Troubleshooting Guide

This guide contains information for identifying and correcting issues that may arise.

Applicable Models:

i200   iQ251
i200P  iQ251D
i250   iQ751
i250P  iQ1001
i200X  iQ1501
i201X
i250X
i251X  ** GEN I units have
        the push-button screen

Product Support / Warranty
If the water heater requires additional service, please use one of the following options for contacting Intellihot Technical Support:
- Call: 309-473-8040 (toll-free 1-877-835-1705), and press 3
- Email: support@intellihot.com

When you contact Technical Support, please have the following information ready:
- Model Number
- Serial Number
- Date purchase / Date installed
- Installation location & application
- Error code (if any) or other problem with the unit
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### Error Code List

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<tr>
<td>E3</td>
<td>Blocked Flue</td>
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<td>E7</td>
<td>Ignition Failure</td>
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<td>E9</td>
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<td>Temperature Sensor Open Circuit</td>
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<td>EC</td>
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</tr>
<tr>
<td>Ed</td>
<td>Heat Exchanger Outlet Temperature Exceeded</td>
<td>9</td>
</tr>
</tbody>
</table>

### Suggested Tool List

- Digital Manometer
- Electrical Multimeter
- Flue Gas Analyzer (for NOx & CO₂)
- 7mm Socket & Ratchet
- #1 Phillips Screwdriver
- #2 Phillips Screwdriver
- Instrument Flat Blade Screwdriver
- Pliers
- Adjustable Wrench
E1 - Blower Speed Fault

E1 Blower Speed Fault

- Reboot the unit.

- Does the blower run on Start-up?
  - Yes: In Floor models, unplug the 5 pin connector from the blower. In wallhung models, unplug the J18 connector from the Control board.
  - No: Measure the voltage at the Control board's J15 connector.

- Measure the voltage at the Control board's J15 connector.
  - Measures 120V AC?
    - Yes: Replace the blower.
    - No: Check fuse. Is it blown?
      - Yes: Replace the fuse.
      - No: Replace the Control board.

- Does the blower speed ramp up?
  - Yes: Is the blower noisy?
    - Yes: Power cycle the unit. At startup, use a multimeter to measure the voltage at Control board's J18, pin 2 & 4.
    - No: Check the wirings and connectors (J15 & J18).

- Check the wirings and connectors (J15 & J18).
  - Yes: Is the voltage reads between 10-90% of 24V DC?
    - Yes: Replace the blower.
    - No: Replace the blower.
E3-Blocked Flue

Check exhaust termination. Is it blocked?
- Yes: Remove blockage and install screens if not installed
- No: Turn off gas and remove condensate line. Remove the condensate tube/input trap. Is it blocked?
  - Yes: Are the drain hoses sloped away from unit?
    - Yes: Check for double loops, air locks or debris in loop
    - No: Slope drain per Manual
  - No: Is vent piping sized (diameter & total length and installed per manual?)
    - Yes: Contact Authorized Service Personnel
    - No: Check Air switch wiring (green/black). Is it loose
      - Yes: Repair faulty wiring at air switch
      - No: Correct piping per manual specs

Turn off gas and remove condensate line. Remove the condensate tube/input trap. Is it blocked?
- No: Check Air switch wiring (green/black). Is it loose
  - Yes: Repair faulty wiring at air switch
  - No: Correct piping per manual specs

Is vent piping sized (diameter & total length and installed per manual?)
- No: Slope drain per Manual
- Yes: Contact Authorized Service Personnel
E7 - Ignition Failure

If wall-hung model, turn off the unit and reset the overheat limit switch. If floor model, press the overheat limit switch to reset it.

New install or existing install for more than 6 months?

Natural Gas (NG) or Liquid Propane (LP)?

LP Conversion completed?

Are the regulators & gas lines sized for loads?

Check internal & external re-circulation pump. End

By using the display, restart the unit.

Check the static gas pressure at the gas valve. Is it within specs?

Complete the conversion as per the manual

Size gas lines and regulators for max BTU/h requirements

Size gas lines and regulators for max BTU/h requirements

End
Is the flame visible for 5 seconds or less?

Yes flame stays less than 5 seconds

Is the flame visible for 5 seconds or less?

