KilnMaster LT
Operating Manual

SKUTT

KILNMASTER LT

START STOP ENTER · UP VIEW SEGMENT · DOWN REVIEW

GlazeTech and FireBox 8 with KM-LT Controller

Be Safe

Tens of thousands of kilns are used safely in homes, schools, and professional studios throughout the world. With a good understanding of your kiln and a little common sense you can avoid any accidents. Please observe the following safety recommendations:

Operation

- The stainless steel jacket and some of the other fixtures surrounding the kiln will get hot enough to burn your skin when the kiln is heated. Therefore it is important to be extremely careful when working close to the kiln. We recommend posting warning signs of this potential hazard in the kiln room.
- Keep anyone who cannot understand warning signs such as small children and pets away from the kiln when it is firing.
- Be careful when opening the kiln door while the kiln is heated. We recommend you use fire rated gloves to protect your skin and make sure clothing is kept well away from any kiln opening or hot kiln surface.
- The elements inside the kiln chamber will cause an electrical shock if touched. Never insert metal instruments or place any part of your body into the kiln while it is firing.
- Always be sure to unplug the kiln before working on the electrical components. If the kiln is hard wired, turn off the circuit breaker.
- Plan on being with the kiln when it is scheduled to turn off.
- Remove all potentially combustible materials from the kiln area.
- Long term viewing inside the kiln chamber can cause damage to your eyes. Therefore, it is recommended that you use IR and UV protective glasses when looking into the kiln for extended periods of time. #3 welders green or gray glasses will protect your eyes.
- Be cautious of intense heat around the peep holes when the peep holes are removed.
- In the event of a severe storm, unplug the kiln. Exposure to static shock or electrical surges can damage the circuit board in the controller.
- The kiln lids on many models are heavy. Make sure the lid brace is secure before releasing the lid. Make sure the hardware that secures the lid brace is secured and not corroded.
- Do not place anything in the kiln you are unsure of. Certain items may potentially melt, explode, or release toxic fumes. Items that may be damp (i.e. greenware, kiln shelves) have the potential to crack or explode inside the kiln when the moisture is trapped inside them turns to vapor when heated.
- Never allow your kiln to exceed the temperature rating listed on the serial plate.
- For your safety, the protection of your kiln, and the protection of your ware inside the kiln, we recommend that you avoid unloading the kiln when it is above 125ºF.

Precautions for the KilnMaster Controller

- The controller is a temperature control device. It is not a safety device.
- The maximum operating temperature is 100ºF (38ºC). This temperature refers to the room temperature while the kiln is firing and does not pertain to the internal temperature of the kiln.
- The minimum operating temperature is 33ºF (1ºC).
- The controller contains static-sensitive parts that may be damaged by static electricity. Use caution to avoid creating static that may damage the equipment. In areas where static electricity is common, or during dry times of the year throughout the country, touch the kiln lid handle before touching the controller to discharge the static.

Installation

- As with all electrical products, there is danger of electrical shock. Use only properly sized and rated copper wire when installing the power supply for your kiln. We recommend this work be done by a licensed electrician.
- Kilns should always be located in a dry place to prevent electrical shock and corrosion.
- Follow all instructions for installation in this manual. Always observe fire and building safety codes when installing any Skutt Product.
- If there are fire sprinklers located in the kiln room make sure they are rated high enough so they will not be set off when the kiln is at peak temperature. This should be tested with the kiln at peak temperature, the ventilation system turned off and all doors and windows closed for maximum insurance.
- We recommend having a fire extinguisher rated for electrical fires easily accessible near the kiln.
- Skutt Ceramic Products Inc. will not assume liability for injury or damages caused by variations from the instructions put forth in this manual.
- Kilns get hot. Observe all the instructions to ensure proper clearances from flammable or temperature sensitive objects and living things.
- Ventilation is key to maintaining a healthy work environment and proper room temperature. Proper installation of a Skutt EnviroVent 2 will clear potentially harmful fumes from the room. To ensure proper room temperature is maintained, consult a qualified HVAC professional.
- The proper placement of thermocouples is crucial to the proper operation of all automatically controlled kilns. Check all thermocouples for damage and correct placement. Thermocouples must protrude into the kiln chamber at least 1" to ensure an accurate reading.
- Only use the stand that is designated by Skutt Ceramic Products for your particular kiln model. Other stands may not properly support the weight of your kiln, provide adequate clearance, and could pose a fire hazard.
- The power cord is sized correctly to handle the power for your particular kiln. Never use an extension cord.
- Make sure the power cord is routed in such a way as to not touch any portion of the kiln that gets hot.
- Be careful of pinch hazards when working on or assembling the kiln.
- Be sure to properly tension the springs on kilns equipped with lid lifters.

