GENERAL INFORMATION AND INSTRUCTIONS

K2 – K13 KILNS – 04/08/2022

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SECTION 1 - KILN AND FURNITURE PACKING

1.1 LOCAL AND INTERSTATE KILN PACKING

Kilns delivered locally or Interstate will be packed differently as shown below:

Programmers, Bungs and Door Handles

Kiln Delivered Locally (**Note**: Local Delivery of Kiln does not require a pallet)

Pallet (Note: Kiln will be bolted onto Pallet)

Programmers Bungs and Door Handles

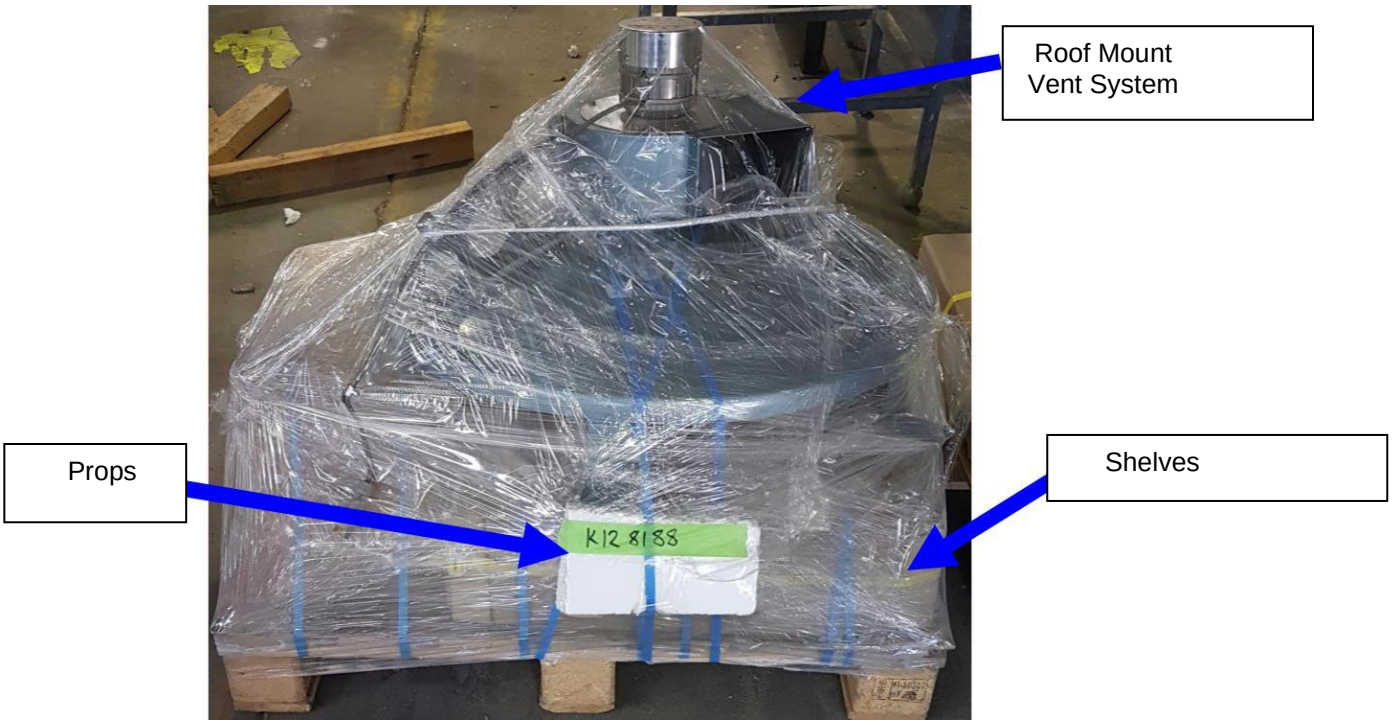
Kiln Delivered Interstate

1.2 KILN FURNITURE PACKING

Kiln Furniture will be packed and wrapped on a pallet and delivered as shown below:

1.3 KILN FURNITURE WITH ROOF MOUNT VENT SYSTEM PACKING

Kiln Furniture with Roof Mount Vent System will be packed and wrapped on a pallet and delivered as shown below:



1.4 HOW TO MOVE THE KILN WITH A PALLET JACK OR FORK LIFT

When moving or relocating a kiln with a pallet jack or a fork lift, always remember to make sure the fork can be seen through the other side of the kiln. (**Note:** If the fork cannot be seen through the other side of the kiln and lifting has proceeded, kiln can be damaged and the tipping of the kiln can occur).

SECTION 2 - POSITIONING ELECTRIC KILNS

The kiln should be installed in a well-ventilated (but not drafty) area, on a clean, flat, non-combustible surface (such as concrete or cement sheet), with adequate space around the kiln for the natural circulation of air. Nothing should be resting against the sides of the kiln, stored under the kiln or on top of the kiln. There should be no flammable or combustible materials stored in the room or area where the kiln is situated.

It is recommended that there be a minimum gap of 150 mm of wall on the non-control box sides and 600 mm of wall on the control box side, where the walls are of a non-combustible material (such as steel sheet, brick or cement sheet). If the walls are of potentially combustible material (including but not limited to wood or plasterboard), a minimum of 300 mm is recommended for the non-control box sides and 600 mm for the control box side.

