

The Mitchell Kiln

Kiln Installation

- Adequate ventilation around the kiln is essential, make sure that the kiln is situated in an area where there is good natural ventilation to the outside of the building. If not, you may have to consider forced ventilation.

Fumes from kilns can be unpleasant and can be toxic depending on what you are firing and are also corrosive and can badly damage any metal fittings in the room. Fumes can also concentrate and represent a risk to your health. So make sure you have good ventilation.

- If using on a wooden bench use a ceramic tile under the centre of kiln making sure the kiln is level and sturdy enough.(kiln design keeps bottom of kiln cool)

- Make sure that there are no combustible materials in the room of the kiln when it's on.

- Do not store anything on top of the kiln while it is firing.

- No unauthorised persons should be allowed near the kiln during the firing process. As it gets very hot around Max 1295 deg C especially at schools etc.

- Always ensure adequate distance for ventilation purposes is left around your Kiln the minimum distance of at least 200mm or 8 Inches from any wall or structure. Please also ensure a minimum of 600mm above the Kiln.

- Please ensure that you do install a sufficient power circuit with the appropriate sized circuit breaker to ensure it doesn't false trip while under load for long periods. Moisture within the kiln can also false trigger RCD switches should they be overly sensitive.

25AMP RCD Should be used for the 20amp Mitchell Kiln (electrician information)

When Kiln is turned off and empty.

If moisture is heavily present, use a fan to dry out the kiln. Open the door with the fan pointing towards chamber. Depending on how much moisture I would leave the fan on for at least 12 Hours or over night.

- Always keep controller as far away from door opening area as possible when operating / cooling down kiln.

Controller assembly

Controller Mounting assembly(if not bench version)

The Controller comes separately from kiln and needs to be mounted on to the kiln when in position.

Unpack controller and gas strut arm from boxes,next mount controller to gas strut vera mount/to the 4 screws on rear of controller and place cabling into cable holders by pulling out slightly(see gas strut manual) to push leads into place as pictured.



Due to our dual insulated thermocouples an overshoot will occur at start of firing this is normal and doesn't effect your results.

If controller becomes inactive or doesn't show firing profiles or graph please refresh your web browser.

Kiln Loading

If you have an item that is not glazed on the bottom, set it directly on the shelf or use a triangle stilt to support your piece. Kiln wash can be used on shelves to stop them sticking but it's not a foolproof system.

- Let your pottery breathe.

In order for the heat to properly fire your ceramic pieces, make sure your pieces are around 30 - 50cm (2inches) apart, and leave about 20mm of room at the top of each level for the heat to pass evenly throughout the kiln.

Loading a kiln is a delicate task.

One misstep and your pottery can melt, shatter, under-fire or misfire. However, if properly loaded, your kiln can create beautiful ceramic or glass pieces or PMC.

If you are 'not reaching temperature' please ensure that the kiln is packed as advised before blaming the kiln.

Most under firings are caused by incorrect spacing around the thermocouple or the ware itself or uneven packing.

- Before you begin ensure you have the correct safe working clothing to fire the kiln:

- Mask – Class P2 minimum recommended.

- Leather gloves

- Long sleeved loose fitting clothing non combustible. (cotton)

- Safety glasses with infrared filters should be worn when viewing through spy holes at elevated temperatures.

- Prepare your kiln. Make sure that any debris from previous firings has been removed, including any material used to prop your pieces.

Always place a shelf on the floor of the kiln to begin loading, this helps protect the floor of the Kiln which can't be easily replaced like a shelf can.

It's a good idea to vacuum out any residual dust regularly. Do not plug vacuum into MeltTech controller plug as this will blow the fuse 5Amp max only.

Do not place this on props as the props will eat into the fibre floor of the kiln over time.

- Inspect your pottery. Make sure the ceramic pieces you are about to load are dry.

Check that the piece is in good condition with no visible fractures or cracks. One broken piece can ruin an entire kiln load.

- Make sure the KILN LOAD IS EVEN and as symmetrical as possible. This means left to right, front to back and most importantly TOP to BOTTOM. Too often we see loads that have all the ware stacked at the bottom of the Kiln with nothing in the top of the kiln. Doing this will make the chamber uneven as the kiln can't adjust the power in puts into the kiln top to bottom.