Maintenance

- Always unplug the kiln before performing any repairs or general maintenance. If your kiln is wired direct, turn off the breaker.
- Use only Skutt replacement parts. Improperly sourced parts may pose a hazard to you and your kiln and void your warranty.
- Never modify your kiln without first consulting Skutt. Improper modifications may pose a hazard to you and your kiln and void your warranty. Items such as alternative thermocouples, controllers, kiln coatings may ruin your kiln if improperly installed or applied.
- Replace any electrical components that are discolored, brittle, or corroded.
- Inspect all stainless steel bands to ensure they are tight. If they loosen, tighten them as much as possible to prevent the band from slipping or flexing.

Electrical Check List

Make sure serial plate matches electrical supply. If you are uncertain, consult an electrician.

Locating the Kiln

• Locate your kiln near your present electrical outlet or where a new circuit can be installed. Position the kiln to the left of your electrical outlet so the cord will have an easy run and will not place a strain on the plug or outlet.

• Install it in a well ventilated, sheltered area such as a carport, garage, utility or hobby room. Allow a minimum 18 inches (46 cm) of space between your kiln and adjacent walls, other kilns, shelving, etc. When multiple kilns will be installed in the same room, make sure the control boxes on the kiln are not facing adjacent kilns. Radiant heat from nearby kilns can damage the controller.

• For small rooms, monitor the firing so room temperatures do not exceed 105ºF (41ºC). Do not fire if room temperatures are 32ºF (0ºC) or less as damage to the electrical components may result. Below is an example of a typical room layout.

• Locate the kiln in a room with a bare cement floor. If a bare cement floor is not available, the uniform mechanical code requires two inches of masonry below the kiln extending a minimum of 12" (31 cm) beyond the outside circumference of the kiln.

• When installing a kiln in a room with a fire control sprinkler system, do not place kilns within a 10 ft. (3m) radius below sprinkler heads. If this is not possible, contact Skutt for alternative solutions before installing.

