

L&L EASY-FIRE AUTOMATIC KILN INSTRUCTIONS



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CAUTIONS

See the *cautions.pdf* in this section. **READ THESE CAUTIONS.** They will help protect you and your property. Not all of the cautions are obvious - even experienced operators will need to pay attention.

INSTALLATION

See the INSTALLATION section (*easy-fire-install.pdf*) in this Instruction Manual. There is important information on electrical hookup, ventilation requirements, clearances, codes, etc. You must pay attention to these issues or you could create a dangerous situation.

TEMPERATURE RATINGS

The Easy-Fire kilns are rated for use to 2350°F (1287°C) (Cone 10). **DO NOT FIRE ANY HIGHER THAN THIS.** The elements, element holders and firebrick will melt. (Although the e28T single phase unit is only rated to go to Cone 5 or 8 depending on voltage this is simply because of the lower power per square inch in that kiln; if you can get it to go above Cone 5 it won't hurt the kiln as long as you don't go above Cone 10).

PREPARATION & ASSEMBLY

See the *easy-fire-install.pdf* in the INSTALLATION section in this Instruction Manual for instructions on how to assembly your kiln.

L&L EASY-FIRE AUTOMATIC KILN INSTRUCTIONS

UNDERSTANDING THE DESIGN

BASIC CONCEPT OF THE KILN

An Easy-Fire electric kiln is an insulated polygonal heating device designed specifically for firing of ceramics. Coiled elements made of a special high temperature alloy (iron-aluminum-chrome) are mounted around the perimeter of the kiln.

SECTIONAL CONSTRUCTION

The Easy-Fire kiln is made up of two or three separate sections that sit on top of a separate kiln floor. The are attached together by their control panel and hinge.

REMOVABLE CONTROL BOX

The control panel can be easily removed and sent to factory for repairs if ever necessary.

STURDY ALUMINIZED STEEL STAND

Aluminized steel resists corrosion at the high temperatures experienced in the important stand. The stand has a full plate of aluminized steel under the bottom brick. This allows the bottom brick to move freely while expanding and contracting - which helps prevent broken bottoms.! The legs, which have two bends for stiffness, are bolted onto the stand plates. There are plastic feet that slip over the metal legs.

SOLID STAINLESS STEEL CASE

Resists corrosion and strengthens construction. Stainless steel screws are used throughout for long-term corrosion resistance.

"EASY-OPEN, EASY-LOAD" LID

The 'Easy-Open, Easy-Load' spring-assisted hinge is counterbalanced with a torsion spring which dramatically lightens the weight of the lid and makes it easy to open and close. A lighter lid also reduces lid and lip damage. A spring loaded safety latch holds the lid in place while loading. The lid, when open, is tilted away from the kiln opening allowing greater access to the interior. There are no lid supports in the way when loading your kiln. You can safely and easily load from both sides. Anyone who has tried to load a large kiln with a lot of work can fully appreciate this great feature. The hinge extends over three kiln sections and ties the kiln together for stability. All hinge parts

are aluminized or galvanized steel for corrosion resistance.

THREE CASE CLAMPS PER SECTION

The stainless steel case of each kiln section is held together by three adjustable stainless steel hose clamps. Behind the hose clamps the stainless steel case is reinforced with a piece of aluminized steel to prevent distortion. The clamps are easily accessible for adjustment. Two clamps are used on lids and bottoms.

STAINLESS CLIPS HOLD BRICK LID IN PLACE

Some manufacturers rely on the metal band around the kiln to hold the entire weight of the firebrick. L&L screws on several stainless steel clips that hold the firebrick in the band.

HEATING ELEMENTS IN CERAMIC HOLDERS

The heating elements are designed to have a low watt density (radiating watts per square inch of element surface area) and good stretch ratio (ratio of stretched length to original coiled length). These are supported in hard ceramic element holders (a unique L&L feature).

CHOICE OF 2-1/2" OR 3" OF INSULATION

The insulation is a special hand picked lightweight firebrick, which is 2-1/2" or 3" thick (depending on the model). This firebrick resists temperatures up to about 2450°F. It is highly insulating. The case temperature, when the kiln has reached final set point and the firebrick is saturated with all the heat it will absorb, can be several hundred degrees. After the heating elements are turned off the insulation will slowly loose its heat and the kiln and ware will cool down. (e28S and e28T kilns have 3" of brick as a standard feature).

LARGE DIAMETER PEEPHOLES

There is one 1" diameter peephole per section for ventilation and cone sighting. These are full diameter all the way through the firebrick, which allows greater visibility into kiln than with the tapered holes that are often used in other kilns. One ceramic peephole plug is supplied per hole.

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CONTROL SYSTEM

The Dynatrol automatic program control uses two or three separate thermocouples to sense temperature in each of the two or three zones. The control then automatically adjusts power output (turns the contactors for each zone on and off) to evenly heat up the kiln. The Dynatrol is a program control, which varies the target set point for the temperature according to various ramps and soak periods that are programmed in the control. Note that some models are programmed for single zone operation.

OPTIONAL "KISS" SOFTWARE

Software is available to provide communications between the DynaTrol and a PC. This is called KISS software. It does require some simple hardware modifications. See *kiss.pdf* for more information.

REVERSIBLE BOTTOM

The brick bottom can be easily reversed in case of a firing mishap. (Not true for kilns with powered bottoms).

