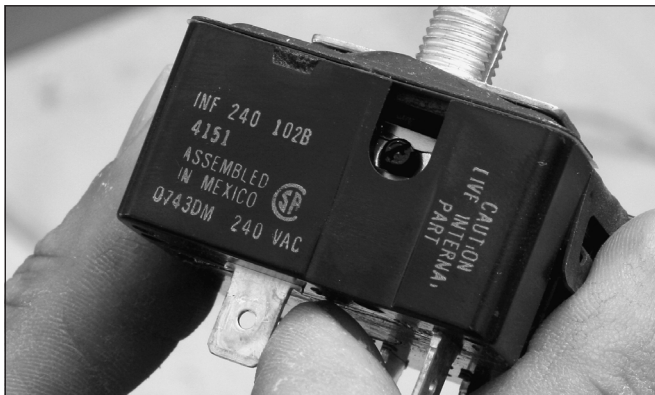


# Paragon Switch Operated Ceramic Kiln Instruction and Service Manual



# INTRODUCTION

Thank you for purchasing a Paragon kiln. We are confident that the kiln will give you many years of relaxation and creative enjoyment—provided you read and follow the manuals. Though you may be excited to fire your kiln, first read the manuals that came with your kiln. The more you know about your kiln, the more you will enjoy it.

This manual covers the kiln switches and the Orton Auto-Cone® automatic shutoff. Before you read this manual, read "Paragon Ceramic Kiln Instruction and Service Manual" and "Safe Installation of the Electric Kiln," which are also shipped with your new kiln. Please contact the factory if you do not have copies. You can also download them at [www.paragonweb.com](http://www.paragonweb.com). Select "Support" and then "Instruction Manuals" from the drop menu. The manuals are listed alphabetically.

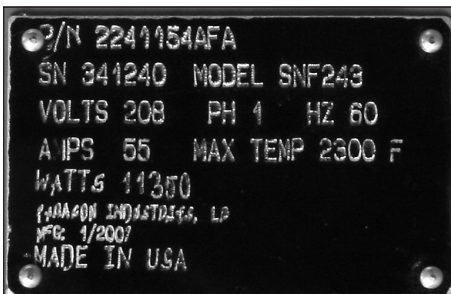
Also, go to [www.paragonweb.com](http://www.paragonweb.com) and select "Products," then "Books & DVDs" from the drop menu. The books we recommend will enhance your kiln experience.

At [www.paragonweb.com](http://www.paragonweb.com) you will also find online videos for many of the procedures shown in this manual. As you read each section, you can go online to watch an actual demonstration from your computer.

Throughout the manual you will find photos of the Dawson Kiln Sitter®. These photos also apply to the Orton Auto-Cone, which has replaced the Dawson Kiln Sitter. (Orton, the company that makes pyrometric cones, began making the Auto-Cone in 2009.) The Auto-Cone is Orton's version of the Kiln Sitter. To avoid confusion, we refer to the Auto-Cone as the Kiln Sitter throughout this manual.

Even though your Paragon kiln has an Orton Auto-Cone automatic shut-off, check the kiln at the expected shut-off time. The Kiln Sitter is reliable, but since it is a mechanical device, it can malfunction and overfire the kiln. The warranty on your kiln does not cover damage from overfiring, regardless of the circumstances. It is the operator's responsibility to make sure the kiln turns off when the firing is completed. Never leave your kiln unattended near the end of the firing.

Check your new kiln frequently during the first few firings and note the color change inside the kiln. After awhile you can learn to estimate, with considerable accuracy, when the kiln is about to shut off just by observing the color.



If you call us about your kiln, please have the model number, part number (P/N), and voltage from the kiln's electrical data plate handy. (The plate is attached to the side of the switch box.) Write that information on the cover of the manual for quick reference.

Do not be concerned that your kiln makes a clicking sound during firing. Infinite control switches click as they cycle on and off until turned to high. The sound is normal.

Special thanks to Mel Jacobson for reading the manuscript and offering suggestions. Feel free to send comments about this manual to [ahoward@paragonweb.com](mailto:ahoward@paragonweb.com).

  
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## IMPORTANT

Please read each page of this manual in detail before you operate your kiln. Warranty does not cover damage caused by failure to follow instructions.

## TOXIC GLAZES

Some glazes may be toxic when used for surfaces that will be in contact with food or drink. When you make food or drink containers, select a glaze that has been formulated, tested and labeled as approved for surfaces that will be in contact with food or drink. Follow the glaze manufacturer's instructions exactly, without any variations. You can learn more about glaze safety in *Mastering Cone 6 Glazes*, by John Hesselberth and Ron Roy.

## IMPORTANT SAFETY RULES

- An electric ceramic kiln is extremely safe to operate provided you follow these safety rules:
- Unplug kiln when not in use.
- Do not touch hot sides.
- Keep unsupervised children away.
- Place kiln on stand before connecting power.
- Do not install closer than 12" from any wall or combustible surface.
- Do not open lid until kiln has cooled to room temperature and all switch(es) are off. Cooling time is usually twice the firing time.
- Fire only in a well ventilated, covered, and protected area.
- Keep cordset away from hot sides of kiln.
- DANGEROUS VOLTAGE! Do not touch heating elements with anything.
- Disconnect kiln before servicing.
- Do not leave kiln unattended while firing.
- Wear firing safety glasses when looking into the peephole of a hot kiln.
- Turn the switches off after the Kiln Sitter fires to completion.

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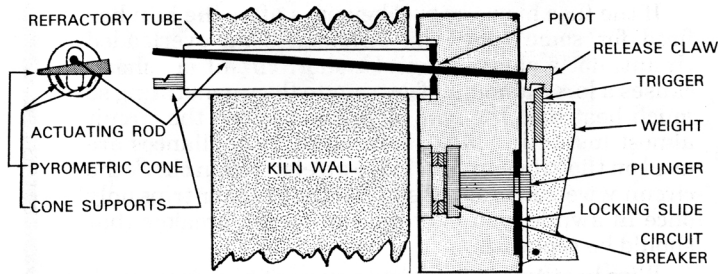
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# The Kiln Sitter and Limit Timer

**WARNING:** Since proper operation and control of the Kiln Sitter and Limit Timer rest wholly with the operator, we cannot extend our warranty to cover any damage caused by overfiring regardless of the circumstances.

**DO NOT LEAVE THE KILN SITTER UNATTENDED!**

For the longest life of your kiln and for safety, all kiln switches must be in the OFF position before the Kiln Sitter plunger is pushed in. Pushing in the plunger with kiln switches on will result in extra wear on the Kiln Sitter contact points.



## How the Kiln Sitter Works

The Kiln Sitter is elegantly simple and reliable. But it is subjected to the harsh temperatures and atmosphere of the kiln and must be adjusted from time to time. This is easier to do when you know how it works.

A correctly adjusted Kiln Sitter shuts off the power to your kiln when a properly inserted, small, pyrometric cone or pyrometric bar sags under the actuating rod. When the plunger (see photo and diagram) is pressed, a locking slide holds the plunger down, closing the four contact points of the Kiln Sitter electrical contacts. The kiln then receives power. When the cone or bar fires to maturity and sags, the actuating rod that rests on top of the cone sags with it. The release claw rises at the same time, causing the weight on the front of the Kiln Sitter to fall. The weight unlocks the locking slide, releasing a plunger. The contact points separate, interrupting the current to the kiln.



The Kiln Sitter with the weight in the raised position.



The Kiln Sitter with the weight in the lowered position.

**Q** What is the clanking noise that comes from my kiln when it shuts off?

**A** That is the sound of the falling Kiln Sitter weight. The weight releases a switch and shuts off the kiln.

The Limit Timer is a clock motor that acts as a backup safety shutoff. It is designed to prevent an



Setting the Limit Timer.

overfiring should the Kiln Sitter malfunction and fail to shut off the kiln.

Turn the Limit Timer dial to the number of hours you think the firing will take, and add 30 minutes. When you start the kiln, the countdown timer will begin. Should the Kiln Sitter weight fail to drop, the Limit Timer will shut off the kiln when the timer runs out of time. Since the Limit Timer is a backup shutoff, always set it for more time than you estimate that the firing will need.

The Limit Timer will help you learn to estimate future firing times. For example, if you set the timer knob at 10 before firing, and the white dot indicator is on 1 when firing is completed, you know the firing took 9 hours. When you become familiar with the firing times for your ware, you will be able to set the Limit Timer accurately to shut off 30 minutes after the expected firing time.

**Q** What is the purpose of the Limit Timer?

**A** The Limit Timer is designed to prevent an overfire should the Kiln Sitter weight fail to drop.

The Limit Timer may be set for any period up to 20 hours. If the firing will take more than 20 hours, you can reset the knob at any time during the firing.

**Caution:** Never set the Limit Timer beyond 20 hours. This could result in an overfire should the Limit Timer motor stop running.

**Q** If I turn the Limit Timer dial to 5, the Kiln Sitter always shuts off at around 4 hours. What Limit Timer settings should I use for greenware, underglaze, and glaze?

**A** If the Kiln Sitter shuts off at 4 hours, turning the dial to 5 gives you a one-hour margin of safety. This means that after the cone bends and shuts the kiln off, there is still one hour left on the Limit Timer. If the Kiln Sitter cone fails to bend, the kiln will continue to fire for another hour before the Limit Timer shuts it off. We suggest setting the Limit Timer half way between 4 and 5 so that you have a 30-minute safety margin. Keep a firing log book so you can estimate firing time for each type of ware.

The primary value of the Kiln Sitter is the convenience of relief from closely watching the large cones through the peepholes and the uniform firing that the Kiln Sitter gives from one firing to the next. It is a mechanical device and cannot be considered fully automatic nor relieve the user from responsibility for damage due to overfiring. It must be kept in good working order and tested before EACH firing.

Your Kiln Sitter was adjusted properly when shipped from the factory, but vibration during shipping may have moved the guide plate. You MUST adjust the Kiln Sitter, as we will show you next, before you fire your kiln.

## How to Adjust the Kiln Sitter

**Note:** Never lubricate the Kiln Sitter. Lubricants will only attract dust.

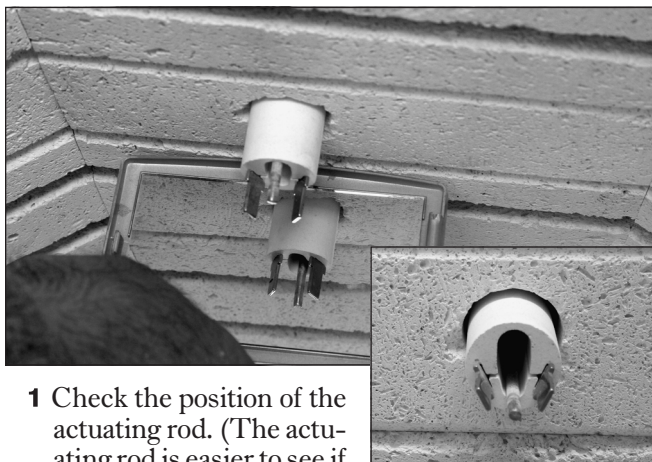


Your kiln will arrive with the firing gauge in place on the cone supports and the actuating rod inserted through the center hole. Remove the rubber band that holds the gauge in place; then remove the gauge. Save the gauge for future adjustment. Do not fire with the gauge in place!

