AquaCal®

Installation Manual

HEATWAVE SUPERQUIET®

TropiCal® SWIMMING POOL /SPA HEAT PUMPS

TropiCool® WATER CHILLER

Important

Read this document before operating / installing this product

For additional product manuals and operation / installation procedures, please visit www.AquaCal.com

MODEL / SERIAL NUMBER

LTP0114 REV 2.03- (project rel 7.02)

Table of Contents

Contacting AquaCal AutoPilot, Inc.

For further assistance, please contact the distributor or installer of this product.

If unavailable, please contact AquaCal® for a partner in your area. To better assist you, please have the heat pump model and serial number available.

- See "*Identifying Model Specifications*" on page 79.

Product Information:	
Website	www.AquaCal.com
Phone	(1) 727-823-5642
Hours	8-5 pm, Eastern M-F

Service Information:	
Website	www.AquaCal.com/request-heat-pump-service/

SAFETY INSTRUCTIONS

- For personal safety, and to avoid damage to equipment, follow all safety instructions displayed on the equipment and within this manual. Repair and service of heat pump must be performed by an authorized service center.
- Warranties may be voided if the equipment has been improperly installed, maintained or serviced.
- If service is deemed necessary, please contact AquaCal. See "*Contacting AquaCal AutoPilot, Inc.*" above.

SAFETY SIGNALS

Throughout this document, safety signals have been placed where particular attention is required.

DANGER Failure to heed the following will result in injury or death.

WARNING Failure to heed the following may result in injury or death.

NOTICE Failure to heed the following may result in damage to equipment.

When installing and using your heat pump basic safety precautions must always be followed, including the following:

DANGER Failure to heed the following will result in injury or death.

- The heat pump utilizes high voltage and rotating equipment. Use caution when servicing.
- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- Installation and repairs must be performed by a qualified technician.
- The heat pump contains refrigerant under pressure. Repairs to the refrigerant circuit must not be attempted by untrained and/or unqualified individuals. Service must be performed only by qualified HVAC technicians. Recover refrigerant before opening the system.
- Improper water chemistry can present a serious health hazard. To avoid possible hazards, maintain pool/spa water per standards as detailed in the product's operation manual.
- Prolonged immersion in water warmer than normal body temperature may cause a condition known as Hyperthermia. The symptoms of Hyperthermia include unawareness of impending hazard, failure to perceive heat, failure to recognize the need to exit the spa, and unconsciousness. The use of alcohol, drugs, or medication can greatly increase the risk of fatal Hyperthermia. People having an adverse medical history, or pregnant women should consult a physician before using a hot tub or spa. Children and the elderly should be supervised by a responsible adult.
- Prolonged immersion in water colder than normal body temperature may cause a condition known as Hypothermia. The symptoms of Hypothermia include shivering (although as hypothermia worsens, shivering stops), clumsiness or lack of coordination, slurred speech or mumbling, confusion and poor decision-making, drowsiness or low energy, lack of concern about personal welfare, progressive loss of consciousness, weak pulse and slow or shallow breathing. Persons having an adverse medical history, or pregnant women, should consult a physician before immersing in a cold body of water. Children and the elderly should be supervised by a responsible adult.

NOTICE Failure to heed the following may result in damage to equipment.

- Maintain proper water chemistry to avoid damage to the pump, filter, pool shell, etc.
- Water flow exceeding the maximum flow rate requires a bypass. Damage due to excessive water flow will void the warranty.

SAVE THESE INSTRUCTIONS

1 - Installation

WARNING Failure to heed the following may result in injury or death.

- Installation of this equipment by anyone other than a qualified installer can result in a safety hazard.
- The information contained throughout the "Installation" section is intended for use by qualified installation technicians familiar with the swimming Pool/Spa safety standards.

NOTICE Failure to heed the following may result in damage to equipment.

- Failure to protect equipment against corrosive conditions will adversely affect the life of the equipment and will void equipment warranty.

IN THIS SECTION:

1.1 Positioning Equipment

NOTICE Failure to heed the following may result in damage to equipment.

- Do not install equipment inside of a building.

Outdoor Use Only

Do not install equipment inside of a room or building.

- Heat Pumps require unobstructed airflow for proper operation. Heat Pumps should never be installed indoors or in a location where airflow is restricted.
- See "*Clearances*" on the facing page.

Controlling Irrigation and Rainwater Runoff

- Irrigation water may damage heat pump components. Direct irrigation water away from the heat pump.
- The heat pump will withstand normal rainfall. Do not allow a roof slope to direct rainwater onto the heat pump. Have a gutter installed on the roof edge to direct this water away from the heat pump. Or install the heat pump in another location.

Planning for Condensation

The heat pump can produce a large amount of condensation. The amount of water depends on air temperature and humidity.

- Install the heat pump with enough height to allow for water drainage.
- Plan for water drainage as needed.
  - See "*Condensation Drain Kit (# STK0202)*" on page 82.

Mounting Pad Requirements

- The heat pump's base must be installed on a flat and level surface that completely supports the entire base.
- Build the heat pump pad out of concrete or other code-approved material.
- Confirm the pad can support the weight of the heat pump. See "*Weights*" on page 81.
- Elevate the pad enough to allow for drainage.
- Make sure the pad is flat and level.
- Have the pad support the entire heat pump base in all directions.
- Do not install the heat pump on soil or grass.
- Do not allow the heat pump base to touch the building's foundation.
- Do not place the heat pump directly on a concrete floor. This can cause noise to be transmitted to an occupied space. If necessary install vibration dampers between the heat pump base and floor.
- Equipment pad must meet all requirements of authorities having code-related jurisdiction.

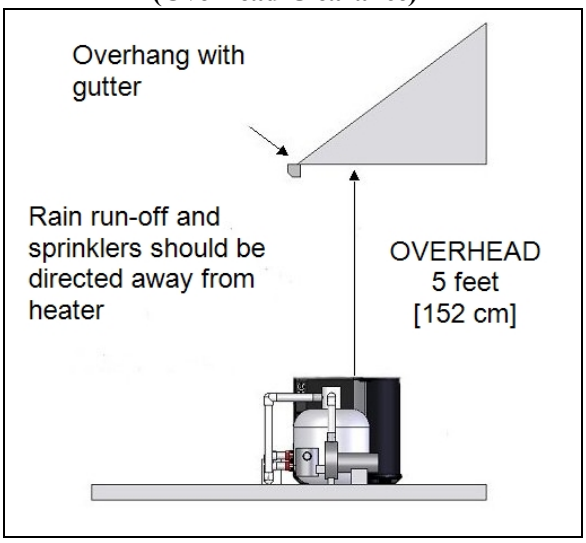
Anchoring to Pad

- Follow all applicable local, state, and national requirements regarding wind load anchoring.
- The shipping brackets used to secure the heat pump to the pallet are approved mounting (hurricane) brackets. They should be used to anchor the heat pump to the pad.
- If needed, contact AquaCal® to obtain anchoring kit information. Please have the heat pump model number and serial number when requesting support. See "*Identifying Model Specifications*" on page 79.

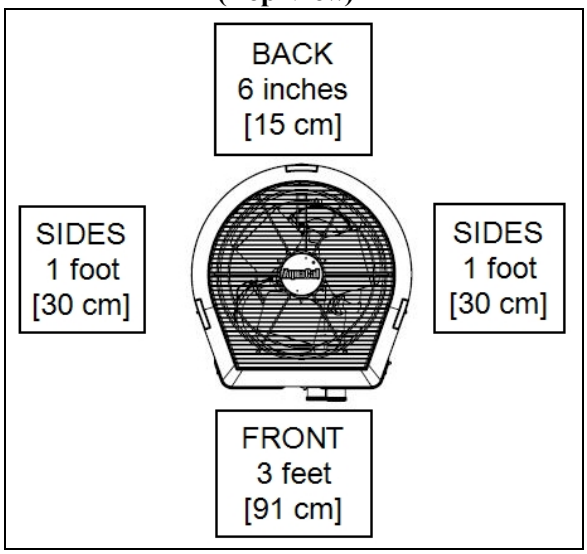
1.2 Clearances

- Proper air circulation is required for the heat pump to operate efficiently. The following diagrams show the minimum clearances required for the proper operation of the heat pump.
- Avoid storing chemical containers near the heat pump. The chemicals can cause equipment damage.
- Avoid placing objects near or on top of the heat pump. This includes shrubbery and lawn furniture. These objects will reduce performance and efficiency and hinder maintenance access.

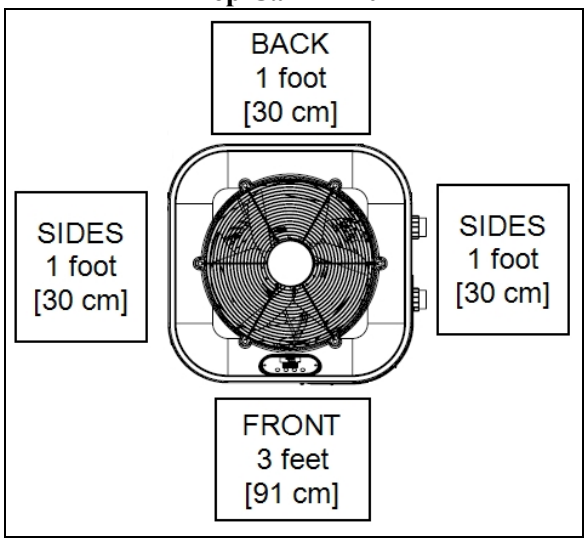
(Overhead Clearance)



(Top View)

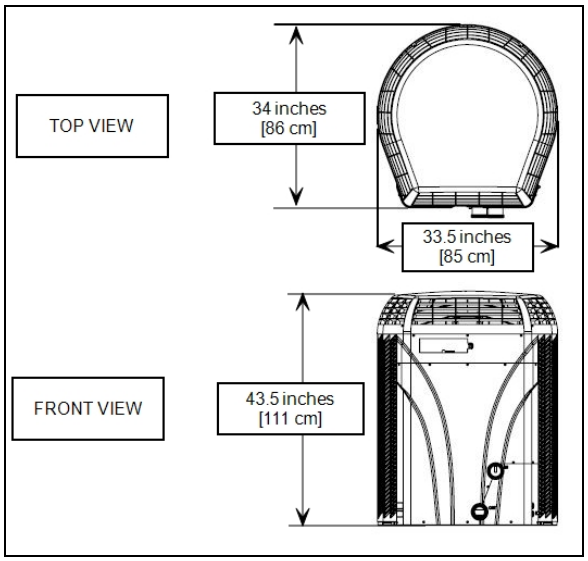


(Top View)
TropiCal® T170

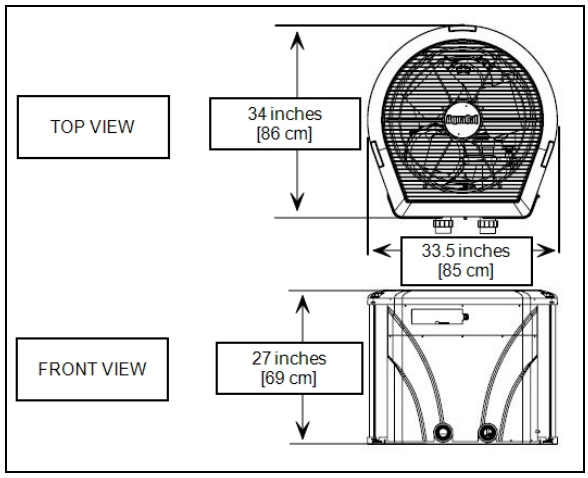


1.3 Dimensions

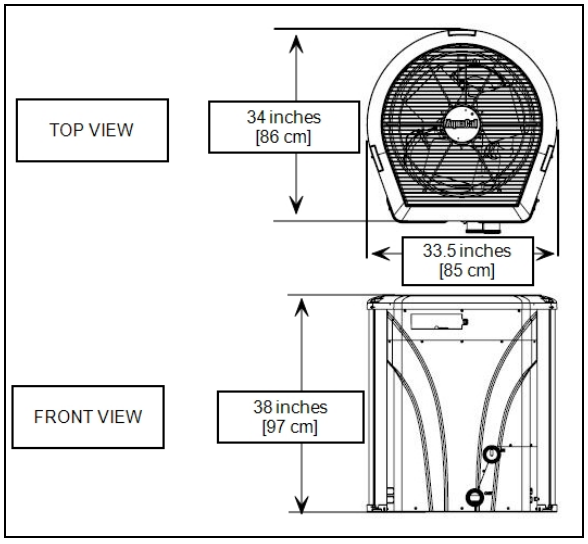
(HeatWave SuperQuiet® SQ120R, SQ125, SQ145, SQ166R and SQ225)
(TropiCool® TC1500)



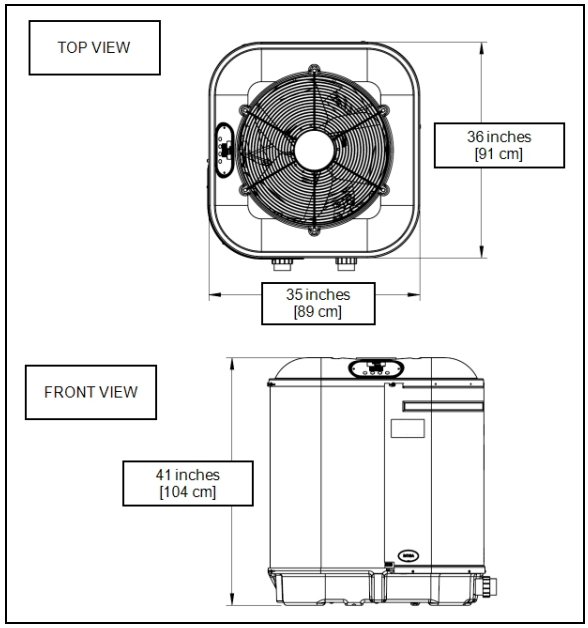
(TropiCal® T035, T055 and T075)
(TropiCool® TC500)



(TropiCal® T090, T115 and T135)
(TropiCool® TC1000)



(TropiCal® T170)



1.4 Plumbing

1.4.a Plumbing Requirements

NOTICE Failure to heed the following may result in damage to equipment.

- Do not use glue on the threaded portion of the equipment's unions. A glued-in-place union will prevent the equipment from being properly winterized.
- The heat pump must receive water flow within the specified minimum ranges under worst-case conditions such as a fouled water filter.
- Failure to provide clean filtered water to the heat pump can void the product warranty.
- Water flow exceeding maximum flow rates will negatively affect the total pool filtration performance and may damage the heat pump. This will not be covered under the equipment warranty. See "*Water Flow Rates*" on page 11.
    - Install a bypass valve whenever water-flow may exceed the maximum rating.
        - See "*Bypass Valve Kit (# STK0135)*" on page 82.
        - For additional guidance testing water flow rates, please contact AquaCal®.
- A safety-enhancing "Over Temperature Alarm" kit is strongly recommended for all spa applications. See "*Over Temperature Alarm Kit*" on page 83.

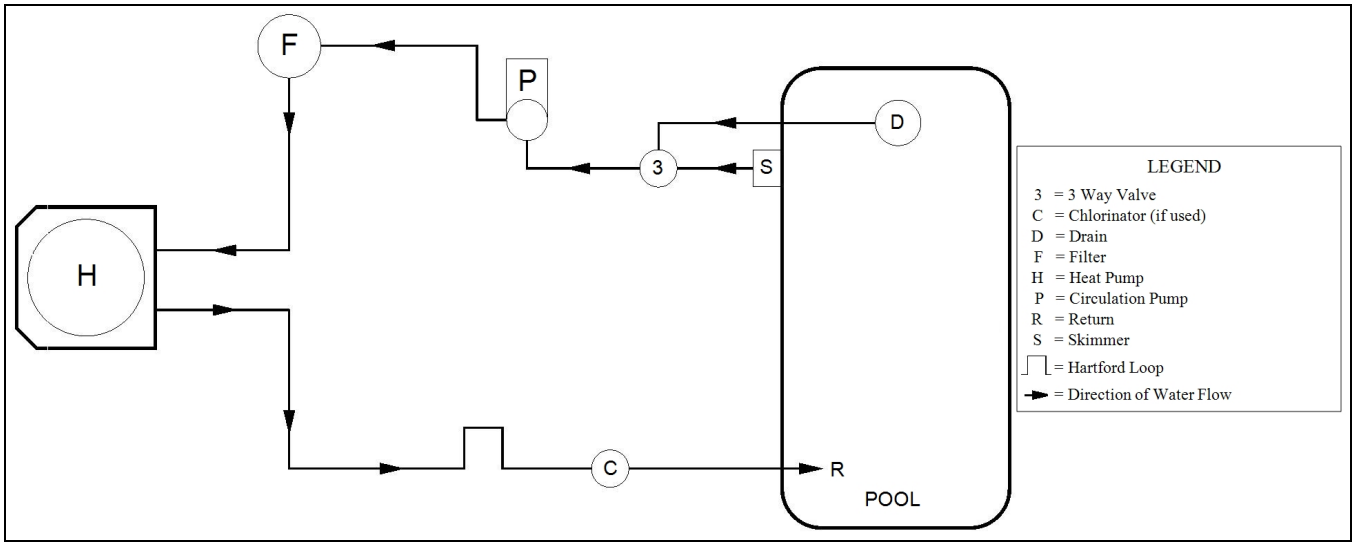
1.4.b Plumbing Diagrams

Plumbing diagrams are provided in this section as a planning guide to the sequence of equipment, valves, and fittings.

- The basic plumbing configurations for typical installations are shown.
- If the installation does not closely follow any of the supplied plumbing diagrams, AquaCal® Technical Support is available for installation advice and guidance.
- Confirm water provided to the heat pump is clean and filtered.

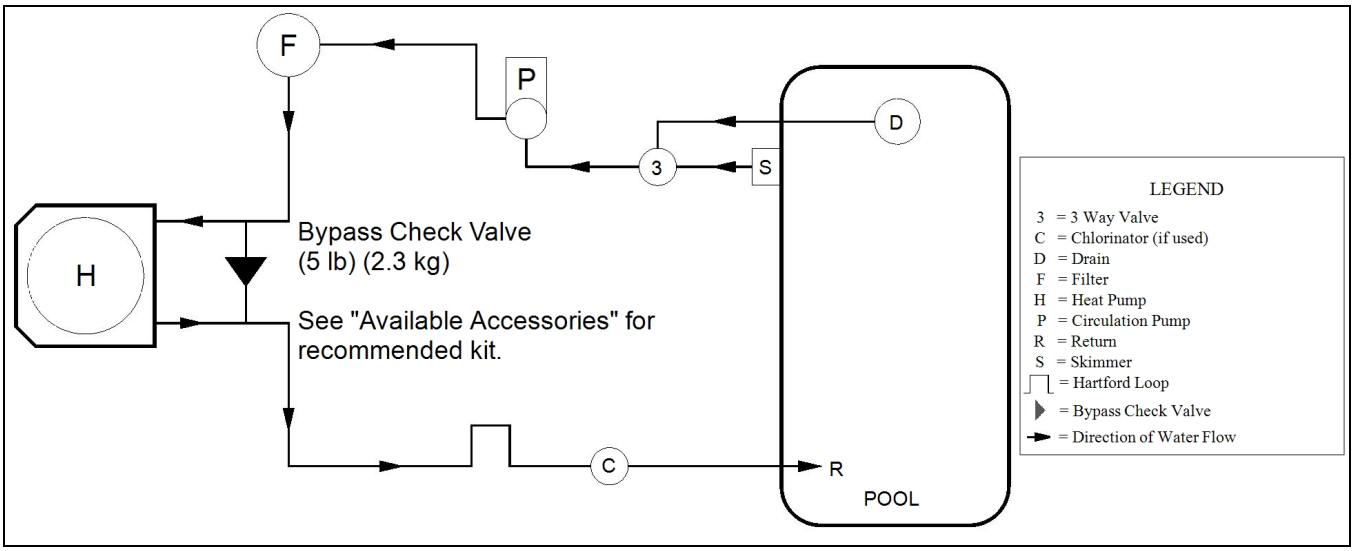
Heat Pump with water flows equal or less than the maximum listed flow rate

See "*Water Flow Rates*" on page 11.

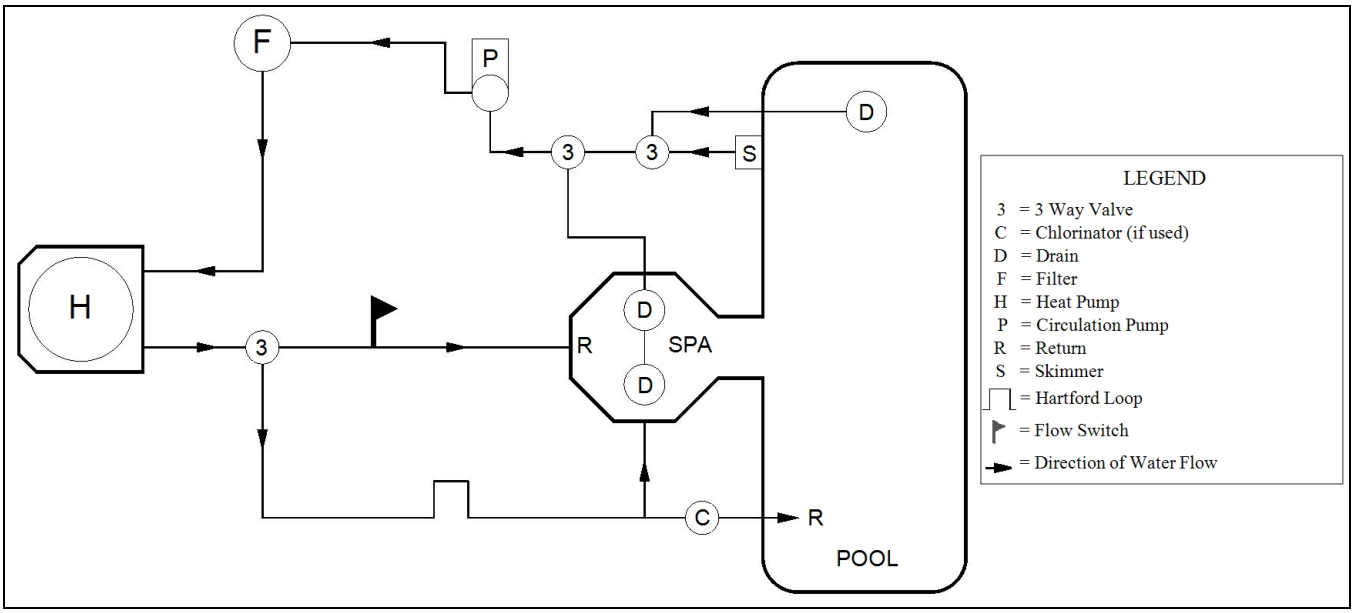


Heat Pump with water flows greater than the maximum listed flow rate

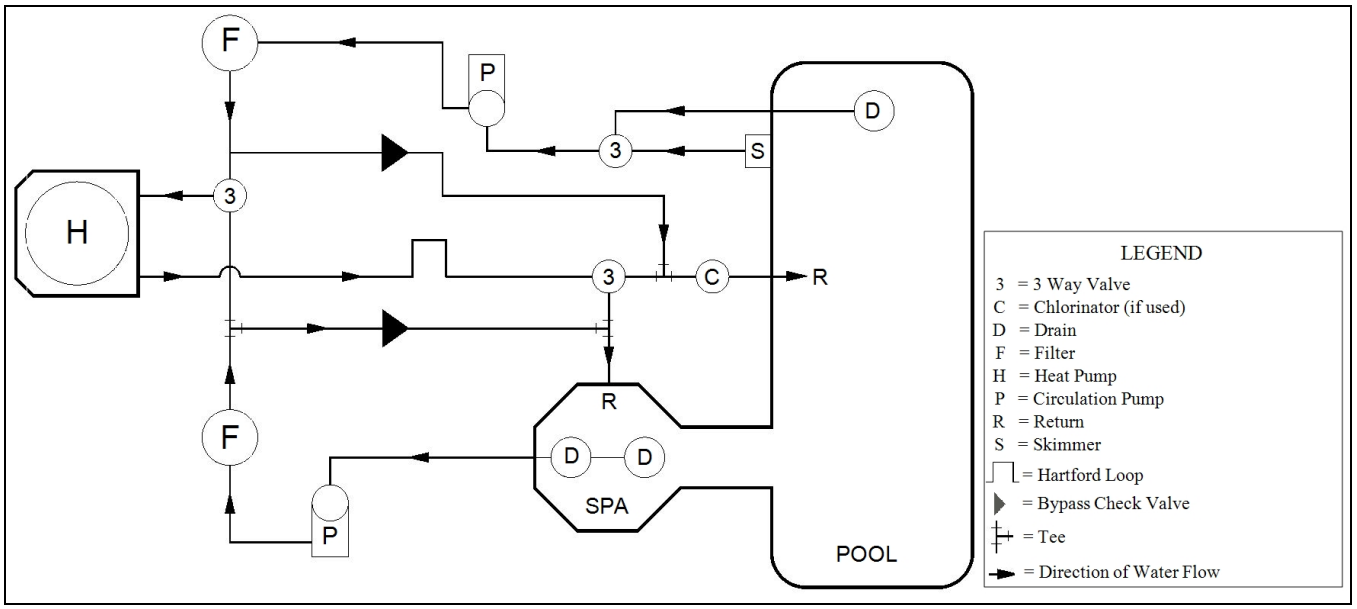
See "*Water Flow Rates*" on page 11.



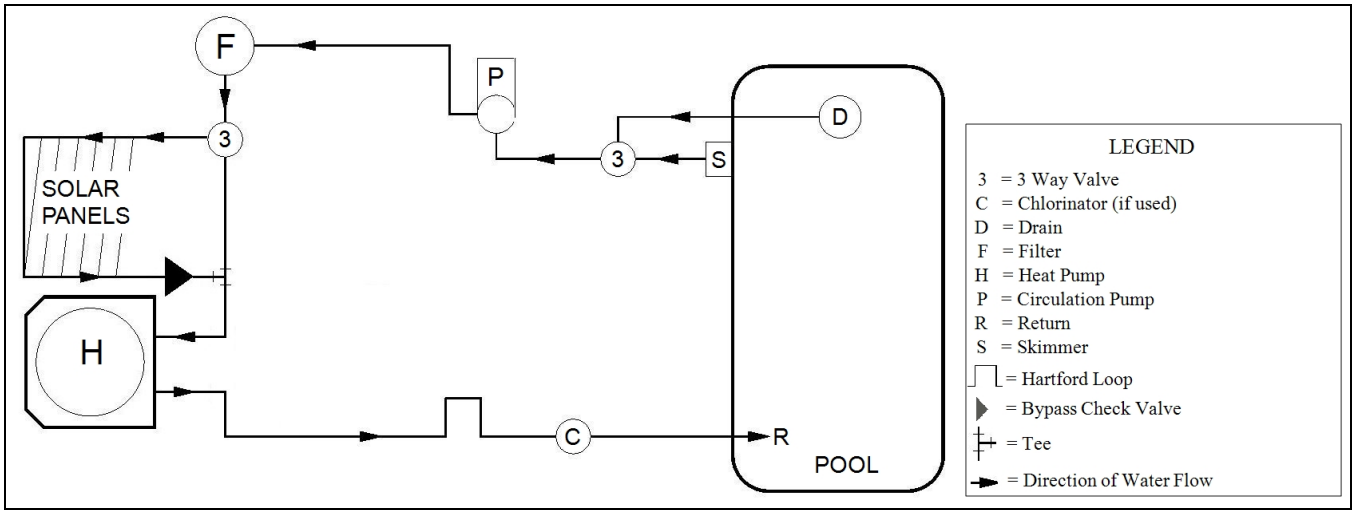
Heat Pump with Spillover Spa (One filter Pump)



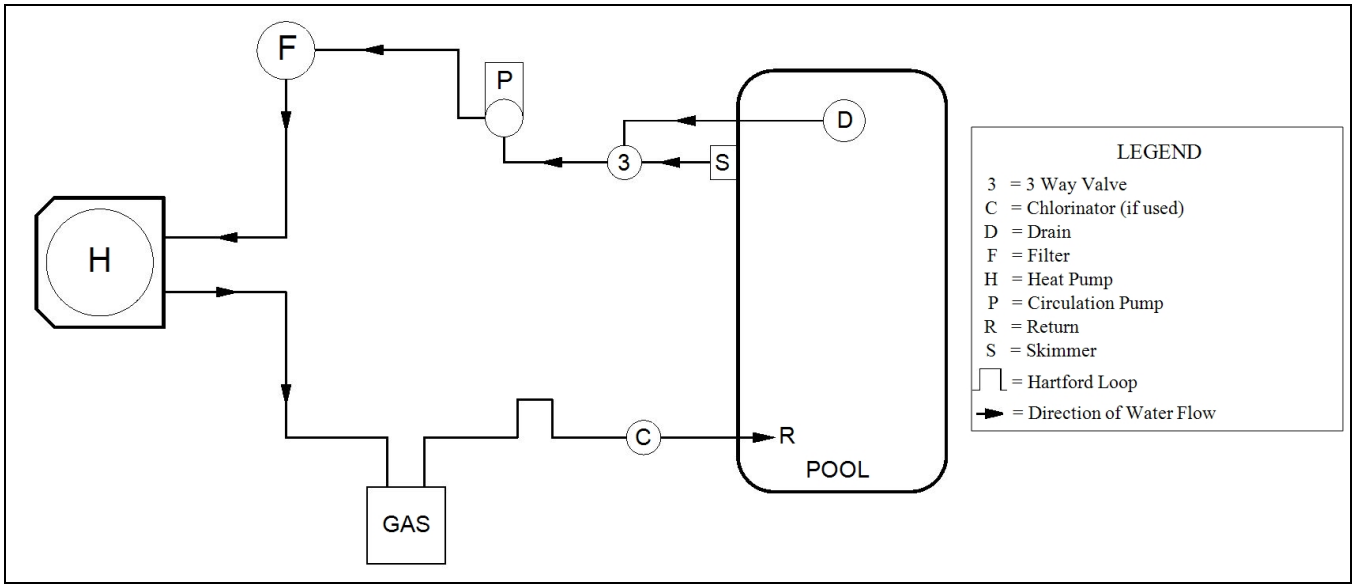
Heat Pump with Spillover Spa (Two filter Pumps)



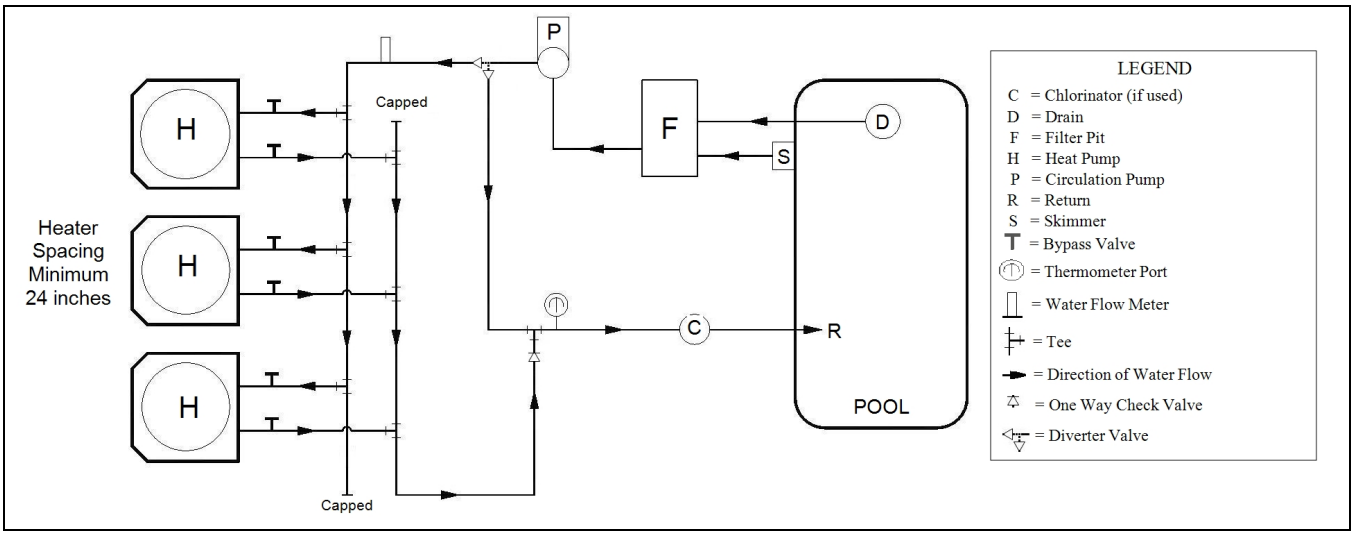
Heat Pump with Solar Panels in Plumbing Circuit



Heat Pump with Gas Heater backup



Multiple Air Source Heat Pumps



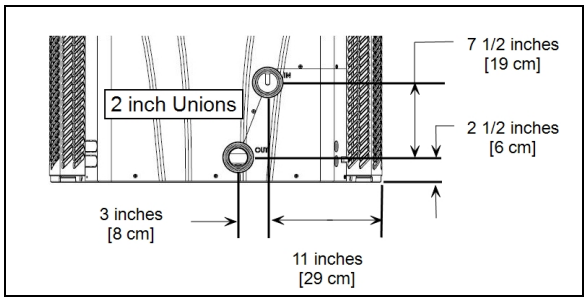
1.4.c Water Connections to Heat Pump

- Heat Pump union sizes are specified on diagrams.
- Connections to site plumbing are made via PVC solvent cement to the female slip socket of the plumbing unions.
- Plumbing unions are available from AquaCal®.

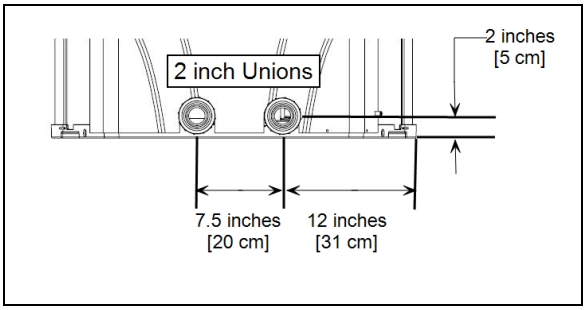
NOTICE Failure to heed the following may result in damage to equipment.

- Do not use glue on the threaded portion of the equipment's unions. A glued-in-place union will prevent the equipment from being properly winterized.

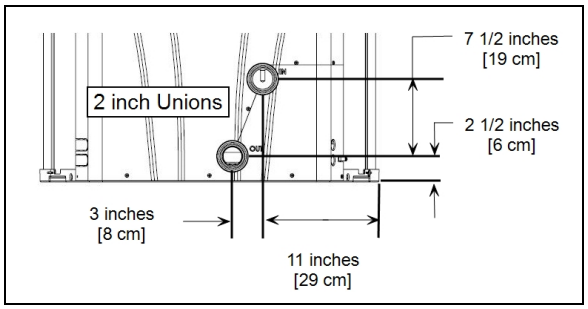
HeatWave SuperQuiet® SQ120R, SQ125, SQ145, SQ166R, SQ225
TropiCool® TC1500



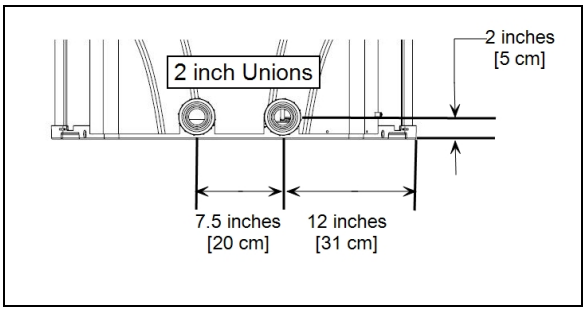
TropiCool® TC500



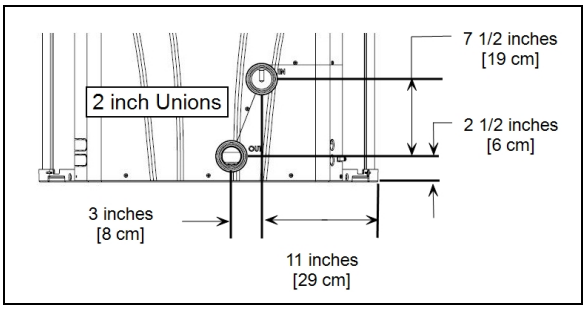
TropiCool® TC1000



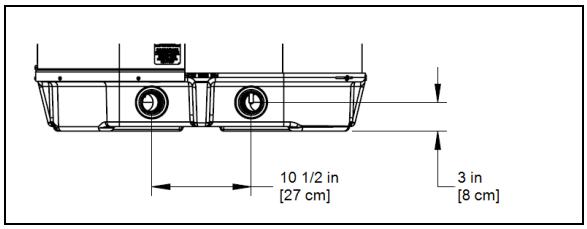
TropiCal® T035, T055, T075



TropiCal® T090, T115, T135



TropiCal® T170

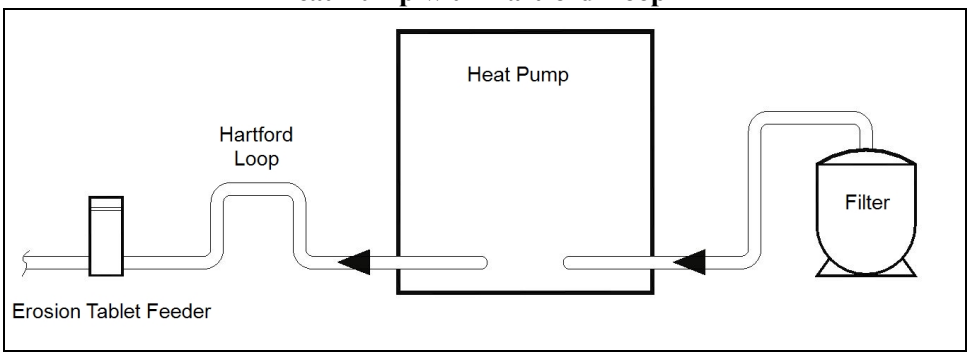


1.4.d In-Line Chlorine Feeders

Place in-line chlorinators downstream from the heat pump and as low in elevation as possible.

- If an erosion type feeder is used, it is recommended that a Hartford Loop be installed to protect internal heat pump components.
- A Hartford Loop is not necessary with a Salt Chlorine Generator.

Heat Pump with Hartford Loop



1.4.e Water Flow Rates

Maintain water flow rates as indicated. Please note, these specifications relate to the heat pump only. Code-specified whole system turnover rates must be satisfied.

NOTICE Failure to heed the following may result in damage to equipment.

- Water flow exceeding maximum flow rates will negatively affect the total pool filtration performance and may damage the heat pump. This will not be covered under the equipment warranty.

MODEL	HEAT EXCHANGER TYPE	FLOW RATES	
		MINIMUM	MAXIMUM
SQ120R	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
SQ125	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
SQ145	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
SQ150VS	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
SQ166R	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
SQ225	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
T035	Titanium Tube-in-Tube	20 GPM (75.7 L/min)	45 GPM (170 L/min)

MODEL	HEAT EXCHANGER TYPE	FLOW RATES	
		MINIMUM	MAXIMUM
T055	Titanium Tube-in-Tube	20 GPM (75.7 L/min)	45 GPM (170 L/min)
T075	Titanium Tube-in-Tube	20 GPM (75.7 L/min)	45 GPM (170 L/min)
T090	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
T115	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
T135	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
T170	Titanium Tube-in-Tube	30 GPM (113.6 L/min)	70 GPM (265 L/min)
TC500	Titanium Tube-in-Tube	20 GPM (75.7 L/min)	45 GPM (170 L/min)
TC1000	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)
TC1500	Titanium ThermoLink®	30 GPM (113.6 L/min)	70 GPM (265 L/min)

PLEASE NOTE -

If minimum flow rates are not met, heat pump performance is reduced and performance will suffer. Internal safety devices may deactivate the heat pump with the following errors:

- **HIGH PRESSURE FAULT**
- **HP5 SYSTEM LOCKOUT**
- **LOW PRESSURE FAULT**
- **LP5 SYSTEM LOCKOUT**

- Operate water filtration devices per manufacturer's specifications. Dirty filters can cause a reduction of water flow to the heat pump. An increase of 7-10 psi (48 to 69 kPa) higher than the clean filter pressure typically reduces flow rates. This requires the filter to be cleaned or back-washed.
- Keep baskets free of debris. A large quantity of debris in the pump and skimmer baskets can reduce water flow.
- Check for improper valve settings. A partially closed valve after the filter, or a full-open bypass around the heat pump, will cause insufficient water flow through the heat pump.
- The maximum static pressure (or operating pressure) is 50 psi (345 kPa). These specifications relate to the heat pump only.
- Code-specified whole system turnover rates must be satisfied.

1.4.f Adjusting Water Flow Using ΔT (Delta-T)

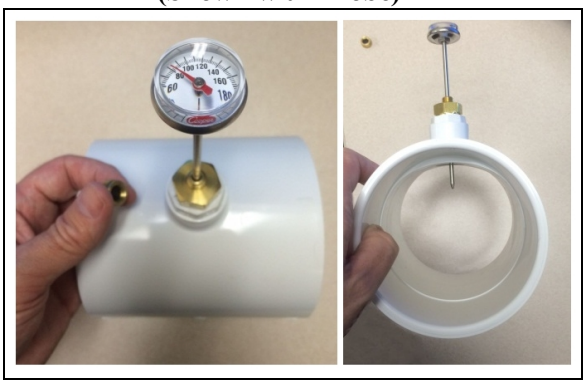
The Delta-T is the temperature difference between the water temperatures entering and leaving the heat pump. The equipment can be fine-tuned for maximum performance by balancing water flow rates to maintain an ideal ΔT.

The adjustment procedure must be completed with the unit in heating mode.

- Installed temperature ports are required to perform the following procedures.
- These ports are typically located on the pool in and pool out water lines approximately six inches away from the heat pump.

> ***PLEASE NOTE -***
> - The installation of temperature ports is required for all commercial applications.
> - The installation of temperature ports is strongly recommended for residential installations.
>   - See "*Temperature Port Kit (# STK0096)*" on page 84.

Temperature Port (Shown with Probe)



1. Adjust the thermostat to its lowest setting with the unit in heating mode.
2. Deactivate the water filtration pump.
3. Confirm that the filters leading to the heat pump are clean.
4. Adjust the valves controlling water headed towards the heat pump to the half-open position.
5. Adjust the valves controlling water leading away from the heat pump to a fully open position.
6. Activate the pool water filtration pump.
7. Slowly raise the thermostat temperature until the heat pump activates.
   - After a three-minute delay, the heat pump's compressor will start.
8. With the heat pump running, confirm the filtration pump is operating properly with adequate flow and no short cycling.
9. Wait for water temperatures to stabilize (approximately 5 minutes).

12. Adjust valves in the following order using the temperature chart provided.
    a. Adjust the valve that controls water exiting the heat pump until the correct temperature differential is achieved. Match the temperature measured with a temperature probe to the chart.
    b. Wait for water temperatures to stabilize. Then check the temperature again. Re-adjust the valve as needed.
13. Mark valves at these positions for future reference.

HEAT EXCHANGER TYPE	MODEL	TEMPERATURE
Titanium ThermoLink®	SQ120R	3° to 7° F (1.7° C to 3.9° C)
Titanium ThermoLink®	SQ125	3° to 7° F (1.7° C to 3.9° C)

HEAT EXCHANGER TYPE	MODEL	TEMPERATURE
Titanium ThermoLink®	SQ145	3° to 7° F (1.7° C to 3.9° C)
Titanium ThermoLink®	SQ150VS	3° to 7° F (1.7° C to 3.9° C)
Titanium ThermoLink®	SQ166R	3° to 8° F (1.7° C to 4.4° C)
Titanium ThermoLink®	SQ225	4° to 9° F (2.2° C to 5° C)
Tube-in-Tube	T035	1° to 4° F (.5° C to 2.2° C)
Tube-in-Tube	T055	2° to 5° F (1.1° C to 2.8° C)
Tube-in-Tube	T075	3° to 7° F (1.7° C to 3.9° C)
Titanium ThermoLink®	T090	3° to 6° F (1.7° C to 3.3° C)
Titanium ThermoLink®	T115	3° to 7° F (1.7° C to 3.9° C)
Titanium ThermoLink®	T135	4° to 8° F (2.2° C to 4.4° C)
Titanium Tube-in-Tube	T170	3° to 7° F (1.7° C to 3.9° C)
Titanium Tube-in-Tube	TC500	2° to 5° F (1.1° C to 2.8° C)
Titanium ThermoLink®	TC1000	2° to 5° F (1.1° C to 2.8° C)
Titanium ThermoLink®	TC1500	3° to 7° F (1.7° C to 3.9° C)

Table 1 - Temperature Chart

PLEASE NOTE -

- Temperature differences are based on pool water temperatures of 69° to 75° F. (20.5° to 23.8° C)
- For water temperatures outside this range, contact AquaCal®. See "*Contacting AquaCal AutoPilot, Inc.*" on page 1.

1.4.g Maintaining Ability to Winterize

Do not glue the threaded portion of the unions. The unions are used to decouple the heat pump from the plumbing system during hard freeze conditions.

NOTICE Failure to heed the following may result in damage to equipment.

- Do not use glue on the threaded portion of the equipment's unions. A glued-in-place union will prevent the heat pump from being properly winterized.

1.4.h Adjusting Water Pressure Switch

Adjust the water pressure switch when heat pump attempts to operate without water flow.

Before attempting any adjustments confirm the following :

- The filter is clean.
- Filter pump is operating.
- The valves are set to direct the appropriate amount of water through the heat pump. See "*Water Flow Rates*" on page 11.
- "**NO POOL/SPA WATER FLOW**" is displayed (or displays intermittently).

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

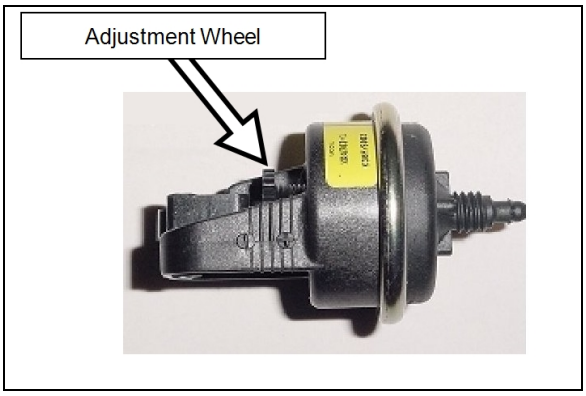
WARNING Failure to heed the following may result in injury or death.

- Water Pressure Switch adjustment procedure to be performed by experienced service personnel only; procedure must not be attempted by individuals lacking adequate electrical and mechanical experience.

NOTICE Failure to heed the following may result in damage to equipment.

- If the heat pump continues to operate after a water pressure switch adjustment, deactivate equipment and perform additional troubleshooting.

1. Remove heat pump access panel.
2. Locate the water pressure switch. It will be outside and along the bottom edge of the electrical enclosure. The exact location varies by model.
3. Activate the filter pump.
4. Apply power to heat pump.
5. Slowly rotate the adjustment wheel on the switch. Keep turning the wheel until the heat pump indicates it is receiving water. The display will no longer indicate "**NO POOL/SPA WATER FLOW**".



6. Deactivate filter pump. If correctly adjusted, the heat pump will deactivate and the display will show "**NO POOL/SPA WATER FLOW**".
7. Re-install heat pump access panel.
8. If the heat pump continues to operate without water flow, the installation of a grid flow switch may be required.
   - This can become necessary if the heat pump is installed below the elevation of the body of water to be heated or cooled. The standing pressure from the water can cause the water pressure switch to activate when the circulation pump is off. Therefore a water flow switch must be used in place of a water pressure switch to determine if incoming water is being sent to the heat pump. See "*Grid Flow Switch (# 0040S)*" on page 83.
9. If the heat pump continues to operate without water flow, contact AquaCal®.

1.5 Electrical

1.5.a Electrical Requirements

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- The information contained in this section is intended for use by qualified electricians familiar with electrical service-industry safety standards and methods.
- Locate the equipment disconnect as near to the heat pump as possible. Always satisfy applicable codes and standards.
- Never mount power-disconnects directly to the heat pump.
- In sizing power wiring, be especially aware of up-sizing requirements necessary due to wiring distances. Always satisfy applicable codes and standards.
- AquaCal® heat pumps are designed to use copper conductors, only. Do not use aluminum wire.
- If multiple heat pumps are on-site, confirm that the multiple heat pump configuration has been utilized. See "*Connecting Multiple Heat Pumps (Master / Slaved)*" on page 39. This will prevent multiple heat pumps attempting to start at the same time, causing an excessive power drop at start-up.

Electrical Standards

Standards	Title
NFPA 70, Nat'l Elec. Code 2017	The electrical installation must conform to the current version of the National Electric Code (NEC), and all applicable local and state codes
IEC 60335-1	Household and similar electrical appliances - Safety - General Requirements
IEC 60335-2	Household and similar electrical appliances - Safety – Particular requirements for electrical heat pumps, air-conditioners, and dehumidifiers
UL 1995 & CSA C22.2 No. 236-15	Standard for Safety - Heating and cooling equipment

Table 2 - Standards

Grounding and Bonding

Follow local code requirements for proper grounding and bonding of heat pump equipment.

- A bonding lug has been provided on the lower right-hand corner of the front access panel.

Surge Suppression

The use of approved commercial surge protectors is strongly recommended.

Sizing the Electrical Service

Refer to equipment data plate for specific information required to size electrical service and over-current protection of the heat pump. Sizing is based on data plate information, wire size, wiring devices, and over-current protection per applicable local codes and standards. See "*Identifying Model Specifications*" on page 79.

Minimum and Maximum Operating Voltage

The heat pump must operate within specified voltages.

NOTICE

Failure to heed the following may result in damage to equipment.

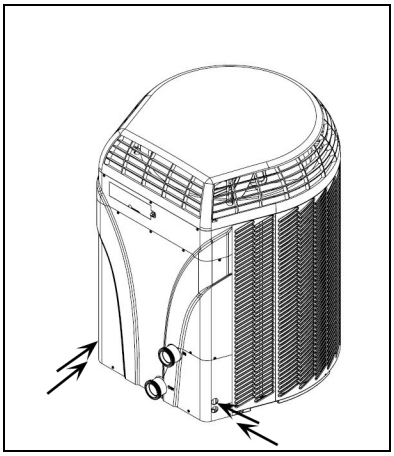
- Operating equipment under higher or lower voltage conditions may result in damage to your compressor, motors or other electrical components. This damage will not be covered by the product warranty.

1. Measure site voltage. The site voltage **MUST** be measured under “FULL LOAD” conditions. Activate all equipment using the same electrical panel as the heat pump.
2. If measured site voltage is outside listed ranges, immediately deactivate equipment until site conditions have been corrected. If unsure of heat pump equipment rating, please see "*Identifying Model Specifications*" on page 79.

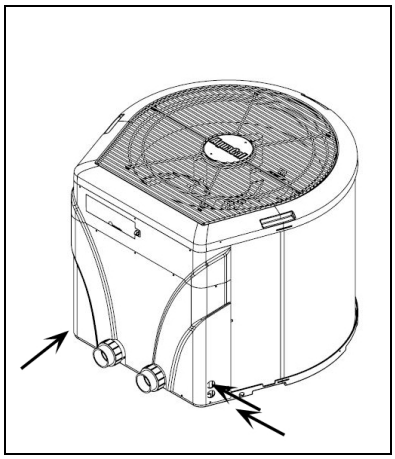
Equipment Rating	Minimum Site Voltage	Maximum Site Voltage
A Voltage (208 to 230 Volts) Single Phase 60 hertz	200 Volts	253 Volts
B Voltage (208 to 230 Volts) Three Phase 60 hertz	200 Volts	253 Volts
D Voltage (380 to 420 Volts) Three Phase 50 hertz	361 Volts	441 Volts
E Voltage (380 Volts) Three Phase 60 hertz	361 Volts	399 Volts
G Voltage (460 Volts) Three Phase 60 hertz	437 Volts	483 Volts
H Voltage (200 to 240 Volts) Single Phase 50 hertz	180 Volts	264 Volts

1.5.b Incoming Power Access Holes

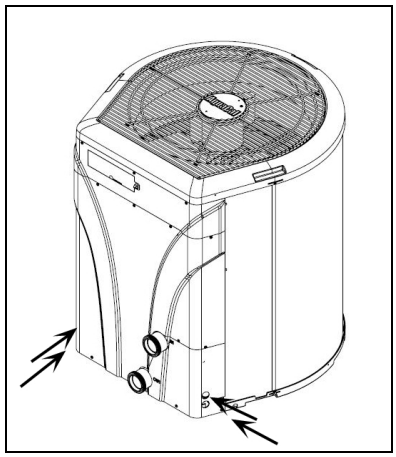
(HeatWave SuperQuiet® SQ120R, SQ125, SQ145, SQ166R and SQ225)
(TropiCool® TC1500)



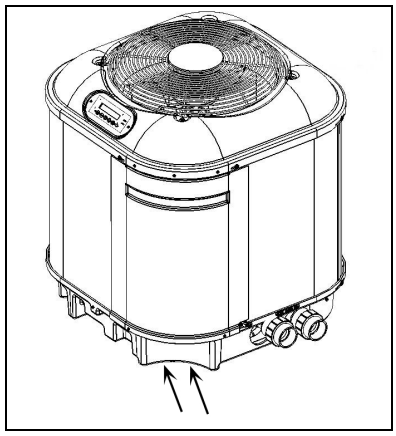
(TropiCal® T035, T055 and T075)
(TropiCool® TC500)



(TropiCal® T090, T115 and T135)
(TropiCool® TC1000)



(TropiCal® T170)

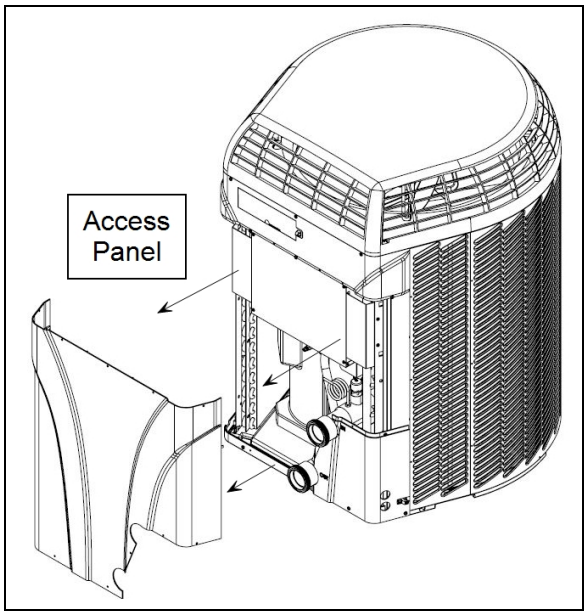


1.5.c Access Panels

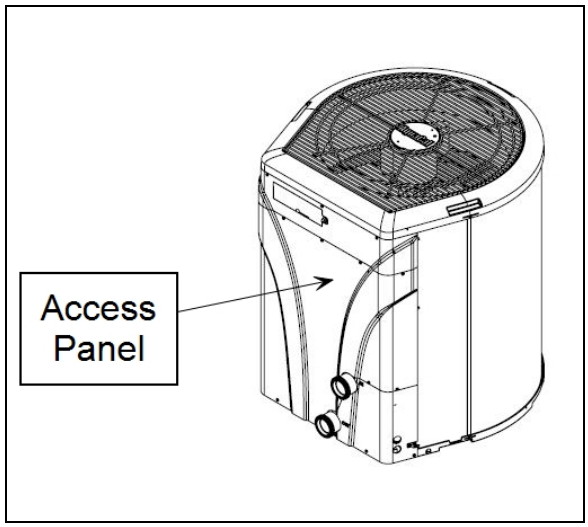
DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

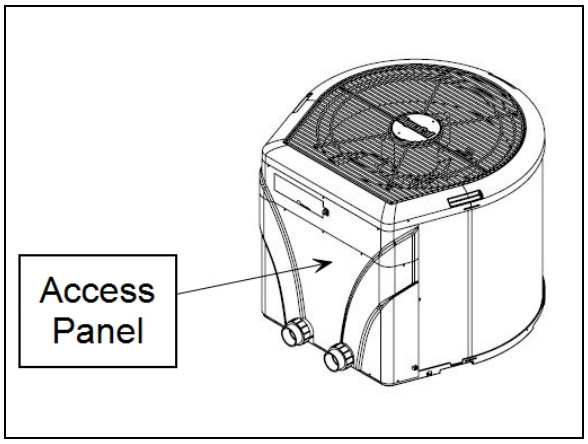
HeatWave SuperQuiet® TropiCool® TC1500



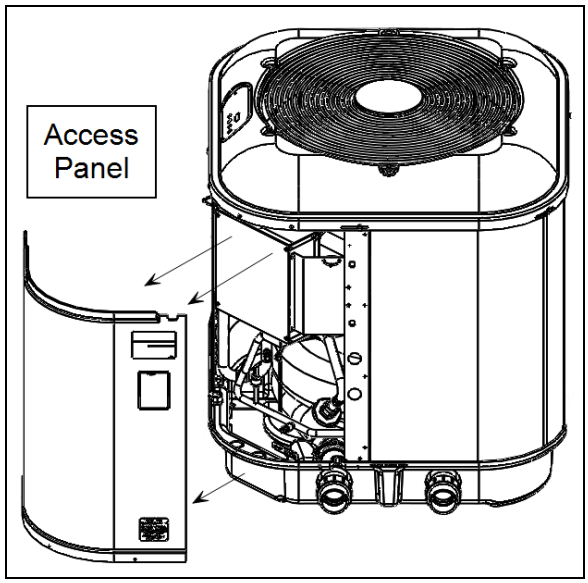
TropiCal® T035, T055 and T075 TropiCool® TC1000



TropiCool® TC500



TropiCal® T170



1.5.d Verifying Transformer Setting

Transformer voltage must be confirmed and set correctly depending on the measured voltage found on the site. Incorrect settings may cause heat pump damage. The following procedure will allow the installer to set the heat pump's transformer for the appropriate site voltage.

DANGER Failure to heed the following will result in injury or death.

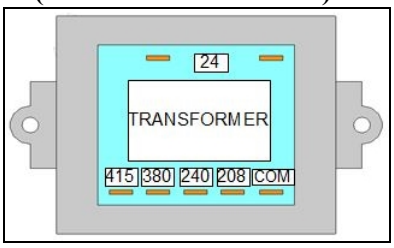
- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- The information contained in this section is intended for use by qualified technicians, familiar with electrical service-industry safety standards and methods.

1. Turn heat pump on by adjusting the thermostat to call for heating or cooling. If more than one heat pump is on-site, turn them all on. Allow time for all heat pump compressors to activate.
2. Measure the running site voltage.
3. Confirm transformer tap is set for the measured site voltage. If more than one voltage tap is shown, select the voltage nearest to the running site voltage.

Example of heat pump transformer (Varies between models)



PLEASE NOTE -

- If more than one voltage is shown on the equipment's data plate, the factory default setting is usually the higher voltage on the transformer.
- As an example, a "208/230" voltage will be set to "240" from the factory.

1.5.e Three-Phase Adjustment

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- The information contained in this section is intended for use by qualified technicians, familiar with electrical service-industry safety standards and methods.

If a three-phase unit fails to operate at start-up, the orientation of the line voltage "field" wiring may need to be adjusted.

- The phase monitor is located inside the electrical panel.

1. Deactivate power to the unit. **Confirm that power is off to all three legs using an electrical test meter set for the correct voltage.**
2. Switch position of the incoming power wires at each leg as follows, re-connect power and attempt to restart the unit. If the unit fails to start, disconnect power. Verify off and proceed to the next leg.
   - Switch incoming power wires at L1 and L2 on the line side to the contactor.
   - Switch incoming power wires at L1 and L3 on the line side to the contactor.
   - Switch incoming power wires at L2 and L3 on the line side to the contactor.
3. When heat pump starts, disconnect power and verify off. Then confirm all line voltage connections are securely tightened. Reconnect power.
   - If the heat pump does not start, contact AquaCal® for further assistance. See "*Contacting AquaCal AutoPilot, Inc.*" on page 1.

Three-Phase Monitor

1.5.f Schematic Location

Schematics are located on the inside of the electrical panel.

1.6 External Equipment

1.6.a Connecting a Call Flex

To support a direct connection to a call flex accessory, AquaCal® heat pumps are equipped with optional terminal blocks on the microprocessor. The microprocessor is located on the low-voltage side of the electrical enclosure.

> The call flex accessory can override a circulation pump to provide water flow to the heat pump when the set temperature is not met. For ordering information on the accessory, see "*Call Flex Accessory (# 0030-LEDS)*" on page 83.

Connecting a Call Flex

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

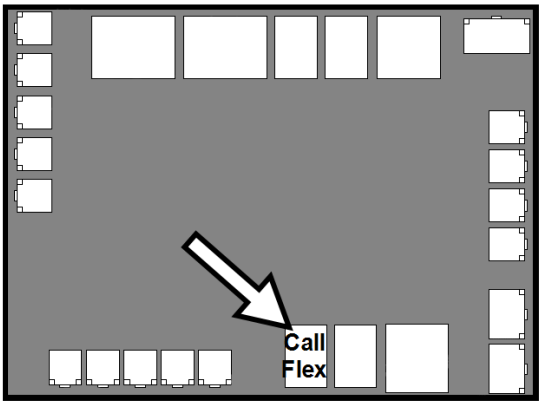
- This section is only for qualified installers who are familiar with the swimming pool and spa safety standards.
- The installer must be familiar with service industry techniques.

NOTICE Failure to heed the following may result in damage to equipment.

- The wire size connecting the controller must be 22-gauge (minimum), 2-conductor, low-voltage wire.

