

GM10F

An optional bead door may be purchased any time and fitted to your GM10F.

The GM10F when ordered with a bead door, comes with removable refractory heat baffles designed to protect the operator from electrical shock. This feature was introduced primarily for people inserting mandrels into the kiln while it is firing.

The baffles slide into grooves located in the lid and slab next to the element walls. It may be necessary to slide the baffles back and forth slightly to seat them in the grooves. A 1 5/8" Tri post may be ordered from Skutt to use as a mandrel rest inside the kiln.

Caution: Do not leave the bead door unattended in the open position. Damage could result if the bead door slams shut accidentally. Always raise and lower the bead door gently.

The bead door does not come attached to the kiln and must be assembled. In the box with the kiln you will find the following:

- | | |
|--------------------------------|---|
| 1) 1 Bead Door handle with rod | 4) 1 Bead Door |
| 2) 4 Split Ring Collars | 5) 2 Baffle Plates (1 Left and 1 Right) |
| 3) 1 Allen Wrench | 6) Strips of fiber cloth. |

Step 1

Remove 3 of the 4 split ring collars using the Allen wrench taped to the rod and then slide the bead door rod through the first bracket hole.

Step 2

Slide on another split ring collar and then the bead door.

Step 3

Slide on another split ring collar and then slide the end of the rod through the right hand bracket so the end is sticking out far enough to slide the last collar on flush with the end of the rod.

Step 4

Tighten the 2 out side collars making sure they are flush with the bracket.

Step 5

Center the bead door on the hole, slide the 2 inside collars up flush with the bead door bracket and tighten the set screws. The bead door should be in the closed position and the wooden handle should be pointing directly towards you. Rotate the wooden handle 180 degrees so that it is pointing towards the back of the kiln. The bead door should be completely open. The weight of the wooden handle should hold the bead door in the open position.

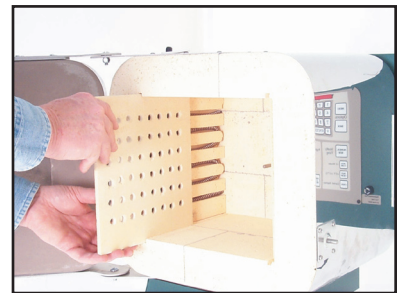
Step 6

Open the side hinged door and slide the baffle plates into the grooves near the element walls. The baffle plates have a top and bottom. They need to be positioned so the holes in the baffles are aligned with the element grooves.

Step 7

Place 1 fiber cloth sheet on the bottom edge of the door plate if you are going to be using mandrels. Use 3 sheets if you would like to seal the door for fusing.

Your bead door is now ready for use.



Using the GM10F

ALTERNATE THERMOCOUPLE POSITION

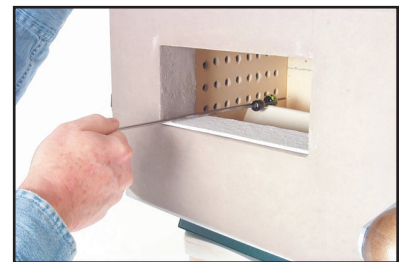
The GM10F thermocouple is positioned in the center of the kiln. This position gives the most accurate reading when the glass is located in the center of the kiln. If this thermocouple position is inconvenient for the work you are doing, it can be moved to an alternate location higher in the chamber. To do this perform the following steps:

1. Unplug the kiln.
2. Remove the back panel of the control box.
3. Remove the screws securing the thermocouple block to the back wall and carefully slide the thermocouple out. Leave the thermocouple attached to the block.
4. Locate the alternate hole location and use the hole as a guide to drill a 1/4" hole through the brick for the thermocouple.
5. Slide the thermocouple into the hole and use a 3/32" drill bit to drill pilot holes for the screws that secure the block.
6. Attach the thermocouple block screws.
7. Stuff previous hole with fiber, replace the back panel and plug in the kiln.

