

# MiniMax<sup>®</sup> NT Heater

## Digital Display Temperature Controller (DDTC) Installation Instructions

**IMPORTANT SAFETY INSTRUCTIONS**  
*READ AND FOLLOW ALL INSTRUCTIONS*  
**SAVE THESE INSTRUCTIONS**

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*This instruction is to be used with the DDTC Retrofit Kit (P/N 472377) to replace the 6800 Temperature Controller for all Pentair Pool Products NT Heaters.*

### **DANGER**

#### **FOR YOUR SAFETY – READ BEFORE OPERATING**

This product must be installed and serviced by a professional service technician qualified in pool/spa heater installation and maintenance. If you do not follow these instructions exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.

### **WARNING**

Before installing this product, read and follow all warning notices and instructions which are included. Failure to follow safety warnings and instructions can result in severe injury, death, or property damage. Call (800) 831-7133 for additional free copies of this manual.

### **Important Notice**



Attention Installer.

This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner/operator of this equipment.

#### **Pentair Pool Products**

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## SECTION I. INSTALLATION

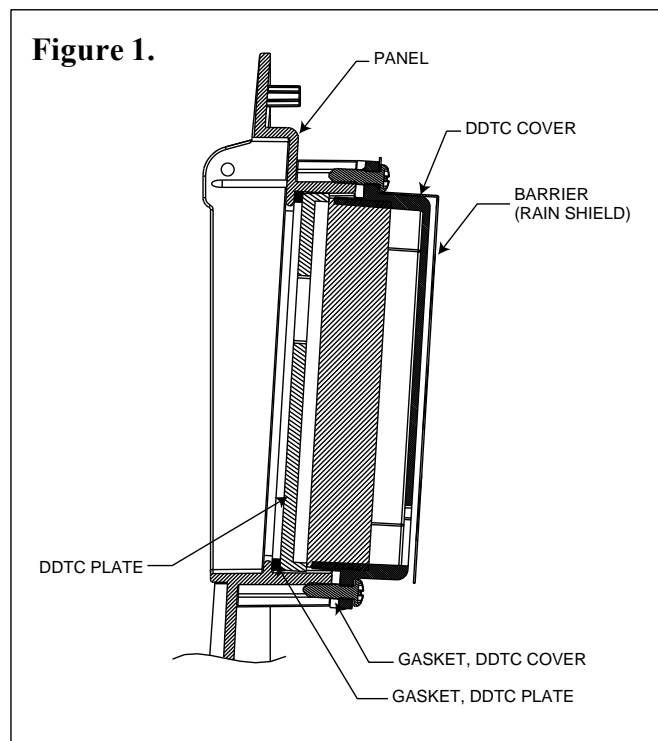
1. Turn off the electrical power to the heater.
2. Open the heater's right door.
3. Disconnect all wires from the 6800 Temperature Controller.
4. Remove the left and right doors from the heater if necessary.
5. Remove four screws on the cover of the 6800 Temperature Controller.
6. Remove the existing rain shield if any.
7. Install the mounting plate gasket before putting DDTC board into the place, see Figure 1 and Figure 2.

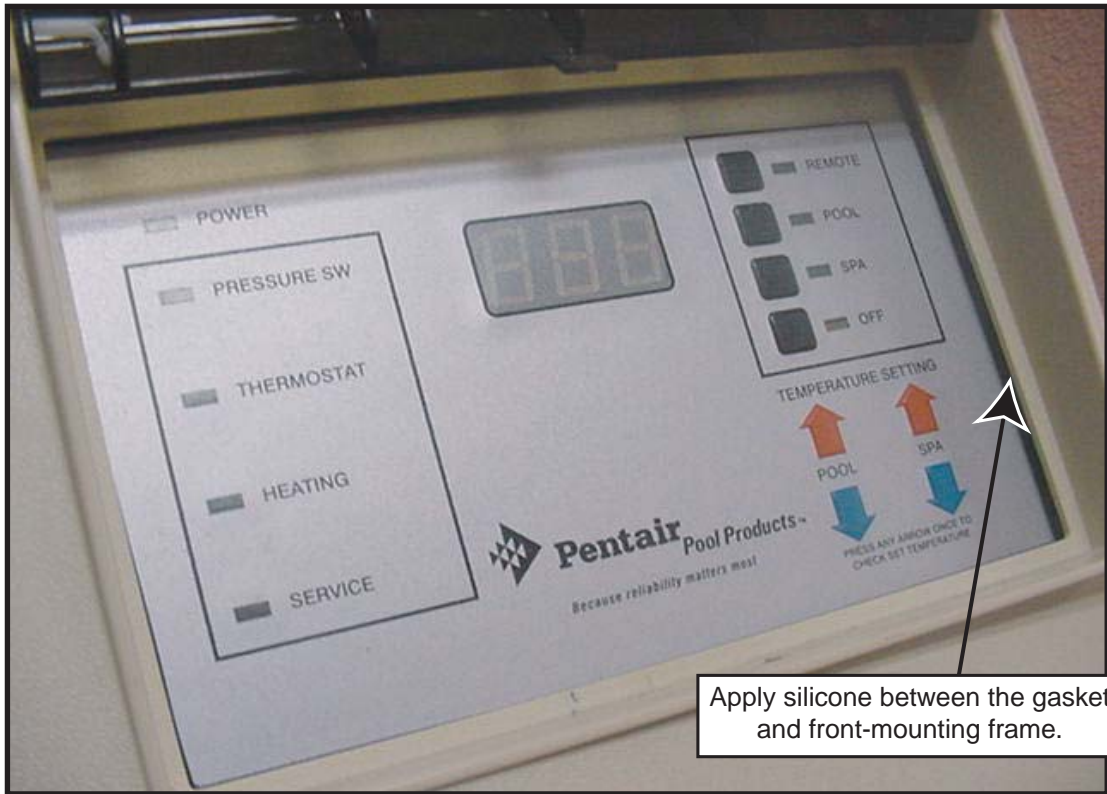
**NOTE:** Install mounting plate gasket before installing face plate for DDTC board.

