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Burner Management System DEMO

Operating instructions

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Burner Management System DEMO – Operating Instructions

Startup Summary - Normal startup is accomplished in four basic steps:

1. Leak Test
    a. Safety Valve Leak Test
    b. Gas Valve Leak Test
2. Purge
3. Pilot Ignition
4. Main Flame Ignition

Sequence of Operation

5. Leak Test is performed
    a. Test 1 - Vent valve is closed and the pressure transmitter is checked for a rise in pressure. The pressure must be less than 10 PSI for the entire test. A pressure rise indicates a leaking safety valve
    b. Test 2 – After Test 1 is successful the safety valve opens and allows the area after the safety valve and before the gas valves to fill with gas. Then the safety valve is closed and the pressure transmitter is checked for a pressure drop. The pressure must be greater than 30 psi for the entire duration of test 2. A pressure drop indicates a leaking gas valve or vent valve.

6. Purge is performed – Purge fan is turned on and modulating valve is set to the full open position. The purge is then executed for the required purge time.
7. Post purge window opened – After successful purge, the post purge window is opened. Given normal startup, the post purge window is the final required permissive to start the burner operation
8. Automated Burner Startup
    a. Burner receives startup signal when all interlocks and permissives are satisfied.
    b. Burner starts transformer and opens pilot gas valve
    c. Pilot flame check is performed after time for ignition is expired.
    d. When pilot flame is present, main gas valve is opened.
    e. Main flame check is performed after time for main flam is expired.
9. Burner operates until fault is detected or until burner off command is given

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Error Handling

1. If an error occurs during any process the process is automatically aborted.
2. Burner will not start while errors are present.
3. Errors are cleared with a global acknowledgement from the alarm screen.

BMS DEMO Panel Hardware Errors

1. All the analog switches are labeled with a range. If range is undershot system will execute an abort until sensors are back in range and error is cleared from alarm screen.
2. Digital switches should be left in the normal position. Changing the position of the digital switches will demonstrate the safety PLCs hardware error handling.

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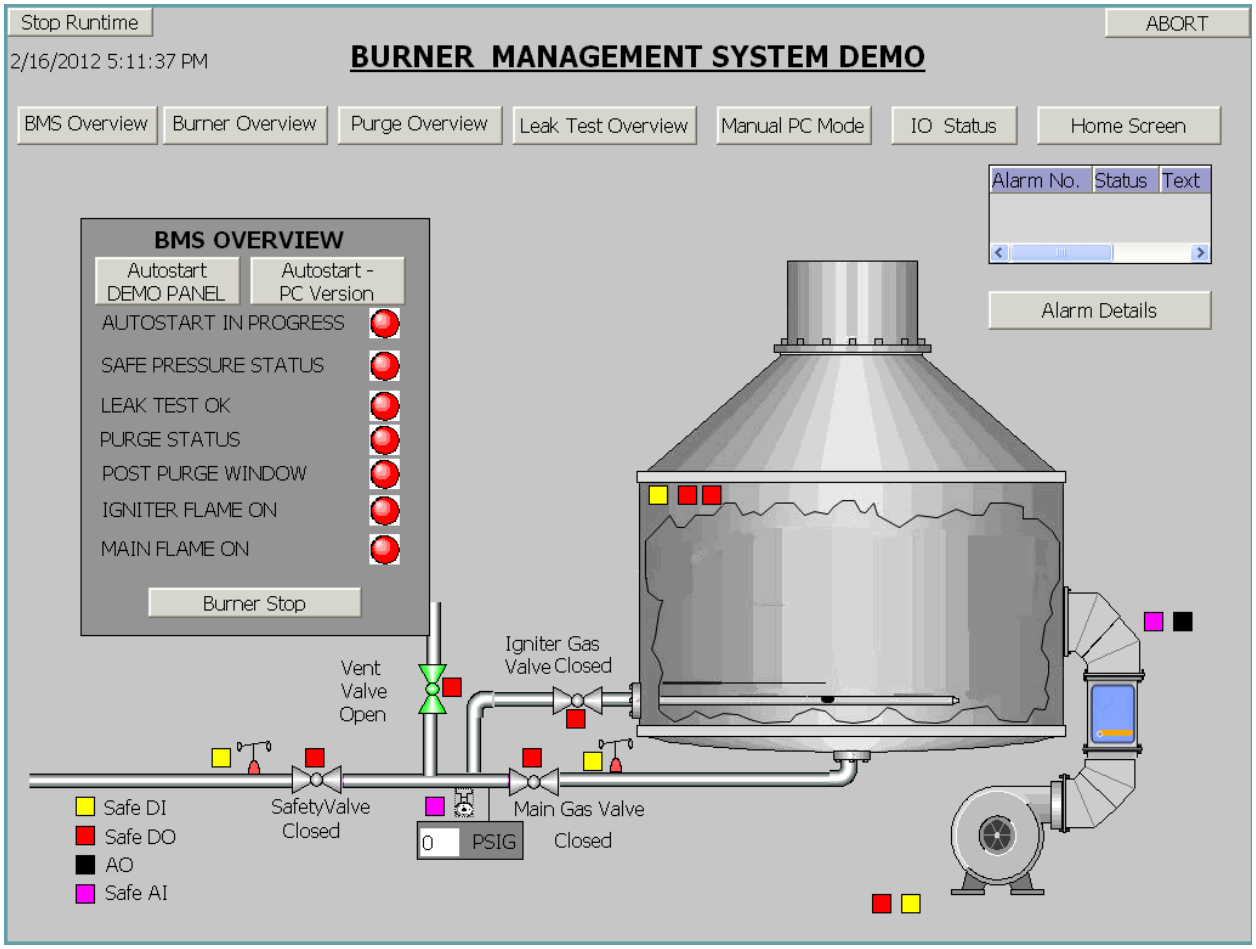
BMS OVERVIEW HELP



