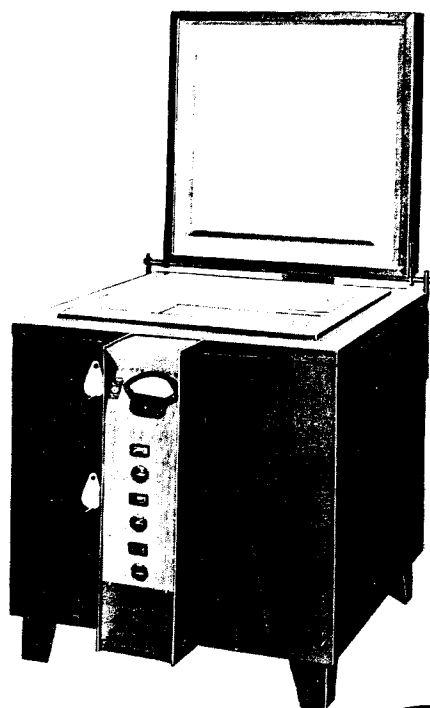


# "DYNA - KILN"



**UL Approved**  
**WORLD'S FINEST - SAFEST ELECTRIC KILNS**  
**for**

**"Porcelain — Ceramics — China Painting — and Decorating"**  
**Complete with the famous L & L Patented "Dyna-Glow" Element Holders**



**MODEL H-8800**  
Shown with door  
counter balance and  
pyrometer system



"Dyna-Kilns" continue to be the accepted standard throughout school systems, universities, institutions and studios.

"Dyna-Kilns" have been chosen because of their superior firing characteristics, construction and heat control.

A few of the reasons for their superiority is that they are equipped with the unique patented (Pat. No. 2,744,946) "Dyna Glow" element holders, multiple peepholes, multiple temperature indication, multiple heat zones, (minimum of 3—maximum of 9 heats) and pilot light systems.

All doors are hinged, interiors are face-hardened, non-flaking elements, recessed door construction, properly graded insulation, rugged all steel case construction, and the styling is pleasing to the eye with two tone color combination.

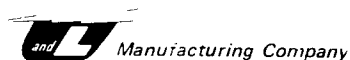
"Dyna-Kilns" are completely UL approved for your protection. Also, further proof of the superiority of the "Dyna-Kiln" is the absolutely unconditional guarantee for one year of workmanship, elements, and switches.

## Importance of "UL" Approval . . .

L and L Manufacturing Company again has shown why they are the leaders in the pottery electric kiln field, by now having and being the first to have top loading electric kilns Underwriters' Laboratory (UL) approved.

This means that the L and L top loading electric kilns have been tested by the Underwriters' Laboratory and have been given their seal of approval.

Your local electric company or fire insurance company will be happy to explain the extreme importance of having the Underwriters' Laboratory (UL) seal of approval on any appliance operated by electricity.



**144 CONCHESTER ROAD • TWIN OAKS, PENNA. 19014**  
On U. S. Route 322 - Just West of Chester, Pa.

— or —

BOX 938, CHESTER, PA. 19016  
215-485-6334 215-485-6530



Manufacturing Company

# **“DYNA - KILN”**

## **WORLD’S FINEST - SAFEST ELECTRIC KILNS**

### **Case Construction . . .**

The case is of all welded steel construction, painted inside and out with heat resistant paint to prevent rusting.

The exterior is painted with a fine two tone color combination for beauty.

Four sturdy steel legs are mounted under each kiln, thus permitting free air circulation beneath the kiln.

Your “Dyna-Kiln” may be placed on practically any surface without fear of causing a fire or heat damage.

### **All Steel Instrument Panel . . .**

The “Dyna-Kiln” front instrument panel which houses all of the wiring, is designed with perforated metal.

This contributes to a longer life for all of the connection wires, switches, and pilot lights by keeping normally high temperatures at this point, to a relatively low temperature. This design also permits installation of the pyrometer at the top of the instrument panel for convenient observation since the ambient temperature at this point will not adversely affect the pyrometer accuracy. A unique feature of the instrument panel design provides a hood over the pyrometer for protection from accidental damage.

