

Direct Ignition Operation

On a call for heat by the thermostat, the ignition control module performs a safe start check that tests the internal components of the control for flame simulating condition. If it finds a flame, ignition won't start. If not, the control begins safety lockout timing, powers the igniter, and opens the gas valve so gas can flow to the burner. The igniter sparks and the gas valve opens at the same time. Once ignition starts the burner must light and the flame must be proved within the safety lockout timing. Otherwise, the igniter stops, the gas valve closes, and the system must be reset. Some control models allow several tries for ignition before safety lockout occurs.

Some control modules have a pre-purge cycle that occurs before ignition starts. During pre-purge, a blower may run to clear out the combustion chamber of any unburned gas.

Flame Rectification

Flame is proven by the method of flame rectification that senses current flow from the sensor through the flame to the burner head to ground. Current flows mainly in one direction and becomes pulsating direct, or rectified, current. This current tells the control that flame has been established and stops the ignition spark and the burner runs.

As long as the flame current is above the minimum, the control keeps the gas valve open. If the flame drops below the minimum, or becomes unsteady, the gas valve will close, stopping the gas flow to the burner. The control performs another safe start check and restarts the ignition sequence.

