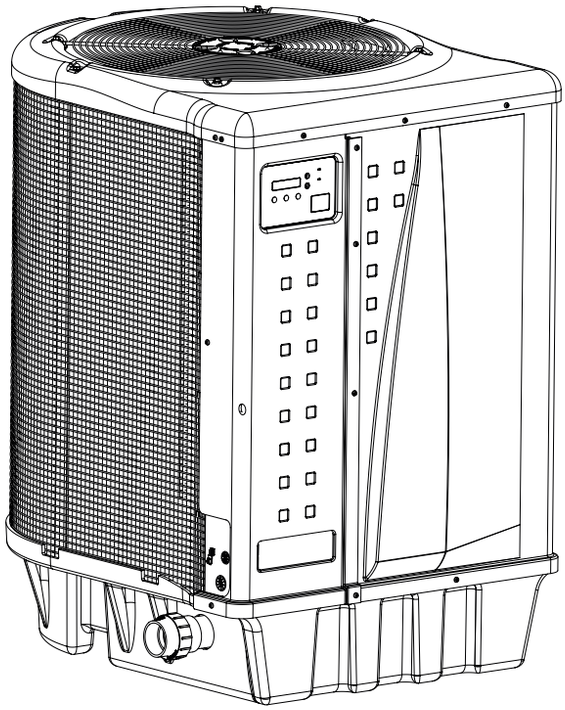
ENGLISH

FRANÇAIS

ESPAÑOL

ULTRATEMP®
HEAT PUMP



INSTALLATION AND USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

Digital copies of all UltraTemp manuals, as well as translated versions, can be found at www.pentair.com, or by scanning the provided QR code.

Se pueden encontrar copias digitales de todos los manuales de UltraTemp, así como versiones traducidas en www.pentair.com, o escaneando el código QR proporcionado.

Des copies numériques de tous les manuels UltraTemp, ainsi que les versions traduites, peuvent être trouvées sur www.pentair.com, ou en scannant le code QR fourni.

IMPORTANT SAFETY INSTRUCTIONS



Important Notice:

This guide provides installation and operation instructions for this heat pump. Consult Pentair with any questions regarding this equipment.

Attention Installer: This guide contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment after installation or left on or near the heat pump.

Attention User: This manual contains important information that will help you in operating and maintaining this heat pump. Please retain it for future reference.

⚠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 these instructions.

Codes and Standards

UltraTemp heat pumps are listed by ETL as complying with the latest edition of the "UL Standard for Safety for Heating and Cooling Equipment", UL 1995 and CSA C22.2 No. 236.

All Pentair heat pumps must be installed in accordance with the local building and installation codes as per the utility or authority having jurisdiction. All local codes take precedence over national codes. In the absence of local codes, refer to the latest edition of the National Electric Code (NEC) in the United States and the Canadian Electric Code (CEC) in Canada for installation.

⚠WARNING **RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.** The electrical supply to this product must be installed by a licensed, certified electrician or qualified personnel in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to pool or spa users, installers, or others due to electrical shock, and may also cause damage to property. Read and follow the specific instructions inside this guide.

⚠WARNING This appliance is not intended for use by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Do NOT permit children to use this product.

⚠WARNING For units intended for use in other than single-family dwellings, a clearly labeled emergency switch shall be provided as part of the installation. The switch shall be readily accessible to the occupants and shall be installed at least 5 ft [1.5 m] away, adjacent to, and within sight of the unit.

Consumer Information and Safety

The UltraTemp series of heat pumps are designed and manufactured to provide safe and reliable service when installed, operated and maintained according to the information in this manual and the installation codes referred to in later sections. Throughout the manual, safety warnings and cautions are identified by the "⚠" symbol. Be sure to read and comply with all of the warnings and cautions.

⚠WARNING The U.S. Consumer Product Safety Commission warns that elevated water temperature can be hazardous. See below for water temperature guidelines before setting temperature.

⚠WARNING The following "Safety Rules for Hot Tubs" recommended by the U.S. Consumer Product Safety Commission should be observed when using the spa.

1. Spa or hot tub water temperatures should never exceed 104°F [40°C]. A temperature of 100°F [38°C] is considered safe for a healthy adult. Special caution is suggested for young children. Prolonged immersion in hot water can induce hyperthermia.
2. Drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness and subsequently result in drowning.
3. **Pregnant women beware**! Soaking in water above 100°F [38°C] can cause fetal damage during the first three months of pregnancy (which may result in the birth of a brain-damaged or deformed child). Pregnant women should stick to the 100°F [38°C] maximum rule.
4. Before entering the spa or hot tub, the user should check the water temperature with an accurate thermometer. Spa or hot tub thermostats may err in regulating water temperatures.
5. Persons with a medical history of heart disease, circulatory problems, diabetes or blood pressure problems should obtain their physician's advice before using spas or hot tubs.
6. Persons taking medication which induce drowsiness, such as tranquilizers, antihistamines or anticoagulants should not use spas or hot tubs.

Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above normal body temperature of 98.6°F [37°C]. The symptoms of hyperthermia include: drowsiness, lethargy, dizziness, fainting, and an increase in the internal temperature of the body.

The effects of hyperthermia include:

1. Unawareness of impending danger.
2. Failure to perceive heat.
3. Failure to recognize the need to leave the spa.
4. Physical inability to exit the spa.
5. Fetal damage in pregnant women.
6. Unconsciousness resulting in danger of drowning.

General Specifications

Installation Location Certified for use:
OUTDOOR USE ONLY. Failure to provide the proper clearances outlined on page 3 will lower the performance of the heat pump and void the warranty.

Water Pipe/Heater Connection — Plastic 2" [50 mm] PVC (Unions included)

Flow Rate

- Maximum 120 gpm [456 lpm] - If system flow rate exceeds 120 gpm [456 lpm], a bypass valve is required
- Minimum 30 gpm [110 lpm]
- Maximum Working Water Pressure 50 psi [3.5 bar]

For Electrical Supply and Voltage Requirements, refer to the table on page 25.

ENGLISH

CUSTOMER SERVICE / TECHNICAL SUPPORT

Hours: 8:00AM to 7:30PM EST (5:00AM - 4:30PM PST)

Call: (800) 831-7133

Visit: www.pentair.com

Fax: (800) 284-4151

TABLE OF CONTENTS

IMPORTANT SAFETY INSTRUCTIONS ..... **i**

MENU TREE QUICK START GUIDE ..... **iii**

BEFORE INSTALLING THE HEAT PUMP **1**
- Heat Pump Overview 1
- Installation Requirements 1
- General Installation Information 1
- General Features 1

INSTALLATION AND LOCATION **2**
- Materials Required for Installation 2
- Equipment Pad 2
- Drainage and Condensation, Roof Run Off, and Lawn Sprinklers 2
- Heat Pump Dimensions 2
- Location and Clearances 3
- Anchor Clamp Installation 3
- Water Connections and Plumbing 4
- Automatic Flow Control Valve 4
- Water Connections to the Heat Pump 5
- Drainage Connection to the Heat Pump 5
- Water Pressure Switch Adjustment 6
- Multiple Unit Installation 7
  - Heat Pump, Heater, Solar Combination 7
  - Multiple Heat Pump Connections 7
- Electrical Connections and Wiring 9
  - Wiring Diagram – (Single Phase – 50/60 Hz) 10
  - Wiring Diagram – (Three Phase – 60 Hz) 11

CONNECTING TO AN AUTOMATION SYSTEM ... **12**
- Remote Operation 12
- Relay Remote Controls 12
  - Connecting to IntelliTouch or EasyTouch via Heat Pump Spade Terminals 13
- Connecting to IntelliTouch or EasyTouch via RS-485 Connector 14
  - Pin Configuration for Heat Pump Control Board to IntelliTouch 15
  - Connecting IntelliTouch or EasyTouch to the Heat Pump 15

OPERATING THE HEAT PUMP **16**
- Swimming Pool Energy Saving Tips 16
- Heat Pump Control Panel Overview 16
- Operator Menu Tree Guide 17
  - Starting and Stopping the Heat Pump 18
  - Changing the Set Point - Pool and Spa 18
  - Heat, Cool, and Auto Modes 18
  - Heat Pump Timer 18
  - Relay Remote 18
  - RS-485 Remote (Serial Cable) 18
  - AutoSet Operation 19
  - Extend Operation 19
- Timers and Delays 20
- Control Panel Alarm Messages 20
- Service Menu Tree Guide 21
  - Setting Temperature Scale 22
  - Set Water Temperature Offset 22
  - Defrost Cycle 22
  - Run Time Counters 22
- Locking the Control Panel 22

MAINTENANCE **23**
- Water Chemistry 23
- Winterizing 23
- Spring Start Up 23
- Inspection and Service 23
- Owner Inspection 24
- Professional Maintenance and Service 24

TECHNICAL INFORMATION **25**
- Electrical Supply - Voltage Requirements 25
- Temperature Resistance Chart 25
- Ambient/Water Flow Table for Professional Maintenance and Service 26
- Heat Pump Pressure Drop 26

