PowerVent with Honeywell Electronic Control
(PowerVent ESII and PowerVent ESII with Electronic Control)

Service Mode

Service Mode is entered by pressing down and holding all keys for 5 seconds.

Alarm history of the connected appliance is displayed, alarms are indexed by “E1” for most recent alarm, “E2” for second alarm to “E9” for ninth alarm (alarm history can be scrolled by pressing “Up” and ”Down” keys).

Displayed alarm history can be cleared by pressing “Clear” key. If the alarm history is empty dashes “--“are displayed instead of “E1”, E2” to “E9” and particular error numbers. Setup Mode is closed and enters User Mode after 5 minutes of user inactivity or when “Done“ key is pressed.

Control Settings

SETTING	VALUE
Set point Range	90°F (32°C) to 160°F (71°C)
“HOT” Set point	120°F (49°C)
Differential	15°F (9°C)
ECO Limit	199°F (93°C)
Flame Prove Igniter Off	0.5 μA
Flame Prove RUN	0.7 μA
Flame Lost	< 0.5 μA
Strong Flame	≥ 1.5 μA

Timings

IGNITION STATE	TIMING
Soft Lockout	5 minutes; then retries for main burner
ECO Limit Lockout	Indefinite
Flammable Vapor Sensor Lockout	Indefinite
Hardware Error Lockout / Hard lockout	Indefinite
Pre-purge	2 seconds
Trial For Ignition	90 seconds
Flame Stabilization Period	3 seconds
Inter-purge	90 seconds
Flame Failure Response Time	1.5 seconds
Post-purge	30 seconds
Pressure Switch Fault Delay (failed open/closed)	2 minutes

Error Code Flash Display

Display Code	Gas Valve “Status” Flash Code	Control Status
None	Short flash once every four seconds	IDLE (no call for heat, no fault conditions)
None	"Heartbeat", alternates bright/dim	Call For Heat (no fault conditions)
12	One Flash, three second pause	Low flame signal (control continues to operate)
44	Two Flash, three second pause	Pressure switch failed closed
46	Three Flash, three second pause	Pressure switch failed open
31	Four Flash, three second pause	Thermal Cut Off limit lockout
14	Five Flash, three second pause	Flame out of sequence

11	Six-One Flash, three second pause	Failed trial for ignition
45	Six-Two Flash, three second pause	Recycle limit - PS/limit opened
13	Six-Three Flash, three second pause	Recycle limit - flame lost
10	Six-Five Flash, three second pause	Hard Lockout; manual reset required
47	Seven Flash, three second pause	Flammable vapor sensor lockout
49	Eight-One Flash, three second pause	FVS fault detected
89	Eight-Two Flash, three second pause	Temperature sensor fault detected
15	Eight-Three Flash, three second pause	Electronics fault detected
93	Eight-Four Flash, three second pause	Valve fault detected

No Power or No Blower Motor

Indications	**Display**
Nothing happens at all. No blower motor; no sounds.	There is not a display code for this problem.
Troubleshooting	
1. Check wall plug power with a table lamp. 2. Check that the unit is plugged in. 3. Verify blower motor switch and gas control switch is ON. 4. Verify the remote control is working and displaying something. 5. Verify power to the gas control thru the black wire on the gas valve Molex. 6. Verify power to the blower at the yellow wire on the gas valve Molex. Replace blower if there is power on the yellow wire, but no blower motor.	

Error 10

Indications	**Display**
The control is in hard lockout.	Six-Five Flash, three second pause
Troubleshooting	**Solution**
1. Low gas supply pressure 2. Carbon buildup on electrode 3. Igniter Wire damage 4. Pilot tube restriction 5. Main burner supply tube restriction	1. See Error Code history for most resent fault code. 2. This lockout can only be cleared by manually cycling the control power.

Error 11

Indications	**Display**
Failed trial for ignition; Maximum ignition attempts. If flame is not sensed during the Trial period, the igniter turns off, the pilot valve closes, the control runs the inducer through Post-purge then turns of the inducer and enters Soft Lockout and flashes the Soft Lockout error code. The control remains in Soft Lockout for 5 minutes before responding to the demand for heat. If the control has entered Soft Lockout three times, the control will enter hard lockout.	Six-One Flash, three second pause
Troubleshooting	**Solution**
1. Low gas supply pressure 2. Carbon buildup on electrode 3. Igniter Wire damage 4. Combustion air blockage	1. Verify gas pressure with rating plate on water heater. 2. Clean spark electrode and pilot hood with steel wool.