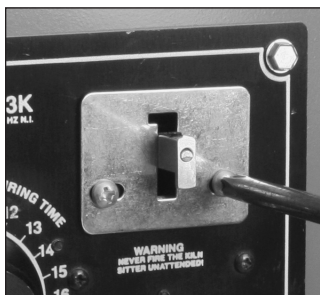
**Note:** Store the firing gauge, Kiln Sitter allen wrenches, and storage bag in a handy place near the kiln along with a small bottle of kiln wash.

**Note:** Most people think the firing gauge is only to keep the actuating rod from bouncing during shipping. Please do not throw the gauge away! You will need it to keep the Kiln Sitter adjusted to factory specifications.

## Guide Plate Adjustment



**1** Check the position of the actuating rod. (The actuating rod is easier to see if you hold a small mirror inside the kiln.) The rod should be centered side-ways in the refractory tube's oblong slot. If not, loosen the two guide plate adjusting screws and move the plate to the right or left, as necessary.



**Note:** The easiest way to adjust the guide plate is to loosen the screws so that they barely hold the guide plate in place. Then gently nudge the plate

sideways. If you loosen the screws completely, the guide plate is more difficult to adjust.

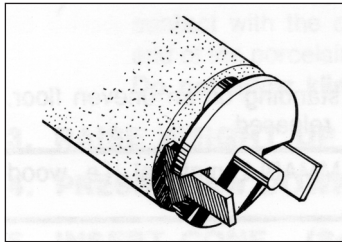
- 2 After the rod is centered, securely tighten guide plate screws.
- 3 Test the full travel of the actuating rod. Watch the actuating rod inside the kiln as you move the release claw up and down. The actuating rod should be free to move within the tube without touching the sides.

If the rod does not fall freely to the bottom of the tube, check the guide plate to see that its slot is parallel to the direction of travel of the release claw. If not, straighten the guide plate and readjust rod centering. Be sure to retighten the two screws securely.

**Note:** As the Kiln Sitter develops wear, the actuating rod may no longer fall freely within the tube. This is usually caused by a corroded tube assembly. Replace the tube.

### Trigger Adjustment

- 1 Inside the kiln, slide the firing gauge over the end of the actuating rod and the two slotted cone supports. The actuating rod fits into the firing gauge hole.



- 2 Lift the weight on the outside of the Kiln Sitter all the way to the fully raised position. At the end of the weight is the adjustable trigger. With the firing gauge in place, the trigger should just clear the release claw, coming as close as possible without touching. If the trigger is too high to clear release claw or if it is too low, loosen the set screw in the center of the weight, move the trigger up or down until it just clears the release claw, and retighten the set screw.

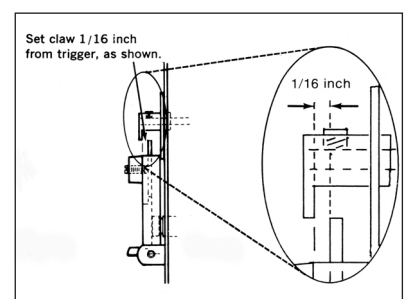


**Note:** Check the trigger adjustment with the firing gauge after every 12 firings.

**Caution:** If the set screw is too loose, the trigger will slide out of adjustment with repeated use. But if the set screw is too tight, you can strip out the threads.

### Release Claw Adjustment

After you have adjusted the trigger height, check the amount of play between the trigger and the release claw. Raise the weight and lower the release claw over the trigger. Look at the Kiln Sitter from the side to check the play between the trigger and the release claw. It should be 1/16" (2 mm). To adjust, loosen the setscrew on top of the release claw.



### Test the Mechanical Operation

- 1 With all kiln switches turned OFF, raise the weight and lower the release claw over the trigger. The weight **MUST NOT** be able to stand up alone, and the trigger **MUST** lean against the release claw.
- 2 With your other hand, hold up the end of the actuating rod inside the kiln. Let go of the release claw. The release claw should hold the weight up while you hold up the end of the actuating rod inside the kiln.
- 3 Set the Limit Timer clock. Push the plunger all the way in until it locks into position. (The Limit Timer clock **MUST** be set before the plunger will lock.)
- 4 From inside the kiln, move the actuating rod slowly downward until the claw releases the trigger. The weight should fall all the way to the bottom, releasing the



plunger and allowing the button to pop out to its original position. Repeat the operation 6 - 12 times to loosen the mechanism.

**Note:** For reliable operation of the Kiln Sitter, the kiln should be level. You can level it by inserting shims under the stand legs.

## Kiln Sitter Operation

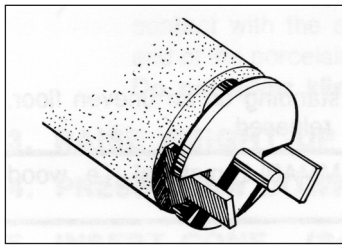
Regardless of your firing experience, check the operation of your new Kiln Sitter by watching large pyrometric cones placed in the kiln behind a peephole for at least 12 firings. (These are called witness cones. See "Paragon Ceramic Kiln Instruction and Service Manual.") We recommend that you use large witness cones in every firing. Their cost is less than the smallest piece of greenware, and using witness cones is the only way to check the accuracy of your Kiln Sitter.

Keep a firing log book so that you can accurately estimate the firing time for each type of ware.

1 Turn the kiln switch(es) to the OFF position.\*

2 Remove the metal firing gauge and save.

**Caution:** Do not fire with the metal gauge in place! Serious damage to the kiln and Kiln Sitter will result.



3 Apply a thin coat of high fire kiln wash to the upper edges of the cone supports and the lower side of the actuating rod. The application of kiln wash should be thin enough to dry in 5 to 10 minutes.



Apply kiln wash to the cone supports. Let the kiln wash dry before inserting the cone.



Applying the kiln wash is easier if you remove the cone supports.

\*To turn off the Paragon SnF kiln: Turn the top switch to the OFF position. The second switch (and third, if you have one) is a switch-timer. Turn the switch-timer pointer to a number, then turn clockwise until it clicks and points to "On." Turn it clockwise one more click to the right to turn it off.

**Note:** It is a good idea to have two sets of cone supports. They easily slide out of their slots. Coat the extra set with kiln wash while the other set is in the kiln. The fresh set will be dry and ready the next time you load the kiln. Do not allow kiln wash to build up on the cone supports.

**Note:** Keep a small bottle of kiln wash near the kiln. A nail polish bottle with the built-in brush is a convenient applicator. Shake the bottle before each use.

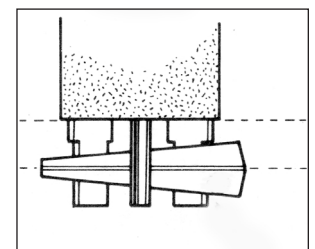
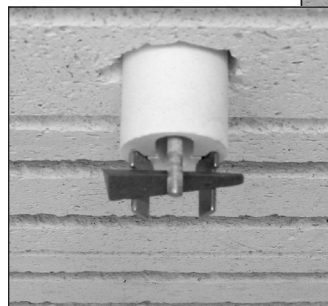
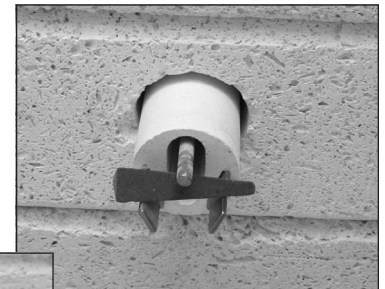
**WARNING:** You MUST apply kiln wash before each firing. Otherwise the cone could stick to the metal and prevent the Kiln Sitter from shutting off the kiln. Remove old kiln wash and apply new before each firing. Do not allow kiln wash to touch the cone or the inside of Kiln Sitter tube. Make sure the kiln wash has dried before inserting the cone.

**Note:** Examine the cone supports each time you fire the kiln, and replace them if they are corroded or warped. Use emery cloth to remove traces of greenware, corrosion, or bits of melted cones. These foreign materials can catch on the cone, preventing it from slumping freely.

4 Check that the sensing rod moves up and down freely and is centered in the tube. (Do not fire the kiln if the sensing rod movement is sluggish, which may indicate that corrosion has built up inside the tube. If necessary, replace the tube.)

5 Raise the weight and lightly press the release claw down over the trigger.

6 After checking the number on the small pyrometric cone to be sure it is correct, place the cone under the actuating rod and on top of the cone supports. The cone should be centered on the cone supports, and the rod should rest on the center of the



cone. Never apply pressure to the cone when you load it into the Kiln Sitter. Handle cones as if they were extremely fragile.



Loading a cone into the Kiln Sitter requires two hands or a helper.

**Note:** The cone has a number stamped onto one of the sides. Place the cone in the Kiln Sitter with the number side down. That side is the strongest of the three sides. Placing that side down lessens the chance of the cone breaking as it bends.

**7** Load the kiln for firing, placing the correct pyrometric cones behind each peephole. Keep all ware and kiln shelves at least 1/2" away from the sides, top and bottom of the end of the cone supports and actuating rod.

**8** Keep the area outside the Kiln Sitter clear of objects that could interfere with the falling weight. The Kiln Sitter weight must fall completely to the bottom of the sitter to shut off the kiln.

**Note:** Keep chairs, stools, and small loading tables away from the kiln. Many of these items are the same height as the Kiln Sitter weight. It is easy for someone to come by and move a stool or small table up against the weight, which would prevent it from dropping, thus causing an overfire.

**Note:** Never set anything on top of the kiln or lean anything against the kiln's switch box. We know of cases where a kiln shelf leaning against the Kiln Sitter prevented the weight from dropping and caused an overfire. Leaning something

against the Kiln Sitter or bumping into it can also move the guide plate out of alignment, preventing the actuating rod from dropping. This will overfire the kiln.



Set the Limit Timer.



Push in the plunger.

**9** Set the Limit Timer dial to the estimated firing time plus 30 minutes. (This must be done before the plunger will lock into position.)