TROUBLESHOOTING **27**

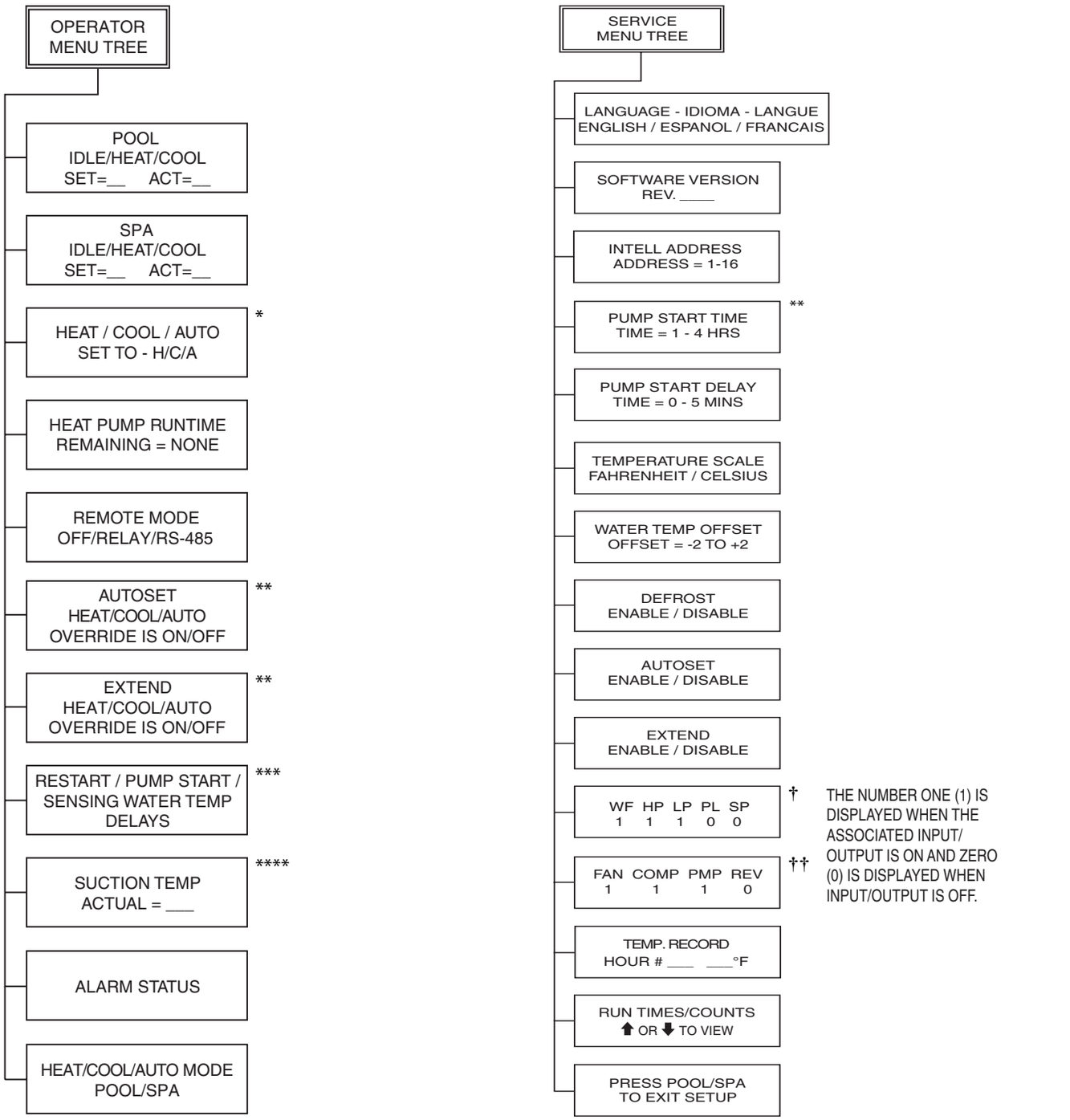
REPLACEMENT PARTS **32**
- Illustrated Parts View 32
- Parts List 33

For pool energy saving tips, refer to page 16, under "Operating the Heat Pump". For technical data, voltage requirements, or ambient/water flow information, refer to page 25 at the back of the manual.

ULTRATEMP® MENU TREE QUICK START GUIDE

1. Push the ON/OFF button to turn the unit on, the green “ON” light should be lit.
2. Select either Pool or Spa mode. The default is Pool mode.
3. Adjust the temperature to the desired setting by pushing either the UP arrow or DOWN arrow.
4. Allow 5 minutes for compressor restart delay.

See pages 17-22 for details on the Operator and Service menu screens on the control panel.



* Menu appears only if Heat and Cool mode is enabled at the factory.
** Menu appears only if AutoSet or Extend is enabled in the Service menu.
*** Menu appears only if a delay is active.
**** Menu appears only if Defrost is enabled in the Service menu.

† **INPUT STATUS**
WF = WATER FLOW SWITCH
HP = HIGH REFRIGERANT PRESSURE SWITCH
LP - LOW REFRIGERANT PRESSURE SWITCH
PL - POOL REMOTE
SP - SPA REMOTE

†† **OUTPUT STATUS**
FAN - FAN
COMP - COMPRESSOR
PMP - FILTER PUMP
REV - REVERSING VALVE

BEFORE INSTALLING THE HEAT PUMP

Heat Pump Overview

Your Pentair heat pump will provide you with years of heated pool enjoyment. Heat pumps operate by taking heat from the surrounding air and transferring it into the water. The warmer the air and the more humidity in the air, the more latent heat is available for heating your pool. With a properly sized heat pump for your pool, the heat pump should raise your pool on average 1°F (-17°C) per hour depending on air temperature, humidity, and water temperature. The ideal or rated condition for the heat pump is 80°F (27°C) air temperature, 80% relative humidity, and 80°F (27°C) water temperature. As conditions decrease from 80/80/80, the heat pump performance will decrease slightly.

Heat Pumps are best utilized to maintain a set water temperature; they are not intended to provide instant or fast heating. It is not reasonable to expect a heat pump to perform like a gas heater which has a much higher BTU output and faster response. Additionally, gas heaters are not dependent on environmental conditions. Swimming pool heat pumps are very similar to home heating and air conditioning heat pumps and therefore should be treated similarly.

Proper operation and use of the heat pump is to set it at your desired temperature and leave it. Your heat pump will turn on and off automatically to maintain your desired temperature much like your home HVAC unit. To take advantage of the sun's energy, operate your heat pump during the heat of the day.

Your heat pump will still operate when the temperature drops at night, but the output will be decreased. It is acceptable to shut the heat pump off and not use it for extended periods of time. When you have a need to heat your pool, please plan accordingly since it may take the heat pump days to heat your pool back to your desired temperature, depending on your pool temperature and environmental conditions.

Heat Pump Installation Requirements

Correct installation is required to assure safe operation. The requirements for Pentair heat pumps include the following:

- Dimensions for critical connections.
- Field assembly (if required).
- Appropriate site location and clearances (pages 2-3).
- Proper electrical wiring (pages 9-11).
- Adequate water flow (page i).

This manual provides the information needed to meet these requirements. Review all application and installation procedures completely before continuing the installation.

General Installation Information

1. Installation and service must be performed by a qualified installer or service agency, and must conform to all national, state, and local codes.
2. Heat pumps get electrical power from an external source and provide a dual electronic thermostat control system for pool/spa combinations or preheat convenience.
3. This heat pump is specifically designed for heating fresh water swimming pools and spas. Do not use it as a general service heater. Consult your dealer for the appropriate Pentair products for these applications.

General Features

- Dual digital thermostats offer precise temperature control to maintain the desired separate water temperatures in pool/spa combinations without overheating or wasting energy.
- Long-life corrosion resistant composite plastic cabinet stands up to severe climates and pool chemicals.
- 100% pure titanium heat exchanger assures corrosion-free performance for extra long life.
- Self-diagnostic control panel monitors and troubleshoots heat pump operations to ensure safe, dependable operation.
- Autoset (time clock over-ride) feature monitors water temperature and turns the water circulation pump on and off as needed to maintain desired pool temperatures.
- Extend (time clock over-ride) feature monitors water temperature and turns the water circulation pump on and off as needed to prolong a heating cycle that has been interrupted.
- Automatic Defrost feature senses refrigerant temperature and prevents the heat pump from freezing, allowing the heat pump to operate at even lower temperatures.
- Compatible with all automated control packages. RS-485 communication compatible with IntelliTouch® and EasyTouch® Control Systems.
- Thermostatic expansion valve (TXV) controls refrigerant flow for optimum efficiency and BTU output over a wider operating range.
- Elevated base pan for positive drainage of condensation.
- 2-inch plumbing connections for easy installation.
- Separate isolated electrical compartment prevents internal corrosion, extends heater life.
- Highest efficiency available, meets or exceeds existing codes and standards.
- Adjustable timer allows the operator to set the heat pump to run for a predetermined time. Incremental by 10 minutes to a maximum of 99 hours.
- An extensive list of operational conditions, alarms and water temperatures are logged on the control board. This information is available for the user to track performance and troubleshoot issues.

INSTALLATION AND LOCATION

⚠CAUTION When pool equipment is located below the pool surface, a leak from any component can cause large scale water loss or flooding. Pentair Water Pool and Spa, Inc. cannot be responsible for such water loss or flooding which may cause damage to property or to the product. Avoid placing the heat pump in locations where it can cause damage by water or condensate leakage. If this is not possible, provide a suitable drain pan to catch and divert any leakage.

Only a qualified service person should install the UltraTemp® Heat Pump. Before installing this product, refer to *IMPORTANT SAFETY INSTRUCTIONS* on page i.

Materials Required for Installation

The following items are needed and are to be supplied by the installer for all heat pump installations:

1. Plumbing connections (2-inch).
2. Level surface for proper drainage.
3. Suitable electrical supply line. See rating plate on unit for electrical specifications. A junction box is not needed at the heat pump; connections are made inside of the heat pump electrical compartment. Conduit may be attached directly to the heat pump jacket.
4. Electric cutout switch that will interrupt all power to the unit. This switch must be within line of sight of the heat pump. Check local codes for requirements.
5. Watertight conduit to run the electrical supply line.

Equipment Pad

For proper drainage of condensation and rain water, place the heat pump on a flat slightly pitched surface, such as a concrete or fabricated slab (pad).