5. Pilot tube restriction	3. Verify igniter spark at electrode 4. Verify air inlet holes on side of water heater are clean and clear 5. Inspect pilot tube for obstructions 6. This lockout can only be cleared by manually cycling the control power.

Error 12

Indications	**Display**
Low flame signal (control continues to operate)	One Flash, three second pause
Troubleshooting	**Solution**
1. Low gas supply pressure 2. Carbon buildup on electrode 3. Pilot tube restriction	1. Verify gas pressure with rating plate on water heater. 2. Clean spark electrode and pilot hood with steel wool. 3. Inspect pilot tube for obstructions

Error 13

Indications	**Display**
Recycle limit – Pressure switch opens during RUN (resulting in loss of flame before the tank is recovered) - the control turns off the pilot and main valves, runs Inter-purge, and waits for the PS to close. If the PS fails to close, the control proceeds as described above in PS Failed Open. If the PS closes again by the end of Inter-purge, the Recycle Counter is incremented and, if the Recycle Count has not reached its limit, another Trial for Ignition begins. If the Recycle Count Limit has been reached, the control turns off the inducer and enters Hard Lockout.	Six-Three Flash, three second pause
Troubleshooting	**Solution**
1. Venting not within use and care standard. (You will normally see this on first installation only) 2. Something is blocking the termination vent (You may see this after installed for a period of time) 3. Pressure switch is failing 4. Blower is failing (not enough air flow)	1. Check use and care manual for venting requirements and repair as needed. 2. Check termination vent for obstructions. 3. Replace pressure switch 4. Replace blower

Error 14

Indications	**Display**
Flame Sensed Out Of Sequence - the control only looks for pilot flame when the inducer is running. If flame is present when the pilot valve is not open, the control proceeds to Wait Flame Lost and flashes the Flame out Of Sequence error code. Blower remains on.	Five Flash, three second pause
Troubleshooting	**Solution**
1. Pilot or main burner valve has failed open	1. Recycle heater to verify error code

	2. Replace gas control valve

Error 15

Indications	Display
Electronics fault detected - The electronic control module contains a relay for communicating with the display.	Eight-Three Flash, three second pause
Troubleshooting	**Solution**
1. Panel fault 2. Gas control fault	1. Recycle heater to verify error code 2. Replace display panel 3. Replace gas control valve

Error 31

Indications	Display
ECO limit lockout - Water temperature sensed in excess of ECO limit (199º) - the control immediately turns off pilot and main valves and enters ECO Limit Lockout. During ECO Limit Lockout, the inducer motor runs continuously.	Four Flash, three second pause
Troubleshooting	**Solution**
1. Thermal well fault 2. Gas control fault	1. The sensed water temperature must be below 120Fº 2. Power must be cycled to remove the control from ECO limit hard lockout.

Error 44

Indications	Display
PS Failed Closed at start of Call for Heat - the control waits four seconds then begins to flash error code (44). The control waits 2 minutes, and then turns on the inducer for 30 seconds. The inducer shuts off after 30 seconds and the control returns to waiting for the pressure switch to open. The control will attempt this sequence 5 times before entering into a hard lockout.	Two Flash, three second pause
Troubleshooting	**Solution**
1. Pressure switch tube blockage 2. Faulty pressure switch	1. Inspect pressure switch tube for blockage 2. Do continuity test on pressure switch. If there is continuity, replace pressure switch. 3. The hard lockout will require a manual power cycle of the control to clear the hard lockout.

Error 45

Indications	Display
Recycle limit - PS/limit opened – Maximum number of retries has occurred. Unit is in hard lock-out.	Six-Two Flash, three second pause
Troubleshooting	**Solution**
1. Pressure switch tube blockage o	1. Check pressure switch for proper operation

2. Faulty pressure switch	2. Replace pressure switch 3. The hard lockout will require a manual power cycle of the control to clear the hard lockout.

Error 46

Indications	Display
Pressure switch failed open – at the beginning of the heat cycle the control runs the inducer for 30 seconds waiting for the Pressure Switch to close. If the PS does not close in 30 seconds, the inducer turns off and the control flashes PS Failed Open error code. The control waits in this PS Failed Open mode for 2 minutes before turning on the inducer and trying for another 30 seconds to see the PS close. This cycle repeats for a maximum of five times before entering a hard lockout.	Three Flash, three second pause
Troubleshooting	**Solution**
1. Vent blockage or improper installation 2. Switch tube blockage 3. Faulty pressure switch 4. Blower improper operation 5. Over temperature switch open	1. Verify over temp switch is cool to the touch 2. Inspect venting run for blockage 3. Inspect pressure switch tube for blockage 4. Check blower for proper operation 5. Replace pressure switch 6. The hard lockout will require a manual power cycle of the control to clear the hard lockout.

