

Jen-Ken Kilns

AF3P Pre-programmed
“One Smart Controller”

Chilipepper Operating Manual

-BEAD-
Small Moretti
Large Moretti
Batch Annealing
Borosilicate
+4 Extra



Jen-Ken Kilns and Orton have produced the most user-friendly and powerful, kiln controller for artists. If the Jen-Ken Kiln can perform all the above tasks then all of the above settings will be turned on. The Chilipepper is a low firing annealing kiln and will only have the –BEAD- setting turned on.

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This manual contains instructions on the operation of our Jen-Ken Kilns with the AF3P Pre-programmed Controller, that was made for Jen-Ken Kilns by Orton, This manual is not intended to replace a proper and safe lampworking techniques. The products you put in the kiln to anneal will come with or have available firing schedules for these products.

Jen-Ken Kilns wants you to have this controller to get you firing sooner and to see sample programs that you can use (or modify) the programs to match the one's for the items you are firing.

SAFETY FIRST

Read and understand all operating instructions before operating your kiln.

SAFETY PRECAUTIONS: Kilns are as safe as any other electrical appliance when used under normal and proper operating conditions. All safety precautions throughout this manual should be observed.

- Use common sense while installing and using this kiln.
- Do not install kiln closer than 12" from any surface, or closer than 18" from a combustible surface. Remove all potentially combustible materials from the kiln area
- Make sure all electrical specifications are followed. Use correct voltage, wire size and circuit breaker. Make sure all connections are tight. Avoid using aluminum wire. Always use the proper grounded receptacle. A qualified electrician or service person should be used for all electrical service or repairs.
- Install in covered, walled in, well-ventilated area. Do not allow your kiln to get wet. Fumes from the ware should be vented to the outside. Never use your kiln outside! Avoid moisture.
- Always keep children and unsupervised personnel away. Surface will get hot and a burn could result.
- Fire glass only to the manufacturers recommended firing temperature. Improper fire temperatures could result in damage to your kiln. Do not operate chilipepper kilns over the maximum temperature rating of 1100°F for top and side firing glass kilns
- Chilipepper kilns are for annealing glass only with a max temperature of 1100°F
- Replace any worn or defective parts with ONLY genuine Jen-Ken Kiln replacement parts.
- Unplug kiln when not in use and if there is an electrical storm.
- Unplug the kiln before servicing or vacuuming.
- Do not drop or slam the lid shut.
- Let the kiln cool to room temperature before opening the lid.
- NOTE: If you are in doubt about anything, call Jen-Ken Kilns during regular business hours M-F 8-4 Eastern at 863-648-0585 or send an email to mike@jenkenkilns.com.

KILN SPECIFICATIONS

To operate the kiln safely and efficiently, your kiln needs the proper electrical outlet with the correct electrical capacity and voltage. The chart below will assist you in the selection of the proper wire and breaker size for your Jen-Ken Kiln. A licensed electrician or the local power company should determine if you have the proper voltage and wiring.

MODELS GS & Digitals	Voltage	Amperage Draw	Wire Size Required	Fuse Required	Receptacle
Chilipepper	120	8	10	15	5-15R

This Chilipepper is on a stainless steel table with no wood under it. This is a great choice for a kiln.



It is important to have an air space under the kiln. If you have a wood table or a wood table with a metal top, you need to put smooth ceramic tiles down first. You can cut a piece of dry wall or cement board larger than the tool box base and put it down as base. To clean up the look use a strip of duct tape around the edges of the dry wall. Call with any questions. 863-648-0585

CHOOSING A LOCATION FOR YOUR Chilipepper Kiln

The proper location is as important as choosing the right kiln. Below are some safety guidelines.

- Please review the safety considerations listed on page 5 when selecting a location for your kiln.
- Your kiln should be located in a covered, dry, fireproof and well ventilated area, but **never** in a small enclosed area such as a closet, cabinet or very small room. Otherwise, the room temperature will increase past a reasonable level quickly. In a larger room, the exterior of the kiln will stay cooler than in a very small room.
- Your kiln should be on a cement or fireproof surface and positioned a minimum of 12" from any surface. The best and safest place for your kiln is on a all steel table or cement tile that is elevated with an air space under it. If not, some type of adequate fireproof material should be used beneath the kiln to prevent a possible fire hazard or prevent discoloration of the table surface.
- Air must always be allowed to circulate under the kiln so that heat can dissipate and not build in temperature.
- Air circulation and ventilation are needed to remove heat and vapors that may be released from the firing. In a larger room, the exterior of the kiln will stay cooler than in a very small room. If ventilation is a problem, call to see if an Orton Vent System or a hood system is applicable.

- Proper electrical service must be available. Refer to the section on Electrical Specifications. Select a grounded, three-pronged receptacle that is as close as possible to either your fuse or breaker box. DO NOT use extension cords!
- Remove all flammable or combustible materials such as gasoline, paper, paints, plastics, etc. from the surrounding area.
- Since the exterior of the kiln gets very hot, place the kiln out of the way of children, traffic, and work areas.
- Do not let the power cord come in contact with the kiln. The kiln may need to be rotated a little for the cord not to touch the kiln.
- Never install a kiln outside and avoid undue moisture.

