

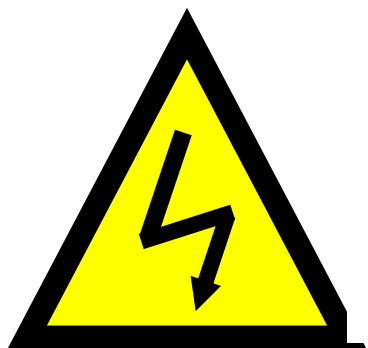


# H100 Induced Draft Heater Troubleshooting Guide



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# Safety

**Warning**



## High Voltage Electrocution Hazard

***Read and follow all instructions in the service and installation manual and on the equipment. Failure to follow instructions can cause severe injury and/or death.***

Hazardous voltage can shock, burn, cause serious injury and or death. To reduce the risk of electrocution and or electric shock hazards:

- Only qualified technicians should attempt repairs.
  - Replace damaged wiring immediately.
- Insure Heater is properly grounded and bonded.

# Normal Sequence of Operation

Below are the processes the heater goes through during normal sequence of operation.

1. 120 VAC supplied to heater
2. Neutral leg goes to one side of blower motor, gas valve and ignition module. Hot leg path is as follows:
3. Panel interlock switch (door closed) or ON/Off Switch, if equipped.
4. Thermostat (calling for heat)
5. Water pressure switch(pumps running-N/O held closed)
6. Low speed contacts of 2-speed fan motor switch.
7. Fan energizes on low speed.
8. Temp. Limit switches (N/C)
9. Air pressure switch (proves the blower is functioning. N/O held closed)
10. Control module sends spark to igniter
11. Control module sends 120 VAC to gas valve
12. Gas valve energizes
13. Spark ignites gas
14. Flame sensor rectifies presence of flame through ground potential
15. Control module recognizes flame
16. Heat from burners changes position of fan speed contacts.
17. Fan operates at high speed.
18. Rectification and continues to energize gas valve until t-stat is satisfied.
19. When temperature reached, the thermostat opens up
20. Electrical path is opened at thermostat
21. Blower shuts down.
22. Gas valve de-energizes
23. T-stat calls for heat
24. Process repeats.



# Heater Does Not Ignite- Water Flow

**Note:** Water flow rate to the pool must be between 20 and 70 gpm for the heater to operate.

Step 1: Ensure circulation pump is running.  
For multi-speed pumps, make sure the pump is in high speed. If correct, proceed to Step 2.

Step 2: Check for dirty filter, skimmer baskets, and pump strainer basket. Clean as needed. If okay, proceed to Step 3.

Step 3: Hold your hand over one of the water return outlets on the pool or spa wall to reduce the flow of water coming back. If the heater blower comes on, and then shuts off when you remove your hand, a smaller eyeball fitting is needed for the return outlet. If not resolved, continue to Step 4.

Step 4: Verify the flowrate coming to the heater by use of a flowmeter. Changes may be required to the pump and/or plumbing configuration.



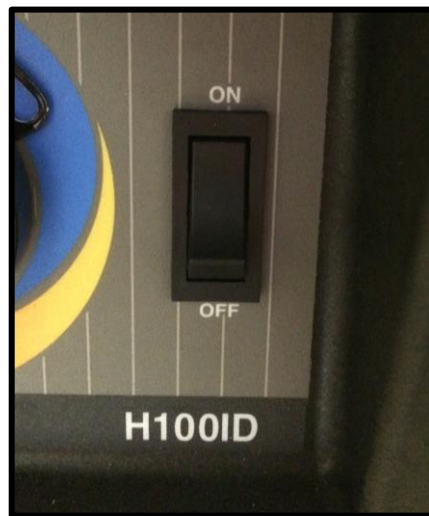
# Heater Does Not Ignite- Blower Does Not Come On

**Note:** For the following steps, place one Multimeter lead on the White wire terminal of the Gas Valve, Blower terminal, or Transformer (if equipped) and leave it there while troubleshooting. Both of these locations are Neutral or Common potential.

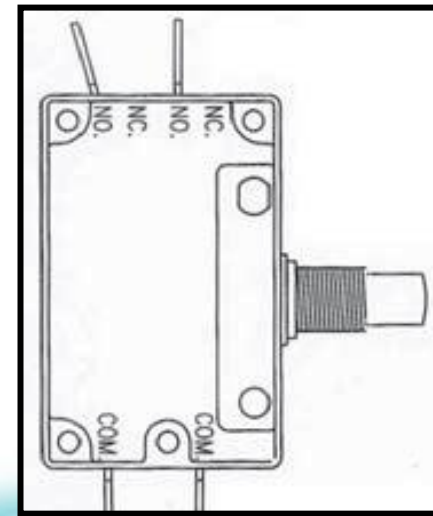
Models manufactured before December 2011 have an Interlock Switch for the Front Access Door. These models do not have an On/Off Switch.

Models manufactured after December 2011 will have an On/Off Switch, instead of the Interlock Switch.

On/Off Switch



Interlock Switch

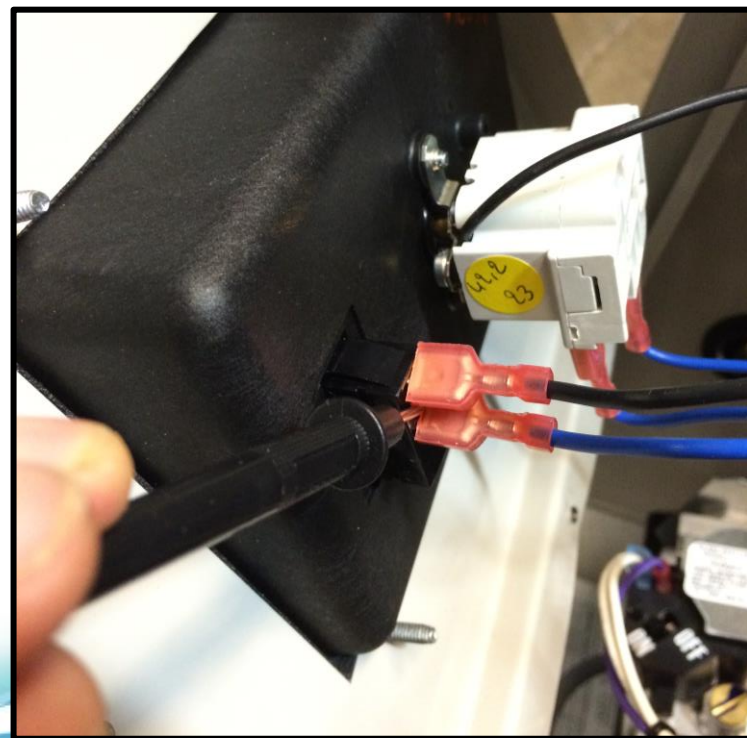


# Heater Does Not Ignite- Blower Does Not Come On

**Step 1:** Verify field supply power of 120 VAC (+/- 10%) at the Black Wire terminal of the Interlock Switch or the On/Off Switch if equipped. If not present, correct incoming power. If okay, proceed to Step 2.



**Step 2:** Verify Interlock Switch is depressed, or On/Off Switch is in the On position, and measure for 120 VAC at Blue wire terminal of Switch. If voltage is not present, replace the Switch. Otherwise, proceed to Step 3.



