SEATTLE POTTERY SUPPLY KILNS

operator's manual

SEATTLE POTTERY SUPPLY
SINCE 1975
SEATTLE POTTERY SUPPLY

Seattle Pottery Supply Kilns

35 South Hanford Street • Seattle, Washington 98134

(206) 587-0570 • (800) 522-1975
FAX (888) 587-0373

www.seattlepotterysupply.com

TABLE OF CONTENTS

SAFETY

Kilns are safe and easy to use in schools, homes, studios, and other spaces, as long as one follows simple safety precautions. As with any electrical appliance, have a licensed electrician ensure that the wiring and the outlet are correct for your specific kiln model. Always observe local building, fire, and safety codes.

Installation

- Follow all set up instructions.
- Place kiln at least 12 inches from any walls or flammable items.
- Reserve a clear empty zone extending 12 inches out from the kiln's steel jacket.
- Sufficient clearance should be left around the kiln to allow access for maintenance, servicing and free movement of air.
- Do not install kiln outside. Keep away from moisture and protect from weather.
- Install only on the stand provided with the kiln.
- Good housekeeping around kilns is essential. Combustible materials should never be stored near the kiln, or allowed to accumulate around it.
- Ventilation is important. Make sure that there is ventilation that is appropriate for the kiln and the space that the kiln is installed.
- Never store anything inside, under, or on the kiln.
- Never use an extension cord.
- The exterior steel skin of the kiln can become very hot - up to 320° F (160°C) in some cases- despite high-duty brick insulation – warning labels near the lid's handle and control boxes should be clearly visible.

WARNING — HOT
DO NOT TOUCH!

- Care should be taken, particularly where children, members of the public, or potentially vulnerable people (such as those with learning difficulties or physical disabilities) are undergoing instruction or are able to gain access to the kiln. In these cases, a barrier or kiln cage should be used.
- Ventilation of your workspace is essential to provide a healthy working environment. A properly installed Orton VentMaster™ Kiln Vent will remove potentially harmful products of combustion.

Operation

- Read all information in the kiln manual before firing your kiln.
- Do not fire the kiln unattended.
- Keep children away from the kiln even when it is not in use.
- Electric kilns should only be used by operators who are familiar with safe working procedures (including proper use of controls and safety devices) and are capable of recognizing faults and coping with emergencies.
- During firing and cooling, the kiln's stainless steel jacket bands and lid handle will be hot. Do not touch the exterior of the kiln until it has cooled to room temperature.
- During firing, wear fire-rated gloves (Kevlar) to protect your skin when removing the prop brick and closing the lid.
- High voltage! Never touch heating elements with anything while the kiln is firing.
- Do not store or use flammable liquids or sprays in the same room as your kiln.
- Do not open kiln during a firing.
- Never lean anything against the outside or inside the kiln.
- Only start the kiln firing after the kiln has been loaded and the lid is closed.
- Keep the kiln's power cord out of traffic areas and keep kiln room tidy to prevent a tripping hazard.
- If looking into a hot kiln, make sure to wear appropriate Infrared (IR) and ultraviolet (UV) eye protection, such as #3 welder's green safely glasses.

- Do not unplug or plug an electric kiln in unless the circuit is off. Before loading or unloading the kiln, turn kiln OFF.
- Do not try to unload a kiln until the outside of the kiln is cool to the touch and the pieces can be easily touched by hand.
- Be careful when opening the kiln door while the kiln is heated. We recommend you use fire rated gloves to protect your skin and make sure clothing is kept well away from any kiln opening or hot kiln surface.
- Kiln lids may be quite heavy. Secure the lid open only with the lid brace provided.
- When loading or unloading a kiln, use gloves to protect your hands from possible sharp edges on items coming out of the kiln.

Maintenance

- Inspect electrical connections and safety controls before each use.
- Never fire your kiln if it has a damaged plug, receptacle, or power cord.
- Always unplug your kiln before performing any maintenance to the kiln. This includes vacuuming, replacing elements, and any other maintenance on the kiln or area around the kiln.
- Only put clay items that are meant to be fired in a kiln. Make sure that clay and glaze are fired to the appropriate temperatures. Call the supplier the items were purchased from with any questions.

INSTALLATION

Placement

A kiln is hard-working appliance that needs adequate space to function effectively and safely. It gets very hot on its outside skin during firing and must have an 12" air space around it on all sides away from any adjacent surfaces and materials, shelving, and other kilns. Overhead open space should extend up to the ceiling and be clear of any obstructions, including shelving, draperies, cabinets, etc.

A bare concrete, tile, or brick floor is the best flooring surface for your kiln. If the kiln is installed over any other type of floor install a fire-retardant board, extending a minimum 12" beyond the kiln's exterior steel skin, under the kiln's stand to protect the floor from discoloration due to the heat from the kiln.

Locate your kiln along an exterior wall where installation of a motorized vent – like an Orton VentMaster™ - is more straightforward.

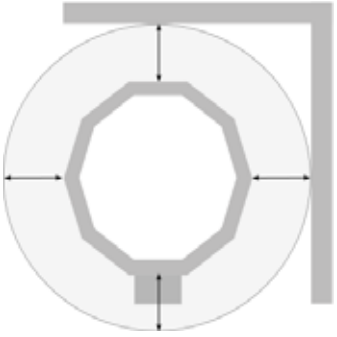
If your studio has a fire control sprinkler system, locate your kiln outside of a 10' (3m) radius below sprinkler heads.

Locate your kiln in an area free from flammable materials.

The kiln room must be ventilated so that the room does not get too hot or cold, as the kiln will not operate properly. Safe operating temperature range in the kiln room is between 32°F (0°C) and 100°F (37.8°C). Extremes outside of this range may damage electronic components.

Clearance

Reserve a generous 12" of clear space all around your kiln. Kiln shelves, posts, cones, stilts, and kiln wash may be conveniently located on shelving outside of this clear area.



Electrical

Always observe local building, fire, and safety codes. Before setting up a kiln in any space, have a licensed electrician evaluate all wiring for the kiln. Your new kiln must have the proper outlet and breaker to supply adequate voltage and amperage. Have your electrician compare your building's capacity with the electrical specifications for the kiln model you have. Also, confirm your measured on-site voltage (outlets and service boxes are marked only with their ratings and not your local available voltage).