If possible, place the pad at the same level or slightly higher than the filter system equipment pad.

Note: Be sure that the pad is pitched not more than 1/4 in. per foot in any direction as needed for runoff.

Drainage and Condensation

Condensation occurs from the evaporator coil while the unit is running, and drains at a steady rate (usually three to five gallons per hour), depending upon ambient air temperature and humidity. The more humid the ambient conditions, the more condensation will be produced.

The bottom of the unit acts as a tray to catch rainwater and condensation. Keep the drain holes, located on the bottom pan of the base of the unit, clear of debris.

Roof Run-off

Make sure the heat pump is not located where large amounts of water may run-off from a roof into the unit.

Sharp sloping roofs without gutters will allow massive amounts of rain water, mixed with debris from the roof to be forced through the unit. A gutter or down spout may be needed to protect the heat pump.

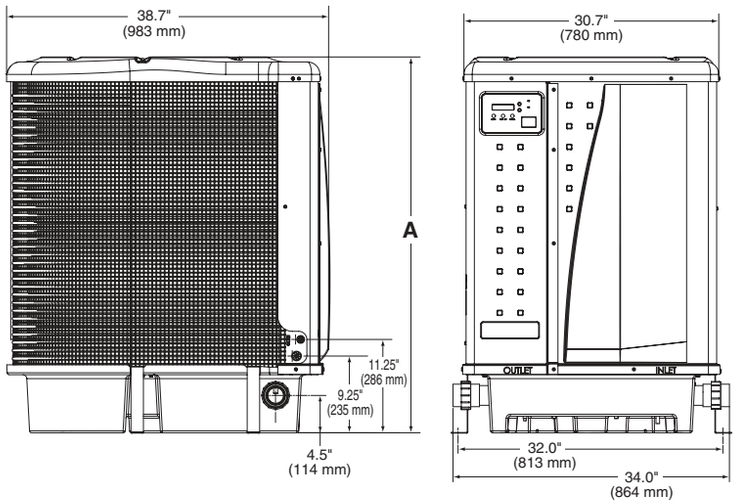
Lawn Sprinklers

Avoid placing lawn sprinkler near the heater - they can spray water into the heater and void the warranty.

Be sure to direct any spraying water away from the heater. Note the wind direction to be sure water from sprinklers is not blown toward the heater. Sprinkler heads can produce high water pressure and spray at an angle, different from typical rain and humid weather. Also, sprinklers connected to a well water system can cause mineral build up on the evaporator coils and electronics. Salt water can also be an issue if located near the coast.

Heat Pump Dimensions

MODELS	DIMENSION "A"
70, 90	33.5" (851 mm)
110, 120, 120C, 140C 120 H/C, 140, 140 H/C	45.5" (1156 mm)

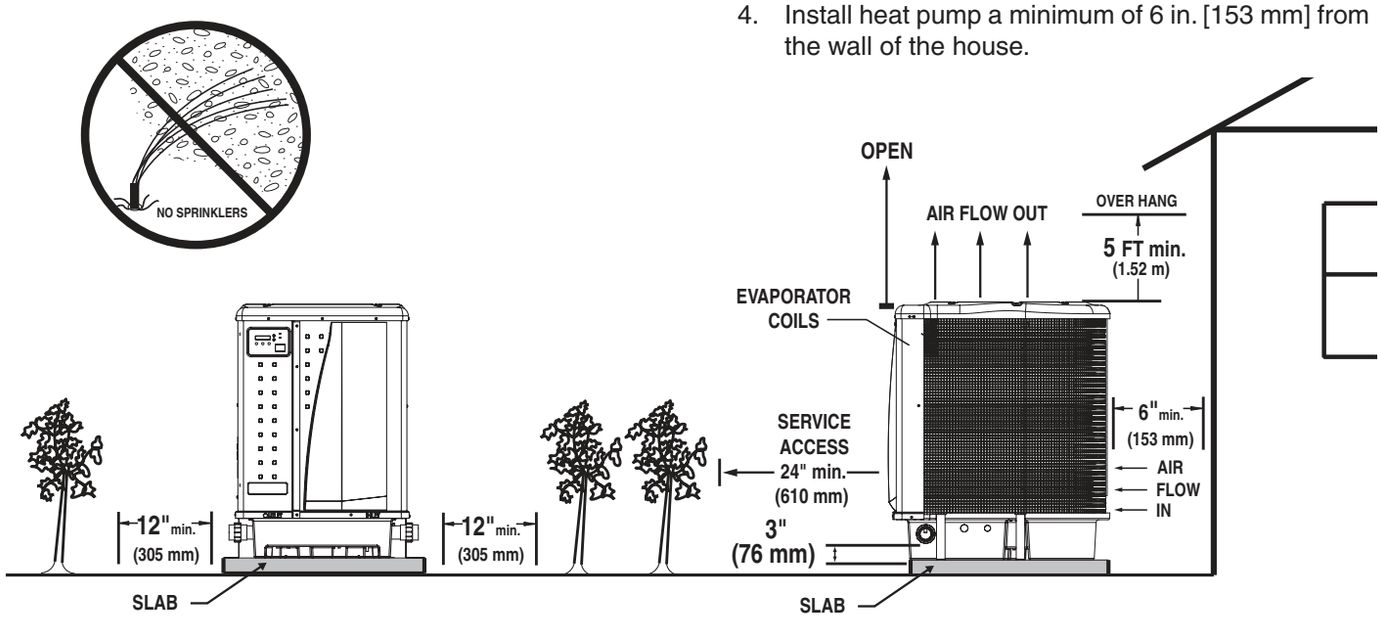


Location and Clearances

All criteria given in the following sections reflect minimum clearances. However, each installation must also be evaluated, taking into account the prevailing local conditions such as proximity and height of walls, and proximity to public access areas.

The UltraTemp® Heat Pump must be placed to provide clearances on all sides for maintenance and inspection.

1. At least 24 in. [610 mm] access must be available in the front and 12 in. [305 mm] on all the other sides of the heat pump for service and proper air flow. (Manufacturer's recommendation).
2. If the heat pump is to be installed under a cover or under a vertical overhang, the unit must have a minimum of five (5) feet [1.52 m] clearance from the top of the heat pump. (Manufacturer's recommendation).
3. Install a minimum of five (5) feet [1.52 m] from the inside wall of the pool or spa unless the heat pump is separated from the pool or spa by a five (5) foot [1.52 m] high solid fence or other permanent barrier. Canadian installations require a minimum of three (3) meters [9.84 ft] from pool water.
4. Install heat pump a minimum of 6 in. [153 mm] from the wall of the house.



Heat Pump Location and Clearances

Anchor Clamp Installation

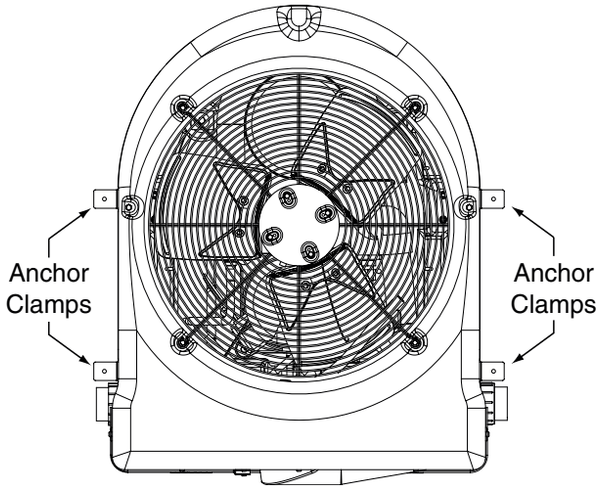
Installation of the anchor clamps is recommended in all installations. Installation of the anchor clamps is required in Florida (see Florida Building Code 301.13).

Anchor clamps hold the heat pump to the equipment pad in order to withstand high winds caused during extreme weather (i.e. hurricanes).

To install the anchor clamps:

1. Be sure the heat pump is in its permanent location on the equipment pad.
2. Place the clamps at the base of the heat pump in the four (4) locations, shown in the image to the right.

   Note: Bolts and bolt anchors are not included with the heat pump. The installer must provide 1/4" x 1-3/8" stainless steel anchor bolts and the appropriate size concrete anchor to mount the clamp to the equipment pad. Be sure to check local codes.
3. Fit the hook of each clamp over the lip on the base panel of the heat pump. The hook should fit between the lip of the base panel and the evaporator coil guard.

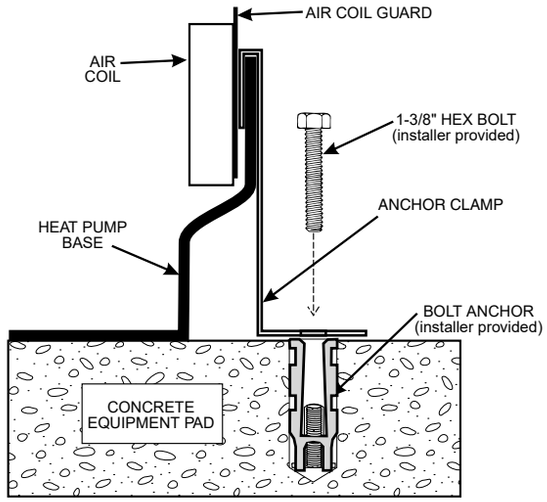


Anchor Clamp Installation

Anchor Clamp Installation, Continued

4. Mark the position of the hole in each clamp on the equipment pad.
5. Use a masonry drill bit and drill a hole in the cement with a diameter as determined by the concrete anchor, at each of the marks on the equipment pad. The hole should be approximately 1/2-in. deep.
6. Insert a bolt anchor into each of the holes. Be sure the anchors are set completely into the holes.
7. Position the anchor clamps so that the holes in the clamps are over the bolt anchors.