No, flame stays 7 to 10 seconds

For floor models, perform continuity test on the (white color) flame sensor wire (that goes between the electrode and the control board). For wall hung, check the continuity and damages on the electrode white wire.

Damaged flame sensor wire?

Yes

For wall hung, replace electrode. For floor model, replace the

Is the Control Board RED LED is

Yes

Replace the DSI and High Voltage cable

No

Replace the control board

No

Is the flame visible for 5 seconds or less?

Yes flame stays less than 5 seconds

Is the flame orange in color?

By using the high fire adjustment (flat screw), richen the gas until the color changes to orange 80% & blue 20%. Quarter turn at a time, but please do not go more than 3 full turns.

Does the flame stay lit?

Yes

By using recommended gas analyzer, perform combustion and adjustment CO2. For Natural Gas CO2 is 9.1% - 9.3% and for Liquid Propane CO2 is 10.1% - 10.3%.

No

Replace DSI & high voltage cable

For wall hung, replace electrode.

Yes, flame visible

Replace the DSI & high voltage cable

Replace DSI & high voltage cable
E9 Temperature Sensor Shorted
EA - Temperature Sensor Open Circuit

Wire color table (based on secondary error code):
- HE - Heat exchanger water outlet temperature sensor (orange wire)
- FL - Flue temperature sensor (gray wire)
- IN - Inlet water temperature sensor (blue wire)
- rE - Recirculation temperature sensor (white wire)
- Ou - Domestic hot water outlet temperature sensor (green wire)

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Resistance depends on temperature of</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE (orange wires)</td>
<td>hot water at the outlet</td>
</tr>
<tr>
<td>FL (gray wires)</td>
<td>Flue gas</td>
</tr>
<tr>
<td>IN (blue wires)</td>
<td>inlet cold water</td>
</tr>
<tr>
<td>rE (white wires)</td>
<td>recirculation water</td>
</tr>
<tr>
<td>Ou (green wire)</td>
<td>domestic hot water (combi models)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Sensor Resistance (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>18</td>
</tr>
<tr>
<td>77</td>
<td>10</td>
</tr>
<tr>
<td>140</td>
<td>3</td>
</tr>
</tbody>
</table>

In the control board, disconnect the J3 connector. Check the corresponding wire for damage, corrosion and perform continuity from the corresponding wires to sensor.

Wires damaged / corroded or no continuity?
- No: Disconnect the harness at J3 connector from the control board. Check resistance between the two respective color wires.
- Yes: Replace the wiring harness.

Resistance is as per the table?
- No: Replace the Overheat sensor.
- Yes: Contact authorized service personnel.
EC-Flue Temperature Exceeded

1. Is the inlet/return temp >157°F?
   - Yes
   - No
2. Is the venting material CPVC, PP, or SS?
   - Yes, Install proper approved venting material
   - No, Go to next step
3. Is unit set for proper venting material?
   - Yes
   - No
4. Change flue material setting on units per manual (PVC,CPVC, etc.)
   - Ensure inlet temperature is lower than 150°F if vent pipe material is PVC or lower than 190°F if vent pipe material is CPVC or Polyproplene.
5. Check resistance of appropriate temperature sensor. Is it faulty?
   - Yes, Refer to E9/EA error codes charts for guide (page 6 & 7).
   - No, Contact authorized service personnel
Ed - Heat Exchanger Outlet Temperature Exceeded

1. **On a well water system?**
   - Yes: **Unit is a Combi or Internal pump model?**
     - Yes: **Check for scale buildup. Contact authorized service personnel.**
     - No: **Check the temperature before and after the external recirculation pump.**
   - No: **Install external recirculation pump.**

2. **Wall-hung model without internal pump?**
   - Yes: **Check the temperature before and after the external recirculation pump.**
   - No: **Replace the pump.**

3. **Is there an external recirculation pump?**
   - Yes: **Is the pump working?**
     - Yes: **Check the temperature before and after the external recirculation pump.**
     - No: **Is the check valve normal?**
       - Yes: **Inspect Solenoid valve. Check the direction of the solenoid valve installation.**
       - No: **Remove jammed check valve due to water not flowing through the unit.**
   - No: **Is the check valve plugged, damaged, or installed backwards?**
     - Yes: **Replace the check valve. Correct the direction ((For combi modes, arrow pointing right; for Pump models, arrow point left).**
     - No: **Unit is a Combi or Internal pump model?**
       - Yes: **Check for scale buildup. Contact authorized service personnel.**
       - No: **Check the temperature before and after the internal recirculation pump.**