## **Optional Feature For “Dyna-Kilns”**

### **Counter-Balance System . . .**

A counter-balance system has been devised by L & L for easy opening and closing of top-loading kiln doors.

This system also eliminates the possibility of accidentally dropping the door, and damaging the fire-brick of the kiln, plus damage to the ware inside the kiln through shock.

All of the kilns are so made that the counter-balance system can be factory installed, or installed by yourself at home.

“Prices for each Model are listed on Price List.”

### **Pyrometers . . .**

Pyrometers provide the only method by which you can determine the temperature in your kiln at all times

This is of the utmost importance in telling you whether you are firing too fast, and also whether you are firing at the proper rate for the ware as recommended by the manufacturer.

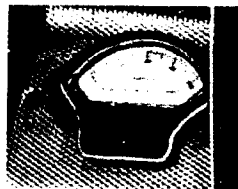
A cone only tells you the maturing point, a pyrometer tells you at all points.

Accuracy of the L & L pyrometer is of a very high order and is 2% of full scale deflection.

Prices are as listed:

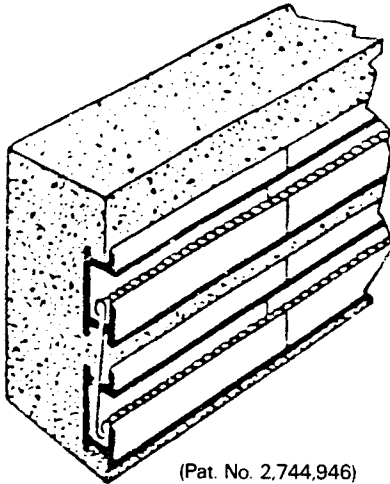
2500°F — \$64.00

Plus Thermocouple — \$7.50



# **“Dyna-Glow” Element Holders, Elements and Switch Circuits . . .**

## **“Dyna-Glow” Elements**



(Pat. No. 2,744,946)

## **Elements and Switch Circuits . . .**

The holders also provide a cleaner, more orderly and attractive kiln interior.

The elements are of the non-flaking type and will not cause discoloration of the ware.

Each switch is of the safety 2 pole, 3 position type providing low, medium and high heat at each switch zone. They operate in either a clockwise or counter-clockwise direction.

Due to the above factors, the L and L Manufacturing Company can unconditionally guarantee their elements and switches for one year.

## **“Dyna-Glow” Element Holders . . .**

Each “Dyna-Kiln” is equipped with the patented “Dyna-Glow” element Holders which provide the elements with excellent support, and allow element replacement without removing anything but the elements.

Also, the “Dyna-Glow” element holders permit the elements to expand and contract properly, contributing to longer element life. The element holders also prevent, during the expansion and contraction of the elements, the flaking of brick particles onto the ware. They also prevent concentrated element heat radiation from burning parts of the ware, while at the same time, distributing the radiation more evenly throughout the kiln interior, thereby providing a more even firing.

These holders do not allow the elements to protrude into the kiln, thus eliminating the hazards of electrical shock.

## **Insulation . . .**

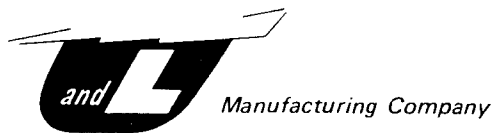
The proper selection of the various types of insulating fire-brick and other insulating materials provide the most economical operation, and long kiln life.

The interior of each “Dyna-Kiln” has been face-hardened to prevent dusting of the fire-brick onto the ware.

## **Recessed Door . . .**

Typical of L & L care and thoroughness is the design of the door used on your Dyna-Kiln. Recessed lids on top loaders prevents heat loss, and also prevent cold down drafts from entering Dyna-Kiln. The door is hinged so that it does not have to be lifted off the Kiln.

A backstop for the door is also provided, so that it opens the proper distance for easy handling. Counterweights are available for all models. See Optional Equipment Sheet.

