



# ThermalFlo™

Heat Pump



## Autoset Control Board Addendum

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

# ThermalFlo Heat Pump Control Panel Addendum

**The information in this addendum supercedes information in the ThermalFlo Installation and User's Guide (P/N 473426 Rev. C 10/19/06). For additional information not covered in this addendum, please refer to the above-named manual.**

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## Technical support

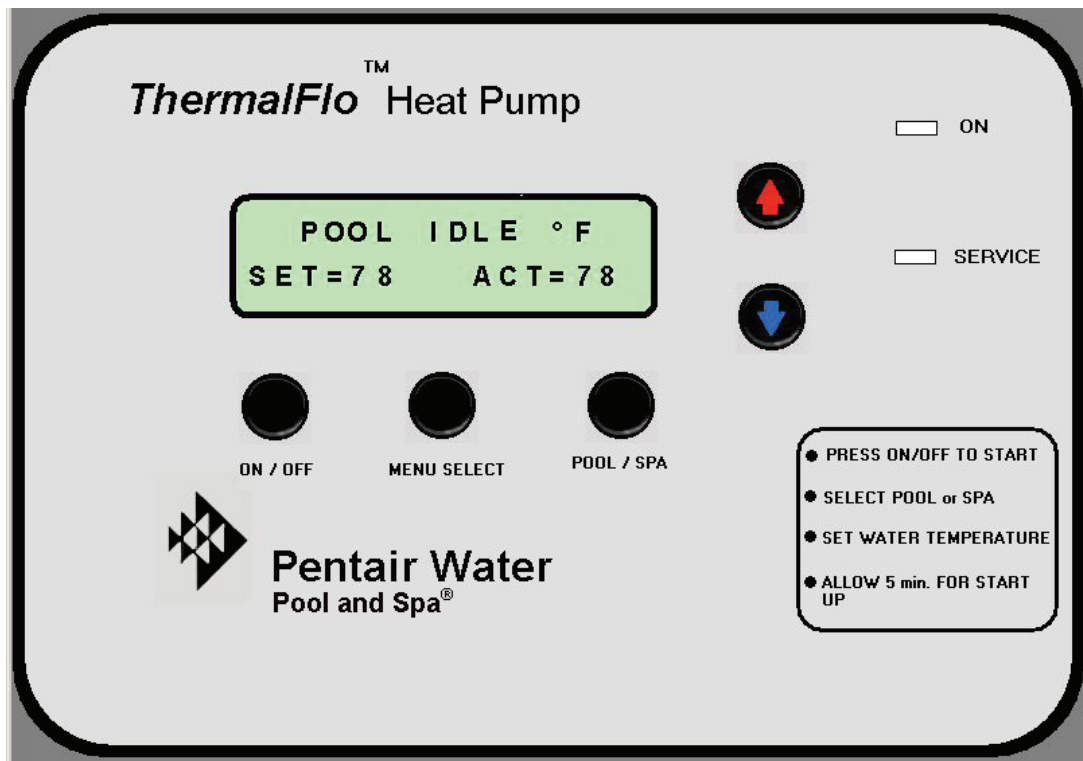
Phone: (800) 831-7133 (8 A.M. to 5 P.M. - ET) – (8 A.M. to 5 P.M. - PT)

Fax: (800) 284-4151

# THERMALFLO HEAT PUMP CONTROL PANEL OVERVIEW

## CONTROL PANEL LAYOUT

1. **ON/OFF** Pushbutton – Turns the heat pump On and Off.
2. **MENU SELECT** button – Use to select menu items. While in the Run screen, pressing this button displays the Control Panel Menu screen. Also, use this button to scroll through Operator Setup Menu screens
3. **POOL/SPA** button – On the first press the current heat, cool or auto mode will be displayed along with the active set point, pool or spa. On subsequent presses, the use of the pool or spa setpoints will be toggled. You can also toggle between the pool and spa set point by using the Up and Down arrow buttons.
4. **Up and Down Arrow** buttons – Use the Up and Down arrows to raise or lower the temperature setpoint while in the Run screen. These buttons are also used to scroll through the various parameter values on the Menu Select and Operator Setup screens.
5. **ON Light** – Illuminated when the heat pump is on.
6. **SERVICE Light** – Illuminated when an alarm condition exists.



