USING YOUR KILN

TURNING ON THE KILN
1) Make sure your circuit breaker or fused disconnect switch is turned on.
2) Make sure the kiln is plugged in.
3) Turn on kiln with the toggle On/Off switch on the front of the control box.

WHEN YOU FIRST TURN ON THE KILN
1) When the kiln is turned on you will see either ErrP or Stop in the display. If you see ErrP press any key to see Stop. When you see Stop or IdLE alternating with the temperature you are ready to begin programming. (NOTE: If the power was on recently the display may read what it said before power was turned off).
2) Press Enter to begin.
3) The previously fired program will be displayed, either USr1, USr2, USr3, or USr4.

NOTE: These programs are preprogrammed:
USr1 is a slow bisque fire to cone 05.
USr2 is a fast bisque fire to cone 06.
USr3 is a slow glaze fire to cone 6.
USr4 is unprogrammed.

All of the above can easily be changed.

4) If you want to review that program hit the Down (Review) button.
5) If you want to fire that program hit Enter and keep hitting Enter to scroll through the program. At the end of the program you will see Redl. Hit Enter again to start the program.
6) If you make a mistake just hit Enter again to stop the program. (You can stop the program from firing at any time by doing this). This will return you to the IdLE alternating with temperature. Hit Enter again to display the program you are in. You can then change the program (see “Editing a Program” below) or can hit Enter again and review and edit the program you are in.

WHAT YOU SEE WHILE FIRING
1) If you have a Delay Time programmed you will see Delay alternating with a time (i.e. 00.30). This will count down until it hits 00.00.
2) Then the display will show you the actual temperature inside the kiln as it begins to fire.

TO CHANGE TO A DIFFERENT PROGRAM
1) Select the program to change or fire with: When the display reads IdLE alternating with temperature hit Enter. One of the four USr programs will display. Use the Up and Down arrows to scroll to the program you want to change.
2) Hit Enter and you will scroll through that program. If you don’t want to make any changes just keep hitting Enter until Redl displays. You must go through the entire program. You can make changes while you are doing this if you want (see “Editing a Program” below). This is actually a good way to review the program before firing. You can not bypass this process. Once Redl displays and you hit Enter the program will fire.
3) NOTE: If the Display reads Redl and you do not want to fire the program that the control is ready to fire then hit Enter once to start that program and then again to stop it. The display will then read Stop briefly and then alternate between IdLE and temperature and you can now choose a different program to run or edit.

EDITING A PROGRAM
1) The Delay Time will delay the start of your firing. Enter a Delay Time: DELA is displayed alternating with a time like 03.00 (Hours.Minutes). Use the Up and Down keys to change the delay time. Press Enter when the desired delay time is displayed. Note: 00.00 equals no delay.
OPERATION OF YOUR THREE BUTTON CONTROL

2) Enter the number of segments your program will have. NOTE: Each segment consists of a ramp rate, a set point temperature and a hold time. There are 8 segments available for programming. You will see SEG alternating with the last selected number of segments. Use the UP and DOWN keys to select the number of segments, then press ENTER. Note that you can have as little as one segment (for instance a program that makes the kiln go as fast as possible to a single temperature and then holds there).

3) Now program the ramp rate for the first segment. You will see rA1 alternating with the ramp rate. Ramp rates are expressed in degrees per hour. Use the UP and DOWN keys to select the desired rate and press ENTER. A rate of 9999 will cause the kiln to heat (or cool if in a down ramp) at the maximum rate. The first segment of a program must always be an "up" ramp.

4) Now program what Temperature to reach at the end of the first segment. You will see °F1 alternating with the temperature. Use the UP and DOWN keys to select the desired temperature and press ENTER.

5) Now program the Hold Time for the first segment. You will see HLd1 alternating with the currently selected hold time. Use the UP and DOWN keys to select the desired hold time and press ENTER.

6) Repeat the above three steps for each additional segment for the ramp rate, temperature, and hold time.

7) rEdl will be displayed after the last segment is entered. Press ENTER to begin firing. Remember - if you don’t want to fire that program just start it and then stop it. You will return to the idle display alternating with temperature and you can then change programs.

The delay time is like a countdown timer - it will countdown the hours and minutes after you start the program before the program actually sends heat to the kiln.

PREHEATING CERAMICS: We recommend you preheat any previously unfired ceramic work at a temperature of 150°F for several hours. We have 3 hours programmed into our standard slow bisque program. This will help remove water from the work and could prevent an explosion in the kiln. There is no need to use this will glass or metal work.

