

# The Kiln Corner

## Simple Thermocouple Repairs

by Arnold Howard

The temperature sensor in a digital kiln is called the thermocouple. The tip of the thermocouple generates a faint electric signal when heated, and the controller, in turn, interprets that signal as a temperature.

When the temperature in your controller becomes inaccurate or the temperature fluctuates during a hold, don't assume that you have to replace the thermocouple or the controller. The problem is often easy to correct without replacing expensive parts. Let's cover some of the things you can check.

*First, unplug your kiln or disconnect it from the power and find the thermocouple.*

1



The thermocouple is the small rod that extends into the firing chamber. On the other side of the kiln wall you will find a control panel or switch box. Remove that panel.

2

*Locate the place where the thermocouple is attached to the connection block.*



The thermocouple is attached to a connection block and the yellow and red wires go from the connection block to the controller. On most kilns the block is oval shaped.

3

*Pull the thermocouple out of the kiln.*



Label the four wires on the connection block so you can reinstall them correctly later. Two screws attach the thermocouple connection block to the kiln. Remove those two screws as shown and gently slide the thermocouple out of the kiln for further examination.

4

*Check the position of the pins in the connection block and replace the block if necessary.*



Turn the connection block over and look at the side that goes toward the kiln wall. You will find two pins. If those pins extend past the ceramic block, they could touch the kiln case and short out the thermocouple. It would still work, but with reduced accuracy. If the pins extend past the oval block surface, replace the block.

5

Check to see if the thermocouple wires have any damage.



When I removed the thermocouple-to-relay wires on a kiln I was repairing, I found that the wire on the left had been broken due to excessive pressure from a screw. This type of damage can be seen by removing the wires.

Loosen the four screws in the connection block, then remove and examine the thermocouple wires. Often the thermocouple will still work even with a damaged wire, but with reduced accuracy.

If the connection block is old and tarnished, either replace the block or clean out the four brass holes where the wires go.

6



The thermocouple connection block shown here on the left is new. The one on the right is tarnished. Replace the connection block if it's tarnished or clean out the holes where the wires go. Clean and reinstall the wires on the connection block.

Before you slide the thermocouple back into the kiln, make sure the hole in the kiln wall hasn't become enlarged. If the thermocouple is wobbly in that hole, accuracy will be reduced, because cooler air from outside will enter the kiln and affect the thermocouple. If necessary, the thermocouple should be wrapped with a tiny amount of ceramic fiber to tighten the hole.

Reinstall the two screws that attach the connection block to the kiln. The thermocouple should extend into the firing chamber 3/4" to 1". Reinstall the control panel and check the kiln for accuracy.

**GPO**

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Since 1977 when Arnold Howard began working at Paragon Industries, he has seen kilns evolve from switches to touch screen displays. He helped test the early glass kilns and wrote Paragon instruction manuals, newsletters, and advertisements.

Arnold has taught kiln classes at trade shows, Bullseye Glass in Portland, and in Australia and England. In September 2019, he started Howard Kilns, a repair and preventive maintenance business, to serve the Dallas-San Antonio, Texas, area. Arnold works on all brands of kilns. Feel free to contact him at [arnoldhoward@gmail.com](mailto:arnoldhoward@gmail.com).



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