   Be sure that the clamp hooks are over the lip of the heat pump base.
8. Insert an anchor bolt through each clamp into the anchor and tighten to secure the clamp and heat pump to the equipment pad.



Anchor Clamp Installation

Water Connections and Plumbing

The image below shows the standard plumbing layout with a single UltraTemp® Heat Pump. Follow the image from right to left for the standard plumbing sequence.

Arrangement of pool system components (other than the standard plumbing image below), and the location of the heat pump (above or below the pool water surface) can affect the operation of the heat pump's water pressure switch.

The pressure switch can be adjusted to accommodate this effect if the heat pump water connections are no more than six (6) feet [1.8 m] below the pool water surface.

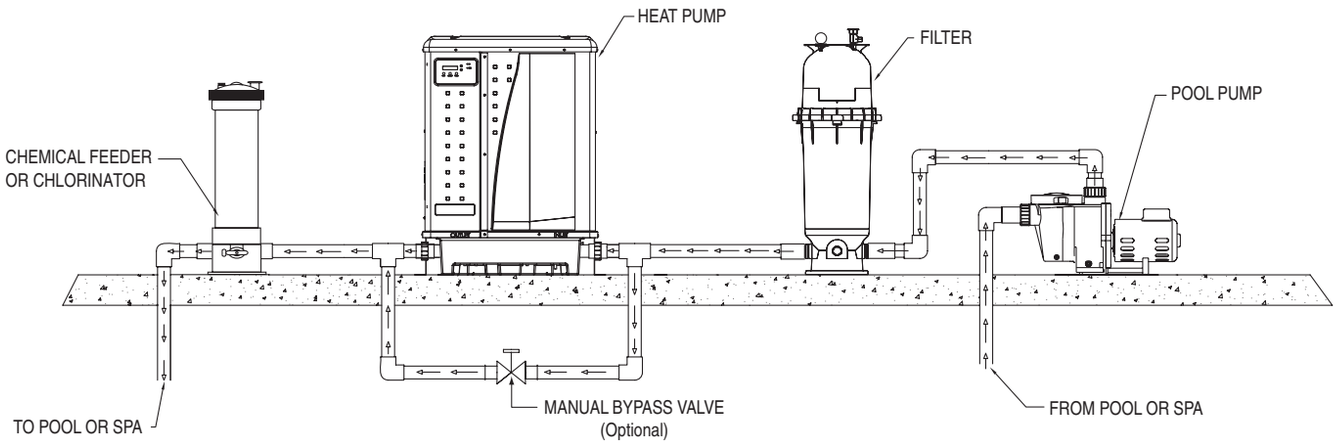
See instructions for pressure switch adjustment on page 6. If the heat pump is installed outside of this range, an external pressure switch may need to be installed in the plumbing upstream of the heat pump.

Note: Be advised that when pool equipment is located below the pool surface a leak can result in large-scale water loss or flooding. Pentair is not responsible for such water loss or flooding or damage.

Automatic Flow Control Valve

The inlet/outlet header of the heat pump comes equipped with an internal automatic flow control valve. The automatic flow control valve maintains the proper flow through the heat pump at rates up to 120 gpm (456 lpm). If the filter system flow rate is higher than 120 gpm (456 lpm), install a manual bypass valve, see image below.

Note: Be advised that if your circulation pump is over 2 HP or if the total flow exceeds 120 gpm (456 lpm), you will have to add an external bypass valve. Excess water flow will damage the heat exchanger.

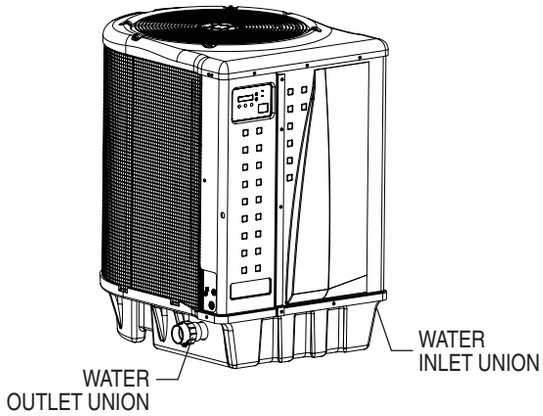


Standard Plumbing Layout

Water Connections to the Heat Pump

2 in. Quick Connect fittings have been installed on the water inlet and outlet connections. Filtered cool water is plumbed to the inlet, located on the right side of the UltraTemp® Heat Pump. Heated water flows through the outlet, located on the left side of the heat pump.

Plastic piping (PVC Schedule 40) should be connected to the heat pump. The unions, provided with the unit, accept 2” PVC pipe.



Heat Pump Water Connections

⚠CAUTION Always be sure that flow requirements and pool water turnover rates can be maintained with the installation of additional heat pumps and plumbing restrictions.

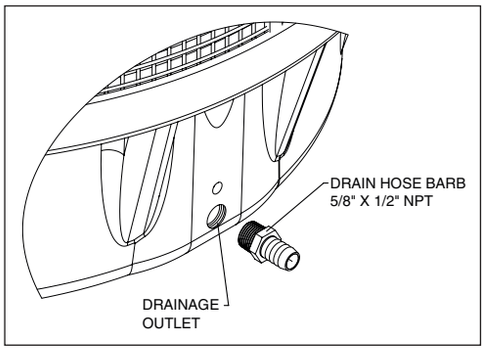
Drainage Connection to the Heat Pump

A 5/8” x 1/2” NPT threaded drain hose barb is included with the heat pump union kit.

Before operating the heat pump for the first time, the drain hose barb must be installed into the threaded drainage outlet located in the base of the heat pump.

To install the Drain Hose Barb and Drain Hose:

1. Thread the drain hose barb into the threaded drainage outlet in the base of the heat pump. See the image below.
2. Connect a 5/8” garden hose to the hose barb.
3. Ensure the end of the garden hose is positioned so that drainage will flow away from the heat pump and equipment pad.



Drain Hose Barb Installation

Water Pressure Switch Adjustment

⚠CAUTION The water pressure switch should be adjusted to turn the heater off when the pump is off. Setting the switch to close at too low of a flow can damage the appliance. Adjust the switch to turn the heater off, not on.

The pressure switch is preset at the factory for activation at 1.5 psi [10 kPa]. This factory setting works for most basic installations. Only adjust the water pressure switch if the heat pump does not operate ***when the proper flow is applied to unit*** or if the heat pump does not shut off when the filter pump is off. Occasionally, unusual plumbing configurations or necessary restrictions in the plumbing may cause pressure sensing problems. In these rare situations, the plumbing system configuration may require adjustment of the water pressure switch.

Adjustment of the pressure switch may be necessary if any part of the filter system piping is 3 feet [0.9 m] or more above the top of the heat pump.

In general, if the heat pump is installed more than 6 feet [1.8 m] below the pool surface, an external water flow switch must be added to the plumbing system.

On some installations, the piping from the heat pump to the pool is very short. The back pressure could be too low to trigger the pressure switch. If this happens, install a directional fitting or elbow where the return line enters the pool. This will increase back pressure for the heat pump to operate properly. Be sure to check that the system flow is above the minimum requirement of 30 gpm (110 lpm) after the directional fitting installation.

Be sure the pool filter is clean before making any pressure switch adjustment: A dirty filter will restrict the water flow and the pressure switch cannot be adjusted properly.

To adjust the pressure switch:

The following adjustment is for installations where the heat pump is *below* pool water level.

1. Be sure that all valves in the system are set to allow water flow through the heat pump. Start the filter pump.
2. Set the heat pump temperature above the actual temperature to call for heat. Turn the heat Pump ON.
3. Once the heat pump is running, turn off the filter pump. The heat pump should turn off immediately.
4. If the heat pump continues to operate when the filter pump is off, then the water pressure switch needs to be adjusted.
5. Remove the heat pump's left front panel and remove remaining right front panel. The water pressure switch is located in the water plumbing in the lower right corner of the heat pump.
6. Slowly rotate the adjustment wheel on the water pressure switch in a clockwise direction until the "LOW WATER FLOW" Alarm shows on the LCD, the red SERVICE light turns ON, and the heat pump stops.
7. Check the setting of the water pressure switch by starting and stopping the filter pump and checking the control panel and operation of the heater between each flow change.
8. If the water pressure switch cannot be adjusted to accommodate the conditions listed above, an external flow switch must be added to the plumbing system to ensure that the heat pump will not operate without the proper flow through the heat exchanger.

The following adjustment is for installations where the heat pump is *above* pool water level.

1. Be sure that all valves in the system are set to allow water flow through the heat pump. Start the filter pump.
2. Set the heat pump temperature above the actual temperature to call for heat. Turn the heat pump ON.
3. If the LCD shows a "LOW WATER FLOW" Alarm and red SERVICE light is present then the water pressure switch needs to be adjusted.
4. Remove the UltraTemp® Heat Pump's left front panel and remove remaining right front panel. The water pressure switch is located in the water plumbing in the lower right corner of the heat pump.
5. Slowly rotate the adjustment wheel on the water pressure switch in a counterclockwise direction until the "LOW WATER FLOW" Alarm and red SERVICE light vanish, time delay countdown will start.
6. Once the heat pump is running, turn off the filter pump. The heat pump should turn off immediately.
7. If the heat pump continues to operate when the filter pump is off, turn the adjustment wheel on the water pressure switch in a clockwise direction until the "LOW WATER FLOW" Alarm shows on the LCD, the red SERVICE light turns ON, and the heat pump stops.
8. Check the setting of the water pressure switch by starting and stopping the filter pump and checking the control panel and operation of the heater between each flow change.
9. If the water pressure switch cannot be adjusted to accommodate the conditions listed above, an external flow switch must be added to the plumbing system to ensure that the heat pump will not operate without the proper flow through the heat exchanger.

