Maintenance

MAINTENANCE INSTRUCTIONS

It is recommended that you check the following items at least every six months and at the beginning of every swimming season.

1. Examine the venting system. Make sure there are no obstructions in the flow of combustion and ventilation air.
2. Visually inspect the main burner and the pilot burner flame. The normal color of the flame is blue. When flame appears yellow, burners should be inspected and cleaned; see Figure 8.
3. Keep the heater area clear and free from combustibles and flammable liquids.

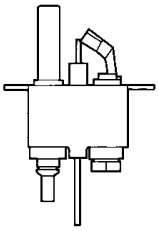


Figure 7.

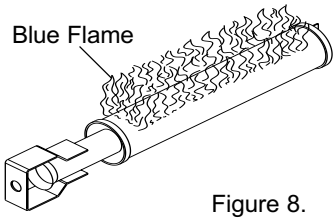


Figure 8.

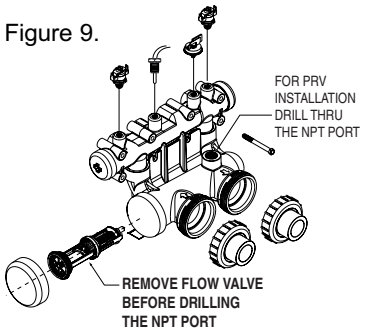
⚠CAUTION

REMOVE THE FLOW VALVE ASSEMBLY WHEN DRILLING THE HOLE TO INSTALL A PRV. OTHERWISE, YOU WILL DRILL INTO THE VALVE ASSEMBLY.

Pressure Relief Valve

In some installations, a pressure relief valve (PRV) is required on the MiniMax CH heater. To install a PRV, carefully drill a 3/8 in. hole in center of 3/4 in. NPT port (on main header) being careful to drill only thru wall at bottom of 3/4 in. NPT port and no deeper—now thread in the 3/4 NPT PRV. *(Sold separately.)*

Figure 9.



ENERGY SAVING TIPS

1. If possible, keep pool or spa covered when not in use. This will not only cut heating costs, but also keep dirt and debris from settling in the pool and conserve chemicals.
2. Reduce the pool thermostat setting to 78° F. or lower. This is accepted as being the most healthy temperature for swimming by the American Red Cross.
3. Use an accurate thermometer.
4. When the proper maximum thermostat settings have been determined, tighten the thermostat knob stopper.
5. Set time clock to start circulation system no earlier than daybreak. The swimming pool loses less heat at this time.
6. For pools that are only used on the weekends, it is not necessary to leave the thermostat set at 78° F. Lower the temperature to a range that can be achieved easily in one day. Generally, this would be 10° F. to 15° F., if pool heater is sized properly.
7. During the winter or while on vacation, turn the heater off.
8. Set up a regular program of preventative maintenance for the heater each new swimming season. Check heat exchanger, controls, burners, operation, etc.

SPRING AND FALL OPERATION

If the pool is being used occasionally, do not turn the heater completely off. Set the thermostat down to 65° F. This will keep the pool and the surrounding ground warm enough to bring the pool up to a comfortable swimming temperature in a shorter period of time.

WINTER OPERATION

⚠CAUTION

OPERATING THIS HEATER CONTINUOUSLY AT WATER TEMPERATURE BELOW 68° F. WILL CAUSE HARMFUL CONDENSATION AND WILL DAMAGE THE HEATER AND WILL VOID THE WARRANTY.

If the pool won't be used for a month or more, turn the heater off at the main gas valve. For areas where there is no danger of water freezing, water should circulate through the heater all year long, even though you are not heating your swimming pool. The MiniMax CH should not be operated out doors at temperatures below 0° F. for propane and -20° F. for natural gas. Where freezing is possible, it is necessary to drain the water from the heater. This may be done by opening the drain valve located at the inlet/outlet header (see Figure 9.) allowing all water to drain out of the heater. It would be a good practice to use compressed air to blow the water out of the heat exchanger. ***(See additional notes under Important Notices in Introduction on page 3.)***

CHEMICAL BALANCE

POOL AND SPA WATER

Your Pentair Pool Products pool heater was designed specifically for your spa or pool and will give you many years of trouble free service provided you keep your water chemistry in proper condition.

