Tetlow

KILNS & FURNACES

General Information and Instructions 2026 - 2027

K-Series Kiln and Multisided-Series Kiln

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@TETLOWKILNS

Contents

Introduction

Thank you for choosing Tetlow's electric kiln. This manual has been designed to guide you through the safe installation, operation, and maintenance of your kiln to ensure reliable performance and the longevity of your kiln.

Please read this manual carefully before operating the kiln. It contains important safety information, operating instructions, and recommended maintenance practices. Following these guidelines will help you achieve consistent firing results while maintaining a safe working environment.

Kiln and Furniture Packing

Local and Interstate Kiln Packing

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

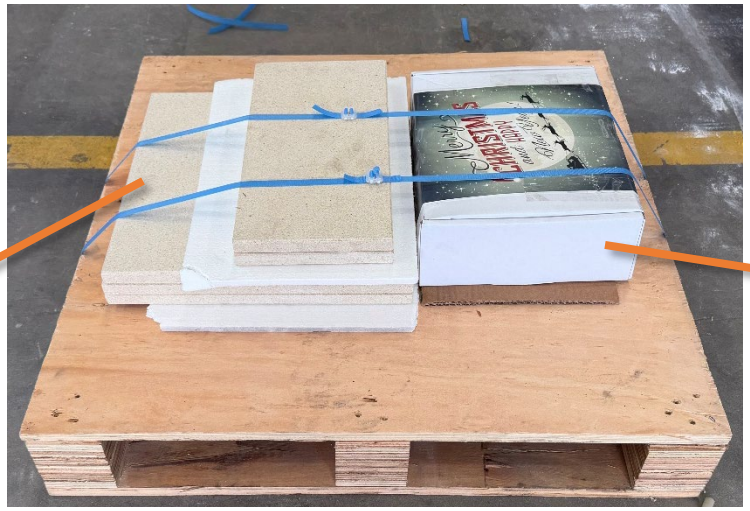
Kiln Delivered Locally by Tetlow
(Note: Local delivery of kilns does not require a pallet).

Programmer, Bungs and Door Handles

Kiln Delivered Interstate
(Note: kiln is bolted onto pallet)

Kiln Furniture Packing

Kiln Furniture is typically packed and wrapped on a pallet and delivered as shown below:



Ceramic Shelves

Ceramic props usually packed in a box and strapped onto pallet

Roof Mount Ventilation System Packing

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

How to Move the Kiln with a Pallet Jack or a Fork Lift

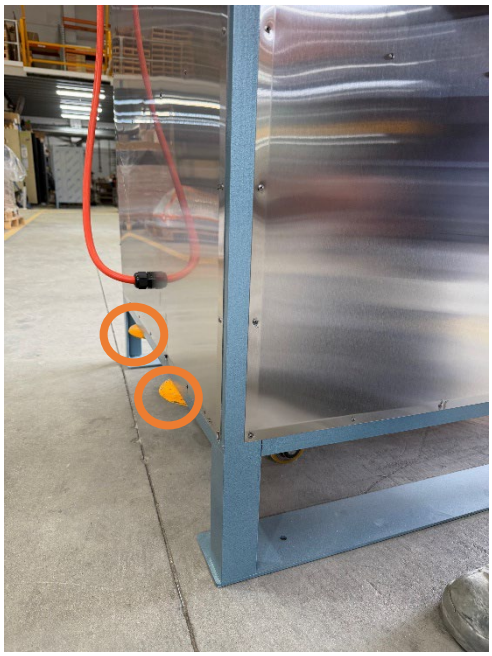
When moving or relocating a kiln using a pallet jack or forklift, always ensure that the forks extend fully through the kiln and are clearly visible on the opposite side.

Note: If the forks are not visible on the other side and lifting proceeds, the kiln may be damaged and there is a risk of the kiln tipping.

Correct

Correct

Wrong



Wrong

Positioning Electric Kiln

Positioning of Electric Kiln(s)

The kiln must be installed in a well-ventilated (but not drafty) area on a clean, flat, non-combustible surface, such as concrete or cement sheet. Adequate clearance must be maintained around the kiln to allow for natural air circulation. Nothing should be placed against the sides of the kiln, or stored beneath or on top of the kiln. No flammable or combustible materials should be stored in the room or area where the kiln is installed.

