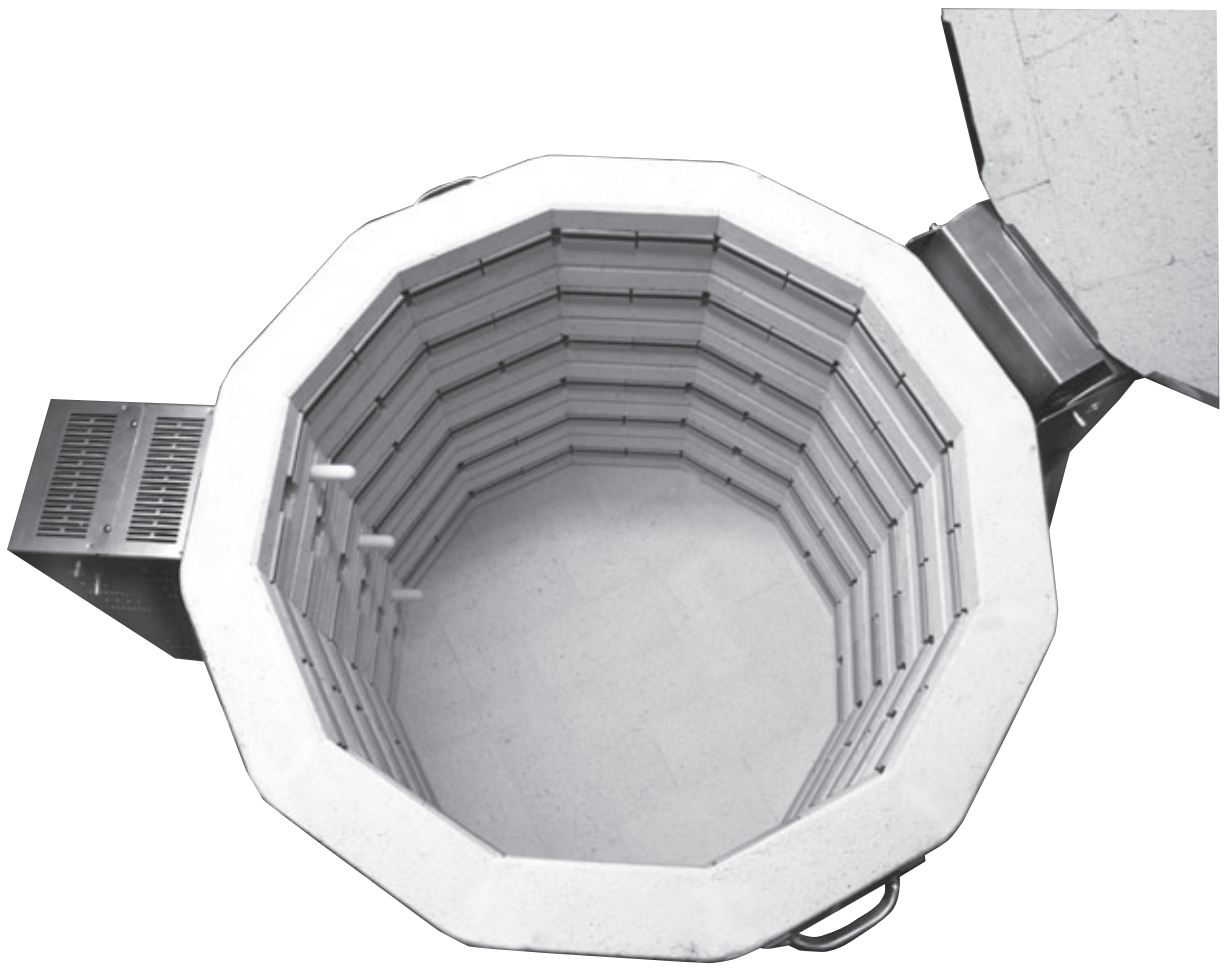


L&L SCHOOL KILN GUIDE

Note: The prices, specifications and policies in this booklet are valid until Dec 31, 2012 unless superceded by revised documents.



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



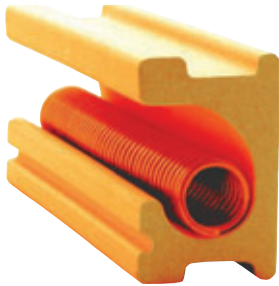
L&L Kiln's patented hard ceramic element holders protect your kiln.

Features & Benefits of L&L Kilns

L&L Kilns are unique. It just starts with the easy maintainability of the kiln.

Dyna-Glow holders enhance uniformity

L&L kilns naturally fire evenly top to bottom. The whole Dyna-Glow ceramic element holder glows with radiant heat. (See hotkilns.com/zone-control.html for test data comparing an Easy-Fire e23T to a competitive model).



Dyna-Glow holders protect elements

Reliability, durability and element life are enhanced by Dyna-Glow element holders. The smooth, hard surface of the inside channel allows the elements to expand and contract freely - unrestricted by pins - preventing catastrophic element failure. Elements won't droop out of broken firebrick channels. Also the dense ceramic Dyna-Glow holders extend element life because they do not insulate the hot elements from the kiln interior.

Holder Prevents Rim Damage

Hard ceramic holders support the brick inside the element grooves, creating a strong structure and preventing damage to the rim.



Quick-change elements

With L&L's Dyna-Glow element holders in your kiln, changing elements takes minutes, not hours. You don't need to worry about breaking brick, installing clumsy pins, or crimping element connectors. Anyone can do it with a screwdriver and a wrench.



L&L kilns are easy to troubleshoot

Open up any L&L kiln control panel and see how easy it is to check amps, element resistance, and voltage. No other kiln can be serviced as quickly, easily, or inexpensively as an L&L kiln.

Sectional construction makes repair work easy

All top-loading L&L kilns are sectional. Even the large 35 cubic foot standard DaVinci kiln is easy to move, set up, and repair.

Protected thermocouples last longer

Our standard thermocouple is shielded from corrosion by a ceramic protection tube. We use the finest "special limit" aerospace-grade heavy-gauge thermocouple wire. The protection tube also prevents black dust from the thermocouple end from discoloring your work.

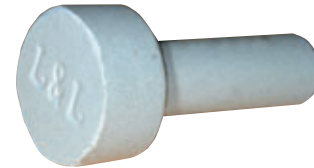


Maximum corrosion resistance

Stainless, aluminized, and galvanealed steel are used where needed. Hardware and screws are pure stainless steel.

Solid peephole plugs

Our solid straight plugs are strong. They do not slip out like tapered, fragile slip-cast plugs.



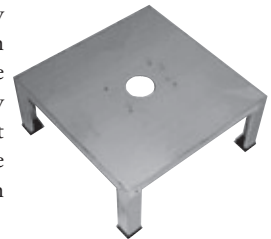
Lid brick is secured

Stainless "U" brackets secure the firebrick to the edge metal. The lid brick support does not rely on friction.



Full-support stands

L&L provides an engineered full-support 14 gauge (about 2 millimeters thick) aluminized steel stand. They are stronger than hollow frame stands and they provide important support in the center of the kiln bottom.



Proprietary Brick Coating

L&L's proprietary reflective brick coating protects the surface of the firebrick and keeps dusting down inside the kiln.



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



L&L Kiln's patented hard ceramic element holders protect your kiln.

Features & Benefits of L&L Kilns

Performance • Durability • Support • Serviceability • Safety

Our “Easy-Open, Easy-Load” lid is feather-lite yet opens wide for loading

The whole kiln supports the lid (not just one section). Our positive safety pin secures the lid so it can't accidentally fall while loading the kiln. No support bars get in the way of loading when the lid is fully tilted back.



The DynaTrol is easy and powerful

Artists have four choices of Easy-Fire programs plus six of their own. The important Delay, Preheat, and Alarm options are organized into a One-Touch “Easy Options” section on the control face.



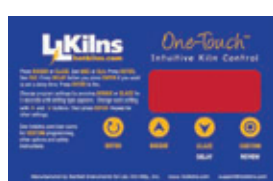
Zone control dynamically adjusts kiln

Zone control dynamically adjusts the kiln firing - maintaining evenness over time and with different loads. You can replace one element at a time without worrying about an imbalance.

Uniform even without zone control

Even on the School-Master kilns, where we do use graded elements, L&L kilns are so fundamentally uniform because of the element holders that the differential in the graded elements is much less than in competing kilns.

The One-Touch™ Control is designed for K-12 schools & hobbyists

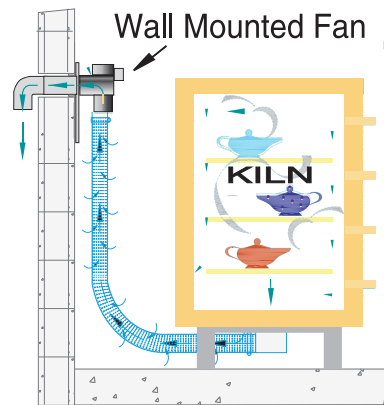


Proprietary One-Touch™ Intuitive Kiln Control is designed for busy school teachers - One touch and you are ready to fire the bisque and glaze programs typically used in schools (also easy to adjust simple parameters like cone, delay, hold, heat-up and cool-down rates).

Vent-Sure is safe, strong and adaptable

Our powerful 148 CFM downdraft Vent-Sure adapts to long installation runs. In fact you can

normally vent two kilns with one vent using our optional vent doubler. Even if the vent duct leaks, fumes will get *pulled* into the duct, not *pushed* into your room. Our Vent-Sure motors keep on working because they are mounted away from the kiln heat and floor dust. Motor vibration is isolated from your work.



Mercury-free

All L&L kilns use mercury-free relays.

On-off Switch

All L&L kilns include an industrial-grade on-off switch.

UL499 listing

Many L&L kilns, including Easy-Fire, Jupiter and DaVinci kilns, as well as our Vent-Sure vent, are c-MET-us listed to UL499 standards. Our Renaissance and Easy-Load Front-Loading kilns are MET-us listed to UL499 standards.

Support from experienced people

The staff at L&L has worked as a team for many years to ensure customer satisfaction. We support our distributors with extensive technical information so they can effectively support you.



Easy-to-use visual instructions

No one has a better or more complete instruction manual. Our visual instructions address the needs of the artist, the installer, and the repair person. You get a fully illustrated operation and service manual. Various instructional videos are available at www.youtube.com/LLKilns.

Web support for kilns

One customer recently said: “I am truly impressed with your web site, it is more than informative and your products are well designed. The fact that all the information, including repair manuals, are listed, speaks well of your dedication to customer service.”

Free 800 numbers for support

We respond quickly to your needs Monday through Friday.

Safe, fast delivery

L&L's flow manufacturing system allows us to ship built-to-order kilns quickly. Typical delivery for an Easy-Fire, School-Master kiln or Liberty-Belle kiln is about two weeks. Parts normally ship within 24 hours (often the same day). Our advanced packaging guarantees your kiln arrives in great shape.

Responsive engineering since 1945

We pride ourselves on flexibility, technical depth, and the ability to listen to customers. L&L makes more models, kiln configurations, and options than anyone. L&L kilns and custom furnaces are in continuous use by NASA, Fermi Lab, Kodak, 3M, Corning, General Motors, General Electric as well as countless art schools, universities, schools, and pottery studios worldwide. More and more people recognize the unique value of L&L kilns.

Each Kiln Series has its own special features

Each series of L&L kilns has its own special features and even, in some cases like the JH Series, its own applications. Read through the specification sheets and our product selection guides and price list to see what fits your exact needs. And don't forget - we and our fine distribution network are here to help you make the right choice. Call us!

Four-Key Control that Redefines Simplicity • Perfect for Schools & Hobbyists

One-Touch™

Intuitive Kiln Control

The new One-Touch™ Intuitive Kiln Control was designed for busy school teachers, contemporary studios, and hobbyists. One touch and you are ready to fire the bisque and glaze programs. No programming is necessary, simple adjustments are easy, yet sophisticated programming is possible.



Simplicity without Compromise

1) One-Touch: Press one of two buttons marked **BISQUE** and **GLAZE**.

- You will then see either **bISC** or **GLA**
- Press **ENTER** and the kiln fires a slow Cone 04 Bisque or a 06 Glaze.
- You can add a Delay time to the program by pressing the **DOWN** arrow when you see **FIRE** and before you press **ENTER**
- Press the **REVIEW** button to review the program. You can do this when you see the **FIRE** display or while firing

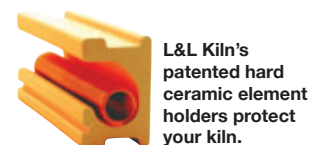
2) Simple: It is easy to change simple parameters to customize your program. When the user presses **BISQUE** or **GLAZE** and the holds the button for 5 seconds then a series of options will appear:

- **CndL** Candle at a low temperature to dry out the work – expressed in hours and minutes
- **COnE** Choose the cone that the program fires to
- **HLd** Add a soak time at the end of the firing
- **COOL** Cool the kiln – Fast, Medium or Slow for special effects or thick work
- **HEAT** Speed of firing – Fast, Medium or Slow
- **rStr** Restore the original default settings
- The **UP** and **DOWN** button will allow adjustment of these values
- The internal program ramps are transparent to the user

3) Advanced: Press **CUSTOM** and you have four regular Ramp/Soak programs open for custom programming. Each program has eight segments with a ramp, set point and hold for each segment.



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



24-Key Control with 4 Preset Ceramic Programs and 6 User Defined Programs

FEATURES

Four “Easy-Fire” Preset Firing Profiles: Make it easy to fire ceramics with Slow Bisque, Fast Bisque, Slow Glaze and Fast Glaze. All have time proven profiles for the vast majority of ceramic firing. Just enter cone number and optional delay time, soaktime, candling time and alarm. A cool-down segment can be added to an Easy-Fire program.

Six User-Defined “Vary-Fire” Profiles: This allows you to have 6 separate repeatable stored programs with up to 8 segments (cooling or heating ramps, temperature setpoint and an optional hold time per segment). The DynaTrol allows you to soak at a low temperature for a long time (i.e. you can have an automatic drying period) and then automatically ramp up to your high fire at different rates. You can ramp slowly through critical periods or soak at end point temperatures for more consistent maturing of work. It also allows for a controlled cool-down to avoid heat shock. You can link two of these profiles to make one 16 segment program.

Delay Start by up to 99 hours, 99 minutes: Allows you to plan end of firing conveniently.

Candle (low temp soak) for up to 99 hours, 99 minutes: To dry ware.

Soak at Final Set Point for up to 99 hours, 99 minutes: Soaking can dramatically improve firing results.

Thermocouple Offset: Allows you to individually bias thermocouples to adjust for thermocouple drift or kiln uniformity adjustments.

Cone Offset: Allows you to match the “Easy-Fire” cone set points to your real firing experience.

Program Review: See the entire program before or while running it.

Segment Review: Lets you review the segment you are on. Also shows you what your current set point is during the program as it is changing.

Audible Temperature Alarm: Can alert you at any point in program.

Change of Program During Firing: Make adjustments as needed.

Last Temperature Reached: Shown at end of Easy-Fire program. Also the final rate of rise is stored for diagnostics.

Thermocouple Burnout Protection: Kiln will shut down automatically if all thermocouples burn out. Kiln continues to fire if one or two thermocouples burn out.

Digital Indication: See temperature in either degrees F or C. You can scroll through all three thermocouple readings to see what each zone is doing. 14 segment display for clear messages.

Electronic Control Matches Pyrometric Cone Performance: This feature adjusts the final temperature reached in an Easy-Fire profile based on the speed of the actual firing. It results in accurate automatic control of heat-work in ceramic firing.



Number of Zones is Programmable: You can easily change the control from a three zone to a two or even single zone control. This is useful on L&L's unique sectional kilns where you can remove or add sections.

Filtering & Noise Control: Advanced electrical noise filtering.

Diagnostics: A number of diagnostic and troubleshooting systems are built into the control.

Adjustable Cycle Time: Adjustable from 200 milliseconds to 60 seconds.

Selectable Thermocouple Type: Type K and Type S are selectable.

Monitor DynaTrol from a Computer: KISS Software package, 25 foot cable and RS485/232 converter that plugs into a Windows based computer. Monitor up to 10 kilns. Download profiles, chart/graph actual firing, monitor kiln temperatures all in Windows. See hotkilns.com/kiss.pdf for more information.



Tough Kilns mean Easy Times

① Save Money Long Term.

L&L Kilns last years longer because the hard element holders protect the brick. Also we protect the electronic controls by keeping them away from the heat. Everything about the kiln is built with EXTRA materials and care. We don't cost less but you get a lot more for your money.

② Eminently Repairable.

Anyone can fix an L&L Kiln with a screwdriver and a wrench. Our unique hard ceramic element holders make changing elements something even a novice can do. Servicing an L&L control panel is a dream - it pulls down and stays perpendicular to the kiln - for easy viewing and working.

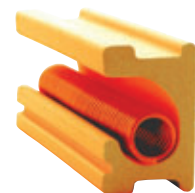
③ Fires Evenly.

Whether you get a School-Master kiln with graded elements or upgrade to the Easy-fire kilns with three-zone control - your L&L kiln will fire evenly.



L&L Kilns
hotkilns.com
Toll Free: 800-750-8350
Swedesboro, NJ 08085

L&L Kiln's
patented hard
ceramic element
holders protect
your kiln.



L&L SCHOOL KILN GUIDE

**SPECIFICATIONS
OF SCHOOL KILNS**



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



L&L Kiln's
patented hard
ceramic element
holders protect
your kiln.

School-Master

K-12 School Kilns

One-Touch Intuitive Kiln Control • 6.7 to 10.2 Cubic Feet • Cone 6



FEATURES

Temperature Rating: All models rated for Cone 6 (2280°, 1248°C) except for the SM28T-3, 208V/1 phase which is rated for Cone 5.

Loading: Lid position, when open, rests at an angle away from the kiln without lid supports so that the loading is easy and unobstructed.

Hinge: Spring loaded for “feather-lite” easy opening.

Stand: Heavy-duty 14 gauge full solid stand with multiple bends for strength. Bolt on legs. Feet protectors included.

Assembly: Three 9” high sections stack on top of each other. Easy to assemble. Bottom is reversible.

Construction: Stainless steel wrapped around brick with 3 clamps on each section. All stainless screws.

Insulation: 2-1/2” or 3” K23 firebrick depending on model.

Brick Coating: Reflective coating protects brick and reduces dusting.

Element Holders: Hard ceramic element holders protect brick.

Elements: Six heavy-duty graded elements.

Element Connections: Proprietary all-ceramic element connection block makes changing elements easy.

Control Panel: All controls and components are mounted in a hinged control panel/element connection box. A layer of insulation and separation plate helps keep the controls cool. Control box can be easily removed for servicing. On/off switch and control fuse are included.

Control: One-Touch™ Intuitive Kiln Control easily fires the bisque and glaze programs typically used in schools. It is also easy to adjust simple parameters like cone, delay, hold, heat-up and cool-down rates. Also four custom ramp/hold programs with 8 segments each.

Relays: Mercury free relays.

Thermocouples: Type K 8 gauge with ceramic protection tubes prevent metallic dusting in kiln and result in longer thermocouple life.

Peephole Plugs: Non-fragile solid ceramic with heat-locked head. 1” diameter full-view non-tapered. One per section.

Power Cord/Plug: 50 Amp NEMA 6-50 six foot cord included for one phase; 50 Amp NEMA 15-50 six foot cord included for three phase.

Instructions: Complete visual instructions with control reference, process information, assembly, troubleshooting, and parts list.

Warranty: Special Five-Year Limited Warranty. (See hotkilns.com/five-year-warranty.pdf).

UL Listing: c-MET-us listed to UL499 standards.

OPTIONS

Furniture Kits: See Dimension & Hearth Specifications.

Vent System: Vent-Sure downdraft vent (see hotkilns.com/vent.pdf)



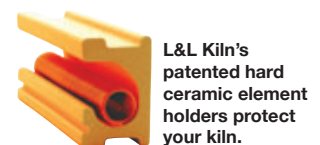
One-Touch™ Intuitive Kiln Control



The School-Master Kiln Series was designed in conjunction with the One-Touch™ Intuitive Kiln Control specifically with busy school teachers in mind. One touch and you are ready to fire the bisque and glaze programs most often used in K-12 schools. No programming is necessary, simple adjustments are easy (like cone level, heating and cooling speed, hold time and delay time), yet sophisticated programming is also possible. Together with features such as hard ceramic element holders, a protected thermocouple, and the most efficient spring hinge on the market (with full-access loading), the School-Master Kiln Series is the standard for the unique demands of the classroom.



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



L&L Kiln's patented hard ceramic element holders protect your kiln.

SCHOOL-MASTER K-12 SCHOOL KILNS

SCHOOL-MASTER K-12 SCHOOL KILNS

DIMENSION, WEIGHT & FURNITURE KIT SPECIFICATIONS

Model Number	Inside Dimensions	Cubic Feet	Brick Thick	Furniture Kit	Furn. Kit Part No.	Outside Dimensions	Shipping Dimensions (with Kit)	Ship Wght Kiln Only	Ship Wght Kiln + Kit
SM23T	23-3/8"D x 27"H	7.0	2-1/2"	(2) 21" full, (4) 21" half	H-E-K23T/00	32" W x 40" H x 45" D	44" W x 61" H x 44" D	325 lbs	420 lbs
SM23T-3	22-3/8"D x 27"H	6.7	3"	(2) 20" full, (4) 20" half	H-E-K23T/30	32" W x 40" H x 45" D	44" W x 61" H x 44" D	360 lbs	455 lbs
SM28T-3	28"D x 27"H	10.2	3"	(8) 25-1/2" half	H-E-K28T/00	40" W x 41" H x 50" D	48" W x 61" H x 44" D	460 lbs	565 lbs

Minimum Space Requirements: Differs with each model. Refer to General Dimension Diagrams of the comparable Easy-Fire kilns.

Moving and installation: This comes assembled but can be quickly disassembled and reassembled to move through any door or up stairs. It comes packed in a skidded carton with secure foam-in-place packaging.

