

# *Chili Pepper Kiln*

***BEAD ANNEALER***

**Tool Box Type Kiln**

**Model: BA-1-B-3K**

***3-Key Digital Controller***

## **Owners Manual**

***Digital Controller***

*Chili Pepper Kiln*

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# Operating Your Chili Pepper Kiln

## What Causes Heating Variations

The voltage available to the kiln will affect the switch calibration. We assume that your kiln is receiving a full 120 volts. If the actual voltage is more than 120 volts, the amount of time on will be significantly decreased. This does not mean the switch is out of calibration, but that the switch is reacting to the voltage being applied to it. Low voltage will also affect the switch's performance, but in the opposite manner. The switch will be on more than is normal. This can cause the switch to be out of its set range percentages.

## Slow Heating from One Kiln to Another

Some customers find that one kiln may fire more slowly than another. A standard firing time to one customer may be too long for another. This can be related to kiln size and load, or to varying electric current. Electric current can be restricted by the following conditions:

1. Gauge of house wiring too small
2. Available voltage is low
3. Loose wire connection in kiln control panel
4. Loose wire connection in house wiring or in receptacle
5. Other electrical items using the same power line, i.e., fan, radio, lights, etc.

## The Clicking Sound

The clicking sound is the made by the relay making and breaking contact. This is normal. Sometimes it clicks fast, like a stutter, other times it clicks at a slower rate.

## Pilot Light

The green pilot light is on when ever the relay is on and providing power to the element. The green pilot light is off when the relay cycles to not supplying power to the element. this occurs as the controller maintains a certain temperature in the kiln.

### Warning:

Do Not Allow Kiln to Exceed 1100 °F Max Temperature.

Temperature above 1100 °F may cause the paint on this kiln to ignite causing a fire.

The exterior surface of this kiln is hot when turned on – Do not touch or handle you may receive a severe burn.

## Loading the Kiln With Beads

There are two ways to load the Bead Annealer Kiln with beads.

First, lift the front green door and insert the bead, while on its mandrel, directly into the kiln. It is ok for part of the bead mandrel to stick out of the kiln. After inserting the bead close the front green door. Make sure that the Bead Annealer is at the correct annealing temperature for the glass you are using before inserting beads to be annealed – other wise the bead may crack due to thermoshock from the cooler environment in the kiln.

Second, if you already have beads made that have not been annealed you may anneal them. Make sure that the bead annealer Infinite Control Switch is in the OFF position (the pilot light off also). Then open the top lid and place the beads on the floor of the bead annealer. After loading all the beads into the bead annealer close and latch the top lid. Now turn the kiln Infinite Control Switch to the setting you have previously determined to represent the annealing temperature for the type of glass you are using. Never open the top lid door with the kiln turned on.

Follow the recommendations of the glass manufacturer or your dealer on how to fire the glass you are using. Glass type, thickness, size, and annealing techniques can be widely different. This is an art and there is no firm set of rules.

**DO NOT OPEN THE TOP LID DOOR WITH THE KILN TURNED ON**

**DO NOT REACH INTO A FIRING KILN**

**NEVER USE AN EXTENSION CORD**

**NEVER LEAVE A FIRING KILN UNATTENDED**

**NEVER ALLOW THIS KILN TO EXCEED 1100 °F**

**THE EXTERIOR SURFACE OF THIS KILN IS HOT WHEN TURNED ON**

Do not touch or handle the exterior surface - you may receive a severe burn!

**DO NOT OPERATE KILN WHILE SETTING ON ANY SURFACE WHICH IS FLAMABLE**

**DO NOT PLACE ANYTHING ON TOP OF THIS KILN**

**DO NOT PLACE REFRACTORY (INSULATING) FELT / WOOL ON TOP OF THIS KILN**

**DO NOT ENCLOSE THIS KILN INSIDE ANY TYPE OF INSULATING BOX**

**Specifications**

Maximum Safe Operation Temperature: 1100 °F

**Warning: This kiln is capable of reaching 1500 °F temperature**

Inside Chamber: 16" wide x 4 1/2" deep x 6" tall

Door Opening: 16" wide x 2 3/4" tall

Door has two stainless steel rods for opening

Exterior metal bead mandrel rest at bottom of door opening

Exterior Measurements: 24" wide x 12" deep x 9 1/2" tall

Kiln Weight: 18 1/2 pounds

3-Key Digital Controller

Type K thermocouple

Power On Green Pilot Light

Electrical Draw: 120 volt, 5.93 amps (712 watts)

Electrical Requirements: 120 volt, 15 amps, 50 – 60 Hz, Single Phase

Single Kanthal A-1 Element

Element is inserted inside quartz glass tube

Element is mounted at the top of the back wall

Kiln insulating lining is two 1" layers of 8 pound refractory blanket which is Non-Carcinogenic

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# Su-Mar Industries, Inc. Kiln Warranty

Su-Mar Industries, Inc. kilns are warranted to the original purchaser to be free from defects in materials and workmanship when used under normal and proper conditions for the periods specified below. The warranty period begins at the date of original purchase from an authorized distributor or dealer.