**10** Push in the plunger (the button on the front of the Kiln Sitter).

**11** Fire your ware. Occasionally check the pyrometric witness cones through the peepholes.

**Note:** Experienced kiln operators keep a small timer with them as a reminder that the kiln is firing. You could set the alarm on a digital wristwatch for the estimated firing time less 20 minutes. Go back and check the kiln when the alarm sounds. Do not leave the kiln unattended, especially near the estimated shutoff time.



Set the alarm on a digital watch to remind yourself that the kiln is firing.



**Note:** Leave the top peephole plug out during the entire firing. This practice extends the life of the Kiln Sitter tube by allowing moisture to exit the kiln through the peephole instead of through the tube. But if you use the Orton down-draft KilnVent, keep all peephole plugs inserted throughout the firing. Leave the KilnVent on during firing and cooling. If you turn the KilnVent off when the kiln fires to maturity,



moisture can build up inside the Kiln Sitter tube as the kiln cools.

If the Kiln Sitter weight is still in the upper position after the kiln shuts off, the Limit Timer turned off the kiln. Let the kiln cool to room temperature and examine the small cone in the Kiln Sitter. Find out why the cone did not shut off the kiln. You may have loaded the wrong cone, or the actuating rod may be out of adjustment. You may need to add more time to the Limit Timer the next time you fire so that the falling weight shuts off the kiln.

## Selecting Cones for the Kiln Sitter

Only the small Orton pyrometric cone or the Bell bar may be used in the Kiln Sitter. The pyrometric bar will fire a little hotter than the small pyrometric cone.

The small cone or the bar may not react to heat in exactly the same way as a large pyrometric cone placed upright on the shelf. This is because of the difference in size, weight, and positioning in the kiln.

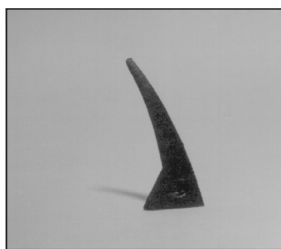
A rule of thumb is to fire one cone hotter in the Kiln Sitter than on the shelf. For the first few firings, place three large pyrometric witness cones on a shelf a few inches from the Kiln Sitter cone. One of these large cones should be the same number as the small cone or bar in the Kiln Sitter. The other two large cones should be one cone hotter and one cone cooler.

Examine the cones after your first testing firing. If the witness cone of the correct number is still straight, and the Kiln Sitter shut off properly, fire a hotter cone in the Kiln Sitter the next time. If the witness cone bends too far or “puddles,” fire a cooler cone in the Kiln Sitter.

For instance, if you have a small cone 05 in the Kiln Sitter, the large cones on the shelf should be 04, 05, and 06. When the Kiln Sitter shuts off and the kiln cools completely, inspect the cones. If the large cone 05 on the shelf bent to six o'clock, the small Kiln Sitter cone and the large witness cone should be of the same cone number during future firings. If the large cone 04 bent to six o'clock, use a cone rated one cone cooler in the Kiln Sitter than on the shelf. If the large cone 06 bent to six o'clock, use a cone rated one cone hotter in the Kiln Sitter than on the shelf. (See the



Witness cone fired to maturity.



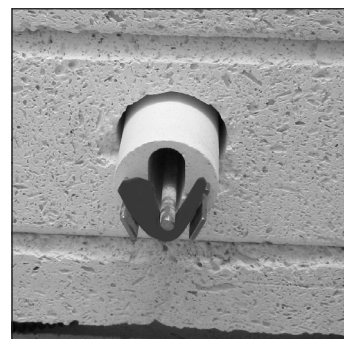
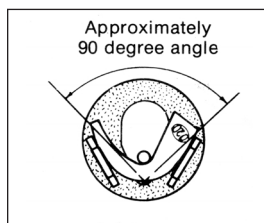
An underfired witness cone.



An overfired witness cone.

cone temperature charts in “Paragon Ceramic Kiln Instruction & Service Manual” to understand how cones are rated.)

Since the witness cones are on the shelf where the ware is placed, the witness cones measure the maturity of the ware more accurately than the small cone in the Kiln Sitter. To get like firings, you must place the cone in the Kiln Sitter exactly the same way each time. You **MUST** always center the cone so that at least 3/16" of the thick end of the cone extends past the cone support. Do not try to get a hotter firing except by using a hotter cone, and vice versa.



If your Kiln Sitter is properly adjusted and the small cone is correctly inserted, the cone in the Kiln Sitter will bend into a U" shape at the end of the firing.

## Loading Around the Refractory Tube

Loading too close to the Kiln Sitter refractory tube could cause an overfire.

- 1 Keep ceramic shelves at least 1/2 inch above or below the Kiln Sitter tube. If jarred, a shelf that is even with the tube could stop the actuating rod from dropping all the way, causing an overfire.



- 2 Do not position poorly stilted ware near the end of the refractory tube. If someone bumps the kiln, an unstable stilted piece could fall against the actuating rod, causing an overfire.



- 3 Never load moist greenware in your kiln. It could explode, and a piece of clay could lodge beneath the actuating rod or inside the porcelain tube.



Check the Kiln Sitter cone with a flash light before closing the lid and firing the kiln.

- 4 Before closing the lid, shine a flashlight down into the kiln to check the cone and actuating rod one last time. Position the shelves so that they do not block the view of the Kiln Sitter cone from above.

**Note:** Do not allow a piece of glazed ware to extend past a shelf and over the Kiln Sitter cone. If the glaze drips from the ware onto the cone and actuating rod, the cone could harden, fail to bend, and overfire the kiln.

## Summary of Kiln Sitter Operation

- 1 Turn the kiln switch(es) to the OFF position.
- 2 Clean off old kiln wash from the cone supports and rod and apply new before each firing.
- 3 Check that the sensing rod moves freely and is centered in the tube. Check that the weight falls when you lift the release claw.
- 4 Raise the weight and lower the release claw over the trigger.
- 5 Check that the number on the small pyrometric cone is correct. Place the cone under the actuating rod and on top of the cone supports.
- 6 Load the kiln; place pyrometric cones behind each peephole.
- 7 Set the Limit Timer dial to the estimated firing time plus 30 minutes.
- 8 Push in the plunger.



Set the Limit Timer.



Push in the plunger.

- 9 Never leave the Kiln Sitter unattended during firing. Though it shuts off the kiln automatically, it still needs the operator's attention.

### Kiln Shuts Off Too Soon or Too Late

Adjust the Kiln Sitter as shown on pages 5 - 6.

#### Kiln Sitter Shuts Off Before Witness Cones Bend

- 1 Raise the weight.
- 2 Press in the plunger.
- 3 Gently lower the weight.

**WARNING:** This puts the kiln on MANUAL CONTROL and prevents the Kiln Sitter from cutting off automatically. When large witness cones bend, turn the kiln switch(es) to the OFF position. Then trip the Kiln Sitter by raising the weight and dropping.

- 4 Before the next firing, use the firing gauge to check the adjustment of the Kiln Sitter trigger (see page 6). See also "Selecting Cones for the Kiln Sitter," page 9.

#### Witness Cones Bend Before Kiln Sitter Shuts Off

- 1 Turn the kiln switch(es) to the OFF position.
- 2 After the kiln has cooled, compare the small cone in the Kiln Sitter with the witness cones on the shelves. Determine if the small cone bent almost to the cut off point. In most cases, firing a few minutes longer with the Kiln Sitter cutting itself off would have no adverse effect on the ware. However, avoid overfiring glass, reds, and porcelain.
- 3 See "Selecting Cones for the Kiln Sitter," page 9.

### Points To Remember

DO adjust the guide plate if the rod does not fall freely to the bottom of the oblong slot.

DO leave clearance inside the kiln around the actuating rod.

DO check the Kiln Sitter with pyrometric witness cones.

DO place the Kiln Sitter cone in the same position each time for the same firing results.

DO use a hotter cone for a hotter firing.

DO clean off old kiln wash from cone support holders and apply new before each firing.

DO check the Kiln Sitter adjustments often.

DO NOT use your kiln before you read and understand this section.

DO NOT fire with the firing gauge in place.

DO NOT throw firing gauge away.

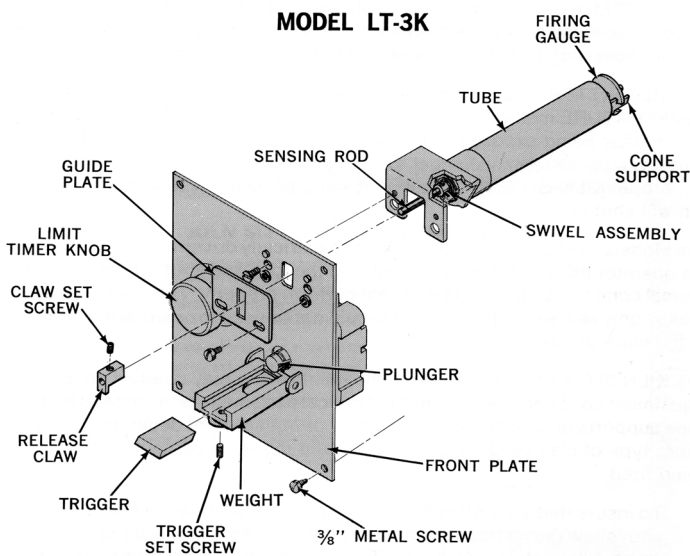
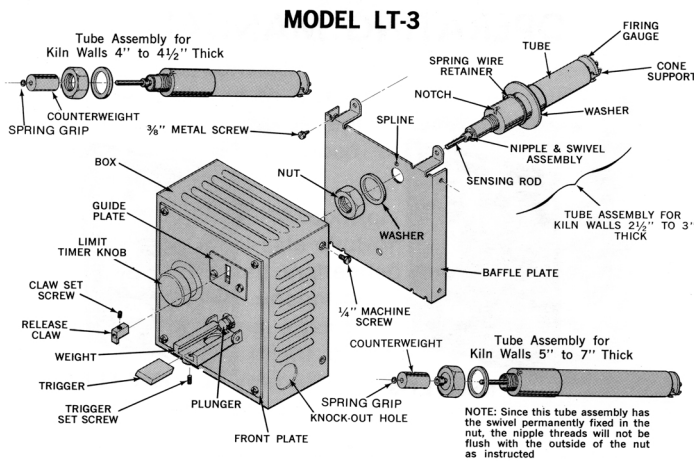
DO NOT load shelves and ware so close to the refractory tube that either would interfere with the drop of the actuating rod.

DO NOT put anything near your kiln sitter exterior that would keep the weight from dropping freely.

DO NOT let kiln wash get into the refractory tube, or onto the cone or heating elements.

DO NOT adjust the trigger to control shut off point. Adjust the shut off point by using cooler or hotter cones.