Furniture / Accessory Kit: Shelves are higher alumina shelves. Each post kit includes six each 1/2", 1", 2" 4", 6" and 8" high 1-1/2" square cordierite posts. All furniture kits include heat-resistant gloves and 5 pounds of cone 10 kiln wash.

General Dimension Drawings: PDFs of all General Dimension drawings of the comparable e23T, e23T-3 and e28T-3 can be downloaded from each model page on our web site.



Furniture kit for a SM23T-3 kiln.



Furniture kit for a SM28T-3 kiln.

ELECTRICAL SPECIFICATIONS

Model Number	Part Number	Volt/Phase	Watts	Max Cone	Amps	Wire Size	Fuse Size
SM23T-240	K-S-2322/31	240/1P	11,520	6	48.0	6 ga	60 Amps
SM23T-240-3P	K-S-2322/32	240/3P	11,520	6	27.7	8 ga	40 Amps
SM23T-208	K-S-2322/21	208/1P	9,980	6	48.0	6 ga	60 Amps
SM23T-208-3P	K-S-2322/22	208/3P	11,000	6	30.5	8 ga	40 Amps
SM23T-3-240	K-S-2323/31	240/1P	11,520	6	48.0	6 ga	60 Amps
SM23T-3-240-3P	K-S-2323/32	240/3P	11,520	6	27.7	8 ga	40 Amps
SM23T-3-208	K-S-2323/21	208/1P	9,980	6	48.0	6 ga	60 Amps
SM23T-3-208-3P	K-S-2323/22	208/3P	11,000	6	30.5	8 ga	40 Amps
SM28T-3-240	K-S-2823/31	240/1P	11,520	6	48.0	6 ga	60 Amps
SM28T-3-240-3P	K-S-2823/32	240/3P	16,620	6	40.0	6 ga	60 Amps
SM28T-3-208	K-S-2823/21	208/1P	9,980	5	48.0	6 ga	60 Amps
SM28T-3-208-3P	K-S-2823/22	208/3P	14,340	6	39.8	6 ga	60 Amps

UL Listing: c-MET-us listed to UL499 standards.

Power connection: A six foot cord with a 50 amp NEMA 6-50 plug for single phase units or a 15-50 plug for 3 phase units is included. (No neutral is necessary). May be direct wired.

10-Sided Kilns • 4.4 to 7.0 Cubic Feet • Cone 10 • 2-1/2" & 3" Brick

FEATURES

Temperature Rating: Cone 10, 2350°F, 1290°C

Loading: Lid position, when open, rests at an angle away from the kiln without lid supports so that loading is easy.

Hinge: Spring loaded for easy opening while still allowing lid to be supported without supports that get in the way of loading.

Stand: Heavy-duty 14 gauge full solid stand with multiple bends for strength. Bolt on legs. Feet protectors included.

Assembly: Two or three 9" high sections stack on top of each other. Easy to assemble. Bottom is reversible.

Construction: Stainless steel wrapped around brick with 3 clamps on each section. All stainless screws.

Insulation: 2-1/2" or 3" K23 firebrick.

Brick Coating: Reflective coating protects brick and reduces dusting.

Element Holders: Hard ceramic element holders protect brick.

Elements: Heavy-duty. 2 elements per 9" high section.

Element Connections: Proprietary all-ceramic element connection block makes changing elements easy.

Control Panel: All controls and components are mounted in a separate control panel that is piggy-backed to the element connection box. A layer of insulation and this separation helps keep the controls cool. The control panel and element box are hinged for easy access and maintenance. Control box can be easily removed for servicing. On/off switch and control fuse are included.

Control: DynaTrol with 4 Easy-Fire programs, 6 Vary-Fire programs, PreHeat, Delay, Program & Segment Review, and Diagnostics.

Zone Control: Two or three zones with separate thermocouples.

Peephole Plugs: Non-fragile solid ceramic with heat-locked head. 1" diameter full-view non-tapered. One per section.

Thermocouples: Type K 8 gauge with ceramic protection tubes.

Relays: Mercury free relays.

Power Cord/Plug: 50 Amp NEMA 6-50 six foot cord included for one phase, 50 Amp NEMA 15-50 six foot cord included for three phase.

Instructions: Complete visual instructions with control reference, process information, assembly, troubleshooting, and parts list. In addition web videos show how to assemble the kiln and how to fire it. (<http://www.youtube.com/user/LLKilns#p/u>)

Warranty: Limited 3 year warranty. (See hotkilns.com/warranty.pdf).

UL Listing: c-MET-us listed to UL499 standards.

OPTIONS

Furniture Kits: See Dimension & Hearth Specifications.

Thermocouple Options: Type S platinum or 1/4" pyrocoil metallic sheathed (see hotkilns.com/tc.pdf).

Vent System: Vent-Sure downdraft vent (see hotkilns.com/vent.pdf)



The Easy-Fire kiln meets the needs of teachers, institutions, camps, hobbyists, potters and others who need an easy to operate, easy to set up, easy to maintain, easy to understand, and easy to buy kiln. It has L&L's robust and time-proven technology like ceramic element holders, industrial-grade element terminals, ceramic thermocouple protection tubes, heavy-duty elements, corrosion resistant materials, "Easy-Open, Easy-Load" spring hinge, removable control panel and zone control with four "Easy-Fire" programs.



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



L&L Kiln's patented hard ceramic element holders protect your kiln.

DIMENSION, WEIGHT & FURNITURE KIT SPECIFICATIONS

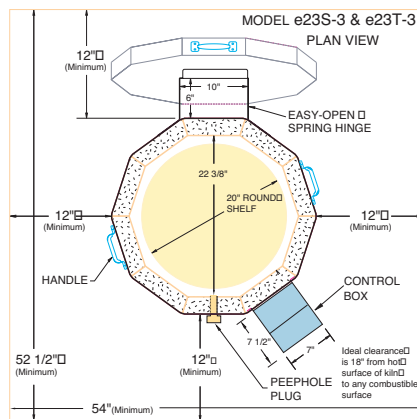
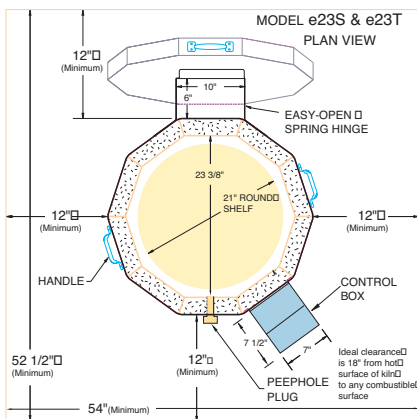
Model Number	Inside Dimensions	Cubic Feet	Brick Thick	Furniture Kit	Furn Kit Part No.	Outside Dimensions	Shipping Dimensions (w Kit)	Ship Wght Kiln Only	Ship Wght Kiln + Kit
e23S	23-3/8"D x 18"H	4.7	2-1/2"	(1) 21" full, (4) half	H-E-K23S/00	31" W x 32" H x 42" D	44" W x 55" H x 44" D	265 lbs	375 lbs
e23S-3	22-3/8"D x 18"H	4.4	3"	(1) 20" full, (4) half	H-E-K23S/30	31" W x 33" H x 42" D	44" W x 55" H x 44" D	305 lbs	400 lbs
e23T	23-3/8"D x 27"H	7.0	2-1/2"	(2) 21" full, (4) half	H-E-K23T/00	31" W x 41" H x 42" D	44" W x 60" H x 44" D	325 lbs	445 lbs
e23T-3	22-3/8"D x 27"H	6.7	3"	(2) 20" full, (4) half	H-E-K23T/30	31" W x 42" H x 42" D	44" W x 60" H x 44" D	360 lbs	480 lbs

Minimum Space Requirements: 54" wide by 52-1/2" deep.

Furniture / Accessory Kit: Shelves as listed above. Each kit also includes a post kit with six each 1/2", 1", 2" 4", 6" and 8" high 1-1/2" square cordierite posts as well as heat-resistant gloves and 5 pounds of cone 10 kiln wash.

Moving and installation: This comes assembled but can be quickly disassembled and reassembled to move through any door or up stairs. It comes packed in a skidded carton with secure foam-in-place packaging.

General Dimension Drawings: See each model page on hotkilns.com to download PDF drawings.



Furniture kit for a e23S kiln.



Furniture kit for a e23T kiln.

ELECTRICAL SPECIFICATIONS

Model Number	Part Number	Volt/Phase	Watts	Amps	Wire Size	Fuse Size
e23S-240	K-E-23SX/31	240/1P	9,460	39.4	6 ga	50 Amps
e23S-208	K-E-23SX/21	208/1P	8,320	40.0	6 ga	50 Amps
e23S-3-240	K-E-23S3/31	240/1P	9,460	39.4	6 ga	50 Amps
e23S-3-208	K-E-23S3/21	208/1P	8,320	40.0	6 ga	50 Amps
e23T-240	K-E-23TX/31	240/1P	11,520	48.0	6 ga	60 Amps
e23T-240-3P	K-E-23TX/32	240/3P	11,520	27.7	8 ga	40 Amps
e23T-208	K-E-23TX/21	208/1P	9,980	48.0	6 ga	60 Amps
e23T-208-3P	K-E-23TX/22	208/3P	11,000	30.5	8 ga	40 Amps
e23T-3-240	K-E-23T3/31	240/1P	11,520	48.0	6 ga	60 Amps
e23T-3-240-3P	K-E-23T3/32	240/3P	11,520	27.7	8 ga	40 Amps
e23T-3-208	K-E-23T3/21	208/1P	9,980	48.0	6 ga	60 Amps
e23T-3-208-3P	K-E-23T3/22	208/3P	11,000	30.5	8 ga	40 Amps

UL Listing: All models are c-MET-us listed to UL499 standard.

Power connection: A six foot cord with a 50 amp NEMA 6-50 for single phase units or a 15-50 plug for 3 phase units is included. (No neutral is necessary). May be direct wired.

12-Sided Kilns • 6.8 or 10.2 Cubic Feet • Cone 10 • 3" Brick

FEATURES

- Temperature Rating:** See Specifications - depends on volts and phase
- Loading:** Lid position, when open, rests at an angle away from the kiln without lid supports so that loading is easy.
- Hinge:** Spring loaded for easy opening while still allowing lid to be supported without supports that get in the way of loading.
- Stand:** Heavy-duty 14 gauge full solid stand with multiple bends for strength. Bolt on legs. Feet protectors included.
- Assembly:** Two or three 9" high sections stack on top of each other. Easy to assemble. Bottom is reversible.
- Construction:** Stainless steel wrapped around brick with 3 clamps on each section. All stainless screws.
- Insulation:** 3" K23 firebrick.
- Brick Coating:** Reflective coating protects brick and reduces dusting.
- Element Holders:** Hard ceramic element holders protect brick.
- Elements:** Heavy-duty. 2 elements per 9" high section.
- Element Connections:** Proprietary all-ceramic element connection block makes changing elements easy.
- Control Panel:** All controls and components are mounted in a separate control panel that is piggy-backed to the element connection box. A layer of insulation and this separation helps keep the controls cool. The control panel and element box are hinged for easy access and maintenance. Control box can be easily removed for servicing. On/off switch and control fuse are included.
- Control:** DynaTrol with 4 Easy-Fire programs, 6 Vary-Fire programs, PreHeat, Delay, Program & Segment Review, and Diagnostics.
- Zone Control:** Two or three zones with separate thermocouples.
- Peephole Plugs:** Non-fragile solid ceramic with heat-locked head. 1" diameter full-view non-tapered. One per section.
- Thermocouples:** Type K 8 gauge with ceramic protection tubes.
- Relays:** Mercury free relays.
- Power Cord/Plug:** 50 Amp NEMA 6-50 six foot cord included for one phase, 50 Amp NEMA 15-50 six foot cord included for three phase.
- Instructions:** Complete visual instructions with control reference, process information, assembly, troubleshooting, and parts list. In addition a web videos show how to assemble the kiln and how to fire it. (<http://www.youtube.com/user/LLKilns#p/u>)
- Warranty:** Limited 3 year warranty. (See hotkilns.com/warranty.pdf).
- UL Listing:** c-MET-us listed to UL499 standards.



The Easy-Fire kiln meets the needs of teachers, institutions, camps, hobbyists, potters and others who need an easy to operate, easy to set up, easy to maintain, easy to understand, and easy to buy kiln. It has L&L's robust and time-proven technology like ceramic element holders, industrial-grade element terminals, ceramic thermocouple protection tubes, heavy-duty elements, corrosion resistant materials, "Easy-Open, Easy-Load" spring hinge, removable control panel and zone control with four "Easy-Fire" programs.

OPTIONS

- Furniture Kits:** See Dimension & Hearth Specifications.
- Thermocouple Options:** Type S platinum or 1/4" pyrocoil metallic sheathed (see hotkilns.com/tc.pdf).
- Vent System:** Vent-Sure downdraft vent (see hotkilns.com/vent.pdf)



DIMENSION, WEIGHT & FURNITURE KIT SPECIFICATIONS

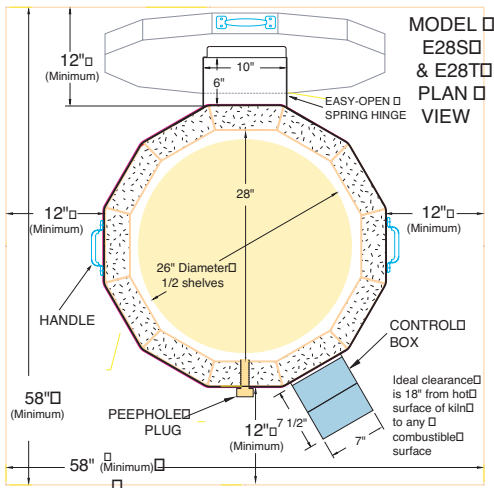
Model Number	Inside Dimensions	Cubic Feet	Brick Thick	Furniture Kit	Furn Kit Part No.	Outside Dimensions	Shipping Dimensions (w Kit)	Ship Wght Kiln Only	Ship Wght Kiln + Kit
e28S-3	28"D x 18"H	6.8	3"	(6) 25-1/2" half	H-E-K28S/00	37" W x 33" H x 48" D	48" W x 55" H x 44" D	370 lbs	495 lbs
e28T-3	28"D x 27"H	10.2	3"	(8) 25-1/2" half	H-E-K28T/00	37" W x 42" H x 48" D	48" W x 60" H x 44" D	460 lbs	610 lbs

Minimum Space Requirements: 58" wide by 58" deep.

Furniture / Accessory Kit: Shelves as listed above. Each kit also includes a post kit with six each 1/2", 1", 2" 4", 6" and 8" high 1-1/2" square cordierite posts as well as heat-resistant gloves and 5 pounds of cone 10 kiln wash.

Moving and installation: This comes assembled but can be quickly disassembled and reassembled to move through any door or up stairs. It comes packed in a skidded carton with secure foam-in-place packaging.

General Dimension Drawings: See each model page on hotkilns.com to download PDF drawings.



Furniture kit for a e28S-3 kiln.



Furniture kit for a e28T-3 kiln.

ELECTRICAL SPECIFICATIONS

Model Number	Part Number	Volt/Phase	Watts	Max Cone	Amps	Wire Size	Fuse Size
e28S-3-240	K-E-28SX/31	240/1P	11,500	10	47.9	6 ga	60 Amps
e28S-3-208	K-E-28SX/21	208/1P	9,984	10	48.0	6 ga	60 Amps
e28T-3-240	K-E-28TX/31	240/1P	11,520	8	48.0	6 ga	60 Amps
e28T-3-240-3P	K-E-28TX/32	240/3P	16,620	10	40.0	6 ga	50 Amps
e28T-3-208	K-E-28TX/21	208/1P	9,980	5	48.0	6 ga	60 Amps
e28T-3-208-3P	K-E-28TX/22	208/3P	14,340	10	39.8	6 ga	50 Amps

UL Listing: All models are c-MET-us listed to UL499 standard.

Note about high fire: If you plan to fire regularly to higher temperatures like cone 6 and you only have single phase electric it is recommended to get a Jupiter JD2927-3. That model has higher watts and amperage.

Power connection: A six foot cord with a 50 amp NEMA 6-50 for single phase units or a 15-50 plug for 3 phase units is included. (No neutral is necessary). May be direct wired.

Downdraft Vent for L&L Kilns

FEATURES

Type of Vent: Downdraft - pulls air from the bottom of a kiln to ventilate fumes from the kiln under vacuum. Vents kiln fumes to the outside. The Vent-Sure downdraft ventilation system produces better firing by promoting higher temperature uniformity in the kiln - up to a 1/2 cone improvement.

Voltage and Amperage: 120 Volts at 1.37 Amps.

On/Off Switch and Cord: Switch on six foot cord.

Blower Mounting: Blower is normally mounted on the wall with discharge through a 4" round opening. (See Options below for optional Multi-mount bracket). This keeps the heat of the kiln away from the motor (for long motor life) and keeps the motor vibration away from the kiln (which can cause ware to move, damage to the kiln, and misfiring of cones on a kiln sitter). Although the vent motor normally discharges right through the wall it is mounted on, use of 4" duct can extend this distance 60 feet (horizontally or vertically) with up to four 90 degree bends.

Duct Work: 15 Feet of 3" flexible and expandable duct is included along with necessary hose clamps. Longer lengths or lengths of 3" stove pipe can be used as well.

Capacity: The blower vents up to 148 cfm (cubic feet per minute). This will handle up to a 20 cubic foot kiln (and usually larger) or even two separate kilns. More than one vent can be attached to larger kilns.

Vent Control: A vacuum bypass on the kiln bypass/collection box adjusts the amount of venting from the system.

Application: The Vent-Sure is designed to be used on almost all our kilns, as well as other brand kilns. You can order one of our Easy-Fire kiln stands with the bypass/collection box attached to the bottom or you can attach the bypass collection box directly to the side of the kiln. (See hotkilns.com/vent.pdf).

Warranty: Limited 3 year warranty. (See hotkilns.com/warranty.pdf).

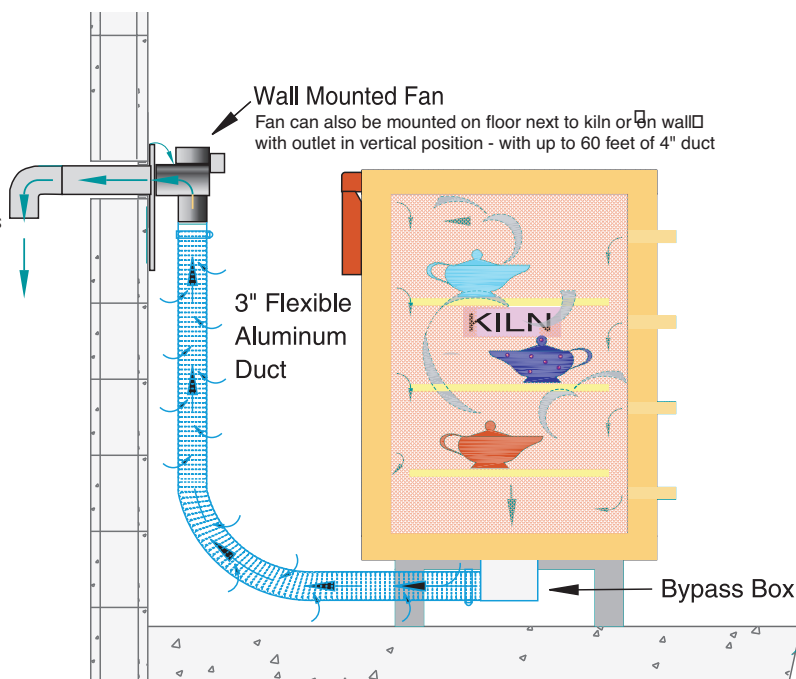
UL Listing: The Vent-Sure is c-MET-us listed to UL499 standards for use with Easy-Fire, Jupiter, JH Series, and DaVinci kilns. It is MET-us listed to UL499 standards for use with Hercules, Easy-Load, and Renaissance kilns.

OPTIONS

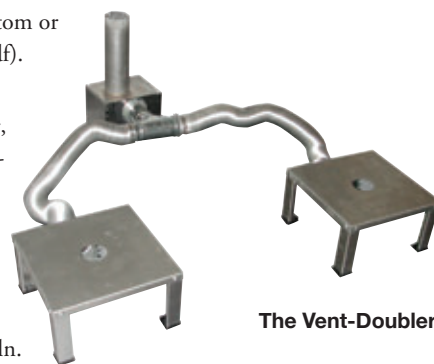
Vent Doubler: The Vent-Doubler allows you to connect two kilns to a Vent-Sure vent system. This can be added to an existing vent system or ordered with a new vent. In some cases you may be able to fire two kilns at once. The Vent-Sure has enough force to vent at least 20 cubic feet of kiln. The "T" duct fitting attaches to the inlet of the fan motor. There are two dampers on it to allow you to both control the flow and to shut off one or the other kiln. Flexible aluminum duct connects this "T" duct and the two fittings that attach to the kiln stands. M-V-VENT/DB

Multi-Mounting Bracket: An adapter to mount our motor on the floor is available for people who don't want to mount the motor on the wall. There is a 4" duct outlet that you can hook up to an existing wall opening. This can be used to mount motor on wall as well with output going into an existing ventilation system. M-V-BRKT/00

220-240 Volt Option: Motor is 220 volt. Plug to be specified.



The Vent-Sure pulls air out of the kiln and the room keeping fumes in the duct under vacuum so any leaks get pulled out instead of pushed into your room. The Vent-Sure is the worry-free, super-safe vent!



The Vent-Doubler



The Multi-Mounting Bracket

FREQUENTLY ASKED QUESTIONS

How do I know if the system is working?

The easiest way to test the operation of the vent system is to turn the unit on and to place a lit match directly over and level with one of the holes in the bottom of the kiln. The flame from the match should be gently pulled into the kiln as a result of the draft.

How hot does the duct get during the firing?