REVIEWING THE PROGRAM WHILE FIRING

1) Once you have started a program firing you can review it by hitting the DOWN (Review) Button.

2) The program will scroll. You will see, in the following order, various aspects of the program.

a) The program name (USr1, USr2, USr3, USr4)

b) Number of Segments (SEG followed by some number, i.e. 0004)

c) rA1 alternating with the ramp rate.

d) °F1 alternating with the temperature (i.e. 0900).

e) HLd1 alternating hold time (i.e. 00.30)

f) The above three steps are repeated for each segment.

CONTROLLED COOLING
You can control the cooling of the kiln by having a segment in the program that ramps down. You ramp down by having the temperature of a segment be lower than the temperature of the previous segment. Note that the first segment has to start with an up ramp.

THE END OF THE PROGRAM
1) The control will shut off power to the elements at

IMPORTANT NOTE ABOUT HOLD TIMES DURING THE LAST SEGMENT: Be careful with hold times in the final segment of a program designed for ceramics - this will add to the heat work and will typically mean you need to fire to a lower temperature to get the same cone result.

TIP
the end of the program.

2) At the end of the program the control will flash CPtL and a number like 7.34. The 7 stands for hours and the 34 stands for minutes. This is how long it took for the kiln to reach final set point.

OPTIONS WHILE FIRING

SKIP A STEP
During a firing you may advance from the current segment to the next ramp rate by using Skip Step or if you are in a hold period you may add time and temperature to the hold period.

1) While firing (running a program) press the UP (View Segment) key. The current ramp or hold is displayed followed by the current or traveling set-point, then "SStP" is displayed.

2) If you do not press a key within several seconds the display will return to showing the current temperature in the kiln.

3) When "SStP" is displayed press ENTER to skip to the next ramp rate.

ADD TIME TO HOLD PERIOD
This option allows you to add time in 5 minute increments to a hold (soak) period.

1) When in a hold period (during a hold or soak, the temperature in the kiln will be alternating in the display with the remaining hold time), press the UP (View Segment) key.

2) When "SStP" is displayed press the UP key again and "tMP" will be displayed.

3) Press ENTER and 5 minutes will be added to the hold time.

4) You will see the new hold time displayed.

5) You may use this procedure as many times as necessary to get the hold temperature that you want.

ADD TEMPERATURE TO A HOLD PERIOD
This option allows you to add temperature in 5 degree increments to a hold (soak) period.

1) When in a hold period (during a hold or soak, the temperature in the kiln will be alternating in the display with the remaining hold time), press the UP key.

2) When "SStP" is displayed press the UP key twice more and "tMP" will be displayed.

3) Press ENTER and 5 minutes will be added to the hold time.

4) If you hit the UP key again you will see the new hold temperature displayed briefly.

5) You may use this procedure as many times as necessary to get the hold temperature that you want.

CHANGE PROGRAM WHILE FIRING
You can reprogram the control by stopping it and changing the program and then restarting it. The control will compare the current temperature with where the kiln should be in its new program.

To stop the kiln hit ENTER. Then hit ENTER again and you will see your program name (i.e. USr2). Then hit ENTER again to reprogram your program. When you see rEdl press ENTER again to restart the program where you left off.

NOTE IF YOU HAVE A DOWN RAMP IN YOUR PROGRAM: If there is a down ramp it will look for the first up ramp that has the temperature it is looking for. You may need to use SKIP STEP to get back to where you want to be if you have a down ramp in the program.
**DISPLAY MESSAGES**

**CPLt**  Firing Cycle Complete (firing time is alternately displayed).

**dELA**  Delay. Displays when entering the delay time (hour:minutes) until the start of the firing.

**DLy**  Delay. Alternates with the remaining delay time until the start of the kiln.

**°F #**  Segment temperature in °F - Set temperature for a user program.

**°C #**  Segment temperature in °C - Set temperature for a user program. A decimal point will display in lower right corner.

**EdIt**  Edit the default options (beeping at complete, temperature scale, maximum programmable temperature)

**Err1**  Error 1, kiln was heating less than 15°/hr and it has been stopped.

**Errd**  Error d, kiln temperature is 50° hotter than the set-point temperature. Kiln has been stopped.

**ErrF**  Error F, similar to Err1 but during a down ramp the temperature is decreasing less than 15°/hr. Kiln has been stopped.

