TROUBLESHOOTING GUIDE
(for all Gen II units)

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

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), press 1
- Email: support@intellihot.com

When contacting Technical Support, please have the following information ready:

- Model Number
- Serial Number
- Date Purchased/Installed
- Installation location & application
# Table of Contents

Air Filter Blocked Alert ............................................................................................................. 3  
Blocked Flue Fault ..................................................................................................................... 4  
Blower Speed Fault ................................................................................................................... 5  
Breaker Tripped (Over-Load) .................................................................................................... 6  
Cascading Fault ....................................................................................................................... 7  
Dead Unit – No Power Up ......................................................................................................... 8  
Flue Overheat Fault ................................................................................................................. 9  
Heat Exchanger Overheat ......................................................................................................... 10  
Ignition Fault ............................................................................................................................ 11  
Pump Fault .................................................................................................................................. 14  
Rough Ignition ........................................................................................................................... 15  
Rumbling ...................................................................................................................................... 16  
Sensor Fault ............................................................................................................................... 17  
Sensor Open ............................................................................................................................... 17  
Water Valve Fault ..................................................................................................................... 18  

## Appendix

Blower Replacement .................................................................................................................... 19  
Gas Valve Replacement ............................................................................................................. 20  
Electrode Replacement ............................................................................................................. 22  
Controller Pin Layout ................................................................................................................ 23  
Wiring Diagram (Wall-Hung) .................................................................................................... 23  
Wiring Diagram (Floor-Standing) ............................................................................................. 24  
Gas Valve Detail ......................................................................................................................... 25  
Resettable Overheat Switch .................................................................................................... 27
Suggested Tool List

- Digital Manometer
- Electrical Multimeter
- Flue Gas Analyzer (for NOx & CO₂)
- 7mm Socket/Ratchet
- #1 & #2 Phillips Screwdrivers
- Instrument Flat Blade Screwdriver
- Pliers
- Adjustable Wrench
Air Filter Blocked Alert

- Is the Intake air ducted from the outside? [No] → Inspect intake air filter → Is there debris/dirt? [No] → Is the filter damaged? [No] → Contact Authorized Service Personnel

- Is there a blockage at the intake termination?
  - Yes → Remove blockage and install screens
  - No → Inspect intake air filter → Is there debris/dirt? [Yes] → Clean filter per the manual
  - No → Is the filter damaged? [Yes] → Replace Filter

- No → Contact Authorized Service Personnel
Blocked Flue Fault

1. Check exhaust termination. Is it blocked?
   - No: Turn off gas and remove condensate line. Remove the condensate tube/input trap. Is it blocked?
     - Yes: Remove blockage and install screens if not installed
     - No: Are the drain hoses sloped away from the unit?
       - No: Slope drain per manual
       - Yes: Check for double loops, air locks or debris in loop
   - Yes: Check Air switch wiring (green/black). Is it loose?
     - Yes: Repair faulty wiring at air switch
     - No: Correct piping per manual specs
2. Is vent piping sized (diameter & total length and installed per manual)?
   - Yes: Contact Authorized Service Personnel
   - No:
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.
  - **Measures 120V AC?**
    - Yes: Replace the blower.
    - No: Check fuse. Is it blown?
      - Yes: Replace the fuse.
      - No: Replace the Control board.

- **Check the blower for damages, broken vanes etc. Replace the blower.**
  - **Is the blower noisy?**
    - Yes: Shut down the unit and disconnect the J18 connector. 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).
      - **Is the voltage reads between 10-90% of 24V DC?**
        - Yes: Replace the control board.
        - No: Replace the control board.
Breaker Tripped (Over-Load)

Breaker Tripped

Review manual for breaker sizes. Are they size appropriately?

Yes → Power down the unit. Unplug transformer, pump and blower. (J12, J7, J18)

No → Appropriately size the breakers per the manual

Plug in transformer (J12), and power up unit did breaker trip?

No → Replace transformer

Yes → Plug in Pump (if present) (J7). Did breaker trip?

No → Replace pump

Yes → Plug in blower, (J18) Did Breaker trip?

No → Replace blower

Yes → Contact Authorized Service Personnel
Cascading Fault

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, 2, ...) 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: Are the DIP Switches for the end units set properly?

Are the DIP Switches for the end units set properly?

- Yes: Refer to manual for proper configuration
- No: Are the DIP Switches for the non-end units set properly?

Are the DIP Switches for the non-end units set properly?

- Yes: Refer to Guide for that specific error code.
- No: Do any of the units show an error code?