Due to the introduction of fresh air through the plenum of the vent system mixing with the hot gases being drawn from the kiln, the temperature of the duct is below 150°F. This will prevent burns from occurring in the event of the duct being touched.

How long can the duct be and with many bends?

Up to 60 feet of ducting containing four 90 degree bends may be safely used with no drop in static air flow at the duct exhaust point or a reduction in draw at the kiln. The ducting can be run either horizontally or vertically.

Do I need double wall duct when going through the roof?

You do not normally need double wall ducting when going through the roof since the pipe or duct does not reach high temperature. It is always advisable to check your local building codes for their requirements.

What type of duct do I use if I need more than 15 feet?

You can use more of the flexible aluminum dryer ducting or you can use galvanized furnace ducting. We recommend using 4" diameter galvanized duct.

Will the fumes coming through the vent damage my plants, the neighborhood pets or disturb the local environment?

No. The fumes and the gases coming from the kiln have been diluted with enough fresh air to make them safe for the environment. Do not, however, place the outlet of the vent below an open window.

Will using the vent cause my firing to take longer?

The vent system pulls only a very small amount of air out of the kiln, so very little heat is removed and firing times will change very little. For some kilns, a high firing may take a little longer. The insulation value and the number of air leaks in the kiln also determine the length of the firing. We have seen vents overpower smaller kilns - so it is important to adjust the amount of venting in some cases. On the other hand an example of an e23T seven cubic foot kiln firing an 85 pound load on Fast Glaze program to cone 8 took 7 hours and 4 minutes with a vent on and 6 hours and 24 minutes without a vent. The vent was on the whole time.

What does it cost to operate the vent system?

The vent system typically costs less than 1 cent/hour to operate (electricity costs). Vent systems save on heating and cooling costs when compared to hoods. Hoods remove massive amounts of air from the kiln room - air that may have been heated or cooled, depending on the time of year. Downdraft type vents remove 80% less air in the kiln room than a hood. (It does cost more to run the vent because it does take heat out of the kiln. For instance an e23T in the example above took 70 KW hours with a vent on and 62 KW hours without a vent. At 8 cents per KW hour that would be a cost of \$0.64. The vent was on the whole time).

Will the cold air entering the kiln damage the product?

The amount of air that is entering the kiln is so small that it does not cause problems with the ware. The top holes are placed toward the outside of the chamber area so that no air comes down directly onto ware that is placed near the top of the kiln. (L&L NOTE: This is fine but we do not normally recommend holes in the lid - a kiln is porous enough).

Will faster cooling crack the ware if I leave the vent on during the cooling Cycle?

No. Some kilns can cool an average of 4-1/2 hours faster with the use of the vent system. The cooling is faster but it is taking place at an even rate throughout the kiln avoiding uneven stresses being placed on the ware. Most ceramic ware can be cooled more quickly if the cooling takes place at an even rate. The rate of cooling increase will depend on the kiln size and the density of the load. The vent will remove more molecules of air and hence heat as the kiln cools. This is because the density of the air increases the lower in temperature you go. This is one reason why kiln vents are so efficient - they don't remove too much heat when you don't want them too at the higher temperatures).

What should I do if I still smell fumes?

You should check your duct work to make sure it is properly connected and that the joints are sealed. You can also check for extra air leaks around your kiln and repair these if necessary.

Note: These Frequently Asked Questions are provided courtesy of The Edward Orton Jr. Ceramic Foundation with some modification based on our Vent-Sure vent system and experience.



This shows several small kilns hooked up with one Vent-Sure using two Vent-Doublers. (Up to 20 cubic feet can be ventilated with one vent).

Diane Emerson switched to L&L because she needed a kiln that didn't fall apart.

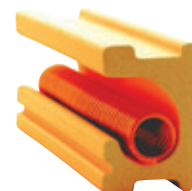


Diane Emerson has worked with clay for 30 years. Whether teaching in the Pemberton New Jersey School District or pursuing her own artistic endeavors, Diane has always been passionate about what she does. Her work is influenced by her beautiful surroundings - she uses everything from leaves and found objects to make impressions on her tiles. In school she advocates firing to Cone 05 because she can bisque and glaze at the same time. Diane supports the local ceramic community through the organization "Clay in Mind" which provides a juried ceramic show for New Jersey students showcasing the winners at the Clay Studio in Philadelphia.

Why L&L? Diane chooses an L&L JD230 because the fully opening lid allows her to easily load her large sculptures and tiles and because the durable ceramic element holders have kept her L&L kiln in like-new condition - even when loading her large pieces. She switched to L&L because of the deterioration of the element channels in her old kiln.

L&L Kilns
hotkilns.com
Toll Free: 800-750-8350
Swedesboro, NJ 08085

L&L Kiln's
patented hard
ceramic element
holders protect
your kiln.



L&L SCHOOL KILN GUIDE

PRICE LIST

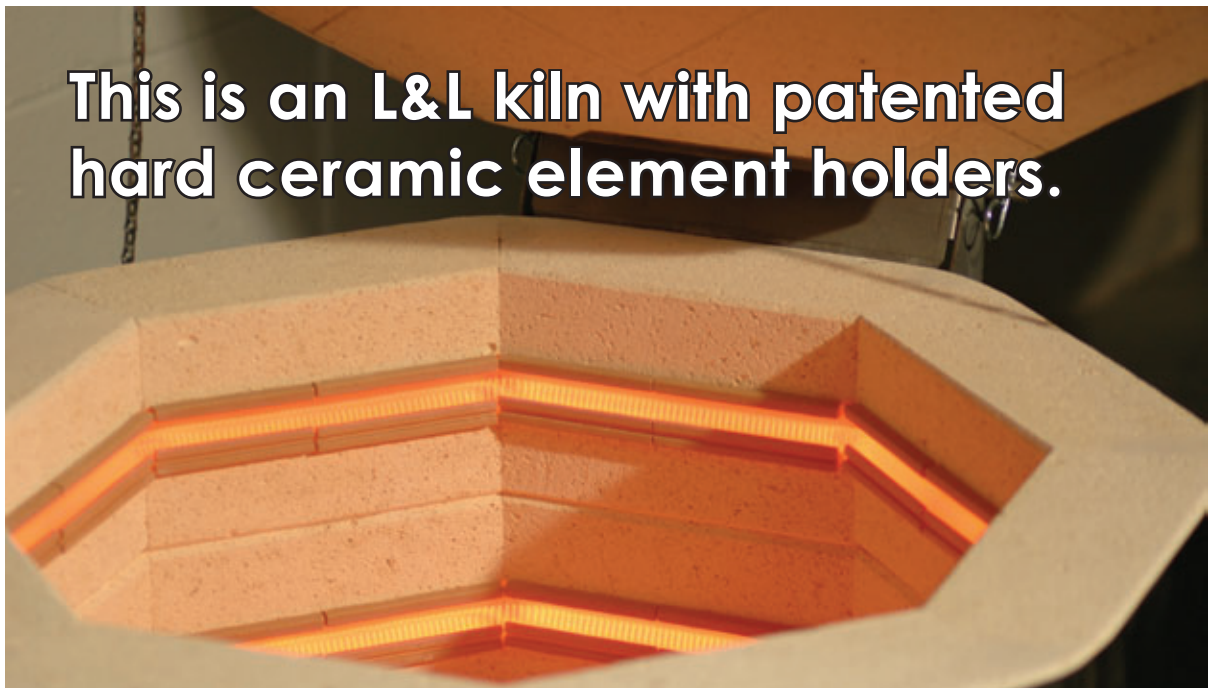
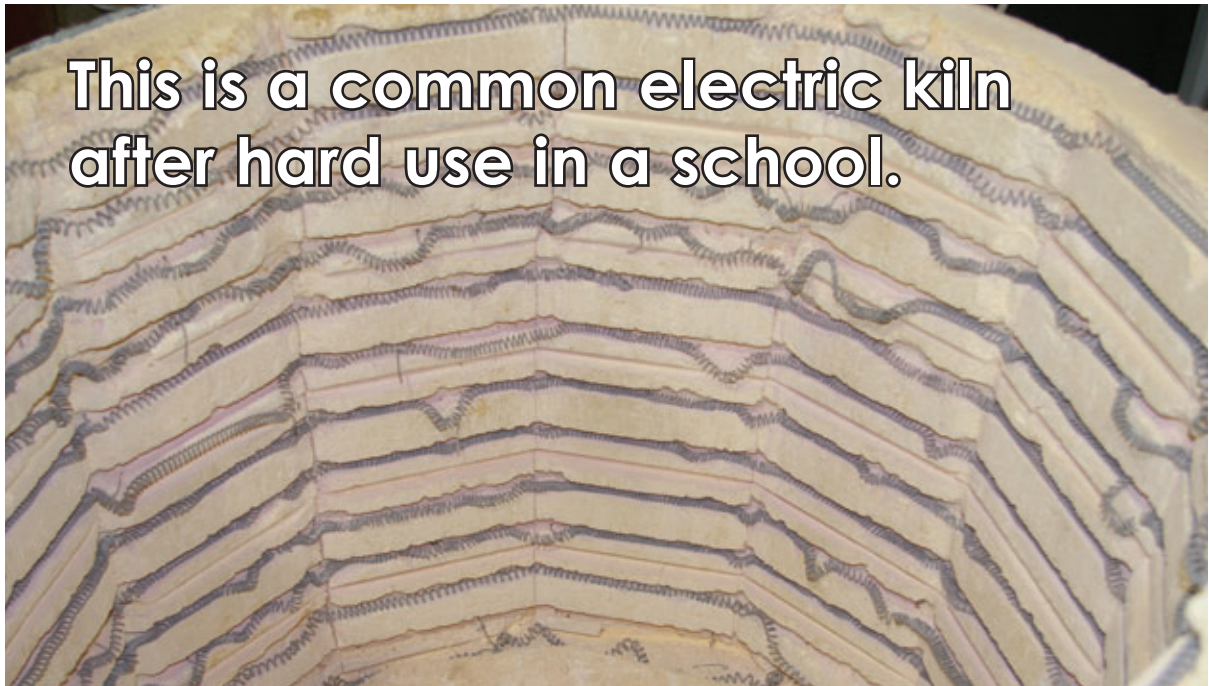


505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



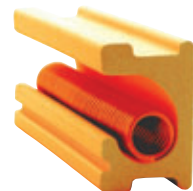
L&L Kiln's
patented hard
ceramic element
holders protect
your kiln.

INVEST IN AN L&L KILN



L&L Kilns
hotkilns.com
Toll Free: 800-750-8350
Swedesboro, NJ 08085

L&L Kiln's patented hard ceramic element holders protect your kiln.





2012 Price List and Mini-Catalog

Effective January 1, 2012 (Revised 4-30-12)

Easy-Fire Kilns with Dynamic Zone Control	Page 2
Easy-Fire XT Square Kilns with Dynamic Zone Control.....	Page 2
School Master K-12 School Kilns with One-Touch™ Control	Page 3
Hercules Medium-Sized Front-Loading Kilns with Dynamic Zone Control.....	Page 3
Jupiter Customizable Kilns with Dynamic Zone Control	Page 4
eQuad-Pro Production Kilns with Dynamic Zone Control	Page 5
JH Series Crystalline Glaze Kilns Kilns with Dynamic Zone Control.....	Page 5
Easy-Load Large Front-Loading Kilns with Dynamic Zone Control	Page 6
DaVinci Square and Rectangular Production Kilns with Dynamic Zone Control.....	Page 7
Jupiter Manual Customizable Kilns with Kiln Sitter and Manual Zone Control.....	Page 8
Dura-Fire Manual Kilns with Kiln Sitter and Hi-Medium-Low Control	Page 9
Pyrometers	Page 9
Corona PMC & Glass Kiln	Page 9
Liberty-Belle Hobby Kilns with One-Touch™ Control	Page 10
Doll/Test Kilns with Three Control Options (One-Touch™, DynaTrol or Kiln Sitter)	Page 10,11
Accessories (Vents, Misc).....	Page 11
Shelves and Posts.....	Page 12

Prices are subject to change without notice. All prices are FOB Swedesboro, NJ. All kilns ship Class 85. Shipping weights are approximate. Packaging is included in the price (except for shelves, which go by common carrier, and some export crating which will be quoted). All kilns include L&L's Standard Limited Three-Year Warranty except for the School-Master kilns, which include a special Five-Year Limited Warranty, and the Corona kilns, which include a One-Year Limited Warranty. Kilns are not returnable.

See hotkilns.com/policies for all L&L sales policies.

Orders are accepted by phone, fax or email. Accepted forms of payment are Visa, Discover, Mastercard or American Express. Wire transfer is welcome (contact office for details). Terms are available for most schools and institutions with a Purchase Order.

Toll Free: 888.683.7472

505 Sharptown Road, Swedesboro, NJ 08085

Phone: 856-294-0077 Fax: 856-294-0070 Email: sales@hotkilns.com Web: hotkilns.com

EASY-FIRE KILNS WITH DYNAMIC ZONE CONTROL

Model No.	Kiln Price	Furn Kit	Quad Elem	No. Shelves F=full, H=half	Brick Thick	Inside Diam	Inside Height	Cubic Feet	Exterior Dimensions (in)	240/1 KW~Amp~Fuse	240/3 KW~Amp~Fuse	208/1 KW~Amp~Fuse	208/3 KW~Amp~Fuse	Lbs Kiln	Lbs w/Kit
e18S	\$1750	\$295	\$175	15-1/2" (1F, 4H)	2-1/2"	17-1/2"	18"	2.6	29W x 31H x 30D	5.7~23.9~30	5.7~18.9~30	5.0~23.9~30	5.0~18.9~30	190	245
e18S-3	\$1795	\$295	\$175	15" (1F, 4H)	3"	16-1/2"	18"	2.5	29W x 32H x 30D	5.7~23.9~30	5.7~18.9~30	5.0~23.9~30	5.0~18.9~30	220	255
e18T	\$2325	\$335	\$250	15-1/2" (2F, 4H)	2-1/2"	17-1/2"	27"	3.9	29W x 40H x 30D	8.4~35.0~50	8.4~20.2~30	8.4~40.4~60	8.4~23.3~30	230	305
e18T-3	\$2395	\$335	\$250	15" (2F, 4H)	3"	16-1/2"	27"	3.7	29W x 41H x 30D	8.4~35.0~50	8.4~20.2~30	8.4~40.4~60	8.4~23.3~30	255	325
e23S	\$2350	\$335	\$200	21" (1F, 4H)	2-1/2"	23-3/8"	18"	4.7	31W x 32H x 42D	9.5~39.4~50	9.5~31.2~40	8.3~40.0~50	8.3~31.6~40	265	350
e23S-3	\$2450	\$335	\$200	20" (1F, 4H)	3"	22-3/8"	18"	4.4	31W x 33H x 42D	9.5~39.4~50	9.5~31.2~40	8.3~40.0~50	8.3~31.6~40	305	375
e23T	\$2895	\$415	\$300	21" (2F, 4H)	2-1/2"	23-3/8"	27"	7.0	31W x 41H x 42D	11.5~48.0~60	11.5~27.7~40	10.0~48.0~60	11.0~30.5~40	325	420
e23T-3	\$2995	\$415	\$300	20" (2F, 4H)	3"	22-3/8"	27"	6.7	31W x 42H x 42D	11.5~48.0~60	11.5~27.7~40	10.0~48.0~60	11.0~30.5~40	360	455
e28S-3	\$2895	\$520	\$275	25-1/2" (6H)	3"	28"	18"	6.8	37W x 33H x 48D	11.5~47.9~60	11.5~37.9~50	10.0~48.0~60	10.0~38.0~50	370	470
e28T-3	\$3425	\$635	\$400	25-1/2" (8H)	3"	28"	27"	10.2	37W x 42H x 48D	11.5~48.0~60	16.6~40.0~50	10.0~48.0~60	14.3~39.8~50	460	565

Furniture Kit: includes the shelves listed above plus six (6) each of 1/2", 1", 2", 4", 6" and 8" high square posts, plus insulated gloves for unloading, and 5 lbs of Cone 10 kiln wash. **Cone Rating:** All models are rated to Cone 10 except the e28T-3 which is rated to Cone 8 at 240V/1 Phase, Cone 5 at 208V/1 Phase and Cone 10 for any 3 phase kiln. **More:** See various Easy-Fire Specification Sheets at hotkilns.com/spec-easy-fire for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. For controls see hotkilns.com/dynatrol and hotkilns.com/zone-control.

This is the classic L&L multi-purpose kiln.



Standard Features

24-Key DynaTrol with Dynamic Zone Control (two zones for "S" models and three zones for "T" models) • Type K 8 gauge thermocouples with ceramic protection tubes • Piggy-back control panel with drop-down front panel for easy maintenance • Full support 14 gauge aluminized steel stand • Solid peephole plugs with full 1" view (no tapering) • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • "Easy-Lift, Easy-Load" stainless steel spring hinge system with full-support when door is up and tilted back (there are no support bars to get in the way of loading) (Spring hinge not available on e18S & e18T models) • Mercury-free relays • Plugs on all USA models (6-50 on single phase and 15-50 on three phase) • c-MET-us listed to UL499 standards • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Voltage & Element Options

240 or 208, 1 phase or 3 phase are all standard options. no charge
 220 volts single phase or 380 volts Wye or Delta (for non-USA installations) no charge
 Quad Element System (watts & amps do not change - elements doubled & more massive with Quad system).... See above

Control Options

Pyrocoil metal-sheathed thermocouple (instead of 8 ga TCs with ceramic protection tubes).....no charge
 Type S platinum thermocouples (2 required for 18" High "S" models, 3 required for 27" High "T" models)\$185 each
 KISS Computer Software to monitor control with USB connector for computer.....\$575

Vent System

Vent-Sure Downdraft Kiln Vent System (See page 11)\$440

EASY-FIRE XT SQUARE KILNS WITH DYNAMIC ZONE CONTROL

Model No.	Kiln Price	Furn Kit	Quad Elem	Shelves in Furniture Kit	Inside W x D	Inside Height	Cubic Feet	External Dimensions	Stand KW	240/1 Amp~Fuse	240/3 Amp~Fuse	208/1 Amp~Fuse	208/3 Amp~Fuse	Lbs Kiln	Lbs w/Kit
X2318-EZ	\$3525	\$360	\$250	(4) 20" x 10"	22" Square	18"	5.0	40W x 32H x 42D	9.5	39.4~50	34.1~40	45.5~60	39.4~50	500	550
X2327-EZ	\$3975	\$455	\$350	(6) 20" x 10"	22" Square	27"	8.1	40W x 41H x 42D	11.5	48.8~60	27.1~40	48.0~60*	32.0~40	600	665
X2818-EZ	\$4295	\$395	\$275	(4) 23" x 11-1/2"	26-1/2" Square	18"	7.8	45W x 32H x 43D	11.5	48.0~60	41.6~60	48.0~60*	48.0~60	625	695
X2827-EZ	\$5275	\$510	\$400	(6) 23" x 11-1/2"	26-1/2" Square	27"	11.7	45W x 41H x 43D	14.9	48.0~60*	41.6~60	48.0~60*	48.0~60	735	835

Furniture Kit: includes the shelves listed above plus six (6) each of 1/2", 1", 2", 4", 6" and 8" high square posts, plus insulated gloves for unloading, and 5 lbs of Cone 10 kiln wash. **Cone Rating and Special High Amperage Models:** Most models are rated to Cone 10. Most models have cords but a few require a direct hookup. *These 60 amp models are not rated to cone 10 and do not have the standard KW but most you can get with a higher amperage/KW direct-wire cone 10 version. See hotkilns.com/spec-easy-fire-xt for shipping dimensions, electrical ratings, cone rating, special higher amperage/KW models, fuse sizes and wire connection sizes. **More:** For controls see hotkilns.com/dynatrol and hotkilns.com/zone-control.



Standard Features

The Easy-Fire XT Square kilns feature a square body shape as used in our DaVinci Series • Stainless steel spring hinge as used on the Easy-fire kilns • 3" brick • Two elements per 9" section • Strong arched sides with extra space added to interior dimensions for good air circulation • Strong aluminized stands • Hinged control panel for easy maintenance mounted on the element box • Automatic 24-Key DynaTrol with Dynamic Zone control (2 zone for 18" models and 3 zone for 27" models) • Type K 8 gauge thermocouples with ceramic protection tubes • Solid peephole plugs with full 1" view (no tapering) • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • Mercury-free relays • 6-50 or 15-50 plug on most models (some are direct wired - see specification sheet) • Not listed to UL499 • Three-year Limited Warranty • Skidded Carton or Crate for Common Carrier

Voltage & Element Options

See above options for Easy-fire Kilns.

Control and Vent Options

See above options for Easy-fire Kilns.

SCHOOL-MASTER K-12 SCHOOL KILNS WITH ONE-TOUCH™ CONTROL

Model No.	Kiln Price	Furn Kit	No. of Shelves F=full, H=half	Brick Thick	Inside Diam	Inside Height	Cubic Feet	Exterior Dimensions	240/1 KW~Amp~Fuse	240/3 KW~Amp~Fuse	208/1 KW~Amp~Fuse	208/3 KW~Amp~Fuse	Lbs Kiln	Lbs w/Kit
SM23T	\$2675	\$415	21" (2F, 4H)	2-1/2"	23-3/8"	27"	7.0	31W x 41H x 42D	11.5~48.0~60	11.5~27.7~40	10.0~48.0~60	11.0~30.5~40	325	420
SM23T-3	\$2775	\$415	20" (2F, 4H)	3"	22-3/8"	27"	6.7	31W x 42H x 42D	11.5~48.0~60	11.5~27.7~40	10.0~48.0~60	11.0~30.5~40	360	455
SM28T-3	\$3200	\$635	25-1/2" (8H)	3"	28"	27"	10.2	37W x 42H x 48D	11.5~48.0~60	16.6~40.0~50	10.0~48.0~60	14.3~39.8~50	460	565

Furniture Kit: includes the shelves listed above plus six (6) each of 1/2", 1", 2", 4", 6" and 8" high square posts, plus insulated gloves for unloading, and 5 lbs of Cone 10 kiln wash. You can substitute two half shelves for one full shelf at no charge. **Cone Rating:** All models rated for Cone 6 except for the SM28T-3, 208V/1 phase which is rated for Cone 5. **More:** See hotkilns.com/spec-school-master for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. Also see hotkilns.com/spec-one-touch for more information about the One-Touch™ control. See hotkilns.com/five-year-warranty for information about the K-12 Five-Year Warranty.

