DALIAN AMAZON COFFEE ROASTER POWER CONTROL MODIFICATION

I have done this modification on my own roaster to allow me to control the power of the heating elements. I believe this will improve the control of the roaster and ability to repeat a roasting profile. This describes how I did it, but does not endorse this particular method for your roaster. If you decide to modify your own roaster, I take no responsibility for anything that happens if you choose to do a similar modification.

DALIAN AMAZON DL-A721-S POWER CONTROL MOD

Why did I want to modify the roaster

It's a very good roaster, it's currently winter and the cooler weather gives plenty of control. As summer approaches, voltages will rise and the roaster (which can already go very quickly indeed) will be quite fast. This speed may be tempered by lowering controller temperatures and/or drawing more air through the roast chamber. However, I modified all my electric roasters for power control over the years and I felt this one should be no different. For me it might actually allow me to reduce the variables and get more control.

- I can hold airflow constant and reduce/increase power to affect ramp rate
- I can get quite a fine and repeatable control of the power input before and during 1st crack
- I can moderate power without the binary heater on/off situation
- I don't have to draw lots of air to reduce or moderate the temperature
- The process controllers simply become a guide and a limiting controller if I don't control it first
- At some point it allows for computer control of an SCR circuit for profile roasting and stored profiles.

The modification

I wanted to modify the roaster in such a way that the warranty would not be affected, so of course by definition, my modification may not be the most efficient way to do it, but does allow the roaster to be easily returned to stock. The only evidence of a modification would be a 10mm hole in a side panel, easily covered by a grommet.

I felt the skill level required would not be high and it would only take around 20m. I used the following equipment.

- Ring main cable (had a spare bit), with solid wire cores
- Wire strippers
- 10mm, 6mm and 4mm HSS drill bits and drill
- SCR Power controller (ebay)
- Phillips screwdriver

Risks

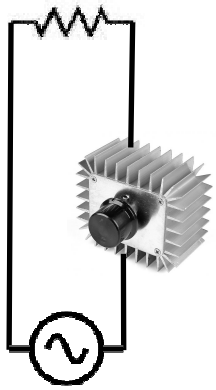
There are always risks, but I felt they were minimal. The biggest risks are:

- A wire comes loose and shorts out against the case
- The SCR controller burns out
- A loose connection overheats

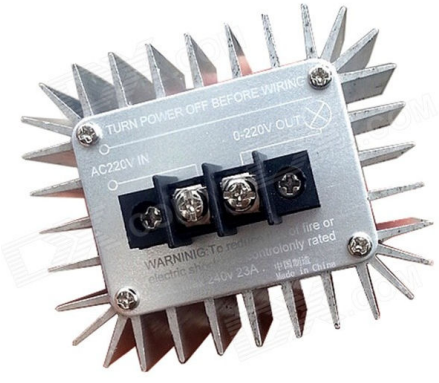
I felt both these risks were manageable as the case is earthed, the roaster has an RCD and I didn't see there would be a huge problem.

The procedure

It's a very simply modification and simply places an SCR based power control box in line with the heating element. The wiring is very simple as shown below.



The back of the SCR controller



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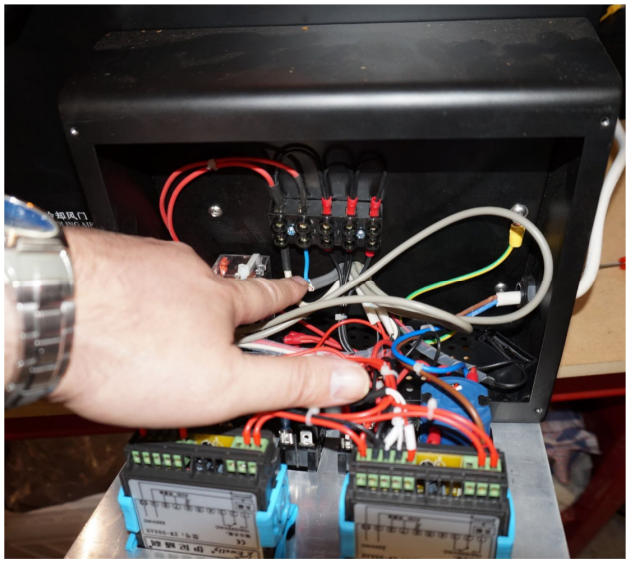
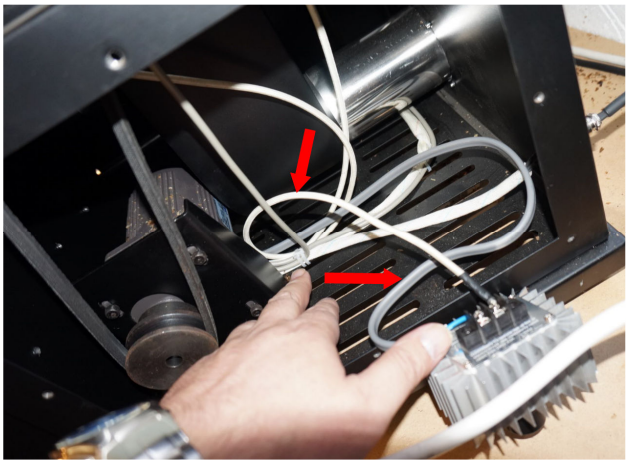
I removed both panels at the rear of the roaster. It's this heater wire I wanted to use, because it's far away from the drum belt.



