

# Tropical™

## Installer Quick Start

*Inverter Heat Pump  
T70, T100, and T130*



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## 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.

<b>Product Information:</b>	
<b>Website</b>	www.AquaCal.com
<b>Manuals</b>	<a href="https://www.aquacal.com/product/inv-tropical/">https://www.aquacal.com/product/inv-tropical/</a>
<b>Phone</b>	(1) 727-823-5642
<b>Hours</b>	8-5 pm, Eastern M-F

<b>Service Information:</b>	
<b>Website</b>	<a href="http://www.AquaCal.com/request-heat-pump-service/">www.AquaCal.com/request-heat-pump-service/</a>

## Additional Installation Advice

Additional product specific installation advice is available online at <https://www.aquacal.com/product/inv-tropical/>

Scan QR Code  
for Manuals



## SAFETY

- 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 the issue persists, please contact the installing dealer for service.

### ***SAFETY SIGNALS***

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



Refrigerant Safety  
Group A2L

Flame Symbol and A2L Refrigerant

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

**⚠ 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:



Refrigerant Safety  
Group A2L

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

- THIS EQUIPMENT CONTAINS SEMI-FLAMMABLE REFRIGERANT. Read the section entitled "FLAMMABLE REFRIGERANT" before servicing / installing this equipment. See "*Flammable Refrigerant*" on page 7.
- Do not pierce or burn the appliance.
- Be aware that refrigerants may not contain an odor. If a refrigerant leak is present, it may not be immediately obvious and can either displace breathable air or become a source for a fire.
- The R32 is a refrigerant of category A2L per ISO 817, which is considered as potentially flammable.
- Do not release R32 refrigerant into the atmosphere. This refrigerant is a greenhouse effect fluorinated gas, covered by the Kyoto Protocol, with a global warming potential (GWP) = 675 for R32.
- Do not use a means to accelerate the defrosting process or to clean the equipment, other than what is recommended by the manufacturer.
- Install the unit outdoors. Do not install the unit indoors or in an outdoor area that is closed and poorly ventilated.
- If stored, the appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- To comply with the relevant standards and regulations in terms of the environment and installation procedures, and in particular with decree Number 2015-1790 and / or European regulation EU 517/2014, a search for leaks of the cooling circuit must be conducted at least once a year. This operation should be carried out by a certified specialist of cooling devices.
- Please keep and transfer these documents for reference throughout the lifespan of the device, And please save these instructions.

## 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.
- Prior to installing and servicing the equipment, ensure that power has been deactivated, and a lockout-tag out procedure has been performed.
- 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.
- Handling, installation, cleaning, servicing and / or disposal of the refrigerant can only be done by a person with the proper qualifications (EPA or equivalent licensing).
- For any action, other than simple maintenance operations by the user as described in this manual, the product should be maintained by a certified professional.
- Moving parts can cause severe injury or death. Do not touch the fan or the moving parts, and do not insert objects or your fingers close to the moving parts when the device is operating.
- Do not pull on hoses and / or connections to move the machine.
- Follow all instructions for installation and usage in this manual in order to prevent injury or death.

## WARNING

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

- Installation and repairs must be performed by a qualified technician possessing the adequate technical skills (electricity, hydraulic, refrigeration) in order to undertake maintenance operations or repairs on the device.
- A qualified technician working on the device must use / wear personal protective equipment (safety goggles, protection gloves, etc.) in order to avoid risk of injury during work on the device.
- 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.
- Sudden or prolonged immersion in water warmer than normal body temperature may cause a condition known as Hyperthermia and related injuries.
  - Hyperthermia occurs when the internal temperature of the body reaches a level several degrees higher than the normal body temperature of 98.6° F (37° C).
  - The symptoms of Hyperthermia include, but are not limited to, a failure to perceive heat, slurred speech or mumbling, slow, shallow breathing, weak pulse, clumsiness, drowsiness or low energy level, confusion, poor decision-making, lack of concern about personal welfare; progressive loss of consciousness resulting in danger of drowning.
  - The effects of Hyperthermia include failure of the nervous system, respiratory system and heart; failure to recognize the need to exit spa; unawareness of impending hazard; physical inability to exit the spa; progressive loss of consciousness resulting in danger of drowning.
  - Persons having an adverse medical history, or pregnant women, should consult a physician before immersing in a warm body of water. Children and the elderly should be supervised by a responsible adult.
  - When pregnant, soaking in warm water for long periods of time can harm the fetus.
  - The use of alcohol, drugs, or medication can greatly increase the risk of fatal Hyperthermia.
  - Exit immediately if uncomfortable, dizzy, or sleepy.

- Sudden or prolonged immersion in water colder than normal body temperature may cause a condition known as Hypothermia and related injuries.
  - Hypothermia occurs when the internal temperature of the body reaches a level several degrees below the normal body temperature of 98.6° F (37° C).
  - The symptoms of Hypothermia include, but are not limited to, shivering (although as hypothermia worsens, shivering stops), slurred speech or mumbling, slow, shallow breathing, weak pulse, clumsiness, drowsiness or low energy level, confusion, poor decision-making, lack of concern about personal welfare, unconsciousness, and bright red, cold skin (in infants).
  - The effects of Hypothermia include failure of the nervous system, respiratory system and heart; failure to recognize the need to exit spa or cold plunge; unawareness of impending hazard; fetal damage in pregnant women; physical inability to exit the spa or cold tub; progressive loss of consciousness resulting in danger of drowning.
  - 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.
  - When pregnant, soaking in cold water for long periods of time can harm HIthe fetus.
  - The use of alcohol, drugs, or medication can greatly increase the risk of fatal Hypothermia.
  - Exit immediately if uncomfortable, dizzy, shivering, or sleepy.
- This appliance is not to be used by individuals (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction by a person responsible for their safety.
- Children must be supervised and are not to play with the appliance.
- 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.
- Please check equipment data plate for breaker sizing. If local codes require a GFCI be installed, confirm it has a minimum current leakage rating of 20 mA.
- AquaCal AutoPilot, Inc. heat pumps are designed to use copper conductors, only. Do not use aluminum wire.
- If a fixed device does not have a power cord and plug, or any other means to disconnect from the power supply with separation of the contacts in all poles, enabling total disconnection in case of a category III electrical surge, the manual will specify that the disconnection means must be integrated into the fixed wiring, as per relevant wiring rules.
- An appropriate disconnection method, complying with all local and national requirements relating to category III electrical surges, and that disconnects all poles of the supply circuit, must be installed in the device's supply circuit. This disconnection method is not provided with the device and should be supplied by the installation technician.
- Prior to installation, ensure that:
  - The voltage indicated on the device's information plate matches the voltage of the power supply.
  - The power supply is suitable for operating the device and has a ground connection.
  - Any electrical plug (if necessary) is designed to properly fit the electrical outlet.
- Do not use an extension cord to connect the device; connect the device directly to a suitable power outlet.
- If a power cord is used and it becomes damaged, it must be replaced by a qualified individual.