Standard Features

SPECIAL FIVE-YEAR LIMITED WARRANTY. Proprietary One-Touch™ Intuitive Kiln Control is designed for busy school teachers - One touch and you are ready to fire the bisque and glaze programs typically used in schools (also easy to adjust simple parameters like cone, delay, hold, heat-up and cool-down rates). You can even create four custom ramp/hold programs. • Type K 8 gauge thermocouple with protection tube • Single zone with graded elements • Full support 14 gauge aluminized steel stand • Three solid peephole plugs with full 1" view (no tapering) • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • "Easy-Lift, Easy-Load" stainless steel spring hinge system with full-support when door is up and tilted back (there are no support bars to get in the way of loading) • Mercury-free relays • Plugs on all USA models (6-50 on single phase and 15-50 on three phase) • c-MET-us listed to UL499 standards • Skidded Carton with foam-in-place packaging for Common Carrier



For busy school teachers who want a simple control.

Voltage Options

240 or 208, 1 phase or 3 phase no charge
 220 volts single phase or 380 volts Wye or Delta (for non-USA installations) no charge

Vent System

Vent-Sure Downdraft Kiln Vent System (See page 11)\$440

HERCULES MEDIUM SIZE FRONT-LOADING KILNS WITH DYNAMIC ZONE CONTROL

Model No.	Furn Price	Kit	Inside Dimensions	Cubic Feet	Hearth Size	Shelves in Furniture Kit	Hearth Height	KW	240/1 Amp~Fuse	240/3 Amp~Fuse	208/1 Amp~Fuse	208/3 Amp~Fuse	480/3 Amp~Fuse	Lbs Kiln	Lbs w/Kit
EL2424-H	\$7800	\$360	25W x 26D x 24H	8	22" x 22"	(4) 11" x 22"	30"	15.0	63.0~80	55.0~70	73.0~90	63.0~80	28.0~40	1075	1250
EL2427-H	\$8500	\$465	25W x 26D x 27H	9	22" x 22"	(6) 11" x 22"	30"	15.0	68.8~90	39.6.0~50	79.3~100	45.7~60	19.8~25	1200	1450

Furniture Kit: includes the shelves listed above plus six (6) each of 1/2", 1", 2", 4", 6" and 8" high square posts, plus insulated gloves for unloading, and 5 lbs of Cone 10 kiln wash. **Cone Rating:** Cone 10 **More:** See hotkilns.com/spec-hercules for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. For controls see hotkilns.com/dynatrol and hotkilns.com/zone-control.



This is a great value in medium-sized front-loading kilns. Elements in the door, gasketed plug door, arched roof, door shut-off switch - all are standard at an excellent price. Now there are two sizes - a 24" high and a 27" high model.

Standard Features

Adjustable door • Plug seal with gasket • Heavy 12 gauge welded case with separate but attached stand • Leveling pads • Extra-tough K25 2500°F 4-1/2" firebrick arch • Other insulation is 3" of K23 brick with 2" of mineral wool backup insulation • Elements on door, sides and back • 24-Key DynaTrol with Dynamic Zone Control • Type K 8 gauge thermocouples with ceramic protection tubes • Control panel mounted with air space between it and the case • Branch fusing in control panel • Two solid peephole plugs with full 1" view (no tapering) in the door • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • Door power safety shut-off switch • Direct wire • Mercury-free relays • MET-us listed to UL499 standards • The kiln will fit through a 34-1/2" wide door without disassembly or removal of door • Crated with interior support and air-cushion skids. Shipping arrangements by air-ride truck are made by factory • (Fill out this installation checklist prior to ordering: hotkilns.com/shipping-front-loader-checklist.)

Voltage Options

See all control voltage options for the Easy-Load Kilns on Page 6.

Control Options

See all control options for the Easy-Load Kilns on Page 6.

Hinge Mounting

Hinge mounted on right and panel mounted on left (allow extra production time) \$800

FOR LARGER FRONT-LOADING KILNS SEE PAGE 6

JUPITER CUSTOMIZABLE KILNS WITH DYNAMIC ZONE CONTROL

Model No.	Kiln Price	Powered Bottom	Furn Kit	Quad Elem	No. of Shelves F=full, H=half	Inside Diam	Inside Height	Cubic Feet	Cone Rating	240/1 KW-Amp-Fuse	240/3 KW-Amp-Fuse	208/1 KW-Amp-Fuse	208/3 KW-Amp-Fuse	Lbs Kiln	Lbs w/Kit
JD Jupiter Automatic Kilns with 2-1/2" Brick															
JD18	\$1795	n/a	\$295	\$175	15-1/2" (1F, 4H)	17-1/2"	18"	2.6	10	5.5~23.0~30	5.5~19.9~30	5.5~26.5~30	5.5~23.0~30	200	245
JD18X	\$2495	n/a	\$335	\$250	15-1/2" (2F, 4H)	17-1/2"	27"	3.9	10	8.3~34.5~50	8.3~19.9~30	8.3~39.8~50	8.3~23.0~30	245	295
JD23V	\$2365	\$450	\$335	\$200	21" (1F, 4H)	23-3/8"	18"	4.7	5	7.0~29.3~40	7.0~25.4~40	6.1~29.3~40	6.1~25.4~40	275	350
JD230V	\$2935	\$450	\$415	\$300	21" (2F, 4H)	23-3/8"	27"	7.0	10	10.6~44.0~60	10.6~25.4~40	9.1~44.0~60	9.1~25.4~40	330	425
JD236V	\$3535	\$450	\$485	\$400	21" (3F, 4H)	23-3/8"	36"	9.4	10	14.1~58.6~80	14.1~38.1~50	12.2~58.6~80	12.2~38.1~50	360	455
JD245V	\$4135	\$450	\$560	\$500	21" (4F, 4H)	23-3/8"	45"	11.8	10	17.6~73.3~100	17.6~50.8~70	15.2~73.3~100	15.2~50.8~70	445	560

JD Jupiter Automatic Kilns with 3" brick

JD18-3	\$1845	n/a	\$295	\$175	15" (1F, 4H)	16-1/2"	18"	2.5	10	5.5~23.0~30	5.5~19.9~30	5.5~26.5~30	5.5~23.0~30	230	280
JD18X-3	\$2600	n/a	\$335	\$250	15" (2F, 4H)	16-1/2"	27"	3.7	10	8.3~34.5~50	8.3~19.9~30	8.3~39.8~50	8.3~23.0~30	270	320
JD23V-3	\$2495	\$450	\$335	\$200	20" (1F, 4H)	22-3/8"	18"	4.5	5	7.0~29.3~40	7.0~25.4~40	6.1~29.3~40	6.1~25.4~40	315	340
JD230V-3	\$3065	\$450	\$415	\$300	20" (2F, 4H)	22-3/8"	27"	6.7	10	10.6~44.0~60	10.6~25.4~40	9.1~44.0~60	9.1~25.4~40	385	470
JD236V-3	\$3695	\$450	\$485	\$400	20" (3F, 4H)	22-3/8"	36"	8.9	10	14.1~58.6~80	14.1~38.1~50	12.2~58.6~80	12.2~38.1~50	460	545
JD245V-3	\$4365	\$450	\$560	\$500	20" (4F, 4H)	22-3/8"	45"	11.1	10	17.6~73.3~100	17.6~50.8~70	15.2~73.3~100	15.2~50.8~70	540	650
JD2918-3	\$3435	\$575	\$520	\$250	25-1/2" (6H)	28"	18"	6.8	5	9.1~38.0~50	9.1~32.9~50	8.3~40.0~50	8.3~34.6~50	380	480
JD2927-3	\$4295	\$575	\$635	\$350	25-1/2" (8H)	28"	27"	10.2	10	13.7~57.0~80	13.7~32.9~50	12.5~60.0~80	12.5~34.6~50	450	575
JD2936-3	\$5460	\$575	\$755	\$475	25-1/2" (10H)	28"	36"	13.6	10	18.2~76.0~100	18.2~49.3~70	16.6~80.0~100	16.6~52.0~70	565	715
JD2945-3	\$6475	\$575	\$875	\$575	25-1/2" (12H)	28"	45"	17.0	10	22.8~95.0~125	22.8~65.8~90	20.8~100.0~125	20.8~69.3~90	645	820

Note: All the J2300 series are available with higher watts "EZ" elements (the same elements used in the e23T kilns) at no extra charge. Contact factory for details. **Furniture Kit:** includes the shelves listed above plus six (6) each of 1/2", 1", 2", 4", 6" and 8" high square posts, plus insulated gloves for unloading, and 5 lbs of Cone 10 kiln wash. You can substitute two half shelves for one full shelf at no charge. **Cone Rating:** See above chart. **More:** See various Jupiter Automatic specification sheets at hotkilns.com/spec-jd for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. For controls see hotkilns.com/dynatrol and hotkilns.com/zone-control.

Standard Features

Automatic 24-Key DynaTrol with zone control • Kiln sections plug into separate control panel • Type K 8 gauge thermocouples with ceramic protection tubes • Separate control box with plug-in sections • Full support 14 gauge aluminized steel stand • Solid peephole plugs with full 1" view (no tapering) • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • "Easy-Lift, Easy-Load" stainless steel spring hinge system with full-support when door is up and tilted back (there are no support bars to get in the way of loading) is standard on all 12 and 10 sided models (29", 28", 22" and 23" diameter), Not available on the 8 sided (17-1/2" and 16-1/2" diameter models) • Branch fusing on all models above 50 amps • 6-50 plug on JD18, JD18X, JD23, JD230 and JD230-EZ single phase models. 15-50 plug on JD18, JD18X, JD23, JD230 and JD230-EZ three phase models. All other models are direct wire • Mercury-free relays • c-MET-us listed to UL499 standards • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Voltage & Element Options

240 or 208, 1 phase or 3 phase no charge
 220 volts single phase or 380 volts Wye or Delta (for non-USA installations) no charge
 480 volts/3 phase\$650
 (needs NEMA1 panel for MET-us listing) (sections hard wired to power box)
 NEMA 1 Control box for industrial use (MET-us listed with this extra option for 480 volts).....\$650
 Quad Element System (watts & amps do not change from the standard models. For JD1800 & JD2300 elements are doubled & more massive with Quad system. For JD2900 - there are two doubled elements in four rows instead of the normal three) See above

Pull-Apart Option for Sculpture (No Charge)

"Pull-Apart" Option for sculpture. Includes floor mount stand for control panel, lift off lid with extra handles but no hinge. This option allows the entire kiln to be dismantled to make it easy to load large sculptural pieces. The kiln sections are unplugged and then taken off one at a time. There is no charge for this option. **However, If you want the "Easy-Lift, Easy-Load" spring hinge with it there is a \$200 extra charge.**

Control Options

Orton Kiln Sitter is available as safety backup to the automatic control.....\$650
 120 volt power supply with electrical noise filter for the automatic control.....\$185
 Pyrocil metallic type K thermocouples instead of 8 ga type K TCs with ceramic protection tubes no charge
 Type S platinum thermocouples (2 required for 18" kilns, 3 required for all other models).....\$185 each
 KISS Computer Software to monitor control with USB connector\$575

Vent System

Vent-Sure Downdraft Kiln Vent System (See page 11)\$440



Jupiter kilns are highly customizable, with tall heights possible (even taller than what is shown here. They are easy-to stack and disassemble because of the plug-in sections-great for sculpture.

eQUAD-PRO PRODUCTION KILNS WITH DYNAMIC ZONE CONTROL

Model No.	Kiln Price	Furn Kit	No. of Shelves F=full, H=half	Inside Diam	Inside Height	Cubic Feet	Exterior Dimensions	240/1 KW~Amp~Fuse	240/3 KW~Amp~Fuse	208/1 KW~Amp~Fuse	208/3 KW~Amp~Fuse	Lbs Kiln	Lbs w/Kit
eQ2327-3	\$3695	\$415	20" (2F, 4H)	22-3/8"	27"	6.7	31W x 42H x 42D	13.4~56.0~70	13.4~32.4~50	11.7~56.0~70	11.7~32.4~50	365	485
eQ2827-3	\$4265	\$635	25-1/2" (8H)	28"	27"	10.2	37W x 42H x 48D	15.0~62.3~80	15.0~36.0~50	15.0~71.9~90	15.0~41.5~60	480	585
eQ2836-3	\$4995	\$755	25-1/2" (10H)	28"	36"	13.6	37W x 51H x 48D	19.0~79.2~100	19.0~51.5~70	19.0~91.3~125*	19.0~59.4~80	595	725

*Note: Special model eQ2836-X-208-1P is available with 16.6 KW, 208 Volt/1 Phase, 80 amps for a 100 amp fuse. **Furniture Kit:** includes the shelves listed above plus six (6) each of 1/2", 1", 2", 4", 6" and 8" high square posts, plus insulated gloves for unloading, and 5 lbs of Cone 10 kiln wash. **Cone Rating:** Cone 10 **More:** See hotkilns.com/spec-equad-pro for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. For controls see hotkilns.com/dynatrol and hotkilns.com/zone-control.



The eQuad-Pro sets a new standard in production kilns.

Standard Features

24-Key DynaTrol with Dynamic Zone Control • 3" brick • Quad element system (four rows of super heavy gauge elements per 9" high section) • Extra power with branch fusing for high production work • Type K 8 gauge thermocouples with ceramic protection tubes • Full support 14 gauge aluminized steel stand • Solid peephole plugs with full 1" view (no tapering) • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • "Easy-Lift, Easy-Load" stainless steel spring hinge system with full-support when door is up and tilted back (there are no support bars to get in the way of loading) • Mercury-free relays • Direct wired • Not UL499 Listed • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Voltage Options

240 or 208, 1 phase or 3 phase no charge
 220 volts single phase or 380 volts Wye or Delta (for non-USA installations) no charge

Control Options

Type S platinum thermocouples (3 required if you want to maintain the 3 zone capability)\$185 each
 KISS Computer Software to monitor control with USB connector for computer.....\$575

Vent System

Vent-Sure Downdraft Kiln Vent System (See page 11)\$440

JH SERIES CRYSTALLINE GLAZE CONE 12 KILNS WITH DYNAMIC ZONE CONTROL

Model No.	Kiln Price	APM Elements	Furn Kit	No. of Shelves F=full, H=half	Inside Diam	Inside Height	Cubic Feet	240/1 KW~Amp~Fuse	240/3 KW~Amp~Fuse	208/1 KW~Amp~Fuse	208/3 KW~Amp~Fuse	Lbs Kiln	Lbs w/Kit
JD18-JH	\$2625	\$580	\$295	15-1/2" (1F, 4H)	17-1/2"	18"	2.6	8.8~36.7~60	8.8~31.7~50	8.8~42.3~60	8.8~36.8~50	255	300
e23S-JH	\$3065	\$620	\$335	21" full (1F, 4H)	23-3/8"	18"	4.7	10.5~47.9~60	n/a	10.0~48.0~60	n/a	280	365
JD230-JH	\$4860	\$930	\$415	21" full (2F, 4H)	23-3/8"	27"	7.0	13.7~57.0~80	13.7~32.9~50	12.5~60.0~80	12.5~34.7~50	400	505
JD2927-JH	\$6185	\$1050	\$635	25-1/2" (8H)	29"	27"	10.3	18.0~75.2~100	18.0~43.5~60	18.0~86.7~125	18.0~50.1~70	580	710

Furniture Kit: includes high alumina shelves listed above plus six (6) each of 1/2", 1", 2", 4", 6" and 8" high square posts, plus insulated gloves for unloading, and 5 lbs of Cone 10 kiln wash. You can substitute two half shelves for one full shelf at no charge. **Cone Rating:** Cone 12 **More:** See hotkilns.com/spec-jh for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. For controls see hotkilns.com/dynatrol and hotkilns.com/zone-control.

Standard Features

These kilns will reach 2400°F (cone 12) • Includes 2-1/2" of K25 2500°F firebrick of sides and bottom with a 3" thick top • Approximately 25% more power than the base models • Quad element holder system with super heavy-duty elements • Type S platinum thermocouples • 24-Key DynaTrol dynamic zone control • Other features that are standard on the base models • Plugs vary with model, voltage and phase. See Specification sheet • Not UL499 Listed • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Voltage Options

240 or 208, 1 phase or 3 phase no charge
 220 volts single phase or 380 volts Wye or Delta (for non-USA installations) no charge

Control Options

KISS Computer Software to monitor control with USB connector for computer..... \$575

Vent System

Vent-Sure Downdraft Kiln Vent System (See page 11) \$440

Custom Variations

We can make a large number of variations on this design - for instance to accommodate industrial processes. We can offer thicker firebrick, multi-layered insulation, many different sizes, more power and many other options too numerous to mention. Please contact the factory to discuss your requirements.



This is the "Thoroughbred" of kilns. Designed specifically for Crystalline Glaze firing - fast, responsive and precise.

EASY-LOAD LARGE FRONT-LOADING KILNS WITH DYNAMIC ZONE CONTROL

Model No.	Price	Furn Kit	Inside Dimensions	Cubic Feet	Hearth Size	Shelves in Furniture Kit	Hearth Height	KW	240/1 Amp-Fuse	240/3 Amp-Fuse	208/1 Amp-Fuse	208/3 Amp-Fuse	480/3 Amp-Fuse	Lbs Kiln	Lbs w/Kit
EL2436	\$12,500	\$725	25W x 25D x 36H	12	22" x 22"	(8) 11" x 22"	29"	19.0	80.0~100	46.0~60	92.0~125	53.0~70	24.0~30	1350	1500
EL2448	\$15,250	\$830	25W x 25D x 48H	16	22" x 22"	(10) 11" x 22"	18"	24.2	101.0~125	59.0~80	117.0~150	68.0~90	30.0~40	1500	1750
EL2848	\$16,375	\$1105	31W x 25D x 48H	20	28" x 24"	(12) 14" x 24"	18"	27.0	113.0~150	66.0~90	130.0~175	75.0~100	33.0~50	1750	2000
EL3048	\$18,950	\$1165	31W x 31D x 48H	25	28" x 28"	(12) 14" x 28"	18"	31.5	132.0~175	76.0~100	152.0~200	88.0~125	39.0~50	2000	2300

Furniture Kit: includes twelve each (two large post kits) 1/2", 1", 2", 4", 6", & 8" high 1-1/2" square ceramic posts, insulated gloves for unloading and 5 lbs of Cone 10 kiln wash. **Cone Rating:** Cone 10 **More:** See hotkilns.com/spec-easy-load for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. For controls see hotkilns.com/dynatrol and hotkilns.com/zone-control. Easy-Load kilns are only sold directly through the factory.



Big, strong, well-built - if you need a large front-loading kiln we have it. L&L has been building front-loading kilns for over 60 years.

Standard Features

Adjustable door • Massive hinge for stability of door • Plug seal with gasket • Heavy 10 gauge welded case with integrated stand • Extra-tough K25 2500°F 4-1/2" firebrick arch • Other insulation is 3" of K23 brick with 2" of mineral wool backup insulation • Elements on door, sides and back • 24-Key DynaTrol with Dynamic Zone Control • Type K 8 gauge thermocouples with ceramic protection tubes • Control panel mounted with air space between it and the case • Branch fusing in control • Three solid peephole plugs with full 1" view (no tapering) in the door • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • Door power safety shut-off switch • Direct wire • MET-us listed to UL499 standards • Crated with interior support and air-cushion skids • All the kilns except the EL3048 will go through a 34-1/2" wide by 75" high door. The EL3048 needs a minimum door size of 40-1/2" wide by 75" high. • Crated with interior support and air-cushion skids. Shipping arrangements by air-ride truck are made by factory • (Fill out this installation checklist prior to ordering: hotkilns.com/shipping-front-loader-checklist.)

