L and L KILN MFG, INC
FOR OVER 50 YEARS... THE KILN TECHNOLOGY LEADER
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GQ1714 "Colorado" Kiln

AUTOMATIC KILN INSTRUCTIONS

You are now the proud owner of an L&L GQ1714 Glass Kiln, engineered to give you the utmost in performance and results. This is an expensive and potentially hazardous appliance (if not used with proper caution). ***PLEASE TAKE THE TIME TO READ THESE INSTRUCTIONS.*** *This is the first question we ask when you call for our free technical support. There is important information that you need to understand to operate your kiln safely and properly. After you read the instructions please feel free to call our technical support staff us to answer any questions. Check out our web site for updated instruction manuals, troubleshooting information, special offers and current links to web sites with useful technical information on kilns and ceramics. We apologize in advance for the length of these instructions and the occasional redundancy. We feel strongly that it is better to say too much rather than too little. Please let us know if you find any errors or have any suggestions for improvements in our kilns or instructions.*

BASIC DESCRIPTION

These are front loading glass kilns with a maximum temperature rating of 2350°F. There is a wide opening suitable for most glass working procedures. The kiln can be used for a variety of glass processes including glass slumping & fusing, lamp working, annealing, staining and laminating. In addition the kiln can be used for many other hobby and industrial uses.

FEATURES

- DYNA-GLOW' Ceramic Element Holders provide easier maintenance and more efficient firing of the kiln, *help prevent dusting!*
- Spring Loaded Counterbalanced Vertical Door
- Long Life Low Watt Density Elements
- Stainless Steel Case; Heavy Duty Steel Base.
- Elements in the roof and the sides.
- Low power operation.
- Finest Quality insulating Firebrick with reflective ceramic coating - reduces dusting, aids brick life and increases operating efficiency. 3" firebrick on top (for extra strength), 2-1/2" firebrick on other surfaces.
- 30 Amp 240 Volt NEMA 14-30P Power plug included.
- Optional ceramic hearth plate available.
- Single Zone DynaTrol program control is included.
- 14 Gauge Type K thermocouple is included
- Run on any single phase voltage from 208 volts up to 240 volts.

CHECKING SHIPMENT

Your kiln was carefully packed and inspected prior to shipment to make sure that your kiln and accessories were in perfect condition.

When carrier makes delivery, you should immediately unpack your kiln and accessories to ascertain whether or not any damage has occurred in transit.

If damage has occurred, retain all of the packaging material, and notify the delivering carrier at once, requesting an inspection report. Retain all papers to insure that a proper claim can be filed. We will assist you in any way possible with your claim; however, filing and collecting on freight claims is the receiver's responsibility.

PREPARATION

1. *Unpack kiln carefully and remove all packing material including the plywood base or skid if included.*
2. *Install kiln in well-ventilated area.*
3. *Make certain floor or bench is not flammable and install no closer than 12" to any wall.*
4. *Make certain the area is free of moisture and is under cover and protected from the weather.*
5. *Be sure to allow air to ventilate from underneath the kiln base. It is important to the controls and wiring to get good air circulation. Do not operate without the included rubber legs.*
6. *Install the hearth plate (if you purchased this accessory) on its 1/2" high standoffs supports.*
7. LEVEL THE KILN!