Be familiar with where the electrical service panel is and which specific breaker switch will shut off power to the kiln. Remember to turn off the power to the kiln when performing any maintenance.

Assembly

The kiln should be set up *only* on the stand that was supplied with the kiln. As you move the kiln into position, make sure that the base is level on the stand. Use metal shims under the feet of the stand, if needed, to level. Do not place shims between the kiln's base and the stand as that could cause damage to the kiln. Adjust the position of the base and stand to provide a 12" clear space around your kiln. To move the kiln, never push the kiln, as that will cause damage to the kiln's brick and possibly other components of the kiln. Center the base on the stand, level it, and then stack the kiln's rings onto the base. Align the kiln's electrical boxes and re-attach section brackets and back-braces if included. Specific installation instructions are provided with each kiln model.

Larger Seattle Pottery Supply Kilns models have hardwired connections in their top and bottom boxes. Follow the installation directions provided with your specific kiln model. Wiring diagrams for most Seattle Pottery Supply Kiln models are provided in the appendix of this manual.

Before using the kiln for the first time, disconnect from power, and clean the interior by vacuuming with a soft bristle attachment. Apply kiln wash to the tops of the kilns shelves only. Do not apply kiln wash to the walls, lid or elements of the kiln.

The following accessories are included with the purchase of your New Seattle Pottery Supply Kiln:

- Peep Hole plugs for each hole in front of the kiln. (Oval kilns have hole in lid as well.) If you are looking in the kiln through one of the peep holes in the front be sure to use dark glasses to protect your eyes from the heat of the kiln. Peep holes will be hot when kiln is firing, use protective gloves if touching during a firing schedule.
- The Prop brick is a brick wedge used to prop the kiln's lid open in the beginning of firings. The Prop brick should only be used if the kiln is on the lowest setting, on a preheat cycle or cooling and under 300°F (149°C).

LOADING THE KILN

Balance the Load

When planning how to load your kiln, keep in mind that the center of the kiln is generally the hottest. Therefore, you will want to distribute the load with the larger, thicker pieces towards the middle and the smaller, thinner pieces towards the top and bottom. In addition, if half your load consists of small, heavy pieces and the other half is large, thin-walled pieces, don't group them all in one section. Mix them so there is a balance of each type throughout the kiln.

Allow the Kiln to Breathe

Many studios work with glazes that require oxygen to develop properly. Provide enough space between items to allow them to "breathe". Using half shelves with a 1/4" space gap in the middle will also help increase the flow of oxygen within the kiln chamber, especially when used in combination with a vent system.

Allow for Proper Clearances

Kilns lose most of their heat from the lid and the base. Ideally, there should be at least two inches of space between the lid and the closest piece. The first shelf should be posted up one inch from the bottom slab.

Nothing Directly Under Kiln Vent Holes

If you have holes drilled in the lid of the kiln in order to have Orton VentMaster or other kiln vents installed, air will be drawn into the kiln chamber. If a piece of ware is sitting directly under one of these holes, it could leave a spot in the glaze. If it is not possible to cap the load with a shelf, leave a five-inch radius on the shelf directly below each hole.

Load Slowly

Dropped ware on shelves may damage the inside of your kiln.

DO NOT set pieces directly on kiln floor

The first shelf should be 1" off the floor of the kiln. For best results, ware should not be placed within 1" of the elements. Large flat pieces like plates that demand the full width of the kiln should have their rims positioned between two elements.

DO NOT crowd the Thermocouple

Keep shelves at least 1/4" from the sensing rod and ware at least 1/2" away. If your load should shift during firing, there will be less danger of having ware resting against the thermocouple causing inaccurate temperature readings or damage to the ware.

TEST FIRING

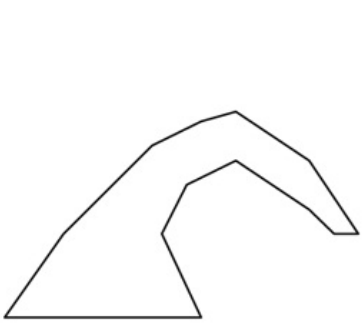
The first firing of a new kiln is considered important by many in order to ensure that the kiln is operating correctly and has been installed properly. The test firing also is to put a protective oxide layer on the elements and thermocouple. This done without any wares in the kiln that might give off fumes that contaminate the elements although the shelves and a witness cone should be in the kiln to test that the firing temperature is correct.

Bartlett Digital Controller

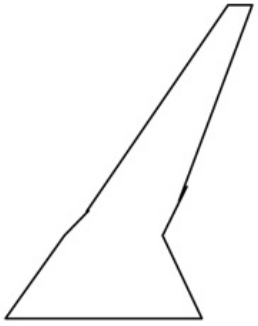
For the test firing, load the kiln with freshly kiln washed shelves, with one of the shelves placed on 1 inch posts on the base of the kiln. Then stack the remaining shelves to ensure proper ventilation and air movement in the kiln. The witness cone should be placed on the middle of the shelf nearest the center of the kiln. Program the kiln to cone 04, matching the Self-Supporting Cone provided with the kiln. Following the instructions found in the programming section of this manual to program a Cone 04 firing a Medium Speed with No Hold and No Preheat.

Review the Results

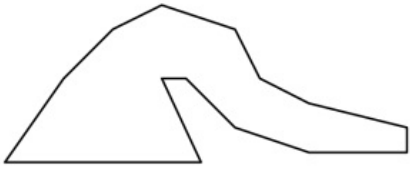
A properly bent cone indicates that the kiln is functioning properly and accurately. The tip of the cone will be level with the top of the cone's base when fired properly. The diagrams below will give you an idea of a properly fired, under fired and over-fired cone. Some variation from a proper bend is expected and can be compensated for with the cone-offset adjustment for each particular cone number based on test firings.



Proper bend



Under fired



Over fired

PROGRAMMING DIGITAL CONTROLLERS

All digital controllers contain electronic components, which are sensitive to static electricity. Before touching the controller disperse any static charge you may have by touching metal or a grounded object before touching the controller panel.