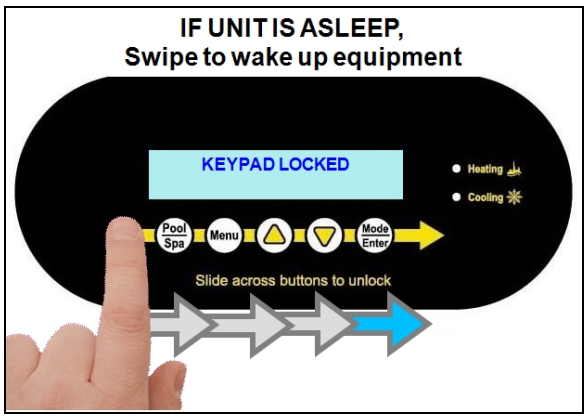
1. Deactivate power to heat pump.
2. Remove heat pump electrical access panel.
3. Route 22-gauge (minimum), 2-conductor, low-voltage wires to the low voltage side of the electrical enclosure. Follow all National Electric Codes (NEC) unless State or Local guidelines supersede.
4. Connect the controller wires to the port labeled "Call Flex" on the microprocessor as indicated.
5. Reattach heat pump access panel.
6. Apply power to heat pump.
7. Configure the heat pump to indicate an installed Call Flex. See "*Configure Call Flex*" on the next page.

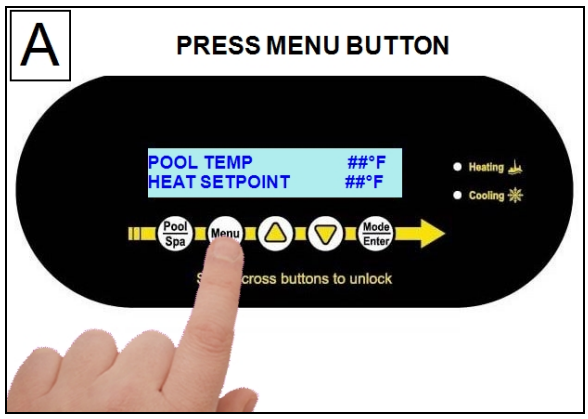
Connection Points to the Microprocessor

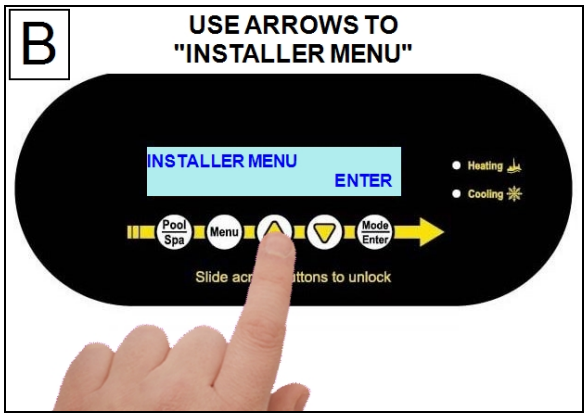


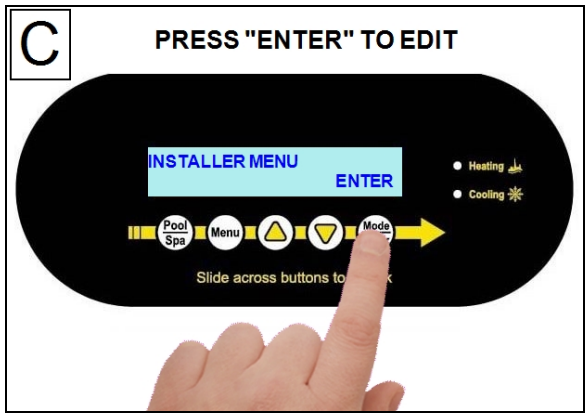
Configure Call Flex

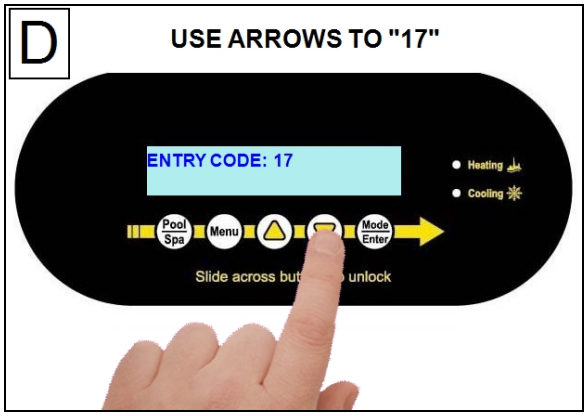
Enter "Installer Menus", then proceed

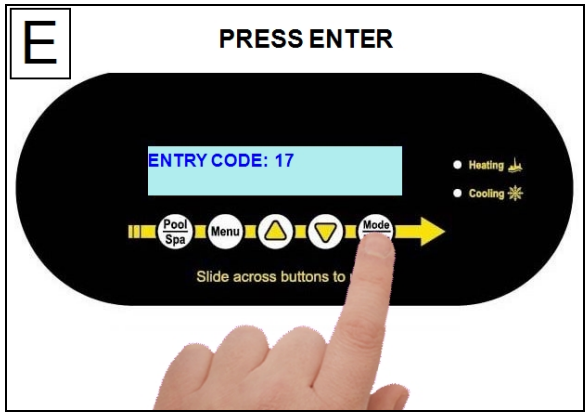


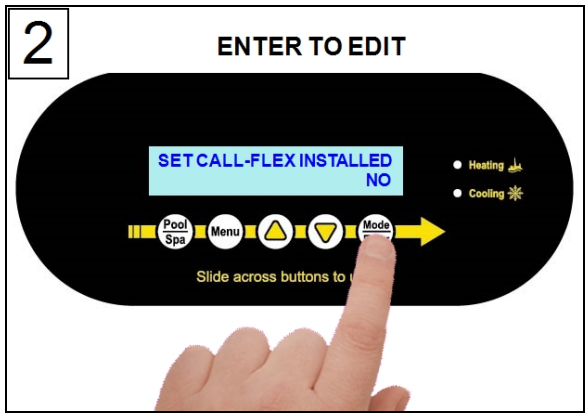


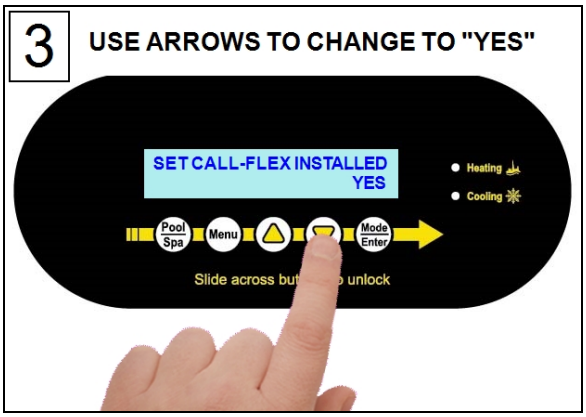


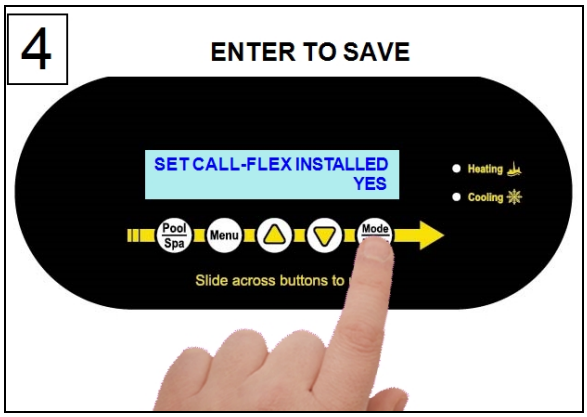


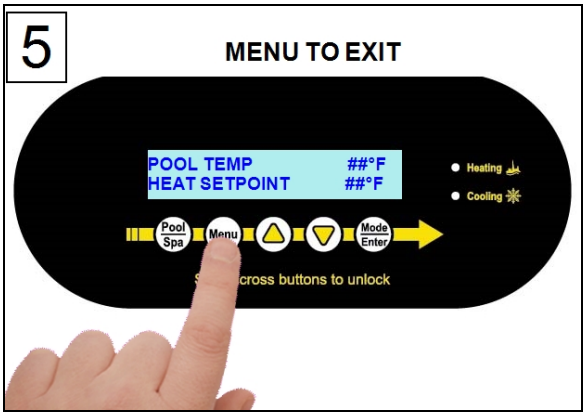












1.6.b Connecting a Chlorinator

To support an AutoPilot® ChlorSync chlorinator, select AquaCal® heat pumps are equipped with a power supply outlet on the front of the unit. The chlorination cell can be plugged directly into the heat pump without the need for a ChlorSync power supply.

DANGER

Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

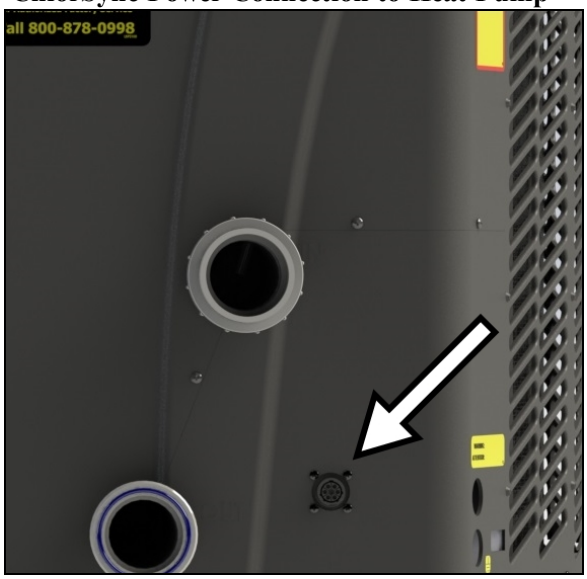
WARNING

Failure to heed the following may result in injury or death.

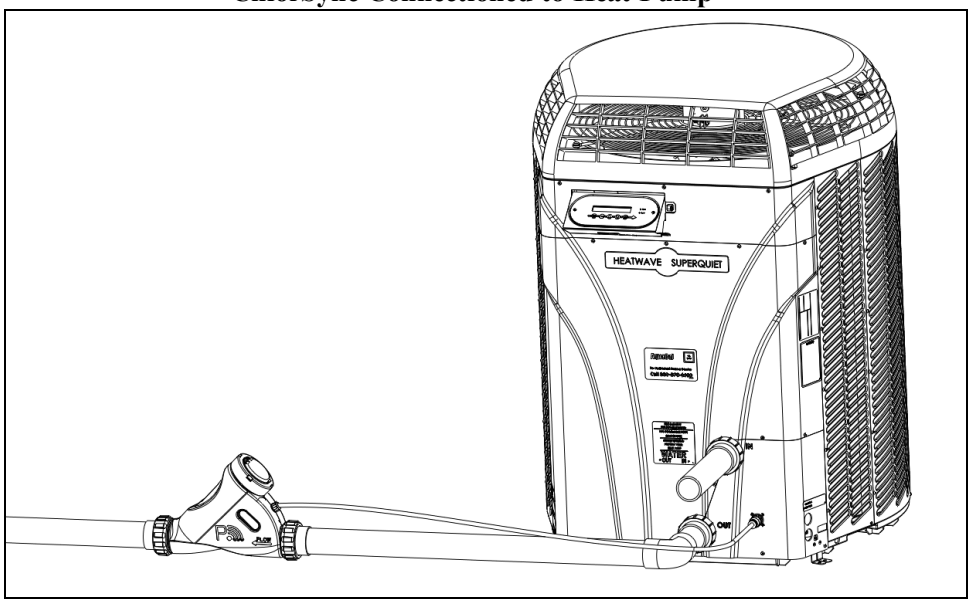
- This section is only for qualified installers who are familiar with the swimming pool and spa safety standards.
- The installer must be familiar with service industry techniques.

1. Deactivate power to heat pump.
2. Route the ChlorSync cell cord so that it is protected from possible damage by lawn equipment or foot traffic. If desired, the cord may be secured to plumbing or electrical conduit using tie wraps (not included).
3. Align and insert the six (6) pin cell cord connector to the heat pump's power supply port as indicated.
4. Turn the round nut until it locks the connector in place.
5. Apply power to heat pump.

ChlorSync Power Connection to Heat Pump



ChlorSync Connectioned to Heat Pump



1.6.c Connecting External Controllers to Heat Pump

To support a direct connection to an external controller, AquaCal® heat pumps are equipped with optional removable terminal blocks on the microprocessor. The microprocessor is located on the low-voltage side of the electrical enclosure.

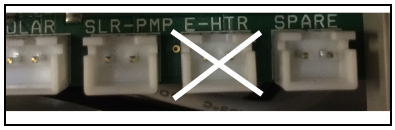
DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- This section is only for qualified installers who are familiar with the swimming pool and spa safety standards.
- The installer must be familiar with service industry techniques.

NOTICE Failure to heed the following may result in damage to equipment.



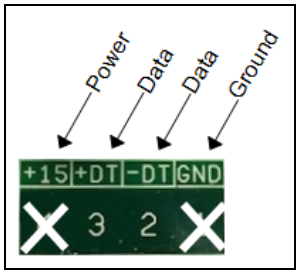
- **Do not use an electric heater connection on external controllers for heat pump wiring.** This can cause damage to external controllers, heat pumps, and pad equipment. This damage is NOT covered by warranty.
- The wire size connecting the external controller to the heat pump must be 22-gauge, 2-conductor, low-voltage wire.
- Use the two middle data lines on the external controller's standard communication port (RS-485). Do not use the outside power or ground connection on the port.

c.1 Connecting Smart Bus Controllers

Wire Connections

1. Deactivate power to heat pump and external controller.
2. Remove electrical access panels on the heat pump and external controller.
3. Route 22-gauge, 2-conductor, low-voltage wires from the external controller communication port (com port) to the low voltage side of the heat pump's electrical enclosure. Do not use the power or ground wire.

External Controller Communication Port



4. Connect control wires to the heat pump's "Port B" of the microprocessor as indicated. See Figure 1 and Figure 2.
   - It is OK to double up wires at the external controller connection if necessary.
   - If, for example, the external controller is using the data port for an indoor controller, add wires to the existing configuration. *Connectors can be removed from terminals for ease in connecting wires. See Figure 3*

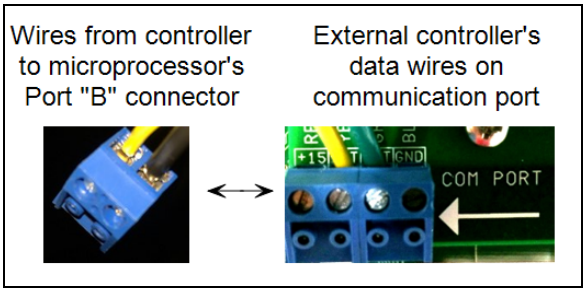


Figure 1

Typically a smart bus controller will have four wires on its smart bus for a heat pump. The power and ground (usually the 1st and 4th wire) are not used.

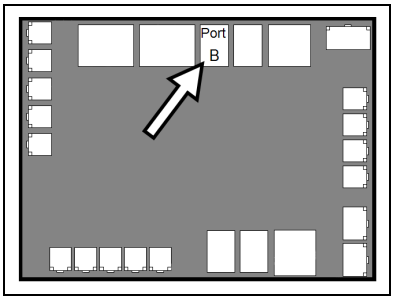


Figure 2

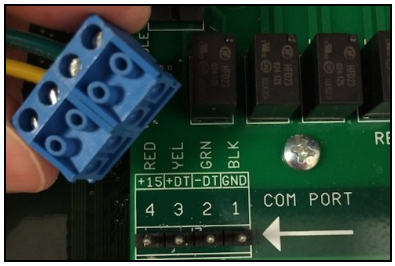


Figure 3

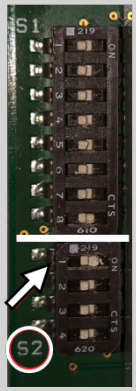
5. If dip-switch settings are required, configure them on the external controller now.

DANGER Failure to heed the following will result in injury or death.

- Deactivate power to the external controller while setting dip-switches

Example - Jandy AquaLink® :
This external controller has dip switches. Confirm they are properly positioned to operate a heat pump.

- Set dip-switch "S2" #1 to "ON". The solar option is to be used for the heat pump.
- Check Jandy documentation for any further dip switch settings.



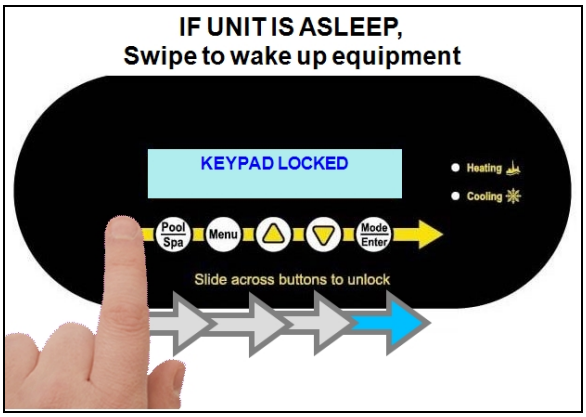
6. If additional sensors are required on the external controller, install them on the external controller now.

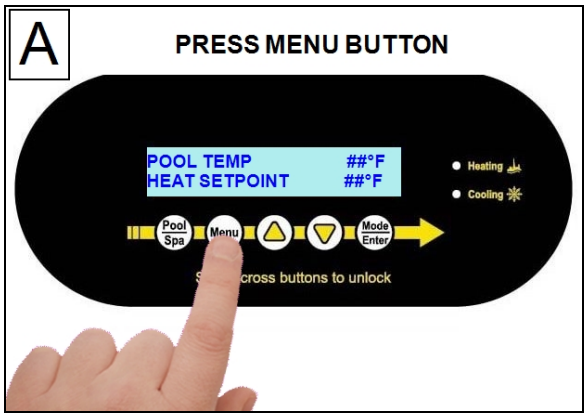
Example - Pentair EasyTouch® and Pentair IntelliTouch® :
Some controllers require an additional sensor be connected to the external controller's power supply circuit board at the solar connection point. The sensor is not used but will show an error if not connected.

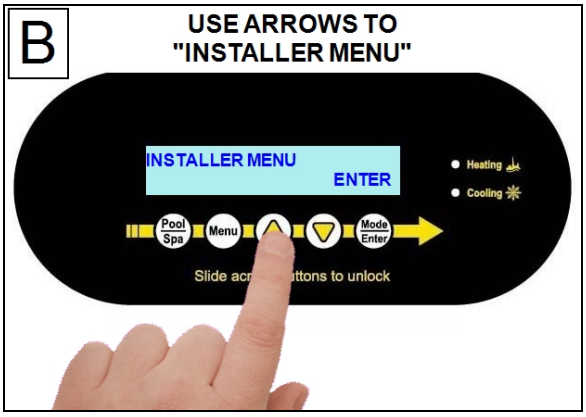
7. Reinstall electrical access panels on both the heat pump and external controller.
8. Reactivate power to heat pump and external controller.
9. Configure the heat pump to accept external controller signal. See "*Configure for Smart Bus Controller*" on the facing page.

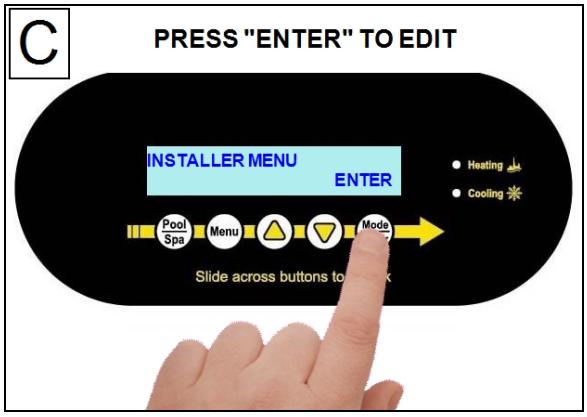
Configure for Smart Bus Controller

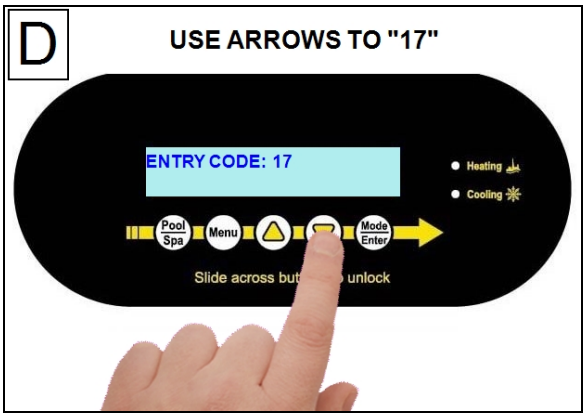
Enter "Installer Menus", then proceed

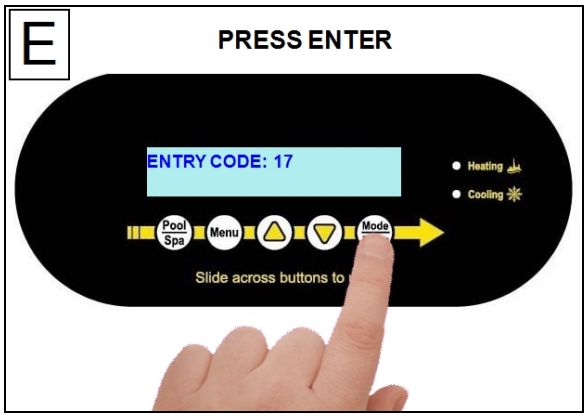


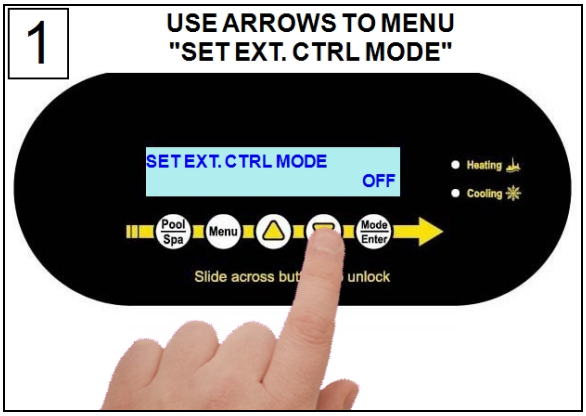


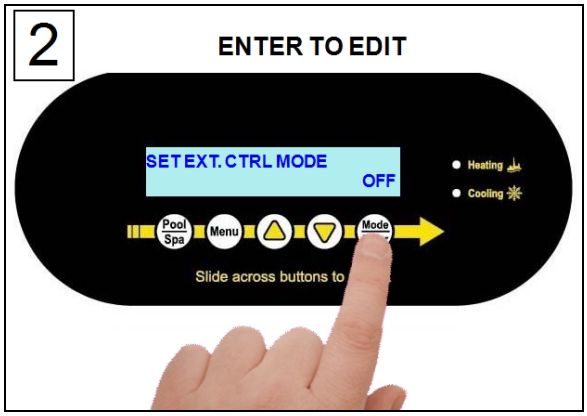


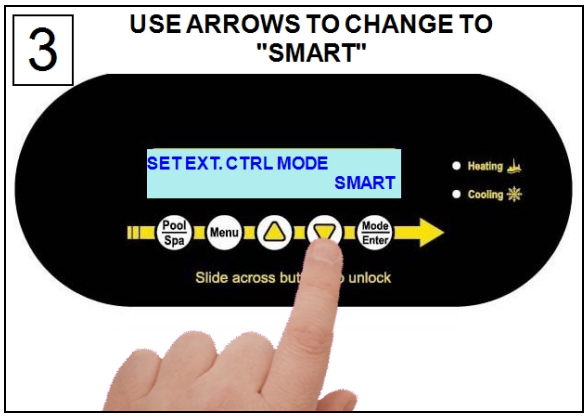


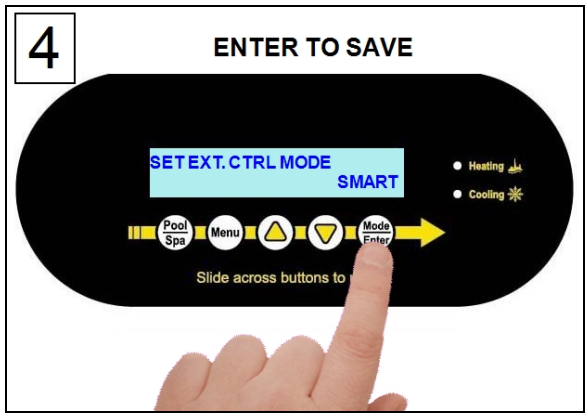


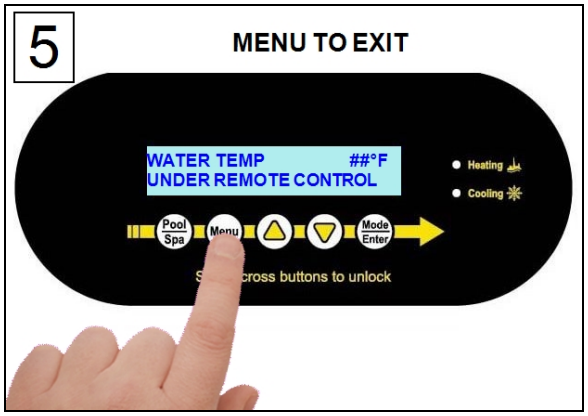












10. If after 45 seconds, the heat pump displays a "**SMART COMM FAULT**":
    A. **Confirm dip switches -** If external controller uses dip switches, confirm switches are in the correct position. Otherwise, proceed to confirm wiring.
        a. Deactivate power to the external controller.
        b. Remove access panel on external controller.
        c. Check the external controller manual for proper dip switch positioning and confirm dip switches.
        d. Reinstall electrical access panel.
        e. Reactivate power to the controller.
        f. If the fault persists, proceed to confirm wiring.
    B. **Confirm wiring -** Confirm wires are oriented properly on the heat pump's "Port B" of the microprocessor.
        a. Deactivate power to heat pump and external controller.
        b. Remove the access panel on the heat pump.
        c. Reverse wires on "Port B".
        d. Reinstall electrical access panel.
        7. Reactivate power to the controller.
        8. Reactivate power to the heat pump.
    C. If fault continues to occur, check with the manufacturer of the external controller for additional advice on using a heat pump with the controller.
11. After establishing a connection from the external controller to the heat pump, further programming will be required at the external controller.
    - See external controller manuals or contact installer or manufacturer of that product.

c.2 Connecting Two-wire Controllers (with internal thermostat)

PLEASE NOTE

2-Wire controllers are not designed to control chiller operation.

For full functionality, the Heat and Cool, and Cool Only heat pumps must use an external controller that has a SMART bus connection. Check with the external controller manufacturer for more information.

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- This section is only for qualified installers who are familiar with the swimming pool and spa safety standards.
- The installer must be familiar with service industry techniques.

1. Deactivate power to heat pump.
2. Remove heat pump electrical access panel.
3. Route 22-gauge (minimum), 2-conductor, low-voltage wires from the controller to the low voltage side of the heat pump's electrical enclosure. Follow all National Electric Codes (NEC) unless State or Local guidelines supersede.
4. Connect the controller wires to the microprocessor port labeled "Ext Controller" with the terminals labeled "Y" and "Z" as follows. See Figure 4.
   - Connect one wire to “Y”.
   - Connect other wire to “Z”.
   - The polarity of the wire is not important.
5. Reattach heat pump access panel.
6. Apply power to heat pump.
7. Configure the heat pump to accept a 2-wire external controllers signal as shown. See "*Configure 2-wire controller*" on the next page.

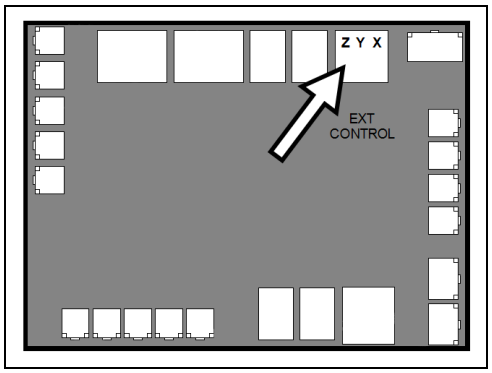
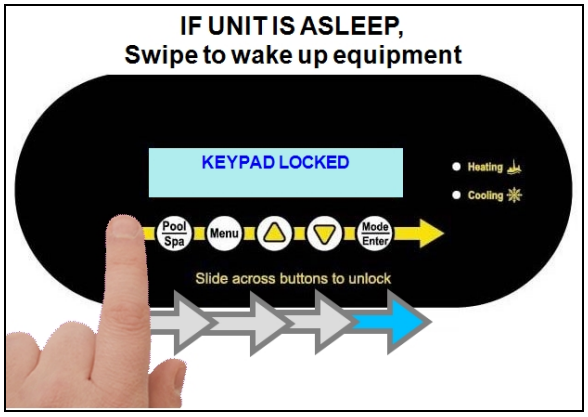
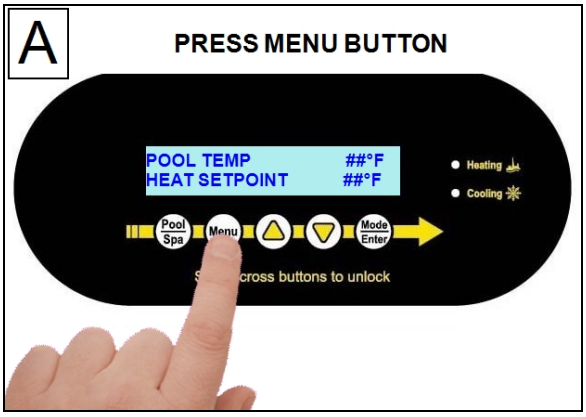
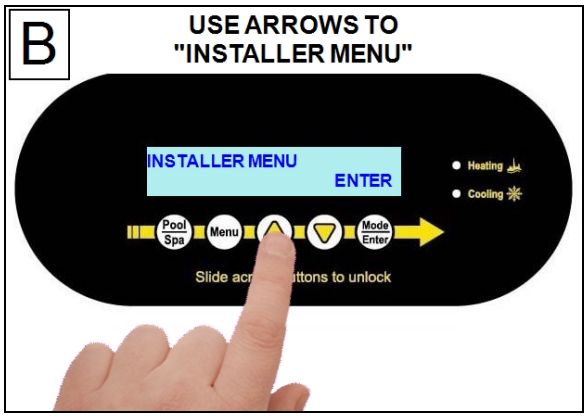


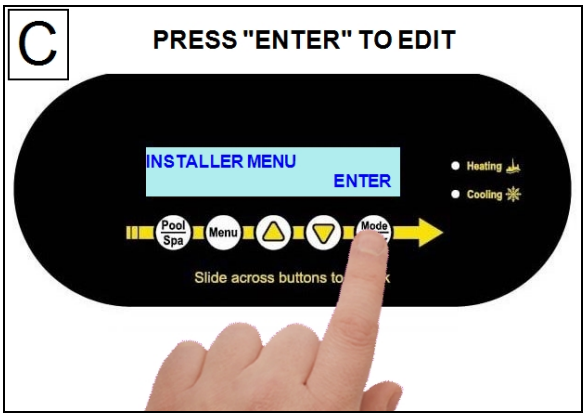
Figure 4

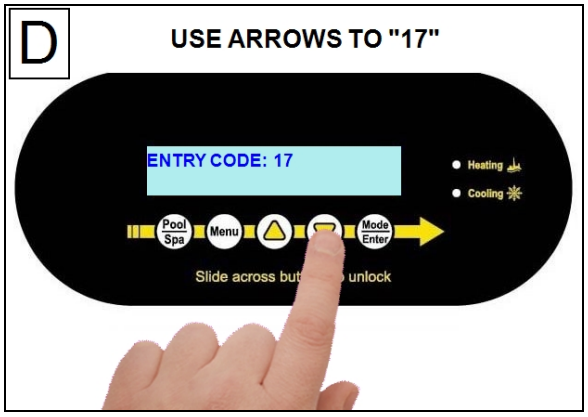
Enter "Installer Menus", then proceed

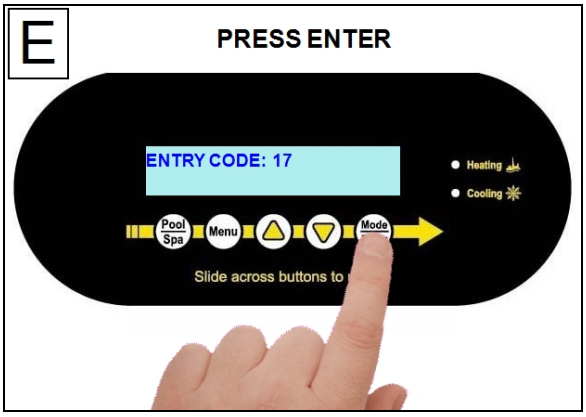


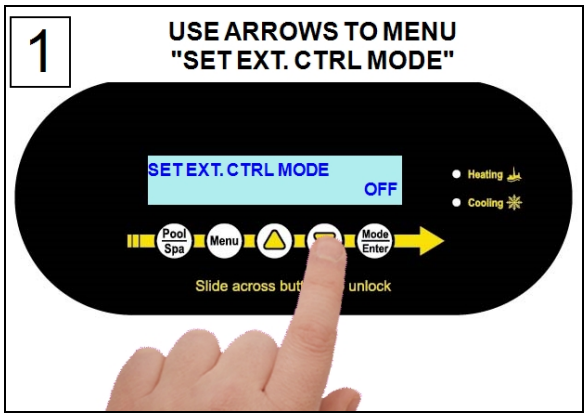


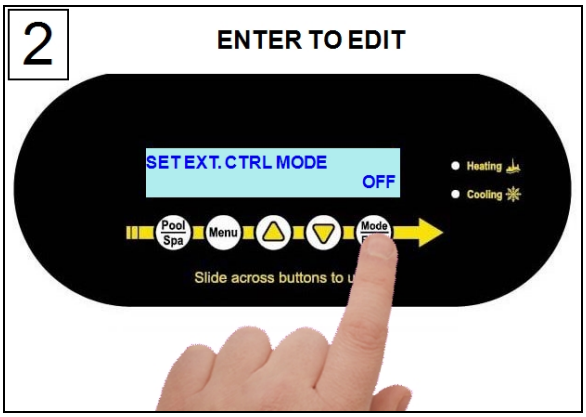


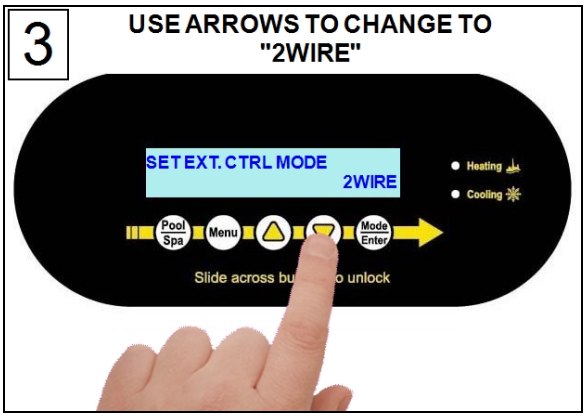


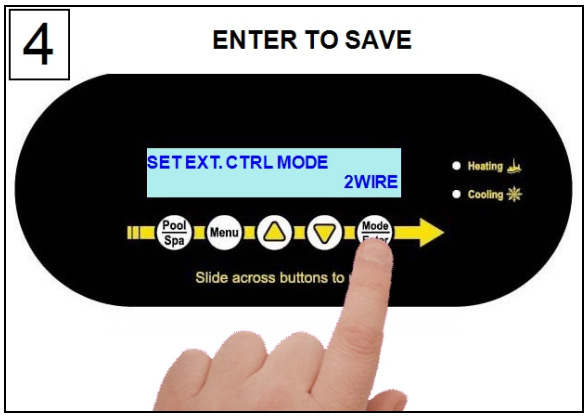


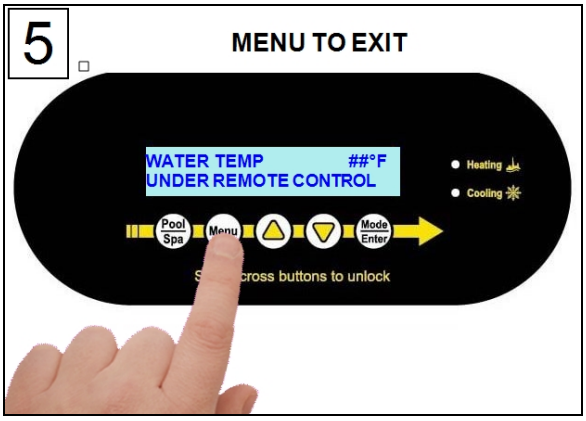












1.6.d Connecting Gas Backup Heater to Heat Pump

To support a direct connection to a gas backup heater, AquaCal® heat pumps are equipped with optional terminal blocks on the microprocessor. The microprocessor is located on the low-voltage side of the electrical enclosure.

> ***PLEASE NOTE -***
> *If the heat pump is connected and using an external controller with a SMART bus connection, the gas backup option is not available. The gas backup should be connected directly to the external controller.*

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- This section is only for qualified installers who are familiar with the swimming pool and spa safety standards.
- The installer must be familiar with service industry techniques.

NOTICE Failure to heed the following may result in damage to equipment.

- The wire size connecting the gas heater to the heat pump must be 22-gauge (minimum), 2-conductor, low-voltage wire.
- Use direct connection (**dry contact)** provided on the microprocessor for the gas heater.
- Failure to follow the manufacturer's installation requirements for a fireman (cool down) switch may result in damage to the gas heater.

Connections

1. Deactivate power to heat pump and gas heater.
2. Remove heat pump and gas heater's electrical access panels. Follow all National Electric Codes (NEC) unless State or Local guidelines supersede.
3. Route 22-gauge (minimum), 2-conductor, low-voltage wires from the gas heater to the low voltage side of the heat pump's electrical enclosure. Depending on the gas heater's circuit boards, use the following connection points from the gas heater.
   - Use the "Com" and "Pool" connection points from the gas heater. See Figure 5.
   - Or replace the jumper wire from the Fireman's Switch on the gas heater with two wires leading to the heat pump. See Figure 6.

Gas Heater's Pool and Common Connection

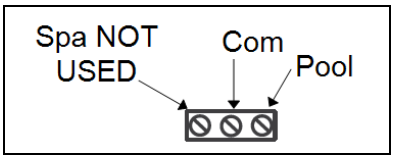


Figure 5

Gas Heater's Fireman Switch

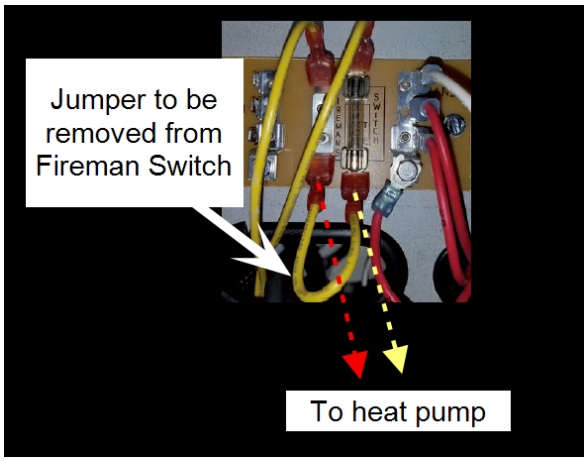


Figure 6

If the Gas Heater requires a fireman (cool down) switch, it is the installer's responsibility to ensure this requirement is met.

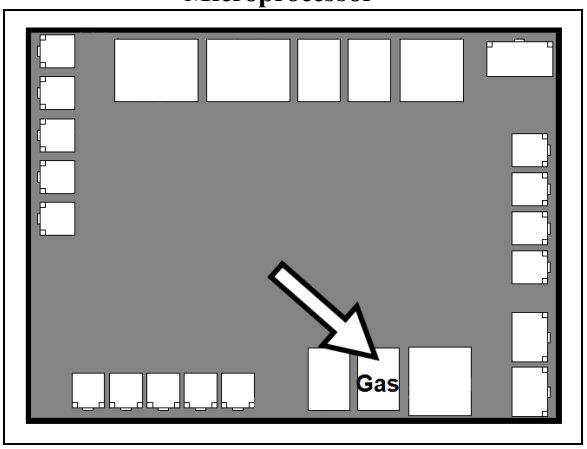
Failure to follow the manufacturer's installation requirements may result in damage to the gas heater.

PLEASE NOTE

Do not use a smart connection data comm port from the gas heater.

4. Connect the controller wires to the port labeled "Gas" on the microprocessor as indicated.
5. Reattach heat pump and gas heater access panels.
6. Apply power to heat pump and gas heater.
7. Configure gas heater to accept a two-wire remote control signal. See gas heater's manual for specifics on this procedure.
8. Configure gas backup mode on heat pump. See "*Configuring Gas Backup*" below.

Dry Contact Connection Points to the Microprocessor



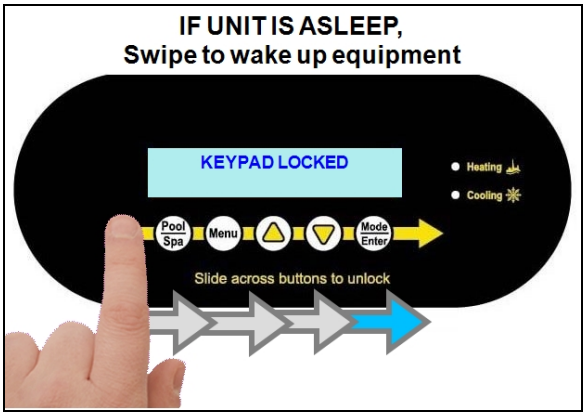
Configuring Gas Backup

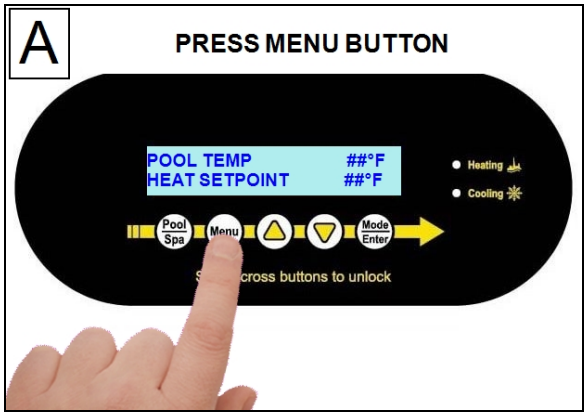
There are two different ways the gas backup heater can be configured.

- **24-hour mode** - commonly used for commercial applications
  - The circulation pump operates continuously.
  - The gas heater will activate if the water temperature falls two degrees below the set temperature. When the set temperature is reached, the gas heater will be deactivated. See "*Configure for 24-Hour Mode*" below.
  - The Heat Pump will continue to maintain the set temperature.
- **Scheduled mode** - commonly used for residential applications
  - The circulation pump operates on the circulation pumps regular on-off schedule.
  - The gas heater will activate as needed to ensure that the desired temperature will be reached within the circulation pumps schedule. The gas heater will deactivate when the water is warm enough to allow the heat pump to finish within schedule. The heat pump will then continue to heat the water till the set temperature is reached. See "*Configure for Scheduled Mode*" on page 37.

Configure for 24-Hour Mode

Enter "Installer Menus", then proceed





B

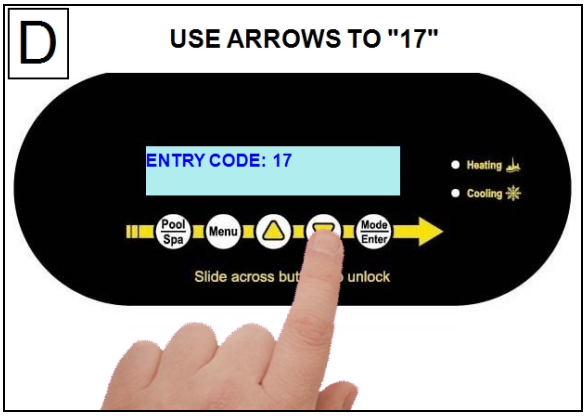
USE ARROWS TO "INSTALLER MENU"

C

PRESS "ENTER" TO EDIT

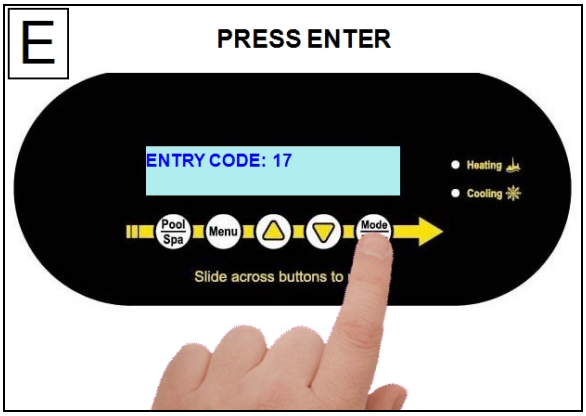
D

USE ARROWS TO "17"



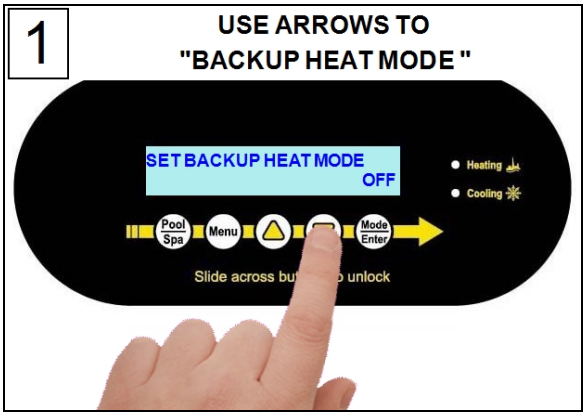
E

PRESS ENTER



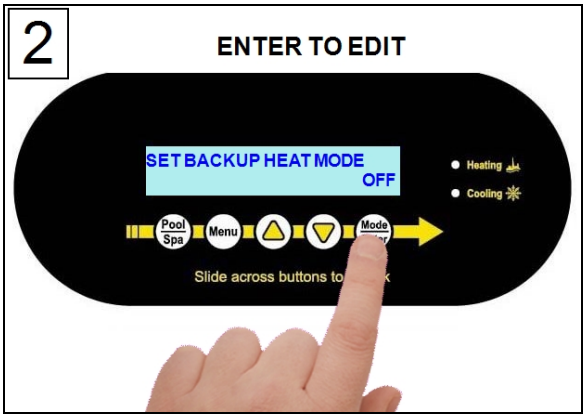
1

USE ARROWS TO "BACKUP HEAT MODE "



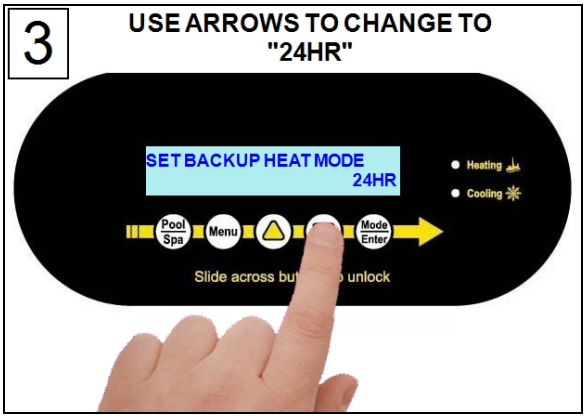
2

ENTER TO EDIT



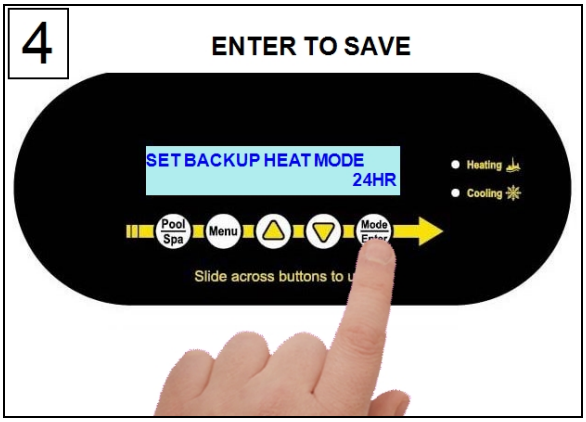
3

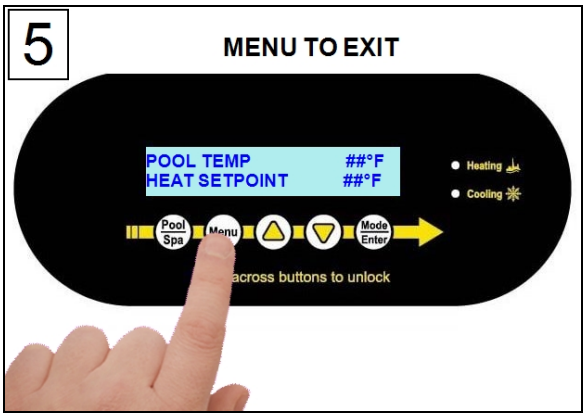
USE ARROWS TO CHANGE TO "24HR"



4

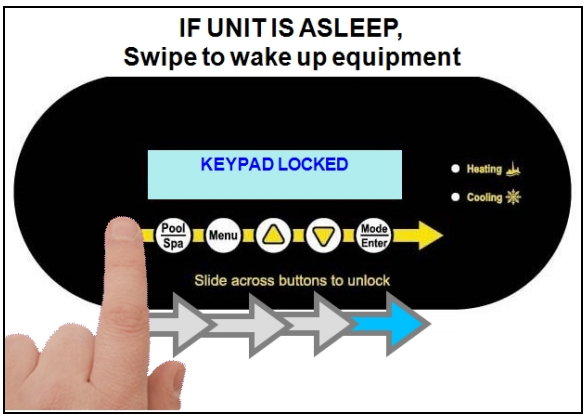
ENTER TO SAVE

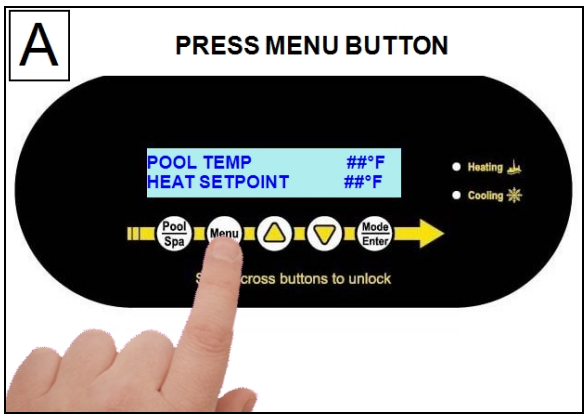


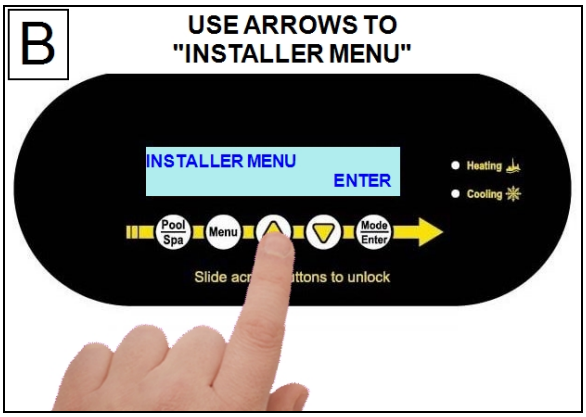


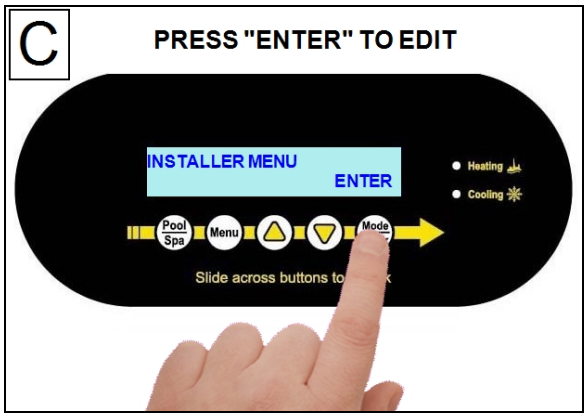
Configure for Scheduled Mode

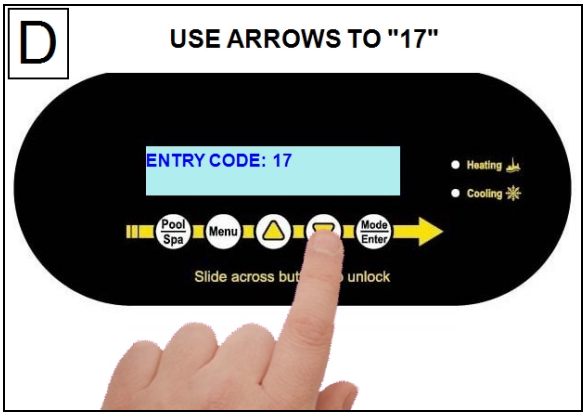
Enter "Installer Menus", then proceed

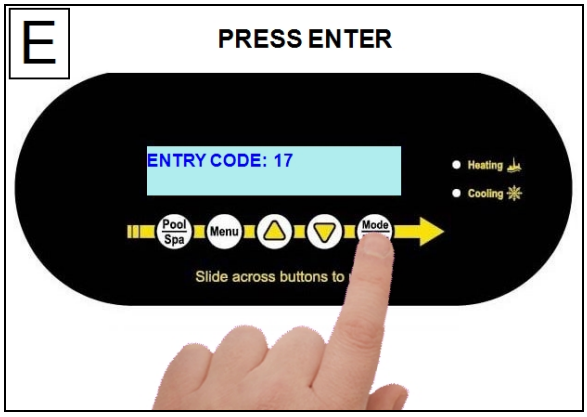


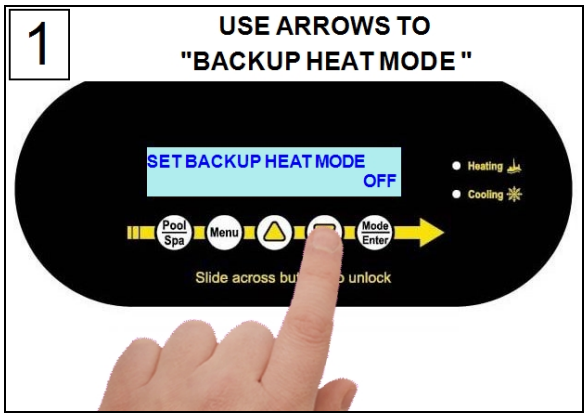


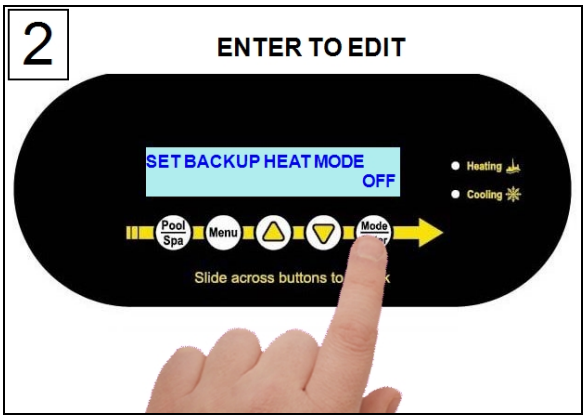


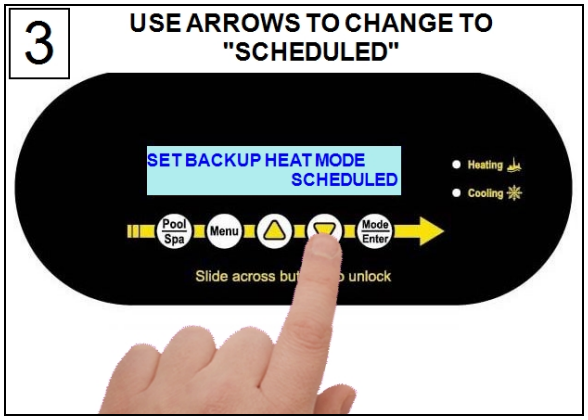


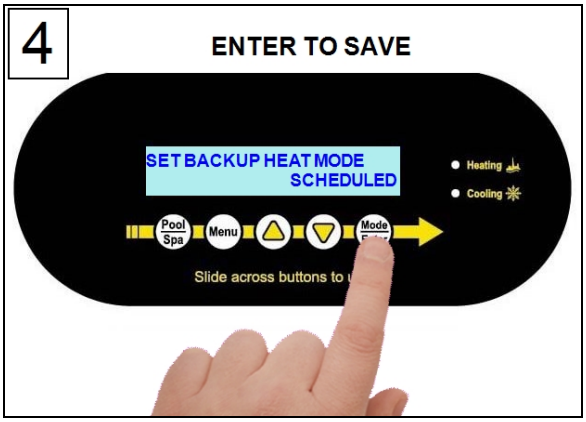


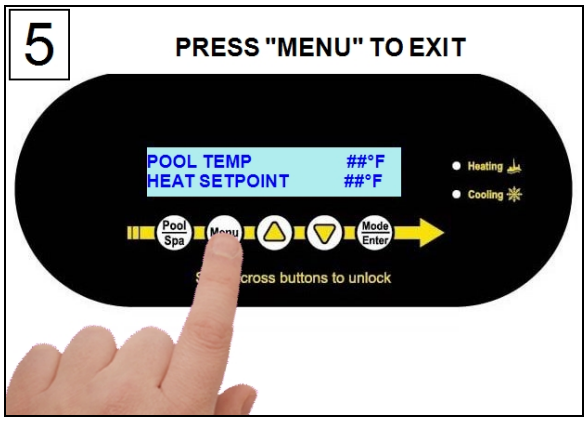



1
USE ARROWS TO
"BACKUP HEAT MODE "
SET BACKUP HEAT MODE
OFF
Heating
Cooling
Pool Spa
Menu
Mode Enter


2
ENTER TO EDIT
SET BACKUP HEAT MODE
OFF
Heating
Cooling
Pool Spa
Menu
Mode


3
USE ARROWS TO CHANGE TO
"SCHEDULED"
SET BACKUP HEAT MODE
SCHEDULED
Heating
Cooling
Pool Spa
Menu
Mode Enter


4
ENTER TO SAVE
SET BACKUP HEAT MODE
SCHEDULED
Heating
Cooling
Pool Spa
Menu
Mode


5
PRESS "MENU" TO EXIT
POOL TEMP ##°F
HEAT SETPOINT ##°F
Heating
Cooling
Pool Spa
Mode Enter

1.6.e Connecting Multiple Heat Pumps (Master / Slaved)

Up to 16 heat pumps can be connected and controlled from a primary heat pump.

There are two reasons for using a multiple heat pump configuration:

1. Controlling multiple heat pumps from one location; the master heat pump.
2. Preventing heat pumps from starting up at the same time and causing an excessive power draw on the electric circuit.

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- This section is only for qualified installers who are familiar with the swimming pool and spa safety standards.
- The installer must be familiar with service industry techniques.

NOTICE Failure to heed the following may result in damage to equipment.

- The wire size connecting the heat pumps must be 22-gauge, 2-conductor, low-voltage wire. Be sure that the size of the wire will allow at least two wires per connection point.
- Do not attempt to connect heat pump equipment in multiple configurations with previous HP7 and HP7R versions of the microprocessor. See Figure 7. No onboard port is provided for heat pumps with these microprocessor versions. An Automatic Sequencing Controller (ASC) accessory is required for those types of heat pumps.

DO NOT CONNECT HP7 or HP7R boards

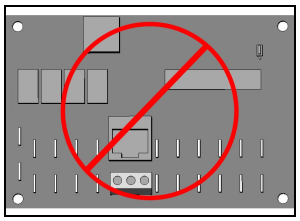


Figure 7

Connecting Multiple Heat Pumps

1. Choose one unit to be the lead (or master) unit. This is typically a unit that can be accessed easily when temperature adjustments are needed.
   - Note - The Lead unit can be connected to an external controller via the "smart bus" connection point if desired.
2. Deactivate power to heat pumps.
3. Remove electrical access panels.
4. Route 22-gauge, 2-conductor, low-voltage wires to the low voltage sides of the electrical enclosures. Follow all National Electric Codes (NEC) and/or State and Local guidelines.
5. Connect the first slaved heat pump's wires to the unit selected as the master heat pump's.

Dry Contact Connection Points to the Microprocessor

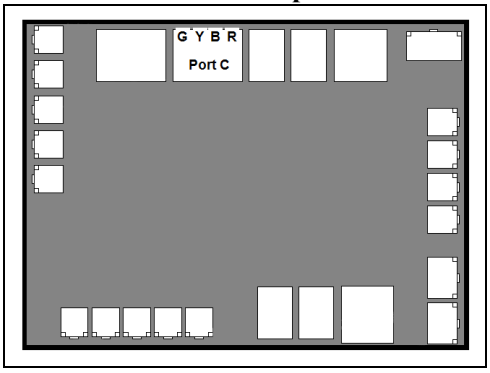


Figure 8

6. Use "Port C" on the microprocessors as indicated. Connecting the "Y" to the "Y" and the "B" to the "B" on each heat pump's port "C" connection point. The "G" and "R' connection points are not used. See Figure 8.
7. Connect any additional heat pumps as indicated, doubling up the wires as shown. See Figure 9. Confirm the same color wires connect to the same wires on each heat pump ("Y" to "Y" and "B" to "B"). Up to 16 heat pumps can be controlled by one heat pump.
8. Label the heat pumps appropriately as a master unit and slaved units (Master, Slaved 01, Slaved 02, etc.) to simplify configuration and future operation.
9. Reattach access panels.
10. Apply power to master heat pump. Confirm the mode is set to "**SYSTEM OFF**".
11. Apply power to the next heat pump and confirm the mode is set to "**SYSTEM OFF**". Do this for each heat pump.
12. Program heat pumps with assigned addresses. See "*Configuring Multiple Heat Pumps*" below.