Three major items that can cause problems with your pool heater are improper pH, disinfectant residual, and total alkalinity. These items, if not kept properly balanced, can shorten the life of the heater and cause permanent damage.

⚠CAUTION

Heat exchanger damage resulting from chemical imbalance is not covered by the warranty.

WHAT A DISINFECTANT DOES

Two pool guests you do not want are algae and bacteria. To get rid of them and make pool water sanitary for swimming - as well as to improve the water's taste, odor and clarity - some sort of disinfectant must be used.

Chlorine and bromine are universally approved by health authorities and are accepted disinfecting agents for bacteria control.

WHAT IS A DISINFECTANT RESIDUAL?

When you add chlorine or bromine to the pool water, a portion of the disinfectant will be consumed in the process of destroying bacteria, algae and other oxidizable materials. The disinfectant remaining is called chlorine residual or bromine residual. You can determine the disinfectant residual of your pool water with a reliable test kit, available from your local pool supply store.

You must maintain a disinfectant residual level adequate enough to assure a continuous kill of bacteria or virus introduced into pool water by swimmers, through the air, from dust, rain or other sources.

It is wise to test pool water regularly. Never allow chlorine residual to drop below 0.6 ppm (parts per million). The minimum level for effective chlorine or bromine residual is 1.4 ppm.

pH - The term pH refers to the acid/alkaline balance of water expressed on a numerical scale from 0 to 14. A test kit for measuring pH balance of your pool water is available from your local pool supply store; see Table 1.

Table 1. **pH Chart**

Strongly Acid						Neutral					Strongly Alkaline			
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Muriatic Acid has a pH of about 0. Pure water is 7 (neutral). Weak Lye solution have a pH of 13-14.

RULE: 7.4 to 7.6 is a desirable pH range. It is essential to maintain correct pH, see Table 2.

If pH becomes too high (over alkaline), it has these effects:

1. Greatly lowers the ability of chlorine to destroy bacteria and algae.
2. Water becomes cloudy.
3. There is more danger of scale formation on the plaster or in the heat exchanger.
4. Filter elements may become blocked.

If pH is too low (over acid) the following conditions may occur:

1. Excessive eye burn or skin irritation.
2. Etching of the plaster.
3. Corrosion of metal fixtures in the filtration and recirculation system, which may create brown, blue, green, or sometimes almost black stains on the plaster.
4. Corrosion of copper in the heater, which may cause leaks.
5. If you have a sand and gravel filter, the alum used as a filter aid may dissolve and pass through the filter.

CAUTION: Do not test for pH when the chlorine residual is 3.0 ppm or higher, or bromine residual is 6.0 ppm or higher. See your local pool supply store for help in properly balancing your water chemistry.

RULE: Chemicals that are acid lower pH. Chemicals that are alkaline raise pH.

Table 2. **pH Control Chart**

6.8 7.0	7.2	7.4 7.6	7.8	8.0 8.2 8.4
Add Soda, Ash or Sodium Bicarbonate	Marginal	Ideal	Marginal	Add Acid

ALKALINITY High - Low:

"Total alkalinity" is a measurement of the total amount of alkaline chemicals in the water, and control pH to a great degree. (It is not the same as pH which refers merely to the relative alkalinity/acidity balance.) Your pool water's total alkalinity should be 100 - 140 ppm to permit easier pH control.

A total alkalinity test is simple to perform with a reliable test kit. You will need to test about once a week and make proper adjustments until alkalinity is in the proper range. Then, test only once every month or so to be sure it is being maintained. See your local pool dealer for help in properly balancing the water chemistry.