8. Install the cover gasket, DDTC cover, and rain shield by using six screws, (six screws are provided in the kit). See Figure 3.
9. **NOTE:** Apply some silicone between gasket and mounting frame to keep waterproof. Do **NOT** over tighten screws on DDTC cover or gasket will be displaced.
10. Reconnect the wires per Section II. Wiring, below.

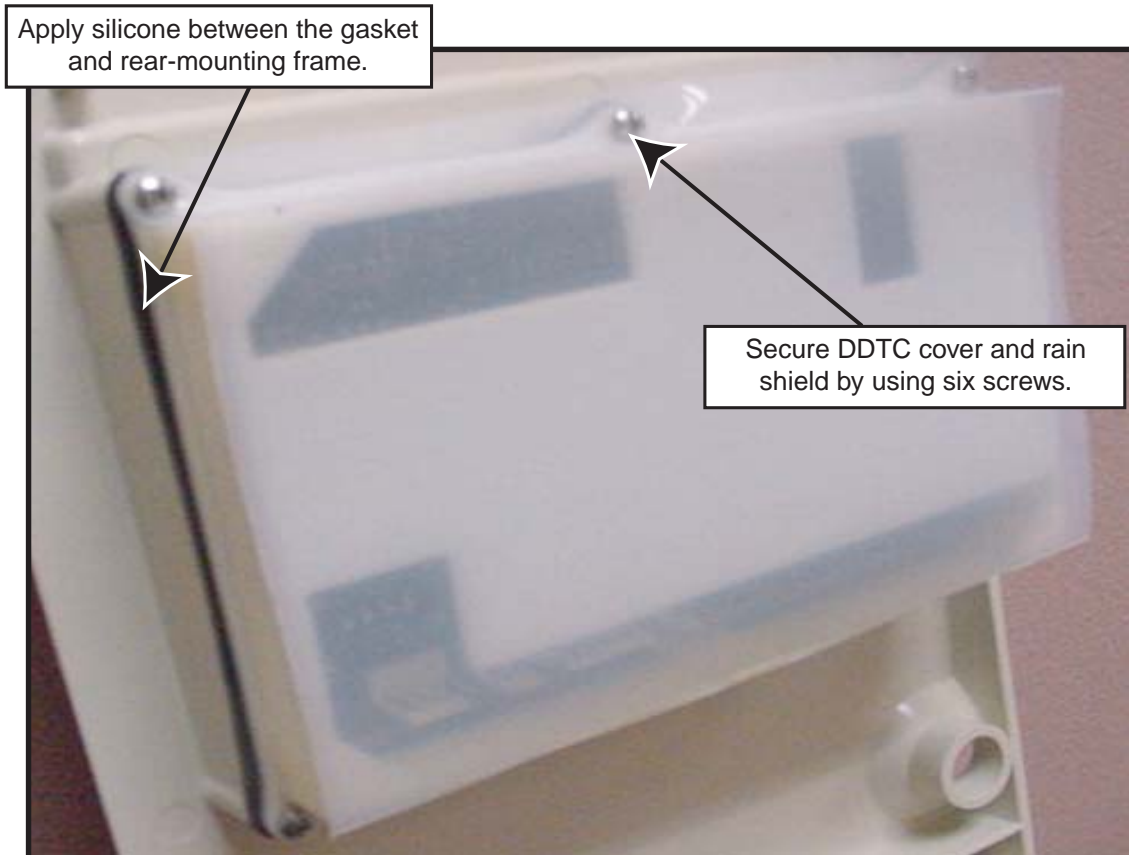
## SECTION II. WIRING

1. Please see wiring diagram's, Figure 4 for MiniMax NT LN DV Heater, Figure 5 for MiniMax NT DV Heater, and Figure 6 for MiniMax NT TSI LN Heater and follow the instructions below exactly.