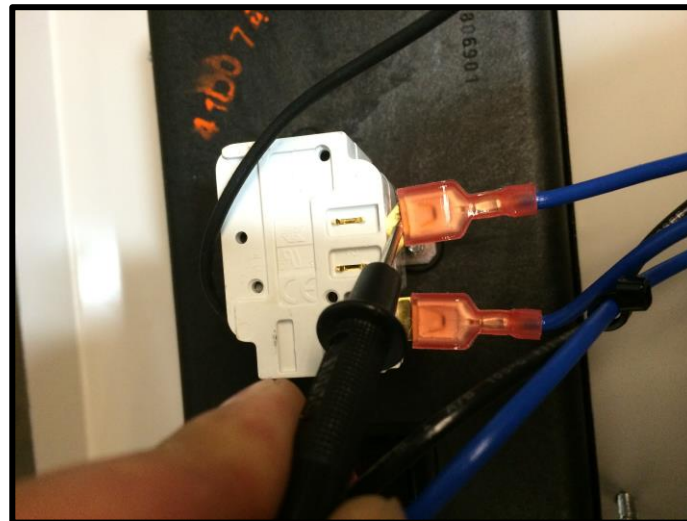


# Heater Does Not Ignite- Blower Does Not Come On

**Step 3:** Ensure Thermostat set point is higher then pool or spa water temperature. If okay, proceed to Step 4.



**Step 4:** Check for 120 VAC at the Blue wire terminal of Thermostat (one coming from Interlock Switch or On/Off Switch). If voltage is not present, replace Wire Harness. Otherwise, proceed to Step 5.





# Heater Does Not Ignite- Blower Does Not Come On

**Step 5:** Check for 120 VAC at Blue wire terminal of Thermostat (one going to Water Pressure Switch). If voltage is not present, replace the Thermostat, otherwise proceed to Step 6.



**Step 6:** Check for 120 VAC at the single Blue wire terminal of Water Pressure Switch. If no voltage, replace wire harness. Otherwise, proceed to Step 7.

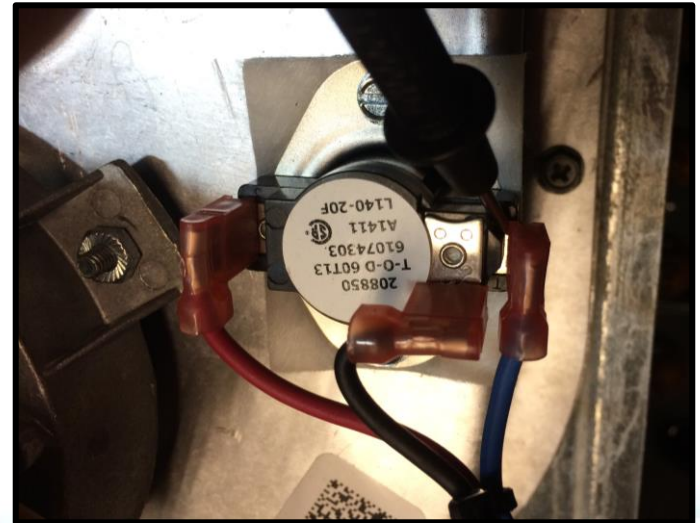


# Heater Does Not Ignite- Blower Does Not Come On

**Step 7:** Check for 120 VAC at Blue/Red wire terminal of Water Pressure Switch. If voltage not present, and flowrate is adequate through the Heat Exchanger, replace Water Pressure Switch. Otherwise, proceed to Step 8.

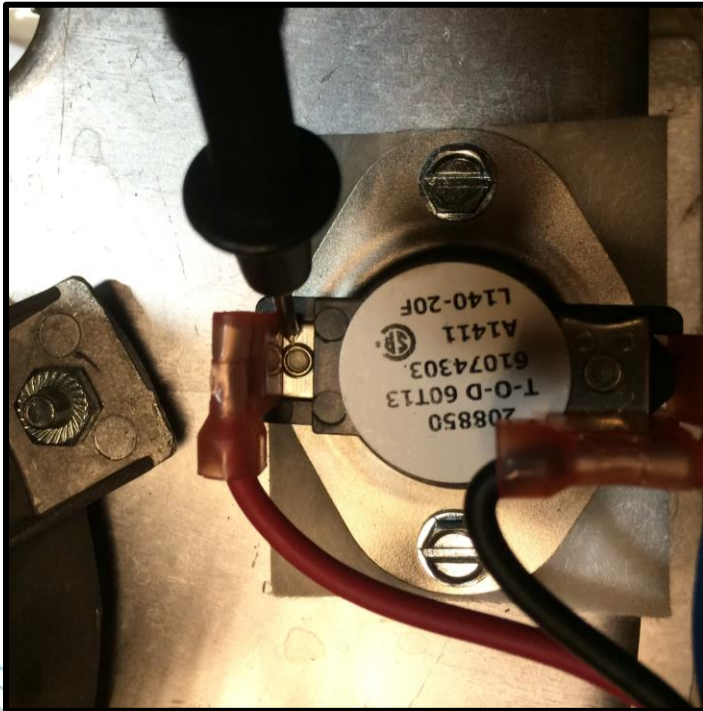


**Step 8:** Check for 120VAC at Blue wire terminal of Blower Switch. If voltage is not present, replace the wire harness. Otherwise, proceed to Step 9.



# Heater Does Not Ignite- Blower Does Not Come On

**Step 9:** Check for 120 VAC at the Red wire terminal of Blower Switch. If voltage is not present, replace the Blower Switch. If voltage is present, replace Blower

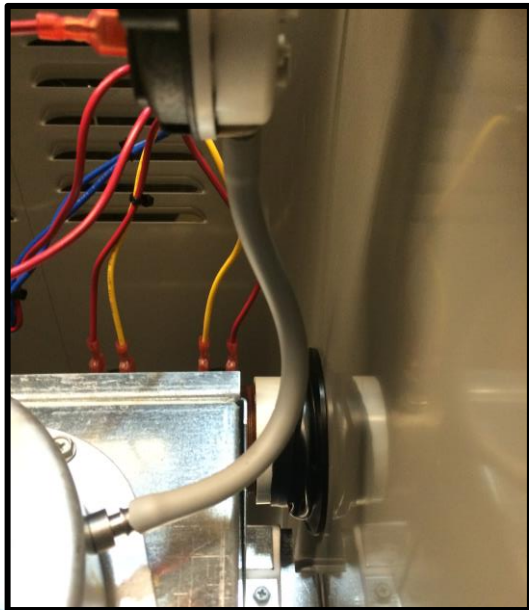




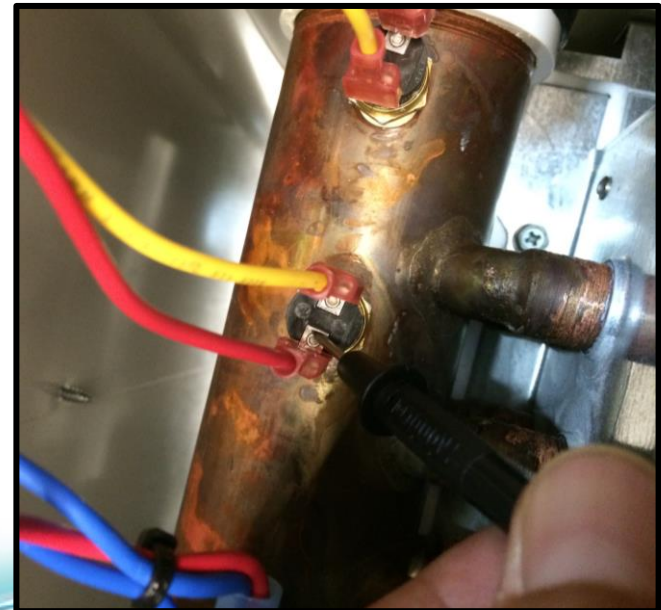
# Heater Does Not Ignite- Blower Comes On

**Note:** For the following steps, place one Multimeter lead on the White wire terminal of the Gas Valve, Blower terminal, or Transformer (if equipped), and leave it there while troubleshooting. Both of these locations are Neutral or Common potential.