I am ready to use the kiln, now what?

The Chilipepper is an annealing kiln only. It has been preprogrammed with some common annealing schedules. These can be changed to meet your annealing needs. There are four extra user programs that you can use for any unique schedules you need. The ideal use of the Chilipepper Kiln, is to fire up and hold, at the annealing temperature for the longest number of hours you wish to work with the torch. You garage your pieces at the annealing temperature and when you have finished working and put the last piece in the kiln, you can skip step to the next segment where the kiln will soak at the same temperature for a time and then ramps down. This is so the last bead that it put into the kiln has a chance to anneal before the ramp down.

AF3P Controller

(Auto Fire 3 Button Programmable Controller)



AF3P Chilipepper Controller



This button is for selecting a firing program and advancing through the programming steps. After programming is complete, use this button to Start and Stop the firing.



This button is used to change the firing program during programming and to change the display values for specific program settings. During a firing, use this button for special firing options (including Skip Step).



This button is used to change the display values for specific program settings. It is also used to activate the Program Review feature.



When using the Increase and Decrease buttons to change number settings, the values will change more rapidly if the button is held in.

Status Indicator Lights

3 lights are located to the right of the display.

- | | |
|-----------|---------------------------------------|
| Ⓞ Program | lit during controller programming |
| Ⓞ Review | lit during Program Review. |
| Ⓞ Run | lit (blinks) during an active firing. |

Audible Alarm

The controller is equipped with a small buzzer that will sound during button presses and at the successful completion of a firing for 30 seconds. The alarm will also sound to notify you of diagnostic alarms that may occur during a firing. To silence an active buzzer, Press any button.

Temperature display preference

All temperature displays on the controller can be viewed as °F (Fahrenheit) or °C (Celsius). The temperature display preference is set by positioning a small circuit board jumper on the back side of the controller that is labeled C/F. The C/F jumper has 2 pin positions, when installed on the 2 corresponding circuit board pins the controller will display all temperatures as °F(Fahrenheit). When no jumper is installed on the 2 circuit board pins the controller will display all temperatures as °C (Celsius). To determine if your controller is set for °F or °C without viewing the jumper position, the small decimal point light in the bottom right-hand corner of the display panel indicates °F or °C. If this decimal point light is lit, the controller is set for °C.

The C/F jumper position is shown on the wiring diagram included in this manual (page 29).

Temperature Measurement

The controller monitors and controls temperature from a single Type K thermocouple sensor. The thermocouple probe extends into the firing chamber to measure the temperature. Use caution to avoid damage to the system thermocouple. If the probe is damaged, the controller may not function properly.

Temperature Control

The controller heats the firing chamber by turning relays on and off at the appropriate rate to maintain the program schedule. It is normal to hear the clicking noises associated with turning relays on and off throughout the firing.

Firing Program Terminology

As we begin our discussion on programming your kiln, it may be handy to first discuss basic fusing terminology and fusing techniques.

All modern electronic kiln controllers require three pieces of information for each heating or cooling step (commonly called a "segment") of a firing schedule. These variables are:

- Heating or cooling rate (speed, commonly referred to as Ramp Rate)
- Heating or cooling temperature (Target, or Set Point Temperature)
- Time Spent at a specific heating or cooling temperature (Hold or Soak Time)

The following graphical representation of a "typical" firing schedule may help you visualize exactly what your kiln does. A complete firing schedule can be multiple heating and/or cooling steps or segments. However, for many applications a single step is all that is required. The maximum number of program segments in the AF3P controller is limited to 8.

Key Terms for Programming:

IdLe Kiln is at rest in idle mode Shows IdLe and current kiln temperature
Ra 1 Ramp rate per hour for this segment of the program
°F1 Temperature kiln is going to for this segment of the program
HLd1 Hold time in hour and minutes if needed for this segment of the program
Strt Kiln is programmed and save and ready to run
-on- Kiln is running program and should be heating

Ramp Rate

Each step of a firing program must have a programmed Rate of temperature increase or decrease. These rate values are selected as Degrees per Hour. During the programming the display prompt for Rate settings are **rA** followed by the step number like **rA1**, **rA2**, **rA3**, etc... This may be either a positive number (for heating), or a negative number for cooling. To heat or cool as fast as possible, an alternative setting is available at the beginning or end of the temperature range. This setting appears as **FULL** on the controller display. The easiest way to find FULL is to go down to 0 and go down once more. If zero is set for any rate, this tells the controller that there are no more steps to your firing schedule, and ends your program. This feature can also be used to erase an entire firing program by setting the first **rA1** value to zero. The ramp rates built in to the controller were selected to give optimum performance for most projects. You may need to modify this part of the firing schedule if you have a special project.

Target or Set Point Temperature

After the ramp rate has been set, the target hold temperature is then selected. Once again, the built in temperatures are suitable for a typical project, but may need to be modified for certain special projects.