Troubleshooting - General

Possible Cause	*Remedy*
Heater will not come on	
Pump not running	Place pump in operation
Pump air locked	Check for leaks
Filter dirty	Clean filter
Pump strainer clogged	Clean strainer
Defective wiring or connection	Repair or replace wires
Defective pressure switch	Replace switch
Defective gas controls	Call serviceperson
On-Off switch in "OFF" position	Turn switch to "ON"
Heater Short Cycling (Rapid On and Off Operation)	
Insufficient water flow	Clean filter and pump strainer
Defective wiring	Repair or replace wiring
Defective flow valve or out of adjustment	Call serviceperson
Defective hi-limit and/or thermostat	Call serviceperson
Heater Makes Knocking Noises, Make sure all valves on system are open	
Heater operating after pump has shut off	Shut off gas supply and call serviceperson
Heater exchanger scaled	Shut off gas supply and call serviceperson

⚠CAUTION

Please consult the latest edition of the "MiniMax Service Manual" for complete service and repair instructions. Repairs should only be attempted by properly trained service personnel.

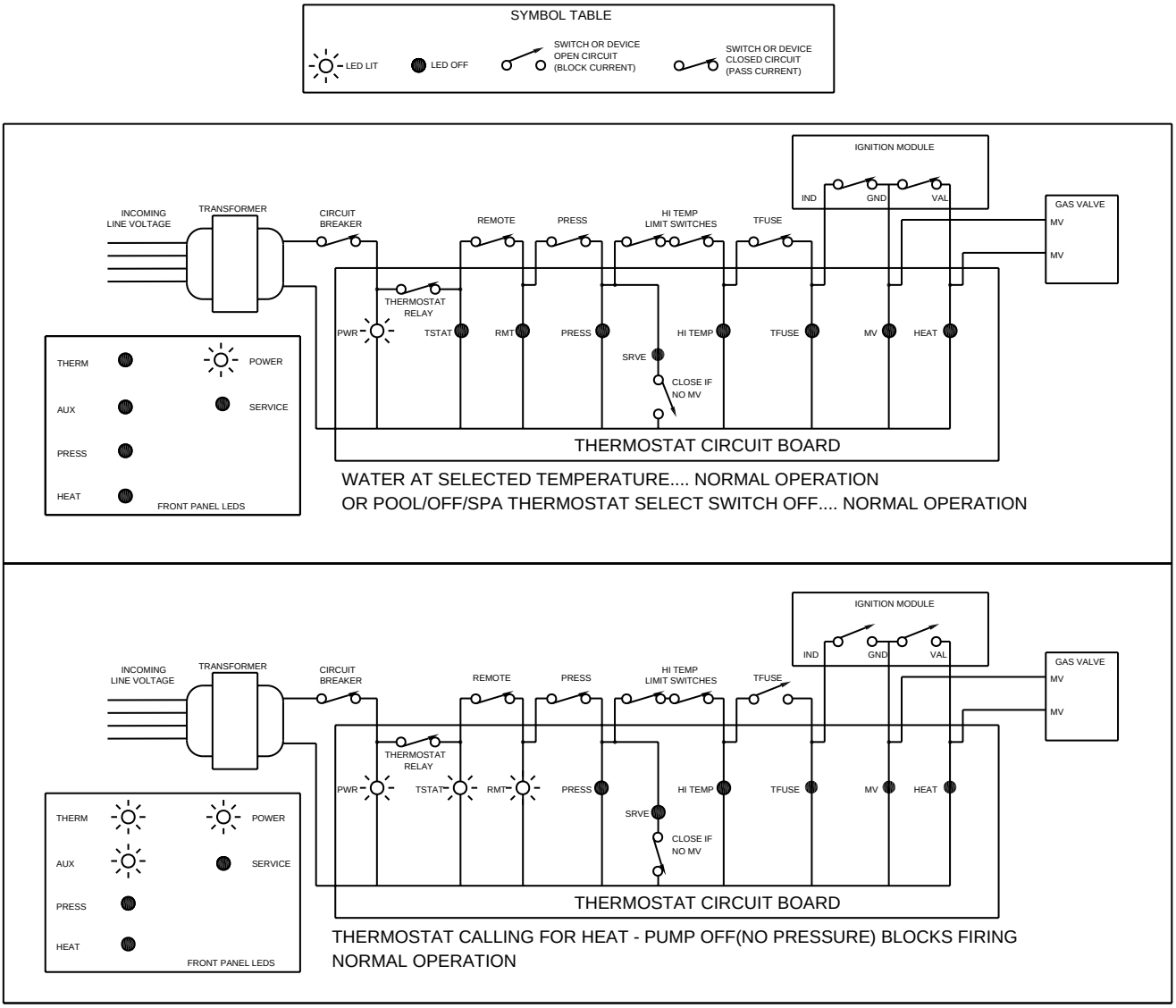
HEAT (HEAT)
The heat light is on any time the thermostat has signaled a call for heat which initializes the ignition safety firing circuit -- the light comes on to indicate successful firing of the main burners.