## KILN-SITTER PARTS IDENTIFICATION



# Kiln Switches

This section covers the switches on the S- and SnF-series kilns. To find out which kiln you have, please see the small black electrical data plate attached to the side of the switch box.

You can also tell by looking at the switch box. Infinite control switches are labeled with MIN and MAX. Switch-timers are labeled with HOURS. If your kiln has only infinite control switches, read the section for S-series kilns. If the top switch on your kiln is an infinite control but the 2nd and 3rd switch(es) are labeled with HOURS, read the section for SnF-series kilns.



The infinite control switch.



The SnF switch-timer.

## All Models

The warranty on your kiln does not cover damage from overfiring, regardless of the circumstances. It is the operator's responsibility to make sure the kiln turns off when the firing is completed. Never leave your kiln unattended near the end of the firing.

Check your new kiln frequently during the first few firings, and note the color change inside the kiln. After awhile you can learn to estimate, with considerable accuracy, when the kiln is about to shut off just by observing the color inside the kiln.

## The Clicking Sound of the Infinite Control

Do not be alarmed when your kiln makes a clicking sound during firing. Infinite control switches on S- and SnF-series kilns click as they cycle on and off until turned to high.

## S-Series Models: Kilns with Infinite Control Switches

S-Series kilns are manually operated with infinite control switches.

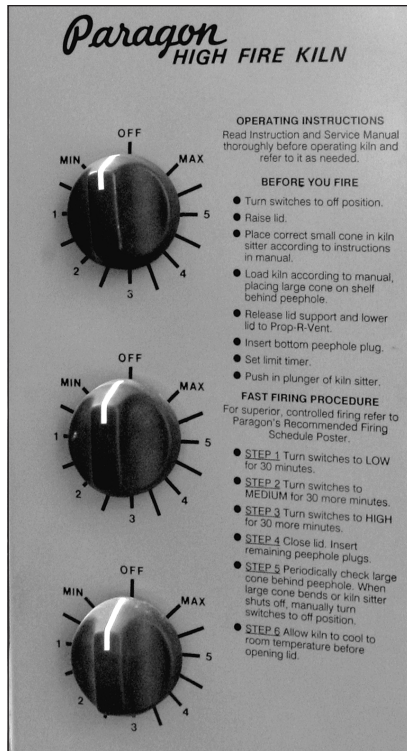
**WARNING: After the Kiln Sitter shuts the kiln off, turn all switches to their OFF position.**



When you engage the Kiln Sitter and turn on a switch, the elements controlled by that switch cycle on and off. You will hear them hum as they turn on. A click followed by silence means the ele-

ments for that switch have cycled off. The higher the setting, the longer the elements stay on during each cycle. On the MAX (High) position, the elements stay on continuously.

The switch can be turned from MIN, 1 - 5, to MAX. MIN is the slowest heating rate. The 3 position is Medium. As you turn the switch from MIN to progressively higher numbers, the kiln begins to heat at a faster rate. The switch is called an infinite control because you can position the pointer anywhere between MIN and MAX to vary the firing rate. When you finally turn the switch to MAX, the kiln will fire at the maximum rate.



The infinite control switches.

**Q** Is there any documentation that has the approximate rate of speed on the infinite control switch? For example, the heating rate when the knob is set to 2.5.

**A** The heating rate at a particular infinite control setting varies from one kiln to another. This is because the rate at each setting depends on the size of the kiln, voltage, age of elements, type of insulation, etc.

**Q** Instructions for certain glazes state that the kiln should be fired at a certain rate per hour. How do you know how fast the kiln is firing?

**A** Use a pyrometer to figure the firing rate at each switch setting on your particular kiln. The rate at those settings will be fairly repeatable.

If your S-series kiln has more than one switch, you can use them to help balance the heat in the kiln. The top switch controls heating elements in the top half of the kiln; the bottom switch controls heating elements in the bottom half. If your kiln has three switches, the middle switch controls elements in the middle of the kiln. To add more heat to a section of the kiln, turn the switch for that section to a higher position sooner than the other switches.

## S-Series Firing Schedules

These firing schedules are only suggestions. You will need to test fire your kiln to find the schedule best suited for your ware. Most S-Series kilns also have a general-purpose firing schedule printed on the front of the kiln's switch box.

### Decals

**1** Prop the lid in the vented position and remove the peephole plug(s). Turn switch(es) to MIN for 45 minutes or until moisture no longer appears on a mirror held near the lid. (Moisture indicates that steam is still coming out of the kiln.)



**2** Turn switch(es) to MAX (High). Close the lid from the vented position and insert the plug in the bottom peephole.

### Low-Fire Greenware and Glaze

**1** Prop the lid in the vented position and remove the peephole plug(s). Turn switch(es) to MIN for 2 hours or until moisture no longer appears on a mirror held near the lid. (Moisture indicates that steam is still coming out of the kiln.)

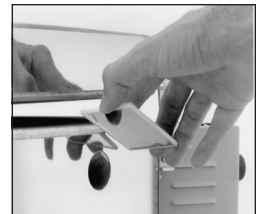


**2** Turn switch(es) to 3 (Medium) for 2 hours.

**3** Turn switch(es) to MAX (High). Close the lid from the vented position and insert the plug in the bottom peephole.

### Porcelain and Stoneware

**1** Prop the lid in the vented position and remove the peephole plug(s). Turn switch(es) to MIN for 1 1/2 hours or until moisture no longer appears on a mirror held near the lid. (Moisture indicates that steam is still coming out of the kiln.)



**2** Turn switch(es) to 3 (Medium) for 1 1/2 hours.

**3** Turn switch(es) to MAX (High). Close the lid from the vented position and insert the plug in the bottom peephole.

## How to Control the Cooling Rate of an S-Series Kiln

After you hear the Kiln Sitter weight drop and the kiln shuts off, turn the kiln switches to the OFF position. Add more time on the Limit Timer. Raise the weight and press the Kiln Sitter plunger (the button that turns on the Kiln Sitter). Then gently lower the weight. The kiln is now firing again. Please be aware that the Kiln Sitter is operating on manual and will not shut off the kiln.

With a pyrometer, adjust the switches to maintain the desired cooling rate. When the needle on the pyrometer goes too high, lower the switch settings. When the needle goes too low, raise the switch settings.

If you don't have a pyrometer, you can still control the cooling rate by observing the color of the firing chamber. (You can see the color through the peephole and around the edge of the lid.) You might want to experiment with a test sample before adjusting the cooling rate of a full load of ware.

**Note:** You can set the Limit Timer for the length of the desired cooling time.



A pyrometer measures the heat inside a kiln.

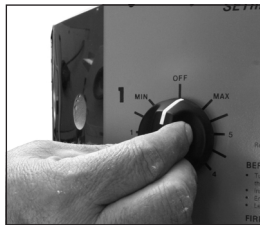


Set the Limit Timer.

## SnF-Series Models: Non-Digital Automatic Kilns

The SnF-series kilns fire in stages. Set the switches at the beginning of the firing, and the kiln will automatically go through its firing stages, turning itself up at the proper time.

**WARNING:** After the Kiln Sitter shuts the kiln off, turn all switches to their OFF position.



The top switch is an infinite control. When you engage the Kiln Sitter and turn on the top switch, the elements controlled by that switch cycle on and off. You will hear them hum as they turn on. A click followed by silence means the elements for that switch have cycled off. The

higher the setting, the longer the elements stay on during each cycle. On the MAX (Maximum, or High) position, the elements stay on continuously. The setting on the top switch remains the same throughout the firing unless you manually change it.

The second switch is a timer. It does not cycle on and off like an infinite control. When you turn the timer knob pointer to a number, you are NOT turning on the heating elements for that switch. Instead, you are setting the timer for the hours of firing that will elapse before its elements turn on. The switch-timer will begin counting down its time only when the top switch is turned on.

The third switch (if your kiln has one) is also a timer. The third switch begins counting down its time only when the second switch runs out of time.

When the timers run out of time, they click on. To turn them back off, turn clockwise one more click. Do this after the Kiln Sitter shuts off at the end of a firing.

In summary, the heating elements controlled by the top switch come on at the beginning of the firing. The elements powered by the second switch (and third, if your kiln has one) remain off until the timer runs out of time.

### SnF-82 & SnF-82-3

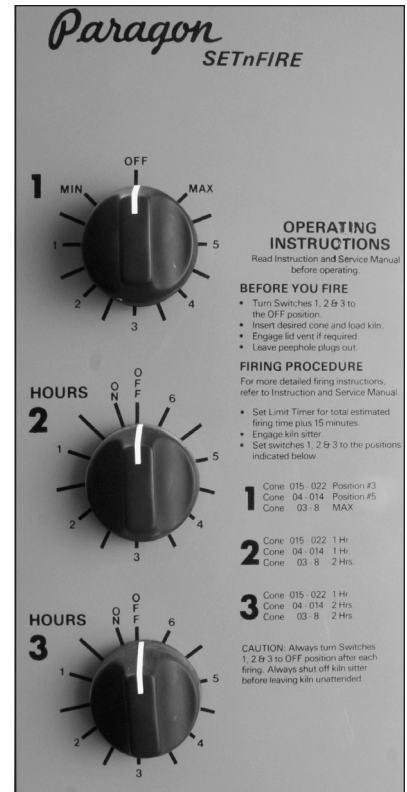
These kilns fire in two stages: LOW and HIGH. Turn the top switch to the amount of power that you want during LOW, the first stage.

The second switch is a timer. Turn the switch pointer to the number of hours that you want to fire the kiln on LOW. As the kiln fires, you will notice that the pointer gradually moves toward the ON position. When the time is up, the second switch turns on stage two elements full power. The kiln is then firing on HIGH.

Look inside your kiln. It has eight rows of brick grooves each containing an element. Counting down from the top, switch #1 controls elements 2, 4, 6 and 8. Switch #2 controls elements 1, 3, 5 and 7.

### SnF-24, SnF-24-3 & SnF-28-3

SnF kilns with three switches fire in three stages: LOW, MEDIUM, and HIGH. Three-switch kilns operate the same as the two-switch kilns just described except



that you add one more stage. Turn the top switch to the amount of power that you want during LOW, the first stage.

The second switch is a timer. Turn the switch pointer to the number of hours that you want to fire the kiln on LOW. As the kiln fires, you will notice that the pointer gradually moves toward the ON position. When the time is up, the second switch turns on its elements full power. The kiln is then firing on MEDIUM.

The third switch is also a timer. Turn the switch pointer to the number of hours that you want to fire the kiln on MEDIUM. The third switch will begin counting down the time only when the second switch turns on. When the third switch's time is up, the third switch turns on its elements full power. The kiln is then firing on HIGH.

