

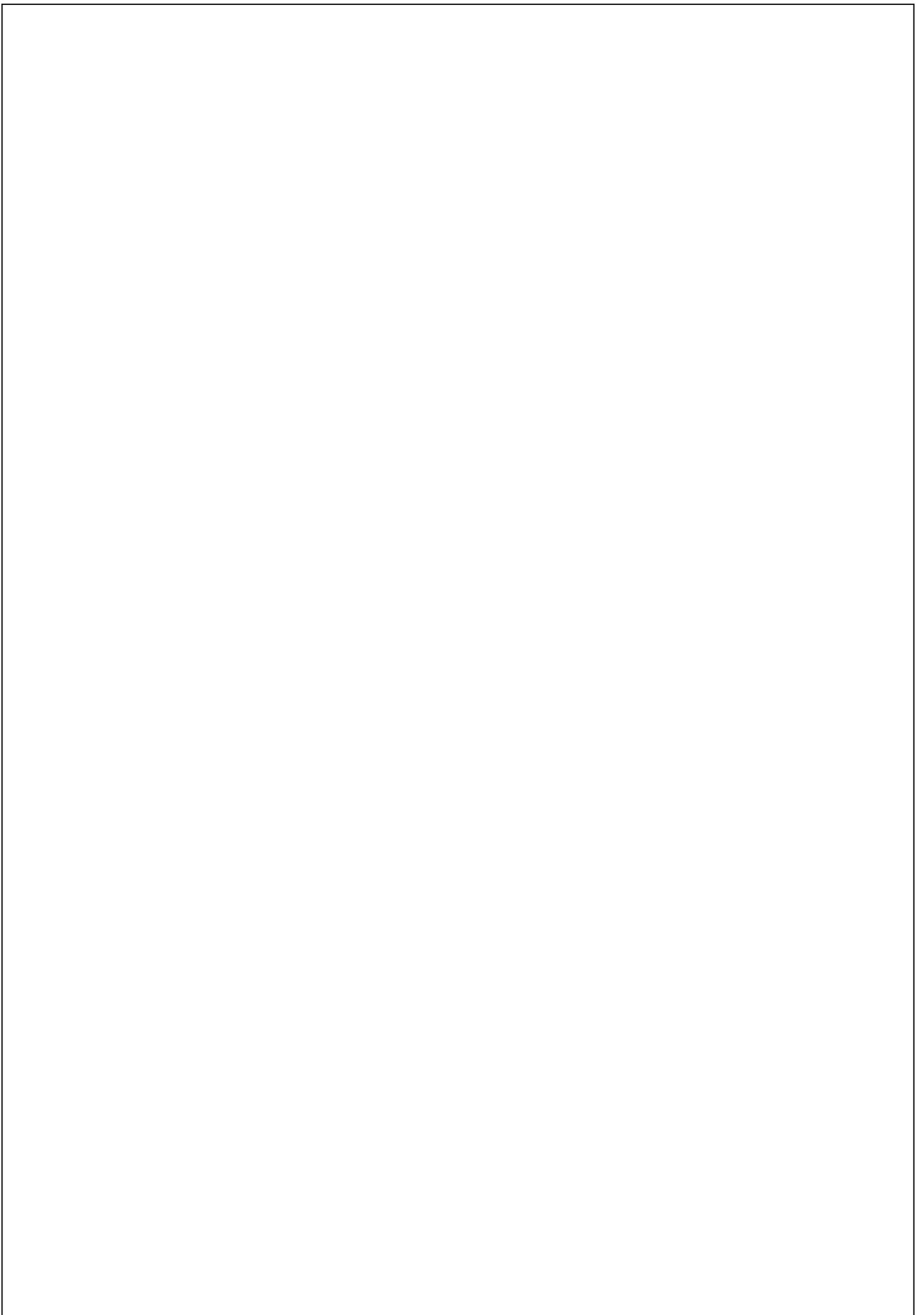
INSTRUCTION MANUAL

Woodrow Kiln

Fitted with Caho SRT-4 Temperature Controller
Single Program
(with Ramp Rate and Soak Time Functions)



NOTE: Please read instructions before using your kiln.
Failure to do so may result in damage to the kiln and it's contents.



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SECTION 1 – Getting to know your Controller

The **Caho SRT-4 Digital Indicating Temperature Controller** fitted to the Kiln is designed to allow automatic firing to a set temperature at a constant set rate of rise (Ramp Rate – in Deg°C/Min). Once the Kiln has reached that temperature, the Kiln can then Soak (Dwell) at the Set Temperature for a pre-set number of minutes (Soak time is in mins and secs).

The controller has two rows of digital read out:

The Top **YELLOW** row is the **PV** or **Process Value** (sometimes called the **Present Value**) This represents the temperature of the Kiln at that moment. This is the temperature being measured at that moment by the Thermocouple (the internal temperature sensing probe that protrudes through the back wall of the kiln).

The Bottom **GREEN** row is the **SV** or **SET VALUE**
This is the Set value for either the Max Temperature, Ramp Rate or Soak Time.

The  button to the bottom left of the controller enables the operator to cycle through the above values. The "▲" or "▼" arrows allow the operator to adjust these values.

The  button (Return button) to the bottom right of the controller returns the operator to the “home page” where the displays show both the Process Temperature and the Set Temperature.

The small **Yellow “AI”** light above the  button indicates that the controller is still running. The light will turn off when the heating cycle is finished. If this light is off, then the **RED “Cycle End”** lamp should be illuminated.

The small **Green “C”** light above the  button indicates that the controller is turning the heating elements ON. This is also mirrored by the main **GREEN** Element lamp elsewhere on the control panel.