• All kilns are vulnerable to the highly corrosive effects of marine air. If you live near salt water, locate the kiln indoors and protect it from damp air.
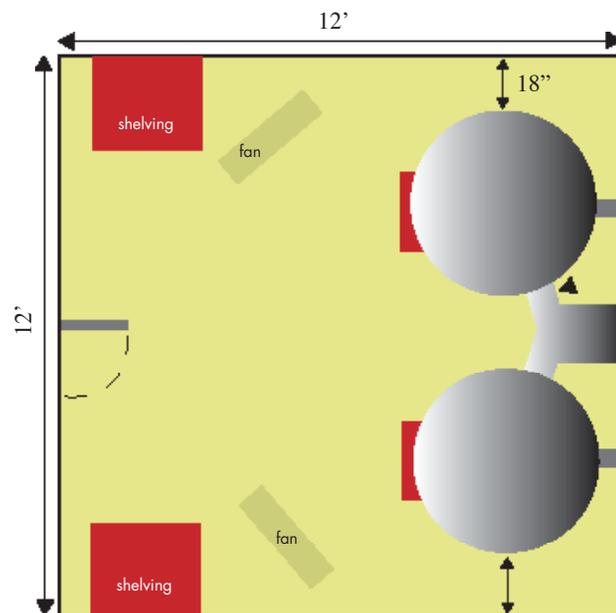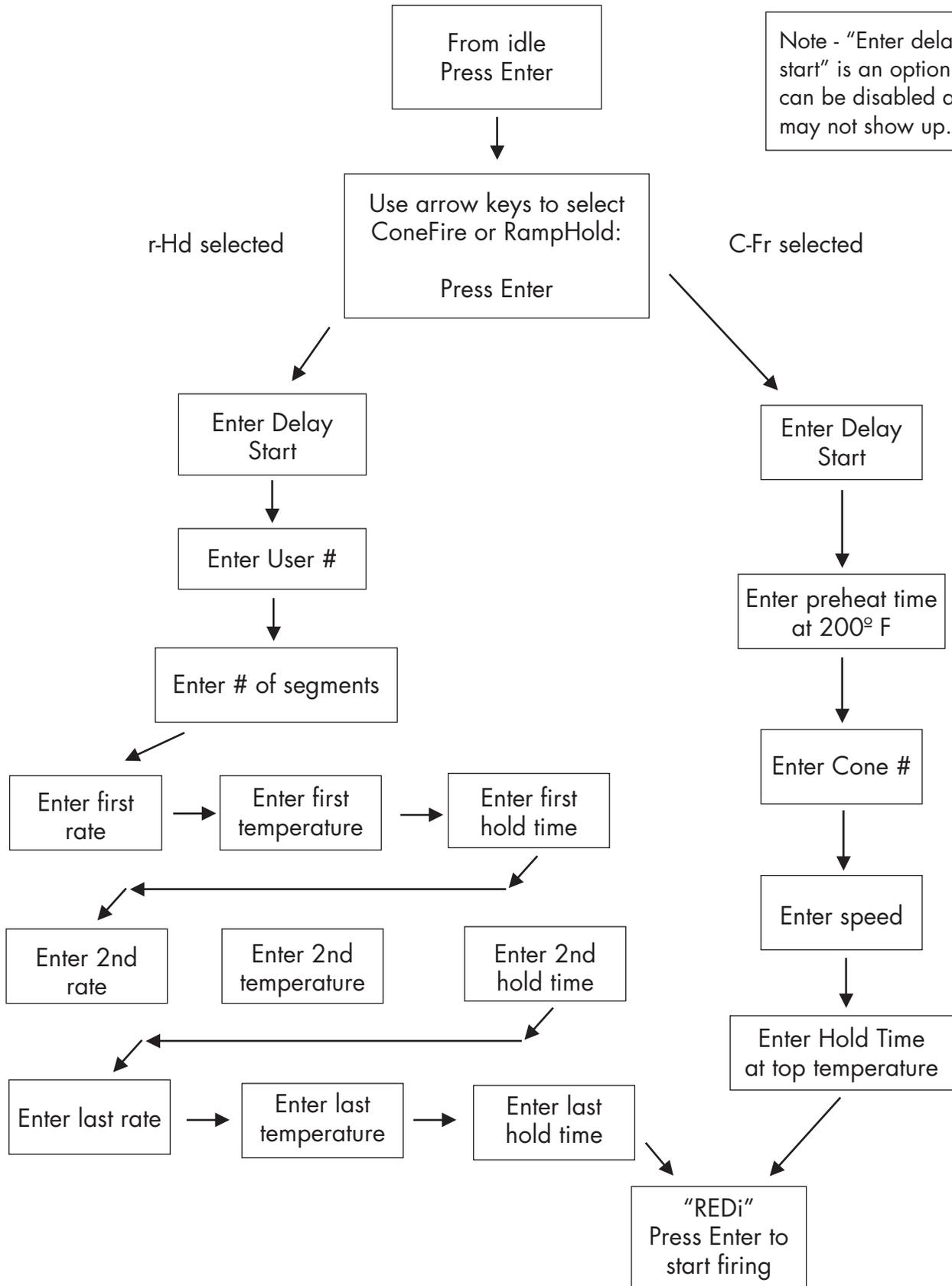

Typical layout for a dual kiln studio.

KILNMASTER LT

START
STOP
ENTER

UP
VIEW
SEGMENT

DOWN
REVIEW

Controller Stage	Stop/Start Key	Up Arrow	Down Arrow
Idle	Initiates Programming	No Function	Press once to review Press twice to go to "redi"
Programming	Stores Displayed Value	Increases Value	Decreases Value
At Ready (redi)	Starts Firing	No Function	No Function
During Firing	Stops the Firing	Shows Current Segment Access to Skip Step Add Time Add Temp	Reviews Current Program
At Complete	Back to Idle	No Function	No Function

Programming Flow Chart

From idle
Press Enter

Note - "Enter delay start" is an option that can be disabled and may not show up.

Use arrow keys to select ConeFire or RampHold:

Press Enter

r-Hd selected

C-Fr selected

Enter Delay Start

Enter Delay Start

Enter User #

Enter preheat time at 200º F

Enter # of segments

Enter Cone #

Enter first rate → Enter first temperature → Enter first hold time

Enter speed

Enter 2nd rate   Enter 2nd temperature   Enter 2nd hold time

Enter Hold Time at top temperature

Enter last rate → Enter last temperature → Enter last hold time

"REDi"
Press Enter to start firing

GETTING TO IDLE

When power is applied, the display will show either cF-A or rH-A and then ErrP, an error code or StOP flashing with the current temperature. The cF indicates the controller is set for cone fire and the rH means is has only ramp and hold programming. The letter indicates the software version .