**ErrP**  There has been a power interruption that has stopped the firing. Press any key to clear.

**FULL**  Beeps continuously at end of firing until a key is pressed.

**HLD#**  Soak time in hours:minutes at a hold temperature.

**OFF**  No beeping when firing is complete.

**On**  Beeps for 15 seconds at end of firing.

**rA #**  Ramp Number (rate per hour of temperature increase or decrease).

**rEdl**  Ready to fire current program. Press START to begin firing.

**SEG**  Short for Segments. You can enter up to 8 segments in a program.

**SStP**  Skip Step (used to advance to the next ramp)

**StOP**  The kiln is at idle and ready to be programmed. Stop alternates with the current kiln temperature.

**USr #**  User program number displayed

**tMP**  Temperature (used in the Skip Step Option. The display actually looks like two “U”s upside down)

**tME**  Time (used in the Skip Step Option. The display actually looks like two “U”s upside down)

**ERROR CODES**

**Err1**  Error 1 indicates the temperature in the kiln is rising during an up ramp slower than 15°F/hr. If this rate continues for 8 minutes the firing will be stopped. Err1 may be an indication that the elements are worn or that a relay has stopped working.

**ErrF**  Error F indicates the temperature in the kiln is decreasing during a down ramp less than 15°F/hr. If this rate continues for 8 minutes the firing will be stopped. ErrF may be an indication that a relay has stuck in the on position.

**Errd**  Error d indicates that the kiln temperature is 100°F above the traveling set-point, which is the current desired temperature in the kiln. The traveling set-point will increase or decrease according to the programmed rate.

**ErrP**  ErrP is displayed whenever there is a power interruption that is long enough to stop the firing. If the power interruption is brief the kiln will continue to fire when power is restored; in this case there will no indication of a power failure. To clear the error, press any key.

**tC FAIL**  tC alternating with FAIL indicates the thermocouple has failed. Replace the defective thermocouple. To clear the error, press any key.

**tC- -**  The red and yellow thermocouple wires are reversed.
**FIRST FIRING TO CONE 6**

The first firing of the kiln should be a test fire. Fire it empty except for shelves and posts.

NOTE: You may experience some smoking from the kiln on its first firing. This, if it occurs, is due to residual oil left on the element wire when the elements were made.

The test firing should be done with nothing in the kiln except the furniture kit and a cone 6 self-supporting cone or cone pack in each zone of the kiln; top, middle, and bottom. Be sure to monitor the kiln from time to time. Especially watch it in the first few hundred degrees to be sure that the kiln was set up properly and then at the end of the firing to be sure the location you have chosen is safe and that everything is working properly.

Note: It is a good idea to apply kiln wash to your shelves before you do your test firing. This will help sure the kiln wash in preparation for use. See the section call “Applying Kiln Wash” later in these instructions.

You can run these programs one after the other or split the test firing into two days.

On Day 1:

Turn the on/off toggle switch on to turn on the kiln.

Press any key. The display will say "IDLE", "60" over and over again. (That "60" will be whatever the temperature is currently)

Press Enter, see "USR1". (That "USR1" can be any USr number 1 through 4)

Press the up or down arrows if you see another USr number besides 1. Make it say "USR3"

Press Enter as often as necessary to scroll through all the steps of the program: The control makes you press Enter to advance through each step of the program (this serves as a good review).

Continue to press Enter until the display says "REDI"

Press Start/Stop to begin the program.

This program should heat the kiln up into the 2250 deg F range in about 4-5 hours. It will be finished when the display says "CPLt"

Once you see the "CPLt" it is OK to Press Start/Stop and then the toggle switch to turn everything off.

Turn the toggle switch off.

On Day 2:

Turn the on/off toggle switch on to turn on the kiln.

Press any key. The display will say "IDLE", "60" over and over again. (That "60" will be whatever the temperature is currently)

Press Enter, see "USR1". (That "USR1" can be any USr number 1 through 4)

Press the up or down arrows if you see another USr number besides 1. Make it say "USR3"

Press Enter as often as necessary to scroll through all the steps of the program: The control makes you press Enter to advance through each step of the program (this serves as a good review).

Continue to press Enter until the display says "REDI"

Press Start/Stop to begin the program.