IMPORTANT CAUTIONS

8. **The GQ 1714 kiln is rated for use to 2350°F (1287°C).** DO NOT FIRE ANY HIGHER THAN THIS.
9. The kiln is heavy. Be sure to have several people help you when lifting or moving.
10. Have electrical installation performed by an electrician or other qualified technician. There is danger of electric shock.
11. Do not allow children near the kiln at anytime.
12. Kiln surface is extremely hot (the case can get over 400°F) and will burn you if touched.
13. Do not leave the kiln while firing. NO AUTOMATIC SAFETY DEVICE IS FOOLPROOF! BE ESPECIALLY CAREFUL ABOUT ATTENDING THE KILN WHILE IT IS SUPPOSED TO SHUT OFF.
14. **Kiln should be located at least 18" from any wall.** The ultimate test of fire safety is a function of the flammability of the walls (and what temperature anything in or on the walls might ignite), the ambient temperature in the room, and the closeness of the radiating surface of the kiln walls. Keep in mind that the walls of the kiln can get up to over 400°F and that this will radiate quite a bit of heat over the long time that the kiln is firing. It is best to take actual temperatrure readings at the kiln walls under worse conditions (i.e at the peak of your firing on a hot day) and make sure that the wall temperature is reasonable. The autoignition temperatrure (the temperature at which a material will ignite) is xxx for wood. You should assume that there is wood in the wall unless you know otherwise.
15. The floor or bench should be protected from the heat if it is combustible. IMPORTANT NOTE: If kiln overfires certain materials such as glass or glazes can reach superhot temperatures because they become electrically conductive and can melt. This can burn through the kiln bottom and, if there is a combustible floor, cause a fire. Be sure to protect against this possibility.
16. Check temperatures around the kiln when it is at high fire to be sure that you are not creating an unsafe condition.
17. Do not let the kiln's power cord or wire connection come in direct contact with the kiln side. The kiln could melt the cord covering and potentially cause a short circuit.
18. Do not put sealed containers or combustible materials in kiln.
19. Keep all flammable and combustibles away from kiln. Examples are solvents, curtains, rags, etc.
20. Operate in a well ventilated area.
21. Read the control instructions as well as these and other general instructions that come with your kiln - BEFORE OPERATING THE KILN!
22. Use dark glasses to view inside the kiln through the peepholes when firing. (We sell these as an accessory). There is an intense amount of radiant energy that comes through an open peephole. This is very dangerous. We have heard of a child's clothing catching on fire from the heat coming from a peephole.
23. Do not apply kiln wash to the brick sides, element holders or undersides of kiln shelves.
24. If you replace the door counterbalance spring be sure to also reinstall the safety spring that goes inside of this spring. This safety spring is there to protect you in case the main spring breaks while under tension.
25. Do not operate kiln with deteriorated wiring. Be sure to check this periodically.
26. Do not touch elements with any metallic device while the door is closed (for instance when you are inserting something though the slot in the door). Elements operate on high voltage and could electrocute you.
27. Do not use silica sand in the kiln (some people like to use this as a work support medium). The silica sand will attack the elements and thermocouples. It can migrate in the kiln from expansion and movement due to heat. If you must use sand to support or stabilize your load try alumina oxide sand. Also consider ceramic fiber blanket.

REGULAR KILN MAINTENANCE

To keep your kiln in top operating shape, we recommend the following minimum housekeeping:

WEEKLY OR AFTER EACH FIRING

1. Check element holders for possible contamination (pieces of clay, glaze, etc.). Replace if necessary. Contamination may cause abnormal element failure.
2. Remove any glaze or glass that has splattered on the firebrick or shelves**. (USE SAFETY GLASSES WHEN DOING THIS)** Vacuum afterward.
3. Make sure bottom and shelves are coated with kiln wash. Brush off or vacuum off any loose particles from the kiln shelves. Be careful to avoid heating elements.
4. Check each shelf for cracks (you don't want a kiln shelf to break when loaded and cause a disaster in the kiln).
5. Observe thermocouples (if used) for excessive corrosion which could lead to thermocouple failure.

MONTHLY(15 FIRINGS)

1. Vacuum out kiln and element holders, repair any firebrick problems. USE THE SOFT BRUSH ATTACHMENT ON YOUR VACUUM CLEANER.
2. Check temperatures around kiln (at the high end of use).
3. Check kiln plug and outlet box for excessive heat during firing (at the high end of use).
4. Repair any firebrick chips or gouges.

SEMI-ANNUALLY (90 FIRINGS)

1. Check element resistance. Replace elements if resistance is more than about 9% of stated nominal resistance (see chart in back of instructions), or firing time has increased substantially.
2. Check tightness of case and retighten if necessary.

3. Check wires for deterioration or oxidation. Replace any that seem brittle or where the wire insulation has deteriorated or fallen off. Check terminals for oxidation (discoloration).
4. Check power connection terminals in the kiln for tightness. (Be sure to do this with the power disconnected (unplugged) for the kiln). If these terminal connections get loose, heat can be generated and cause a fire.