There should be ample clearance from the top of the kiln to the ceiling or roof (at least 1000 mm), and any flue (if fitted) should be installed by a qualified provider in such a way as to prevent contact with flammable or combustible substances. In any event, the kiln should not be situated below a combustible roof or ceiling.

2.1 POSITIONING OF KILN OUTSIDE IN A SHED

If the kiln is to be positioned outside of a building, it is vital that there is a structure around the kiln to shield it from weather conditions, such as rain, wind and humidity. If the kiln is exposed to moisture, the bricks will absorb the moisture and, when firing the kiln, the moisture will disperse from the brickwork causing reduced life of the bricks. It should also be noted that the performance of the kiln will be adversely affected by wind and drafts.

2.2 POSITIONING OF KILNS IN A SCHOOL ROOM

When the kiln is situated in a school room or any other environment where people who are not intimately familiar with the hazards of an operational kiln are exposed to the kiln, it is recommended that the kiln has a barrier with a lockable gate around the outside to stop anyone from touching the kiln during operation (Tetlow can supply).

SECTION 3 - VENTILATION OF ELECTRIC KILNS

It is recommended that kilns be fitted with a powered ventilation system, which can be provided by Tetlow. The ventilation dilution system removes the by-products from the clay and glazes, which could impact on the life of your kiln, and of other objects in the area around the kiln. The dilution air system also lowers the temperature in the exhaust, which allows PVC pipe to be used.

Adequate ventilation around the kiln is essential - make sure that the kiln is situated in an area where there is at least some natural ventilation to the outside of the building (a window or doorway grill).

Tetlow Kilns & Furnaces can visit sites to recommend positioning and ventilation system of electric kilns.

SECTION 4 - ELECTRICAL CONNECTION FOR THE KILN

In order to ensure electrical safety, any wiring or maintenance of the electrical system or elements must be undertaken by a suitably qualified electrician. Only a suitably qualified electrician may remove any cover panels, as the connections underneath may be live and cause an electrical shock if touched.

No modifications to the electrical wiring or controls should be undertaken unless done by a qualified electrician, and then only with the approval in writing of Tetlow Kilns & Furnaces.

At all times, please ensure that the kiln is connected to a power supply in full conformance with applicable electrical regulations, and that no modifications are made which might compromise the circuitry or safety of the kiln.

The kiln will either come fitted with a power cord and plug, or will be supplied ready for hard-wiring to power supply, depending on the model.

If the kiln is supplied with a cord and plug, please ensure that it is plugged into a suitably rated power outlet matching the supplied plug, as installed by a qualified electrician.

If the kiln is supplied ready for hard-wiring to electrical supply, please ensure that it is connected to the power supply by a suitably qualified electrician, in conformance with applicable electrical regulations.

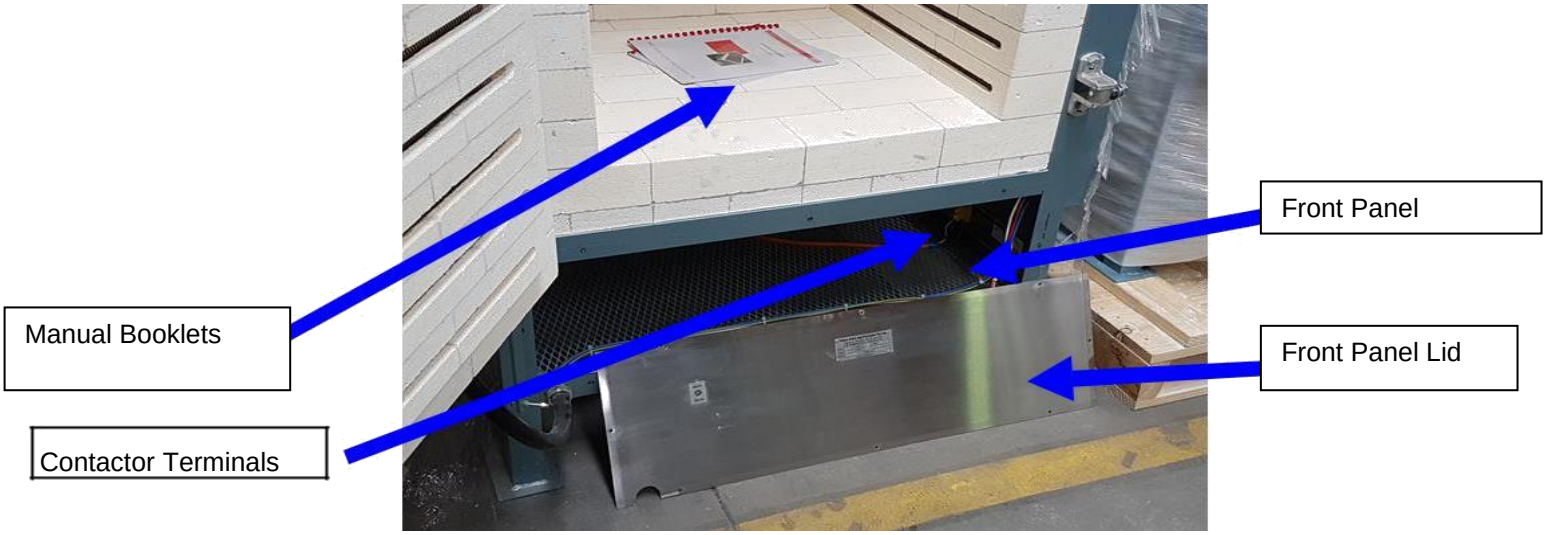
Please ensure that you do not install a kiln on an electrical connection with an EARTH LEAKAGE SYSTEM (RCD or RESIDUAL CURRENT DEVICE BREAKER). These systems will often cause the kiln to trip out. A circuit breaker (D-curve type) is more suitable. Should an Electrician have an issue with not installing an RCD then the kiln may need to be hardwired to the connection, in accordance with rules and regulations including AS3000.