If ErrP is displayed press any key to clear this error message.

If StOP or IdLE is alternating with the current temperature, you are ready to begin programming.

CONE FIRE PROGRAMMING

STEP   DESCRIPTION

1. Start with the display reading IdLE, Press "enter".

2. Select cone fire. If "C-Fr" is displayed, press "enter", else press an arrow key to display "C-Fr" and then press "enter".

3. Set delay start – The beginning of the firing can be delayed from the time you press "start". This allows the firing to start later and end when you can supervise the end. Use the arrow keys to adjust the amount of delay and press enter. ** Caution should be taken to make sure that no one can place anything around or on the kiln during the delay start. Treat the kiln as firing during the delay start. **

4. Enter the preheat time. The first segment of a cone fire program ramps to 200 F. The preheat time is the length of time you will hold at 200 F. Thin, dry clay may not need any preheat time and thick hand-built items may require several hours of preheat. Use the arrow key to adjust the preheat time and then press "enter" to store the value. REMEMBER the time is displayed in the form HH.mm. H= hours, m=minutes

5. Enter Cone #.   Use the arrow keys to display the desired cone number. The up arrow moves toward a hotter cone number. Press "enter" to store the displayed cone #.

6. Enter Heating rate. Use the arrow keys to display Slow, Medium or Fast.

7. Enter hold time. A hold at the top temperature adds heat work and can help produce a more even firing from top to bottom. Typical hold times are in the 10-15 minute range (00.15). Use the arrow keys to display the desired hold time and then press "enter" to store the value.

8. READY "rEdi" You are now at ready. Press "enter" to start the firing.

THE CONE FIRE PROFILES ARE LISTED AT THE END OF THE MANUAL

RAMP-HOLD PROGRAMMING

STEP   DESCRIPTION

1 Start with the display reading IdLE, Press "enter".

2 Select ramp-hold. If "r-Hd" is displayed, press "enter", else press an arrow key to display "r-Hd" and then press "enter".

3 Set delay start – The beginning of the firing can be delayed from the time you press "start". This allows the firing to start later and end when you can supervise the end. Use the arrow keys to adjust the amount of delay and press enter. ** Caution should be taken to make sure that no one can place anything around or on the kiln during the delay start. Treat the kiln as firing during the delay start. **

4 Enter user #. The controller holds 4 user programs. This step chooses which of the 4 programs you are going to use. Use the arrow keys to display the correct user number and then press "enter". To reuse a previously entered program simply press "enter" for each value. To change a program, just adjust the displayed value.

5 Choose number of segments. All programs consist of 1 or more segments as shown in the sample profile at the end of the manual. Each segment has 3 parts – ramp rate (speed of temperature rise in degrees per hour), soak temperature, and hold time at soak temperature. It is helpful to draw your profile to see how many segments you need. Then use the arrow keys to display the desired number of segments and press "enter" to store the value.

6 ENTER RAMP RATE. The rate is displayed in degrees per hour. Slow rates range from 1-50 degrees per hour and are used for thick glass projects. Medium rates range from 60 to 200 degrees per hour and are used for thick, hand-built ceramics. Fast rates range from 250 – 1000 degrees per hour and are used for glazes, thin ceramics and small glass projects. A rate of 9999 sets the kiln to ramp as fast as possible. Use the arrow keys to adjust the rate and press "enter" to store the value.

7 ENTER SOAK TEMPERATURE. For a single segment program, this is the top temperature of the firing. For multi-segment programs, this can be a temperature where you want to hold to dry the ware or for carbon burn-out, or equalize the temperature across the item or it can be where you just want to switch ramp rates without a hold. Adjust the temperature with the arrow keys and press enter to store the displayed value.

8 ENTER HOLD TIME. Use the arrow keys to adjust the hold time at the soak temperature. Hours are displayed to the left of the decimal point and minutes to the right (HH.mm) . Use a zero (00.00) hold time to change rates and move to the next segment. Drying ware can take several hours while holds at peak temperature usually range 10 – 15 minutes to even out the kiln.

9 REPEAT STEPS 5-7 for each segment.

10 DISPLAY WILL SHOW "REDI" (ready) when all segments have been entered. Press "enter" to start the firing.

To re-fire the last used program, press the DOWN key when StOP or IdLE is displayed. The program will be quickly reviewed and rEdi will be displayed. Press START to begin the firing. Note – pressing the down arrow twice will go directly to redi.