**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.
- Failure to protect equipment against corrosive conditions will adversely affect the life of the equipment and will void equipment warranty.
- The device is designed specifically for use in swimming pools and spas; it must not be used for purposes other than designed.

**SAVE THESE INSTRUCTIONS**

## 1 - Flammable Refrigerant



Refrigerant Safety  
Group A2L

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

- This equipment contains a refrigerant of category A2L. This refrigerant is a greenhouse effect fluorinated gas, covered by the Kyoto Protocol, with a global warming potential. This refrigerant is considered as potentially flammable. Procedures in this section outline proper handling of equipment and refrigerant.

### Checks to the area

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized.

### Work procedure

Work shall be undertaken, under a controlled procedure, so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

### General Work Area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

### Checking for the presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

### Presence of a fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry power or CO fire extinguished adjacent to the charging area.

### No ignition sources

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. Possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

## **If winterizing equipment**

- DO NOT use a means to accelerate the defrosting process, other than those recommended by the manufacturer.
- If the equipment is to be removed and stored, confirm possible ignition sources, such as gas heaters with a pilot light, cigarette smoking, etc. are kept sufficiently far away from the equipment.
- The area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks.
- "No Smoking" signs shall be displayed in the area.

## **Ventilated area**

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. An adequate degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

## **Checks to the refrigeration equipment**

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS.

- The actual REFRIGERANT CHARGE is in accordance with the room size, within which the refrigerant containing parts are installed. This equipment is NOT intended to be installed indoors.
- The ventilation machinery and outlets are operating adequately and are not obstructed.
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
- Marking to the equipment continues to be visible and legible. Marking and signs that are illegible shall be corrected.
- Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitable protected against being so corroded.

## **Checks to electrical devices**

Repair and maintenance to electrical components shall include initial safety checks and component inspections procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately, but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

## **Initial safety checks shall include:**

- That capacitors are discharged; this shall be done in a safe manner to avoid the possibility of sparking.
- That no live electrical components or wiring are exposed while charging, recovering, or purging the system.
- That there is continuity of earth (ground) bonding.

## Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks; such as a halide torch (or any other detector using a naked flame).

The following leak detection methods are deemed acceptable for all refrigerant systems.

- Electronic leak detectors may be used to detect refrigerant leaks, but in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area). Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.
- PLEASE NOTE - Leak detectors may be used provided they are certified by the manufacturer for use with this specific refrigerant and comply with current standards for safety and flammability.
- Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

***NOTE: EXAMPLES OF LEAK DETECTION FLUIDS ARE:***

- Bubble method
- Fluorescent method agents

- If a leak is suspected, all naked flames shall be removed / extinguished.
- If a refrigerant leak is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to the below guidance.

## **Removal and Evacuation**

When breaking into the refrigerant circuit to make repairs - or for any other purpose - conventional procedures shall be used. However, for flammable refrigerants, it is important that best practice be followed since flammability is a consideration. The following procedure shall be adhered to:

- Safely remove refrigerant following local and national regulations;
- Evacuate the system;
- Purge the circuit with inert gas;
- Evacuate the system;
- Continuously flush or purge with inert gas when using flame to open the circuit; and
- Open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

- After refrigerant recovery of appliances containing flammable refrigerants, refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Do not use a means to accelerate the defrosting process or to clean the equipment, other than those recommended by the manufacturer.

## **Repairs to intrinsically safe components**

- Sealed electrical components shall be replaced.
- Intrinsically safe components must be replaced.
- Components must meet OEM specifications, certifications, performance, fit and / or compatibility.

## **Charging procedures:**

In addition to conventional charging procedures, the following requirements shall be followed.

- These procedures must be performed by a qualified HVAC technician.
- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the REFRIGERATING SYSTEM is earthed (grounded) prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

## Decommissioning:



Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

- a. Become familiar with the equipment and its operation.
- b. Isolate system electrically.
- c. Before attempting the procedure, ensure that:
  - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
  - all personal protective equipment is available and being used correctly;
  - the recovery process is supervised at all times by a competent person;
  - recovery equipment and cylinders conform to the appropriate standards.
- d. Pump down refrigerant system, if possible.
- e. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f. Make sure that cylinder is situated on the scales before recovery takes place.
- g. Start the recovery machine and operate in accordance with instructions.
- h. Do not overfill cylinders (no more than 80% volume liquid charge).
- i. Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k. Recovered refrigerant shall not be charged into another REFRIGERATION SYSTEM unless it has been cleaned and checked.

## Labeling

Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

## Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is a recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valve in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovery refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in the recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from system, it shall be carried out safely.

**SAVE THESE INSTRUCTIONS**

## 2 - Positioning Equipment

### FLAMMABLE REFRIGERANT

- THIS EQUIPMENT CONTAINS SEMI-FLAMMABLE REFRIGERANT. See document on "FLAMMABLE REFRIGERANTS" included with this product before attempting to install or service this equipment.