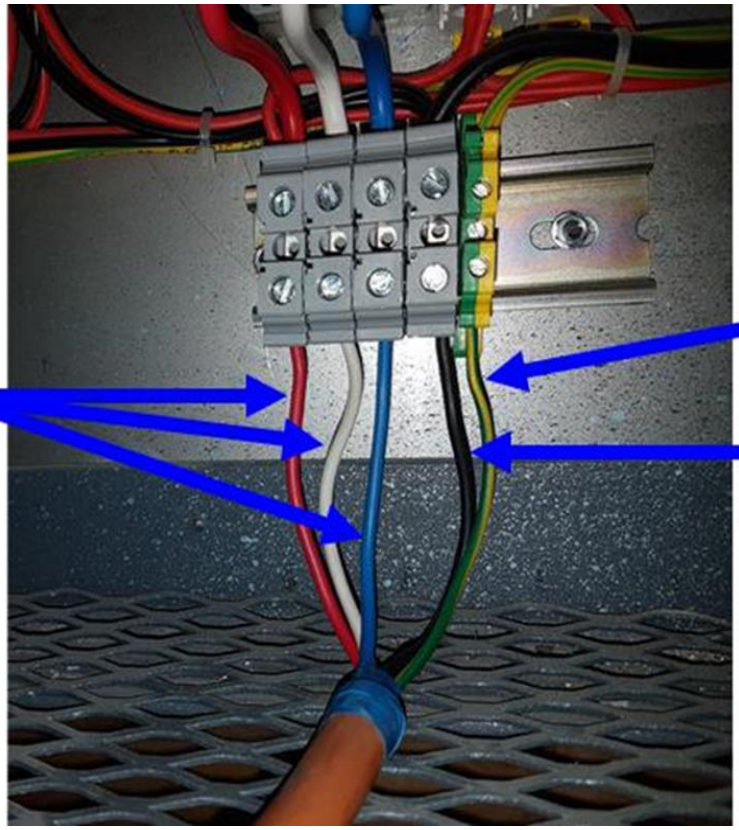
Small kilns rated up to 20 amp, single phase, come complete with a cord and a 3-pin plug. Depending on the rating of the kiln, the plug will be a 10 amp, 15 amp or 20 amp plug - the installed power outlet will need to match this plug. Alternatively, a qualified electrician can hard-wire the kiln to the electrical supply.

Larger kilns rated above 20 amp, single phase, or with multi-phase will require hard-wiring. All kilns require neutral and earth in addition to active phase(s).

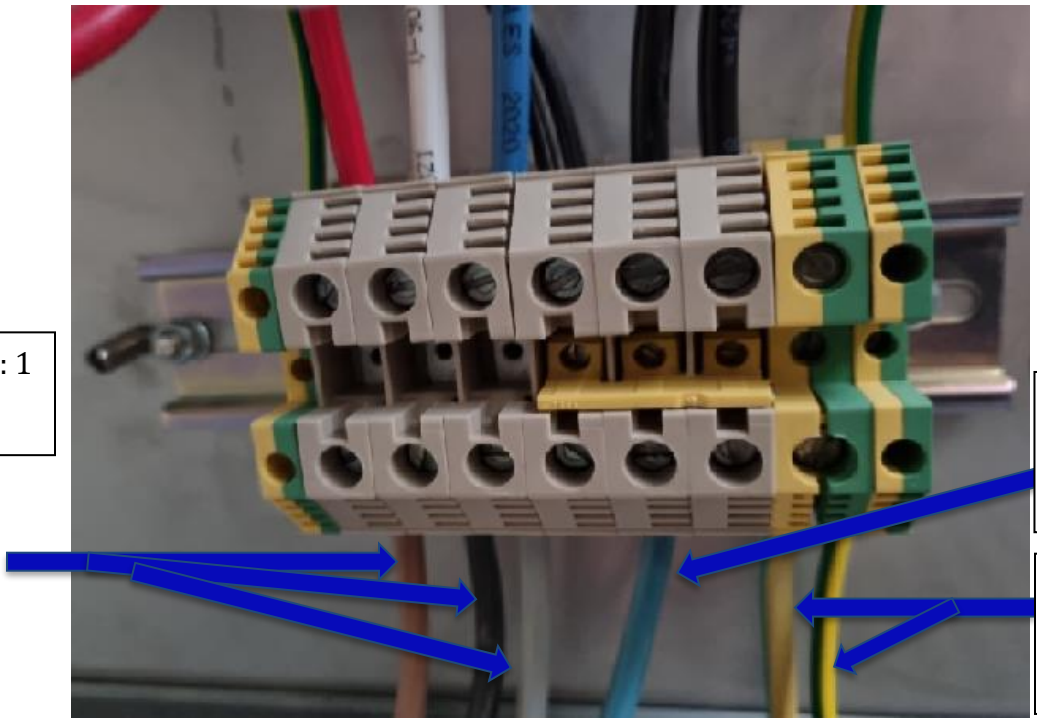
All active and neutral connections are to a terminal strip mounted in the control area along with a screwed terminal for earth (as pictured below).