Voltage Options

240 or 208, 1 phase or 3 phase are all standard options. KW does not change	no charge
220 volts single phase or 380 volts Wye or Delta (for non-USA installations)	no charge
480 volts/3 phase (needs NEMA1 panel for MET-us listing)	\$650
NEMA 1 Control box (MET-us listed with this extra option for 480 volts)	\$650

Control Options

Orton Kiln Sitter to backup to automatic control	\$650
High Limit Electronic Control latching relay (alternate to Kiln Sitter back-up)	\$650
120 volt power supply with electrical noise filter for the automatic control	\$185
Pyrocil metallic type K thermocouples instead of 8 ga type K TC with ceramic protection tubes	no charge
Type S platinum thermocouples (3 required for Easy-Load and Hercules EL2427-R, 2 for Hercules EL2424-H) price is per thermocouple.....	\$185
KISS Computer Software to monitor control with USB connector for computer.....	\$575

Vent System

Vent-Sure Downdraft Kiln Vent System (See page 11)	\$440
--	-------

Hinge Mounting

Hinge mounted on right and panel mounted on left (Special order: allow extra production time).....	\$800
--	-------

DAVINCI SQUARE & RECTANGULAR PRODUCTION KILNS WITH DYNAMIC ZONE CONTROL

Model No.	Kiln Price	Power Bottom	High Power	Furn Kit	Quad Elem	Shelves in Furn Kit	Post Kits	Inside W x D	Inside Height	Inside Cubic Feet	External Dimensions	Stand KW	High KW	240/1 Fuse	240/3 Fuse	208/1 Fuse	208/3 Fuse	Lbs Kiln	Lbs w/Kit
XB2318-D	\$4575	n/a	n/a	\$360	\$250	(4) 20" x 10"	(1)	22" Square	18"	5.0	40W x 32H x 42D	8.9	n/a	50	40	60	50	600	650
X2327-D	\$5045	n/a	\$35	\$455	\$350	(6) 20" x 10"	(1)	22" Square	27"	8.1	40W x 41H x 42D	11.7	13.4	60	40	70	40	700	765
X2336-D	\$5725	n/a	\$70	\$695	\$465	(8) 20" x 10"	(2)	22" Square	36"	10.8	40W x 50H x 42D	15.6	17.9	80	60	90	60	775	870
X2345-D	\$6345	n/a	\$95	\$785	\$575	(10) 20" x 10"	(2)	22" Square	45"	13.5	40W x 59H x 42D	19.5	22.3	100	40	125	80	875	985
XB2818-D	\$5400	\$725	n/a	\$395	\$275	(4) 23" x 11-1/2"	(1)	26-1/2" Square	18"	7.8	45W x 32H x 43D	11.6	n/a	60	60	70	60	725	795
X2827-D	\$6475	\$725	\$60	\$510	\$400	(6) 23" x 11-1/2"	(1)	26-1/2" Square	27"	11.7	45W x 41H x 43D	14.9	17.4	80	50	90	60	835	935
X2836-D	\$7250	\$725	\$95	\$785	\$525	(8) 23" x 11-1/2"	(2)	26-1/2" Square	36"	15.6	45W x 50H x 43D	19.9	23.2	100	70	125	80	935	1075
X2845-D	\$8000	\$725	\$120	\$905	\$675	(10) 23" x 11-1/2"	(2)	26-1/2" Square	45"	19.5	45W x 59H x 43D	24.9	29.0	125	90	150	100	1050	1220
XB3218-D	\$6150	\$875	n/a	\$475	\$325	(4) 28" x 14"	(1)	30-1/2" Square	18"	10.0	49W x 32H x 49D	14.2	n/a	80	70	90	80	880	985
X3227-D	\$7225	\$875	\$115	\$625	\$500	(6) 28" x 14"	(1)	30-1/2" Square	27"	15.0	49W x 41H x 49D	18.0	21.3	100	60	125	70	1000	1150
X3236-D	\$8195	\$875	\$135	\$930	\$675	(8) 28" x 14"	(2)	30-1/2" Square	36"	20.0	49W x 50H x 49D	24.4	28.4	125	80	150	100	1135	1340
X3245-D	\$9100	\$875	\$180	\$1090	\$825	(10) 28" x 14"	(2)	30-1/2" Square	45"	25.0	49W x 59H x 49D	30.5	35.5	175	125	200	125	1275	1525
TB2318-D	\$6085	\$1000	n/a	\$490	\$325	(6) 22" x 11"	(1)	26-1/2" x 34-3/4"	18"	9.7	54W x 32H x 43D	15.3	n/a	80	70	100	80	900	995
T2327-D	\$7125	\$1000	\$115	\$655	\$500	(9) 22" x 11"	(1)	26-1/2" x 34-3/4"	27"	14.6	54W x 41H x 43D	19.5	23.0	100	60	125	70	1035	1175
T2336-D	\$7850	\$1000	\$135	\$985	\$675	(12) 22" x 11"	(2)	26-1/2" x 34-3/4"	36"	19.4	54W x 50H x 43D	26.0	30.7	125	90	150	100	1165	1355
T2345-D	\$8850	\$1000	\$180	\$1140	\$825	(15) 22" x 11"	(2)	26-1/2" x 34-3/4"	45"	24.3	54W x 59H x 43D	32.5	38.4	175	125	200	125	1300	1530
TB3418-D	\$6575	\$1175	n/a	\$755	\$400	(6) 28" x 14"	(2)	30-1/2" x 43-1/2"	18"	13.8	62W x 32H x 49D	19.9	n/a	100	90	125	100	1065	1225
T3427-D	\$7695	\$1175	\$135	\$1005	\$600	(9) 28" x 14"	(2)	30-1/2" x 43-1/2"	27"	20.7	62W x 41H x 49D	24.9	36.5	125	80	150	90	1225	1455
T3436-D	\$8915	\$1175	\$180	\$1230	\$800	(12) 28" x 14"	(2)	30-1/2" x 43-1/2"	36"	27.6	62W x 50H x 49D	33.3	39.9	175	125	200	125	1475	1775
T3445-D	\$10,425	\$1175	\$205	\$1675	\$1000	(15) 28" x 14"	(3)	30-1/2" x 43-1/2"	45"	34.5	62W x 59H x 49D	41.6	49.8	200	150	225	175	1675	2050

One Large Square Post Kit: includes six each 1/2", 1", 2", 4", 6", & 8" high 1-1/2" square ceramic posts. The Number of post kits varies with model and is shown above. **Furniture Kit:** includes insulated gloves for unloading and 5 lbs of Cone 10 kiln wash. **Cone Rating:** Cone 10 **More:** See various DaVinci specification sheets at hotkilns.com/spec-davinci for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. For controls see hotkilns.com/dynatrol and hotkilns.com/zone-control.

Standard Features

Counterbalanced Lid with springs inside of tubes • Welded angle-iron stand and hinge system • 3" brick with all brick construction (including lid) • Strong arched sides with extra space added to interior dimensions for good air circulation • Solid peephole plugs with full 1" view (no tapering) • Floor mounted control panel (except for X2300 series) • Branch fusing in control panel • 24-Key DynaTrol with Dynamic Zone Control • Type K 8 gauge thermocouples with ceramic protection tubes • Control mounted in a handheld box with 4' cord • Solid peephole plugs with full 1" view (no tapering) • Hard ceramic element holders • Direct wired • Mercury-free relays • c-MET-us listed to UL499 standards • Three-year Limited Warranty • Wood Crating for Common Carrier. Depending on the model there are either two or three crates

Voltage & Element Options

240 or 208, 1 phase or 3 phase are all standard options. KW does not change.....no charge
 220 volts single phase or 380 volts Wye or Delta (for non-USA installations)no charge
 480 volts/3 phase (sections are hard wired to power box with SO cord) (needs NEMA1 panel for MET-us listing)..... \$650
 NEMA 1 Control box (MET-us listed with this extra option for 480 volts)..... \$650
 Quad Element System (watts & amps do not change - there are two doubled elements in four rows instead of the normal three).....See above

High Power Option

XB and TB elements, which have a higher KW rating, are available on the 27", 36" and 45" high DaVinci kilns. Price adder listed above (High Power column).

Control Options

Manual kiln with manual infinite zone switches and Orton Sitter/Timer instead of 24-Key DynaTrol.....no charge
 Orton Kiln Sitter to backup to automatic control \$650
 High Limit Electronic Control latching relay (alternate to Kiln Sitter back-up)..... \$650
 120 volt power supply with electrical noise filter \$185
 Pyrocil metallic type K thermocouplesno charge
 Type S platinum thermocouples..... \$185 each (2 required for 18" kilns, 3 required for all other models)
 KISS Computer Software to monitor control with USB Connector \$575

Vent System

Vent-Sure Downdraft Kiln Vent System (See page 11) \$440 (Kilns over 20 Cubic feet may need an extra vent)



This is L&L's classic production kiln. Great for Universities too.



Bell Lift Option

Available on any X3200 series or T3400 series.....\$4675 See hotkilns.com/Spec-Bell-Lift

T644754 (100 cubic feet, 66" W x 47" D x 54" H).....special quote See hotkilns.com/Spec-TB644754

JUPITER CUSTOMIZABLE KILNS WITH KILN SITTER & MANUAL ZONE CONTROL

Model No.	Kiln Price	Powered Bottom	Furn Kit	Quad Elem	No. of Shelves F=full, H=half	Inside Diam	Inside Height	Cubic Feet	Cone Rating	240/1 KW-Amp-Fuse	240/3 KW-Amp-Fuse	208/1 KW-Amp-Fuse	208/3 KW-Amp-Fuse	Lbs Kiln	Lbs w/Kit
Jupiter Manual Kilns with 2-1/2" Brick															
J18	\$1795	n/a	\$295	\$175	15-1/2" (1F, 4H)	17-1/2"	18"	2.6	10	5.5~23.0~30	5.5~19.9~30	5.5~26.5~30	5.5~23.0~30	200	245
J18X	\$2495	n/a	\$335	\$250	15-1/2" (2F, 4H)	17-1/2"	27"	3.9	10	8.3~34.5~50	8.3~19.9~30	8.3~39.8~50	8.3~23.0~30	245	295
J23V	\$2365	\$450	\$335	\$200	21" (1F, 4H)	23-3/8"	18"	4.7	5	7.0~29.3~40	7.0~25.4~40	6.1~29.3~40	6.1~25.4~40	275	350
J230V	\$2935	\$450	\$415	\$300	21" (2F, 4H)	23-3/8"	27"	7.0	10	10.6~44.0~60	10.6~25.4~40	9.1~44.0~60	9.1~25.4~40	330	425
J236V	\$3535	\$450	\$485	\$400	21" (3F, 4H)	23-3/8"	36"	9.4	10	14.1~58.6~80	14.1~38.1~50	12.2~58.6~80	12.2~38.1~50	360	455
J245V	\$4135	\$450	\$560	\$500	21" (4F, 4H)	23-3/8"	45"	11.8	10	17.6~73.3~100	17.6~50.8~70	15.2~73.3~100	15.2~50.8~70	445	560
Jupiter Manual Kilns with 3" brick															
J18-3	\$1845	n/a	\$295	\$175	15" (1F, 4H)	16-1/2"	18"	2.5	10	5.5~23.0~30	5.5~19.9~30	5.5~26.5~30	5.5~23.0~30	230	280
J18X-3	\$2600	n/a	\$335	\$250	15" (2F, 4H)	16-1/2"	27"	3.7	10	8.3~34.5~50	8.3~19.9~30	8.3~39.8~50	8.3~23.0~30	270	320
J23V-3	\$2495	\$450	\$335	\$200	20" (1F, 4H)	22-3/8"	18"	4.5	5	7.0~29.3~40	7.0~25.4~40	6.1~29.3~40	6.1~25.4~40	315	340
J230V-3	\$3065	\$450	\$415	\$300	20" (2F, 4H)	22-3/8"	27"	6.7	10	10.6~44.0~60	10.6~25.4~40	9.1~44.0~60	9.1~25.4~40	385	470
J236V-3	\$3695	\$450	\$485	\$400	20" (3F, 4H)	22-3/8"	36"	8.9	10	14.1~58.6~80	14.1~38.1~50	12.2~58.6~80	12.2~38.1~50	460	545
J245V-3	\$4365	\$450	\$560	\$500	20" (4F, 4H)	22-3/8"	45"	11.1	10	17.6~73.3~100	17.6~50.8~70	15.2~73.3~100	15.2~50.8~70	540	650
J2918-3	\$3435	\$575	\$520	\$250	25-1/2" (6H)	28"	18"	6.8	5	9.1~38.0~50	9.1~32.9~50	8.3~40.0~50	8.3~34.6~50	380	480
J2927-3	\$4295	\$575	\$635	\$350	25-1/2" (8H)	28"	27"	10.2	10	13.7~57.0~80	13.7~32.9~50	12.5~60.0~80	12.5~34.6~50	450	575
J2936-3	\$5460	\$575	\$755	\$475	25-1/2" (10H)	28"	36"	13.6	10	18.2~76.0~100	18.2~49.3~70	16.6~80.0~100	16.6~52.0~70	565	715
J2945-3	\$6475	\$575	\$875	\$575	25-1/2" (12H)	28"	45"	17.0	10	22.8~95.0~125	22.8~65.8~90	20.8~100.0~125	20.8~69.3~90	645	820

Furniture Kit: includes the shelves listed above plus six (6) each of 1/2", 1", 2", 4", 6" and 8" high square posts, plus insulated gloves for unloading, and 5 lbs of Cone 10 kiln wash. You can substitute two half shelves for one full shelf at no charge. **Cone Rating:** See chart above. **More:** See various Jupiter Manual specification sheets at hotkilns.com/spec-jupiter for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. **(CAUTION: Kiln Sitters are not as reliable as shut-off devices as digital controls. Be sure to fire these kilns attended and use witness cones and/or a pyrometer).**



This is the original L&L manual kiln with manual infinitely variable zone control.



Standard Features

Orton Kiln Sitter with Timer backup mounted in external box • Infinite Zone Switches for manual zone control of each section • Kiln sections plug into separate control panel • Full support 14 gauge aluminized steel stand • Solid peephole plugs • Hard cramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • "Easy-Lift, Easy-Load" stainless steel spring hinge system with full-support when door is up and tilted back (there are no support bars to get in the way of loading) is standard on all 12 and 10 sided models (29", 28", 22" and 23" diameter), not available on the 8 sided (17-1/2" and 16-1/2" diameter models) • Branch fusing and relays on all models above 50 amps • 6-50 plug on J18, J18X, J23, and J230 single phase models. 15-50 plug on J18, J18X, J23, and J230 three phase models. All other models are direct wire • Mercury-free relays • c-MET-us listed to UL499 standards • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Voltage & Element Options

240 or 208, 1 phase or 3 phaseno charge
 220 volts single phase or 380 volts Wye or Delta (for non-USA installations)no charge
 Quad Element System (watts & amps do not change from the standard models. For JD1800 & JD2300 elements are doubled & more massive with Quad system. For JD2900 there are two doubled elements in four rows instead of the normal three)See above

Vent System

Vent-Sure Downdraft Kiln Vent System (See page 11).....\$440

Multi-Zone Pyrometer (Tru-View) System

Varies with Number of thermocouples (See Page 11)

Blank Unheated Rings (Can be used on JD Models as well but not on Easy-Fire or Dura-Fire Kilns)

JU18	Blank Ring with no elements - 4-1/2" high for an 8 sided J18 or J18X (R-J-18BK/00)	\$285
JU18-3	Blank Ring with no elements - 4-1/2" high for an 8 sided J18-3 or J18X-3 (R-J-18BK/03)	\$325
JU23	Blank Ring with no elements - 4-1/2" high for a 10 sided J23, J230, J236 or J245 (R-J-23BK/00)	\$325
JU23-3	Blank Ring with no elements - 4-1/2" high for a 10 sided J23-3, J230-3, J236-3 or J245-3 (R-J-23BK/03)	\$335
JU29	Blank Ring with no elements - 4-1/2" high for a 12 sided J2918, J2927, J2936 or J2945 (R-J-29BK/00)	\$430
JU29-3	Blank Ring with no elements - 4-1/2" high for a 12 sided J2918-3, J2927-3, J2936-3 or J2945-3 (R-J-29BK/03)	\$475

(Note: See Jupiter Parts List on the L&L web site for prices of heated rings)

DURA-FIRE MANUAL KILNS WITH KILN SITTER & HI-MED-LOW CONTROL

Model No.	Kiln Price	Furn Kit	Quad Elem	No. of Shelves F=full, H=half	Brick Thick	Inside Diam	Inside Height	Cubic Feet	Cone Rate	External Dimension	240/1 KW-Amp-Fuse	208/1 KW-Amp-Fuse	Lbs Kiln	Lbs w/Kit
D18S	\$1600	\$295	\$175	15-1/2" (1F, 4H)	2-1/2"	17-1/2"	18"	2.6	10	29W x 31H x 30D	6.4~26.6~40	5.5~26.6~40	190	245
D18S-3	\$1650	\$295	\$175	15" (1F, 4H)	3"	16-1/2"	18"	2.5	10	29W x 31H x 30D	6.4~26.6~40	5.5~26.6~40	220	255
D18T	\$2150	\$335	\$250	15-1/2" (2F, 4H)	2-1/2"	17-1/2"	27"	3.9	10	29W x 40H x 30D	9.6~40.0~50	8.3~39.8~40	230	305
D18T-3	\$2225	\$335	\$250	15" (2F, 4H)	3"	16-1/2"	27"	3.7	10	29W x 40H x 30D	9.6~40.0~50	8.3~39.8~40	255	325
D23S	\$2075	\$335	\$200	21" (1F, 4H)	2-1/2"	23-3/8"	18"	4.7	10	31W x 32H x 42D	9.5~39.4~50	8.3~40.0~50	265	350
D23S-3	\$2175	\$335	\$200	20" (1F, 4H)	3"	22-3/8"	18"	4.5	10	31W x 33H x 42D	9.5~39.4~50	8.3~40.0~50	305	400
D23T	\$2725	\$415	\$300	21" (2F, 4H)	2-1/2"	23-3/8"	27"	7.0	10	31W x 41H x 42D	11.5~48.0~60	10.0~48.0~60	325	420
D23T-3	\$2825	\$415	\$300	20" (2F, 4H)	3"	22-3/8"	27"	6.7	10	31W x 42H x 42D	11.5~48.0~60	10.0~48.0~60	360	455
D28S-3	\$2725	\$520	\$275	26" (6H)	3"	28"	18"	6.8	10	37W x 33H x 48D	11.5~47.9~60	10.0~48.0~60	370	470
D28T-3	\$3275	\$635	\$400	26" (8H)	3"	28"	27"	10.2	5 or 8	37W x 42H x 48D	11.5~48.0~60	10.0~48.0~60	460	565

One Large Square Post kit: includes six each 1/2", 1", 2", 4", 6", & 8" high 1-1/2" square ceramic posts. The Number of post kits varies with model and is shown above. **Furniture Kit:** includes insulated gloves for unloading and 5 lbs of Cone 10 kiln wash. **Cone Rating:** All Dura-Fire kilns are rated to Cone 10 except the D28T model. 208 volt D28T reaches cone 5, 240 volt D28T reaches cone 8 **More:** See hotkilns.com/spec-dura-fire for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. **(CAUTION: Kiln Sitters are not as reliable shut-off devices as digital controls. Be sure to fire these kilns attended and use witness cones and/or a pyrometer).**



This is the most basic and durable kiln we make.

Standard Features

Orton Kiln Sitter with Timer backup mounted in external box • Hi-Medium-Low Switches for each section • Full support 14 gauge aluminized steel stand • Solid peephole plugs • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • "Easy-Lift, Easy Load" Spring Hinge is standard on the D28S & D28T, optional on the D23S & D23T and not available on the D18 & D18T models • 6-50 plugs on all USA models • Single phase only. • Mercury-free. • Not listed to UL499 • Vent-Sure is optional • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Voltage & Element Options

240 or 208, 1 phase only because of the way Kiln Sitter is wired no charge
 220 volts single phase (for non-USA installations) no charge
 Quad Element System (watts & amps do not change - elements doubled & more massive with Quad system) See above

Lid Option

Easy-Lift spring hinge option for D23S, D23S-3, D23T and D23T-3.....\$185

TRU-VIEW DIGITAL MULTI-ZONE PYROMETER SYSTEMS FOR MANUAL KILNS

Tru-View Digital Pyrometers



- P1 Single Zone Digital Pyrometer with one 8 gauge thermocouple (T-G-PC00/00) \$375
- P2 Two Zone Digital Pyrometer with two 8 gauge thermocouples (T-G-P200/000) \$465
- P3 Three Zone Digital Pyrometer with three 8 gauge thermocouples (T-G-P300/00)..... \$505
- P4 Four Zone Digital Pyrometer with four 8 gauge thermocouples (T-G-P400/00)..... \$550
- P5 Five Zone Digital Pyrometer with five 8 gauge thermocouples (T-G-P500/00) \$590
- Pyrocil metallic type K thermocouples instead of 8 ga type K TCs \$25 each

Standard Features

A highly accurate digital pyrometer is mounted in an open control box. It is connected from one to five separate type K thermocouples with a selector switch. The pyrometer operates with one 9 volt battery. NOTE: All thermocouples should be the same thickness and of similar age. **More:** See hotkilns.com/Spec-Tru-View

CORONA FRONT-LOADING PMC AND GLASS KILNS

Temperature Rating: 1100°C, 2012°F • Front loading with horizontal plug door hinged on left • Quartz window is 2-1/2" (6.4 cm) wide by x 1" (2.5 cm) high • Vent hole in top • Base with control is integrated into the kiln. Powder-coated precision sheet metal. All controls and components are mounted in a control panel that slides into the ventilated case assembly. An air space keeps controls cool. The control box can be easily removed for servicing. An On/Off switch and control fuse are included. Rubber feet are included. • 1-1/2" (3.8 cm) molded ceramic fiber with a 3/4" (1.9 cm) air space between the case and the insulation module. Door has an insulating plug that insets into the muffle opening • Side elements molded into the ceramic fiber insulation module • Orton Autofire Express Program Control with five PMC (Precious Metal Clay programs, 3 ACS (Art Clay) programs and 12 Custom Programs each with 8 segments. Each program has 8 segments with a ramp, soak and set point for each segment • Type K 14 gauge thermocouple • Not UL499 Listed • One year limited warranty. See hotkilns.com/spec-corona for additional information.



Heat up time with no load: 15 minutes to 1600°F. 30 minutes to 1900°F.
Inside Dimensions: 7-3/4" (19.7 cm) wide by 8-1/4" (20.9 cm) deep by 5-3/4" (14.6 cm) high
Outside Dimensions: 13" (33 cm) Wide by 14" (35.6 cm) Deep by 14-3/4" (37.5 cm) High
Shipping Dimensions: 16" (40.6 cm) Wide by 16" (40.6 cm) Deep by 19" (48.3 cm) High
Kiln Weight: 30 lbs (13.6 Kg), **Shipping Weight:** 35 lbs (15.9 Kg)
Electrical Specifications: 12 amps, 120 volts, 1440 watts, 6 foot cord with a 15 amp 5-15P plug
Price: \$815

LIBERTY-BELLE HOBBY KILNS WITH ONE-TOUCH™ CONTROL

Model No.	Kiln Price	Furn Kit	Quad Elem	No. of Shelves F=full, H=half	Brick Thick	Inside Diam	Inside Height	Cubic Feet	Exterior Dimensions	240V KW-Amp-Fuse	208V KW-Amp-Fuse	Ship Lbs	Lbs w/Kit
LB18	\$1585	\$215	\$175	15-1/2" (1F, 4H)	2-1/2"	17-1/2"	18"	2.6	29W x 31H x 30D	5.7~23.9~30	5.0~23.9~30	200	240
LB18-3	\$1635	\$215	\$175	15" (1F, 4H)	3"	16-1/2"	18"	2.5	29W x 32H x 30D	5.7~23.9~30	5.0~23.9~30	215	250

Furniture Kit: includes four each of 1", 2", 4" and 6" triangular posts plus one pound of Cone 10 kiln wash. You can substitute two half shelves for one full shelf at no charge. **Cone Rating:** Cone 10 **More:** See hotkilns.com/Spec-Liberty-Belle.pdf for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes. Also see hotkilns.com/Spec-One-Touch for more information about the One-Touch™ control.