## CONTROL PANEL OPERATION

### 1. Use the ON/OFF button to start and stop the heat pump.

- a. Start the heat pump – With power supplied, press the ON/OFF button to start the heat pump. The ON light will illuminate.
- b. Stop the heat pump – With the ON light illuminated, press the ON/OFF button to stop the heat pump. The ON light will be off followed by the temporary screen shown below.

PENTAIR WATER  
HEAT PUMP OFF

### 2. Adjusting the set point temperature – There are two (2) independently adjustable temperature setpoints for the pool and spa.

- a. To adjust the pool or spa set point temperature press the Up or Down button while in the Run screen. The setpoint is displayed after the letters SET in the lower left corner of the display. The number after ACT= on the bottom row is the actual measured water temperature.

POOL  
IDLE/HEAT/COOL  
SET=\_\_ ACT=\_\_

SPA  
IDLE/HEAT/COOL  
SET=\_\_ ACT=\_\_

- b. The setpoint need not be active to be adjusted. Press the MENU SELECT button repeatedly until the associated run screen is displayed. With that screen displayed, adjust the setpoint with the UP and DOWN arrows. The screen will automatically return to the active run screen after 15 seconds of keypad inactivity.
  - c. The maximum water temperature set point in Pool mode is 95°F.
  - d. The maximum water temperature set point in Spa mode is 104°F.
- ### 3. Toggling between Pool and Spa - The active mode of operation between Pool and Spa can be changed in one of the following two ways.
- a. On the first press of the POOL/SPA button the current heat, cool or auto mode will be displayed along with whether the pool or spa set point is active. On subsequent presses, the use of the pool or spa set points will be toggled. You can also toggle between the pool and spa set point by using the UP and DOWN arrows when this screen is displayed.
  - b. The Mode screen can also be made active by repeatedly pressing the MENU SELECT button. Once the Mode screen is displayed the active set point can be toggled between pool and spa by pressing the UP or DOWN arrows.

AUTO MODE  
POOL/SPA

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**4. Heat, Cool and Auto Modes Operation** - Certain heat pump models have the ability to both heat and cool.

- a. These heat pumps can be setup to operate in any one of three modes:
  - Heat only mode
  - Cool only mode
  - Automatic Heat and Cool – The heat pump automatically switches between heat and cool based on whether the water temperature is below or above the active setpoint.
- b. If the cooling option is available, the operating modes can be changed as described here. Press the MENU SELECT button repeatedly until the Heat or Cool screen is displayed. Once displayed, press the up or down arrows to scroll through the heat, cool and auto options. The last option shown on the display will become active.

HEAT / COOL / AUTO  
SET TO - H/C/A

**5. Relay Remote** – In relay remote operation the heat pump is started and stopped by remote relays which are connected to the remote POOL, COMMON and SPA quick connect connectors on the back of the control board. When conductivity is provided between the pool and common connections or the spa and common connections the heat pump will start as long as the water temperature is not over the local set point (under for chiller operation). The local set points are active in relay remote operation.

- a. If the heat pump is to be controlled by a remote device such as an automation system, the heat pump set point should be made higher (if heating) than the desired temperature. For example, if your remote connections wired to the back of the board are connected to the pool and common terminal, and you want your pool maintained at 85 degrees, you should set the heat pump to 90 Fahrenheit and then turn on the remote function.
- b. If you have a separate spa, you must have the automation system wired to the spa and common terminals on the back of the board. If you want your spa temperature maintained at 102 Fahrenheit, you should set the heat pump to 104 Fahrenheit and then turn on the remote function.
- c. To activate the relay Remote Mode, press the MENU SELECT button repeatedly until the Relay Remote screen is displayed. Once displayed, press the UP or DOWN arrows to go between ON and OFF. The last option shown on the display will become active.

RELAY REMOTE  
REMOTE IS ON/OFF

- 6. AutoSet** – Certain heat pump models have the ability to start and stop a remote water pump. This AutoSet feature, if enabled, allows the heat pump to periodically energize the filter pump and test the temperature of the water in the pool or spa. If the water requires heating, or cooling if available, the filter pump will remain energized until the water reaches the set point temperature. This menu is only shown if the AutoSet feature is enabled during factory setup.
- To activate the AutoSet feature, press the MENU SELECT button repeatedly until the AutoSet screen is displayed. Once displayed, press the UP or DOWN arrows to go between ON and OFF. The last option shown on the display will become active.