Choose pieces to load based on height. Load tall pieces on one level, and shorter pieces on another. If you have items of different sizes, split the shelves to maximise space.

Always try and evenly load a Kiln, from side to side, top to bottom. This will help ensure the kiln provides an even firing.

- NOTE: Ensure that the Thermocouple protrudes the kiln brick wall internally by 30 – 50mm (2 to 3 fingers)

The Thermocouple is the temperature probe that protrudes into the Kiln to enable the Digital controller to control the firing.

Make sure it is not too close to any pieces or too close to any shelf. As this is where the controller reads temperature from within the kiln we want to ensure that it accurately reflects the air temperature within the kiln and is not damaged in any way.

You need at least 30 -40mm from any item and especially a shelf. This way you avoid inaccurate readings caused by re-radiated heat from the ware or a shelf.

- If your pieces are glazed on the base, use a ceramic stilt to support your ceramics; setting it on a shelf will fuse the piece right to the Shelf.

For pieces with wider bases, use a wider stilt, which can prevent your piece from tipping.

If your piece does not have a flat bottom, and is not easily supported with a single stilt, use another stilt.

Kiln Shelves

- Most shelves will ultimately bend. The kiln does not spend too much time at the top end of its cycle. Flipping shelves will also help prolong their life so any bending offsets itself over time.
- Cracking: Generally speaking a shelf should not crack. If a shelf does crack the cause should be sought and eliminated if possible.
- If the kiln shelf has begun to bend and then ultimately a crack appears where it bends the shelf is nearing than end of its life.
- It's better to be proactive in replacing then as major damage can occur to insulation, elements and ware if a shelf fails during firing and thus collapses.
- Shelves don't last forever and will need replacing over time.

The following causes may be the reason for the cracking:

- **THERMAL SHOCK** - Too rapid cooling or firing particularly at the 30 > 250 C range. For thinner shelves a maximum Ramp Rate of 300'C is suggested as an upper limit. Never fire a damp shelf as the escaping moisture can cause it to crack.
- Uneven heating or cooling possibly due to poor circulation or uneven loading of ware.
- Bad propping - probably the most common cause.
- Three props are better than four, being structurally more stable.
- If four props must be used, make sure that they all touch the underside of the shelf above.
- Props should be placed in line vertically. Ensure that the end faces of the props are flat and parallel.

Important notes

- Moisture levels – never fire pieces which are damp (you can feel the moisture in them – they feel slightly cool).
- This moisture gradually damages the refractories and elements in the kiln particularly if the kiln is fired fast. The more moisture you need to drive out of the ware the greater chance that the ware will explode in the kiln. If the moisture turns to steam before it can leave the ware the pressure will cause the ware to crack, pop or explode.
- Do not place foreign materials in kiln. Do not introduce contaminants like camphor or wood chips (popular with professional potters) to create a reduction atmosphere as elements will be permanently damaged.
- Do not allow paper or cloth to be burnt out after acting as support or stuffing – this can also Damage the kiln.
- Metallic (electrically conductive) materials should never be put into the kiln whilst in operation. With exposed Elements this can be a serious safety risk.

NOTE: A Special mention for Paper Clay With the increased popularity of paper clay in recent years we have had a number of people cause false fire alarms etc from the amount of smoke and fumes that are generated from the Kiln.

Due to the paper content you must bare in mind there will be smoke as it fires. Even if the bungs are in this smoke will find its way out of the Kiln and can cause issues like fire alarms etc. If you wish to fire them you will need significant ventilation in the room. We would advise fitting of an External Ventilation System (Vent master) to help alleviate this problem.

Bungs Door

- For bisque firing – should be left out of the kiln until the kiln has reached around 600C or the point where you can see an orange glow from within the Kiln. The bung can be removed if desired after the kiln has reached maximum temperature to accelerate the cooling cycle. (Always ensure that you wear protective clothing and gloves when operating on or near the Kiln when at temperature.) If you can't be there to put the bungs in, then fire with the bungs in from the start and ensure the ware is extra dry as the moisture will have trouble escaping the chamber and will result in reduced element life.
- For firing glaze – bungs can be left in the kiln at the start providing there are no oils or burn out materials which need to be driven off during the early stages of firing eg: oils in gold lustres.

