DIRECT SPARK IGNITION (DSI) OPERATING SYSTEM

WIRING DIAGRAM



DSI CONTROL

THEORY OF OPERATION

OVERVIEW

The GDS/DSI control interfaces with an Electronic Range Control (ERC), a Gas Distribution System (GDS) regulator / valve, and spark electrodes to provide a complete direct spark ignition and gas distribution system for gas range applications. The GDS/DSI consists of four top burner spark outputs, and two oven burner spark outputs with flame sensing and valve enable safety supervision.

When the ERC Start button is pressed, the bake or broil relay is closed. This initiates the micro-controlled logic on the spark module to direct gas to the bake or broil burner, as appropriate. It ignites and monitors the flame presence. It supervises gas distribution to the oven burner, as well as the ignition / flame sense safety circuits.

When the top burner switches close, the micro-controlled logic initiates and provides operator-attended spark ignition for the top burners.

TOP BURNER IGNITION

Once the module has detected voltage from the ignitor switch, input J1-9, it generates 3-sparks-per-second at the top burner ignitors.

If both the top and oven burners are calling for heat at the same time, alternating sparks will occur between the top and oven burners.



OVEN BURNER IGNITION

When the broil (BR) and bake (BA) switches are closed, L1 is applied to the broil input (J1-7), and to the bake input (J1-6). The broil and bake inputs are detected by the control board, which operates the gas valve and spark ignition sequence.

When the range is first plugged in, the oven will not operate for 30 seconds to allow any potential gas buildup to be dissipated. This delay is called a "safety purge." There will also be a safety purge any time the "call for heat" is either cancelled, or times out without sensing a flame.

When the ERC calls for heat on either the bake or broil burner, the microcomputer electronically checks both solenoids for continuity to ensure that they are properly connected. If the checks fail, the module will turn the oven off, or lock it out. If the checks are successful, the module will open the appropriate valve, and initiate sparking at the burner ignitor. Both the bake and broil ignitors spark simultaneously.

If no gas is present at the burner, the microcomputer will allow the ignitor to spark for 4 seconds. A 30 second purge will then occur, after which time, the microcomputer will attempt to light the burner for another 4 seconds. If gas still fails to ignite, the microcomputer will perform another 30 second purge, and then lock out the system.

Once gas has ignited, the flame sensing circuitry will monitor the flame at the burner to make sure that it is present. If no flame is detected, the microcomputer will perform a 30 second purge, and then lock out the system.

All lockouts can be reset by pressing the Off / Cancel keypad on the ERC, and then restarting the oven operation.

FLAME WITH GAS VALVE OFF

If there is evidence of a flame for more than 10 seconds with the gas valve off, the microcomputer will lock out the system.

LOCKOUT

The microcomputer will perform a lockout if any of the self-checks fail during normal operation. The microcomputer will also lock out the system if it fails to ignite the gas after the selected number of ignition attempts. During any system lockout, the valve and ignition are turned off. The bake or broil control must be manually reset by turning it off and on.

TESTING THE DSI CONTROL

INPUTS & OUTPUTS (J1 CONNECTOR)

With power applied to the unit, use a voltmeter, and touch the test probes to the following J1 connector pins :

- 1. Pins 1 and 2 = 10 to 18 volts DC.
- 2. Pins 2 and 3 = 10 to 18 volts DC.
- 3. Pins 4 and 6 = 120 volts AC.
- 4. Pins 4 and 7 = 120 volts AC.
- 5. Pins 4 and 10 = 120 volts AC.
- 6. Pins 4 and 9 = 0 volts AC with the top burners on.

NOTES:

- A. If you lose a ground connection, the unit will light <u>one time</u>. Forty seconds later, the unit will go into the lockout mode.
- B. When the unit is plugged in, there will be a 30- to 40-second delay before the oven system is operational. (The timer will count down, but the ignition system will not operate.)

