Residential High Efficiency (RHE) Troubleshooting

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. Remember, if everything is working on the heater, then none of the lights on the control come on.
Troubleshooting	**Solution**
1. Check wall plug power with a table lamp. 2. Check that the unit is plugged in. 3. Verify gas control switch is ON. 4. Verify power to the control thru the black and white wires on the Molex at the top of the heater. You should be able to 'wake up the control' by holding down the red and blue arrow keys at the same time. Adjust water temp to 120^0F. 5. Verify power to the blower at the yellow wire on the Molex. Replace blower if there is power on the yellow wire, but no blower motor. Replace control if no power on yellow wire.	1. Check the T&P valve to see if it is hot to the touch. That usually indicates the heater is satisfied. 2. Steps 1, 2, 3 and 4 verify 120VAC to the water heater; and that the gas control is turned ON. 3. Any lights on the control indicated the presence of AC voltage. 4. IF the control is working, then it will be sending power to the blower to turn on. IF the blower is not working, you will not hear any sounds.

Error

Indications	**Display**
An open earth ground circuit to the water heater. The water heater uses ground as part of its flame rectification circuit. Without a good earth ground, the flame rectification circuit may be erratic. The water heaters 3 prong plug ensures correct polarity when plugged into a properly wired circuit.	
Troubleshooting	**Solutions**
Verify properly wired wall plug. 	1. Check that the earth ground conductor is properly connected at the fuse box or breaker panel and the water heater. 2. Check that the grounding conductors on the water heater are properly connected and secure. 3. Check green grounding wire connection on side of control valve.

Error

Indications	**Display**
Miswired plug or wrong polarity. The self diagnostic test detected a wiring error. The control will enter a 3 minute lockout, after lockout time expires, the control will reset and perform a power up check.	

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Troubleshooting	Solution
Verify wall plug is properly wired. 	1. Check for proper connection of the line neutral and line hot wires at the wall plug. 2. Check that the appliance is securely connected to earth ground.

Error

Indications	Display
The differential pressure switch (normally open) remained closed longer than 5 seconds after the call for heat began. At the start of call for heat, the control checks for an open pressure switch; and then turns the blower on to close it. The control will continuously sense the pressure switch status. When the pressure switch is sensed closed, the control will proceed with the ignition sequence, starting with pre-purge.	

Troubleshooting	Solution
1. The pressure switch has been jumped. 2. Pressure switch rubber tube blockage 3. The pressure switch is defective (contacts inside switch permanently closed) and must be replaced.	1. Check continuity on the inlet pressure switch. IF the differential pressure switch has continuity, replace the pressure switch. 2. Clean and clear pressures switch hoses. 3. Replace pressure switch.

Error

Indications	Display
One of the two pressure switches remained open longer than 5 seconds after the combustion blower energized. Blower thermal switch (normally closed) is tripped.	

Troubleshooting	Solutions
1. The pressure switch tube(s) is not connected correctly or pinched off. 2. The vent over-temperature switch is activated or defective. Check for heat at the top of the blower; and check continuity thru the over temp switch. 3. Obstructions or restrictions in the water heater venting. Remove venting and recycle to rule out venting. If unit goes to main burner, the venting is the problem. If the code repeats without the venting connected, replace the blower assembly.	1. Check continuity on the exhaust pressure switch. IF the pressure switch does not have continuity, replace the pressure switch. 2. Clean and clear pressures switch hoses. 3. Verify blower is operating properly. 4. Check for excess vent runs.

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Error

Indications	Display
The self diagnostic test has detected an error in the Hot Surface Igniter circuit. (open igniter circuit)	

Troubleshooting

1. Check that the wiring harness Molex is connected and secure.
2. Disconnect the ignitor connector and measure the ignitor resistance with an ohmmeter between pins 1 and 2. Resistance should be between 11.0 and 18.0 ohms.
3. If the reading is incorrect, replace the Hot Surface Ignitor assembly.
4. If the above checks are good, replace the gas control.

Error

Indications	Display
The maximum number of ignition retries or recycles has been reached and the system is in lockout. (This means there was no flame rectification to the control to verify main burner.) The control will enter into a 60 minute lockout. After the lockout timer has expired, the automatic reset feature is activated providing additional Try For Ignition sequences. The control may also be reset by a power cycle.	