Error 47

Indications	Display
Flammable vapor sensor lockout - FVS > 100 and < 300KΩ - the control immediately turns off all outputs (valves closed, inducer off, ignition off). Control enters hard lockout and registers Flammable Vapor Present error code.	Seven Flash, three second pause
Troubleshooting	**Solution**
1. Gasoline or other flammable gas was detected by the flammable vapor sensor.	1. Check for flammable vapors around water heater 2. Verify FVS sensor resistance ~ 9KΩ -45 KΩ 3. Replace FVS sensor if >45 KΩ 4. Reset gas control valve. Hard lockout to be cleared when the power is manually cycled, the control dial is rotated through the HOT setting 7 times within 30 seconds and the resistance of the sensor is within the normal operation range.

Error 49

Indications	Display
FVS fault detected - FVS < 7 or > 300 KΩ - the control immediately turns off all outputs (valves closed, inducer off, ignition off) and enters Hardware Error Lockout and registers Flammable Vapor Device Interface/Miswiring error code.	Eight-One Flash, three second pause

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Troubleshooting	Solution
1. Flammable vapor sensor resistance is out of range (well below or well above parameters) 2. Wiring to FV sensor is faulty (open) 3. Gas control is faulty	1. Verify FVS sensor resistance ~ 9KΩ -45 KΩ 2. Replace sensor and wiring harness. 3. Replace control if new sensor does not work. 4. Hard lockout will be cleared when the power is manually cycled, the control dial is rotated through the HOT setting 7 times within 30 seconds and the resistance of the sensor is within the normal operation range.

Error 89

Indications	Display
Thermal well fault - Temperature Sensors not reading the same temperature within ± 5.5 °F (measure when water temperature is changing less than 1 °F/minute) - the control immediately turns off all outputs (valves closed, inducer off, ignition off) and enters Hardware Fault Lockout. Hardware Fault Lockout self clears if the fault clears for at least 15 seconds.	Eight-Two Flash, three second pause
Troubleshooting	**Solution**
1. Thermal well fault	1. Recycle power to verify error 2. Replace thermal well

Error 91

Indications	Display
Communications Error- when display does not detect any gas control valve. User display is periodically checking the connection to the water heater.	None. Heater works without remote. This error code is for the display only.
Troubleshooting	**Solution**
1. Display and gas control valve are not talking to each other	1. Recycle power to verify error 2. Verify control molex correct at gas valve

Error 93

Indications	Display
Valve fault detected	Eight-Four Flash, three second pause
Troubleshooting	**Solution**
1. Gas control valve needs to be reset or has been damaged.	1. Recycle power to verify error 2. Replace gas control

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Reset Gas Control

This will clear the current fault and force the unit to recycle for ignition.

1. **Turn temperature control knob all the way clockwise**
2. **Recycle power to the heater (both blower and gas valve)**
3. **Rotate the temp knob all the way to the left, then back to the right. You must cross the midline seven (7) times to reset the gas valve.**
4. **Unit should return to normal operations if all faults have been cleared and repaired. You will hear the blower motor come on.**
5. **Set water temperature to a safe setting of 120º or less.**

Replacing the Gas Control.

The electronic component for the gas valve is replaceable without draining the water from the tank. To replace just the electronic control portion:

1. **Turn off the blower and the gas valve. Unplug the water heater.**
2. **Remove wiring harnesses from the gas valve.**
3. **Remove main burner supply tube and pilot supply tube.**
4. **Remove / disconnect gas supply line.**
5. **Grab the bottom of the gas valve (at the main burner supply tube area) and lift up and out at the same time. There are two small plastic locking tabs that will release.**
6. **The electronic component will slide up and off the thermal well still installed in the tank.**
7. **Replace the control in reverse order.**
8. **Reconnect fuel supply lines and tubes.**
9. **Reconnect wiring harnesses.**
10. **Recycle power to the water heater.**
11. **Set the water temperature not to exceed 120º F.**
12. **Check for safe water heater operations.**