Note: remove the bung slowly It is recommended that safety glasses with infrared filters be worn when viewing through spy holes at elevated temperatures. The glow is the same as the heat from a fire and can damage your eyes or skin.

Replacement Bungs are available and can be posted direct from us.

PREVENTATIVE MAINTENANCE

- Refractory Walls and Floor

Carefully brush or vacuum dust out of kiln after every few firings (you should use an approved mask for this so that you do not inhale the dust). Make sure you are very careful around the grooves if vacuuming the Kiln. Check that the element grooves are not broken leaving the element without adequate support. If there are broken sections and the problem is not attended to immediately then the element will curl out at the broken section and begin to droop down. The element will then need replacing.

Repairing these grooves early will avoid a problem that is harder to fix if left unattended for too long. If a wall or floor begins to crack do not be alarmed. If however, this crack continues to grow or the insulation becomes loose please contact A.A.Kilns to arrange a service for your Kiln. If you begin to feel a crust forming on the face of the insulation this can be sulphur deposits or the like from the ware. While this won't ruin the Kiln it can cause the top surface to crack like a dry creek bed. If you see this or tell tail signs of white salt like deposits on the kiln casing you should begin to fire the entire bisque firing with the bungs out to evacuate these contaminants as much as possible.

Be sure to clean up the deposits too as they can eat through the kiln aluminium frame and casing.

Elements

Regularly check the condition of your elements. They should have a slightly grey colour. They should be rough on surface. ie: they should have a sandy appearance. This protective oxide coating is typical on all Kanthal A1 elements. The coils should be evenly stretched throughout their length (they should not be bunched together anywhere). If the coils are leaning over on each other they will need replacing soon. As the elements wear the kiln will become slower over time and worn elements can also affect how even the Kiln fires across its chamber. Please also ensure you regularly check the electrical connection to your Kiln (ie Plug and Lead) as well as the fuse/breakers for the Kiln circuit to ensure they are in good working order.

IMPORTANT Before doing checking or doing any work at all on the electrical components of the Kiln please ensure you unplug the Kiln from the power point. If your Kiln is 'hardwired' always contact a licensed electrician to work on the Kiln.

Should elements fall out of their groove they should be attended to as quickly as possible in order to try and save the element. You will need to heat the elements with a small blow torch until they are glowing before you try and bend them back into the groove. If you don't heat them they will easily break if you try and bend them. This is quite tricky so it may be best to get an experience technician to do this. If you see dark spots or a rust like appearance, something in what you are firing is attacking the protective oxide coating on the elements and will cause them to fail. You should immediately contact A.A.Kilns if you see these marks as we will need to determine its possible cause and we can advise what to stop firing.

A slight brown or black stain may occur around the door seal, this is caused by a build-up of fumes that slowly leak around the seal.(kiln will come slightly discoloured due to first firing at our factory to burn binders out of fibre board)

This is normal and doesn't affect the kiln. In larger kilns that have joints in the door you will often find a point where this stain occurs over the crack as this is wear any smoke or fumes will escape along the joint. This is very typical and is to be expected.

Safety Door Switch

The thermocouple is the white ceramic tube like sensor device which extends into the kiln chamber through the wall. The thermocouple will require replacement during the life of the kiln. If the thermocouple fails during a firing, then the Automatic temperature controller will immediately turn the kiln off (fail safe). However, most Kiln faults, even those that appear to be the Controller are as a result of the Thermocouple being faulty. To check the Thermocouple first disconnect the Kiln from the power supply.

Next unscrew the Thermocouple holder screw and remove the Thermocouple from the Kiln. Inspect the Thermocouple, if it appears damaged in any way contact A.A.Kilns to organise a replacement. Generally, you will be looking for excessive corrosion of the tip or a break in the wires inside the small white ceramic beads (A greenish colour can be expected due to the copper in the wires). We can express post a replacement to you within a few days depending upon your location. Before calling check the colour of the cable leading to the thermocouple as this will indicate what 'type' you need.

- Replacement of Thermocouples

Thermocouples have two connections (+ and -)

Supplied is a type K thermocouple dual sheathed for longer lasting finer control.