**Step 1:** Check the vacuum hose tubing and make sure it's securely fastened to the Blower and the Air Pressure Switch and make sure no holes or cracks are in the hose.



**Step 2:** Place the other meter lead on the Red wire terminal of the High Limit Switch (the one coming from the Water Pressure Switch) and check for 120 VAC. If not present, replace Wire Harness. If okay, proceed to Step 3.



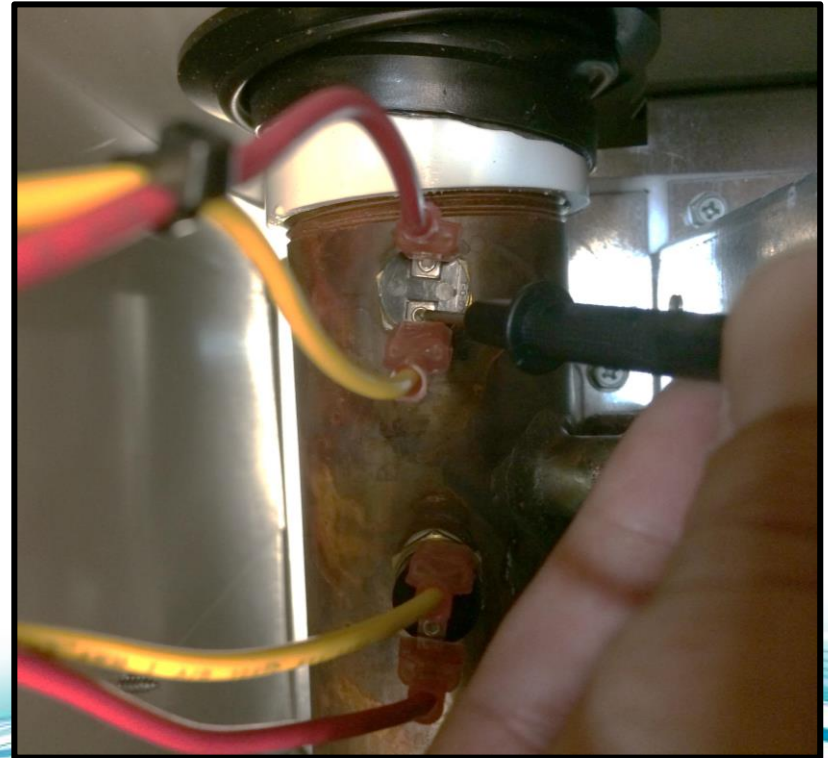


# Heater Does Not Ignite- Blower Comes On

**Step 3:** Place meter lead on the Yellow wire terminal of the first High Limit Switch and measure for 120 VAC. If voltage is not present, replace High Limit Switch. If present, proceed to Step 4.

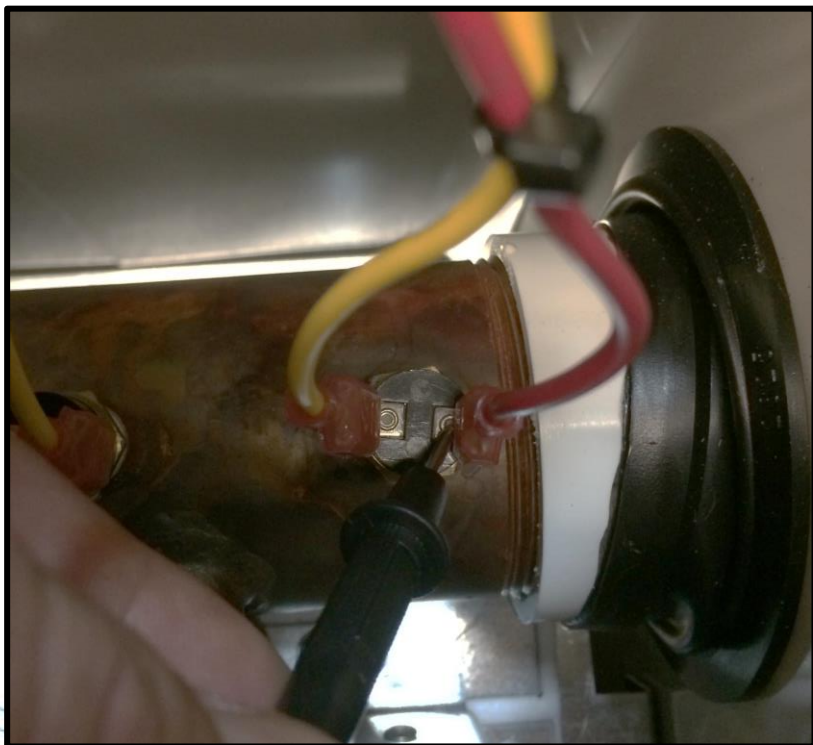


**Step 4:** Place meter lead on the Yellow wire terminal of the second High Limit Switch and measure for 120 VAC. If voltage is not present, replace Wire Harness. Otherwise, proceed to Step 5.

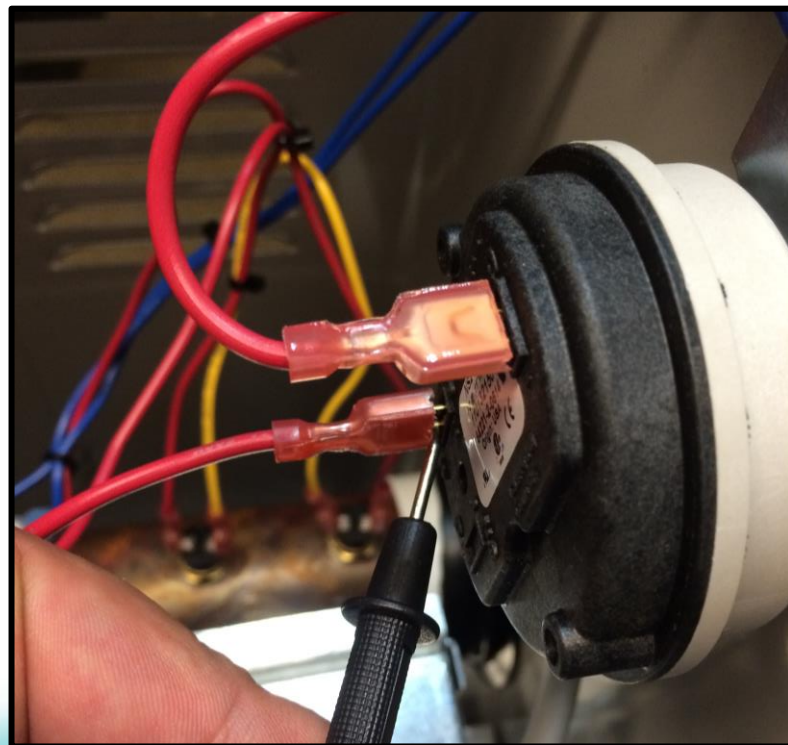


# Heater Does Not Ignite- Blower Comes On

**Step 5:** Check for 120 VAC on Red wire terminal of second High Limit Switch. If voltage is not present, replace High Limit Switch. Otherwise, proceed to Step 6.