AUTOSET  
 OVERRIDE IS ON/OFF

## CONTROL PANEL MENU SCREENS

To scroll through the menu screens press the MENU SELECT button to view each screen. While in the menu screens, if no activity is detected after 15 seconds the main screen is displayed.

- 1. Pool Run Screen** – Displays whether the heat pump is idle, heating or cooling if the Pool setpoint is active. This screen also displays the water temperature setpoint and the actual measured water temperature. The Pool setpoint can be raised or lowered using the up and down arrows while this screen is displayed. The display will automatically return to this screen after 15 seconds of push button inactivity when the Pool setpoint is active.

POOL  
 IDLE/HEAT/COOL  
 SET=\_\_ ACT=\_\_

- 2. Spa Run Screen** - Displays whether the heat pump is idle, heating or cooling if the Spa setpoint is active. This screen also displays the water temperature setpoint and the actual measured water temperature. The Spa setpoint can be raised or lowered using the up and down arrows while this screen is displayed. The display will automatically return to this screen after 15 seconds of push button inactivity when the Spa setpoint is active.

SPA  
 IDLE/HEAT/COOL  
 SET=\_\_ ACT=\_\_

- 3. Heat or Cool Mode Selection Screen** – *This screen is only shown on Auto Heat and Cool heat pumps, not on heat only units.* On these units this screen allows the operator to switch the heat pump between heat-only, cool-only and auto heat/cool modes.

HEAT / COOL / AUTO  
 SET TO - H/C/A

4. **Remote On/Off Screen** – Allows the operator to turn the Relay Remote mode On and Off. In Relay Remote mode, the heat pump is started and stopped by remote relays in an automation controller. The local Pool and Spa setpoints are still active in this Relay Remote mode.

REMOTE  
REMOTE IS ON/OFF

5. **AutoSet On/Off Screen** – *This screen is only shown if the AutoSet mode is enabled during factory setup.* Allows the operator to turn the AutoSet mode On and Off. AutoSet mode periodically energizes a filter pump contactor to start a remote filter pump which allows the heat pump to heat or cool the water as necessary.

AUTOSET  
OVERRIDE IS ON/OFF

6. **Time Delay Screen** – *This screen is only shown if the heat pump is waiting due to a pre-programmed delay.* If the heat pump is waiting on any of the restart, pump start, sensing water temperature or defrost delays this screen shows how much delay time is left.

RESTART / PUMP START /  
DEFROST / SENSING  
WATER TEMP DELAYS

7. **Defrost Temperature** – *This screen is only shown if the defrost feature is enabled during operator setup.* If the Defrost feature is enabled this screen will display the temperature of the compressor suction line. This temperature is used to determine when the heat pump requires defrosting.

SUCTION TEMP  
ACT = \_\_\_\_

8. **Alarm Screen** – If an alarm condition is present it will be displayed on this screen. If no alarms are present the screen will display ALARM STATUS NONE.

ALARM STATUS

9. **Mode Screen** – Displays whether the heat pump is in Heat only, Cool only or Auto mode. It also displays whether the Pool or Spa set point is active. The active set point can be switched between Pool and Spa by using the UP and DOWN arrows.

AUTO MODE  
POOL/SPA

## OPERATOR SETUP MENU SCREENS

To access this menu, press the **Up** and **Down** arrow simultaneously. While in the Operator Setup Menu screen, if no activity is detected after 15 seconds the main screen is displayed. To get back into the Setup menu you must press the **Up** and **Down** arrow simultaneously again.

1. **Software Revision** – Displays the software revision level loaded on the control board.

SOFTWARE VERSION  
REV. \_\_

2. **Pump Start Time** – *This screen is only shown if the AutoSet mode is enabled during factory setup.* This displays the period at which the heat pump will close the AutoSet contactor to start the filter pump. Adjustable from 1 to 4 hours using the UP and DOWN arrows.