A minimum clearance of **150 mm** is recommended on the non-control box sides and **600 mm** on the control box side when adjacent walls are constructed of non-combustible materials (such as steel sheet, brick, or cement sheet). Where walls are of potentially combustible materials (including, but not limited to, wood or plasterboard), a minimum clearance of **300 mm** is recommended on the non-control box sides and **600 mm** (from the kiln body) on the control box side.

There must be sufficient clearance between the top of the kiln and the ceiling of the kiln room, with a minimum of **1000 mm** recommended. Any flue (if fitted) must be installed by a qualified technician/plumber and arranged to prevent contact with flammable or combustible materials. Under no circumstances should the kiln be installed beneath a combustible roof or ceiling.

Positioning Of Kilns in a School Room

When the kiln is installed in a school room or any other environment where individuals may not be familiar with the hazards associated with kiln operation, it is recommended that a suitable safety barrier with a lockable gate be installed around the kiln. This is to prevent accidental contact with the kiln during operation. *(Tetlow can supply a suitable barrier upon request.)*

Positioning Of Kiln Outside in a Shed

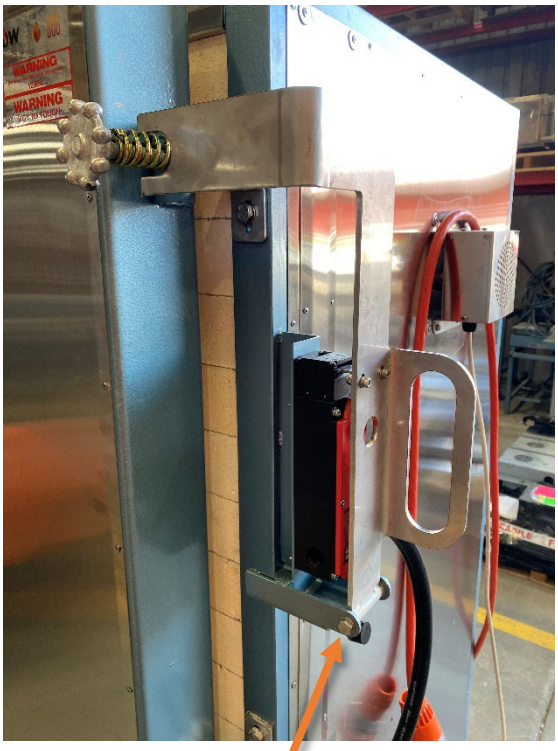
If the kiln is to be installed outside a building, it must be housed within a suitable structure that provides protection from weather conditions, including rain, wind, and humidity. Exposure to moisture can result in the kiln bricks absorbing moisture which, during firing, is released from the brickwork and may lead to a reduction in brick life.

It should also be noted that kiln performance may be adversely affected by exposure to wind and drafts.

