

## HOW TO BUY A KILN

When choosing an electric kiln there are many questions you must ask:

What voltage, phase and amp service is available at my location?

What is the distance from the circuit box to the outlet?

How much space do I have?

What is my desired firing temperature?

Do I want a computer or manual controlled kiln?

First, lets start with voltage. There generally are two voltage services available; 240 volt and 208 volt. If the kiln is to be used in a home, it more than likely will use 240 volts. This is the service provided to private residences by the electric company. Schools and industrial buildings usually are supplied with 208 volt service. A 240 volt kiln will operate efficiently between 232 and 245 volts. Depending on the time of year, voltage supplied to any one area can fluctuate up or down. During the summer months when air conditioners are running, the voltage sent to a home could drop down to 230-235 volts. Lower voltage makes kiln elements work harder to reach higher cones and working harder decreases their life. In the months when furnaces and air conditioners are not needed, voltages can reach up to 245 volts. This will not adversely effect the kiln.

In the state of Illinois, most schools and industrial buildings receive 208 volt service. A kiln equipped with 208 volt elements is not as forgiving as one with 240 volt elements. It must have 208 volts to run efficiently. The kiln can handle up to 215 volts, but the elements wear out at a faster rate when the voltage drops below 208.

A quick note about 120 volt kilns. Residences with 240 volt service and schools or businesses with 208 volt service all can accommodate kilns firing on 120 volts.

One more thing about voltage to consider is the draw. This is the amount of electricity the kiln uses at different stages of firing. The draw can be read with a volt meter. When the kiln is on low, the voltage to the outlet remains high. As the kiln reaches higher levels of firing, the voltage reading at the outlet will decrease. For example, a 240 volt kiln on low might read 242 volts at the outlet, but when the kiln is on high and pulling maximum amps, the voltage reading could drop down to 235 volts. This would still be within acceptable operating parameters. On the other hand, a 208 volt kiln receiving 209 volts on low at the outlet could drop down to 202 volts when the kiln is on high. The kiln would struggle to reach the higher temperatures and would wear out the elements faster than normal.

One other factor that effects voltage is the distance from the main power box to the outlet. The longer the distance, the lower the volt reading will be at the outlet. 6 gauge wiring is normally needed on all 240 or 208 volt kilns, but when the power line goes past 40 feet, 4 gauge wire should be used. This will enable the power lines to draw enough voltage to fire the kiln properly. When ordering a kiln, have an electrician check the electrical service with a volt meter.

Phase is the next item to consider with a kiln. For the most part, all private homes are wired with single phase. This just means that the electrical service supplied to the main circuit box consists of two hot leads of 120 volts each, a neutral and a ground. Most schools and industrial buildings are equipped with three phase wiring. 240 volt three phase power has two leads of

120 volt, one lead of 240 volt (referred to as the crazy leg) and a ground. 208 volt three phase service consists of three leads of 120 volt and a ground. If a building is equipped with single phase service, there is no option as to what phase the kiln must be; however, any building supplied with three phase power can choose between a single or a three phase kiln. A three phase kiln costs less to run because it uses less amps.

This leads us to amps. The size of a kiln considered could be determined by the amperage supplied to the building. Most private homes are built with 100 amp service. Industrial buildings and schools usually have much more than that. A new Skutt PK kiln drawing 90 amps would not work in a house with a 100 amp service. Sometimes in a home studio situation, additional amperage must be added by way of expanding existing service, or installing a separate power box to the studio.

The amp rating of a kiln also determines what size circuit breaker or fuses need to be installed for care-free firing. The circuit breaker or fuses need to be rated 7% higher than the amps the kiln draws when on high. For instance, a Skutt KM1027 240v. single phase kiln draws 48 amps when on high. 7% more than 48 is 51 1/2. A 60 amp circuit breaker is needed to operate this kiln. The reason for the 7% is because, as stated before, the voltage provided can vary up or down. When less voltage is delivered, the kiln pulls more than the designated amps to make up for the loss of power. If a 50 amp breaker was used for the KM1027, the breaker could trip when the kiln is on high.

Determining what size kiln to have depends on voltage and amperage available, the area in which it is to be placed and what type and size pottery or ceramics is to be produced. A kiln used strictly for bisque or earthenware does not need to fire beyond cone 1, but a kiln used for glazed stoneware needs to be rated at cone 10. On most switch kilns, a blank ring can be added for extra bisque space. This blank ring drops the kiln's maximum temperature from cone 10 to cone 1.

Now, a choice can be made between kilns which fire manually with switches and a kiln sitter, and kilns that have computers mounted into the front control box for automatic firing. This choice comes down to personal preference. Switch kilns can have additional rings added on and some people feel more in control if they still can turn their kiln up manually. Computer kilns do not use cones, have no chance of over firing, are capable of multiple firing programs and free up the artist's time. One thing to consider about computer kilns in a school situation: When the volt reading drops below 208 volts, a manual kiln will still fire to temperature even though the elements will strain themselves; however, the computer on an automatic kiln must sense that the kiln is increasing its temperature at least 180° per hour. If the computer kiln is not getting the proper voltage, the elements will not be able to produce enough heat, and the computer will shut the kiln down. A power transformer can be installed to provide the proper voltage and remedy this situation.

When ordering a kiln, please take a few moments to check off the following items:

- 120v.                       240v.                       208v.  
 Single Phase             Three Phase

If you are a teacher, please check with your maintenance department for this information.