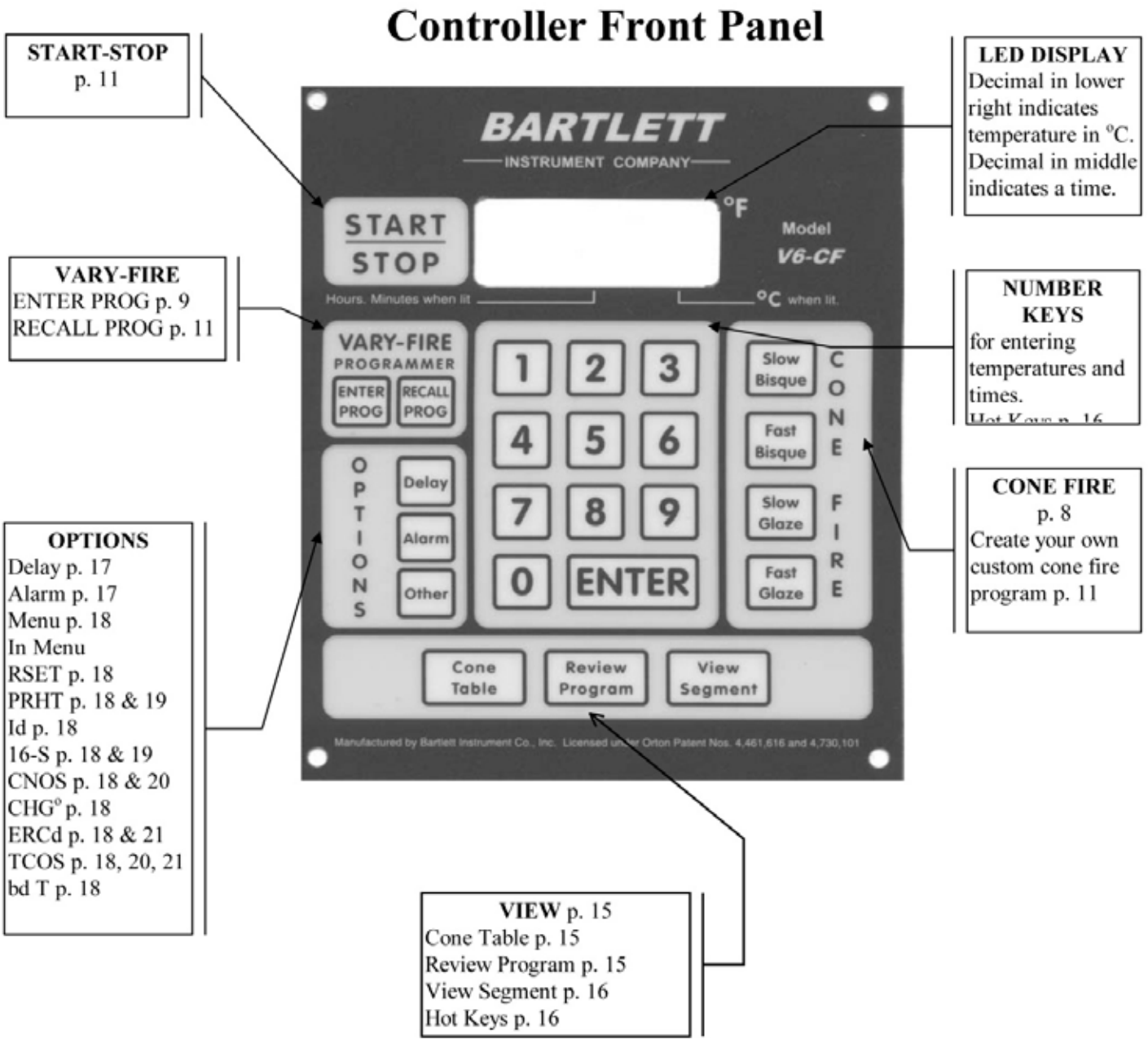
Always check the position of the thermocouple before starting a firing. The current temperature displayed on the controller is measured at the end of the thermocouple, which must be in the firing chamber about 1" to 1-1/2".

Always review the current program (by pressing Review Program) before firing to ensure the correct profile is programmed.

Ensure the kiln and the area around the kiln are clear of combustible material and has a clearance of 12" from walls.

When programming the kiln press the buttons firmly and slowly. Give the computer time to accept the information especially after pressing the Enter button. After Start is pressed 4-5 seconds will pass before the controller will begin the firing. The controller will cycle on and off at varying speeds depending on the program, amount of wares in kiln and the size of the kiln.

BARTLETT V6-CF



QUICK START

1. Read all precautions before using your controller.
2. Apply power to the kiln/controller.
3. Clear the display and get to the idle mode by pressing ENTER.
4. Program the controller.
5. Review the program before firing to ensure the correct program is ready to fire.
6. Press Start. -On- will be displayed and then the kiln temperature. The relays and elements will be cycled on and off to regulate the temperature according to the program.
7. At the end of the firing the controller will flash the current temperature, firing time, and CPLt. Press ENTER to return to the IdLE state.

- **IMPORTANT PROGRAMMING NOTE:** Before initiating a firing profile or performing any other function, the controller must be at IdLE. Pressing the ENTER key will clear the display of errors (E-) or FAIL.
- In most cases when programming, you will choose an option, then press ENTER to accept the option.
- With the display flashing IdLE alternating with the current temperature, you are ready to proceed with programming.
- The CONE FIRE mode uses a patented method to achieve correct heat-work so it is ideal for firing ceramics. The advantage of using the CONE FIRE method is that a very complicated firing profile may be chosen with just a few key strokes. The CONE FIRE method helps protect against over and under firing by carefully tracking and controlling the temperature at the end of the firing as the cone temperature is approached. The final temperature is adjusted according to the final firing rate. For example, as the heating elements age and the heating rate slows, the final temperature will be adjusted downward to ensure the correct amount of heat-work.

- The VARY-FIRE mode can be used for ceramics, glass, jewelry, glazes, decals, etc. It allows you to create your own firing profiles which can be saved and used over and over.
- If there is a kiln sitter on the kiln it must be set according to the manufacturer's directions. Insert a cone in the sitter that is one or two cones hotter than the controller setting.

First Firing of the Kiln

The programmed cone number should match the cones provided with the kiln.