### Outdoor Use Only

#### **WARNING**

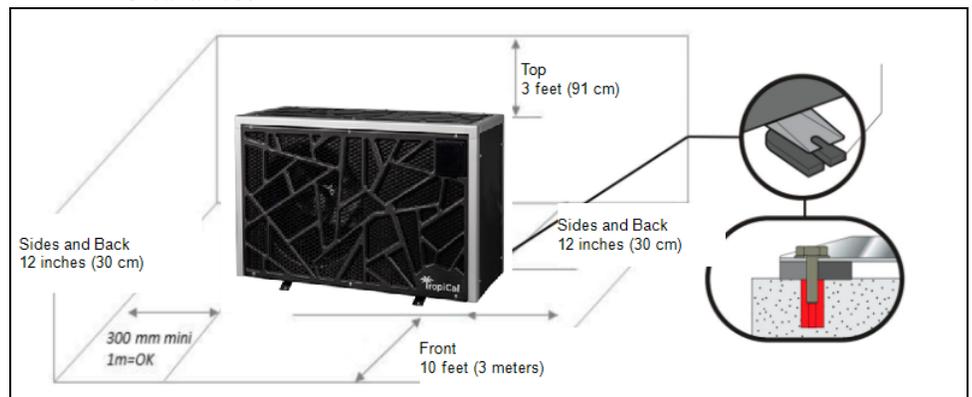
Failure to heed the following may result in injury or death.

- DO NOT INSTALL EQUIPMENT INSIDE OF A BUILDING
- This heat pump contains A2L type refrigerant and is not rated to be installed indoors or in an equipment room.
- Heat Pumps also require unobstructed airflow for proper operation.

### Mounting Pad Requirements

- Allow at least 3 feet (91 cm) clearance above heat pump.
- Build the heat pump pad out of concrete or other code-approved material. This pad must be separate from the building foundation.
- The heat pump's base must be installed on a flat and level surface that completely supports the entire base.

#### Clearances



- Confirm the pad can support the weight of the heat pump.
- Elevate the pad enough to allow for drainage.
- Make sure the pad is flat and level.
- Do not allow the heat pump base to touch the building's foundation.
- If necessary, install vibration dampers between the heat pump base and floor.
- Equipment pad must meet all requirements of authorities having code-related jurisdiction.

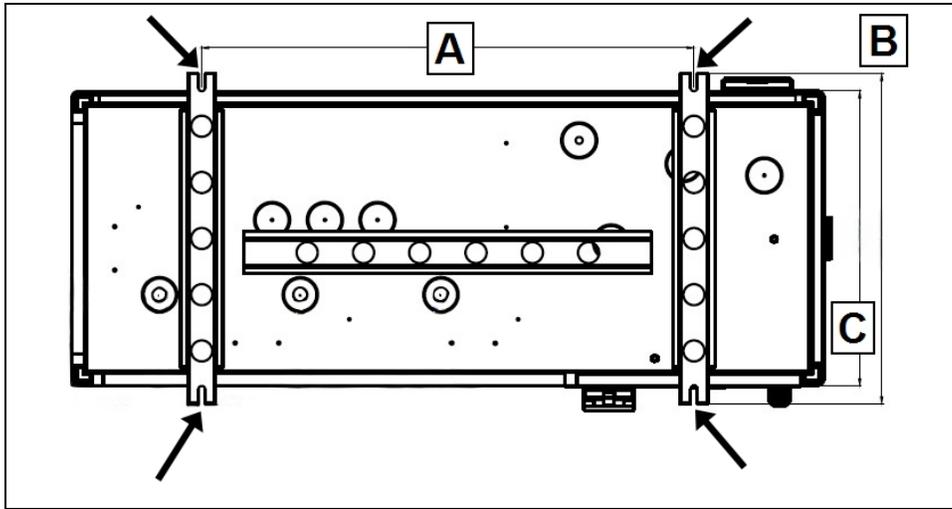
## Anchoring to Pad

- Follow all applicable local, state, and national requirements regarding wind load anchoring.

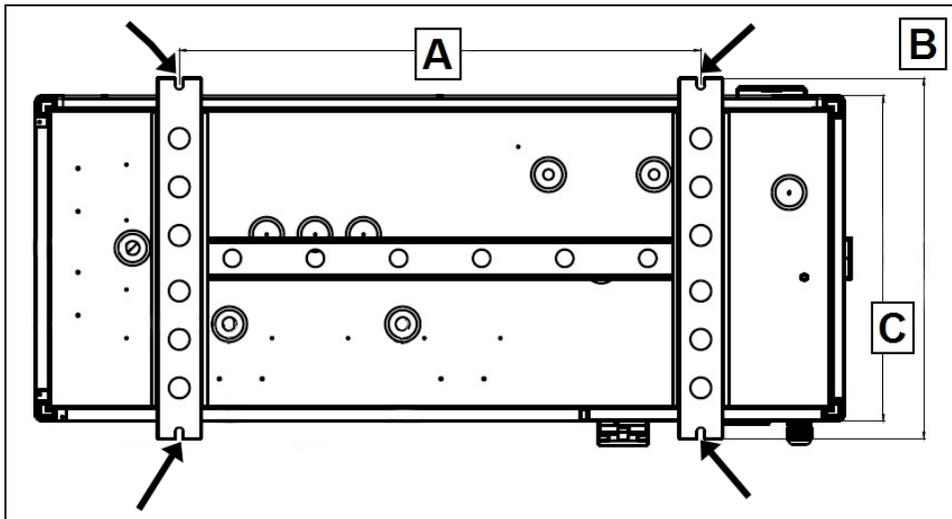
### Anchor points (on base of unit)

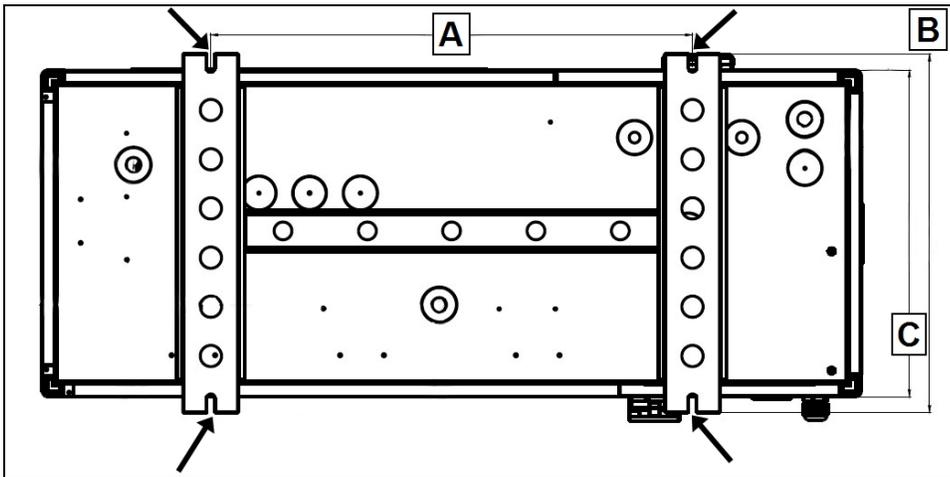
Model	A	B	C
T70	27 6/10 in (700 mm)	18 1/2 in (470 mm)	16 1/2 in (420 mm)
T100	29 6/10 in (753 mm)	20 2/5 in (520 mm)	18 1/2 in (470 mm)
T130	27 in (685 mm)	20 1/12 in (510 mm)	18 1/4 in (465 mm)