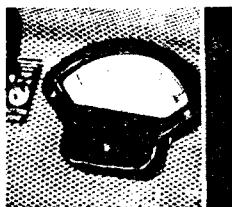


# Optional Features For

## "DYNA - KILNS"

January 1, 1988 Prices

### Pyrometer System



The pyrometer system which consists of the pyrometer, dual thermocouple and selector switch provides the only method by which you can determine the temperature in your kiln at all times.

During the pre-heat cycle, it is very often necessary not to exceed a very low temperature for various periods of time. At the maturing point under varied firing conditions, it is desirable to take temperature readings at various points of the kiln.

With the unique design of the Dyna-Kiln switching circuits, temperature differences are easily corrected at the maturing point by measuring the temperature to detect any difference between top and bottom. Then, at the various points, the necessary adjustments are easily made by the fine switching controls on every Dyna-Kiln. Thus you can load your kiln to capacity without worrying about temperature differences.

Another important advantage — you may place your load to best advantage without regard to temperature differences. Perfect firings are possible at all times. No more refiring.

Still another great advantage of using the new L & L Pyrometer System is that better glaze results are possible when used with the Dyna-Kiln switching action. Control over the flow of glaze is possible by varying the time and temperature factors. This may be accomplished by holding your temperature at a particular level. By observing your pyrometer and using your switches to their best advantage, it is very easy to hold your temperature constant for varying periods of time until through practice you are able to obtain far superior glaze and body results.

Another important reason for using the L & L Pyrometer is to cool your kiln slowly by using a low heat during the cooling cycle. By this method it is frequently possible to obtain much better glaze and body results, particularly with fine porcelain work.

All of the Dyna-Kilns are made so that this system is factory installed, or can be installed by you at any time.

Accuracy of the L & L Pyrometer is of a very high order, and is 2% of full scale deflection.

### DYNA-KILNS "UL" TOP LOADERS — ELECTRIC KILNS TO 2300 °F

Model No.	Firing Chamber	Outside Dimensions	Volts 10-AC	Amperes For Wiring	Watts	Heats	Kiln Cost	Kiln/w Sitter	Kiln/w Sitter/Timer	Pyr/w Thermocouple	Pyrometer System	Packing Cost	Approx. Shipping Weight
H-1100	11x11x11	20½x25½x24½	110	18	1980	3	\$494.00	\$574.00	\$655.00	\$79.75	\$88.00	\$8.00	125 lbs.
H-1500	15x15x15	24½x29½x28½	110/220	25.2	4150	9	759.00	839.00	875.00	79.75	88.00	11.00	225 lbs.
H-8800	18x18x18	27½x32½x31½	110/220	36	5940	9	979.00	1059.00	1095.00	79.75	96.00	15.00	300 lbs.
H-1824	18x18x24	27½x35½x40	110-/220	36	7920	12	1425.00	1505.00	1540.00	79.75	104.50	28.00	575 lbs.

All 220V-3 Wire Edison System.

All Prices F.O.B. our plant

Prices may be changed without notice.

\*Model H-1100 if ordered with plug in cord will not carry the UL label  
It will be designated HP-1100.

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## INSTRUCTION SHEET

PLEASE READ THOROUGHLY BEFORE OPERATING KILN



**L&L MANUFACTURING CO.**

142 CONCHESTER ROAD

TWIN OAKS, PA 19016

(215) 485-6334

You are now the proud owner of the DYNA-KILN, designed and engineered by the L & L Manufacturing Co., Chester, Pa., to give you the utmost in performance and results. Your kiln was carefully packed and fully inspected before shipping. If it was damaged enroute, retain all packing and crating materials and notify the delivering carrier at once, requesting an inspection report. Retain all papers and file claim for damage.

Every L & L kiln should have a one year element warranty slip. This slip when filled out properly and the lower portion mailed to us also warrants the switches for a period of one year from date of purchase. Do not fire kiln for extended periods over the rated maximum temperature — 2050°F. for low temperature models and 2300°F. for high temperature models.