Multiple Unit Installation

1. Heat Pump, Heater and/or Solar Combination

In certain regions of the country it may be more economical to run a UltraTemp® Heat Pump during the warmer months and a gas heater during the cooler months. In some situations it may be desirable to run the heat pump in the “Chiller” mode, if so equipped, during the hottest portion of the year and a heater during the cooler months. The Pentair heat pump may be used in conjunction with a gas or electric heater or any combination of heat sources including solar. All heat sources must be plumbed in series to work correctly and efficiently.

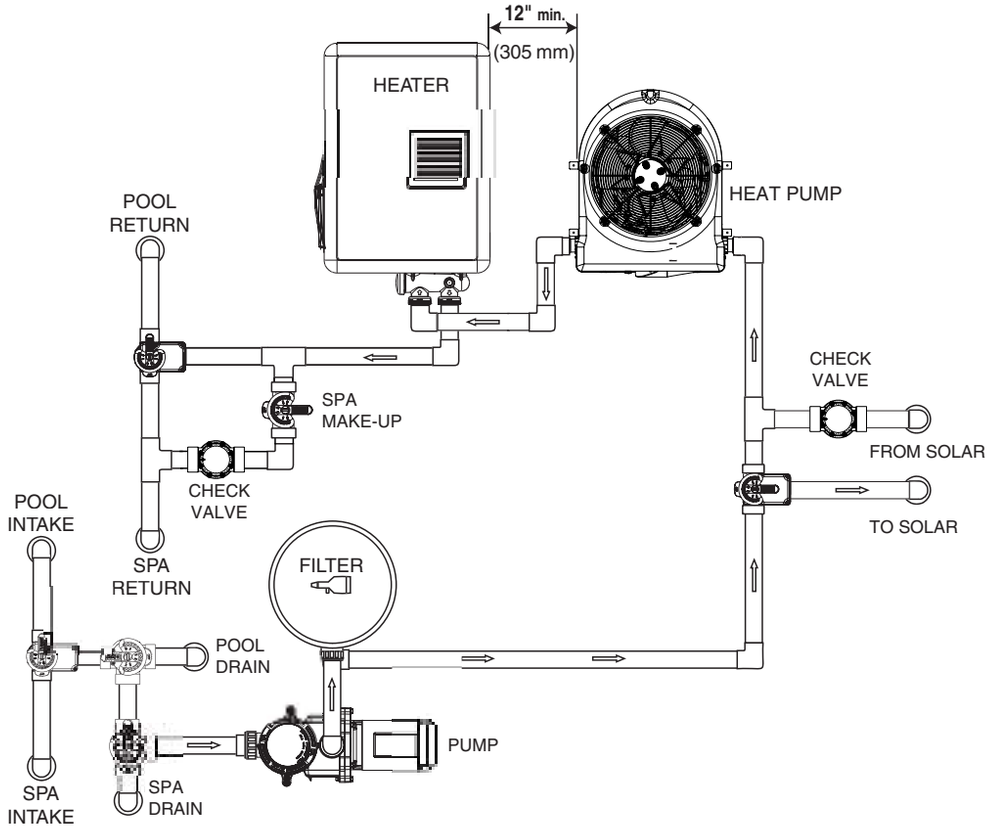
A recommended plumbing layout for a heat pump / heater / solar combination heating system for a pool / spa combination is shown below. Your system may not contain all of these components, but the basic plumbing will apply by eliminating the component in the illustration that is not a part of your system.

2. Multiple Heat Pump Connections

All plumbing on multiple heat pump installations must be done in parallel (see next page). An equal flow of water to each heat pump is important for optimum operation.

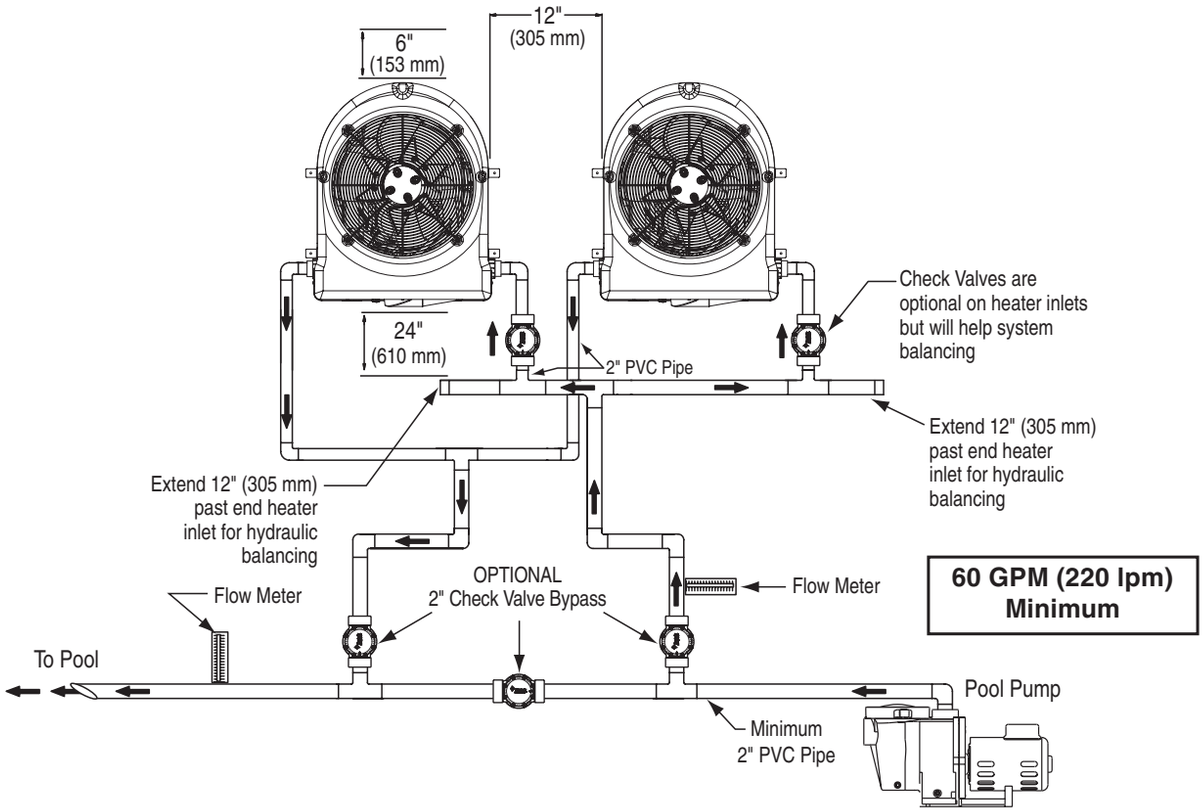
Note: It may be necessary to adjust the water pressure switch if a unit is installed below the water level. Refer back to page 6 for details on when and how to adjust the pressure switch.

Each heat pump in a multiple unit installation allows a maximum flow rate of 100 gpm (380 lpm) and requires a minimum of 30 gpm (110 lpm).

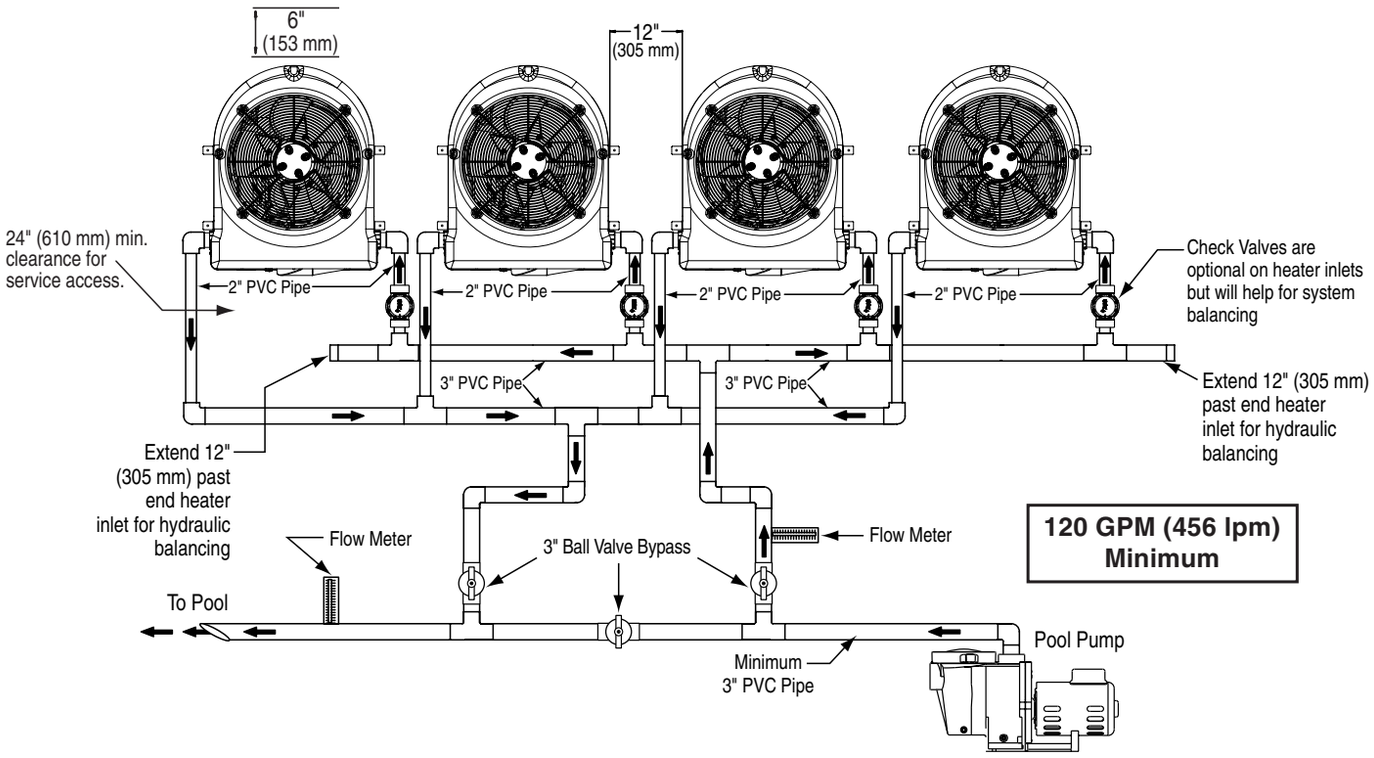


Heater and/or Solar Combination

Multiple Unit Installation (cont.)