#### T70



#### T100





### 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.
- Prevent installations in corrosive conditions that will adversely affect the life of the equipment and void equipment warranty.

### 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.

## 3 - Plumbing

### Plumbing Requirements

- The heat pump must receive water flow under worst-case conditions such as a fouled water filter.
- 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.
- Three valves must be installed before the heat pump; Two isolation valves, and one adjustment valve as indicated. See Figure 1.

- Follow the basic plumbing diagram as shown. Additional installation advice is available online. See "*Contacting AquaCal AutoPilot, Inc.*".

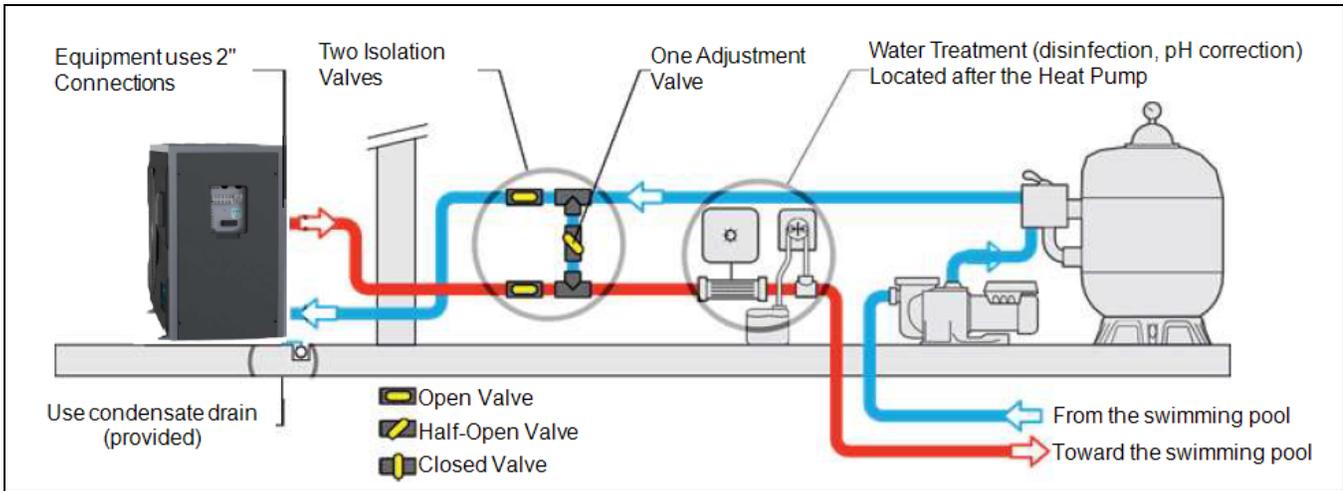


Figure 1

### Water Connections to Heat Pump

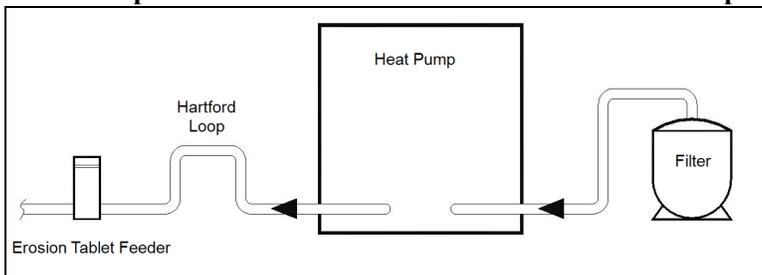
- Connections to site plumbing are made via PVC solvent cement to the female slip socket of the plumbing unions.
- Additional installation advice is available online. See "*Contacting AquaCal AutoPilot, Inc.*".
- Do not use glue on the threaded portion of the equipment's unions. A glued-in-place union will prevent the equipment from being properly winterized.

### 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 required when using a Salt Chlorine Generator.
- Avoid storing corrosive chemicals near the heat pump to minimize potential damage to the exterior of the heat pump.

### Heat Pump with Erosion Tablet Feeder and Hartford Loop



## Water Flow Rates

### Titanium (Optimal Twist) Exchanger



MODEL	FLOW RATES	
	MINIMUM	MAXIMUM
T70	20 GPM (90.9 L/min)	60 GPM (272.8 L/min)
T100	30 GPM (136.4 L/min)	70 GPM (318.2 L/min)
T130	30 GPM (136.4 L/min)	70 GPM (318.2 L/min)

- Maintain minimum and maximum water flow rates as shown. Please note, these specifications relate to the heat pump only. Code-specified whole system turnover rates must be satisfied.
- 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.
- Additional installation advice is available online. See "*Contacting AquaCal AutoPilot, Inc.*".
- 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.

## 4 - Electrical

### Electrical Requirements

#### **⚠ DANGER**

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

- Deactivate power while routing wiring to control board.
- Follow all National Electric Codes (NEC) and/or State and Local guidelines.
- Refer to equipment data plate for specifications on breaker sizing.
- The heat pump must be properly grounded.
- If local codes require a GFCI be installed, confirm it has a minimum current leakage rating of 20 mA.

#### **⚠ 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.

## Standards

This Heat Pump is listed by ETL as complying with the latest edition of the UL Standard for Safety for electrical heat pumps, air conditioners, and dehumidifiers UL 60335 and CSA C22.2 No. 60335-1 and 60335-2-40.