Standard Features with the new One-Touch™ Intuitive Kiln Control

Proprietary One-Touch™ Intuitive Kiln Control. One touch and you are ready to fire the most common bisque and glaze programs. (also easy to adjust simple parameters like cone, delay, hold, heat-up and cool-down rates). You can even create four custom ramp/hold programs • 12 foot long cord with Nema 14-30 dryer type plug • Full support 14 gauge aluminized steel stand • Solid peephole plugs • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • Mercury-free relays • c-MET-us listed to UL499 standards • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Voltage & Element Options

240, 220 or 208 single phase are all standard options at no charge. 3 phase is not available. Quad Element System (watts & amps do not change - elements doubled & more massive with Quad system)See above

Control Options

Pyrocil metallic thermocouple instead of 8 ga thermocouple\$25

Plug & Cord Options

Standard Nema 12 foot long 14-30 plug can be changed by customer to Nema 14-50 (hardware is included to do this). Nema 6-30 plug, Nema 15-50 or 6-50, Nema 10-30 or NEMA 10-50 plug is available for prices below. A 6 foot long 6-50 plug is available at no charge. (All these plugs can be easily changed in the field if necessary.) All cords are 12 feet long.

The perfect hobby kiln and great for people who need to stay portable. The 12 foot cord plugs into your dryer outlet!

Standard	Standard	No Charge	\$65	\$65	\$65	\$65

DOLL / TEST KILNS WITH THREE CONTROL OPTIONS

Dimensions

Cubic Feet:0.5 **Inside Diameter:**11" **Inside Height:**9" **Outside Width:**19" **Outside Depth (front to back):**23"

Standard Features of Manual Doll Kiln with Orton Kiln Sitter/Timer

Orton Kiln Sitter/Timer • Infinite manual switch • 120 volt operation • Power cord • Full support 14 gauge aluminized steel stand • Solid peephole plug • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • Not UL499 listed • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Standard Features of Automatic Doll Kiln with the One-Touch™ Intuitive Kiln Control

Proprietary One-Touch™ Intuitive Kiln Control. One touch and you are ready to fire the most common bisque and glaze programs. (also easy to adjust simple parameters like cone, delay, hold, heat-up and cool-down rates). You can even create four custom ramp/hold programs • 120 volt operation (for all but the "DX" versions) • Type K 8 gauge thermocouple with ceramic protection tube • Full support 14 gauge aluminized steel stand • Solid peephole plug • Hard ceramic element holders • Proprietary reflective brick coating that protects brick and keeps dusting down • Not UL499 listed • Three-year Limited Warranty • Skidded Carton with foam-in-place packaging for Common Carrier

Standard Features of Automatic Doll Kiln with 24-Key DynaTrol Program Control

Same as the automatic with the One-Touch™ Program Control except it has the 24-Key DynaTrol (single zone version).

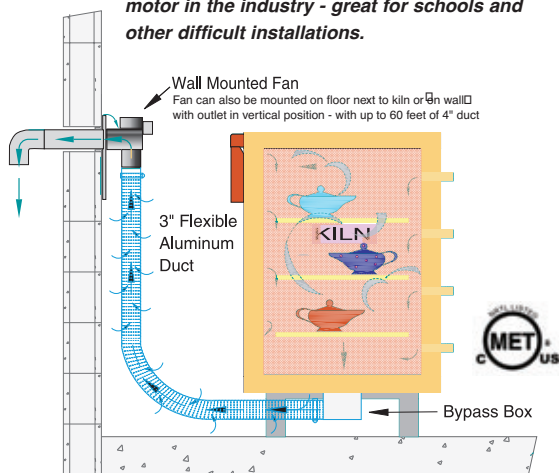


VENT-SURE DOWNDRAFT KILN VENT SYSTEM

Vent-Sure Super-Safe Downdraft Kiln Vent System

Vent-Sure Downdraft Kiln Vent System	\$440
Vent Doubler (includes all the parts necessary to vent two kilns up to 10 cubic feet each with one vent)	\$140
Bracket for mounting motor on floor or in vertical position on wall	\$25

The L&L Vent-Sure has the strongest fan motor in the industry - great for schools and other difficult installations.



Standard Features

Downdraft venting pulls air down to bottom of kiln • Improves temperature uniformity inside the kiln • Powerful 130 CFM fan motor, typically mounted on wall, allows fumes to be under vacuum in your studio • 120 volts with on/off switch on cord 220-240 volt model available at no charge) • 15 foot long flexible aluminum duct • Bypass collection box mounted on kiln allows adjustment of venting. Note that, because of the air restrictions, the vent doesn't actually pull that much air out of the kiln - just enough • The strong fan motor helps overcome static pressure in long exhaust lines • Fan motor stays cool and there is no vibration transmitted to the kiln • Three-year Limited Warranty • c-MET-us Listed to UL499 standards for use on c-MET-us L&L Kilns (Easy-fire, Jupiter & Davinci). MET-us Listed to UL499 standards on Hercules, and Easy-Load kilns. Not listed, Liberty-Belle, Dura-Fire and other brand kilns.

Which kilns you can use the Vent-Sure on?

Almost all L&L kilns will work with the L&L Vent-Sure power kiln vent system. The only exceptions are the Chameleon kilns listed in this Price List.

More information?

Specifications: See hotkilns.com/Spec-Vent-Sure
Instructions: See hotkilns.com/vent-sure-instructions

MISCELLANEOUS ACCESSORIES

Loading & Firing Accesories

Dark Viewing glasses. #3 shade (M-A-GLAS/00)	\$31
Cotton/Kevlar gloves will protect your hands from heat up to 300°F (M-A-GLOV/00)	\$22
1 lb box of Cone 10 Kiln wash (M-G-WASH/01)	\$5
5 lb Box of Cone 10 Kiln Wash (M-G-WASH/05).....	\$12

Books

What Every Potter Should Know (A 222 page book about firing ceramics) by Jeff Zamek. (B-G-WHAT/00).....	\$28
Electric Kiln Firing (A 284 page book about firing ceramics with electric kilns). By Richard Zakin. (B-G-ELCM/00).....	\$40
Mastering Cone 6 Glazes (A 168 page book about making and firing durable Cone 6 glazes) by John Hasselberth and Ron Roy. (B-G-CON6/00).....	\$40

Other

Brick Repair Kit (M-G-BKIT/00).....	\$37
-------------------------------------	------

DOLL / TEST KILNS WITH THREE CONTROL OPTIONS

Model No.	Kiln Price	Furn Kit	Control	Cone Rating	Watts	Amps	Volts	Fuse	Plug	Lbs Kiln	Lbs w/Kit
DL11	\$1125	\$150	Orton Sitter/Timer	5	1800	15	120	20	5-15R	110	130
DLH11	\$1125	\$150	Orton Sitter/Timer	10	2160	18	120	25	5-20R	110	130
DL11-DB	\$1085	\$150	One-Touch™ Control	5	1800	15	120	20	5-15R	110	130
DLH11-DB	\$1085	\$150	One-Touch™ Control	10	2160	18	120	25	5-20R	110	130
DLH11-DXB-240	\$1085	\$150	One-Touch™ Control	10	2800	11.7	240	15	14-30R	110	130
DLH11-DXB-208	\$1085	\$150	One-Touch™ Control	10	2800	13.5	208	20	14-30R	110	130
DL11-D	\$1215	\$150	24-Key DynaTrol Control	5	1800	15	120	20	5-15R	110	130
DLH11-D	\$1215	\$150	24-Key DynaTrol Control	10	2160	18	120	25	5-20R	110	130
DLH11-DX	\$1215	\$150	24-Key DynaTrol Control	10	2800	11.7	240	15	14-30R	110	130
DLH11-DX	\$1215	\$150	24-Key DynaTrol Control	10	2800	13.5	208	20	14-30R	110	130

Furniture Kit: includes two 9" diameter full shelves, one 9" diameter half shelf, four each of 1/2", 1", 1-1/2", 2", 2-1/2", 3" and 4" triangular posts plus one pound of Cone 10 kiln wash. You can substitute two half shelves for one full shelf at no charge. **Cone Rating:** See chart above. **More:** See hotkilns.com/Spec-Doll for additional information like shipping dimensions, electrical ratings, fuse sizes and wire connection sizes.

NOTE: The 240 or 208 volt versions are highly recommende for high fire applications.

KILN SHELVES

SHELF MATERIAL AND RATING: All shelves that are 15" in diameter and above are currently made of a *press-molded (not cast) high alumina* cordierite body that holds up to Cone 11 firing with little warpage. This is particularly important for these larger shelves.

ROUND & POLYGONAL SHELVES

Shelves for 11" Diameter Kilns

For Doll/Test Kilns

Full Round 9" diameter shelf (7/16" thick) (H-D-9000/00)	\$26.00
Half Round 9" diameter shelf (7/16" thick) (H-D-9050/00)	\$15.50

Shelves for 14" Diameter Kilns

For J14 Kilns

Full Round 13" diameter (1/2" thick) (H-J-1300/00)	\$31.00
Half Round 13" diameter (1/2" thick) (H-J-1350/00)	\$18.50

Shelves for 16-1/2" Diameter Kilns

For LB18-3, e18S-3 & e18T-3, and J18-3 kilns with 3" brick

Full Round 15" diameter (5/8" thick) (H-J-150A/00)	\$38.00
Half Round 15" diameter (5/8" thick) (H-J-155A/00)	\$22.50

Shelves for 17-1/2" Diameter Kilns

For LB18, e18S & T, and J18 kilns with 2-1/2" brick

Full Octagonal 15-1/2" diameter (5/8" thick) (H-J-1500/00)	\$38.00
Half Octagonal 15-1/2" diameter (5/8" thick) (H-J-1550/00)	\$22.50

Shelves for 22" Diameter Kilns

For e23S-3, e23T-3, SM23T-3, & J2300-3 kilns with 3" brick

Full Round 20" diameter (3/4" thick) (H-J-2000/00)	\$75.00
Half Round 20" diameter (3/4" thick) (H-J-2050/00)	\$37.00

Shelves for 23" Diameter Kilns

For e23S, e23T, SM23T & J2300 kilns with 2-1/2" brick

Full Round 21" diameter (3/4" thick) (H-J-2100/00)	\$76.00
Half Round 21" diameter (3/4" thick) (H-J-2150/00)	\$38.00

Shelves for 28" & 29" Diameter Kilns

For e28S, e28T, SM28T, J2900 Series with 2-1/2" or 3" brick

Half Round 25-1/2" diameter (3/4" thick) (H-J-2650/00)	\$62.50
--	---------

SQUARE & RECTANGULAR SHELVES

Shelves for Small Front-Loading Kilns

For E48, E49, R490

6" x 8" rectangular (5/8" thick) (H-R-6800/00)	\$31.00
--	---------

Shelves for 17" Square Kilns

For SQ1818, SQ1827, X1800 Series, EL1824, EL3648

8" x 16" rectangular (5/8" thick) (H-S-1608/00)	\$33.00
16" x 16" square (3/4" thick) (H-S-1616/00)	\$63.00

Shelves for 22" Square Kilns

For X2300 Series

20" x 10" rectangular (5/8" thick) (H-X-2010/00)	\$45.50
--	---------

Shelves for 26" Square Kilns

For X2800 Series and X2800-XT Series kilns

23" x 11-1/2" rectangular (3/4" thick) (H-X-2311/00)	\$57.00
--	---------

Shelves for 26" x 35" Rectangular Kilns and 24" square Front-Loaders

For T2300 Series, T2300-XT Series, EL2424-H, EL2427-H, EL2436 & EL2448

22" x 11" rectangular (3/4" thick) (H-X-2211/00)	\$53.00
--	---------

Shelves for 30" x 28" Front Loader Kilns

For EL2848

24" x 14" rectangular (3/4" thick) (H-J-2414/00)	\$66.00
--	---------

Shelves for 30" Square, & 30" x 43" Rectangular Kilns

For X3200 Series, T3400 Series & EL3048

28" x 14" rectangular (3/4" thick) (H-J-2814/00)	\$72.00
--	---------

KILN POSTS

POST KITS

Large Square Post Kit (C-G-SPKT/EZ)	\$150.00
(Six each 1/2", 1", 2", 4", 6" & 8" square posts)	

Small Square Post Kit (C-G-SPKT/SM)	\$99.00
(Four each 1/2", 1", 2", 4", 6" & 8" square posts)	

Doll-Baby Post Kit (C-G-TPKT/DB)	\$62.00
(Four each of 1/2", 1", 1-1/2", 2", 2-1/2", 3" and 4" triangular posts)	

Liberty-Belle Post Kit (C-G-TPKT/LB)	\$42.00
(Four each 1", 2", 4" & 6" triangular posts)	

Large Triangular Post Kit (C-G-TPKT/O1)	\$121.00
(Six each 1/2", 1", 1-1/2", 2", 2-1/2", 3", 4", 5" & 6" triangular posts)	

Small Triangular Post Kit (C-G-TPKT/O0)	\$66.00
(Four each 1", 2", 3", 4", 5" & 6" triangular posts)	

FREIGHT FOR SHELVES AND FURNITURE KITS: Depending on the quantity and size of shelves, posts and furniture kit(s) ordered, the order may have to ship by common carrier freight. If so a skid/carton charge of \$40 will apply.

L&L sells the highest grade posts on the market. They are very straight (even in lengths up to 12" long), precision cut for squareness and are strong without being excessively thick.

TRIANGULAR POSTS (1" Triangular)

1/2"	Triangular Post (C-G-T005/00)	\$1.90
1"	Triangular Post (C-G-T010/00)	\$1.95
1-1/2"	Triangular Post (C-G-T015/00)	\$2.00
2"	Triangular Post (C-G-T020/00)	\$2.20
2-1/2"	Triangular Post (C-G-T025/00)	\$2.25
3"	Triangular Post (C-G-T030/00)	\$2.40
4"	Triangular Post (C-G-T040/00)	\$2.85
5"	Triangular Post (C-G-T050/00)	\$3.20
6"	Triangular Post (C-G-T060/00)	\$3.85
7"	Triangular Post (C-G-T070/00)	\$4.50
8"	Triangular Post (C-G-T080/00)	\$4.80
10"	Triangular Post (C-G-T100/00)	\$5.85
12"	Triangular Post (C-G-T120/00)	\$6.40

SQUARE POSTS (1-1/2" Square)

1/2"	Square Post (C-G-S005/00)	\$2.45
1"	Square Post (C-G-S010/00)	\$3.20
2"	Square Post (C-G-S020/00)	\$3.80
4"	Square Post (C-G-S040/00)	\$4.15
6"	Square Post (C-G-S060/00)	\$5.20
8"	Square Post (C-G-S080/00)	\$6.20
10"	Square Post (C-G-S100/00)	\$7.85
12"	Square Post (C-G-S120/00)	\$9.55

L&L SCHOOL KILN GUIDE

**SUPPORT AND
INSTALLATION**



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



L&L Kiln's
patented hard
ceramic element
holders protect
your kiln.

“The instruction manual alone is an education”

John Mathews, Ceramic Arts High School Teacher



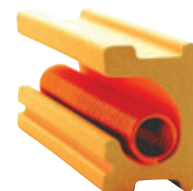
For over 15 years John Matthews has taught advanced ceramics, including wheel throwing, large sculptural clay work, and a variety of hand built techniques, at Conestoga High School in Berwyn PA. Ceramic classes are taught 8 periods a day, 5 days a week with about 22 students each with two other teachers. They fire all of this work in an L&L Jupiter JD230 and an L&L DaVinci X3227. Conestoga has always used L&L kilns – going back over 30 years. Why? They hold up to the heavy use of this ambitious program.

This is one of the most successful ceramic arts clay programs in the United States on a high school level. Many former students have gone onto artistic careers. A partial list of alumni includes Liz Bryant ('93), Nick Bonner ('73), Michael Connelly ('90), Ginger Cox ('71), Paul Donnelly ('92), David East ('85), Eric Eley ('95), Rich Holck ('95), Robert Howard ('76), Mark Lueders ('87), Malcom Mobutu-Smith ('88), Chris Staley ('73) and Jeffery Warnock ('94).



L&L Kilns
hotkilns.com
Toll Free: 800-750-8350
Swedesboro, NJ 08085

L&L Kiln's
patented hard
ceramic element
holders protect
your kiln.



Technical Resources

Hotkilns.com features Videos, Knowledgebase, FAQs & Specifications

Start Up Support

See the various videos at www.hotkilns.com/videos. This is the place to look! Also read the start up instructions in this manual or on-line.

Ordering Parts

See the parts list at www.hotkilns.com/parts. Select by Kiln Series and Category or search by name or part number. See www.hotkilns.com/policies for information on ordering parts, which credit cards we accept, how we ship, etc. It's all there.

Troubleshooting

Go to www.hotkilns.com/knowledgebase for a fantastic knowledgebase of kiln issues and answers. Go to www.hotkilns.com/actions to see how to do various things like change elements. In addition you will find videos on how to change elements and other components at www.hotkilns.com/videos.

Tech Support

Go to www.hotkilns.com/technical-support-form and request help.

MSDS Sheets

Go to www.hotkilns.com/pdf and search by MSDS Category

Complete Instruction Manuals and more

Go to www.hotkilns.com/pdf and select by Kiln Series (for instance Easy-Fire). You can download every PDF that pertains to your kiln. You can find information on the Ceramic Process, Cones, Firing Tips, etc.



Technical Resources

Technical Resources



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



L&L Kiln's patented hard ceramic element holders protect your kiln.

STANDARD LIMITED THREE YEAR WARRANTY FOR L&L KILNS

THREE YEAR LIMITED KILN WARRANTY

L&L Kilns are warranted to be free of defects in workmanship for a period of three (3) years, starting on the date of original purchase from L&L Kiln Mfg., Inc. (L&L) or from an authorized L&L distributor or dealer, subject to the following terms and conditions, including but not limited to, the exclusions and limitations set forth herein.

- 1) A sales receipt is required for proof of purchase.
- 2) In addition, L&L may require you to deliver defective parts to L&L for examination to determine the applicability of these warranty provisions. **DO NOT DISCARD PARTS BEFORE CONTACTING L&L FOR INSTRUCTIONS. FAILURE TO ADHERE TO L&L'S INSTRUCTIONS, INCLUDING THOSE CONTAINED IN THE INSTRUCTION MANUAL AND AS STATED HEREIN, WILL VOID THIS WARRANTY.**
- 3) L&L will replace or repair any defective part that is covered by this warranty and sent freight-prepaid to L&L. L&L will prepay return shipping cost without charge in the Continental United States.
- 4) On-site labor is not part of this warranty and is not covered by L&L. Any warranty labor provided by Dealers and Distributors is provided at their own discretion and expense.

APPLICATION

Applies to Easy-Fire, Easy-Fire XT, Dura-Fire, Jupiter, DaVinci, Easy-Load, Doll/Test, JH Series, Quad-Pro kilns, Chameleon, Robin, Fuego and Liberty-Belle kilns when used for non-industrial ceramics and glass.

EXCLUSIONS AND LIMITATIONS

The following are examples of items that are not covered by and/or circumstances that will void L&L's warranties:

- 1) Kiln warranty may be voided by firing materials that introduce harmful atmospheres into the kiln. Atmospheres containing carbon, reducing atmospheres (caused, for example, by introducing carbonaceous

gasses or solids like graphite or paper into the kiln), binders from lusters and decals, wax burn out effluents, fluorines, halogens, acids, metal oxides, and salts are some of the corrosive and harmful atmospheres that will damage a kiln. Most ceramic processes will release some of these harmful constituents into the kiln and venting will prevent most of the problems that those processes would cause. Also, depending on the concentration of the harmful gasses, kiln source ventilation (such as our Vent-Sure) may limit the damage to the kiln. It is the customer's sole responsibility to ensure that the materials and the processes used are not harmful. This is of particular importance for industrial uses where processes may be unusual.

- 2) Over-firing damage for any reason and regardless of cause. **IMPORTANT:** We specifically warn you not to fire the kiln unattended. Neither the Kiln Sitter, The Orton Sitter, the DynaTrol, the Bartlett 3-Button control nor any other electronic control used by L&L is designed to be a failproof shut off device. L&L is not responsible for damage caused by failure of any of these controls.

The Kiln Sitter, in particular, can be very unreliable because of the moving parts, dirt or clay that can get into the tube, the way cones are placed on the tube, corrosion, etc. DO NOT FIRE THIS KILN UNATTENDED WHEN THE KILN IS SUPPOSED TO TURN OFF AND LEARN HOW TO USE THE TIMER BACK UP. Neither L&L Kiln Mfg., Inc. nor Edward Orton Jr. Ceramic Foundation warranty the kiln or kiln sitter against damage caused by overfiring. We highly recommend firing all manual kilns with witness cones that you can see through the peephole and/or a pyrometer so you have some idea of what is happening inside the kiln.

Also note that it is easy to melt clay if you inadvertently fire it hotter than its rating. It is possible in some controls to limit the upper firing limit of the kiln to avoid accidental overfirings of this type. Contact factory or read your control instruction manual if you would like further information on this.

- 3) Firebrick by its nature is fragile and will chip, crack, and create dust. L&L designs its kilns to minimize the effects of this but can not warrant against cracking, breakage, spalling or dusting. There is specifically no

STANDARD LIMITED THREE YEAR WARRANTY FOR L&L KILNS

warranty for cracked arches, tops, lids or bottoms.

4) Controls made by Orton (including the Oront Kiln Sitter), Eurotherm or Honeywell are warranted by their manufacturers. L&L is not responsible for damage caused by failure of one of these controls.