SERVICE (SERVICE)
The service light is off during normal operation of heater. The light only comes on if a problem with a control has occurred or when the heater is first firing. The problem must be investigated by the serviceman prior to attempts to fire the heater again.

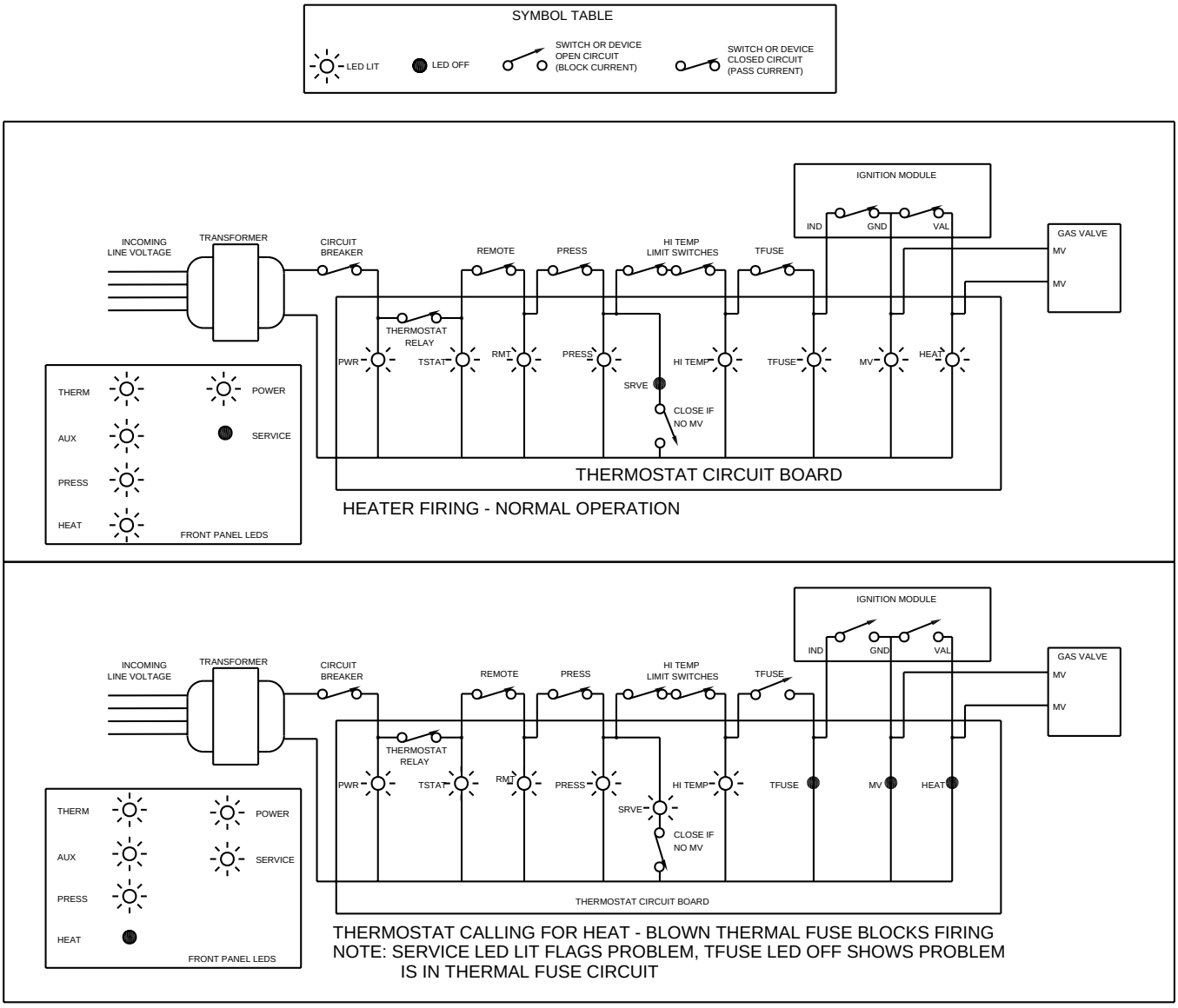
The diagrams that follow give examples of troubleshooting a malfunctioning heater using the assistance of the indicator lights.