Troubleshooting

1. Check if the gas supply is off or too low to operate.
2. Check the flame sense rod to see that it is located properly and free from contamination. Reposition the flame sense rod or lightly clean with an abrasive cloth.
3. The Hot Surface Ignitor may not be positioned on the burner correctly. Reposition as necessary.
4. Low voltage to the water heater. (***Verify the hot surface ignitor glows by recycling power and looking thru sight glass window. If you have a glowing ignitor, then your problem is probably fuel related.***)
5. Inadequate fresh air to support combustion inside combustion chamber.
6. Main burner supply tube is blocked, bent or restricted; burner orifice is blocked or restricted.

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Error

Indications	Display
The self-diagnostic test found a problem with the gas valve driver circuit. If the control senses the gas valve is energized when it should be off, the control will turn off all outputs. It will show the Gas Valve Sensed On When it Should Be Off error code. If the error persists the control will re-energize inducer relay	

Troubleshooting

1. Cycle power to the water heater off for 10 seconds and then back on.
2. If the above step did not clear the error, the Intelli-Vent™ control must be replaced.

Note: There are no further tests to conduct when the control fails one of its "self-diagnostic" tests. If the valve thinks there is something wrong; then the recourse is to replace the control.

Error

Indications	Display
Weak flame current. If the control senses weak flame signal during a call for heat, the control will continue with normal operation, but display the Weak Flame Sensed error code. If the control then senses a strong flame signal during the same call for heat, the error code display will be removed.	

Troubleshooting

1. Verify gas pressure and gas volume. (low flame pattern)
2. Verify adequate fresh air. (flame is weak due to poor fuel air mixture)
3. Propane tanks may be low on fuel.
4. Clean flame rod
5. Replace gas valve

Error

Indications	Display
The self-diagnostic test found a problem with the internal circuit - If an internal check error occurs, the control will enter into internal fault lockout mode. In this error mode, the control will turn off inducer relay and the gas valve relay; the control will turn on all LEDs to show the error code. After 3 minutes has expired, the control will reset and perform power up check again.	

Troubleshooting

1. Cycle power to the water heater off for 10 seconds and then back on.
2. If the above step did not clear the error, the Intelli-Vent™ control must be replaced.

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Note: There are no further tests to conduct when the control fails one of its "self-diagnostic" tests. If the valve thinks there is something wrong; then the recourse is to replace the control.

Error

Indications	Display
Flame signal sensed out of proper sequence. (The flame probe sensed the presence of flame when it was not supposed to.)	

Troubleshooting

1. Cycle power to the water heater off for 10 seconds and then back on.
2. Verify main burner is OFF.
3. If the above step did not clear the error, the Intelli-Vent™ control must be replaced.

Error

Indications	Display
High temperature thermal cut-off (ECO) switch is tripped. If either one of the two thermistors measure a temperature greater than the high temperature limit, the control will turn on the inducer, turn off the gas valve relay, and enter into a hard lockout. *The control will be resettable* when the temperature is at or below the reset 135^0 temperature. The control must be reset by a manual reset sequence. See last page of this document.	

Troubleshooting

1. Cycle power to the water heater off for 10 seconds and then back on.
2. If the above step did not clear the error, then purge the tank with cold water and repeat step #1.
3. If the above step did not clear the error, the control must be replaced.

Error

Indications	Display
The self diagnostic test has indicated one of the temperature adjustment buttons is stuck closed.	

Troubleshooting

1. Make sure that there are no objects leaning against the front of the control

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2. Lightly press and release each of the buttons once.
3. If the above actions do not clear the error, the control will continue to regulate water temperature at the last setting, but you are not able to change settings unless you replace the Intelli-Vent™ control.

Error

Indications	Display
The self-diagnostic test has detected that the water temperature sensor (thermistor) is either open or short circuited.	

Troubleshooting

1. Cycle power to the water heater off for 10 seconds and then back on.
2. If the above step did not clear the error, the Intelli-Vent™ control must be replaced.

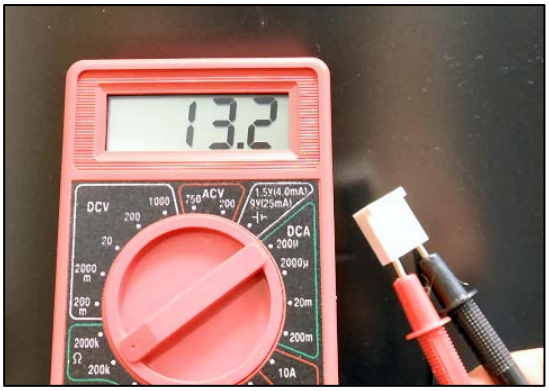
Note: There are no further tests to conduct when the control fails one of its "self-diagnostic" tests. If the valve thinks there is something wrong; then the recourse is to replace the control.