### SETTING UP KILN — Top Loader

After the carton has been opened and the kiln lid carefully removed, inspect all the packing material before discarding, so as to prevent the loss of miscellaneous parts present with every kiln. Remove kiln from carton. Put legs on the bottom using the ½" long—#10-24 screws with a washer and nut on each bolt. Position kiln in proper location. Place the lid on the kiln and attach to kiln by means of sheet metal screws. Screw lid support on the rear of the kiln and your furnace is ready for electrical hookup.

#### WARNING!

Due to the recessed design necessary for the heat lock door, it is important to remember that when the kiln is stacked, the door will protrude into the furnace equal to the depth of the recessed lid. Although this will not diminish the inside working space the work load height must nevertheless be accurately determined before closing lid. In the L & L model top loaders this important point must always be considered. The danger involved is the accidental crushing of the ware in the kiln if stacked too close to the recessed door.

### WIRING AND INSTALLATION

Your kiln has been checked for circuitry at the plant before shipment. On each wiring diagram which comes with every kiln, the location of the points at which the input wires from the fuse box to the furnace must be connected, are specified. If your kiln is a plug in type, you are ready for operation. If it is a direct line type, retain the services of an electrician for hook up. We recommend the use of cartridge type fuses in the fuse box due to the fact that your kiln is a continuous operating electrical appliance.

All L & L kilns are designed for rated voltages of either 110 volt AC or 110-220v, 3 wire volt AC unless otherwise specified.

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#### TOP LOADER HOOKUP

##### Direct Line

Remove the front control panel in order to expose the switch and pilot light wiring. Locate recommended safety switch (as supplied by customer) at a convenient place on the wall near the kiln. Place recommended power input cables (as supplied by customer) by means of cable connector through the appropriate hole in bottom of front panel. Connect to terminal board on furnace. Connect power input wires to safety switch and kiln is ready for operation.

Observe the location of the terminal connections to which the power input wires are to be connected. They should be clearly marked and should compare with the wiring diagram. If the circuit and wiring diagram shows an unbalanced electrical circuit (made necessary for proper kiln performance), extreme care must be exercised by the electrician in order to connect the circuit correctly. Improper hookup will result in constant blowing of fuses. Size of power input wires must be determined from the wiring diagram according to the maximum ampere (current) consumption. The maximum current occurs when all the switches are on high.

#### (a) Poor Voltage

If your kiln takes an unusually long time to fire, it is possible that you may have poor voltage. First, check your receptacle for poor connections. If receptacle on plug in types heats up and is very hot to the touch, replace with a heavier-duty receptacle. Sometimes running a heavier line will correct the trouble. In some cases it is possible for your electric company to correct the trouble. Ask them to run a recorded volt test with the kiln running and also with the kiln not running. Ask for the results of the test and if the average voltage is less than that rated voltage on the kiln, an extended firing time may be expected. This test should be run over a 24 hour period to give you an exact picture of your voltage.

#### (b) Trouble Shooting

If elements do not heat, follow this procedure:

- (1) In plug in types, check to see that plug is in receptacle properly.
- (2) Check fuses. Put in new ones just to make sure. Check switch box for oxidation of contacts.
- (3) Check elements by testing with a test lamp of some similar method.
- (4) If fuses are okay, then the trouble is with the switch. When ordering the switch be certain to give model number of the kiln.

#### (c) Pilot Light

The pilot light is not an indication of a burned out element. It only indicates if and when the current is being fed into the furnace.

If pilot light does not glow on "low heat" do not be alarmed. It will not necessarily mean that your elements are burned out. These lights being of the neon type may give the false impression of an inoperative kiln because of the small amount of current available on "low heat", even though your "low heat" is operating properly. Therefore, turn the switch on medium or high. If the pilot light glows on medium and high heats, your kiln is operating properly, including your low heat. If, however, the pilot light does not glow on both medium and high heats, then either the switch or element needs replacement.

## PYROMETER INSTALLATION

It is very important that the pyrometer be calibrated against the performance of standard cones before using furnace for production purposes. The method is simply to insert a cone plaque in the empty kiln adjacent to the peephole with the welded end of the thermocouple protruding through either of the small holes in the side of the kiln for about 1½".