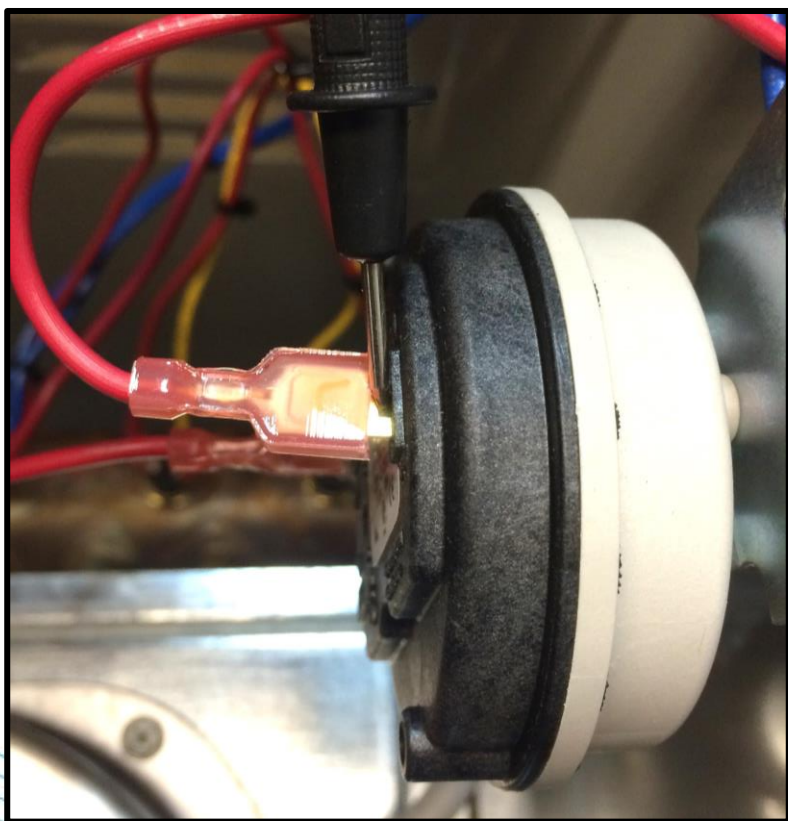
**Step 6:** Check for 120 VAC on Red wire terminal of Air Pressure Switch (wire coming from High Limit Switch). If voltage is not present, replace Wire Harness. Otherwise, proceed to Step 7.



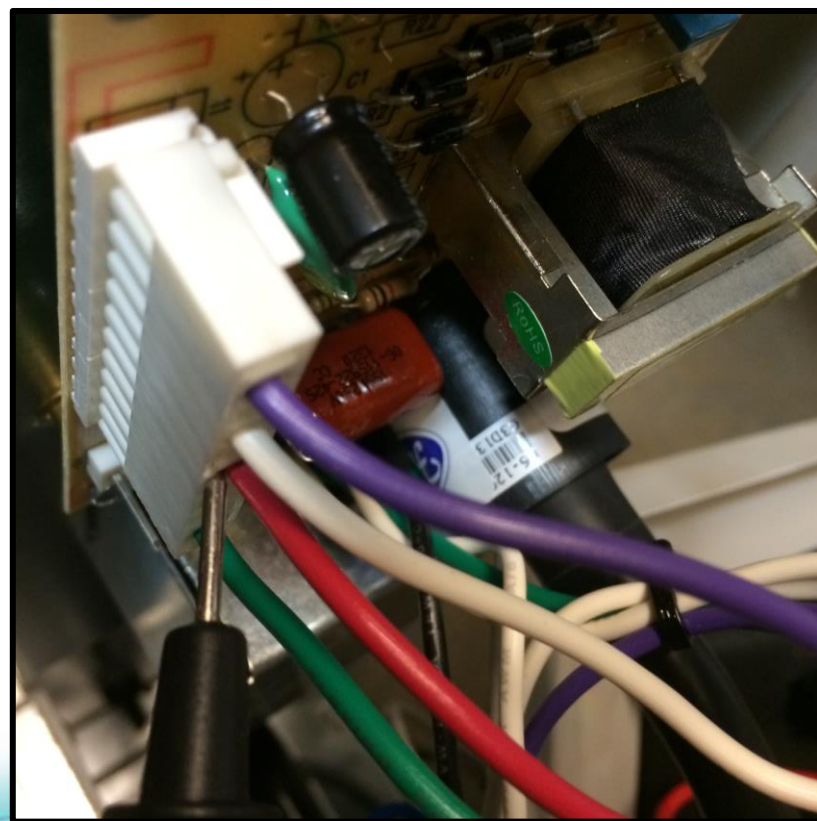


# Heater Does Not Ignite- Blower Comes On

**Step 7:** Check for 120 VAC on Red wire terminal of Air Pressure Switch (wire going to Ignition Module). If no voltage is present, replace Air Pressure Switch



**Step 8:** Check for 120 VAC on Red wire terminal of Ignition Module. If no voltage is present, replace Wire Harness. Otherwise, replace the Ignition Module.

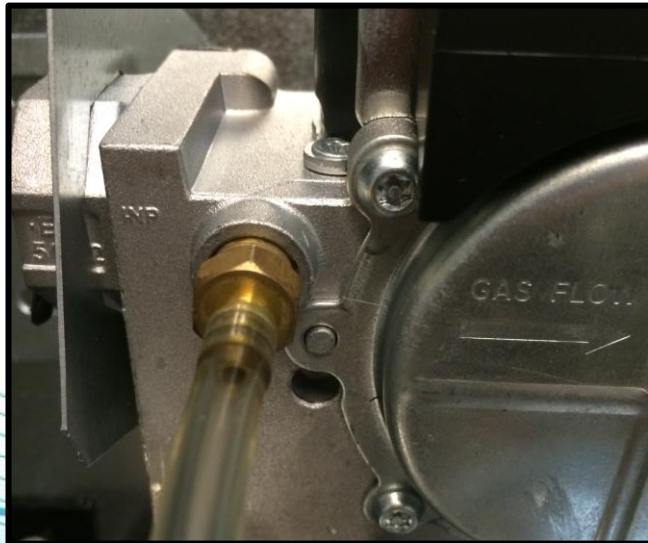


# Heater Does Not Ignite, But It Does Spark

**Step 1:** Using a manometer, determine the inlet gas pressure at the Gas Valve. The inlet gas pressure must not exceed 10.5" W.C. (water column pressure) for Natural gas or 13" W.C. for Propane gas.

The inlet gas pressure must not be below 3.0" W.C. for Natural gas and for Propane.

