

Model 115A Temperature Chamber Improvements effective Jan. 2014

Improved control architecture for reduced energy consumption and more responsive temperature control

The original Model 115 and 115A has "bucking" control architecture. Control at set point involves cycling the heater on while simultaneous energizing a refrigeration solenoid to reduce (but not stop) the cooling. Like controlling your car speed by hitting the brakes with one foot but not completely lifting your other foot from the accelerator. This is identical to the control scheme on Tenney JR and Thermotron S-1.2 chambers. Although simple and cost-effective to manufacture, it has several drawbacks.

The improved Model 115A has full Bidirectional Heat/Cool Control. This means the heating and cooling throttle is independently modulated full on or off. This provides several benefits as described below.

Improved Energy Efficiency

The original Model 115 and 115A consumed 1,010 Watts when maintaining a 0°C set point. The improved Model 115A consumes only 770 Watts when maintaining a 0°C set point. That's a 23.8% reduction in energy consumption!

More Responsive Temperature Control

This chart below shows the control dynamics when cooling down to a 0°C set point. The 115A with bucking control undershoots to -0.7°C and takes 18 minutes to stabilize to within 0.3°C after crossing 0°C. The improved Model 115A with bidirectional control stabilizes to within 0.3°C of set point within 2.3 minutes. The resolution on this chart is expanded - minor perturbations represent 0.1°C.