Be sure to test fire the kiln after relocating the thermocouple. The temperature reading at the top of the chamber may be slightly different, and therefore, you may want to adjust your firing programs to compensate for the difference.

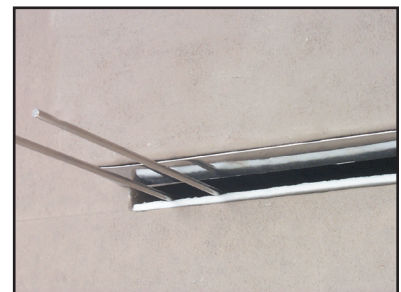
BEAD MAKING TIPS

If you have the GM10F but do not have the bead door we highly suggest you order this option for annealing beads. The bead door is designed to allow you to insert flame-worked glass beads on a mandrel conveniently and without losing much heat out of the kiln.



The first step is to program your kiln to heat up to working temperature. This should take about 20 to 30 minutes. Below is a sample 2-segment bead program that can be entered in the Ramp/Hold mode on the controller.

To insert the mandrel just lift the door handle with your free hand and place the bead end of the mandrel through the bead opening. The kiln should already be on and at the suggested temperature. Rest one end of the mandrel on a shelf post and the other end on the ledge of the bead opening. Be sure that the bead is not touching other beads or the post.



When you lower the door there will be a gap between the bottom of the door and the ledge. This is normal and will not cause any problems. If you would like to make the gap smaller when you are fusing, just add more fiber strips until you get a good seal.

When you are done working with the torch you will want to press "ANNEAL NOW" on the controller. This will advance the kiln program to the annealing schedule you have programmed. When it is done with the programmed annealing cycle the kiln will shut off.

	RATE	TEMPERATURE	HOLD
SEGMENT 1	9999	980 F	8 HOURS
SEGMENT 2	300	700 F	0 HOURS

What Is Zone Control

Ever since the first kiln was fired kiln makers have sought ways to distribute heat more evenly throughout the kiln. Zone Control has been around for quite some time, however, until recently the cost of the technology restricted it's use to highly technical industrial type kilns. Just as with automatic controllers, the cost of Zone Control technology has reached a level which makes it affordable for studio sized kilns.

The idea of Zone Control is to use multiple thermocouples to control various sections of the kiln. Traditionally kilns fire hottest in the center and cooler in the bottom and top. At Skutt we balance the elements to compensate for this natural variation in temperature, however, the elements are designed with the assumption that the kiln will be loaded evenly. The more mass you place in a particular section of a kiln the cooler it will fire. For example, if you were to load shelves of tile closely spaced in the bottom of the kiln and tall thin vases in the middle and top of the kiln, it is likely that the tile in the bottom will be under fired.

Zone Control kilns overcome this problem by placing a thermocouple in each section of the kiln. Each thermocouple sends an independent signal back to the controller. The controller then processes the temperature information for each section and determines whether the section is following the program. If the section is firing cool, it will send a signal to the relay which will energize the elements in that section.

Tighter Controls

The Controller has a programmable "lag" feature so the user can determine how much the temperature in any zone can "lag" behind the desired temperature of the program. The controller senses when any section is lagging behind the desired temperature setting and keeps the controller from increasing the current temperature setting (ramping) until the lagging section catches up. Ramping is only suspended when a section is behind by more than the programmable "lag". A smaller "lag" will result in tighter controls between the sections but may cause a slower firing if one section has proportionally weaker elements or the load is extremely unbalanced. The default setting for the lag is 10 degrees F. Therefore, anytime a section is more than 10 degrees behind the current setting the controller will wait for the lagging section to catch up before increasing the current set point. The default setting can always be reinstated by entering the reset command.