The heater may fail to operate at low inlet gas pressures. If the inlet gas pressure is too high or too low, the installer must contact the gas supplier and request that the inlet pressure to the heater be adjusted.



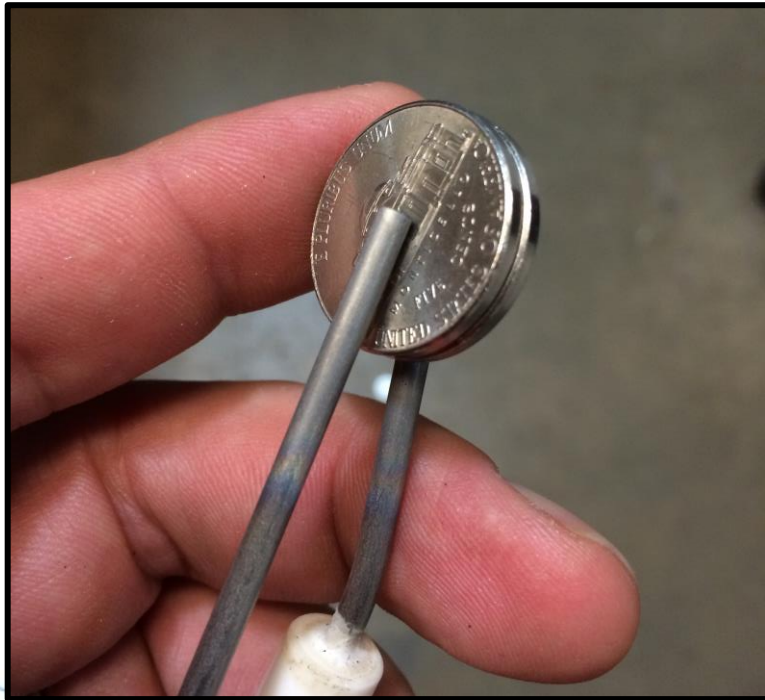
**Step 2:** Make sure Gas Valve is On. Using a manometer, determine the gas operating pressure. Manifold pressure for both natural and propane gas is 2.0" W.C. The gas valve is preset to operate at this pressure, no adjustment is necessary.





# Heater Does Not Ignite, But It Does Spark

**Step 3:** Check gap of Igniter. The gap between the tips should be the width of two nickels. Also check the ceramic and wire of Igniter for damage. If not in tact, replace the Igniter. Otherwise, proceed to Step 4.



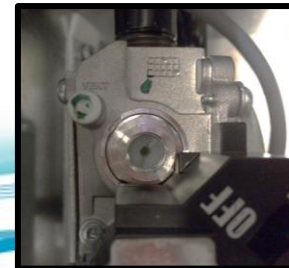
**Step 4:** Measure for 120 VAC at Gas Valve by placing a meter lead on each terminal. With the unit calling for heat (sparking) you should read 120 VAC. If not, replace the Ignition Module. Otherwise, replace the Gas Valve.



# Heater Ignites, But Goes Off When Blower Goes To High Speed

**Step 1:** Verify gas pressures ( Page XX).  
Adjust if needed, otherwise proceed to  
Step 2.

**Step 2:** If Propane model, you may need a  
different Air Orifice Bracket (IDXA0B1931) or  
Manifold gas pressure may need adjustment.  
Call Hayward Tech Service (908) 355-7995



# Control Module Red Light

Beginning with serial #21131310101204001, the H100 Control Module has a red light that identifies normal operation, or if a fault has been detected. The chart below explains what the various light conditions mean.

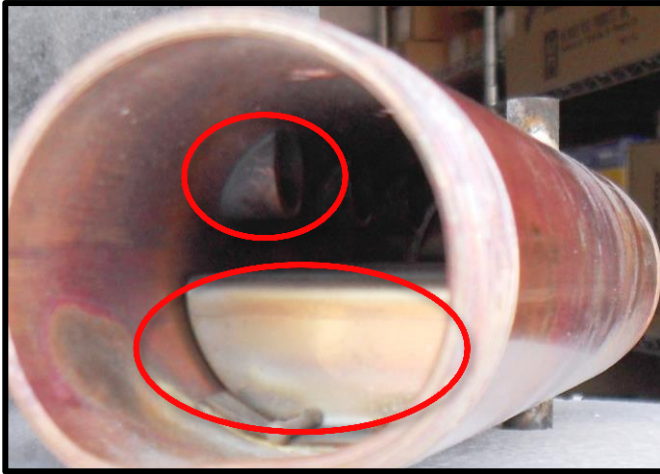


H100 Control Module Trouble Lights			
Light	Meaning	Issue	Remedies
Blinks once for 1 second then goes off	Normal operation/ no issues		
Solid light	Internal control/module failure	Failure of control module	Replace module
2 Flashes	Flame fault	Flame sensed either in pre or post purge/ flame when there shouldn't be one	Check sensor grounding. Check gas valve. Should be closed. If flame is present with no voltage to valve replace valve. If no flame is present, but fault still appears, replace module
3 Flashes	Ignition Lockout Fault	Heater did not fire on call for heat	Check heater using attached troubleshooting guide

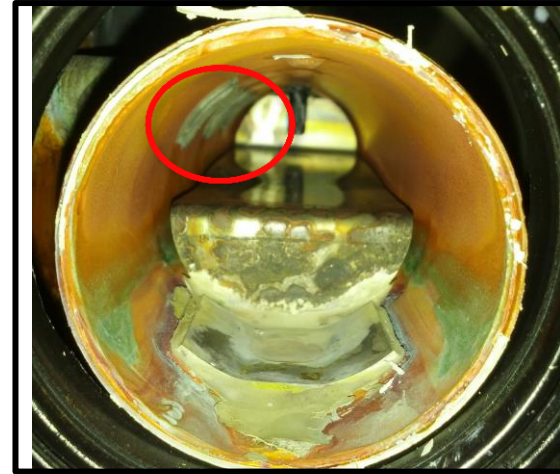


# Heat Exchanger- Failure Modes

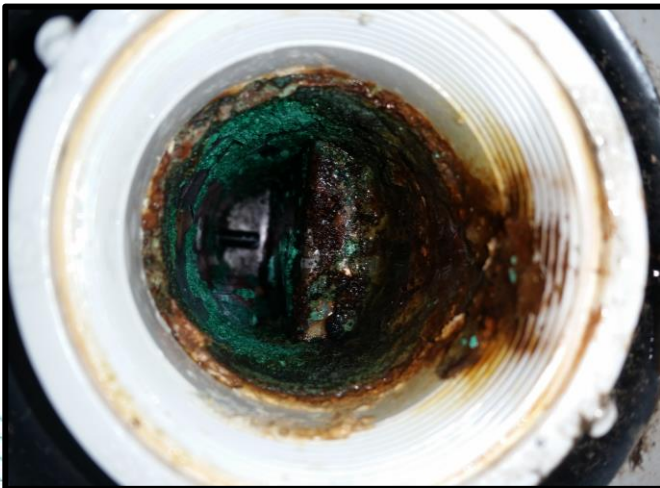
New Heat Exchanger- Full tube ends & bypass intact.