Multiple Heat Pump
Connection Points to "Port C"

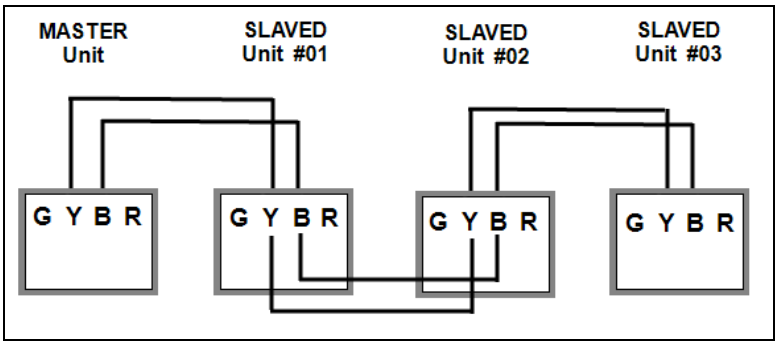


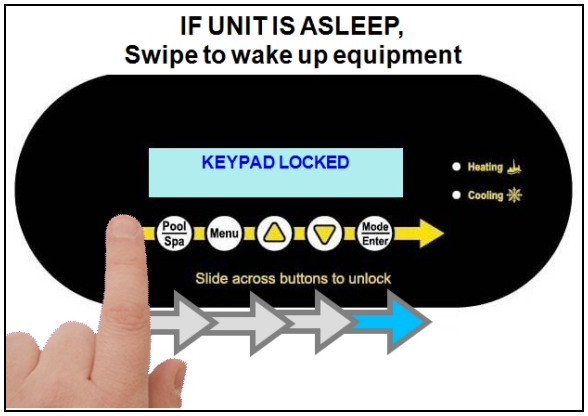
Figure 9

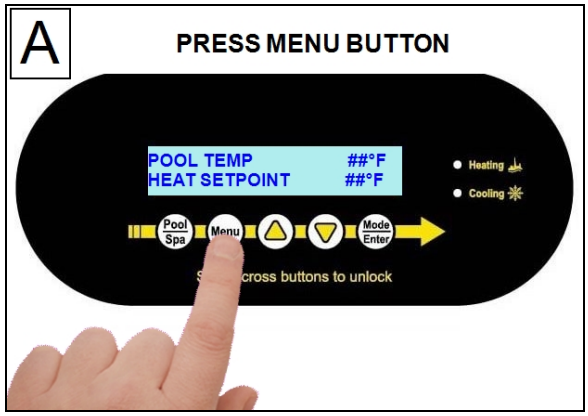
Configuring Multiple Heat Pumps

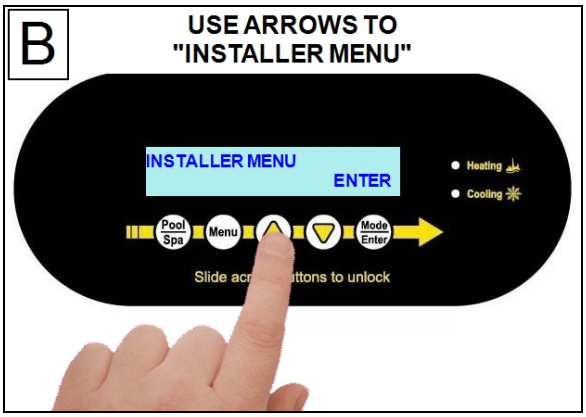
Master (Primary) Heat Pump

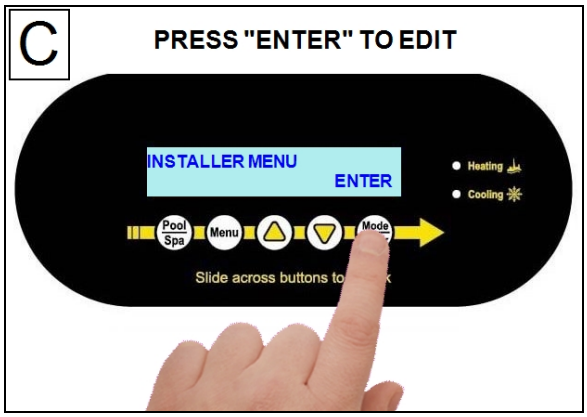
Confirm the first connected heat pump is designated as the master (primary) unit.

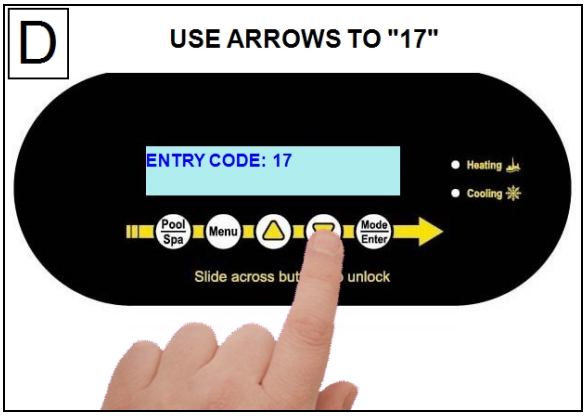
Enter "Installer Menus", then proceed

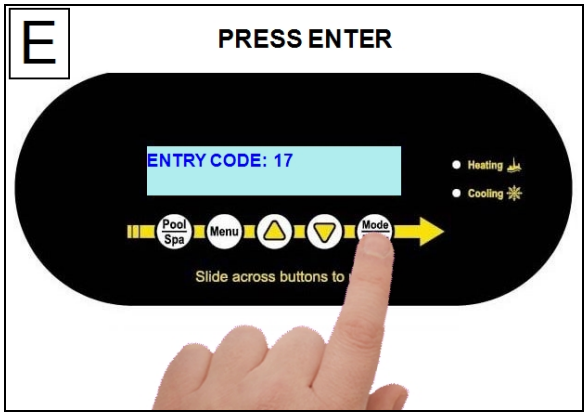


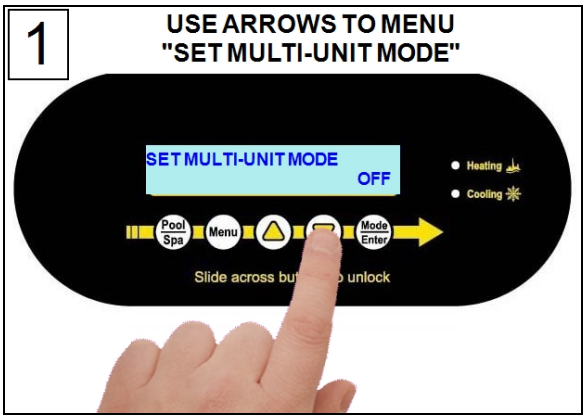


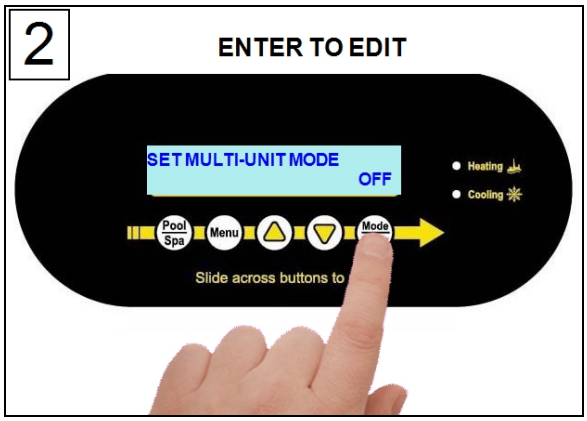

B
USE ARROWS TO
"INSTALLER MENU"
INSTALLER MENU
ENTER
Heating
Cooling
Pool Spa
Menu
Mode Enter

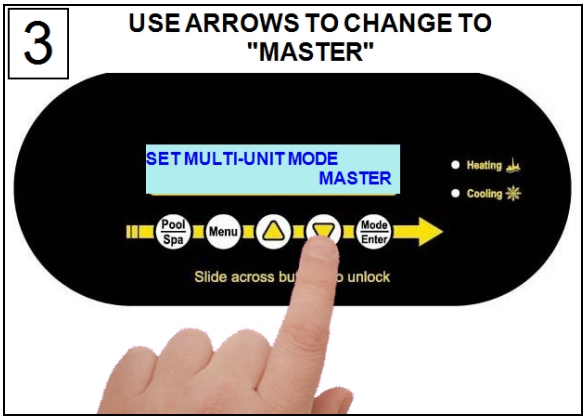

C
PRESS "ENTER" TO EDIT
INSTALLER MENU
ENTER
Heating
Cooling
Pool Spa
Menu
Mode

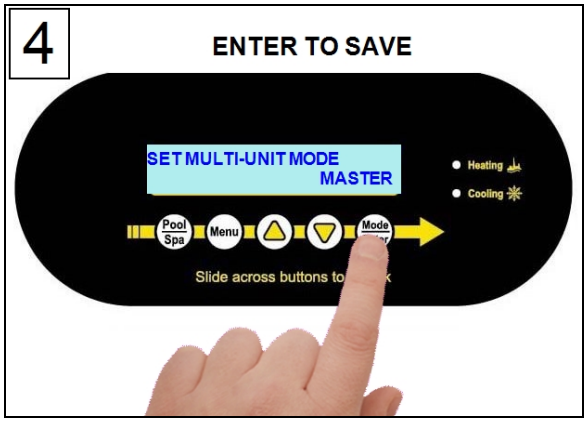

D
USE ARROWS TO "17"
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode Enter

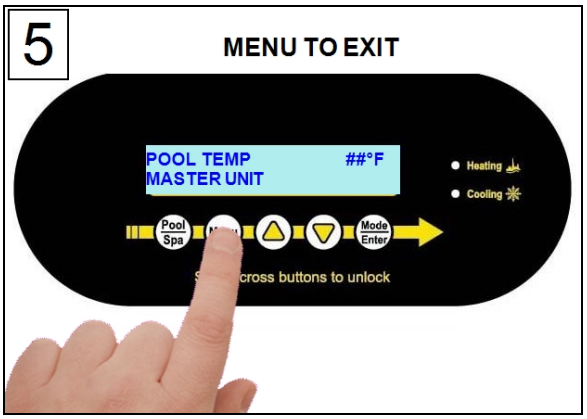

E
PRESS ENTER
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode


1
USE ARROWS TO MENU
"SET MULTI-UNIT MODE"
SET MULTI-UNIT MODE
OFF
Heating
Cooling
Pool Spa
Menu
Mode Enter


2
ENTER TO EDIT
SET MULTI-UNIT MODE
OFF
Heating
Cooling
Pool Spa
Menu
Mode


3
USE ARROWS TO CHANGE TO
"MASTER"
SET MULTI-UNIT MODE
MASTER
Heating
Cooling
Pool Spa
Menu
Mode Enter

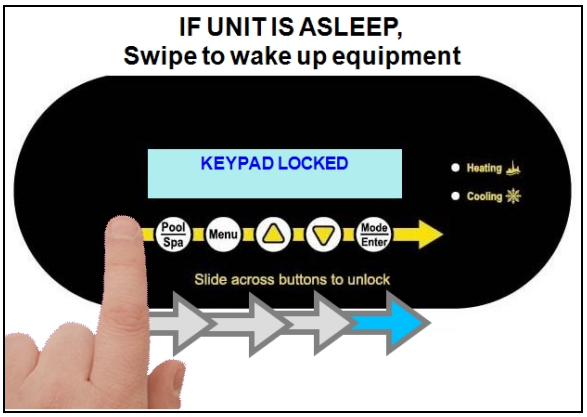

4
ENTER TO SAVE
SET MULTI-UNIT MODE
MASTER
Heating
Cooling
Pool Spa
Menu
Mode

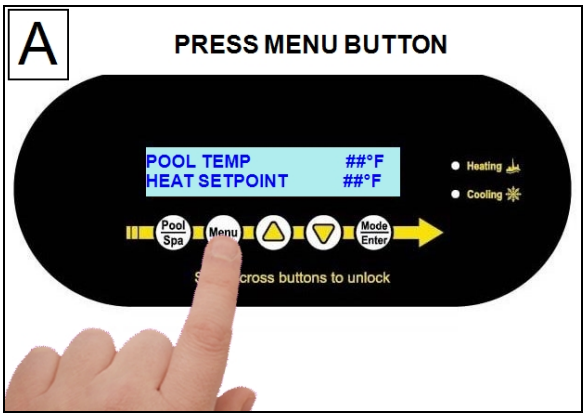


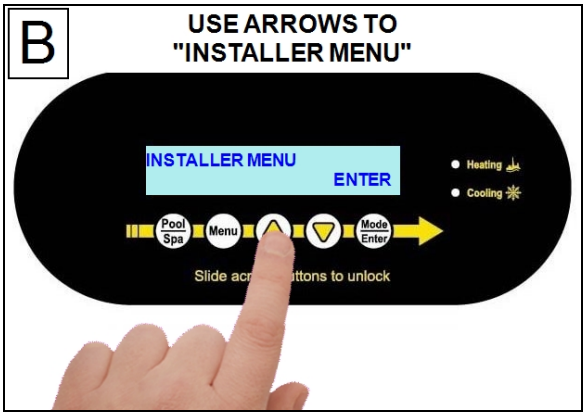
Slaved (Secondary) Heat Pumps

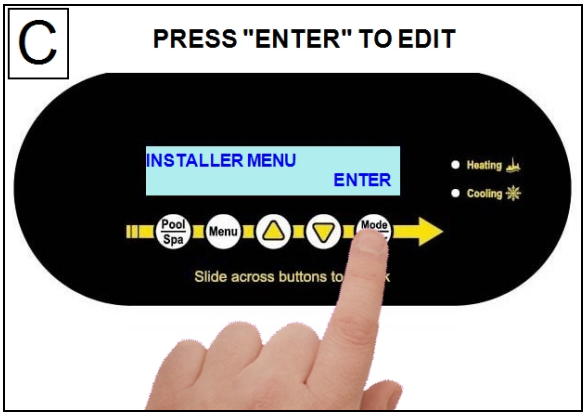
Go to the next connected heat pump and configure it as a slaved unit with a heat pump address of "01". Each additionally connected heat pump will require a unique heat pump address ("02", "03", etc.)

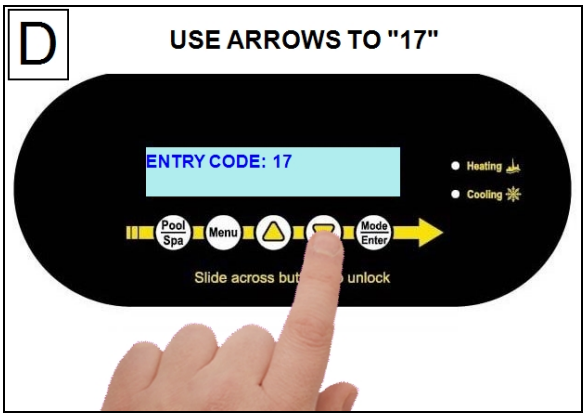
Enter "Installer Menus", then proceed

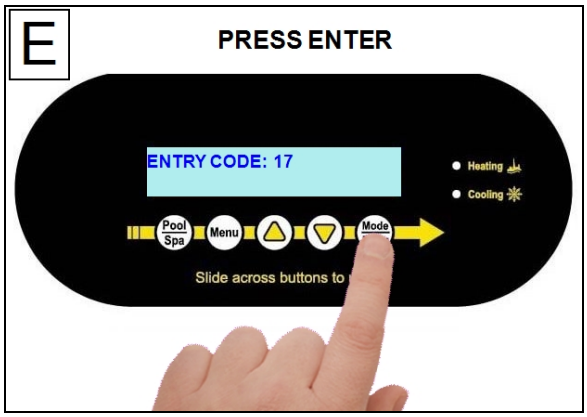


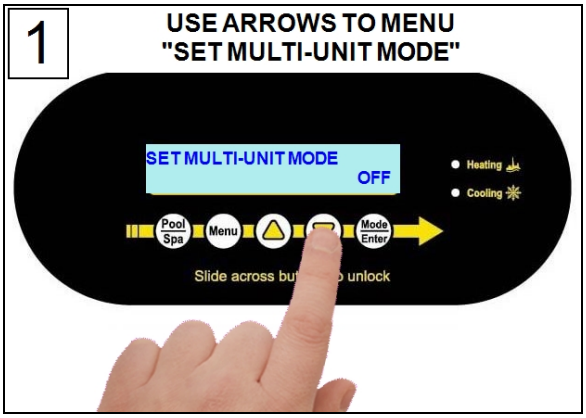


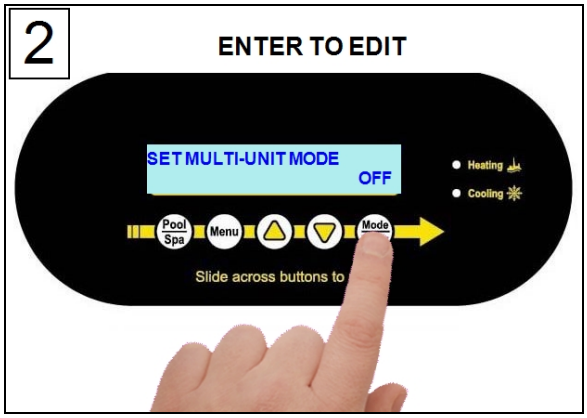


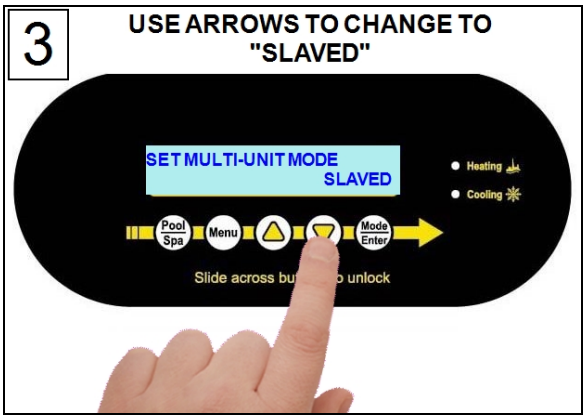


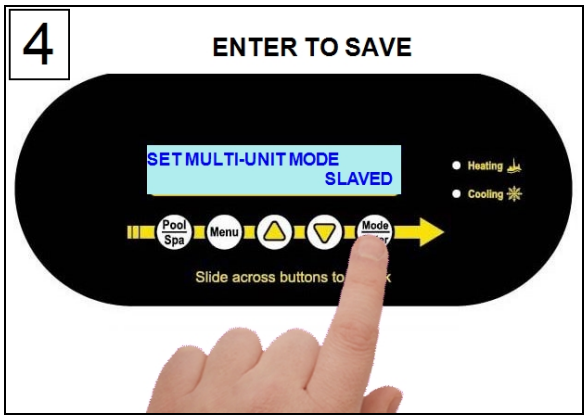

D
USE ARROWS TO "17"
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode Enter

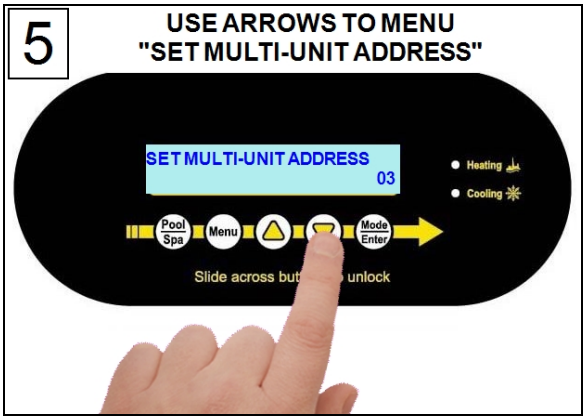

E
PRESS ENTER
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode

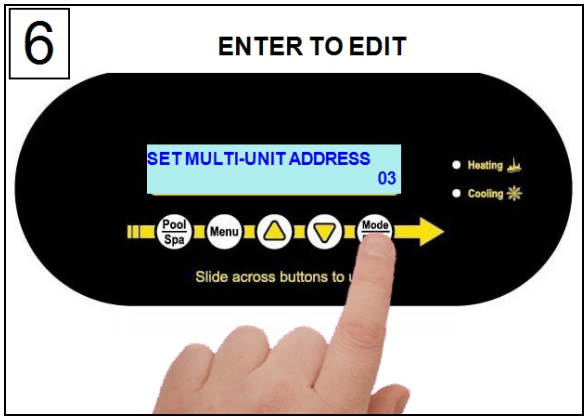

1
USE ARROWS TO MENU
"SET MULTI-UNIT MODE"
SET MULTI-UNIT MODE
OFF
Heating
Cooling
Pool Spa
Menu
Mode Enter

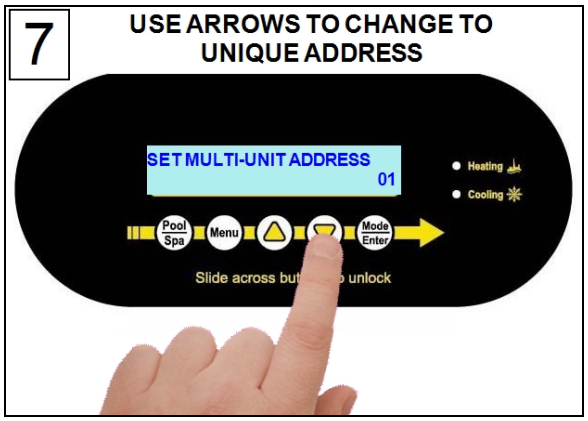

2
ENTER TO EDIT
SET MULTI-UNIT MODE
OFF
Heating
Cooling
Pool Spa
Menu
Mode

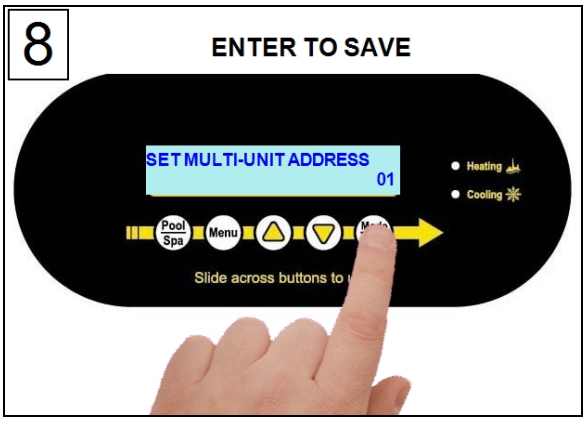

3
USE ARROWS TO CHANGE TO
"SLAVED"
SET MULTI-UNIT MODE
SLAVED
Heating
Cooling
Pool Spa
Menu
Mode Enter

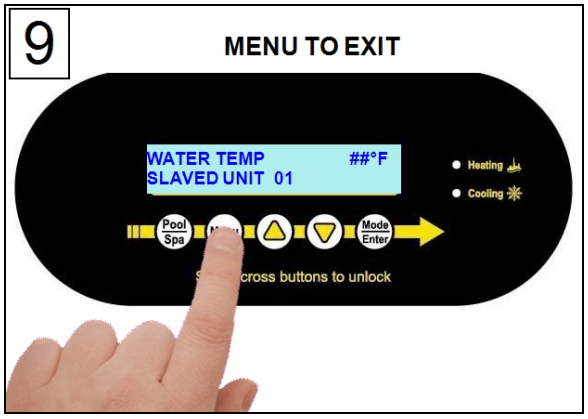

4
ENTER TO SAVE
SET MULTI-UNIT MODE
SLAVED
Heating
Cooling
Pool Spa
Menu
Mode


5
USE ARROWS TO MENU
"SET MULTI-UNIT ADDRESS"
SET MULTI-UNIT ADDRESS
03
Heating
Cooling
Pool Spa
Menu
Mode Enter


6
ENTER TO EDIT
SET MULTI-UNIT ADDRESS
03
Heating
Cooling
Pool Spa
Menu
Mode







1.6.f Connecting a Pool/Spa Switching Relay

A direct connection to an external flow relay switch has been provided on the terminal microprocessor.

A pool/spa relay switch will automatically change between the pool and spa thermostat depending on the position of the plumbing valves.

- When water flows to the pool, the pool thermostat will be used.
- When water flows to the spa, the spa thermostat will be used.

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- This section is only for qualified installers who are familiar with the swimming pool and spa safety standards.
- The installer must be familiar with service industry techniques.

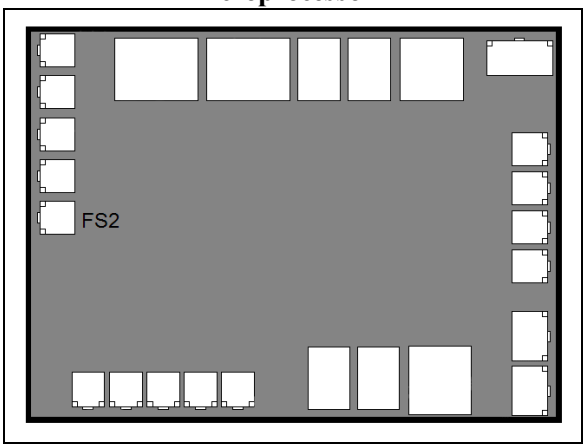
NOTICE Failure to heed the following may result in damage to equipment.

- The wire size connecting the relay switch must be a minimum 22-gauge, 2-conductor, low-voltage wire.
- Use FS2 (**dry contact)** connection on the microprocessor.

Connecting Switch

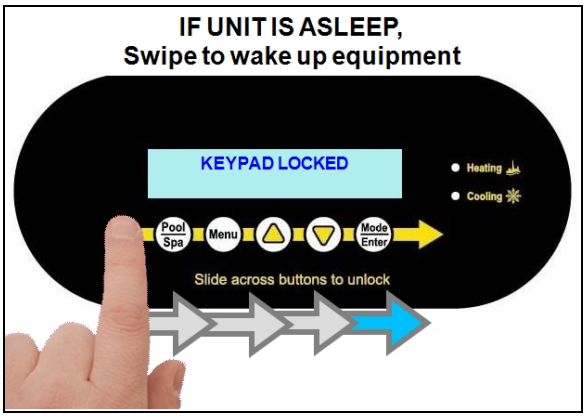
1. Deactivate power to heat pump.
2. Plumb the switch as indicated in accessories installation instructions.
3. Remove heat pump electrical access panel.
4. Using two of the three wires from the installed switch, route wires to the low voltage side of the electrical enclosure. The third wire is not used. Follow all National Electric Codes (NEC) unless State or Local guidelines supersede.
5. Connect the wires to the jumper provided. Polarity is not important.
6. Reattach heat pump access panel.
7. Apply power to heat pump.
8. Configure the heat pump to accept the pool/spa relay switch. See "*Configuring Switch*" below.

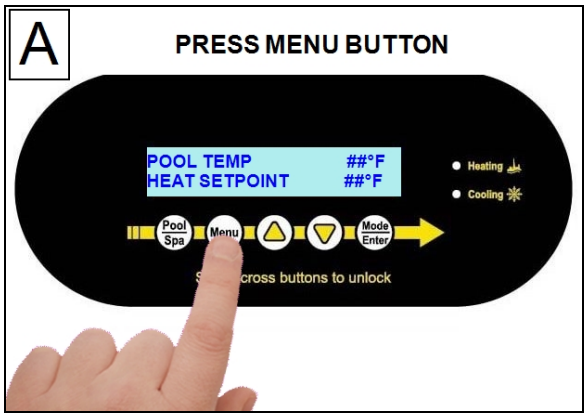
Dry Contact Connection Points to the Microprocessor

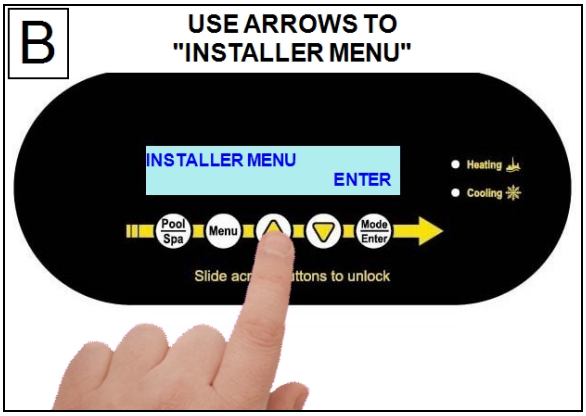


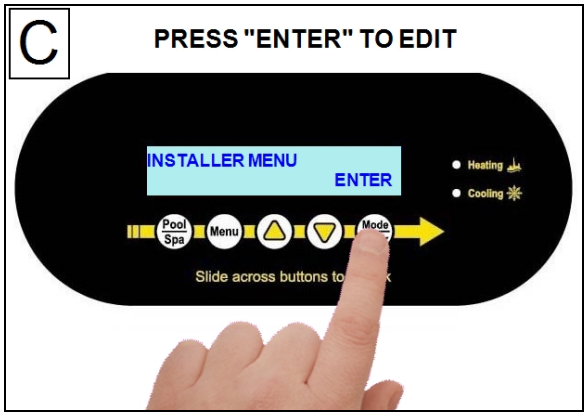
Configuring Switch

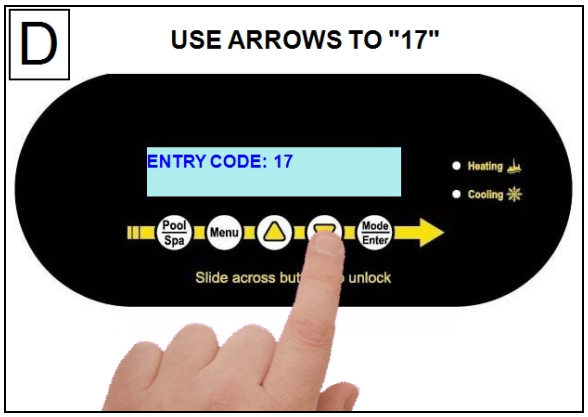
Enter "Installer Menus", then proceed

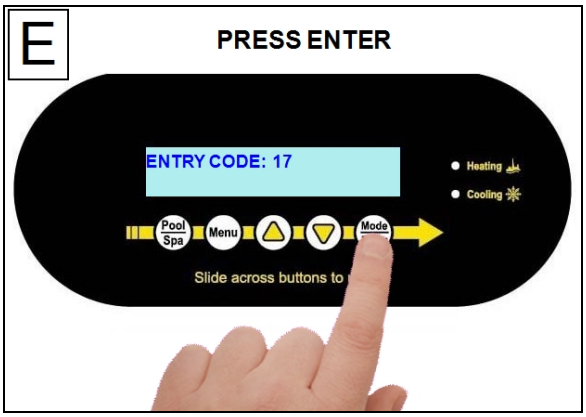


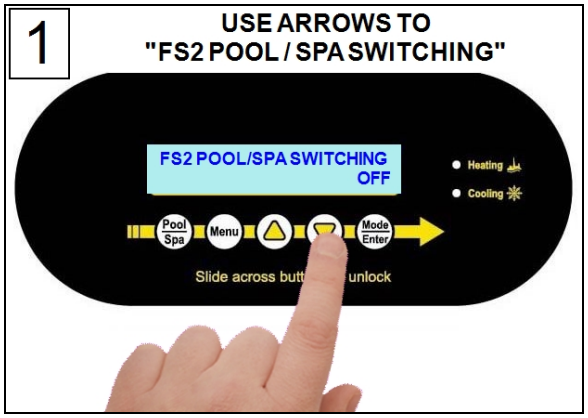


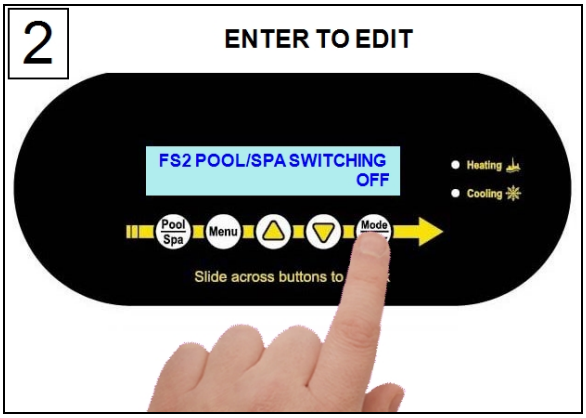


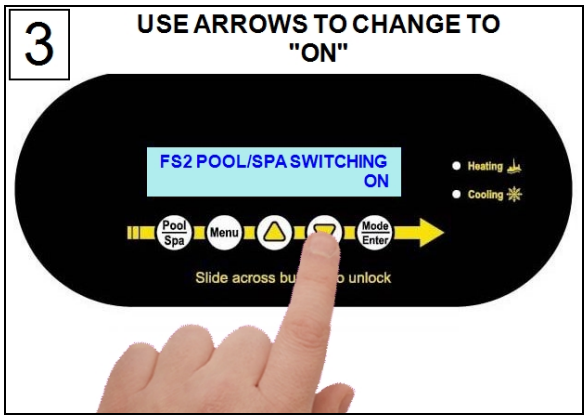


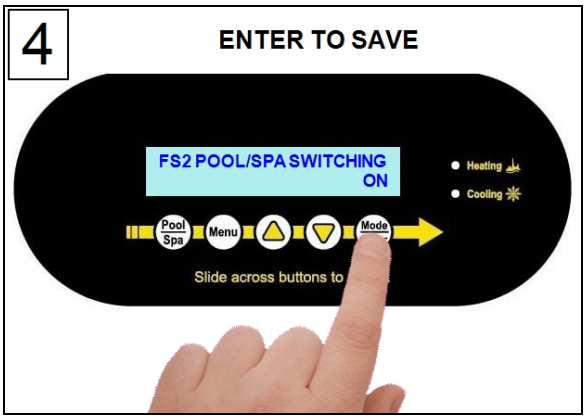

D
USE ARROWS TO "17"
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode Enter

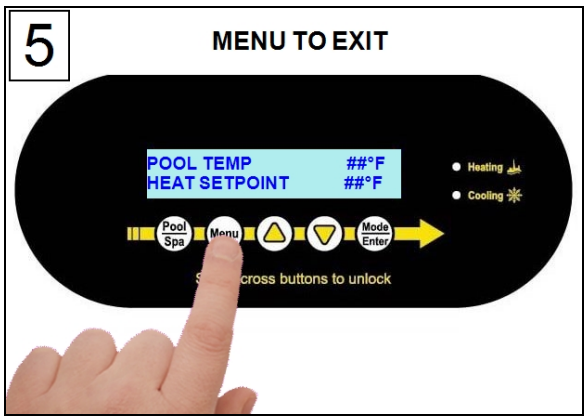

E
PRESS ENTER
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode


1
USE ARROWS TO
"FS2 POOL / SPA SWITCHING"
FS2 POOL/SPA SWITCHING
OFF
Heating
Cooling
Pool Spa
Menu
Mode Enter


2
ENTER TO EDIT
FS2 POOL/SPA SWITCHING
OFF
Heating
Cooling
Pool Spa
Menu
Mode


3
USE ARROWS TO CHANGE TO
"ON"
FS2 POOL/SPA SWITCHING
ON
Heating
Cooling
Pool Spa
Menu
Mode Enter

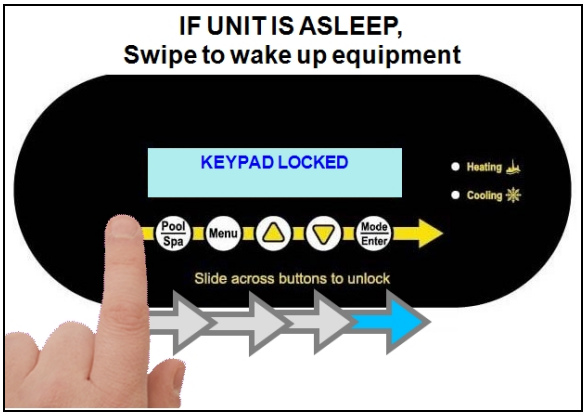

4
ENTER TO SAVE
FS2 POOL/SPA SWITCHING
ON
Heating
Cooling
Pool Spa
Menu
Mode

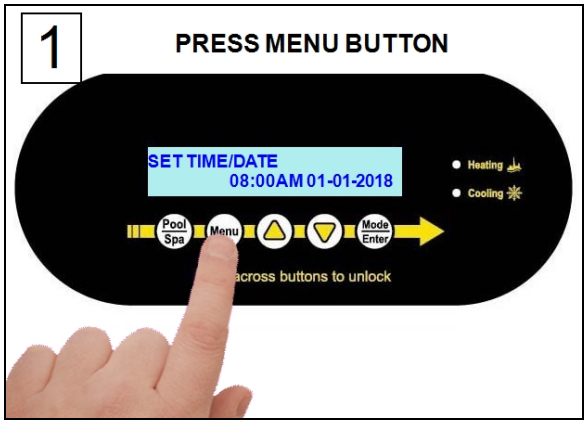

5
MENU TO EXIT
POOL TEMP ##°F
HEAT SETPOINT ##°F
Heating
Cooling
Pool Spa
Menu
Mode Enter

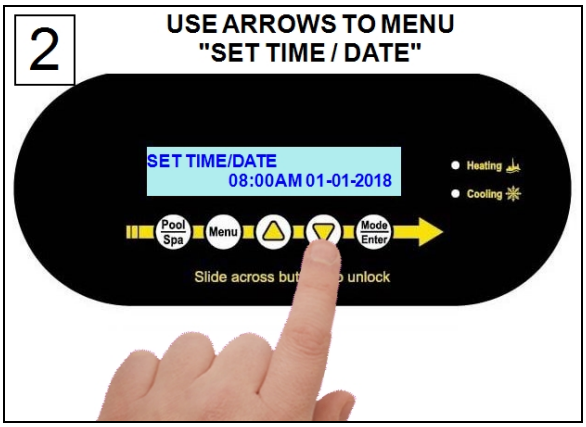
1.7 Program Heat Pump for the Customer

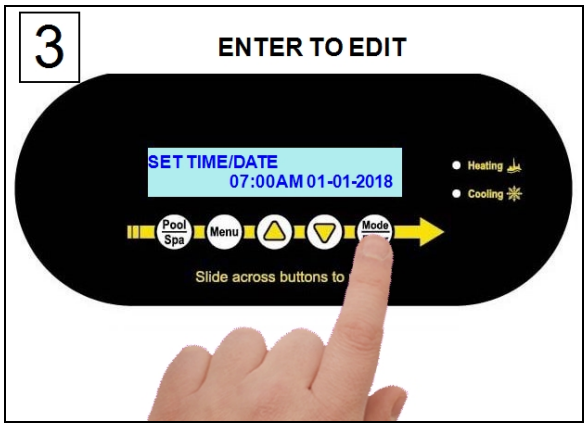
1.7.a Setting Date and Time

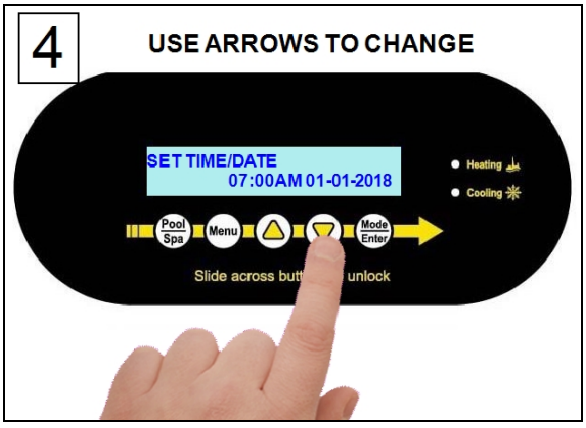
Set the heat pump's time and date using the following steps.

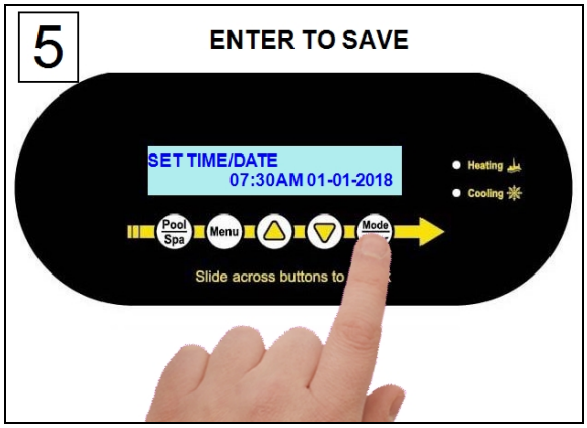


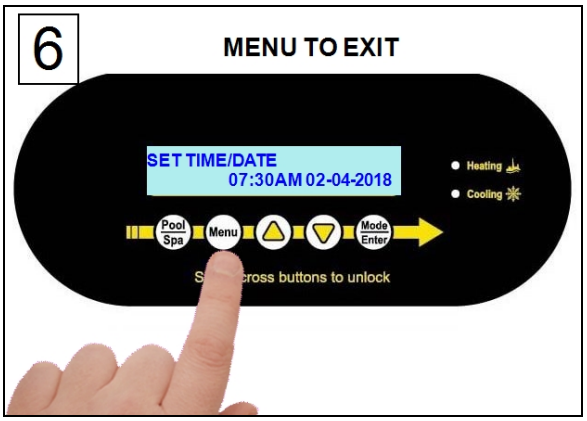












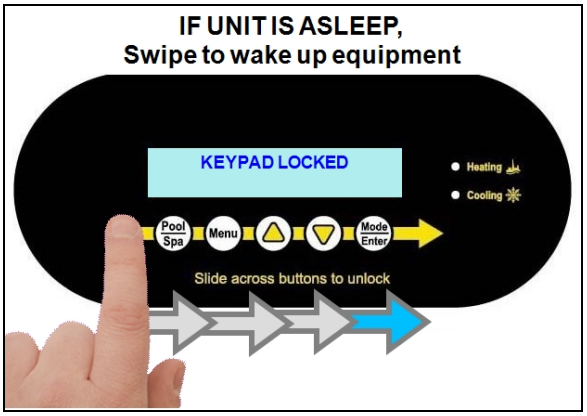
1.7.b Setting Time and Date Format

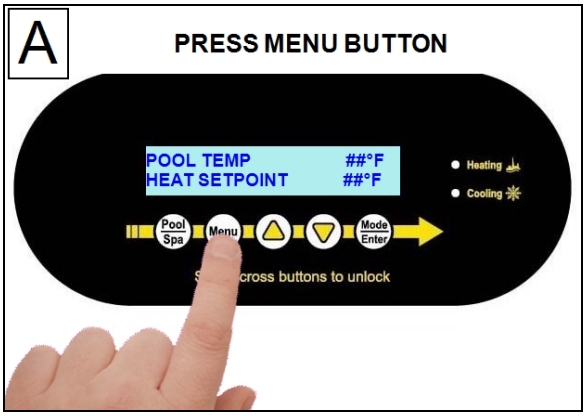
The heat pump's time and date format can be customized.

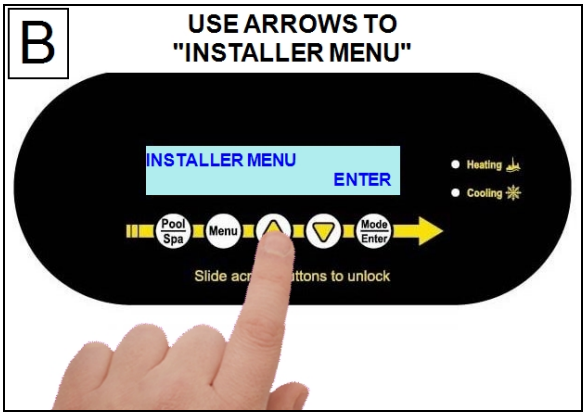
Customize Time

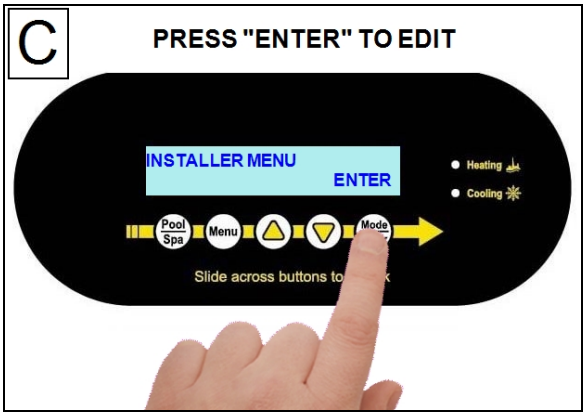
The time can be displayed in 24-hour *military* time (the default display is 12 hour).

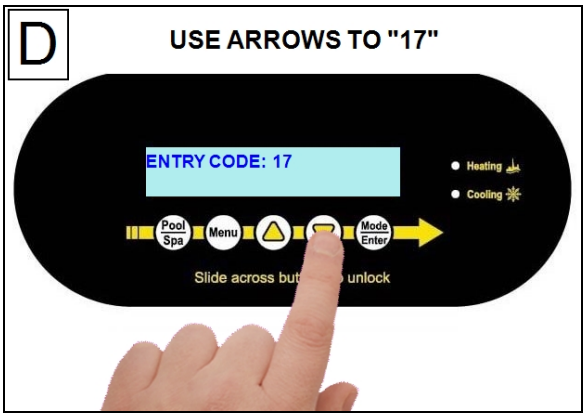
Enter "Installer Menus", then proceed

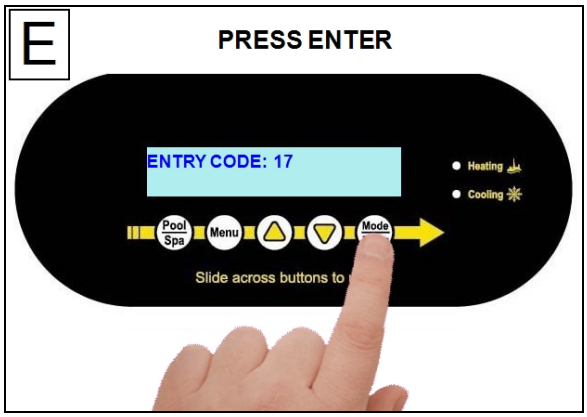


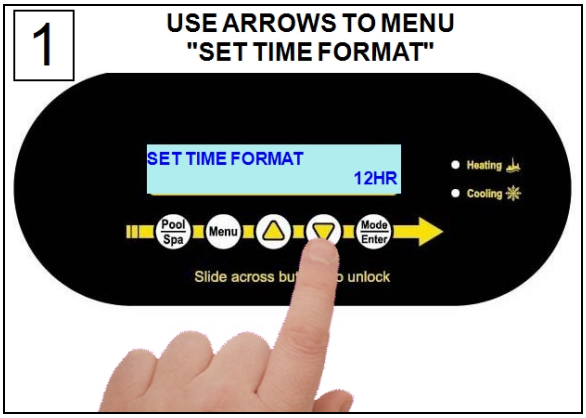


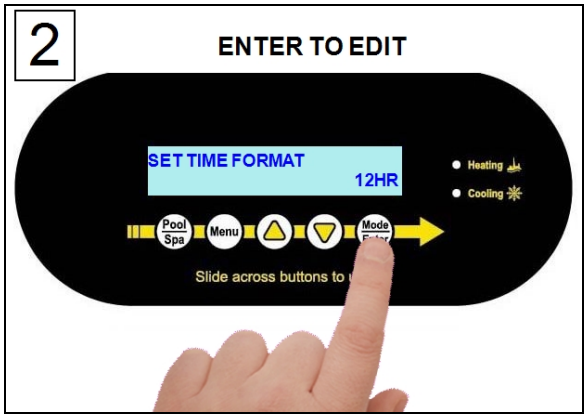


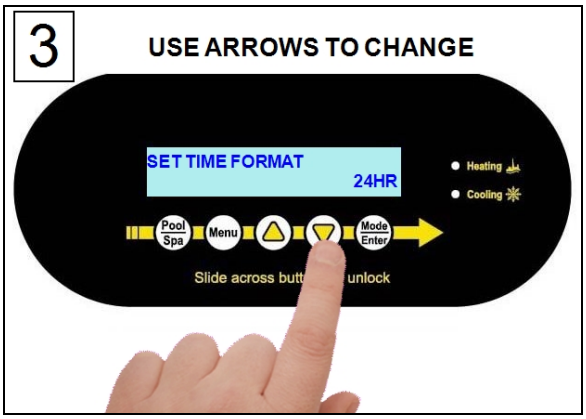


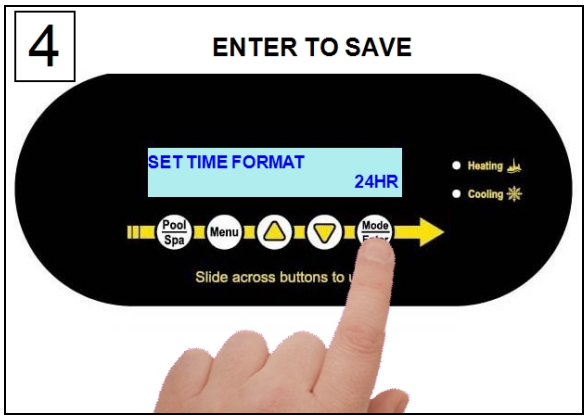

D
USE ARROWS TO "17"
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode Enter

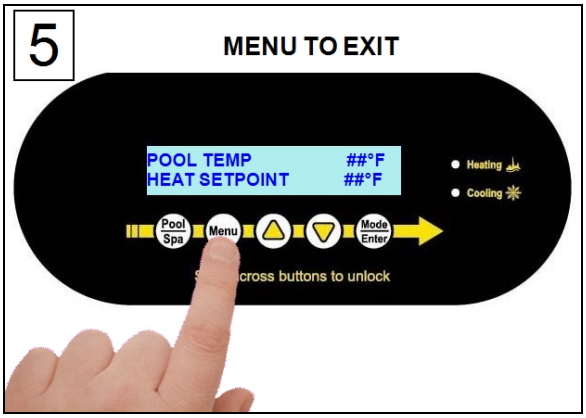

E
PRESS ENTER
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode

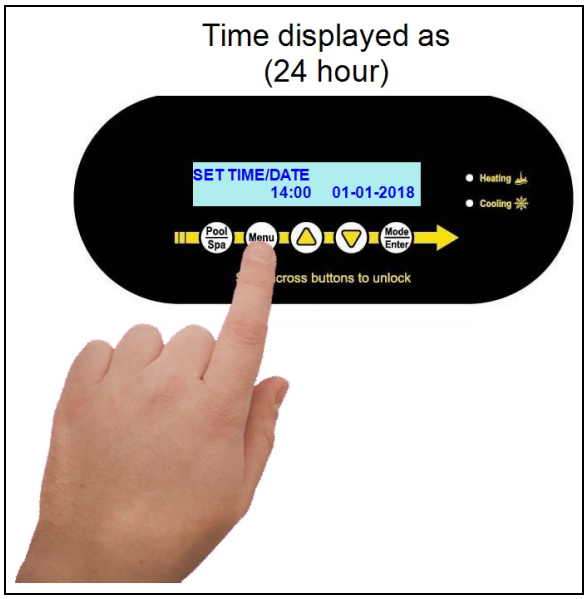

1
USE ARROWS TO MENU
"SET TIME FORMAT"
SET TIME FORMAT
12HR
Heating
Cooling
Pool Spa
Menu
Mode Enter


2
ENTER TO EDIT
SET TIME FORMAT
12HR
Heating
Cooling
Pool Spa
Menu


3
USE ARROWS TO CHANGE
SET TIME FORMAT
24HR
Heating
Cooling
Pool Spa
Menu
Mode Enter


4
ENTER TO SAVE
SET TIME FORMAT
24HR
Heating
Cooling
Pool Spa
Menu

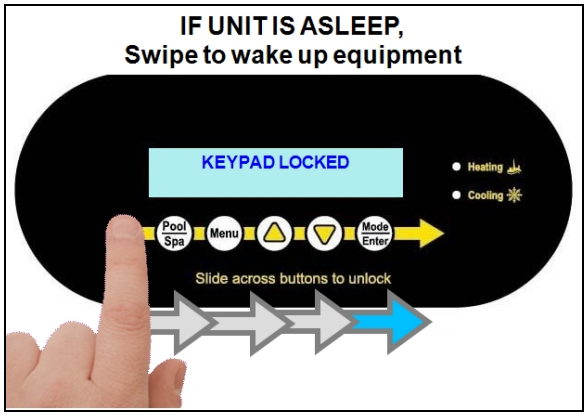

5
MENU TO EXIT
POOL TEMP ##°F
HEAT SETPOINT ##°F
Heating
Cooling
Pool Spa
Menu
Mode Enter

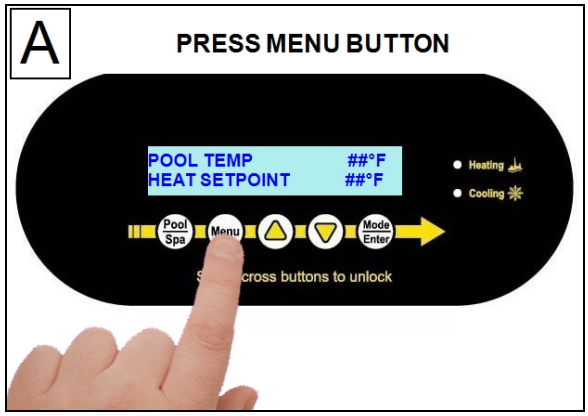


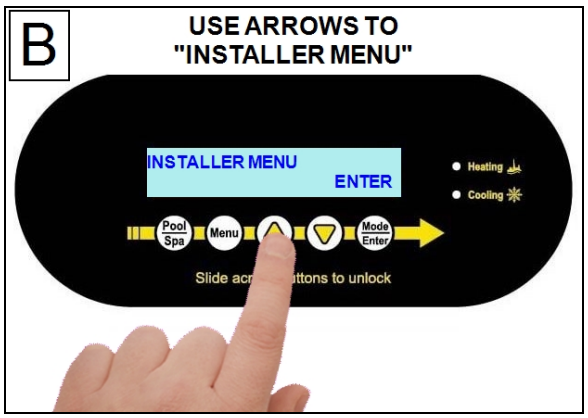
Customize Date

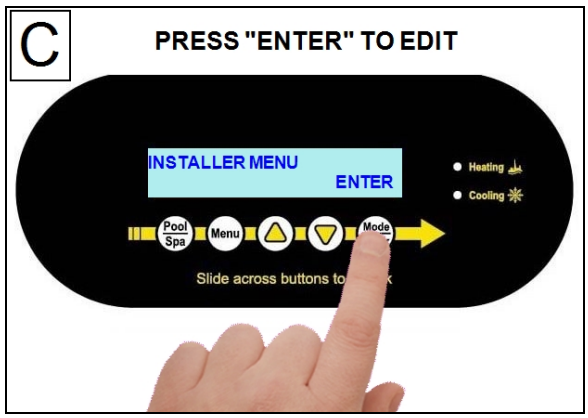
The date can be displayed as Day-Month-Year (the default is Month-Day-Year).

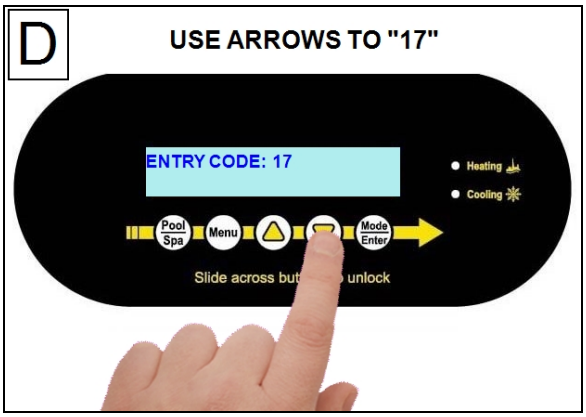
Enter "Installer Menus", then proceed

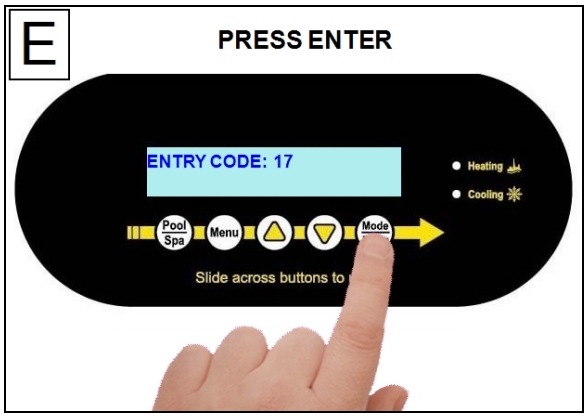


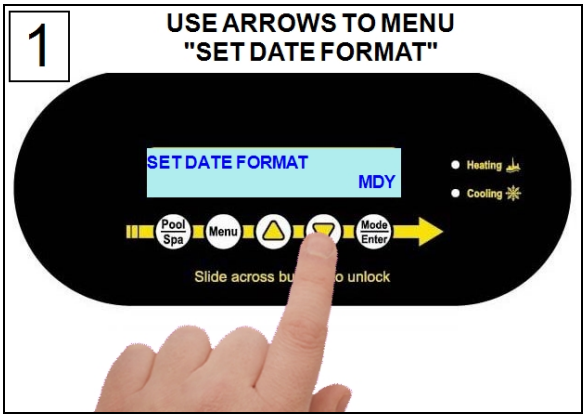


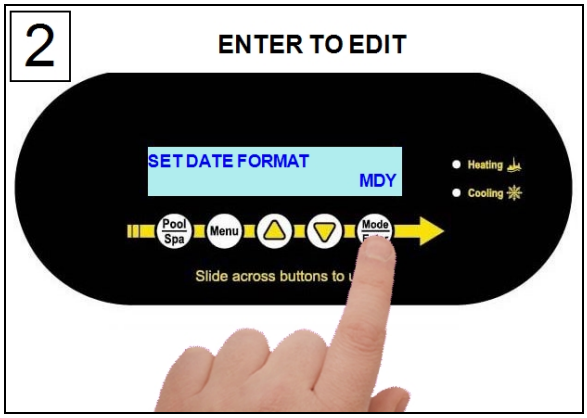


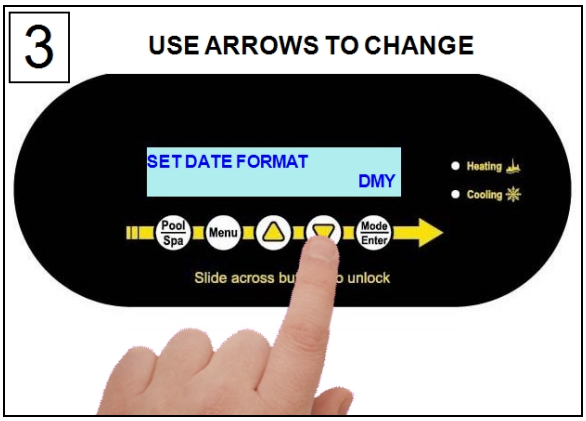


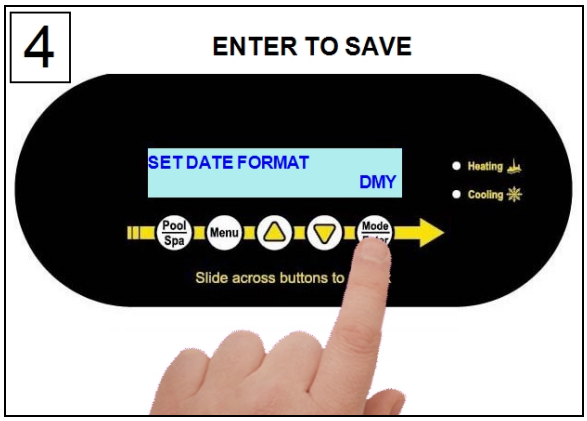

D
USE ARROWS TO "17"
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode Enter

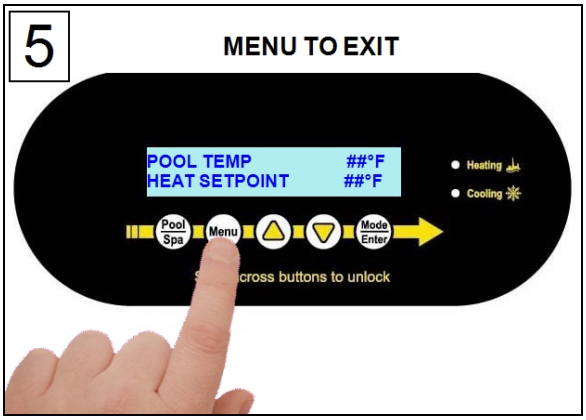

E
PRESS ENTER
ENTRY CODE: 17
Heating
Cooling
Pool Spa
Menu
Mode

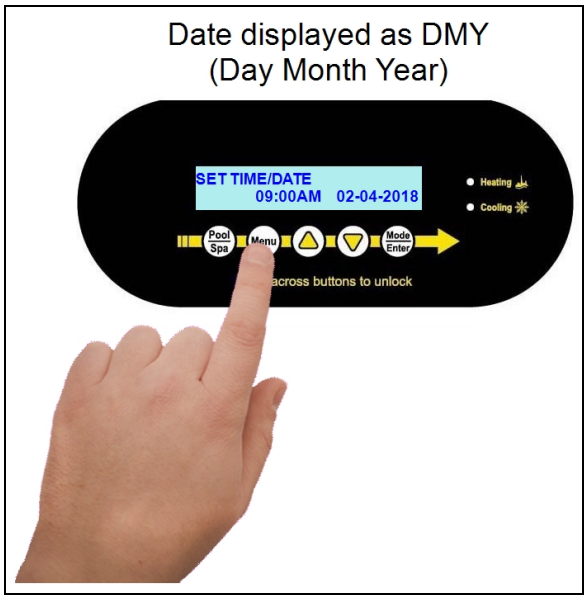

1
USE ARROWS TO MENU
"SET DATE FORMAT"
SET DATE FORMAT
MDY
Heating
Cooling
Pool Spa
Menu
Mode Enter


2
ENTER TO EDIT
SET DATE FORMAT
MDY
Heating
Cooling
Pool Spa
Menu
Mode


3
USE ARROWS TO CHANGE
SET DATE FORMAT
DMY
Heating
Cooling
Pool Spa
Menu
Mode Enter


4
ENTER TO SAVE
SET DATE FORMAT
DMY
Heating
Cooling
Pool Spa
Menu
Mode

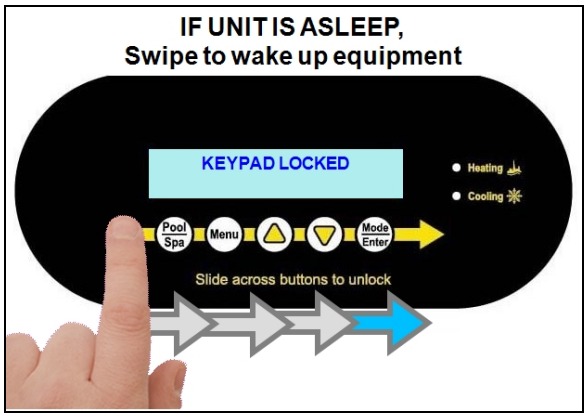

5
MENU TO EXIT
POOL TEMP ##°F
HEAT SETPOINT ##°F
Heating
Cooling
Pool Spa
Menu
Mode Enter

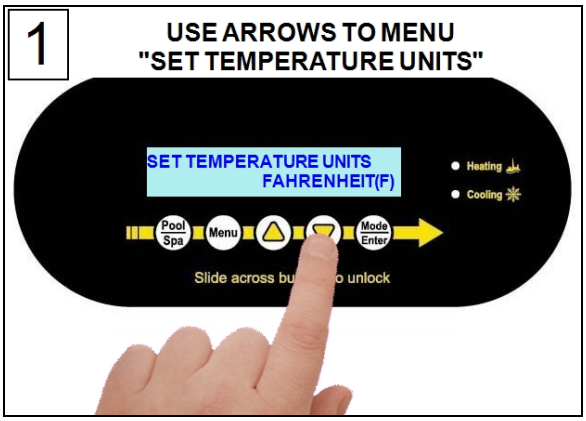


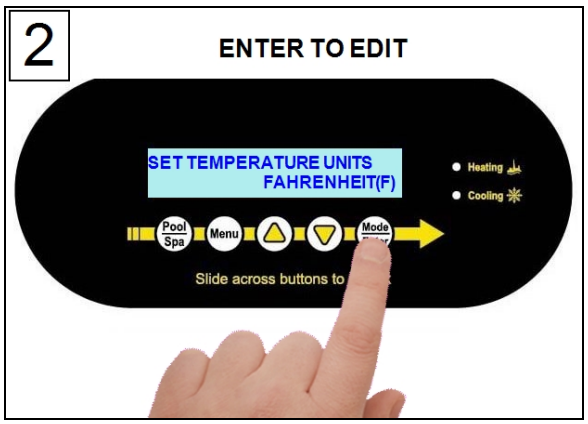
1.7.c Selecting Celsius or Fahrenheit

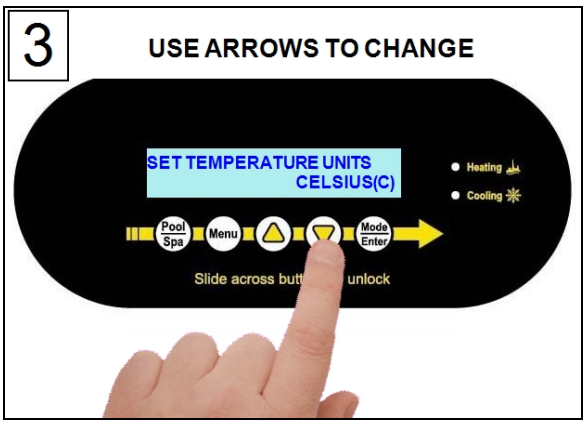
Set the water temperature to show in either Fahrenheit (default) or Celsius.

