

THERMOCOUPLE AND PILOT SAFETY TEST

MODELS: 80VP, 125VP, 170VP



WARNING

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

When a traditional tank type water heater has a pilot problem, the Service-person usually changes the thermocouple. Much of the time it corrects the problem.

With the AquaStar, however, the therm-ocouple is rarely the cause of pilot problems. Moreover, because the AquaStar's thermocouple is quite expensive, it is really unwise to change it unless you are quite certain that it has failed.

IMPORTANT NOTE: If you have not specifically ruled out overheating as the cause of your pilot outage (using appropriate testing) you are probably wasting your time and money changing the thermocouple or any other component in the pilot safety circuit.

TESTING THE THERMOCOUPLE CIRCUIT

The electromagnet drop out test checks the strength of the pilot safety circuit. When you shut off the gas to the heater the pilot goes out, thermocouple cools, voltage drops and eventually the electromagnet releases the safety valve. The length of time that it takes for the magnet to release the safety valve is indicative of the condition of the circuit and is referred to below in the "drop out time".

1. Light pilot and let it warm the thermocouple for at least one minute. Do not operate the heater during this time.
NOTE: If pilot always goes out as soon as you release the pushbutton assembly, follow steps 3 & 4 in the next section - then proceed with step 2 below.
2. Observing the second hand on a watch or clock, then blow out the pilot flame.
3. Count the number of seconds from when you blow out the pilot flame until you hear the sound of the electromagnet valve closing shut.
4. A good drop out time is usually 15 to 20 seconds; longer is better. Heaters equipped with power vents have drop out times of 10 to 15 seconds.
5. Repeat the test to confirm it is consistent.

PINPOINTING PROBLEM AREAS

NOTE: Once you have established a base time you can make adjustments to the system and compare results.

1. Check your pilot. If it looks small or misaligned follow the instructions for removing, cleaning and reinstalling the pilot head assembly: Bulletin Q20. Then, repeat the drop out test and observe if the time has improved.
2. Snug up the connector of the thermocouple to the electro-magnet. There are two hex fittings, one is 5/8 inch (16mm) and the other is 12mm. The larger one holds the electro-magnet in place while the smaller one secures the thermocouple to the electro-magnet. If the 16mm nut is not tight enough when you attempt to tighten the 12mm nut, the magnet will just spin around. You might twist the thermocouple tubing instead of tightening the connection; so always tighten up the electro-magnet retaining collar first. Then repeat the drop out test and observe if the time has improved.
3. Clean and snug up the connections of the overheat temperature shut-off to the thermocouple. The thermocouple circuit operates at a very low voltage (millivolts). Very good connections are critical to the thermocouple circuit. Even if the terminals look perfectly clean, there may be a thin layer of oxidation on them, decreasing voltage. Polishing terminals with a pencil eraser improves drop out times. Then repeat the drop out test and observe if the time has improved.
4. **If the drop out times are still poor, or if you have been unable to get the pilot to hold at all, bypass the overheat temperature shutoff sensor by screwing together the two thermocouple leads. Then repeat the drop out test and observe if the time has improved. If there is still a problem, either your thermocouple or your electromagnet is bad.**