Look inside your kiln. It has 12 rows of brick grooves each containing an element. Counting down from the top, switch #1 controls elements 3, 6, 9 and 12. Switch #2 controls elements 2, 5, 8 and 11. Switch #3 controls elements 1, 4, 7 and 10.

### SnF-66 & SnF-66-3

These kilns have four elements. During LOW, the four elements are powered by the top switch. It is an infinite control. Turn the top switch to the amount of power that you want during LOW, the first stage. When the second switch runs out of time, the elements all turn on full power.

### Changing Firing Speed of an SnF Kiln

To fire slower, turn the top switch to a lower number and the 2nd (and 3rd) switch(es) to a higher number. To fire faster, turn the top switch to a higher number and the 2nd (and 3rd) to a lower.

**Q** My SnF kiln is taking too long to fire.

**A** If the top switch setting is too low, the kiln will not reach maximum temperature, because the elements for that switch will not get hot enough. Turn that switch to a higher setting.

**Q** Should I set switches 2 and 3 to one hour if I want the kiln to fire one hour?

**A** No. The elements for switches #2 and #3 turn on when the switches are in the ON position. The switches are countdown timers, and the numbers they point to are hours of time that will elapse before the switches turn on.

**Q** Do you make the kiln fire hotter by turning switch 2 and 3 to higher numbers?

**A** No. The higher the number on switch 2 and 3, the longer it will take for those switches to turn on.

## Operating Instructions for SnF-Series Kilns

These switch settings are only guidelines. Feel free to change them to suit your firing needs.

### SnF-82 & SnF-82-3

- 1 Turn switches to their OFF position.
- 2 Insert desired cone in Kiln Sitter and load kiln.
- 3 Engage lid vent if desired.
- 4 Leave peephole plugs out.
- 5 Set Limit Timer for the total estimated firing time plus 30 minutes.
- 6 Engage Kiln Sitter.
- 7 Set switches to the positions indicated below:

#### Cone 015 - 022

Set top switch to position #3.  
Set second switch to 1 Hr.

#### Cone 04 - 014

Set top switch to position #4.  
Set second switch to 2 Hrs.

#### Cone 03 - 8

Set top switch to MAX.  
Set second switch to 3 Hrs.

### SnF-24, SnF-24-3 & SnF-28-3

- 1 Turn switches to their OFF position.
- 2 Insert desired cone in Kiln Sitter and load kiln.
- 3 Engage lid vent if desired.
- 4 Leave peephole plugs out.
- 5 Set Limit Timer for the total estimated firing time plus 30 minutes.
- 6 Engage Kiln Sitter.
- 7 Set switches to the positions indicated below:

#### Cone 015 - 022

Set top switch to position #3.  
Set second switch to 1 Hr.  
Set third switch to 1 Hr.

#### Cone 04 - 014

Set top switch to position #5.  
Set second switch to 1 Hr.  
Set third switch to 2 Hrs.

#### Cone 03 - 8

Set top switch to MAX.  
Set second switch to 2 Hrs.  
Set third switch to 2 Hrs.

### SnF-66 & SnF-66-3

- 1 Turn switches to their OFF position.

- 2 Insert desired cone in Kiln Sitter and load kiln.
- 3 Engage lid vent if desired.
- 4 Leave peephole plugs out.
- 5 Set Limit Timer for the total estimated firing time plus 30 minutes.
- 6 Engage Kiln Sitter.
- 7 Set switches to the positions indicated below:

#### Cone 015 - 022

Set top switch to position #2.  
Set second switch to 1 Hr.

#### Cone 04 - 014

Set top switch to position #3.  
Set second switch to 2 Hrs.

#### Cone 03 - 8

Set top switch to position #4.  
Set second switch to 3 Hrs.

### How to Control the Cooling Rate of an SnF-Series Kiln

At the end of the firing, you will hear the Kiln Sitter weight drop, shutting off the kiln. First, turn the kiln switches to the OFF position. Add more time on the Limit Timer. Raise the weight and press the Kiln Sitter plunger (the button that turns on the Kiln Sitter). Then gently lower the weight. The kiln is now firing again. Please be aware that the Kiln Sitter is operating on manual and will not shut off the kiln.

Turn the top switch to 3. With a pyrometer, adjust the top switch to maintain the desired cooling rate. When the temperature shown on the pyrometer goes too high, lower the switch setting. When the temperature goes too low, raise the switch setting.

If you need more heat in the kiln, turn off the top switch and turn on one of the switch-timers.

If you don't have a pyrometer, you can still control the cooling rate by observing the color of the firing chamber. (You can see the color through the peephole and around the edges of the lid.) You might want to experiment with a test sample before adjusting the cooling rate of a full load of ware.

**Note:** You can set the Limit Timer for the length of controlled cooling time.

**Q** How do I candle an SnF kiln overnight?

**A** Engage the Kiln Sitter. Set the Limit Timer to the number of hours that you want to candle the kiln. Leave the switch-timers turned off. Set the top switch to MIN. Prop the lid and leave out the peephole plugs.



Set the Limit Timer.

# General Trouble Shooter

## Kiln Will Not Fire

Probable Causes:

- Tripped circuit breaker or blown fuse
- Cord not plugged in
- Kiln Sitter plunger not locked into position
- Limit Timer clock not set
- Kiln Sitter contacts dirty

Check circuit breakers or fuses first. Check the wall receptacle voltage with a voltmeter. (Only a qualified person should perform this test.)

**66 & 66-3 Kilns of All Series:** Elements are wired in series; one broken element can prevent the kiln from heating. Check the elements with an ohmmeter. (See "Paragon Ceramic Kiln Instruction & Service Manual," publication IM-104.)

**S & SnF-series:** Set the timer clock before pushing in the Kiln Sitter plunger.

If the wall receptacle checks out okay with a voltmeter, and the pilot light does not light, the problem may be a disconnected switch box wire or dirty Kiln Sitter contacts. Disconnect the power to the kiln and remove the switch box. Check for disconnected wires. Compare switch box wiring to the wiring diagram. If wiring is okay, check the Kiln Sitter contacts with an ohmmeter.

## Not All Elements Fire

Probable Causes:

- Broken element
- Defective switch
- Disconnected wire inside switch box

To find which element has burned out, check the elements with an ohmmeter. (See "Paragon Ceramic Kiln Instruction & Service Manual.")

## Slow Firing, And/Or Kiln Will Not Reach Maximum Temperature

Probable Causes:

- Low voltage
- Moisture from greenware
- Worn elements
- Loading the kiln heavier than usual

Firing moist greenware can slow the firing to a crawl. It will also rust kiln parts and shorten element life.

Keep a firing log book. If the firing time gradually increases over a long period, it is probably due to worn rather than broken elements.

Before replacing elements, make sure the problem is not merely low voltage, which can double firing time and strain elements. It is common during hot summer days. If low voltage is a problem, schedule firing during off-peak hours when the voltage is higher.

You may also be firing a 240 volt kiln on a 208 volt outlet. (240 and 208 volt receptacles look the same.) If you are not sure which voltage you have, call your power company.

## Fuse Blows Or Circuit Breaker Trips

Probable Causes:

- Overloaded circuit
- A short in the receptacle wiring or kiln wiring

If the kiln blows a fuse or trips a breaker immediately, the problem is a short in the kiln wiring or circuit wiring. Do not attempt to fire until corrected.

If the fuse blows or breaker trips after the kiln has fired for some time, the problem is an overloaded circuit, not a short circuit. (A short circuit or “short” causes a large amount of current to flow, generating so much heat that the fuse or breaker opens the circuit almost instantly.) Make sure no other appliances are used on the kiln’s circuit. Have an electrician check the circuit wire and breaker sizes. If the breaker trips only once in awhile, you may have a weak breaker that should be replaced.

Wire heats when an electric current passes through it. If the same current passes through both a small wire and a large wire, the smaller wire will reach a higher temperature. A fuse uses this principle to protect the wiring in a building. It has a small, short wire of low melting temperature metal connected in such a manner that all current passing through the circuit must also pass through the fuse. A circuit breaker uses a tiny heating element to heat a thermostat, which interrupts the current when the maximum safe amount is reached.

A loose or poor connection at the fuse or breaker will generate heat. If the fuse or circuit breaker panel feels unusually warm, have your electrician check for loose connections, particularly at the center screw of the fuse socket, even in a new fuse box.

## Hot Plug Or Outlet

If you smell burning plastic, turn off the breaker immediately. Touch the wall receptacle faceplate. If it feels hot, replace the receptacle. Replace the kiln cord if it has been damaged by heat. Do not fire until repaired.

**Note:** As the kiln fires, it is a good habit to place your hand on the kiln's power cord to check the temperature. It is okay if the cord is slightly warm, but it should never feel hot.

## Middle Elements Do Not Glow Red

The middle elements in most Paragon kilns do not glow as bright as the top and bottom elements. Do not be concerned as long as the kiln is firing properly.

## Kiln Heats Unevenly

You can increase heat in a section of the kiln by loading that section lighter; lower heat by loading heavier. Increase mass to lower temperature; decrease mass to raise temperature. Fire the kiln more slowly. Slow firing gives the heat time to even out inside the firing chamber.

## Infinite Control Switch Wears Out Prematurely

The infinite control switch makes a clicking noise during operation. This is the sound of a bimetallic timer turning the elements on or off to control the firing rate. When the switch is about to fail, it sometimes makes a faint popping instead of a clicking noise. This is a sign to order a new switch.

Probable Causes:

- New elements are higher amperage than the kiln was designed for.
- Push-on connectors are loose.
- The kiln's heat shield is missing.
- A 120 volt switch is installed on a 240 volt kiln.
- The kiln room is too hot.

Loose connectors over-heat the switch by creating a tiny electrical arc inside the connector.

The kiln's heat shield is a sheet metal channel that helps guide heat away from the switch box. The heat shield is under the porcelain insulators of most kilns.

120 volt and 240 volt switches look the same; the voltage is printed on the switch body.

Switches burn up more frequently on hot summer days. In this case, use a fan to circulate air through the kiln switch box. But do not blow air against the outside of the firing chamber.

## The SnF Switch-Timer Fails

Probable Causes:

- Disconnected wire
- Defective switch-timer motor

Paragon SnF kilns use an infinite control switch plus one or two switch-timers. (The Limit Timer on the Kiln Sitter is a different type of timer.)

A wire from the PL terminal on the infinite control switch powers a clock motor on the switch-timer. After the correct amount of time has elapsed, the switch-timer turns on additional elements.

If you have just replaced a switch-timer, and the new timer does not operate, the reason is usually a crossed wire. The easiest way to track down the problem is to trace the wires inside the switch box using the kiln's wiring diagram. (Before examining the wiring, please unplug or disconnect the kiln.)



