

INSTALLATION & PREORDER INFORMATION FOR L&L KILNS

TABLE OF CONTENTS

KILN CAUTIONS	1
DATED INFORMATION	1
SAFETY APPROVALS & LISTINGS	1
LOCAL CODES	1
UL LISTING	1
NATIONAL ELECTRICAL CODE	2
NATIONAL FIRE PROTECTION ASSOCIATION	2
UNIFORM MECHANICAL CODE	2
ELECTRICAL INSTALLATION	2
VOLTAGE AND POWER	2
WHAT VOLTAGE DO YOU REALLY HAVE?	2
WHAT PHASE DO YOU HAVE?	2
USE A FUSED DISCONNECT	3
USE PROPER FUSES	3
LOCATE KILN WITHIN 50 FEET OF BREAKER	3
USE PROPER GROUNDING	3
USE COPPER WIRE FOR HOOK UP	3
USE THE PROPER WIRE GAUGE	4
INSTALLING A PLUG RECEPTACLE	4
PROTECT POWER CORD FROM KILN CASE	4
DIRECT HOOK-UP KILNS	4
DO NOT USE EXTENSION CORDS	4
OFF-PEAK ELECTRICAL USAGE	4
WHERE TO GET MORE INFORMATION	4
CLEARANCES & SURFACES	4
DOORWAY CLEARANCES FOR MOVING	4
CLEARANCES IN KILN ROOM	5
WALL MATERIALS	5
FLOORS	5
AIR CIRCULATION UNDER THE KILN	5
OTHER CLEARANCES	5
KILN ROOM ENVIRONMENT	5
KEEP KILN DRY & IN PROTECTED SPACE	5
AMBIENT TEMPERATURE	6
FIRE EXTINGUISHER	6
FIRE SPRINKLERS	6
VENTILATION REQUIREMENTS	6
VENTILATION IS ESSENTIAL	6
VENTILATION FOR THE KILN	6
CARBON MONOXIDE MONITORING	7
VENTING CODES	7
HVAC AND AIR CONDITIONING ISSUES	7
OTHER ACCESSORIES NEEDED	7
SHELVES AND POSTS	7
GLOVES AND GLASSES	7
CONES	8
SELECTING AN ELECTRICAL CONTRACTOR	8
When considering an electrical contractor:	8
FINAL CHECKLIST	8

INSTALLATION & PRE-ORDER CHECKLIST FOR NEW KILNS

Please review and fill out the checklist at the end of this form, to avoid unpleasant surprises after your new kiln is installed. Make sure of your electricity and your physical environment, then you can place your kiln order with complete ease of mind! This checklist should be used for anyone specifying a kiln, including architects. Kilns are appliances with a few special characteristics, such as high power draw, ventilation requirements and unusually hot surfaces. A few hours work up front can save lot of trouble and expense later. There is a more specific installation guide for EASY-FIRE kilns (hotkilns.com/easy-fire-install.pdf).

KILN CAUTIONS

See *cautions.pdf* in the CAUTIONS section for a complete list of cautions associated with electric kilns.

DATED INFORMATION

The information in these Installation Instructions is believed to be correct to the best of our knowledge at the time of publication (see the date at the bottom). You can download the most recent update from our web site at www.hotkilns.com/install.pdf at any time.

SAFETY APPROVALS & LISTINGS

LOCAL CODES

Local fire and safety codes superceed information that is provided in these Installation instructions or in our Caution instructions.

UL LISTING

You may want to check with your local building inspector if you are uncertain what codes may apply to the installation of a kiln. This does vary from place to place. It may also be a requirement of your insurance policy. In any case, you will never go wrong in having a UL499 listing label on any appliance. Most building inspectors will accept this as adequate evidence of proper adherence to national safety standards.

INSTALLATION & PREORDER INFORMATION FOR L&L KILNS

All Jupiter, Easy-Fire, and DaVinci (except the Model TB644754) are listed to UL 499 Standards for both the US and Canada by MET (An NRTL - Nationally Recognized Testing Laboratory). The Vent-Sure vent is listed in both the US and Canada for use with L&L listed kilns. UL 499, CSA C22.2, No. 122, CSA C22. Listing No E112742.