When the cone matures, observe the pyrometer reading. If the pyrometer reading is 50°F. to 75°F. different than the maturing point of the cone, this is not an indication of a faulty pyrometer mechanism. It is, however, an indication that for future firings the furnace operator must fire to the same indicating point on the pyrometer. In this way the resultant maturing point of the cone will always be the same. On the other hand it may be possible to adjust the screw on the face of the pyrometer but

**DO NOT TURN ADJUSTMENT SCREW PAST THE POINT WHERE NEEDLE STOPS MOVING.**

If pyrometer stops indicating, the thermocouple will need replacement. With proper care the thermocouple should last about two years. If pyrometer holes on the right side of furnace have not been drilled through the firebrick, simply insert a small screw driver and drill the necessary hole.

## THERMOCOUPLE

All L & L pyrometers come equipped with a thermocouple. A thermocouple is a calibrated length of two special wires welded together into a bead at one end, the other end being attached to a temperature indicator (known as a pyrometer).

For attaching thermocouple after ordering a replacement, scrape the two free ends of the thermocouple clean (either with a knife or sandpaper) back for a distance of one inch. Attach free ends to pyrometer and test beaded end of thermocouple with a match flame. If the indicator needle on the pyrometer either does not move or moves backwards, IMMEDIATELY reverse the thermocouple leads where they are attached to the pyrometer. Retest thermocouple bead with a match flame. If needle moves up scale, the installation is correct. If needle still does not move, thermocouple needs replacement.

## WARNING!

Thermocouple bead from pyrometer must be inserted in kiln to the required 1½" depth in order to give accurate temperature readings. Failure to observe and check location of beaded end of thermocouple before operating kiln will lead to erroneous temperature readings and cause overfiring with subsequent damage to kiln. The L & L Manufacturing Company cannot be held responsible for damage incurred due to operator negligence.

## ELEMENTS

If replacement is necessary, take your elements out one at a time and replace with a new one. This is so that your connection wires do not get mixed up. However, if this happens, follow the wiring diagram to get back on the proper hook up. Merely insert elements into the special L & L DYNA-GLOW element holders and rewire.

If elements as ordered do not come stretched, simply add up the total inches in the kiln where coiled section of element is to be located and stretch the coil to desired length. It is better to stretch to 2" less than the required length to allow for any error in calculation when put in place.

## FIREBRICK MAINTENANCE

Your furnace is constructed of first quality firebrick designed for minimum heat loss and high firing efficiency. The surface of all our kilns is covered with a high temperature refractory cement applied liberally for purposes of prevention of firebrick dusting and longer brick life. Prolonged heating of any object which expands or contracts will eventually lead to surface cracks. This fact is true with all refractory firebrick. It does not mean, however, that firing efficiency will be impaired. The appearance of cracks after the kiln has been in use, whether it be surface cracks or seam cracks, will therefore necessitate only a simple repainting of the surface with L & L refractory mortar. If the cracks appear to be wider than of the hairline variety, i.e., approximately 1/16 to 1/8 of an inch wide, mix some ground up firebrick with L & L refractory mortar to a putty consistency. Moisten the crack with water and pack solidly with the mortar mixture, smoothing off flush with the firebrick surface. All linings can be replaced on L & L kilns. Directions for installing are given when brick is ordered. When ordering, always specify the model number and location of the lining to be replaced (left side, right side, top, etc.) when looking at the front of the kiln.

## KILN WASH ( For Ceramic Use)

Apply kiln wash only to the surface on the bottom of the kiln when there are no elements in the bottom. If elements are located in the bottom of the kiln, apply the kiln wash only on the upper surface of the shelf and not on the bottom of the kiln. Under no circumstances is kiln wash to be applied to any other part of the kiln. Kiln wash can be purchased in any ceramic shop where L & L kilns are sold.

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## SPECIALS

### SETTING UP KILN (Top Loaders)

Large top loading Dyna-Kiln models are generally crated with the lid of the kiln on the side of the furnace. In this way no vibration of moving parts can injure the firebrick interior.