PUMP START TIME  
TIME = 1 - 4 HRS

3. **Intell Address** - IntelliTouch RS-485 Communications Address which must match the address used in the IntelliTouch automation controller being communicated with. Adjustable from 1 to 16 using the UP and DOWN arrows.

INTELL ADDRESS  
ADDRESS = 1 - 16

4. **Serial Remote** – Determines whether or not the heat pump will accept IntelliTouch RS-485 command. Adjusted to On or Off with the UP and DOWN arrow buttons.

SERIAL REMOTE  
ON/OFF

5. **Temperature Scale** – The control board can display temperatures in either degrees Fahrenheit or Celsius. The temperature scale in use can be changed as described below.

- a. Press the MENU SELECT button repeatedly until the Temperature Scale screen is displayed. Once displayed, press the UP or DOWN arrows to toggle between the Fahrenheit and Celsius options. The last option shown on the display will become active.

TEMPERATURE SCALE  
FAHRENHEIT / CELSIUS

6. **Temp Offset** – Adjusts the measured water temperature up or down to allow the operator to match the heat pump measured temperature to a remote temperature monitoring device. The offset can be varied from -2 to +2 using the up and down arrows. The temperature offset can be changed as described below.

- a. Press the MENU SELECT button repeatedly until the Temperature Offset screen is displayed. Once displayed, press the UP or DOWN arrows to select the desired offset.

The last number shown on the display will become active.

TEMP OFFSET  
 OFFSET = -2 TO +2

7. **Defrost** – Allows the operator to turn the defrost feature on or off. Adjusted to enable or disable with the UP and DOWN arrow buttons.

DEFROST  
 ENABLE / DISABLE

8. **Exit** – Pressing the POOL/SPA button while this screen is displayed returns the display to the Pool or Spa Run Screen as appropriate.

PRESS POOL/SPA TO  
 EXIT SETUP

## LOCKING THE CONTROL PANEL

1. **Heat pump control panel lock-out** - To prevent unwanted adjusting or manipulating of the heat pump settings, the control panel can be locked. Once locked, if any button is pressed, the display will read:

HEAT PUMP  
 CONTROLS LOCKED

- To activate the control panel lockout, press the MENU SELECT and POOL/SPA buttons simultaneously.
- To unlock the control panel, press the MENU SELECT and POOL/SPA buttons simultaneously.

## DEFROST CYCLE

At air temperatures below 50° F, the heat pump may enter a defrost cycle. The defrost cycle is initiated when a sensor on the evaporator detects that the refrigerant temperature has fallen below the defrost set point. At this time, the heat pump compressor will stop. The heat pump evaporator fan will continue to run, and will draw air over the evaporator fins for about 15 minutes. If, at the end of the 15 minutes, the temperature sensor detects a temperature above 44° F, the compressor will restart. Otherwise the unit will shut down.

Because a heat pump's efficiency decreases as air temperature decreases, it is preferable to operate the heat pump during the warmest time of day. As a rule, the unit should not be operated during the coolest time of day, or when the air temperature falls below 45° F.

## AUTOSET

Autoset is a feature that allows the heat pump to automatically turn on your water circulation pump at predetermined time intervals after the water circulation pump shuts off. To utilize this feature, the water circulation pump must be wired in parallel with your mechanical time clock using the auxiliary relay supplied in the high voltage power panel of the heat pump.

For example, if your pool water circulation pump is wired properly with the time clock through the heat pump, have the heat pump control board programmed with a pump start time interval of 4 hours, have the AutoSet feature enabled, and you wish to maintain your pool to 80°F., this is the sequence of events that will happen.

1. If your mechanical time clock is set to shut off at 9:00 pm., once the water circulation pump shuts off, the heat pump will display a countdown window.

