

## THERMOCOUPLE AND PILOT TEST

**MODELS:** 1000P, 1600P,  
260PN, 425PN



### WARNING

LP & NG ARE EXTREMELY FLAMMABLE SO  
TAKE EXTRA PRECAUTIONS WHEN  
PERFORMING ANY WORK TO THE HEATER

## Before replacing the thermocouple, please test the thermocouple safety circuit and the pilot as follows.

### A. Pilot does not stay lit when the button is released.

1. When lighting pilot, ensure the gas valve button is fully depressed and held down for at least 15 seconds after pilot is lit.
2. Pilot flame should be a sharp blue flame that fully engulfs the thermocouple tip. If pilot does not look this way, please see bulletin '[CT-22 Cleaning pilot assembly](#)' for instructions on how to clean pilot assembly and orifice.
3. If heater is equipped with an AQ4 power vent kit (models 1600P and 425PN only), press reset button on power vent spill switch to check if it is tripped. NOTE: running the heater without electrical power to power vent fan will trip the spill switch. Also check the AQ4 safety circuit connections for corrosion or loose connections. Consult AQ4 manual for part locations.
4. Check the electromagnet connections. The electromagnet is located on the back side of the gas valve. The electromagnet connection from the thermocouple is a 5 mm brass nut that screws into a 17 mm aluminum nut. Tighten both nuts snugly but do not over tighten.
5. Check if connections at both temperature limiters (ECO) are loose or corroded. Clean any corrosion with very fine sand paper or an eraser and reconnect leads.
6. If cleaning the terminals attached to the ECO's does not fix the problem, choose one ECO and remove two wires attached. Connect a jumper wire between the two wires removed from the ECO. Try to relight the pilot. If the pilot flame now remains on, the ECO may be defective. If the pilot still goes out, remove jumper, reconnect wires leads and perform the same step with the other ECO.



**Note:** Never attempt to operate heater for normal use with jumper wire connected!

7. Replace ECO.
8. Have a licensed gas technician verify the proper operation of the thermocouple. To test the thermocouple, disconnect wire from the thermocouple where it connects to the upper ECO (located top right side of the heat exchanger). Insert a multi-meter probe into the thermocouple lead and attach or hold the other probe to the metal chassis of the heater (DC common). Light the pilot flame and hold button while observing the meter reading. If the reading is 24mVDC or more the thermocouple is good.

### B. Pilot goes out during use

1. Light the pilot and allow it to warm the thermocouple tip for 2 minutes.
2. Perform drop test by blowing out the pilot flame and listen for the electromagnet to close. This closure will make a distinct clunk noise as it shuts. The time between blowing out the flame and the electromagnet closing should be between 20 and 30 seconds. Units equipped with an AQ4 power vent kit have drop times between 10 and 15 seconds.
3. Repeat drop test several times to confirm it is consistent.
4. If drop times are not within specifications, then follow steps 2-7 in section A. After each step, repeat drop test. Proceed to the next step until drop test is within specifications.

### C. Pilot goes out during use and drop test is within specifications.

1. Check the vent size and length. Vent should be 5 inches in diameter for the 1600P and 425PN and 4 inches in diameter for the 1000P and 260PN. The heater must have a rise of 1-foot before any elbows in the vent system, at least 6 feet vertical in length and terminate through the roof. Any reduction in vent size or the presence of an elbow directly on the top of the unit may cause the flue gas sensor to trip the pilot safety circuit. Please see the venting section in the manual for more detailed information regarding the required venting for this heater.
2. Inspect the draft hood and heat exchanger fins for signs of soot build-up or any other foreign material such as spider webs. Clean out any debris found in the vent hood. Signs of soot indicate insufficient combustion air or exhaust draft. Check for vent assembly blockage or combustion air blockage on the underside of the unit. Ensure combustion air requirements are being met as specified in the installation manual.
3. Measure the outgoing temperature of the hot water exiting the unit. Temperature in excess of 160F may trip the pilot safety circuit. The heater must not be supplied with water in excess of 90F. Preheated water may cause the heater to overheat the outlet water and shut down as a safety precaution.