

# Kiln Corner

## Common Questions on Digital Controllers

by Arnold Howard

Photography Courtesy of Paragon Industries, LP.

*Though Arnold Howard works for Paragon Industries, L.P., the information here applies to all brands of glass kilns. Feel free to send questions for this column no matter what brand of kiln you own.*

**When my kiln is at idle, the temperature in the digital display is 80.6°F–82.4°F (27°C–28°C), but room temperature is 68°F–69.8°F (20°–21°C). Why is the controller inaccurate?**

A controller may be more accurate at firing temperatures than at room temperature. You may have entered a thermocouple offset in your controller. A thermocouple offset adjusts the thermocouple readout to more closely match the temperature inside the kiln. The offset can throw off the room temperature reading by a few degrees.

**My temperature display shows the temperature rising with a stair step pattern. Is that normal?**

In theory, the heating of a digital controller is linear. A rate of 300°F per hour will raise the temperature 5°F per minute. But instead of showing a perfectly linear rise in temperature, the display window will show the “stair step” that you describe. It has no effect on firing results, however.

The stair step pattern is due to relays cycling the heating elements on and off to control the heating rate. The stair step effect is most noticeable at low temperatures.

**Every time I turn on my Sentry Xpress [Orton 3-key controller] prior to programming, I get an E-1 in the display. This “error” message is not in the user manual. Can I assume it’s just a start up code and not really an error.**

You are right. E-1 is the software version of your Sentry Xpress 4.0 controller, not an error code. The new Sentry Xpress 5.0 does not show the software version during start up. We eliminated it because the code confused people.

**I found a glass firing schedule that says to “cool at a natural rate” from 1600°F to 1020°F. What does that mean?**

Cooling at a natural rate means you should turn off the kiln heating elements from 1600°F to 1020°F by using a Full cooling rate. Full, during cooling, means the controller will try to cool as quickly as possible. It does that by leaving the elements turned off.

**Do solid-state relays improve temperature holds?**

Solid-state relays give more even temperature holds than mechanical relays on small digital kilns, but not on large kilns. The smaller the kiln, the greater the improvement in temperature holds. A large kiln can’t fluctuate rapidly in temperature, since the thermal mass of a large firing chamber is stable. Like a large ocean liner that can’t turn quickly, a large kiln can’t change temperature quickly either.



*In this photo, three controllers show temperatures of 452°F, 469°F, and 456°F. The three thermocouples in the test kiln each give a slightly different reading because of the differences in positioning in the kiln and the thickness of the thermocouple tips.*



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