1. Apply power to the kiln/controller. The display will show WAIT, and then go to IdLE.
2. If the display shows PF press ENTER to proceed to the IdLE state.

Program the controller

Press	Fast Glaze	Display will show F-GL
Press	Enter	Display will show Cone/xxx
Press	0	Display will show 0
Press	4	Display will show 04
Press	Enter	Display will show HOLd/0.00
Press	Enter	Display returns to IdLE/temp

This example is for a Fast Glaze to cone 04 with no hold time at the end of firing which is a good firing schedule for the test firing.

It is a good idea to review the program every time before the kiln is fired.

Review the program before firing

Press **Review Program** key, the display will cycle through the following information:

Display Shows	Description
F-GL	Firing speed, fast glaze
PRHT/0.00	Shows zero preheat time
CONE/ 04	Programmed for cone 04
°F /1945	Top temperature for cone 04
CNOS/0	Shows 0°F cone adjustment
HOLD/0.00	Indicates zero hold at the top temperature
dELA/00.00	Indicates delay start of 0
ALRM/9999	Alarm is disabled
ERCD/on	Error detection is enabled
FIRE/xxxx	Shows the number of firings done with this controller

Starting Firings

Press **START** to begin the firing	The display will show -ON- then the current temperature. You will hear clicking when the relays cycle power to the elements to regulate the temperature. (The test firing will take around 6 to 7 hours, depending on the size of the kiln.)
End of firing CPLT	At the end of the firing, the display will flash between CPLT / Firing time / kiln temperature.
Press **ENTER** to return to IdLE	The display will now flash IdLE / kiln temperature. You may open the kiln when the temperature has cooled to 150°F.

Programming for Cone Firings

For ceramics, the pre-set Cone Fire Mode programs will likely satisfy your most common firings. The programs are written by ceramic engineers and have been created to properly fire your clay pieces through the different temperature stages of a firing. You simply input the target cone and firing speed and press start.

Although the Cone Fire Mode is incredibly easy to use, the software itself is extremely advanced. Cone Fire Mode uses complex algorithms to simulate the heatwork of a Pyrometric Cone. It automatically makes adjustments to the firing profile based on your kiln's performance. Cone values are based on heatwork and heatwork is a function of time and temperature. Therefore, if your kiln is firing slow due to a heavy load or aging elements, Cone Fire Mode automatically adjusts the peak temperature down so you get the perfect amount of heatwork. There are very few reasons not to use this mode of programming.

The firing speed is determined by the type of firing and thickness of the clay. The bisque firings include *water smoking* and carbon burn-out stages. The glaze speeds allow for faster firings. All 4 speeds will calculate the firing rate at the end of a firing and adjust the final temperature for correct heat-work. Follow these few steps to enter a cone fire program.

Press	**Slow Bisque**	Display shows S-bC	The slow bisque speed is used for thicker hand thrown ware. The slow speed gives extra time for release of water and carbon burn-out. Typical firing times range from 13-17 hours depending on the cone #. Most pieces need a preheat stage.
	OR **Fast Bisque**	Display shows F-bc	The fast bisque speed is for thinner ware that requires less time for water smoking and carbon burn-out. Firing time is 9 - 11 hours, typically, and depends on the cone number.
	OR **Slow Glaze**	Display shows S-GL	Slow glaze is used for firing glaze on thicker ware or for bisquing very thin ware. Typical firing time is 6-8 hours depending on the cone number.
	OR **Fast Glaze**	Display shows F-GL	Fast glaze is the fastest speed and is used for glaze firing on thin ware, china paint firings, and decal firings. Firing times range from 4 to 5 hours
Press	**ENTER**	Display shows CONE/xxx	The displayed firing speed was accepted and now the controller is waiting for the cone number to be entered. The x's represent the cone number last selected.
Press	**Number keys** for cone number	Display shows xxx	Use the number keys to display a new cone number. Remember, cone numbers starting with a 0 are lower temperature than cone numbers not starting with a 0. For example, don't mistake a cone 6 for a cone 06!
Press	**ENTER**	Display shows HOLd/0.00	The displayed cone number was accepted and now the controller is waiting for the hold time at the top temperature to be entered. Usually this value is left at 0. If a time is entered the hours are to the left of the decimal and the minutes to the right.
Press	**ENTER**	Programming complete Display is back to Idle	Zero hold was accepted and programming is complete.

NOTE: A preheat segment for drying (candling) ware can be added to any cone fire program.

*Use the **Slow Bisque** program with a preheat segment for all bisque firings.*

PRHT shows in the menu only when a cone fire is programmed. Preheat is used with the CONE FIRE Mode only. When Preheat is selected, the temperature ramps up at 60˚F/hour (33˚C/hr) to 200˚F (93˚C) and then holds at 200˚F (93˚C) for the amount of time programmed. Preheat is automatically set to zero during cone fire programming and at the end of each firing. Therefore, if a preheat stage is desired, it must be reprogrammed for each firing and be the last item programmed before START is pressed.

Step	Press	Display	Comment
1	**Menu**	PrHt	If PrHt does not show on the display, even after cycling through al the options it means that ConeFire mode has not been selected. Exit the menu and select2 a Cone Fire speed, then return to the Menu to set Preheat.
2	**ENTER**	Alternately flasing: Hld & 00.00	Preheat has been selected; enter the time you want to hold the temperature at 200oF (for example, 4 hours)
3	**4, 0, 0**	04.00	Displays the selected time of 2 hours. Numbers to left of decimal point are hours, to the right are minutes. If you type a wrong number, press zero 4 times, then enter the correct number.
4	**ENTER**	Display returns to current temperature and IdLE	Accepts the 4 hour preheat time. The current temperature then flashes in the display.

Remember the controller must be at IdLE to program a Preheat.

End of Firing – CPLT

At the end of the firing, the display will flash between CPLT / Firing time / kiln temperature

Press **ENTER** to return to IdLE - The display will now flash IdLE / kiln temperature.

You may open the kiln when the temperature has cooled to 150°F.

