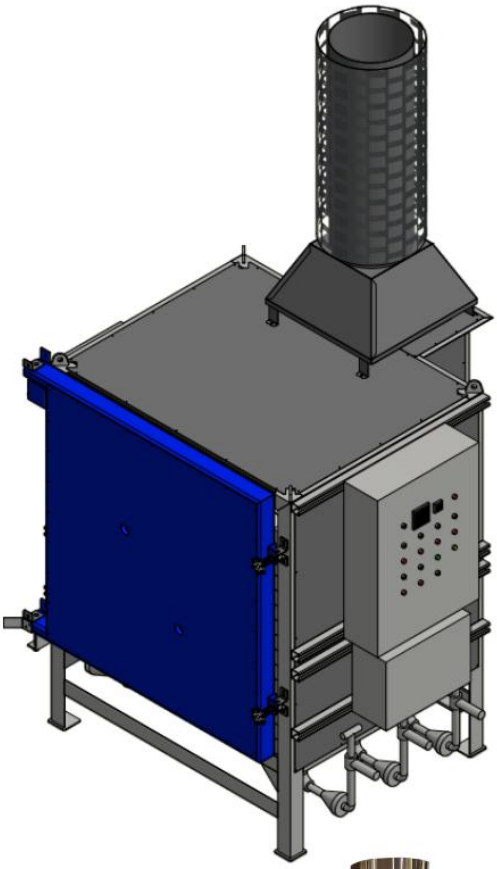
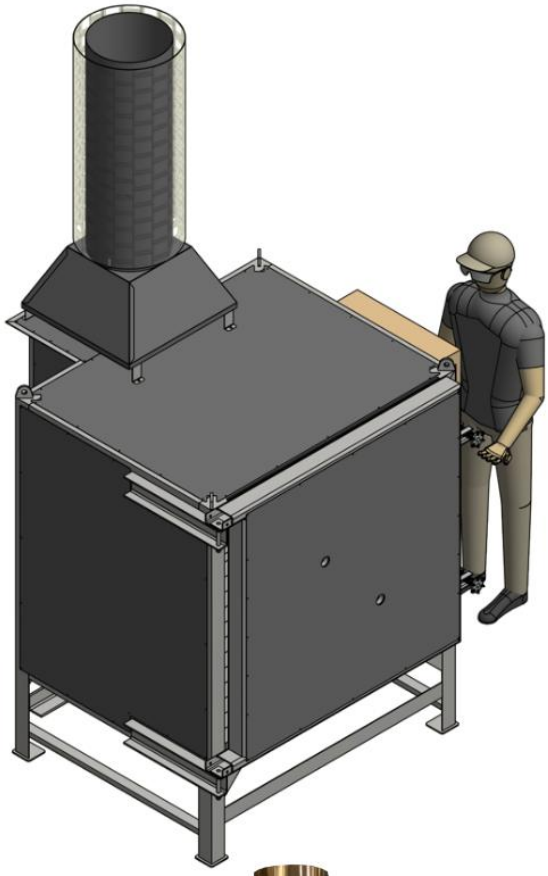
# GENERAL GAS KILN MANUAL