1phase:	3wires	1active	1neutral	1earth
2phase:	4wires	2active	1neutral	1earth
3phase:	5wires	3active	1neutral	1earth





Wiring Cord Colour – Orange Flexible Cord (Older Kilns used Orange Flexible Cables)



Wiring Cord Colour – Black Flexible Cord (European cables and current AS/NZS flexible cords flexible cables and equipment wiring)

Please double check colour of power cable and wire accordingly to above images

SECTION 5 - ELECTRICAL ISOLATORS

For a kiln which is hard-wired, an electrical isolating switch must be fitted adjacent to the kiln, so the kiln can be safely isolated in accordance with rules and regulations including AS3000.

IMPORTANT: Before electrical connections are made, have your qualified electrician check and secure all terminal screws and nuts on factory fitted cables (contactor, etc). These may have come loose in transport and associated handling.

SECTION 6 - BRICKS

The K23 insulated bricks is a type of soft/light weight brick made of refractory ceramic material a blend of alumina and silica, that can withstand extremely high temperature applications and has low thermal conductivity.

All Tetlow kilns are built to brick layout drawings (with insulation blanket behind the bricks) which have expansion/contraction joints in them to reduce cracking and have consistency of manufacture.

Brick kilns/Furnaces, do develop thin cracks through the brick. which are caused by the thermal expansion/contractions of the brick (when kiln is cycling from cold to hot) and then contraction of the brick (when kiln is cooled down back to ambient temperature).

Please monitor and take and send photos in the future if you observe any change to these cracks

SECTION 7 – KILN OPERATION

It is recommended that the kiln is isolated from power prior to performing any cleaning

1. Before turning the Kiln ON, visually inspect the kiln inside and out for any damage. Do not operate the kiln if there is damage.

2. The kiln should be cleaned out before every firing. This entails removing all props and shelves from the kiln and vacuum cleaning, as below.

3. Vacuum clean the floor and carefully inside each element groove. This will assist in removing any residual contamination from the clay and glazes and thus prolonging the life of the kiln and elements.

4. Ensure that the inside is clean and relatively dust free. Remember to wear a mask when cleaning.

5. Check that kiln furniture is still in good condition: without cracks, etc. (This will reduce the likelihood of the shelves breaking during firing).

6. Carefully load the kiln checking to ensure that there is adequate space (30 mm) around the Thermocouple (Temperature Probe) and adequate clearance to the walls and roof.

7. Close the door. For smaller kilns (K2-K6) make sure that the door is tight against the body once the latch is closed. For larger kilns (K7-K13) make sure the fastening knob(s) are finger-tight and that there are no gaps between the door and the kiln body.

8. Make sure power is connected to the kiln and turn on the power switch on the control panel.

9. Check over the settings you have for your desired program/cycle and begin the firing. You should see a run light or hear a clicking to indicate the kiln is running.

10. Before you leave your kiln to run, ensure there is nothing touching up against the kiln or resting on it. Check to ensure that the kiln bungs are in or out depending on your preference - see also guidelines below.

SECTION 8 - KILN BUNG GUIDELINES

For pottery and ceramics we'd suggest you leave your bung(s) out till the kiln has reached around 250°C - 300°C. This will allow any excess moisture and clay gases from the ware to escape the chamber. Above this temperature, the bung(s) should ideally be placed in the bung-holes. This will ensure that the heat loss is minimised. Operating with the bungs out at higher temperature can, in some cases, prevent the kiln from achieving maximum operating temperature.

If you can't be there to put them back in at the above recommended temperature, you can leave just one of the bungs out in the top, this will allow for most of the gasses to leave the kiln.

Operating with the bungs out for the entire cycle is not generally recommended. Once the kiln achieves a higher temperature the heat loss from the bung holes is quite significant and can, in some cases, prevent the kiln from achieving maximum operating temperature and can, over time, result in damage to the kiln elements and/or insulation due to excessive time at the higher temperatures (over-firing).

Conversely, if the bungs are left in the kiln all the time (i.e. not removed at the start of firing), damage to the kiln elements and/or insulation can occur due to excess moisture and clay gases which are unable to discharge from the kiln.