Easy-Load and Renaissance kilns are listed to UL499 Standards in the US only. UL 499. Listing No E112742.

The Doll/Test Kiln, Liberty-Belle, Chamelion, and GS1714 are not listed.

NATIONAL ELECTRICAL CODE

Be sure your electrician follows the National Electric Code and any other local requirements when hooking up the kiln. One of the requirements of this code that bears particular mentioning is the fact that you must fuse your kiln appliance for 125% of its rated maximum amperage draw. This explains why you see fusing requirements in our electrical specifications that are in excess of the amperage draw of the kiln. The fuse for the kiln is either a circuit breaker or a fused disconnect switch.

NATIONAL FIRE PROTECTION ASSOCIATION

To the best of our knowledge, the NFPA has nothing specific about the installation of kilns. The NFPA 86 goes into considerable detail about industrial furnaces and ovens but generally with respect to internal processes and gas-fired equipment. There is one section in the NFPA 86 (Section 2-1.5 concerning Floors and Clearances) that might be construed as applicable to kilns. It requires that temperatures at combustible ceilings and floors be kept below 160°F (71°C). In general the NFPA recommends installing furnaces on noncombustible surfaces and has specific requirements if this is not possible. You can order a copy of this by going to their web site at www.nfpa.org or by calling 617-984-7249.

UNIFORM MECHANICAL CODE

Section 920.0 specifically discusses Small Ceramic Kilns and their installation. Some of the clearance information from this is given further on. However, it is best to refer to this book for complete details. This is

published by the International Association of Plumbing and Mechanical Officials and can be purchased online at www.iapmo.org/iapmo/publications.html or by calling 800 85-IAPMO (800-854-2766) / Fax (909) 598-4720.

ELECTRICAL INSTALLATION

VOLTAGE AND POWER

The first item on the checklist is electricity. Make sure that you know your voltage and phase before placing an order for a new kiln! We can supply kilns with either 208, 220, 240, 380 or 480 volts, single or three phase - all depending on your power characteristics. If you do not know for sure what your power is, have an electrician check it for you.

WHAT VOLTAGE DO YOU REALLY HAVE?

L&L makes different heating elements for 208 volts, 220 volts, 240 volts, 380 volts and 480 volts. It is not easy or cheap to change the kiln from one voltage to another once it is installed. A kiln supplied from the factory for 240 volts will have 25% less power if operated on 208 volts - and this will result in slow firing, and perhaps underfiring if not corrected. Many schools and factories in the United States have 208 volts whereas almost all homes in the United States have 240 volts. (Nominal 240 volts can actually be as low as 220 volts). Some people think they have 220 volt power because many appliances are designed to run off either voltage and are labeled 220. Even if you only measure 220 volts (if you are in the United States), this is probably due to an under-voltage condition. You wouldn't normally want to have 220 volt elements because if the power does go up from the measured 220 volts then the kiln would be over-powered and it could draw too many amps for the circuit. Note that utility companies typically allow for a 10% voltage fluctuation. The most common voltage outside the United States is either 380/3 phase or 220/1 phase.

WHAT PHASE DO YOU HAVE?

Also check for proper phase. Most residential buildings have single phase power which consists of 2 hot wires, a neutral and a ground wire. Many com-

INSTALLATION & PREORDER INFORMATION FOR L&L KILNS

mercial areas have 3 phase power available which consists of 3 hot wires, a neutral and a ground.

You also need to make sure that your home or building has enough ampere capacity to carry the electrical load of your new kiln. Each kiln model is listed with voltage, phase, KW, and amperes. Using these electrical specifications, check the listed amperes and check that your building power supply is adequate. A trickier thing to know is the real capacity of your power grid. We have sometimes seen situations (rarely, but very annoying when it happens) where the demand put on a specific power grid ends up lowering the voltage of the entire grid. For instance you might go in and test the lines and find you have 238 volts and then, when a large kiln is firing, have only 218 volts. Again, if you do not know for sure whether your power supply can handle this new load, have an electrician check it for you. NOTE: like anything else there are good and bad electricians. Chose one with care by getting a few references.