Low pH damage- no tube ends remain



High Sanitizer levels



High Sanitizer levels and/or low pH-damaged tubes & bypass

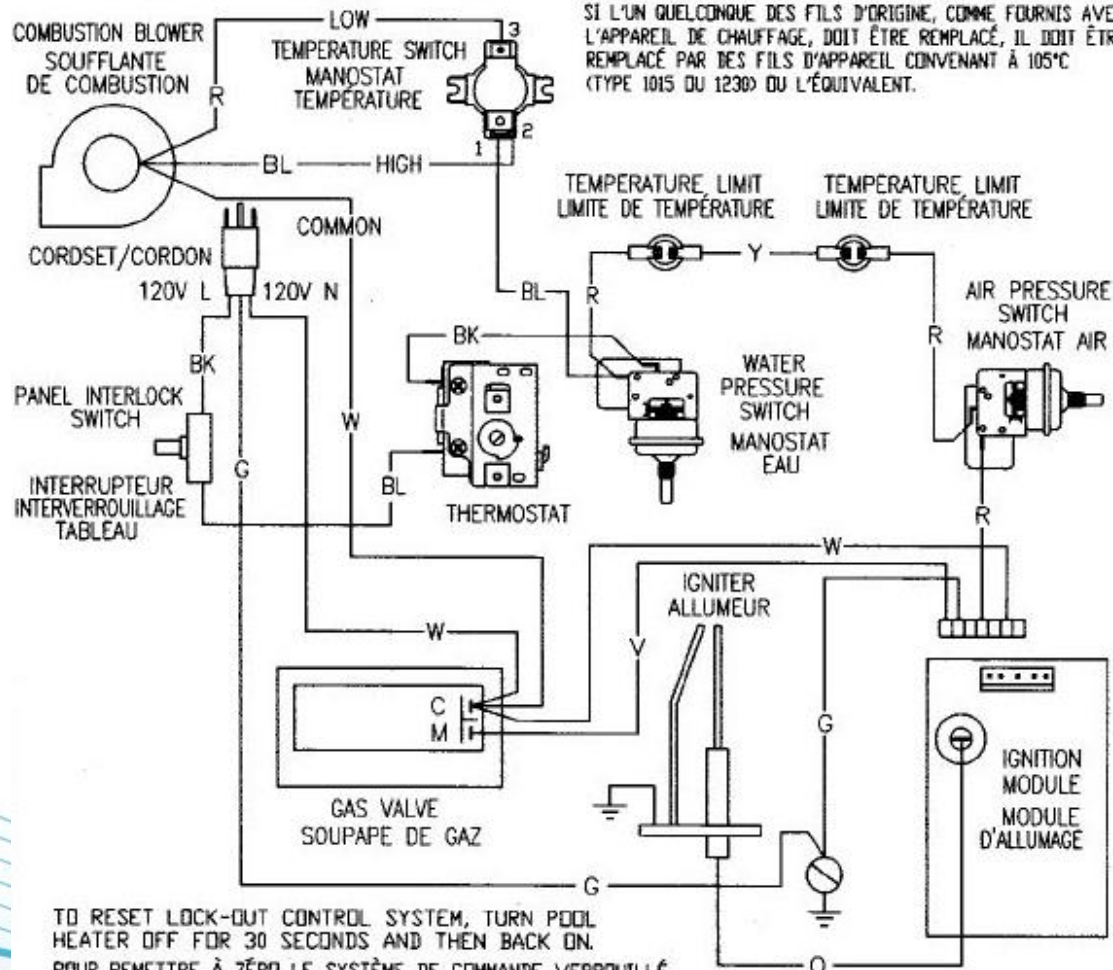




# Wiring Diagram & Schematic- May 2009 and prior (no transformer)

## ELECTRICAL DIAGRAM / DIAGRAMME DE CÂBLAGE

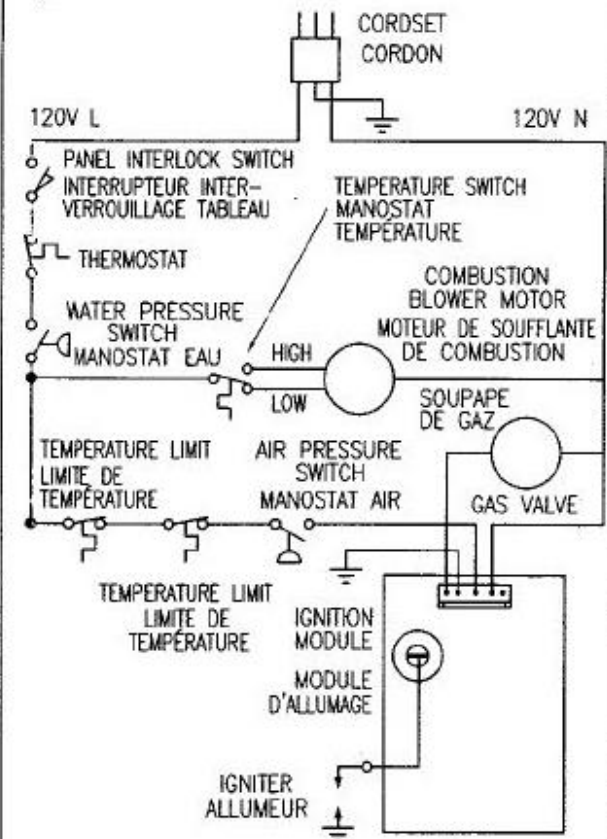
### CONNECTION DIAGRAM SCHEMA DE RACCORDEMENT



TO RESET LOCK-OUT CONTROL SYSTEM, TURN POOL HEATER OFF FOR 30 SECONDS AND THEN BACK ON.  
POUR REMETTRE À ZÉRO LE SYSTÈME DE COMMANDE VERROUILLÉ, METTRE L'APPAREIL DE CHAUFFAGE DE PISCINE À L'ARRÊT PENDANT 30 SECONDES, PUIS LE REMETTRE EN MARCHÉ.

IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE HEATER MUST BE REPLACED, IT MUST BE REPLACED WITH APPLIANCE WIRING MATERIAL SUITABLE FOR 105°C (STYLE 1015 OR 1230) OR EQUIVALENT.  
SI L'UN QUELCONQUE DES FILS D'ORIGINE, COMME FOURNIS AVEC L'APPAREIL DE CHAUFFAGE, DOIT ÊTRE REMPLACÉ, IL DOIT ÊTRE REMPLACÉ PAR DES FILS D'APPAREIL CONVENANT À 105°C (TYPE 1015 OU 1230) OU L'ÉQUIVALENT.