Su-Mar Industries, Inc. kilns – are warranted for 1 year from date of original purchase, including elements, controller, & pyrometer.

To File A Warranty Claim the Purchaser Must:

- Provide written proof of the date of purchase.
- Notify Su-Mar Industries, Inc. or our distributor/dealer from whom the kiln was purchased
- Make the kiln immediately available for inspection.

For Warranty Repairs:

1. All warranty repairs are handled directly through Su-Mar Industries, Inc. Contact Su-Mar Industries, Inc. for any repair or replacement of parts under the terms of the warranty. Warranty work, other than that performed at the Su-Mar Industries, Inc. factory; does not include labor, parts only. The defective part must be returned to Su-Mar Industries, Inc. (postage prepaid). Include your name and address, a letter of explanation, and the name and address of the dealer from where the kiln was originally purchased. If after factory examination the part is found to be defective, a new or repaired part will be sent prepaid by Su-Mar Industries, Inc.
2. If the entire kiln is to be returned to the factory, all shipping costs are the responsibility of the purchaser. The purchaser should notify Su-Mar Industries, Inc. prior to shipping. Su-Mar Industries, Inc. will advise the best shipping method and if it is necessary to return the entire kiln or only certain parts. Factory warranty work will be performed within 30 days after the defective part is returned to the factory.
3. Su-Mar Industries, Inc. reserves the right, at its option, to replace the entire kiln or any part of it in order to fulfill its obligation under this warranty.

This Warranty Does Not Cover:

- Freight Damage
- Kilns altered in any way after leaving our factory
- Abuse or neglect, moisture, improper storage
- Improper Installation
- Kiln Over Fires – (exceeding the melting temperatures of the materials being fired) regardless of the cause of the over fire.
- Kilns operated on incorrect voltage
- Improper Electrical Installation
- Kiln Furniture
- Kiln Ware
- Kilns used for purposes other than firing glass or ceramic materials
- Kilns operated in excess of the temperature rating of the kiln
- Damages that may occur from kilns that are fired on or near combustible materials (example: wood floors.)

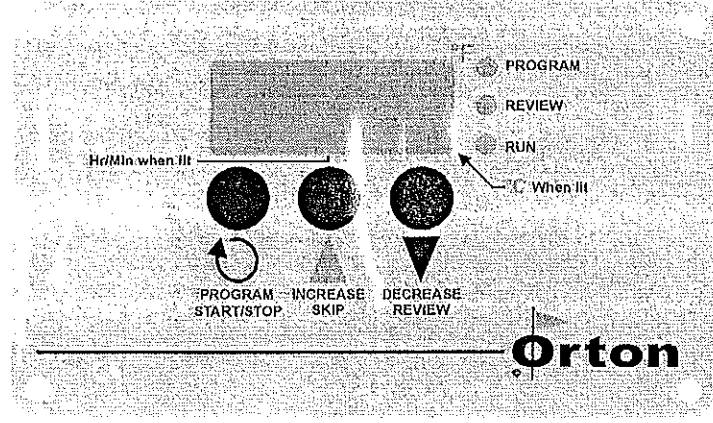
This Warranty is in lieu of all other warranties, expressed or implied. Su-Mar Industries, Inc. neither assumes nor authorizes any Distributor, Dealer, Retailer, or Employee to assume for it any other obligations of liabilities in connection with Su-Mar Industries, Inc.

This warranty is limited as specified above and excludes incidental or consequential damages, so the above limitations or exclusions may not apply to you, This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



Orton Ceramic Foundation - 6991 Old 2C Highway, Westerville, OH 43082-9026  
Phone (614) 895-2663, Fax (614) 895-5610 (www.ortonceramic.com)

### AF-3 Speed Controller



Left button;

Select a Program or Start a firing or Stop a firing.



Middle button;

Increase values in the display or Skip Step during a firing.



Right button;

Decrease values in the display or Review the program being used.