2.0 Turning the kiln On

- I. Turn power On at the power outlet
- II. Turn the On/Off Switch on the front of the control panel to the ON position.
The “Cycle End” light should be illuminated.

2.1 Setting the Firing Temperature

Set the temperature you wish to fire to by pressing the "▲" or "▼" arrows on the front of the Digital controller. The longer you hold the buttons down, the faster the setting changes (like an alarm clock).



2.2 Setting the Ramp Rate (Heating Rate)

Now press the  button in the bottom left corner of the controller to advance to the (Ramp Rate) Setting. This is indicated when the controller displays “**rAmP**” in the top display (as shown below). The Ramp rate is measured in Deg °C/minute. (**Refer to the recommended firing rates –SECTION 5**) Adjust the Ramp Rate using the “▲” or “▼” if necessary.

Note: The controller is set to show the Ramp Rate in DegC/Minute.

2.2 Setting the Soak Period (Hold Time at the Top Temperature)

Now press the  button again to advance to the “Automatic Soak Period” Timer. This is indicated when the controller displays “**AISP**” in the top display (as shown below). This Soak time is measured in Minutes and Seconds of Soak Time required. The range is from 1 second to 999 minutes.



You can now or at any time during the firing process press the  Scroll button in the bottom left Corner of the controller to scroll through and see what settings you have programmed for the Temperature, Ramp Rate (**rAmP**) and Soak Time (**AISP**).

SECTION 3 Running the Kiln

3.1 To Start the Firing

Always turn the kiln OFF and then back ON just before starting a firing. This does two things:

- I. It resets the controller so that it knows it is starting a new firing.
- II. It also gives the controller a starting point temperature – the temperature actually in the kiln at that moment – usually room temperature or close to it.

WARNING:

Failure to reset the controller as above may result in exploded work pieces during bisque firing.

To begin the firing, press the **RED** Start button. The cycle End light will turn off.

The controller will begin to cycle the elements ON and OFF, so that the temperature rise is in accordance with the Ramp rate that has been set. The small GREEN “**C**” light in the lower left hand corner of the controller (just above the  button) will be illuminated, along with the main green “ELEMENT” lamp each time the elements are turned ON.

The Top Digital Display will begin to show the actual rise in the process temperature.

If the indicated kiln temperature exceeds the theoretical target temperature at any point, then the elements will be turned OFF. Similarly, if the theoretical target temperature at any point is above the actual kiln temperature, then the elements will be turned ON.

This control process will continue for the whole of the firing.

3.2 Completion of the Firing

At the moment that the top digital display shows that the actual process temperature has reached the same temperature as shown in the bottom display, the controller will begin the Soak Period which is the “**AISP**” value. The controller will achieve this by cycling the heating elements On and OFF.

At the completion of the Soak Period, the small GREEN “**C**” light in the lower left hand corner of the controller (just above the  button) will turn OFF, along with the main ELEMENT lamp.

The small YELLOW “**AL**” (Alarm light) just above the  button will also turn OFF.

The **RED** CYCLE END lamp on the main front panel will turn ON.

The temperature in the kiln (as displayed in the Top display) will begin to fall naturally.

NOTE:

The cooling down process may take around 9 - 12 hours, depending largely upon how much LOAD (mass of work) is in the kiln and also to what temperature it was fired.

SECTION 4 - Firing Time

4.1 Influences on Firing Time

For kilns & kilns fitted with Non Indicating Control firing time depends upon many use factors including the type of ware, the mass of the ware and the temperature which the kiln is required to operate at. Once the operator has learned the heating time taken for the particular process for which the kiln is being used, this time should be noted so that in future, the kiln can be checked to observe that it is not taking an unusually long time to reach the set temperature- which could indicate a problem with the kiln.

NOTE: The firing time will vary slightly with variations in the mass of the load, but this is normal.

4.2 Adjusting the Ramp rate while running a program

The Ramp rate can easily be adjusted while running if required by changing the “**rAmp**” value. Press the  button (left hand button) and advance to the “**rAmp**” setting. Providing the noperator does not set a Ramp Rate that is unachievable, the kiln firing time will be predictable.

NOTE: If a ramp rate of 0000 (zero) is set, the ramp feature of the control will be defeated and the kiln will heat at the fastest possible speed. ie The natural full power heating rate of the kiln.

4.3 Firing Time - Influences on Firing Time

It is possible to set the firing rate to a speed that is faster than the kiln power can provide. Therefore it is important to learn what the kiln is capable of providing particularly at the very end of the firing. The maximum firing rate will be influenced by many factors including the type of ware, the mass of the ware and the maximum temperature to which the kiln is required to operate. Once the operator has learned the maximum heating rates and has the times, then the firing rate can be set so that it is always controlling the kiln and so the firing time (for a particular setting rate) from one firing to another will always be the same. The kiln can be checked to observe that it is not taking an unusually long time to reach the set temperature-which could indicate a problem with the kiln.

SECTION 5

Wall Chart – Caho SRT-4 Suggested Firing Schedules

Type of Firing	Top Temp	Ramp Rate (rAmp)	Soak Time (AISP)
Bisque (Check Clay Recommendations)	980°C-1000°C	1.0°C -1.7°C/min	0 - 5 mins
Earthenware Glaze (Check Glaze Recommendations)	1080°C-1100°C	1.7°C- 2.5°C/min	5-10 mins
Stoneware/Porcelain (Check Clay Recommendations)	1220°C-1260°C	1.0°C -1.7°C/min	0-10 mins
Stoneware/Porcelain Glaze	1220°C-1260°C	1.7°C- 2.5°C/min	0-15 mins