SERVICE FOR YOUR KILN

L&L kilns are designed to be as easy to work on and fix as possible. Most of our customers are comfortable doing their own service. The TROUBLESHOOTING GUIDE provides many helpful tips and suggestions. You can also call your local distributor, most of whom service the kilns they sell. If they don't they may be able to direct you to a local kiln service person. Also try your local yellow pages. L&L may also be able to recommend a local service person. If you can't find a person experienced specifically in kiln repair, then a good electrician is often more than adequate to repair most of the types of problems that commonly occur. Some of the more difficult problems occur within the instrument panel. The panel/base can be removed and sent to the factory for repair. We are happy to answer technical questions on the phone. HOWEVER; PLEASE TAKE THE TIME TO READ THESE INSTRUCTIONS AND THE TROUBLESHOOTING GUIDE BEFORE CALLING THE FACTORY FOR HELP. ALSO WE CAN NOT GIVE YOU ADVICE OVER THE PHONE ON HOOKING UP YOUR KILN TO YOUR ELECTRICAL SYSTEM. YOU MUST HAVE A QUALIFIED ELECTRICIAN WHO CAN PHYSICALLY SEE WHAT YOUR SPECIFIC ELECTRICAL SITUATION IS.

WARRANTY

See separate warranty for details on warranty. *We can only be responsible for defects in the kiln itself. L&L purchases the shelves used in the kilns, and again, cannot assume any responsibility for defects or imperfections. Note that it is completely normal to experience hairline cracks in the firebrick. As the kiln heats up and expands this does not create a problem with the kiln. See the Troubleshooting Guide for more information.*

Be sure to read and fill out the warranty form that is given with each kiln. Return the lower portion to our company, for filing purposes.

KILN FURNITURE

L&L supplies ceramic kiln furniture for all our kilns. Kiln posts of two crossections are available. The larger, stronger posts are fluted square tubes approximately 1-1/2" square. The smaller posts are triangular posts. The square posts are available in 2", 4", 6" 8" 10" and 12" lengths. The triangular posts are available in 1/2", 1", 1-1/2", 2", 2-1/2", 3", 4", 5", 6", 8", 10" and 12" lengths. Three "post kits" are available which include a selection of posts. Kits for each kiln with a selection of posts and shelves are also available. See the price sheets for more information.

REPLACEMENT ELEMENTS

Replacement Elements made by L&L Kiln Mfg., Inc. are designed for each individual model for long life and superior performance. Good element design is a complex balance of watt density, design voltage, stretch ratio, wire gauge, element length and material. It takes hours and years of experience to design a good element for each model. Do not expect an outside supplier with no interest in your kiln performance or long experience with L&L kilns to spend the necessary time to do this right. In the end you will not save money.

IMPORTANT NOTE: All elements (both side and bottom) are the same value on the GQ1714 kiln.

ELEMENT HOLDERS

Any number of element replacements will not affect the hard ceramic element holders or brick walls, unlike other kilns where elements are pinned into the soft firebrick grooves. All pinning problems are eliminated and full firing space is always insured.

Dyna-Glow element holders secure and protect the elements so that the elements can not accidentally come out and cause damage to themselves, the kiln or your ware. Yet, replacement is simple.

Dyna-Glow element holders reflect the infra-red heat instantly into the kiln and therefore operate at a lower temperature relative to the internal kiln temperature. They require less firebrick insulation to be cut out. This means L&L Kilns are more efficiently insulated than other kilns of this type. This results in better, more accurate firing, lower electrical cost, lower case temperatures and, most significantly, longer element life.

Dyna-Glow element holders have a hard smooth surface. This allows the elements to expand and contract freely. No loose particles will fall in the kiln and ruin ware. Element life is longer because elements do not get easily snagged and bunched up (which causes hot spots and burn outs).

See the TROUBLESHOOTING GUIDE for information on how to replace elements and element holders.

POWER SUPPLY

VOLTAGE

G Series kilns are wired to work on either 240 Volt Single Phase, 220 Volt Single Phase or 208 Volt Single Phase. BE SURE TO GROUND THE KILN PROPERLY USING THE GROUND WIRE.

ELEMENT VOLTAGE

The elements are designed to work on any voltage between 208 and 240 volts. The kiln will generate different amperages depending on the voltage supplied.