# Kiln Sitter Trouble Shooter

## The Kiln Sitter Fails To Shut Off

Probable Causes:

- The cone is sticking to the cone supports. This prevents the cone from sagging properly.
- There is no play between the trigger and the release claw.
- The actuating rod is not centered in the porcelain tube.
- The kiln is not level.
- The wrong cone was loaded in the Kiln Sitter.

If the Kiln Sitter does not shut off when the weight drops, see “Clean the Back Side of the Kiln Sitter,” next page.

## The Limit Timer Clock Does Not Operate.

Probable Causes:

- One of the wires that connects the clock motor to the power has burned out.
- The timer motor is burned out.



## The Kiln Sitter Plunger (Button) Won't Stay Pressed In

Probable Causes:

- The Limit Timer is set to 0.
- Something is obstructing the locking slide.
- The locking slide is rusted or dirty.
- The spring for the locking slide is broken.



A wire may be in the way of the Kiln Sitter plunger mechanism, preventing it from locking in the on position. Sometimes heat causes a wire to move inside the switch box.

Something may have fallen into the switch box and is interfering with the plunger: a matchstick, a piece of dried clay, a lost screw. If anything lodges where the contact blocks come together, the plunger will not stay locked on.

The locking catch is rusted or has material stuck to it. To free the catch, try rotating the Limit Timer knob past 20 hours while pressing the Kiln Sitter plunger.

## The Kiln Sitter Plunger Overheats

If the Kiln Sitter overheats, the white plastic plunger can get so hot that it melts. Ways to prevent this:

- 1 Make sure the high temperature washer on the porcelain tube is pressed against the firebrick kiln wall. A spring wire retainer keeps the washer in place. This helps prevent heat from escaping the kiln.
- 2 Check the wires that are connected to the Kiln Sitter contact block. If they are loose or corroded, they will cause the block to overheat. This, in turn, overheats the plunger. Heating and cooling of the kiln can loosen the screws over time.
- 3 Has anyone ever replaced the wires that are attached to the Kiln Sitter contact block? Another reason for overheating is that the wires are too light a gauge.
- 4 Circulate air with a fan if the firing room temperature rises past 110 degrees F. (Measure room temperature about 3 feet from the kiln.)

## The Kiln Sitter Gives Inconsistent Firing Results

Probable Causes:

- The actuating rod is bent.
- The actuating rod is corroded.
- The cone supports are warped or corroded.

The actuating rod in the Kiln Sitter rests on top of the cone. As the cone bends, the rod moves downward and releases a trigger that shuts off the kiln.

As the rod corrodes, it no longer moves freely inside the porcelain tube. The rod's pivot point causes sluggish movement of the rod. If your Kiln Sitter is giving inconsistent results, this is one of the possible causes. When you raise the rod from inside the kiln and let go, the rod should drop freely.

The tip of the rod corrodes as it ages. That is natural. However, if the corrosion extends all the way up to the pivot point inside the porcelain tube, your kiln is most likely subjected to too much moisture.

The solution to excessive moisture inside the kiln is to dry the ware longer before firing. You could also leave the kiln on low for a longer period at the beginning of the firing. It is better, though, to dry the ware thoroughly before placing it inside the kiln.

Leave the top peephole plug out. This allows moisture to exit the kiln through the peephole instead of through the Kiln Sitter tube. But if you use the Orton down-draft Vent Master, keep all peephole plugs inserted throughout the firing. Leave the Vent Master on during both firing



Slide out the cone supports to examine.

and cooling. If you turn the Vent Master off when the kiln fires to maturity, moisture can build up inside the Kiln Sitter tube as the kiln cools.

If the Kiln Sitter tube corrodes even though you use a Vent Master, make sure that you have enough negative pressure inside the kiln. Orton recommends holding a match above one of the air intake holes in the lid. The air flowing into the hole should pull the flame toward the hole.

## Cones Break In The Kiln Sitter

Probable Causes:

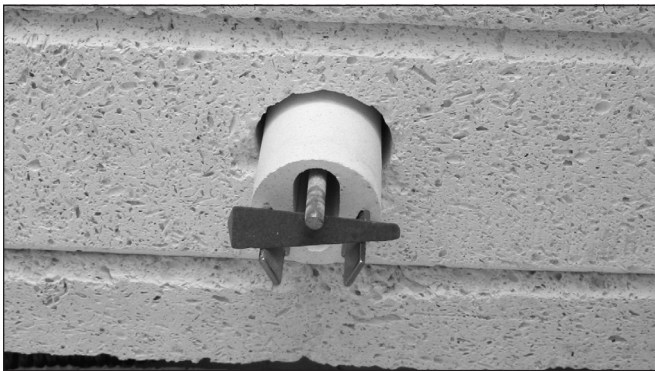
- Hairline cracks in cones
- Too much pressure against cone
- Fast firing
- Kiln Sitter is out of adjustment

When handled roughly, cones develop hairline cracks, which can break during firing. This is the most common reason for cone breakage in the Kiln Sitter.

The Kiln Sitter sensing rod binding at the pivot point can exert too much pressure against the cone. Binding of the rod can be due to glaze buildup inside the porcelain tube. Make sure the sensing rod can pivot freely.

The cone has a number stamped onto one of the sides. You should place the cone in the Kiln Sitter with the number side down. That side is the smoothest of the three sides. Placing that side down lessens the chance of breakage.

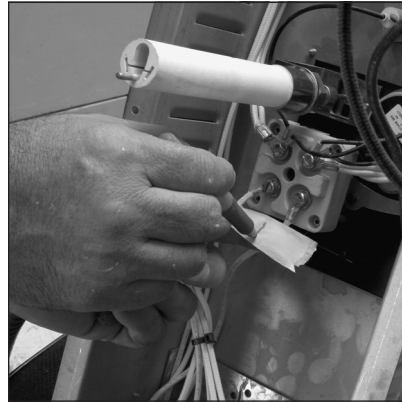
**Note:** Never apply pressure to the cone when you load it into the Kiln Sitter. Handle cones as if they were extremely fragile.



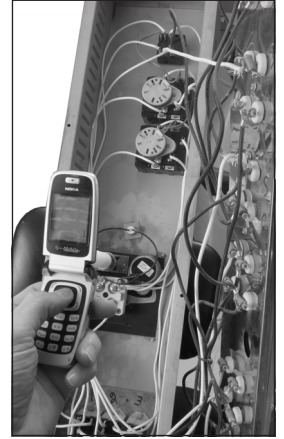
# Maintenance

**Caution:** Whenever you turn off the circuit breaker to your kiln, tape the breaker box door shut and leave a note saying, "WORKING ON KILN. BREAKER OFF."

**Note:** When replacing parts, mark wires with colored tape for easy reassembly of the kiln. It is also useful to photograph the switch box with a cell phone before you remove any parts. Refer to the photo if necessary as you install the new part.



Labeling wires with tape.



Taking a picture with a cell phone.

## Maintaining the Kiln Sitter

**Note:** You can see some of these procedures on video at [www.paragonweb.com](http://www.paragonweb.com).

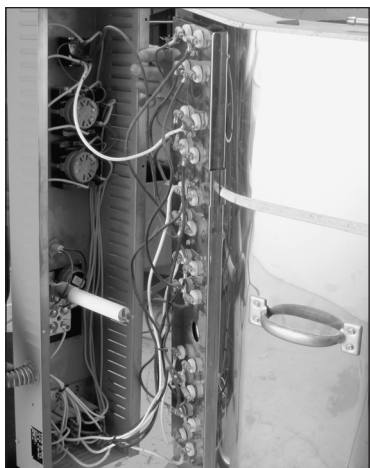
Adjust the Kiln Sitter every dozen or so firings. Please see pages 5 - 7.

### Clean the Back Side of the Kiln Sitter

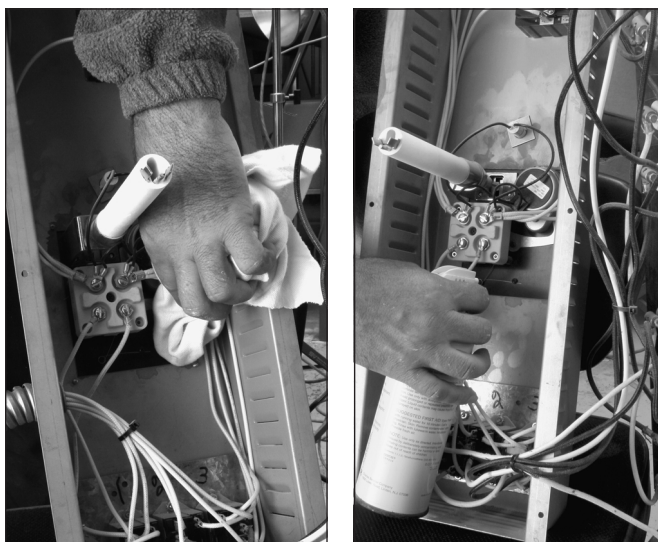
If the Kiln Sitter does not shut off when the weight drops, the locking slide inside the Kiln Sitter may be corroded or dirty. About once a year, clean the back side of the Kiln Sitter:

- 1 Disconnect the power from the kiln.
- 2 Make sure there is no cone or firing gauge in the Kiln Sitter.
- 3 Remove the screws from the switch box that houses the Kiln Sitter. Pull the box straight out to avoid damaging the Kiln Sitter tube.





**4** Leaving the wires attached to the Kiln Sitter, clean the backside of the Kiln Sitter. Canned air is helpful. (But do not blow air into the Kiln Sitter tube.)



**5** Reinstall the switch box. Arrange the wires so they do not interfere with the locking slide that trips when the weight drops. (You can see how the locking slide works by lifting the weight, pressing the plunger, and then dropping the weight.) Also, arrange the wires inside the switch box so that wires do not touch the element connectors or the kiln case.

### Clean the Kiln Sitter Tube

Each time you vacuum the kiln, also vacuum the Kiln Sitter tube assembly. First, remove the cone supports from the Kiln Sitter tube. Then place a vac-



Remove the cone supports before vacuuming the Kiln Sitter tube.



Place the vacuum hose directly over the Kiln Sitter tube.

uum hose directly over the tube. This removes debris and rust from around the pivot point. Do not blow compressed air into the tube.

Debris from exploding ware inside the kiln sometimes lodges in the Kiln Sitter refractory tube. These fragments can interfere with the travel of the actuating rod, resulting in an overfire. After you have removed exploded clay fragments from the firing chamber, always check the refractory tube for debris. It may not be readily apparent that fragments are inside the tube. Check the travel of the actuating rod. It should be free to move up and down without binding.