All Heat Pumps must be installed in accordance with all applicable National and Local codes. In the absence of local codes, refer to the latest edition of the National Electric Code (NEC) in the United States and the Canadian Electric Code (CEC) in Canada.

## Grounding and Bonding

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

- A bonding lug has been provided on the heat pump.

## 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.

- Refer to equipment data plate for specifications on breaker sizing.
- If local codes require a GFCI be installed, confirm it has a minimum current leakage rating of 30 mA.

## 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.

Equipment Rating	Minimum Site Voltage	Maximum Site Voltage
Single Phase 60 hertz and Single Phase 50 hertz	208 Volts	230 Volts

## Verifying Site Voltage

Confirm site voltage supplied to heat pump matches the data plate on the equipment. Incorrect applied voltage will cause heat pump damage.

Additional installation advice is available online. See "*Contacting AquaCal AutoPilot, Inc.*".

## Schematic Location

Schematics are located on the inside of the top panel of the heat pump.

## Connection Points

### Line Voltage's Connection Point

Connect line voltage to L1 and L2 as indicated. See Figure 2 and Figure 3. Follow all National Electric Codes (NEC) and / or State and Local guidelines. It is strongly recommended that wire terminals are used for a better electrical contact between the wire and power supply terminals.

#### T70

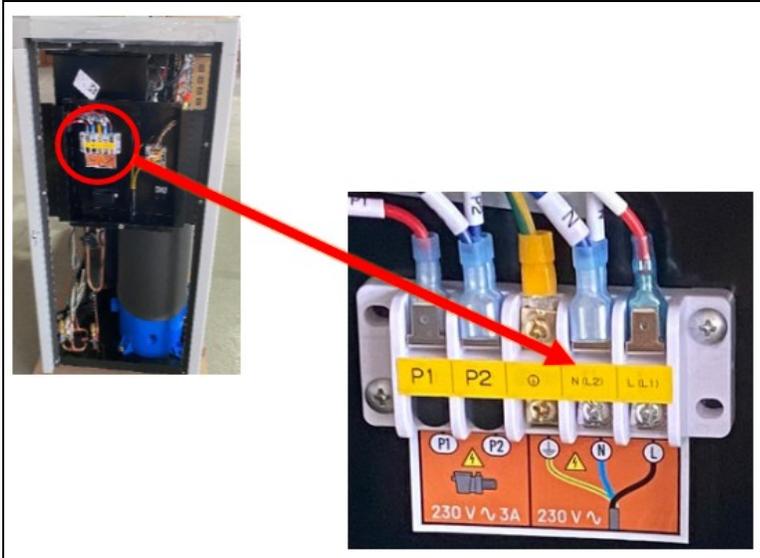


Figure 2

#### Wire Terminals



#### T100 and T130

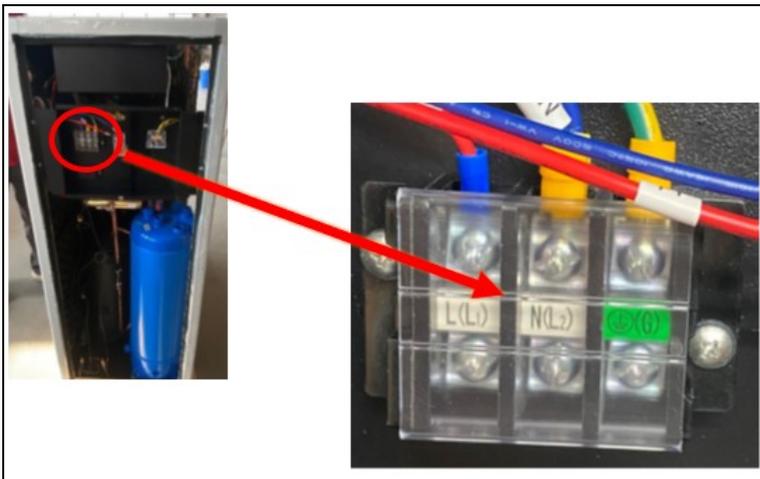


Figure 3

## Circulation Pump's Connection Point

The water circulation pump can be connected to the heat pump to force pump operation if the water is not at the desired water temperature.

- A normally open relay with a 230 V coil should be provided by the installer.
- Connect the coil of the relay ("A1" and "A2") to the "P1" and "P2" terminals to the heat pump as indicated. See Figure 4, Figure 5, and Figure 6.
- Connect the pump wiring to the relay in parallel with the filtration time clock.