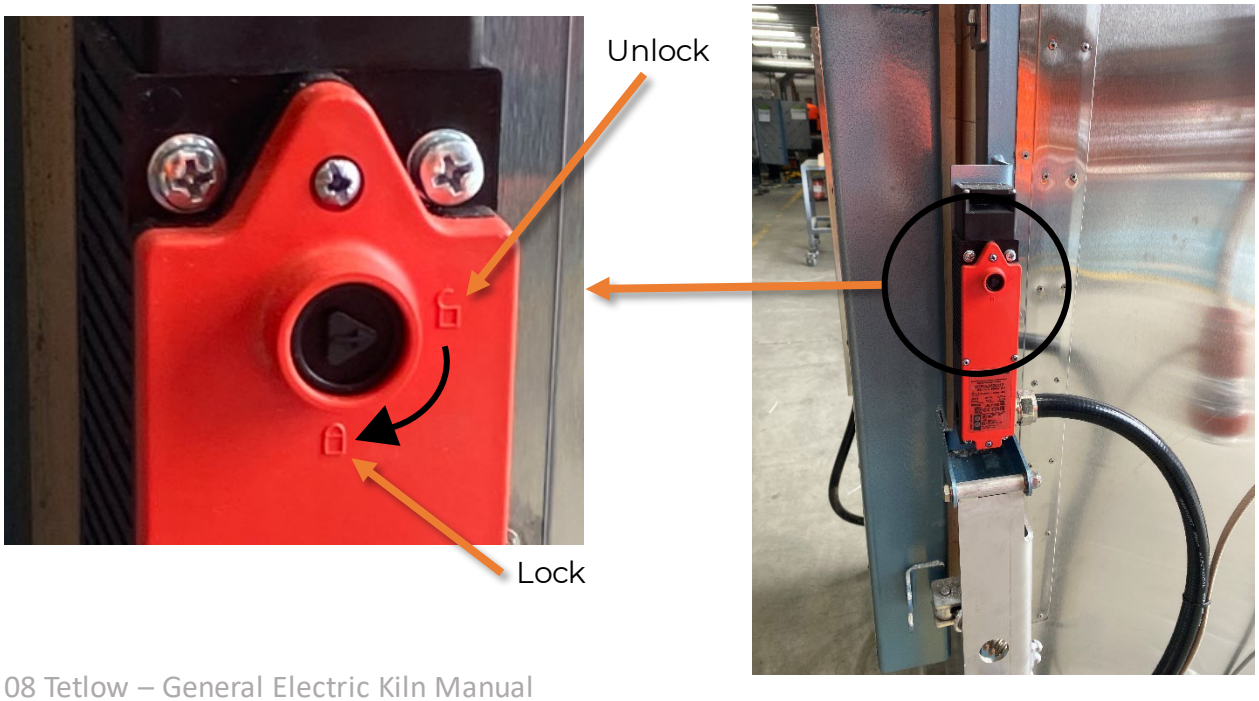
Door Interlock System

Upon purchase of the kiln, you may have opted to include a Door Interlock System. If so, there will be an additional unit attached to one of the door handles. This system prevents the kiln from being opened when the kiln is too hot. Tetlow sets to 150°C in the factory before the kiln is sent out.

<u>Important:</u> The metal arm and connecting bolt of the Door Interlock System will be packed separately for transport, so it will need to be re-installed once the kiln has been positioned. To do this, simply hold the metal arm in position and slide the connecting bolt into place. Ensure that the bolt is tight and secure before operating the kiln.



Power to the kiln must be on for the interlock to release



Ventilation of Electric Kilns

It is recommended that kilns be fitted with a powered ventilation system, which can be supplied by Tetlow. The ventilation dilution system removes by-products generated from clay bodies and glazes, which may otherwise impact the longevity of the kiln and surrounding equipment or surfaces. The dilution air ventilation system also reduces exhaust temperatures, allowing for the use of PVC flu/ducting where appropriate.

Adequate ventilation around the kiln is essential. The kiln should be installed in an area with access to natural ventilation to the outside of the building, such as a window or doorway grille.

Tetlow Kilns & Furnaces can conduct site visits to assess kiln positioning and recommend suitable ventilation systems for electric kilns.

Electrical Connection for the Kiln

To ensure electrical safety, all electrical wiring, servicing, and maintenance—including work on heating elements—must be carried out by a suitably qualified electrician. Only a qualified electrician may remove any cover panels, as live electrical connections may be present and pose a risk of electric shock if touched.

No modifications to the kiln's electrical wiring or control systems are to be undertaken unless performed by a suitably qualified electrician and approved in writing by Tetlow Kilns & Furnaces.

At all times, the kiln must be connected to a power supply that fully complies with applicable electrical regulations. No alterations are to be made that may compromise the integrity, performance, or safety of the kiln's electrical circuitry.

All standard electric kiln will be supplied with a factory-fitted power cord and plug. The power plugs supplied are generally 5-pin or 3-pin, images as below.


5-pin plug, 3 phase, 20 amps

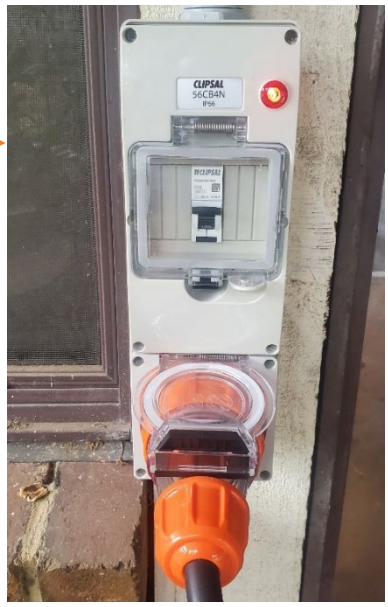

5-pin plug, 3 phase, 32 amps

3-pin plug,
1 phase, 25 amps

3-pin plug,
1 phase, 15 amps


5-pin plug, 3 phase, 10 amps

The kiln must be connected to a suitably rated power outlet that matches the supplied plug and for 3 phase powered kilns we generally recommend the power outlet similar to image on the right.