Remove crate, set in position and place door on top of kiln. Be extremely careful in lifting door. Due to the quality of firebrick and the gauge steel, its weight therefore is a concentrated mass. After door has been set into its hinges, unpack the counterweight boom. "Boom" is located to the rear of the furnace, and bolted into position. Wind the flexible steel wire rope with attached sheave at the top around the sheave in the "boom" and attach to steel loop in door. After assembled, put scrap steel or facsimile into counterweighted box so that a lift of 20 lbs. on the door by the operator will allow the door to gently ease up to its resting position against the boom.



# DYNA-KILN PARTS LIST

October 1986 Prices  
All prices subject to change  
without notice.

## SQUARE SHELVES

Switches	-	\$15.00
Pilot Lights	-	7.50

SIZE	COST	WEIGHT
6 x 10	\$12.50	2 lbs.
10 x 10	\$15.00	3 lbs.
11 x 11	\$17.50	5 lbs.
8 x 16	\$18.50	5½ lbs.
13 x 13	\$20.00	5½ lbs.
16 x 16	\$25.00	10½ lbs.

POST SIZE 1⅜"D	COST
½"	\$ .25
1"	\$ .45
1½"	\$ .70
2"	\$ .70
2½"	\$ .85
3"	\$ .90
4"	\$1.00
5"	\$1.05
6"	\$1.15
8"	\$1.55
10"	\$1.80
12"	\$2.10

MODEL NO.	Lid Brick		Floor Brick		Sidewall Brick		Lids		Counter Balances
	COST	WEIGHT	COST	WEIGHT	COST	WEIGHT	Reg. Steel Cost	Stainless Steel Cost	COST
H-1100	\$ 60.00	11 lbs.	\$77.00	25 lbs.	\$ 70.00	10 lbs.	\$45.00	\$ 80.00	—
H-1300	\$ 75.00	30 lbs.	\$95.00	30 lbs.	\$ 77.00	12 lbs.	\$ 50.00	\$ 90.00	—
H-1500	\$ 85.00	35 lbs.	\$95.00	35 lbs.	\$ 84.00	15 lbs.	\$ 55.00	\$ 90.00	\$ 86.50
H-3800	\$110.00	45 lbs.	\$120.00	45 lbs.	\$ 96.00	19 lbs.	\$ 75.00	\$150.00	\$ 98.50
H-5800	\$110.00	45 lbs.	\$120.00	45 lbs.	\$120.00	20 lbs.	\$ 75.00	\$150.00	\$104.50
H-8800	\$110.00	45 lbs.	\$120.00	45 lbs.	\$138.00	21 lbs.	\$ 75.00	\$150.00	\$116.50
H-1824	\$110.00	45 lbs.	\$120.00	45 lbs.	\$233.00	30 lbs.	\$ 75.00	\$150.00	\$126.50

MODEL NO.	ELEMENT COST
H-1100	\$16.50
H-1300	\$17.50
H-1500	\$19.50
H-3800	\$21.00
H-5800	\$21.00
H-8800	\$21.00
H-1824	\$21.00

- F.O.B. Twin Oaks, Pa.
- One order shipped to one address must total \$10.00 minimum before handling and postage charges are added.
- Shelves: 2 per carton. \$3.00 handling, plus shipping cost.
- Brick Sections: \$10.00 packing and handling each 2 sections, plus shipping cost.
- Elements: Add \$1.50 each for handling and postage.
- Posts: Add \$1.00 per length packing and handling, plus shipping costs.
- Metal Lids: \$3.00 packing and handling, plus shipping cost.
- C.O.D. charge on parts only — \$1.90
- No C.O.D.'s on kilns!

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## 10. AIR DRAFTS

Always plug peepholes with a post to prevent cold air from surrounding your cone placque and giving you an erroneous maturing point. Your cone should be back away from the peephole. When a pyrometer has been ordered, your kiln will have the two thermocouple holes drilled through the firebrick. Plug the hole, through which the thermocouple has NOT been inserted, with the special  $\frac{3}{8}$ " dia. ceramic plug sent for that purpose.