Kiln Moisture

If your Kiln is not to be used for an extended period, please ensure the door is kept closed to stop a moisture build up in the Kiln. We would also suggest that for the first firing you should initially allow the Kiln to 'dry' out by heating to around 200 Deg C to ensure any built up moisture in the refractory's has been allowed to burn off. This is only required if the Kiln has not been fired for a few months or in areas with a lot of moisture in the ambient air. Before firing touch the insulation if it has a slightly damp or cold feeling it may need to be dried. This moisture if present can false trip RCD breakers.

Safety Door Switch

If the Kiln doesn't heat up at all when you begin firing, please make sure you check that the safety door switch is working correctly.

The switch is inside the right side of the Kiln controller box under the kiln. As small probe that is attached to the base of the door enters the control box and triggers the safety door switch. The door pin can be bumped and become un-aligned to the hole in the control box. If this happens adjust the probe to align it correctly. When the probe enters the hole you should be able to hear a small click as the door switch engages. The switch isolates the power to the elements when the door is opened to protect you from live elements inside the chamber.

Operation

- POWER - does your kiln “plug into” a power outlet or is it directly wired into the wall.
- Check that the power is ON at the outlet and turn Kiln OFF then ON (This ensures the controller resets).
- If no lights come on, then check supply fuses or circuit breaker.
- If the Kiln will not start, check the kiln door is properly closed. A.A. Kilns kilns are wired so that the control circuit power goes through a safety door switch. Unless the door is closed the kiln will not start. This may need slight adjustment over time.
- Please select a Program or enter a New Program to begin firing (Please refer to MeltTech Instruction Manual or bottom of this manual)

FIRING RECOMMENDATIONS

Much like a recipe for an oven, a Kiln Firing Profile / Cycle is something that you need to learn and adjust over time. We can provide you with a starting point but as Clay's, Glazes etc differ, just like ingredients do, you will need to determine what cycle works best for your particular circumstance. Please read the HEATWORK section below to understand that time is as important as top temperature.

NOTE: Always follow the firing temperature recommendations of the glaze or clay manufacturer. Their recommendations should always be followed then select required firing profile. Also download the Orton cone chart for Temperature references.

Please Download the Orton Cone Chart.

Cones/Heat Work

- As quoted from Orton Ceramics 'Cones Explained':
"Orton Pyrometric Cones are not temperature measuring devices.
 - They measure the amount of heat in the kiln, which is the combined effect of temperature and time."
 - People often get fixated on top Temp and complain that their controller didn't reach top temp or over fired if their ware doesn't come out as expected.
 - Firing pottery or ceramics is like cooking. There is a time component that is as important as the temperature reached.
 - An analogy is like baking a chicken. Your chicken may get to 180C in your oven but if its only in there for 10mins it won't be cooked properly. So the time the ware spends at top temp or more importantly in the final range of firing (usually the last 100C) is an important factor.
 - This is were ramp rate and soak time play an important part. People often check their firings with pyrometric cones.
 - These were used before digital controllers to measure the heat work the ware had undergone.
 - These are the default measures of what heat work you are normally after, but most people are unaware how drastically the temps that they will fall(indicate) at can vary depending upon the rate of firing and soak time. People also don't realise that every kiln will have it's own heat signature. That being how intense the heat work created is.
 - Much like every different oven or bbq you've owned cooked a little differently.
 - In that respect we must understand that cones, cone chart temp etc are only ever an approximation and you should always judge the ware on the results first. Please download the **ORTON CONE CHART**. We recommend you fire no faster that 60c/hr in the final 100C of your firings to hit the temps shown. The reason we suggest this rate is that it offers the best balance for kiln firing time vs element wear and tear. Firing faster especially above 1200C will prematurely wear your elements. This is where midfire will be handy for longer lasting elements.
- As your kiln elements wear you're also advised to slow down the firings as they wear to get the most number of firings from them. The general rule is that the slower you fire and the better the accuracy of the controller the more consistent your results will be.
- Current controller preprogrammed firing profiles are set to last stage 60deg C hour this can be slowed down to last stage 40Deg C per hour when elements wear and temperatures are no longer achievable.