3 phase power-outlet

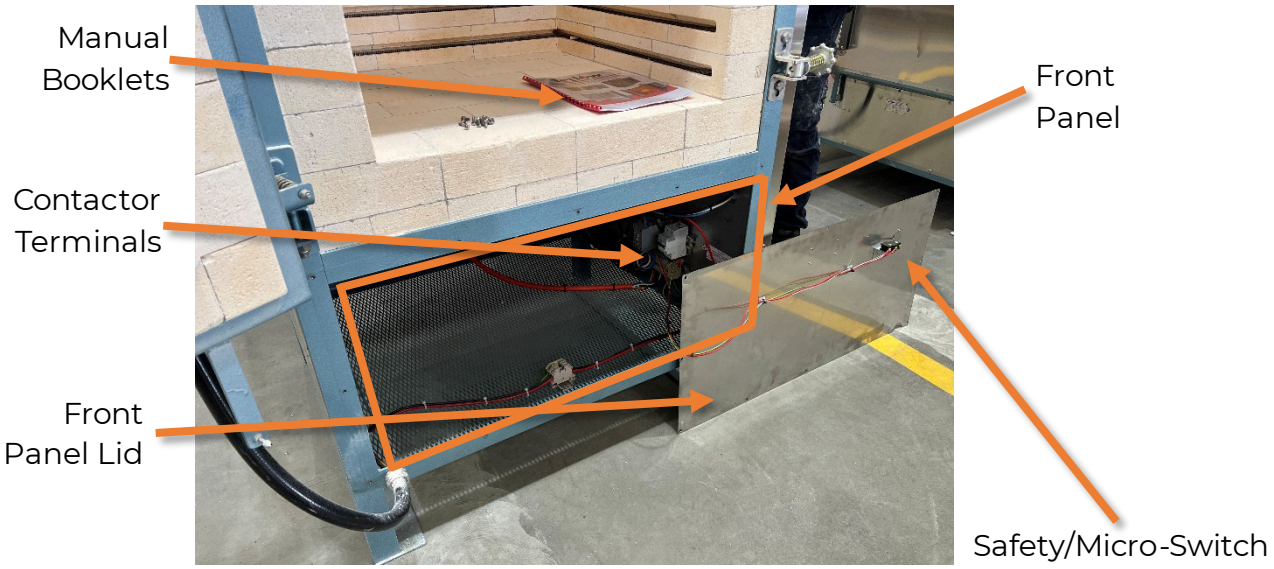
Where the kiln is supplied ready for hard-wiring, it must be connected to the electrical supply by a suitably qualified electrician in accordance with all applicable electrical regulations.

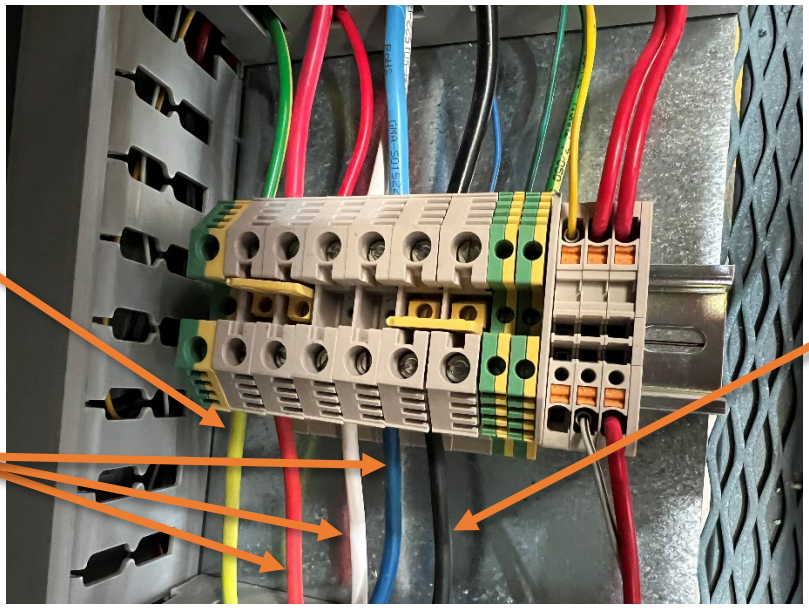
Kilns must not be installed on circuits protected by an earth leakage system (RCD or residual current device), as these devices may cause nuisance tripping during kiln operation. A suitably rated D-curve circuit breaker is recommended. Where installation without an RCD presents compliance concerns, the kiln may be hard-wired or plugged-in.