Before you go home in about 8 hours or so, press Start/Stop to stop the program before you leave.
### STANDARD PROGRAMS

**USR1 - SLOW BISQUE TO CONE 05**

<table>
<thead>
<tr>
<th>DISP</th>
<th>VALUE</th>
<th>TIME</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>dLAY</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEG</td>
<td>0006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rA 1</td>
<td>60</td>
<td>1.15 hours</td>
<td></td>
</tr>
<tr>
<td>°F1</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hld1</td>
<td>03.00</td>
<td>3 hours Preheat</td>
<td></td>
</tr>
<tr>
<td>rA 2</td>
<td>80</td>
<td>1.25 hours</td>
<td></td>
</tr>
<tr>
<td>°F2</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hld2</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rA 3</td>
<td>200</td>
<td>3.75 hours</td>
<td></td>
</tr>
<tr>
<td>°F3</td>
<td>1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hld3</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rA 4</td>
<td>100</td>
<td>1 hour</td>
<td></td>
</tr>
<tr>
<td>°F4</td>
<td>1100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hld4</td>
<td>00.00</td>
<td>This is the quartz inversion phase</td>
<td></td>
</tr>
</tbody>
</table>

- rA 5 180 3 hours
- °F5 1638 Second to Final Temperature
- Hld5 00.00
- rA 6 80 3.12 hours
- °F6 1888 Final Temperature
- Hld6 00.00

Total Estimated Time: 16.3 hours (16 hours, 18 min)

Note: These are best possible times based on the program. Times will vary with load size, voltage, element age, etc.
OPERATION OF YOUR THREE BUTTON CONTROL

USR2 - SLOW GLAZE TO CONE 06

<table>
<thead>
<tr>
<th>DISP</th>
<th>VALUE</th>
<th>TIME</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>dLAY</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEG</td>
<td>0003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rA 1</td>
<td>150</td>
<td>1.2</td>
<td>hours</td>
</tr>
<tr>
<td>°F1</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hld1</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rA 2</td>
<td>400</td>
<td>3.3</td>
<td>hours</td>
</tr>
<tr>
<td>°F2</td>
<td>1578</td>
<td></td>
<td>Second to Final Temp</td>
</tr>
<tr>
<td>Hld2</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rA 3</td>
<td>120</td>
<td>2.1</td>
<td>hours</td>
</tr>
<tr>
<td>°F3</td>
<td>1828</td>
<td></td>
<td>Final Temperature</td>
</tr>
<tr>
<td>Hld3</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Estimated Time: 6.6 hours (6 hours, 36 min)
Note: These are best possible times based on the program. Times will vary considerably with load weight, voltage, element age, etc.

USR3 - FAST GLAZE TO CONE 6

<table>
<thead>
<tr>
<th>DISP</th>
<th>VALUE</th>
<th>TIME</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>dLAY</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEG</td>
<td>0002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rA 1</td>
<td>570</td>
<td>3.3</td>
<td>hours</td>
</tr>
<tr>
<td>°F1</td>
<td>1982</td>
<td></td>
<td>Second to Final Temp</td>
</tr>
<tr>
<td>Hld1</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rA 2</td>
<td>200</td>
<td>1.25</td>
<td>hours</td>
</tr>
<tr>
<td>°F2</td>
<td>2232</td>
<td></td>
<td>Final Temperature</td>
</tr>
<tr>
<td>Hld2</td>
<td>00.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Estimated Time: 4.55 hours (4 hours, 33 min)
Note: These are best possible times based on the program. Times will vary considerably with load weight, voltage, element age, etc.

Typical KW usage for a 55 pound load: 23 KWH (at 8 cents per KWH that would be a total cost of $1.84)
**OPERATION OF YOUR THREE BUTTON CONTROL**

### OTHER PROGRAMS

#### A FAST BISQUE PROGRAM TO CONE 05

This is a sample of how you would write a program to do a Fast Bisque to Cone 05. You may want to try this on very thin walled pieces but in general the Slow Bisque is a safer way to fire.