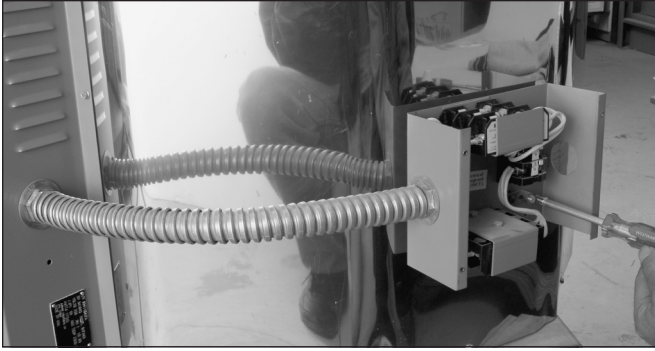
**Note:** Probe the inside of the Kiln Sitter tube with a clean artist's brush. Keep the brush near the kiln for checking the tube.

## Replacing the Porcelain Tube Assembly

Replace the porcelain tube assembly when the movement of the sensing rod becomes sluggish or when the sensing rod is bent. Be sure the replacement tube assembly is the correct length for you kiln.

- 1** Disconnect the power to the kiln.
- 2** Make sure there is no cone or firing gauge in the Kiln Sitter.
- 3** Remove and save the screws at the side of the switch box that hold it to the kiln and remove the box, carefully pulling straight out to avoid damaging the Kiln Sitter tube. You may need to prop the box on a chair or other object as you lean the box against the kiln. Leave the wires attached to the Kiln Sitter.



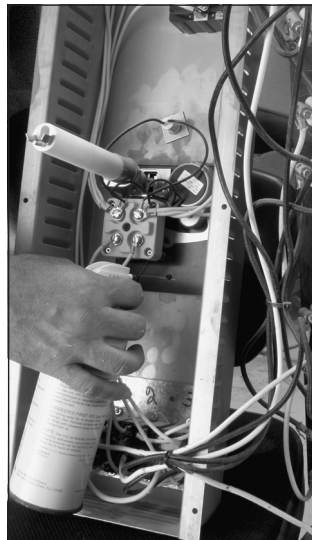


If your kiln is direct wired, you will also need to disconnect the electrical terminal box.



Prop the switch box on a chair or other object. Do not strain the wires.

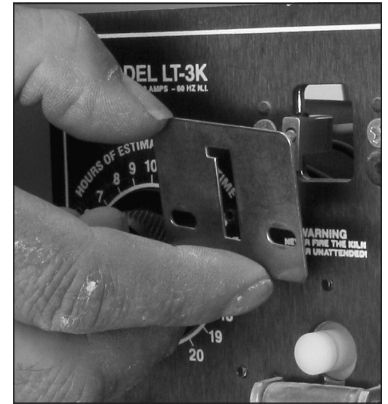
**Note:** While you have the Kiln Sitter out, it is a good idea to clean the back side of the Kiln Sitter with compressed air.



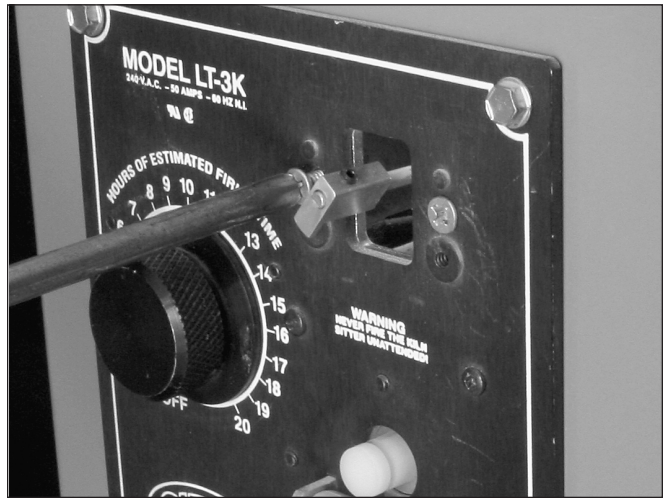
**4** Remove the 2 screws holding the guide plate to the front of the Kiln Sitter.



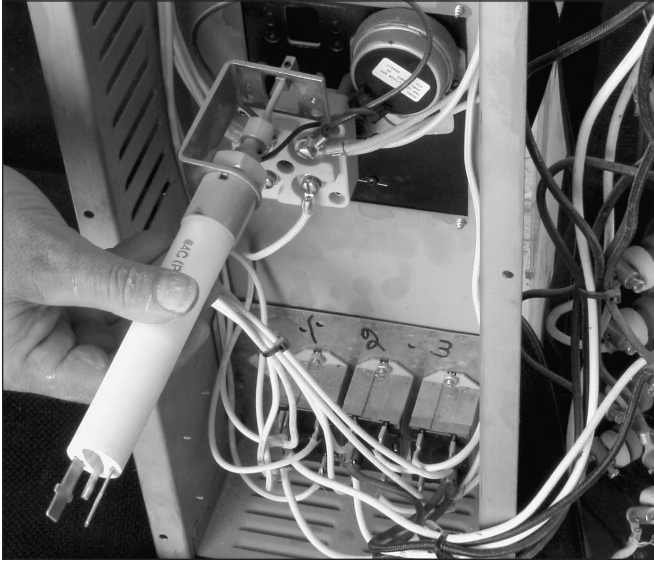
**5** Remove the guide plate.



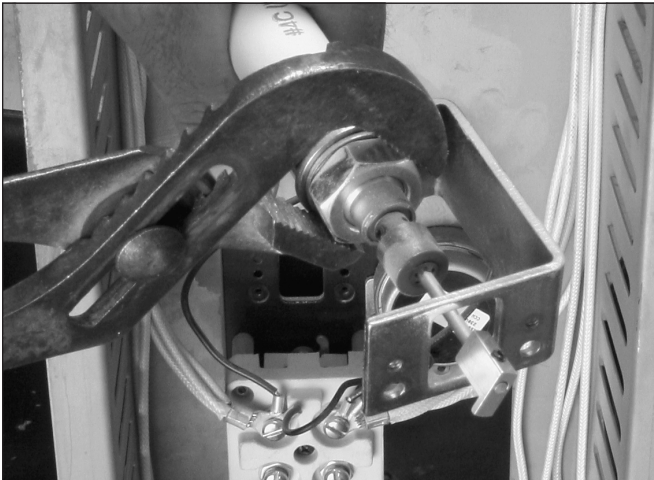
**6** Remove the 2 screws that hold the porcelain tube bracket to the Kiln Sitter.



**7** Remove the porcelain tube and bracket.



**8** (Steps 8 and 9 are for Dawson tube assemblies. Skip steps 8 and 9 for Orton tube assemblies, which have the tube assembly bracket permanently attached.) Remove the nut holding the porcelain tube assembly to the tube assembly bracket.

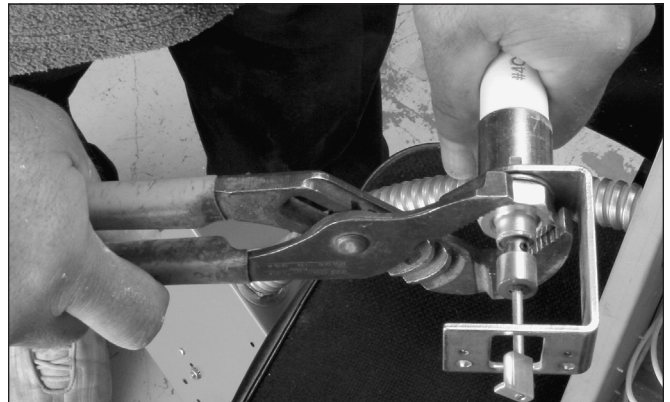


Installing the bracket to the new tube assembly (Dawson tubes).

**9** You will see a notch on the top of the new tube assembly. Align that notch with the pin on the tube assembly bracket. Install the washer and nut. (The washer goes under the nut on the front of the tube assembly bracket.)

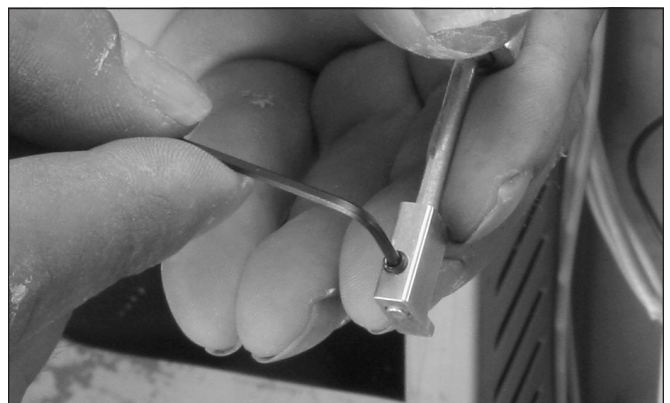


Align the notch on the new Dawson tube assembly with the pin on the bracket. This assures that the porcelain tube slot will be perfectly vertical inside the kiln.



Tighten the nut on the Dawson tube assembly.

**10** Remove the release claw from the old porcelain tube and install it on the new tube.



**11** Some porcelain tube assemblies have a fiber washer and spring ring, which help to prevent heat from entering the switch box. Transfer the fiber washer and spring ring, if any, to the new porcelain tube.



**12** Install the porcelain tube bracket to the Kiln Sitter (the reverse of step 6).

**13** Reinstall the guide plate to the front of the Kiln Sitter. Tap the guide plate from side to side until the rod is centered in the porcelain tube.



**Note:** The easiest way to adjust the guide plate is to loosen the screws so that they barely hold the guide plate in place. Then gently nudge the plate side-ways. The guide plate is more difficult to adjust if you loosen the screws completely.

**14** After the rod is centered, securely tighten guide plate screws.

**15** Reinstall the switch box. Arrange the wires so they do not interfere with the locking slide that trips when the weight drops. (You can see how the locking slide works by lifting the weight, pressing the plunger, and then dropping the weight.) Also, arrange the wires inside the switch box so that wires do not touch the element connectors or the kiln case.

Important: Check the Kiln Sitter adjustments shown on pages 5 - 7 before firing the kiln.

## Cleaning or Replacing the Kiln Sitter Contacts

The contact block is behind the Kiln Sitter plunger (the button that starts the Kiln Sitter). Pressing the plunger closes the electrical contacts inside the block.

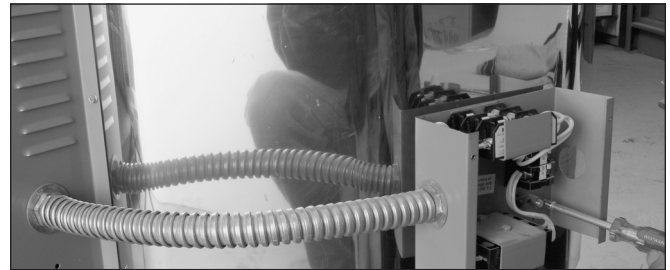
Sometimes the contact block needs cleaning. It is not uncommon to find spider webs or bugs inside the contact block if the kiln has been in storage for a few years. Dirt or other foreign objects interfere with the closing of the con-

tact block, which causes the current to arc. This, in turn, overheats the contacts, sometimes melts the Kiln Sitter button, and damages the wires attached to the contact block. While you have the Kiln Sitter opened, examine the wires and replace if damaged by heat.