Small kilns rated up to 1 phase 20 amps, are supplied with a power cord and 3-pin plug. Depending on the kiln rating, this may be a 10 amp, 15 amp, or 20 amp plug, and the installed outlet must match the supplied plug. Alternatively, the kiln may be hard-wired by a suitably qualified electrician.

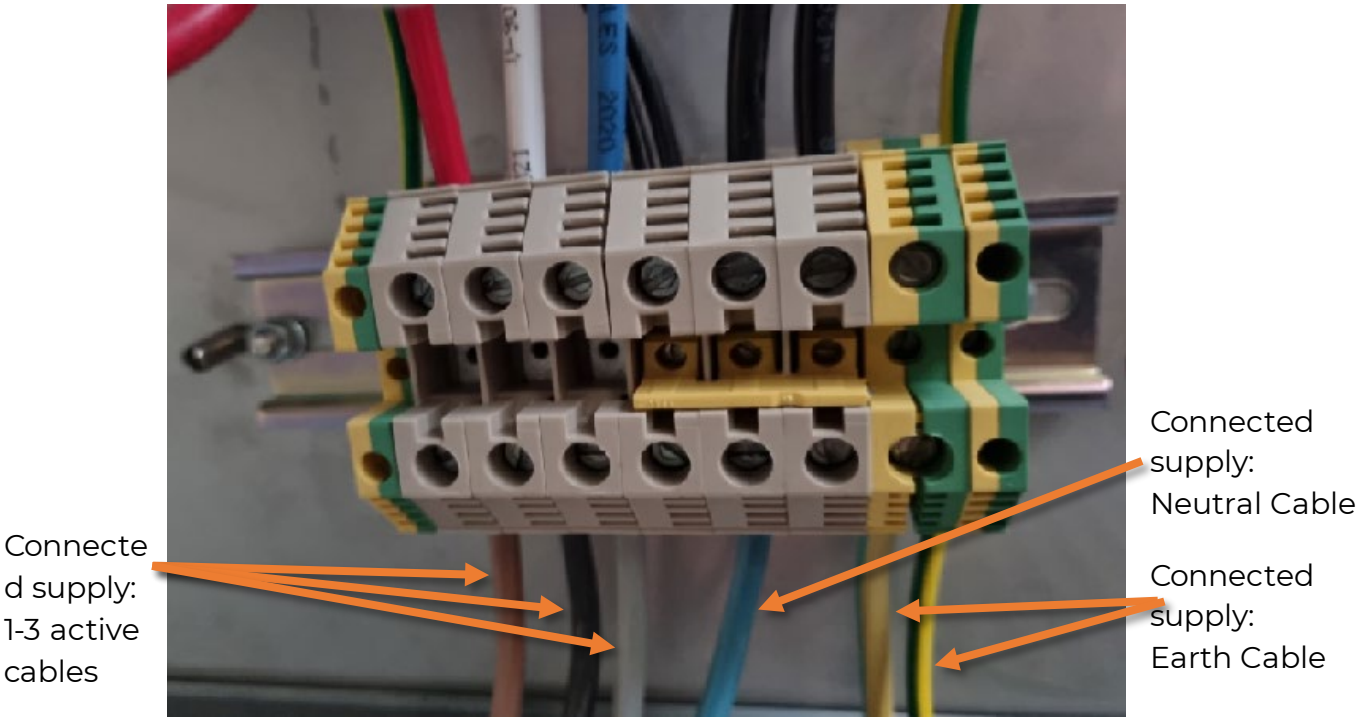
Our larger electric kilns are generally rated above 1 phase 20 amps and operate on multi-phase power, they can be hard-wired to the isolator by a licensed electrician or plugged-in. All kilns require neutral and earth connections in addition to the active phase(s). All active and neutral conductors are connected to a terminal strip located in the control box, with a dedicated screw terminal provided for the earth connection (as shown below).

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





Wiring Cord Colour – Orange Flexible Cord (Older Kilns used Orange Flexible Cable and equipment wiring



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

Electrical Isolators

For kilns that are hard-wired, an electrical isolating switch must be installed adjacent to the kiln to allow the unit to be safely isolated in accordance with applicable rules and regulations, including **AS/NZS 3000**.

IMPORTANT: Prior to making any electrical connections, a licensed or qualified electrician must inspect, check, and securely tighten all terminal screws and nuts on factory-fitted cables (including contactors and related components). These connections may loosen during transport or handling.

Kiln Bricks

K23 insulating bricks are lightweight refractory bricks manufactured from a ceramic blend of alumina and silica. They are designed to withstand extremely high temperatures while providing low thermal conductivity.