When using the increase and decrease buttons to change number values, the values will change rapidly if the button is held in.

**Programming Temperature Values:** Temperature values can be displayed and programmed in degrees Fahrenheit or Celsius. If the bottom right decimal point is lit on the display, temperature values are °C, if the decimal point is not lit, temperature values are °F.

**Changing the Temperature Display:** The temperature display can be changed from °F to °C by removing the jumper (JPR1) on the back of the controller. Refer to the wiring diagram included with these instructions to locate the jumper position.

**Temperature Measurement:** The controller measures and controls temperature from a single Type K thermocouple probe. Thermocouple probes extend into the firing chamber to measure the temperature. Use caution to avoid damage to the thermocouple. If the probe is damaged, the controller will not function.



**Programming Hold Time Values:** Time is entered in Hours.Minutes format. The decimal point between the 2 left display segments and the two right display segments separate hours and minutes. 1hr and 20 minutes = 01.20 on the display.

**Status Indicator Lights:** 3 lights are located to the right of the display.

- ⊗ Program lit during programming and Program Review.
- ⊗ Review lit during Program Review.
- ⊗ Run blinks when the controller is in firing mode.

CONTROLLER FEATURES

<i>PID Control</i>	Accurate control with minimum temperature cycling
<i>8 Step Ramp/Hold</i>	One Ramp/Hold program
<i>Maximum Temperature</i>	Factory set up to 1300°C / 2372°F
<i>Preset Programs</i>	Speed1 thru Speed5
<i>Temperature Units</i>	Fahrenheit or Celsius
<i>4 Digit Display</i>	Front panel display
<i>3 Status LED's</i>	Front panel display
<i>Program Review</i>	Displays current program
<i>Delay Start</i>	Programmable in Hours.Minutes
<i>Skip Step</i>	Skips to the next ramp when firing Ramp/Hold program
<i>Set-Point Control</i>	Program to hold indefinitely
<i>Rapid Heat/Cool</i>	Full power heating or cooling rates
<i>Power Recovery</i>	Resumes firing when power is restored.
<i>Diagnostics</i>	Audible Alarm and display codes
<i>Thermocouple Type</i>	K

ALARMS

FTL	Display alarms indicate why a firing was terminated.
ETH	Firing To Long [FTL] - kiln is not increasing in temperature by more than 27°F/Hr (15 °C/hr) and the firing time is 4 hours longer than programmed
TCO	Electronics Too Hot [ETH] - electronics temperature exceeds 185°F (85°C)
TCR	ThermoCouple Open [TCO] - Thermocouple not detected / controller idle.
PF1	ThermoCouple Reversal [TCR] - Thermocouple connected incorrectly.
PF2	Power Failure #1 [PF1] - Temperature dropped more than 212°F (100°C)
FAIL	Power Failure #2 [PF2] - Temperature is below 212°F (100°C)
	Thermocouple FAIL [FAIL] - Thermocouple not detected / controller running.

**Power Fail Recovery:** A firing will resume when power is restored if the temperature is above 100°C (212°F) and the temperature drop is less than 100°C (212°F). If these conditions are not met, one of the two Power failure alarms will terminate the firing.




DISPLAY MESSAGES

[COMPLETE]  
[DELAY]  
[FULL]  
[IDLE]  
-ON-  
[Program]  
[SStP]  
[STOP]  
[START]  
[DEGREE F #1]  
[DEGREE C #1]  
[HLD]  
[RA]

[COMPLETE] - Firing is complete. Alternates with final temperature, current temperature and firing time. *Controller beeps for 30 seconds to indicate firing is complete.*  
[DELAY] - Delay start mode. Alternates with remaining delay time during a firing.  
[FULL] Full ON or Full OFF- Rate programmed at 9999°C/hour or 1799°F/hour  
[IDLE] - Controller Idle Mode. Not running a program. Not in programming mode.  
[ON] - Firing program is running.  
[Program] - Ramp/hold Program  
[Skip Step] - Advance to the next ramp segment  
[STOP] - Firing was stopped – Alternates with current temperature and firing time.  
[START] - Controller is ready to be started.  
[DEGREE F #1] - Ramp/Hold program temperature. °F 1 thru °F 8  
[DEGREE C #1] - Ramp/Hold program temperature. °C 1 thru °C 8  
[HOLD] - Ramp/Hold program dwell time. HLD1 thru HLD8  
[RAMP] – Ramp/Hold program heating/cooling rate. RA 1 thru RA 8

**Programming for Set-Point Control:** The controller can be programmed to hold at a set-point temperature indefinitely. This is achieved by setting the Hold time value to 99 hours and 59 minutes [99.59]. The controller will remain at the set-point temperature until the STOP button is pressed.