Autostart PC Version – This button performs an automated start sequence with simulated inputs. The required inputs are simulated and set to the proper set points at the proper point in the operation.

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Autostart DEMO PANEL – This button performs an automated start sequence and requires the user to set the inputs during the startup sequence as follows:

1. Preset
    a. PT200 LPS GAS TRAIN – Set knob greater than 70
    b. PT300 HPS GAS TRAIN – Set knob between 20 and 90
    c. PT AIR D POS SENS – Set knob between 30 and 90.
    d. PT-201B LEAK TEST PT – Set knob so that pressure sensor on screen reads less than 10.
2. Press Autostart – DEMO PANEL
3. LEAK TEST STARTS
    a. Watch the screen till gas valve turns green. When gas valve is green, adjust PT-201B so that pressure sensor on screen reads greater than 30.
4. LEAK TEST FINISHES – LEAK TEST OK light turns green
5. PURGE STARTS
    a. Fan turns on and air damper moves to full open position
    b. Purge lasts 5 seconds
6. PURGE FINISHES – POST PURGE WINDOW light turns green
7. Burner Ignition Process Begins
    a. Igniter transformer starts and pilot valve opens
    b. Set PT-201A to greater than 90
    c. After ten seconds pilot flame lights
    d. Set TT-500 to greater than 90
    e. After ten seconds main flame lights
    f. Set PT-201A to less than 90.
8. Press Burner Stop to extinguish flame
    a. Set TT-500 to less than 90