TROUBLESHOOTING (CONTROLS)

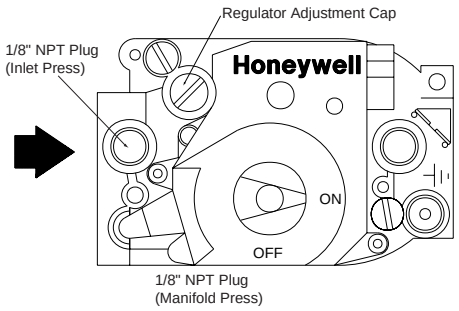
Example of troubleshooting with the assistance of the indicator lights.



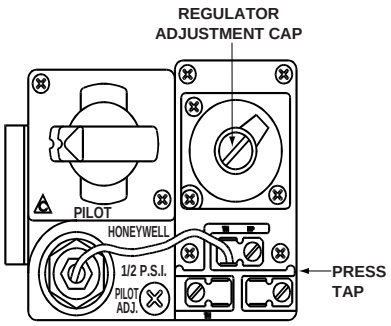
TROUBLESHOOTING (CONTROLS) - Continued



REGULATED MANIFOLD PRESSURE TEST



1. Attach the manometer to the heater jacket.
2. Shut off the main gas valve.
3. Remove 1/8 in. NPT plug on the outlet side of the valve and screw in the fitting from the manometer kit.
4. Connect the manometer hose to the fitting.
5. Fire the heater.
6. The manometer must read 4 in. WC for natural gas, 11 in. WC for propane gas, **while** the heater is operating.
7. For adjustment, remove the Regulator Adjustment Cap and using a screwdriver turn the screw clockwise to increase - counterclockwise to decrease gas pressure.



ELECTRICAL, IID ELECTRONIC UNITS

Electrical Rating

60 Hz	115 V.A.C. or 230 V.A.C.
50/60 Hz	208 V.A.C. or 240 V.A.C.

NOTE

If any of the original wiring supplied with this heater must be replaced, installer must supply (No. 18 AWG 105° C. U.L. approved AWM low energy stranded) copper wire or it's equivalent.

In Canada: wires must be CSA approved.

⚠WARNING

The heater must be electrically grounded and bonded in accordance with local codes or, in the absence of local codes, with the latest national electrical codes ANSI/NFPA No. 70.

In Canada: CSA standard C22.1 Canada Electrical Code Part 1 and/or local codes.

Always use crimp type connectors when connecting two wires.

This heater is equipped with a reversible junction box to allow line voltage to be wired from either side.