USE A FUSED DISCONNECT

We recommend having a separate fused disconnect box with a lockout provision mounted near the kiln, even if you also have a separate circuit breaker for your kiln. This way you can easily turn off power to the kiln and prevent unauthorized people from turning it on. We recommend this even for kilns with plugs because it makes it so much easier to disconnect all power to the kiln when not using it. Note that if you unplug a kiln frequently the spring tension in the outlet can weaken over time. A Fused Disconnect switch allows you to positively turn off power to the kiln without unplugging it.

USE PROPER FUSES

Fuses and circuit breakers are overcurrent devices designed to protect electrical circuit components. If a circuit develops too many amperes, they are designed to open, interrupting the flow of current in the circuit. Fuses self-destruct when they sense an overload in the circuit. Circuit breakers are commonly used in new construction; they trip (turn off power) when they sense an overload, and can be reset (turned back on) when the circuit is returned to normal.

Circuit breakers are more convenient because of this

feature. However, they can cause nuisance tripping and ruin kiln firings when they trip part way through a firing. This is because most circuit breakers are activated thermally; if the circuit breaker temperature rises above a preset level, a bimetallic element inside the circuit breaker opens, and the power is turned off. This works well most of the time; however, over time the bimetallic element becomes weaker because resistance heating circuits are at their rated load longer than other types of electrical loads such as motors. Eventually the circuit breaker becomes too weak to hold itself closed over a long enough time to finish a kiln firing, unless the circuit is drastically oversized to compensate for this gradual aging process.

For protecting kiln circuits, 'one-time' general-purpose type fuses should be used. These are inexpensive, have no appreciable time delay, and are available in a large variety of sizes. They are also widely and easily available, and are made by several large fuse manufacturers.

LOCATE KILN WITHIN 50 FEET OF BREAKER

Try to locate the kiln within 50 feet of your breaker box. For longer runs you will probably have to increase the size of the hook up wire that we recommend in our literature. In any case, be sure to have a licensed electrician who knows the National Electrical Code hook up the kiln and size the hook up wire.

USE PROPER GROUNDING

Make sure your electrician properly grounds the kiln and then tests for proper grounding after the installation.

USE COPPER WIRE FOR HOOK UP

Don't use aluminum wire. It is cheaper to use aluminum wire and you may be tempted to do so. Many electricians will tell you that, with the new types of connectors, it is OK. However, it is of particular importance with kilns not to use aluminum wire for the hook ups. The specific reason particular to kilns is that the wire tends to get hotter near the kiln than it might going into some other types of appliance. Also, being a resistive load, there is constant heat being generated by the conductors for quite a few hours. When aluminum wire gets hot it accelerates oxidation. Aluminum oxide is a resistor; copper oxide is not as much. If the connection at the

INSTALLATION & PREORDER INFORMATION FOR L&L KILNS

terminal board gets oxidized it will really heat up - to the point where it could cause a fire. Note: Depending on local codes it may be OK to use aluminum wire to your subpanel - as long as that wire is not exceeding its temperature rating while kiln is firing on full power for an extended period of time.

USE THE PROPER WIRE GAUGE

Hook-up wire sizes are provided for many of our kilns in the electrical specifications. However, this can vary depending on ambient temperature conditions and length of wire run.

Running power for your kiln over a long distance will result in a drop in voltage. This chart gives some approximate idea of this:

7 volts per 100 feet with 10 awg wire

21 volts per 300 feet with 10 awg wire

6 volts per 100 feet with 6 awg wire

18 volts per 300 feet with 6 awg wire

3 volts per 100 feet with 1 awg wire

9 volts per 300 feet with 1 awg wire

These estimates are dependent on the kiln operating at 50% to 100% of its capacity, with the temperature of the wire no more than 167°F.

INSTALLING A PLUG RECEPTACLE

If you a plug in your kiln install the receptical in such a way that the cord hangs down (not up). Do not place the outlet so close to floor that the kiln cord bends up at a sharp angle. The principle to pay attention to is make sure the plug seats securely in the receptical. Otherwise it could overheat and corrode which could cause an electrical fire.

