

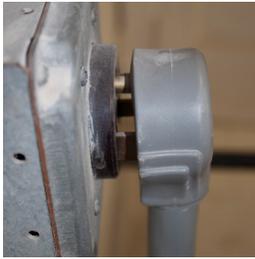
## Testing Voltage in a SINGLE PHASE Skutt Kiln

This PDF describes how to test voltage on a single phase Skutt kiln. For testing three phase Skutt kilns please see the PDF titled "Testing Voltage in a THREE PHASE Skutt Kiln."

Many problems can be diagnosed by simply testing the voltage at several points in a Skutt kiln. If you get an error message or your kiln is not firing evenly testing the voltage is a good first step to determining what is wrong. If you need help using your electrical meter or you have not yet purchased one take a look at our two electrical meter tutorials under the "Learn" tab at kilnparts.com.

**CAUTION:** Testing voltage must be done with the kiln plugged in and running. Electrical components (including the wiring, elements, connector and relays) are live and should NEVER be touched with anything except the electrical meter probes. Electricity can seriously hurt or kill you, so if you do not feel comfortable working on live circuits get help from a qualified person.

### Testing voltage on a kiln with a plug



1. Pull the plug out of the receptacle about 1/4". Just enough so that the probes of your electrical meter will fit into the gap and you can touch the blades.



2. Set your electrical meter to "AC Voltage." If your meter does not have an auto range feature you should set your meter to the highest available voltage setting (usually 600 volts). For more information about meters check the PDFs available under the "Learn" tab at kilnparts.com



3. Carefully put one probe onto each of the flat blades making sure not to touch anything with the metal probe except the flat metal blade. When testing AC

voltage the probe color does not matter. Take a note of the voltage. This is your "No Load" voltage.

4. Now that you have a "No Load" voltage it's time to get a voltage with the kiln running. This is known as a "Load" voltage. You will need to program a "Ramp/Hold" program with one segment that climbs at 9999 degrees/hour to a temperature of 300

degrees with no hold. This will turn the kiln on and allow you to test the voltage.



5. Carefully put one probe onto each of the flat blades making sure not to touch anything with the probe except the flat metal blade.

Take a note of the voltage. This is your "Load" voltage. Because the kiln is firing and your goal is to test the voltage when the elements are on, listen for the relays to click on and the elements to hum before you test your load voltage.

6. The load voltage read at the receptacle should match the voltage listed on the side of the kiln (+/- 5%). If you do not get voltage at the receptacle check your circuit breaker or fuse box. You may need to consult an electrician if you do not find a tripped breaker or bad fuse. If the voltage read at the plug matches the voltage on the side of the kiln you will need to test the voltage inside the control box with the kiln running to try and isolate the problem.

### STOP THE PROGRAM BEFORE CONTINUING TO STEP 7!

#### Testing voltage on a hard wired kiln



1. Push the control arm to the "Off" position (almost always down). The red handle is the control arm in this image. Open the cover of the shutoff box.

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2. Set your electrical meter to “AC Voltage.” If your meter does not have an auto range feature you should set your meter to the highest available voltage setting (usually 600 volts). For more information about meters check the PDFs available under the “Learn” tab at kilnparts.com



3. Open the cover of the control box and look for the two wires coming from your main breaker box. They will be secured into a metal block with set screws. Care-

fully put one probe onto each of screws making sure not to touch anything with the probe except screws. When testing AC voltage the probe color does not matter. Take a note of the voltage. This is your “No Load” voltage.

4. Now that you have a “No Load” voltage it’s time to get a voltage with the kiln running. This is known as a “Load” voltage. You will need to program a “Ramp/hold” program with one segment that climbs at 9999 degrees/hour to a temperature of 300 degrees with no hold. This will turn the kiln on and allow you to test the voltage.