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DEMO Panel Inputs

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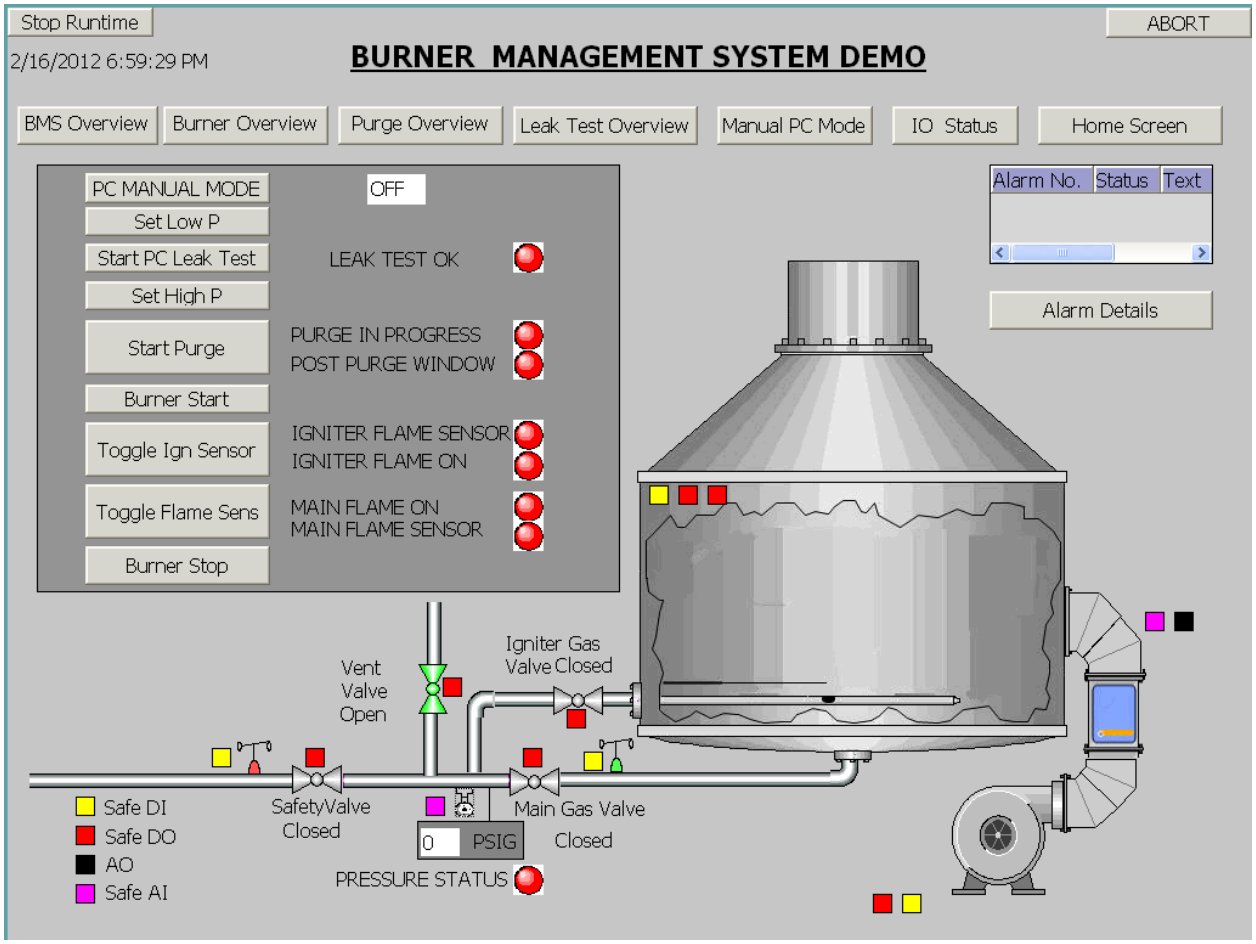
MANUAL MODE PC HELP



Manual Mode PC Version allows for a step by step startup of the burner without the requirement to manipulate the actual inputs on the demo panel. The startup sequence is performed as follows:

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1. Set PC MANUAL MODE to ON
2. Presets
    a. Toggle HPS and LPS to safe state, indicated by green switches and a green SAFE PRESSURE STATUS light. If not toggled correctly a box will appear around the switches and ask for toggling.
    b. Toggle air damper to start position. If not toggled properly a box will appear around the air damper and ask for toggling.
3. Press "Set Low P" Button – Pressure displayed in on screen transducer should be less than 10.
4. Press " Start PC Leak Test" – Leak test 1 starts
5. When the safety valve opens press "Set High P"
6. When the safety valve closes leak test 2 starts. After 10 more seconds, leak test is complete and LEAK TEST OK light turns green.
7. Press "Start Purge" – Purge fan powers on and air damper moves to full open.
8. After purge finishes, air damper moves back to starting position and post purge window opens.
9. While post purge window is open, press "Burner Start"
10. Ignition transformer starts firing
11. Press "Toggle IGN Sens"
12. After time for ignition expires, pilot flame lights.
13. Press "Toggle Flame Sens"
14. After time for main flame expires, main flame lights.
15. Press "Toggle IGN Sens" to reset to low position.