WATTS AND AMPS

WATTS AT 240 VOLTS: 6000
WATTS AT 220 VOLTS: 5042
WATTS AT 208 VOLTS: 4507

AMPS AT 240 VOLTS: 25.0
AMPS AT 220 VOLTS: 22.9
AMPS AT 208 VOLTS: 21.7

FOR ALL VOLATAGES FUSE THE KILN FOR 30 AMPS.

POWER HOOK UP

A NEMA 14-30P plug is supplied with the kiln. This has a neutral and ground and fits the new style 30 amp dryer outlets that are common today. We do not use the neutral leg. Have receptacle placed in such a manner that the plug-in cord can in no way touch the body of the kiln. Be sure that your fuse ampere capacity is enough to carry the electrical load required. Also, ensure that your power lines are heavy enough to carry the required electrical load. If this is being used in an industrial application or environment be sure to follow lock out/tag out requirements and procedures. Be sure to ground kiln properly. FOR ALL VOLATAGES FUSE THE KILN FOR 30 AMPS.

WHY PROPER GROUNDING IS IMPORTANT

All electrical appliances should be properly grounded. This can be to either a cold water pipe or proper system ground in your building. (NOTE: Grounding is normally provided in NEMA 14-30 type hook ups). If there is ever a short circuit (where the electricity flows through to the case or control panel and where you might touch it) you could be electrocuted if the kiln is not grounded. This is especially important with the high line voltage used on kilns. The higher the voltage the more easily it could flow through your body. In addition, because of the heat generated in a kiln, wires are subject to potential deterioration over time and expansion and contraction can move insulators and cause short circuits. BE SURE TO REPLACE ANY DETERIORATED WIRES!

THERMOCOUPLES

L&L Sells mostly Type K Chromel-Alumel thermocouples. These work by creating a slight milivoltage at the junction of the two dissimilar metals. This milivoltage varies proportionately with temperature. The thermocouple ends insert into a junction block. Into this junction block is also inserted precisely calibrated lead wire of varying lengths. The wires must touch with nothing in between and each wire must be of the correct polarity. See the Troubleshooting Guide for more information. Note that Industrial Grade thermocouples (heavier duty than the standard 14 gauge thermocouples) are available if you are experiencing frequent thermocouple burn out.

KILN WASH

Kiln wash the floor of the kiln, avoiding the bottom heating elements, and the upper sides of the shelves only. Apply the kiln wash to the thickness of a post card or 1/16th of an inch. The only purpose of kiln wash is to prevent any glaze that drips from a piece from sticking to the floor or shelves. This saves both the piece and the floor or shelves. If dripping should occur, simply remove dripping and cover the spot with new kiln wash. Kiln wash is a powder mixed with water to a light creamy consistency. Do not put kiln wash in element holders.

FIRST FIRING OF THE KILN

On the first firing of the kiln fire it empty except for shelves and posts. Fire the kiln on low for two hours to bake out any moisture. Then set to medium for two hours and then increase enough to reach final temperature. There is no need to fire the kiln to a higher temperature than you intend to use the kiln at. This first firing will bake out the brick, oxidize the elements and act as a final test of the kiln's operation before real use. Keep note of how long it takes to fire your first load under normal conditions. This will give you a benchmark to determine when the elements begin to "slow down."

AUTOMATIC CONTROL

The GQ1714 comes with a single zone DynaTrol program control. See the separate instructions for how to use this.

SPARE PARTS

If you are operating in a production environment it is imperative that you stock certain spare parts if you must prevent down time. Do not rely on L&L to be your emergency supplier. While we do our best to ship parts quickly and to keep all parts in stock we can not be responsible for your downtime. We recommend the following parts be kept on hand:

- Complete set of elements
- Power contactor
- Spare program control
- Spare thermocouple
- Several element holders
- 1/2 pint firebrick cement
- 1/2 pint grout
- 1/2 pint facing

TROUBLESHOOTING

See the separate **TROUBLESHOOTING GUIDE** included with these instructions. BE SURE TO READ THIS ALONG WITH THE SUGGESTIONS FOR IMPROVING ELEMENT LIFE. THERE ARE MANY HELPFUL POINTERS AND SUGGESTIONS.