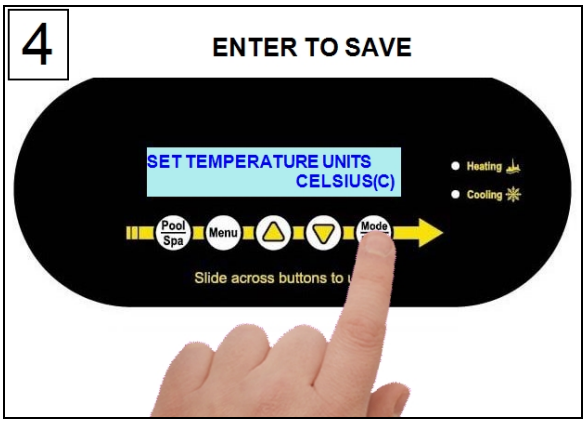
Enter "Installer Menus", then proceed

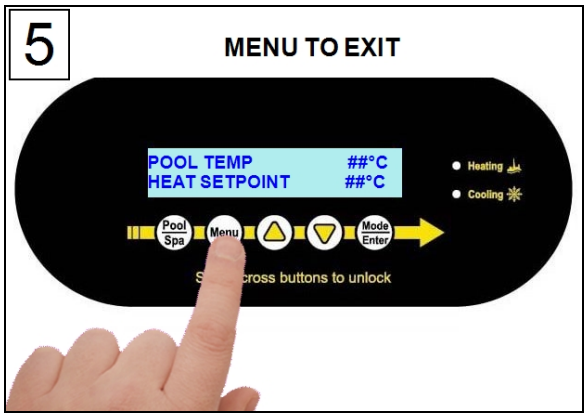












1.7.d Configure Variable Speed Compressors

Selected heat pumps have variable speed compressors designed to more quickly and efficiently reach a temperature set point. The compressor's performance can be controlled using a turbo boost mode or two different types of efficiency modes.

Turbo Boost

Upon demand, the heat pump's compressor can be set to maximum speed to heat or cool the water quickly. This is regardless of any previously set efficiency mode settings.

- The system will heat or cool the water with the compressor speed set to maximum. This will continue until the set temperature is reached. Then the configured efficiency mode (scheduled or 24-hour) will resume.

Efficiency Mode - 24 Hour

When using this mode, the compressor is set to its maximum speed until the temperature set point is reached.

- The compressor speed will then lower to maintain that temperature set point. This will continue as long as there is water flow.
- See "*Set Efficiency Mode to 24 Hour*" on page 55.

Efficiency Mode - Filtration Schedule

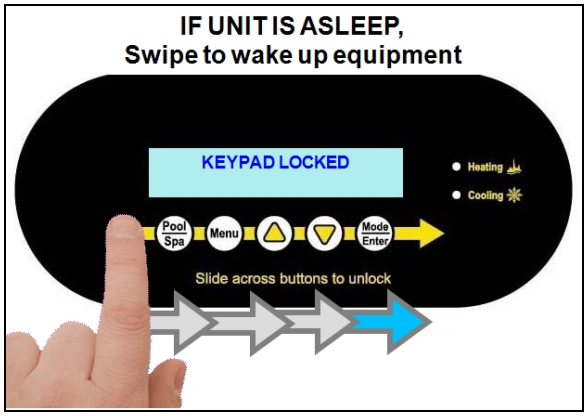
When using this mode, the compressor's speed is set to heat or cool the water within 60% of the circulation pump's filtration time period. This is the highest efficiency operational mode, providing the lowest cost of operation.

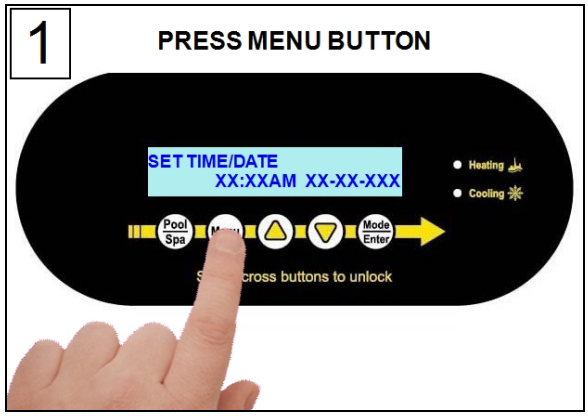
- Example - If the filtration period is set from 10:00 am to 8:00 pm, the system attempts to bring the water to set point by 4:00 pm at optimal performance.

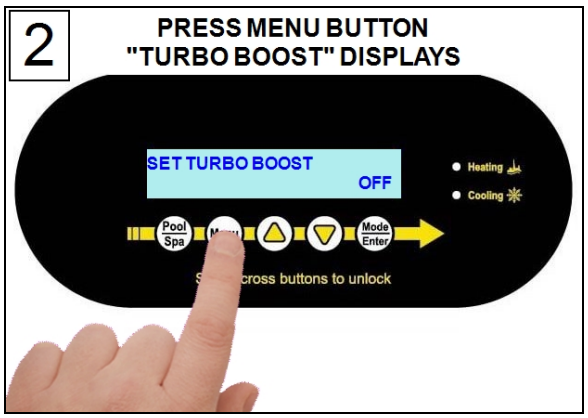
> ***PLEASE NOTE:***
> *Setting a filtration schedule outside the current circulation pump's schedule will cause an incorrect efficiency mode.*

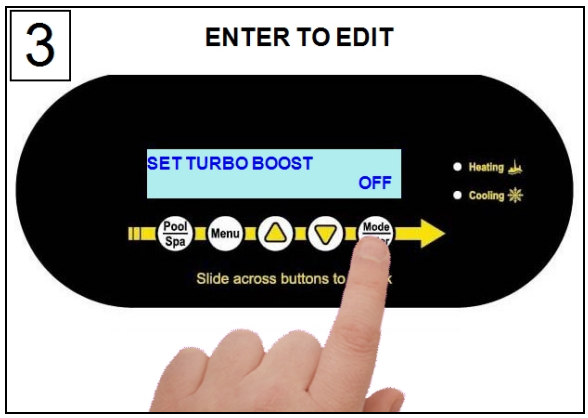
- See "*Set Efficiency Mode to Filtration Schedule*" on page 56.

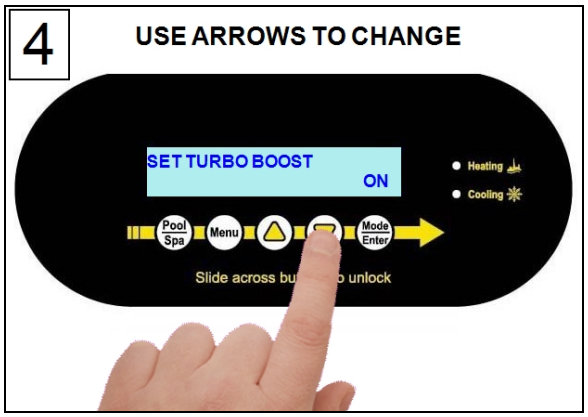
Turbo Boost

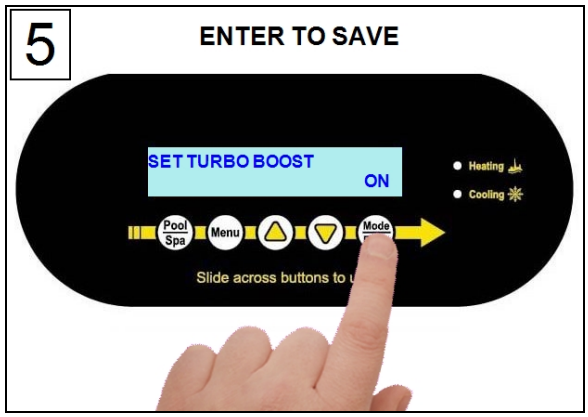

IF UNIT IS ASLEEP,
Swipe to wake up equipment
KEYPAD LOCKED
Heating
Cooling
Pool Spa
Menu
Mode Enter
Slide across buttons to unlock

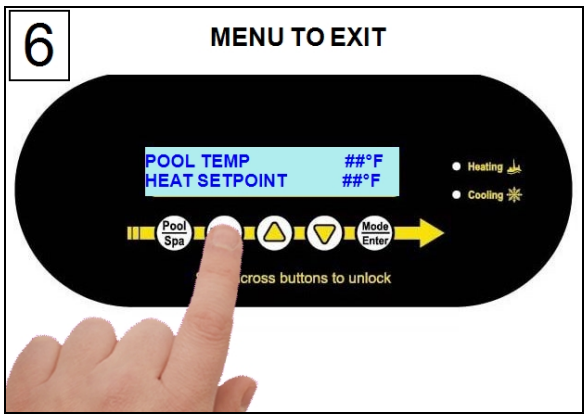

1
PRESS MENU BUTTON
SET TIME/DATE
XX:XXAM XX-XX-XXX
Heating
Cooling
Pool Spa
Mode Enter


2
PRESS MENU BUTTON
"TURBO BOOST" DISPLAYS
SET TURBO BOOST
OFF
Heating
Cooling
Pool Spa
Mode Enter

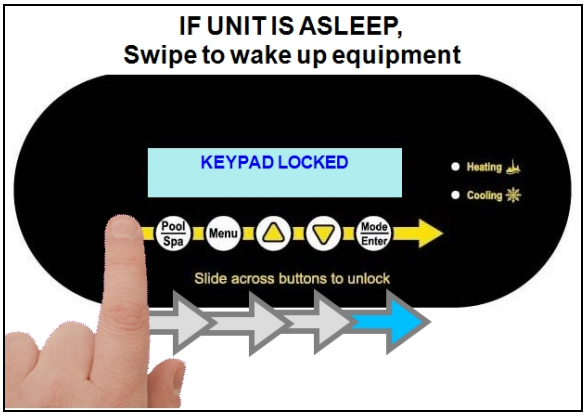

3
ENTER TO EDIT
SET TURBO BOOST
OFF
Heating
Cooling
Pool Spa
Menu
Mode Enter

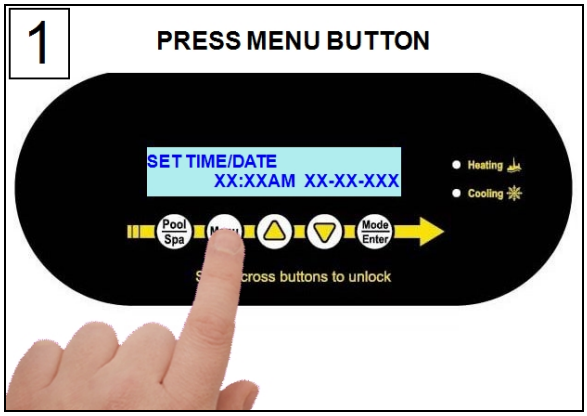

4
USE ARROWS TO CHANGE
SET TURBO BOOST
ON
Heating
Cooling
Pool Spa
Menu
Mode Enter

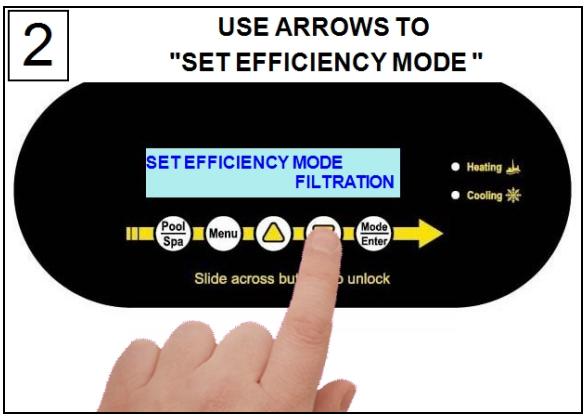

5
ENTER TO SAVE
SET TURBO BOOST
ON
Heating
Cooling
Pool Spa
Menu
Mode

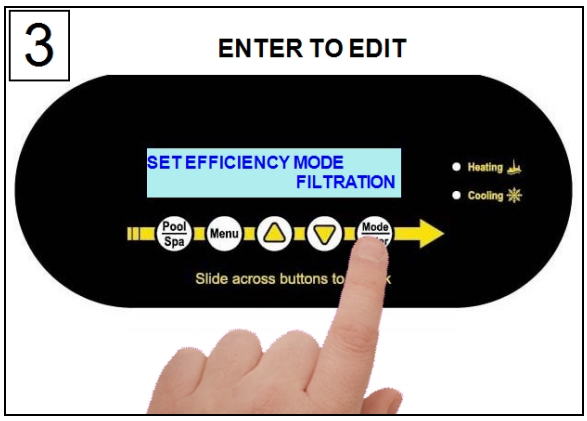

6
MENU TO EXIT
POOL TEMP ##°F
HEAT SETPOINT ##°F
Heating
Cooling
Pool Spa
Mode Enter

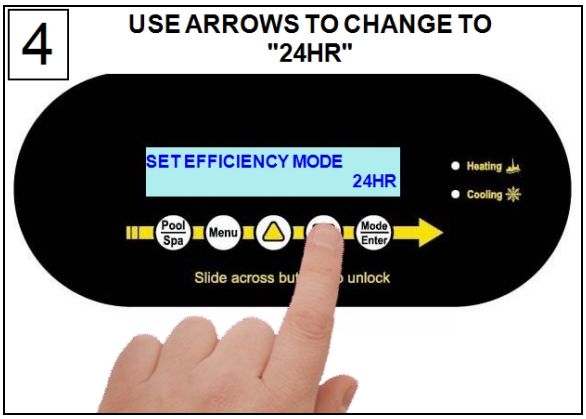
Set Efficiency Mode to 24 Hour

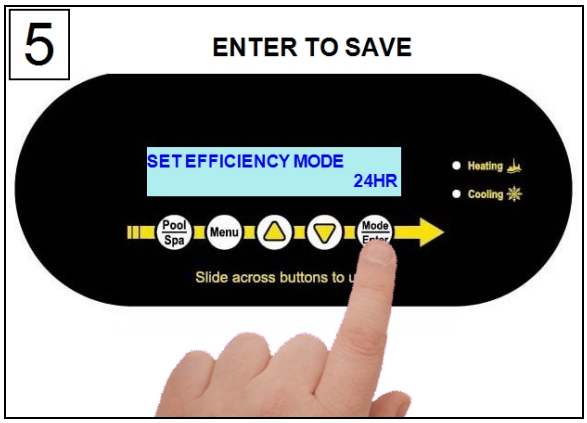


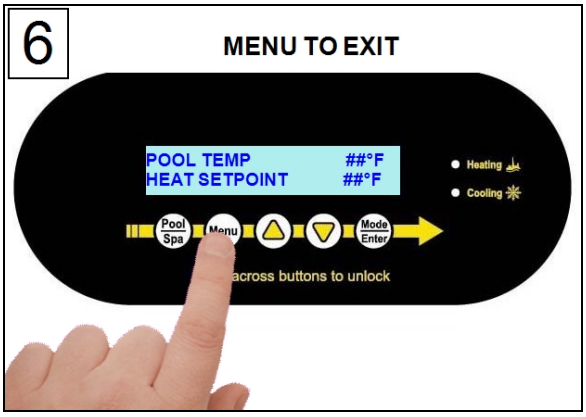




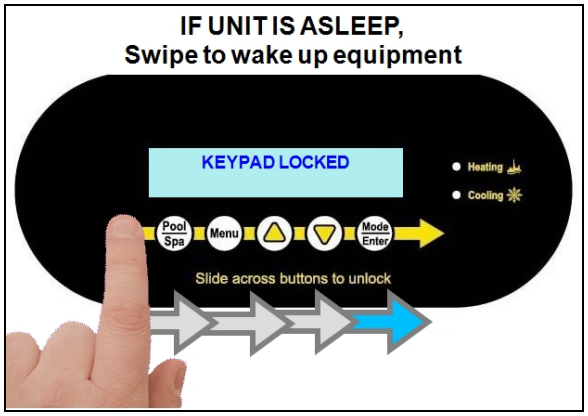


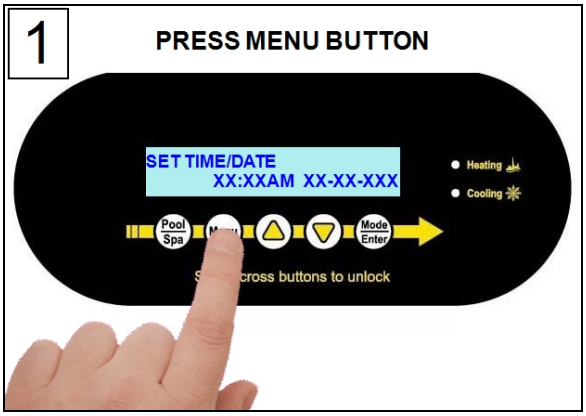


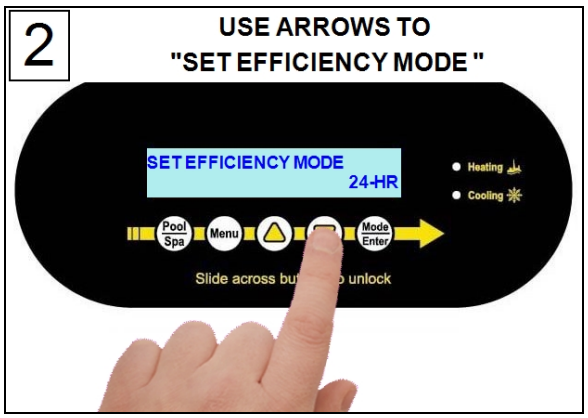


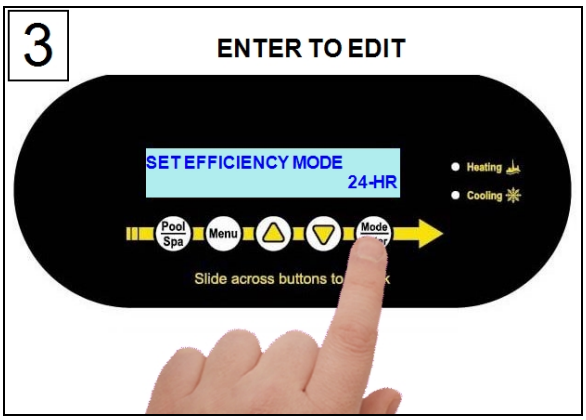


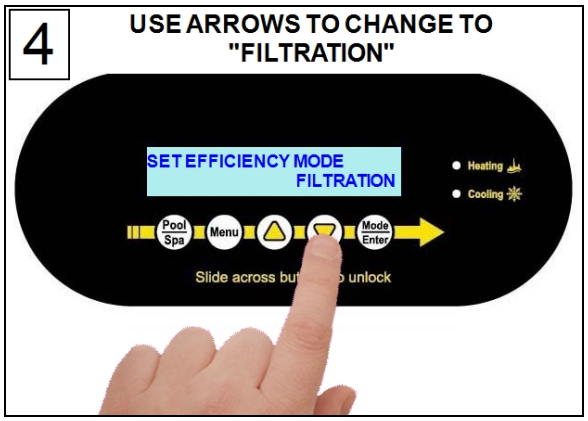
Set Efficiency Mode to Filtration Schedule

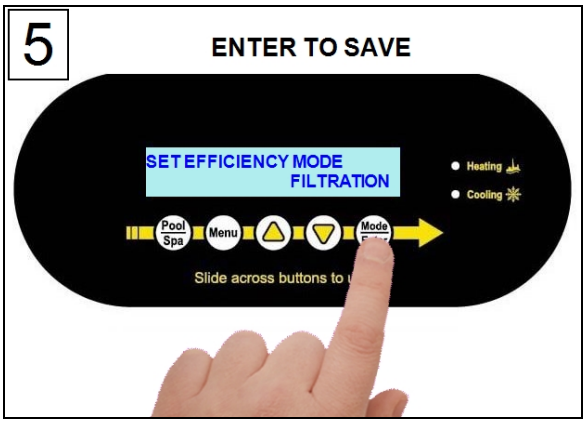


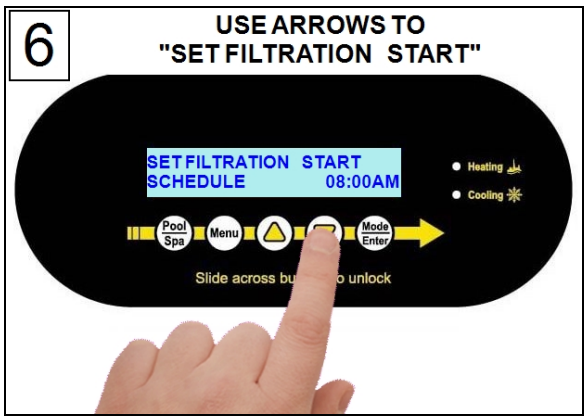


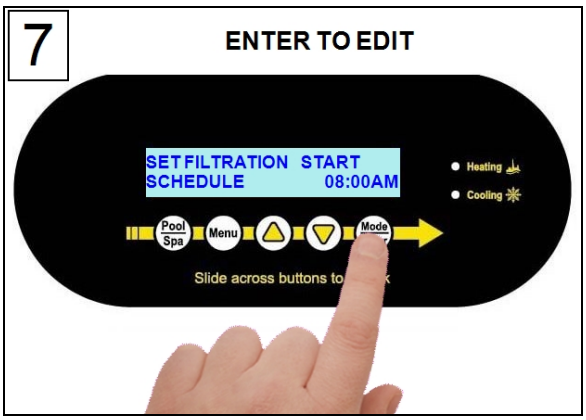


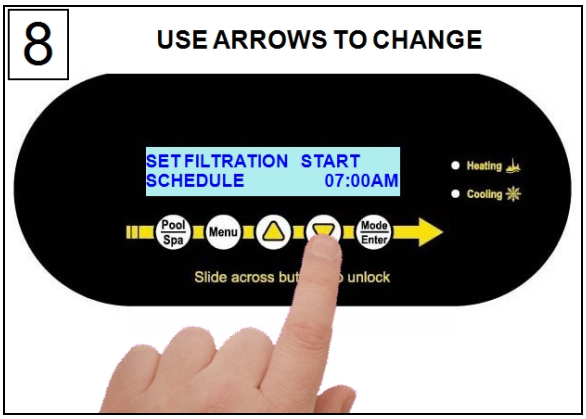


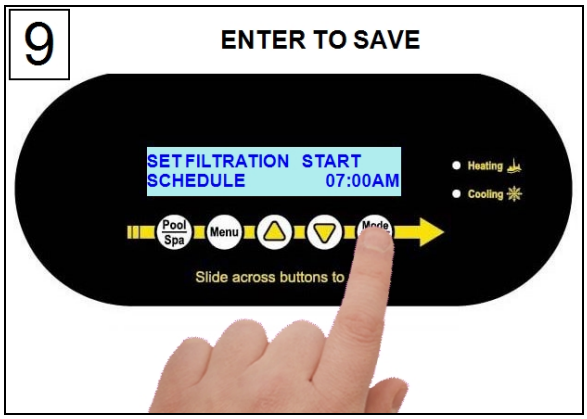


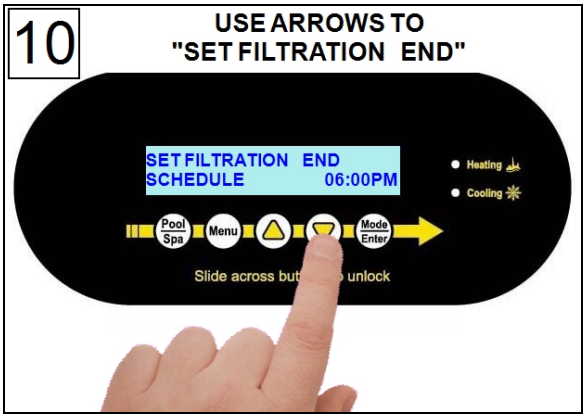


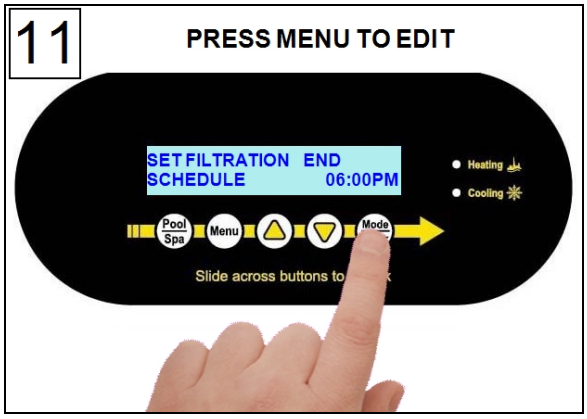


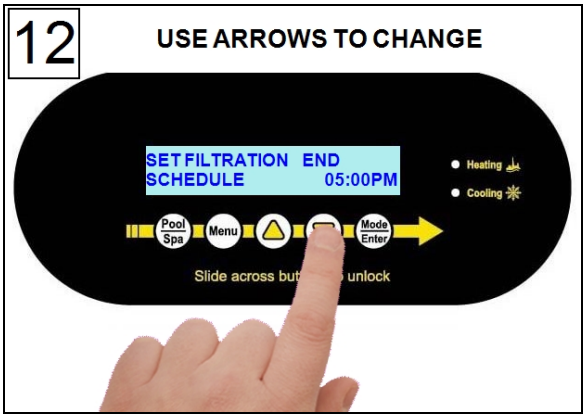


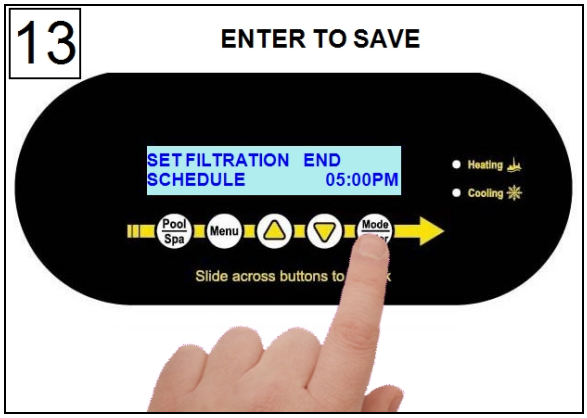

8
USE ARROWS TO CHANGE
SET FILTRATION START
SCHEDULE 07:00AM
Heating
Cooling
Pool Spa
Menu
Mode Enter

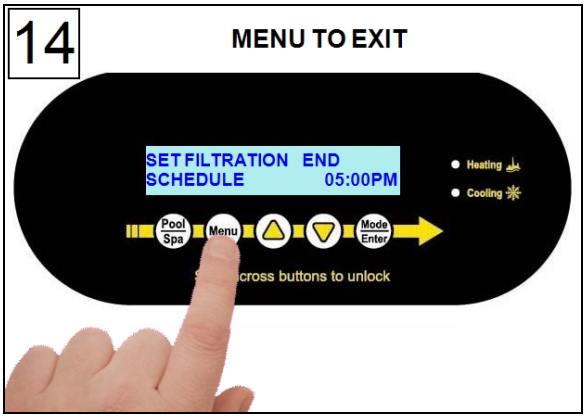

9
ENTER TO SAVE
SET FILTRATION START
SCHEDULE 07:00AM
Heating
Cooling
Pool Spa
Menu


10
USE ARROWS TO
"SET FILTRATION END"
SET FILTRATION END
SCHEDULE 06:00PM
Heating
Cooling
Pool Spa
Menu
Mode Enter


11
PRESS MENU TO EDIT
SET FILTRATION END
SCHEDULE 06:00PM
Heating
Cooling
Pool Spa
Menu


12
USE ARROWS TO CHANGE
SET FILTRATION END
SCHEDULE 05:00PM
Heating
Cooling
Pool Spa
Menu
Mode Enter


13
ENTER TO SAVE
SET FILTRATION END
SCHEDULE 05:00PM
Heating
Cooling
Pool Spa
Menu


14
MENU TO EXIT
SET FILTRATION END
SCHEDULE 05:00PM
Heating
Cooling
Pool Spa
Menu
Mode Enter

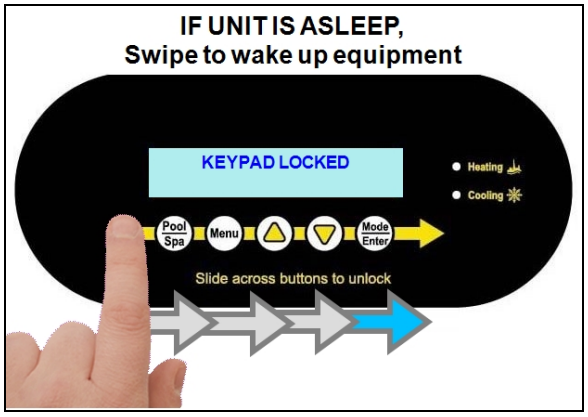
1.7.e Setting Entry Code Option

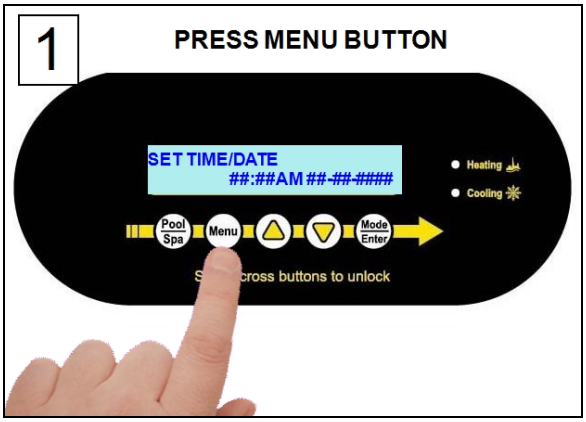
The entry code feature can prevent unauthorized temperature adjustments. This feature initiates after the heat pump goes into the sleep mode for the first time.

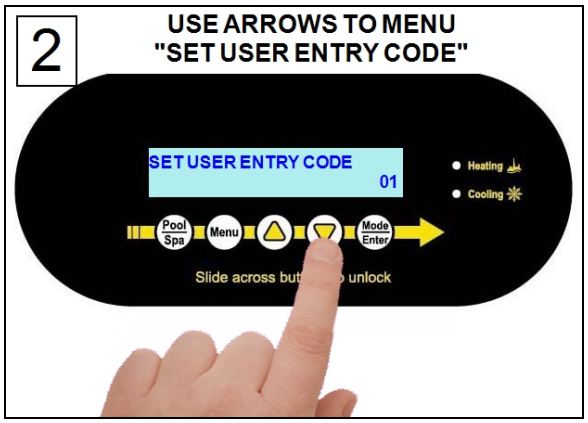
NOTICE

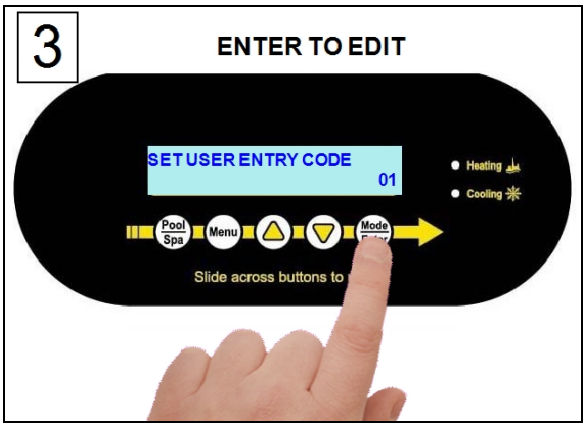
Failure to heed the following may result in damage to equipment.

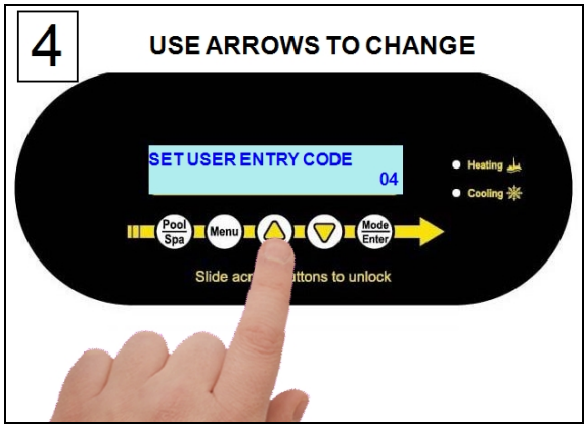
- **Before enabling the entry code feature, be sure to record the code.** If lost, the heat pump will require a program reset to regain access. This reset may require additional configuration by the installer.

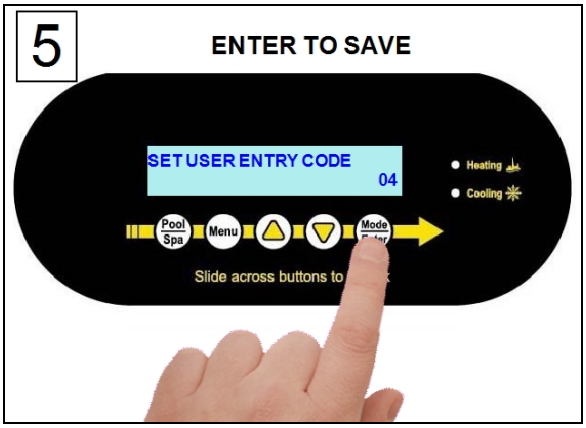


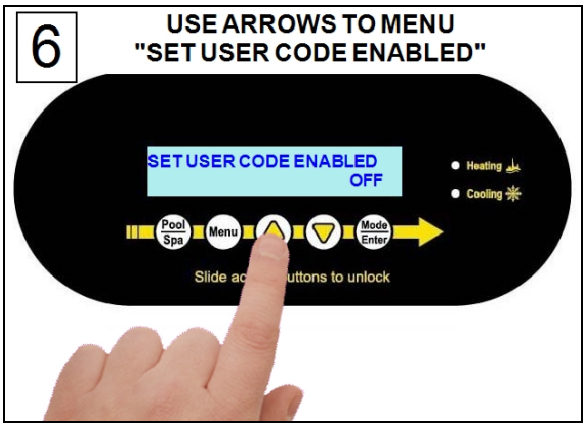


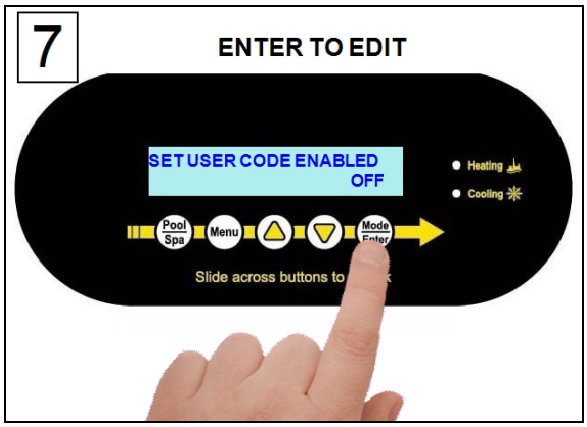


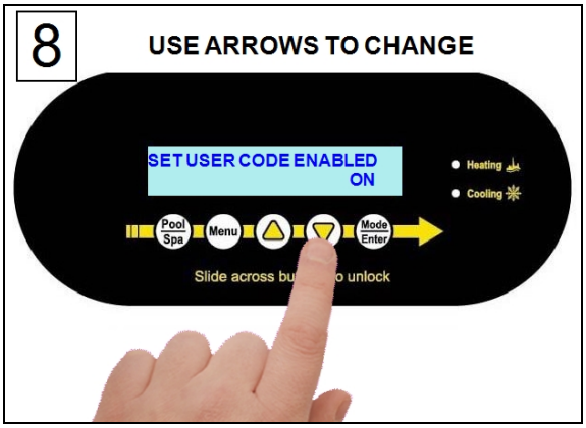


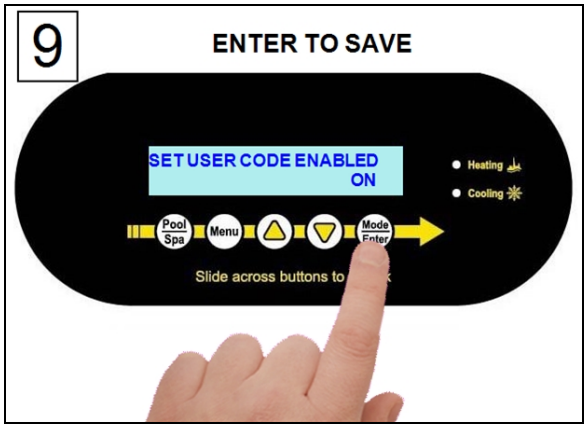


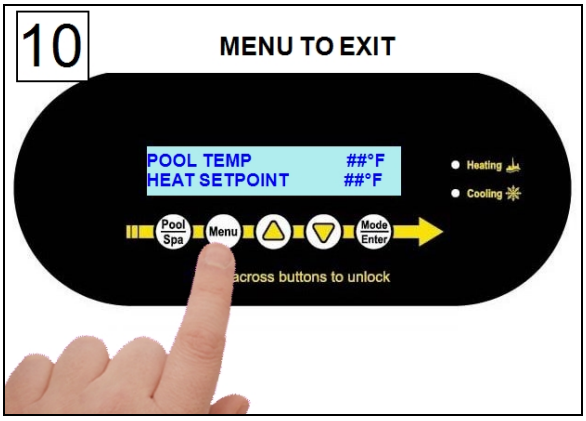



6
USE ARROWS TO MENU
"SET USER CODE ENABLED"
SET USER CODE ENABLED
OFF
Heating
Cooling
Pool
Spa
Menu
Mode
Enter


7
ENTER TO EDIT
SET USER CODE ENABLED
OFF
Heating
Cooling
Pool
Spa
Menu
Mode
Enter

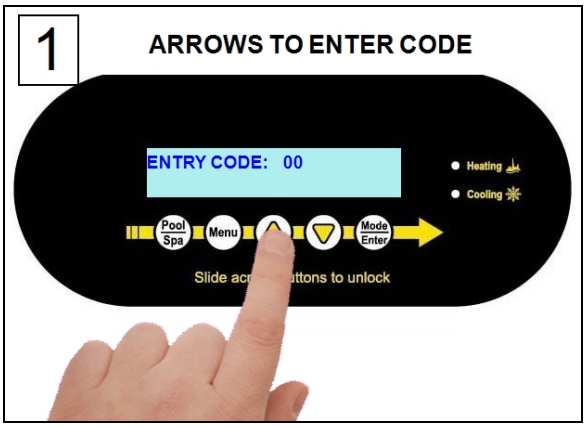

8
USE ARROWS TO CHANGE
SET USER CODE ENABLED
ON
Heating
Cooling
Pool
Spa
Menu
Mode
Enter

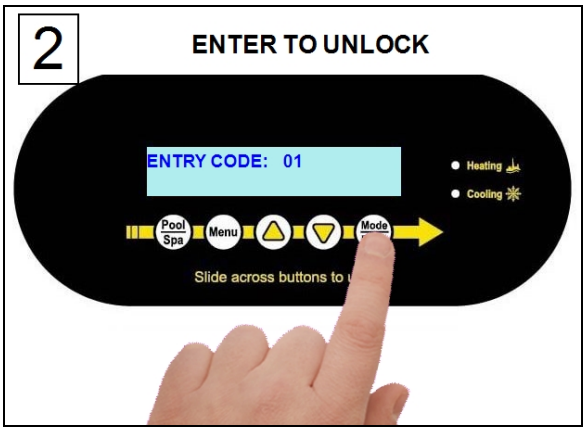

9
ENTER TO SAVE
SET USER CODE ENABLED
ON
Heating
Cooling
Pool
Spa
Menu
Mode
Enter


10
MENU TO EXIT
POOL TEMP ##°F
HEAT SETPOINT ##°F
Heating
Cooling
Pool
Spa
Menu
Mode
Enter

1.7.f Using Entry Code to Access Heat Pump

If a user entry code has been enabled in the user menu, an entry code will be required to access heat pump options.





PLEASE NOTE -

- If the entry code has been misplaced, the heat pump will need to be reset to factory defaults.
- After three minutes of inactivity, the heat pump's sleep mode will activate.

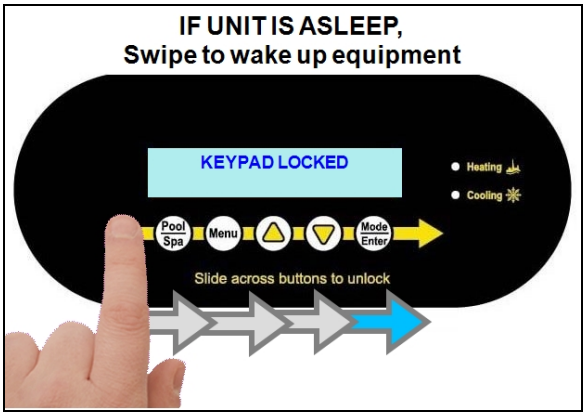
1.7.g Resetting Factory Defaults

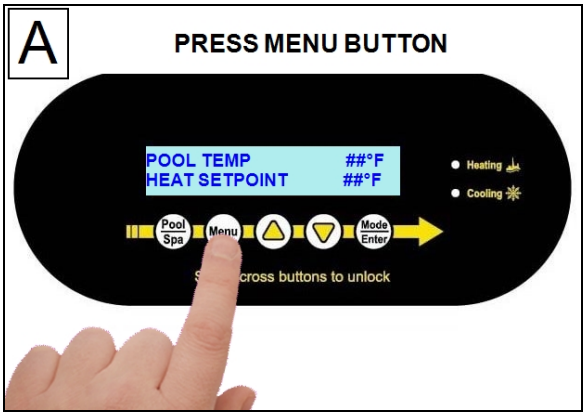
If needed, the installer can reset programming to the heat pump's factory default settings. See "*Factory Defaults*" on page 78.

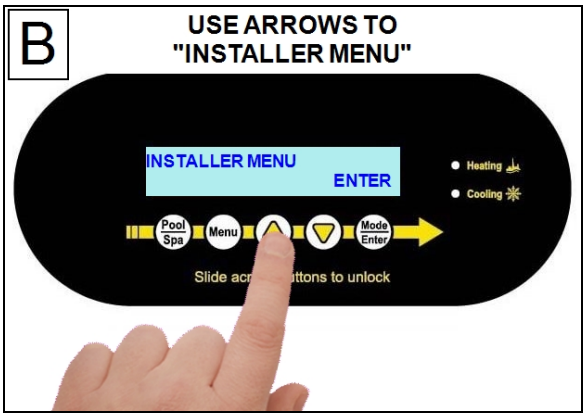
PLEASE NOTE:

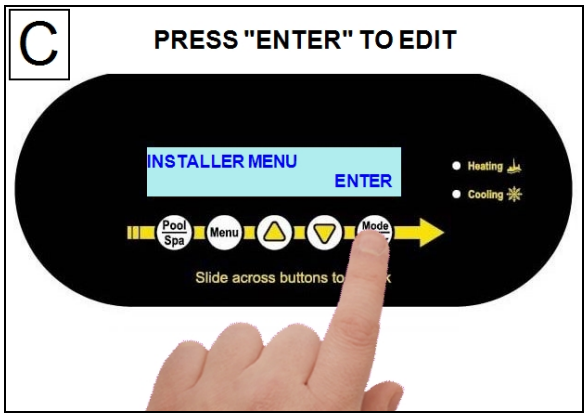
This will reset any external device configurations.

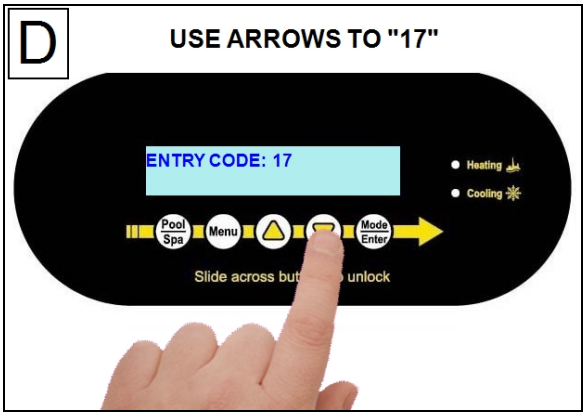
Enter "Installer Menus", then proceed

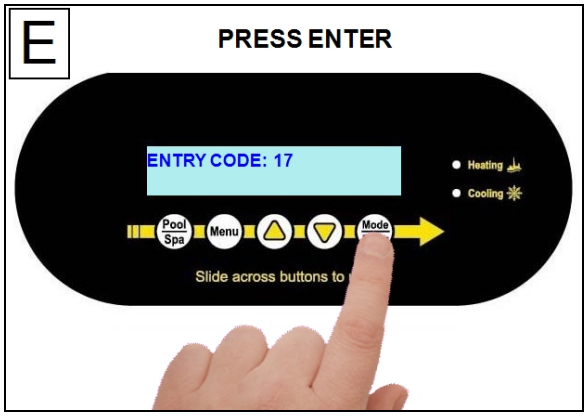


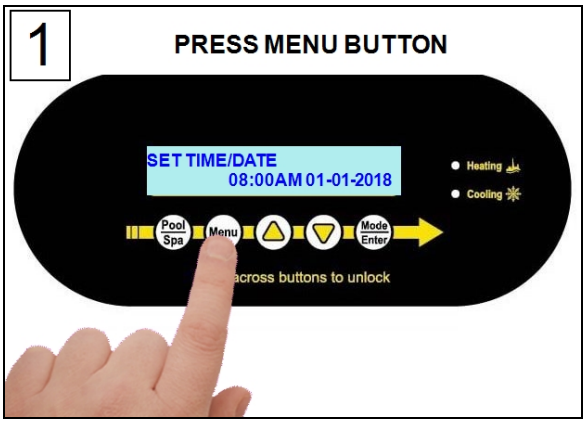


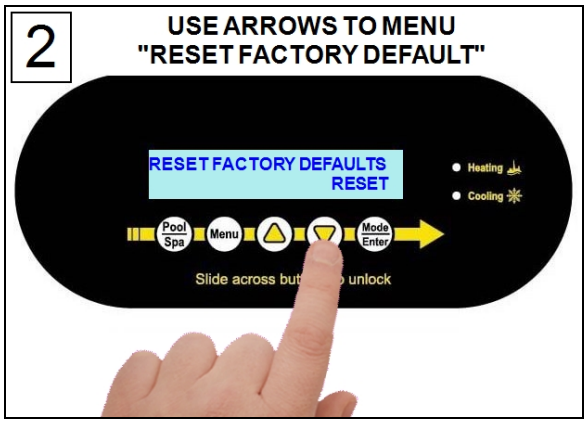

B
USE ARROWS TO
"INSTALLER MENU"
INSTALLER MENU
ENTER
Heating
Cooling
Pool
Spa
Menu
Mode
Enter

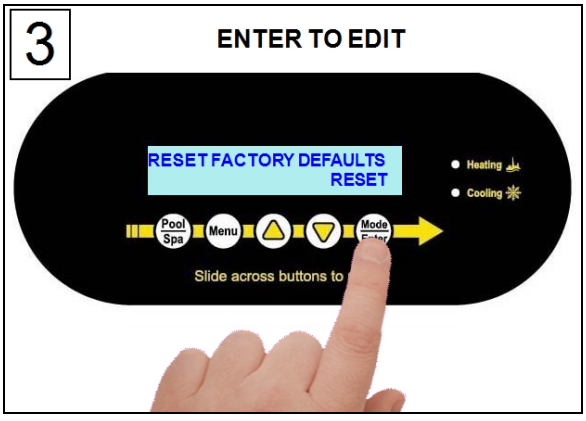

C
PRESS "ENTER" TO EDIT
INSTALLER MENU
ENTER
Heating
Cooling
Pool
Spa
Menu
Mode

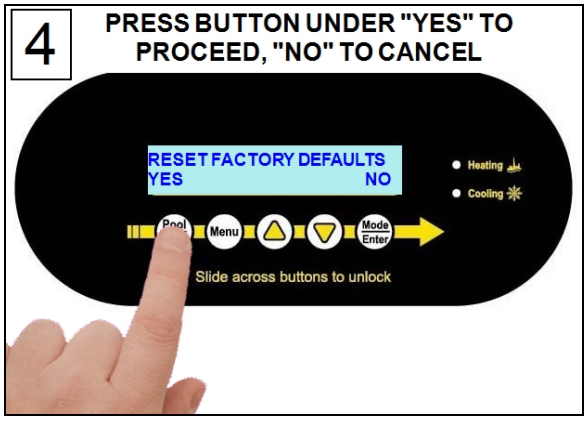

D
USE ARROWS TO "17"
ENTRY CODE: 17
Heating
Cooling
Pool
Spa
Menu
Mode
Enter

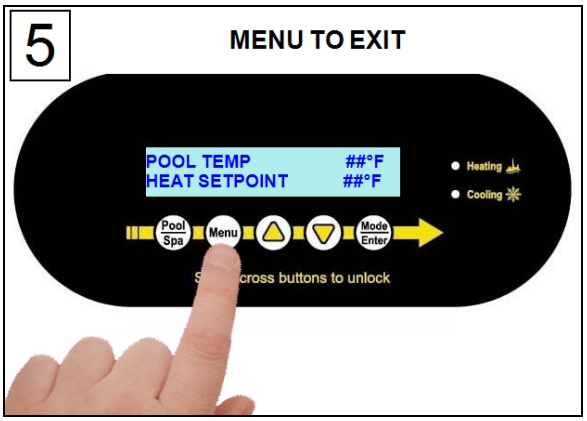

E
PRESS ENTER
ENTRY CODE: 17
Heating
Cooling
Pool
Spa
Menu
Mode


1
PRESS MENU BUTTON
SET TIME/DATE
08:00AM 01-01-2018
Heating
Cooling
Pool
Spa
Menu
Mode
Enter


2
USE ARROWS TO MENU
"RESET FACTORY DEFAULT"
RESET FACTORY DEFAULTS
RESET
Heating
Cooling
Pool
Spa
Menu
Mode
Enter


3
ENTER TO EDIT
RESET FACTORY DEFAULTS
RESET
Heating
Cooling
Pool
Spa
Menu
Mode


4
PRESS BUTTON UNDER "YES" TO
PROCEED, "NO" TO CANCEL
RESET FACTORY DEFAULTS
YES
NO
Heating
Cooling
Menu
Mode
Enter
Slide across buttons to unlock



1.8 Cleaning Equipment After Installation

Installer - If you need to clean the equipment after installation, please use the following guidelines.

WARNING Failure to heed the following may result in injury or death.

- Possible electric shock hazard - Deactivate power to all electrical devices on the pad when washing heat pump. Do not restore electrical power until equipment is completely dry.

NOTICE Failure to heed the following may result in damage to equipment.

- Do not use a pressure cleaner to wash the heat pump. Damage to heat pump components may result. If using a hose-end spray nozzle adjust the spray pattern to low strength only.
- Do not spray water directly into the interior of the heat pump; damage to components may result.
- Do not use chemicals on the display panel.

Cleaning

1. Wash cabinet using a low-pressure water hose. A high-pressure water stream will cause damage to the aluminum fins of the heat pump. This damage is not covered under the product warranty.
2. While the heat pump is still wet, use an approved cleaning agent to clean the exterior of the heat pump. **Do not use chemicals on the display panel.**
3. Use a detergent-dampened cloth to wipe the heat pump's exterior cabinet.
4. Flush all exterior with fresh water using a low-pressure water hose.
5. Dry the cabinet using a soft cloth being careful not to damage fins.

APPROVED CLEANING AGENTS•
Fantastic®
Formula 409®
Cascade®
All Power Plain Detergent (3% Solution)

Table 3 - Cleaning Agents

• The trademarks used in approved cleaning agents are the property of their owners and are not related to AquaCal®.

Polishing

1. Polish the heat pump's cabinet panels using an approved polishing agent and following the manufacturer's instructions. **Do not use chemicals on the display panel.**
2. Rinse the heat pump panels with fresh water, wipe, and buff panels using a dry soft cloth.
3. Allow heat pump interior and surrounding equipment to "air-dry" for several hours prior to restoring electrical power.

APPROVED POLISHING AGENTS•
Simoniz® Wax
Glo-Coat®
Armor All® Protectant

Table 4 - Polishing Agents

• The trademarks used in approved polishing agents are the property of their owners and are not related to AquaCal®.

2 - Troubleshooting

IN THIS SECTION:

Fault Codes

Issues and resolutions

2.1 Fault Codes

A fault code indicates a specific issue or condition that will require action before the equipment can resume operating.

Please perform the following troubleshooting.
If the issue reoccurs, please contact AquaCal. See "*Contacting AquaCal AutoPilot, Inc.*" on page 1.

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- Repairs must not be attempted by untrained or unqualified individuals.
- The heat pump contains refrigerant under high pressure. Repairs to the refrigerant circuit must not be attempted by untrained or unqualified individuals. Service must be performed only by qualified HVAC technicians. Recover refrigerant before opening the system.

NOTICE Failure to heed the following may result in damage to equipment.

- Service by unauthorized personnel will void the heat pump warranty.

AIR TEMP SENSOR OPEN or AIR TEMP SENSOR SHORT

ISSUE

Open or shorted air sensor.

RESOLUTION

A qualified technician should replace the air sensor.

CLOCK LOW BATTERY

ISSUE

The real-time clock controller indicates a low battery condition.

- The time will reset to factory default.
- If connected, a gas backup heater may start and stop at an incorrect time when set to use a "SCHEDULED" mode.

RESOLUTION

A qualified technician should replace the battery. The date and time will need to be reset on the heat pump after replacement.

DEFROST1 SENSOR OPEN or DEFROST2 SENSOR OPEN

ISSUE

Open defrost sensor.

RESOLUTION

A qualified technician should replace the defrost sensor.

DEFROST1 SENSOR SHORT or DEFROST2 SENSOR SHORT

ISSUE

Shorted defrost sensor.

RESOLUTION

A qualified technician should replace the defrost sensor.

ERROR AT MASTER UNIT

ISSUE

The heat pump is slaved to a master heat pump that is displaying a fault code.

RESOLUTION

The error at the master heat pump must be corrected before the slaved unit will resume operation.

HIGH PRESSURE FAULT

ISSUE

The refrigerant system's high-pressure switch is showing as open.

RESOLUTION

Heat Only Units

Place heat pump in heating mode and perform the following troubleshooting.

Determine if an insufficient amount of water is being supplied to the equipment.

1. Confirm the filter pump is on.
2. If a multiple-speed filter pump is being used, run filter pump at a higher speed. Do not exceed the maximum flow rate for the model.
3. Confirm water is not being diverted away from the heat pump.
   - See "*Water Flow Rates*" on page 11.
   - See "*Adjusting Water Flow Using ΔT (Delta-T)*" on page 13.
4. The water pressure switch may be incorrectly calibrated.
   - See "*Adjusting Water Pressure Switch*" on page 15.

Cool Only Units

Determine if an insufficient amount of air is being supplied to the equipment.

1. Check for proper fan operation. If the fan is not operating, contact AquaCal® Technical Support.
2. Check for obstructed airflow around the heat pump.
   - See "*Clearances*" on page 5.
3. Check for a dirty or blocked evaporator coil.
   - See "*Cleaning Equipment After Installation*" on page 62.

Heat and Cool Units (Reversing)

Place heat pump in heating mode and perform the following troubleshooting.

Determine if an insufficient amount of water is being supplied to the equipment.

1. Confirm the filter pump is on.
2. If a multiple-speed filter pump is being used, run filter pump at a higher speed. Do not exceed the maximum flow rate for the model.
3. Confirm water is not being diverted away from the heat pump.
   - See "*Water Flow Rates*" on page 11.
   - See "*Adjusting Water Flow Using ΔT (Delta-T)*" on page 13.
4. The water pressure switch may be incorrectly calibrated.
   - See "*Adjusting Water Pressure Switch*" on page 15.

HIGH WATER TEMPERATURE

ISSUE

Incoming water temperature has exceeded 110° F (43° C) and the unit has been deactivated. The heat pump will not operate until the incoming water temperature drops to 100° F (38° C) or lower.

RESOLUTION

1. Determine if a gas heater is sending water directly to the heat pump. This situation would need to be corrected before continuing.
2. If a solar heater is sending water directly to the heat pump, the water can initially be hotter than 110° F (43° C). After the water from the solar panel normalizes, the fault will no longer display and the heat pump will resume as needed.
3. If the **HIGH WATER TEMPERATURE** fault continues to display, the water temperature sensor may require replacement.

HP5 SYSTEM LOCKOUT

ISSUE

The heat pump has locked due to five high-pressure faults during one call for heating or cooling.

RESOLUTION

1. Deactivate then reactivate power to the heat pump to clear error.
2. Troubleshoot the high-pressure issue causing the error.
    - See "*HIGH PRESSURE FAULT*" on the previous page.

LOW PRESSURE FAULT

ISSUE

The refrigerant system's low-pressure switch is showing as open.

RESOLUTION

Heat Only Units

Place heat pump in heating mode and perform the following troubleshooting.

1. Check for proper fan operation. If the fan is not operating, contact AquaCal® Technical Support.
2. Check for obstructed airflow around the heat pump.
   - See "*Clearances*" on page 5.
3. Check for a dirty or blocked evaporator coil.
   - See "*Cleaning Equipment After Installation*" on page 62.
4. Check for signs of heavy ice buildup on the coil.

Cool Only Units

Place heat pump in heating mode and perform the following troubleshooting.

Determine if an insufficient amount of water is being supplied to the equipment.

1. Confirm the filter pump is on.
2. If a multiple-speed filter pump is being used, run filter pump at a higher speed. Do not exceed the maximum flow rate for the model.
3. Confirm water is not being diverted away from the heat pump.
   - See "*Water Flow Rates*" on page 11.
   - See "*Adjusting Water Flow Using ΔT (Delta-T)*" on page 13.
4. The water pressure switch may be incorrectly calibrated.
   - See "*Adjusting Water Pressure Switch*" on page 15.

Heat and Cool Units (Reversing)

Place heat pump in heating mode and perform the following troubleshooting.

1. Check for proper fan operation. If the fan is not operating, contact AquaCal® Technical Support.
2. Check for obstructed airflow around the heat pump.
   - See "*Clearances*" on page 5.
3. Check for a dirty or blocked evaporator coil.
   - See "*Cleaning Equipment After Installation*" on page 62.
4. Check for signs of heavy ice buildup on the coil.

LP5 SYSTEM LOCKOUT

ISSUE

The heat pump has locked due to five low-pressure faults during one call for heating or cooling.

RESOLUTION

1. Deactivate then reactivate power to the heat pump to clear error.
2. Troubleshoot the low-pressure issue causing the error.
   - See "*LOW PRESSURE FAULT*" above.