Soak Times

We recommend adding at least a 10mins soak at the end of every firing, with a longer soak of up to 30mins for glaze firings. This gives the kiln a chance to even out the firing and for the heat to soak into the ware and for Glazes to mature properly. Be aware however that a soak time will affect the amount of heat work the ware gets and will affect the cones. 20mins soak is like adding another 10C. Adjustments will be needed to get your desired effects.

HELP

If you require any help with firing your Mitchell Kiln please feel free to contact us by phone or email.

Always be there for shut off of kiln

Warranty

As kiln manufacturers state Never fire kiln unattended.

Warranty

This limited warranty is given only to the immediate purchaser of the A.A.Kilns Kiln. The limited warranty is not transferable. A.A.Kilns warrants the kiln for 12 Months to be in good working order under normal operating conditions for a period of 1 year from the date of purchase. 90 days For Businesses

If the A.A.Kilns to be not in good working order at any time during the 1 year period, A.A.Kilns at it's discretion repair or replace faulty part or parts.

The liability of A.A.Kilns is limited to replacement and/or repair at its workshop/Premises
All replaced parts or products become the property of A.A.Kilns.

Limited warranty services may be obtained by delivering Posting your A.A.Kilns during the warranty period to your kiln to A.A.Kilns Head Quarters (see website for contact information)

You must provide proof of purchase and a description of the defect or issue but please contact us before returning product as it may not be a fault or it can be remedied with patches or updates.

Buyer will be responsible for shipping and handling incurred by A.A.Kilns in returning the kiln to the Buyer.

A.A.Kilns units returned for service where no warranted defect is found will be subject to service and shipping fees.

This warranty does not apply to any damage to the kiln resulting from...

Over firing (melting of materials being fired) regardless of the cause of the over firing.

Operation beyond electrical rating unit is designed for.

Improper or inadequate maintenance by Buyer.

Parts or equipment not supplied by A.A.Kilns.

Unauthorised modification or misuse. Designed for the A.A.Kilns.

Operation outside environmental specifications.

Improper installation and connecting to damaged equipment.

Other sources including, but not limited to, chemicals, and improper care proper ventilation must be used.

.

Each kiln is tested prior to sale through our quality control Process.

ANY INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES OF ANY KIND WHATSOEVER, WHETHER A

CLAIM IS BASED UPON THEORY OF CONTRACT, NEGLIGENCE OR TORT.

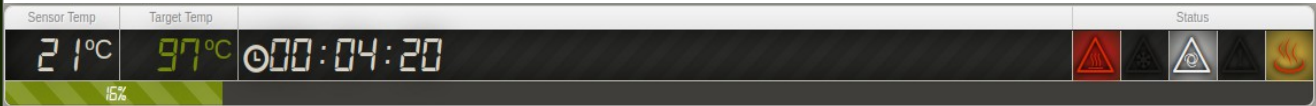
Buyer shall determine suitability of the A.A.Kilns kiln for it's intended use and assume all risk and liability therewith.

Heating devices such as High Temperature Kilns should be Never fired unattended, As per manual

MeltTech

Temperature Controller Basic Guide

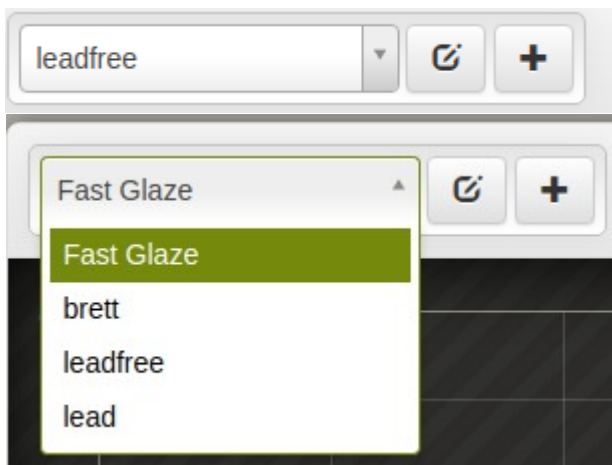
Below is the main Bar



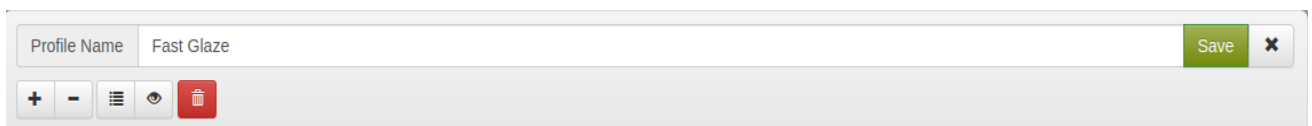
Main Bar shows current Sensor Temp / Program Set Point Target Temp Time remaining to shut off also icons to tell you when your device is Heating / Cooling / Fan / Warning / Power. Warning light is currently stuck on.