<table>
<thead>
<tr>
<th>rA</th>
<th>°F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
<td>1.15 hours</td>
</tr>
<tr>
<td>2</td>
<td>120</td>
<td>.83 hours</td>
</tr>
<tr>
<td>3</td>
<td>300</td>
<td>2.5 hours</td>
</tr>
<tr>
<td>4</td>
<td>150</td>
<td>.66 hours</td>
</tr>
<tr>
<td>5</td>
<td>180</td>
<td>3 hours</td>
</tr>
<tr>
<td>6</td>
<td>108</td>
<td>2.31 hours</td>
</tr>
</tbody>
</table>

On loads that are very important always use cones you can see through the peepholes in case of a failure of some kind.
A PROGRAM FOR SLUMPING GLASS

People have many different ways and programs for firing glass. Here is one recommendation for slumping that you can try. **CAUTION:** Be very careful not to overfire glass - it can cause a real mess when it melts (like a big hole in your kiln floor) which we cannot be responsible for. Use your peepholes to observe the glass when it starts to slump - and be sure to use proper safety glasses.

dLAY 00.00  
SEG 0003

| rA 1 | 400 |
| °F1 | 1400 |
| Hld1 | 00.15 | Hold |

| rA 2 | 9999 | Ramp down as fast as possible |
| °F2 | 950 |
| Hld2 | 01.00 | Hold |

| rA 3 | 100 | Slow Ramp down |
| °F3 | 100 | to room temperature |
| Hld3 | 00.00 |

A PROGRAM TO HEAT TO 1800 DEG F AND HOLD FOR EIGHT HOURS

dLAY 00.00  
SEG 0001

| rA 1 | 9999 |
| °F1 | 1800 |
| Hld1 | 08.00 |

FIRING TO OTHER CONES

You can use these same basic programs for firing to different cones.

For a Slow Bisque Program change the temperatures in ramp 5 (rA 5) and ramp 6 (rA 6) to the following values.

For a Slow Glaze Program change the temperatures in ramp 2 (rA 2) and ramp 3 (rA 3) to the following values.

For a Fast Glaze Program change the temperatures in ramp 1 (rA 1) and ramp 2 (rA 2) to the following values.

Note that the final ramp starts 250°F below the final temperature to be reached.

FIRING TO CONE | SECOND TO FINAL TEMP | FINAL TEMP
---|---|---
07 | 1539 | 1789
06 | 1578 | 1828
05 | 1638 | 1888
05-1/2 | 1609 | 1859
04 | 1695 | 1945
03 | 1737 | 1987
02 | 1766 | 2016
01 | 1796 | 2046
1 | 1829 | 2079
2 | 1838 | 2088
3 | 1856 | 2106
4 | 1874 | 2124
5 | 1917 | 2167
5-1/2 | 1947 | 2197
6 | 1982 | 2232
7 | 2012 | 2262
8 | 2030 | 2280
9 | 2050 | 2300
10 | 2095 | 2345
OPERATION OF YOUR THREE BUTTON CONTROL

OTHER CONTROL OPTIONS

**Default Settings**
The Model 3K controller with RMPATE software has several selectable features. These features include:

1) Complete beeping sequence. This is the alarm sounding at the end of a firing. The default setting is “On”.

2) Temperature scale, °F or °C. The default setting is °F.

3) Maximum temperature, 1700°F, 2000°F, or 2350°F. The default setting is 2350°F.

**Programming the Options**
In order to program the above options the controller must first be turned OFF. Press and hold any key while you turn the power back ON. Continue to hold the key until **Edit** is displayed, then release the button.

NOTE: There is NO beep when keys are pressed while programming the following options.

1) **FULL**, **On**, or **OFF** will be displayed depending on the currently selected option for Complete Beeping. Press the **UP** or **DOWN** keys to select the option you want and press **ENTER**.

2) °F or °C will be displayed depending on the currently selected option. Press the **UP** or **DOWN** keys to select the option you want and press **ENTER**.

3) 2350 will be displayed. Press the **UP** or **DOWN** keys to select the maximum programmable temperature you want and press **ENTER**.

The options are now programmed. The controller will continue where it was prior to editing. The controller will fire if it was firing or be in the programming mode where it left off.

**Complete beeping**
There are three choices for the beeping which occurs when the firing is complete.

1) **FULL** - this option causes a continuous beep when the firing is complete. Beeping stops with a key press.

2) **On** - this option causes a 15 second beep at complete.

3) **OFF** - with this option there is no audible beep at the end of firing.

**Temperature Scale**
1) °F - this sets the controller to the Fahrenheit scale

2) °C - this sets the controller to the Celsius (centi-grade) scale

**Maximum Temperature**
With the Fahrenheit scale the maximum programmable temperatures are: With the Celsius scale the maximum programmable temperatures are:

1) 2350 °F 1288 °C

2) 2000 °F 1093 °C

3) 1700 °F 927 °C