MULTI-UNIT COMM FAULT

ISSUE

Slaved heat pump is not receiving a signal from the master heat pump.

RESOLUTION

1. Confirm the master heat pump is operating correctly. If, for example, no power is supplied to the master heat pump, an error will appear on the slaved heat pumps.
2. Confirm the heat pump is properly connected and configured to a master unit.
   - See "*Connecting Multiple Heat Pumps (Master / Slaved)*" on page 39.

OTA SYSTEM LOCKOUT

ISSUE

A malfunction has occurred that could allow the water temperature to surpass a safe level. An installed "Over Temperature Alarm" kit has disabled the system.

- See "*Over Temperature Alarm Kit*" on page 83 for more information.

RESOLUTION

Call for service.

SMART COMM FAULT

ISSUE

Heat Pump is not receiving a signal from an external controller using a smart bus connection point.

RESOLUTION

1. Confirm a smart bus external controller is being used.
   - If not, set external controller mode to "none" instead of "SMART".
     - See "*Configure for Smart Bus Controller*" on page 29.
2. Confirm connection points from the external controller to the heat pump are correctly configured.
   - See "*Connecting Smart Bus Controllers*" on page 27.
3. If using a smart bus external controller, confirm the controller is correctly set to send signals to the heat pump. See manuals or guides provided with the external controller.

VARIABLE DRIVE FAULT

ISSUE

A problem was detected in the variable speed compressor.

RESOLUTION

Deactivate heat pump at power disconnect. Wait for two minutes for the capacitors to discharge. Then reactivate heat pump's power at disconnect. If error reoccurs, call for service.

WATER TEMP SENSOR SHORT or WATER TEMP SENSOR OPEN

ISSUE

Shorted or open water sensor.

RESOLUTION

A qualified technician should replace the water sensor.

2.2 Issues and Resolutions

DANGER Failure to heed the following will result in injury or death.

- RISK OF ELECTRICAL SHOCK FROM ENERGY STORED IN CAPACITORS - MODELS EQUIPPED WITH VARIABLE FREQUENCY COMPRESSOR DRIVES STORE ELECTRICITY EVEN AFTER THE POWER HAS BEEN DEACTIVATED AT THE POWER BREAKER. ***Wait for 2 minutes after the shut down of equipment before servicing.***
- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.

WARNING Failure to heed the following may result in injury or death.

- Repairs must not be attempted by untrained or unqualified individuals.
- The heat pump contains refrigerant under pressure. Repairs to the refrigerant circuit must not be attempted by untrained or unqualified individuals. Service must be performed only by qualified HVAC technicians. Recover refrigerant before opening the system.

NOTICE Failure to heed the following may result in damage to equipment.

- Service by unauthorized personnel will void the factory warranty.

Please perform the following troubleshooting.
For further assistance, please contact AquaCal. See "*Contacting AquaCal AutoPilot, Inc.*" on page 1.

Blank Display

ISSUE

The Heat Pump may have an incoming power problem.

RESOLUTION

Confirm electrical power is being supplied to the heat pump from electrical disconnect(s).

Display Panel Not Responding

ISSUE

The heat pump's display panel will not respond to user input.

RESOLUTION

1. If heat pump display shows "**UNDER REMOTE CONTROL**", use the external control device to control the heat pump.
2. If needed, check with the external controller manufacturer for further assistance using that device.

Displays "DEFROSTING"

ISSUE

The heat pump has sensed the coil is icing up. See "*Ice Forming on the Heat Pump*" on page 76.

No action is required.

RESOLUTION

Heat Only Units - Passive Defrost

When ice starts to form on the coil, the compressor will stop operating while the fan continues to operate.

- The coil will begin to warm to the surrounding air temperature. When the coil's temperature rises above 38° F (3.3° C), the compressor is restarted and heating resumes.
- If the coil's temperature remains below 38° F (3.3° C), the compressor will remain off.

Cool Only Units - Passive Defrost

When ice starts to form on the coil, the compressor will stop operating while the fan continues to operate.

- The coil will begin to warm to the surrounding air temperature. When the coil's temperature rises above 38° F (3.3° C), the compressor is restarted and cooling resumes.
- If the coil's temperature remains below 38° F (3.3° C), the compressor will remain off.

Heat and Cool Units - Active Defrost

Hot refrigerant gas will be sent through the coil to rapidly remove ice or frost.

During this process, the melting of the ice may appear as steam coming off the heat pump. This is normal.

Displays "NO SYSTEM FIRMWARE"

ISSUE

The heat pump has encountered a software error.

RESOLUTION

Call for service.

Displays "NO POOL/SPA WATER FLOW"

ISSUE

Low or no water detected. This is normal when the circulation pump is deactivated.

RESOLUTION

1. Confirm the filter pump is on.
2. If a multiple-speed filter pump is being used, run at a higher speed to determine if the error persists. Do not exceed the maximum flow rate for your model.
3. Confirm water is not being diverted away from the heat pump.
   - See "*Water Flow Rates*" on page 11.
   - See "*Adjusting Water Flow Using ΔT (Delta-T)*" on page 13.

Displays "SET TO SWITCH REMOTELY"

ISSUE

If when pressing the "Pool / Spa" button the display flashes the message "**SET TO SWITCH REMOTELY**", the heat pump is using a remote relay switch or a 3-wire controller.

RESOLUTION

- The Pool and Spa thermostat automatically switch when using these modes.
- Operation manually will not be available when using these external devices. No action is required.

Displays "SET UNIT MODEL NUMBER"

ISSUE

The heat pump has encountered a software error.

RESOLUTION

- The model number and serial number will need to be re-entered into the system. The system will then operate as normal.
- If the issue reoccurs, please contact AquaCal® Technical Support.

Heat Pump Not Running

ISSUE

The heat pump will not run.

RESOLUTION

1. Confirm equipment is receiving power. Is the heat pump display illuminated?
   - If not, confirm the main breaker (located at the power supply panel) and the disconnect switch (located near the heat pump) are both turned on.
   - If the display still does not illuminate, it is recommended that the heat pump installer or electrician confirm the heat pump is receiving power.
2. Confirm correct mode is selected.
3. Confirm thermostat is set correctly.
   - When heating the water is desired, the thermostat should be set above the current water temperature.
   - When cooling the water is desired, the thermostat should be set below the current water temperature.
4. If an error code is displayed, diagnose and correct the cause of the code.
   - See "*Fault Codes*" on page 65.
5. If the heat pump is using an external controller, the heat pump may not be set correctly to accept the controller's signal.

Heat Pump's Tripping Breaker

ISSUE

The heat pump breaker(s) keeps tripping.

RESOLUTION

1. If AquaCal® heat pumps have been connected using a multiple heat pump configuration, the configuration may be incorrect. Please confirm settings or contact installer of equipment.
   - See "*Connecting Multiple Heat Pumps (Master / Slaved)*" on page 39.
2. Have an electrician confirm breakers are correct type, in good condition, and properly sized for the heat pump.

Heat Pump Won’t Shut Off

ISSUE

The heat pump will not deactivate.

RESOLUTION

> ***PLEASE NOTE***
> *When the heat pump is set to off, the display will show the current water temperature or no water flow indicator.*

1. Confirm the correct mode has been set on the heat pump.
2. Confirm the heat pump has reached the desired temperature set on the thermostat. The heat pump will continue to run until the set temperature is reached.
3. If the heat pump is using an external controller, it may not be set correctly. See the external controller's manual.

Heat Pump Is Running, Not Heating

ISSUE

The heat pump is running. But the water is not heating.

RESOLUTION

1. If the heat pump is using an external controller, confirm it is set correctly.
   - See operation manual for operating heat pump with an external controller.
   - If the heat pump is still not running correctly with this device, contact the installer of the device or the device’s manufacturer for further assistance.
2. Confirm heat pump mode is set to heat.
3. Confirm thermostat is set to the desired water temperature.
4. Confirm valves are positioned to heat the correct body of water (either the pool or the spa). If heating a spa that overflows into a pool, confirm the spa is isolated when being heated (not flowing into the pool).
5. Confirm heat pump is transferring heat into the water.
   - Measure the temperature of air discharge coming out of the heat pump fan. If discharge air is between 8° to 10° F (4.4° to 5.6° C) colder than the outside ambient air, the heat pump is moving heat into the water.
6. If an error code is displayed, diagnose and correct cause of code.
   - See "*Fault Codes*" on page 65.
7. Confirm that the filter pump has a sufficient run-time. The heat pump will not run (or heat the water) without water flow.
   - See "*Heating Recommendations*" on page 82.
8. If heating a spa, deactivate air blower or venturi (if equipped) to allow for quicker heating times. For pools, deactivate water features, such as slides, waterfalls, or fountains to allow water to retain heat. Use of a liquid pool blanket product, such as an Aqua Blanket™, can also compensate for excessive heat loss.
   - See "*Liquid Blankets*" on page 83.

Heat Pump Is Running, Not Cooling

ISSUE

The heat pump is running. But the water is not cooling.

RESOLUTION

1. If the heat pump is using an external controller, confirm the heat pump is programmed properly to allow for cooling.
2. Confirm the heat pump mode is set to cool.
3. Confirm the thermostat is set below the current water temperature.
4. Confirm valves are positioned to cool the correct body of water (either the pool or the spa). If cooling a spa that overflows into a pool, confirm the spa is isolated when being cooled (not flowing into the pool).
5. If an error code is displayed, determine and correct the condition causing the code.
   - See "*Fault Codes*" on page 65.
6. Confirm heat pump is transferring heat out of the water.
   - Measure the temperature of air discharge coming out of the heat pump's fan. If the air is between 8° to 10° F (4.4° to 5.6° C) warmer than the outside ambient air, the heat pump is moving heat out of the water.
7. Confirm that the filter pump has a sufficient run-time. The heat pump will not run (or cool the water) without water flow.

Ice Forming on the Heat Pump

ISSUE

When conditions are too cold for proper operation, the heat pump will enter a defrost mode. This prevents ice from building up on the evaporator coil.

RESOLUTION

Heat Only Units:

- The heat pump may develop a fine layer of white frost on the outside coil before entering the defrost mode. This is normal.
  - See "*Displays Defrosting*" on page 72.
- If heavy ice (not frost) starts to build up, shut off the heat pump. Contact the installer or manufacturer.
- If the ambient air temperature will be falling below 32° F (0° C) for more than 8 hours, winterize equipment.

Cool Only Units

- The heat pump may enter defrost mode if the water flow rate falls below the acceptable range. See "*Water Flow Rates*" on page 11.
- If the ambient air temperature will be falling below 32° F (0° C) for more than 8 hours, winterize equipment.

Heat and Cool Units (with Active Defrost or "Icebreaker"):

- During freezing conditions, pool or spa heating will continue. Frost or ice may develop during the "countdown" to the active defrost (up to 50 minutes). This is normal. See "*Displays Defrosting*" on page 72.
- The heat pump will enter an "active defrost" stage to remove the accumulated frost and ice.
  - Be sure to observe the unit for at least 50 minutes. If it has not entered an active defrost cycle, call for service.

> ***TIP:***
> *The heat pump can be manually set to defrost by temporarily switching to the cooling mode until the ice or frost melts.*

- If the ambient air temperature is (or will be) falling below 32° F (0° C) for more than 8 hours, winterize equipment.

"Pool / Spa" Button Will Not Work

ISSUE

The "Pool / Spa" button is disabled if the following devices have been configured on the heat pump.

RESOLUTION

- A 2-wire external controller.
- A 3-wire external controller.
- An external flow switch.

Water Coming From Heat Pump

ISSUE

The water may be normal condensation produced as a by-product of the heat pump's refrigeration process.

The heat pump can produce up to 8 to 10 gallons (30 to 38 liters) of condensation per hour depending on the humidity of the ambient air. Determine if the water is condensation or a possible leak.

RESOLUTION

1. Deactivate heat pump, leaving the filter pump on. After several hours, determine if the water is still coming from the heat pump.
2. If using chlorine or bromine as a pool/spa sanitizer, test the water around the heat pump using a test strip. If the test strip indicates that chlorine or bromine is present, a leak may exist.

> ***PLEASE NOTE -***
>
> *If desired, a kit is available to re-direct condensation water away from the heat pump.*
>
> - See "*Condensation Drain Kit (# STK0202)*" on page 82.

3 - Appendix

IN THIS SECTION:

3.1 Factory Defaults

Certain programming options have been preset at the factory. These options can be overwritten for site-specific conditions.

NOTICE

Failure to heed the following may result in damage to equipment.

- Unauthorized adjustments in Service Menus (**not shown**) may void the heat pump's warranty.

User Menus		
MENUS	**DEFAULT**	**OPTIONS**
SET GAS BOOST	OFF	OFF ON
SET TIME / DATE	USER TO SET	
SET BACKUP HEAT MODE	OFF	OFF SCHEDULED 24HR
SET ENTRY CODE ENABLED	OFF	OFF ON
SET USER ENTRY CODE	01	
SET CALL-FLEX MODE	OFF	OFF CALL FLEX

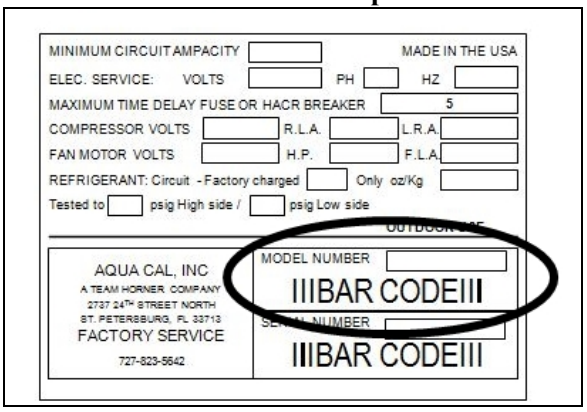
Installer Menus		
MENUS	**DEFAULT**	**OPTIONS**
SET MULTI-UNIT MODE	OFF	OFF MASTER SLAVED
SET EXT. CTRL MODE	OFF	OFF SMART 2WIRE 3WIRE

Installer Menus		
MENUS	**DEFAULT**	**OPTIONS**
SET TIME FORMAT	12 Hour	12 Hour 24 Hour
SET DATE FORMAT	MDY	MDY DMY
SET TEMPERATURE UNITS	Fahrenheit	Fahrenheit Celsius
SET BACKUP HEAT MODE	OFF	OFF SCHEDULED 24HR
SET ENTRY CODE ENABLED	OFF	OFF ON
SET USER ENTRY CODE	01	
SET CALL-FLEX INSTALLED	NO	YES NO
SET CALL-FLEX MODE	OFF	OFF CALL FLEX

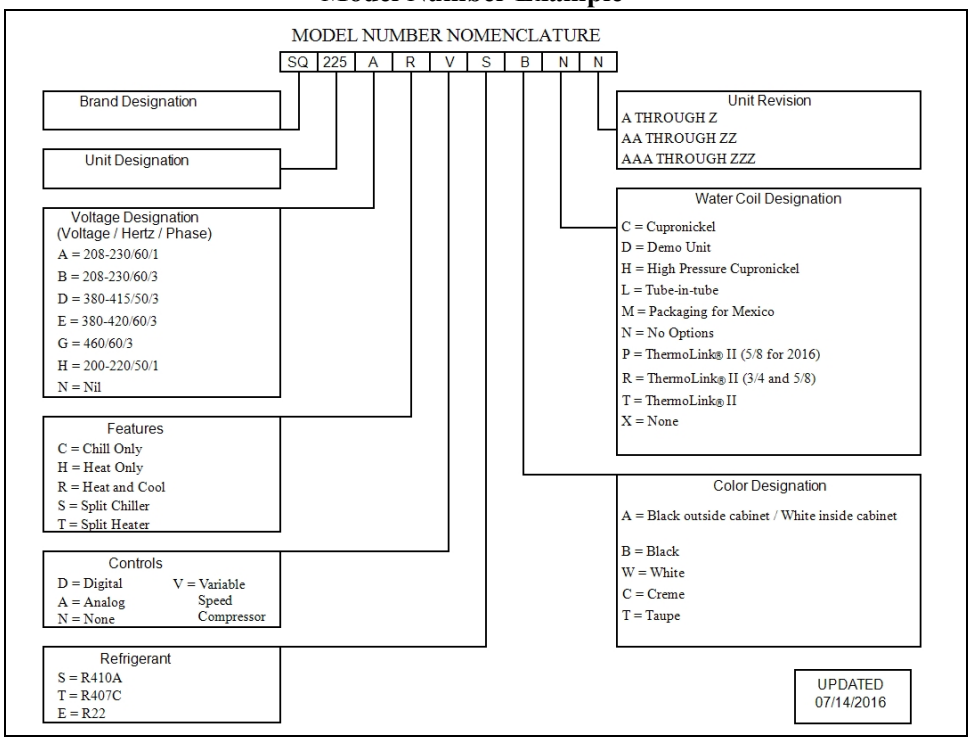
3.2 Identifying Model Specifications

1. Find Data Plate - The data plate is usually posted on the side of the equipment or the inside of the heat pump's access plate.
2. Find the model number on the data plate. The first letters and numbers indicate the model type.
3. The complete model number identifies the equipment's specifications.

Data Plate Example



Model Number Example



3.3 Weights

NOTE:
Specifications subject to change.

Model Type	Model Number	Install Weight
TropiCal®	T035	180 Pounds (81.6 kg)
TropiCal®	T055	180 Pounds (81.6 kg)
TropiCal®	T075	200 Pounds (90.7 kg)
TropiCal®	T090	255 Pounds (115.7 kg)
TropiCal®	T115	259 Pounds (117.5 kg)
TropiCal®	T135	287 Pounds (130 kg)
TropiCal®	T170	326 Pounds (148 kg)
HeatWave SuperQuiet®	SQ120R	268 Pounds (121.6 kg)
HeatWave SuperQuiet®	SQ125	268 Pounds (121.6 kg)
HeatWave SuperQuiet®	SQ145	328 Pounds (148.8 kg)
HeatWave SuperQuiet®	SQ150VS	350 Pounds (158.8 kg)
HeatWave SuperQuiet®	SQ166R	328 Pounds (148.8 kg)
HeatWave SuperQuiet®	SQ225	328 Pounds (148.8 kg)
TropiCool®	TC500	215 Pounds (97.5 kg)
TropiCool®	TC1000	285 Pounds (128.8 kg)
TropiCool®	TC1500	328 Pounds (148.8 kg)

3.4 Heating Recommendations

The following recommendations will reduce the amount of time required to heat a pool. **If unsure of equipment heating capability, review equipment data plate.** See "*Identifying Model Specifications*" on page 79.

1. Confirm heat pump mode has been set to heating mode.
2. Set the desired temperature (set-point) for the water.
3. Temporarily set the filter pump for continuous operation.
    - This will allow the Heat Pump the time required to heat the water at start-up.
    - After the water has reached the desired temperature, reset the filter pump to normal operating time-frames.
4. Activate Turbo Boost Mode if equipped.
5. Use a pool cover or blanket to reduce heating time.

3.5 Cooling Recommendations

The following recommendations will reduce the amount of time required to cool a pool or cold plunge application. **If unsure of equipment cooling capability, review equipment data plate.** See "*Identifying Model Specifications*" on page 79.

1. Confirm heat pump mode has been set to cooling mode.
2. Set thermostat to desired water temperature.
3. Activate Turbo Boost Mode if equipped.
4. Temporarily set the filter pump for continuous operation.
    - This will allow the Heat Pump the time required to cool the water at start-up.
    - After the water has reached the desired temperature, reset the filter pump to normal operating time-frames.

3.6 Available Accessories

Accessories may be purchased through an authorized dealer of AquaCal® products.

Bypass Valve Kit (# STK0135)

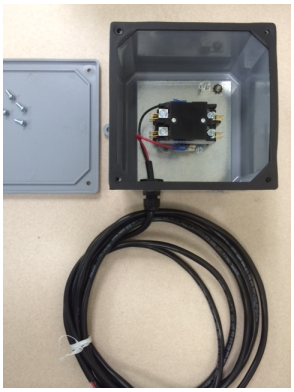
- When high flow rates are outside recommended specifications, please use this kit or an alternative bypass valve system.
- This kit can be used to control excessive water flow through the heat pump. It provides automatic flow adjustments for most applications.

Condensation Drain Kit (# STK0202)

- Used when condensation water flow must be directed to a specific location.

Call Flex Accessory (# 0030-LEDS)

- This accessory will override a circulation pump to provide water to the heat pump when the set temperature is not met.



Grid Flow Switch (# 0040S)

- Used for automatic pool/spa thermostat switching.
- This switch can also be used in place of the water pressure switch. This may be needed when the pool/spa elevation is higher than the heat pump. A higher elevation of the water can cause a false signal to the heat pump; indicating water is flowing through the heat pump when it isn't.
- This kit is not to be used on applications exceeding 50 PSI (345 kPa).

Liquid Blankets

- An invisible liquid heat barrier designed to retain heat and extend the swimming season.
- AquaCal® recommends Lo-Chlor® Aqua Blanket™.

Over Temperature Alarm Kit

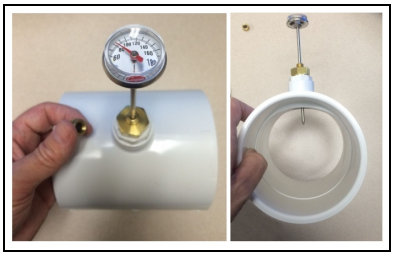
- This kit is an additional safety device. It disables the heat pump if any malfunction occurs that allows the water temperature to surpass a safe level.
- This kit is strongly recommended for all spa applications.
  - Single Phase Heat Pump - (# STK0221)
  - Three Phase Heat Pump - (# STK0222)

Plumbing Unions

- 2 Inch Unions - (# PLS2627)

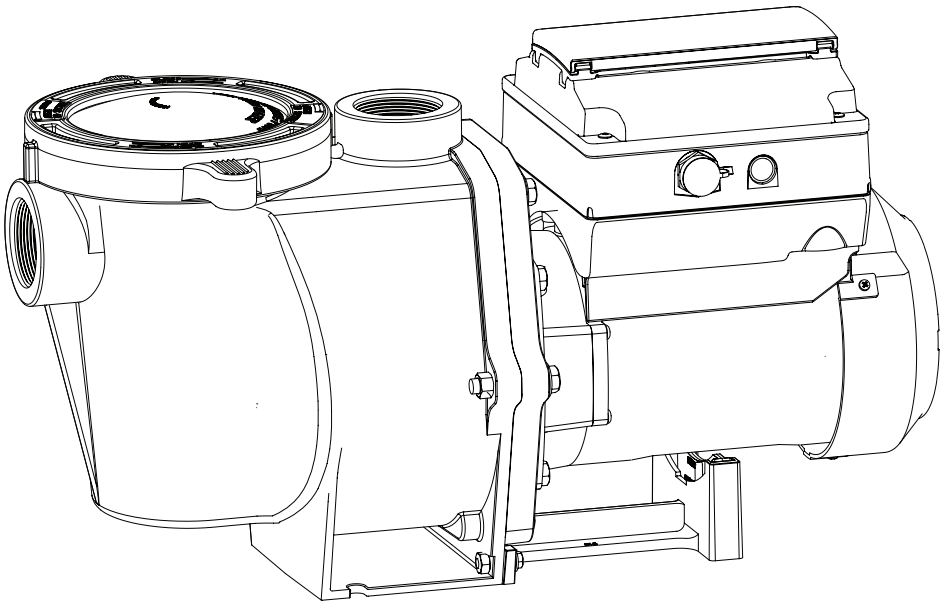
Temperature Port Kit (# STK0096)

- This kit can be used to adjust water flow using Delta-T.
- The kit comes with a port, installation components, and a temperature probe.



PENTAIR

INTELLIFLO® VSF
VARIABLE SPEED AND FLOW PUMP



INSTALLATION AND USER'S GUIDE

ENERGY STAR

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

Eco® Select
Efficiency • Conservation
PENTAIR

CUSTOMER SERVICE / TECHNICAL SUPPORT

If you have questions about ordering Pentair Aquatic Systems replacement parts, and pool products, please contact:

Customer Service and Technical Support, USA
(8 A.M. to 4:30 P.M. — Eastern/Pacific Times)
Phone: (800) 831-7133
Fax: (800) 284-4151

Web site
Visit *www.pentairpool.com* or *www.staritepool.com* for information about Pentair products.*

Sanford, North Carolina (8 A.M. to 4:30 P.M. ET)
Phone: (919) 566-8000
Fax: (919) 566-8920

Moorpark, California (8 A.M. to 4:30 P.M. PT)
Phone: (805) 553-5000 (Ext. 5591)
Fax: (805) 553-5515

TABLE OF CONTENTS

** Translated versions of this manual are available online at / La versión en español de este manual del producto, se puede encontrar en línea a / La version française de ce manuel est disponible à :* **https://pentairpool.com/en/products/pumps/intelliflo%20vsf#resources**

P/N 356652 Rev. D 2/22/18

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

IMPORTANT NOTICE

This guide provides installation and operation instructions for this 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 pump.

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

READ AND FOLLOW ALL INSTRUCTIONS SAVE THESE INSTRUCTIONS

This is the safety alert symbol. When you see this symbol on your system or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

DANGER Warns about hazards that can cause death, serious personal injury, or major property damage if ignored.

WARNING Warns about hazards that may cause death, serious personal injury, or major property damage if ignored.

CAUTION Warns about hazards that may or can cause minor personal injury or property damage if ignored.

NOTE Indicates special instructions not related to hazards.

Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.

When installing and using this electrical equipment, basic safety precautions should always be followed, include the following:

WARNING Do not permit children to use this product.

WARNING **RISK OF ELECTRICAL SHOCK.** Connect only to a branch circuit protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the circuit is protected by a GFCI.

WARNING This unit must be connected only to a supply circuit that is protected by a ground-fault circuit-interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of an electric shock. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.

CAUTION This pump is for use with permanent swimming pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently-installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it is capable of being readily disassembled for storage and reassembled to its original integrity.

General Warnings

- Never open the inside of the drive motor enclosure. There is a capacitor bank that holds a 230 VAC charge even when there is no power to the unit.
- The pump is not submersible.
- The pump is capable of high flow rates; use caution when installing and programming to limit pumps performance potential with old or questionable equipment.
- Code requirements for electrical connection differ from country to country, state to state, as well as local municipalities. Install equipment in accordance with the National Electrical Code and all applicable local codes and ordinances.
- Before servicing the pump; switch OFF power to the pump by disconnecting the main circuit to the pump.
- This appliance is not intended for use by persons (including children) of reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

DANGER FAILURE TO FOLLOW ALL INSTRUCTIONS AND WARNINGS CAN RESULT IN SERIOUS BODILY INJURY OR DEATH. **THIS PUMP SHOULD BE INSTALLED AND SERVICED ONLY BY A QUALIFIED POOL SERVICE PROFESSIONAL. INSTALLERS, POOL OPERATORS AND OWNERS MUST READ THESE WARNINGS AND ALL INSTRUCTIONS IN THE OWNER'S MANUAL BEFORE USING THIS PUMP. THESE WARNINGS AND THE OWNER'S MANUAL MUST BE LEFT WITH THE POOL OWNER.**

DANGER SUCTION ENTRAPMENT HAZARD: STAY OFF THE MAIN DRAIN AND AWAY FROM ALL SUCTION OUTLETS!

THIS PUMP PRODUCES HIGH LEVELS OF SUCTION AND CREATES A STRONG VACUUM AT THE MAIN DRAIN AT THE BOTTOM OF THE BODY OF WATER. THIS SUCTION IS SO STRONG THAT IT CAN TRAP ADULTS OR CHILDREN UNDER WATER IF THEY COME IN CLOSE PROXIMITY TO A DRAIN OR A LOOSE OR BROKEN DRAIN COVER OR GRATE.

THE USE OF UNAPPROVED COVERS OR ALLOWING USE OF THE POOL OR SPA WHEN COVERS ARE MISSING, CRACKED OR BROKEN CAN RESULT IN BODY OR LIMB ENTRAPMENT, HAIR ENTANGLEMENT, BODY ENTRAPMENT, EVISCERATION AND/OR DEATH.

The suction at a drain or outlet can cause:

Limb Entrapment: When a limb is sucked or inserted into an opening resulting in a mechanical bind or swelling. This hazard is present when a drain cover is missing, broken, loose, cracked or not properly secured.

Hair Entanglement: When the hair tangles or knots in the drain cover, trapping the swimmer underwater. This hazard is present when the flow rating of the cover is too small for the pump or pumps.

Body Entrapment: When a portion of the body is held against the drain cover trapping the swimmer underwater. This hazard is present when the drain cover is missing, broken or the cover flow rating is not high enough for the pump or pumps.

Evisceration/Disembowelment: When a person sits on an open pool (particularly a child wading pool) or spa outlet and suction is applied directly to the intestines, causing severe intestinal damage. This hazard is present when the drain cover is missing, loose, cracked, or not properly secured.

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

Mechanical Entrapment: When jewelry, swimsuit, hair decorations, finger, toe or knuckle is caught in an opening of an outlet or drain cover. This hazard is present when the drain cover is missing, broken, loose, cracked, or not properly secured.

NOTE: ALL SUCTION PLUMBING MUST BE INSTALLED IN ACCORDANCE WITH THE LATEST NATIONAL AND LOCAL CODES, STANDARDS AND GUIDELINES.

⚠WARNING TO MINIMIZE THE RISK OF INJURY DUE TO SUCTION ENTRAPMENT HAZARD:

- A properly installed and secured ANSI/ASME A112.19.8 approved anti-entrapment suction cover must be used for each drain.
- Each suction cover must be installed at least three (3') feet apart, as measured from the nearest point to nearest point.
- Regularly inspect all covers for cracks, damage and advanced weathering.
- If a cover becomes loose, cracked, damaged, broken or is missing, replace with an appropriate certified cover.
- Replace drain covers as necessary. Drain covers deteriorate over time due to exposure to sunlight and weather.
- Avoid getting hair, limbs or body in close proximity to any suction cover, pool drain or outlet.
- Disable suction outlets or reconfigure into return inlets.

⚠WARNING A clearly labeled emergency shut-off switch for the pump must be in an easily accessible, obvious place. Make sure users know where it is and how to use it in case of emergency.

The Virginia Graeme Baker (VGB) Pool and Spa Safety Act creates new requirements for owners and operators of commercial swimming pools and spas.

Commercial pools or spas constructed on or after December 19, 2008, shall utilize:

(A) A multiple main drain system without isolation capability with suction outlet covers that meet ASME/ANSI A112.19.8a Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs and either:

(i) A safety vacuum release system (SVRS) meeting ASME/ANSI A112.19.17 Manufactured Safety Vacuum Release systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems and/or ASTM F2387 Standard Specification for Manufactured Safety Vacuum Release Systems (SVRS) for Swimming pools, Spas and Hot Tubs or

(ii) A properly designed and tested suction-limiting vent system or

(iii) An automatic pump shut-off system.

Commercial pools and spas constructed prior to December 19, 2008, with a single submerged suction outlet shall use a suction outlet cover that meets ASME/ANSI A112.19.8a and either:

(A) A SVRS meeting ASME/ANSI A112.19.17 and/or ASTM F2387, or

(B) A properly designed and tested suction-limiting vent system, or

(C) An automatic pump shut-off system, or

(D) Disabled submerged outlets, or

(E) Suction outlets shall be reconfigured into return inlets.

For Installation of Electrical Controls at Equipment Pad (ON/OFF Switches, Timers and Automation Load Center)

⚠CAUTION Install all electrical controls at equipment pad, such as on/off switches, timers, and control systems, etc. to allow the operation (startup, shut-down, or servicing) of any pump or filter so the user does not place any portion of his/her body over or near the pump strainer lid, filter lid or valve closures. This installation should allow the user enough space to stand clear of the filter and pump during system start-up, shut down or servicing of the system filter.

⚠DANGER **HAZARDOUS PRESSURE: STAND CLEAR OF PUMP AND FILTER DURING START UP**

Circulation systems operate under high pressure. When any part of the circulating system (i.e. locking ring, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the pump housing cover, filter lid, and valves to violently separate which can result in severe personal injury or death. Filter tank lid and strainer cover must be properly secured to prevent violent separation. Stand clear of all circulation system equipment when turning on or starting up pump.

Before servicing equipment, make note of the filter pressure. Be sure that all controls are set to ensure the system cannot inadvertently start during service. Turn off all power to the pump. **IMPORTANT: Place filter manual air relief valve in the open position and wait for all pressure in the system to be relieved.**

Before starting the system, fully open the manual air relief valve and place all system valves in the "open" position to allow water to flow freely from the tank and back to the tank. Stand clear of all equipment and start the pump.

IMPORTANT: Do not close filter manual air relief valve until all pressure has been discharged from the valve and a steady stream of water appears. Observe filter pressure gauge and be sure it is not higher than the pre-service condition.

General Installation Information

- All work must be performed by a qualified service professional, and must conform to all national, state, and local codes.
- Install to provide drainage of compartment for electrical components.
- These instructions contain information for a variety of pump models and therefore some instructions may not apply to a specific model. All models are intended for use in swimming pool applications. The pump will function correctly only if it is properly sized to the specific application and properly installed.

⚠WARNING Pumps improperly sized or installed or used in applications other than for which the pump was intended can result in severe personal injury or death. These risks may include but not be limited to electric shock, fire, flooding, suction entrapment or severe injury or property damage caused by a structural failure of the pump or other system component.

⚠WARNING The pump can produce high levels of suction within the suction side of the plumbing system. These high levels of suction can pose a risk if a person comes within the close proximity of the suction openings. A person can be seriously injured by this high level of vacuum or may become trapped and drown. It is absolutely critical that the suction plumbing be installed in accordance with the latest national and local codes for swimming pools.

Warnings and safety instructions for Pentair Aquatic Systems pumps and other related products are available at: **http://www.pentairpool.com/pool-owner/safety-warnings/** or call (800) 831-7133 for additional free copies of these instructions.

Please refer to **http://www.pentairpool.com/pool-owner/safety-warnings/** for warning and safety instructions related to the this product.

SAVE THESE INSTRUCTIONS

Warning Page P/N 352557 Rev. B 9/16

PUMP 0VERVIEW

The IntelliFlo® VSF Variable Speed and Flow Pump can be programmed to run at a speed or a constant flow rate over set time intervals for maximum operating efficiency and energy conservation for a variety of inground pools.

- The pump can operate from 450 RPM to 3450 RPM with four preset speeds of 750, 1500, 2350 and 3110 RPM, or the pump can be set to control its own speed and maintain a constant flow rate.
- The pump can adapt to applications between 20 and 140 GPM. Simply program the pump to the desired flow rate, and the pump will automatically adjust to operating conditions to maintain that specific flow rate.
- Up to 8 customizable programs that can be set for constant flow or speed in either Manual, Egg Timer or Schedule modes.
- Pump control panel alarm LED and error messages warn the user of improper operation.
- Programmable priming mode with automatic detection of prime for easy start-up and automatic detection of loss of prime.
- Compatible with most cleaning systems, filters, and jet action spas.
- UL/CUL/NSF

Drive Assembly and Control Panel

The IntelliFlo VSF pump drive is designed to produce maximum motor operational efficiency. The drive controls the motor's rotational speed by controlling the frequency of the supplied current. It also protects the motor and pump from operating outside of their intended operating parameters.

The control panel can be mounted on the pump in four different directions in order to provide the user the best access. The control panel can also be mounted in a more convenient location with the help of the keypad relocation kit (P/N 356904Z).

External Control

Most Pentair automation systems and IntelliComm® Communication Centers can remotely control the IntelliFlo VSF pump. The pump's communications address and other functions are accessible from the pump's control panel.

- RS-485 communication cable included
- IntelliComm systems control one IntelliFlo pump using the 4 External Control programs.

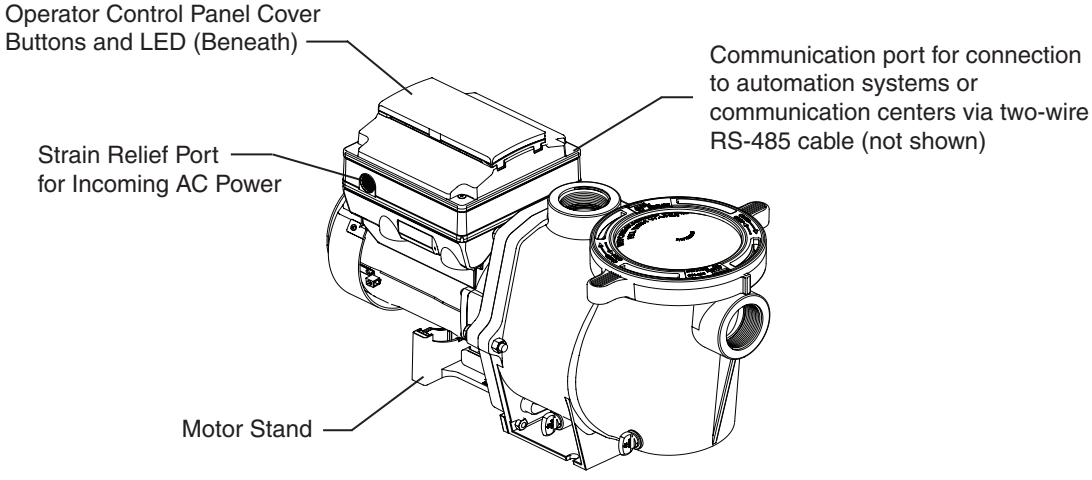
Refer to the automation system manual for further details on how to connect and use the system with your variable speed pump.

Motor Features

- High Efficiency Permanent Magnet Synchronous Motor (PMSM)
- Superior speed control
- Operates at lower temperatures due to high efficiency
- Designed to withstand outdoor environment
- Totally Enclosed Fan Cooled (TEFC) Motor
- 56 Square Flange
- Low noise

Drive Features

- Active Power Factor Correction
- UL 60730 Compliant
- Rotatable Keypad
- Easy Overhead Wiring
- High Drive Operational Efficiency
- Sensorless Flow and Pressure Control Technology
- Loss of Prime Detection



Variable Speed and Flow Drive Assembly

INSTALLATION

Only a qualified plumbing professional should install the IntelliFlo® VSF Variable Speed and Flow Pump. Refer to *"Important Pump Warning And Safety Instructions"* on pages ii - iii for additional installation and safety information.

Note: The IntelliFlo VSF pump cannot be connected in series with other pumps.

Location

Note: Do not install this pump within an outer enclosure or beneath the skirt of a hot tub or spa unless marked accordingly.

Note: Ensure that the pump is mechanically secured to the equipment pad.

Be sure the pump location meets the following requirements:

1. Install the pump as close to the pool or spa as possible. To reduce friction loss and improve efficiency, use short, direct suction piping returns.
2. Install a minimum of 5 feet (1.52 meters) from the inside wall of the pool and spa. Canadian installations require a minimum of 9.8 feet (3 meters) from pool water level.
3. Install the pump a minimum of 3 feet (.9 meters) from the heater outlet.
4. Do not install the pump more than 10 feet (3.1 meters) above the water level.
5. Install the pump in a well ventilated location protected from excessive moisture (i.e., rain gutter downspouts, sprinklers, etc.)
6. Install the pump with a rear clearance of at least 3-inches (76.2 mm) so that the motor can be removed easily for maintenance and repair. See **Figure 1**.

Piping

1. For improved pool plumbing, it is recommended to use a larger pipe size. When installing the inlet and outlet fittings (male adaptors), use thread sealant.
2. Piping on the suction side of the pump should be the same or larger than the return line diameter.
3. Plumbing on the suction side of the pump should be as short as possible.
4. For most installations Pentair recommends installing a valve on both the pump suction and return lines so that the pump can be isolated during routine maintenance. We also recommend a valve, elbow or tee installed in the suction line should be no closer to the front of the pump than five (5) times the suction line pipe diameter. See **Figure 2**.

   Example: A 2-inch pipe requires a 10-inch (254 mm) straight run in front of the suction inlet of the pump). This will help the pump prime faster and last longer.

   Note: DO NOT install 90° elbows directly into the pump inlet and outlet.

Electrical Requirements

- Install all equipment in accordance with the National Electrical Code and all applicable local codes and ordinances.
- A means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

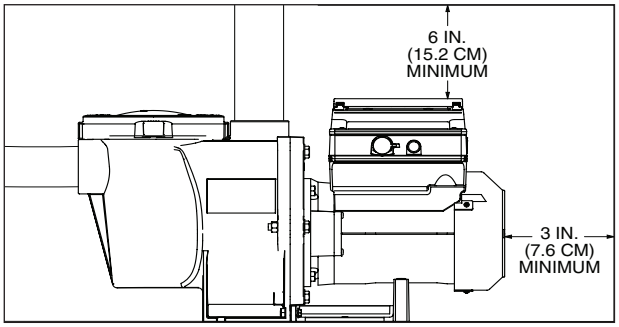


Figure 1: Pump Rear and Overhead Clearance

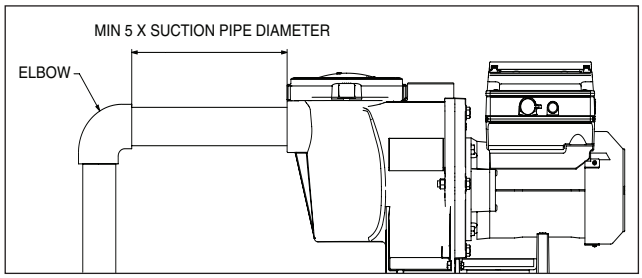


Figure 2: Recommended Piping

Optional Keypad Relocation Kit

In special cases when the user lacks easy or convenient access to the IntelliFlo VSF pump, a Keypad Relocation Kit (P/N 356904Z) may be purchased from your local pool equipment supplier. This kit allows the user to remove the keypad from the top of the drive and mount the keypad in a fixed location with better access.

For installation instructions refer to the *Keypad Relocation Kit Installation Instructions* provided with the kit.

Fittings and Valves

1. Do not install 90° elbows directly into pump inlet.
2. Flooded suction systems should have valves installed on suction and discharge pipes for maintenance, however, the suction valve should be no closer than five times the suction pipe diameter as described in this section.
3. Use a check valve in the discharge line when using this pump for any application where there is significant height to the plumbing after the pump.
4. Be sure to install check valves when plumbing in parallel with another pump. This helps prevent reverse rotation of the impeller and motor.

Electrical Installation

⚠WARNING **RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.** This pump must be installed by a licensed or certified electrician or a qualified service professional 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 users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pump at the circuit breaker before servicing the pump. Failure to do so could result in death or serious injury to service people, users or others due to electric shock.

Read all servicing instructions before working on the pump.

Note: ALWAYS reinstall the drive lid onto the field wiring compartment when leaving the pump unsupervised during servicing. This will prevent foreign matter (i.e. rainwater, dust, etc.) from accumulating in the drive.

Note: When connecting the pump to an automation system, continuous power must be supplied to the pump by connecting it directly to the circuit breaker. When using an automation system, be sure that no other lights or appliances are on the same circuit.

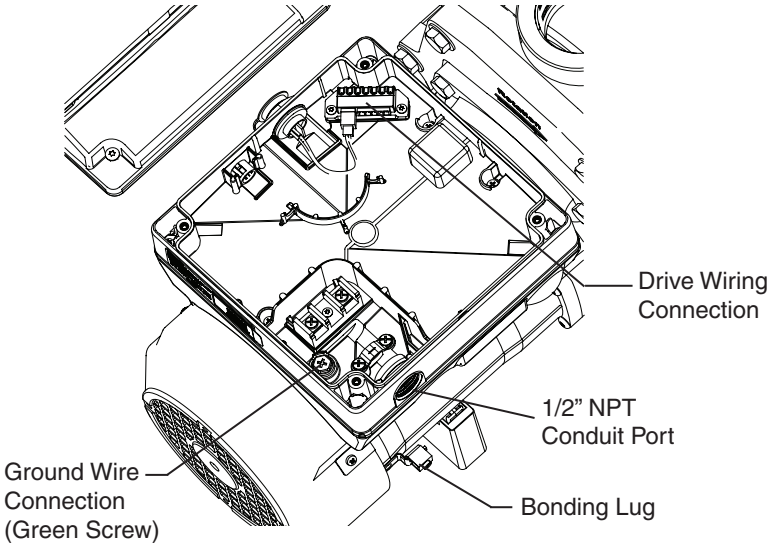
Wiring

1. Be sure all electrical breakers and switches are turned off before wiring motor.

   ⚠WARNING **STORED CHARGE** - Wait at least sixty (60) seconds before servicing.

2. Be sure that the supply voltage meets the requirements listed on the motor nameplate. If these requirements are not met, permanent damage may occur.
3. For wiring sizes and general guidelines for proper electrical installation, please follow the specifications defined in the National Electric Code and any local codes as required.
4. Use strain relief and be sure all electrical connections are clean and tight.
5. Cut the wires to the appropriate length so they do not overlap or touch when connected.
6. Reinstall the keypad after wiring the pump by plugging the cover back into the drive wiring connection and re-seating the keypad in the desired orientation with the four (4) corner screws.

   Note: Ensure that the keypad cable is not pinched between the drive and keypad during re-seating.



Field Wiring Compartment

Grounding

1. Permanently ground the drive using the green ground screw, as shown below. Use the correct wire size and type specified by National Electrical Code. Be sure the ground wire is connected to an electrical service ground.
2. The pump should be permanently connected to either a circuit breaker, 2-pole timer or 2-pole relay.

   Note: If AC power is supplied by a GFCI circuit breaker, the pump should be wired on its own independent circuit **unless the pump is operated in tandem with a Pentair salt chlorine generator.**

Bonding

1. Bond the motor to the structure in accordance with the National Electrical Code. Use a solid copper bonding conductor not smaller than 8 AWG. For Canadian installations, a 6 AWG or larger solid copper bonding conductor is required. Run a wire from the external bonding screw or lug to the bonding structure.
2. Connect the wire from the accessible bonding lug on the motor to all metal parts of the swimming pool, spa, or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet (1.52 meters) of the inside walls of the swimming pool, spa, or hot tub. Run a wire from the external bonding screw or lug to the bonding structure.

Note: When the pump is started and stopped by removing power with a relay or timer, a two-pole device should be used to apply and remove power to both POWER LINE TERMINALS.

Pentair offers 2-Pole 20 Amp GFCI breakers (P/N PA220GF) which offer personnel protection while meeting 2008 to current NEC Standards for Pool Pumps.

Connecting to an Automation System

All IntelliFlo and IntelliPro pumps, including the IntelliFlo® VSF Variable Speed and Flow Pump, are compatible with Pentair Automation Systems.

An RS-485 communication cable is provided with the pump and will be used to connect the pump to a Pentair automation system.

Refer to the automation system manual for further details on how to connect and use the system with your variable speed pump.

⚠WARNING An IntelliTouch® Control System with firmware 1.170 or earlier will display "VSF+SVRS" in the pump type/selection. While you will choose this option, **the IntelliFlo VSF pump DOES NOT incorporate SVRS entrapment protection.**

OPERATING THE PUMP

NOTE: When setting up the IntelliFlo® VSF Variable Speed and Flow Pump, the user must set the pump's internal clock and establish an operation schedule by following the steps in this manual. Please refer to user's guide sections: 'Set Time' (page 10) and 'Set Programs 1-8 in Schedule Mode' (page 15) to schedule a time to run the pump.

⚠CAUTION This pump is shipped with Priming mode ENABLED. Unless the Priming settings are changed in the menu, **be aware that the pump will speed up to the maximum speed when the pump is powered on for the first time, and the Start/Stop button is pressed.** To change the maximum speed of the pump, refer to page 10.

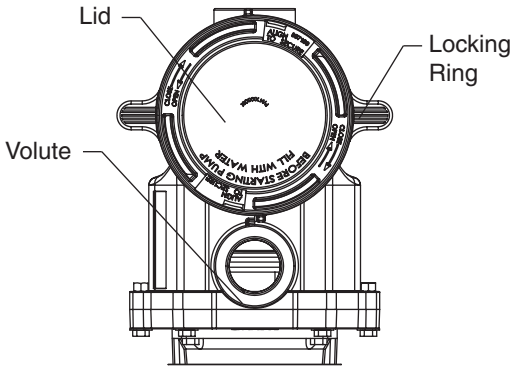
Before turning the pump ON, be sure the following conditions are met:
1. Open filter air relief valve.
2. Open valves.
3. Pool return is completely open and clear of any blockages.
4. Water in the pump basket.
5. Stand clear of the filter or other pressurized vessels.

Priming the Pump

Prime the pump before starting the pump for the first time. Remove the lid and fill the basket with water. The pump basket must be filled with water before initial start up or after servicing.

Follow the steps below to prime the pump for start up:

1. Press **Start/Stop** to stop the pump. Disconnect the pump main power supply and communication cable.
2. Close all valves in suction and discharge pipes. Relieve all pressure from the system.
3. Remove the pump lid and locking ring.
4. Fill the pump strainer pot with water.
5. Reassemble the pump lid and locking ring onto the strainer basket. The pump is now ready to prime.
6. Open all valves in suction and discharge pipes.
7. Open the filter air relief valve and stand clear of the filter.
8. Connect power to the pump. Be sure green power light is on.
9. Press **Start/Stop** to start the pump. The pump will enter into priming mode (if enabled) and speed up to the maximum speed set in the pump menu settings.
10. When water comes out of the filter air relief valve, close the valve. The system should now be free of air and recirculating water to and from the pool
11. Do not allow your pump to run longer than 30 minutes time without developing full flow. If the pump does not prime, check your priming settings on the control panel or see the "Troubleshooting" section on pages 25-27.



Top View

Priming Features

The default priming setting is ENABLED.
The pump also allows you to set the following from the operator control panel:

- Priming speed
- Priming range (1-10)
- Priming delay

Set up instructions on page 19.

⚠CAUTION Do not add chemicals to the system directly in front of pump suction. Adding undiluted chemicals may damage the pump and will void the warranty.

⚠CAUTION This is a variable speed pump. Typically the lower speeds are used for filtration and heating. The higher speeds can be used for spa jets, water features, and priming.

⚠CAUTION DO NOT run the pump dry. If the pump is run dry, the mechanical seal will be damaged and the pump will start leaking. If this occurs, the damaged seal must be replaced. ALWAYS maintain proper water level in your pool (half way up skimmer opening). If the water level falls below the skimmer opening, the pump will draw air through the skimmer, losing the prime and causing the pump to run dry, resulting in a damaged seal. Continued operation in this manner could cause a loss of pressure, resulting in damage to the pump case, impeller and seal and may cause property and personal injury.

Using the Operator Control Panel

Use the operator control panel to start and stop the IntelliFlo® VSF Variable Speed and Flow Pump, set, and change programs, and access pump features and settings.

Controls and LEDs on Keypad

① **Button 1:** Press to select Program 1 (750 RPM). LED on indicates Program 1 is active.

② **Button 2:** Press to select Program 2 (1500 RPM). LED on indicates Program 2 is active.

③ **Button 3:** Press to select Program 3 (2350 RPM). LED on indicates Program 3 is active.

④ **Button 4:** Press to select Program 4 (3110 RPM). LED on indicates Program 4 is active.

⑤ **Back:** Goes one step back in menu; exits without saving current setting.

⑥ **Save:** Saves current menu item setting. When a parameter has been adjusted the "Save?" icon will be displayed.

⑦ **Menu:** Accesses the menu items when and if the pump is stopped.

⑧ **Select:** Press to select the currently displayed option on the screen.

⑨ **Arrow buttons:**

- **Up arrow:** Move one level up in the menu or increase a digit when editing a setting.
- **Down arrow:** Move one level down in the menu or decrease a digit when editing a setting.
- **Left arrow:** Move cursor left one digit when editing a setting.
- **Right arrow:** Move cursor right one digit when editing a setting.

⑩ **Quick Clean:** Pump increases to a higher RPM (for vacuuming, cleaning, adding chemicals, etc.). LED light is on when active.

⑪ **Time Out:** Allow the pump to remain in a stopped state for a set period of time before resuming normal operation. LED is on when active.

⑫ **Start/Stop button:** To start or stop the pump. When LED is on, the pump is running or in a mode to start automatically.

⑬ **Reset button:** Reset alarm or alert.

⑭ **LEDs:**

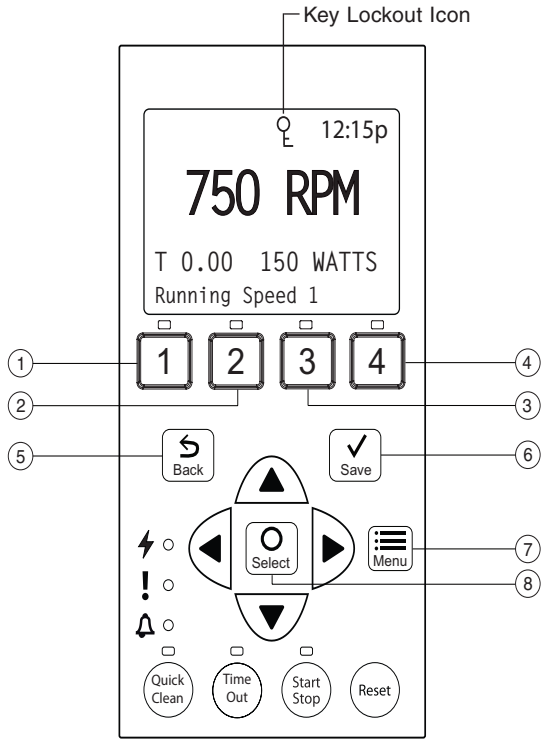
On: Green light when pump is powered on.

Warning: On if warning condition is present. *See "Alerts and Warnings" on page 25.*

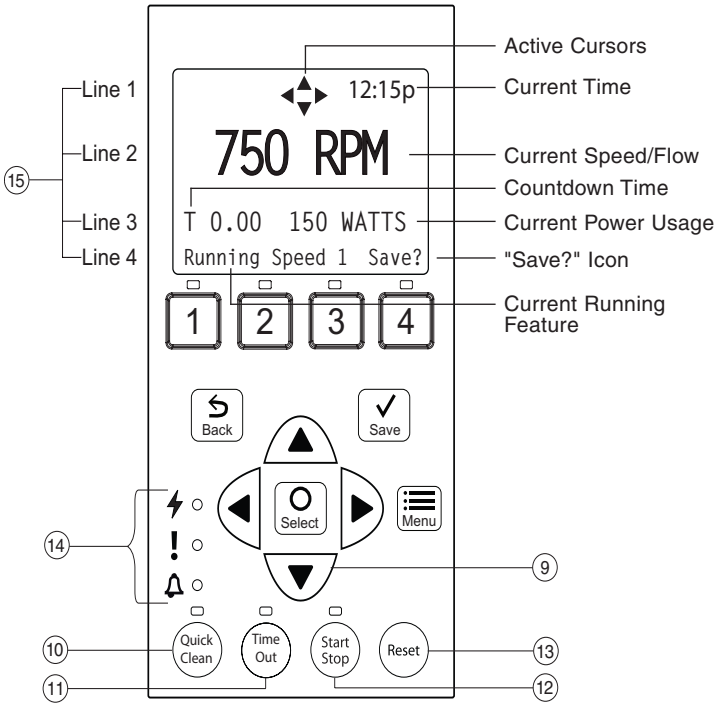
Alarm: Red LED on if alarm condition occurs. *See "Alerts and Warnings" on page 25.*

⑮ **Control Panel LCD Screen:**

- **Line 1:** Key icon indicates password protection mode is active. If password protect is not enabled, no key icon is displayed. Also shows current time of day. Active cursors display when arrow key input is available.
- **Line 2:** Displays current pump speed/flow (RPM/GPM).
- **Line 3:** Countdown time and watts
- **Line 4:** Current pump status and current feature. "Save?" will display on this line when a parameter adjustment can be saved.



Control Panel #1-8



Control Panel #9-15

Note: Always close the keypad cover after using the keypad.

Note: Using screwdrivers or pens to program the pump will damage the keypad overlay. Use your fingers only when programming the pump.

Stopping and Starting the Pump

Starting the Pump

1. Be sure the pump is powered on and the green power LED is on.
2. Select one of the program buttons, then press the **Start/Stop** button (LED on) to start the pump. The pump will go into priming mode if priming feature is enabled.

Stopping the Pump

1. Press **Start/Stop** to stop the pump.

When servicing equipment (filters, heaters, chlorinators etc.), disconnect the communication cable, and switch OFF circuit breaker to remove power from the pump.

Note: The pump can automatically restart if the communication cable is connected.

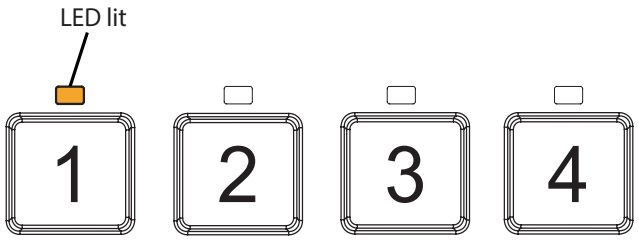
Adjusting and Saving a Pump Speed/Flow

1. While the pump is running, press the **Up** or **Down** arrow to adjust to desired speed or flow setting.
2. Press and hold down a **Program** button (1-4) for three (3) seconds to save speed/flow to the button or press **Save** to save the speed/flow.

Operating the Pump at Preset Speeds

The pump is programmed with four default speeds of 750, 1500, 2350 and 3110 RPM. Program buttons 1-4 are for each of the preset speeds as shown below.

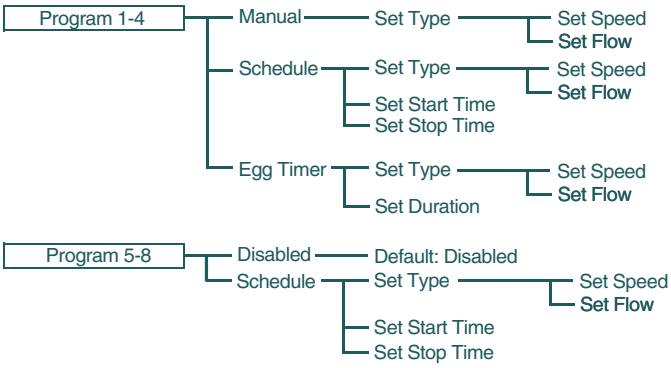
1. Be sure the pump is powered on and the green power LED is on.
2. Press the **Program** button (1- 4) corresponding to the desired preset speed and release quickly. The LED above the button will turn on.
3. Press **Start/Stop**. The pump will quickly change to the selected preset speed.



Pump Operating Modes

The IntelliFlo® VSF Variable Speed and Flow Pump can be programmed in three different modes:

Programs 1-4 can be programmed in all three modes. Programs 5-8 can only be programmed in Schedule mode since there are no buttons on the control panel for Programs 5-8. The default setting for Programs 5-8 is “Disabled”.



Program Menu Tree Options

Manual

Assigns a speed or flow to one of the four Program buttons on the control panel. This mode can only be used for programs 1-4. Programs 1 and 2 are Manual by default.

To operate in Manual mode, press one of the four program buttons and then press the **Start/Stop** button. The pump will run the assigned speed or flow assigned to that program button.

Egg Timer

Programs 1-4 can be programmed to run at a certain speed or flow and for a duration of time once a program button is pressed.

Programs 3 and 4 are Egg Timers by default. If you desire a different method of operation, programs 3 and 4 can be changed to Manual mode in the control menu.

To operate in Egg Timer mode, press a program button and then press **Start/Stop**. The pump will run that setting for the set amount of time and then turn off.

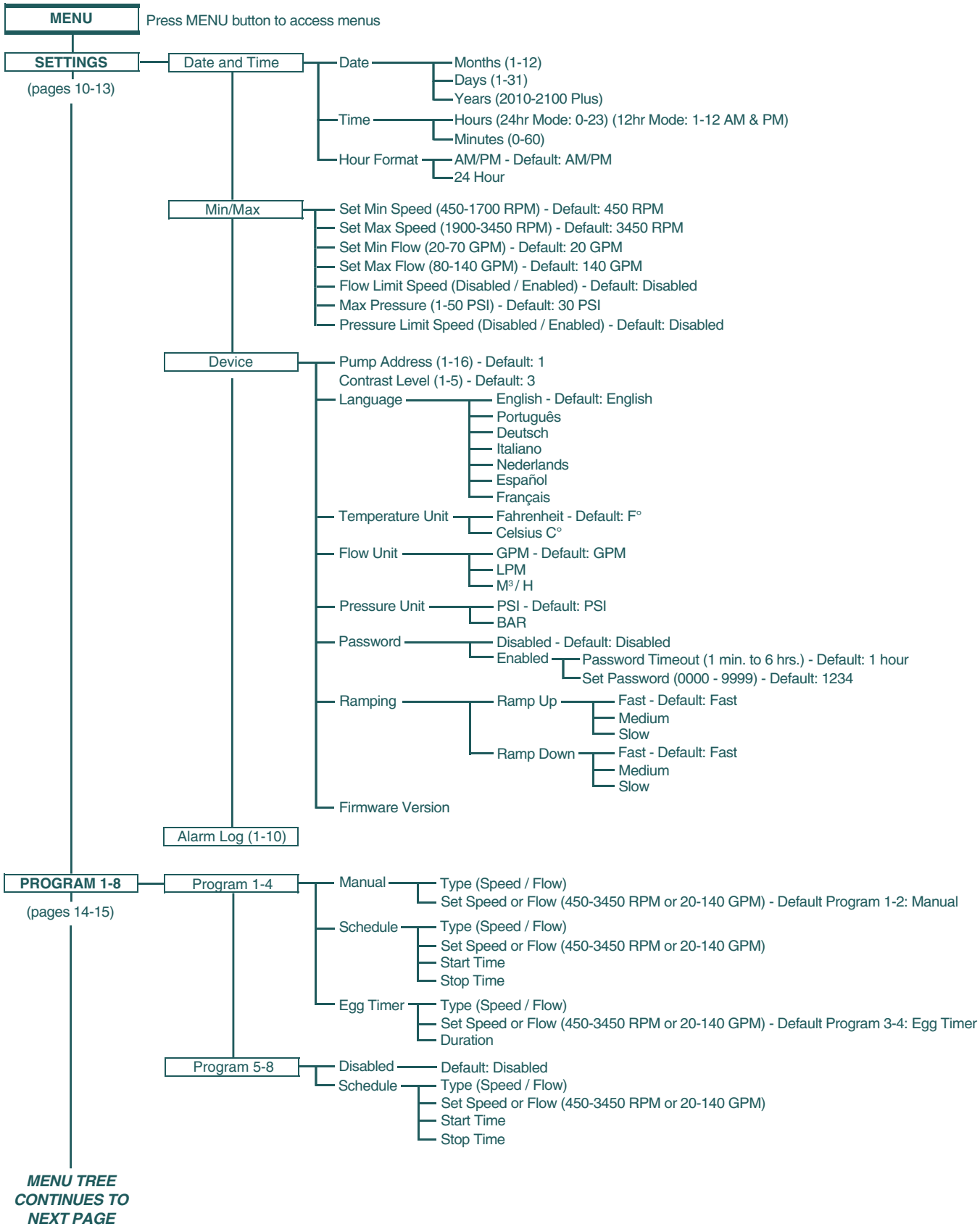
Schedule

Programs 1-8 start and stop at a specific time during a 24 hour period. Speeds or flows programmed in Schedule mode will override any manually selected speed or flow once the next Schedule command commences.