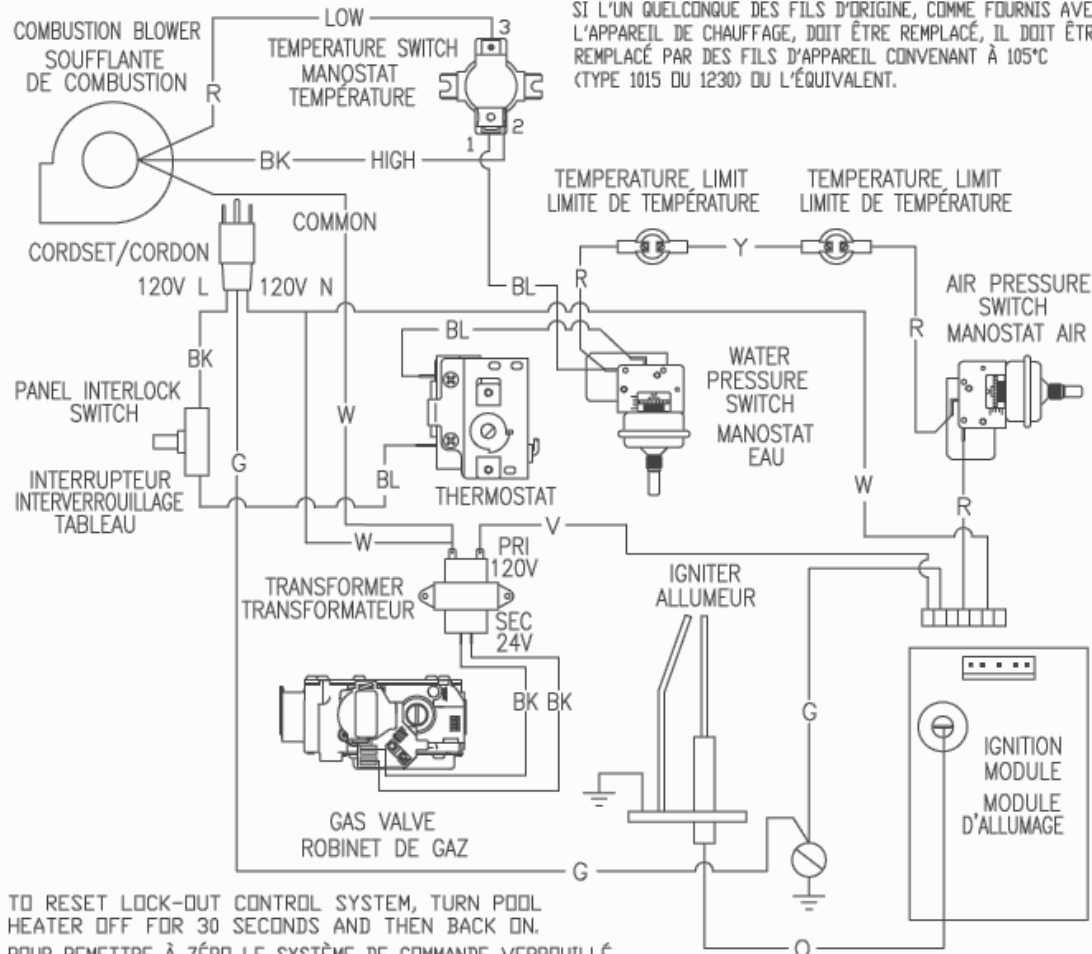
### SCHEMATIC DIAGRAM SCHEMA



# Wiring Diagram & Schematic- May 2009 to December 2011

## ELECTRICAL DIAGRAM / DIAGRAMME DE CÂBLAGE

CONNECTION DIAGRAM  
SCHEMA DE RACCORDEMENT

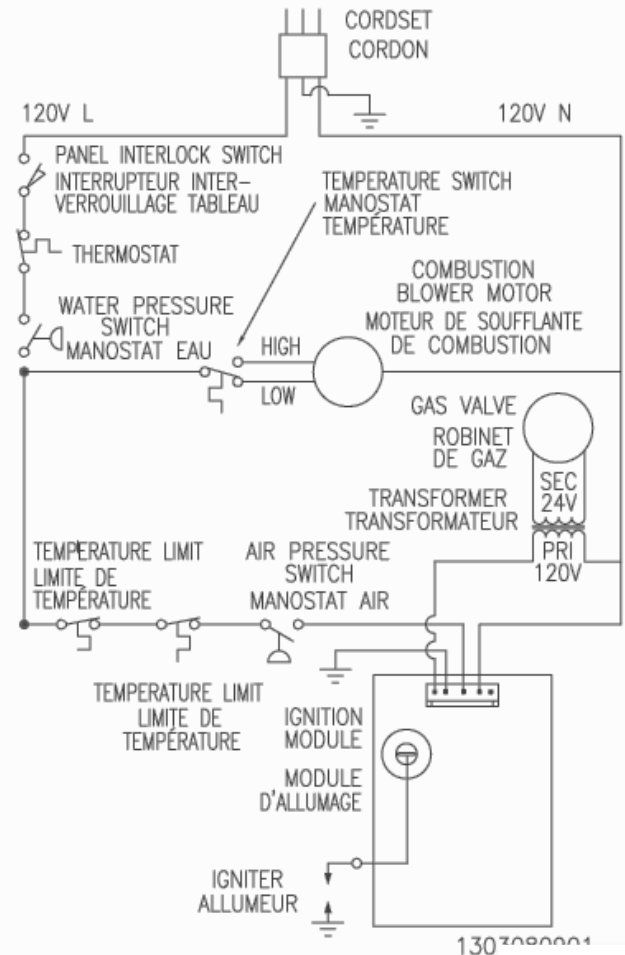


TO RESET LOCK-OUT CONTROL SYSTEM, TURN POOL  
HEATER OFF FOR 30 SECONDS AND THEN BACK ON.  
POUR REMETTRE À ZÉRO LE SYSTÈME DE COMMANDE VERROUILLÉ,  
METTRE L'APPAREIL DE CHAUFFAGE DE PISCINE À L'ARRÊT PENDANT  
30 SECONDES. PUIS LE REMETTRE EN MARCHÉ.

IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE HEATER MUST BE REPLACED, IT MUST BE REPLACED WITH APPLIANCE WIRING MATERIAL SUITABLE FOR 105°C (STYLE 1015 OR 1230) OR EQUIVALENT.