4. **Outlet water Temperature (°F) | Sensor Resistance KΩ**
   - 50: 18
   - 77: 10
   - 140: 3

5. **Is there air in the system?**
   - Yes: **In the control board, disconnect the J3 connector. Check the orange wires for damage, corrosion and perform continuity from the orange wire to sensor.**
   - No: **Check the temperature before and after the internal recirculation pump.**

6. **Is the pressure within 30-150 psi?**
   - Yes: **Check the temperature before and after the external recirculation pump.**
   - No: **Correct well water system.**

7. **Is the pump working?**
   - Temperature is same before and after the pump?**
   - Yes: **Replace the pump.**
   - No: **Check the temperature before and after the external recirculation pump.**

8. **Wall-hung model without internal pump?**
   - Yes: **Check the temperature before and after the internal recirculation pump.**
   - No: **Replace the pump.**

9. **Is there air in the system?**
   - Yes: **Turn off the unit. By using T&P valve, bleed out the air in the unit.**
   - No: **Check the temperature before and after the internal recirculation pump.**

10. **Resistance is as per the table?**
    - Yes: **Replace the Overheat sensor.**
    - No: **Disconnector the harness at J3 connector from the control board. Check the resistance between the two orange wires.**

11. **Wires damaged /corroded or no continuity?**
    - Yes: **Replace the wiring harness.**
    - No: **Is the check valve normal?**
      - Yes: **Inspect Solenoid valve. Check the direction of the solenoid valve installation.**
      - No: **Remove jammed check valve due to water not flowing through the unit.**

12. **Replace if damaged/plugged. Correct the direction ((For combi modes, arrow pointing right; for Pump models, arrow point left)).**

13. **Replace the Overheat sensor.**
    - No: **Install external recirculation pump.**

14. **Correct well water system.**
Flashing Icon

Unit is locked, Error Code has occurred. Refer to applicable error code resolution for the code that is present on the units.

To reset the water heater, press and hold the power button on the display or unplug unit and plug back in after 10 seconds.
Cascading Icon Flashing

Check connection data cables, are they damaged or unplugged?
- Yes: Reconnect cables and replace any damaged cables or connectors
- No: Set each unit with unique number (1-10) per manual

Go to cascading mode in each unit. Does each unit have a unique identifier set?
- Yes: Refer to manual for proper configuration
- No: Refer to manual for proper configuration

Are the DIP Switches for the end units set properly?
- Yes: Refer to manual for proper configuration
- No: Refer to Guide for that specific error code.

Are the DIP Switches for the non-end units set properly?
- Yes: Contact Authorized Service Personnel
- No: Refer to Guide for that specific error code.

Do any of the units show an error code?
- Yes: Contact Authorized Service Personnel
- No: Refer to Guide for that specific error code.
Recirculation Icon Flashing

(Pump Models Only)

Recirc Icon Flashing

Check to see if pump is rotating by touching or with pump rotation tester.

Yes → Contact Authorized Service Personnel

No → Inspect the pump wiring connections (J7). Are they damaged or unplugged?

Yes → Replace controller

No → Check J7 that there is 120V when the recirc icon is on.

Yes → Remove and inspect check valve on the line and inside pump. Is it normal?

Yes → Inspect solenoid valve. Is it damaged/plugged or installed backwards??

Yes → Correct direction (arrow pointing right-Combi, Left for Pump Model) and replace if damaged

No → Remove and inspect check valve due to water not flowing through unit.

No → Contact Authorized Service Personnel

Plug in or repair wiring & connections.

Combi Pump Model
Blank (Blue) / Illegible Display

Power Cycle the Unit. Is Display still blue/illegible?

Yes

Check the wiring at display end. Is it loose?

Yes

Plug in securely. Repeat power cycle of the unit.

No

Replace the Display

No

Is Display still blue/illegible?

Yes

Check the wiring at display end. Is it loose?