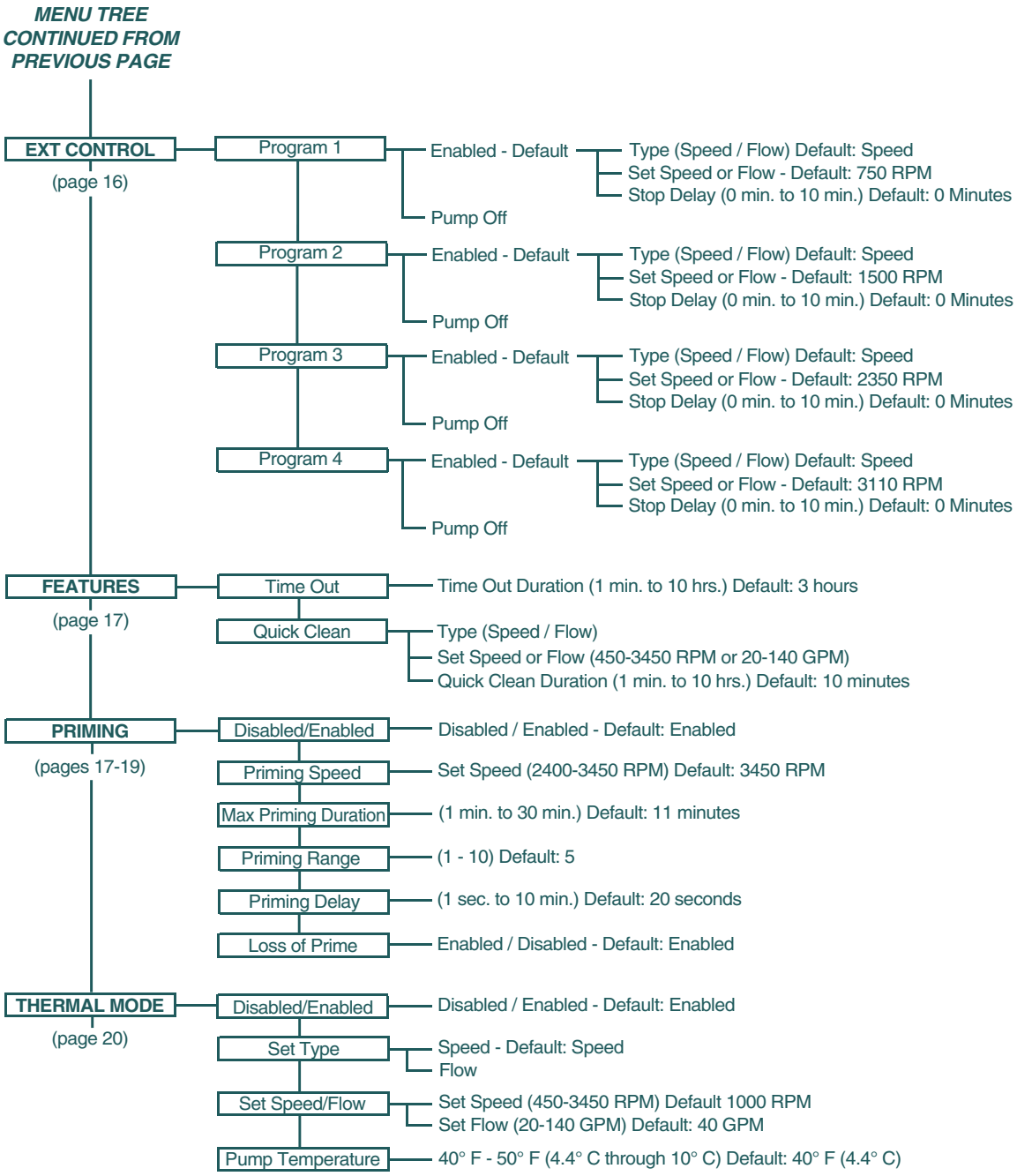
Program Types

This pump can run saved programs at either constant speeds or constant flow rates. This gives the user the ability to precisely assign the output from the pump so that no energy is wasted and the job is completed accurately.

Operator Control Panel: Pump Menu Guide



Operator Control Panel: Pump Menu Guide (cont.)



Pump Menu: Settings

Set Date and Time

The time controls all scheduled times, functions, and programmed cycles and stores the correct time for up to 96 hours after power is turned off. Reset if the power is off longer than 96 hours.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Date and Time”. Press **Select**.
5. Press **Select** again and use **Up** or **Down** arrows to set the date.
6. Press **Save** to save user input and return to "Date and Time."
7. Use the **Up** or **Down** arrows to scroll to “Time”. Press **Select**.
8. Use the **Up** or **Down** arrows to scroll to edit the time.

   Note: To set AM/PM or a 24 hour clock see the next section "Set AM/PM or 24 Hour Clock."
9. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
10. Press **Back** to exit.

Set AM/PM or 24-Hour Clock

To change the time from a 12 hour clock (AM/PM) to a 24 hour clock:

1. Press **Menu**.
2. Press **Select** to select “Settings”.
3. Use the **Up** or **Down** arrows to scroll to “Date and Time". Press **Select**.
4. Use the **Up** or **Down** arrows to scroll to "AM/PM". Press **Select**.
5. Use the **Up** or **Down** arrows to scroll to choose between 24 hr. and AM/PM.
6. Press **Save** to save. To cancel any edits, press **Back** to exit without saving.
7. Press **Back** to exit.

Set Minimum Speed (RPM)

The minimum pump speed can be set from 450 RPM to 1700 RPM. The default setting is 450 RPM.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Min/Max”. Press **Select**.
5. Use the **Up** or **Down** arrows to scroll to “Set Min Spd”.
6. Press **Select** to change the setting. The cursor will appear in the first number column (ones).
7. Press the **Up** or **Down** arrows to edit the minimum speed setting from 450 to 1700 RPM.
8. Press **Save** to save. To cancel, press **Back** to exit edit mode without saving.
9. Press **Back** to exit.

Set Maximum Speed (RPM)

The maximum speed can be set from 1900 RPM to 3450 RPM (default is 3450). Use this setting to set the maximum running speed of the IntelliFlo® VSF Variable Speed and Flow Pump.

Note: Maximum and minimum speed settings, and the associated alarms, remain active when in Flow mode.

1. Check that the green power LED is on.
2. Press **Menu.**
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Min/Max”. Press **Select**.
5. Use the **Up** or **Down** arrows to scroll to “Set Max Spd”.
6. Press **Select** to change. The cursor will appear in the first number column (ones).
7. Press **Up** or **Down** arrows to edit the maximum speed setting from 1900 to 3450 RPM.
8. Press **Save** to save. Press **Back** to exit. To cancel, press the **Back** to exit without saving.

Note: Maximum Speed will limit Priming Speed, except in one case. If the Maximum Speed is set below the lowest available Priming Speed (2400 RPM) then the pump will exceed the Maximum Speed while the priming feature is running. This prevents the pump from having trouble priming if the Maximum Speed is set this low. If this is a problem, priming can be disabled in the Priming Menu (see “Priming” section on page 17).

Set Minimum Flow Rate (GPM)

The minimum programmed flow rate can be set from 20 GPM to 70 GPM.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Min/Max” and press **Select**.
5. Use the **Up** or **Down** arrows to scroll to “Set Minimum Flow”.
6. Press **Select** to change the setting. The cursor will appear in the first number column (ones).
7. Press the **Up** or **Down** arrows to edit the minimum flow rate setting from 20 to 70 GPM.
8. Press **Save** to save. To cancel, press **Back** to exit edit mode without saving.
9. Press **Back** to exit.

Pump Menu: Settings

Set Maximum Flow Rate (GPM)

The maximum programmed flow rate can be set from 80 GPM to 140 GPM.

Note: Maximum and minimum speed settings, and the associated alarms, remain active when in Flow mode.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Min/Max”. Press **Select**.
5. Use the **Up** or **Down** arrows to scroll to “Set Maximum Flow”.
6. Press **Select** to change the setting. The cursor will appear in the first number column (ones).
7. Press the **Up** or **Down** arrows to edit the maximum flow rate setting from 80 to 140 GPM.
8. Press **Save** to save. To cancel, press **Back** to exit edit mode without saving.
9. Press **Back** to exit.

Set Flow Limit for Speed Program

The flow limit in constant speed program type is disabled by default. This setting allows the user to ensure that the drive does not exceed the flow rate output that is set when they are operating in a constant speed mode. The system may change during a run at a constant speed that would increase the flow rate, it this feature is enabled then the pump will automatically limit itself to keep below the previously set Maximum Flow Rate.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Min/Max” and press **Select**.
5. Use the **Up** or **Down** arrows to scroll to “Flow Limit (Speed)”.
6. Press **Select** to move the cursor over the "Disabled".
7. Press and the **Up** or **Down** arrows to change it to "Enabled".
8. Press **Save** to save. To cancel, press **Back** to exit edit mode without saving.
9. Press **Back** to exit.

Set Maximum System Pressure

The maximum pressure can be set using the drive, so that the pump does not exceed a set system pressure level when it is asked to do a high power job, or if the system changes during normal operation. This gives the user a better way than Maximum Speed to limit the output of their pump. If the system is less restrictive, then the pump is still capable of the higher flow rates than it would have been if the user had used a speed limit, but the pressure is still limited where the user needed it to be limited.

The pressure is the total system head, so it is a product of the suction pressure and the discharge pressure. The calculated value is equivalent to Total Dynamic Head (TDH). This value may not correspond with the filter's pressure reading, because it is the TDH across the pump and not the local pressure of the filter.

When the pump is running a Flow Program, it will always attempt to reach the set flow no matter what the system setup is. If the system pressure changes during the run (such as from filter dirt loading, or manually changing a valve position), the drive adjusts motor RPM to maintain a consistent flow rate.

In some cases the newly requested motor speed will increase the discharge pressure in order to maintain the requested flow rate. While maintaining the flow rate, the drive will remain within the pressure and speed limits set within the Min/Max menu. If the pump meets one of the limits, it will continue to run at the limit and the warning light will illuminate. The limit warning will be displayed on the bottom of the drives' keypad screen indicating that the requested flow rate is not being achieved and which limit that the drive is running into.

When the pump is running a Speed Program, the drive is not monitoring the flow or pressure limits by default. These features need to be Enabled in the Min/Max menu.

To Set Maximum System Pressure:

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Min/Max”. Press **Select**.
5. Use the **Up** or **Down** arrows to scroll to “Set Maximum Pressure”.
6. Press **Select** to change the setting. The cursor will appear in the first number column (ones).
7. Press the **Up** or **Down** arrows to edit the maximum flow rate setting from 1 to 50 PSI.
8. Press **Save** to save. To cancel, press **Back** to exit edit mode without saving.
9. Press **Back** to exit.

Pump Menu: Settings

Set Pressure Limit for Speed Program

While Pressure Limit is active whenever the pump is operating a Flow type of program, the pressure limit is disabled by default when running the pump in a constant speed mode. Enabling this feature will make sure that the drive is monitoring the system pressure when operating in constant speed mode also.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Min/Max”. Press **Select**.
5. Use the **Up** or **Down** arrows to scroll to “Press Limit (Speed)”.
6. Press **Select** to move the cursor over the "Disabled".
7. Press and the **Up** or **Down** arrows to change it to "Enabled".
8. Press **Save** to save. To cancel, press **Back** to exit edit mode without saving.
9. Press **Back** to exit.

Pump Address

Use this setting if your pump is connected via the RS-485 COM port to a Pentair automation system.

The default pump address is #1 and only needs to be changed when there is more than one pump on an automation system. Change the address to allow the automation system to send a command to the correct pump. The pump address can be set from 1-16.

Refer to the automation system manual for further details on how to connect and use an automation system with your variable speed pump.

1. Be sure the green power LED is on and the pump is stopped.
2. Press **Menu.**
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Device”. Press **Select**.
5. Use the **Up** or **Down** arrows to scroll to “Pump Address”. Press **Select**.
6. Press **Up** or **Down** arrows to change the address number from 1-16.
7. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
8. Press **Back** to exit.

Set Screen Contrast

The default contrast setting for the LCD screen is 3. Screen contrast levels can be adjusted from 1 to 5 units for low or high lighting conditions.

Note: Changes to the contrast setting do not update instantaneously. Changes to this setting must be saved before the contrast level changes.

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrow to scroll to “Device”. Press **Select**.
5. Use the **Up** or **Down** arrow to scroll to “Contrast Level."
6. Press **Select**. Screen will show current contrast setting number. Use **Up** or **Down** to change number.
7. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
8. Press the **Back** button to exit.

Set Control Panel Language

To access the language menu:

1. Check that the green power LED is on.
2. Press **Menu** and press **Select** to select “Settings”.
3. Use the **Up** or **Down** arrows and scroll to “Device”. Press **Select**.
4. Use the **Up** or **Down** arrows to scroll to “Select Language". Press **Select**.
5. Use the **Up** or **Down** arrows to choose the desired language.
6. Press **Save** to select the control panel language. To cancel any changes, press **Back** to exit without saving.
7. Press **Back** to exit.

Set Temperature Unit

The default setting is Fahrenheit (°F). The pump can be set to either Celsius (°C) or Fahrenheit (°F).

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select “Settings”.
4. Use the **Up** or **Down** arrows to scroll to “Device” menu item. Press **Select**.
5. Use **Up** or **Down** arrows to scroll to "Temperature Units". Press **Select**.
6. Use **Up** or **Down** arrows to choose Celsius (°C) or Fahrenheit (°F).
7. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.
8. Press **Back** to exit.

MENU

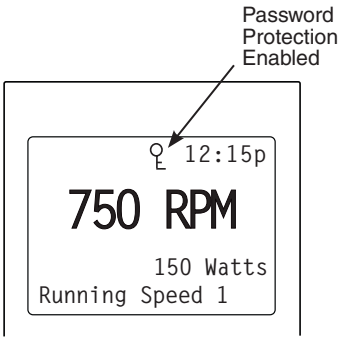
SETTINGS — **Pump Menu: Settings**

Password Protection

The default setting for password protection is disabled. When this feature is enabled, the pump display will prompt for the password before allowing access to the control panel and buttons.

The entered password is any combination of four (4) digits.

- The pump can always be stopped by pressing **Start/Stop**, even when password protection is enabled.
- If the pump is stopped, the pump cannot be turned back on with **Start/Stop** while running in manual mode.
- Pressing **Start/Stop** when the pump is off will return it back to the Running Cycles Mode and run at the next scheduled run time. If the present time is within the scheduled run time, the pump will run the scheduled speed.
- All functions including programming are disabled in Password Protection Mode.
- Screen will read "Enter Password" if any button other than the **Start/Stop** button is pressed
- Key icon displayed in the upper left side of the screen when Password Protection is on.



Setting Password

1. Check that the green power LED is on.
2. Press **Menu**. Press **Select** to select "Settings".
3. Use the **Up** or **Down** arrow to scroll to "Device". Press **Select.**
4. Press **Up** or **Down** arrow to scroll to "Password". Press **Select.**
5. The default setting is "Disabled". Press **Up** or **Down** arrow to change the setting to "Enabled". Press **Save** to save.
6. Press the **Down** arrow. "Password Timeout" will be displayed. The factory default time is 1 hour. This means the IntelliFlo® VSF Variable Speed and Flow Pump will go into Password Protection mode 1 hour after the last control panel key is pressed.
7. Press **Select** to enter edit mode. Use the **Up** or **Down** arrow to edit the time setting from 1 minute to 6 hours and press **Save** to save setting.
8. Press the **Down** arrow and then press **Select** on "Set Password" to change the setting.
9. Press the **Left** or **Right** arrows to move cursor and press the **Up** or **Down** arrow to change the password number to desired setting.
10. Press **Save** to save. To cancel any changes, press **Back** to exit without saving.

Entering Password

1. Press any button (besides the program buttons) to prompt the screen for a password.
2. To enter password, use the **Left** and **Right** arrows to move the cursor and the **Up** and **Down** arrow button to scroll through the digit then press **Save** to confirm.

Set Ramping Rate

The rate that the drive changes the motor speed can be reduced for smoother operation. This setting increases or decreases how quickly the pump can ramp up or down between two speeds. Rates can be set and adjusted for ramping up and ramping down individually.

If the **Start/Stop** button is ever pressed, the motor will immediately stop and will not follow the programmed ramping rate. The default setting is Fast, which is the traditional IntelliFlo ramping rate. Medium will take twice as long to change speeds, and Slow will take three times as long.

To Set Ramping Rate:

1. Check that the green power LED is on.
2. Press **Menu**.
3. Press **Select** to select "Settings".
4. Use the **Up** or **Down** arrow to scroll to "Device". Press **Select**.
5. Use the **Up** or **Down** arrow to scroll to "Ramping". Press **Select**.
6. Use the **Up** or **Down** arrow to scroll to "Ramp Up". Press **Select** and use the **Up** or **Down** arrow to choose between "Fast", Medium or "Slow". Press **Save**.
7. Use the **Up** or **Down** arrow to scroll to "Ramp Down". Press **Select** and use the **Up** or **Down** arrow to choose between "Fast", Medium or "Slow". Press **Save**.

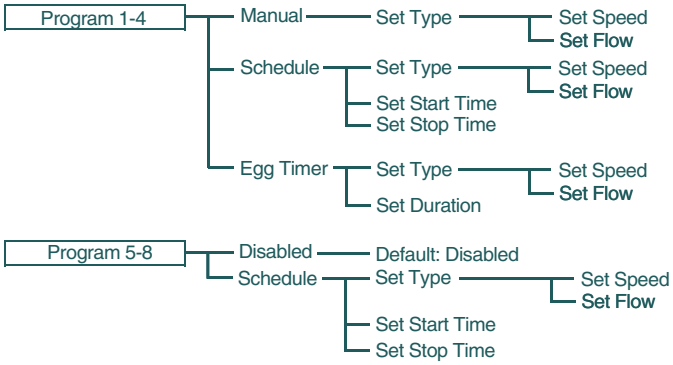
MENU

PROGRAM 1-8 — **Pump Menu: Programs 1-8**

Pump Operating Modes

This pump can be programmed in three different modes:

Programs 1-4 can be programmed in all three modes. Programs 5-8 can only be programmed in Schedule mode since there are no buttons on the control panel for Programs 5-8. The default setting for Programs 5-8 is “Disabled”.



Program Menu Tree Options

Manual

Assigns a speed or flow to one of the four Program buttons on the control panel. This mode can only be used for programs 1-4. Programs 1 and 2 are Manual by default.

To operate in Manual mode, press one of the four program buttons and then press the **Start/Stop** button. The pump will run the assigned speed or flow assigned to that program button.

Egg Timer

Programs 1-4 can be programmed to run at a certain speed or flow and for a duration of time once a program button is pressed.

Programs 3 and 4 are Egg Timers by default. If you desire a different method of operation, programs 3 and 4 can be changed to Manual mode in the control menu.

To operate in Egg Timer mode, press a program button and then press **Start/Stop**. The pump will run that setting for the set amount of time and then turn off.

Schedule

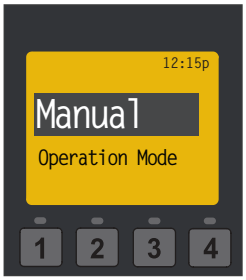
Programs 1-8 start and stop at a specific time during a 24 hour period. Speeds or flows programmed in Schedule mode will override any manually selected speed or flow once the next Schedule command commences.

Set Programs in Manual Mode (Programs 1-4 Only)

1. Press **Menu**.
2. Use **Up** or **Down** arrows to scroll to “Program 1-8”, then press **Select**.
3. Use **Up** or **Down** arrows to find the program (1-4) you wish to edit, then press **Select**.
4. "Operation Mode" will display. Press **Select** and use the **Up** or **Down** arrow to scroll to "Manual". Press **Save**.
5. Use the **Up** or **Down** arrow to scroll to "Set Type". Press **Select** and use the **Up** or **Down** arrow to choose between "Speed" or "Flow". Press **Save**.
6. Use the **Up** or **Down** arrow to scroll to "Set Speed/ Flow". Press **Select** and use the **Up** or **Down** arrow to adjust the speed or flow settings.
7. Press **Save** to save the new speed or flow setting.

Set Programs in Egg-Timer Mode (Programs 1-4 Only)

1. Press **Menu**.
2. Use **Up** or **Down** arrows to scroll to “Program 1-8”, then press **Select**.
3. Use **Up** or **Down** arrows to find the program (1-4) you wish to edit, then press **Select**.
4. "Operation Mode" will display. Press **Select** and use the **Up** or **Down** arrow to scroll to "Egg Timer". Press **Save**.
5. Use the **Up** or **Down** arrow to scroll to "Set Type". Press **Select** and use the **Up** or **Down** arrow to choose between "Speed" or "Flow". Press **Save**.
6. Use the **Up** or **Down** arrow to scroll to "Set Speed/ Flow". Press **Select** and use the **Up** or **Down** arrow to adjust the speed or flow settings. Press **Save**.
7. Now press the **Down** arrow ("Egg Timer Duration" will display) and press **Select** to change. Use the **Up** or **Down** arrows to adjust the time.
8. Press **Save** to save the new time setting.



Manual Mode Menu Screen

Egg Timer Menu Screen

MENU

PROGRAM 1-8 — **Pump Menu: Programs 1-8**

Set Programs 1-8 in Schedule Mode

In Schedule mode, Programs 1-8 can be programmed to run a certain speed or flow at a certain time of day. To run a scheduled speed or flow, press **Start/Stop**. The screen will display "Running Schedules" when it is ready to run a scheduled speed/flow. If **Start/Stop** is pressed while a scheduled speed/flow is running, the pump will stop running the scheduled speed/flow. The pump will not continue to run the scheduled speed/flow until the **Start/Stop** button is pressed again.

1. Press **Menu**.
2. Use **Up** or **Down** arrows to scroll to "Program 1-8", then press **Select**.
3. Use **Up** or **Down** arrows and press **Select** for the speed you wish to set and schedule.
4. "Operation Mode" will display. Press **Select** and use the **Up** or **Down** arrow to scroll to "Schedule". Press **Save**.
5. Use the **Up** or **Down** arrow to scroll to "Set Type". Press **Select** and use the **Up** or **Down** arrow to choose between "Speed" or "Flow". Press **Save**.
6. Use the **Up** or **Down** arrow to scroll to "Set Speed/Flow". Press **Select** and use the **Up** or **Down** arrow to adjust the speed or flow settings.
7. Press **Save** to save the new speed or flow setting.
8. Press the **Down** arrow again, "Start Time" will display. Press **Select** - the cursor will highlight the minute column.
9. Use the **Up** or **Down** arrow to change the time and the **Left** or **Right** arrow to move cursor from minutes to hours.
10. Press **Save** to save the new start time setting.
11. Press **Down** arrow - "Stop Time" will display. Press **Select**. Repeat Steps 8-9 to set stop time.
12. Press **Save** to save the new stop time setting.
13. Press **Start/Stop**.

The IntelliFlo® VSF Variable Speed and Flow Pump will prime and begin to run the programmed schedule at the specified start time.

When running in Schedule or Egg Timer mode, the countdown time (T 00:01) showing the hours and minutes remaining is displayed.

Programming Schedule for Constant Run

Two programs cannot be programmed with the same start and stop times. To run a program without stopping, set the Start time one minute after the stop time.

Example: A single program will run non-stop if programmed with a Start Time of 8:00 AM and a Stop time of 7:59 AM.

Note: The pump will not run the scheduled speeds or flows until the **Start/Stop** button is pressed (LED on) to place the pump in Schedule mode.

Scheduled Program Priority

When operating the pump in Schedule mode it is important to keep each program within its own individual run time. If program run times overlap the pump will prioritize programs as explained below:

Schedule priorities are in descending order as follows: Highest Flow » Lowest Flow » Highest Speed » Lowest Speed

- When two speed ***OR*** two flow program schedules overlap, the pump will run the higher RPM Speed or GPM Flow regardless of program in use.
- When both a speed ***AND*** flow program schedule overlap the pump will run the flow program first.
- A manual or egg timer command takes precedent over a running schedule. The manual or egg timer command will operate until completed, unless the next schedule program takes place or another command is given.

Pump Menu: External Control

External Control

This function is for programming speeds or flows that will run when the IntelliComm® Communication Center sends it a command. For example, Terminal 3 and 4 in the IntelliComm system will correspond to External Control Program #1. (5 and 6 to Ext Ctrl #2).

The Stop Delay feature allows the user to program the pump to run a Program after the External Control has been deactivated. This feature can be used to provide a cooling down period for the pump after a trigger signal from an installed heater has been deactivated. Each individual Program can have a Stop Delay of 1 to 10 minutes programmed.

Use the External Control feature to program the IntelliComm system power center.

External Control can also be used for disabling the pump by choosing "Pump Off" when selecting an operation mode. If this program is triggered via external control the pump will stop running for as long as the program is active. This feature could be useful for demand response systems using an IntelliComm to communicate with the pump.

To access the External Control menu:

1. Check that the green power LED is on.
2. Press the **Menu** button.
3. Use **Up** or **Down** arrow to scroll to “Ext. Ctrl.”. Press **Select**.
4. “Program 1” will display. Press **Select** to enter the Program 1 menu.
5. "Operation Mode" will display. Press **Select** and use the **Up** or **Down** arrows to choose between "Enabled" or "Pump Off". Press **Save**.

   Note: The program you are attempting to edit must be enabled in order to proceed further into the menu.
6. Use the **Up** or **Down** arrow to scroll to "Set Type". Press **Select.**
7. Use the **Up** or **Down** arrow to choose between "Speed" or "Flow". Press **Save**.
8. Use the **Up** or **Down** arrow to scroll to "Set Speed/Flow". Press **Select** and use the **Up** or **Down** arrow to adjust the speed or flow settings. Press **Save**.
9. If you do not wish to program a Stop Delay, continue to step 11. If you do wish to program a Stop delay press **Up** or **Down** arrow to scroll to “Stop Delay”. Press **Select**.
10. Use the **Up** or **Down** arrows to change the Stop Delay setting. Stop Delay can be set from 0 minutes (disabled) to 10 minutes.
11. Press **Save** to save the settings.
12. Press **Back** to return to set Program 2.
13. Use **Up** or **Down** arrow to scroll to “Program 2”.
14. Repeat Steps 4 through 11 to set Program 2, 3, and 4.

MENU

FEATURES — **Pump Menu: Features**

Time Out

The Time Out feature keeps the IntelliFlo® VSF Variable Speed and Flow Pump *from running it's programmed speeds or flows for a set duration adjustable in the menu.* The Time Out feature is displayed in hours and minutes (Hrs:Mins).

Once Time Out is finished, the pump will return to its previous mode of operation, the Start/Stop LED will be lit and ready to turn on at the next scheduled run time.

To access the Time Out menu:

1. Check that the green power LED is on.
2. Press **Menu**.
3. Use **Up** or **Down** arrows to scroll to "Features", then press **Select**.
4. Press **Select** to choose "Timeout".
5. "Timeout Duration" will display. Press **Select** to highlight the minutes column.
6. Press the **Left** arrow to move cursor to the hours column. Time out can be set from 1 minute to 10 hours.
7. Press **Save** to save the setting.

   Note: To cancel any changes, press **Back** to exit without saving.
8. Press **Back** to exit the menu.

Quick Clean

This feature can be used to increase the pump speed or flow for the purposes of vacuuming, cleaning, adding chemicals, after a storm for extra skimming capability.

Press the **Quick Clean** button (LED on) and then **Start/Stop** to start. When the Quick Clean cycle is over, the pump will resume regular schedules and return to "Schedule" mode.

To access the Quick Clean menu:

1. Check that the green power LED is on and the pump is stopped.
2. Press **Menu**.
3. Use **Up** or **Down** arrows to scroll to "Features", then press **Select**.
4. Press the **Down** arrow and press **Select** for "Quick Clean".
5. Press **Select** to choose "Set Type". Use the **Up** or **Down** arrow to choose between "Speed" or "Flow". Press **Save**.
6. Use the **Up** or **Down** arrow to scroll to "Set Speed/ Flow". Press **Select** and use the **Up** or **Down** arrow to adjust the speed or flow settings. Press **Save**.
7. Press **Save** to save the speed or flow setting.
8. Press the **Down** arrow and press **Select** for "Time Duration".
9. The cursor will highlight the minutes column. Use **Up** or **Down** arrows to change the time from 1 minute to 10 hours.
10. Press **Save** to save the time.
11. Press **Back** to exit the menu.

MENU

PRIMING — **Pump Menu: Priming**

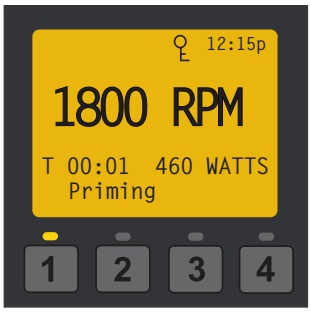
The default setting for Priming is ENABLED. This setting allows the pump to automatically detect if it is primed for startup.

The priming feature increases the pump speed to 1800 RPM and pauses for three (3) seconds. If there is sufficient water flow in the pump basket, the pump will go out of priming mode and run its commanded speed.

If the water flow is not sufficient, the pump speed will increase to the "Priming Speed" setting and remain for the priming delay time (default 20 seconds). If there is sufficient water flow in the pump basket at this time, it will exit priming mode and transition to the commanded speed.

If there is still insufficient flow in the pump basket, as determined by the Priming Range setting, the pump will try to prime at the "Priming Speed" for the amount of time set in the "Maximum Priming Time" menu. Once the pump achieves prime, it will resume normal operation after the preset priming delay.

Note: It is possible to set "Maximum Speed" too low for the pump to properly prime. Maximum Speed will limit Priming Speed, except in one case. If the Maximum Speed is set below the lowest available Priming Speed (2400 RPM) then the pump will exceed the Maximum Speed while the priming feature is running. This prevents the pump from having trouble priming if the Maximum Speed is set this low. If this is a problem, priming can be disabled in the Priming Menu.



Display during priming

Pump Menu: Priming

Priming Features

Disabled/Enabled

Default: ENABLED

Allows IntelliFlo® VSF Variable Speed and Flow Pump to automatically detect if pump if is primed for startup. The pump will speed up to 1800 RPM and pause for three (3) seconds - if there is enough water in the basket, the pump will go out of priming mode and run the commanded speed.

Priming Speed

Default: 3450 RPM

The priming speed can be set between 2400 RPM and 3450 RPM. If the pump is on an equipment pad that is close to the water level, it will not need to run at 3450 RPM to successfully prime. The setting can be lowered to prevent running at a higher speed than necessary.

Day to day factors (i.e. local ambient pressure, water/air temperatures, amount of water retained from last system run) can effect priming performance. Because of the frequently changing nature of these factors the priming speed should be set high enough to accommodate environmental and mechanical changes to ensure that the pump can successfully prime. Finding the most effective and efficient speed for your specific needs may take careful testing and evaluation of priming performance.

Max Priming Duration

Default: 11 minutes

The maximum priming time can be set from 1 - 30 minutes. This setting is the amount of time the pump will try to prime before it gives a priming error. If this occurs, fill the pump basket with water and restart the pump.

Priming Range

Default: 5

Priming range can be set from 1-10. The smaller the range, the more water the pump has to be moving to detect that it is primed. At larger ranges, the pump will detect that it is fully primed while moving less water. If the range is set too high, then the pump may exit Priming mode before it has fully primed. The range will automatically adjust with the priming set speed because the flow rates of the pump will be lower at lower speeds.

Priming Delay

Default: 20 seconds

Priming delay can be set from 1 second to 10 minutes.

When a pump ramps to full priming speed in an attempt to establish a prime, priming delay allows the pump to operate at that speed for an additional set period of time prior to continuing on to the requested or scheduled program.

Loss of Prime

Default: Enabled

This feature allows the pump to recognize unanticipated low-flow or no-flow situations while running a program.

For example, the pump will pause for one (1) minute after detecting that it has lost its prime unexpectedly. After this pause the pump will attempt to prime, and if prime is successful it will continue programmed operation. If priming is not successful the pump will continue attempting to prime, per normal priming operation, until a prime is achieved or priming error occurs and is displayed.

MENU

PRIMING

Pump Menu: Priming

Setting Priming Features

1. Press **Menu**.
2. Use **Down** arrow to scroll to “Priming” and press **Select.**
3. The factory default is set to priming “Enabled“. To disable, scroll to "Disabled" and press **Select**.

   Note: All priming features are only accessible if priming is “Enabled”.
4. Press **Save** if you have changed the setting - this will save the selection.
5. Press the **Down** arrow to scroll to "Set Speed". Press **Select** to edit.
6. Use the **Up** or **Down** arrows to change the speed settings. Press **Save**.
7. Press the **Down** to scroll to “Max Priming Duration”. Press **Select** to edit.
8. Use the **Up** or **Down** arrows to change the time from 1 minute to 30 minutes. Press **Save**.
9. Press the **Down** arrow to scroll to “Priming Range”. Press **Select** to edit.
10. Use the **Up** or **Down** arrows to change from 1 to 10. Increasing the number allows the drive to detect prime with less water flow.
11. Press **Save**.
12. Press the **Down** arrow to scroll to “Priming Delay”. Press **Select** to edit.
13. Use the **Up** or **Down** arrows to change from 1 second to 10 minutes. Press **Save**.

⚠CAUTION Increasing the time causes the pump to stay in the priming mode longer.

14. Press the **Down** arrow to scroll to “Loss of Prime”.
15. The factory default is “Enabled“. To disable, press **Select** to edit and use the **Down** arrow to scroll to "Disabled". Press **Save**.
16. Press **Back** to exit the priming menu.

Disabling Priming with an Automation System

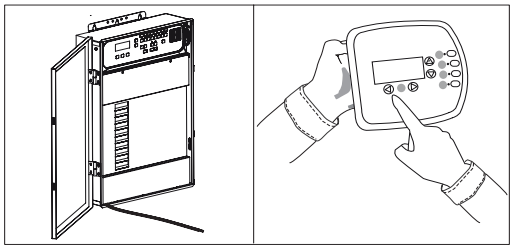
When the IntelliFlo® VSF Variable Speed and Flow Pump is connected to an automation control system, (IntelliTouch®, EasyTouch® or SunTouch® Control Systems), ***the priming feature on the pump cannot be disabled by the external automation control system only. It must also be disabled on the pump itself.***

If priming is enabled on start up, the pump responds to its internal settings *before* responding to commands from an automation control system.

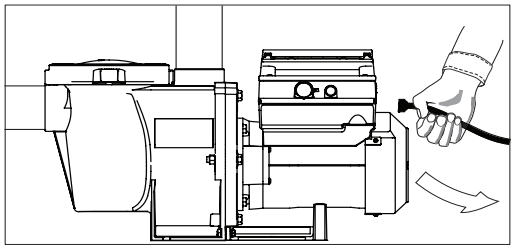
If the pump is connected to an automation control system and priming is not desired, ***disable the priming feature on both the pump and the automation control system.***

To disable priming with an automation system:

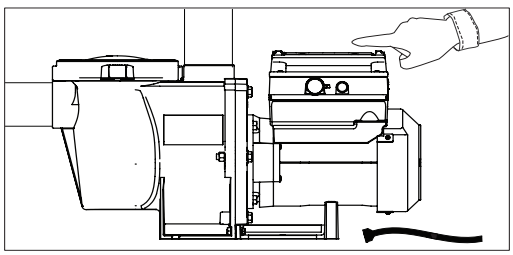
1. Disable the priming feature on the automation control system at the load center or using an IntelliTouch or EasyTouch system remote. (Refer to the automation control system user’s guide for additional information).
2. Temporarily disconnect the RS-485 communication cable.
3. Open the lid to the control panel to disable priming on the pump. Press **Menu**, use the **Arrow** buttons to scroll and select “Priming”, then select “Disabled” (the factory default is set to “Enabled”). Press **Back** to exit the menu.
4. Once priming is disabled, reinstall the RS-485 communication cable.



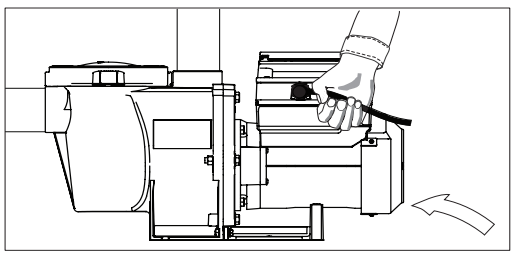
1. Disable priming on automation control system.



2. Disconnect the RS-485 communication cable.



3. Disable priming on pump.



4. Reinstall the RS-485 communication cable.

MENU

THERMAL MODE

Pump Menu: Thermal Mode

The sensor for Thermal Mode is in the drive, on top of the motor. This feature allows you to set a speed (450-3450 RPM) or flow (20-140 GPM) that runs when the IntelliFlo® VSF Variable Speed and Flow Pump goes into Thermal Mode. The temperature level that you wish Thermal Mode to start can also be set.

IMPORTANT: This feature is for protection of the pump. Do not depend on the Thermal Mode feature for freeze protection of the pool. Certain situations could cause the pump to sense a different temperature than actual air temperature.

Your automation systems air temperature sensor should be used to sense actual temperature. For example, if the pump is located indoors, the temperature of the room does not indicate the outdoor temperature. The pump does not sense the water temperature.

To access the Thermal Mode menu:

1. Check that the green power LED is on.
2. Press **Menu**.
3. Use the **Down** arrow to scroll to “Thermal Mode” and press **Select**.
4. The factory default for Thermal Mode is “Enabled“. To disable Thermal Mode, press **Select** to highlight “Enabled”.
5. Press the **Up** arrow - “Disabled” is displayed.
6. Press **Save** to save.

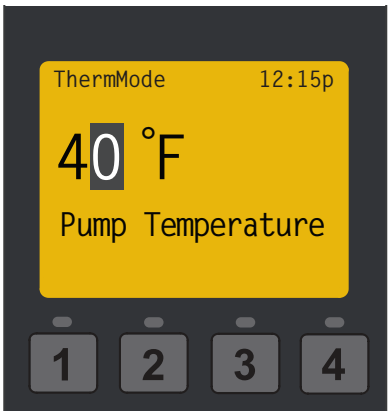
Setting the Thermal Mode Pump Speed

To Set Thermal Mode Speed/Flow and Pump Temperature:

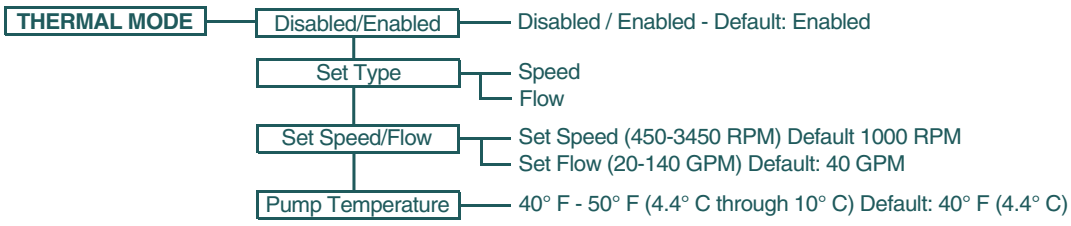
Note: Thermal Mode features are only accessible if Thermal Mode is “Enabled”.

1. Use the **Up** or **Down** arrows to scroll to "Set Type". Press **Select.**
2. Use the **Up** or **Down** arrow to choose between "Speed" or "Flow". Press **Save**.
3. Use the **Up** or **Down** arrow to scroll to "Set Speed/Flow". Press **Select.**
4. Use the **Up** or **Down** arrow to adjust the speed or flow settings. Press **Save**.
5. Press the **Down** arrow. "Temperature" will display. (This value will determine at what temperature the pump will activate Thermal Mode, default is 40° F/4.4° C).
6. Press **Select** to edit. Use the **Up** or **Down** arrow to adjust the settings.
7. Press **Save** to save the temperature setting.

   Note: To cancel any changes, press **Back** to exit without saving.
8. Press **Back** to exit.



Setting the Thermal Mode Pump Temperature



Thermal Mode Menu Options

MAINTENANCE

⚠WARNING **DO NOT** open the strainer pot if IntelliFlo® VSF Variable Speed and Flow Pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, be sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.

⚠CAUTION To prevent damage to the pump and for proper operation of the system, clean pump strainer and skimmer baskets regularly.

Pump Strainer Basket

The strainer basket (or 'strainer pot'), is located in front of the pump housing. The strainer basket must be kept clean and free of debris. Inspect basket through the lid on the top of the housing. Be sure to visually inspect the strainer basket at least once a week. Dirty strainer baskets reduce filter and heater efficiency and put abnormal stress on the pump motor.

Cleaning the Pump Strainer Basket

1. Press **Start/Stop** button on the pump and turn off the pump at the circuit breaker. Disconnect communication cable from pump.
2. Relieve pressure in the system.
3. Turn the lid and locking ring counter-clockwise and remove from the pump.
4. Remove debris and rinse out the basket. Replace the basket if it is cracked.
5. Put the basket back into the housing. Be sure to align the notch in the bottom of the basket with the rib in the bottom of the volute.
6. Fill the pump pot and volute up to the inlet port with water.
7. Clean the lid and locking ring, O-ring, and sealing surface of the pump pot.

   Note: It is important to keep the lid O-ring clean and well lubricated.
8. Reinstall the lid by placing the locking ring and lid on the pot. Be sure the lid O-ring is properly placed.

   Seat the locking ring and lid on the pump then turn clockwise until the locking ring handles are perpendicular to the inlet.
9. Turn the power "ON" at the circuit breaker. Reconnect communication cable from pump.
10. Open the manual air relief valve on the top of the filter. Stand clear of the filter.
11. Wait until all pressure is relieved. Start the pump.
12. Bleed air from the filter until a steady stream of water comes out of the filter air relief valve. Close the manual air relief valve.

⚠WARNING **THIS SYSTEM OPERATES UNDER HIGH PRESSURE.** When any part of the circulating system (e.g., Lock Ring, Pump, Filter, Valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to separate which can result in serious injury, death, or property damage.

To avoid this potential hazard, follow above instructions.

Winterizing

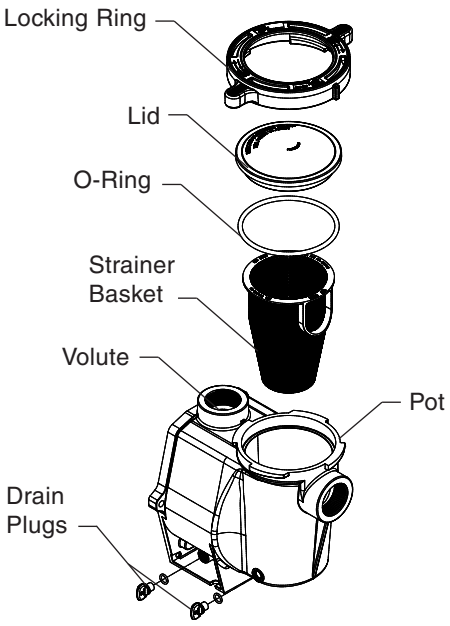
To protect the pump electronics from freeze damage, the pump will switch on to generate internal heat as the temperature drops below freezing if Thermal Mode is enabled. *The Thermal Mode feature on the pump is not intended to protect the system plumbing from freezing.*

- In mild climate areas, when temporary freezing conditions may occur, run your filtering equipment all night to prevent freezing.
- You are responsible for determining when freezing conditions may occur. If freezing conditions are expected, take the following steps to reduce the risk of freeze damage. ***Freeze damage is not covered under warranty.***

To prevent freeze damage, follow the procedures below:

1. Shut off electrical power for the pump at the circuit breaker.
2. Drain the water out of the pump housing by removing the two thumb-twist drain plugs from the housing. Store the plugs in the pump basket.
3. Cover the motor to protect it from severe rain, snow and ice.

Note: The motor may be covered during a storm, winter storage, etc., but never when operating or expecting operation. Never wrap motor with plastic or other air tight materials during winter storage.



Strainer Pot Assembly

SERVICING

⚠WARNING Always disconnect power to the IntelliFlo® VSF Variable Speed and Flow Pump at the circuit breaker and disconnect the communication cable before servicing the pump. Failure to do so could result in death or serious injury to service people, users or others due to electric shock. Read all servicing instructions before working on the pump.

⚠WARNING **DO NOT** open the strainer pot if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, be sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.

⚠CAUTION Be sure not to scratch or mar the polished shaft seal faces; seal will leak if faces are damaged. The polished and lapped faces of the seal could be damaged if not handled with care.

Motor and Drive Care

Protect from heat

1. Shade the motor from the sun.
2. Any enclosure must be well ventilated to prevent overheating.
3. Provide ample cross ventilation.
4. Provide a minimum clearance of 3-inches behind the motor fan for proper circulation.

Protect against dirt

1. Protect from any foreign matter.
2. Do not store (or spill) chemicals on or near the motor.
3. Avoid sweeping or stirring up dust near the motor while it is operating.
4. If a motor has been damaged by dirt it may void the motor warranty.

Protect against moisture

1. Protect from continuous splashing or continuous sprayed water.
2. Protect from extreme weather such as flooding.
3. If motor internals have become wet - let it dry before operating. Do not allow the pump to operate if it has been flooded.
4. If a motor has been damaged by water it may void the motor warranty.
5. Be sure to close the keypad cover after every use.

Shaft Seal Replacement

The Shaft Seal consists primarily of two parts, a rotating ceramic seal housed in the impeller and a stationary spring seal in the sealplate. The pump requires little or no service other than reasonable care, however, a shaft seal may occasionally become damaged and must be replaced.

Note: The polished and lapped faces of the seal could be damaged if not handled with care.

Pump Disassembly

Tools required:

- 3/32-inch Allen head wrench
- Two (2) 9/16-inch open end wrenches
- 1/4-inch Allen head wrench
- No. 2 Phillips head screwdriver
- Adjustable wrench

To remove and repair the motor subassembly, follow the steps below:

1. Turn off the pump circuit breaker at the main panel.
2. Disconnect the RS-485 communication cable from the pump (if connected to pump).
3. Drain the pump by removing the drain plugs. No tools are required.
4. Remove the four (4) Phillips head screws from the outer corners of the keypad.
5. Disconnect the keypad from the drive and set it to the side in a safe place.
6. Remove the three (3) Phillips head screws, located inside the drive, that anchor the drive to the motor.
7. Remove the drive by lifting upwards to separate it from the motor.
8. Use the 9/16-inch wrenches to remove the six (6) bolts that hold the housing (strainer pot/volute) to the rear subassembly.
9. Gently pull the two pump halves apart, removing the rear subassembly.
10. Use a 3/32-inch Allen head wrench to loosen the two (2) holding screws located on the diffuser.
11. Hold the impeller securely in place and remove the impeller lock screw by using a Phillips head screwdriver. The screw is a left-handed thread and loosens in a clockwise direction.

⚠CAUTION The pump impeller may have sharp edges that could potentially cut or scratch the user's hands. Pentair recommends that safety gloves be worn when holding the impeller during disassembly and reassembly.

12. Use a 1/4-inch Allen head wrench to hold the motor shaft. The motor shaft has a hex-shaped socket on the end which is accessible through the center of the fan cover.
13. To unscrew the impeller from the shaft, twist the impeller counterclockwise.
14. Remove the four (4) bolts from the seal plate to the motor, using a 9/16-inch wrench.
15. Place the seal plate face down on a flat surface and tap out the carbon spring seat.
16. Clean the seal plate, seal bore, and the motor shaft.

- Pump illustrated parts view on the next page -

Pump Reassembly

1. When installing the replacement shaft seal, use silicone sealant on the metal portion before pressing into the seal plate as shown. **Note:** Use extreme care when applying sealant. Be sure no sealant contacts the seal plate surface or the ceramic seal. Allow sealant to cure overnight before reassembling.
2. Before installing the rotating portion of the seal into the impeller, be sure the impeller is clean. Use a light density soap and water to lubricate the inside of the seal. Press the seal into the impeller with your thumbs and wipe off the ceramic and carbon faces with a clean cloth.
3. Remount the seal plate to the motor.
4. Screw in the impeller lock screw (counterclockwise to tighten).
5. Remount the diffuser onto the seal plate. Be sure the plastic pins and holding screw inserts are aligned.

   Note: Ensure that the seal plate o-ring is clean and free of debris.
6. Grease the diffuser o-ring and seal plate gasket prior to reassembly.
7. Assemble the motor subassembly to the pump housing by using the two (2) through bolts for proper alignment. Do not tighten the through bolts until all six (6) bolts are in place and finger tightened.

   Note: Ensure that the seal plate gasket is properly seated inside of the pump assembly. The seal gasket can be pinched between the seal plate and the pump housing while tightening these six (6) screws, preventing a proper seal and producing a slow leak when the pump is restarted.
8. Reinstall the drive onto the top of the motor.
9. Fill the IntelliFlo® VSF Variable Speed and Flow Pump with water.
10. Reinstall the pump lid and plastic locking ring. See “Cleaning the Pump Strainer Basket” on page 21 for details
11. Reconnect the RS-485 communication cable to the pump.
12. Turn on the pump circuit breaker at the main panel.
13. Prime the pump; refer to “Priming the Pump” on page 5.

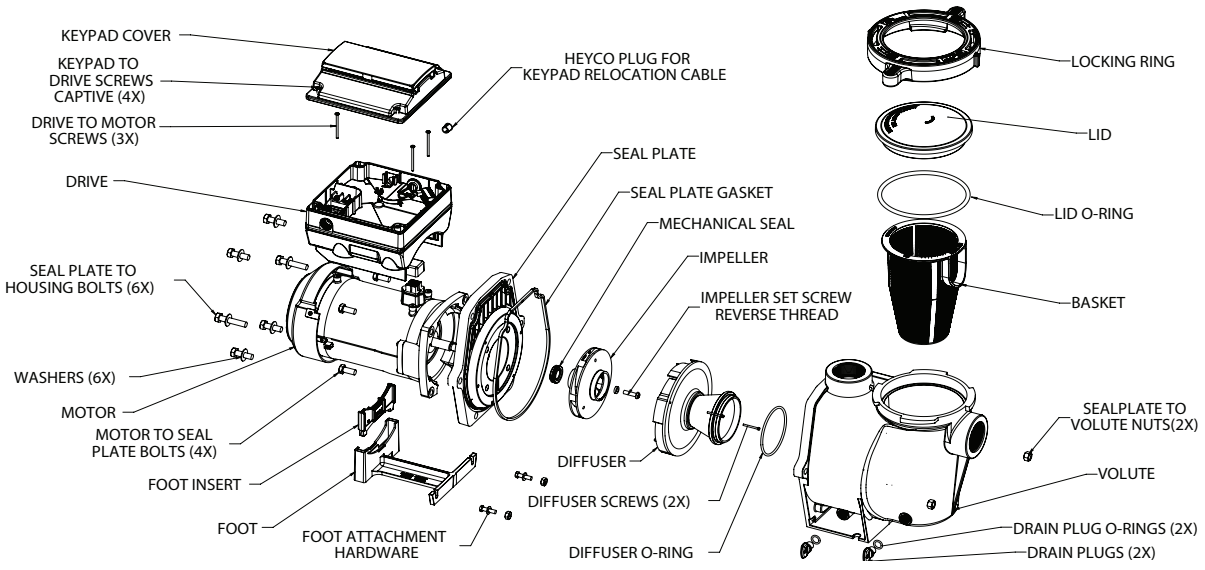
Drive Assembly Removal and Installation

⚠WARNING	To avoid dangerous or fatal electrical shock hazard, switch OFF power to motor before working on pump or motor.
⚠CAUTION	To avoid electrical hazard, do not remove the four tamper proof screws from the motor assembly.

To remove the drive and control panel from the motor assembly:

1. Be sure all electrical breakers and switches are turned off before removing the control panel.
2. Disconnect the RS-485 communication cable from the pump.
3. Remove the four (4) Phillips head screws from the outer corners of the keypad.
4. Unplug the keypad from the drive and set it to the side in a safe place.
5. Remove the three (3) Phillips head screws, located inside the drive, that anchor the drive to the motor.
6. Lift up the drive assembly and remove it from the motor adapter located on top of the motor assembly.

   Note: Be careful not to remove the gasket between the drive and motor, it is critical in keeping moisture out of the drive and motor. Replace the gasket if damaged. Do not reassemble with a damaged or missing gasket.



Pump Illustrated Parts View

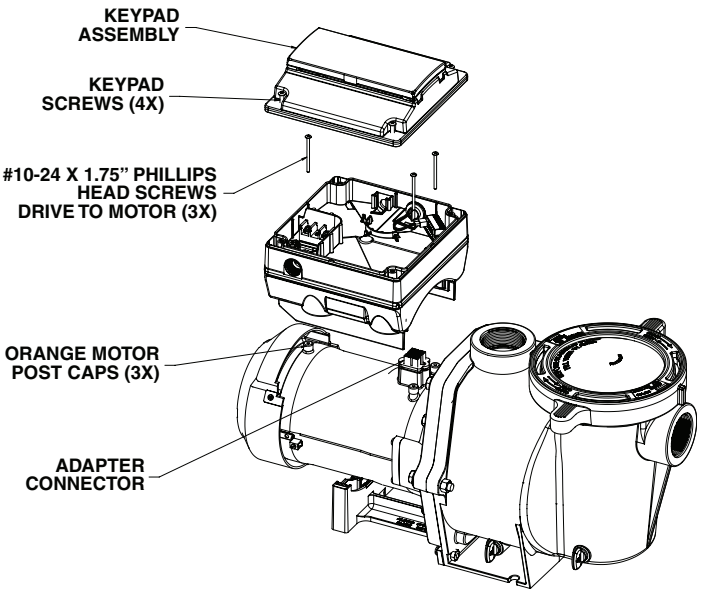
Drive Assembly Removal and Installation, (continued)

⚠CAUTION Before installing this product, read and follow all warning notices and instructions on page ii - iii.

To install the drive assembly onto the motor assembly:

1. Be sure all electrical breakers and switches are turned off before installing the drive.
2. Be sure that the gasket between the drive and motor is in place. It is critical in keeping moisture out of the drive and motor. Replace the gasket if damaged. Do not reassemble with a damaged or missing gasket.
3. Verify that the three (3) orange motor post caps are in position before placing the drive on the motor assembly.
4. Align the drive assembly with the motor adapter and seat the drive on the motor assembly.
5. Secure and tighten the drive assembly with the three (3) Phillips head screws.
6. Plug the keypad back into the drive.
7. Place the keypad in the desired orientation on the drive and reattach the four (4) screws in the corners of the drive.

   Note: Ensure that the keypad cable is not being pinched between the drive and keypad.



Drive Assembly and Removal

⚠WARNING **FIRE and BURN HAZARD** - The pump motor may run at a high temperatures. To reduce the risk of fire, do not allow leaves, debris, or foreign matter to collect around the pump motor. To avoid burns when handling the motor, shut off the motor and allow it to cool for 20 minutes before servicing. The pump provides an automatic internal cutoff switch to protect the motor from heat damage during operation.

TROUBLESHOOTING

⚠WARNING

Always disconnect power to the IntelliFlo VSF Variable Speed and Flow Pump at the circuit breaker and disconnect the communication cable before servicing the pump. Failure to do so could result in death or serious injury to serviceman, pool users or others due to electric shock. DO NOT attempt to adjust or service without consulting your dealer or a qualified pool technician. Read the entire Installation & User's Guide before attempting to use, service, or adjust the pool filtering system or heater.

Alerts and Warnings

The IntelliFlo® VSF Variable Speed and Flow Pump displays all alarms and warnings on the control panel display. When an alarm or warning condition exists, the corresponding light will be lit on the display.

In the event of an alarm: The alarm light "🔔" will illuminate and all control panel buttons will be disabled until the alarm is cleared. Pressing the **Reset** button will clear the alarm once the fault condition has been resolved.

In the event of a warning: The warning light "**!**" will illuminate, but the pump will continue to run. The speed, flow or pressure limit that is causing the warning must be adjusted in order to correct the warning.

Note: The pump will not start if the impeller is rotating.

Power Out/OFF
The incoming supply voltage is less than required. The drive faults to protect itself from over current. The drive contains capacitors that keep it powered up long enough to save the current run parameters. If power is restored during this process, approximately 20 seconds, the drive will not restart until completed.

Priming Failure
If the pump is not defined as primed within the "Max Priming Duration" it will stop and generate a "Priming Alarm" for 10 minutes, then attempt to prime again. The "Max Priming Duration" is set by the user on the priming menu as discussed on page 19. If the pump cannot prime within five attempts it will generate a permanent alarm that must be manually reset.

Overheat
If the drive temperature gets above 54.4° C (130° F) the pump will slowly reduce speed until the over temperature condition clears.

Thermal Mode
When active, the motor will run at the preset RPM until the drive internal temperature increases above the minimum. The pump's internal thermal protection is disabled when connected to an automation system. Thermal protection is provided by selecting YES at the ON WITH FREEZE portion of the circuit function menu in the IntelliTouch® Control System. To re-enable the internal thermal protection, the power to the drive must be cycled off then back on. **IMPORTANT: See explanation of Thermal Mode on page 20.**

Over Current
Indicated that the drive is overloaded or the motor has an electrical problem. The drive will restart 20 seconds after the over current condition clears.

Over Voltage
Indicates excessive supply voltage or an external water source is causing the pump and motor to rotate thereby generating an excessive voltage on the drives internal DC buss. The drive will restart 20 seconds after the over voltage condition clears.

Internal Error
Indicates that the self-monitoring motor control software has encountered an error. Clear the alarm and restart the pump. If this alarm persists, contact Pentair Technical Service at 1-800-831-7133.

Speed Limit (Warning)
The pump has detected that it has met the maximum allowed speed set in the Min/Max menu. The pump will continue to run, but it will not achieve the desired speed.

Pressure Limit (Warning)
The pump has detected that it has met the maximum system pressure set in the Min/Max menu. The pump will continue to run, but it is not achieving the desired flow rate or speed because of the pressure limit. The feature is enabled by default while running a program at a constant flow rate, but must be enabled manually if the user wants the drive to monitor maximum pressure while running a constant speed program.

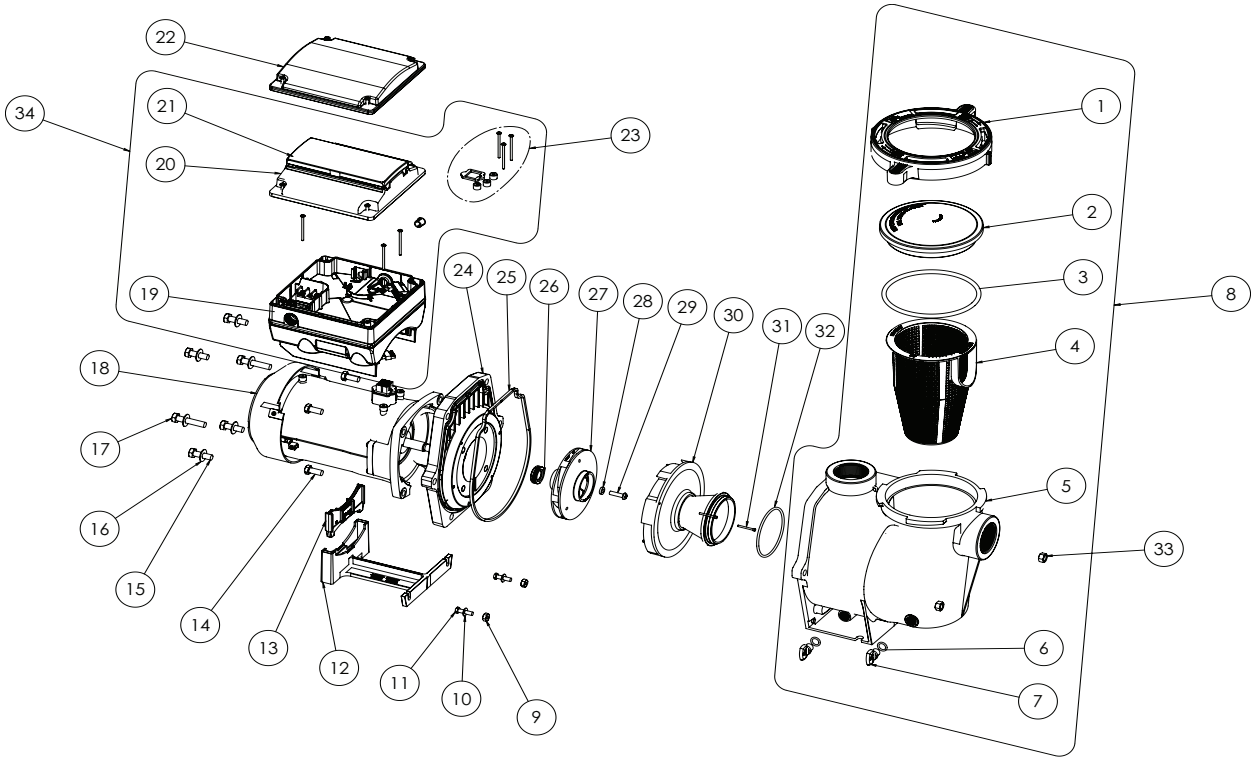
Flow Limit (Warning)
The pump has detected that it has met the maximum flow rate set in the Min/Max menu. The pump will continue to run, but it is not achieving the desired speed because it is running at the maximum flow rate. The Maximum Flow can be set in the Max/Min menu. This feature must be enabled in the Min/Max menu to be active while running a speed program.