Hold / Soak Time

Hold or soak times are important parts of the firing cycle. The heat soak, or heat hold, allows both the kiln and glass to completely stabilize before continuing to the specified high temperature. The cooling soak or hold (also called the pre-annealing soak), commonly at about 940°F to 968°F degrees allows stress built up in the cooling glass to be released slowly. Without the cooling soak, the glass could retain stress resulting in breaks.

Program Modes

The program mode for the Chilipepper is prompted on the controller display when the controller is turned on.

bEAd For bead annealing projects

To change the program mode the controller display should be showing the **IdLE** message. (When the kiln is first turned on, the **IdLE** message should appear after about 5 seconds.) Press and hold the Increase button for about 7 seconds until the display shows the code CFG. Release the Increase button and press the Program button to view the CFG code alternating with the current mode setting. Press the Increase or Decrease buttons to select a new mode setting. When the desired mode appears on the controller display, press the Program button to return the controller display to the **IdLE** message. The new program mode can be confirmed by turning the controller off and back on to view the new start up message.

Changing Program Modes

All program edits and custom firing schedules are saved in the controller memory. If you change the Program Mode, the edits you have saved in one Program Mode will not be reset or erased. All program changes will be available the next time you return to the same Program Mode.

Selecting the Firing Schedule or Programs

After selecting a Program Mode, to select any of the available programs, first press the Program button when the display shows **IdLE**. The last used program will be the first choice on the controller display. If a different program is desired, press the Increase button to see another program. Then press the Program button again when the display shows the program code you want. The available programs will be in the order below:

→ Preset Programs → PrO1 → PrO2→ PrO3→ PrO4→

After selecting a program continue to press the Program button to step through the program settings (each setting can be changed if desired by pressing the increase or decrease buttons to edit the values), at the end of the program settings, the display will show the message **Strt**. Press the Program button again to start the firing, the controller display will show the message - **On-**.

To stop a firing after it has been started. Press the Program button and the controller display will show **StOP**. Press the Program button again to return to the **IdLE** message.

bEAd Program Mode

The bEAd mode provides 4 preset firing schedules for bead annealing and 4 optional User Programs for creating custom firing schedules. The 4 preset programs are recommended firing schedules that can also be customized if necessary. These programs provide the various heating and cooling steps for easy selection.

Ramp and Holding Working Programs are useful while beading and lampworking. When the program is started the kiln heats fast and then holds at an annealing temperature for the longest amount of time that is planned to work. In this case 4 hours and if the time to work suddenly becomes less, then use skip step feature (sstp) (the middle button once and the left button twice) to advance the segment of the program. This segment has the same annealing temperature to hold so that the last couple beads have a chance to anneal for a time before the kiln proceeds to lower in temperature at 100 degrees.

RECAP: If you plan on working for 8 hours making beads and you need to stop after 5 hours, then skip step will advance you to the next segment so that the last few beads inserted into the kiln will have a chance to anneal before the kiln starts to cool.

½” Beads Small Moretti Displayed as **bd 1 Ramp and Hold Working Program**

This program heats at Full Power (fast as it can) to 960°F and holds this temperature for 4 hours. Then heats at Full Power (fast as it can) to 960°F and holds this temperature for 30 minutes. Then heats at 100°F/hour to 500°F and holds this temperature for 0 minutes.

1” Beads Large Moretti Displayed as **bd 2 Ramp and Hold Working Program**

This program heats at Full Power (fast as it can) to 960°F and holds this temperature for 4 hours. Then heats at Full Power (fast as it can) to 960°F and holds this temperature for 1 hour. Then heats at 100°F/hour to 500°F and holds this temperature for 0 minutes.

Batch Anneal Moretti Displayed as **bd 3 Batch Annealing From a Cold Start**

This program heats at 300°F/hour to 960°F and holds this temperature for 1 hour. Then cools at 100°F/hour to 670°F and shuts off.

Borosilicate Ramp and Hold Displayed as **bd 4** **Ramp and Hold Working Program**

This program heats at Full Power (fast as it can) to 1050°F and holds this temperature for 4 hours. Then heats at Full Power (fast as it can) to 940°F and holds this temperature for 30 minutes. Then heats at 100°F/hour to 500°F and holds this temperature for 0 minutes.

. **These programs should only be used in kilns with a properly installed bead door to ‘garage’ hot projects. Do not put objects in through the top of the kiln, only in the front flip door opening.

bEAd Programs

bEAd	Program	Rate	Target	Hold
bd 1	Small Moretti	FULL*	960.0F(515.5C) *	04.00 *
		FULL*	960.0F(515.5C) *	00.30 *
		100.0F(55.5C)/hour *	500.0F(260.0C) *	00.00 *
bd 2	Large Moretti	FULL*	960.0F(515.5C) *	04.00 *
		FULL*	960.0F(515.5C) *	01.00 *
		100.0F(55.5C)/hour *	500.0F(260.0C) *	00.00 *
bd 3	Batch Anneal	300.0F(166.6C)/hour *	960.0F(515.5C) *	01.00 *
bd 4	Borosilicate	FULL*	1050.0F(565.5C)*	04.00 *
		FULL*	940.0F(504.4C) *	00.30 *
		100.0F(55.5C)/hour *	500.0F(260.0C) *	00.00 *
Pr01	User			
Pr02	User			
Pr03	User			
Pr04	User			

The preset bead programs can be edited. Each program segment can be changed by the operator. To restore the factory values, enter a zero value for the first **rA1** segment of each program and press the Program button.