- Yes: Contact Authorized Service Personnel
- No: Refer to manual for proper configuration
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: Contact Authorized Service Personnel  
      - No: Replace with appropriate fuse  

Is corresponding breaker tripped?  
- Yes: See Breaker tripped page  
- No: Is the corresponding breaker tripped?  
  - Yes: Replace with appropriate fuse  
  - 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: Contact Authorized Service Personnel  
    - No: Replace with appropriate fuse
Flue Overheat Fault

- Flue overheated fault
  - Is the Inlet/return temp >157°F?
    - Yes
      - Install proper approved venting material
    - No
      - Is the venting material CPVC, PP, or SS?
        - Yes
        - Check resistance of appropriate temperature sensor. Is it faulty?
          - Yes
            - Contact Authorized service personnel
          - No
            - Refer to Flue Sensor fault for guidance
        - No
          - 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 Polypropylene.
Heat Exchanger Outlet Temperature Exceeded

1. **On a well water system?**
   - Yes
   - No
     - **Correct well water system**

2. **Is pressure within 30 - 150 psi?**
   - Yes
   - No
     - **Wallhung model or floor model?**
       - Yes
         - **Check the temperature before and after the pumps.**
       - No
         - **Install external recirculation pump**

3. **Is there an external recirculation pump?**
   - Yes
   - No
     - **Wallhung**
       - **Is there air in the system?**
         - Yes
           - **Turn off the unit. By using T&P valve, bleed out the air in the unit.**
         - No
           - **In the control board, disconnect the J3 connector. Check the orange wires for damage, corrosion and perform continuity from the orange wire to sensor.**
             - **Wires damaged / corroded or no continuity?**
               - Yes
                 - **Replace the wiring harness**
               - No
                 - **No**

4. **Replace the Overheat sensor.**

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

   - **Check for scale buildup. Contact authorized service personnel**

   - **Check resistance between the two orange wires**
     - **No**
     - **Yes**

Ignition Failure

- 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.
  - Still E7/Ignition Failure error?
    - Yes
      - By using the display, restart the unit.
    - No
      - Check internal & external recirculation pump. End

- New install or existing install for more than 6 months?
  - New Install
    - Natural Gas (NG) or Liquid Propane (LP)?
      - Natural Gas
        - Are the regulators & gas lines sized for loads?
          - Yes
            - Check the static gas pressure at the gas valve. Is it within specs?
          - No
            - Size gas lines and regulators for max BTU/h requirements
      - Liquid Propane
        - LP conversion completed?
          - Yes
            - Complete the conversion as per the manual
          - No
            - Size gas lines and regulators for max BTU/h requirements
  - Existing Install
    - By using the display, restart the unit.

- Yes
Is the flame visible for 5 seconds or less?

Yes: flame stays less than 5 seconds

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.

Is the flame orange in color?

Yes: 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.

No: 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%.

Does the flame stay lit?

Yes: For wall hung, replace electrode. For floor model, replace the flame sensor wire.

No: Replace DSI & high voltage cable

Replace the control board

Damaged flame sensor wire?

Yes: Replace the DSI and High Voltage cable

No: Replace the control board

Is the Control Board RED LED?

Yes: Replace the DSI and High Voltage cable

No: Replace the control board
Pump Alert

Is there a GREEN LED on the
Fix wiring or replace the fuse.

Check to see if the pump is rotating by using Grundfos pump checker or by

Bad pump?
Yes Replace the pump.

Is there air in the system?
Yes Bleed the air by using the Pump Bleed Screw.

Check the flow rate at the unit. Open faucets & showers to increase the flow.

Is the flow rate less than 2 gpm?
No Contact Authorized Service Personnel

Set staging OFF (Settings->cascading)

Close the hot water outlet to the unit. Wait for 2 minutes. Check Flow rate at each HEX. Normally, the flow rate is more than 4 gpm.

Any HEX with less than 3 GPM flow
Yes Blockage inside the Heat exchanger such as scale buildup.

For each HEX, connect a garden hose to the cold water connection at the bottom and make sure the other end of the hose goes to drain.

3 GPM or more flow going through the hose?
No Blockage in the Silver cold water pipe. Drain the unit

Yes Close the drain ball valve. Remove the garden hose. Close the hot water outlet ball valve at the top of the HEX. Open the T&P valve.

3 GPM or more flow going through?
No Blockage or scale buildup in the heat exchanger.

Yes

Any more HEX with low flow

No

End

Yes

No

Contact Authorized Service Personnel

Yes

No

End
Rough Ignition

1. Nat. Gas or LP?
   - Yes: Go to step 2.
   - No: See manual and convert.

2. Has unit been converted to LP per manual?
   - Yes: Go to step 3.
   - No: Retune gas valve to set emissions to specs.

3. Check HV cable. Is it unplugged or damaged?
   - Yes: Replace or plug in HV cable.
   - No: Check the static gas pressure. Is it within specs?

4. Check the static gas pressure. Is it within specs?
   - Yes: Go to step 5.
   - No: Gas lines and/or regulators inadequate. Please correct.

5. Check the emissions. Are they within specs?
   - Yes: Go to step 6.
   - No: Check with gas company about the caloric value of gas value is within limit (975-1050)?

6. Check with gas company about the caloric value of gas value is within limit (975-1050)?
   - Yes: Contact Authorized Service Personnel.
   - No: Retune gas valve to set emissions to specs.
Rumbling

Unit is Rumbling

Verify the intake & exhaust is installed per specification?