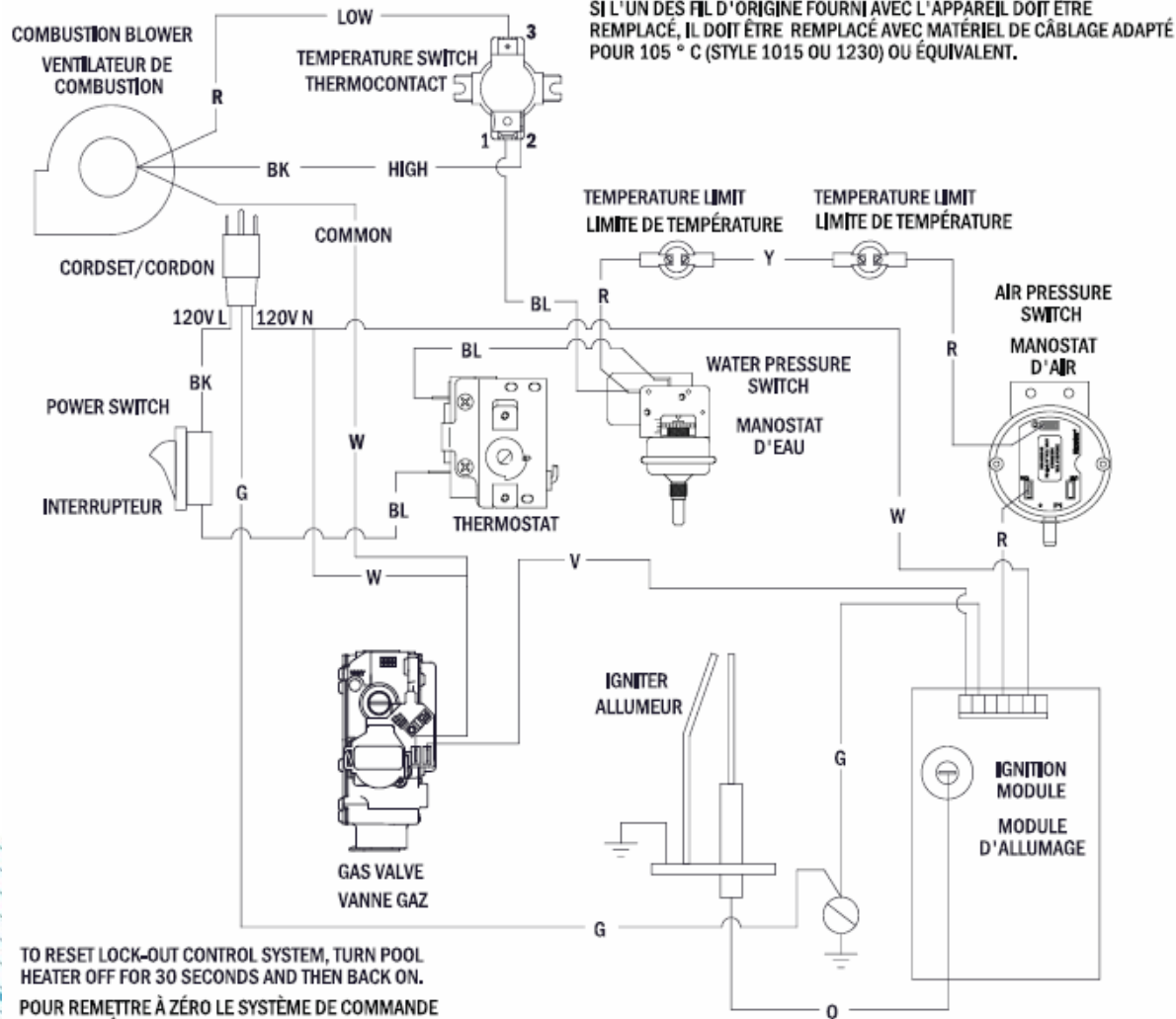
SI L'UN QUELCONQUE DES FILS D'ORIGINE, COMME FOURNIS AVEC L'APPAREIL DE CHAUFFAGE, DOIT ÊTRE REMPLACÉ, IL DOIT ÊTRE REMPLACÉ PAR DES FILS D'APPAREIL CONVENANT À 105°C (TYPE 1015 OU 1230) OU L'ÉQUIVALENT.

SCHEMATIC DIAGRAM  
SCHÉMA



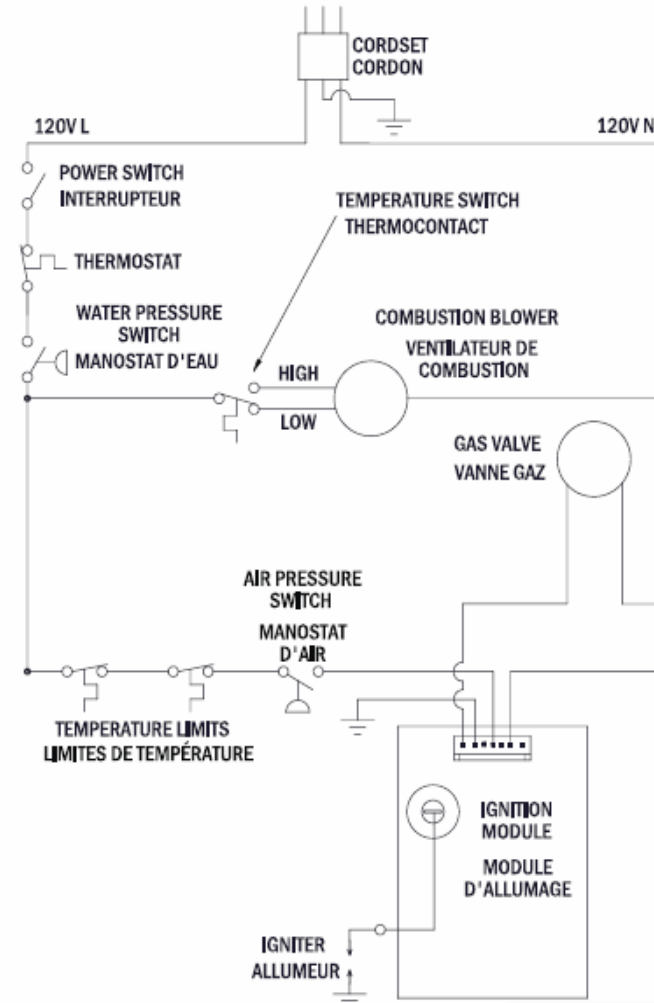
# Wiring Diagram & Schematic- December 2011 and after

**CONNECTION DIAGRAM**  
**SCHEMA DE RACCORDEMENT**



TO RESET LOCK-OUT CONTROL SYSTEM, TURN POOL HEATER OFF FOR 30 SECONDS AND THEN BACK ON.  
POUR REMETTRE À ZÉRO LE SYSTÈME DE COMMANDE VERROUILLÉ, METTRE L'APPAREIL DE CHAUFFAGE DE PISCINE À L'ARRÊT PENDANT 30 SECONDES, PUIS LE REMETTRE EN MARCHÉ.

**SCHEMATIC DIAGRAM**  
**SCHEMA**



# Heat Exchanger/Blower Compatibility

## H100 Heat Exchanger/Blower Assembly Compatibility

HX	Blower Assembly	Efficiency	Serial Number Break 21131304101440001	Designated as
IDXHXA1101	IDXBWR1935	80%	Prior to	Older
IDXHXA1102	IDXBWR1936	82%	Beginning serial	Newer

## Heat Exchanger Differences

HX	Tubes	Efficiency	Serial Number Break 21131304101440001	Compatibility Concerns
IDXHXA1101	6	80%	Not forward Compatible	If installed on newer heater the heater will function safely, but with a lowered efficiency (80%) and will be in violation of DOE energy requirement 10 CFR Part 430
IDXHXA1102	8	82%	Not backward compatible unless installed with Blower Assembly IDXBWR1936	If installed on older heater without IDXLBWR1936, blower may not switch to high speed as needed. Heater will not be in compliance with our agency listing with CSA and internal components may run at higher temperatures than desired, resulting in premature component failure/ reduced product life.



# Heat Exchanger/Blower Compatibility

Blower Assembly Differences				
Blower Assembly	Efficiency	Serial Number Break 21131304101440001	Thermal Switch	Compatibility Concerns
IDXBWR1935	80%	Not forward Compatible	Surface Mount	<p>If installed on newer heater the heater may not run properly. Depending on ambient temperatures and manufacturing variations, the blower may not switch from low to high speed when appropriate.</p> <p>Emissions at this condition have been tested and are safe, but the heater construction will not be in compliance with CSA, and internal components may run at higher than desired temperatures resulting in premature component failure/ reduced product life.</p>
IDXBWR1936	82%	Backward Compatible. Allows both IDXHXA1101, and IDHXA1102 heat exchangers to be used on older heaters.	Air Stream Mount	<p>If installed on older heater this will allow the heater to operate properly with either heat exchanger</p>