5. Carefully put one probe onto each of the screws making sure not to touch anything with the probe except screws. Take a note of the voltage. This is your

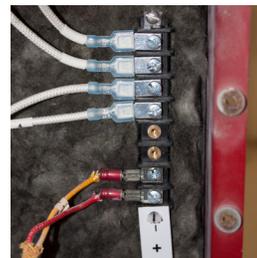
“Load” voltage. Because the kiln is firing and your goal is to test the voltage when the elements are on, listen for the relays to click on and the elements to hum before you test your load voltage.

6. The load voltage read at the shutoff box should match the voltage listed on the side of the kiln (+/- 5%). If you do not get voltage at the box check your circuit breaker or fuse box. You may need to consult an electrician if you do not find a tripped breaker or bad fuse. If the voltage read at the box matches the voltage on the side of the kiln you will need to test the voltage inside the control box with the kiln running to try and isolate the problem.

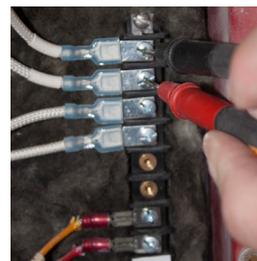
### STOP THE PROGRAM BEFORE CONTINUING TO STEP 7!



7. Remove the screws from the left side of the box. Skutt kilns have a hinged box which is held closed by 3-6 philips screws depending on the model.

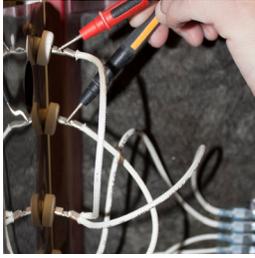


8. Squeeze the white plastic clip together at the top of the plastic terminal strip label and pull the label forward and allow it to swing down out of the way.



9. Start your test ramp/hold program again so the kiln is heating. Place one probe of your meter (still set to AC Voltage) on the metal screw of tabs #1 and 2. Record the voltage. Test tabs 3/4 and 5/6 (if you have them) in the same way. You should get the same voltage at each set of tabs. If you get voltage at some, but not all of the tab combinations chances are you have a bad relay. It’s also possible to have a bad/burned wire connection that would result in a voltage reading of “0,” but the most likely cause is a bad relay.

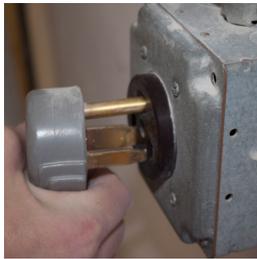
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10. Testing the voltage at each element can also be helpful. Touch one probe to each set of element pigtails with the kiln running and record each voltage.

### Testing voltage the touchpad

If you get voltage at the receptacle or shut-off box but do NOT have a display on the touchpad check the fuse on the control box first. If the fuse is okay, test the voltage at the touchpad.



1. Unplug or turn the power off to the kiln. You will need to plug the kiln in once you remove the panel, but unplug the kiln for now.

2. Remove the four phillips screws holding the computer touchpad to the front of the kiln. Carefully pull the touchpad out from the front of the kiln. A helper to hold the touchpad while you test voltage makes it much easier and safer. Make sure to position the touchpad so none of the metal parts are allowed to touch the metal control box.



3. Plug the kiln back in or turn the power on.



4. With the kiln plugged in, test the voltage between the metal tabs labeled "AC1" and "AC2." You should get 24 Volts (+/- 5%). Note your voltage.

5. Unplug or turn off the power to the kiln and carefully replace the touchpad.

## VOLTAGE WORKSHEET

NO LOAD VOLTAGE \_\_\_\_\_

LOAD VOLTAGE \_\_\_\_\_

### TERMINAL STRIP VOLTAGE - LOAD

1-2 \_\_\_\_\_

2-3 \_\_\_\_\_

3-4 (IF APPLICABLE) \_\_\_\_\_

### ELEMENT VOLTAGE - LOAD

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

5 (IF APPLICABLE) \_\_\_\_\_

6 (IF APPLICABLE) \_\_\_\_\_

7 (IF APPLICABLE) \_\_\_\_\_

### TOUCHPAD VOLTAGE

VOLTAGE \_\_\_\_\_