5) Corrosion of the case is specifically not warranted. Corrosion is typically due to use of a kiln in an unheated outside shed (where morning dew condenses on the kiln and humidity attacks the kiln) or from an unvented kiln (where the water vapor and fumes generated by firing ceramic materials attack the kiln case). However, even a vented kiln can corrode due to all the environmental and process conditions that a kiln can be exposed to. Exposure to other ambient conditions, including but not limited to humidity, rain, snow, dust, and salt air will also cause corrosion.

6) Damage due to neglect, inadequate room or kiln ventilation, mechanical abuse, improper storage, inadequate maintenance, improper use or freight damage.

7) Damage to the elements or element holders due to failure to properly keep the kiln clean (i.e. allowing glaze or ceramic chards from exploding pots) to make contact with the element holders.

8) Damage to the kiln caused for firing in ambient conditions that are too hot for the control or other components in the kiln. The DynaTrol is rated for use up to 125°F (52°C). That means that the room that you fire in should be less than 110°F (43°C) (because the control will be slightly hotter than room air due to transferred heat from the kiln). Note that direct sunlight on the control face may raise the temperature of the board beyond what you would expect from the ambient temperature or the kiln heat. Also note that the DynaTrol specifically allows the operator to check the control board temperature.

9) Failure to report defect within fifteen (15) days after it becomes manifest or known.

10) Any alteration of parts or design that vary from factory designs.

11) Use of elements and/or other parts other than genuine L&L parts supplied by L&L or its authorized Distributors and Dealers.

12) Thermocouple Protection Tubes are not warranted against breakage.

13) L&L's warranty is strictly limited to repair or replacement of defective items. Kilns may not be returned.

14) Distributors and Dealers are not authorized by L&L to modify and/or assume any other obligations or liabilities other than those expressed in this limited warranty and any such additional obligations are null and void.

15) EXCEPT AS SPECIFICALLY WARRANTED HEREIN, KILNS ARE SOLD AS IS. L&L MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, COVERING THE GOODS AND SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Purchaser acknowledges that certain conditions or circumstances may be created or incurred by Purchaser or user or over which L&L has no control, including, but not limited to, climactic conditions, improper use, inadequate maintenance, and Purchaser, as a condition of purchase or use, assumes responsibility for and releases L&L from liability arising out of the use of the kilns attributable to such causes.

16) L&L SHALL NOT BE LIABLE FOR ANY INCIDENTAL, SECONDARY, OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO BODILY INJURY OR DEATH, LOST PROFITS, LOSS OF USE, OR OTHER ECONOMIC LOSSES. Purchaser agrees that L&L's total liability for any damages or remedies arising hereunder shall be limited to direct damages, in an amount not exceeding the purchase price actually paid. Replacement or repair or refund, at L&L's sole discretion, of the purchase price of the equipment purchased shall constitute the exclusive and sole remedy available to Purchaser. Any action for breach of contract or negligence must be commenced by Purchase within one (1) year after delivery of the equipment to Purchaser.

17) L&L's full Terms and Conditions of Sale are available at <http://hotkilns.com/terms>.

STANDARD LIMITED THREE YEAR WARRANTY FOR L&L KILNS

3 YEAR PRO-RATED ELEMENT & THERMOCOUPLE LIMITED WARRANTY

Elements and thermocouples are warranted for three (3) years on a pro-rated basis with the following exceptions:

- 1) Glaze damage to the elements caused by accidentally scraping edges of unfired glazed ware against element groove. **WARNING:** causing unfired glaze to contaminate element will damage elements and can lead to element failure, and creates a fire hazard.
- 2) Firing of kiln to a temperature that exceeds the lower of
 - a) The maximum rating of kiln
 - b) 2350°F (1290°C).
- 3) Damage to elements caused by explosion of ceramic object. **WARNING:** this may cause damage to the elements and can lead to element failure, and creates a fire hazard.

Following is the pro-rated Schedule for elements and thermocouples:

- 1) Elements are warranted on a prorated schedule based on the ship date of the kiln. All dates are based on ship date from factory if sold direct or drop shipped to customer. If sold from a distributor's warehouse the date would be based on when it was shipped and/or sold from the distributor. The warranty is not extended for any period of where operation of the kiln is delayed for shipping, warehousing, or other reasons.
- 2) This replacement schedule is limited to new kilns. L&L does not warrant replacement elements and thermocouples except for catastrophic failure (for instance, a situation where the element end broke off without fault of the operator).
- 3) Labor to replace elements is not covered.

- 4) The pro-rated discount schedule only is valid for elements that you are actually replacing. In other words you can't buy a whole set of elements at these prices for anticipated future replacement. We reserve the right to ask for replaced elements in return.

Date from time of shipment from factory	Price of thermocouples and elements
0-12 Months	No Charge
12-24 Months	25% of full list price
24-36 Months	50% of full list price

3 YEAR LIMITED VENT WARRANTY

L&L VS-1 Vent-Sure is warranted to be free of defects in workmanship for a period of (3) years, starting from date of original purchase from L&L Kiln Mfg., Inc. or from an authorized L&L distributor or dealer. A sales receipt is required for proof of purchase. In addition, L&L may require you to send in defective parts for examination to determine the applicability of these warranty provisions. **DO NOT DISCARD PARTS BEFORE CONTACTING L&L.** L&L Kiln Mfg., Inc. will replace or repair any defective part sent freight-prepaid to L&L Kiln Mfg., Inc. following L&L's written acknowledgement and authorization regarding the specific issue. L&L Kiln Mfg., Inc. will prepay return shipping cost without charge in the Continental United States. On site labor is not covered by the factory; however, local distributors or dealers may offer this service.

EXCLUSIONS & LIMITATIONS

- 1) The Vent-Sure must be used as instructed in our vent instructions.
- 2) The use of any wax process that might cause condensation of wax or other similar substance in the vent system will void the warranty.
- 3) The Vent-Sure is not warranted to vent highly corrosive fumes, and any such use will void any warranties otherwise provided.

STANDARD LIMITED THREE YEAR WARRANTY FOR L&L KILNS

3 YEAR LIMITED TRU-VIEW PYROMETER WARRANTY

L&L Tru-View Pyrometer System is warranted to be free of defects in workmanship for a period of (3) years, starting from date of original purchase from L&L Kiln Mfg., Inc. or from an authorized L&L distributor or dealer. A sales receipt is required for proof of purchase. In addition, L&L may require you to send in defective parts for examination to determine the applicability of these warranty provisions. **DO NOT DISCARD PARTS BEFORE CONTACTING L&L.** L&L Kiln Mfg., Inc. will replace or repair any defective part sent freight-prepaid to L&L Kiln Mfg., Inc following L&L's written acknowledgement and authorization regarding the specific issue. L&L Kiln Mfg., Inc. will prepay return shipping cost without charge in the Continental United States.. On site labor is not covered by the factory; however, local distributors may offer this service.

EXCLUSIONS & LIMITATIONS

1) Thermocouples are not warranted for the Tru-View system.

LIMITED FIVE YEAR WARRANTY FOR L&L KILNS

(For School-Master & Renaissance Kilns with the One-Touch™ Control)

FIVE-YEAR LIMITED KILN WARRANTY

Certain designated L&L Kilns are warranted to be free of defects in workmanship for a period of five (5) years, starting on the date of original purchase from L&L Kiln Mfg., Inc. (L&L) or from an authorized L&L distributor or dealer, subject to the following terms and conditions, including but not limited to, the exclusions and limitations set forth herein.

- 1) A sales receipt is required for proof of purchase.
- 2) In addition, L&L may require you to deliver defective parts to L&L for examination to determine the applicability of these warranty provisions. **DO NOT DISCARD PARTS BEFORE CONTACTING L&L FOR INSTRUCTIONS. FAILURE TO ADHERE TO L&L'S INSTRUCTIONS, INCLUDING THOSE CONTAINED IN THE INSTRUCTION MANUAL AND AS STATED HEREIN, WILL VOID THIS WARRANTY.**
- 3) L&L will replace or repair any defective part that is covered by this warranty and sent freight-prepaid to L&L. L&L will prepay return shipping cost without charge in the Continental United States.
- 4) On-site labor is not part of this warranty and is not covered by L&L. Any warranty labor provided by Dealers and Distributors is provided at their own discretion and expense.

APPLICATION

Applies to School-Master Kilns and Renaissance Kilns sold with the One-Touch set for a maximum temperature of 2280° (1248°C).

EXCLUSIONS AND LIMITATIONS

The following are examples of items that are not covered by and/or circumstances that will void L&L's warranties:

- 1) Kiln warranty may be voided by firing materials that introduce harmful atmospheres into the kiln. Atmospheres containing carbon, reducing atmospheres (caused, for example, by introducing carbonaceous gasses or solids like graphite or paper into the kiln), binders from lusters and decals, wax burn out effluents,

florines, halogens, acids, metal oxides, and salts are some of the corrosive and harmful atmospheres that will damage a kiln. Most ceramic processes will release some of these harmful constituents into the kiln and venting will prevent most of the problems that those processes would cause. Also, depending on the concentration of the harmful gasses, kiln source ventilation (such as our Vent-Sure) may limit the damage to the kiln. It is the customer's sole responsibility to ensure that the materials and the processes used are not harmful. This is of particular importance for industrial uses where processes may be unusual.

- 2) Over-firing damage for any reason and regardless of cause. **IMPORTANT:** We specifically warn you not to fire the kiln unattended. The electronic One-Touch™ control used by L&L is not designed to be a failproof shut off device. L&L is not responsible for damage caused by failure of any of this control.

Also note that it is easy to melt clay if you inadvertently fire it hotter than its rating.

- 3) Firebrick by its nature is fragile and will chip, crack, and create dust. L&L designs its kilns to minimize the effects of this but can not warrant against cracking, breakage, spalling or dusting. There is specifically no warranty for cracked arches, tops, lids or bottoms.

- 4) Corrosion of the case is specifically not warranted. Corrosion is typically due to use of a kiln in an unheated outside shed (where morning dew condenses on the kiln and humidity attacks the kiln) or from an unvented kiln (where the water vapor and fumes generated by firing ceramic materials attack the kiln case). However, even a vented kiln can corrode due to all the environmental and process conditions that a kiln can be exposed to. Exposure to other ambient conditions, including but not limited to rain, snow, dust, and salt air will also cause corrosion.

- 5) Damage due to neglect, inadequate room or kiln ventilation, mechanical abuse, improper storage, inadequate maintenance, improper use or freight damage.

- 6) Damage to the elements or element holders due to failure to properly keep the kiln clean (i.e. allowing glaze or ceramic chards from exploding pots) to make contact with the element holders.

LIMITED FIVE YEAR WARRANTY FOR L&L KILNS **(For School-Master & Renaissance Kilns with the One-Touch™ Control)**

7) Damage to the kiln caused for firing in ambient conditions that are too hot for the control or other components in the kiln. The One-Touch™ control is rated for use up to 125°F (52°C). That means that the room that you fire in should be less than 110°F (43°C) (because the control will be slightly hotter than room air due to transferred heat from the kiln). Note that direct sunlight on the control face may raise the temperature of the board beyond what you would expect from the ambient temperature or the kiln heat.

8) Failure to report defect within fifteen (15) days after it becomes manifest or known.

9) Any alteration of parts or design that vary from factory designs.

10) Use of elements and/or other parts other than genuine L&L parts supplied by L&L or its authorized Distributors and Dealers.

11) Thermocouple Protection Tubes are not warranted against breakage.

12) L&L's warranty is strictly limited to repair or replacement of defective items. Kilns may not be returned.

13) Distributors and Dealers are not authorized by L&L to modify and/or assume any other obligations or liabilities other than those expressed in this limited warranty and any such additional obligations are null and void.

14) EXCEPT AS SPECIFICALLY WARRANTED HEREIN, KILNS ARE SOLD AS IS. L&L MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, COVERING THE GOODS AND SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Purchaser acknowledges that certain conditions or circumstances may be created or incurred by Purchaser or user or over which L&L has no control, including, but not limited to, climactic conditions, improper use, inadequate maintenance, and Purchaser, as a condition of purchase or use, assumes responsibility for and releases L&L from liability arising out of the use of the kilns attributable to such causes.

15) L&L SHALL NOT BE LIABLE FOR ANY INCIDENTAL, SECONDARY, OR

CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO BODILY INJURY OR DEATH, LOST PROFITS, LOSS OF USE, OR OTHER ECONOMIC LOSSES. Purchaser agrees that L&L's total liability for any damages or remedies arising hereunder shall be limited to direct damages, in an amount not exceeding the purchase price actually paid. Replacement or repair or refund, at L&L's sole discretion, of the purchase price of the equipment purchased shall constitute the exclusive and sole remedy available to Purchaser. Any action for breach of contract or negligence must be commenced by Purchase within one (1) year after delivery of the equipment to Purchaser.

16) L&L's full Terms and Conditions of Sale are available at <http://hotkilns.com/standardterms.pdf>.

5 YEAR PRO-RATED ELEMENT & THERMOCOUPLE LIMITED WARRANTY

Elements and thermocouples are warranted for five (5) years on a pro-rated basis with the following exceptions:

1) Glaze damage to the elements caused by accidentally scraping edges of unfired glazed ware against element groove. **WARNING:** causing unfired glaze to contaminate element will damage elements and can lead to element failure, and creates a fire hazard.

2) Firing of kiln to a temperature that exceeds 2280°F (1248°C).

3) Damage to elements caused by explosion of ceramic object. **WARNING:** this may cause damage to the elements and can lead to element failure, and creates a fire hazard.

Following is the pro-rated Schedule for elements and thermocouples:

1) Elements are warranted on a prorated schedule based on the ship date of the kiln. All dates are based on ship date from factory if sold direct or drop shipped to customer. If sold from a distributor's warehouse the date would be based on when it was shipped and/or sold from the distributor. The warranty is not extended for any period of where operation of the kiln is delayed for shipping, warehousing, or other reasons.

LIMITED FIVE YEAR WARRANTY FOR L&L KILNS
(For School-Master & Renaissance Kilns with the One-Touch™ Control)

- 2) This replacement schedule is limited to new kilns. L&L does not warrant replacement elements and thermocouples except for catastrophic failure (for instance, a situation where the element end broke off without fault of the operator).
- 3) Labor to replace elements is not covered.
- 4) The pro-rated discount schedule only is valid for elements that you are actually replacing. In other words you can't buy a whole set of elements at these prices for anticipated future replacement. We reserve the right to ask for replaced elements in return.

Date from time of shipment from factory	Price of thermocouples and elements
0-12 Months	No Charge
12-24 Months	20% of full list price
24-36 Months	30% of full list price
36-48 Months	40% of full list price
48-60 Months	50% of full list price

3 YEAR LIMITED VENT WARRANTY

L&L VS-1 Vent-Sure is warranted to be free of defects in workmanship for a period of (3) years, starting from date of original purchase from L&L Kiln Mfg., Inc. or from an authorized L&L distributor or dealer. A sales receipt is required for proof of purchase. In addition, L&L may require you to send in defective parts for examination to determine the applicability of these warranty provisions. **DO NOT DISCARD PARTS BEFORE CONTACTING L&L.** L&L Kiln Mfg., Inc. will replace or repair any defective part sent freight-prepaid to L&L Kiln Mfg., Inc. following L&L's written acknowledgement and authorization regarding the specific issue. L&L Kiln Mfg., Inc. will prepay return shipping cost without charge in the Continental United States. On site labor is not covered by the factory; however, local distributors or dealers may offer this service.

EXCLUSIONS & LIMITATIONS

- 1) The Vent-Sure must be used as instructed in our vent instructions.
- 2) The use of any wax process that might cause condensation of wax or other similar substance in the vent system will void the warranty.
- 3) The Vent-Sure is not warranted to vent highly corrosive fumes, and any such use will void any warranties otherwise provided.

3 YEAR LIMITED TRU-VIEW PYROMETER WARRANTY

L&L Tru-View Pyrometer System is warranted to be free of defects in workmanship for a period of (3) years, starting from date of original purchase from L&L Kiln Mfg., Inc. or from an authorized L&L distributor or dealer. A sales receipt is required for proof of purchase. In addition, L&L may require you to send in defective parts for examination to determine the applicability of these warranty provisions. **DO NOT DISCARD PARTS BEFORE CONTACTING L&L.** L&L Kiln Mfg., Inc. will replace or repair any defective part sent freight-prepaid to L&L Kiln Mfg., Inc following L&L's written acknowledgement and authorization regarding the specific issue. L&L Kiln Mfg., Inc. will prepay return shipping cost without charge in the Continental United States.. On site labor is not covered by the factory; however, local distributors may offer this service.

INSTALLATION INSTRUCTIONS FOR L&L EASY-FIRE AND SCHOOL-MASTER KILNS

Contents

CAUTIONS	1
DATED INFORMATION	1
SAFETY APPROVALS & LISTINGS	1
LOCAL CODES	1
MET LISTING TO UL499 STANDARDS	1
NATIONAL ELECTRICAL CODE	1
NATIONAL FIRE PROTECTION ASSOCIATION	1
UNIFORM MECHANICAL CODE	1
ELECTRICAL INSTALLATION	2
VOLTAGE	2
HOOKING UP TO POWER	2
NOTE ABOUT PLUG & FUSE RATINGS	2
PROTECT POWER CORD FROM KILN CASE	2
USE A FUSED DISCONNECT	2
LOCATE KILN WITHIN 50 FEET OF BREAKER	2
FUSING YOUR CIRCUIT	2
USE PROPER GROUNDING	3
USE COPPER WIRE FOR HOOK UP	3
DIRECT HOOK-UP	3
DO NOT USE EXTENSION CORDS	3
OFF-PEAK ELECTRICAL USAGE	3
WHERE TO GET MORE INFORMATION	3
CLEARANCES & SURFACES	3
CLEARANCES IN KILN ROOM	3
WALL MATERIALS	3
FLOORS	3
AIR CIRCULATION UNDER THE KILN	4
OTHER CLEARANCES	4
KILN ROOM ENVIRONMENT	4
KEEP KILN DRY & IN PROTECTED SPACE	4
AMBIENT TEMPERATURE	4
FIRE EXTINGUISHER	4
FIRE SPRINKLERS	4
VENTILATION REQUIREMENTS	4
VENTILATION IS ESSENTIAL	4
VENTILATION FOR THE KILN	4
CARBON MONOXIDE MONITORING	5
VENTING CODES	5
HVAC AND AIR CONDITIONING ISSUES	5
SELECTING AN ELECTRICAL CONTRACTOR	6
When considering an electrical contractor:	6
FINAL CHECKLIST	6
EASY-FIRE ELECTRICAL SPECIFICATIONS	7
SCHOOL-MASTER ELECTRICAL SPECIFICATIONS	8

CAUTIONS

See hotkilns.com/cautions for the latest information. You can also download a PDF at hotkilns.com/general-kiln-cautions

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 hotkilns.com/easy-school-install at any time.

SAFETY APPROVALS & LISTINGS

LOCAL CODES

Local fire and safety codes supercede information that is

provided in these Installation instructions or in our Caution instructions.

MET LISTING TO UL499 STANDARDS

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.

All Easy-Fire and School-Master kilns 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.

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 is 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 <http://www.iapmo.org/iapmo/publications.html> or by calling 800 85-IAPMO (800-854-2766) / Fax

INSTALLATION INSTRUCTIONS FOR L&L EASY-FIRE AND SCHOOL-MASTER KILNS

(909) 598-4720.

ELECTRICAL INSTALLATION

VOLTAGE

EASY-FIRE and SCHOOL-MASTER kilns are wired to work on either 240 Volt single phase, 240 Volt three phase, 208 Volt single phase or 208 Volt three phase. Some non-US kilns (sold to countries with 380 Volt power systems) work on 220 Single Phase or even 380 volt 3 phase. It is important that the kiln be hooked up to the proper voltage. 208 volt kilns hooked up to 240 volt power supplies will generate too many amps. 240 volt kilns hooked up to a 208 volt power supply will heat up about 25% slower than they should and may not reach the higher temperatures. Although it is possible to hook a single phase kiln to two legs of a three phase supply, it will cause an unbalanced load on your electrical supply. CHECK WITH A QUALIFIED ELECTRICIAN. It is best to get a three phase kiln for a three phase power supply. In addition to the power wires there is, on all L&L kilns, a ground wire. The ground wire is not used as a neutral (i.e. no electricity normally flows through the ground). BE SURE TO GROUND THE KILN PROPERLY USING THE GROUND WIRE. AN UNGROUNDED KILN IS A DANGEROUS KILN. Also, it is important for the control operation to have a good earth ground as well (to get rid of electrical noise).

HOOKING UP TO POWER

All EASY-FIRE and SCHOOL-MASTER kilns include either a 6-50P plug (for single phase kilns) or a 15-50P plug (for three phase kilns). No cords are supplied for kilns sold outside the United States.

Using the charts on pages seven and eight as a reference, have your electrician install the proper receptacle and safety switch at your kiln location. 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 or institutional setting, be sure to follow lock out/tag out requirements and procedures.

NOTE ABOUT PLUG & FUSE RATINGS

L&L Kiln uses a UL listed NEMA 6-50P or 15-50P plug and cord that is robustly designed, and marked for 50 amperes at up to 250 Volts AC, 1 Phase (or 3 phase for the 15-50P), with a grounding prong. The (2 or 3) current carrying conductors are 6 AWG, which according to the 2002 NEC (National Electrical Code) Table 400.5 for flexible cables have an allowable ampacity of 55 amperes, and the grounding conductor is 8 AWG, which does not normally carry any current. The plug, or cap, is designed and constructed so

that there are no exposed current-carrying parts except for the prongs, which only carry current when the plug or cap is safely inserted into its mating receptacle.

