

Pilot Lights

A question was asked of me about pilot lights, specifically for hot water heaters but I will go over all types. When I was very young we had a stove and oven that had no pilot lights at all and there was always a box of wooden matches on the shelf above the stove to light the burners and the oven. Later we had a stove that had a pilot light for the top burners, but you still had to light the oven with a match. Nowadays you will usually only find a flame type pilot light on your hot water heater because there is no electricity going to it. Most other appliances use an electronic or electrical type ignition. So, the question was, “If the pilot light goes out on the hot water heater, will gas continue to flow and fill the room with gas?” The quick answer is no. The pilot flame is placed right under something called a thermocouple. It is the electrical device that senses if the pilot flame is hot enough to ignite natural gas going to the burner.



Typical Thermocouple

If the thermocouple thinks it's safe, then it keeps the main gas valve located in the pilot assembly open. If the thermocouple does not sense enough heat from the pilot flame (such as when the pilot is blown out), then the thermocouple shuts off the gas valve to the burner and pilot light. So what is this thing and how does it work? Well the thermocouple (technically called a thermocouple junction) is a device that contains two dissimilar metal wires welded at the ends and placed inside a protective metal case. The thermocouple sensor is found at the business end of the pilot flame and is designed to be placed in the hottest part of the flame. The other end is connected to the pilot valve body. As the thermocouple heats up, it produces a small amount of electricity at the welded junction and when it gets hot enough from the pilot, sends a signal to open the gas valve. The thermocouple calls the shots, and by converting heat to an electrical signal, it allows the gas valve to open or close.

Once the gas valve is open, gas is then constantly supplied to the pilot and as required for the gas burner (as called for by the thermostat). If the pilot goes out, then the thermocouple gets cold and produces no electric signal to open the gas valve and the gas valve shuts off the gas supply to the pilot and burner. That is the safety to prevent a gas build up.

Our hot air furnaces and ovens have something different. It is what's called a 'Hot Surface



Ignition'. The hot surface ignition system uses an electronically controlled resistance heating element similar to a light bulb filament (but much heavier) to ignite the gas burner or oven. It is made from a special material that has a high

electrical resistance so when electricity is put to it, it gets very hot and glows enough to ignite the gas. For this reason it is also called a glow bar. The furnace and oven cannot be lit with a match.



Some of the glow bars are flat and some are wound spirally. They can and do go bad and should be replaced by a reputable service company if it happens. The top burners on our gas ranges use a different ignition system. It is called a spark ignition and works

similar to a spark plug. That is the clicking sound you hear when you first turn it on. The top burners can be lit with a match or hand held spark igniter if there is a power failure. This could come in handy if the power fails and you have a coffee percolator (remember them?), or you want to heat up some soup.



Most of my past articles can be found on the Fairways web site, click on the links tab.

Bob Mattsson