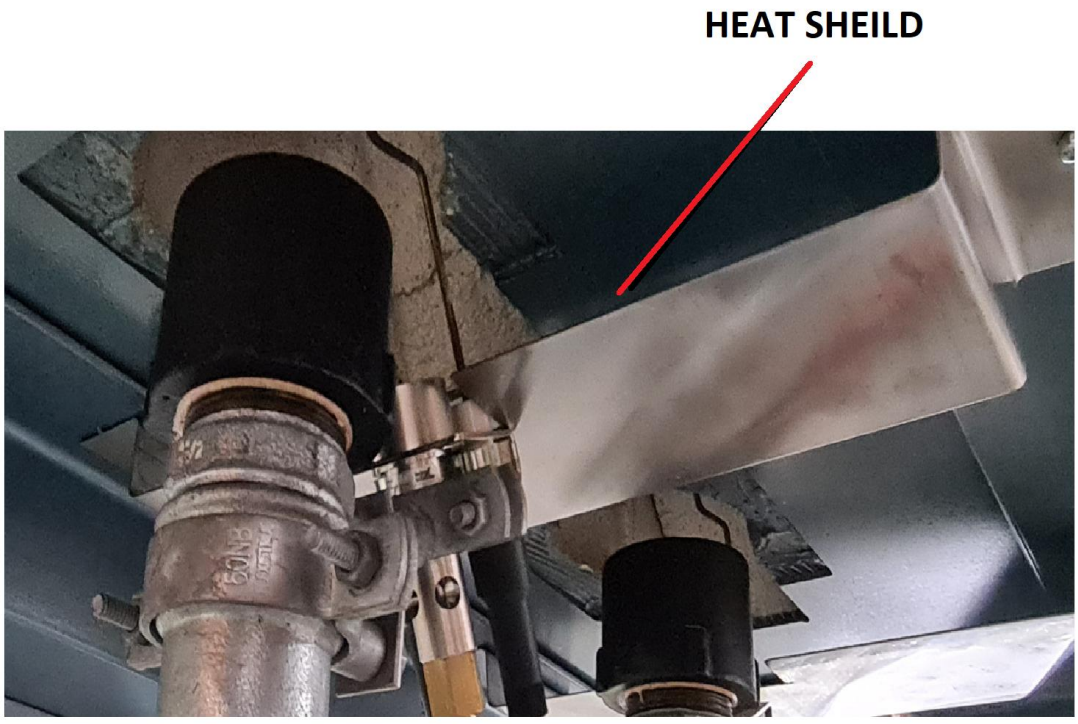



**Tetlow Kiln Pty. Ltd.** ABN: 26 166 832 300 405 – 409 Ferntree Gully Road, Mount Waverly, Victoria Australia
T: +61 3 8545 8296 E: info@tetlow.com.au **www.tetlow.com.au**

## 1. GAS CONNECTION AND WIRING

**Only a licensed gas technician with relevant qualifications can assemble or work on gas or electric components of the furnace**

- Position gas kiln on flat concrete floor
- Minimum clearance kiln from wall 0.5m
- Ensure the gas pipes are correctly lined up before bolting together.
- Join gas pipes together ensuring good clean joints and seals
- Have your roof plumber install a stainless-steel exhaust
- Plug in mains power cable into a 10Amp plug outlet
- Fit door handle onto door
- Heat shield to protect the spark ignition cable from radiating heat from piolet and burner



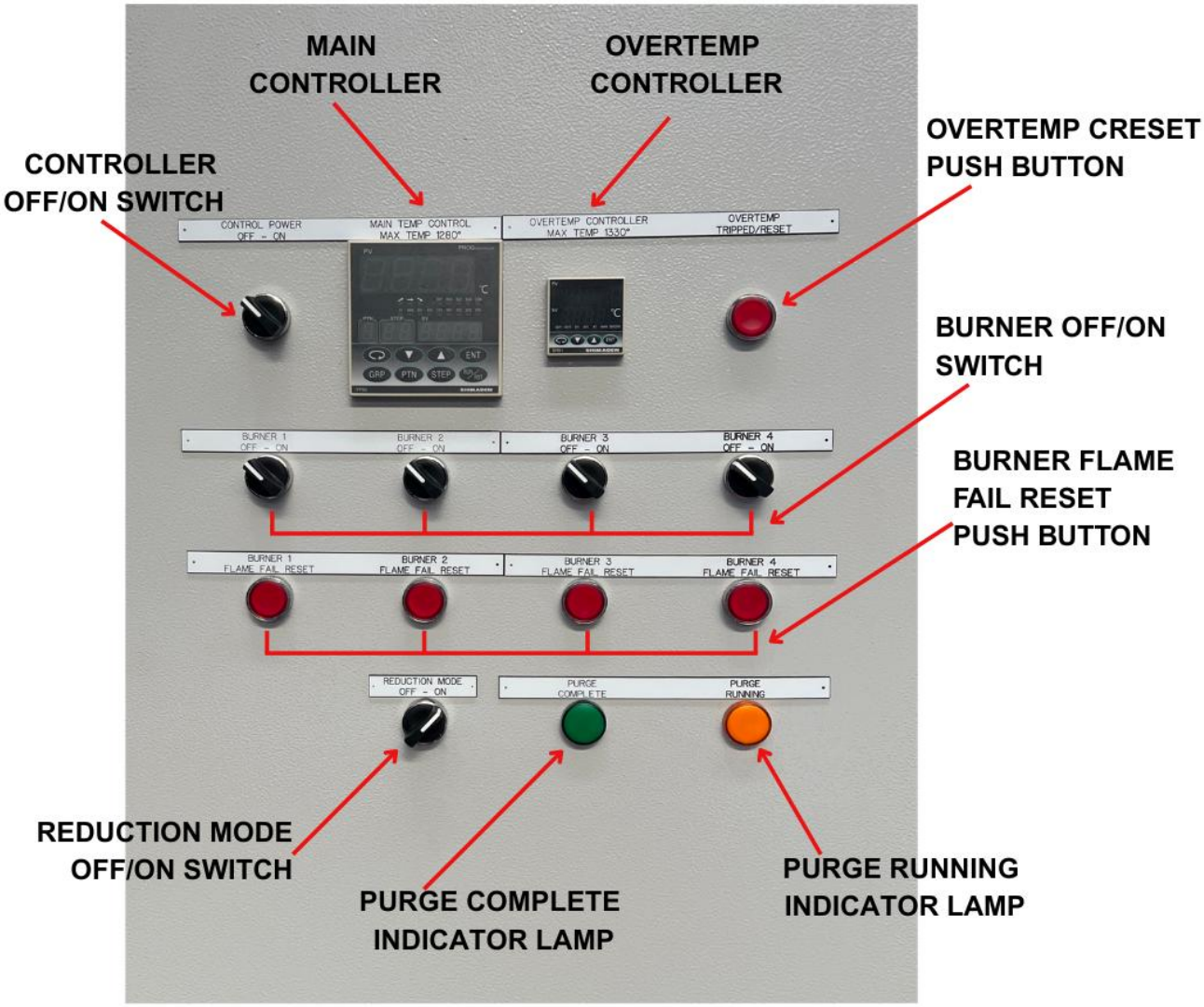
- Fit the ceramic bund wall tiles inside the kiln