For 'Glass' or Glaze firing the bungs should generally be left in unless you are using moulds that contain moisture. If you have lost or broken bungs please contact Tetlow Kilns & Furnaces for a replacement. For reasons noted above, it is not recommended to fire a kiln without using bung(s).

SECTION 9 – KILN LOADING GUIDELINES

It is normal practice to maximize the amount of pottery loaded into the kiln, whilst having regard to the clearances, and other characteristics required for good operation of the kiln. Typically, pottery ware is loaded on multiple levels separated by kiln shelves or batts (made from cordierite or other kiln-safe material) and props of varying heights. Choose pieces to load based on height, and other relevant characteristics. It is common practice to load tall pieces on one level, and shorter pieces on another. If the kiln load has items of different sizes, consider splitting the shelves to maximize space. Always try to load the kiln evenly, from side to side, top to bottom. This will help ensure the kiln provides an even firing. The kiln applies the same heat pattern regardless of the load, so always try to "keep things symmetrical".

Generally, support each shelf with three posts instead of four. Four posts can cause the shelves to wobble unless the bottom of the kiln is even, the shelves are flat, and the posts are exactly the same height. You can still use four if you wish, just make sure the shelves are as stable as possible.

Give your pieces room to “breathe”. In order for the heat to properly fire your ceramic pieces, try to leave at least 20 mm between pieces, and leave some room at the top of each level for the heat to pass evenly throughout the kiln. If you find you are getting cold spots between pieces increase the gap. Only air dried pieces should be loaded for bisque firing.

Glaze can bubble and splatter onto the kiln walls and shelves. For this reason, keep ware at least 30 mm away from element grooves and walls. Periodically check your kiln for glaze contamination. Dig out glaze from kiln walls and the bottom with a putty knife, removing as little insulation as possible. Again if you need advice, take a photo and email us for feedback.

SECTION 10 – GENERAL FIRING GUIDELINES

10.1 FIRST STAGE (BISQUE) FIRING:

In the beginning, go slow:
Even if you have air dried your ware for many days there will still be moisture trapped inside the clay that needs to get out while firing.

If you go up in temperature too fast this trapped moisture turns to steam and can result in ware ‘exploding’ in the kiln.

Once this moisture has escaped and the organic contents of the kiln have burnt off (around 300°C). It's not just the top temperature you must reach, it's the amount of heat and time the ware receives. This means that the Ramp rate (rate of temperature rise) that occurs in the last 100°C of rise is as important as the top temperature the ware must reach. This is why clay often refers to a Cone number. These represent an amount of heat work.

For this reason, we suggest setting the last 100°C ramp at 60°C /hr. This represents the middle of the chart for a Cone firing and gives the best results. We suggest you refer to an Oroton Cone Chart which can be found on the internet.

To ensure the best results we would suggest adding a soak at the top of the cycle. This allows the whole kiln to ‘catch up’ or even out to a uniform temperature and gives a little extra time for the desired temperature to soak through the entire thickness of the ware. For bisque, stoneware or ceramics we’d suggest 10 -15mins. (If you find you are getting cold spots in your kiln you can extend this soak. Uneven packing can also be partially overcome by extending this soak. Note: You need to try and see what works for your specific firing and packing arrangements).

10.2 SECOND STAGE (GLAZE) FIRING:

As the ware has already been fired it can handle much higher temperature ramp rates. This means that even through a glaze firing is generally to a higher temperature the total cycle time can be more or less the same.

To ensure the best results, especially with glazes, we would suggest adding a soak at the top of the cycle. This has two effects. Firstly, it allows the whole kiln to 'catch up' or even out to a uniform temperature. Secondly, it allows the glaze time to mature. For most glazes a 30 min soak would be typical.

Remember just like a recipe for an oven you may need to tweak the speeds and temperatures to get the best results for your particular application.

Opening the kiln after firing

We'd advise against opening the door at temperatures over 200°C. This is for personal safety reasons and also to protect the kiln from thermal shock, which could reduce life expectancy of the kiln.
To speed up cooling it is acceptable to remove all bungs from the door and roof, and below 300°C you can loosen the door latch and crack the door open slightly. At 200°C you can fully open the door. **Note: that ware can be susceptible to thermal shock if they drop in temperature too quickly.**

Personal protective equipment (PPE) should always be worn when operating the kiln.

SECTION 11 - FITTING OF ELEMENTS

Please note, as this is electrical work, it must be performed by a licensed electrician.

Make sure the kiln is disconnected from power – unplugged from wall socket, fuses out or isolator off, whichever applies.

Remove cover(s) from kiln to enable you to have access to element terminals. Undo brass nuts on terminator remove end of old element from terminal, cut though old element at the point where it comes out of the ceramic insulating tube, remove any residual insulating fibre from the opening of the ceramic insulating tubes and then slide ceramic insulating tube outwards from the outside of the kiln wall - do this on both ends of each element. Then from inside the kiln carefully remove the element from channel, being gentle so as not to damage brickwork.

If element has blown out and there is molten metal embedded in brickwork make sure all of metal is removed by digging out with a screwdriver or something similar. Make sure element channels are spotlessly clean before installing new elements (vacuuming is recommended).