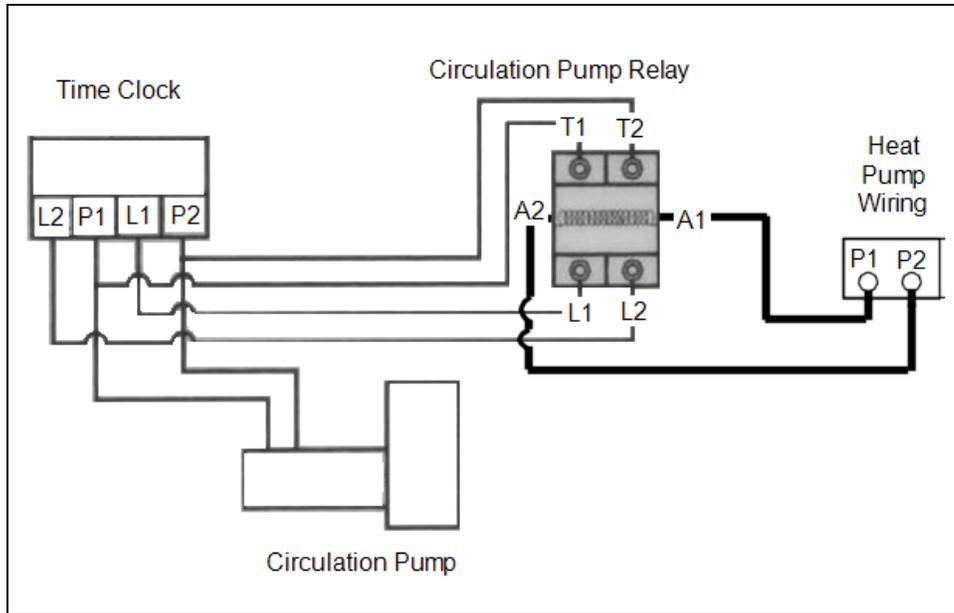


Figure 4

**T70 (P1 and P2)**

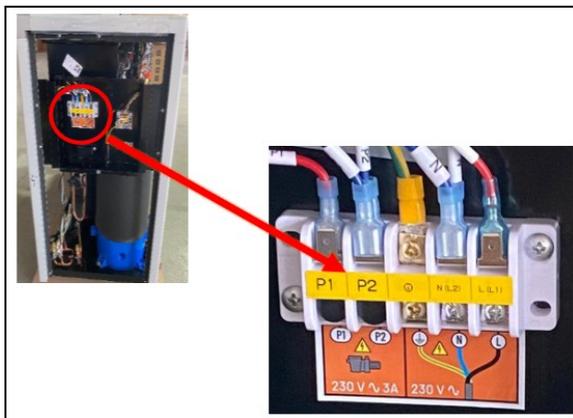


Figure 5

**T100 and T130 (P1 and P2)**

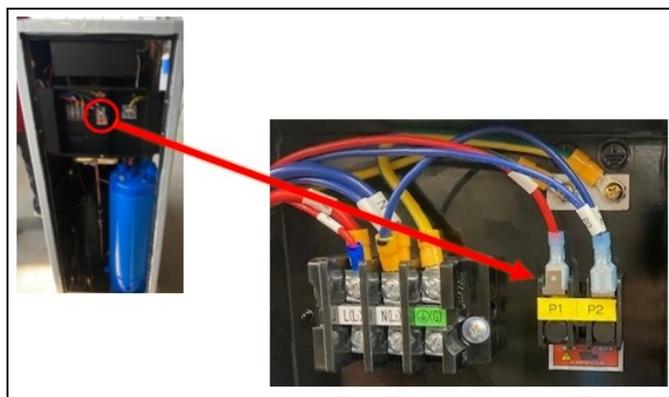


Figure 6

## 5 - Installer Start Up Check List

Once the heat pump is connected to the water circuit with the bypass, and is connected to the power supply by a technician, perform the following:

- Confirm the heat pump is level on the pad.
- Confirm the heat pump is secured and stable.
- Have the water circuit purged of air trapped in the piping of the heat pump.
- Check the pressure gauge on the back of the unit. Confirm that the unit is in the green range on the gauge.
- Confirm the water circuit is properly connected with no leaks or damage. And confirm that the connections are properly tightened (hand tight).
- Confirm the electric circuit is properly connected and connected to the ground connection.
- Confirm the outdoor temperature is between 5° F (-15° C) and 109° F (+43° C).
- Confirm the water temperature is a minimum of 59° F (15° C).
- Confirm the evaporator at the rear and sides of the heat pump is clean (leaves, dust, pollen, cobwebs, etc.).

The heat pump can then be started by the following, in the given order, using the following steps:

- Open the 3 valves of the bypass (refer to the hydraulic diagram). See Figure 1 on page 16.
- Half-close the bypass marked the adjustment valve on the plumbing diagram in See "*Plumbing Requirements*" on page 15.
- Remove all unused items or tools from the area surrounding the heat pump.
- Power the heat pump by engaging the circuit-breaker and using the ON / OFF button of the display. See "*Menus*" on the next page.
- Check that the heat pump starts and stops in sync with the filtration circuit; if no water is detected in the heat pump, the display will show "FLO".
- The heat pump will start after a delay of a few minutes.
- Adjust the temperature. (See "*Menus*" on the next page for more information.)
- Adjust the water flow. (See "*Water Flow Rates*" on page 17 for more information.)
- After a few minutes, the user can adjust the bypass valve as indicated in the water flow adjustment procedure.
- Having completed the above steps, use a pool cover if available and let the heat pump operate for a few days with the filtration pump active until the water reaches the desired water temperature.

## 6 - Programming

### Menus

#### Starting Heat Pump

For more information on Modes, Controls, and features, view online manual at <https://www.aquacal.com/product/inv-tropical/>

The diagram illustrates the TropiCal control panel interface with several key features highlighted:

- To User Settings:** Points to the gear icon in the top right corner of the main display.
- Start / Stop Heat Pump:** Points to the power button in the top right corner of the main display.
- Current Water Temperature:** Points to the large circular temperature gauge showing 77°F.
- Change Set Temperature:** Points to the temperature input field showing 89°F.
- Set Heat / Cool Mode:** A menu with three options: Heating Mode (sun icon), Cooling Mode (snowflake icon), and Auto Heat / Cool Mode (circular arrows icon).
- Set Operating Mode:** A menu with three options: Eco-Silent Mode (leaf icon), Boost Mode (speedometer icon), and Smart Mode (lightbulb icon).
  - Eco-Silent Mode:** 50% output to attempt to maintain set temperature
  - Boost Mode:** Max output to reach set temperature as soon as possible
  - Smart Mode:** Maintain set temperature [activates when > 2° F (or 1° C) difference between set and actual water temperature]

#### To Lock Display Panel

The diagram illustrates the steps to lock the TropiCal display panel:

- Press and Hold for 2 seconds to show display screen:** Shows the TropiCal logo screen.
- Press to lock display:** Shows the main display with a lock icon in the bottom left corner.
- Press to enter code of "0066", then press ok:** Shows the numeric keypad with "0000" displayed.
- Display will show locked and prevent user input:** Shows the main display with the temperature at 75°F and the lock icon in the bottom left corner.

## Error Codes

Error codes will display on the face of the display.

Codes in Blue are low priority. Codes in Red are urgent and require attention.

The user can go online for more on troubleshooting / descriptions of errors. See "*Contacting AquaCal AutoPilot, Inc.*" on page 1.



## 7 - Configure the TropiCal<sup>®</sup> Inverter Heat Pump to use WiFi

The TropiCal<sup>®</sup> Inverter heat pump comes with internal WiFi that can be activated to control the heat pump remotely.

