

## **Hot Surface Ignitor and flame sensor**

**Hot Surface Ignitor;** Due to efficiency and design changes most furnace manufacturers have done away with pilot lights, both standing and intermittent spark, and now use ignitors or “glow coils”. Gas cloth dryers have used these ignitors for many years, and quite honestly with much better success, unfortunately, bad ignitors are a common problem with many furnaces. All an ignitor is is an electric resistant element, much like a cooking element on an electric stove top. When energized they become glowing red hot to ignite the gas from the burners. These ignitors are fragile and any break in them will break the circuit to the resistant heater and it will fail. When changing an ignitor it is important to take care not to touch the element because the oil from your skin can cause the element to deteriorate. It is also important to change the ignitor with the exact replacement from the furnace manufacturer so that it ignites the gas quickly and does not impinge the flame. There are some universal ignitors but these should only be installed by qualified technicians to insure safe ignition and operation.

**Flame Sensor;** To insure that the gas has ignited on a hot surface ignition system the furnace utilizes a “flame sensor” to “sense” the flame. If the primary or ignition board does not sense that a flame has been established in just a few second the board will de-energize the gas valve to stop the flow of gas to the burners. If a flame is not established most boards will retry a set number of times before going into “lock out”. The flame sensor is just a small metal rod with ceramic about half way down it, and is usually located at the opposite end of the burners from the hot surface igniter, this is done to insure that all burners have lit. Although the flame sensor has the same purpose as a thermocouple on standing pilot furnaces they work completely different. A flame sensor does not rely on heat from the flame; instead it uses flame recto faction to achieve its purpose. Current can pass through a flame, when the ignition module energizes the gas valve it also sends a small electrical current signal to the flame sensor. When the burners ignite, and the flame touches the sensor, current passes through the flame and grounds to the burner completing the circuit, the control senses that the circuit has been completed and allows the gas valve to continue to be open and allow gas to flow to the burners. Often these sensors collect debris and ash from the burning process and this debris acts as an insulator, not allowing current to flow and causing the module to lock out the system. Usually when a dirty sensor is the problem a furnace will run through its ignition sequence, ignite for 4 to 6 seconds, and then drop the flame out and start over. A sensor is usually held in by one screw with a 1/4 or 5/6 hex head on it, and these sensors can be cleaned with steel wool or a very fine emery cloth. Using too rough of a sand paper will put grooves in the metal sensor and these groove will collect debris and ash much faster. Also remember to clean the burner surface that the circuit is completing to.