Transformer Wiring Instruction

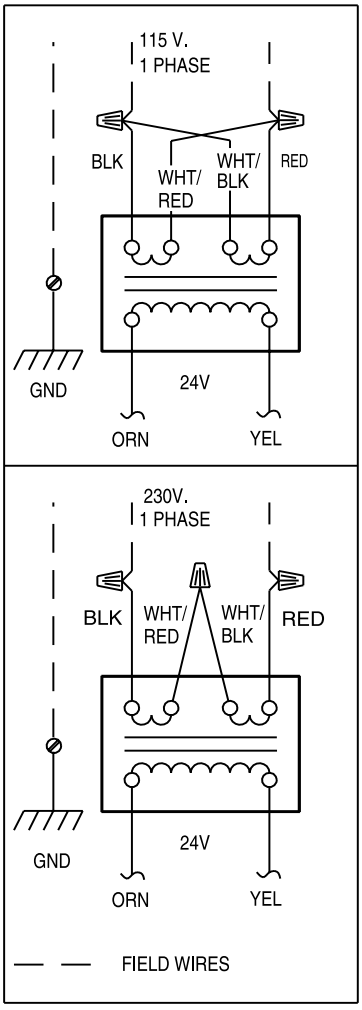


Figure 5.

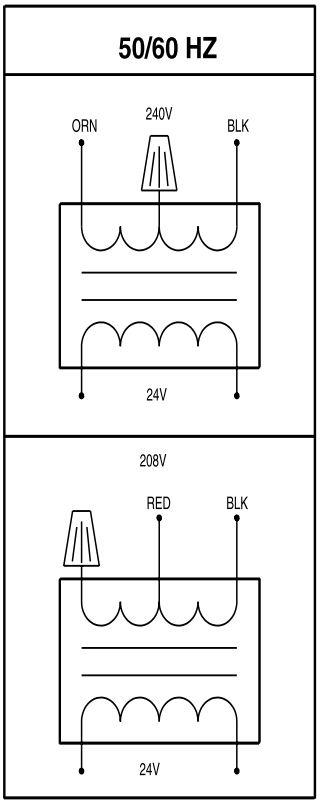
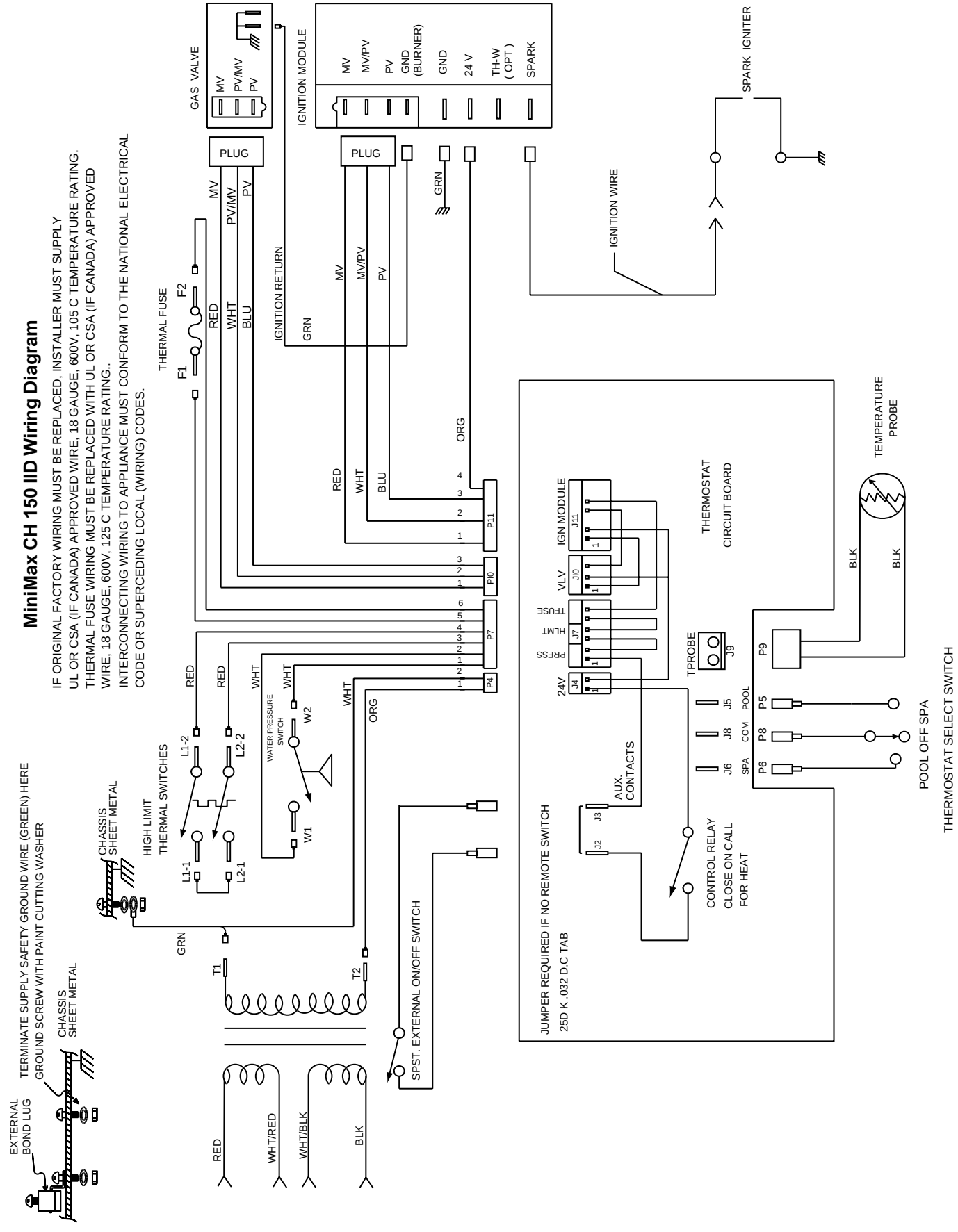