Install new elements in channels feeding tails through holes in the brick wall into termination areas. Slide the ceramic insulating tubes back on to the element tails, push insulating material back into tube, terminate each end of the element around brass screw, making sure all washers are replaced. Cut off any excess length of element tail as pictured, and make sure that the cut-off end of the element does not come back in contact with itself or another element wire, the casing or the cover as per diagram.

Tighten terminal nuts and test fire kiln.

11.1 FITTING ELEMENT PINS

1. Drill hole by hand using a drill bit (smaller than ceramic pin, say around 5 mm) hold drill bit between fingers and rotate.
2. Drill into the brick at the corner of the kiln in the back of the groove, the hole should be on a slight downwards angle.
3. If element is not sitting at the bottom of the groove then wedge down with a small section of wood or similar, do not forget to remove before firing.
4. Drill in approximately 25 to 35 mm deep.
5. Put pin into hole and very gently tap in with a piece of wood or soft hammer.
6. It does not matter if the ceramic protrudes out the front of the brick.
7. Do not remove the ceramic pin after installation.
8. Pins should be left in to keep element from jumping out of the corner.

Note:
If your elements have been fired they will be brittle and probably break, **we recommend this operation be done by a qualified kiln technician,** during the above operation. If elements have turned brittle the only way to get them down or back into groove is to use gas torch and heat then red hot and manually put them in position.

11.2 RESISTANCE TO CHEMICALS

Reducing gases with a sulphur content reduce the life of your kiln's electric elements, and a kiln atmosphere containing halogens (such as fluorine and chlorine) are highly detrimental to electric elements.

11.3 FIRST FIRING OF ELEMENTS

It is recommended that the first firing of a new kiln's elements is a slow firing, with the kiln empty, to a temperature of 1050°C. The cycle is outlined below, and is also referred to as a pre-oxidisation or re-oxidisation cycle.

- Do not fit ceramic close off bungs to vent holes during dry out firing.
- You should heat up to 1050°C with a ramp up time of seven (7) hours, (roughly 150°C per hour)
- Hold at 1050°C for four (4) hours
- Turn off the elements and allow to cool with the door closed until the furnace is below 200°C
- The elements will now be oxidized and ready for use, and added benefit is this will enable the cement to mature/dry and to remove moisture from the brickwork.

11.4 SPECIAL NOTE IF THE KILN IS TO HAVE A REDUCTION ATMOSPHERE

The durability of electric elements in air at high temperature is greatly increased by an oxide surface layer formed by a reaction with oxygen from the air, as noted above in the section "first firing". The protective nature of this oxide layer is proportional to its area and depth. Foreign matter usually interferes with the formation of the oxide layer, and this causes a reduced life. At high temperatures the protective layer of element materials consists almost entirely of aluminium oxide. This has a light grey colour and good chemical resistance. At temperatures below 1000°C (1832°F) the oxide layer has a dark colour since the aluminium oxide is impure.

If exposed to gases with a low oxygen content (including during Reduction Firing) the oxide layer may be attacked by reducing gases including nitrogen. The kiln may be used in low oxygen atmosphere (including Reduction Firing) provided you have first performed a pre-oxidisation cycle as noted above. It is also necessary to perform a re-oxidisation cycle periodically (frequency will depend on your particular application).

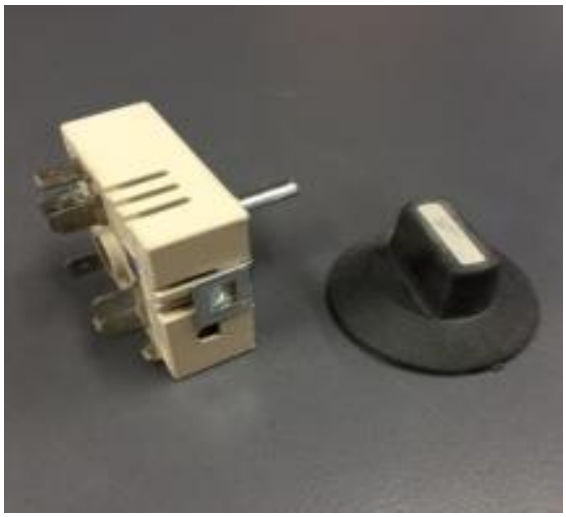
SECTION 12 - KILN ACCESSORIES AND INSTRUMENTATION

12.1 ENERGY REGULATOR

This is purely a device which controls the rate of temperature increase through control of the heat input to the kiln. It comprises a timed switching device, with the time of activation being variable from 0 to 100% of the time.

Setting the regulator to a low number will limit the effective power output of the elements, and this will alter the length of time it takes the kiln to heat to temperature required. At 100%, the elements will be powered all of the time and the kiln will heat at its maximum rate. A small red indicator light is incorporated in the regulator which illuminates when power is going to the elements.

An energy regulator is a very useful piece of equipment to easily control the rate of temperature rise. For example, if thick-walled pots are being fired, the rate of temperature increase can very easily be reduced. If a digital temperature controller is fitted to the kiln and there is a need to maintain the kiln at a certain temperature, the energy regulator setting can be adjusted until a position is found where the elements would be powered slowly enough to prevent further temperature rise, but fast enough to prevent the temperature dropping. This procedure should only be done for short periods of time to ensure minimal temperature drifts.