PROTECT POWER CORD FROM KILN CASE

Rout Power Cord away from kiln in such a way that it can not touch the hot case of the kiln. Secure it so it can not move. If cord touches the hot case it could melt and cause a short circuit and/or fire.

DIRECT HOOK-UP KILNS

If you are getting a "direct hook up" kiln (all kiln sizes above 48 amps and most 3 phase kilns) be sure to have the kiln wired so that the final connection to the

box is flexible (for instance, by using liquid tight flexible conduit). Ideally, the kiln should be wired to a fused disconnect box located within 15 feet of the kiln. This way, if you ever need to remove the control panel for factory service you can turn off power to the kiln, unhook the 3 or 4 wires from the control box terminal block, and remove the panel.

Use a supply wire size large enough for the whole circuit amperage - not just the amperage that the kiln is pulling under load.

All L&L power cords are rated for 105°C. Anything less than this can cause a malfunction and possible fire where the power leads connect to the control box.

It is OK, and will not void the warranty, to remove the plug that comes with the kiln and direct wire the kiln. However, the connection wires must be rated for a minimum of 105°C.

Protect the wire with flexible or rigid conduit.

DO NOT USE EXTENSION CORDS

Extension cords are only OK to use for the 120 volt vent system. Do NOT use an high power extension cord for the kiln.

OFF-PEAK ELECTRICAL USAGE

Some utilities offer special rates for running energy intensive appliances (like kilns) during off-peak hours. Check with local utility. This would require a special time-of-use electrical meter.

WHERE TO GET MORE INFORMATION

See hotkilns.com/volts.pdf for a complete description of electrical theory, fusing, hook-up wire sizes, etc. as they apply to kilns. See the section on POWER SUPPLY in troubleshoot-general.pdf in the TROUBLESHOOTING section of your manual.

CLEARANCES & SURFACES

DOORWAY CLEARANCES FOR MOVING

All Jupiter, Easy-Fire, Liberty-Belle and DaVinci kilns can be disassembled and carried in sections through any standard 30" or larger doorway. Doll kilns and the GS1714 will fit through a 30" door. The

INSTALLATION & PREORDER INFORMATION FOR L&L KILNS

Easy-Load front loading kilns vary in door width requirements (see the brochure for specifications).

CLEARANCES IN KILN ROOM

Make certain floor is not flammable and install no closer than 12" to any wall. (18" is strongly recommended). Note that, when we did our testing for UL, temperatures were measured 12" from the walls of the kiln and found to be safe from a flammability standpoint. The Uniform Mechanical Code 2000 Edition states that "the sides and tops of kilns shall be located a minimum of eighteen (18) inches (457 mm) from any noncombustible wall surface and three (3) feet (914 mm) from any combustible wall surface." The National Fire Protection Agency states that temperatures at combustible ceilings and floors be kept below 160°F (71°) near industrial furnaces (which are like kilns).

WALL MATERIALS

Check with local building codes for recommended non-combustible wall materials for walls that are adjacent to the kiln. Cement board, cinderblocks, and masonry tile are possible choices.

FLOORS

The Uniform Mechanical Code 2000 Edition states that "kilns shall be installed on noncombustible flooring consisting of at least two (2) inches (51 mm) of solid masonry or concrete extending at least twelve (12) inches (305 mm) beyond the base or supporting members of the kiln." Recommended floor surfaces are cement, ceramic tile, stone, slate, cinder blocks or brick. Do not install on a wood floor or on carpet. Vinyl flooring may be combustible. Protect linoleum flooring from discoloration with a noncombustible covering. **BE VERY CAREFUL ABOUT IMPLEMENTING THESE SUGGESTIONS.** Remember that the kiln is putting out heat over a long period of time and that this could very well start a fire under certain conditions. Also, if an overfiring occurs, materials like glass and glazes can be super-heated and electrically conductive and they can melt right through the kiln floor. If there is a combustible floor, this could cause a fire. Also keep in mind the continued heat of the kiln can dry out combustible surfaces over time and reduce their flash point. The

NFPA 86 (Section 2-1.5 concerning Floors and Clearances) that might be construed as applicable to kilns requires that temperatures at combustible ceilings and floors be kept below 160°F (71°C). In general the NFPA recommends installing furnaces on noncombustible surfaces and has specific requirements if this is not possible.