KILN OPERATION DURING A FIRING

At the start of a firing, the controller sets its traveling set point to the current temperature in the kiln. The traveling set point is where the controller wants the kiln temperature to be. The controller will then move the traveling set point up at the programmed rate and cycle power to the elements to make the temperature follow the traveling set point. You will hear the relays clicking to regulate the kiln temperature. The elements will receive power when the temperature is below the traveling set point. The relays will click off when the temperature is above the traveling set point. The current segment and traveling set point can be viewed by pressing the up arrow during a firing.

OPTIONS DURING FIRING

Displaying the current set-point and accessing the following options. During a firing you may advance from the current segment to the next ramp rate by using Skip Step or if you are in a hold period you may add time and temperature to the hold period. When the UP key is pressed during a firing the current ramp or hold is displayed followed by the current or traveling set-point, then "SStP" is displayed. If you do not press a key within several seconds the display will return to showing the current temperature in the kiln.

 Skip Step. This option allows you to skip from the present segment to the next ramp rate. Press the UP key, the display will show the current segment, then the set-point, then "SStP". When "SStP" is displayed press ENTER to skip to the next ramp rate.

Add Time to Hold Period Available only during a hold period This option allows you to add time in 5 minute increments to a hold (soak) period. When in a hold period (during a hold or soak, the temperature in the kiln will be alternating in the display with the remaining hold time), press the UP key. When "SStP" is displayed press the UP key again and "tME" will be displayed. Press ENTER and 5 minutes will be added to the hold time. You may use this procedure as many times as necessary to get the hold time that you want.

Add Temperature to Hold Period Available only during a hold period This option allows you to add temperature in 5 degree increments to a hold (soak) period. When in a hold period (during a hold or soak, the temperature in the kiln will be alternating in the display with the remaining hold time), press the UP key. When "SStP" is displayed press the UP key twice more and "tMP" will be displayed. Press ENTER and 5 degrees will be added to the hold temperature. You may use the add temperature procedure as many times as necessary to get the hold temperature that you want.

ERROR CODES

tC FAIL tC alternating with FAIL indicates the thermocouple has failed. Replace the defective thermocouple. To clear the error, press any key.

ErrP ErrP is displayed whenever there is a power interruption that is long enough to stop the firing. If the power interruption is brief the kiln will continue to fire when power is restored; in this case there will no indication of a power failure. To clear the error, press any key.

tC- - The red and yellow thermocouple wires are reversed.

Messages

CPLt   Firing Cycle Complete (firing time is alternately displayed).

dELA   Delay. Displays when entering the delay time (hour:minutes) until the start of the firing.

DLy   Delay. Alternates with the remaining delay time until the start of the kiln.

°F #   Segment temperature in °F – Set temperature for a user program.

°C #   Segment temperature in °C – Set temperature for a user program. A decimal point will display in lower right corner.

EdIt   Edit the default options (beeping at complete, temperature scale, cone fire, delay, maximum programmable temperature)

ErrP   There has been a power interruption that has stopped the firing. Press any key to clear.

FULL   Beeps continuously at end of firing until a key is pressed.

HLd#   Soak time in hours:minutes at a hold temperature.

OFF   No beeping when firing is complete.

On   Beeps for 15 seconds at end of firing.

rA #   Ramp Number (rate per hour of temperature increase or decrease).

rEdl   Ready to fire current program. Press START to begin firing.

SEG   Short for Segments. You can enter up to 8 segments in a program.

SStP   Skip Step (used to advance to the next ramp)

StOP   The kiln is at idle and ready to be programmed. Stop alternates with the current kiln temperature.

USr #   User program number displayed

SEGMENT	RAMP RATE°/HR	TEMPERATURE	HOLD
1	570	200	PREHEAT
2	570	1050	0
3	570	CT - 256	0
4	200	CT	HOLD
NOTE		CT = CONE TEMPERATURE	

SEGMENT	RAMP RATE°/HR	TEMPERATURE	HOLD
1	120	200	PREHEAT
2	400	1050	00.10
3	300	CT - 256	0
4	120	CT	HOLD
NOTE		CT = CONE TEMPERATURE	

SEGMENT	RAMP RATE°/HR	TEMPERATURE	HOLD
1	80	200	PREHEAT
2	200	1050	00.30
3	200	CT - 256	0
4	108	CT	HOLD
NOTE		CT = CONE TEMPERATURE	

Sample glass profile

TIME