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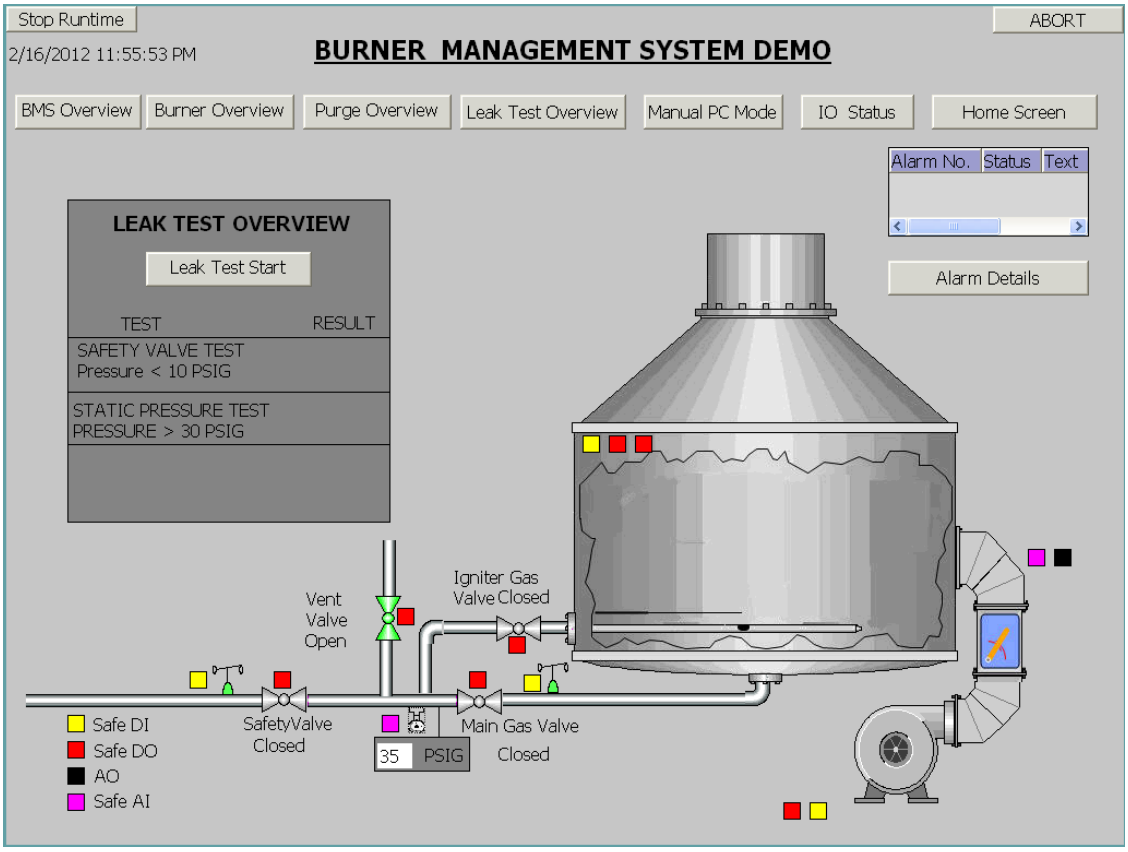
Leak Test Overview Help



The Leak Test Overview Screen allows the leak test to be performed on demand, using the demo panel inputs. Leak test is performed as follows:

1. Preset PT-201B LEAK TEST PT – Set knob so that pressure sensor on screen reads less than 10.

2. Press "Leak Test Start" - Vent valve is closed and the pressure transmitter is checked for a rise in pressure. The pressure must be less than 10 PSI for the entire test. A pressure rise indicates a leaking safety valve

3. Test 2 – Watch the screen till gas valve turns green. When gas valve is green, adjust PT-201B so that pressure sensor on screen reads greater than 30. Then the safety valve is closed and the pressure transmitter is checked for a pressure drop. The pressure must be greater than 30 psi for the entire duration of test 2. A pressure drop indicates a leaking gas valve or vent valve.