AIR CIRCULATION UNDER THE KILN

It is **CRITICAL** to have air circulation under the kiln. This prevents heat from being directly conducted to the floor surface. If the floor (or subfloor) is combustible a fire could result. Even if the floor is non-combustible (like solid cement) you would create a very inefficient system by placing the kiln directly on the floor. The supplied stands (which typically raise the kiln 8" from the floor) have been tested to ensure a minimum of heat transfer. It is important to use the kiln with its supplied stand. Any substitutes must be carefully tested by the user.

OTHER CLEARANCES

Make sure there is adequate clearance in the room for opening the kiln lid, and for periodic maintenance such as opening the element connection boxes, opening the control panel, thermocouple replacement, etc. 18" to 24" clearance around the outside wall of the kiln is usually sufficient.

KILN ROOM ENVIRONMENT

KEEP KILN DRY & IN PROTECTED SPACE

The kiln must be kept dry so it must be kept in an enclosed room away from inclement weather. The electrical circuits must not get wet. If for some reason they do get wet they must be thoroughly dried before operating the kiln. Kilns can corrode fairly rapidly if kept in rooms that have no climate control. The constant heating and cooling in an unheated shed, for instance, can cause dew to form on the cold metal and this can cause corrosion. Also exposure to salt air will accelerate corrosion dramatically. Also failure to adequately vent the kiln will allow the corrosive fumes that are generated in the firing process to corrode the metal, the wiring and even the firebrick. This sort of damage is specifically excluded from warranty

INSTALLATION & PREORDER INFORMATION FOR L&L KILNS

coverage.

AMBIENT TEMPERATURE

The kiln should operate in an environment that is between 0°F and 100°F. Some people keep their kilns in unheated garages or sheds. This is OK as long as the room is dry. The DynaTrol has a specification that says it can work from 32°F to 125°F. These limits can be exceeded on the low end. (The control won't deal with negative numbers so if you go below 32°F you must have the control set up for Deg F - not Deg C) On the low end it has more to do with the accuracy of the control. As the kiln reaches the point where accuracy is an issue then the control will most likely be warmed sufficiently by the kiln to insure that it is operating within specification. However, on the high end, the electronics could degrade if operated for long periods above 125°F.

FIRE EXTINGUISHER

We would recommend that an adequate fire extinguisher be kept near the kiln and checked on a regular basis. You may want to check with your local fire authorities to see if there are any specific requirements they have such as sprinkler systems, automatic foam extinguishers, etc. Use a fire extinguisher that is rated for electrical fires. We recommend an ABC fire extinguisher.

FIRE SPRINKLERS

If you have a fire sprinkler system position the sprinkler heads in the ceiling away from the kiln(s). The rising heat from the kiln, under normal operating conditions, could set off the sprinklers which will cause water damage. Consider using a higher temperature sprinkler head or one that is set off by smoke. Also consider using the canopy type vent system in this type of environment which will lower the temperature above the kiln. Test the installation under the worse conditions to be sure that you are not creating a hazard.

VENTILATION REQUIREMENTS

VENTILATION IS ESSENTIAL

Kilns generate harmful fumes when firing ceramics. Fumes can include carbon monoxide, formaldehyde,

sulfur dioxide, heavy metal vapors, and fluorides (all of which can be very toxic). Install kiln in well-ventilated area. Never operate in an enclosed space such as a closet unless you have good ventilation. Aside from issues of ventilating the fumes from the firing, the heat build up in an enclosed room could present a significant fire hazard. Severe corrosion can be caused by kiln fumes, salt air or other environmental conditions. Good venting can minimize these problems. **Ventilation must be to the outside.** We recommend room ventilation of at least 10-25 times the cubic feet of the kiln per hour. For example, if a kiln has 10 cubic feet then 250 cubic feet per hour (about 4 cubic feet per minute) should be adequate. Our suggestion is to get a variable speed fan for ambient room ventilation and keep a thermometer on the wall. That way you can vary the ventilation to suit the needs of ambient heat conditions in the room. Grainger is an excellent source for ventilation equipment. (See www.grainger.com)