2. Reconnect the wire P4 to J4, P7 to J7, P9 to J9, P10 to J10, and P11 to J11 respectively on the DDTC board.
3. Connect orange wire assembly from "FAN" of DDTC board to air pressure switch.
4. Disconnect the orange wire assembly from transformer to "24VAC" of Ignition Module.
5. Connect orange wire assembly (same wire as above #4) from "24VAC" of DDTC board to "24VAC" of Ignition Module.
6. **NOTE:** Orange wire from transformer to module will no longer be used.





**Figure 2.**



**Figure 3.**

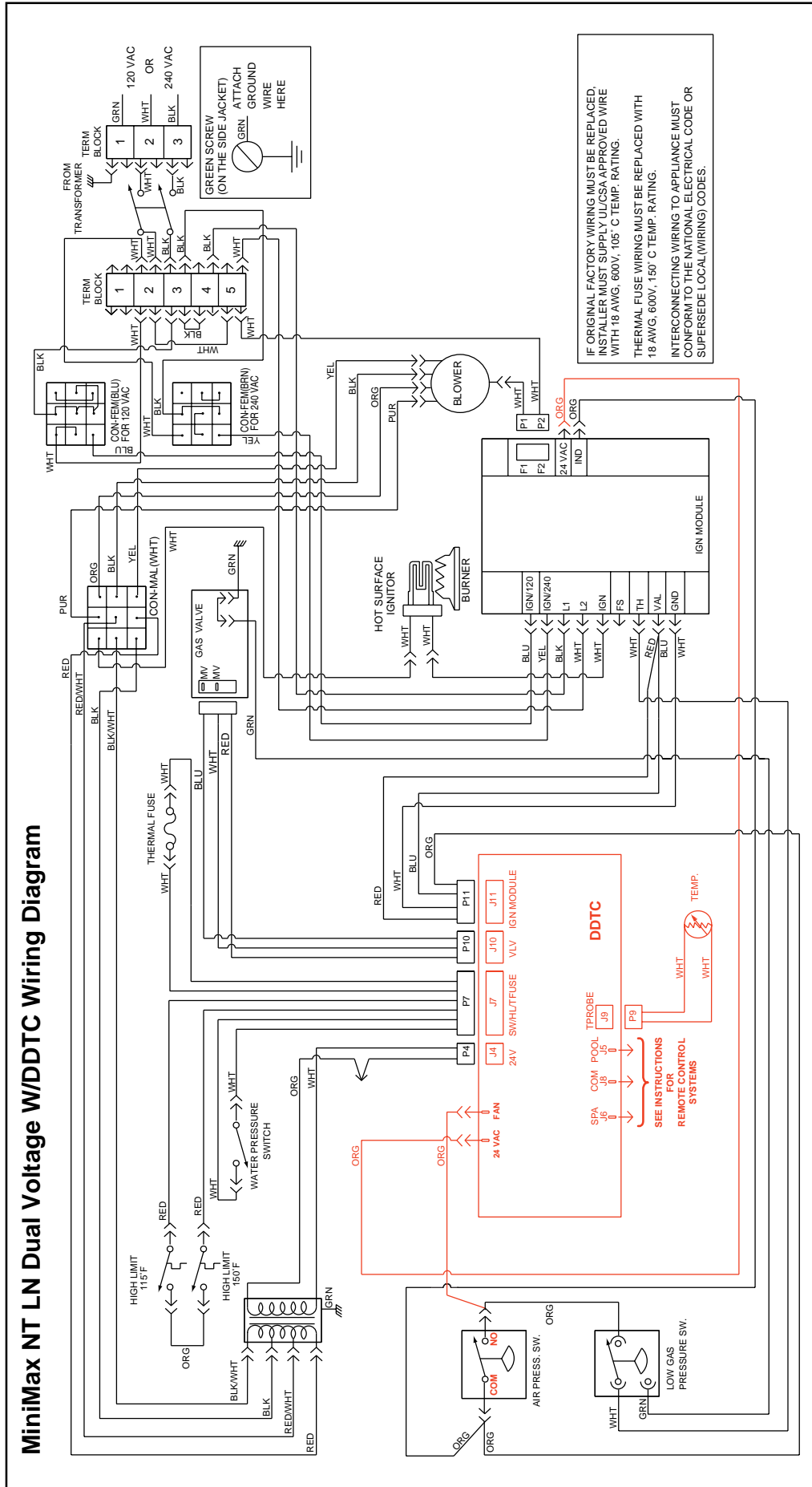


Figure 4.

