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Culmination Updates
Progress Report 2
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After some research, I discovered a different heating control system called Proportional, Integral, and Derivative (PID) that regulates temperature, flow, pressure, speed, and other process variables in industrial control systems. This controller should work for my problem. The current problem is stabilizing the target temperature it keeps blowing past the target temp which was 230 degrees Fahrenheit by 20-30 degrees. Then after turning it off the temperature would drop another 20-30 degrees below the target temperature before turning it on the heating element to start the process over again. After some time in transit, the new temperature controller would come into the main and I started wiring it up using the prior knowledge I gained from installing the first one. But this turned out to be useless because the new part had additional connections for additional heating elements and even an alarm system. All of which I didn't need and only made wiring up the system even more complicated. Reading the instructional manual for the part was like reading hieroglyphics because it was a broad instruction sheet for all of the company products so I had to study the sheet and was able to connect it all up and it was reading the temperature using the temperature sensor that was already apart of my test system.__Next after connecting the Solid State Relay (SSR) it would not turn on. After rereading the instructions and looking up videos on installing an SSR. Then two very interesting things happened, first I was trying to figure out a solution with a CLT who was helping me try and solve the issue. He wanted to see if the sensor would properly sense a change in temperature. Since it wasn't heating up he put his hand on the heating block to see if it would change. As he couched the wire next to the heating block that belonged to the sensor the heating element exploded. This was completely unexpected and we had no idea why that happened so I replaced the heating element and temperature sensor. Still, before putting the sensor into the block like the heating element we decided to test the sensor before we put it in so after turning on the controller I grabbed the sensor with my two-fingered and pop the heating element blew up again. Fortunately, we were both fine but after the second I decided I would stop there for the day. Later I talked with Josh a professor who teaches fabrication and is very knowledgeable when it comes to circuits and electronics. He was able to give some very helpful feedback, he noticed that I was supplying the controller with DC power and that I might need to convert it to AC instead. But I decided after doing more research on how the parts work I saw a guy using a PID controller the same way I needed to so I ordered the new part and was going to see how that works out. In terms of modeling and 3d printing, I've been working on many parts that need to fit together with varying tightness. So I made a test print to test out different clearances since I need parts to fit together snugly or lose enough that it can spin freely. So each block has a slightly shorter diameter than one another. While this may be a good reference for gauging the sizes of parts something unusual happened while fitting some of the test parts together. The opening the blocks were inserted into had a diameter of 25mm I had a 25mm block printed so I could prove it would not fit but it did perfectly. This is very unusual but fortunately, it's a non-issue.