In addition to the bead preset programs, the bEAd mode provides 4 User defined programs for custom firing schedules. Each user defined program can be up to 8 steps. The User programs are;

<u>Program</u>	<u>Rate</u>	<u>Temp</u>	<u>Hold</u>
PrO1	Undefined	Undefined	Undefined
PrO2	Undefined	Undefined	Undefined
PrO3	Undefined	Undefined	Undefined
PrO4	Undefined	Undefined	Undefined

Programming Heating and Cooling Rate

Each step of a firing program must have a programmed Rate of temperature increase or decrease. This is the speed of the heat-up or cool-down. These rate values are selected as Degrees per Hour. ‘Degrees per hour’ rate can be determined by dividing the total amount of temperature change by the number of hours required to achieve the temperature change. For Example, If you want to heat the kiln to 900°F from room

temperature (72°F) in 2 hours time. The heating rate would be 414 Degrees/hour. [900-72 = 828, 828/2 = 414]

During programming the display prompts for all Rate settings is **rA** followed by the step number like **rA 1**, **rA 2**, **rA 3**, etc...

The values available for setting Rate are 0-1798°F/hour or 0-998°C/hour. If it's desired to heat or cool as fast as possible, an alternative setting is available at the beginning or end of the temperature range. This setting appears as **FULL** on the controller display.

Entering Zero in an rA__ to end the program

The controller determines where your firing program ends by the **rA** value. If zero is set for any Rate, this tells the controller that there are no more steps to your firing schedule. If additional steps had previously been saved in the active program, all steps after the zero entry will be erased. This feature can also be used to erase an entire firing program by setting the first **rA 1** value to zero.

Programming Heating or Cooling Temperatures

Each step of a firing program must have a programmed heating or cooling temperature. The controller must have at least one heating step to accept the firing program as valid (an invalid program results in a **bAdP** display alarm). A heating step is simply any step with a temperature setting that is above the current display temperature.

Cooling steps are automatically determined by the temperature value. If a heating or cooling temperature value is programmed to a lower setting than the previous heating or cooling temperature, it will be a cooling step.

During programming the display prompts for all Heating or Cooling Temperature settings is °F (or °C) followed by the step number like **°F 1**, **°F 2**, **°F 3**, etc...

The temperature range available for setting heating or cooling temperatures is 32-1100°F or 0-1316°C. If the controller does not allow you to program temperatures up to 1100°F/1316°C, it has been factory set by the supplier to a lower safety temperature. This is often necessary to limit the controller to the maximum operating temperature of the system.

Programming Hold Time

Each step of a firing program can have an optional Hold time. Hold time is the amount of time you want to stay at the previously determined heating or cooling temperature. Hold time is also referred to as Soak or Dwell time.

Hold Time is entered in Hours & Minutes format. The middle decimal point light on the controller display is used to separate Hours from Minutes. For Example, a 1 hour hold time should be set like [01.00], while a 1 hour and 30 minute hold time would be [01.30]. If no hold time is desired, the setting should be [00.00]

A special Hold time is available for indefinite Hold periods. If it is desired to hold the program temperature until someone manual stops the firing or manually advances the program, a hold time of [99.59] represents indefinite Hold.

The value range available for setting Hold time is 00.00 to 99.58.

During a firing, the hold time begins as soon as the temperature reaches the heating or cooling temperature. As the hold time progresses, the controller display will count-down the remaining time until the hold time has expired.

During programming the display prompts for all Hold settings is **HLd** followed by the step number like **HLd1**, **HLd2**, **HLd3**, etc...

Other Programming Notes

After a firing program is set in the controller, the values will not change or be lost when the controller is turned off.

It is not possible to back-up in the programming mode. If a mistake is made while programming a previous step, you must start over from the **IdLE** mode to make corrections.

If no buttons are pressed for 1 full minute during programming, the controller will automatically exit the program mode and return to the **IdLE** display. During a firing, if the options menu is activated for programming, the controller will return to the active display if no buttons are pressed for 1 full minute.

Delay Start Option

Prior to the active start of any firing, the controller display will show a Start prompt of **Strt**. This appears after the firing program selection and programming. If a delay start time is desired, press the Decrease/Review button to activate a delay start prompt. The display will show **dELA** alternating with the adjustable delay time in Hours & Minutes format. Use the Increase/Decrease buttons to set the Delay time and then press the Program button to return to the **Strt** prompt. When you are ready to begin the delay period, press the Program button again.