Review the Results

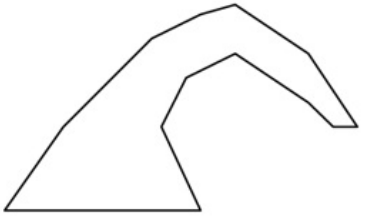
FINAL TEMPERATURE REACHED at the end of a cone fire program:

When the display is at IdLE, pressing Review Program will show the heat-work adjusted temperature that was reached. The temperature is displayed after °F in review program. This temperature will remain until the controller is reprogrammed. Record this temperature in your log after each cone firing.

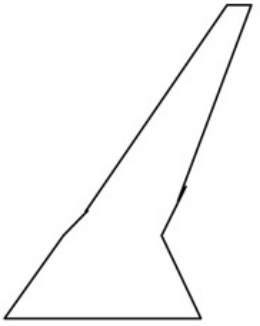
After a firing, record the firing time, and load size. In your log keep any repair information. If cones are placed in the kiln, record the amount of bending that took place.

A properly bent cone indicates that the kiln is functioning properly and accurately. The tip of the cone will be level with the top of the cone's base when fired properly. The diagrams below will give you an idea of a properly fired, under fired and over-fired cone. Some variation from a proper bend is expected and can be compensated for with the cone-offset adjustment for each particular cone number based on test firings.

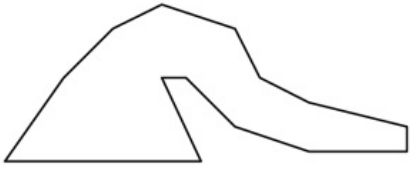
NOTE - An error code (E-) in the display indicates an abnormal end to a firing. See the Error code section in the supplemental Bartlett Manual to help determine the reason for the error code.



Proper bend



Under fired



Over fired

KILN MAINTENANCE

Keeping up with kiln maintenance is important for the kiln to run safely and efficiently, for pieces to come out correctly, and to extend the life of the kiln. Most of the preventative upkeep is simple and quick, and these thing should be done routinely.

It is important that before any work is done on a kiln that it is off. Leave Digital kilns plugged in when vacuuming to ground any static charges that may occur at the nozzle tip of the vacuum. Try to keep the vacuum away from the touch pad area.

The interior of the kiln should be vacuumed between each use, removing bits of loose dust and other materials that may accumulate in the kiln. Dust and debris in a kiln can settle on glazed wares and ruin them by leaving little dark spots in the glaze.

Use a soft bristle attachment when vacuuming the kiln so as to not cause any damage to the firebrick or elements. When vacuuming take care around the elements, as they are brittle and can be damaged by being moved.

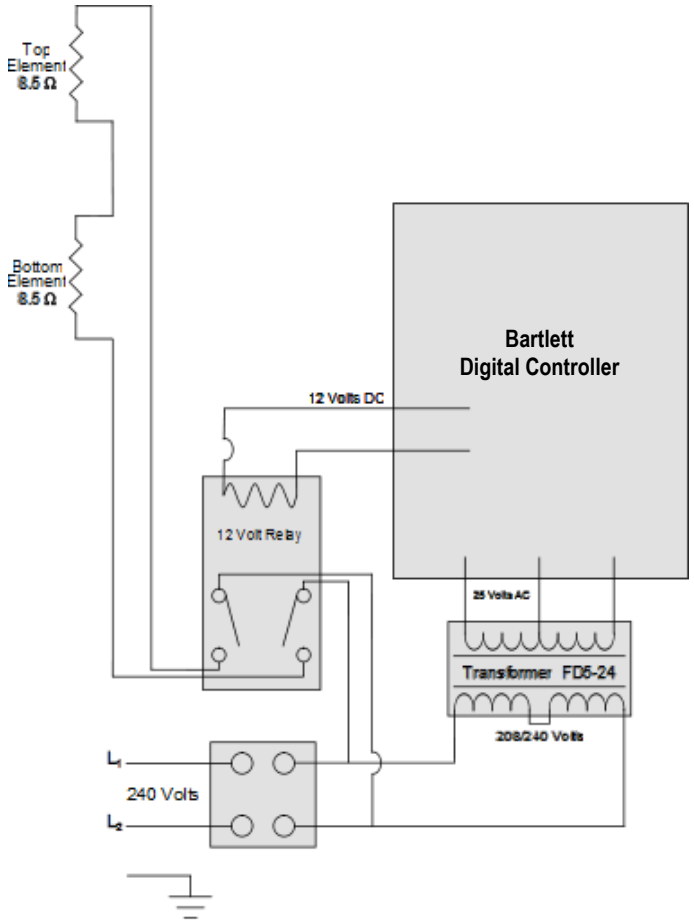
Don't forget the maintenance of the kiln shelves. Maintain a coating of kiln wash on the tops, touching up as it flakes off, and removing any glaze drips that will re-melt and damage the next firing.

Remember, when removing any of the glaze chips, to take proper safety precautions as the process of cleaning creates flying debris.

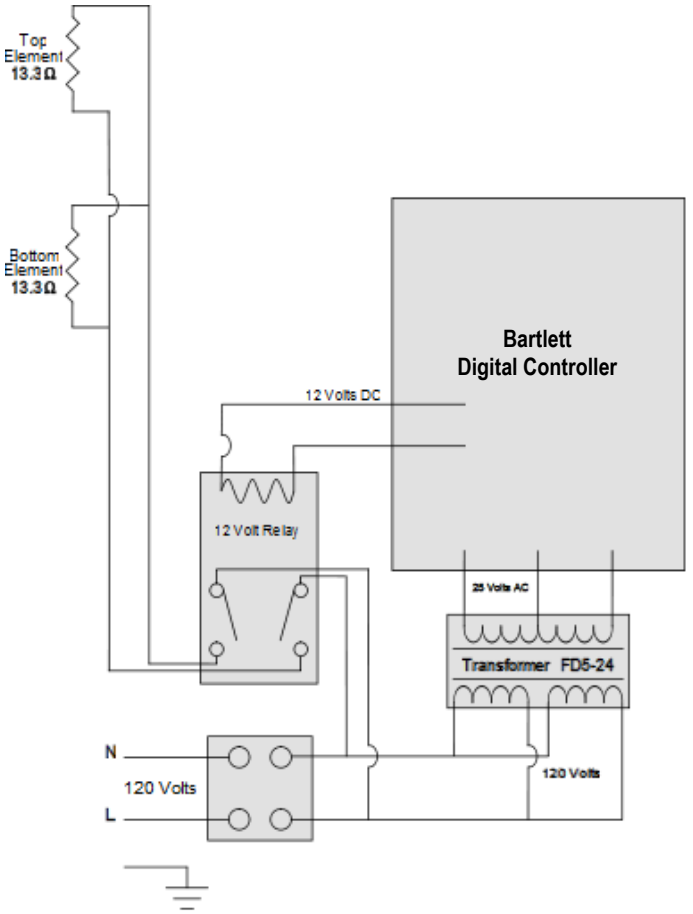
Visually inspect the interior of the kiln before firing and check for glaze spots that may have happened. If found, glaze spots should be removed, when the kiln is unplugged, with a flat-bladed screwdriver (if the spot is not too large or not near an element). If glaze spots are near an element or large call for assistance as these glaze spots will re-melt in the next firing and only cause further damage.

