



FIRED ^{UP} KILNS

BY:  pottery**crafts**



Operating Manual

RODERVELD PYRAMID KILNS (LPG)

RDVK17 135 litre kiln and RDVK19 burner

RDVK2 240 litre kiln and RDVK4 burner

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THE KILN

The Pyramid gas kiln is constructed from stove enamelled, heavy gauge steel and is insulated with high efficiency ceramic fibre in the upper, pyramid section. The base of the kiln has furnace grade insulation bricks with a central hole or burner port. A bagwall or flame deflector consisting of a kiln shelf must be positioned on props directly over the burner; this allows the flame to spread evenly throughout the kiln. It has handles on each side for easy movement.

The door rests against the chamber opening, there are no fastenings as the weight of the door keeps it securely closed and allows it to be cracked open to view the progress of the firing and easily lifted clear to access the kiln chamber. The Pyramid kiln is the ideal Raku kiln as with the door open the pots can easily be removed safely without being exposed to heat as with a top loading kiln. Ensure that the door is correctly positioned, fully closing the aperture during firing, if not heat escaping around the edge of the door can cause warping to the door and an extend firing time.

The burner is mounted on a stand which can be removed for lighting then positioned under the kiln for the firing. The burner assembly has a sliding, adjustable air intake valve, a gas pressure tap, a peizo spark ignition button and a flame failure device. The flame failure device will turn off the gas if the flame goes out. If the flame failure has been activated it will not allow gas to flow again until it resets after approximately 30 seconds. The burner assembly must be connected to two LPG gas bottles by a flexible rubber hose that is fitted with two bottle connectors and a regulator with a pressure gauge. The regulator enables the user to adjust the gas pressure which is shown on the gauge next it. Do not allow the pressure to exceed 2 BAR, this point is marked by a red sticker on the dial of the pressure gauge.

NOTE

The regulator closes the valve when turned anti-clockwise and opens the valve to allow gas flow when turned clockwise. The excess flow safety valve (see illustrations) will stop the flow of gas if the pressure exceeds 3BAR.

The light weight of the kiln makes it easy to move to a suitable outside location for firing. If the kiln is used indoors, it is important to ensure that the gas fumes and heat are ducted safely through the wall or roof of the building. It is also vital to ensure that doors and windows are open to provide sufficient air for the gas to burn and to avoid the build-up of carbon monoxide which is very dangerous in an enclosed space.

STARTING A FIRING

1. Remove the door of the kiln. Do not start the firing with the door closed as gas could accumulate and ignite causing an explosion.
2. Move the burner assembly out from under the kiln.
3. Ensure the gas pressure tap on the burner assembly is closed by turning it clockwise.
4. Ensure the regulator at the bottle end of the pipework is closed by turning it anti-clockwise.
5. Open one of the gas bottles fully; you may switch between bottles during firing but use only one at a time.
6. Open the regulator slowly by turning it clockwise gradually until the gauge shows gas pressure 0.25 to 0.50 BAR (the first one or two small divisions on the gauge).
7. Adjust the sliding air intake valve to halfway between open and closed.
8. Open the gas pressure tap, turn anti-clockwise.
9. Press down and hold the button on the flame failure safety valve, gas will start to flow into the kiln.
10. Press the peizo spark ignition button, repeat until the flame has lit.
11. Continue to hold down the flame failure valve button for 10 to 20 seconds, ensure that the flame holds when it is released.
12. Adjust gas flow by opening or closing the regulator keeping an eye on the pressure gauge, move the sliding air intake in or out to adjust the flame to the desired height and intensity. Start the firing with a longer, less intense flame to avoid thermal shock to the pots.
13. Ensure that the flame is stable for a few minutes, now you can slide the burner assembly under the kiln positioning it so that the flame enters the kiln through the centre of the burner port, (the hole in the bottom of the kiln).
14. Close the door after ensuring that the flame is stable; keep checking that the flame is stable throughout the early stages of firing, if the flame is extinguished, gas could accumulate in the kiln chamber.
15. Control the rate of increase in temperature by balancing the gas pressure and air intake by using the regulator and the sliding air intake valve.

STOPPING THE FIRING

At the end of the firing or if you wish to stop during the firing, you must follow this sequence to avoid leaving gas in the pipework: First close the taps on the gas bottles, then the regulator valve (turn anti-clockwise to close) and finally the pressure gauge on the burner assembly.

NOTE

If the flame failure valve is activated turning the gas off there will be a delay of 10 to 20 seconds before the valve resets itself and allows gas to flow. The flame failure valve is connected to a thermocouple, the tip of the thermocouple must protrude into the path of the flame, if the flame keeps going out check that it is in the flame and adjust the position of the thermocouple if necessary.