Delay time counts-down on the controller display before the actual start of the firing. When the delay time expires, the actual firing program begins automatically. The Delay time has a setting range of 00.00 (no delay) to 99.59 (99 hours. 59Minutes)

An active delay time can be canceled by pressing the Program/Start button any time during the delay count-down to begin the actual firing.

Thermocouple Offset Option

Thermocouple Offset allows you to correct the temperature display a few degrees in a positive or negative direction. This can improve the controller accuracy if the thermocouple probe is aged or if the firing results appear to be slightly under or over

fired. This offset allows you to make minor adjustments to the firing temperatures without changing the programmed heating or cooling temperatures.

Prior to the active start of any firing, the controller display will show a Start prompt of **Strt**. This appears after the firing program selection and programming. If a thermocouple offset is desired, press the Increase/Skip button to activate a thermocouple offset prompt. The display will show **tCOS** alternating with the adjustable offset value. Use the Increase/Decrease buttons to set the Offset and then press the Program button when you are ready to return to the **Strt** prompt.

Thermocouple offset (**tCOS**) has a limited offset range of +/-20°F (+/-11°C). A positive correction will increase the controller display temperature by the amount selected. This will make the firing temperatures lower. A negative correction will decrease the controller display temperature by the amount selected, making the firing temperatures higher.

Program Review

Any time during an active firing, the Program Review feature can be activated to show you the complete firing schedule on the controller display. Press the Decrease button to activate the Program Review. Each segment of your firing schedule will scroll automatically on the display for a few seconds each. To cancel the Review in process, simply press any button.

Program Review can also be activated when the controller is **IdLE** or during program selection. After this type of Program Review, the controller advances directly to the **Strt** prompt. The Review can be used to bypass making any changes to the current firing schedule.

Program Recall

Program Review can be used to quickly select any firing schedule that is already programmed into the controller memory. To select a saved program, the controller should first be at the **IdLE** prompt. Press the Increase button until the display shows the desired program, then press the decrease button to automatically load the program and to review the program settings. At the end of automatic program review, the controller will go directly to the **Strt** prompt and the firing can be started with one more press of the Program button. Only use the quick program recall to start a new firing if no changes are required for the entire firing program.

Options Menu

During an active firing, the Increase button will activate an options menu and scroll through the available options with each button press. These options allow you to make adjustments to the firing program without stopping the firing. The available options follow.

Skip Step

During an active heating, cooling or hold time, it is possible to skip ahead to the next program step. Press the Increase button to display the Skip Step prompt **SStP**. Then Press the Program button to display the current ramp or hold segment. Press the Program button again to initiate the Skip and the controller display returns to the normal

firing mode. If the Decrease button is pressed, the Skip function is canceled and the controller display returns to the normal firing mode.

The Skip function can be used to end a Hold time early or to skip from any heating/cooling step to the next heating/cooling step. The Skip function does nothing during the final program step. To end a final program step, simply press Stop.

Add Hold Time

During an active heating, cooling or hold time, it is possible to add more Hold time to the current program step. Press the Increase button until the Hold Time prompt **HLdt** is displayed. Then Press the Program button to display the current hold time. Press the Increase button to add 5 minute increments to the original Hold time. Then Press Program button to return to the normal firing mode. If the Decrease button is pressed while the **HLdt** prompt is displayed, the controller display returns to the normal firing mode.

Change Heating/Cooling Temperature

During an active heating, cooling or hold time, it is possible to change the heating or cooling temperature of the current program step. Press the Increase button until the Change Temperature prompt **CHGt** is displayed. Then Press the Program button to display the current temperature setting. Adjust the temperature setting with the Increase or Decrease buttons. Then Press Program button to return to the normal firing mode. If the Decrease button is pressed while the **CHGt** prompt is displayed, the controller display returns to the normal firing mode.

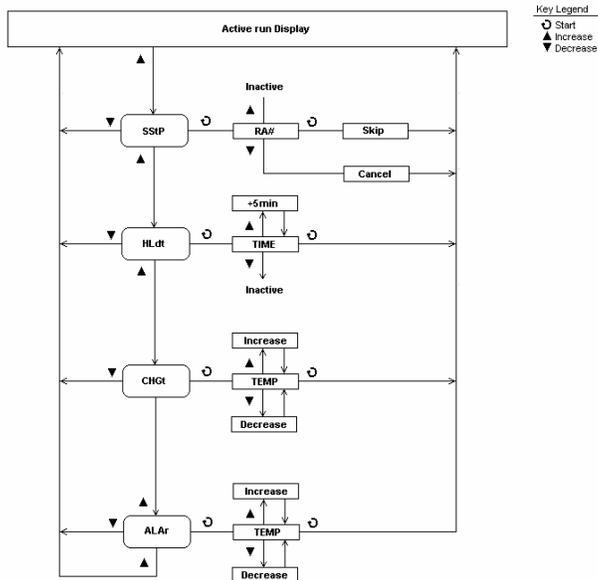
Threshold Alarm

During the firing, it is possible to set an audible alarm and display alarm for when the actual temperature reaches a specified value. The buzzer will sound (for 30 seconds) and the display will show the alarm code **ALAr**.

