

**FLAME RECTIFICATION**  
**Or**  
**FLAME SENSING**

# Flame Conduction

When gas is burned, it releases billions of electrons from the molecules in the fuel. This is called *Flame Ionization* and it lets the flame act as a path for electric current. The flame has high resistance and act as a load when a furnace provides voltage and a ground to complete the circuit. Conduction can be used to close a circuit for proof of flame.

# What Is Flame Rectification?

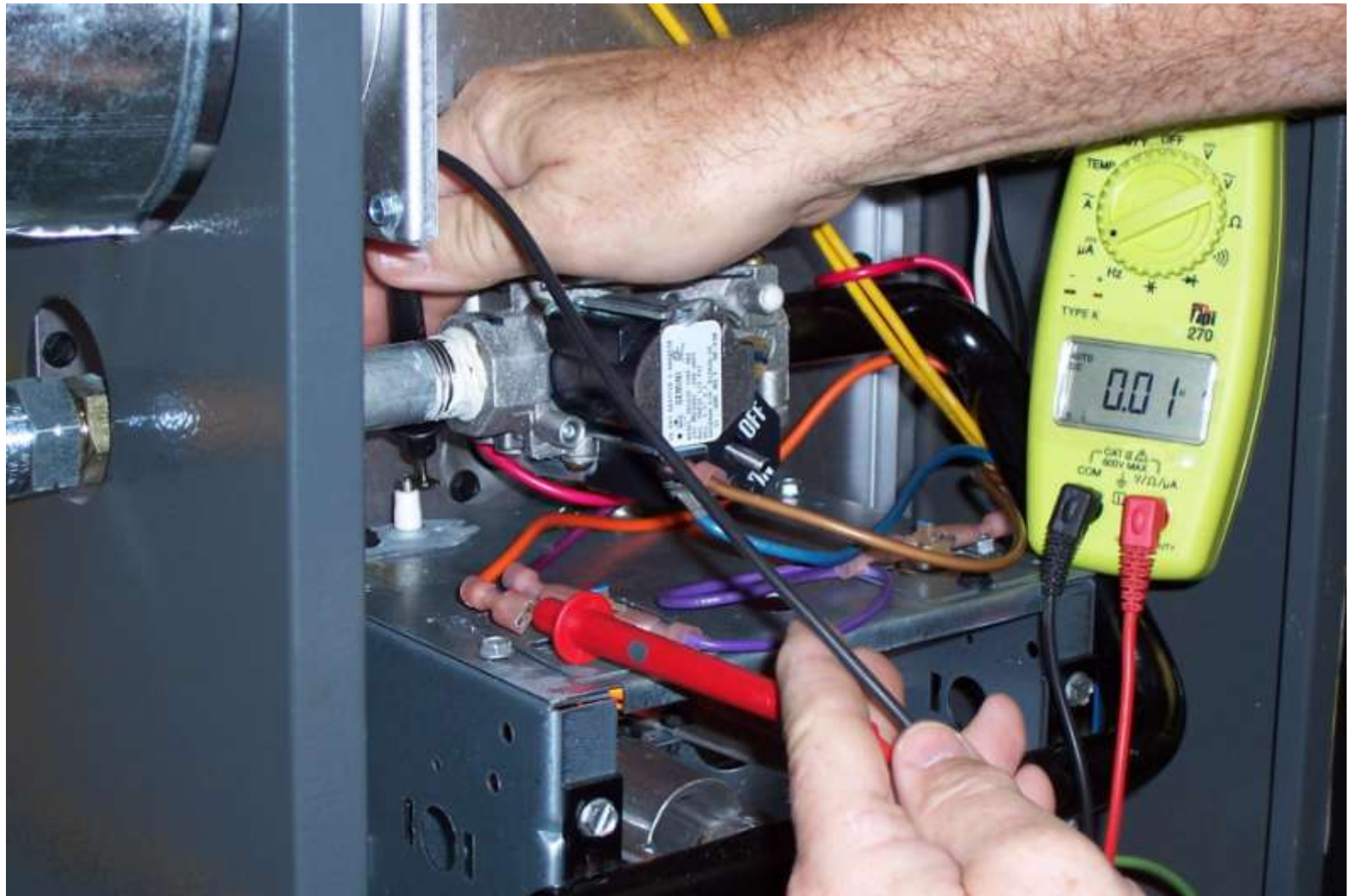
The flame sensor is mounted on the burner box and is enveloped in flame. Current flows from the sensor through the burner head to ground. Because the sensor is smaller than the burner head, current flows in one direction. The resulting pulsating dc current is considered rectified. The presence of pulsating dc current tells the integrated control board to continue the heating sequence.