Troubleshooting Chart

Problem	Possible Cause	Corrective Action
Pump failure. (For alert display messages, refer to Alerts and Warnings on page 25).	Pump will not prime - Air leak in suction. PRIME ERROR may be displayed.	Check suction piping and valve glands on any suction gate valves. Secure lid on pump strainer pot and be sure lid gasket is in place. Check water level to be sure skimmer is not drawing air.
	Pump will not prime - Not enough water.	Be sure the suction lines, pump, strainer, and pump volute are full of water.
	Pump does not come out of priming mode.	Adjust priming range to a higher setting (default setting is 5).
	Pump completes priming mode too early, and/or there is still a large amount of air in the housing	Adjust priming range to a lower setting (default setting is 5).
	Pump stainer basket is clogged.	Clean pump strainer pot.
	Pump strainer gasket is defective.	Replace gasket.
Reduced capacity and/ or head. (For alert display messages, refer to Alerts and Warnings on page 25).	Air pockets or leaks in suction line. PRIMING FAILURE may be displayed.	Check suction piping and valve glands on any suction gate valves.
	Clogged impeller. PRIMING FAILURE may be displayed.	Turn off electrical power to the pump. Remove the (6) bolts that holds the housing (strainer pot/volute) to seal plate. Slide the motor and seal plate away from the volute.
		Clean debris from impeller. If debris cannot be removed, complete the following steps: 1. Remove diffuser and o-ring. 2. Remove reverse-thread impeller screw and o-ring. 3. Remove, clean and reinstall impeller. 4. Reinstall reverse-thread impeller screw and o-ring.
		Reinstall diffuser, and o-ring.
		Reinstall motor and seal plate into volute.
		Reinstall seal plate nuts and volute and tighten securely.
	Pump strainer pot clogged. PRIMING FAILURE may be displayed.	Clean suction trap.
		Clean pump strainer pot.
Inadequate circulation. (For alert display messages, refer to Alerts and Warning on page 25).	Filter or pump basket dirty.	Check trap basket; if plugged, turn pump off and clean basket.
		Check and clean pool filter.
	Suction/discharge piping is too small.	Increase piping size.
	Speed is set too slow for proper filtration cycle.	Increase filtration run time.
Electrical problem. (For alert display messages, refer to Alerts and Warning on page 25).	Could appear as a “Low Voltage” alarm.	Check voltage at motor terminals and at panel while pump is running. If low, see wiring instructions or consult power company.
		Check for loose connections.
	Could appear as “Over Heat” alert.	Check line voltage; if less than 90% or more than 110% of rated voltage consult a licensed electrician.
		Increase ventilation.
		Reduce ambient temperature.
		Tighten any loose wiring connections.
		Motor runs too hot. Turn power to motor off. Check for proper voltage. Check for proper impeller or impeller rubbing.

Problem	Possible Cause	Corrective Action
Control panel LCD screen displays sporadically or flickers on/off.	Loose drive wiring connection.	Check the connection between the drive and keypad. See image on page 3. The drive wiring connection should be tight.
Mechanical troubles and noise.	The pump motor is running but with loud noise.	If suction and discharge piping are not adequately supported, pump assembly will be strained. Do not mount pump on a wooden platform! Securely mount on concrete platform for quietest performance.
	Foreign matter (gravel, metal, etc.) in pump impeller.	Disassemble pump, clean impeller, follow pump service instructions for reassembly.
	Cavitation.	Improve suction conditions.
		Increase pipe size.
		Decrease number of fittings.
		Increase discharge pressure.
	Speaking noise, especially evident at pump start-up or slow down.	Inspect motor slinger and motor shaft seal behind the slinger (NOT the pump's mechanical seal). Apply lubrication to the motor shaft rubber seals.
Pump does not respond to IntelliTouch, EasyTouch, SunTouch, IntelliComm system commands.	Improper automation setup.	1. Be sure that the communication cable is connected at both ends.
		2. Check that the pump local address matches with the address used in the IntelliTouch control system.
		3. Check that the pump has been assigned a circuit name on the IntelliTouch control system.
		4. Ensure that the pump display says "DISPLAY NOT ACTIVE".
	Communication network inoperative.	A defective device on the network can inhibit the proper operation of other network device. Devices should be disconnected sequentially until the network starts working.

REPLACEMENT PARTS



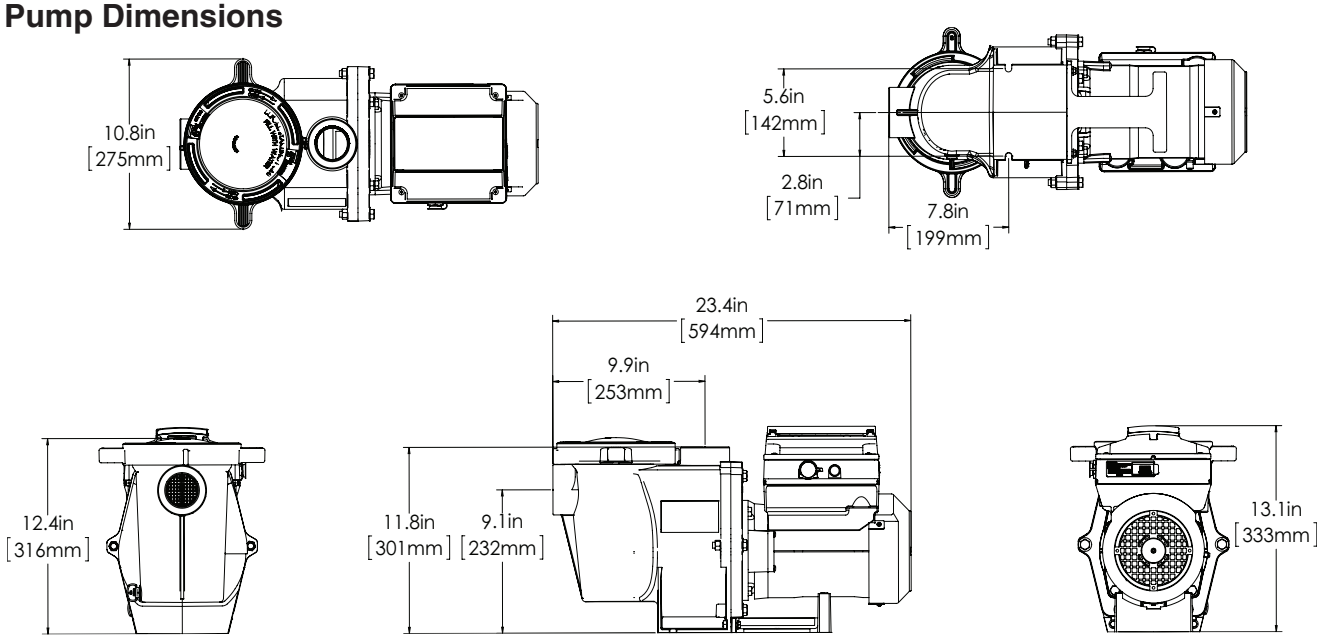
IntelliFlo® VSF Variable Speed and Flow Pump Replacement Parts

Item No.	Description	Almond Part #	Black Part #
1	Clamp, Cam and Ramp	357199	357150
2	See Through Lid	357151	
3	Lid O-Ring	350013	
4	Stainer Basket	070387	
5	Volute WF	350015	357157
6	O-Ring 112 for Drain Plug (Qty2)	192115	
7	Drain Plug WF (Qty2)	071131	357161
8	Volute Kit (Includes Item #1-7)	357243	357244
9	Nut, 1/4-20 Hex. SS (Qty2)	071406	
10	Washer, Flat 1/4" ID x 5/8" OD (Qty2)	072183	
11	Screw, 1/4-20 x 1" Hex Cap SS (Qty2)	071657	
12	Foot WF	070927	357159
13	Foot Insert WFE, Pump Motor Support	070929	357160
14	Bolt, Hex Head 3/8-16 x .875" (Qty4)	070429	
15	Bolt, Hex Head 3/8-16 x 1.25" (Qty4)	070430	
16	Washer, Flat 3/8" ID x 7/8" OD (Qty6)	072184	
17	Bolt, Hex Head 3/8-16 x 2" (Qty2)	070431	
18	Motor, 3.2kW 10 Pole	350305S	350306S
19	Drive, Variable Speed	356880Z	356894Z
20	Drive Cover Kit (Includes Item #21)	357527Z	358527Z
21	Keypad Cover	400100	401100
22	Keypad Relocation Kit (Includes Keypad Relocation Cable and Blank Drive Cover)	356904Z	356905Z

Item No.	Description	Almond Part #	Black Part #
23	Drive Hardware Kit (Includes Drive Screws, Drive Gasket and Screw Caps)	355685	
24	Seal Plate	074564	357158
25	Seal Plate Gasket	357100	
26	Mechanical Seal	071734S	
27	Impeller	073131	
28	Rubber Washer, Impeller Set Screw	075713	
29	Impeller Set Screw, 1/4-20 LH Thread	071652	
30	Diffuser	072928	
31	Diffuser Set Screw, 4-40 x 1-1/8 (Qty2)	071660	
32	Diffuser O-Ring	355227	
33	Nut, 3/8-16 Brass, Nickel Plated (Qty2)	071403	
34	Drive Kit Assembly (Includes Item #19-21 & 23)	356922Z	355868Z
-	50 Ft. Communication Cable	350122	
-	Seal Plate Kit w/ Mechanical Seal (Includes Item #24-26)	350202	350203
-	Union Kit (Contains 2 Complete Unions for 1 Pump - Not Included w/ Pump)	357603	Not Available
-	Seal Plate Kit, Ozone/Salt Resistant	350199	350198

(-) Not Shown

Pump Dimensions

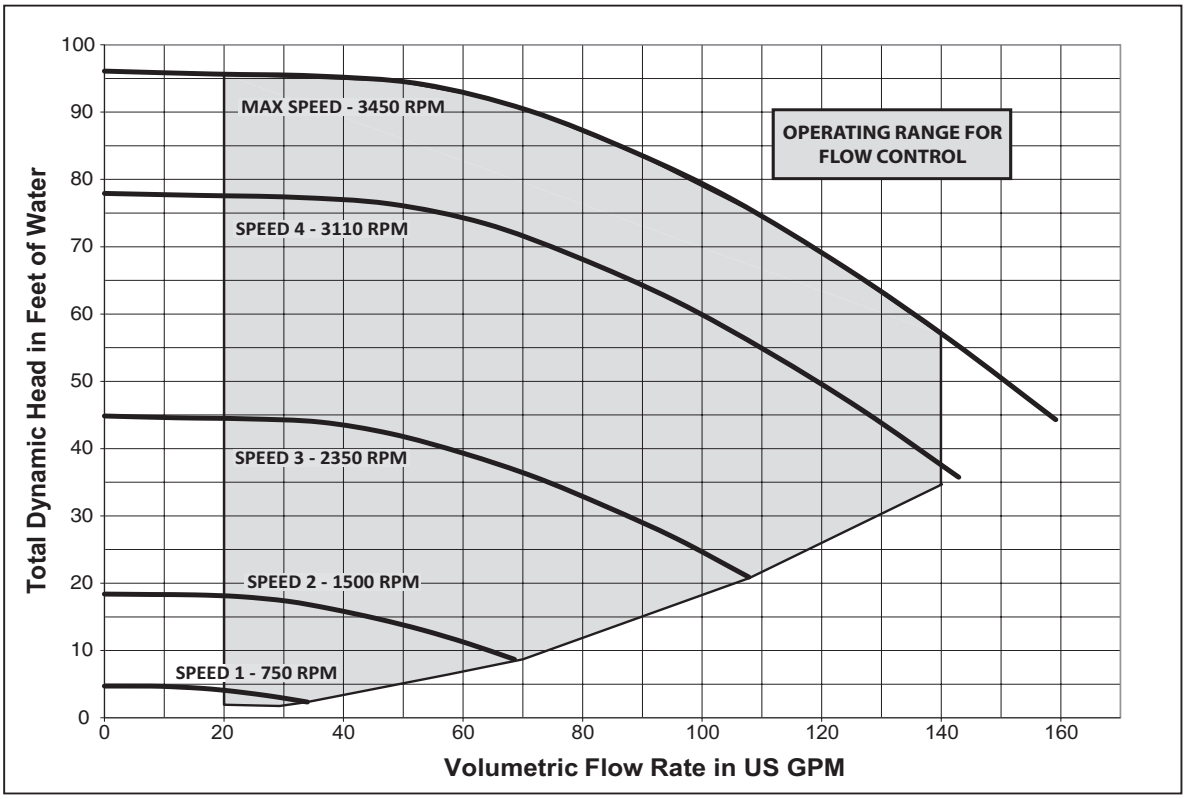


Electrical Specifications

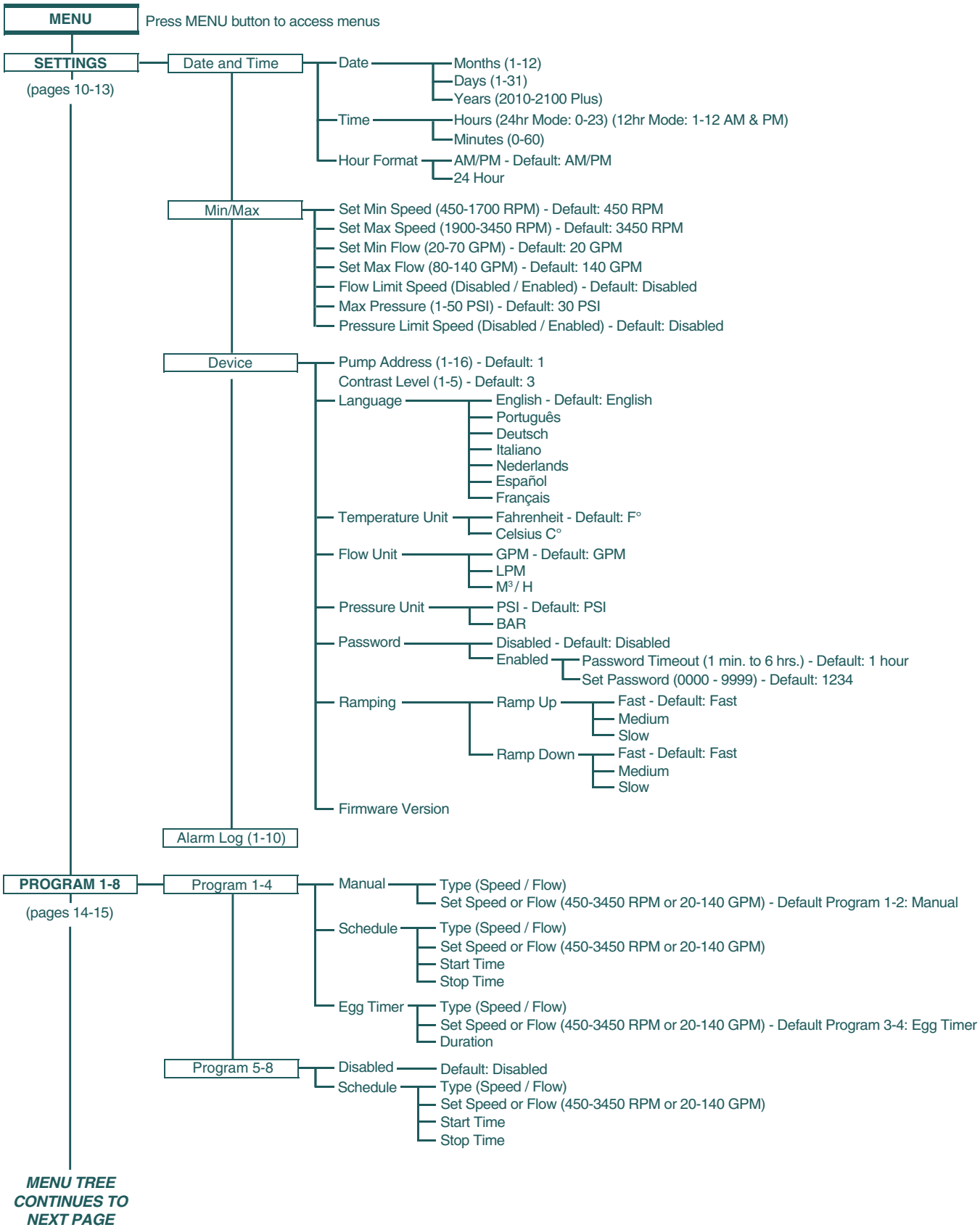
Circuit Protection: Two-pole 20 AMP device at the Electrical Panel.

Input: 230 VAC, 50/60 Hz, 3200 Watts Maximum, 1 phase

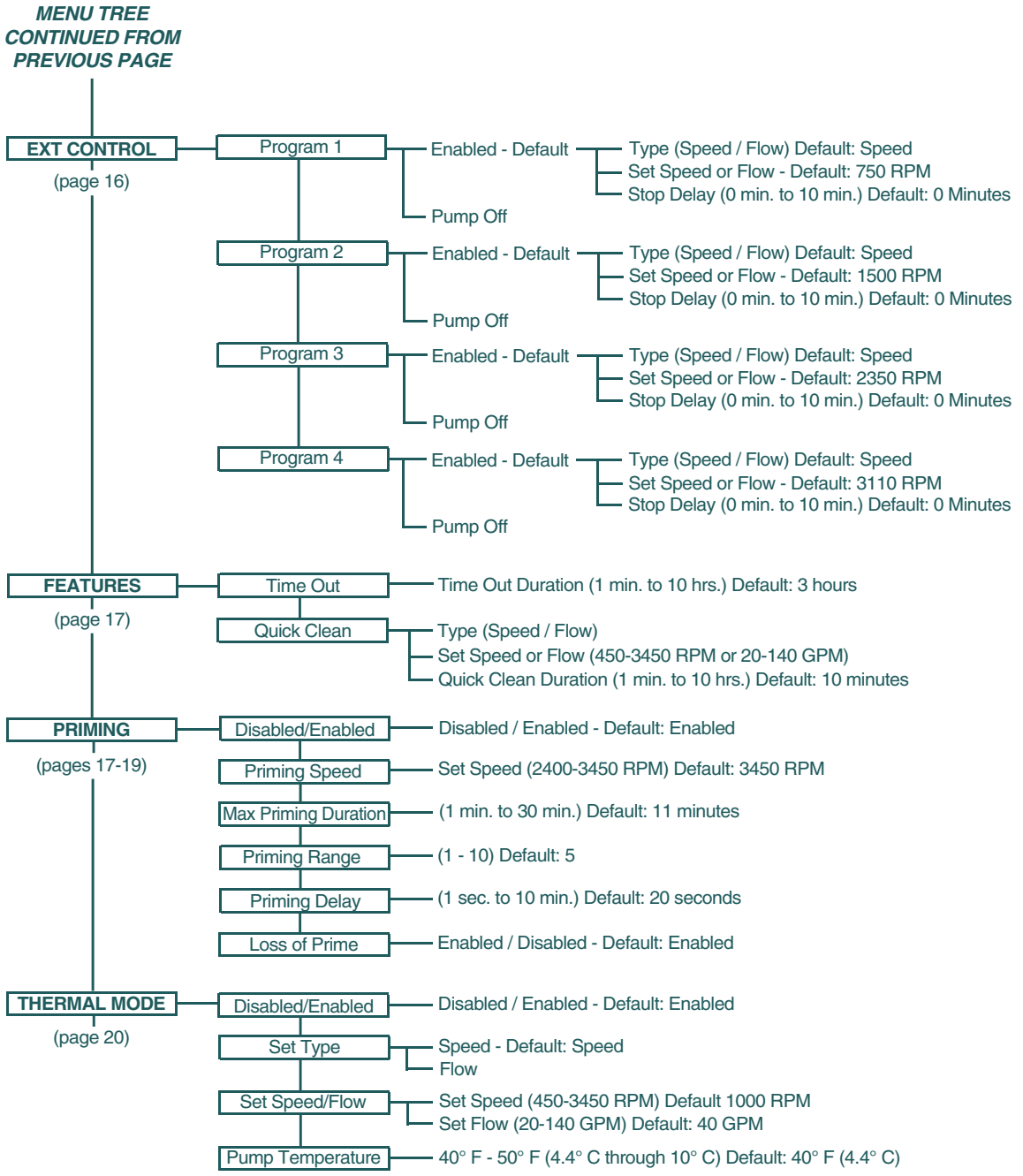
Pump Performance Curves



Operator Control Panel: Pump Menu Quick Reference Guide



Operator Control Panel: Pump Menu Quick Reference Guide (cont.)



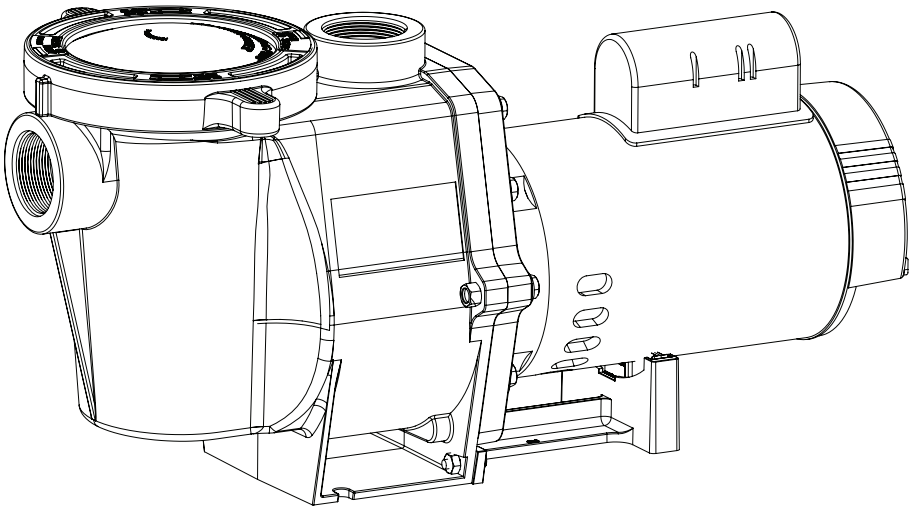
LIT. PKG. P/N 356651

1620 HAWKINS AVE., SANFORD, NC 27330 • (919) 566-8000
10951 WEST LOS ANGELES AVE., MOORPARK, CA 93021 • (805) 553-5000
WWW.PENTAIRPOOL.COM

P/N 356652 REV. D 2/22/18

PENTAIR

WHISPERFLO®
HIGH PERFORMANCE PUMP



INSTALLATION AND USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

CUSTOMER SERVICE / TECHNICAL SUPPORT

If you have questions about ordering Pentair Aquatic Systems replacement parts, and pool products, please contact:

Customer Service and Technical Support, USA
(8 A.M. to 4:30 P.M. — Eastern/Pacific Times)
Phone: (800) 831-7133
Fax: (800) 284-4151

Web site
Visit *www.pentairpool.com* or *www.staritepool.com*

Sanford, North Carolina (8 A.M. to 4:30 P.M. ET)
Phone: (919) 566-8000
Fax: (919) 566-8920

Moorpark, California (8 A.M. to 4:30 P.M. PT)
Phone: (805) 553-5000 (Ext. 5591)
Fax: (805) 553-5515

TABLE OF CONTENTS

NSF - 50 c UL us

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

P/N 071109 Rev. J 8/29/14

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

IMPORTANT NOTICE

This guide provides installation and operation instructions for this product. 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 pump.

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

READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

This is the safety alert symbol. When you see this symbol on your system or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

DANGER Warns about hazards that can cause death, serious personal injury, or major property damage if ignored.

WARNING Warns about hazards that may cause death, serious personal injury, or major property damage if ignored.

CAUTION Warns about hazards that may or can cause minor personal injury or property damage if ignored.

NOTE indicates special instructions not related to hazards.

Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.

When installing and using this electrical equipment, basic safety precautions should always be followed, include the following:

WARNING Do not permit children to use this product.

WARNING **RISK OF ELECTRICAL SHOCK.** Connect only to a branch circuit protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the circuit is protected by a GFCI.

WARNING This unit must be connected only to a supply circuit that is protected by a ground-fault circuit-interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of an electric shock. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.

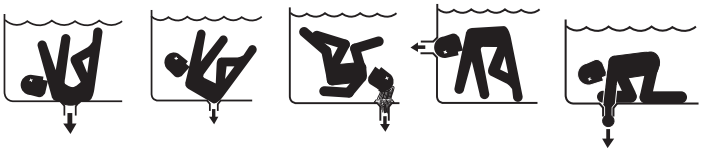
CAUTION This pump is for use with permanent swimming pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently-installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it is capable of being readily disassembled for storage and reassembled to its original integrity.

General Warnings

- Never open the inside of the drive motor enclosure. There is a capacitor bank that holds a 230 VAC charge even when there is no power to the unit.
- The pump is not submersible.
- The pump is capable of high flow rates; use caution when installing and programming to limit pumps performance potential with old or questionable equipment.
- Code requirements for the electrical connection differ from state to state. Install equipment in accordance with the National Electrical Code and all applicable local codes and ordinances.
- Before servicing the pump; switch OFF power to the pump by disconnecting the main circuit to the pump.
- This appliance is not intended for use by persons (including children) of reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

DANGER FAILURE TO FOLLOW ALL INSTRUCTIONS AND WARNINGS CAN RESULT IN SERIOUS BODILY INJURY OR DEATH. **THIS PUMP SHOULD BE INSTALLED AND SERVICED ONLY BY A QUALIFIED POOL SERVICE PROFESSIONAL. INSTALLERS, POOL OPERATORS AND OWNERS MUST READ THESE WARNINGS AND ALL INSTRUCTIONS IN THE OWNER'S MANUAL BEFORE USING THIS PUMP. THESE WARNINGS AND THE OWNER'S MANUAL MUST BE LEFT WITH THE POOL OWNER.**

DANGER SUCTION ENTRAPMENT HAZARD: STAY OFF THE MAIN DRAIN AND AWAY FROM ALL SUCTION OUTLETS!



THIS PUMP PRODUCES HIGH LEVELS OF SUCTION AND CREATES A STRONG VACUUM AT THE MAIN DRAIN AT THE BOTTOM OF THE BODY OF WATER. THIS SUCTION IS SO STRONG THAT IT CAN TRAP ADULTS OR CHILDREN UNDER WATER IF THEY COME IN CLOSE PROXIMITY TO A DRAIN OR A LOOSE OR BROKEN DRAIN COVER OR GRATE.

THE USE OF UNAPPROVED COVERS OR ALLOWING USE OF THE POOL OR SPA WHEN COVERS ARE MISSING, CRACKED OR BROKEN CAN RESULT IN BODY OR LIMB ENTRAPMENT, HAIR ENTANGLEMENT, BODY ENTRAPMENT, EVISCERATION AND/OR DEATH.
The suction at a drain or outlet can cause:

Limb Entrapment: When a limb is sucked or inserted into an opening resulting in a mechanical bind or swelling. This hazard is present when a drain cover is missing, broken, loose, cracked or not properly secured.

Hair Entanglement: When the hair tangles or knots in the drain cover, trapping the swimmer underwater. This hazard is present when the flow rating of the cover is too small for the pump or pumps.

Body Entrapment: When a portion of the body is held against the drain cover trapping the swimmer underwater. This hazard is present when the drain cover is missing, broken or the cover flow rating is not high enough for the pump or pumps.

Evisceration/Disembowelment: When a person sits on an open pool (particularly a child wading pool) or spa outlet and suction is applied directly to the intestines, causing severe intestinal damage. This hazard is present when the drain cover is missing, loose, cracked, or not properly secured.

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

Mechanical Entrapment: When jewelry, swimsuit, hair decorations, finger, toe or knuckle is caught in an opening of an outlet or drain cover. This hazard is present when the drain cover is missing, broken, loose, cracked, or not properly secured.

NOTE: ALL SUCTION PLUMBING MUST BE INSTALLED IN ACCORDANCE WITH THE LATEST NATIONAL AND LOCAL CODES, STANDARDS AND GUIDELINES.

⚠WARNING TO MINIMIZE THE RISK OF INJURY DUE TO SUCTION ENTRAPMENT HAZARD:

- A properly installed and secured ANSI/ASME A112.19.8 approved anti-entrapment suction cover must be used for each drain.
- Each suction cover must be installed at least three (3') feet apart, as measured from the nearest point to nearest point.
- Regularly inspect all covers for cracks, damage and advanced weathering.
- If a cover becomes loose, cracked, damaged, broken or is missing, replace with an appropriate certified cover.
- Replace drain covers as necessary. Drain covers deteriorate over time due to exposure to sunlight and weather.
- Avoid getting hair, limbs or body in close proximity to any suction cover, pool drain or outlet.
- Disable suction outlets or reconfigure into return inlets.

⚠WARNING A clearly labeled emergency shut-off switch for the pump must be in an easily accessible, obvious place. Make sure users know where it is and how to use it in case of emergency.

The Virginia Graeme Baker (VGB) Pool and Spa Safety Act creates new requirements for owners and operators of commercial swimming pools and spas.

Commercial pools or spas constructed on or after December 19, 2008, shall utilize:

(A) A multiple main drain system without isolation capability with suction outlet covers that meet ASME/ANSI A112.19.8a Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs and either:

(i) A safety vacuum release system (SVRS) meeting ASME/ANSI A112.19.17 Manufactured Safety Vacuum Release systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems and/or ASTM F2387 Standard Specification for Manufactured Safety Vacuum Release Systems (SVRS) for Swimming pools, Spas and Hot Tubs or

(ii) A properly designed and tested suction-limiting vent system or

(iii) An automatic pump shut-off system.

Commercial pools and spas constructed prior to December 19, 2008, with a single submerged suction outlet shall use a suction outlet cover that meets ASME/ANSI A112.19.8a and either:

(A) A SVRS meeting ASME/ANSI A112.19.17 and/or ASTM F2387, or

(B) A properly designed and tested suction-limiting vent system, or

(C) An automatic pump shut-off system, or

(D) Disabled submerged outlets, or

(E) Suction outlets shall be re-configured into return inlets.

For Installation of Electrical Controls at Equipment Pad (ON/OFF Switches, Timers and Automation Load Center)

⚠CAUTION Install all electrical controls at equipment pad, such as on/off switches, timers, and control systems, etc. to allow the operation (startup, shut-down, or servicing) of any pump or filter so the user does not place any portion of his/her body over or near the pump strainer lid, filter lid or valve closures. This installation should allow the user enough space to stand clear of the filter and pump during system start-up, shut down or servicing of the system filter.

⚠DANGER HAZARDOUS PRESSURE: STAND CLEAR OF PUMP AND FILTER DURING START UP

Circulation systems operate under high pressure. When any part of the circulating system (i.e. locking ring, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the pump housing cover filter lid and valves to violently separate which can result in severe personal injury or death. Filter tank lid and strainer cover must be properly secured to prevent violent separation. Stand clear of all circulation system equipment when turning on or starting up pump.

Before servicing equipment, make note of the filter pressure. Be sure that all controls are set to ensure the system cannot inadvertently start during service. Turn off all power to the pump. **IMPORTANT: Place filter manual air relief valve in the open position and wait for all pressure in the system to be relieved.**

Before starting the system, fully open the manual air relief valve and place all system valves in the "open" position to allow water to flow freely from the tank and back to the tank. Stand clear of all equipment and start the pump.

IMPORTANT: Do not close filter manual air relief valve until all pressure has been discharged from the valve and a steady stream of water appears. Observe filter pressure gauge and be sure it is not higher than the pre-service condition.

General Installation Information

- All work must be performed by a qualified service professional, and must conform to all national, state, and local codes.
- Install to provide drainage of compartment for electrical components.
- These instructions contain information for a variety of pump models and therefore some instructions may not apply to a specific model. All models are intended for use in swimming pool applications. The pump will function correctly only if it is properly sized to the specific application and properly installed.

⚠WARNING Pumps improperly sized or installed or used in applications other than for which the pump was intended can result in severe personal injury or death. These risks may include but not be limited to electric shock, fire, flooding, suction entrapment or severe injury or property damage caused by a structural failure of the pump or other system component.

⚠WARNING The pump can produce high levels of suction within the suction side of the plumbing system. These high levels of suction can pose a risk if a person comes within the close proximity of the suction openings. A person can be seriously injured by this high level of vacuum or may become trapped and drown. It is absolutely critical that the suction plumbing be installed in accordance with the latest national and local codes for swimming pools.

Warnings and safety instructions for Pentair Aquatic Systems pumps and other related products are available at: **http://www.pentairpool.com/pool-owner/safety-warnings/** or call (800) 831-7133 for additional free copies of these instructions.

Please refer to **http://www.pentairpool.com/pool-owner/safetywarnings/** for warning and safety instructions related to this product.

SAVE THESE INSTRUCTIONS

INSTALLATION

Only a qualified plumbing professional should install the WhisperFlo® High Performance Pump. Refer to *"Pump Warning And Safety Instructions"* on pages ii - iii for additional installation and safety information.

Location

Be sure the pump location meets the following requirements:

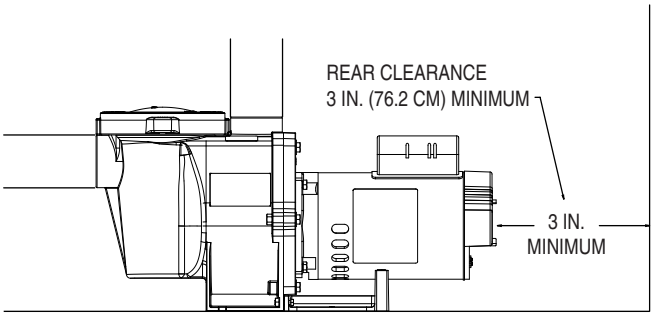
Note: Do not install this pump within an outer enclosure or beneath the skirt of a hot tub or spa unless marked accordingly.

1. Install the pump as close to the pool or spa as possible. To reduce friction loss and improve efficiency, use short, direct suction piping returns.
2. Install a minimum of 5 feet (1.52 meters) from the inside wall of the pool and spa. Canadian installations require a minimum of 9.8 feet (3 meters) from pool water level.
3. Install the pump a minimum of 3 feet (.9 meters) from the heater outlet.
4. Do not install the pump more than 10 feet (3 meters) above the water level.
5. Install the pump in a well ventilated location protected from excessive moisture (i.e., rain gutter downspouts, sprinklers, etc.)
6. Install the pump with a rear clearance of at least 3 inches (76.2 mm) so that the motor can be removed easily for maintenance and repair.

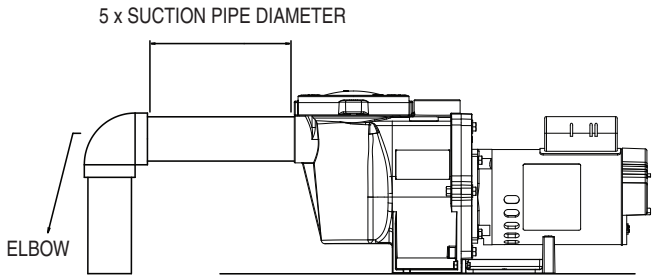
Piping

1. For improved pool plumbing, it is recommended to use a larger pipe size. When installing the inlet and outlet fittings (male adaptors), use thread sealant.
2. Piping on the suction side of the pump should be the same or larger than the return line diameter.
3. Plumbing on the suction side of the pump should be as short as possible.
4. It is recommended that a valve, elbow or tee installed in the suction line should be no closer to the front of the pump than five (5) times the suction line pipe diameter

   Example:
   A 2 inch (50.8 mm) pipe requires a 10 inch (254 mm) straight run in front of the suction inlet of the pump. This will help the pump prime faster and last longer.



Pump Rear Clearance



Recommended Piping

Fittings and Valves

1. Do not install 90° elbows directly into pump inlet.
2. Flooded suction systems should have gate valves installed on suction and discharge pipes for maintenance, however, the suction gate valve should be no closer than five times the suction pipe diameter as described in this section.
3. Use a check valve in the discharge line when using this pump for any application where there is significant height to the plumbing after the pump.
4. Be sure to install check valves when plumbing in parallel with another pump. This helps prevent reverse rotation of the impeller and motor.

⚠WARNING

RISK OF ELECTRICAL SHOCK OR ELECTROCUTION. This pump must be installed by a licensed or certified electrician or a qualified service professional 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 users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pump at the circuit breaker before servicing the pump. Failure to do so could result in death or serious injury to service people, pool users or others due to electric shock and/or property damage.
Read all servicing instructions before working on the pump.

Electrical Wiring Installation

1. Be sure all electrical breakers and switches are turned off before wiring motor.
2. Be sure the supply line voltage matches the motor voltage listed on the motor plate (example 230 VAC or 115 VAC). If they do not match, permanent motor damage may occur.
3. Use strain relief and be sure all electrical connections are clean and tight.
4. Cut wires to the appropriate length so they don't overlap or touch when connected to the terminal board.
5. Permanently ground the motor using the green ground terminal located on the inside of the motor canopy or access plate, see Figure 1. Use the correct wire size and type specified by National Electrical Code. Make sure the ground wire is connected to an electrical service ground.
6. Bond the motor to the pool structure in accordance with the National Electrical Code. Use a solid No. 8 AWG or larger copper conductor. Run a wire from the external bonding to the pool bonding structure.
7. Connect the wire from the accessible bonding lug on the motor to all metal parts of the swimming pool, spa, or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet (1.52 meters) of the inside walls of the swimming pool, spa, or hot tub. For Canada, a 6 AWG or larger solid copper bonding conductor is required.
8. The pump should be permanently connected to either a circuit breaker, 2-pole timer or 2-pole relay. If AC power is supplied by a GFCI circuit breaker, use a dedicated circuit breaker that has no other electrical loads.

Pentair offers 2-Pole 20 Amp GFCI breakers (P/N PA220GF) which offer 6 milliamp personnel protection while meeting 2008 to current NEC Standards for Pool Pumps.

Note: When the pump is started and stopped by removing power with a relay or timer, a two-pole device should be used to apply and remove power to both POWER LINE TERMINALS.

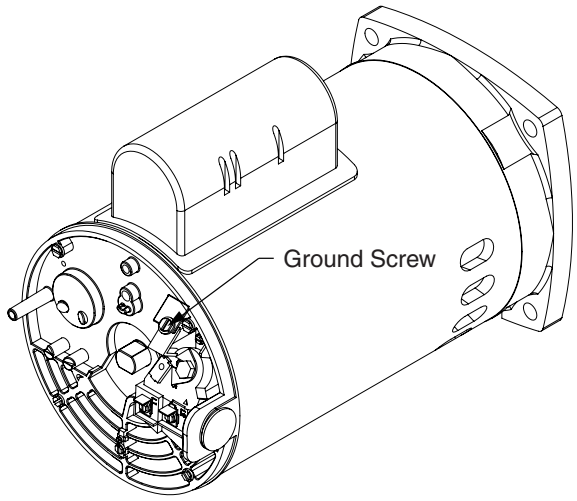


Figure 1. Field Wiring Compartment

MAINTENANCE

⚠WARNING DO NOT open the strainer pot if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, make sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.

⚠CAUTION To prevent damage to the pump and for proper operation of the system, clean pump strainer and skimmer baskets regularly.

Pump Strainer Basket

The pump strainer basket (or 'strainer pot', 'hair and lint pot'), is located in front of the volute. Inside the chamber is the basket which must be kept clean of leaves and debris at all times. View basket through the 'See Through Lid' to inspect for leaves and debris.

Regardless of the length of time between filter cleaning, it is most important to visually inspect the basket at least once a week. A dirty basket will reduce the efficiency of the filter and heater and also put an abnormal stress on the pump motor which would result in a costly repair bill.

Cleaning the Pump Strainer Basket

1. Turn off the pump at the circuit breaker.
2. Relieve pressure in the system by allowing the water to cool.
3. Gently tap the clamp in a counter-clockwise direction to remove the clamp and lid.
4. Remove debris and rinse out the basket. Replace the basket if it is cracked.
5. Put the basket back into the housing. Be sure to align the notch in the bottom of the basket with the rib in the bottom of the volute.
6. Fill the pump pot and volute up to the inlet port with water.
7. Clean the cover, O-ring, and sealing surface of the pump pot. ***Note:*** It is important to keep the lid O-ring clean and well lubricated.
8. Reinstall the lid by placing the lid on the pot. Be sure the lid O-ring is properly placed. Seat the clamp and lid on the pump then turn clockwise until the handles are horizontal.
9. Turn the power "ON" at the house circuit breaker. Reset the pool time clock to the correct time.
10. Open the High Flow manual air relief valve on top of the filter.
11. Stand clear of the filter. Start the pump.
12. Bleed air from the filter until a steady stream of water comes out. Close the High Flow™ Manual Air Relief Valve.

⚠WARNING **THIS SYSTEM OPERATES UNDER HIGH PRESSURE**. When any part of the circulating system (e.g., Lock Ring, Pump, Filter, Valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to separate which can result in serious injury, death, or property damage. To avoid this potential hazard, follow above instructions.

Winterizing

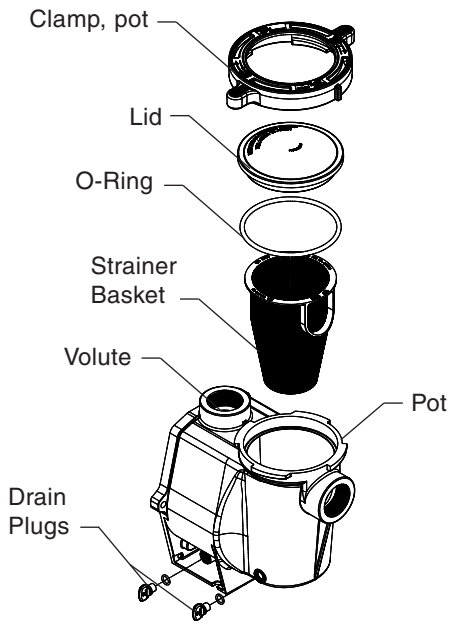
You are responsible for determining when freezing conditions may occur. If freezing conditions are expected, take the following steps to reduce the risk of freeze damage. ***Freeze damage is not covered under warranty.***

To prevent freeze damage, follow the procedures below:

1. Shut off electrical power for the pump at the circuit breaker.
2. Drain the water out of the pump housing by removing the two thumb-twist drain plugs from the housing. Store the plugs in the pump basket.
3. Cover the motor to protect it from severe rain, snow and ice.

Note: Do not wrap motor with plastic or other air tight materials during winter storage. The motor may be covered during a storm, winter storage, etc., but never when operating or expecting operation.

In mild climate areas, when temporary freezing conditions may occur, run your filtering equipment all night to prevent freezing.



Strainer Pot Assembly

ENGLISH

SERVICING

⚠WARNING Always disconnect power to the pump at the circuit breaker and disconnect the communication cable before servicing the pump. Failure to do so could result in death or serious injury to service people, users or others due to electric shock. Read all servicing instructions before working on the pump.

⚠WARNING **DO NOT** open the strainer pot if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, make sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.

⚠CAUTION Be sure not to scratch or mar the polished shaft seal faces; seal will leak if faces are damaged. The polished and lapped faces of the seal could be damaged if not handled with care.

Care of Electric Motor

Protect from heat

1. Shade the motor from the sun.
2. Any enclosure must be well ventilated to prevent overheating.
3. Provide ample cross ventilation.

Protect against dirt

1. Protect from any foreign matter or splashing water.
2. Do not store (or spill) chemicals on or near the motor.
3. Protect from any foreign matter or splashing water.
4. Avoid sweeping or stirring up dust near the motor while it is operating.
5. If a motor has been damaged by dirt it voids the motor warranty.
6. Clean the lid and clamp, O-ring, and sealing surface of the pump pot.

Protect against moisture

1. Protect from splashing or sprayed water.
2. Protect from extreme weather.
3. Protect from any foreign matter or splashing water.
4. If a motor has become wet - let it dry before operating. Do not allow the pump to operate if it has been flooded.
5. If a motor has been damaged by water it voids the motor warranty.

Note: When replacing the motor, be certain that the motor support is correctly positioned to support the size of motor being installed.

Shaft Seal Replacement

The Shaft Seal consists primarily of two parts, a rotating member and a ceramic seal.

The pump requires little or no service other than reasonable care, however, a Shaft Seal may occasionally become damaged and must be replaced.

Note: The polished and lapped faces of the seal could be damaged if not handled with care.

Pump Disassembly

All moving parts are located in the rear sub-assembly of this pump.

Tools required:

- 3/32 inch Allen head wrench
- 1/2 inch open end wrench
- 9/16 inch open end wrench
- Flat blade screwdriver
- #2 Phillips scewdriver

To remove and repair the motor subassembly, follow the steps below:

1. Turn off the pump circuit breaker at the main panel.
2. Drain the pump by removing the drain plugs.
3. Remove the 6 bolts that hold the main pump body (strainer pot/volute) to the rear sub-assembly.
4. GENTLY pull the two pump halves apart, removing the rear sub-assembly.
5. Use a 3/32 inch Allen head wrench to loosen the two holding screws located on the diffuser.
6. Hold the impeller securely in place and remove the impeller lock screw by using a #2 Phillips screwdriver. The screw is a left-handed thread and loosens in a clockwise direction.
7. Remove the shaft cap located at the back of the motor and hold the shaft secure with a ½ inch open-end wrench.
8. To unscrew the impeller from the shaft, twist the impeller counterclockwise.
9. Remove the four bolts from the seal plate to the motor, using a 9/16 inch wrench.

⚠CAUTION **DO NOT run the pump dry.** If the pump is run dry, the mechanical seal will be damaged and the pump will start leaking. If this occurs, the damaged seal must be replaced. ALWAYS maintain proper water level. If the water level falls below the suction port, the pump will draw air through the suction port, losing the prime and causing the pump to run dry, resulting in a damaged seal. Continued operation in this manner could cause a loss of pressure, resulting in damage to the pump case, impeller and seal and may cause property damage and personal injury.

Pump Reassembly

1. When installing the replacement shaft seal, use silicone sealant on the metal portion before pressing into the seal plate, being careful to keep off of the seal face. Ensure the seal is fully seated and allow 24 hours for sealant to cure. (Complete seal plate w/seal replacement kit available, P/N 350201/350101.)
2. Before installing the ceramic section of the seal into the impeller, be sure the impeller is clean. Use a light density soap and water to seal the seal. Press the seal into the impeller with your thumbs and wipe off the ceramic and carbon faces with a clean cloth.
3. Remount the seal plate to the motor by installing bolts in an X pattern and tightening to 70 in-lbs.
4. Clean the motor shaft thread and the impeller insert, then screw the impeller onto the motor shaft.
5. Screw in the impeller lock screw (counter-clockwise and tighten to 25 in-lbs. while holding the motor shaft with wrench).
6. Remount the diffuser onto the seal plate. Make sure the plastic pins and holding screw inserts are aligned.
7. Grease the diffuser O-ring and seal plate gasket.
8. Grease the bolt threads, assemble the motor sub-assembly to the strainer pot-pump body by using the two through bolts for proper alignment. Do not tighten the through bolts until all 6 bolts are in place and finger tightened. Torque in a cross pattern to 110 in-lbs.
9. Fill the pump with water.
10. Reinstall the pump lid and plastic clamp; see the next section, 'Restart Instructions'.
11. Reprime the system.

Restart Instructions

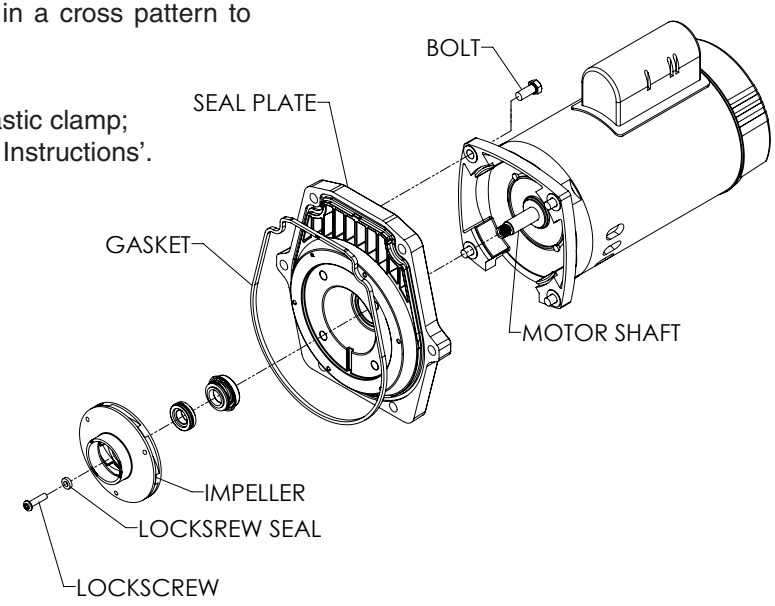
If pump is installed below the water level of the pool, close return and suction lines prior to opening hair and lint pot on pump. Make sure to re-open valves prior to operating.

Priming the Pump

The pump strainer pot must be filled with water before the pump is initially started. Follow these steps to prime the pump:

1. Remove the pump lid plastic clamp. Remove the pump lid.
2. Fill the pump strainer pot with water.
3. Reassemble the pump cover and plastic clamp onto the strainer pot. The pump is now ready to prime.
4. Open the air release valve on the filter, and stand clear of the filter.
5. Turn on the switch or time clock.
6. When water comes out of the air release valve, close the valve. The system should now be free of air and recirculating water to and from the pool.
7. For 2-speed pumps:

- Pump should run on high-speed for priming.
- The pump should not run longer than 8 minutes before priming is achieved.



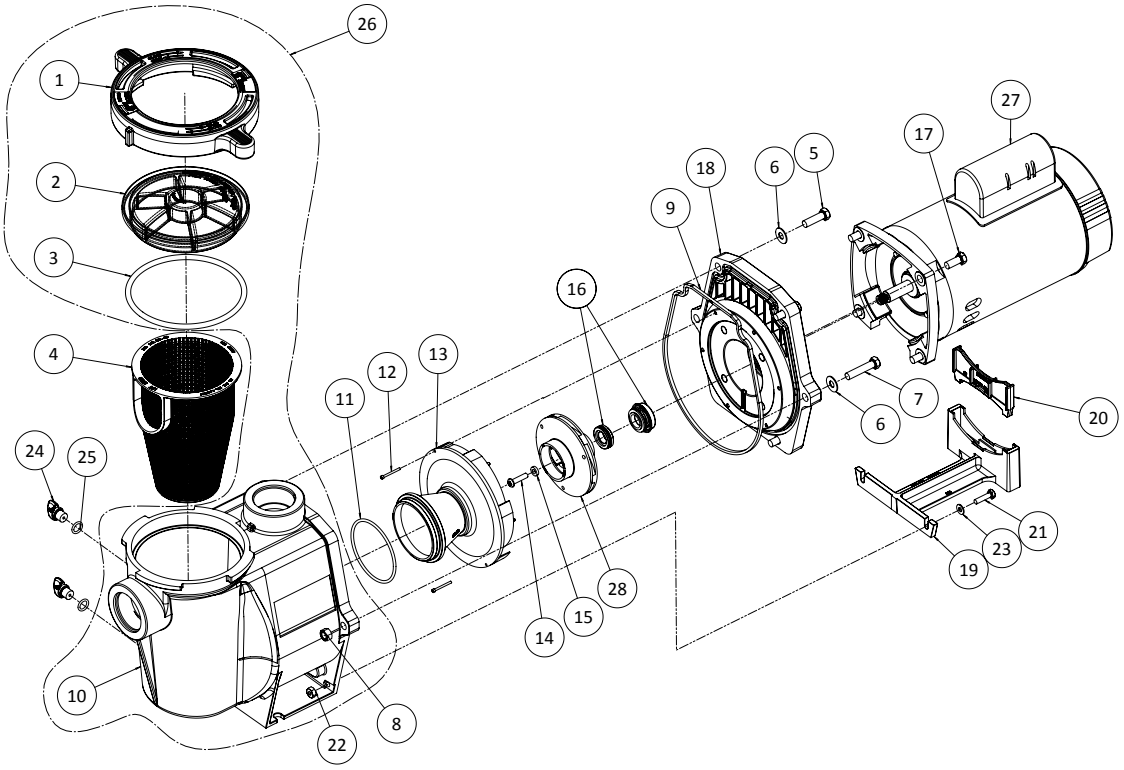
Motor Assembly

TROUBLESHOOTING

Problem	Possible Cause	Corrective Action
Pump failure.	Pump will not prime - Air leak, too much air.	Check suction piping and valve glands on any suction gate valves. Secure lid on pump strainer pot and be sure lid gasket is in place. Check water level to be sure skimmer is not drawing air.
	Pump will not prime - Not enough water.	Be sure the suction lines, pump, strainer, and pump volute are full of water. Be sure valve on suction line is working and open (some systems do not have valves). Check water level to make sure water is available through skimmer.
	Pump stainer gasket is clogged.	Clean pump strainer pot.
	Pump strainer gasket is defective.	Replace gasket.
Reduced capacity and/or head.	Air pockets or leaks in suction line.	Check suction piping and valve glands on any suction gate valves. Secure lid on pump strainer pot and be sure lid gasket is in place. Check water level to be sure skimmer is not drawing air.
	Clogged impeller.	Turn off electrical power to the pump. Disassemble (see page 4, 'Pump Disassembly') Clean debris from impeller. If debris cannot be removed, complete the following steps: 1. Remove left hand thread anti-spin bolt and o-ring. 2. Remove, clean, and reinstall impeller. Reassemble (see page 5, 'Pump Reassembly')
	Pump strainer clogged.	Clean suction trap.

REPLACEMENT PARTS

WhisperFlo® High Performance Pump Parts List



Item No.	P/N	Description
1	357199	Clamp, Cam & Ramp, Almond
1	357150	Clamp, Cam & Ramp, Black
2	357151	Cover, Clear, WFE Pump
2	357156	Cover, chemical resistant Cam & Ramp
3	350013	O-Ring, WFE Cover
4	070387	Strainer Basket, WFE
5	070430	Bolt, 3/8 - 16 x 1.25 Hex Head. SS, 4 Req.
6	072184	Washer, 3/8 x 13/16 O.D. SS, 6 Req.
7	070431	Bolt, 3/8 - 16 x 1.75 Hex Head. SS, 2 Req.
8	071403	Nut, 3/8, 16 Hex Head, 2 Req.
9	357100	Black Gasket for Seal Plate
10	357149	Volute & Seal Plate, Almond Replacement Kit
10	350015	Volute, WFE Pump & Pot, Almond
10	357157	Volute, WFE Pump & Pot, Black ❶
11	355227	O-Ring Parker No. 2-238, WFE Pump
12	071660	Set Screw, 4-40 x 1-1/8 WFE, 2 Req.
13	072928	Diffuser assembly, WFE-12, 3 HP Only
13	072927	Diffuser assembly, WFE 2-8, 1/2 HP-2.5 HP
14	071652	Set Screw, 1/4 - 20 x 1 in. Phillips

Item No.	P/N	Description
15	075713	Rubber Washer, WFE Pump
16	071734S	Seal PA-7 w/ ceramic seat, PS1000
16	071728	Seal A7 w/ ceramic seat, PS201 ❶
17	070429	Bolt 3/8 - 16 x 7/8 SS Hex Head, 4 Req.
18	350201	Seal Plate Kit WFE Almond (Includes Mechanical Seal installed) Items 9, 16 & 18
18	350101	Seal Plate Kit WFE Black (Includes Mechanical Seal installed) Items 16 & 18
19	070927	Foot, WFE Pump, Almond
19	357159	Foot, Black ❶
20	070929	Foot Insert, WFE Pump, Almond
20	357160	Foot Insert, WFE Pump, Black ❶
21	071657	Screw 1/4 - 20 x 1 In. Hex Head, SS, 2 Req.
22	071406	Nut, 1/4 - 20 Hex Head, SS, 2 Req.
23	072183	Washer, 1/4 x 5/8 OD, SS, 2 Req.
24	071131	Knob, Drain Plug, Almond, 2 Req.
24	357161	Knob, Drain Plug, Black, 2 Req. ❶
25	192115	O-Ring, Drain Plug, 2 Req.
26	357149	Volute/Seal Plate Replacement Kit, Almond (Incl. Items: 1-4, 9, 10, 16, 18, 24, and 25)
27	*See Motor Table on next page*	

Item No.	P/N	Description
		Motors
27	355008S	3/4 HP, 60 Hz, WFE-2, 3 & 24, 1 spd., almond, 31 lbs. ❷
27	355010S	1 HP, 60 Hz, WFE-4 & 26, 1 spd., almond, 33 lbs. ❷
27	355012S	1-1/2 HP, 60 Hz, WFE-6 & 28, 1 spd., almond, 39 lbs. ❷
27	355014S	2 HP, 60 Hz, WFE-8 & 30, 1 spd., almond, 40 lbs. ❷
27	355016S	3 HP, 60 Hz, WFE-12, 1 spd., almond, 40 lbs. ❷
27	356630S	1 HP, WFDS-4 & 26, 2 spd., 34 lbs. ❹
27	071320S	1-1/2 HP, WFDS-6 & 28, 2 spd., 36 lbs. ❹
27	071321S	2 HP, WFDS-8 & 30, 2 spd., 45 lbs. ❹
27	355018S	1/2 HP, WF-2 & 23, 1 spd., almond, 39 lbs. ❸
27	355020S	3/4 HP, WF-3 & 24, 1 spd., almond, 26 lbs. ❸
27	355022S	1 HP, WF-4 & 26, 1 spd., almond, 28 lbs. ❸
27	355024S	1-1/2 HP, WF-6 & 28, 1 spd., 39 lbs. ❸
27	355026S	2 HP, WF-8 & 30, 1 spd., 32 lbs. ❸
27	355033S	3 HP, WF-12, 1 spd., almond, 40 lbs. ❸
27	355203S	1 HP, WFK-4, 3 ph, 1 spd., black, 28 lbs.
27	355204S	1-1/2 HP, WFK-6, 3 ph, 1 spd., black, 30 lbs.
27	355205S	2 HP, WFK-8, 3 ph, 1 spd., black, 37 lbs.
27	355398S	3 HP, WFK-12, 3 ph, 1 spd., black, 35 lbs.
27	356626S	1 HP, WFK-4, 3 ph, 1 spd., almond, 28lbs.
27	356627S	1-1/2 HP, WFK-6, 3 ph, 1 spd., almond, 30lbs.
27	356628S	2 HP, WFK-8, 3 ph, 1 spd., almond, 37 lbs.
27	356629S	3 HP, WFK-12, 3 ph, 1 spd., almond, 35 lbs.
27	354805S	1 HP, WFK-4, TEFC, 3 ph, 1 spd., almond, 28lbs.
27	354807S	1-1/2 HP, WFK-6, TEFC, 3 ph., 1 spd., almond, 30lbs.
27	354809S	2 HP, WFK-8, TEFC, 3 ph., 1 spd., almond, 37 lbs.
27	354811S	3 HP, WFK-12, TEFC, 3 ph., 1 spd., almond, 35 lbs.

Not Shown

79129900	2-Speed Toggle Switch
350202	Seal Plate Kit: Seal plate (almond), Gasket (black), with installed Seal (Includes items: 9, 16, & 18)
350203	Seal Plate Kit: Seal plate (black), Gasket (black), with installed Seal (Includes items: 9, 16, & 18)
357244	Pot Assembly, Black NPT. (Includes items: 1-4, 10, 24 [qty. 2], 25 [qty. 2]).
357243	Pot Assembly, Almond NPT. (Includes items: 1-4, 10, 24 [qty. 2], 25 [qty. 2]).