### Connecting to WiFi

1. The user needs to have the credentials for the owner's WiFi access point (network name and password). This will be required to set up the heat pump.
2. Enable WiFi and Bluetooth in the mobile device's settings. The Bluetooth option can be deactivated after configuration is complete.
3. Confirm the mobile device is connected to the same network that the heat pump will be using.
4. The user will also need to be near the heat pump for initial Bluetooth activation.
5. Download the WiFi application on to a mobile device.

The application can be downloaded here:



Look for the PoolSync<sup>®</sup> application from AquaCal AutoPilot, Inc.

Figure 7

5. With the PoolSync® mobile application:
- a. Use the gear icon to access the PoolSync® settings.
  - b. Select "Add New TropiCal Heat Pump". See Figure 9.

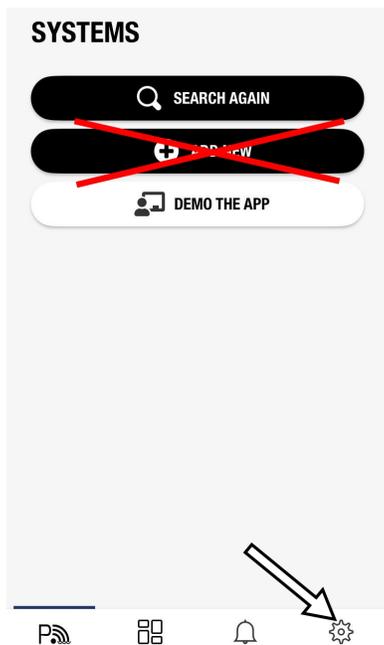


Figure 8

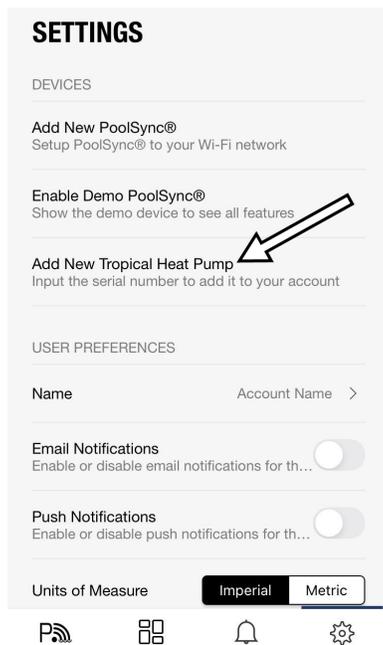


Figure 9

6. Enter the heat pump's serial number found on a sticker on the heat pump. See Figure 10.

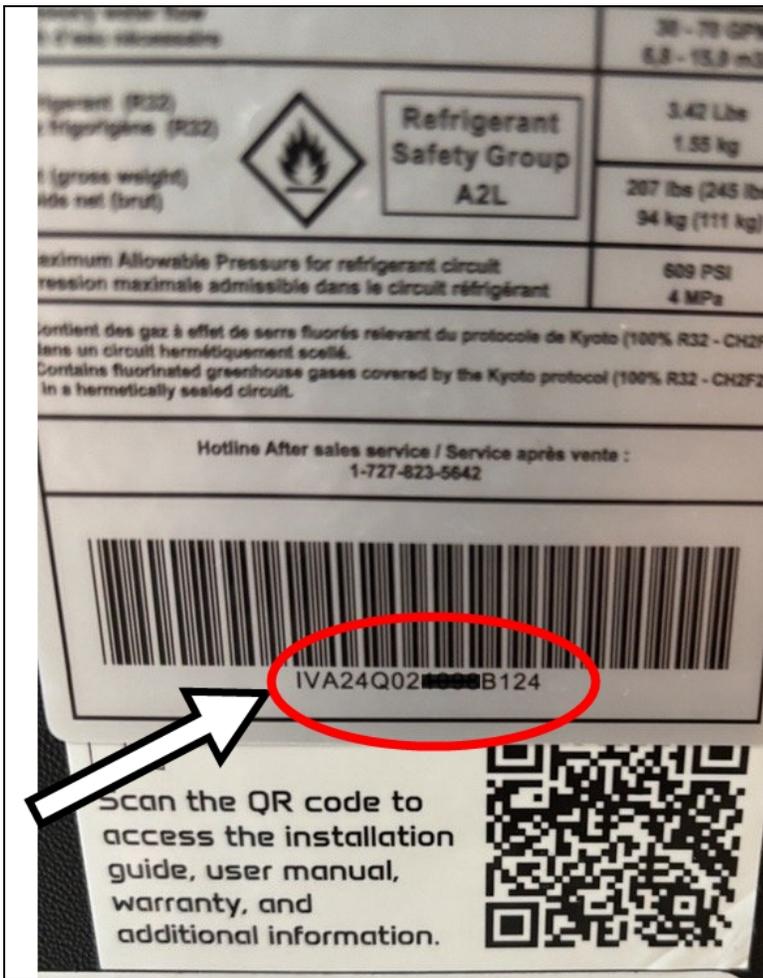


Figure 10

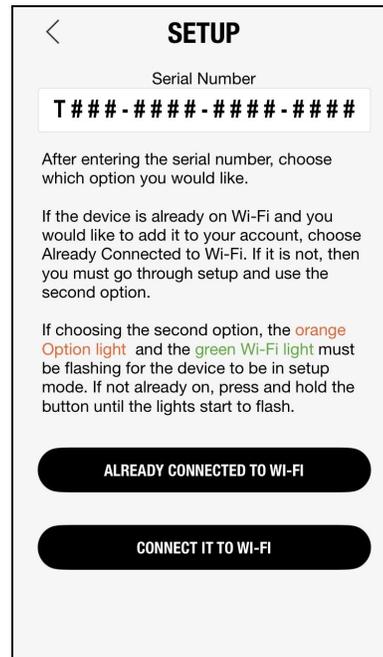


Figure 11

### Firmware Updates

7. Note the LEDs on the back of the unit. Confirm the "On / Off" LED is activated. If not, activate the heat pump at the power breaker.