All Tetlow kilns are constructed in accordance with detailed brick layout drawings and incorporate an insulation blanket behind the brickwork. Expansion and contraction joints are included within the design to reduce cracking and ensure consistency of manufacture.

It is normal for brick kilns and furnaces to develop fine hairline cracks in the brickwork. These occur as a result of thermal expansion and contraction during heating and cooling cycles, as the kiln moves from ambient temperature to operating temperature and back again. These cracks are typically cosmetic in nature and do not affect the kiln's performance or firing temperature.

Please continue to monitor the brickwork and, should you observe any changes in the size, pattern, or extent of these cracks, take clear photographs and forward them to **info@tetlow.com.au** for review.

Pre-Firing Inspection and Cleaning

1. **Pre-Operation Inspection**
   Before switching the kiln ON, visually inspect both the interior and exterior of the kiln for any signs of damage. Do not operate the kiln if any damage is observed.
2. **Cleaning Before Each Firing**
   The kiln should be cleaned prior to every firing. This involves removing all kiln furniture, including shelves and props.
3. **Vacuum Cleaning**
   Vacuum clean the kiln floor and carefully clean inside each element groove. This helps remove residual clay and glaze contaminants and will assist in prolonging the life of the kiln and heating elements.
4. **Dust Control**
   Ensure the kiln interior is clean and relatively dust-free. Always wear a suitable dust mask during cleaning.
5. **Kiln Furniture Inspection**
   Inspect all kiln furniture to ensure it is in good condition and free from cracks or damage. This reduces the risk of shelves toppling during firing cycles.
6. **Loading the Kiln**
   Load the kiln carefully, ensuring:
   - A minimum clearance of **30 mm** around the thermocouple (temperature probe)
   - Adequate clearance between the ware and the kiln walls and roof
7. **Closing the Door**
   - **Small kilns (K2–K6):** Ensure the door is firmly seated against the kiln body once the latch is secured.
   - **Large kilns (K7–K13):** Ensure fastening knob(s) are tight and that there are no gaps between the door and the kiln body.
8. **Power Connection**
   Confirm that the kiln is correctly connected to the power supply, then switch the power ON.
9. **Program Verification and Start-Up**
   Review the programmed firing settings and confirm they are correct for the intended cycle. Commence the firing. A run indicator light or audible relay clicking will confirm the kiln is operating.
10. **Final Safety Check**
    Before leaving the kiln unattended:
    - Ensure nothing is leaning against or resting on the kiln
    - Confirm kiln bungs are left in or removed as required (refer to ventilation guidelines below)

Kiln Bung Usage Guidelines

Pottery and Ceramic Firings

For pottery and ceramic firings, it is recommended that the kiln bung(s) be left out until the kiln reaches approximately 250°C–300°C. This allows excess moisture and clay-related gases to safely escape from the firing chamber.

Once this temperature range has been reached, the bung(s) should be placed back in the bung holes to minimise heat loss and ensure efficient kiln operation. Operating the kiln with bung(s) removed at higher temperatures may, in some cases, prevent the kiln from achieving its maximum operating temperature.

If you are unable to reinstall the bung(s) at the recommended temperature, it is acceptable to leave one bung removed from the top vent only, which will allow most gases to escape while limiting heat loss.

Operating the kiln with all bung(s) removed for the entire firing cycle is not recommended. At elevated temperatures, heat loss through the bung holes can be significant and may prevent the kiln from reaching the required temperature. Prolonged firing under these conditions may also result in damage to kiln elements and/or insulation due to extended exposure at high temperatures.

Conversely, operating the kiln with all bung(s) installed for the entire firing cycle (i.e. not removing them at the start of firing) can also cause damage. Excess moisture and clay gases may become trapped within the kiln chamber, potentially leading to deterioration of the elements and insulation.

Glass and Glaze Firings

For glass or glaze firings, bung(s) should generally remain installed throughout the firing, unless moulds containing moisture are being used, in which case ventilation may be required during the early stages of firing.

If bung(s) are lost or damaged, please contact Tetlow Kilns & Furnaces to obtain replacements. For the reasons outlined above, operating a kiln without bung(s) is not recommended.

Kiln Dry-Out Firing

If the kiln has not been used and has been in storage for an extended period (approximately 2–3 months), it is recommended to perform an empty firing cycle prior to resuming normal operation. For example, Program No. 7 on the Stafford controller may be used.