Yes

Check the CO₂ is within specs.

No

Contact Authorized Service Personnel

No

Install according to manual instructions

Yes

Is the vent length less than 5 ft?

No

Add an elbow or reducer to bring effective length to over 10 ft.

Yes

Set the CO₂ level within table below

<table>
<thead>
<tr>
<th>CO₂ and CO₂ Standards</th>
<th>Description</th>
<th>CO₂ Range (ppm)</th>
<th>Max. CO₂ Level (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas</td>
<td>High Heat</td>
<td>65% to 85%</td>
<td>≤ 200 ppm</td>
</tr>
<tr>
<td></td>
<td>Low Heat</td>
<td>65% to 85%</td>
<td>≤ 100 ppm</td>
</tr>
<tr>
<td></td>
<td>High Risk</td>
<td>65% to 85%</td>
<td>≤ 200 ppm</td>
</tr>
<tr>
<td></td>
<td>Low Risk</td>
<td>65% to 85%</td>
<td>≤ 100 ppm</td>
</tr>
<tr>
<td></td>
<td>LP Gas</td>
<td>65% to 85%</td>
<td>≤ 200 ppm</td>
</tr>
</tbody>
</table>
Inlet, Outlet, Heat Exchanger overheat or Flue Sensor Open
Inlet, Outlet, Heat Exchanger overheat or Flue Sensor Fault

**Wire color table:**
- Overheat Sensor - Heat exchanger water outlet temperature sensor (orange wire)
- Flue Sensor - Flue temperature sensor (gray wire)
- Inlet Sensor - Inlet water temperature sensor (blue wire)
- Outlet Sensor - Hot water outlet temperature sensor (green wire)

<table>
<thead>
<tr>
<th>Sensor (color wires)</th>
<th>Temperature (°F)</th>
<th>Sensor Resistance (KΩ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overheat (orange)</td>
<td>50</td>
<td>18</td>
</tr>
<tr>
<td>Flue (gray)</td>
<td>77</td>
<td>10</td>
</tr>
<tr>
<td>Inlet (blue)</td>
<td>140</td>
<td>3</td>
</tr>
</tbody>
</table>

In the control board, disconnect the J3 connector. Check the corresponding color wire for damage, corrosion, and perform continuity from the corresponding color 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.
  - Resistance as per the table?
    - Yes: Contact authorized service personnel
    - No: Replace the Overheat sensor.

- Yes
  - Replace the wiring harness
Water Valve Fault

If floor model, are all HEXes giving water valve alert?

No

Set staging OFF (Settings->cascading)

Shut down the unit by using touch screen. Power down the unit using the power switch (or unplug power cable), wait for 15 seconds and reboot again.

Is the water valve alert back within 15 minutes of reboot?

No, error is random

Check the total flow rate to the HEX (floor mount) or to the unit (wall-hung). Increase the flow by opening showers, faucets etc.

Is flow less than 1 gpm?

Yes

Contact Authorized Service Personnel

No

Check the silver cold water inlet pipe for blockage or ice buildup.

Found issues with Silver cold water inlet pipe?

Yes

Clear the silver cold water pipe blockage.

For wall-hung, close the hot water ball-valve outside the unit. For floor units, close the hot water outlet valve at the HEX.

Open the T&P valve. Check the flow rate at the drain outlet as well as on the display screen.

Do you see flow of more than 3 gpm steadily?

Yes

Contact Authorized Service Personnel

No

Blockage inside the Heat exchanger such as scale buildup.

Contact Authorized Service Personnel

Wall

Floor

Wall-hung?

Floor

Different HEX

Same HEX

Error on the same HEX?

Replace the water valve

No

Floor Model or Wall-hung?

Power down the unit by using the power switch or unplugging the power cable (this will ensure the water valve open). Close the outlet & inlet water to the unit. Drain the water out of the unit. Check and Clean the Y-strainer

Blow on the water valve inlet side. Do you hear the movement of the turbine?

Yes

Inspect wiring for valve and flow sensor.

No

Is wiring damaged or loose?

Yes

Replace appropriate wiring harness

No

Replace the water valve

Contact Authorized Service Personnel

Is flow less than 1 gpm?

Yes

Contact Authorized Service Personnel

No

Is wiring damaged or loose?

Yes

Replace appropriate wiring harness

No

Contact Authorized Service Personnel

Error on the same HEX?

Replace the water valve

Yes

Blow on the water valve inlet side. Do you hear the movement of the turbine?

No

Inspect wiring for valve and flow sensor.
BLOWER REPLACEMENT (See Diagram, page 20)

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 20)

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
Controller Pin Layout

Wiring Diagram (all wall-hung units)
Wiring Diagram (all floor-standing units)
Gas Valve

Blue Gray 120V AC
Hi-Fire uses flat screwdriver. Low-fire uses T20 Torx screwdriver.
Resettable overheat switch
Resettable overheat switch