Two Heat Pump Plumbing Layout



Four Heat Pump Plumbing Layout

Electrical Connections and Wiring

⚠WARNING **RISK OF ELECTRICAL SHOCK OR ELECTROCUTION**.
This heat pump contains wiring that carries high voltage. Contact with these wires could result in death or serious injury to pool or spa users, installers, or others due to electrical shock, and may also cause damage to property. Always disconnect power circuit before connecting the heat pump.



⚠CAUTION Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

General Information

Wiring connections must be made exactly as shown in the wiring diagram found on the inside of the heat pump access panel; see the wiring diagrams on pages 10-11.

The UltraTemp® Heat Pump must include a definite means of grounding and bonding. There is a ground lug inside the heat pump electrical compartment and a bonding lug on the left side of the heat pump.

Bonding

The National Electrical Code and most other codes require that all metallic components of a pool structure, including reinforcing steel, metal fittings, and above ground equipment be bonded together with a solid copper conductor not smaller than 8 AWG. For Canada, a 6 AWG or larger solid copper bonding conductor is required.. The heat pump, along with pumps and other pool equipment must be connected to this bonding grid. A bonding lug is provided on the left side of the heat pump to ensure this requirement is met.

⚠CAUTION This heater must be connected to a bonding grid with a solid copper wire not smaller in diameter than 8 ga. For Canadian installations a solid copper wire not smaller in diameter than 6 ga should be used.

Main Power

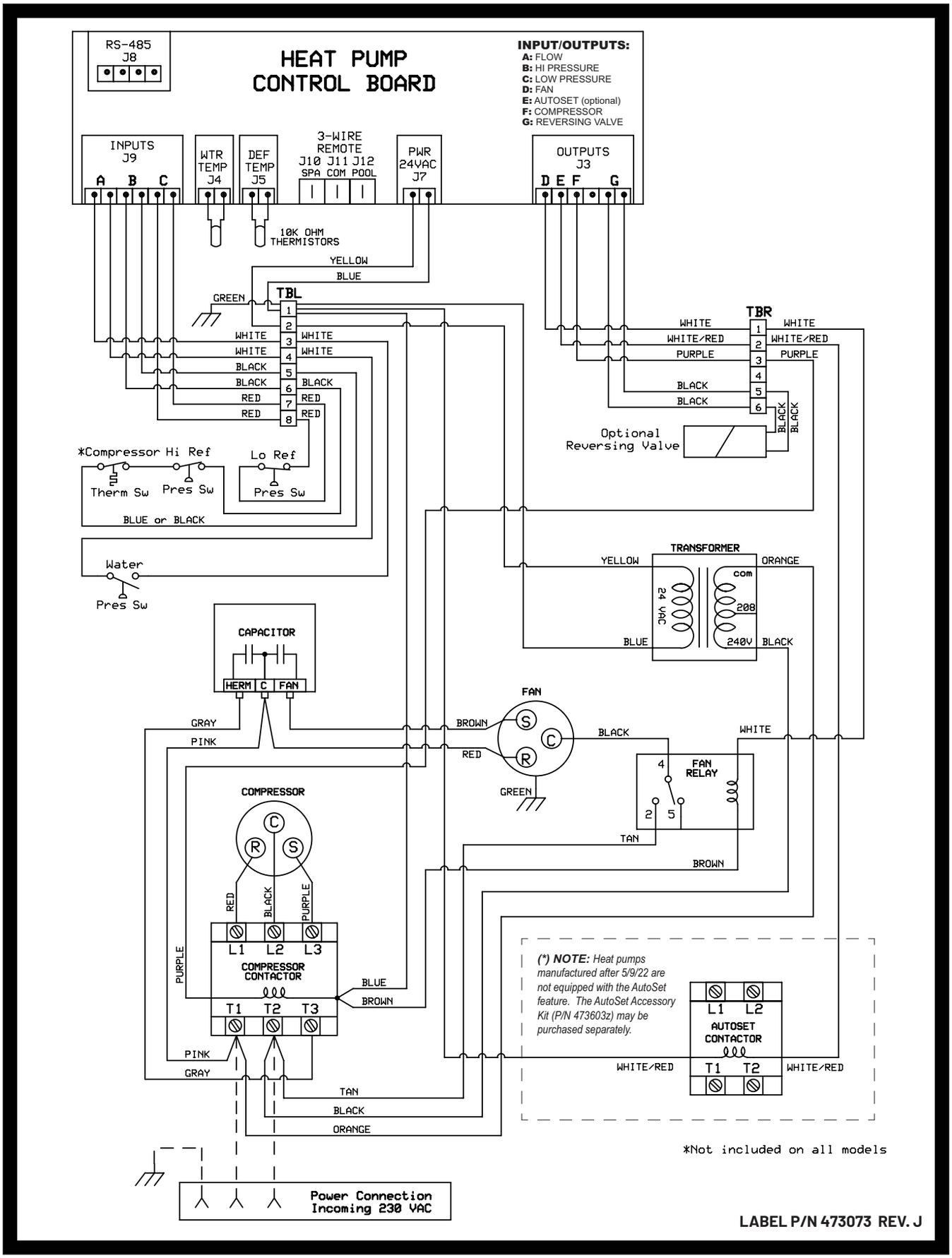
Electrical wiring to the heat pump must be in accordance with the latest edition of the National Electric Code (NEC), ANSI/National Fire Protection Association (NFPA) 70 in the United States, and in Canada, the Canadian Electrical Code (CEC) C22.1, unless local code requirements indicate otherwise. All wiring must be done by a certified or qualified electrician.

The following is the procedure to wire the heat pump to the electrical source:

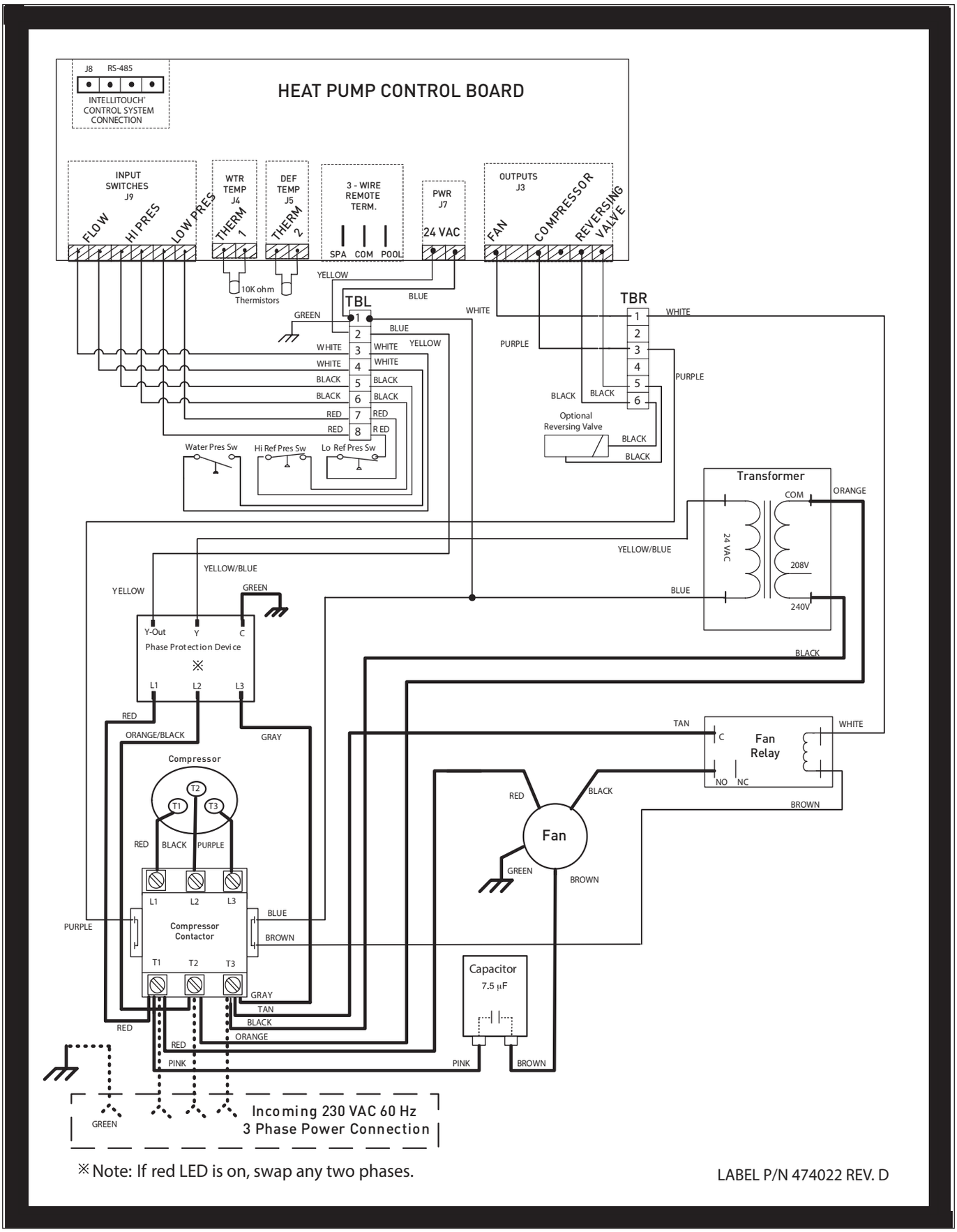
Be sure the power to the circuit for the heat pump is turned off.