During this firing cycle, all bungs must be removed for the entire duration to allow any moisture absorbed by the insulated bricks to be released.

Failure to remove the bungs may result in moisture being trapped within the kiln chamber. This can lead to condensation forming and escaping from the kiln, which may cause corrosion over time.

Kiln Loading Guidelines

It is common practice to maximise the amount of ware loaded into the kiln while maintaining the clearances and conditions required for safe and effective operation. Pottery is typically loaded across multiple levels, separated by kiln shelves or batts (manufactured from cordierite or other kiln-safe materials) and supported by props of varying heights.

When planning a kiln load, select pieces based on height and other relevant characteristics. Taller pieces are commonly grouped on one level, with shorter pieces placed on another. Where the load includes items of mixed sizes, consider splitting shelves to maximise available space. Always aim to load the kiln evenly from side to side and from top to bottom. Even loading helps promote uniform heat distribution and consistent firing results. As the kiln applies the same heat pattern regardless of the load, maintaining symmetry within the chamber is strongly recommended.

In most cases, each shelf should be supported by three posts rather than four. Using four posts can cause instability unless the kiln floor is perfectly level, the shelves are flat, and all posts are exactly the same height. Four posts may be used if required, provided the shelf is stable and securely supported.

Allow adequate space between pieces to enable proper heat circulation. As a general guideline, leave a minimum of 20 mm clearance between items, and ensure there is sufficient space above each shelf level to allow heat to pass evenly throughout the kiln. If cold spots are observed between pieces, increasing the spacing may improve firing consistency. For bisque firings, only fully air-dried ware should be loaded into the kiln.

During glaze firings, glaze may bubble or splatter onto kiln walls and shelves. To minimise the risk of damage, ensure ware is positioned at least 30 mm away from the kiln walls and element grooves. The kiln interior should be inspected periodically for glaze contamination. Any glaze deposits on the kiln walls or floor should be carefully removed using a putty knife, taking care to remove as little insulation material as possible.

If you are unsure about any contamination or damage, please take clear photos and contact us for advice before continuing operation.

General Firing Guidelines

First Stage (Bisque) Firing

Begin the firing cycle moderately and slow as the clay ware/products has been air-dried for several days, residual moisture may still be present within the clay body and must be allowed to escape gradually during firing.

If the temperature increases too rapidly, trapped moisture can convert to steam and may cause ware to crack or “explode” inside the kiln.

Once free moisture has been driven off and organic materials have burnt out (typically up to approximately 300°C), firing can progress more steadily. It is important to note that successful firing depends not only on the final temperature achieved, but also on the total amount of heat applied over time—commonly referred to as *heatwork*.

For this reason, the ramp rate during the final 100°C of the firing cycle is just as important as the peak temperature. This concept is reflected in ceramic cone ratings, which measure *heatwork* rather than temperature alone.

To achieve consistent results, it is recommended that the final 100°C be programmed at a ramp rate of approximately 60°C per hour. This rate represents a mid-range value for cone firings and generally produces reliable outcomes. Refer to an Orton Cone Chart (available online) for guidance specific to your clay body and firing requirements.

To further improve firing uniformity, a soak at the peak temperature is recommended. A soak allows the kiln chamber to equalise and provides additional time for heat to penetrate evenly through the ware. For bisque, stoneware, and ceramic firings, a soak of 10–15 minutes is typically sufficient. If uneven firing or cold spots are observed, extending the soak time may help compensate. Note that firing results can vary depending on kiln loading and ware placement; some trial and adjustment may be required to determine optimal settings.

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 a Firing Cycle

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.

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.

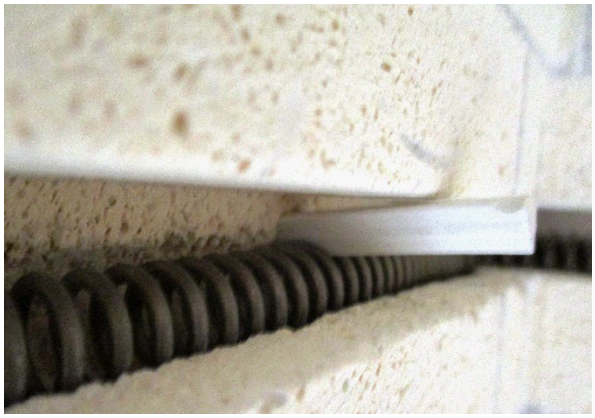
Tighten terminal nuts and test fire kiln.