Another reason for worn contacts is pressing the Kiln Sitter plunger when the kiln switches are already turned on. **TURN OFF ALL KILN SWITCHES BEFORE PRESSING THE KILN SITTER PLUNGER.** Engaging the plunger with the switches turned on causes the contacts to arc and become pitted.

**1** Disconnect the power to the kiln. Check that there is no cone or firing gauge on the Kiln Sitter cone supports.

**2** Remove and save the screws at the side of the switch box that hold it to the kiln and remove the box, carefully pulling straight out to avoid damaging the Kiln Sitter tube. You may need to prop the box on a piece of wood as you lean it against the kiln.

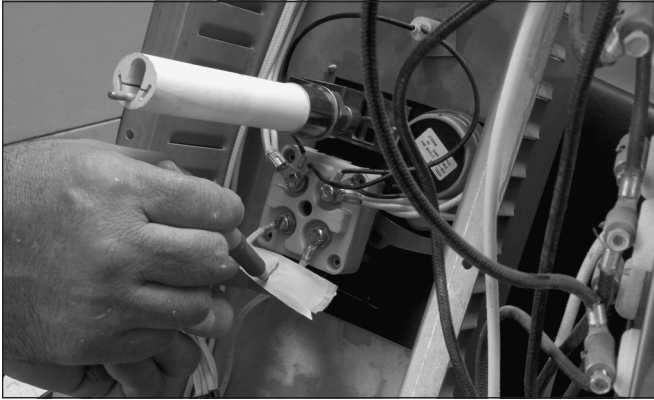


If your kiln is direct wired, you will also need to disconnect the electrical terminal box.

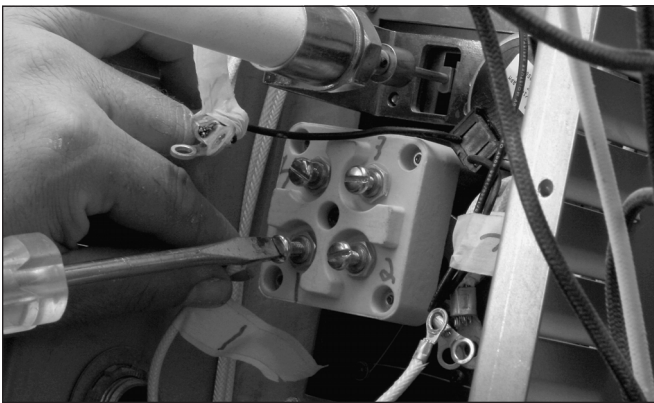


Prop the switch box on a chair or other object. Do not strain the wires.

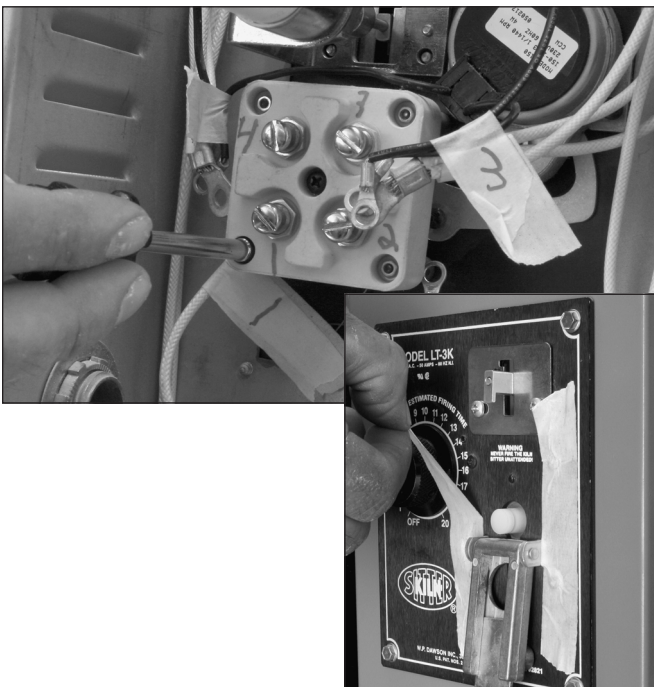
**3** You will see 4 large screws on the back of the Kiln Sitter. Label the wires attached to the screws.



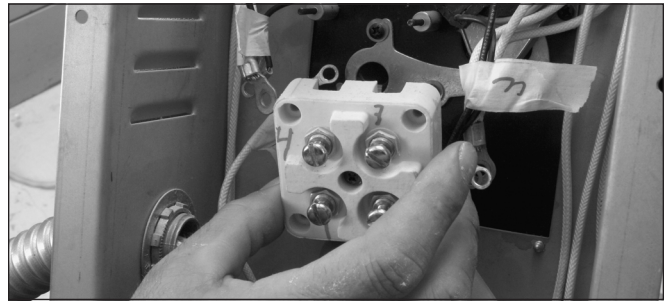
**4** Remove the wires.



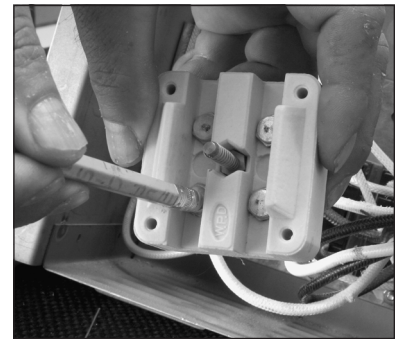
**5** Using a nut driver, remove the four nuts holding the porcelain contact block together. Note: The screws may fall out the front of the Kiln Sitter unless you hold them in place while you remove the nuts. Or place a piece of tape over the Kiln Sitter front to hold the screws.



**4** After removing the four nuts, lift the porcelain switch block out. You will find four nylon washers under the porcelain switch block. Do not lose these, or the contacts will no longer be parallel.



**5** Clean the contacts with a soft pencil eraser. Do not use sandpaper, which destroys the coating on the contacts. This can later cause the contacts to stick together and overfire the kiln.



If the contacts are pitted and burned, replace the contact block assembly.

**Note:** While you are working inside the Kiln Sitter, check the condition of the wires that are attached to the contact block. Replace brittle wires.

**6** Wipe the pencil eraser particles and dirt from the contacts. Reassemble the Kiln Sitter making sure all the washers are back where they belong.

**7** Arrange the wires inside the switch box so that when the Kiln Sitter is in place, no wire is touching the kiln case or Kiln Sitter porcelain tube. Reinstall the switch box.

## Replacing an Infinite Control Switch or Switch-Timer

Look at your wiring diagram to see which elements are controlled by each switch. (You can download the kiln's wiring diagram at [www.paragonweb.com](http://www.paragonweb.com). Select Support, then Kiln Wiring Diagrams from the drop menu.) If the elements to a particular switch are not firing, check those elements and the wiring to the switch. (See the kiln maintenance section of "Paragon Ceramic Kiln Instruction & Service Manual" to check an element.) If the wiring and elements are good, replace the switch.

**Note:** If push-on terminals do not have a snug fit, gently squeeze the end of the terminal with pli-

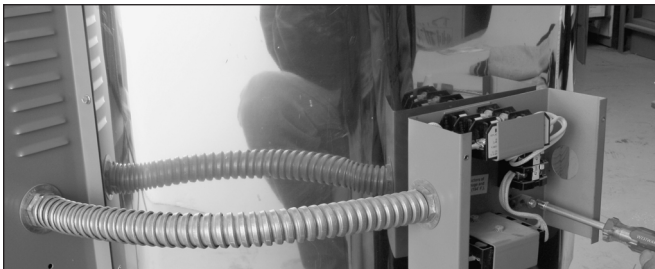
ers. If the push-on terminal is damaged from excessive heat, replace the wire and terminal.

- 1 Pull off the switch knob with fingertips. Some switch knobs are held in place by a setscrew on the side of the knob. If knob won't come off when you pull it, check to see if a setscrew is securing it to the shaft.



- 2 Disconnect the power to the kiln. Check that there is no cone or firing gauge on the Kiln Sitter cone supports.

- 3 Remove and save the screws at the side of the switch box that hold it to the kiln and remove the box, pulling straight out to avoid damaging the Kiln Sitter tube. You may need to prop the box on a piece of wood as you lean the box against the kiln.



If your kiln is direct wired, you will also need to disconnect the electrical terminal box.

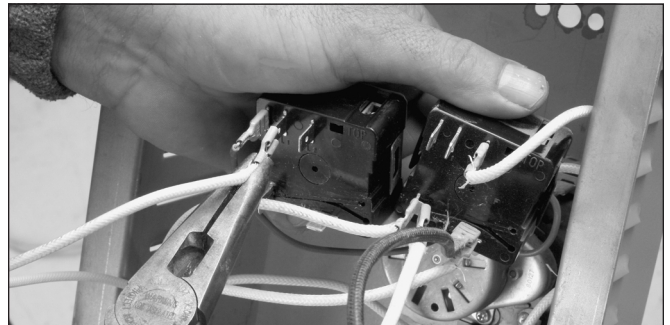


Prop the switch box on a chair or other object. Do not strain the wires.

- 4 Replace heat-damaged wires. Bend a wire to test it. If it sounds like it is cracking, replace it, because the insulation is flaking.
- 5 Check the label printed on the side of the switch to be sure that it is the correct voltage.

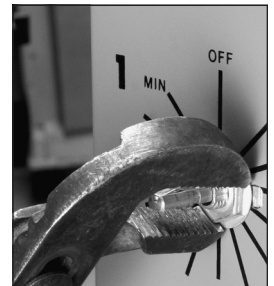


- 6 Hold the new switch at the side of the switch box in the same position as the defective switch. Remove and transfer one wire at a time from the old switch to the new one making sure each connection is tight.



- 6 Remove the single nut from the front of the defective switch. (Some switches are fastened to the front of the switch box with two screws. Remove the screws.) Remove the old switch and put the new one in place making sure it is right side up.

- 7 Reinstall the shaft nut checking to make sure it is not backwards. Tighten so the switch will not turn during operation. If the switch is held in place with two screws, reinstall screws.



- 8 As the switch box is moved back into place, check to see that no wires are touching the kiln case, the element connectors, or the Kiln Sitter tube. Wires touching the case or element connectors will burn.

- 9 Tighten switch box screws. Insert knob on switch shaft.