This plug and cord set is UL listed for carrying 50 amperes at the proper voltage and phase. All L&L kilns which use these plugs and cords are also c-MET-us listed to UL499 standards as complete appliances, with the ratings as listed in L&L Kiln Mfg, Inc., catalogs. When installed, the circuit that supplies power to the kiln must be designed per NEC requirements, and in many cases must be provided with conductors and overcurrent protection rated for 60 amperes, or 125% of the ampere listing of the kiln. (E.g., the e23T is listed at 48 amperes. $48 * 1.25 = 60$ ampere rating for overcurrent protection and power supply conductor rating.) This may initially create some confusion, but remember that the kiln is c-MET-us listed to UL499 standards with the NEMA 6-50P plug and cord set as a component of the appliance - it is the power supply circuit that must be protected at 125% of the listed rating, not the individual components inside the appliance.

PROTECT POWER CORD FROM KILN CASE

Rout the 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 the cord touches the hot case, it could melt and cause a short circuit and/or fire.

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.

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.

FUSING YOUR CIRCUIT

Be sure your electrician follows the National Electric Code and any other local requirements when hooking up the kiln. The full load amps is listed on the data nameplate of the kiln. CHECK WITH A QUALIFIED ELECTRICIAN.

INSTALLATION INSTRUCTIONS FOR L&L EASY-FIRE AND SCHOOL-MASTER KILNS

USE PROPER GROUNDING

Make sure your electrician properly grounds the kiln and then tests for proper grounding after the installation. All electrical appliances should be properly grounded. This can be to either a cold water pipe or proper system ground in your building. 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 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!**

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. When aluminum wire gets hot it accelerates oxidation. Aluminum oxide is a resistor; copper oxide is not as much. If the connection at the terminal board gets oxidized it will really heat up - to the point where it could cause a fire. Braided copper wire is preferred.

DIRECT HOOK-UP

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.

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/kiln-electricity for a complete description of electrical theory, fusing, hook-up wire sizes, etc. as they apply to kilns.

CLEARANCES & SURFACES

CLEARANCES IN KILN ROOM

Make certain floor is not flammable and install no closer than 12" to any wall. (18" is preferable). Note that, when we did all our testing for MET, 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 Deg F (71 Deg C) 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.

INSTALLATION INSTRUCTIONS FOR L&L EASY-FIRE AND SCHOOL-MASTER KILNS

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 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 control boards have a specification that say they 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, the 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 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 25-50 times the cubic feet of the kiln per minute. For example, if a kiln has 10 cubic feet then 250 to 500 CFM should be adequate. See hotkilns.com/calculate-kiln-room-ventilation for a more precise method of calculating heat removal requirements. 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

INSTALLATION INSTRUCTIONS FOR L&L EASY-FIRE AND SCHOOL-MASTER KILNS

the VENT-SURE vent system. Although you can use other kiln venting systems, please note that the VENT-SURE is c-MET-us listed to UL499 standards for use with Easy-Fire and School-Master 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, the largest Orton stand mount vent is only 24" square vs our 29" square stand for the e28S and e28T. If you must use the Orton vent then we recommend you use the 24" square Stand Version for all Easy-Fire and School-Master kilns.

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 listed to UL499 standards and is appropriate to meet this ventilation requirement. If you decide to use a vent other than the c-MET-us 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.

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 chart below. This shows the BTU output if the kiln was held at these temperatures under steady-state conditions (which is rarely the case for a ceramic kiln). Typically it would never be worse than what is shown in the this chart which makes this a safe figure to use for sizing HVAC systems. If just using ambient room ventilation for getting rid of room heat see this web page: hotkilns.com/calculate-kiln-room-ventilation.

MAXIMUM BTU PER HOUR WHEN FIRING

MODEL NUMBER	1800 Deg F (Approx Cone 05)	2350 Deg F (Approx Cone 10)
e18S	6723	9772
e18S-3	5561	8067
e18T	8985	13060
e18T-3	7468	10833
e23S	9816	14267
e23S-3	8135	11800
e23T	12791	18593
e23T-3	10643	15439
e28S-3	10871	15769
e28T-3	13928	20204

Voltage is not an issue with regards to BTU output. e28S-3 and e28T-3 have only 3" brick.

MODEL NUMBER	1800 Deg F (Approx Cone 05)	2232 Deg F (Approx Cone 6)
SM23T	12791	17444
SM23T-3	10643	14481
SM28T-3	13928	18953

Voltage is not an issue with regards to BTU output. SM28T-3 has only 3" brick.

INSTALLATION INSTRUCTIONS FOR L&L EASY-FIRE AND SCHOOL-MASTER KILNS

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)

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.

INSTALLATION INSTRUCTIONS FOR L&L EASY-FIRE AND SCHOOL-MASTER KILNS

EASY-FIRE ELECTRICAL SPECIFICATIONS

MODEL NUMBER	VOLTS	PHASE	WATTS	FULL LOAD AMPS	FUSE SIZE AMPS	HOOK-UP WIRE SIZE*	NEMA PLUG TYPE
e18S-240	240	1	5737	23.9	30	10 ga	6-50P
e18S-208	208	1	4980	23.9	30	10 ga	6-50P
e18S-220	220	1	5267	23.9	30	10 ga	6-50P
e18T-240	240	1	8400	35.0	50	6 ga	6-50P
e18T-240-3P	240	3	8400	20.2	30	10 ga	15-50P
e18T-208	208	1	8400	40.4	60	6 ga	6-50P
e18T-208-3P	208	3	8400	23.3	30	10 ga	15-50P
e18T-220	220	1	8400	38.2	50	6 ga	6-50P
e18T-220-3P	220/380	3	8400	22.1	30	10 ga	15-50P
e23S-240	240	1	9460	39.4	50	6 ga	6-50P
e23S-208	208	1	8320	40.0	50	6 ga	6-50P
e23S-220	220	1	8660	39.4	50	6 ga	6-50P
e23T-240	240	1	11520	48.0	60	6 ga	6-50P
e23T-240-3P	240	3	11520	27.7	40	8 ga	15-50P
e23T-208	208	1	9980	48.0	60	6 ga	6-50P
e23T-208-3P	208	3	11000	30.5	40	8 ga	15-50P
e23T-220	220	1	10560	48.0	60	6 ga	6-50P
e23T-220-3P	220/380	3	11400	29.9	40	8 ga	15-50P
e28S-240	240	1	11500	47.9	60	6 ga	6-50P
e28S-208	208	1	9984	48.0	60	6 ga	6-50P
e28S-220	220	1	10500	47.7	60	6 ga	6-50P
e28T-240	240	1	11520	48.0	60	6 ga	6-50P
e28T-240-3P	240	3	16620	40.0	50	6 ga	15-50P
e28T-208	208	1	9980	48.0	60	6 ga	6-50P
e28T-208-3P	208	3	14340	39.8	50	6 ga	15-50P
e28T-220	220	1	10560	48.0	60	6 ga	6-50P
e28T-220-3P	220/380	3	15060	39.5	50	6 ga	15-50P

INSTALLATION INSTRUCTIONS FOR L&L EASY-FIRE AND SCHOOL-MASTER KILNS

SCHOOL-MASTER ELECTRICAL SPECIFICATIONS

MODEL NUMBER	VOLTS	PHASE	WATTS	FULL LOAD AMPS	FUSE SIZE AMPS	HOOK-UP WIRE SIZE*	NEMA PLUG TYPE
SM23T-240	240	1	11520	48.0	60	6 ga	6-50P
SM23T-240-3P	240	3	11520	27.7	40	8 ga	15-50P
SM23T-208	208	1	9980	48.0	60	6 ga	6-50P
SM23T-208-3P	208	3	11000	30.5	40	6 ga	15-50P
SM23T-220	220	1	10560	48.0	60	6 ga	6-50P
SM23T-220-3P 220/380	220/380	3	11400	29.9	40	8 ga	15-50P
SM28T-240	240	1	11520	48.0	60	6 ga	6-50P
SM28T-240-3P	240	3	16620	40.0	50	6 ga	15-50P
SM28T-208	208	1	9980	48.0	60	6 ga	6-50P
SM28T-208-3P	208	3	14340	39.8	50	6 ga	15-50P
SM28T-220	220	1	10560	48.0	60	6 ga	6-50P
SM28T-220-3P 220/380	220/380	3	15060	39.5	50	6 ga	15-50P

* Note 1: Wire hook up size is a general recommendation. It may vary with the length of the electrical run and other localized conditions. Your electrician needs to follow the rules of the National Electrical Code to make this final determination.

Note 2: 220 volt and 380 volt kilns are for non-US applications. Do not confuse this with nominal 220/110 Edison systems in the US. Treat those as if it were 240 volts.

Note 3: 240 volt kilns may be run on 208 volt circuits; however, they will lose about 25 % of the power. **208 volt kilns MAY NOT be run on 240 volt circuits. The kilns will pull a dangerous amount of amperage if this is done.**

Note 4: Three inch brick kilns have the same electrical specifications as two and a half inch brick kilns. An e23T-3 has the same electrical specifications as an e23T, and a SM23T-3 has the same electrical specifications as a SM23T.



This is a 6-50P Plug Configuration for single phase Easy-Fire kilns.



This is a 15-50P Plug Configuration for three phase Easy-fire kilns

See paragraph on page 2 about fuse and plug ratings if you have a question about fusing a kiln with a 50 amp cord for 60 amps.

L&L SCHOOL KILN GUIDE



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



L&L Kiln's
patented hard
ceramic element
holders protect
your kiln.

**CERAMIC
INFORMATION**

The Ceramic Process

Firing Tips

What happens when you fire clay.

Loading kiln with greenware

When placing greenware in a kiln, all pieces may touch each other. To prevent possible distortion, place lids on the pieces they go with when firing to bisque. It is important to place the tallest pieces on the center of the shelf and work outward to the shortest pieces. This will give you the best heat circulation. Be sure the ware is totally dry before firing (unless you use a very long drying cycle). Moisture in the work can cause cracking or even an explosion. We suggest using either the SLOW BISQUE program for heavy loads with a Pre-heat time of between two to three hours or the FAST BISQUE program for lighter loads (again with a Preheat time of two to three hours). If you want to make up your own program, use the preset program as a guide (see Appendix F in the DynaTrol instructions, hotkilns.com/dynatrol-instruct-blue.pdf, for a description of the segments in the preset programs). It is not a bad idea to Preheat the kiln overnight, as its only purpose is to thoroughly dry and start the expansion of the ware, so that the higher heat will not negatively affect it.

Venting

If you are using the **Vent-Sure** automatic vent system, you can turn it on and leave it on during the entire firing. If you use an automatic vent, you do not normally need to prop the lid open or remove peephole plugs. If manually venting (without a powered vent), fire in the beginning with all the peepholes out. Then put bottom peephole plugs into peepholes after the low firing is over (you will know it is over when you start to see red heat through the peepholes). You typically want to leave the top peephole out during the entire firing if you do not have an automatic downdraft vent. NOTE: HEAVY GREENWARE MAY TAKE LONGER TO DRY. Be sure to use the Preheat feature in the DynaTrol for ensuring dry work. NOTE: If you have a lot of moisture in your work you may want to prop open the lid for the first hour of preheat even if you have an automatic vent system. (CAUTION: Propping open a lid in this way can cause the lid to crack if you are not careful. This is not covered in our warranty).

Loading kiln with glaze ware

When placing ware into the kiln to be glaze-fired, we suggest placing the pieces ½" apart so



that when they expand there is no danger of them touching each other. If pieces are placed too close together, they may touch and stick to each other, thereby ruining both pieces of ware.

Except for placing ware the proper distance from each other for good heat circulation, follow the instructions for the firing of greenware. Be certain that no piece while expanding can touch the thermocouples. Use either the FAST GLAZE or SLOW GLAZE program depending on your glaze needs (experiment if you are not sure), or make up your own program. Ask the supplier of your glaze if you use a commercial glaze. There are some good firing recipes in various glaze books, including Mastering Cone 6 Glazes available from us. Your clay and glaze supplier will know the cone number to which you should fire your work.

Overglaze firing

When firing overglazes such as Gold, Palladium, Mother of Pearl, China Paints, etc., the kiln must be vented during the firing up to 1,100°F. If you are manually venting, leave the peepholes open. (NOTE: This is if you are not using a vent system such as an L&L **Vent-Sure** which automates the venting process). Check with your clay and glaze supplier for recommended cycles.

Speed of firing

Although the kiln may be capable of firing relatively fast, this does not mean you should fire it as fast as it is capable of firing. The speed of firing will depend on what you are trying to accomplish. Check with the glaze or clay manufacturer or supplier for a recommended firing cycle.

Soaking

Soaking is holding the kiln at any given temperature for a set amount of time. One purpose is to achieve uniform temperatures on the inside and outside of your pieces. Other benefits



Robert Shenfeld's studio in Syracuse NY where he produces production quantities of hand-crafted tiles.



505 Sharptown Road • Swedesboro, NJ 08085
Phone: 856.294.0077 • Fax: 856.294.0070
Email: sales@hotkilns.com • Web: www.hotkilns.com



L&L Kiln's patented hard ceramic element holders protect your kiln.

The Ceramic Process

Firing Tips

include the smoothing out of glazed surfaces to get rid of pin holes or craters in the glazed surface. During the bisque firing, people often hold at different temperatures to allow the clay body to out-gas more of its organic material. Holding is also useful at a low temperature like 150°F to 180°F to dry out pottery or kiln wash on shelves.

The downside to holding only happens at high temperatures. There is almost no downside to holding at low temperatures except increased firing time and slight element and thermocouple degradation from the extra firing time. At high temperatures the amount of degradation to the elements and thermocouples is exponentially greater. As a result, holding the kiln at a high temperature will affect the element and thermocouple life.

Try soak times in the range of 5 or 10 minutes at the most. If longer, exercise care as the kiln may over-fire your work. Compensate by reducing the cone's temperature in the cone offset setting, or raise the thermocouple offset. Use witness cones that you can see through your peephole (and be sure to use dark safety glasses when doing so). If you see the cones bending (which would indicate proper heat-work achieved), then you can always turn off the control at that point manually. The Orton website has a great program available for free which helps you calculate how different temperature ramps and hold times will affect the "heat-work" and cone bending in a kiln.

Firing log

Keep a firing log. Keep track of firing times, approximate load weight, firing temperatures and notes on results of the firing. There is a sample log in our instruction manuals (hotkilns.com/log.pdf).

Applying kiln wash

Kiln wash the floor of the kiln and the upper sides of the shelves only. Apply the kiln wash to the thickness of a postcard. The purpose of kiln wash is to prevent any glaze that drips from ware from sticking to the floor or shelves. If dripping should occur, remove dripping and cover the spot with new kiln wash. Kiln wash is a powder mixed with water to a light creamy consistency. See page 53. For best results, apply three separate coats. If you brush one coat on, let it dry and then brush on another; you can brush off the first in the process, so ideally each coat should be fired on. The shelf can be used while firing the kiln wash, so theoretically you would put one coat on, load the shelves and do your test-firing of the kiln. The second coat would be fired on in the first bisque and the third coat in the second bisque or first glaze (whichever comes next). Fire at least to cone 018—hot enough

to give the kiln wash enough adherence to the shelf to prevent it from coming off in the second coating. Note that some people make do without three firings of the kiln wash. However, we include this recommendation as a "best practice".

What happens when you bisque and glaze in your kiln

When you fire a kiln, you chemically and physically alter clay and glaze compounds in a way that, to some degree, can be anticipated and accounted for. There is quite a bit more going on during firing than meets the eye. It is useful to divide the processing cycle into separate distinct stages or segments. The stages that clay and glaze go through in a typical firing can be divided as follows:

Complete drying

Even after you room-dry your work there will be some moisture left in the seemingly dry ware. Your ware will pick up moisture from the air, even if it is left for weeks on a warm, dry shelf. Bisque ware can also absorb moisture during glazing, and the newly applied glaze is really a very fine-grained clay coating at this point; it will retain the water it

was mixed with and the water in the air until it is completely dry.

When you put this piece in the kiln it will first go through a complete drying stage. This is where any water that was in your ware evaporates and expands to 1,170 times its original volume. This moisture must escape from your ware before the kiln temperature gets to 212°F. It is important that the kiln temperature climb very slowly at first, and that the lid be propped 1" with several soft pieces of firebrick or ceramic posts and the peepholes opened if there is no forced venting system. (CAUTION: Keep in mind that propping open a lid in this way can cause the lid to crack if you are not careful). If you have a lot of moisture in your work you may want to prop open the lid for the first hour of preheat even if you have an automatic vent system. The amount of drying needed depends on factors such as how much mass is in the kiln and how wet the ware is. Factors that lead to a longer drying time include fine-grained clay and thick-walled ware. Be sure to use the Preheat feature in the DynaTrol which automatically sets the kiln temperature at the right drying temperature. Preheating overnight is recommended. It is best to be conservative to prevent the ware from exploding in the kiln. After a while you will get a feel for how long is necessary. Remember to carefully vacuum out your kiln if a piece that is not fully dried explodes.

The "Ceramic Change"

This happens to each crystal and mineral particle in the clay body. Even though water between the crystals and minerals has already evaporated (hopefully during the slow preheat time), there is still water in these crystals and minerals that is venting off. This can occur all the way until the kiln reaches red heat. Slow firing is not as critical as there are pathways for the steam to travel through where the water molecules between the particles used to be. Venting, however, is critical to remove the water vapor.

Quartz Inversion

This is a generic name for the 20 or so changes quartz goes through as the temperature increases and the molecules/particles/atoms become increasingly mobile. Most phases that a particle of quartz goes through as the kiln is heating will reverse during cooling. One of the largest and quickest changes the quartz goes through is roughly at 1,060°F with about a 2% increase in the size of the particles during heating. The process is reversed during cooling. Also, during cooling another 2% contraction takes place at about 439°F. This is caused by the formation of "cristobalite" in some clay bodies. There is a lot of other



These instructions refer to the use of our DynaTrol control "Easy-Fire" programs. If you have a manual kiln you will need to adjust the switches to achieve various cycles.

The Ceramic Process

Firing Tips

material in your clay besides quartz, so it is not always that important to account for the quartz while the kiln is heating up. The structure of unfired clay is full of pores and non-glass bound particles, so it can withstand the expansion of a few of its quartz particles. Once the clay is fired, though, the particles become part of a solid mass of glass. This mass is extremely intolerant of the expanding quartz particles. This is especially true in the glaze firing (even more so if the bisque was even slightly under-fired). In under-fired ware the quartz never has a chance to react with the fluxes and remains intact during a second firing, ready to expand and contract as your kiln heats and cools. This is one cause of dunting (fine cooling cracks). The glass mass simply has no room for the expanding quartz crystals.

Burnout

This is the burning off of any trapped organic matter in the clay. Burnout generally takes place at and above red heat. Sufficient airflow and time are necessary to burn off all the organic matter. If a bisque piece is under-fired, or fired too quickly, any unburned organic matter will bubble up through the glaze during the second firing. Even if the bisque is properly fired, there will still be some organic matter in the clay that will burn out once you pass the bisque's firing temperature. A glaze that fluxes too early will block off the exits for the gasses in the clay body and cause bloating or pitting.

Sintering

This is the point at which powdered clay particles will begin to form chemical bonds with each other. Although the clay is not melting yet, it is forming a lump from the powdered clay. The point at which this begins to happen is called the 'sintering point'. This, like burnout, happens right around red heat.

Decomposition

This is where fluxes really start to react and clay and glaze ingredients are deconstructed into their basic building blocks. This process can emit gasses such as sulfur and carbon dioxide which must travel out of the clay body. Once the firing is finished and the kiln cools, reconstruction takes place and the glaze and clay body recombine into a glass.

Vitrification

This is a process that develops in the clay body during firing. At one point a piece of clay might be under-fired and at a higher point it may have good strength, but not good color; at another point it may be perfect and at another,

even hotter point, the piece may warp, or melt. What is important to understand is that as the firing progresses, more and more activity is taking place on a molecular level. This is good only to a certain point, after which you are left with a warped blob, or puddle. You want to achieve the "glassification" of the clay. This occurs right before the clay body begins to slump. At this point the molecular bond between fluxes, quartz, silica and other materials makes the "glass". However, it is the formation of the long mullite crystals (which only occurs above 2,000°F) from the decomposing clay crystals that gives the ware its strength.

Glaze set, cool & freeze

Unlike the clay body, the glaze melts completely, and the bond between it and the clay becomes more complete as the temperature rises; eventually, the glaze starts to run. Things like fluidity and surface tension are determined first by the chemistry of the glaze, then by the layer formed by the heightened interaction between the glaze and clay molecules. When the ingredients of the clay and glaze have been properly matched, the nature of the molten layer between the two is such that when the kiln is at maximum temperature during firing, things like pinholes and bubbles can rise through this layer and reach the surface from the clay body within, and not remain trapped in the surface when the glaze sets and begins to cool. Once maximum temperature is reached and the kiln begins to cool, the glaze and clay body will follow. The glaze will not solidify until some time after the kiln begins to cool. When this happens depends on the rate of cooling and the chemistry of the glaze. Right before the glaze solidifies, however, crystals can form. Depending on its chemistry, the glaze can solidify quickly and form crystals. Or, with some glazes, crystal formation can take place throughout the initial cooling until the glaze finally solidifies several hundred degrees lower than the highest temperature. By adjusting the glaze recipe slightly, one can maximize or minimize the forming of crystals in the glaze during cooling. Once the glaze solidifies it is still important for the kiln to cool slowly. Crazing (fine cracking) can occur if cooling is too rapid. Heat shock, which is usually catastrophic, is something that can happen in the kiln or may occur gradually over time.

In truth, simply test-firing the kiln and the ware to be fired is usually enough to deal with the complexity of the process. Every kiln and kiln-load fires differently, and a new kiln is no exception. The use of a vent system is recommended simply because it will exhaust



Bill Campbell at work.

"I make a living out of my five L&L kilns. I really beat them up firing them at least three times a week to Cone ten. They take a real beating and keep on going" -Bill Campbell

any detrimental particles and fumes from the kiln, circulate air in the kiln and provide an oxygen-rich atmosphere. See ortonceramics.com for helpful information on how to use cones, firing tips and great information on firing kilns. They have an excellent program available for free which helps you calculate how different temperature ramps and hold times will affect the "heat-work" and cone bending in a kiln. ⚡