To set the alarm, Press Increase button during the active firing until the alarm prompt **ALAr** is displayed. Then Press the Program button to display the current alarm temperature setting. Adjust the temperature setting with the Increase or Decrease buttons. Then Press Program button to return to the normal firing mode. If the Decrease button is pressed while the **ALAr** prompt is displayed, the controller display returns to the normal firing mode.

The alarm is disabled (turned off) when the alarm value is set to 32°F (0°C). The alarm value can be reset or changed many times during a single firing. To silence an active alarm, simply press any button. The maximum programmable value for the alarm is 2400°F (1316°C). If the controller does not allow you to program alarm temperatures up to 2400°F/1316°C, it has been factory set by the supplier to a lower safety temperature. This is often necessary to limit the controller to the maximum operating temperature of the kiln it is attached to.

Flow Diagram for Options Menu



Power Fail Recovery

A firing will resume after a power interruption if certain conditions are met.

1. The controller was not performing a cooling step and the cooling temperature was not exceeded. If so, the display will show the alarm code **PF 1** and terminate the firing.
2. When power is restored the actual temperature must be above 212°F (100°C). If not, the display will show the alarm code **PF 2** and terminate the firing.
3. When power is restored, the temperature drop during the power interruption must be less than 72°F (40°C). If not, the display will show the alarm code **PF 3** and terminate the firing.

Status Display Codes

Below is a list of normal display codes which indicate the controller mode of operation.

IdLE - This is ready mode; No firing in process. This message will alternate with the temperature display and/or any alarm messages that may occur.

dELA - This is the delay start mode. This message will alternate with the delay time count-down if programmed.

Strt - This is a final prompt before starting a new firing. The Delay start and thermocouple offset features are accessed from this prompt.

-On- - This is a short (5 second) display that indicates a new firing has been started.

StOP - This is an Abort message; the firing was stopped early. This message will alternate with the temperature display and/or any alarm messages that may occur.

CPLt - This is a firing complete message; the firing ended successfully. This message will alternate with the temperature display and the total firing time from start to finish.

Alarm Display Codes

In addition to Power failure alarms, these messages may be displayed if the controller detects a problem during the firing.

tC - This alarm will appear when the kiln is idle and indicates that the thermocouple sensor is no longer detected. The controller can not operate without a thermocouple signal. In most cases, the thermocouple has failed and will need replacement, or the electrical connections for the thermocouple may be loose or damaged. Check the wiring for the thermocouple and the physical condition of the probe inside the firing chamber.

tCr - This alarm indicates that the thermocouple sensor is detected but the signal is reversed. The firing was terminated. The thermocouple signal is a low voltage direct current with +/- polarity. The controller will sense that the temperature is traveling backwards from what is expected. In most cases, this indicates that the thermocouple needs to be reconnected properly. Check the wiring for the thermocouple.

FAIL - This alarm will appear during an active firing and indicates that the thermocouple sensor is no longer detected. The signal was lost during and the firing was terminated. The controller can not operate without a thermocouple signal. In most cases, the thermocouple has failed and will need replacement, or the electrical connections for the thermocouple may be loose or damaged. Check the wiring for the thermocouple and the physical condition of the probe inside the firing chamber.

FtL - This alarm indicates that the firing was taking too long to complete and the firing was terminated. The controller monitors the deviation from the desired firing schedule as compared with the actual firing results. There are 2 conditions for the **FtL** alarm.

1. The heating or cooling rate is slower than 27°F (15°C) per Hour
2. The current program step has lasted 2 hours longer than anticipated.

In most cases, the **FtL** alarm occurs during heating if the heating rate is set to a fast speed that cannot be maintained by the kiln. If the heating rate is within the systems capability, a component failure has probably occurred with the heating elements or the heater relays.

During cool-down, a well insulated system will have cooling limitation and rapid cooling rates may set off this alarm if the cooling speed cannot be maintained. Increasing the final cool-down temperature or slowing the programmed cooling rate can avoid this alarm.

tCL - This alarm indicates that the thermocouple signal is not responding to the demand for more system power during heat-up. There are 3 conditions for the **tCL** alarm.

1. The heating rate is slower than 9°F (5°C) per Hour
2. The actual kiln temperature is lagging behind the desired setpoint temperature by more than 100°F (56°C).
3. The actual temperature is less than 500°F (260°C)

In all cases, the **tCL** alarm occurs during heating when little temperature rise is detected. This can be the result of a component failure; most likely a failed heating elements or a heater relay. Another possible problem is with the thermocouple sensor signal; if the thermocouple probe is not properly positioned in the firing chamber or if the wiring from the thermocouple has short-circuited the controller will not detect actual temperature changes in the firing chamber.

EtH - This alarm indicates that the Electronics temperature is too hot for controller operation. The controller temperature must be below 176°F (80°C) to prevent damage to the electronic

components. The **EtH** alarm cannot be cleared unless the board temperature has cooled. If the **EtH** occurs frequently, check the kiln for heat loss near the controller. Proper venting and heat-shielding should be inspected.