12.2 DOOR SAFETY SWITCH

This device is designed to isolate the electrical supply to the kiln elements when the kiln door is open. The usual door safety switch consists of a metal bracket that is fixed to the lower edge of the kiln door and depresses a plunger fitted to the front or underside of the kiln. This in turn operates the contactor relay. When the kiln door is shut, the safety

switch permits power to go to the kiln elements. When the door is opened, power is cut off from the kiln elements.

The door safety switch is a safety shutoff. Tampering with this device is strictly prohibited and could cause electric shock and electrocution. It is also forbidden to bypass or defeat the safety switch, as this could cause electric shock or electrocution.

12.3 CONES (PYROSCOPES)

Cones are an important and useful way of controlling your kiln's firing. Buller rings and Holdcroft bars fall into the same category.

Staffordshire cones come generally in two sizes, standard cones are 2½ inches (63.5 mm) tall and miniature cones are 1 inch (25.4 mm) tall. The cones are three-sided conical shape and made of a carefully controlled mixture of ceramic materials, which is designed to give a graduated scale of fusing temperatures at approximately 20°C intervals.

The cones which melt at the lower temperature contain a higher proportion of fluxes than those melting at the higher temperatures, which contain increasingly larger proportions of refractory oxides. This melting or fusing temperature is denoted by a number which is stamped into the back of the cone and by reference to the Staffordshire cone chart. Although it is commonly assumed that the Staffordshire cones melt at indicated temperatures on the chart, the cones can also melt and collapse when they have been subjected to a certain temperature, or rate of temperature increase, for a certain length of time.

Time factor is important because it is usually assumed that when a kiln fires to 1000°C over a period of 8 to 10 hours, the ware has been fired to its recommended temperature and therefore fired correctly. However, if firing is controlled solely by a pyrometer, then the kiln would have switched off when the temperature reached 1000°C and the ware fired in 3 to 4 hours would not have been properly fired and would probably be underfired when withdrawn from the kiln. This is where the time factor of Staffordshire cone becomes useful.

Staffordshire cones will only collapse when subjected to heat for a certain length of time and will not collapse if they are fired too rapidly to a temperature considerably higher than the cone number would indicate. Similarly, if the cones are fired too slowly, they will probably collapse at a temperature lower than that indicated by the cone number. In this way, Staffordshire cones give an indication of the amount of heat work applied to the ware and not merely the temperature to which the ware is subjected.

One of the most important considerations in the use of pyroscopes is the way in which they are mounted. This is generally done by inserting the base of the cones either into special cone holders or into a pad of plastic clay, but regardless of the type of mounting it is important that all the cones be embedded to the same depth. It is necessary for the cones to be placed at an angle of about 15˚ to the vertical, and to ensure this is the case, the manufacturer slants the base of the cone so that this inclination is automatically achieved when the cone is stood upright on its base.

It is standard to use a series of three cones for each firing, one cone indicating a temperature of about 20ºC below the temperature to which the ware is to be fired, one cone indicating the required temperature and one cone indicating a temperature 20˚C above the required one. In this way the collapse of the lower cone serves as a warning that the temperature is rising to the point at which the second cone will collapse (at which time the kiln should be switched off). The third cone serves as a guard to show potential over-firing.

It is important to place the cones in some definite order, which is usually done by placing the cones from left to right in order of increasing fusion point so that the cone on the extreme right will be the last to go down. The fusion point of any cone will be indicated when the cone bends over so that its tip bends down and touches the base on which the cone is mounted. This is referred to as the end-point of the cone. If the temperature continues to increase the cone will collapse further and eventually melt completely.

12.4 TEMPERATURE MEASURING INSTRUMENTS (PYROMETERS)

There are different types of temperature-measuring instruments, but the ones generally used consist of a thermocouple attached by special compensating cables to an instrument, which transforms the voltage fed into it from the thermocouple into degrees of temperature indicated on a scale.

Tetlow Kilns use either the Shimaden SR92 Set Point Controller or the Stafford 316B Programmable controller.

See detailed operations manuals for these instruments on our webpage ***www.tetlow.com.au***.

12.5 PRODUCTS

12.6 THERMOCOUPLES

Thermocouples are the “working end” of the pyrometer. It projects inside the kiln and generates the current, which is measured by the instrument fixed outside the kiln.

It consists of two different metals joined together at one end, called the junction, all located inside a ceramic sheath. The junction (which is the end located inside the kiln) is where the temperature is sensed. The thermocouple gives the temperature only in the immediate vicinity of the junction. If the thermocouple is “shaded” (e.g. by having too much ware or shelving placed too close to it) or if it does not protrude sufficiently into the kiln from the wall, it will give a poor indication of the actual kiln temperature. This can lead to either over-firing or under-firing, which can affect the ware being fired, and can also (with over-firing) result in kiln damage.

You must not pack or place items within 50 mm from the thermocouple, and the thermocouple must protrude from the wall by between 10 mm and 20 mm.