**Program Review :** To check the current program in active memory, press  **DECREASE REVIEW** at any time. The program will be displayed temporarily.

**Skip Step:** During a Ramp/Hold program, press  **INCREASE SKIP** to skip to the next ramp. [SStP] shows in the display alternating with the current ramp segment. To skip, press the skip button again.


















### SPEED PROGRAMMING

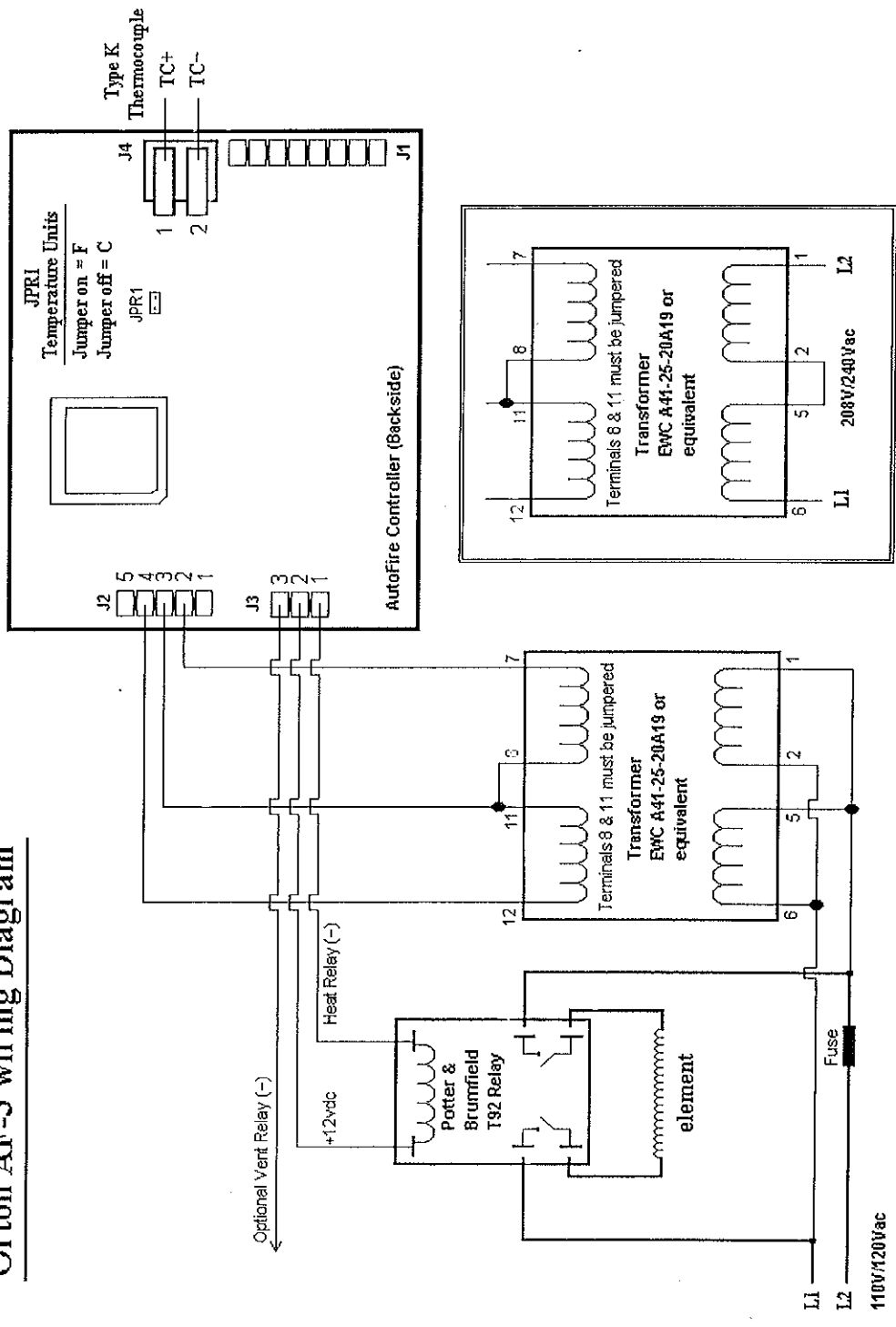
You can fire to a single temperature using one of 5 preset speeds