FIRING A PYRAMID GAS KILN

Gas kilns are quite different from electric kilns, firing with a living flame is an art which requires some experience with trial and error to master. Gas kilns must be attended throughout the firing and nurtured through the reduction process. Time spent getting to know your kiln will be repaid many times over in the results you achieve. We advise using a pyrometer to monitor the temperature during firing, this is particularly important during the early stages of the firing to avoid thermal shock through firing too fast and in reduction firings where there is a balance between amount of reduction and temperature rise.

Always start the firing with a lazy yellow flame, this is achieved by keeping the sliding airflow valve partially closed and adjusting the gas pressure gauge to keep the gas low. To avoid damaging the ware in a glaze firing it is advisable to take three to four hours to reach 600°C; extend the firing time by a further hour or two for a biscuit firing. Different clays, methods of making and size of pots have a big influence on risk of damage in the kiln. After 600°C it is safe to fire faster adjusting the gas pressure gauge and the airflow valve will increase the power of the flame. Pyramid gas kilns have a top temperature of 1200°C.

OXIDATION FIRING

During an oxidation firing keep the flue on top of the kiln open throughout. Watch for any flame appearing at the flue, if the gas pressure is too high there may not be sufficient oxygen in the chamber and the kiln will start to reduce. A flame at the flue is a sign of reduction. The airflow valve should be open fully after the initial slow start.

REDUCTION FIRING

A reduction atmosphere is achieved by adjusting the gas pressure, the airflow valve and the flue opening. The flue should be covered by a brick to restrict the flow of exhaust gases. Note: the flue opening must never be totally covered during firing. Adjust the flame to achieve the increase of temperature required to approximately 1000°C when you can start to reduce. By partially closing the airflow valve you can reduce the amount of oxygen, this can be reduced further by partially covering the flue with the bung. A reduction flame will appear at the flue as gasses burn as they exit the kiln. If the reduction is very strong then the temperature will start to drop, by adjusting the flame you can maintain a temperature rise to required top temperature while continuing the reduction. At the end of the firing the flue can be covered by the bung to avoid re-oxidation as the ware starts to cool.

KILN SHELVES

The position of the kiln shelves will affect the firing, it is important to keep a distance of 4cm between shelves and the kiln wall.

TROUBLE SHOOTING

- Peizo Ignition won't work?
If the peizo does not click when pressed it may be damaged or faulty. If it does click but fails to light the gas, check that there is a spark at the tip of the probe, if there is no spark move the probe nearer to the burner head, if it too far away the spark will not jump across.
- Flame won't stay lit?
Check that the tip of the flame failure thermocouple is directly in the flame, unless it is being heated it will not work. Hold down the flame failure button for about thirty seconds until the flame holds.
- Flame blows out?
The gas may be turned too high too soon and the flame "lifts off". If it occurs at low pressure, shield from wind. Check for debris in the burner.
- Gas pressure drops off?
The gas bottle may be frosting as it empties, pour water on the outside of the bottle to raise the temperature of the bottle.

SHELF ARRANGEMENT

The kiln is supplied with the following kiln furniture:

- 3 props to support the bagwall (flame baffle over the burner port).
- 6 pops to support the two base shelves.
- Additional furniture is available as an optional extra to create extra levels.



Props in place in kiln base



Bagwall in place above burner port



One base shelf in place



Both base shelves in place

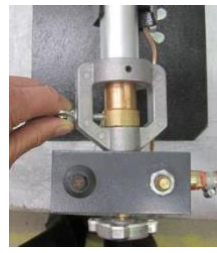
COMPONENT ILLUSTRATIONS



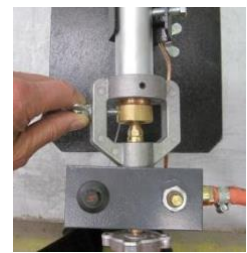
Burner, ignition, flame failure.



Gas pressure tap



Air intake closed



Air intake open



Blue flame air intake valve open



Yellow flame air intake valve closed



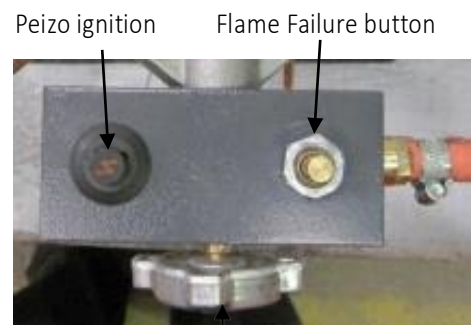
Left: Bottle connector regulator valve pressure gauge and excess flow safety valve



Right: Twin Bottle connectors with regulator valve and pressure gauge.



Burner assembly



Peizo ignition

Flame Failure button

Gas pressure tap