Examine plug and wall receptacle for any sign of excessive heat.

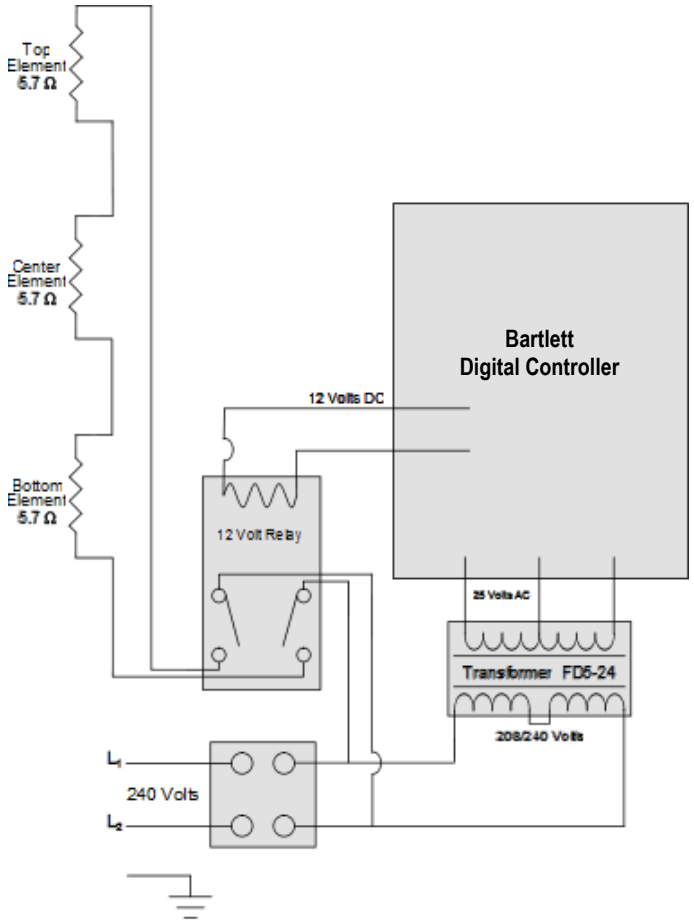
Replace both plug and receptacle if necessary.



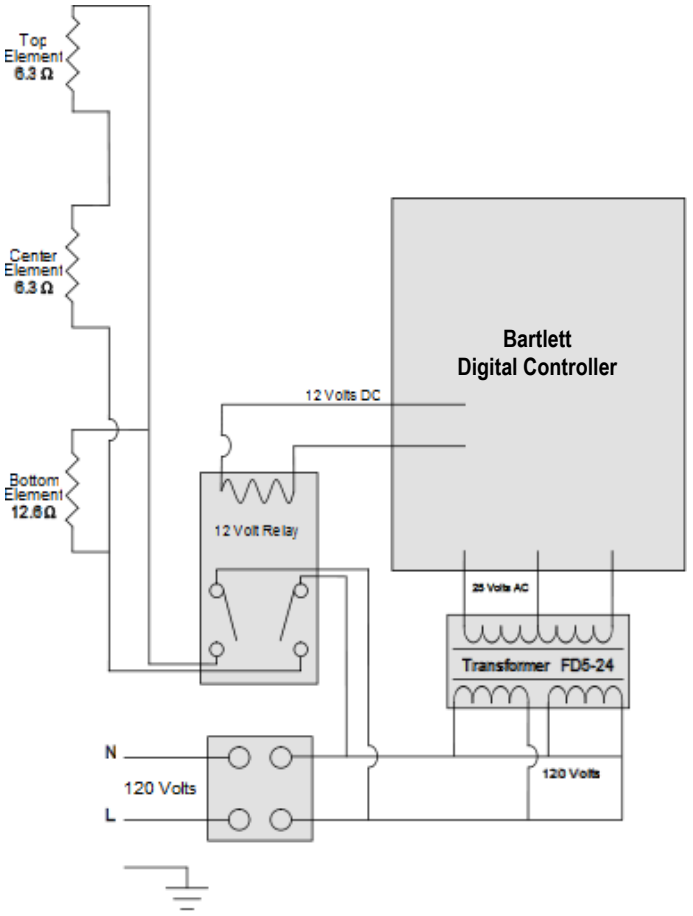
Seattle Pottery Supply Kiln
Model 122
208/240 Volts single-phase