No

All OK
Breaker Tripped (Over-Load)

- **Breaker Tripped**
  - Review manual for breaker sizes. Are they size appropriately? [Yes/No]
  - Yes → Power down the unit. Unplug transformer, pump and blower. (J12, J7, J18)
    - Yes → Appropriately size the breakers per the manual
      - Yes → Replace transformer
      - No → Plug in transformer (J12), and power up unit did breaker trip?
        - Yes → Replace transformer
        - No → Plug in Pump (if present) (J7). Did breaker trip?
          - Yes → Replace pump
          - No → Plug in blower. (J18) Did Breaker trip?
            - Yes → Replace blower
            - No → Contact Authorized Service Personnel
Dead Unit - No Power Up

Unit is Dead - No Power Up

Is Unit plugged in?
  Yes
    Plug in Unit(s)
  No
    Is corresponding breaker tripped?
      Yes
        See Breaker tripped page
      No
        Check the power connection to the controller (J14). Is it loose or damaged?
          Yes
            Correct or replace power connection
          No
            Check the fuses on controller. Are they rated at 10A / 250V?
              Yes
                Are the fuses blown or damaged?
                  Yes
                    Replace Fuse and see Breaker Tripped page.
                  No
                    No
                      Replace with appropriate fuse
                No
            No
            Are Unit plugged in?
              Yes
                Is corresponding breaker tripped?
                  Yes
                    See Breaker tripped page
                  No
                    Correct or replace power connection
            No
              No
                Check the fuses on controller. Are they rated at 10A / 250V?
                  Yes
                    Are the fuses blown or damaged?
                      Yes
                        Replace Fuse and see Breaker Tripped page.
                      No
                        No
                          Contact Authorized Service Personnel
                  No
                No
                  No
                    No
                      Replace with appropriate fuse
No Hot Water

- **No Hot Water**
  - Open faucet, is the flow icon lit?
    - **No**
    - Open drain on bottom of unit is water flowing?
      - **No**
      - Check inlet strainer, is it plugged?
        - **No**
        - Is the inlet & outlet water connection piped correctly?
          - **No**
          - Repair piping to have proper inlet and outlet.
          - **Yes**
          - Remove water inlet valve. Inspect for debris or PTFE paste.
          - **Yes**
          - Blow on valve to hear for movement of turbine?
            - **No**
            - Replace valve
            - **Yes**
            - Is there debris?
              - **No**
              - Clear out debris
              - **Yes**
            - Contact Authorized Service Personnel

- **Yes**
  - Repair or replace check valve
Rough Ignition

Check HV cable. Is it unplugged or damaged?

Check the emissions. Are they within specs?

Check the static gas pressure. Is it within specs?

Check with gas company about the caloric value of gas value is within limit (975-1050)?

Contact Authorized Service Personnel

Nat. Gas or LP?

Has unit been converted to LP per manual?

Replace or plug in HV cable

Gas lines and/or regulators inadequate. Please correct.

Retune gas valve to set emissions to specs.

See manual and convert.
Rumbling

Unit is Rumbling

Verify the intake & exhaust is installed per specification?

- No: Install according to manual instructions
- Yes: Check the CO₂ is within specs.

Is the vent length less than 5 ft?

- No: Contact Authorized Service Personnel
- Yes: Add an elbow or reducer to bring effective length to over 10 ft.

Set the CO₂ level within table below

**CO₂ and CO Standards**

<table>
<thead>
<tr>
<th>Description</th>
<th>CO₂ Range (%)</th>
<th>Max. CO Level (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Gas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Fire</td>
<td>9.1% to 9.3%</td>
<td>&lt; 200 ppm</td>
</tr>
<tr>
<td>Low Fire</td>
<td>9.0% to 9.2%</td>
<td>&lt; 60 ppm</td>
</tr>
<tr>
<td><strong>LP Gas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Fire</td>
<td>9.0% to 9.8%</td>
<td>&lt; 200 ppm</td>
</tr>
<tr>
<td>Low Fire</td>
<td>8.6% to 8.9%</td>
<td>&lt; 60 ppm</td>
</tr>
</tbody>
</table>
Water Leaks

Water Leak (internal)

Remove cover and inspect to locate leak.

Is the leak spotty and located under the casting?

Yes → Contact Authorized Service Personnel

No → Shut off the inlet & outlet and open an fixture to release pressure in system.

Check the internal water lines. Identify location of leaks.

Refer to Serviceable parts diagrams in manual.