<b>SPd1</b>	200°F/hour	(111°C/hour)
<b>SPd2</b>	500°F/hour	(278°C/hour)
<b>SPd3</b>	1000°F/hour	(555°C/hour)
<b>SPd4</b>	1500°F/hour	(833°C/hour)
<b>SPd5</b>	Full Power	

1. Press  to enter programming mode from IdLE.  
**PROGRAM START/STOP**
  
2. Press  until the desired speed program is displayed.  
**INCREASE SKIP**
  
3. Speed number alternates with the preset ramp rate. Press  to continue.  
**PROGRAM START/STOP**
  
4. °F or °C is displayed alternating with the programmed temperature. Use  or  to change the set-point temperature. Press  to continue.  
**INCREASE SKIP** or **DECREASE REVIEW**  
**PROGRAM START/STOP**
  
5. [HLd] alternates with the programmed hold time. Use  or  to enter time (Hours.Minutes) – Press  to continue.  
**INCREASE SKIP** or **DECREASE REVIEW**  
**PROGRAM START/STOP**
  
6. [Strt] is displayed
  
7. For access to delay start, Press  [dELA] is displayed alternating with time. Use  or  to enter the delay time (Hours.Minutes).  
**DECREASE REVIEW**  
**INCREASE SKIP** or **DECREASE REVIEW**
  
8. Press  to start the firing.  
**PROGRAM START/STOP**



# Orton AF-3 wiring Diagram





**WARRANTY**

The Orton Ceramic Foundation warrants the controller to be in good working order for a period of one (1) year from the date of purchase. If the product fails to work, due to materials or workmanship, at any time during this one year period, Orton will, at it's option, repair or replace this product as set forth below.

The liability of the Orton Ceramic Foundation is limited to replacement and/or repair of the controller, at it's factory, that does not remain in good working order, under normal operating conditions. Repair parts or replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of Orton Ceramic Foundation.

Limited warranty service may be obtained by delivering the unit during the one (1) year warranty period to THE ORTON CERAMIC FOUNDATION, 6991 OLD 3C HIGHWAY, WESTERVILLE OH 43082-9026, USA and providing written proof of purchase and description of defect or problem. The buyer must insure the unit or assume the risk of loss or damage in transit, prepay shipping charges to the service location, and use the original shipping container or equivalent. The buyer will be invoiced for shipping and handling changes incurred in returning the unit after service.

Service may also be obtained on units no longer under warranty by returning unit prepaid to Orton with a description of the problem, and the buyer's name, address, and telephone number. The buyer will be contacted with an estimate of the service charges before any work is performed.

All express and implied warranties for this product including the warranties of merchantability and fitness for a particular purpose are limited in duration to a period of one (1) year from the date of purchase and no other warranty, whether expressed or implied, will apply after this period.

This warranty does not apply to the thermocouple and does not apply to any damage resulting from:

1. Over-firing (melting of materials being fired) regardless of cause.
2. Operation beyond electrical rating including overloading or shorts in user equipment.
3. External sources including chemicals, heat abuse, and improper use.
4. Improper or inadequate maintenance by the user.
5. Parts or equipment not supplied by Orton Ceramic Foundation.
6. Unauthorized modification or misuse.
7. Operation outside environmental specifications.
8. Improper installation.

Units returned for service where no defect is found will be subject to a service fee.

If this product is not in good working order as warranted above, your sole remedy shall be repair or replacement as provided above. In no event will Orton Ceramic Foundation be liable for any damages, including any lost profits, lost savings, or other incidental or consequential damages arising out of the use of or inability to use such a product even if Orton Ceramic Foundation has been advised of the possibility of such damages, or for any claim by any other party.

The above limitation of liability does not apply in the event that any Orton Ceramic Foundation control product is determined by a court of competent jurisdiction to be defective and to have directly caused bodily injury, death or property damage; provided, that in no event shall Orton's liability exceed the greater of \$1000 or the purchase price of the specific product that caused such damage.

**SERVICE**

Should your controller require service, please contact your kiln manufacturer or call Orton at 1-614-895-2663. Do not return any unit to Orton without first calling and obtaining an RMA No.

When returning, wrap the controller in protective packaging, and securely pack in sturdy box. Ship the unit prepaid to Orton with a complete description of defect or problem and your name, address, and telephone number. Upon receipt by Orton, the unit will be examined and any defective or damaged parts will be repaired or replaced. For units not under warranty an estimate will be provided before repair.