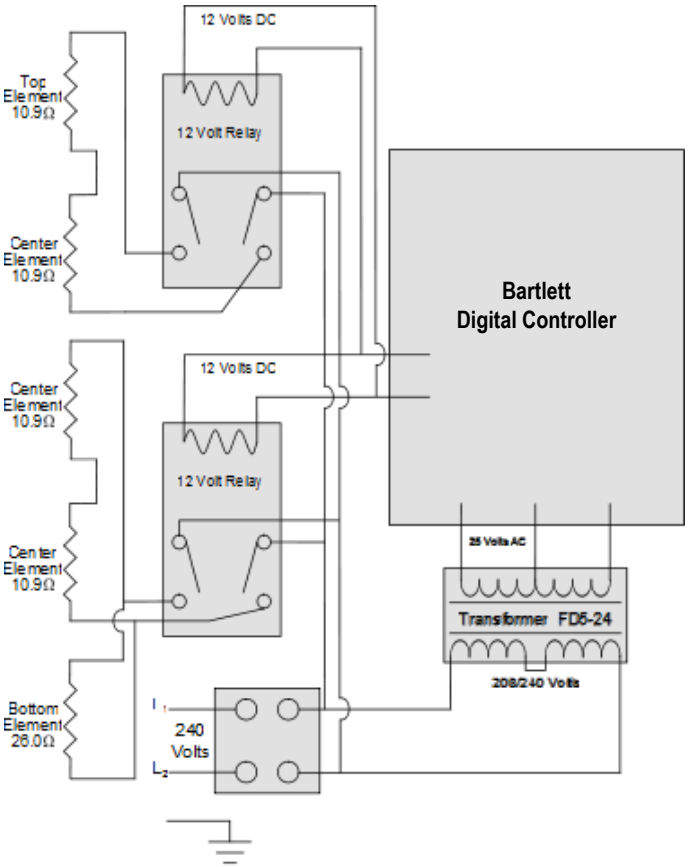
Seattle Pottery Supply Kiln
Model 122
120 Volts single-phase



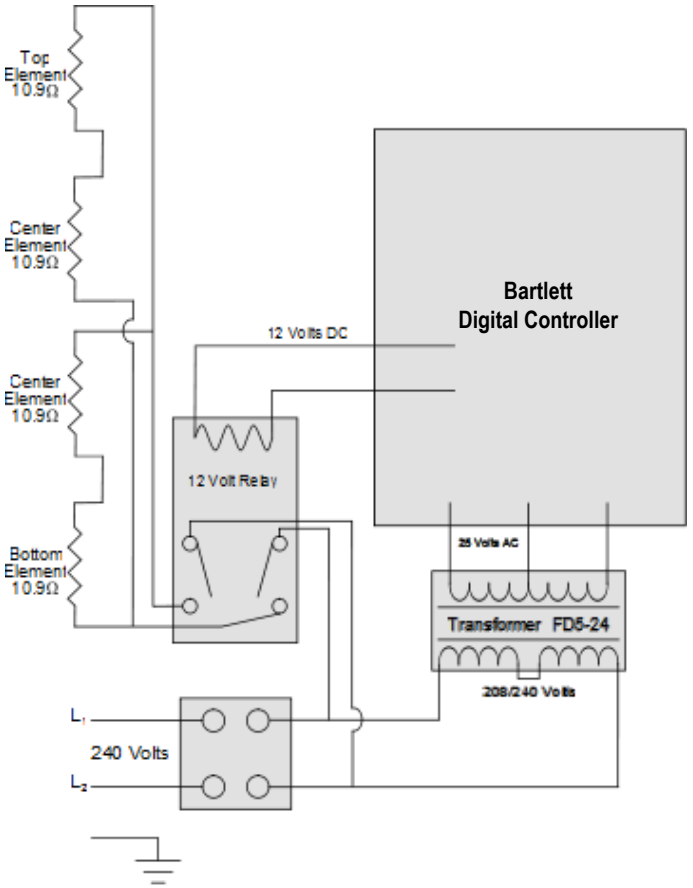
Seattle Pottery Supply Kiln
Model 123
208/240 Volts single-phase



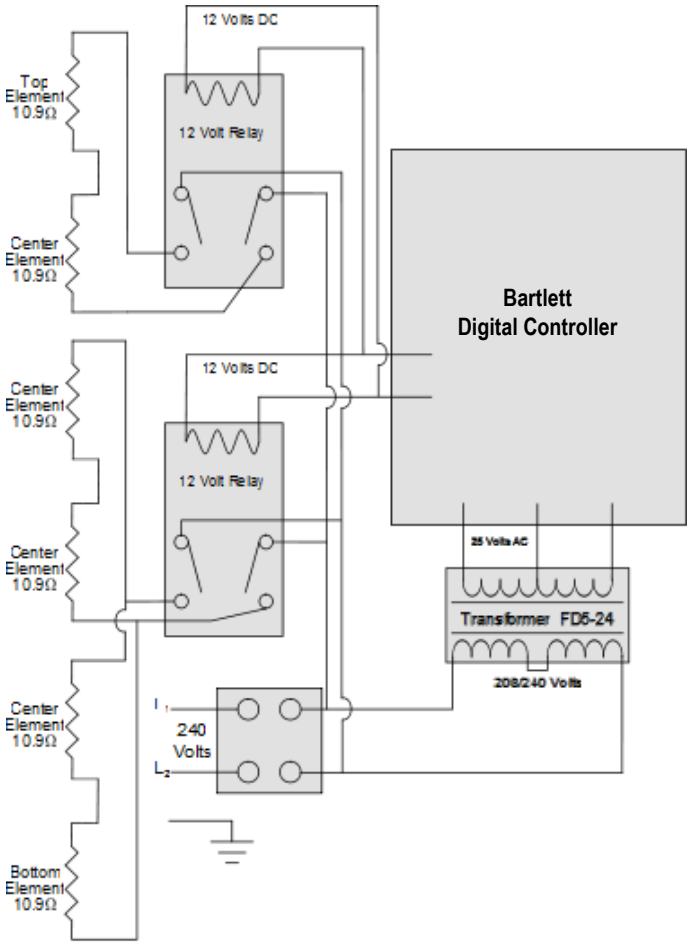
Seattle Pottery Supply Kiln
Model 123
120 Volts