PUMP START DELAY  
REMAINING=4:00

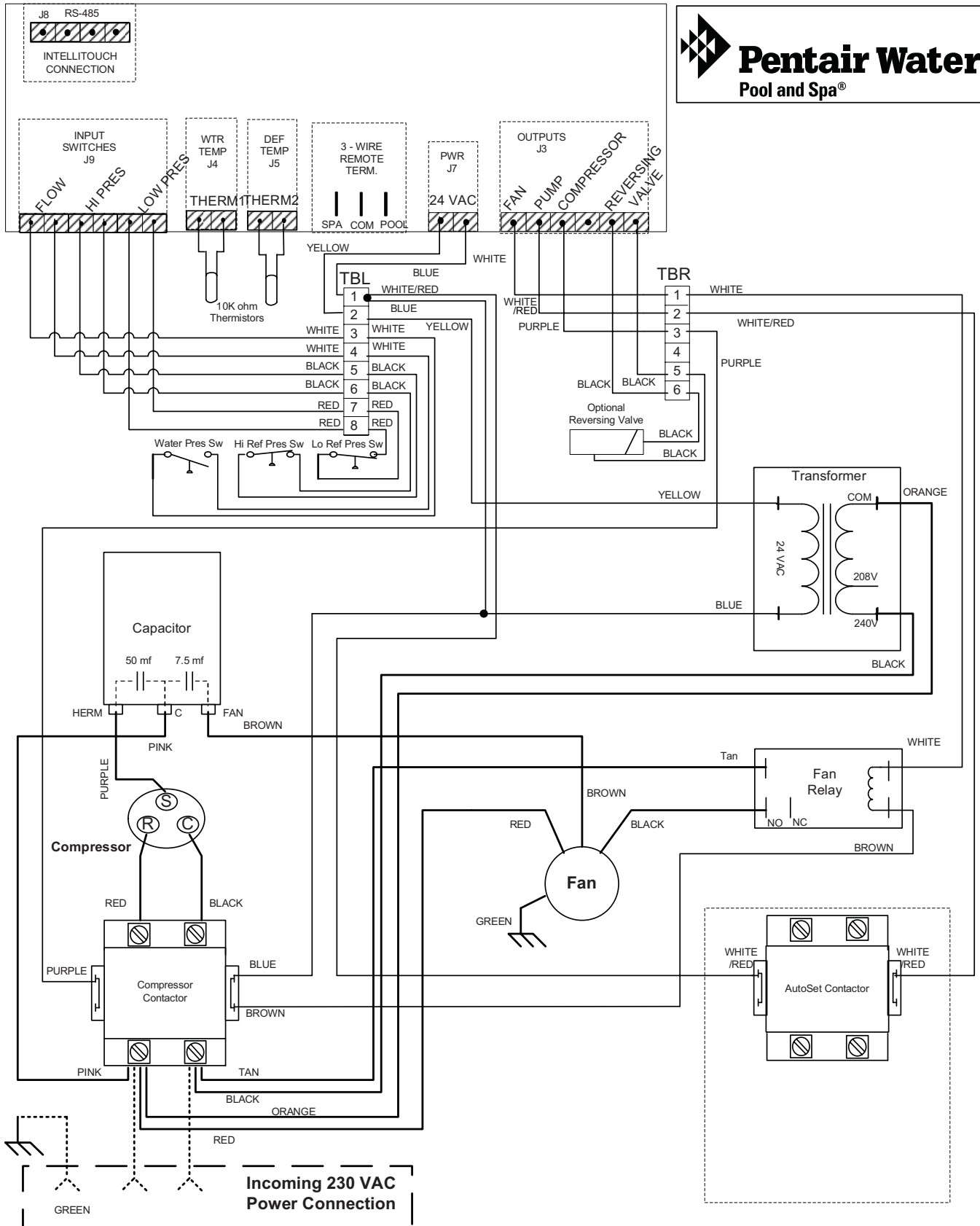
2. The heat pump will continue to countdown in hours and minutes.
3. Once the 4 hours has expired, at 1:00 am, the control board will energize the internal contactor in the heat pump to turn on your water circulation pump.
4. The heat pump will sense water temperature then determine if it needs to continue to circulate water. If the pool temperature has fallen below your set point, 80 degrees for this example, the heat pump will turn on and begin heating the pool. Once the pool temperature has reached its set point, 80 degrees, the heat pump will shut off and will also shut off the water circulation pump.
5. If after the water sensing time, the heat pump detects the pool water is above the set point, 80 degrees for this example, it will shut off and shut the water circulation pump off also.
6. At the time the water circulation pump shuts off, the heat pump will again reset and begin the countdown interval again and display the following window.