# Testing For Flame Sensing

- **Does the unit have a good ground**
- **Check for voltage from the flame sensing wire to ground**
- **Cycle furnace**
- **Set meter for micro amps...Put meter in series with the flame sensing wire and the flame probe**
- **Should measure at least 1  $\mu$ A Want 1-4**

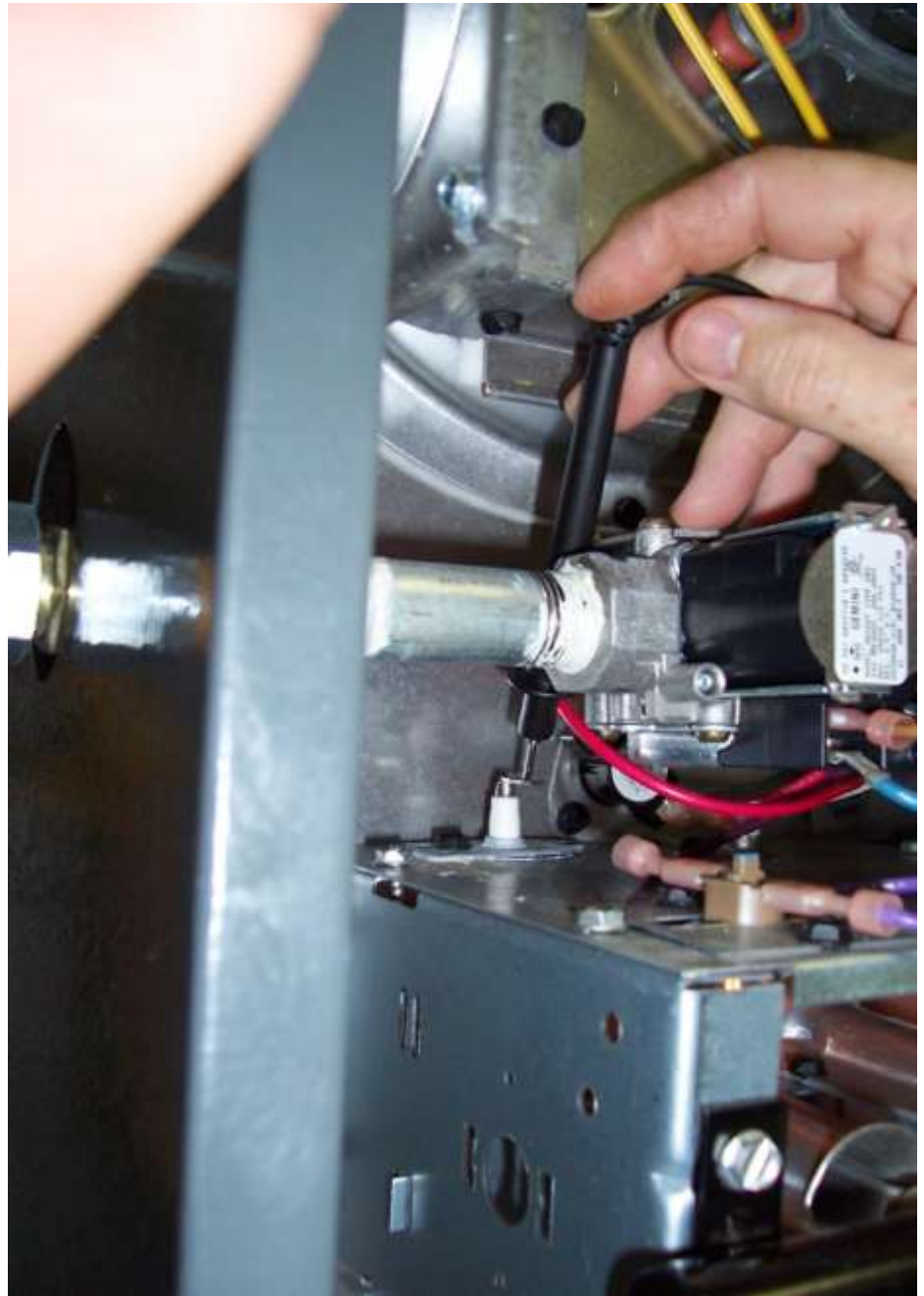


**Test to see if there is have voltage going to the flame sensor.**



**Insert one probe into the female end of the terminal**

**Place a probe on flame sensor and then allow the furnace to cycle.**





**See how many micro amps the meter is reading.**



**In this example the meter is reading 1.7 micro amps. You need to have >1.0 micro amps for the furnace to continue its cycle. Less than 1.0 micro amp and the furnace will shut down and try to recycle. It will try to recycle 3 times and then go into a 1 hour soft lock out.**



# Troubleshoot Flame Sensor

- **The flame sensor in any furnace proves combustion.**
- **If proof of flame is not present, the ICM will de-energize the gas valve and “retry” for ignition or lockout.**

## **To troubleshoot flame sensor:**

- Disconnect the flame sensor wire from sensor.
- Connect a micro-amp meter in series with this wire and the sensor terminal.

