

Model 3K Programming

# Operation Manual

## Model 3K Controller

***BARTLETT***

— INSTRUMENT COMPANY —

1404 Avenue M  
Fort Madison, IA 52627

319-372-8366

[WWW.BARTINST.COM](http://WWW.BARTINST.COM)

Manufactured by Bartlett Instrument Company  
[www.bartinst.com](http://www.bartinst.com)

## INTRODUCTION - 3K Model Controller

Your new kiln is equipped with the three key 3K electronic control manufactured by Bartlett Instruments. It is easy to use but may require some familiarization.

*The 3K controller is made with numerous software programs some of which are described at Bartlett's web site, [www.bartinst.com](http://www.bartinst.com). **Your controller has "Ramp 8" software and is not a part of these instructions.** The two page attached supplement is the only instruction provided by Bartlett. We will attempt to add clarification.*

Your controller has four (4) programs each with eight (8) segments. A segment is a temperature (in degrees per hour) rate change, end temperature and a hold time. You can have as many as eight (8) segments within one program.

When the controller's display reads **SEG** it is asking how many segments to you desire to have throughout the firing. (A segment is raising or decreasing the temperature to a certain temperature in a period of time. Example: You have a piece that needs three segments, 1st segment raise temperature 150 degrees per hour to reach 900 degrees, 2nd segment raises temperature 200 degrees per hour to reach 1800 degrees, 3rd segment decreases temperature 150 degrees per hour to reach 1000 degrees. Segments are used primarily with glaze or glass firings.)

Once a program is entered it will remain in the controller's memory until a new program is entered over the old one.

To program the controller follow the instructions "Programming the Model 3K Controller". They may seem confusing at first but when followed are exact. Remember the words in bold print in the instructions are the letters as they appear in the controller's display.

The Model 3K on your kiln is programmed for end temperatures not cone temperatures, as are some controllers. Your Electric Kiln Operator's Manual has a conversion chart for cones/temperature on page 9. Please refer to this table to determine firing temperatures verses cone for the type of firing you plan to do.

### CONVERTING CONE TO FIRING TEMPERATURE

When firing to a cone equivalent your end temperature will vary based on a time – temperature relationship. The slower the firing rate the lower the end temperature and the faster the rate – the higher the temperature. The firing rate of the controller is in degrees per hour. If, for example, you wish to fire to cone 05 (1915°F from table on page 9 of Electric Kiln Manual) and your firing time is five hours then deduct room temperature (the kiln when turned on will be at room temperature) from 1915 and divide by 5 for degrees per hour rate of change.

### **Example: Steps for a cone 05 firing**

Formula:  $1915^{\circ}\text{F} - 70^{\circ}\text{F} = 1845^{\circ}\text{F}$ ;  $1845^{\circ}\text{F} / 5\text{ hrs} = 369^{\circ}\text{F}$

Because you are doing bisque firing to a specific end temperature you will only want 1 segment. Use the up and down keys to reach the #1 and press Enter.

**rA1** is then displayed (rate in rise/decline of temperature) to determine what happens in each segment. Enter the #369 and Enter.

**F1** will display and you will use the up/down keys to select the end temperature and for cone 05 -  $1915^{\circ}\text{F}$ .

**HLd1** is display requesting how long you want the end temperature of the segment to hold. For bisque you do not need any holding time, so you would use the up/down keys to #0.

**REd1** (READY) is displayed after all the segments in a firing had been entered. Press START to begin the firing.

Once your kiln has fired it will display **CPLt** to show you the kiln has completed the firing process. After the kiln has cooled down, you can then unload your ware.

### **Other Features:**

The eight (8) -segment programs allow creativity. You can do a preheat to 200 degrees and hold then rise to another temperature and hold, then go to the end temperature and either shutoff, hold, or have a controlled cooling.

Other options available with the 3K Controller include changing degrees from Fahrenheit to Celsius, and delayed start – choose when you want the kiln to fire and program it into the controller.

**dELa** will be displayed asking if you want to delay firing of the program, if the answer is yes and you want the kiln to begin firing 5 hours and 30 minutes after you key in the program, enter 530 and then press Enter. If you want the kiln to begin firing immediately when the **dELa** message appears enter 0000.

**Error codes** provide information about unusual situations that may occur while firing. These codes keep you informed about the kiln's firing so that you do not have to guess what has happened during a firing, if something unusual occurred.

If you have any other questions regarding operation of the controller, please call Bartlett Instruments (319) 372-8366 or Olympic Kilns (770) 967-4009.

# Model 3K Programming

## General Information

The Model 3K controller with RMPATE software has four User programs. Each program can have up to eight segments with each segment consisting of a ramp rate (in degrees per hour), a target temperature, and a hold time. Programming consists of choosing the User program (1, 2, 3, or 4), choosing how many segments you want (up to 8), then programming the ramp (rA), temperature (°F), and hold time (HLD) for each segment.

## Programming the Model 3K Controller

When the power is first turned on either ErrP or StOP/current temperature is displayed.

If **ErrP** is displayed press any key to clear this error message.

If **StOP** alternating with the **current temperature** is displayed, you are ready to begin programming.

Press **ENTER** to begin.

The previously fired program will be displayed, USr1, USr2, USr3, or USr4.

Select the user number you want to program by using the UP and DOWN keys, and press ENTER.

**dELA** is displayed alternating with 00:00. Press ENTER if no delay is wanted. **When firing glass no delay is used.** Use the UP and DOWN keys to delay the start of the firing (Hours: Minutes). Press ENTER when the desired delay time is displayed.

**SEG** alternating with the last selected number of segments is displayed. Use the UP and DOWN keys to select the number of segments, then press **ENTER**. NOTE: Each segment consists of a ramp rate to a temperature and a hold time. There are 8 segments available for programming.

**rA 1** alternates with the ramp rate (°/hr). 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 maximum rate. **The first segment must always be an "up" ramp.**

**°F 1** alternates with the currently selected temperature. Use the UP and DOWN keys to select the desired temperature and press ENTER.

**HLD1** alternates with the currently selected hold time. Use the UP and DOWN keys to select the desired hold time and press ENTER. Repeat the above 3 steps for each additional segment for the ramp rate, temperature, and hold time.

**rEdl** will be displayed after the last segment is entered. Press ENTER to begin firing.

**To re-fire the last used program**, press the DOWN key when **StOP** is displayed. The program will be quickly reviewed and **rEdl** will be displayed. Press START to begin the firing.

## Options During Firing

Displaying the current set-point and accessing the following options. 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. When the UP key is pressed during a firing the current ramp or hold is displayed followed by the current or traveling set-point, then "SStP" is displayed. If you do not press a key within several seconds the display will return to showing the current temperature in the kiln.

Skip Step This option allows you to skip from the present segment to the next ramp rate. Press the UP key, the display will show the current segment, then the set-point, then "SStP". 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. 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. When "SStP" is displayed press the UP key again and "tME" will be displayed. Press ENTER and 5 minutes will be added to the hold time. You may use this procedure as many times as necessary to get the hold time that you want.

Add Temperature to Hold Period This option allows you to add temperature in 5 degree increments to a hold (soak) period. 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. When "SStP" is displayed press the UP key twice more and "tMP" will be displayed. Press ENTER and 5 minutes will be added to the hold time. You may use this procedure as many times as necessary to get the hold temperature that you want.

# Model 3K Programming

## 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.

## 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