Remove and disassemble leaking/damaged part.

Inspect part and O-ring for damage. Repair or replace as needed.

Contact Authorized Service Personnel
BLOWER REPLACEMENT (See Diagram, page 23)

The blower is located on the top of the heat exchanger
- Shut off the gas to the heater
- Shut off power to the heater by unplugging the unit from the 120 VAC outlet
- remove the front panel (three screws at top and three at bottom)
- Unplug the display cable from the pcb (press plastic tab and pull)
- lift up and remove the front display bracket
- Unplug all the wiring connections from the blower (press the tabs and pull)
- remove the gas valve wiring located behind the blower
- Unplug the HV cable from the DSI
- Remove the gas connection at the top isolating the unit's gas supply from the building
- remove phillips screws to remove the aluminum gas fitting at the top the unit
- remove 4 allen screws to remove the aluminum gas adapter fitting
- remove two plastic taps on top of the cabinet to access the screws securing the blower
- remove 4 screws securing the blower from the top using a long screwdriver
- remove the entire blower gas valve assembly from the unit
- remove the gas valve 3 torx screws
- install the gas valve on the new blower
- reverse process to assemble the blower back to the heater
- ensure the gasket is installed between the blower and the top housing
- Install the blower gas valve using 4 screws and a long screw driver
- Install the aluminum gas adapter on top of the gas valve
- Install the gas fitting and secure it using 4 screws to the cabinet
- Install the building gas supply
- Install the blower wiring, HV cable and gas valve wiring
- turn gas supply back on and check for any gas leaks
- turn water on and plug the heater to the outlet
GAS VALVE REPLACEMENT (See Diagram, page 23)

The blower gas valve assembly is located on the top of the heat exchanger

- Shut off the gas to the heater
- Shut off power to the heater by unplugging the unit from the 120 VAC outlet
- remove the front panel (three screws at top and three at bottom)
- Unplug the display cable from the pcb (press plastic tab and pull)
- lift up and remove the front display bracket
- Unplug all the wiring connections from the blower (press the tabs and pull)
- remove the gas valve wiring located behind the blower
- Unplug the HV cable from the DSI
- Remove the gas connection at the top isolating the unit's gas supply from the building
- remove phillips screws to remove the aluminum gas fitting at the top the unit
- remove 4 allen screws to remove the aluminum gas adapter fitting
- remove two plastic taps on top of the cabinet to access the screws securing the blower
- remove 4 screws securing the blower from the top using a long screwdriver
- remove the entire blower gas valve assembly from the unit
- remove the gas valve 3 torx screws
- install the new gas valve on the blower 3 torx screws
- reverse process to assemble the blower back to the heater
- ensure the gasket is installed between the blower and the top housing
- Install the blower gas valve using 4 screws and a long screw driver
- Install the aluminum gas adapter on top of the gas valve (ensure the o-ring is in place)
- Install the gas fitting and secure it using 4 screws to the cabinet
- Install the building gas supply
- Install the blower wiring, HV cable and gas valve wiring
- turn gas supply back on and check for any gas leaks
- turn water on and plug the heater to the outlet
ELECTRODE REPLACEMENT

The electrode is located on the top of the heat exchanger
- Shut off the gas to the heater
- Shut off power to the heater by unplugging the unit from the 120 VAC outlet
- remove the front panel (three screws at top and three at bottom)
- Unplug the display cable from the pcb (press plastic tab and pull)
- lift up and remove the front display bracket
- Unplug the HV cable from the electrode
- Unplug the electrode connection from the controller at connection E12
- Remove the 2 screws & washers securing the electrode
- Remove electrode from HEX assembly.
- Insert new electrode into the HEX assembly, careful to use new probe hole seal
- Fasten the electrode with the 2 screws with washers. Verify that the yellow/green wire is attached beneath the right hand screw.
- Connect the electrode to the controller at connection E12
- Connect the HV cable to the electrode
- turn gas supply back on
- turn water on and plug the heater to the outlet
Wiring Diagram (all floor-mount units)
Gas Valve

Blue Gray 120V AC
Gas Valve

Hi-Fire uses flat screwdriver. Low-fire uses T20 Torx screwdriver.
Resettable overheat switch
Resettable overheat switch
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- Error code (if any) or other problem with the unit