Main Bar shows Heating / Cooling / Fan / Warning / Power.



Above Menu selection for different saved Programs other buttons are Edit Program and add a New program



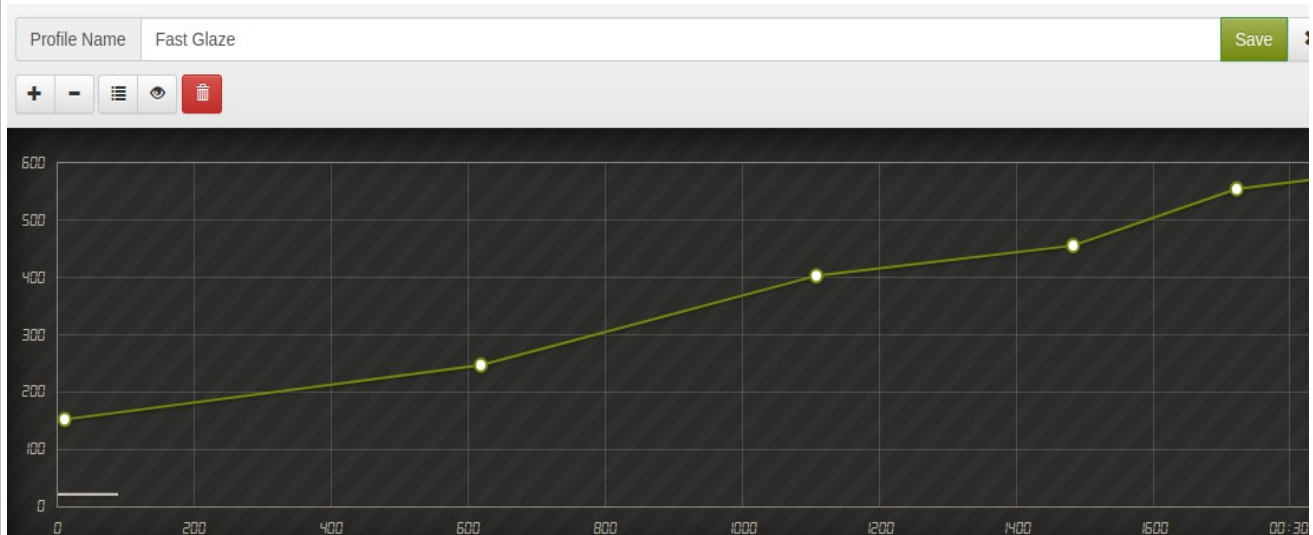
Above Menu selection for a saved Program Fast Glaze



Above Menu selection + - buttons will add Stages to your Program
Next Button brings up Edit Menu
Eye Button Live "will be updated not working"
Trash can = Delete Program

MeltTech

Temperature Controller Basic Guide



Above the graph plotting You can program your controller just using the graph each white dot is a stage click and drag these.
 Temperature is on the Displayed Left
 Time On the bottom

Profile Points

#	Target Time in Minutes	Target Temperature in °C	Slope in °C/m
1	<input type="text" value="0"/>	<input type="text" value="152"/>	<input type="text" value="0"/>
2	<input type="text" value="10"/>	<input type="text" value="247"/>	<input type="text" value="9"/>
3	<input type="text" value="18"/>	<input type="text" value="403"/>	<input type="text" value="19"/>

Above Menu is accessed by clicking the icon with 4 lines next to the eye you can now adjust Time and Temperatures here using keyboard this also displays slope in minutes.



Above is the Program save button click this once your done saving file if a new file it will appear in program menu



Above is the Program Message once your program has completed it's running program Start and stop button well it will start or stop the program ,Refresh Browser if in active or displaying wrong profile or no profiles.