

Heated Rods Experiment

Revision 6.06

A. Startup

The following steps should be taken for startup of the Heated Rods Experiment.

NOTE that the rods take several hours to heat. Therefore, do the startup procedure in the morning before class. This experiment can be left unattended.

- 1) Open the steam valve. (Condensate will leak out for a few minutes. This is normal. Use a bucket to catch the drips.)
- 2) Using the regulator, make sure the steam pressure doesn't exceed 50 psi in the steam chamber located at the north end of the rods.
- 3) Use the transformer at 25 maximum to heat the free rod.

B. Data Acquisition

These steps can be used to acquire the temperatures at several locations along each rod. Make all readings the same day because the conditions in the lab change daily.

I. Electricly Heated Rod (Constant Flux)

- 1) Use a hand held thermocouple to read the temperatures along the length of the free rod.
- 2) Use the multimeter (AC volts) to measure the voltage supplied by the transformer to the free rod.
- 3) With the free rod unplugged from the transformer momentarily, use the multimeter (Ohms) to measure the resistance of the free rod heater.

II. Steam Heated Rods (Constant Temperature)

- 1) Use handheld thermocouple reader to measure rod temperatures.
- 2) Turn the dial on the panel to read the 10 positions along each bar. The number 1 corresponds to the thermocouple positioned closest to the steam chamber.

Note: Type T thermocouples are used along the bars.

C. Shutdown

- 1) Turn off the steam valve. (BE CAREFUL! The steam valve will be HOT!)
- 2) Turn off the transformer and multimeter.