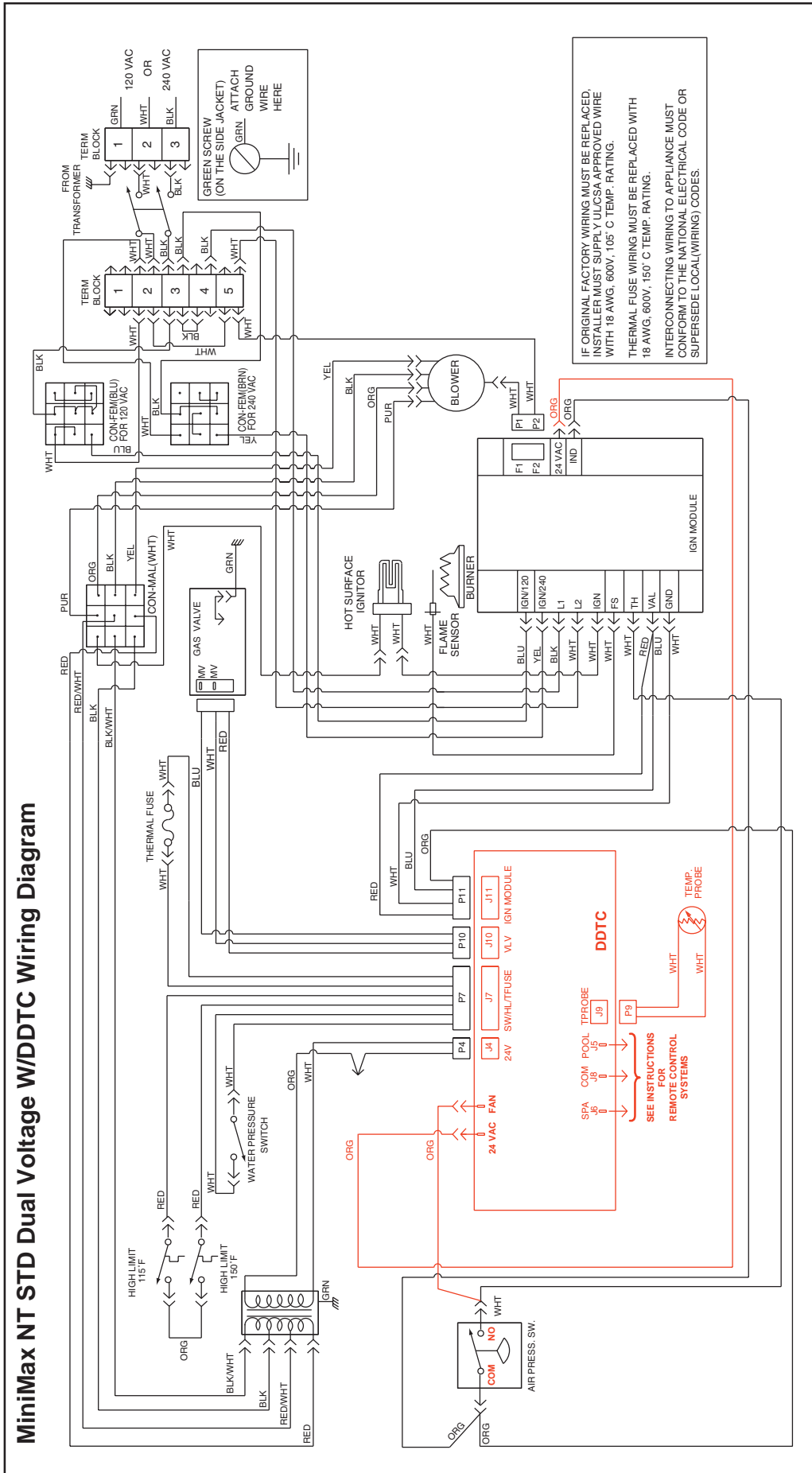


Figure 5.