Thermocouple Failure Control

Zone Control offers additional security through it's multiple thermocouples. A thermocouple can fail and stop the firing with a single zone controller. The Zone Control will continue firing if one or two of the thermocouples fail during a firing. If the top or bottom thermocouple fails the section with the failed thermocouple will fire with the middle section. If the middle thermocouple fails the middle section will fire the same as the top section. The Zone Control will not start a firing with a failed thermocouple. The Zone Control will also give an error message (Errd) if any section gets more than 100 degrees F above the set point. Thermocouples in the wrong section, or a stuck relay can cause an Errd message.

Programming Your Zone Control Kiln

Your zone control kiln programs very much like the standard GlassMaster single zone automatic kilns. These programming instructions can be found in the standard GM Operating Manual (owner's manual).

In addition to all the features found on the GlassMaster single zone kilns, your new zone control kiln has some added features and programming ability. Most of these features are accessed by using the "MENU" button in the upper left hand corner of your kiln touch pad.

Displaying Temperatures by Zone

With a Zone Control controller you can monitor the temperature in each zone of the kiln. The default setting for the thermocouple reading is tC 2 (thermocouple 2). This is the temperature of the center zone. If you would like to view what the temperature is in tC 1, the top zone, or tC 3, the bottom zone, simply press the corresponding number on the touchpad. The temperature reading will display that zone until you enter the number of another zone.

LAG

“Lag” is represented by the number of degrees that any zone is allowed to trail behind the other zones. When a section is “lagging” the firing will be slowed to allow the lagging zone to catch up.

Setting the LAG feature lower than 10 degrees can substantially increase the firing times since the kiln can only fire as fast as the slowest zone. The factory default setting is 10 degrees. This setting is recommended for most firings.

The maximum LAG setting is 50 degrees. This setting will give the fastest firing times with the least amount of Zone Control. To change the Lag setting follow these steps:

Press **MENU** repeatedly until the display reads “**LAG**”

Press **ENTER**

Change the current lag setting and press **ENTER**

If “LAG” does not appear as a MENU item than the kiln is set for single Zone Control. Follow the instructions for changing to 2 or 3 Zone Control and the “LAG” feature will appear.

THERMOCOUPLE OFFSETS

It is possible to make individual sections of the kiln fire hotter or cooler by using this feature. The maximum offset that can be used is 50 degrees. This feature can be used to fine tune the kiln using pyrometric cones on shelves in the various sections.

In most cases it is not necessary to offset the thermocouples and if done wrong it can cause firing problems which are difficult to diagnose. Please contact the factory to attain instructions for this feature.

SETTING SINGLE ZONE, 2 AND 3 ZONE CONTROL

As mentioned earlier there are times when you may want to operate the kiln without the 2 or 3 Zone Control feature. When elements begin to weaken the kiln may lose the ability to complete a firing in zone control mode or extend firing times beyond acceptable limits. This will happen when the kiln lacks the power to maintain minimum temperature rate increases when 1 or 2 of the sections cycle off to allow a slower section to catch up with the program. This will express itself as an Err1 error if the kiln is unable to maintain a temperature rate increase of at least 12° an hour and the controller will stop the program.

If your firing does not require the tight temperature control of zone control and adjusting the lag will not solve the problem the second option is to turn Zone Control off completely and have the kiln cycle all sections together using the input of only the center thermocouple.

This is only a temporary solution. We suggest that you find the root source of the problem which will most likely be the need for new elements.

Turn Zone Control Off and On

Press **MENU** repeatedly until the display reads “rSEt”

Press “4,4,3”

Press **MENU** repeatedly until the display reads “noTC” (Number of Thermocouples)

Enter “1” for single zone or no Zone Control

GP706

The GP706 is equipped with an analog pyrometer and infinite switch to control and monitor the temperature of the kiln. Since there is no automatic shut-off system it is extremely important to monitor the kiln while it is firing. The firing rate will be controlled by how much you turn up or turn down the switch. In order to hold at a specific temperature it may be necessary to allow the kiln to reach the temperature and then adjust the switch slightly down until the kiln “balances” at the desired temperature. It is a good idea to keep a log of what switch settings produce holds at certain temperatures.