1. Remove the front left panel of the heat pump cabinet, (you do not need to remove the star-head screw at the top left corner).
2. Remove the service panel to the heat pump electrical compartment. (Front left corner of unit)
3. Electrical supply lines must be run through watertight conduit. Run the wires and conduit from the power source and connect them to the conduit connection on the left side of the heat pump.
4. Connect the power leads to the bottom terminals on the main compressor contactor as shown in the wiring diagram.
5. Verify that all other contactor wires are secure, they may have loosened during shipment.
6. Connect the ground wire to the ground lug provided on the bottom of the electrical compartment.
7. Replace the service panel and reinstall screws to hold it in place.
8. Replace the front left panel.
9. Connect a copper bonding wire (8 AWG) (6 AWG in Canada) to the bonding lug on the left side of the heat pump.

Wiring Diagram – (Single Phase – 50Hz/60Hz)



Wiring Diagram – (Three Phase – 60Hz)



CONNECTING TO AN AUTOMATION SYSTEM

Remote Operation

The UltraTemp® Heat Pump may be connected to an automation system via the remote spade terminals on the back of the control board (see page 12-13) or via the RS-485 communication connector on the back of the control board (see page 14-15). Refer to the IntelliTouch® or EasyTouch® Control System installation and user's guide for more information.

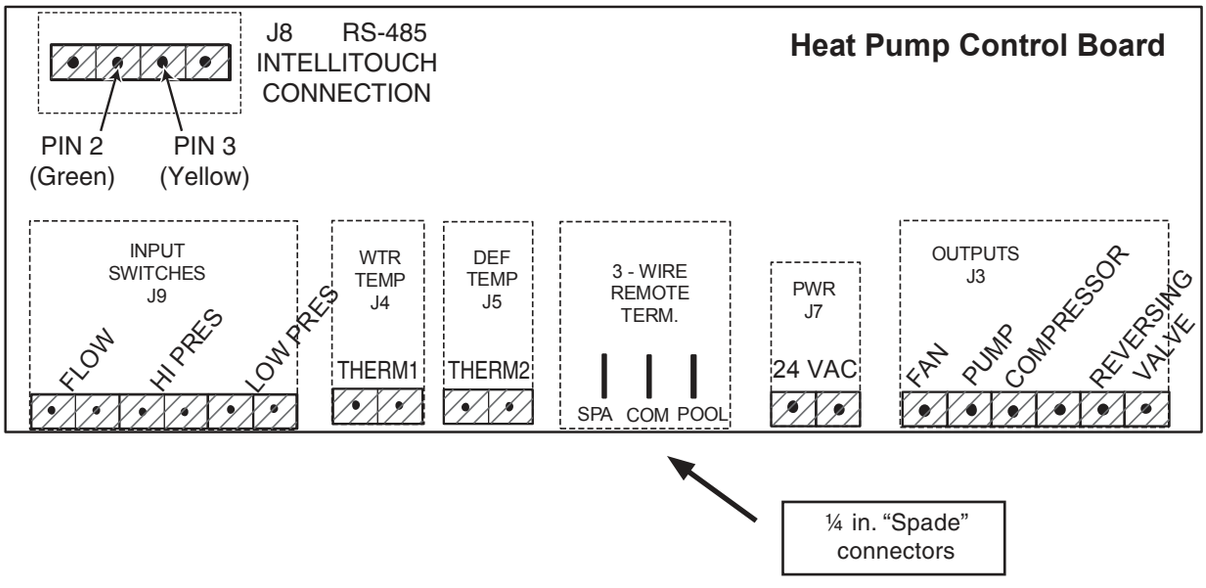
Note: Remote connection via the RS-485 connector is only available on IntelliTouch and EasyTouch software version 1.11 or higher. All other automation packages must connect via the ¼ in. "Spade" terminals (spade terminals not supplied).

Relay Remote Controls

Electrical wiring must be in accordance with the latest edition of the NEC (NFPA 70) in the United States and CEC (CSA 22.1) in Canada, unless local code requirements indicate otherwise.

To connect remote control equipment to the heat pump, perform the following steps:

1. Turn off the power to both the remote pool/spa control system and the heat pump.
2. Remove the front left panel of the heat pump cabinet, (you do not need to remove the star-head screw at the top left corner).
3. Remove the electrical service panel to the heat pump. Remove the 4 bezel retaining screws from above the electrical compartment and rotate the bezel downward. This will allow you to access the Remote terminals on the back of the heat pump control board for the remote control installation.
4. Run the wires from the pool/spa remote control system into the upper electrical compartment.
5. Connect the wiring from the pool/spa remote control system to the heat pump remote control terminals using ¼ in. "Spade" connectors as shown in the image below.
6. Rotate the bezel back upwards into position and reinstall the 4 retaining screws.
7. Replace the electrical service panel.
8. Replace the front left panel.
9. Restore power to the heat pump and the pool/spa remote control system.
10. Press the MENU SELECT button repeatedly to scroll to the Remote Mode screen. Toggle the selection by pressing one of the arrows until the screen displays "Relay".
11. Turn on the heat pump.

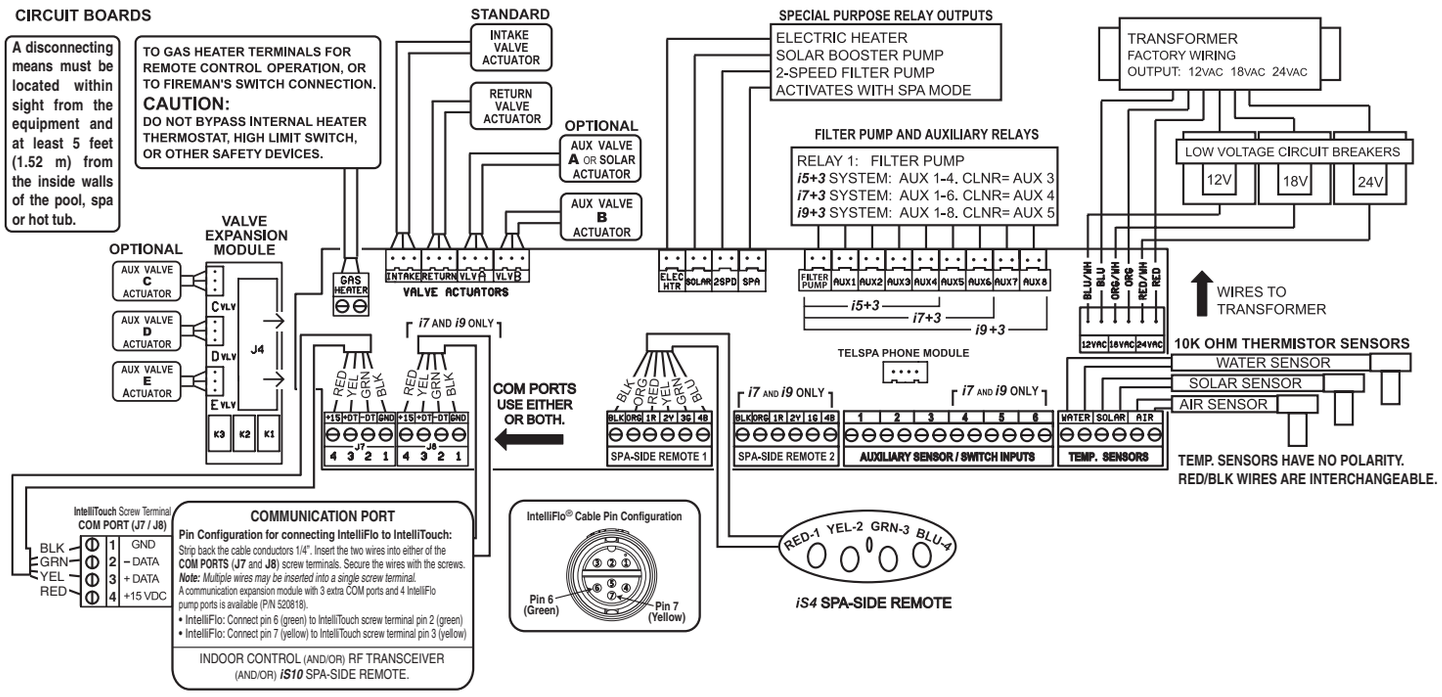


Connecting the Heat Pump to the IntelliTouch® or EasyTouch® Control System Load Center via the Heat Pump Spade Terminals

To connect the UltraTemp® Heat Pump cable to the Personality Board in the IntelliTouch or EasyTouch Load Center:

1. Turn off the main system power before making any connections.
2. Unlatch the front door spring latches, and open the front door of the IntelliTouch or EasyTouch Load Center.
3. Loosen the two retaining screws from the top of the control panel and lower the control panel down to access the Personality Board.
4. Run a UL approved conductor cable from the heat pump to the Load Center.
5. Route the cable up through the low voltage raceway located on the left of the Load Center to the Personality Board, see image below.
6. Insert the UltraTemp cable plug onto the gas heater terminal connector, located on the left side of the Personality Board.
7. If the heat pump is used in conjunction with a gas heater, use a 520403 Dual Heater Relay Kit. Plug the heat pump relay connector onto the SOLAR Terminal on the top center of the Personality Board. Follow the Dual Heater Relay Kit instructions for further set-up details. Be sure to install solar temperature sensor as per instructions.
8. Lift the control panel up into position and secure with the two screws.
9. Connect the cable from the IntelliTouch or EasyTouch Load Center to the heat pump remote control terminals using ¼ in. “Spade” connectors, Refer to previous page for wiring instructions.