# MiniMax NT TSI w/DDTC WIRING DIAGRAM

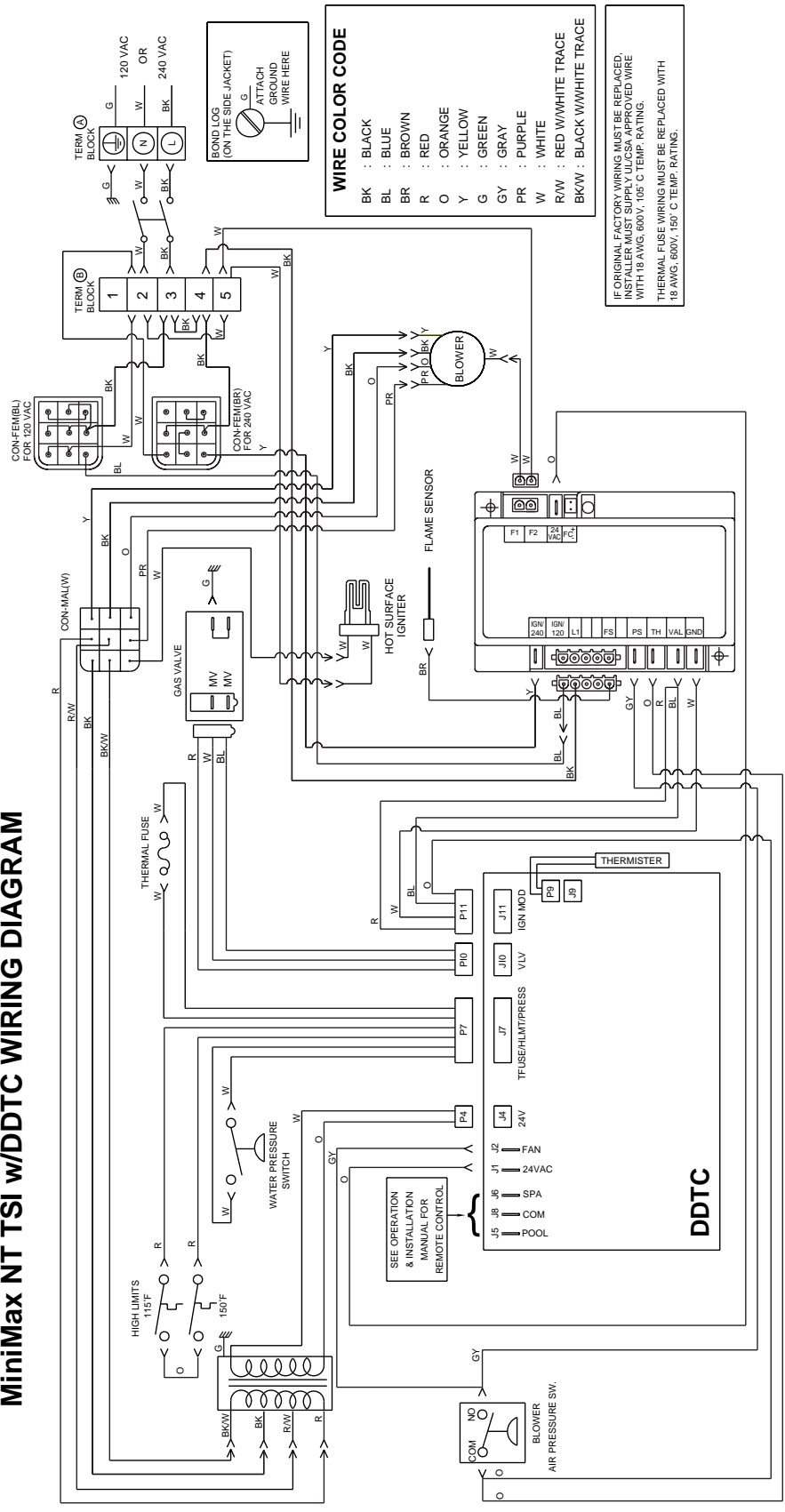
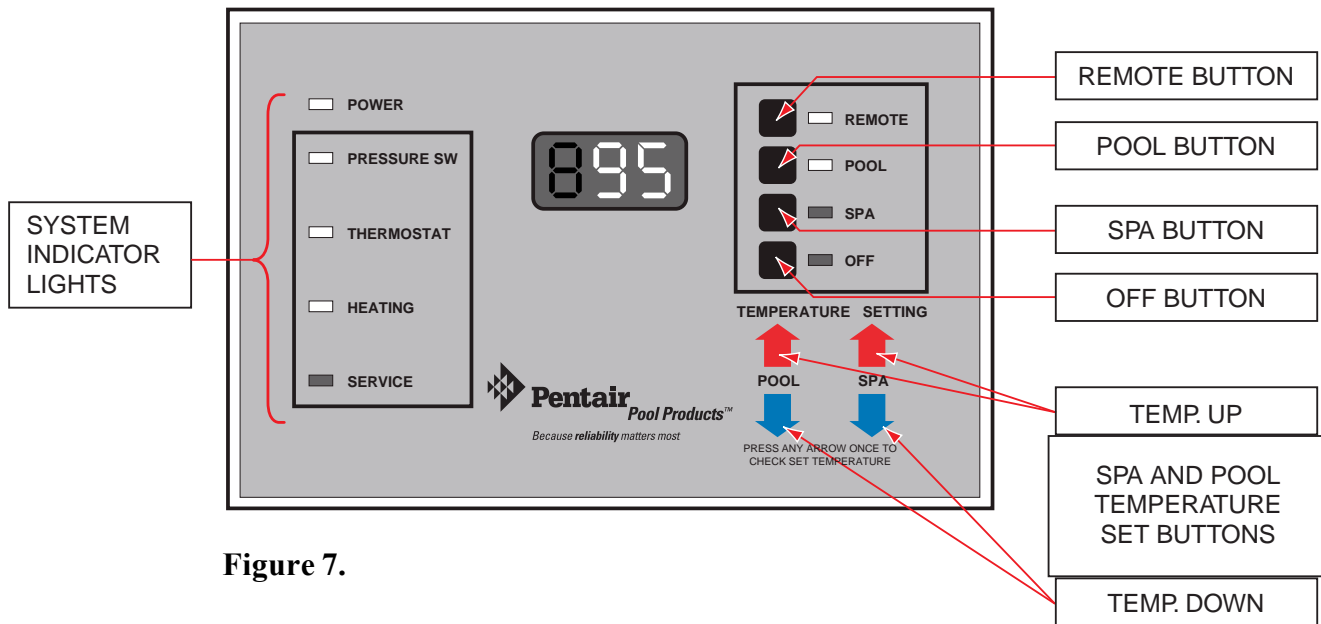