Figure 6.

MiniMax CH (150 IID Model) Electronic Ignition Wiring Diagram



REMOTE SWITCH DUAL THERM IID ONLY

3 Wire Remote

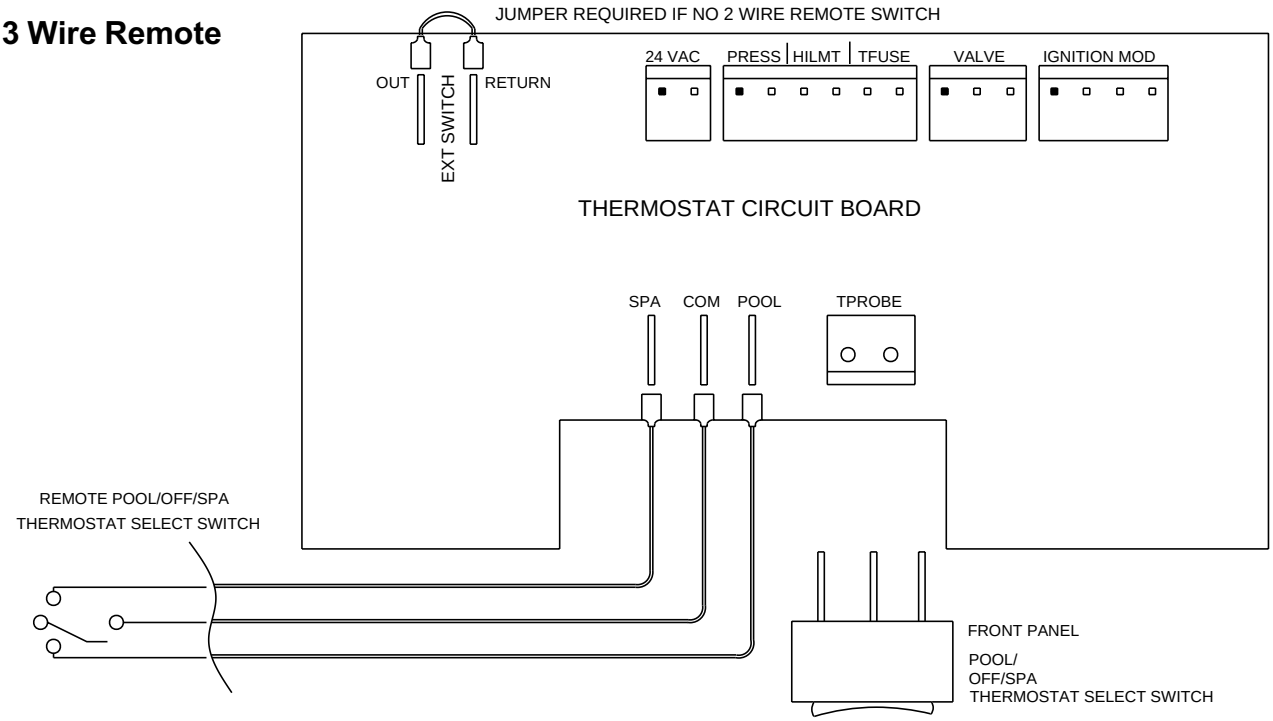


Figure 7.

2 Wire Remote

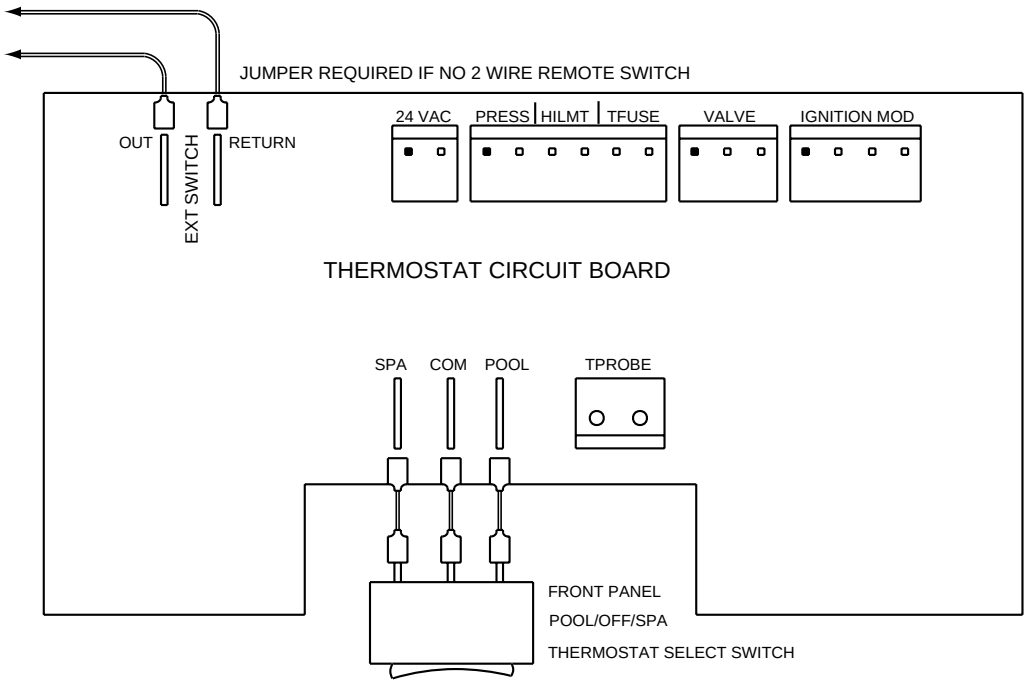


Figure 8.

NOTE: When connecting a remote control to the MiniMax CH, you must install the low voltage thermostat wires in separate conduit from **ANY** line voltage wires. Failure to follow these instructions will cause the thermostat relay to react erratically.