- Connect Natural Gas or LPG
    - Minimum gas supply pressure: (Natural 5KPA; LPG 100KPA)
    - See specification plate for consumption.


***Valves Position: Facing Right: Gas Cut Off; Facing Upwards: Gas Flowing***

- Check for gas leaks over total system.

## 2. OPERATING INSTRUCTION FOR GAS KILN




- Wear the appropriate PPE when operating the kiln
- Turn CONTROL OFF/ON switch to ON
- Check Pilot/s and Burner/s value/s are ON (If valve/s are turned to the Right, it means supply are cut off. If valve/s are turned Upwards, it means supply is flowing) With valve/s turned UP-WARDS with gas supplied to kiln, you will hear the pilot/s clicking – pilot ignited)

  (**Please note:** All valve/s will be turned to the Right, before shipment)


(**Left: Pilot and Right: Burner in on position)**

- Press OTEMP RESET button (Red Illuminated Push Button)
- Set/Start firing MAIN CONTROLLER on (Shimaden FP92 Controller)
- Set OVERTEMP CONTROLLER on (Shimaden SR91) to a value higher by approximately 50°C than the top temperature of the program but never higher than 50°C
- Open kiln door to over 90°C angle (there is a purge limit switch on the bottom door hinge) to activate purge cycle – Once purge cycle has completed PURGE COMPLETE green lamp will illuminate

**Open kiln door more than 90° angle**

**Purge limit switch**


**Purge Cycle Completed**

- Turn individual BURNER/S OFF/ON switch to ON (please check at least one burner is ON) – Door must be OPEN
- Close kiln door
- If a BURNER FAIL light (RED PUSH BUTTON) illuminates, it means gas supply to burner value is off. After 3 tries (E.g. pressing BURNER 1 FLAME FAIL RESET and burner still do not light, please contact Tetlow Kiln (03) 8545 8296 or seek a gas specialist
- When firing to a number of set temperatures it is advisable to choose a PID number for that temperature and use the auto tune facility i.e. Both furnaces have been auto tuned empty at 600°C and achieved excellent uniformity in the furnace chambers.
- On completion of firing burners, go to low fire position. When the door is opened burners turn off
- If a problem occurs with the kiln, only a licensed person with the relevant qualification i.e. Gas fitter, electrician should fault find or work on the furnaces.

## 3. FIRING OF GAS KILN

### BRICKS

The bricks used for manufacturing of electrical kilns are of the refractory insulation type. These have all the heat-resisting qualities of refractory bricks but are very porous.

These allow for air, a good insulator, to use the huge number of air pockets inside these bricks, so that if one face of the brick is exposed to heat it takes a considerable time before this heat is transmitted through the brick to the opposite face. The pore structures also make the bricks very light in weight.

### ELECTRICAL WIRING AND FITMENTS

The electrical wiring and fitments are installed into the control box of the kiln, allowing access to them via removing the control panel side plate.