Figure 6.



**Figure 7.**

### SECTION III. INTRODUCTION OF DDTC

The DDTC board, shown in Figure 7, is a digital temperature controller capable of controlling the pool, spa or both to a minimum temperature of 65° F. (below 65° F. display reads "Off") and a maximum of 104° F. The DDTC board also functions as a system status indicator, using LED lights and programmed error codes.

During normal operation, the DDTC will display the current temperature of the water returning to the heater, depending on which mode has been selected, "Pool" or "Spa". This is accomplished by a thermister (sensor) on the inlet port of the water header of the heater and working in conjunction with the internal microprocessor controlling the operation of the heater.

Changing the desired pool or spa temperature is easily done by simply depressing the appropriate up or down arrow until the display reads the desired set-point temperature. For example, set pool to 78° F. and the spa to 104° F., when releasing the up or down arrow the display will flash once then return to the current temperature.

At any time, you wish to know the temperature setting of the pool or spa, simply press the appropriate up or down arrow, the display will flash once and display the set-point temperature for three (3) seconds, then flash once again and return to the current temperature.

## SECTION IV. SET UP

The MiniMax NT Heater comes from the factory preset with a pool temperature setting of 78° F. and a preset spa temperature of 100° F., and in the off mode setting. Once the power is turned on, the DDTC board will do a self diagnostic internal check, during this time the display will first read “888”, then the display will switch to three dashes “---“, this process takes approximately ten (10) seconds. The DDTC will then illuminate the “Power” LED and “Off” LED, see Figure 8.

1. Turn on the power to the heater; the switch is on the bottom of the electrical junction box located internally on the right side of the cabinet. The DDTC will now go through the self-diagnostic’s test as stated above.
2. Turn on the circulating system pump and make sure that adequate water is being delivered to the heater, The “PRESSURE SW” LED will now illuminate.
3. If you are using the heater with a remote control system, open the right door of the heater to access the rear portion of the DDTC. Locate the three terminals marked “Pool” (J5), “Spa” (J6) and “Com” (J8). If the remote system is a three-wire remote unit, connect the pool lead to the “pool” terminal J5, connect the spa lead to the “spa” J6 terminal and connect the common wire to the “com” terminal J8. If the remote system is a two-wire remote, the remote system will be used to turn the heater on for a selected body of water, Pool or Spa, select which application you are working with and connect one wire to the common terminal J8 and the other wire to either “Pool J5” or “Spa J6”. Close and latch the door.

## SECTION V. LED INDICATORS

There are nine lights that can be seen from the front of the control panel, (five are system indicators and four are mode indicators), which helps you understand the operation of the heater, see Figure 7. If something should go wrong, the lights will aid in troubleshooting the problem. An additional four lights can be seen after opening the control panel. These four lights are diagnostic indicators for the service technician to troubleshoot the system.

On the right front of the DDTC board there are four Buttons and corresponding LED lights, see Figure 7. Using the buttons allows you to select one of the four modes and the lights indicate which operational mode that the heater is in, **Off**, **Spa** mode, **Pool** mode or **Remote** mode. If the heater is not connected to a remote system then the remote mode will not be used.

The following are descriptions of the five system indicators:

### • POWER

The light is on at all times, in any switch position, indicating 24VAC power is being supplied to the control circuit. If it fails to light, no other light will be on. Possible causes are:

1. External power to the heater is disconnected; check service panel circuit breaker or fuses;
2. Transformer has failed.

