

Oasis PID Controlled Shot Maker

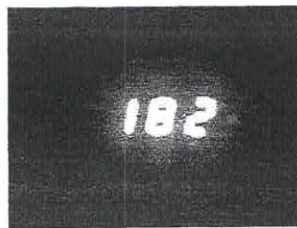
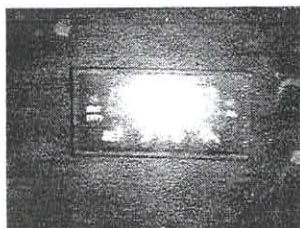
Welcome to the Oasis PID Controlled shot maker. The new PID controls allow for a more stable temperature control to improve your lead shot making experiences and to allow for the making of Bismuth shot. This shot maker is a simple to use, easy to program shot maker that will last you for many years.

Before using the shot maker, you will need to program it to respond the way you want it to perform. A word to the wise, be patient. While the PID control will offer more control, you must know that the digital readout is far more accurate than any thermometer, it can fool you. You are dealing with a molten metal; temperature measurements can have a "bounce" or "over shoot" to some degree. This is affected by your ambient temperature and the rate at which you feed lead or bismuth ingots into the pan. The thing to remember is that when the molten metal rises or lowers in temperature the heat element is either turned on or off as needed to maintain a steady temperature range. To some degree, set the temperature, and forget it.

How it works

PID controls, at least the one you have on your unit, control temperature in a method called "ramping". In simple terms you turn your unit on and full power is applied to the heating element. As your pan and lead heat up close to your set temperature, let's say 850° F. power to the burner starts to cycle on and off. So, at 840° F. the power is on for 2 seconds, off for 1 second, at 849° F. the power is on for ½ second, off for 2 seconds. This on/off cycle is constantly adjusted so the molten metal reaches you set temperature and stays there. Don't be alarmed if you see a little "bounce" in the measured temperature, that's normal and will lessen the longer the unit runs. By bounce we mean high or low temperatures. What we are watching for is a stable temperature that your drippers flow the best at. This is adjusted in the SET temperature menu.

On to Programing



When programing remember that "set" starts the program cycle, enters the function parameters, selects the parameter, and, exits the parameter. Use the arrow keys to navigate the numbers or lists of functions. Don't panic, this guide will lead you step by step on how to program your PID Control. Oh, and you only have to do this once, unless you want to change something like your target temperature. This controller will do a ton more than what we are going to do here, read the PID manual or call if you feel you want to use other features.

Step 1. Press "SET" on the face of the control. Result= 0000 Desired Result= 0036

Press the right arrow button until digit 3 is flashing, press up arrow until 3 is on, press right arrow until digit 4 is flashing then up arrow to 6 then "SET"

Step 2. Press the up arrow until P is shown then press "SET" then right arrow and change 5 to 3. Press "SET" now press up arrow until "END" and press "SET"

Now we are going to program the target temperature, this temperature will depend on if you are using Lead or Bismuth. For Lead I suggest 675° F. for a starting point, and for Bismuth I suggest 540° F. These are starting points, if you are getting a steady stream of metal instead of drips lower the temperature, if you are constantly having to tap on the pan to keep drippers flowing try a higher temperature.

Setting the target temperature

Step 1. Press "SET" on the face of the control. Result=0000. Desired Result=0001

Press the right arrow to highlight the last digit, press the up arrow to 1 then press "SET"

Step 2. Su is the first menu, press "SET" change this value to your set temperature, for lead 0675, for bismuth 0540. Press "SET" use up arrows to find AH1, press set. Set this for 5° ABOVE set temperature, 0680 or 0545. Press "SET" use up arrow to AL1, press "SET". Set this to 100° ABOVE set temperature, 0775, or 0640. Press "SET". Use up arrow to find END and press "SET"

That was so simple, what you did was told the control to keep a tight range on the set temperature, then what the set temperature was. Next you told the control when to turn on the alarm, and when to turn the alarm off.

Now to make shot

Add ingots to your pan, you should see the digits change as the temperature rises. This will be rapid at first and the RED light to the left of the digits will be on, this indicates full power to the burner. As the metal melts and the temperature gets close to your set temperature the red light will start to flash. Slowly at first then faster getting closer to the set temperature. If the temperature rises above the set temperature the "AL" light will come on, don't panic, start making shot and watch for the temperature to come down to the target temperature, the light will turn off.