It came from this terminal behind the front panel. I pulled the heater wire gently until I identified which wire it was. **Here I have already removed the heater wire and connected one of the ring main wires to this terminal block** (I cut the others short, as I won't need them). I fed the wire through the hole used by the other wires.



I pulled the wire connected to the heating element as far as the cable tie, but not through it. I then routed it to the output side of the SCR controller. I routed the grey ring main cable under the drum motor and connected the blue cable to the input side of the SCR controller (I cut of the excess unused wires).

Next I drilled the lower plate (reverse side shown), giving the controller sufficient clearance from the sides and low enough to place it in a cool area. The centre hole I first drilled to 6mm then enlarged to 10mm. The other 2 "holes" are not holes, but just 4mm dimples drilled into the reverse side of the plate, **they do not go all the way through.** These allow the 2 locator pins on the SCRs potentiometer to sit in them and prevent it rotating

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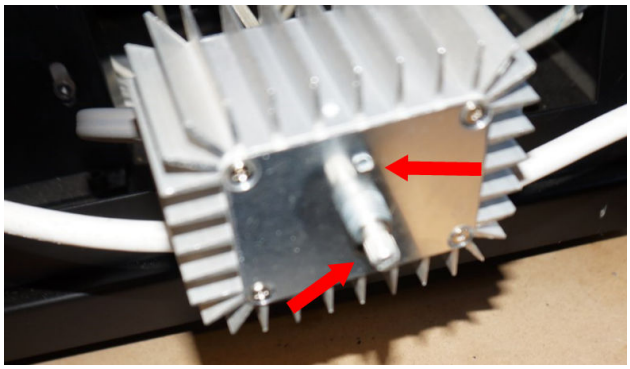
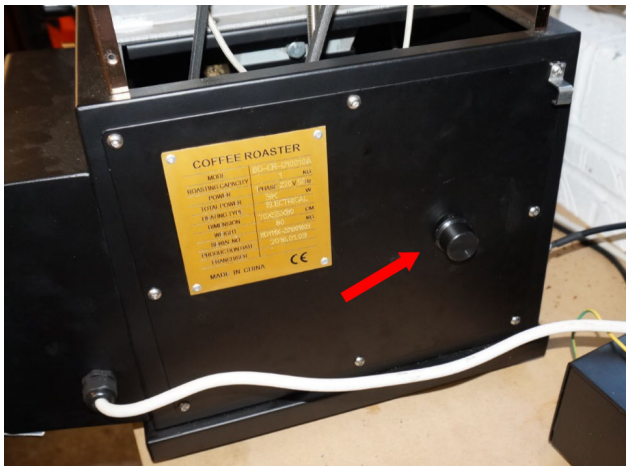
It's a bit blurry but you can see the locating pins top and bottom



I fixed the power controller to the front panel, remembering not to over tighten. The controller heat sink might be slightly loose, but the potentiometer will be firmly fixed and nothing will twist as long as the locator pins sit in the dimples. It only needed to be tight enough to hold the potentiometer firm!



I ran a quick test and heater the roaster a little, visually checked all the connections looked OK. **Unplugged the roaster** and checked none of the connections I had done were getting hot. I also gave them a little tug to ensure they were all well connected.

One of the nice things about wiring behind the front panel was not having to use high temperature cable. The use of a spare bit of ring main cable meant no new connectors had to be crimped in place. The solid cores made good firm contacts to the connector block behind the front panel and the SCR controller screw terminals.

The original heating element wire had a straight flat connector that seemed to be easily clamped under the screw terminal of the SCR power controller.

All in all, a quick, easy, cheap and worthwhile mod. Below is the ebay link for the controller I used, currently £5.75 delivered.

http://www.ebay.co.uk/itm/AC-220V-5000W-SCR-Voltage-Regulator-Dimming-Speed-Controller-Thermostat-/181924240279?hash=item2a5b879b97

I found it by doing a search for "AC 220V 5000W SCR Voltage".

I thought I had better add this last bit of clarification.

At this point, I have no idea if this will work OK long term, or whether the SCR module will fail. I don't even know if it will be of any use, I like tinkering and as stated earlier, I did this to all my other electric roasters.

The Amazon roasts very well already, so I don't think it will improve on roast quality and I'm only guessing as to the benefits. Now, it just gives me another control in the armoury and something else to play with when crafting the roast. I'll report back at intervals during the next 12 months.

Modifying your own roaster is easy, but it may also be pointless, so please don't take this as something you need to do….remember, I have not even tried roasting with this mod yet!

I would certainly advise anyone to learn to use the roaster properly for 6 months (as I did), before even considering modifying it