### • PRESSURE SW (WATER PRESSURE SWITCH)

This light is on when Spa/Pool Selector switch is on, indicates the circulating pump is running properly. If pressure light fails to light, the pump may have lost its prime or water flow may be restricted by an inadvertently closed valve or clogged filter or pump basket. If you have determined that there is no water flow restriction to the heater, you should call a qualified technician.



## • THERMOSTAT

This light is on when the thermostat contacts close, signaled by the water temperature falling below the set-point, calling for the heater to fire to maintain the desired water temperature.

## • HEATING

The heating light is on any time the thermostat has signaled a call for heat which initializes the ignition safety circuit—the light comes on indicating successful firing of the main burners and stays on until the pool/spa reach the water temperature setting.

## • 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 technician prior to attempts to fire the heater again.

## SECTION VI. TEMPERATURE SETTING

The heater comes factory set at 78° F. for the pool mode and 100° F. for the spa mode, using the up and down arrows, you can set the thermostats to a minimum temperature of 65° F., or a maximum of 104° F. If you desire to heat only one body of water, the thermostat is capable of an off mode. As an example, if you only wish to heat the spa and not the pool, simply depress and hold the pool down arrow, and the thermostat will lower its setting to 65° F. then go to an off mode. If there is a remote system connected to the heater, please see the special thermostat setting features under Heating Mode Selection & Remote mode.

## SECTION VII. HEATING MODE SELECTION

1. **Off Mode:** The heater will not come on. **NOTE:** The "Off" display on the Digital Display Temperature Controller does not mean that the heater is off. It only states that the pool or spa thermostat has been turned off.
2. **Spa Mode:** The heater will operate and heat the spa to the desired temperature.
3. **Pool Mode:** The heater will operate and heat the pool to the desired temperature.
4. **Remote Mode:** The DDTC is compatible with two and three wire remote control systems. In order to operate by a remote control system, the REMOTE mode must be selected on the front panel. When the REMOTE mode is selected, the REMOTE LED will light up.

## SECTION VIII. REMOTE CONTROL

*THE TWO-WIRE REMOTE CONTROL SYSTEM* is typically installed and connected to the heater for spa heating. The two-wire remote system is usually provided with a water temperature sensor that monitors the system temperature and turns the heater on or off in response to the temperature of the spa. To heat a spa, it should be connected to terminals J6 and J8. Pool heating remote control would require connecting to terminals J5 and J8. If the REMOTE mode is set at the front panel LED light, the DDTC will respond to a contact closure by remote system and heater will operate until the remote system temperature setting is satisfied.

**NOTE:** With this type of two-wire remote, with its own temperature sensors and system control, using the up arrows on the front of the DDTC, hold down the up arrow until you reach the maximum setting of 104° F., this allows the remote system thermostat to operate the heater at any set-point below 104° F., the heater thermostats then act as a secondary controller if water temperature reaches 104° F.

*THE THREE-WIRE REMOTE CONTROL SYSTEM* will be connected to terminals J5, J6 & J8. J8 is the common terminal. If the heater is in the REMOTE mode, the DDTC will monitor the terminals and respond to a contact closure between J5 & J8 or J6 & J8. A contact closure between J5 & J8 will cause the DDTC to switch to the POOL setting and control the heater to the DDTC pool set-point temperature. A contact closure between J6 & J8 will cause the DDTC to switch to the SPA setting and control the heater to the DDTC spa set-point temperature. If only heating the spa, then depress the pool down arrow until the display goes to “Off”.

## SECTION IX. TROUBLE SHOOTING

The DDTC temperature display contains three LED’s with a decimal point between the first and second, this display is also used to display an error code if for some reason there is a failure within the heater control system or a DDTC internal fault. The DDTC will display the actual temperature or set-point temperature or OFF, as selected by the user. When DDTC detects an error, the display will show Exx, see Figure 8, where Exx is the error code of DDTC fault, see Table 1. Codes 1 through 9 indicate a “soft lockout” error that means after these errors are fixed, the heater will resume normal operation and restart immediately. Code ERR indicates a “hard lockout” error that means after these errors are fixed, you need to reset the power of the heater through the switch on the bottom of the electrical junction box on the right side of the cabinet.

**NOTE:** If Code ERR is shown on the LED display at any time, turn the heater off, (from power switch), then turn on the heater again. If the error code is still displayed, call a certified Pentair Service Technician for repair.