VENTILATION FOR THE KILN

In addition, we recommend our VENT-SURE downdraft kiln vent system. This will take care of most of the venting of the fumes of the kiln, will improve uniformity of firing in the kiln, and will help maintain the oxygen level in the kiln (which is important for certain glaze effects as well as good element life). See the separate instructions in this book for the VENT-SURE vent system. Although you can use other kiln venting systems please note that the VENT-SURE is c-UL-us listed for use with the Easy-Fire kilns. If UL listing is an issue then you may want to ensure that another brand of vent will be acceptable to your local authorities. Also if you use another brand of vent be sure to check with the vent manufacturer for specific installation requirements with our specific kiln model. We specifically do not recommend a plate mount type vent (like the Envirovent or Orton Plate Mount Vent) for use with our kilns. We have seen kiln bottoms crack from lack of support. Although the Orton Stand Version of their Kilnvent is sturdy and provides good support for at least a 23" diameter kiln like the e23S and e23T or JD230, the largest Orton stand mount vent is only 24" square vs our 29" square stand for the e28S and e28T or JD2927. If you must use the Orton vent then we recommend you use the

INSTALLATION & PREORDER INFORMATION FOR L&L KILNS

24" square Stand Version for all Easy-Fire and 23" or 29" Jupiter kilns. You can use there Junior Vent for the Doll kiln and the 18" Stand Vent for the J18 and J18X. Do use an Orton Vent with the DaVinci Series because there is no way to get good support for the kiln.

CARBON MONOXIDE MONITORING

We recommend the use of a carbon monoxide monitor in your kiln room. These are available from good hardware stores or from Graingers for about \$50. (See www.grainger.com)

VENTING CODES

The following information is provided courtesy of The Edward Orton Jr. Ceramic Foundation.

OSHA has set standards for carbon monoxide exposure of 35 ppm (parts per million) for long-term exposure and 200 PPM for short-term exposure. Independent testing has shown that fumes near the kiln can exceed 200 PPM near the kiln during the firing of greenware. This can cause headaches, fatigue, sore throats and nausea. When properly installed and operated, a downdraft vent removes all harmful fumes and provides a safer working environment.

Most states and localities have set venting requirements for firing kilns in public places. Your local and state health board should have this information. The Uniform Mechanical Code says that you must vent ceramic kilns. It says that you can use a canopy-type hood (and gives specific requirements for such use) or that "listed exhaust blowers may be used when marked as being suitable for the kiln and installed in accordance with manufacturer's instructions." Our Vent-Sure vent is UL listed and is appropriate to meet this ventilation requirement. If you decide to use a vent other than the UL listed Vent-Sure vent make sure you check with the manufacturer of the vent to be certain that it is an approved application. L&L takes no responsibility for improperly installed vents or kilns nor do we take responsibility for the use of other vents with our kilns. The manufacturer of the vent must specifically approve it for use with our kiln.

Note about canopy type vent hoods: While canopy type vent hoods can be suitable for venting a kiln from

a safety point of view, they will not give you the superior advantages of a downdraft type vent like our Vent-Sure. A downdraft type vent pulls the rising hot air down to the bottom of the kiln which helps even out the firing. In addition it provides uniform distribution of oxygen in the kiln. You don't have to open the lid or the peepholes when using a downdraft vent.

See ASTM Standard C1023 Appendix for ventilating an electric kiln. xxxx. This states "Ventilation is recommended when firing an electric kiln. Adequate ventilation may be achieved by means of air exchange through cross ventilation, exhaust hoods or self-contained air handling systems. To determine the appropriate ventilation, it is recommended that you consult a local licensed Heating, Ventilation and Air Conditioning Contractor." (put in Easy-Fire as well)

HVAC AND AIR CONDITIONING ISSUES

Kilns put out a lot of ambient heat. If you need to size HVAC units to handle this see the BTU chart in the INSTALLATION section of your manual (*jupiter-btu.pdf* or *davinci-btu.pdf*) for a chart of maximum BTU output for each of our kiln models.