Power End Sub-assembly

Includes Items: 12-18, 27-28

075136	WFE-2
075137	WFE-3, WFE-24
075138	WFE-4, WFE-26 ❷
075139	WFE-6, WFE-28 ❷
075140	WFE-8, WFE-30 ❷
075141	WFE-12 ❷
075145	WFDS-3, WFDS-24 ❹
075142	WFDS-4, WFDS-26 ❹
075143	WFDS-6, WFDS-28 ❹
075144	WFDS-8, WFDS-30
075251	WF-2, WF-23 ❸
075252	WF-3, WF-24 ❸
075253	WF-4, WF-26 ❸
075254	WF-6,WF-28 ❸
075255	WF-8,WF-30 ❸
075256	WF-12 ❸

Fluid Ends-All Parts, w/o Motor

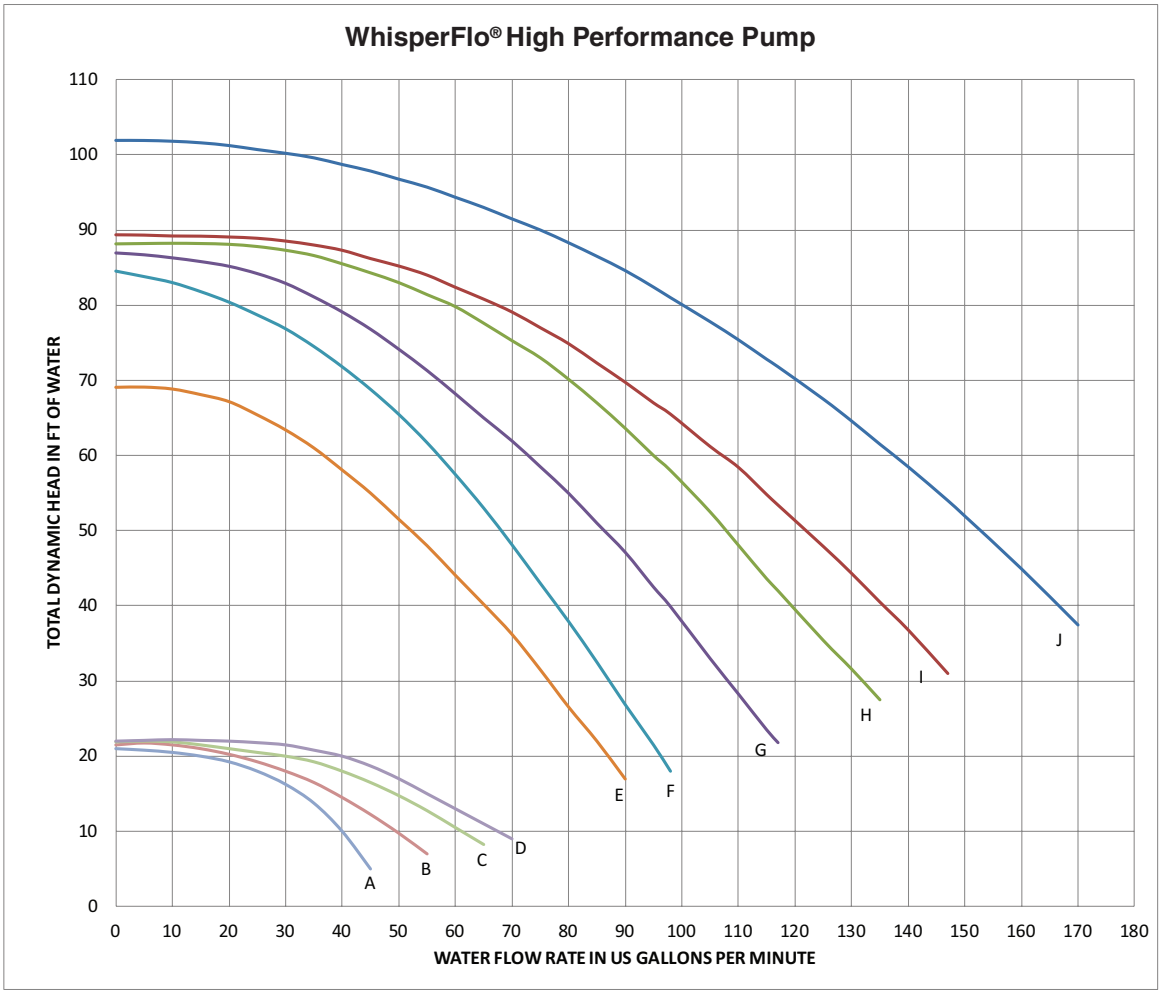
075451	WFE-2 fluid end, 1/2 HP
075452	WFE-3 fluid end, 3/4 HP
075453	WFE-4 fluid end, 1 HP
075454	WFE-6 fluid end, 1-1/2 HP
075455	WFE-8 fluid end, 2 HP
075456	WFE-12 fluid end, 3 HP

❶ CSA/CUL (only) for Canada
❷ Energy efficient, single phase
❸ Standard efficiency, single phase
❹ Two speed, single phase

Impeller Chart

HP	PUMP MODEL	STD PART NO.
1/2	WFE-2, WF-2, WF-23, WFK-2	073126
3/4	WFE-3, WFE-24, WF-3, WF-24, WFK-3, WFDS-24	073127
1	WFE-4, WFE-26, WF-4, WF-26, WFK-4, WFDS-4, WFDS-26	073128
1½	WFE-6, WFE-28, WF-6, WF-28, WFK-6, WFDS-6, WFDS-28	073129
2	WFE-8, WFE-30, WF-8, WF-30, WFK-8, WFDS-8, WFDS-30	073130
3	WFE-12, WF-12, WFK-12	073131

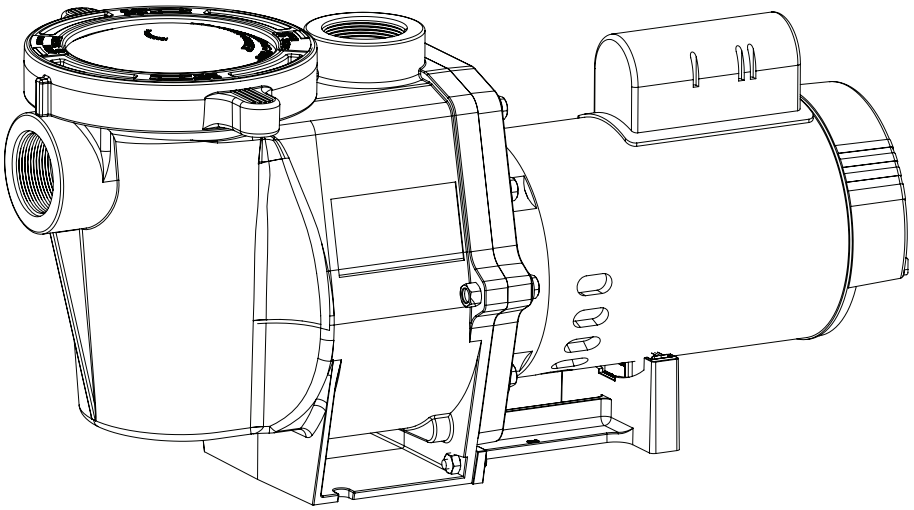
Pump Performance Curves



Curve	Model
A	WFDS-3, WFDS-24
B	WFDS-4, WFDS-26
C	WFDS-6, WFDS-28
D	WFDS-8, WFDS-30
E	WFE-2, WF-2, WF-23, WFK-2
F	WFE-3, WFE-24, WF-3, WF-24, WFK-3, WFDS-3, WFDS-24
G	WFE-4, WFE-26, WF-4, WF-26, WFK-4, WFDS-4, WFDS-26
H	WFE-6, WFE-28, WF-6, WF-28, WFK-6, WFDS-6, WFDS-28
I	WFE-8, WFE-30, WF-8, WF-30, WFK-8, WFDS-8, WFDS-30
J	WFE-12, WF-12, WFK-12

PENTAIR

WHISPERFLO®
BOMBA DE ALTO RENDIMIENTO



GUÍA DE INSTALATIÓN Y DEL USUARIO

INSTRUCCIONES IMPORTANTES DE SEGURIDAD
LEA Y SIGA TODAS LAS INSTRUCCIONES
GUARDE ESTAS INSTRUCCIONES

ATENCIÓN AL CLIENTE / SOPORTE TÉCNICO

Si tiene alguna pregunta sobre cómo realizar pedidos de piezas de repuesto de Pentair Aquatic Systems, utilice la siguiente información de contacto:

Servicio del Cliente y Soporte Técnico, USA
(de 8 a.m. a 4:30 p.m., Horario del Este y del Pacífico)

Teléfono: (800) 831-7133

Fax: (800) 284-4151

Sitio web

Visite *www.pentairpool.com* o *www.staritepool.com* para encontrar información sobre los productos Pentair.

Sanford, Carolina del Norte
(de 8 a.m. a 4:30 p.m., Horario del Este)

Teléfono: (919) 566-8000

Fax: (919) 566-8920

Moorpark, California
(de 8 a.m. a 4:30 p.m., Horario del Pacífico)

Teléfono: (805) 553-5000 (Ext. 5591)

Fax: (805) 553-5515

ÍNDICE

NSF - 50 c UL us

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

P/N 071109 Rev. J 8/29/14

INSTRUCCIONES Y ADVERTENCIAS DE SEGURIDAD IMPORTANTES DE LA BOMBA

Nota Importante:

Atención Instalador: Esta guía contiene información importante sobre la instalación, el funcionamiento y el uso seguro de este producto. Esta información debe ser entregada al propietario y/o al operador de este equipo después de la instalación del limpiador de piscina. **Atención Usuario:** Este manual contiene información importante que le ayudará a utilizar y mantener este limpiador.

LEA Y SIGA TODAS LAS INSTRUCCIONES
GUARDE ESTAS INSTRUCCIONES

Éste es el símbolo de alerta de seguridad.
Cuando vea este símbolo en su sistema o en este manual, busque alguna de las siguientes palabras y esté alerta ante la posibilidad de lesiones.

⚠ PELIGRO Advierte sobre peligros que pueden causar la muerte, lesiones personales graves o daño a la propiedad si son ignorados.

⚠ ADVERTENCIA Advierte sobre peligros que podrían causar la muerte, lesiones personales graves o daño a la propiedad si son ignorados.

⚠ PRECAUCIÓN Advierte sobre los peligros que podrían o pueden causar lesiones personales menores o daños a la propiedad si son ignorados.

NOTA indica instrucciones especiales no relacionadas a peligros.

Lea cuidadosamente y siga las instrucciones de seguridad del equipo que aparecen en este manual. Mantenga las etiquetas de seguridad en buen estado; reemplácelas si faltan o están dañadas.

Cuando instale y utilice este equipo eléctrico, siempre debe respetar precauciones de seguridad básicas, incluyendo las siguientes:

⚠ ADVERTENCIA No permita que los niños utilicen este producto.

⚠ ADVERTENCIA Riesgo de choque eléctrico. Conecte sólo a un circuito eléctrico protegido por un interruptor de circuito con descarga a tierra (GFCI). Comuníquese con un electricista calificado si no puede verificar que el circuito esté protegido por un interruptor GFCI.

⚠ ADVERTENCIA Conecte sólo a un circuito eléctrico protegido por un interruptor de circuito con descarga a tierra (GFCI). Este GCFI debe ser provisto por el instalador y debe ser probado de manera rutinaria. Para probar el GFCI presione el botón de prueba. El GFCI debería interrumpir la energía eléctrica. Presione el botón de reinicio. Debería restaurar la energía. Si el GFCI no funciona de esta manera, el GFCI tiene una falla. Si el GFCI interrumpe la energía a la bomba sin que se presione el botón de prueba, hay presencia de corriente de tierra, indicando la posibilidad de un choque eléctrico. No utilice esta bomba. Desconecte la bomba y haga que un representante de servicio técnico calificado corrija el problema antes de utilizar el equipo.

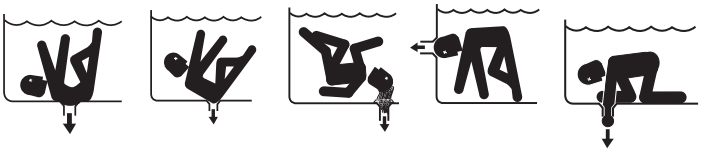
⚠ PRECAUCIÓN Esta bomba se utiliza para piscinas permanentes y también puede ser utilizada en jacuzzis o spa si está indicado. No la utilice con piscinas desmontables. Una piscina con instalación permanente es una piscina construida en el suelo o en una base de manera que no puede ser desmontada. Una piscina desmontable está construida de manera que puede ser fácilmente desmontable para su almacenamiento y rearmada de acuerdo a su formato original.

Advertencias generales

- Nunca abra el interior de la caja del motor. Hay un banco capacitor que admite una carga de hasta 230 VCA incluso cuando la unidad no tenga energía eléctrica.
- La bomba del spa no es sumergible.
- La bomba puede trabajar con flujos máximos altos; tenga cuidado cuando realice la instalación y programación para limitar el potencial de rendimiento de las bombas con equipos antiguos o de origen desconocido.
- Los requisitos de códigos para la conexión eléctrica difieren de un estado a otro. Instale los equipos de acuerdo con el Código Eléctrico Nacional y todos los códigos y ordenanzas locales aplicables.
- Antes de realizarle el servicio técnico a la bomba, APAGUE la energía a la bomba desconectando el circuito principal a la bomba.
- Este dispositivo no debe ser utilizado por personas (incluidos niños) con capacidades físicas, sensoriales o mentales reducidas, o falta de experiencia y conocimiento, a menos que hayan recibido instrucciones y sean supervisados por una persona responsable por su seguridad.

⚠ PELIGRO SI NO SE RESPETAN TODAS LAS INSTRUCCIONES Y ADVERTENCIAS LAS CONSECUENCIAS PUEDEN SER HERIDAS GRAVES O LA MUERTE. **LA BOMBA DEBE SER INSTALADA Y REVISADA ÚNICAMENTE POR UN PROFESIONAL DE SERVICIO DE PISCINAS CALIFICADO. LOS INSTALADORES, OPERADORES Y PROPIETARIOS DE LAS PISCINAS DEBEN LEER ESTAS ADVERTENCIAS Y TODAS LAS INSTRUCCIONES QUE APARECEN EN EL MANUAL DEL PROPIETARIO ANTES DE UTILIZAR ESTA BOMBA. ESTAS ADVERTENCIAS Y EL MANUAL DEL PROPIETARIO DEBEN PERMANECER CON EL PROPIETARIO DE LA PISCINA.**

⚠ PELIGRO PELIGRO DE TRAMPA DE SUCCIÓN: ¡MANTÉNGASE ALEJADO DEL DRENAJE PRINCIPAL Y DE TODAS LAS SALIDAS DE SUCCIÓN!



LA BOMBA PRODUCE ALTOS NIVELES DE SUCCIÓN Y CREA UN FUERTE VACÍO EN EL DRENAJE PRINCIPAL EN LA BASE DEL CUERPO DE AGUA. ESTA SUCCIÓN ES TAN FUERTE QUE PUEDE ATRAPAR A ADULTOS O NIÑOS DEBAJO DEL AGUA SI SE ACERCAN DEMASIADO AL DRENAJE O SI HAY ALGUNA PARTE DE LA CUBIERTA O PARRILLA DEL DRENAJE SUELTA O AVERIADA.

EL USO DE CUBIERTAS NO APROBADAS O PERMITIR EL USO DE UN SISTEMA DE ACUICULTURA CUANDO FALTAN CUBIERTAS, SE ENCUENTRAN FRACTURADAS O AVERIADAS PUEDE TENER COMO RESULTADO EL ATRAPAMIENTO DEL CUERPO O DE UN MIEMBRO, ENREDO DEL CABELLO, ATRAPAMIENTO DEL CUERPO, DESTRIPAMIENTO Y/O LA MUERTE.

La sección en el drenaje o salida puede causar:

Atrapamiento de miembros: Cuando se succiona un miembro o éste es insertado en una apertura que tiene como resultado una obstrucción mecánica o hinchazón. Este riesgo está presente cuando falta una cubierta del drenaje, o está rota, suelta, quebrada o no está bien asegurada.

Enredo del cabello: Cuando el cabello se enreda o se anuda en la cubierta del drenaje, atrapando al nadador debajo del agua. Este riesgo está presente cuando la velocidad del flujo de la cubierta es demasiado baja para la o las bombas.

Atrapamiento corporal: Cuando una porción del cuerpo queda contra la cubierta del drenaje y atrapa al nadador debajo del agua. Este riesgo existe cuando falta la cubierta del drenaje, cuando ésta está quebrada o cuando la velocidad de flujo de la cubierta no es lo suficientemente alta para la o las bombas.

Destripamiento: Cuando una persona está sentada en una piscina abierta (especialmente una piscina poco profunda para niños) o salida de un spa y se aplica la succión directamente a los intestinos, causando un daño intestinal severo. Este riesgo está presente cuando falta una cubierta del drenaje, o está suelta, quebrada o no está bien asegurada.

Atrapamiento mecánico: Cuando quedan atrapados en una entrada o en la cubierta del drenaje objetos tales como: joyas, trajes de baño, accesorios para el cabello, dedos de la mano o del pie o nudillos. Este riesgo está presente cuando falta la cubierta del drenaje, o está rota, suelta, quebrada o no está bien asegurada.

NOTA: LA INSTALACIÓN DE PLOMERÍA DE SUCCIÓN DEBE SER INSTALADA DE ACUERDO CON LOS CÓDIGOS, ESTÁNDARES Y PAUTAS NACIONALES Y LOCALES MÁS ACTUALIZADOS.

INSTRUCCIONES Y ADVERTENCIAS DE SEGURIDAD IMPORTANTES DE LA BOMBA

⚠ ADVERTENCIA PARA MINIMIZAR EL RIESGO DE LESIONES DEBIDO AL PELIGRO DE ATRAPAMIENTO POR SUCCIÓN:

- Para cada drenaje debe utilizarse una cubierta de succión anti-atrapamiento aprobada de acuerdo a ANSI/ASME A112.19.8 que debe estar correctamente instalada y asegurada.
- Cada cubierta de succión debe estar instalada al menos a tres pies (0,9 m) de distancia, medidos entre los 2 puntos más cercanos.
- Inspecciones regularmente todas las cubiertas para controlar que no existan quebraduras, daños o erosión por exposición a la intemperie.
- Si falta una cubierta o si ésta se afloja, quiebra, daña o rompe, reemplácela con una cubierta certificada adecuada.
- Reemplace las cubiertas de drenaje cuando sea necesario. Las cubiertas de drenaje se deterioran con el tiempo debido a la exposición al sol y a la intemperie.
- Evite que el cabello, los miembros o el cuerpo estén próximos a cualquier cubierta de succión, drenaje de la piscina o salida.
- Desactive las salidas de succión reconfigure las entradas de retorno.

⚠ ADVERTENCIA Debe existir un interruptor de emergencia para la bomba en un lugar fácilmente accesible y visible. Asegúrese que de los usuarios conozcan dónde está y sepan cómo usarla en caso de emergencia.

La ley de seguridad para piscinas y spa Virginia Graeme Baker (VGB) crea nuevos requisitos para los dueños y operadores de piscinas y spa comerciales.

Las piscinas y spa comerciales construidos después del 19 de diciembre de 2008 deben utilizar:

(A) Un sistema de drenaje principal múltiple sin aislación con cubiertas de salida de succión que cumplan con las características ASME/ANSI A112.19.8a para accesorios de succión en piscinas, piscinas poco profundas para niños, spas y jacuzzis ya sea:

(i) Un sistema de seguridad de alivio de vacío (SVRS) que cumpla con la normativa ASME/ANSI A112.19.17 Manufactured Safety Vacuum Release systems (SVRS) para sistemas de succión en piscinas residenciales y comerciales, spa, jacuzzis y piscinas poco profundas para niños, y/o especificaciones estándar ASTM F2387 para Manufactured Safety Vacuum Release Systems (SVRS) en piscinas, spa y jacuzzis o

(ii) un sistema de ventilación bien diseñado y con un sistema probado de limitación de succión

(iii) un sistema de apagado automático de bomba

Las piscinas o spa comerciales construidos con anterioridad al 19 de diciembre de 2008 con una salida de succión sumergida deben utilizar una salida de succión que cumpla con ASME/ANSI A112.19.8a y:

(A) un SVRS que cumpla con los requisitos ASME/ANSI A112.19.17 y/o ASTM F2387, o bien

(ii) un sistema de ventilación bien diseñado y con un sistema probado de limitación de succión o bien

(iii) un sistema de apagado automático de bomba, o

(D) salidas sumergidas desactivadas, o

(E) Salidas de succión que deben ser reconfiguradas como entradas de retorno.

Para la instalación de controles eléctricos en la superficie de apoyo del equipo (interruptores ENCENDIDO/APAGADO, relojes o centro de carga automática)

⚠ PRECAUCIÓN Instale todos los controles eléctricos en la superficie de apoyo del equipo, como interruptores de encendido/apagado y sistemas de control, etc. para permitir el funcionamiento (arranque, apagado o servicio) de cualquier bomba o filtro de manera que el usuario no coloque ninguna porción de su cuerpo por encima o cerca de la tapa del filtro de la bomba, la tapa del filtro o el cierre de la válvula. Esta instalación debería permitirle al usuario utilizar espacio suficiente para permanecer alejado del filtro y la bomba durante el arranque, apagado o servicio del filtro del sistema.

⚠ PELIGRO **PRESIÓN PELIGROSA: MANTÉNGASE ALEJADO DE LA BOMBA Y FILTRO DURANTE EL ARRANQUE**

Los sistemas de circulación operan bajo alta presión. Cuando cualquier parte del sistema de circulación (es decir anillo de seguridad, bomba, filtro y válvulas, etc) está siendo controlado por el servicio técnico, es posible que ingrese aire al sistema y que éste se presurice.

El aire presurizado puede provocar que las válvulas y la tapa del filtro de la cubierta de la caja de la bomba se separen violentamente lo cual puede tener como resultado lesiones graves o la muerte. La tapa del tanque del filtro y la cubierta del filtro deben estar correctamente aseguradas para evitar una separación violenta. Manténgase alejado del equipo del sistema de circulación cuando encienda o arranque la bomba.

Antes de realizar el servicio al equipo, tome nota de la presión del filtro. Asegúrese de que se realicen todos los controles para asegurar que el sistema no arranque sin aviso durante el servicio técnico. Desconecte la energía a la bomba. **IMPORTANTE: Coloque la válvula de alivio de aire manual del filtro en posición abierta y espere que se libere la presión del sistema.**

Antes de iniciar el sistema, abra totalmente la válvula de liberación de aire manual y ubique todas las válvulas del sistema en posición "abierto" para permitir que el agua fluya libremente desde y hacia el tanque. Aléjese de los equipos y arranque la bomba.

IMPORTANTE: No cierre la válvula de alivio de aire manual del filtro hasta que se haya descargado la totalidad de la presión de la válvula y aparezca un chorro de agua constante. Observe el indicador de presión del filtro y asegúrese de que no es más alto que el estado anterior al servicio.

Información general para la instalación

- La instalación y el servicio deben ser efectuados por un profesional de servicio calificado, y deben cumplir con todos los códigos nacionales, estatales y locales.
- En la instalación se debe colocar un drenaje en el compartimiento para los componentes eléctricos.
- Estas instrucciones contienen información para una variedad de modelos de bombas y por lo tanto algunas instrucciones pueden no aplicarse a un modelo específico. Todos los modelos deben ser utilizados en aplicaciones de piscinas. La bomba funcionará correctamente sólo si tiene el tamaño adecuado para la aplicación específica y si está correctamente instalada.

⚠ ADVERTENCIA Las bombas de tamaño incorrecto o instaladas de manera incorrecta o utilizadas en aplicaciones diferentes a aquellas para las cuales la bomba fue diseñada pueden tener como resultado daños personales severos o la muerte. Estos riesgos incluyen pero no se limitan a choque eléctrico, incendio, inundación, succión, atrapamiento, lesiones graves o daño a la propiedad causados por una falla estructural de la bomba u otro componente del sistema.

⚠ ADVERTENCIA La bomba puede producir niveles altos de succión dentro del lado de succión del sistema de plomería.

Estos altos niveles de succión pueden implicar un riesgo si una persona se acerca demasiado a los orificios de succión. Este alto nivel de vacío puede causar daños severos en personas, quienes también podrían quedar atrapadas y ahogarse. Es de primordial importancia que el sistema de plomería sea instalado de acuerdo a los más recientes códigos nacionales y locales para las aplicaciones de piscinas.

Antes de instalar este producto, lea y siga todas las advertencias e instrucciones incluidas. Llame al (800) 831-7133 para obtener copias adicionales de estas instrucciones sin costo.

Instrucciones y advertencias de seguridad y la versión en español de este manual del producto, se puede encontrar en línea a: **http://www.pentairpool.com/es/pool-owner/manuals/** o llame al (800) 831-7133 para obtener copias adicionales de estas instrucciones sin costo.

GUARDE ESTAS INSTRUCCIONES

INSTALACIÓN

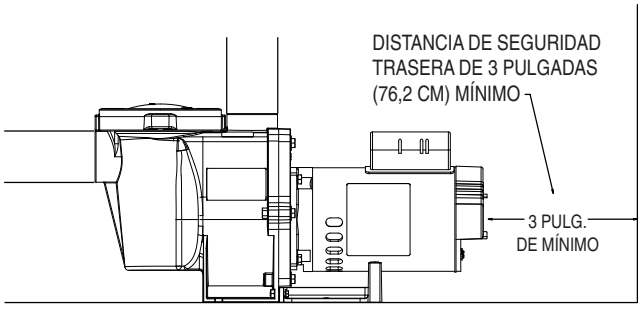
Sólo personal de servicio calificado debe instalar la bomba WhisperFlo®. Consulte la sección “Instrucciones de seguridad y advertencias de la bomba” en las páginas 11 a 12 para obtener información adicional sobre pautas para la instalación y la seguridad.

Ubicación

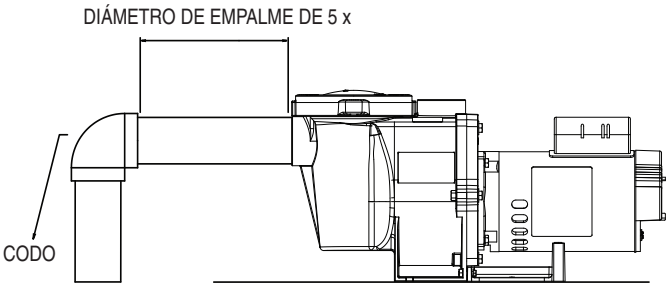
1. Instale la bomba lo más cerca posible a la piscina o spa. Para reducir la pérdida de fricción y mejorar la eficacia, use un mecanismo de succión corta y directa y retornos de tuberías.
2. Realice la instalación a un mínimo de 5 pies (1,52 m.) de la pared interior de la piscina y el spa. En Canadá, las instalaciones deben estar como mínimo a una distancia de 9,8 pies (3 metros) del agua de la piscina.
3. Instale la bomba a un mínimo de 3 pies (0,9 metros) de la salida del calefactor.
4. No instale la bomba a más de 10 pies (2,44 m) por encima del nivel del agua.
5. Instale la bomba en un área cubierta y bien ventilada para protegerla de la humedad excesiva (es decir, lluvia, sistemas de aspersión, etc.)
6. Para jacuzzis y spas, no instale dentro de una caja exterior o debajo de la base de un jacuzzi o spa.
7. Instale la bomba con una distancia de separación trasera de al menos 3 pulgadas (76,2 mm) de manera que el motor pueda ser extraído fácilmente cuando debe ser reparado y cuando se realice el mantenimiento.

Tuberías

1. Para una mejor plomería en la piscina, se recomienda utilizar un tamaño de tubería más grande. Cuando instale los accesorios para entradas y salidas (adaptadores macho), use un sellador de roscas.
2. Utilice tamaños de caños más grandes para una mejor tubería. El diámetro de empalme debe ser el mismo o mayor que el diámetro de la línea de retorno.
3. Las tuberías en el lado de succión de la bomba deben ser lo más cortas posibles.
4. Se recomienda una válvula, codo o pieza en forma de T en la línea de succión no debería estar más cerca al frente de la bomba que cinco veces el diámetro de la tubería de la línea de succión (es decir, una tubería de 2 pulgadas (5,1 cm) necesita un espacio recto enfrente de la entrada de succión de la bomba de 10 pulgadas (254 mm)). Esto ayudará a que el cebado de la bomba sea más rápido y dure por más tiempo.



Distancia de seguridad de la parte trasera de la bomba



Recomendado mínimo Diámetro de empalme

Conexiones y Válvulas

1. No instale codos de 90° directamente en la entrada de la bomba.
2. Los sistemas de succión deberían tener válvulas de compuertas instaladas en las tuberías de succión y descarga para mantenimiento; sin embargo, la válvula de compuerta de succión no debe estar más cerca que cinco veces el diámetro de la tubería de succión como se describe en el párrafo anterior.
3. Utilice una válvula de retención en la línea de descarga al utilizar esta bomba para cualquier aplicación donde hay altura significativa de la tubería después de la bomba.
4. Asegúrese de instalar las válvulas de comprobación cuando nivela en paralelo con otra bomba. Esto ayuda a evitar la rotación inversa del propulsor y el motor.

⚠ ADVERTENCIA

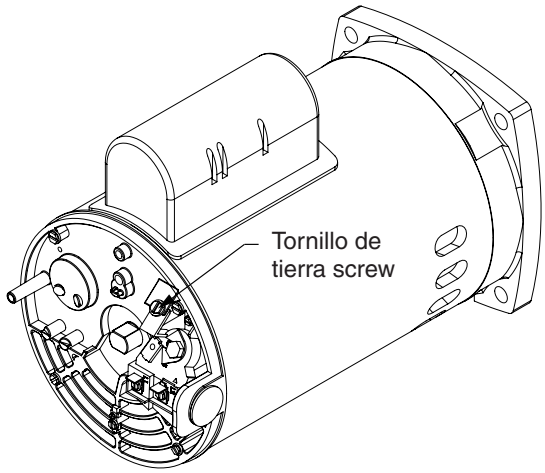
RIESGO DE CHOQUE ELÉCTRICO O ELECTROCUCIÓN. Esta bomba debe ser instalada por un electricista autorizado o matriculado o un profesional de servicio calificado de acuerdo con el Código Eléctrico Nacional y todos los códigos y ordenanzas locales aplicables. Una instalación inadecuada generará un riesgo eléctrico que puede ocasionar la muerte o lesiones graves a los usuarios, los instaladores u otras personas debido a un choque eléctrico, y también puede provocar daños a la propiedad.

Siempre desconecte la energía eléctrica a la bomba en el interruptor de circuito antes de realizar el servicio de la bomba. Si no se hace esto, las personas que realizan el servicio, los usuarios u otras personas pueden resultar muertas o con heridas de gravedad debido al electrochoque.

Lea todas las instrucciones de servicio antes de comenzar a trabajar en la bomba.

Instalación de cableado eléctrico

1. Asegúrese de que todos los interruptores y conmutadores eléctricos estén apagados antes de cablear el motor.
2. Asegúrese de que el voltaje de la línea de suministro coincida con el voltaje del motor descrito en la placa del motor (por ejemplo, 230 VCA o 115 VCA). Si no coinciden, puede ocurrir un daño permanente al motor.
3. Utilice el alivio de tensión y asegúrese de que todas las conexiones eléctricas estén limpias y ajustadas.
4. Corte los cables en la longitud adecuada, de modo de que no se superpongan o toquen cuando estén conectados.
5. Conecte el motor a tierra de manera permanente utilizando el cable a tierra verde, como se muestra a continuación. Utilice el tamaño y tipo de cable correcto especificado por el Código Eléctrico Nacional. Asegúrese de que el cable a tierra esté conectado a una conexión a tierra de servicio eléctrico.
6. Una el motor a la estructura conforme lo estable el Código Eléctrico Nacional. UL requiere el uso de un conductor de interconexión de cobre sólido de un diámetro mínimo de 8 AWG. Pase un cable desde el tornillo o terminal de interconexión externa hasta la estructura de interconexión.
7. Conecte el cable desde el conector de cable accesible en el motor hasta todas las partes metálicas de la estructura y todo el equipo eléctrico, conducto metálico y tubería metálica a 5 pies (1,5 m) de las paredes internas de la estructura. Para Canadá, se requiere un conductor de interconexión de cobre sólido de 6 AWG o más largo.
8. La bomba debe conectarse de manera permanente ya sea a un interruptor de circuito, reloj o relé de 2 polos. Si se suministra energía CA a través de un interruptor de circuito GFCI, utilice un interruptor de circuito especial que no posea otras cargas eléctricas.



Nota: *Cuando la bomba se monta permanentemente dentro de 5 pies (1.524 m) de las paredes interiores de una piscina, tiene que usar un No. 8 AWG o conductor más grande para conectar al tirón de conductor que pega.*

Nota: Cuando la bomba se arranca y detiene al desconectar la energía mediante un relé o reloj, se debe utilizar un dispositivo de dos polos para aplicar y desconectar la energía de las dos TERMINALES DE LÍNEA DE ENERGÍA.

ESPAÑOL

MANTENIMIENTO

ADVERTENCIA **NO** abra el depósito del filtro si el cebado de la bomba falla o si la bomba ha estado funcionando sin agua en el depósito del filtro. Las bombas que funcionan en estas circunstancias pueden experimentar una acumulación de presión de vapor y pueden contener agua caliente escaldada. Si abre la bomba puede resultar herido de gravedad. Para evitar la posibilidad de lesiones personales, asegúrese de que las válvulas de succión y descarga estén abiertas y la temperatura del depósito del filtro esté fría para el tacto, luego ábrala con extrema precaución.

PRECAUCIÓN Para evitar el daño de la bomba y para un adecuado funcionamiento del sistema, limpie el filtro de la bomba y las canastillas de los desnatadores con regularidad.

Canastilla del filtro de la bomba

La canastilla del filtro (o "depósito del filtro") se encuentra enfrente del alojamiento de la bomba. La canastilla del filtro debe mantenerse limpia y sin suciedad. Inspeccione la canastilla a través de la tapa en la parte superior del alojamiento.

Asegúrese de inspeccionar visualmente la canastilla del filtro cada 1 a 4 semanas. Las canastillas del filtro sucias reducen la eficiencia del filtro y del calefactor y ejercen una presión anormal sobre el motor de la bomba. La acumulación de bacterias puede ensuciar la tapa.

Limpieza de la canastilla del filtro de la bomba

1. Apague la bomba en el interruptor de circuito.
2. Libere presión en el sistema.
3. Gire la tapa y abrazadera en el sentido contrario a las agujas del reloj y retírelas de la bomba.
4. Retire los residuos y limpie la canastilla. Reemplace la canastilla si está rajada.
5. Vuelva a colocar la canastilla en la caja. Asegúrese de alinear la perforación en la parte inferior de la canastilla con el acanalado en la parte inferior del alojamiento.
6. Llene el depósito y el alojamiento de la bomba hasta el puerto de entrada con agua.
7. Limpie la tapa y la abrazadera, el anillo tórico y la superficie de sellado del depósito de la bomba.
   Nota: Es importante que mantenga el anillo tórico de la tapa limpio y bien lubricado.
8. Vuelva a instalar la tapa colocando la abrazadera y la tapa en el depósito. Asegúrese de que el anillo tórico de la tapa esté bien colocado.
   Coloque la abrazadera y la tapa sobre la bomba, luego gire en sentido de las agujas del reloj hasta que las manijas del anillo de seguridad estén horizontales.
9. Encienda la bomba en el interruptor de circuito.
10. Abra la válvula de alivio de aire manual en la parte superior del filtro. Aléjese del filtro.
11. Espere hasta que se libere toda la presión. Ponga en marcha la bomba.
12. Purgue el aire del filtro hasta que un flujo constante de agua salga de la válvula de alivio de aire del filtro. Cierre la válvula de alivio de aire manual.

ADVERTENCIA **ESTE SISTEMA OPERA BAJO ALTA PRESIÓN.**

Cuando cualquier parte del sistema de circulación (es decir anillo de seguridad, bomba, filtro, válvulas, etc.) está siendo controlado por el servicio técnico, es posible que ingrese aire al sistema y que éste se presurice. El aire presurizado puede causar que la tapa se separe, lo que puede provocar heridas graves, la muerte o daño a la propiedad. A fin de evitar este riesgo potencial, siga las instrucciones que se mencionan arriba.

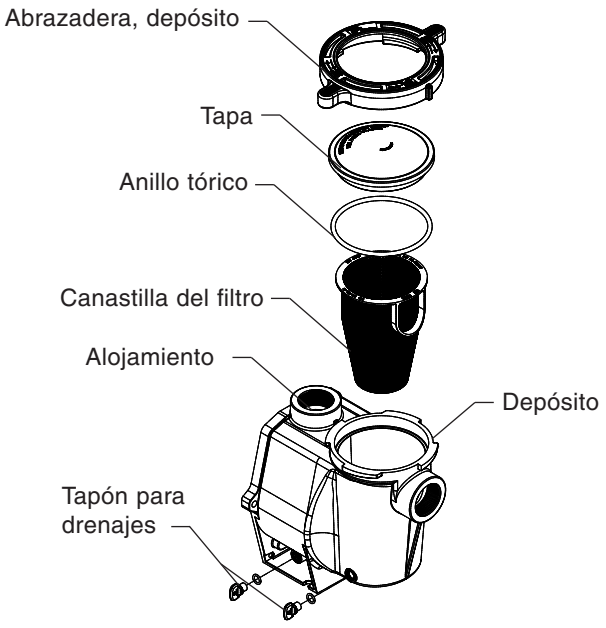
Acondicionamiento para el invierno

- En áreas de clima templado, en caso de condiciones temporales de congelamiento, haga funcionar su equipo de filtración toda la noche para evitar el congelamiento.
- Usted es responsable de determinar cuándo pueden ocurrir condiciones de congelamiento. Si se esperan condiciones de congelamiento, siga los siguientes pasos para reducir el riesgo de daño por congelamiento. El daño por congelamiento no se encuentra cubierto por la garantía.

Para evitar el daño por congelamiento, siga las instrucciones a continuación:

1. Apague el suministro eléctrico de la bomba en el interruptor de circuito.
2. Drene el agua de la caja de la bomba retirando los dos tapones de drenaje de la tapa. Guarde los tapones en la canastilla de la bomba.
3. Cubra el motor para protegerlo de la lluvia fuerte, la nieve o el hielo.

Nota: No envuelva el motor con plástico u otros materiales hermetizados durante el almacenamiento de invierno. El motor puede estar cubierto durante una tormenta, el almacenamiento de invierno, etc., pero nunca cuando esté funcionando o se espere que comience a funcionar.



Conjunto del depósito del filtro

SERVICIO

⚠ ADVERTENCIA Siempre desconecte la energía hacia la bomba en el interruptor de circuito antes de realizar el servicio a la bomba. Si no se hace esto, las personas que realizan el servicio, los usuarios u otras personas pueden resultar muertas o con heridas de gravedad debido al electrochoque. Lea todas las instrucciones de servicio antes de comenzar a trabajar en la bomba.

⚠ ADVERTENCIA **NO** abra el depósito del filtro si el cebado de la bomba falla o si la bomba ha estado funcionando sin agua en el depósito del filtro. Las bombas que funcionan en estas circunstancias pueden experimentar una acumulación de presión de vapor y pueden contener agua caliente escaldada. Si abre la bomba puede resultar herido de gravedad. Para evitar la posibilidad de lesiones personales, asegúrese de que las válvulas de succión y descarga estén abiertas y la temperatura del depósito del filtro esté fría para el tacto, luego ábrala con extrema precaución.

⚠ PRECAUCIÓN Asegúrese de no rayar o marcar las caras pulidas del sello del eje; el sello perderá si las caras se encuentran dañadas. Las caras pulidas y recubiertas del sello se podrían dañar si no son tratadas con cuidado.

Cuidado del motor

Protéjalo del calor

1. Cubra el motor del sol.
2. Cualquier caja del motor debe estar bien ventilada para evitar el sobrecalentamiento.
3. Proporcione amplia ventilación cruzada.

Protéjalo contra la suciedad.

1. Protéjalo contra cualquier materia extraña o salpicadura de agua.
2. No almacene (o derrame) químicos sobre o cerca del motor.
3. Protéjalo contra cualquier materia extraña o salpicadura de agua.
4. Evite barrer o levantar polvo cerca del motor mientras está en funcionamiento.
5. Si un motor se daña por suciedad, la garantía del motor se anula.
6. Limpie la tapa y la abrazadera, el anillo tórico y la superficie de sellado del depósito de la bomba.

Protéjalo contra la humedad

1. Protéjalo contra las salpicaduras o pulverizaciones de agua.
2. Protéjalo de las temperaturas extremas.
3. Protéjalo contra cualquier materia extraña o salpicadura de agua.
4. Si un motor se moja, déjelo secar antes de ponerlo en funcionamiento. No permita que la bomba funcione si se ha inundado.
5. Si un motor se daña por agua, la garantía del motor se anula.

Nota: Cuando está reemplazando el motor, asegúrese que el soporte de motor está colocado correctamente para soportar el tamaño del motor que se está instalando.

El sello de eje

El sello de eje consiste principalmente en dos piezas, un miembro rotativo y un sello cerámico. La bomba requiere de poco o de ningún mantenimiento además de atención razonable, sin embargo, podría ser que de vez en cuando se dañe el sello de eje y tenga que reemplazarse.

Nota: Las caras pulidas y labradas del sello se pueden dañar si no se usa con cuidado.

Desmontaje de bomba

Todas piezas móviles se encuentran en el montaje de abajo por atrás de esta bomba.

Herramientas requeridas:

- 3/ Llave de boca de 3/32 pulgada (.2381 cm)
- 1/Llave de boca de 1/2 pulgada (15.24 cm).
- 9/Llave de boca de 9/16 pulgada (1.429 cm).
- F Destornillador con cabeza plana.

Para quitar y reparar el montaje de abajo del motor ejecute los siguientes procedimientos.

1. Apague el cortacircuito de bomba en el panel principal.
2. Vacíe la bomba al quitar los tapones de drenaje.
3. Quite los 6 pernos que sujetan el cuerpo de bomba principal (olla de colador/voluta) al montaje de abajo por atrás.
4. SUAVEMENTE separe las dos mitades de bomba, quitando el montaje de abajo por atrás.
5. Use una llave de boca de 3/32 pulgada (.2381 cm) para desapretar los dos tornillos que soportan y que se encuentran en el difusor.
6. Mantenga el impulsor seguramente en lugar y quite el tornillo de llave del impulsor al usar un desarmador (desatornillador) de cruz. Este tornillo tiene rosca a mano izquierda y se desaprieta en el sentido de las agujas del reloj.
7. Quite la tapa del eje que se encuentra en la parte de atrás del motor y mantenga el eje seguro con una llave de boca de 1/2 pulgada (15.24 cm).
8. Para destornillar el impulsor del eje, déle vuelta al impulsor en el sentido opuesto de las agujas del reloj.
9. Quite los cuatro pernos de la placa de sello al motor, usando una llave de 9/16 pulgada (1.429 cm).

⚠ PRECAUCIÓN **NO haga funcionar la bomba en seco.** Si hace funcionar la bomba en seco, el sello mecánico se dañará y la bomba comenzará a perder. Si esto ocurre, deberá cambiar el sello dañado. SIEMPRE mantenga el nivel de agua adecuado. Si el nivel de agua cae por debajo del puerto de succión, la bomba extraerá aire del puerto de succión, perderá cebado y funcionará en seco, lo que dañará el sello. El funcionamiento continuo en este estado puede causar una pérdida de presión, lo que dañará la caja de la bomba, el propulsor y sello y puede provocar la pérdida de propiedad y lesiones personales.

Armar la bomba de nuevo

1. Cuando este instalando el sello mecánico de la flecha, use un sellador de silicón en la parte metálica de la flecha antes de presionar contra la placa de sello, y teniendo mucho cuidado de mantener el sellador de silicón alejado del la cara de sellado de la bomba. Asegúrese que el sello se encuentre completamente asentado y deje pasar 24 horas para permitir que el sellador seque. (Kid de remplazo completo con la placa de sello y el sello mecánico esta disponible, P/N 350201/350101.)
2. Antes de instalar la sección cerámica del sello en el impulsor, asegúrese que el impulsor está limpio. Use un jabón de poca densidad y agua para sellar el sello. Empuje el sello en el impulsor con los dedos gordos y pase un paño para limpiar las caras cerámicas y de carbón.
3. Reinstalar de nuevo la placa de sello al motor. Ajustando los Pernos, 3/8-16 x 7/8 (2,22 cm) de cabeza hexagonal, a un torque de 7,91 Nm de manera cruzada (apretar uno de los pernos y después apretar el perno opuesto y repita la misma secuencia hasta que todos los pernos estén ajustados al torque requerido).
4. Limpie la rosca de la flecha y la rosca del impulsor, después enrosque el impulsor a la flecha del motor.
5. Atornille el tornillo de cierre del impulsor (en el sentido opuesto de las agujas del reloj para apretar).
6. Monte de nuevo el difusor en la placa de sello. Asegúrese que las clavijas plásticas y las inserciones de tornillos de mantener están alineado.
7. Engrase el anillo en O del difusor y empaque de placa de sello o el anillo en O antes de armar de nuevo.
8. Engrase las roscas de perno, arme el montaje de abajo del motor al cuerpo de olla de colar y bomba al usar los dos pernos que corren a través para tener alineamiento adecuado. Colocar los Pernos, 3/8 -16 x 2 de cabeza hexagonal 18-8 acero inoxidable (se requieren 2) a través de la placa de sellado y la voluta y no los ajuste hasta que los Pernos de 3/8, 16 x 1-1/4 (3,18 cm) cabeza hexagonal 18-8 acero inoxidable (se requieren 4) estén ajustados a mano. Ajustar todos los pernos a un torque de 12,43 Nm, de manera cruzada.
9. Llene la bomba con agua.
10. Instale de nuevo la tapa de bomba y abrazadera plástica; vea INSTRUCCIONES PARA ENCENDER DE NUEVO.
11. Prepare de nuevo el sistema.

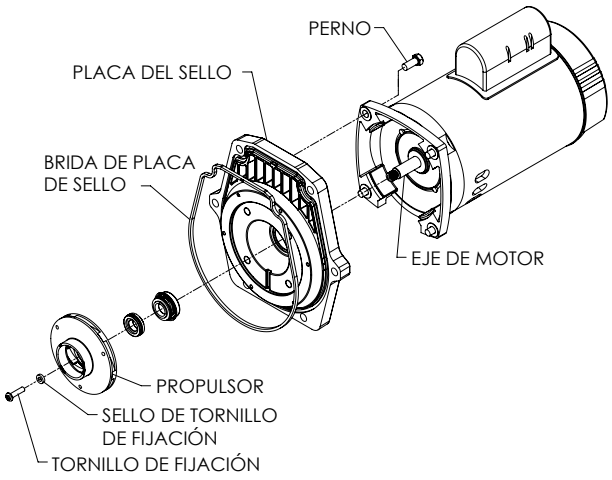
Instrucciones para encender de nuevo

Si se instala la bomba debajo del nivel de agua en la piscina, cierre las líneas de regreso y de aspiración antes de abrir la olla de pelo y pelusa en la bomba. Asegúrese de abrir de nuevo las válvulas antes de usar.

Imprimar la bomba

La olla de colador de bomba tiene que llenarse con agua antes de que se empiece la bomba incialmente. Siga estos pasos para imprimar la bomba.

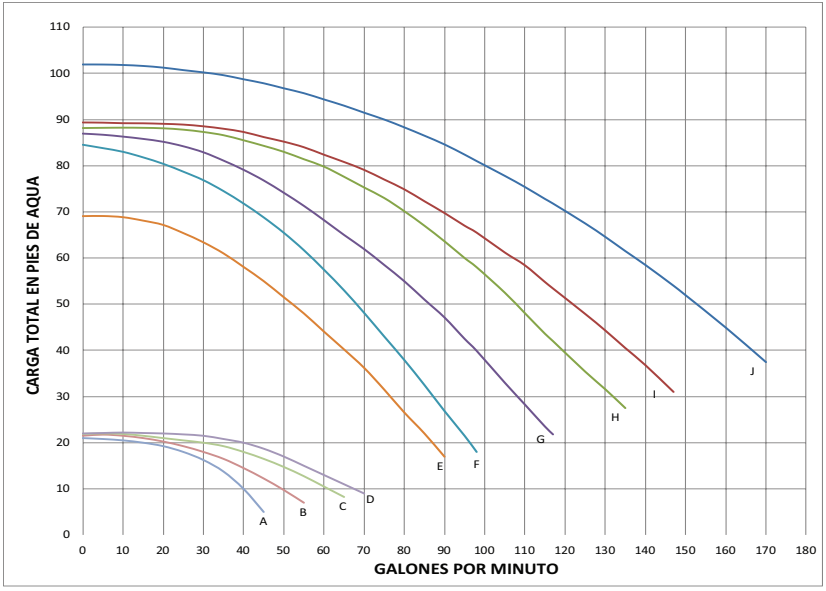
1. Quite la abrazadera plástica de la tapa de la bomba. Quite la tapa de la bomba.
2. Llene la olla de colador de bomba con agua.
3. Arme de nuevo el cubierto de bomba y abrazadera plástica en la olla de colador. Ahora la bomba está lista para imprimar.
4. Abra válvula de escape de aire en el filtro y manténgase a distancia del filtro.
5. Encienda el interruptor o reloj.
6. Cuando agua sale de la válvula de escape de aire, cierre la válvula. Este sistema ahora debe estar libre de aire y circulando agua de nuevo a la piscina y de vuelta.
7. Para bomba de 2 velocidades:
8. La bomba debe funcionar en alta velocidad para imprimar.
9. La bomba no debe funcionar por más de 8 minutos antes de que se logre imprimar.



LOCALIZADOR DE AVERÍAS

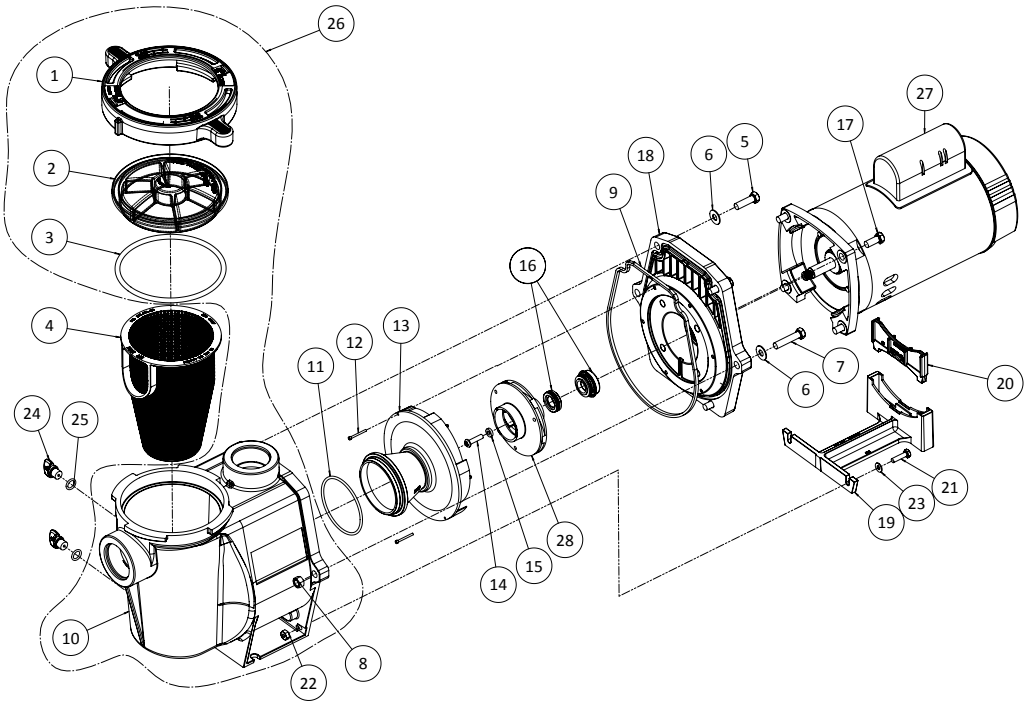
Problema	Posible causa	Medida correctiva
Si la bomba falla.	La bomba no imprima – demasiado aire.	Revise la tubería de succión y las prensastopas en cualquier válvulas de puerta de aspiración. Cierre la tapa en la olla de coladora de bomba y asegúrese que el empaque de tapa está en lugar.Revise el nivel de agua para asegurarse que la desnatadora no está jalando aire.
	La bomba no imprima—no hay agua suficiente	Asegúrese que las líneas de aspiración, el colador de bomba, y la voluta de bomba están llenas con agua. Asegúrese que la válvula en la línea de aspiración está funcionando y abierta, (algunos sistemas no tienen válvulas). Revise el nivel de agua para asegurarse que hay agua disponible a través de la desnatadora.
	El colador de bomba está atascado Empaque de colador de bomba defectuoso.	Limpie la olla de coladora de bomba. Reemplazar empaque.
Capacidad reducida y/o presión baja de agua.	Bolsas de aire o fugas en la línea de aspiración.	Revise la tubería de succión y las prensastopas en cualquier válvulas de puerta de aspiración. Cierre la tapa en la olla de coladora de bomba y asegúrese que el empaque de tapa está en lugar.Revise el nivel de agua para asegurarse que la desnatadora no está jalando aire.
	Impulsor atascado.	Apague la energía eléctrica en los interruptores de circuito de la bomba. Desensamblar (Referir a Desensamblaje de la bomba, página 16). Remover la basura del impulsor, si la basura no pueden ser removida por complete, siga las siguientes instrucciones: 1. Remueva el Tornillo de 1/4, 20x1, LH, Phillips MS 18-8 de acero inoxidable y la arandela de goma del impulsor. 2. Remueva el impulsor, termine de limpiarlo y vuelva a instalar. Reensamblar (Referir a Armar la bomba de nuevo, página 17).
	Colador de bomba atascado.	Limpie el depósito de aspiración.

Curvas de rendimiento de la bomba



Curva	Modelo
A	WFDS-3, WFDS-24
B	WFDS-4, WFDS-26
C	WFDS-6, WFDS-28
D	WFDS-8, WFDS-30
E	WFE-2, WF-2, WF-23, WFK-2
F	WFE-3, WFE-24, WF-3, WF-24, WFK-3, WFDS-3, WFDS-24
G	WFE-4, WFE-26, WF-4, WF-26, WFK-4, WFDS-4, WFDS-26
H	WFE-6, WFE-28, WF-6, WF-28, WFK-6, WFDS-6, WFDS-28
I	WFE-8, WFE-30, WF-8, WF-30, WFK-8, WFDS-8, WFDS-30
J	WFE-12, WF-12, WFK-12

PIEZAS DE REEMPLAZO



Número de artículo	P/N	Descripción
1	357199	Abrazadera, Cam & Ramp, Almendra
1	357150	Abrazadera, Cam & Ramp, Negro
2	357151	Tapa, transparente, bomba WFE
2	357156	Tapa, resistente química, Cam & Ramp
3	350013	Tapa WFE Anillo en O
4	070387	Canastilla del filtro, WFE
5	070430	Perno, 3/8 - 16 x 1,25, cabeza hexagonal acero inox, 4 Req.
6	072184	Arandelas, 3/8 x 13/16 O.D. acero inox, 6 Req.
7	070431	Perno, 3/8 - 16 x 1,75, cabeza hexagonal acero inox, 2 Req.
8	071403	Tuerca, 3/8, 16 hex hd., 2 req.
9	357100	Placa de sello de Empaque, Negro
10	357149	Voluta & placa de sello, Almendra Kit de reemplazo
10	350015	Voluta & Olla de Bomba WFE, Almendra
10	357157	Voluta & Olla de Bomba WFE, Negro ❶
11	355227	Anillo en O Parker de Bomba WFE, #2-238
12	071660	Tornillo de Tope, #4-40 X 1-1/8 SFE, 2 req.
13	072928	Montaje de Difusor, WFE- 12, Sólo 3 HP
13	072927	Montaje de Difusor, WFE- 2-8, .5 HP–2.5 HP
14	071652	Tornillo de Tope, 1/4, 20 x 1 lh. Phillips

Número de artículo	P/N	Descripción
15	075713	Arandela de Hule de Bomba WFE
16	071734S	Sello PA-7 con Asiento Ceramico, PS1000 ❶
16	071728	Sello A7 con Asiento Ceramico, PS201
17	070429	Perno, 3/8, 16 x 7/8 s/s hex hd., 4 req.
18	350201	Placa de Sello Juego WFE, Almendra (Incluye sello mecánico instalado) # 9, 16 & 18
18	350101	Placa de Sello Juego WFE, Negro (Incluye sello mecánico instalado) # 16 & 18
19	070927	Pie WFE - Bomba 4, Almendra
19	357159	Pie, Negro ❶
20	070929	Inserción de Pie de Bomba WFE, Almendra ❶
20	357160	Inserción de Pie de Bomba WFE, Negro
21	071657	Tornillo, 1/4, 20 x 1 pulg. hex hd. s/s, 2 req.
22	071406	Tuerca, 1/4, 20 hex. hd. s/s, 2 req.
23	072183	Tuerca, 1/4, 20 hex. hd. s/s, 2 req.
24	071131	Tapón con Perilla para Desagüe, Almendra 2 req.
24	357161	Tapón con Perilla para Desagüe, Negro 2 req. ❶
25	192115	Tapón de Desagüe de O-anillo, 2 req.
26	357149	Juego para Reemplazar Voluta/Placa de Sello, Almendra (Incluye #1-4, 9, 10, 16, 18, 24, and 25)
27	*Página siguiente*	

Número de artículo	Núm. de pieza	Descripción
		Motores
27	355008S	3/4 HP, 60 Hz, WFE-2, 3 & 24, 1 spd., Almendra, 31 lbs. ❷
27	355010S	1 HP, 60 Hz, WFE-4 & 26, 1 spd., Almendra,, 33 lbs. ❷
27	355012S	1-1/2 HP, 60 Hz, WFE-6 & 28, 1 spd., Almendra,, 39 lbs. ❷
27	355014S	2 HP, 60 Hz, WFE-8 & 30, 1 spd., Almendra,, 40 lbs. ❷
27	355016S	3 HP, 60 Hz, WFE-12, 1 spd., Almendra, 40 lbs. ❷
27	356630S	1 HP, WFDS-4 & 26, 2 spd., 34 lbs. ❹
27	071320S	1-1/2 HP, WFDS-6 & 28, 2 spd., 36 lbs. ❹
27	071321S	2 HP, WFDS-8 & 30, 2 spd., 45 lbs. ❹
27	355018S	1/2 HP, WF-2 & 23, 1 spd., Almendra, 39 lbs. ❸
27	355020S	3/4 HP, WF-3 & 24, 1 spd., Almendra, 26 lbs. ❸
27	355022S	1 HP, WF-4 & 26, 1 spd., Almendra, 28 lbs. ❸
27	355024S	1-1/2 HP, WF-6 & 28, 1 spd., 39 lbs. ❸
27	355026S	2 HP, WF-8 & 30, 1 spd., 32 lbs. ❸
27	355033S	3 HP, WF-12, 1 spd., Almendra, 40 lbs. ❸
27	355203S	1 HP, WFK-4, 3 ph, 1 spd., Negro, 28 lbs.
27	355204S	1-1/2 HP, WFK-6, 3 ph, 1 spd., Negro, 30 lbs.
27	355205S	2 HP, WFK-8, 3 ph, 1 spd., Negro, 37 lbs.
27	355398S	3 HP, WFK-12, 3 ph, 1 spd., Negro, 35 lbs.
27	356626S	1 HP, WFK-4, 3 ph, 1 spd., Almendra, 28lbs.
27	356627S	1-1/2 HP, WFK-6, 3 ph, 1 spd., Almendra, 30lbs.
27	356628S	2 HP, WFK-8, 3 ph, 1 spd., Almendra, 37 lbs.
27	356629S	3 HP, WFK-12, 3 ph, 1 spd., Almendra, 35 lbs.
27	354805S	1 HP, WFK-4, TEFC, 3 ph, 1 spd., Almendra, 28lbs.
27	354807S	1-1/2 HP, WFK-6, TEFC, 3 ph., 1 spd., Almendra, 30lbs.
27	354809S	2 HP, WFK-8, TEFC, 3 ph., 1 spd., Almendra, 37 lbs.
27	354811S	3 HP, WFK-12, TEFC, 3 ph., 1 spd., Almendra, 35 lbs.

No Mostrado

79129900	2-Velocidad Toggle Interruptor
350202	Placa de Sello Juego: Placa de Sello (Almendra), Empaque (Negro), con instalado Sello (Incluye Artículos: 9, 16, & 18)
350203	Placa de Sello Juego: Placa de Sello (Negro), Empaque (Negro), con instalado Sello (Incluye Artículos: 9, 16, & 18)
357243	Olla la Asamblea, Almendra NPT. (Incluye Artículos: 1-4, 10, 24 [qty. 2], 25 [qty. 2])
357244	Olla la Asamblea, Negro NPT. (Incluye Artículos: 1-4, 10, 24 [qty. 2], 25 [qty. 2])

Fondo Potencia Submontaje. Incluye Artículos: 12-18, 27-28

075136	WFE-2
075137	WFE-3, WFE-24
075138	WFE-4, WFE-26 ❷
075139	WFE-6, WFE-28 ❷
075140	WFE-8, WFE-30 ❷
075141	WFE-12 ❷
075145	WFDS-3, WFDS-24 ❹
075142	WFDS-4, WFDS-26 ❹
075143	WFDS-6, WFDS-28 ❹
075144	WFDS-8, WFDS-30
075251	WF-2, WF-23 ❸
075252	WF-3, WF-24 ❸
075253	WF-4, WF-26 ❸
075254	WF-6,WF-28 ❸
075255	WF-8,WF-30 ❸
075256	WF-12 ❸

Fondo Líquido - Todas las Partes sin el Motor

075451	WFE-2 fluid end, 1/2 HP
075452	WFE-3 fluid end, 3/4 HP
075453	WFE-4 fluid end, 1 HP
075454	WFE-6 fluid end, 1-1/2 HP
075455	WFE-8 fluid end, 2 HP
075456	WFE-12 fluid end, 3 HP

❶ CSA/CUL (sólo) para Canadá.
❷ Energía eficiente, sola fase.
❸ Eficiencia Estánder, sola fase.
❹ Dos velocidad, sola fase.

Tabla de impulsor

HP	TAMAÑO	NO. DE PIEZA STD.
1/2	WFE-2, WF-2, WF-23, WFK-2	073126
3/4	WFE-3, WFE-24, WF-3, WF-24, WFK-3, WFDS-24	073127
1	WFE-4, WFE-26, WF-4, WF-26, WFK-4, WFDS-4, WFDS-26	073128
1½	WFE-6, WFE-28, WF-6, WF-28, WFK-6, WFDS-6, WFDS-28	073129
2	WFE-8, WFE-30, WF-8, WF-30, WFK-8, WFDS-8, WFDS-30	073130
3	WFE-12, WF-12, WFK-12	073131

NOTES/NOTAS

NOTES/NOTAS

1620 HAWKINS AVE., SANFORD, NC 27330 • (919) 566-8000
10951 WEST LOS ANGELES AVE., MOORPARK, CA 93021 • (805) 553-5000
WWW.PENTAIRPOOL.COM

P/N 071109 REV. J 8/29/14