### THE FIRST FIRING

Before any kiln is put into use, it should be fired slowly, preferably over 2 or 3 days, to a temperature no higher than 100°C or 200°C below the maximum firing temperature for which it was designed. This gentle firing drives away any moisture present in the brickwork, after which the kiln is ready to be put into full service.

After the first firing has taken place, it may be noted that a few fine cracks will have formed in the interior brickwork of the kiln. These cracks will close up when the kiln is next heated and open again when the kiln is subsequently cooled. They therefore serve as expansion joints and are in no way detrimental to the operation of the kiln.

### DOOR SAFETY SWITCH

This device is designed to isolate the electrical supplies 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, thus allowing current to flow to the kiln elements. When the door is opened the plunger is released, which switches the contactor relay to an “off” position, cutting off the electric supply to the elements. The door safety switch is a hard-wired control shut off, tempering with this device could cause electric shock and electrocution.

## 4. TEMPERATURE CONTROL

### TEMPERATURE MEASURING INSTRUMENTS

There are different types of temperature-measuring instruments, but the ones generally used consists of a thermocouple attached by compensating cables to an instrument, which transforms the voltage fed into it from the thermocouple into degrees of temperature indicated on a scale. The standard pyrometer generally has a simple galvanometer as the recording instrument whereas the more sophisticated recording instruments generally have potentiometric systems or a combination of the two.

### THERMOCOUPLES

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

### Cooling Down

Once firing is complete, the kiln should be switched off. The rate of kiln cooling varies with different models and depends on the temperature and amount of ware and shelves inside the kiln. It is best to leave the kiln as it is until the interior temperature drops to approximately 100°C - 150°C, before opening the door.

The rate of cooling should vary to conform to the type of ware being fired. Many kilns cool too slowly to allow for the best results to be obtained from a glossy glaze, therefore to speed up cooling cycle in this case, partial or complete removal of the vent plug can be done but should be replaced when the kiln has been dropped to 750°C. Below this temperature, the kiln should be allowed to cool slowly until approximately 130°C. the cooling rate can be sped up after this by removing the vent plug or progressively opening the kiln door, noting that the door should be open in intervals and not be flung open as the cold air entering the kiln may crack the pots or kiln shelves.

## Bisque Firing Sequence

1. Turn panel ON
2. Press O/T Reset
3. Open door
4. Start Program 1 (See below for program temperature profile & time)
5. Turn ON burner 1 only
6. Wait for purge to complete
7. Close door only half way
8. 2 hours after purge, close door fully
9. A further 2 hours later turn burner 2 ON
10. A further 1 hour later turn burner 3 & 4 ON

## Glaze Firing Sequence

1. Turn panel ON
2. Press O/T Reset
3. Open door
4. Start Program 2 / 3 / 4 (See below for program temperature profile & time)
5. Turn ON all burners
6. Wait for purge to complete
7. Close door fully

## Program 1 - Bisque - 1000ºC - 19 hrs

1 - 100ºC in 4 hours

2 - 100ºC soak 1 hour

3 - 700ºC in 10 hours

4 - 1000ºC in 4 hours

5 - 1000ºC soak 10 minutes

## Program 2 – Earthenware Glaze - 1080ºC - 8.5 hrs

1 - 600ºC in 4 hours

2 - 600ºC soak 10 minutes

3 - 1000ºC in 3.30 hours

4 - 1080ºC in 1 hour

5 - 1080ºC soak 00.10

## Program 3 – Stoneware Midfire - 1200ºC - 10.5 hrs

1 - 600ºC in 4 hours

2 - 600ºC soak 10 minutes

3 - 1000ºC in 3.30 hours

4 - 1200ºC in 2.30 hours

5 - 1200ºC soak 10 mins

## Program 4 – Stoneware Highfire - 1280ºC - 11 hrs

1 - 600ºC in 4 hours

2 - 600ºC soak 10 minutes

3 - 1000ºC in 3.30 hours

4 - 1280ºC in 3 hours

5 - 1280ºC soak 10 mins

## SAFETY MEASURES

Kilns should be placed on fireproof base, i.e. concrete slab, and a 3inch or 4inch air space should be left around the kiln to prevent surface temperature of the kiln rising.

No objects should be placed on the kiln or leaned against the kiln as this will increase surface temperature of the kiln and create a fire hazard.

Rubbish should not be allowed to build around the base of the kiln as this will prevent air circulation under the kiln and create a fire hazard.

## SERVICING

Tetlow Kilns and Furnaces recommend that you have your kiln 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
Do not hesitate to contact us at Tetlow Kilns and Furnaces at 03 8545 8296 or info@tetlow.com.au