<b>Error Code</b>	<b>Error Description</b>
E01	System Low Voltage
E02	High Temperature Limit
E03	Thermal Fuse Open
E04	Fan Failure
E05	Ignition / Flame Failure
E06	Gas Main Valve / Module Failure
E07, E08, E09	Not Used
ERR	<b>Call Pentair's Technical Service Department at: (800) 831-7133</b>

**Table 1.**

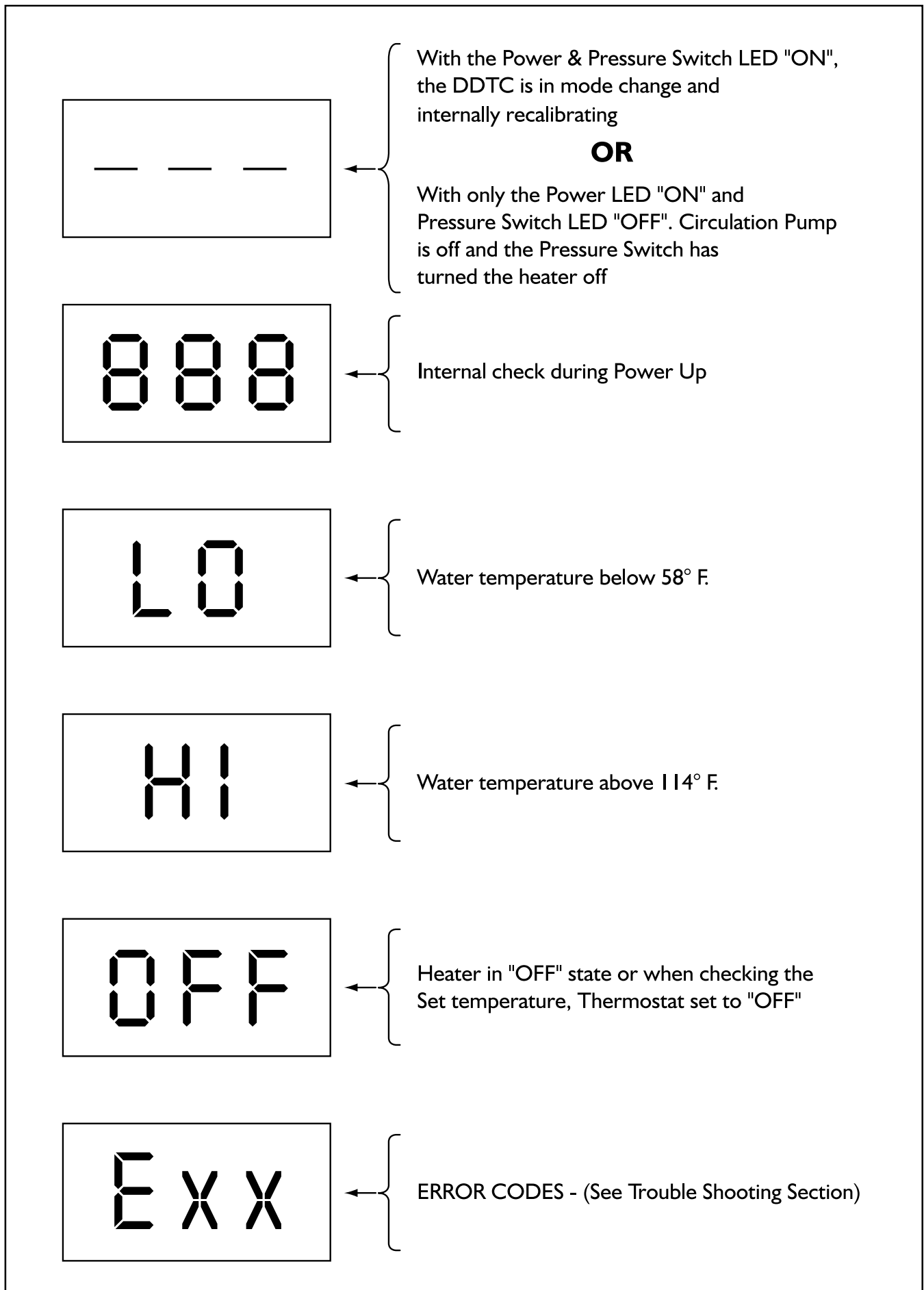


Figure 8.

## SECTION X. MINIMAX NT HEATER DDTC RETROFIT KIT PARTS

P/N	Description	Qty.
072204	Wire Tie	2
471870	Wire Assembly, Orange	2
472060	Silicone Tube	1
472100	DDTC Board	1
472256	Gasket, DDTC Cover	1
472257	Gasket, DDTC Mounting Plate	1
472299	Instruction Sheet, DDTC Retrofit Kit	1
472379	DDTC Cover w/Label	1
472380	Barrier (Rain Shield)	1
472381	¼ in. Female to Double Male, Piggyback	1
472383	DDTC Mounting Plate w/Label	1
98212800	Screw, #6 X 5/8 in.	6

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