Fitting of Element Pins

- Drill hole manually by hand using a drill bit. Ensure the hole is slight smaller than the ceramic pin. (about 4mm diameter) Hold drill bit between fingers and rotate.
- 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.
- If element is not sitting at the bottom of the groove, please wedge the element down with a small section of wood or similar, do not forget to remove the piece of wood before starting a firing cycle.
- Drill in approximately 25 to 35 mm deep.
- Put pin into hole and very gently tap in with a piece of wood or soft hammer.
- It does not matter if the ceramic protrudes out the front of the brick.
- Do not remove the ceramic pin after installation.
- Pins should be left in to keep element from rolling 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 or a heat gun and heat them red hot and manually put them in position.



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.

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.

Important Information for Kilns Operating in 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).

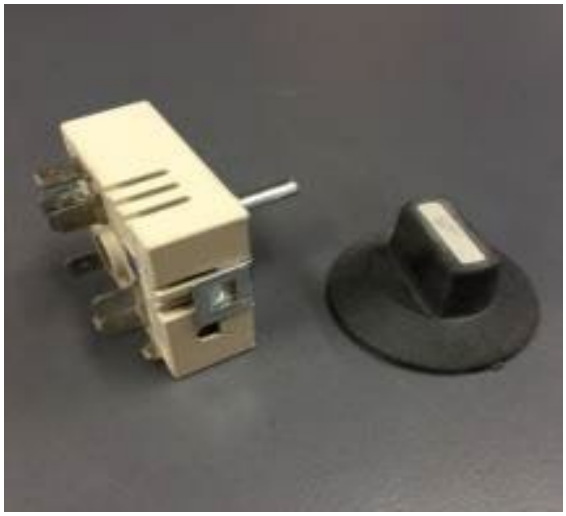
Kiln Accessories and Instrumentation

Energy Regulator and Knob

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.



Door Safety Switch/Microswitch

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.

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 20°C 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.

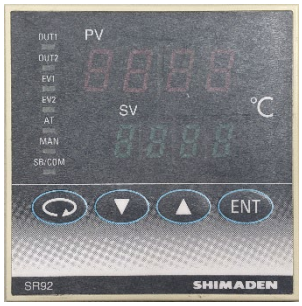
Temperature Measuring Instruments (Pyrometers)

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 the Shimaden SR92 Set Point Controller, the Stafford ST215C Programmable Controller or the Stafford ST535C Multi-zone Programmable Controller.

The ST215C Controller is a replacement for the Stafford ST315B and ST316B Controllers and Tetlow can supply adaptor cables to allow the ST215C to connect to the ST315B/ST316B sockets – The ST315B and ST316B have a 4-pin socket and a coloured (usually green) 2-pin socket, whereas the ST215C has a 7-pin socket. The ST215C to ST316B Adaptor Cable splits the 7-pin socket into the separate 4- and 2-pin plugs to connect to the kiln.

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



Shimaden SR92

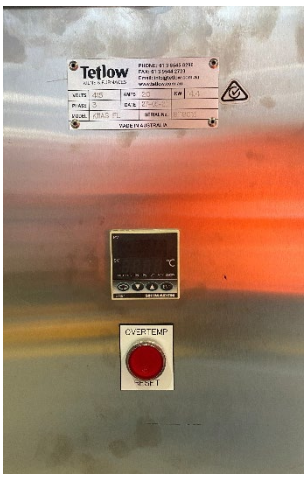
Stafford ST316B

Stafford ST215C

Stafford ST316B to ST215C Adaptor Cable

Overtemperature Controller

Upon purchase of the kiln, you may have opted to include an Overtemperature Controller. If so, you will find a separate Shimaden SR91 Controller, Overtemperature Reset Button and an additional thermocouple installed. This system works as a secondary safety measure that shuts the kiln off if the kiln is getting too hot. Tetlow sets this to 1320°C in the factory before the kiln is sent out. If your kiln has tripped this Overtemperature Controller by reaching the set temperature, you will need to press the Overtemperature Reset Button to be able to use the kiln again.



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.

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.

Servicing Your Kiln

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, you can contact us on:

info@tetlow.com.au

03 8545 8296

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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

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:

Tetlow Kiln Pty. Ltd. ABN: 26 166 832 300 405 – 409 Ferntree Gully Road, Mount Waverley, Victoria Australia
T: +61 3 8545 8296 E: info@tetlow.com.au www.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		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

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Tetlow

KILNS & FURNACES

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