

Making a Dual-Stage Temperature Controller

For your homebrew fermentation chamber

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Parts List

STC-1000 temperature controller, 110VAC (eBay, "mixtea" seller, ~\$27)

Project Box, 8"x6"x3" size (Radioshack, \$7.39)

Green Lamp Assembly, 120VAC (Radioshack #272-0708, \$3.69 for 2)

Red Lamp Assembly, 120VAC (Radioshack #272-0712, \$3.69 for 2)

9' Tool Replacement Cord, 14GA (Home Depot SKU#342576, \$12.97)

3/8" Cable Clamp (Home Depot SKU#839647, \$1.54 for 5)

20-Amp Duplex Outlet (Home Depot SKU#710320, \$2.99)

1-Gang Box Cover (Home Depot SKU#101222, \$0.35)

#6-32x1" Flat Head Phillips Machine Screws Package (Home Depot, "Crown Bolt" #28351, \$0.98)

A handful of wire nuts, various sizes

Optional - 14 GA Wire (\$5-25)

Total cost: \$60.60 (excluding optional wire spool)

Time to completion: About two evenings.



Instructions

1. Use a pencil (or other tool) to trace the cut-out areas on your project box. A single rounded-rectangle for the duplex outlet is easiest, and is cheap to cover up (i.e., with a \$0.35 1plate).
2. Cut out said areas. **This is the longest and hardest part of the entire project.** I used a jigsaw to cut the larger holes (using a pilot hole initiated with a power drill), a dremel to slightly widen the large holes to ensure a tight fit, and a power drill to cut the circular holes. I recommend starting with a small drill bit (e.g., 1/8" or smaller), and slowly working up to the desired diameters; a large bit will take forever to cleanly cut through. Note:
 1. A 5/8" bit works well for the lamp assemblies. The package cites a 9/32" mounting hole.
 2. A 1/8" bit works well for the mounting holes associated with the duplex outlet (those that would be used to secure the outlet to an electrical box). Do *not* drill these mounting holes until *after* the outlet hole has been cut and the outlet placement is known.
3. Push the lamps into place, and secure with the provided nuts. I kept the provided lock washer on the outside, for visual appeal.
4. Insert the cable clamp and secure with the provided nut.
5. Unless you have an alternate wire source (do not use less than 14GA wire), cut off a generous portion (up to 30") of the tool replacement cord to be used as wiring inside the box. Strip an additional 6-8" of the casing on the tool replacement cord, to allow better bending of the wires inside the box. Insert the cord until the casing is just inside the clamp, and secure with the cable clamp screws.
6. For the outlet, bend and remove the tabs connecting the two screws (i.e., connecting the two outlets) on each side. This will allow us to control the outlets separately. You may want to mark the plate to remember which will be "Heat" and which will be "Cool."
7. Wire the box according to the provided diagram (from Bootknockerbrewing.com) Note:
 1. Be sure to cut lengths of wire long enough to allow you to comfortably connect the components, but not too long so as to add unnecessary bulk to the inside of the box. It will **greatly** help if the wire is long enough to allow you to hook-up the controller while the controller is loose, outside the box.
 2. I needed to use additional wire to lengthen each lead on each lamp; you may need additional wire, depending on your placement of the lamps and/or the duplex outlet. I used scrap wire from an old PC power supply.

8. Secure the temperature controller with the provided orange tabs. I did not re-attach its terminal cover.
9. Secure the duplex outlet at its mounting holes with the #6-32x1" screws and nuts. If you drilled 1/8" holes, you will need to use a screwdriver to twist in the screws, but it will ensure a good fit. I used one screw & nut on each side, at opposite corners.
10. Close the project box and mount the 1-gang box cover. I needed a longer screw to mount the box cover.
11. Power on your unit, and confirm it operates as designed. Program your unit for desired operation, according to the instructions included with its packaging. You may want to create a quick reference table to convert °C to °F.

Images



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