HtdE -The High Temperature deviation alarm sounds an audible alarm and terminates the firing if the actual kiln temperature is above the controller set-point by 56°C (100°F). This alarm is active only when the actual kiln temperature is above 500°F (260°C).

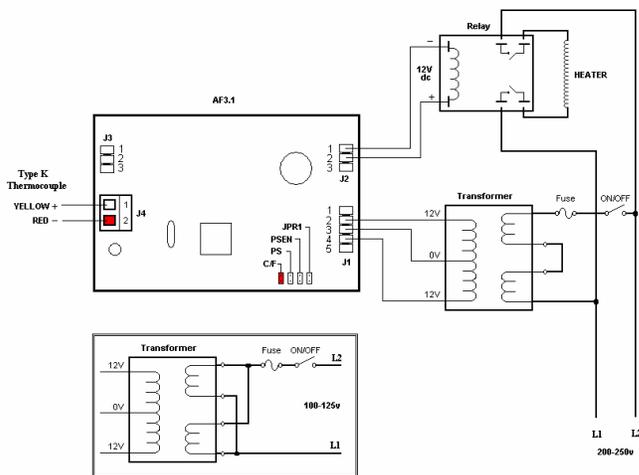
FE # - Fatal software Errors, FE Alarms indicate a hardware failure or software problem with the controller. These alarms will disable the normal controller operation and require corrective action. If a Fatal Error occurs during an active firing, the firing is terminated. These alarms include;

- FE 1 – Failed to read or write to memory device
- FE 2 – Failed memory test during power on
- FE 3 – Corrupt data found in memory
- FE 4 – Errors detecting thermocouple input signal
- FE 5 – Software Execution failed

Turn the controller off and back on, then press any button to try and clear the alarm. If the alarm reoccurs immediately or frequently, the controller may require service or replacement.

FE 4 alarms can often be solved by correcting problems with the system thermocouple. Loose connections or faulty thermocouple wiring or a faulty thermocouple can result in this alarm.

Wiring Diagram



The controller can be set to read in °F or °C. There is a small black shunt on the back of the controller. If the shunt is on the pins it will read in °F and if the shunt is off it reads in °C. The factory setting for the US is °F and outside the US is usually sent to °C



Special Note About Cold Conditions

Controller is not designed to be started in temperatures under 32 °F, it will not hurt the kiln to be stored around this temperature.

If your kiln is set up in an unheated area and the room temperature has dropped to below 32°F the kiln will not start until the kiln and the thermocoupler probe inside the kiln has been brought to well above freezing. The probe inside the kiln needs to be warmer than the outside temperature. You may see an alarm code **TcR** (thermocouple reversed) when you attempt to run a new firing. You can put a match or lighter only on the thermocoupler in the kiln to warm it up a few degrees. .

Orton Controller Limited Warranty

This limited warranty is given only to the immediate purchaser ("Buyer") of the Autofire®Express kiln controller. This limited warranty is not transferable. The Edward Orton Jr. Ceramic Foundation ("Orton") warrants the controller motherboard installed on the Autofire®Express ("Warranted Components") to be in good working order under normal operating conditions for a period of one (1) year from the date of purchase. Should the Warranted Components fail to be in good working order at any time during the stated one (1) year period, Orton will, at its option, repair or replace the Warranted Components as set forth below. The liability of Orton is limited to replacement and/or repair at its factory of the Warranted Components that does not remain in good working order. Repair parts or replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts or products become the property of Orton. Following receipt of notice from Buyer of a valid warranty claim and the Autofire®Express containing the Warranted Components, Orton will perform its obligations under this limited warranty within 10 business days.

Limited warranty service may be obtained by delivering the Autofire®Express during the warranty period to your Orton Supplier or to The Edward Orton Jr. Ceramic Foundation, 6991 Old 3C Highway, Westerville, Ohio 43082 and providing written proof of purchase and a description of the defect or problem. Buyer must insure the shipment 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. Buyer will be responsible for shipping and handling charges in excess of US \$50.00 incurred by Orton in returning the Autofire®Express to the Buyer after completion of limited warranty service.

This warranty does not apply to any damage to the Autofire®Express resulting from:

- Operation beyond electrical rating.
- External sources including, but not limited to, chemicals, heat abuse and improper care.
- Improper or inadequate maintenance by Buyer.
- Parts or equipment not supplied by Orton.
- Unauthorized modification or misuse.
- Operation outside environmental specifications.
- Improper installation.
- Over firing (melting of materials being fired) regardless of the cause of the over firing.

Warranted Components returned for service where no warranted defect is found will be subject to service, and shipping and handling fees.

If the Warranted Components are not in good working order as warranted above, Buyer's sole remedy shall be repair or replacement of the Warranted Components as provided above.

