

# 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 (on millivolt models). The normal color of the flame is blue. When flame appears yellow, burners should be inspected and cleaned; see Figure 6.
3. Keep the burner area clear and free from combustibles and flammable liquids.

### 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 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.

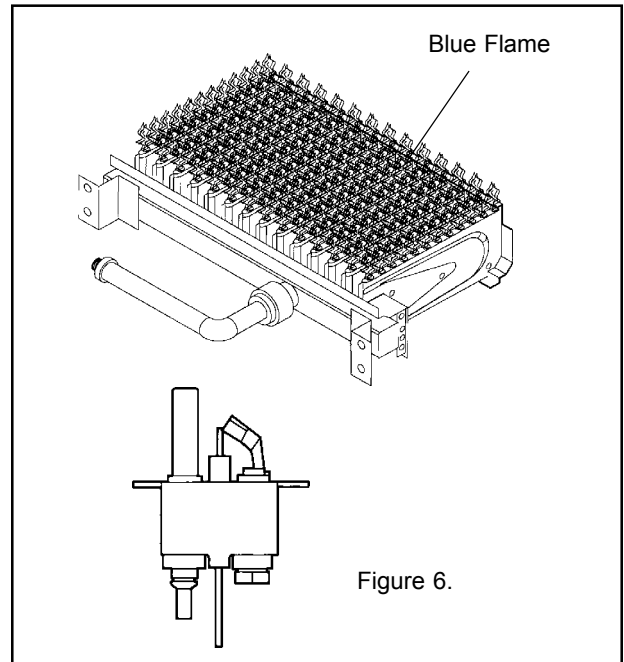


Figure 6.

### 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

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. This heater should not be operated out doors at temperatures below 32° F. (0° C.). 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 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.

## CHEMICAL BALANCE

### POOL AND SPA WATER

Your Pentair Water Pool and Spa 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.

### **⚠ WARNING**

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. 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.