Bismuth Alloy shot dropping for the OASIS shot maker.

Bismuth alloy shot dropping for #56 drippers to drop #4 shot

Bismuth alloy shot dropping for #64 drippers to drop #6 shot

94% Bismuth 6% Tin Alloy – clean alloy and cast into small 1 pound or less ingots

Ambient temperature should be no less than 65 degrees when dropping shot

Prepare shot dropper lip with “high temp” spray graphite – 3 coats works best

Plug the outside edge drippers with bolts, so you will run the machine with the 5 interior drippers for best shot making results.

Make sure the shot dropper is very level, this is critical for even shot dropping in this method

Use shims such as metal washers if necessary to achieve a very level platform (check and double check the level) as noted above this is very critical.

Set the PDI 540 – 545 using the instructions for the OASIS shot maker.

Depending on ambient temperature and your elevation these settings may need to be adjusted up or down.

If during the process you overheat the machine and receive an EEEE code, place a small fan next to the unit to keep the electronics cool once the machine reaches set range

Place 4 to 6 ingots on the back of the machine for a preheated stockpile when the machine is started.

Begin melting one ingot in the pan as the machine starts.

As temp makes its initial rise the ingot will melt, after the first ingot fully melts add another ingot from the preheated stock pile on the back of the machine.

The temps will begin to stabilize near the set points.

Once both ingots melt the metal should be near the bottom of the shot drippers.

Add two more ingots from the stock pile on back of the machine and they should begin to melt and shot should begin to drop, if the shot does not begin to drop, tap the machine very lightly.

Keep a stockpile of ingots (4 to 6) on the back of the machine to keep the ingots preheated.

As the shot drops add a pair of preheated ingots to the upper pan.

Move the pair of ingots into the melted bismuth alloy area slowly.

****Monitor the level and keep the melted alloy level just at the bottom of the drippers just enough so the droppers drop shot.**

If you add/melt too much bismuth the shot will run out the drippers making deformed or tear drop shaped shot.

It is critical to keep the melted alloy clean and scum free!

If drippers stop dropping tap the machine while more bismuth is melting. Do not let the bismuth build up and solidify in the drippers while waiting for ingots to melt.

You must pay attention and keep the process up of moving the ingots into the melted alloy and keep the flow. This may take some practice to learn the timing.

****Remember if the melted alloy is too high up on the drippers the melted alloy will run out the drippers instead of drop.**

Should be able to drop 25+ lbs of shot per hour or more depending on the shot size.

When finished, tilt the machine backwards by placing a block under the machine.

Make sure the drippers are free of bismuth alloy, as you will have to remove the drippers and clean them before the next shot dropping.

Once the machine is cool, remove drippers.

Clean the drippers by heating them with a torch and melting as much bismuth out as possible.

Once the drippers are cool, use a hand drill, such as a jewelry drill and clean the dripper openings rear opening and drippers small openings very well. Be careful to remove only the bismuth and not cut into the dripper metal and "punch" through the dripper.

Any remaining alloy or scum will cause the drippers to make deformed or shot to run on the next shot drop. The cleaning of the drippers is critical in making good round shot!

Trouble shooting:

Shot runs out the drippers and does not drop.

Too much melted alloy in the pan, keep level just at the bottom of the drippers

Drippers have scum from previous use and need cleaning

Temperature setting is above the range set

Some drippers are not making shot.

Scum build up from previous drops, remove drippers and clean

Machine is not level

If the temperature stabilizes above or below your target temperature simply enter the "SET" 0001 menu and change the Su to increase or decrease the stable temperature. This is affected by your ambient temperature and the composition of the metal you are melting. Again, make small changes, 1° to 5° at a time, and wait for everything to calm down.

The End Result

After the first run of shot you simply turn off the power to the unit. The control will remember your settings and every time you start the unit it will come up to and stop at your target temperature, no need to reprogram every time.

Watch your shot, too cold of molten metal and you get larger shot, popcorn shaped shot, or tear dropped shot. Too hot of molten metal you get too small of shot size or long slivers of shot. Extreme high temperature of molten metal your lead will run out the drippers not dripping droplets like it should.

Have fun making shot with your new Oasis PID Controlled shot maker, keep your powder dry and happy shooting.