QUESTIONS AND ANSWERS

What is so great about DynaGlow Element Holders? Why pay the extra money?

There are two incontestable reasons. One, your kiln will last much longer. We have seen L&L kilns that are 20 and even 30 years old that look and function like new kilns. The firebrick around the element grooves in our competitor's kilns is easily subject to breakage. All it takes is a kiln shelf hitting the brick near an element groove and you have a BIG problem. Bang hard on a DynaGlow element holder and nothing much happens. The other reason which is logically clear is that the wall on the DynaGlow element holder that holds the element

in is only 1/16" thick and is made of hard dense non-insulating ceramic. This transfers the heat of the element much better than the highly insulating firebrick wall (typically ¼" or more) that you will find on competitors kilns. Another great feature is that the expansion and contraction of the element coils does not kick up brick dust which can get on your precious ware. Elemet life is longer because elements stay in their hard grooves and don't droop out.

Where should I put my kiln?
Your kiln should be in a covered enclosed space. A basement or garage is usually a good location. Preferable floor should be concrete. There must be at least 18" from the walls of the kiln to any walls of the room. Keep all flammables away from the kiln. Room should be vented with either good natural ventilation or forced ventilation fan.

How far into the kiln should my thermocouples go?
We recommend about 1-1/2" in from the inside surface of the kiln. They absolutely must protrude into the kiln itself because if they are in the insulation they will measure a lower temperature than what is in the kiln and this will cause the kiln to overfire. The only other caution is that the thermocouple connection at the outside end of the thermocouple not be up against the kiln case. Aside from this the depth of insertion is a matter of personal choice. The deeper into the kiln the more interference you will have with your kiln shelves and ware but the more representative the readings on the thermocouple will be.

ELECTRICAL QUESTIONS

Do I need a separate electrical line for my kiln?
We recommend that you install your kiln on a separate line coming out of your main electrical box. It should have its own circuit breaker or fused disconnect switch.

Can I use this kiln on a typical Dryer Circuit?
Yes. The GQ 1714 was designed to be plugged into a typical 30 amp dryer circuit. These typically have a four wire 10-30R receptical. We do not use the neutral of this circuit.

The kiln is on but it won't heat up.
First check the door microswitch for adjustment. If this is not making electrical contact when the door is closed than no power will go to the elements. Read the kiln Troubleshooting Guide.

PARTS, SERVICE AND INSTRUCTIONS FOR L&L KILNS

How old is my kiln?
Look at the Serial Number. Usually the last two digits are the year in which it was made. For instance a kiln with the Serial Number 0992A would have been made in 1992.

Where can I get parts?
Parts are available direct from either your local distributor or direct from the factory. We typically ship the day after we get an order. We can ship next day air if you are in a rush. We accept Visa and Mastercard.

Why should I use L&L elements?
Replacement Elements made by L&L Kiln Mfg., Inc. are designed for each individual model for long life and superior performance. Good element design is a complex balance of watt density, design voltage, stretch ratio, wire gauge, element length and material. It takes hours and years of experience to design a good element for each model. Do not expect an outside supplier with no interest in your kiln performance or long experience with L&L kilns to spend the necessary time to do this right. In the end you will not save money.

What can I do to improve element life?
See our separate instruction sheet on element life.

My kiln is taking longer and longer to heat up. What is the problem?
Chances are the elements have aged. When elements age they increase in restistance and this reduces their power output. Look in the Troubleshooting Guide section that deals with this

My thermocouples keep burning out. What can I do to improve thermocouple life?
If you are using 14 gauge thermocouples at least upgrade to 8 gauge (these use thicker wire). However, for ultimate performance the best Type K thermocouple available is the new MI2300 Industrial Thermocouple. Click here for more information. Platinum thermocouples (which are very expensive) will not work with the Dyna-Trol Control or Truview Pyrometer System.

Is there a temporary fix for a broken thermocouple?
If the weld at the tip breaks you can try cutting the tip off and twisting the two wires together. This may get you by for a little while.

Where can I get service?
If you bought your kiln from a local distributor first check with them. We keep a binder with the names of local kiln service people that we find out about. Call us for a name and we'll see if we can help you. Check the local yellow pages. L&L kilns are designed for easy service. Most qualified electricians should be able to help with service.