PUMP START DELAY  
REMAINING=4:00

7. The heat pump will continue this cycle every time the water circulation pump is shut off.
8. Once the time clock turns on in the morning, the heat pump will stop the AutoSet feature and resume normal operation.

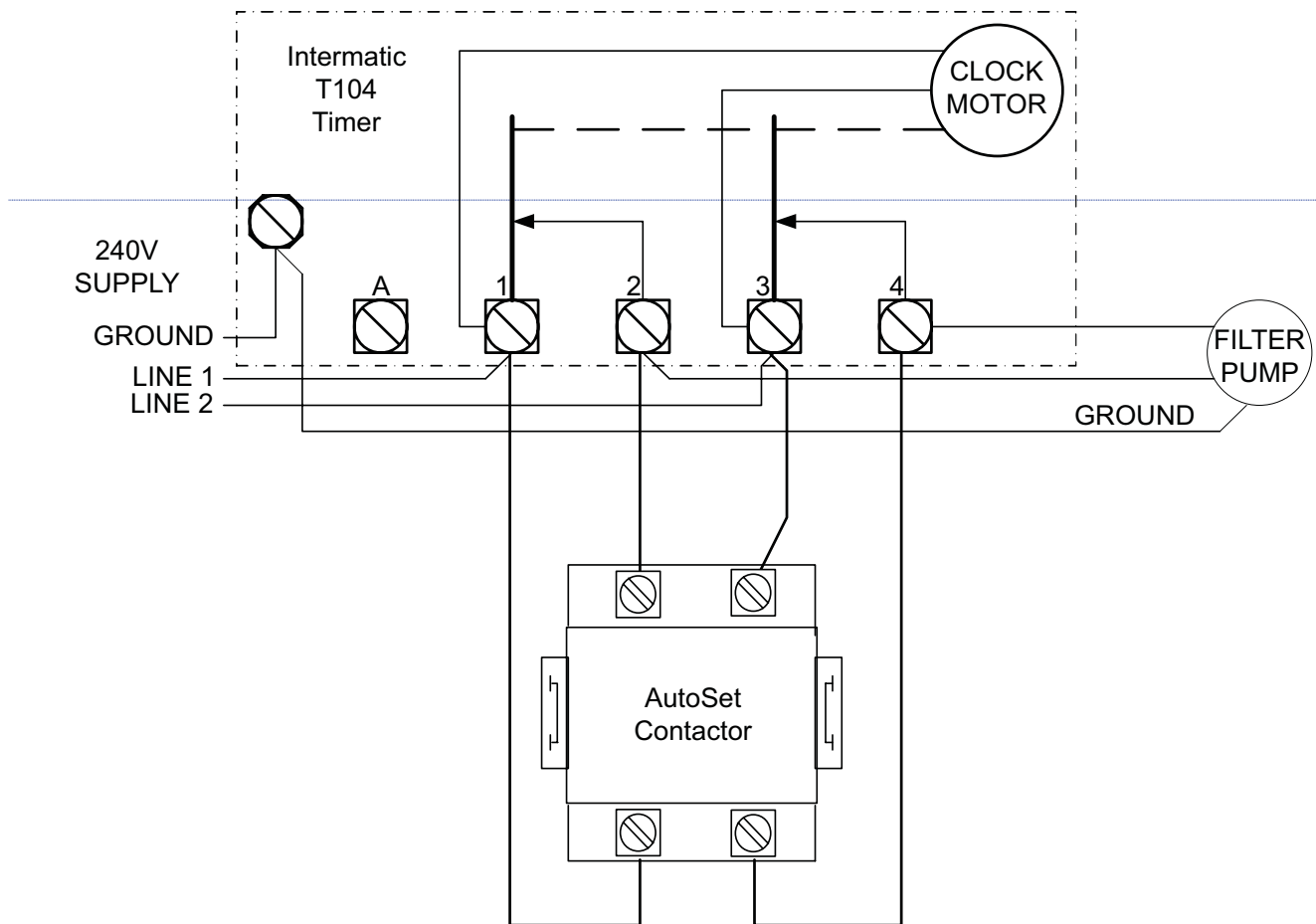
## CONTROL PANEL ALARM MESSAGES

<b>HIGH WATER TEMP</b>	Water temperature is above 109°.
<b>LOW WATER TEMP</b>	Water temperature is below 45°.
<b>LOW WATER FLOW</b>	The pressure switch sensing water flow is open.
<b>REMOTE POOL SPA</b>	Pool and Spa relay remote inputs are simultaneously energized.
<b>WATER THERM SHORT</b>	Water temperature thermistor circuit shorted.