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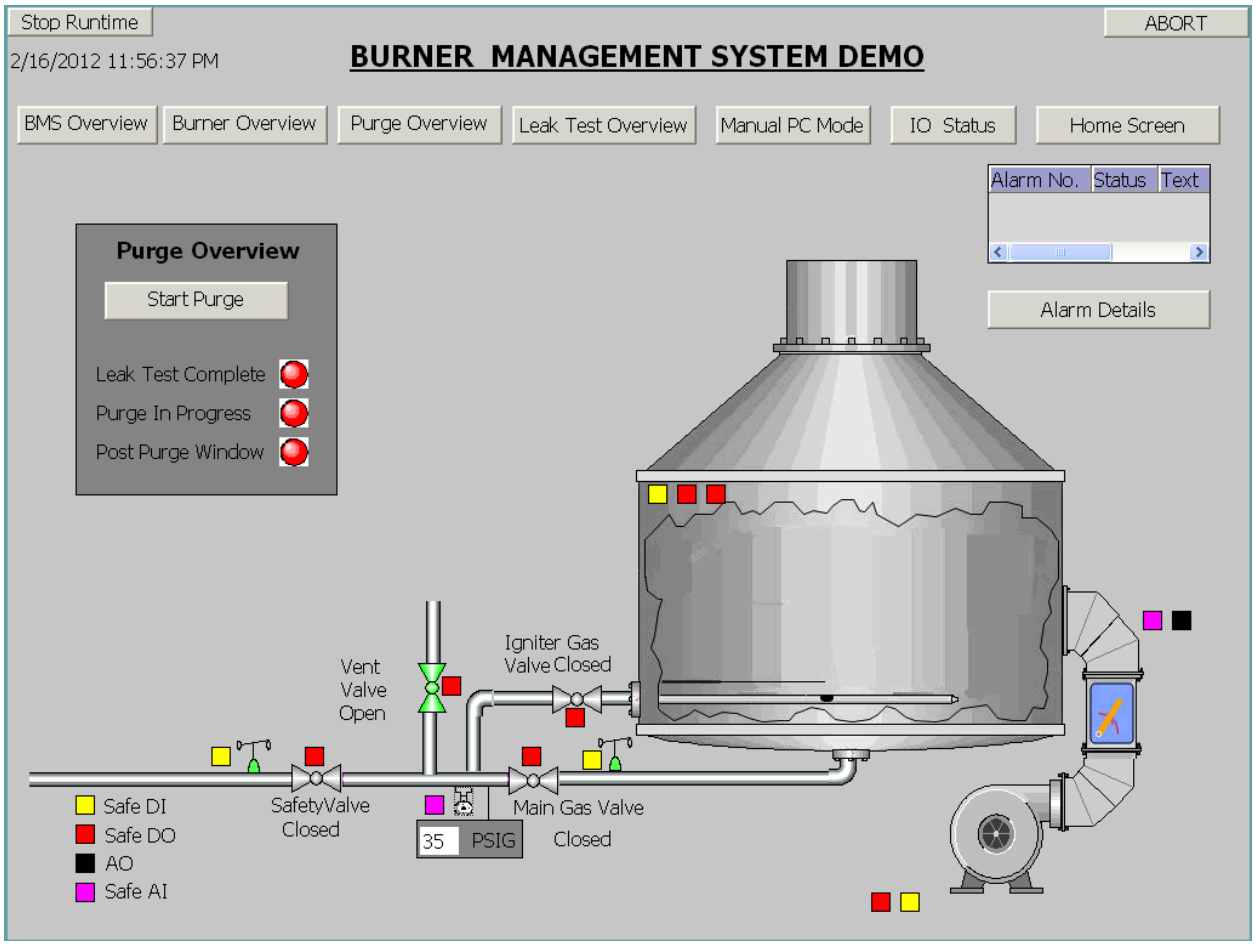
PURGE OVERVIEW HELP



Purge Overview Screen allows the purge to be executed on demand. Purge can only performed when the leak test has been successfully completed.

