



PowerVent Spark Ignition Component Diagnostic Checks

How to check gas pressure - VR8204

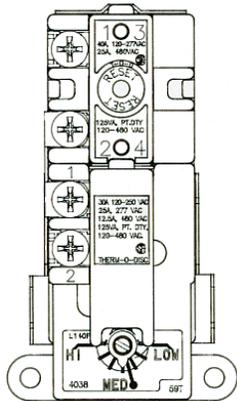
This procedure assumes a supply gas pressure of 14" water column.



1. Turn gas cock knob to OFF.
2. Remove gas pressure check plug using a 3/16" hex key wrench.
3. Connect manometer to 'Press Tap'.
4. Turn gas cock knob to ON. Allow main burner to light.
5. Gauge should read 4" for natural gas or 10" for L.P. gas. If OK, turn gas cock knob OFF, remove gauge and replace 'Press Tap' plug.

How to check electric thermostat and energy cut off switch

Check thermostat calibration by conducting a partial draw test at the closest hot water faucet. Let the hot water run for a few seconds to bleed off the cold water in the pipes. Water temperature should be within 20° F of the thermostat setting. If not, turn off the power to the heater. Reseat the thermostat in the thermostat bracket so it presses against the inner tank wall. Otherwise, replace the thermostat.



Check the functioning of the thermostat and energy cut off (ECO) as follows:

1. Check for 110 volts line voltage at the wall plug and fuse panel. Turn on/off switch to ON. Verify electrical polarity of wall plug.
 2. Place one multimeter probe on position # 1 on the upper portion of the thermostat and the other probe on the L2 side of the transformer. Measure for 110 volts. If not, check the line voltage, circuit breakers, wall plug and on/off switch.
 3. Check ECO by placing the multimeter probe at position # 2. Measure 110 volts. If not, press the red RESET button on the thermostat and recheck. If not, ECO is damaged; replace thermostat.
 4. Turn thermostat to highest temperature setting to demand heat. Place multimeter probe on position # 2 on lower portion of the thermostat and check for 110 volts. If not, replace the thermostat. Return temperature setting to original position.
- **QUICK CHECK:** Go directly to step 4 above. If 110 volts, then line voltage, on/off switch, ECO and thermostat are all functioning properly.

How to check 24 volt transformer

The 24 volt transformer supplies the power to operate the ignition control module and the gas control valve. Assuming the presence of 110 volt power and the thermostat operates -

1. Turn thermostat to highest setting to demand heat.
2. Place the multimeter probe on the 24V (GND) terminal of the ignition control module, place the other probe on the yellow wire leading from the vacuum switch to the transformer. Multimeter should read 24 volts. If not, replace the transformer.
3. Return thermostat to a safe temperature setting.

How to check blower motor

Assuming the presence of power and the thermostat operates -

1. Turn temperature on the thermostat to its highest setting to demand heat.
2. Blower motor should operate.
3. If not check for presence of 110 volts at the power plug at the TOP of the heater. If the plug has power, replace the blower motor.
4. Return thermostat to a safe temperature setting.
5. If the plug does not have power verify presence of power to the heater. Check thermostat and ECO. If there is power to the heater, but not the 110V plug at the top of the heater, then replace the heater.



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How to check vacuum switch

The vacuum safety switch will prevent the heater from operating. Assuming the presence of power, the thermostat operates, and the blower motor is running.

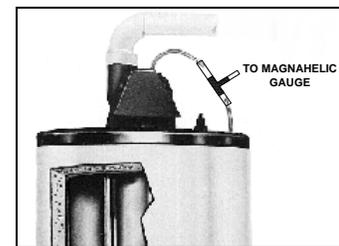
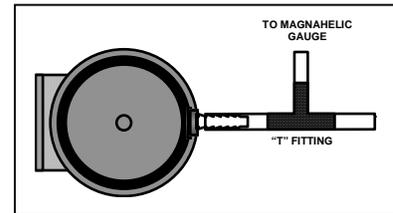
1. Check for 24 volts at the ignition control module by placing one multimeter probe at the 24V terminal (#6) and the other probe on the 24V (GND) terminal (#5). If the meter registers 24 volts, then the vacuum switch is operating normally.
2. If the multimeter does not register 24 volts, the vacuum switch is damaged or there is not enough vacuum pressure to operate the switch.
3. Using a spare 2 foot length of 1/4 inch (I.D.) plastic tubing:
 - a. Remove the vacuum tube from the vacuum switch.
 - b. Place the spare piece of tubing on the vacuum switch.
 - c. Induce a 'vacuum' to the switch by sucking on the tubing like a straw. At the same time, check for 24 volts at the ignition control module by placing one multimeter probe at the 24V terminal (#6) and the other probe on the 24V (GND) terminal (#5). If the meter registers 24 volts, then the vacuum switch is operating normally.