<b>WATER THERM OPEN</b>	Water temperature thermistor circuit open.
<b>SUCTION TH SHORT</b>	Defrost thermistor circuit shorted.
<b>SUCTION TH OPEN</b>	Defrost thermistor circuit open.
<b>BROWNOUT</b>	The 24VAC supply voltage to the control board is low.
<b>HIGH REFRIG</b>	Refrigerant high pressure switch is open.
<b>LOW REFRIG</b>	Refrigerant low pressure switch is open.
<b>FIVE ALARMS</b>	Indicates that 5 faults have occurred in one hour. This fault will automatically reset in one hour or can be manually reset by pressing the ON/OFF button.



ThermalFlo Heat Pump Control Board Connections

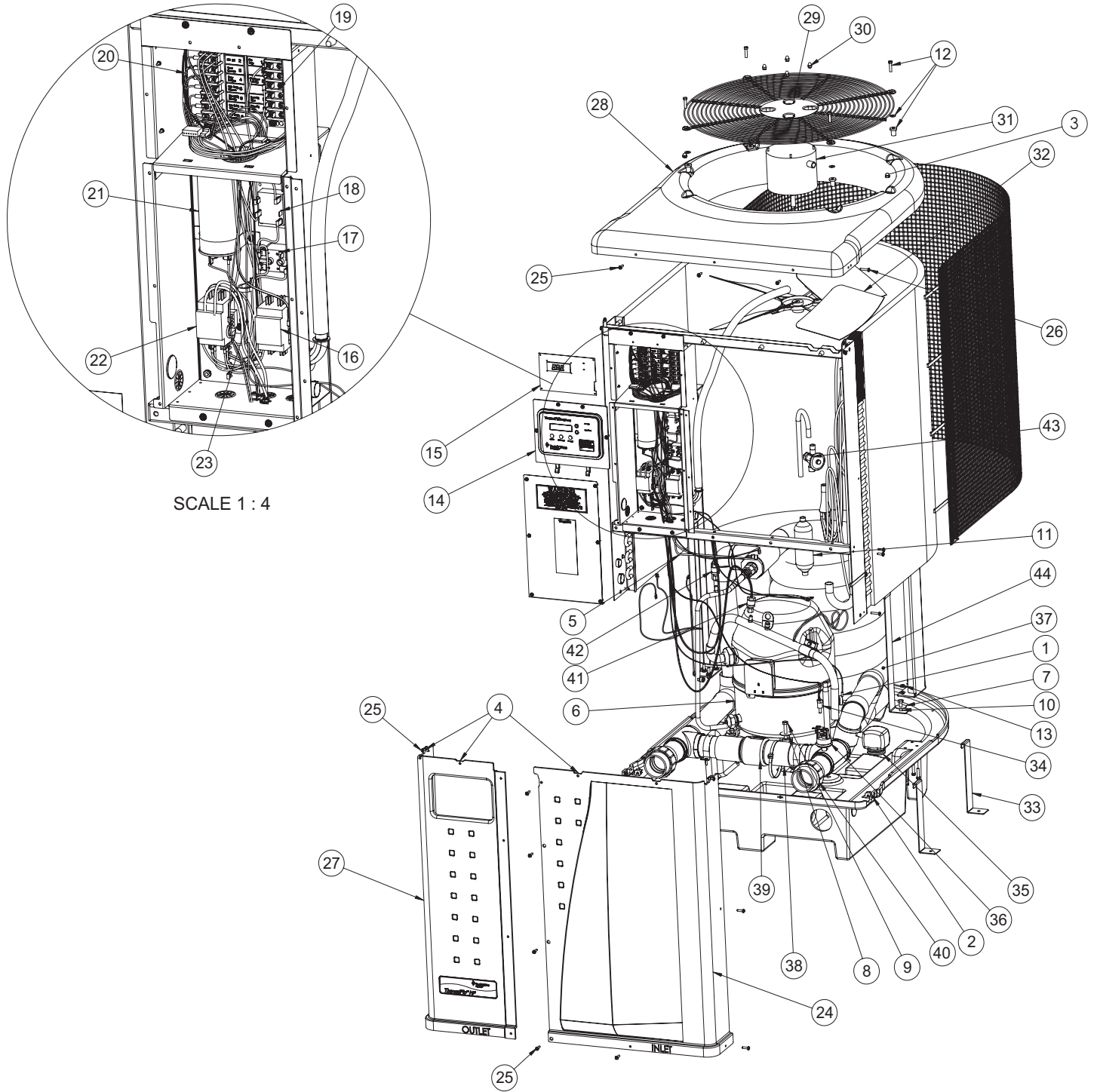
### AutoSet Contactor to Mechanical Timer Wiring Example