### 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.

Table 1. pH Chart

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

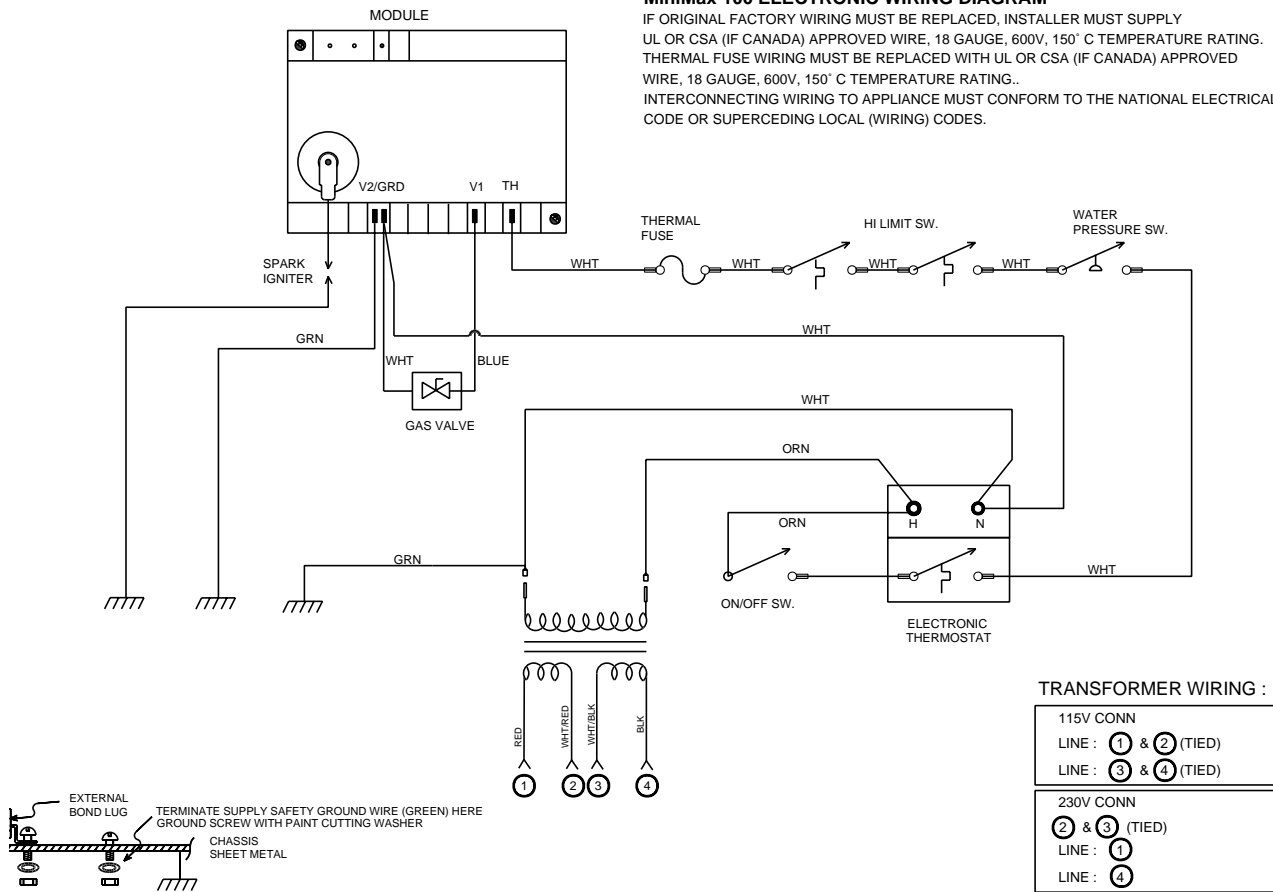
Table 2. pH Control Chart

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			

### MiniMax 100 Electronic Direct Spark Ignition Wiring Diagram

#### MiniMax 100 ELECTRONIC WIRING DIAGRAM

IF ORIGINAL FACTORY WIRING MUST BE REPLACED, INSTALLER MUST SUPPLY UL OR CSA (IF CANADA) APPROVED WIRE, 18 GAUGE, 600V, 150° C TEMPERATURE RATING. THERMAL FUSE WIRING MUST BE REPLACED WITH UL OR CSA (IF CANADA) APPROVED WIRE, 18 GAUGE, 600V, 150° C TEMPERATURE RATING.. INTERCONNECTING WIRING TO APPLIANCE MUST CONFORM TO THE NATIONAL ELECTRICAL CODE OR SUPERCEDING LOCAL (WIRING) CODES.

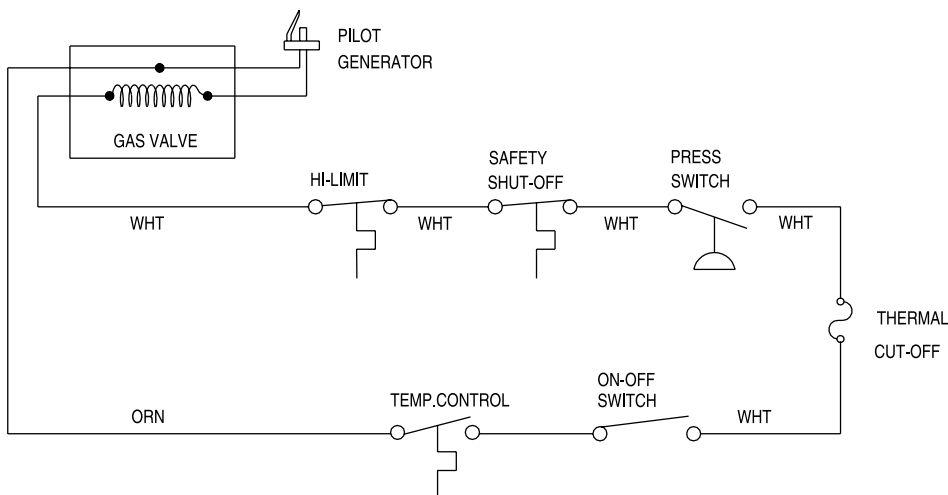


#### TRANSFORMER WIRING :

115V CONN	
LINE :	① & ② (TIED)
LINE :	③ & ④ (TIED)
230V CONN	
LINE :	② & ③ (TIED)
LINE :	①
LINE :	④

### MiniMax 100 Millivolt Wiring Diagram

IF ANY OR THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, INSTALLER MUST SUPPLY (NO. 18 AWG 105°C U.L. & C.S.A. APPROVED FOR CANADA) COPPER WIRE.



#### Remote Wiring Hook-up

The MiniMax 100 may be connected to a two wire remote control by disconnecting the wire connector from the hot (transformer) side terminal of the "ON/OFF" switch and connecting the two wire remote across the end of this wire and the aforementioned terminal.

#### NOTE

When connecting a remote control to the MiniMax 100 you must install the low voltage remote control wires in a separate conduit from ANY line voltage wires. Do not exceed 25 ft. wire run for remotes on millivolt models.

# TROUBLESHOOTING - GENERAL

<i>Possible Cause</i>	<i>Remedy</i>
<b>Heater will not come on</b>	
Automatic ignition system fails	Check if electrical connections are correct and securely fastened – If YES, call serviceman.
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 serviceman
On-Off switch in "OFF" position	Turn switch to "ON"
<b>Heater Short Cycling (Rapid On and Off Operation)</b>	
Insufficient water flow	Clean filter and pump strainer
Defective wiring	Repair or replace wiring
Defective or stuck by-pass valve	Call serviceman
Defective hi-limit and/or thermostat	Call serviceman
<b>Heater Makes Knocking Noises, Make sure all valves on systems are open</b>	
Heater operating after pump has shut off	Shut off gas supply and call serviceman
Heater exchanger scaled	Shut off gas supply and call serviceman

