off the stirrer.

"EDIT" button: The EDIT key is used to enter the program memory to either write or edit a program.

"CANCEL" button: The CANCEL key is used to cancel a program step while writing or editing a program.

"RUN" button: The Run key is used to start running a program in memory.

"ENTER" button. The ENTER button is used to enter a value into a program.

STEP BY STEP OPERATING PROCEDURES:

1. Fill up a glass beaker with at least 800 ml of solution and place it on the hot plate.

2. In a beaker prepare your solution, insert your sample, stirrer bar and stirrer cover (if needed)

3. Insert the temperature probes into the solution as shown on the image below.

4. Press the LOW LEVEL LIMIT RESET button to the right of the hotplate green panel. If the light indicator turns off that means the solution level is sufficient to start the hotplate controller screen.

5. The user may enter either a target probe temperature or a target plate temperature. Only one target temperature is allowed at one time. Setting a target probe temperature will erase any target plate temperature previously set and vice versa.

Setting Solution Temperature: Once the controller screen is on, press the Probe Temperature Button (shown on image) and by using the up and down arrow buttons set a temperature value to start heating up the solution, and press ENTER. The value shown on the screen to the right of the probe temperature icon is the actual temperature of the probe, the letter "C" means the temperature is measured in degrees centigrade. The small letter "A" indicates the value represents the
actual temperature of the probe. After you set up the temperature, the values will begin to toggle between the actual value "A" and the target value (your settings), represented by a "T". These two letters will toggle between TARGET (T) and ACTUAL (A), and the numbers in the display will change accordingly to show the progress of a set temperature toward its target. If no target temperature is set, the display will always show the actual probe temperature.

**Setting Plate Temperature:** If you need to set the plate temperature, press the plate temperature button (shown on image) and by using the up and down arrow buttons set a desired temperature value for the hot plate, and then press ENTER. The value shown on the screen to the right of the plate temperature icon is the actual temperature of the plate, the letter "C" means the temperature is measured in degrees centigrade. The small letter "A" indicates the value represents the actual temperature of the plate. After you set up the temperature, the values will begin to toggle between the actual value "A" and the target value (your settings), represented by a "T". These two letters will toggle between TARGET (T) and ACTUAL (A), and the numbers in the display will change accordingly to show the progress of a set temperature toward its target. If no target temperature is set, the display will always show the actual probe temperature.

**NOTE:** If no plate target temperature is set, the "T" and "A" will not toggle. However, the actual plate temperature will be displayed even when a probe temperature has been set.

6. When the target temperature is reached, the "T" and "A" will alternate but the numerical value will remain the same.

**Setting Ramp:** **NOTE:** If a ramp value is to be used, the ramp value must always be set before setting a target temperature.

To set a ramp value, press the ramp button (shown on image). Using the up and down arrows select the desired value, and press ENTER (ramp values are always in centigrade per hour).

**Setting Stirrer:** If you have not inserted a stirrer bar and stirrer cover into the beaker, please do so at this time. To set up the stirrer speed press the stirrer button (shown on image) and using the up and down arrows set the desired
stirrer speed values (stirrer values are shown in revolutions per minute) then press ENTER.

7. Setting Timer: Press the timer button (shown on image). That icon will now flash in the display. Note that the seconds digits in the display will flash. Seconds can now be set if wanted by pressing the Up arrow button. To set minutes press the timer button again. Note that the minute digits will now flash. Minutes can now be set by touching the up arrow. To set hours press the timer button again and the hours digits will flash. Hours can now be set by touching the up arrow. If only seconds or minutes are set, continue to press the timer button until it scrolls past hours. Touching the timer button again will start the timer. When the timer counts down to zero it will alarm 5 times and start to count up. The up counter lets the user know how long it has been since the Timer counted to zero. To stop the timer at any time touches the down arrow.

8. Setting Auto Off: Press the Auto Off button (shown on image). The words AUTO OFF will appear in the display. When the Auto-off function is activated, the heater will be shut off automatically when the timer counts down to zero. To turn off the Auto-off function, simply press the AUTO OFF button until the words AUTO OFF disappear in the display.

9. Shutting down: As soon as your process is done you may remove the probes from inside the beaker. BE CAREFUL NOT TO TOUCH THE BEAKER WHILE THE UNIT IS HOT! When the probes stop sensing the solution the unit will automatically turn off.

10. Cleaning up: Make sure you wait until your beaker has cooled down in order to dispose of the solution (see Wet Benches SOP for proper chemical disposal). Once you have emptied the contents of the beaker you must wash it with DI water and dry it with a towel. Also make sure you wipe off the ceramic surface of the hot plate and/or clean stains remaining on this surface. DO NOT USE SOLVENTS TO CLEAN THE CERAMIC, ONLY DI WATER.

RUNNING A PROGRAM STORED IN MEMORY

1. Press The Display will show "PR 01" meaning program 1.
2. If program 1 is your choice press ENTER. If not, you may press the up and down arrow buttons to choose another number (1-10) then press ENTER to start running the chosen program. The program number will display on the screen.
3. As the program starts to run, the program steps (1-5) will be displayed at the bottom of the display as well as the program number. **EXAMPLE:** Program 1, Step 4 will be displayed 01 04. In addition, as the unit progresses through the steps in the program, an alarm will beep for every step; the alarm will sound once for Step 1, twice for Step 2 and so on.

**HOW TO WRITE A PROGRAM**

1. Press  

2. Select the program number (1-10) using the up and down arrows  

3. Press  

   The display will now show the program # and step # (Example: 01 01)  

4. Enter the ramp value, if wanted, and then press **ENTER**  

5. Enter either a probe or plate temperature, and then press **ENTER**  

6. Enter stirring speed, if wanted, and then press **ENTER**  

7. Set the timer for that step and then press **ENTER**  

8. Press the up arrow button to go to the next step, step 2. Display shows 01 02  

9. Enter the values for ramp, temperature, stirrer and timer, press **ENTER** after each. Do the same for all remaining steps.  

   **NOTE:** If a mistake is made while entering a program step just press **CANCELS** on that step and make the new entry. To go back to a prior program step, press the down arrow. Likewise, to go forward to another program step, hit the up arrow.  

10. After the last step data has been entered, press **ENTER** twice. The display will now show CYC 01. If only one cycle of the program is needed, press **ENTER**. If more than one cycle of the program is wanted, use the up arrow to go to the number of cycles wanted. For example, twenty cycles would appear on the display as CYC 20. Then press **ENTER** again and the program is written and stored for use.  

11. To start running your program, press **RUN** and **ENTER**.