#### NOTES:

1. Mechanical timer is not provided with the heat pump
2. Example only, other timers will be similarly wired
3. Ensure that the electrical power lines are not crossed when making connections

# Replacement Parts List



## Replacement Parts List (Continued)

Item No.	Part Number	Description
1	473665	Probe Thermister Defrost Sensor
2	470284	Nut, J-Clip
3	473285	Nut, 1/4 - 20 SS Acorn
4	470281	Nut, U-Clip
5	470147	Wire Harness, Compressor
6	473024	Compressor, Trane GH633-LL1-G (Model # 500, 700, 900)
6	473025	Compressor, Trane GH673-LL1-G (Model # 1200, 1200R)
7	473295	Fender Washer
8	473026	Compressor Isolation kit, Grommet and Spacer (1 Set)
9	473294	Bolt 5/16 - 18 x 1.75" SS
10	98219800	Bolt 5/16 - 18 x 1" SS
11	473121	Drier (Model # 500, 700, 900, 1200)
11	473139	Drier, Reversible (Model # 1200R)
12	470441	Fan Guard Fastener Kit
13	71406	Nut, 1/4 - 20 Hex SS
14	473693	Bezel, Control Board w/ Label
15	473602	Auto Heat Control Board
16	473603	Pump Contactor AutoHeat
17	473150	Fan Relay
18	473155	Transformer
19	473422	Wire Harness Terminal Block - Fan, Compressor
20	473315	Wire Harness, Terminal Block - Sensors
21	470146	Capacitor
22	473149	Contactor, Heat Pump
23	473423	Wire Harness, Main
24	473412	Panel, Front Right(Model# 500, 700)
24	473431	Panel, Front Right(Model# 900, 1200, 1200R)
25	470159	Screw #10 x .75" Pan Head Phillips, Almond Head
26	470161	Screw #10 x 1" Button Head Torx, Almond Head
27	470419	Panel, Front Left, w/ Decal (Model# 500, 700)
27	470434	Panel, Front Left, w/ Decal (Model# 900, 1200, 1200R)
28	473134	HP Top
29	473368	Guard, Fan
30	470439	Nut, 10-32 SS Acorn
31	470289	Fan Motor w/ Acorn nut Kit
32	473223	Fan Blade
33	470137	Tie Down Bracket
34	471566	Probe Thermister - Water Temperature
35	473606	Water Pressure Switch Boot
36	473605	Water Pressure Switch
37	472737	Titanium Heat Exchanger (Model# 500)
37	472736	Titanium Heat Exchanger (Model# 700, 900, 1200, 1200R)
38	473664	Water Bypass Manifold w/ 2 Street Elbows
39	R172305	Water Bypass Check Valve
40	473381	Union PVC 2"
41	473656	Switch, Low Pressure
42	473655	Switch, High Pressure
43	472735	Thermostatic Expansion Valve
44	473657	Titanium Water Coil Tie Down Strap
	473135	Reversing Valve (Model # 1200R) [Not shown]
	473136	Reversing Solenoid (Model # 1200R) [Not shown]



Web sites: [www.pentairpool.com](http://www.pentairpool.com) - [www.staritepool.com](http://www.staritepool.com)

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1620 Hawkins Ave., Sanford, NC 27330 • (919) 566-8000  
10951 West Los Angeles Ave., Moorpark, CA 93021 • (805) 553-5000

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