TECHNICAL SERVICE DEPARTMENT
Technical Service Bulletin
1-800-432-8373

Guardian PowerVent Flash Codes for Robertshaw Controls

The LED will have a variety of status conditions:

- ON is defined as constantly on with no blinking patterns.
- Slow Blink is defined as a one blink per second.
- Fast blink is defined as five blinks per second.
- There will be a 1 second period between primary and secondary pattern when LED will be off. (blink-one second-blink)
- After the secondary pattern completes, there will be a 3 second period when LED will be off before patterns repeat. (blink-one second-blink - - three seconds - - blink-one second-blink)

System condition	*Primary pattern*	*Secondary pattern*
Stand-by mode	Slow blink	None
Call for heat present	Fast blink	None
Internal control failure/ miswiring	ON Solid	None
Ignition failure	1 blink	1 blink
Flammable vapors present	2 blinks	1 blink
Flammable Vapor Detector failure/ miswiring	2 blinks	3 blinks
Vacuum switch fails to open	3 blinks	1 blink
Vacuum switch fails to close	3 blinks	3 blinks
Line/ neutral polarity failure	4 blinks	1 blinks
ECO failure	4 blinks	2 blink
False flame	4 blinks	3 blinks
Vacation mode active	5 blinks	None

HOW TO INTERPRET THE FLASH CODES

Solid ON – If the green LED is constantly on, then there is a problem with the internal controls (computer chip) of the gas valve. It can also mean the thermistor/ECO is disconnected. Ensure all connections to the valve are tight and correct. Cycle the power to attempt to reset the control.

Slow Flash - Flashing LED indicates normal operation of the controls. This also indicates the unit is in Stand-By mode and the water inside the tank is hot. There is always a slow flash when power is applied. If there is no LED, then check for unit plugged in. Check for power at the wall plug or other source of 120VAC. Verify 120VAC power at the red #4 wire.

Fast Flash – A fast flash indicates there is a call for heat. You should hear the blower motor running at a minimum.

One (1) Flash / One (1) Flash – Ignition Failure. This means there was no flame rectification of the pilot. Maximum ignition attempts made. This failure occurs when the control does not see proper ignition (flame rectification) given the allotted attempts and ignition cycles. (3) Remember, flame rectification is required before the unit will continue and open the main valve of the gas valve. The flame rectification circuit proves the presence of pilot flame at the pilot and ignitor. The control will lockout if it failed to ignite gas after three (3) ignition attempts. Here is how it works:

1. Verify control valve is ON.
2. Verify there is gas to the valve.
3. Verify minimum gas pressure.
4. Check for 120V voltage to the pilot valve (yellow wire) connection at the gas valve. If voltage is present, replace control valve.
5. If voltage is not present then check for 120V at terminal #7 (yellow wire) and at #5 (yellow wire). If power at #5, but not at #7, then replace control.

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6. If power at #7, check yellow wire and Molex connector to valve. Listen for the spark ignitor. If you do not hear spark, verify 120V at the red #4 wire on the control. Replace the control module.
7. If you hear spark, using insulated pliers, remove the orange cable from the control and reset heater. When you hear spark again, slowly move the orange wire terminal back to the control and verify spark with at least 1/8 inch gap. If there is no spark, replace the control.
8. If there is spark, but not at the ignitor, the check for proper spark gap between electrode and pilot hood. Replace ignitor.
9. If there is spark, then check for a pilot flame first. If there is no pilot flame, then check power to the pilot side (yellow wire) of the gas valve.
10. Check for gas and gas pressure.

Two (2) Flash / One (1) Flash – The FV sensor has detected a flammable favor. Please call the technical support line at 1-800-432-8373 for instructions.

Two (2) Flashes / Three (3) Flashes – The FV sensor has malfunctioned is miswired. Please call the technical support line at 1-800-432-8373 for instructions.

Three (3) Flashes / One (1) Flash – The vacuum switch has failed to open. The control insures that the vacuum switch is open before it turns on the blower. If the control cannot force the switch to open by cycling the blower, it will indicate this failure. The vacuum switch is a safety device. Vacuum switch is normally open. The control checks to ensure the vacuum switch can open (safety position) before it starts its sequence. If the switch is closed and cannot be opened, the code will flash. Vacuum switch is closed and cannot be opened.

1. Turn heater off and remove wires to vacuum switch.
2. Measure continuity thru the switch.
3. If there is continuity, then replace switch.

Three (3) Flashes / Three (3) Flashes - Vacuum switch fails to close. When the blower is turned on, the control insures it that the vacuum switch is closed before continuing with the ignition sequence. If it cannot force the switch to close by cycling the blower, it will indicate this failure. The vacuum switch may also fail or fault during main burner. If this happens, then you will get a flash code of four. If blower motor is operating at speed and there are no vacuum restrictions, a closed vacuum switch will allow 120V power to pass between the red (inbound) wire and the blue (outbound) wire. Blocked venting will be a primary cause of this failure. If venting is blocked, then there is no power thru the vacuum safety switch to the control module and pilot valve. Venting over-temperature switch will be another cause of this failure.

1. Check for rubber vacuum hose and crimping.
2. Verify motor is running.
3. Verify PVC venting is free and clear or all obstructions.
4. Verify termination vent is free and clear of all obstructions.
5. Verify venting does not contain an excessive number of elbows.
6. Verify 120V at the blue #8 wire on the control. If no power, verify 120V at the black wire on the vacuum switch.
7. Verify vacuum safety switch is operating. Reset heater. Remove black wire from vacuum switch and measure for 120V. If no 120V, then verify .75 inches w.c. with a magnahelic gauge. Replace vacuum switch.
8. Verify over-temp safety switch is not open (too hot). If 120V at the black wire on the vacuum switch, but not at the blue #8 wire position of the control, then over-temp switch may be tripped. Cool switch to less than 180^0.

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Four (4) Flashes / One (1) Flash - If the control senses the neutral has a potential with respect to earth ground, it will indicate this failure. On start up and power on, the control module looks for proper polarity. If polarity is reversed or not present, unit locks out immediately. There will be no blower motor or ignition attempts.

1. Incorrect polarity at the wall plug or power connection to the water heater.
2. Remove power strip or other GFI circuit and re-try.

Four (4) Flashes / Two (2) Flashes – ECO failure. If the control senses the ECO has opened, it will indicate this failure. Water temp has exceeded 200^0 F. One time use ECO has tripped. Unit will cycle 3 times and then lock out with 4/2 flashes. During ignition sequence you will NOT have power to the yellow #7 wire to the pilot side of the gas valve.

1. Remove red Molex connector from control.
2. Verify continuity thru the red wires of the ECO/Thermistor Molex connector.
3. If there is no continuity, then ECO is tripped. Replace control.
4. If there is continuity, reinstall Molex and reset heater.

Four (4) Flashes / Three (3) Flashes – False flame. Indicated the control is sensing flame with gas valve "OFF". The blower will turn on immediately if flame is sensed with the gas valve off. If there is proof of flame for 10 seconds with the gas valve off, the control will go into lockout. The blower motor will run during lockout if there is proof of flame. If there is proof of flame for less than 10 seconds, the unit will post-purge.

Five (5) Flashes – Indicates the thermostat dial is set to its lowest setting – Vacation. There will be no calls for heat until the water temperature reaches 68^0F.