CONNECTING YOUR KILN TO THE POWER SUPPLY

Ensure that the kiln's power switch is in the OFF position. Plug the kiln's power cord into the 120 volt receptacle you plan to use. Ensure that the kiln's lid is closed, and turn the kiln switch to HIGH. The pilot light on the control box should illuminate. Leave the switch in the HIGH position for about 5 minutes then turn the switch to OFF. Unplug the kiln, open the lid and lock it in place with the lid brace. Very carefully check for signs of heat from the heating element in the kiln lid. **DO NOT TOUCH THE HEATING ELEMENT AS IT WILL BE VERY HOT.** If the heating element is warm, the kiln is ready for its first firing. If the kiln fails to heat or your circuit breaker trips, it will be necessary to call your distributor or electrician for advice. Skutt's customer service may be called if a distributor or electrician is unavailable.

YOUR FIRST FIRING

It is advisable to perform the first firing with the kiln empty. This firing will ensure that the heating element is properly oxidized (broken in). Install the kiln's ceramic peep plug if you wish. Turn the kiln's switch to the #4 position and leave there for 30 minutes. This will allow the kiln to begin heating slowly. After 30 minutes, turn the kiln switch to HIGH and let the kiln fire until 1650 F degrees is attained. Then shut the kiln off and allow to cool normally.

KILN SWITCH OPERATION

The power control switch of your kiln is similar to the switches found on most ranges. The higher the switch setting, the hotter the kiln will get. On LOW setting, power is supplied to the kiln about 20% of the time. On setting #4 the power is on about 50%, setting #6 about 80% and on HIGH 100%. Some experimentation will be necessary to determine what settings are best for your application.

This particular type of switch is called an “infinite” switch. It is (infinitely) adjustable between LOW and HIGH settings. On settings other than HIGH, the kiln's pilot light will cycle on and off as the infinite switch cycles on and off.

MAINTENANCE

Always close the lid of your kiln gently. Since the heating elements are in the kiln lid, any sudden jar, such as the lid slamming shut, can dislodge the heating elements or the pins that hold the elements in place. If the lid is slammed forcefully enough, the brick in the kiln lid may fracture and break loose. This type of damage is generally not covered by your kiln's warranty.

After each firing, the lid and heating elements should be inspected. Any pins holding the heating elements in place that appear to be coming loose should gently be pushed back into place.

GM22CS

The GM22CS has some unique features that require some clarification.

UNPACKING

The GM22CS comes packed in several boxes. In Box #1 will be the kiln and Operating Manual Packet. In Box #2 will be the Kiln Stand and GlassMaster Controller.

PLACING ON THE STAND

The Kiln Stand needs to be positioned with the buckle latch facing forward. Line up the kiln on the stand so the top half of the latch on the kiln can be attached to the bottom half of the latch on the stand.

MOUNTING THE GLASSMASTER CONTROLLER

- 1) Locate a spot on the wall behind the kiln that is at least 18" from the kiln yet close enough to not stretch the controller cord when it is attached to the kiln. Make sure the location is easy and safe to access and preferably in an area where at least 1 of the mounting screws can be attached to a stud in the wall. If a wall stud can not be accessed it will be necessary to use drywall anchor bolts that can be found at a local hardware store. Using the template in the back of the catalog, mark the holes for drilling.
- 2) Remove the template from the wall and drive the mounting screws (these can be found in your Operating Manual Packet) into the wall in the areas marked. Leave approximately 1/4" of thread showing on the screw to allow for the unit to hang on the screws.
- 3) Hang the GlassMaster Controller on the screws and attach the controller cord to the back box of the kiln using the connector on the end of the cord.

OPENING AND CLOSING THE KILN

The GM22CS's "Clam Shell" design requires shocks to comfortably open the kiln. These shocks have dampeners built into their chambers to keep the kiln from opening too fast. However it is still recommended to control the speed of the lid opening when it is to be opened all of the way. This will reduce the amount of stress placed on the hinges and back row of bricks.