How to check the vacuum line

This test requires the use of a magnahelic gauge.

Following the instructions with your magnahelic gauge -

1. Place an inline "T" fitting between the vacuum switch and the vacuum line from the blower motor.
2. Turn heater on and adjust to demand heat. The blower motor should be operating.
3. Check the pressure on the magnahelic gauge. If the gauge reads between 0.6 and 1.5 inches water column, then the blower motor is inducing the proper draft and the vacuum lines are not obstructed.
4. If the gauge does not read between 0.6 and 1.5 inches water column -
 - a. Move the inline "T" fitting and place it between the blower motor and the vacuum tube at the top of the heater.
 - b. Check the pressure on the magnahelic gauge. If the gauge reads between 0.6 and 1.5 inches water column, then the blower motor is inducing the proper draft and the vacuum lines are obstructed. Replace the heater.
 - c. If the gauge does not read between 0.6 and 1.5 inches water column, then the blower motor is not inducing the proper draft. Replace the blower motor.



How to check gas control valve

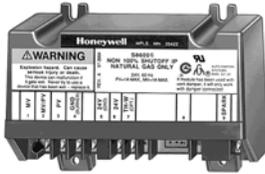
If main burner and or pilot will not light:

1. Check the gas control knob is in the ON position.
2. Verify the presence of a spark at the electrode assembly. You may need to recycle the heater by turning the ON / OFF switch to OFF, waiting one minute and turning the switch back to ON.
3. Adjust the thermostat to its highest setting to demand heat.
4. Using a multimeter check for 24 volts at the gas control:
 - a. If pilot lights, measure across the MV/PV and MV terminals (red & white wires). If multimeter does not register 24 volts, replace the ignition control module. If the multimeter registers 24 volts replace the gas control valve.
 - b. If pilot DOES NOT light, measure across the MV/PV and PV terminals (blue and white). If multimeter does not register 24 volts, replace the ignition control module. If the multimeter registers 24 volts replace the gas control valve.



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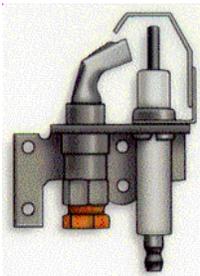
How to check Honeywell ignition control module



The diagnosis of a faulty ignition control module is a process of elimination. To properly isolate the control module, all other components of the powervent heater must be functioning. Insure there is adequate gas pressure and then perform the check below:

1. Recycle the heater by turning the ON / OFF switch to OFF; wait one minute and turn the heater to ON. Adjust thermostat to its highest setting to demand heat.
2. Using a multimeter, place one probe on the 24V terminal of the ignition control module and the other probe on the 24V (GND) terminal. Measure 24 volts.
 - a. If the multimeter registers 24V, then the thermostat, transformer, blower motor and vacuum safety switch are all functioning normally.
 - b. If the multimeter does not register 24V, then check each component using the How to Check..... sections of this manual.
3. Next, perform the How to Check Gas Control Valve procedure.
4. Replace the ignition control module if faulty.

How to check ignition cable and spark ignitor



This procedure will expose you to 10,000 volts of electrical energy. When performing these steps do not touch bare or exposed wiring. Make sure the heater is turned off when servicing or inspecting the spark ignition system.

1. Make sure the ignition cable does not run in contact with any metal surfaces, is no more than 36 inches long, and connections to the ignition control module and ignitor are clean and tight.
2. Check ignition system grounding. *Nuisance shutdowns are often caused by a poor or erratic ground.*
 - a. Check for good metal to metal contact between the pilot burner bracket and the main burner.
 - b. Check the ground lead from the GND (BURNER) terminal on the ignition module to the pilot burner.
 - c. Check the ceramic flame rod insulator for signs of cracked or exposure to extreme heat. This can cause a short to ground and will prevent the pilot electrode assembly from sparking. Clean the flame rod with emery cloth if dirty.
3. Check spark ignition circuit. *You will need a short jumper wire made from ignition cable or other heavily insulated wire.*
 - a. Close the gas valve manually.
 - b. Disconnect the ignition cable at the SPARK terminal of the control module. Move the ignition cable out of your way.
 - c. Energize the module by turning heater on or adjusting the thermostat to demand heat.
 - d. Immediately place one end of the jumper firmly on the 24V (GND) terminal on the control module. Move the free end of the jumper slowly toward the SPARK terminal of the control module until a spark is established.
 - e. Pull the jumper slowly away from the SPARK terminal and note the length of the spark gap. If the arc is 1/8 inch or more, then the voltage output is okay. If the spark is less than 1/8 inch or there is no spark, then replace the control module.
 - f. Remove the jumper, turn heater off, reinstall the ignition cable and turn heater back on.