OTHER ACCESSORIES NEEDED

SHELVES AND POSTS

You will of course need an appropriate number of shelves and posts to load your ware. If you are buying a replacement kiln you may already have the correct shelves. Check the sizes and make sure they will fit into your new kiln. For instance, if you are buying a new 10 sided kiln that has 3" brick and you had a 10 sided kiln with 2-1/2" brick the old shelves will not fit (21" diameter shelves vs. the newly needed 20" diameter shelves. Note that shipping can be expensive for a shelf kit and that you will save a considerable amount of money if you order a shelf kit with your kiln.

GLOVES AND GLASSES

It is usually a good idea to have a pair of heat resistant gloves for removing peephole plugs and unloading the kiln. If you intend to observe witness cones while the kiln is firing you should wear shaded safety glasses. See *parts.pdf* in the PARTS section of your manual.

INSTALLATION & PREORDER INFORMATION FOR L&L KILNS

CONES

It is a very good idea to fire your kiln every time with witness cones. See the whole LOG, CONES, TIPS & CERAMIC PROCESS section in your manual for more information on this. They can easily be purchased after you get your kiln. You can buy pyrometric cones from either your local clay or ceramic supplier or directly from Orton see (www.ortonceramic.com).

SELECTING AN ELECTRICAL CONTRACTOR

You will need a quality electrical contractor who is knowledgeable, skilled and qualified to handle the job. A quality electrical contractor:

- 1) Complies with state and local codes and regulations.
- 2) Carries the proper business and workers compensation insurance.
- 3) Is knowledgeable on a wide range of new equipment, technology and design procedures.
- 4) Has a local facility, and is willing to have you visit.
- 5) Is prompt and courteous and provides fast, reliable service – attempting to perform service at your convenience.
- 6) Is neat and well groomed. This neatness should be reflected in their vehicles and offices as well as their personal appearance.
- 7) Provides a detailed written proposal, clearly outlining the work to be done and the agreed upon cost, including labor and materials. Make sure you understand every word of any contract before you sign it.
- 8) Asks in detail about any problems and offers understandable solutions.

When considering an electrical contractor:

- 1) Ask for references. Find out if other customers were satisfied. Check with the local Better Business Bureau regarding any filed complaints.
- 2) Compare price. Get bids from a few contractors. Make sure you give each contractor the same specifications and materials needed for the job.
- 3) Remember! How a company treats you now reflects how they will treat you if there's a problem. A quality electrical contractor listens to your problems, understands what you want accomplished and is willing to follow up after the work is completed.

FINAL CHECKLIST

VOLTAGE

- ☐ 208 Volts
- ☐ 220 Volts (non US)
- ☐ 240 Volts
- ☐ 380 Volts (non US)
- ☐ 480 Volts

PHASE

- ☐ 1 Phase
- ☐ 3 Phase

AMP CAPACITY

- ☐ I have checked the amperage rating of the kiln with the intended voltage and checked (or had an electrician check) to see that I had enough amps available in my building power supply.

VENTILATION

- ☐ I have a room fan
- ☐ I will also be using a kiln vent
- ☐ I am going to manually vent the kiln but I have adequate room ventilation for this.

FLAMMABILITY ISSUES

- ☐ I can install the kiln at least 12" away from any wall (18" is preferred). 36" is required from any combustible walls.
- ☐ My kiln room floor is non-flammable.
- ☐ I will use an insulated floor and check temperatures when the kiln is at its highest point
- ☐ I have a dedicated fire extinguisher or sprinkler system for the kiln room or kiln.

SAFETY STANDARDS & CODES

- ☐ UL or c-UL-us listing is required.
- ☐ UL or c-UL-us listing is not required.
- ☐ You are using a licensed electrician who knows the National Electrical Code and any other local codes.

OTHER SAFETY ISSUES

- ☐ Children will be adequately protected from hot kiln.
- ☐ There will be wall or other permanent fixture to attach the kiln lid safety chain (on the Jupiter kilns without the Easy-Lift Hinge) to a nearby wall or post. (This is self contained on the DaVinci kilns).