KILN FURNITURE

L&L supplies ceramic kiln furniture for all our kilns. See the catalog and price sheet for details about what is included.

VENT-SURE VENT OPTION

The Vent-Sure kiln ventilation system by L&L vents harmful fumes away from a kiln to the outside. Carbonaceous materials in clay, china paints and glazes containing oils, glue from decals, and certain glazes and other miscellaneous products generate fumes. See the separate installation and operation instructions (*ventsure-instruct.pdf*) for the VENT-SURE ventilation system.

c-UL-US LISTED

All Easy-Fire kilns are c-UL-us listed. The Vent-Sure vent is listed for use with L&L Easy-Fire kilns. No. 789C. File E26330. Listed under the USL standard for Miscellaneous Heating Appliances & CNL for Canadian Standard C22.2, 122-M1989 and 88-1958. This mark is applicable in the US & Canada and is recognized the world over for its integrity.

KILN SECTIONS AND INSTRUMENT PANEL

The kiln consists of two or three separate sections and an attached element box and control panel.

REPAIRING OR REPLACING THE INSTRUMENT PANEL

The instrument panel is removable from the kiln. This is a unique L&L Kiln design feature and allows easy factory repair of your instrument panel. Disconnect power, unplug the kiln (if it has a plug), remove panel (see *easy-fire-assembly.pdf*), pack it carefully in a box with protective cushioning, and send it to L&L Kiln for inspection and/or repair. If the kiln is out of warranty there is still only a nominal charge for inspection. Repairs will be quoted before any work is done. In addition complete instrument panels can be ordered for replacement.

DYNATROL AUTOMATIC CONTROL

Please see the separate Basic DynaTrol Operation instructions (*dynatrol-basic-operation.pdf*) in the OPERATION section and the complete DynaTrol instructions in the CONTROL Section (*dynatrol-instruct.pdf*) concerning this control and its operation.

THERMOCOUPLES

The standard thermocouple used on the Easy-Fire is an 8 gauge Type K thermocouple protected with an industrial grade mullite thermocouple protection tube. These work by creating a slight millivoltage at the junction of the two dissimilar metals. This millivoltage varies proportionately with temperature. The thermocouple ends insert into a ceramic junction block.

When testing a thermocouple that has a mullite protection tube do not heat up with a torch. Heat shock could crack the mullite tube.

METALLIC THERMOCOUPLE OPTION

Note that there is also a Pyrocil metallic sheathed thermocouple option which allows you to remove the thermocouple offsets but has the disadvantage of shorter life in the high temperature ranges and metal spalling in the kiln. See *tc-protect.pdf* in the ACCESSORIES section.

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FIRST FIRING OF THE KILN

Follow the FIRST FIRING INSTRUCTIONS in the *dynatrol-basic-operation.pdf* in this OPERATION section.

SERVICE AND MAINTENANCE

REGULAR KILN MAINTENANCE

See *maintain.pdf* in the MAINTENANCE Section.
NOTE: Failure to properly maintain your kiln could lead to a dangerous condition and could lead to premature aging of the kiln (like elements burning out).

WARRANTY

Easy-Fire kilns carry a three year limited warranty. See *warranty.pdf* in the SERVICE Section.

SERVICE FOR YOUR KILN

See *service.pdf* in the SERVICE Section.

TROUBLESHOOTING

See the separate TROUBLESHOOTING SECTION.

ELECTRICAL SPECIFICATIONS

See *easy-fire-install.pdf* in the INSTALLATION section.

REPLACEMENT ELEMENTS

See *easy-fire-parts.pdf* in the PARTS Section. Also see the *troubleshoot-elements.pdf* in the TROUBLESHOOTING Section.

CRACKS IN THE TOP & BOTTOM

It is quite normal to get hairline cracks in both the top and the bottom firebricks. They are caused by the expansion and contraction of the firebrick as it heats and cools. As long as the bottom is fully supported by the stand the cracks in the bottom will not adversely affect the operation of the kiln. Note that it is possible to put another bottom under the original bottom as a second layer (this can also improve performance and heat up rate of the kiln). (this may take some work in readjusting the counterbalance attachment). It generally does not make sense to cement these hairline cracks.

SPARE PARTS

WHERE TO BUY PARTS

See *service.pdf* in the SERVICE Section.

PARTS TO KEEP ON HAND

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

- Complete set of elements
- Control fuse
- One power contactor
- Set of spare thermocouples
- Several element holders
- Brick Repair kit (See *brickrepair.pdf*)

PYROMETRIC CONES

See *troubleshoot-cones.pdf* in the TROUBLESHOOTING section.

WHERE TO LEARN MORE ABOUT CONES

Visit the Orton Website at *ortonceramics.com*. There is lots of great information on how to use cones and troubleshooting cone problems. See the Orton Cone Chart in the ORTON TIPS section. Note that the kilns tend to slow down considerably in the higher temperature ranges to 50°F to 100°F per hour.

FIRING LOG

We recommend keeping a firing log. Keep track of firing times, approximate load weight, firing temperatures and notes on results of the firing. There is a template in the OPERATION section of your instruction manual (*log.pdf*)

MORE ABOUT FIRING CERAMICS

See the sheet called *ceramic-firing.pdf* in this OPERATION section.