TO THE EXTENT PERMITTED BY LAW, ALL EXPRESS AND IMPLIED WARRANTIES FOR THE WARRANTED COMPONENTS INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE ONE YEAR WARRANTY PERIOD COMMENCING ON THE DATE OF PURCHASE, AND NO OTHER WARRANTY WHETHER EXPRESS OR IMPLIED WILL APPLY TO THIS PERIOD. TO THE EXTENT PERMITTED BY LAW, ORTON'S REMEDY AND BUYER'S SOLE REMEDY IS LIMITED SOLELY AND EXCLUSIVELY TO REPAIR OR REPLACEMENT AS SET FORTH HEREIN. ORTON SHALL NOT BE LIABLE FOR, AND BUYER'S REMEDY SHALL NOT INCLUDE ANY INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES OF ANY KIND WHATSOEVER, WHETHER A CLAIM IS BASED UPON THEORY OF CONTRACT, NEGLIGENCE OR TORT.

Buyer shall determine suitability of the Autofire®Express for the intended use and assume all risk and liability therewith. Some states do not allow this exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion 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.

The above limitation does not apply in the event that any Warranted Components are 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 \$1,000.00 or the purchase price of the specific Autofire®Express that caused such damage.

Service may also be obtained on Warranted Components no longer under warranty by returning the Autofire®Express prepaid to Orton with a description of the problem and Buyer's name and contact information. Buyer will be contacted with an estimate of services charges before any work is performed.

Customer Satisfaction Policy

If for any reason you are not completely satisfied with the performance of the Orton Autofire®Express or the conditions of this warranty, return the Autofire®Express in good working condition, transportation and insurance prepaid, within 30 days of purchase date to your supplier or The Edward Orton Jr. Ceramic Foundation, 6991 Old 3C Highway, Westerville, Ohio 43082 and your purchase price will be refunded. Prior to returning your Autofire®Express contact Orton for an authorization number and include with your shipment. For controllers ordered in error, a restocking charge will apply.

Revised: October 22, 2007

JEN-KEN KILN WARRANTY

JEN-KEN 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 **JEN-KEN KILNS**, a **JEN-KEN KILN** authorized distributor or dealer.

JEN-KEN KILNS are warranted for 2 years from date of original purchase.

Dawson Kiln Sitter is warranted by a separate 1 year warranty from WP Dawson, Inc.

AutoFire panels are warranted by a separate 1 year plan from the manufacturer.

FireRight panels are warranted by a separate 1 year plan from the manufacturer.

To Claim under the Warranty, the purchaser must:

- 1) Provide written proof of the date of purchase.
- 2) Notify **JEN-KEN KILN** (or distributor/dealer) from whom the kiln was purchased.
- 3) Make the kiln immediately available for inspection.

FOR WARRANTY REPAIRS:

- 1) Warranty repairs should be handled from where you purchased the kiln and they will arrange for any repairs or replacement of parts under the terms of the warranty and upon receipt of the kiln or defective part(s). Warranty work, other than that performed at the factory, **DOES NOT** include labor, just parts. The defective parts may be returned to **JEN-KEN KILNS** (postage prepaid) 3615 Ventura Drive West, Lakeland, Florida USA 33811. Include your name and address, a letter of explanation and the name and address from where you purchased the kiln. If, after factory examination the part is found to be defective, a new or repaired part will be sent prepaid by **JEN-KEN KILNS**.
- 2) If the entire kiln is to be returned to the factory, all transportation costs are the responsibility of the purchaser. The purchaser should notify **JEN-KEN KILNS** (863) 648-0585 prior to shipping. We will advise the best shipping method and if it is necessary to return the whole kiln or only certain parts. Factory warranty work will be performed within 30 days after the defective part is returned to the factory.
- 3) **JEN-KEN KILN** reserves the right, as 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:

- 1) Freight damage.
 - 2) Kilns altered in any way after leaving our factory.
 - 3) Abuse or neglect, moisture, improper storage.
 - 4) Improper installation.
 - 5) Kiln Overfires (exceeding the melting temperatures of the materials being fired) regardless of the cause of the overfire. (This does not occur in kilns that are monitored while firing. If in doubt during a firing, turn the kiln off)
 - 6) Dawson Kiln Sitter or Limit Timer.
 - 7) Kilns operated on incorrect voltage.
 - 8) Improper electrical installation.
 - 9) Kiln furniture.
- 1) Kiln ware.
 - 2) Kilns used for purposes other than firing ceramic or glass materials.
 - 3) Kilns operated in excess of the temperature rating of the kiln.
 - 4) Damage that may occur from kilns that are fired on or near combustible materials (i.e.: wood floors).

This Warranty is in lieu of all other warranties, expressed or implied. **JEN-KEN KILN** neither assumes nor authorizes any distributor, dealer, retailer or employee to assume for it any other obligation of liabilities in connection with **JEN-KEN KILNS**.

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 give you specific rights and you may also have other rights why vary from state to state.

JEN-KEN KILNS Manufactured by Sir Ramic Porcelain, Inc.
3615 Ventura Drive West, Lakeland, Florida USA 33811