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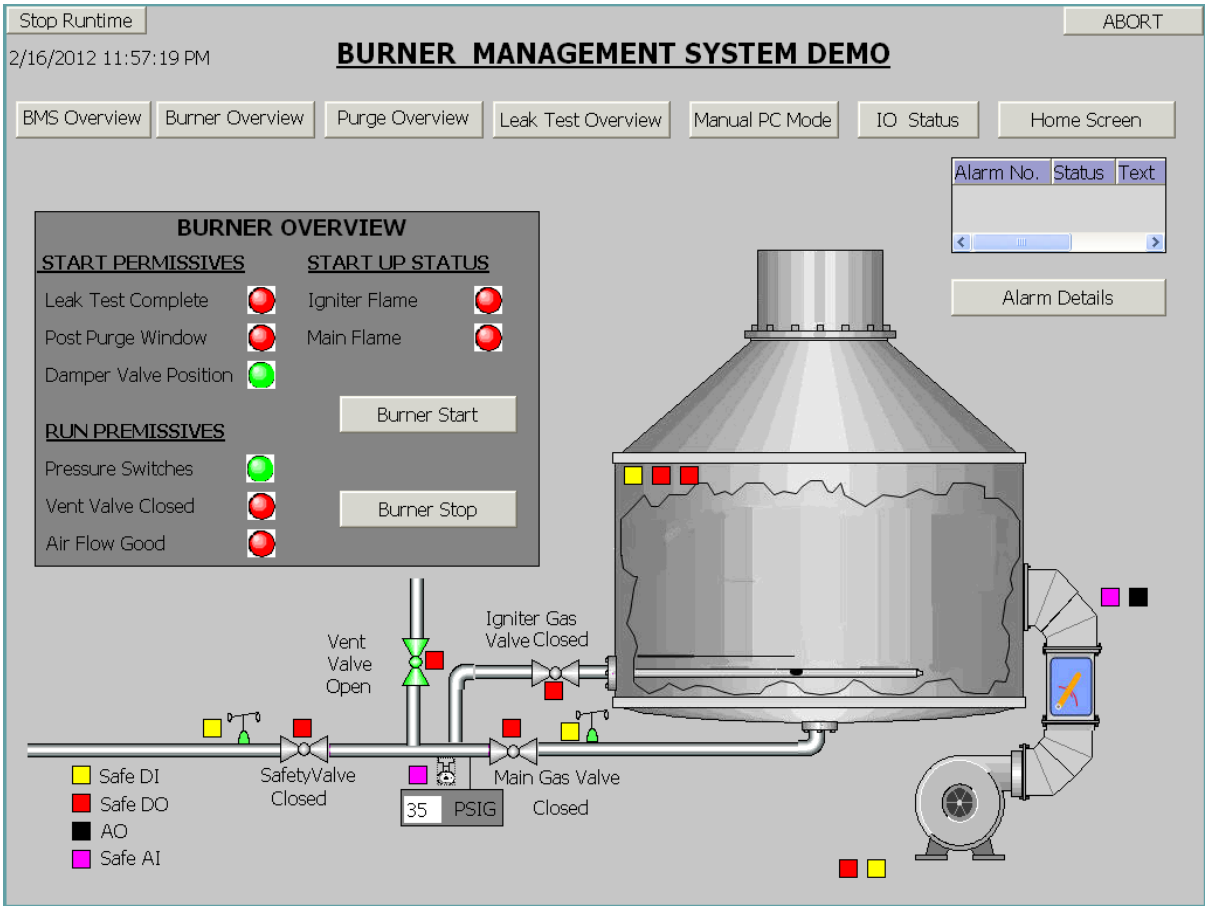
Burner Overview Help



The Burner Overview Screen allows the burner to be started on demand using the demo panel.

To start the burner the leak test must be complete, the post purge window must be opened, the damper valve must be in start position and the pressure switches must be in a safe state. Burner startup is as follows:

1. Press "Burner Start" - Burner Ignition Process Begins
2. Igniter transformer starts and pilot valve opens
3. Set PT-201A to greater than 90
4. After ten seconds pilot flame lights
5. Set TT-500 to greater than 90
6. After ten seconds main flame lights
7. Set PT-201A to less than 90.
8. Press Burner Stop to extinguish flame
9. Set TT-500 to less than 90