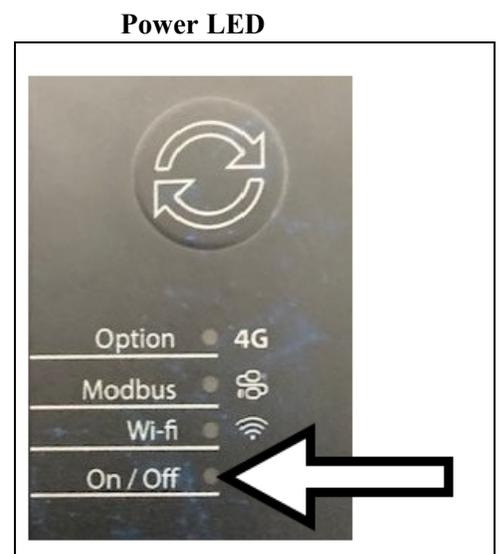


Figure 12





Figure 15

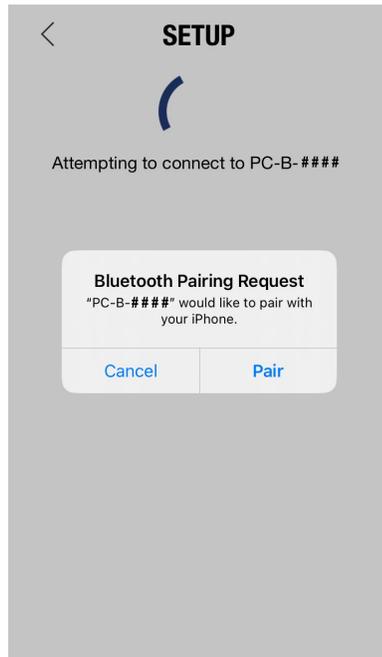


Figure 16

8. Select the WiFi network that will be connecting the heat pump. When prompted enter the password for the network.
9. Once the connection process is complete, use the back arrow and / or the lower left icon to go to the dashboard of the PoolSync® application.

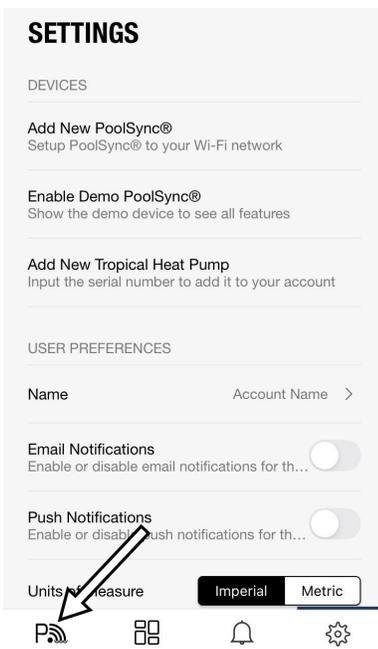


Figure 17

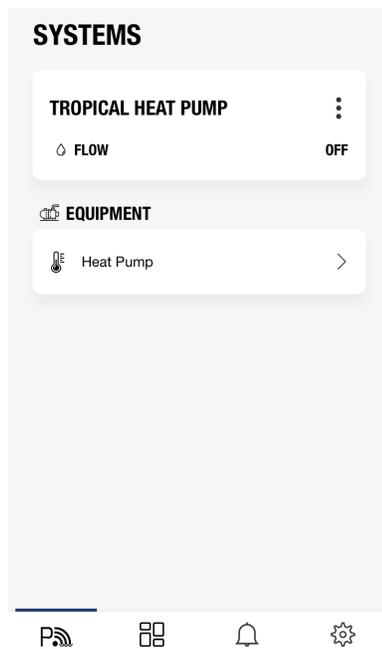


Figure 18

9. If the Heat Pump is not shown, a firmware update may be taking place in the background.
  - a. Close the application and wait 60 minutes.
  - b. Go to mobile device Bluetooth settings, and if a heat pump device is listed, choose to forget the device.
  - c. Then go back to step 5 to connect the heat pump to WiFi.
    - If these step continues to fail:
      - Confirm that the correct network credentials are being used
      - Confirm the mobile device's WiFi and Bluetooth are activated.
      - Confirm that the mobile device is close enough to the heat pump to allow pairing.

### **To add a second user:**

1. Press the Gear icon on the application.
2. Select "add new device".
3. Select "Tropical heat pump".
4. Do not push the Setup button on the heat pump gateway, it is already connected.
5. Enter the serial and follow the in-application instructions to setup the second user.

## 8 - Water Flow Adjustment Procedure

To optimize the heating or cooling performance, and achieve power savings, the water flow through the heat pump should be adjusted. The water flow through the heat pump and the gas pressure in the device are directly related to heat pump performance.

1. Confirm the isolation valves are fully open to the heat pump.
2. With the heat pump off and the circulation pump running, note the pressure on the outer scale of the pressure gauge located on the back of the unit.

Outer Ring (in PSI)

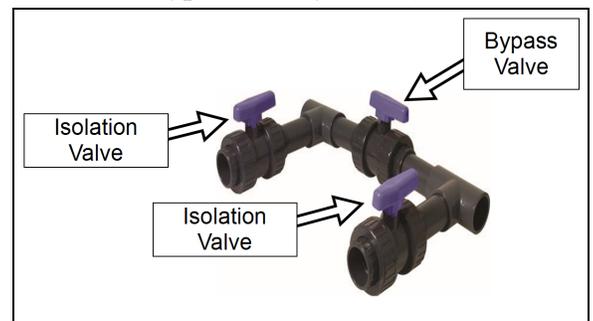


Outer Ring (in MPa)



3. Start the unit in Boost mode and allow it to run for at least five minutes.
4. Adjust the bypass valve so the pressure rise is 87 – 131 PSI (.6 to .9 MPa) higher than the starting pressure.
  - Opening the bypass will raise the pressure.
  - Closing the bypass will lower the pressure.
5. A final adjustment should be made when the pool water temperature is close to the temperature setpoint.

Bypass (Jandy shown)



### Further adjustments required:

The required flow through the heat pump depends on the water temperature, and to a lesser extent, on air temperature. It should be adjusted:

- When the heat pump is first started and the water is cold.
- Re-checked during a rise of temperature upon start up.
- Final adjustments if needed, when at the desired water temperature.
- There should then be no reason to subsequently adjust water flow after the preliminary adjustments have been made.