## 11. CONTROLS

Controls are available for the purpose of either controlling the temperature by holding it constant at the control point after it has been set or to automatically shut off the furnace after the control point has been reached in order to prevent overfiring or underfiring.



**Recommended  
FIRING INSTRUCTIONS**

Model C1100 — H1100

*Dyna* KILN

**Read Carefully Before Operating Kiln**

L & L MANUFACTURING CO.  
BOX 348  
TWIN OAKS - CHESTER, PA.

## 1. TESTING PYROMETER

Before using kiln for production purposes, the first procedure which must be followed is the testing of the pyrometer, if one has been ordered, against standard cones. See General Instructions sheet.

## 2. RECESSED DOOR

See General Instructions sheet for details of stacking ware with respect to the heat lock door. The danger of crushing the ware will be eliminated with a little care and consideration.

## 3. BISQUE FIRING

- Run kiln on low for about ½ hour. Leave door slightly ajar until fumes and steam are no longer evident. If you have a poor voltage condition causing an unusually long firing period, low firing may be ignored. If you have a pyrometer, a reading of about 450°F. is about right before turning kiln to Medium heat.
- After kiln has attained proper temperature on low, turn kiln to medium for about one hour. If you have a voltage condition causing long firing, skip medium. 800°F. is about right at the end of the medium firing.
- Turn kiln to high and fire to maturing of cone or corresponding reading of your pyrometer.

## 4. GLAZE FIRING

- If pieces are vitrified, large, thick, or box like in shape, always use low to start your glaze firing except when you have bad voltage. Fire on low for about ½ hour, or if you have a pyrometer, fire to about 450°F.
- After kiln has attained proper temperature on low, turn kiln to medium for about one hour. Medium can be skipped if your pieces are small, or if you have poor voltage. If you have pyrometer, fire on medium to about 800°F.
- Turn kiln to high and fire until maturing temperature of cone or corresponding reading on your pyrometer.

## 5. DECORATING FIRING

Follow the above directions in most cases. However, it will be necessary to fire with the door slightly open until the oils in your decorating medium have been burned away. This will usually occur when the kiln has attained 800°F. When the oils have burned off, close the door of your kiln and fire until the maturing point of your cone or corresponding reading of your pyrometer.

## 6. PORCELAIN FIRING – (High Temperature H Models Only)

Follow the above directions in most cases. The time cycle to 2300°F. will necessarily be longer in order to obtain proper maturing of the ware. All “Dyna-Kiln” high temperature models have been designed for longer and slower heating and cooling cycles for the proper vitrification of the porcelain ceramic constituents. Do not turn kiln off after maturing temperature has been reached. Due to the L & L switching arrangement you can lower the temperature gradually by turning switches to medium (assuming that all switches have been on high in order for ware to reach maturity) for about 1½ hours. Then reduce heat further by turning switches to low for another 2 hour period. Kiln may then be turned off completely. The cooling cycle is just as important as the heating cycle in porcelain firing in order to produce a high quality of ware.

## 7. CARE OF KILN

Apply kiln wash, which is obtainable in any ceramic supply house, to floor of kiln so that if glaze drips it may easily be removed. Apply a thin coat with a paint brush. If glaze drips on the floor, remove the drippings immediately after kiln cools down. Vacuum clean kiln occasionally to remove particles of foreign matter. Do not apply kiln wash to any other part of the kiln except the floor. If shelves are used, apply kiln wash to upper surface of each shelf only.

## 8. HEATING DATA

See wiring diagram for element designation and electrical hookup.

The above models have three (3) heat controls.

## 9. SWITCHING ARRANGEMENT

The L & L switching arrangement makes it possible to control temperature differences very closely no matter what the load conditions may be. In general the lower heats are used to slow down the rate of heat rise in degrees per hour. This method of lower heat rise is useful for bisque firing and also for starting a heat cycle for china firing on fine vitrified ware to prevent heat shock. The more heats available in a kiln the greater the degree of heat distribution available.