- *Personnel performing this procedure will have training provided by the equipment manufacturer or by a trained UF personnel.*

I. PURPOSE

To establish methods for operating the Lindberg/Blue high temperature furnace.

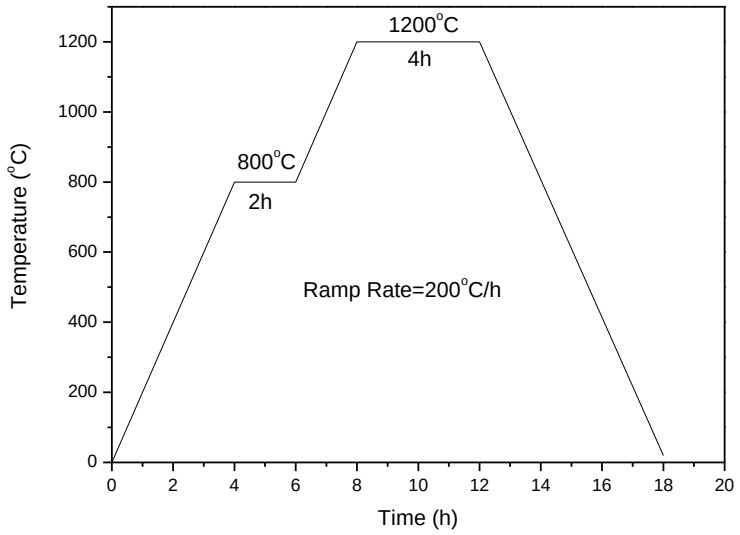
II. PRECAUTIONS

When operating the furnace

1. Never stand in front of an open furnace.
2. Wear protective eyeware.
3. Wear protective gloves.
4. Use tongs to insert and remove furnace load.
5. Do not allow the load to touch the furnace walls or heating elements.

III. PROCEDURE

Assume we will run a program as illustrated in the Figure below:



1. Open the furnace door by pulling it out horizontally then lifting it up;
2. Load the sample with tongs;
3. Close the furnace door;
4. Turn the power switch on;

Now configure the program at right side display panel

5. Press and hold the SET/ENT for three seconds at right side display panel;
6. The "Mode" is displayed as "RES". If not, press the "arrow up" or "arrow down" key until "RES" is appeared;
7. Press SET/ENT once, "PrG" will be displayed in the upper display with "0" in the lower display. Press the "arrow up" key once until "1" is displayed with a flashing decimal;
8. Press SET/ENT key once. Set the SSP (starting set point) value to room temperature (20^oC) by pressing the "arrow up" or "arrow down" key;
9. Press SET/ENT once, "STC=0" will appear which stands for "start code". Leave this setting at "0";
10. Press SET/ENT once, "SP1" (set point 1) will appear. Set it to "800" as our first temperature will go to 800^oC;
11. Press SET/ENT once, "TM1" (time 1) will appear. Set it to "4" which means we need 4 hours to reach 800^oC. Note the time is entered in hours and minutes, for example, 2.50 equals to 2 hours and 50 minutes, not 2 hours and 30 minutes;
12. Press SET/ENT once, "SP2" will appear. Set it to "800";
13. Press SET/ENT once, set "TM2" to 2 as we will keep at 800^oC for 2 hours;
14. Press SET/ENT once, set "SP3" to 1200;
15. Press SET/ENT once, set "TM3" to 2;
16. Press SET/ENT once, set "SP4" to 1200;
17. Press SET/ENT once, set "TM4" to 4;
18. Press SET/ENT once, set "SP5" to 20;
19. Press SET/ENT once, set "TM5" to 6;
20. Press SET/ENT once, set "SP6" to 20;
21. Press SET/ENT once, set "TM6" to "OFF" by pressing the "arrow down" key. This tells the controller you are finished;
22. Press SET/ENT once, "EV1=0" will appear which means "Event 1 is not used". Leave this value at "0";
23. Press SET/ENT once, "AL1=9" will appear. This configures the alarm as a high temperature alarm which is the factory setting;
24. Press SET/ENT once, "A1" will appear. This is the temperature at which the alarm will start. Typically we set this value 50^oC higher than the highest set point in the program. In the example here, we set "A1=1250";

25. From this point, you can press SET/ENT multiple times to advance past "HY1=9", "EV2=0", "AL2=OFF", "JC=0" "VEC=OFF". Or you can just press and hold the SET/ENT for 3 seconds to exit the program parameter setting mode;

Now configure the over temperature controller at left side display panel

26. Press and hold the SET/ENT for three seconds at left side display panel;
27. "SP" (setpoint for limit alarm) will be displayed in the upper display. Press the "arrow up" or "arrow down" key to change the current SP value to the required value. Typically we set this value 50^{o}C higher than the highest set point in the program. By setting the SP value here, we will rewrite the alarm value (A1) which we previously set in the program;
28. Press SET/ENT once, set "A1" the same as "SP";
29. Press SET/ENT once, "HY5"=40, don't change;
30. Press SET/ENT once, "FL"=OFF, don't change;
31. Press SET/ENT once, "bS"=0, don't change;
32. Press SET/ENT once, "LOC"=0, don't change;
33. Press and hold the SET/ENT for three seconds to exit the over temperature controller setup;

Now switching back to right side display panel

34. Press the Run or "arrow down" key at right side display panel. You will hear a "click" and the Power indicator is on. Now the program is running.