Error

Indications	Display
The self-diagnostic test found an electrical problem with the Flammable Vapor Sensor. (This is <u>not</u> a flammable vapor event. It may be caused by disconnecting the FV sensor Molex, or the FV sensor itself. This includes both short and open electrical connections.)	

Troubleshooting

1. Check all FV sensor wiring harness connections; and the connections to the back of the sensor.
2. Cycle power to the water heater off for 10 seconds and then back on.
3. If no wiring problems are found, the Flammable Vapor Sensor must be checked.
    a. Disconnect the FV sensor Molex and measure the resistance of the sensor between the two black wires. If the resistance is less than 9k OHMS or greater than 45k OHMS, then replace the sensor.
    b. If the FV sensor is between 9K OHMS and 45K OHMS and the code will not clear by recycling power, replace the gas control.



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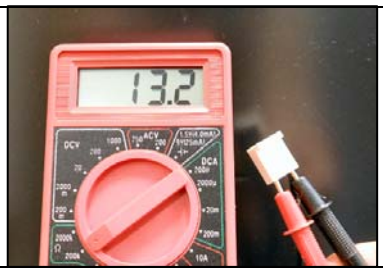
Error

Indications	Display
The control detected the presence of flammable vapors near the water heater and entered lock out. This is a permanent lockout and cannot be cleared by cycling power. Control may be reset.	

Troubleshooting

1. Disconnect the FV sensor Molex and measure the resistance of the FV sensor between the two black wires 2 and 3.
2. Write down this resistance and call the technical support line at 800-432-8373 for further instructions.
3. The control is field resettable; however, we probably need to replace the FV sensor if the sensor is out of tolerance (>45k ohms resistance).



Fault Recall Mode

Up to 3 diagnostic error codes as described above will be stored in non-volatile memory. They may be retrieved for analysis by entering “Fault recall mode”. The following button press sequence shall be used to either enter the Fault recall mode or to exit the Fault recall mode:

1. The operator has to press the buttons in the following sequence:
2. Press both the UP and DOWN temp buttons for minimum of 10 seconds, maximum 15 seconds and release.
3. All LEDs will flash 3 times to indicate entering Fault recall mode.
4. Repeat the button sequence or simply wait one minute to exit fault recall mode.

Display of Fault Codes while the control is in fault recall mode

- Most recent code #1 shall be displayed upon entering fault recall mode. The control shall display the most recent fault code in the following sequence:
    1. Display the fault code for 0.5 sec
    2. Turn off the LEDs for 2 sec.
    3. Repeat from 1) until the Up button is pressed to retrieve the next fault or untill the control exits the fault recall mode.
    4. If no fault is stored, the LEDs flash 3 times and immediately exits fault recall mode.

- Next most recent fault code #2 shall be accessible by pressing UP temp button. Upon accessing the next fault the control shall display the fault in the following sequence:
    1. Display the fault code for 0.5 sec
    2. Turn off the LEDs for 0.5 sec
    3. Display the fault code for 0.5 sec
    4. Turn of the LEDs for 2 sec.

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5. Repeat from A) till the Up button is pressed to retrieve the next fault or until the control exits the fault recall mode.

- Next most recent fault code #3 shall be accessible by pressing UP temp button. Upon accessing the next fault the control shall display the fault in the following sequence:
    1. Display the fault code for 0.5 sec
    2. Turn off the LEDs for 0.5 sec
    3. Display the fault code for 0.5 sec
    4. Turn off the LEDs for 0.5 sec.
    5. Display the fault code for 0.5 sec
    6. Turn off the LEDs for 2 sec.

- The control shall exit the Fault Recall Mode any of the three listed below conditions is true:

    1. If there no button activity for one minute.
    2. Upon turning power off and turning power on the control
    3. Pressing UP temp button for more times than there are faults stored.

- Upon exit of fault recall mode the control shall:
    1. Display temperature set-point for one minute
    2. During set-point display allow the temperature set-point to be changed by pressing UP or
    3. DOWN temp buttons (i.e. there is no need to „wake up“ the control to set the temperature during this time period

Reset Sequence

- Turn off power to control
- Restore power to control
- Press both buttons until lights blink and then press following sequence
    - Left, Right, Left, Left, Right, Left, Right, Right

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