SECTION 13 - CHOOSING YOUR KILN

The choice of the correct kiln is influenced by these major factors:

(a) The approximate size of the kiln required.

(b) The maximum temperature to which the kiln will be fired.

(c) Difficulty of access to the kiln site.

(d) Whether the electricity consumption of the kiln can be accommodated by the electricity supply.

(e) The space in which the kiln is to be situated.

SECTION 14 - SERVICING

Tetlow Kilns and Furnaces recommend that you have your kiln be serviced yearly by a suitably qualified person to ensure that you get the best possible results from your kiln.

For further information, locate us at our website, www.tetlow.com.au

or contact us at Tetlow Kilns & Furnaces on:
Tel: 03 8545 8296 or info@tetlow.com.au

TETLOW KILNS & FURNACES
JOB SAFETY ANALYSIS/RISK ASSESSMENT FORM (JSA/RA)

ACTIVITY: Tetlow Kilns operation

REFERENCE: Electric kilns firing

DATE: 15 June 2015

RISK SCOPE CALCULATOR

LIKELIHOOD	CONSEQUENCE 1	2	3	4	5
A	H	H	E	E	E
B	M	H	H	E	E
C	L	M	H	E	E
D	L	L	M	H	E
E	L	L	M	H	H

TARGET = SHADED AREA

E = Extreme Risk - Immediate action required.
H = High Risk - Senior Mngmt attention required.
M = Moderate Risk – Specify Mngmt responsibility.
L = Low Risk - Manage by routine procedures.

LEGEND

Likelihood

A. Almost Certain – Is expected to occur in most circumstances
B. Likely – Will probably occur in most circumstances
C. Possible – Might occur at some time
D. Unlikely – Could occur at some time
E. Rare – May occur only in exceptional circumstances

Consequence

1 Insignificant – No Injuries.
2 Minor – First Aid treatment, onsite release, immediate containment.
3 Moderate – Medical treatment required, onsite release contained with external assistance
4 Major – Extensive Injuries, loss of production capability, off-site release with no detrimental effects, major financial loss.
5 Death toxic release off-site with detrimental effect, huge financial loss.

LIST STEPS INVOLVED TO ACHIEVE ACTIVITY	LIST ALL HAZARDS FOR EACH STEP	RATING C	L	R	LIST EXISTING AND PROPOSED CONTROLS	REVISED RATING C	L	R	CONTROL ACTIONS	PERSON RESPONSIBLE
Touching the kiln body when it is running	Burns to body	2	B	H	PPE should always be worn when the kiln is firing	2	C	M	Run the kiln when school is finished and wear PPE	School
Students in the classroom when the kiln is firing	Burns to body	3	B	H	The school should only run the kiln when school is finished and wear PPE	3	D	M	School should monitor the kilns usage and provide PPE.	School
Students in the classroom when the kiln is firing	Burns to body	3	B	H	Partition off the work kiln area when running the kiln	3	D	M	School should monitor the kilns usage and provide PPE	School
Touching electrical element wire	Electric shock	3	E	M	Door limit switch isolates electrical circuit	3	E	M	Service kiln at least once a year	School
Opening electrical cabinet	Electric Shock	4	E	H	The cabinet sliding door is fastened with screws and must only be opened by a qualified electrician	4	E	H	Service kiln at least once a year	School

FORM COMPLETED BY: DATE:

AUTHORISED BY: DATE:

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TETLOW KILNS & FURNACES
JOB SAFETY ANALYSIS/RISK ASSESSMENT FORM (JSA/RA)

ACTIVITY: Tetlow Kilns operation

REFERENCE: Electric kilns firing

DATE: 15 June 2015

RISK SCOPE CALCULATOR

LIKELIHOOD	CONSEQUENCE 1	2	3	4	5
A	H	H	E	E	E
B	M	H	H	E	E
C	L	M	H	E	E
D	L	L	M	H	E
E	L	L	M	H	H

TARGET = SHADED AREA

E = Extreme Risk - Immediate action required.
H = High Risk - Senior Mngmt attention required.
M = Moderate Risk – Specify Mngmt responsibility.
L = Low Risk - Manage by routine procedures.

LEGEND

Likelihood

F. Almost Certain – Is expected to occur in most circumstances
G. Likely – Will probably occur in most circumstances
H. Possible – Might occur at some time
I. Unlikely – Could occur at some time
J. Rare – May occur only in exceptional circumstances

Consequence

6 Insignificant – No Injuries.
7 Minor – First Aid treatment, onsite release, immediate containment.
8 Moderate – Medical treatment required, onsite release contained with external assistance
9 Major – Extensive Injuries, loss of production capability, off-site release with no detrimental effects, major financial loss.
10 Death toxic release off-site with detrimental effect, huge financial loss.

LIST STEPS INVOLVED TO ACHIEVE ACTIVITY	LIST ALL HAZARDS FOR EACH STEP	RATING C	L	R	LIST EXISTING AND PROPOSED CONTROLS	REVISED RATING C	L	R	CONTROL ACTIONS	PERSON RESPONSIBLE

FORM COMPLETED BY: DATE:

AUTHORISED BY: DATE:

Kiln firing log

Date:	programme#	start time	finish time