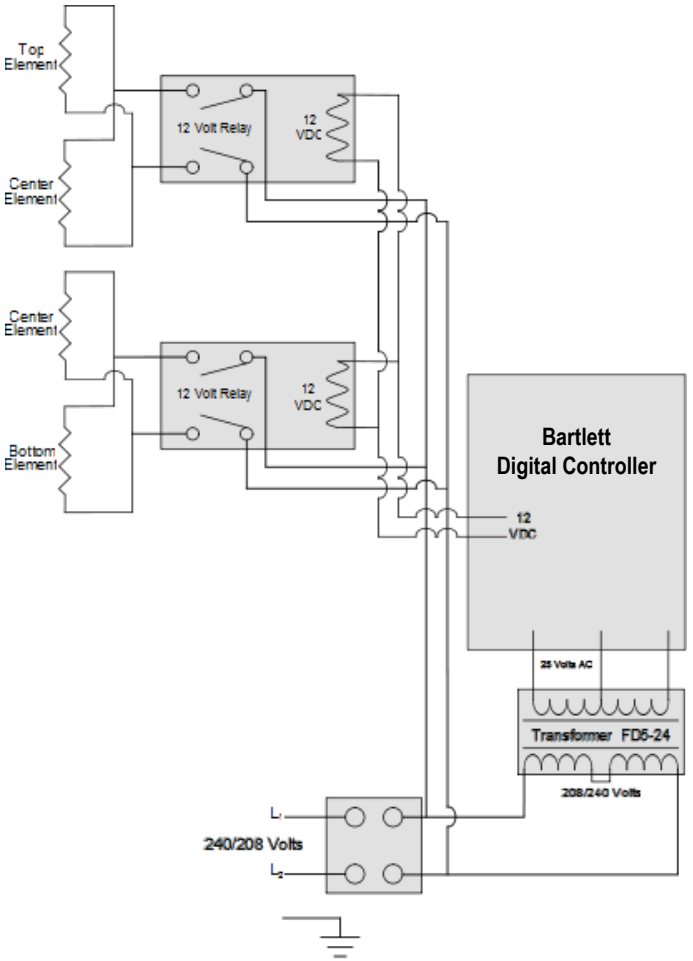
Seattle Pottery Supply Kiln
Model 185WR
208/240 Volts single-phase



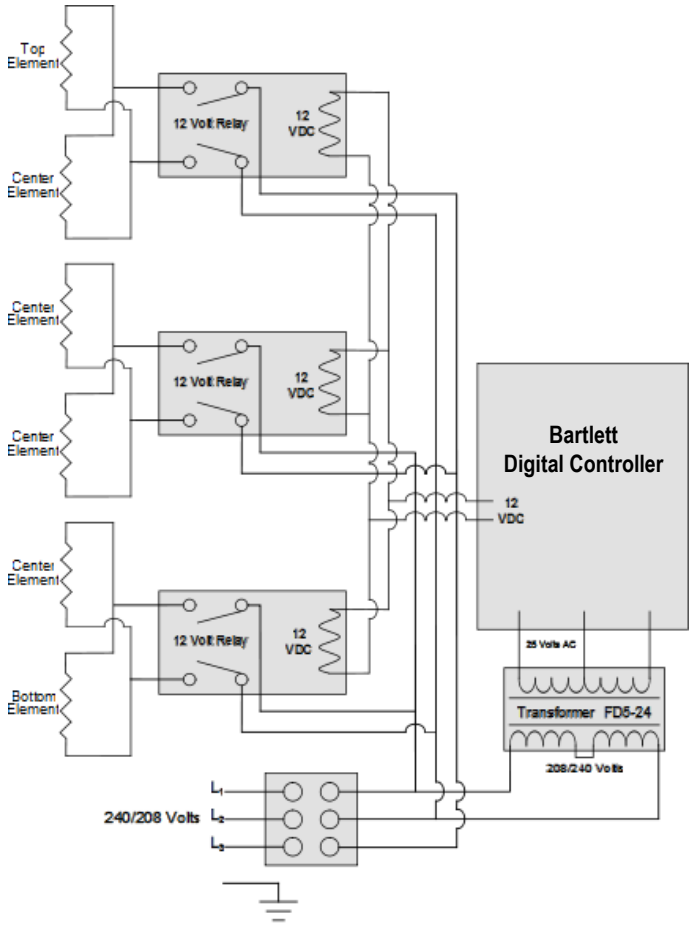
Seattle Pottery Supply Kiln
Model 184
120 Volts single-phase



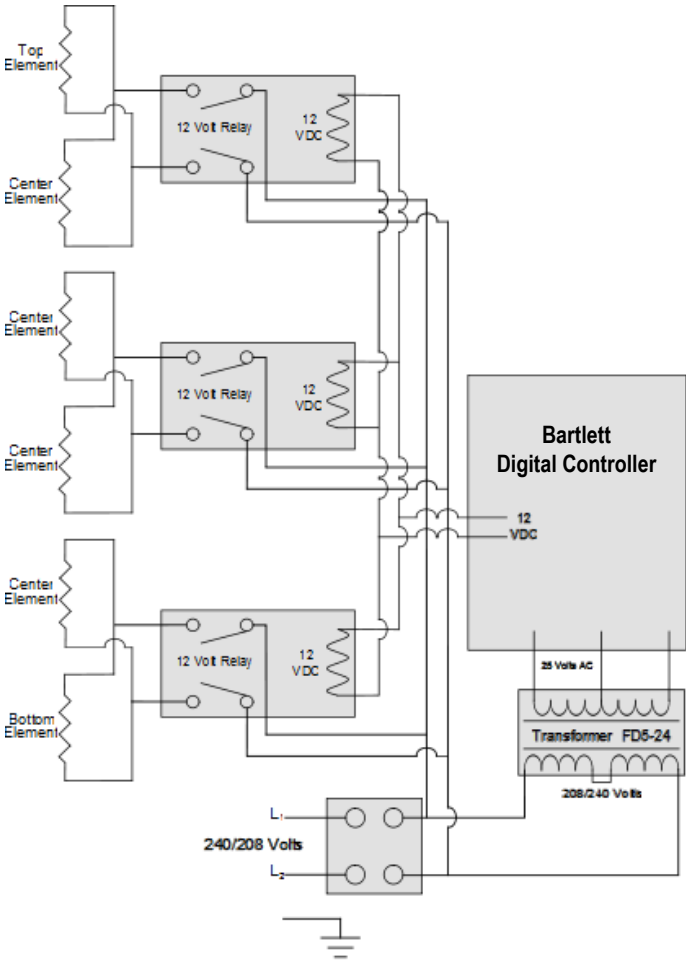
Seattle Pottery Supply Kiln
Model 186
208/240 Volts single-phase



Seattle Pottery Supply Kiln
Models 234, 284, 254, 304 Oval
120 Volts single-phase



Seattle Pottery Supply Kiln
Models 236, 286, 25 Oval, 30 Oval
208/240 Volts 3-phase



Seattle Pottery Supply Kiln
Models 236, 286, 25 Oval, 30 Oval
208/240 Volts single-phase