   Note: Solar temperature sensor could be left loose in load center. The automation system does not use the temperature reading but just looks for resistance.



IntelliTouch/EasyTouch Load Center Wiring Diagram

Connecting the Heat Pump to the IntelliTouch® or EasyTouch® Control System Load Center via the RS-485 Connector

⚠CAUTION Switch the main power off to the IntelliTouch® or EasyTouch® load center before servicing.

The UltraTemp® Heat Pump can be controlled by an IntelliTouch or EasyTouch system via the RS-485 communication cable. In this configuration, IntelliTouch or EasyTouch overrides preset Temperature Set points on the heat pump.

The transfer of this data takes several seconds and causes a delay from when the command is given from the IntelliTouch or EasyTouch indoor control panel until the heat pump physically responds. This happens automatically but may take 1-2 minutes to complete.

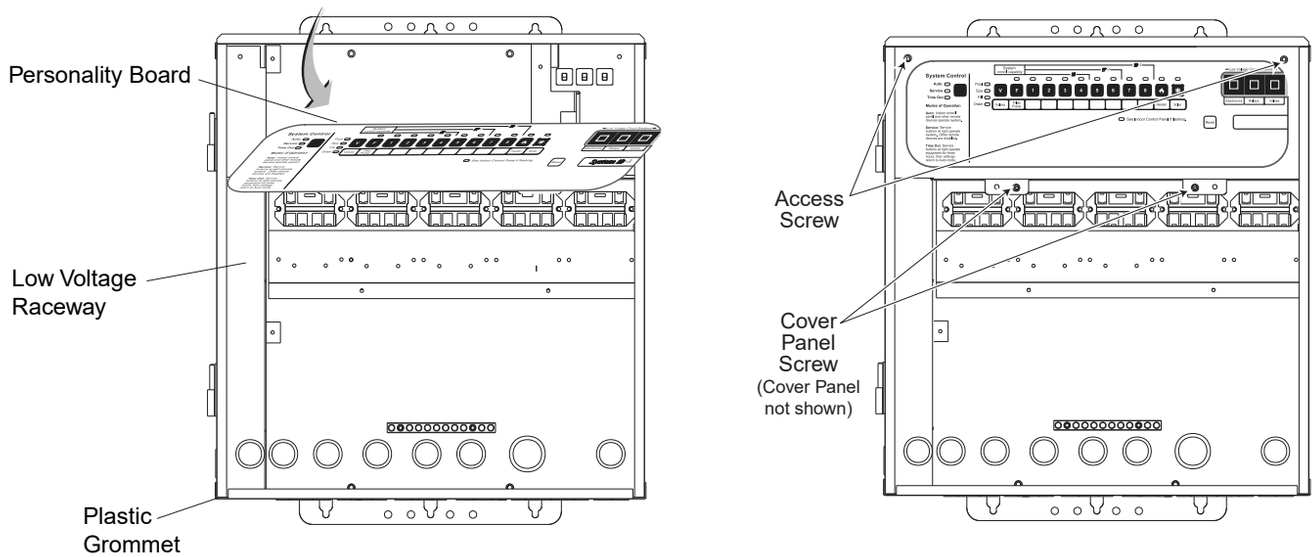
Note: Heat pump control board set points will be shown as "N/A" and will be functionality disabled. For more information, refer to the IntelliTouch User's Guide (P/N 520102) or the EasyTouch User's Guide (P/N 520584) or the EasyTouch Wireless System User's Guide (P/N 520688).

Connection from heat pump board to the IntelliTouch or EasyTouch system is via the optional four-wire cable (P/N 520199).

To connect the heat pump board cable to the IntelliTouch or EasyTouch load center:

1. Unlatch the IntelliTouch or EasyTouch load center front door spring latches, and open the front door.
2. Remove the cover-panel screws securing the high voltage cover-panel, and remove it from the enclosure.
3. Loosen the two control panel access screws and fold down the outdoor control panel.
4. Insert the four-wire cable into plastic grommet on the bottom of the enclosure and route the wire up through the low voltage raceway to the Personality board.
5. Strip back the cable conductors ¼ in. Insert the wires into either of the COM PORTS (J7 and J8) screw terminals located on the left side of the Personality board. Secure the wires with the screws. For wiring details, refer to the pin configuration as shown on page 15.

   Note: Multiple wires may be inserted into single screw terminal.
6. Close the IntelliTouch control panel and secure it with the two access screws.
7. Install the high voltage panel cover and secure it with the two retaining screws.
8. Close the load center front door and secure with the two latches.
9. Switch power on to the IntelliTouch load center.

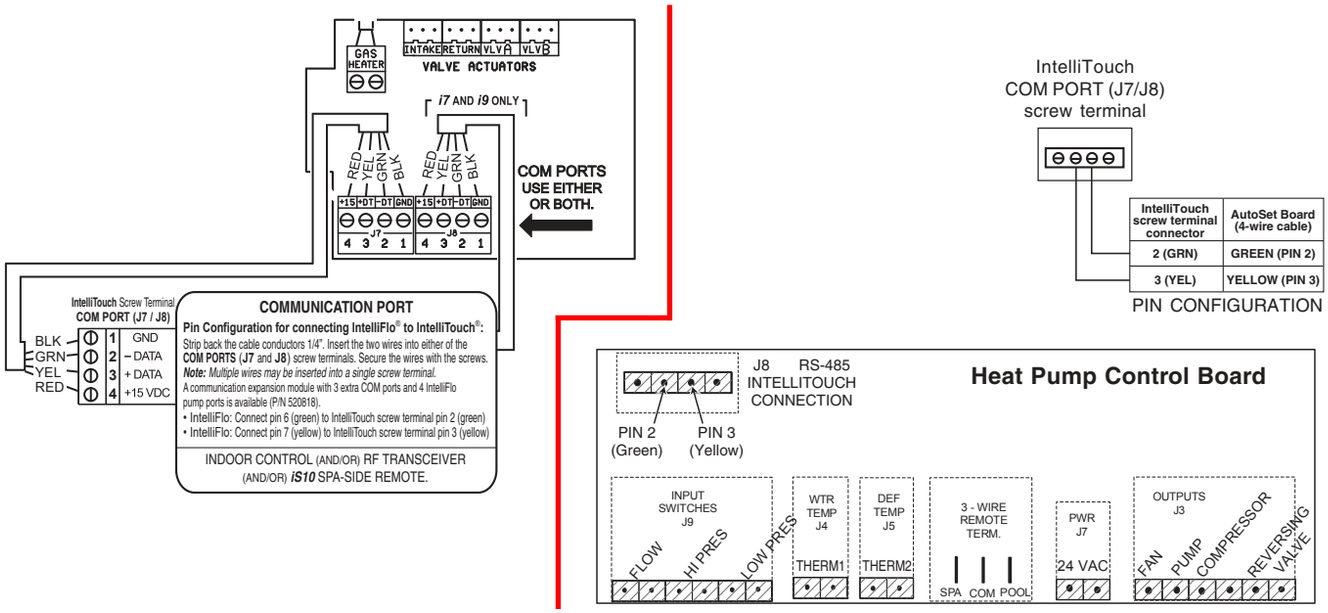


IntelliTouch Load Center

Pin Configuration for the Heat Pump Control Board to IntelliTouch® Control System

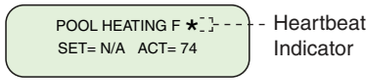
1. Heat Pump Control Board: Connect pin 2 (green) to IntelliTouch screw terminal pin 2 (green).
2. Heat Pump Control Board: Connect pin 3 (yellow) to IntelliTouch screw terminal pin 3 (yellow)

IMPORTANT — Do ***NOT*** use pin 1 (black) or pin 4 (red) on the AutoSet board or the IntelliTouch mother board.



Connecting the IntelliTouch or EasyTouch to Heat Pump

1. Turn off the power to both the remote pool/spa control system and the UltraTemp® Heat Pump.
2. Remove the front left panel of the heat pump cabinet, (you do not need to remove the star-head screw at the top left corner).
3. Remove the electrical service panel to the heat pump. Remove the 4 bezel retaining screws from above the electrical compartment and rotate the bezel downward. This will allow you to access the Remote terminals on the back of the heat pump control board for the remote control installation.
4. Run the wires from the pool/spa remote control system into the upper electrical compartment.
5. Connect the wiring from the IntelliTouch Personality Board COM PORT to the RS-485 IntelliTouch connection (J8) on the heat pump control Board. Connect the green wire to J8 pin 2 and yellow wire to J8 pin 3. Do NOT use pin 1 (red) or pin 4 (black) wires. The connections are shown in the image above.
6. Rotate the bezel back upwards into position and reinstall the 4 retaining screws.
7. Replace the electrical service panel.
8. Replace the front left panel.
9. Restore power to the heat pump and the pool/spa remote control system.
10. Press the MENU SELECT button to scroll to the Remote Mode screen. Toggle the selection by pressing one of the arrows until the screen displays “RS-485.”
11. Once the heat pump has been correctly configured, a “heartbeat” indicator will appear on the main screen each time a message is received from the automation system.



Note: If the system is put into Service Mode at the automation control panel the heat pump will neither heat nor cool, although it will remain powered on.