ABOVE & IN GROUND POOL/SPA HEAT PUMP HEATERS INSTALLATION & OPERATIONS MANUAL

FOR YOUR SAFETY

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.

FOR YOUR SAFETY:

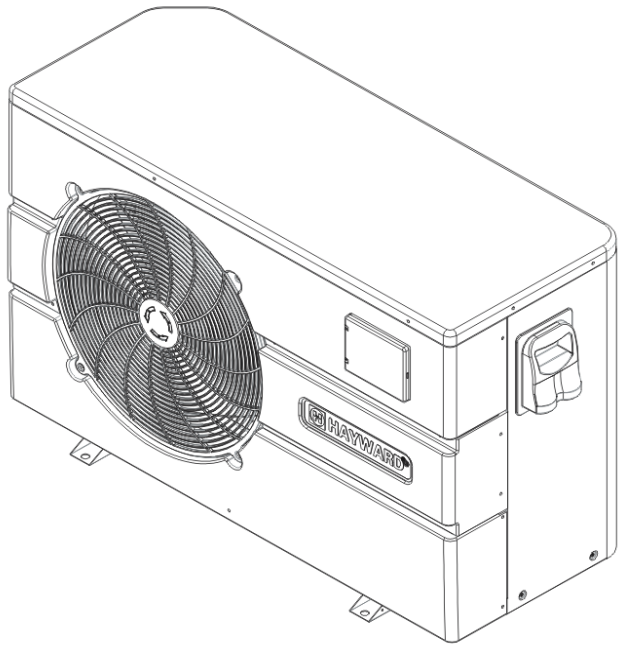
This product must be installed and serviced by authorized personnel, qualified in pool/spa heater installation. **Improper installation and/or operation can cause death, serious injury and/or property damage.**

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R-410A

SAVE THESE INSTRUCTIONS



GETTING STARTED

WHAT TO EXPECT WHEN OPERATING YOUR POOL HEATER

This flow chart provides guidance to protect pool users and product by maintaining good water quality.

INSTALLATION
Verify that product installation was performed to local codes and according to this manual.

INITIAL USE OR SPRING STARTUP
Check all pool / spa water piping. Do not connect product to water piping.

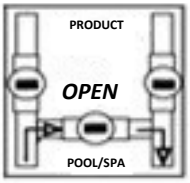
IMPORTANT FOR POOL USER HEALTH AND PRODUCT PERFORMANCE

- Verify Chlorine or Bromine level every 2-3 days
- Verify PH level every week
- Verify Alkalinity level every 3-4 weeks (2 weeks if using an Automatic Chlorine or Bromine Feeder)
- Verify Water Hardness and Total Dissolved Solids (TDS) every month (it is recommended that a pool professional perform this testing)

IS POOL/SPA IN CHEMICAL BALANCE?

NO → **DISCONNECT WATER PIPING TO PRODUCT**

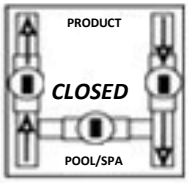
CONNECT WATER PIPING TO PRODUCT, BYPASS TO *OPEN* POSITION



IS HEATING/COOLING NEEDED WITHIN 1 WEEK?

NO → **SET BYPASS TO *OPEN* POSITION, WATER DIVERTED FROM PRODUCT**

BYPASS TO *CLOSED* POSITION, WATER DIRECTED TO PRODUCT



TURN ON ELECTRIC POWER AND GAS AS REQUIRED. START PRODUCT. PROGRAM REQUIRED WATER TEMPERATURE ON PRODUCT CONTROL PANEL.

ENJOY YOUR POOL/SPA

IS HEATING/COOLING NEEDED FOR REST OF YEAR?

NO → **TURN OFF ELECTRIC POWER AND GAS AS REQUIRED**

PLEASE READ BEFORE PROCEEDING

Basic safety precautions should always be followed, including the following: Failure to follow instructions can cause death and/or severe injury.

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

⚠ **WARNING** warns about hazards that **could** cause death and/or severe injury or major property damage and if ignored presents a potential hazard.

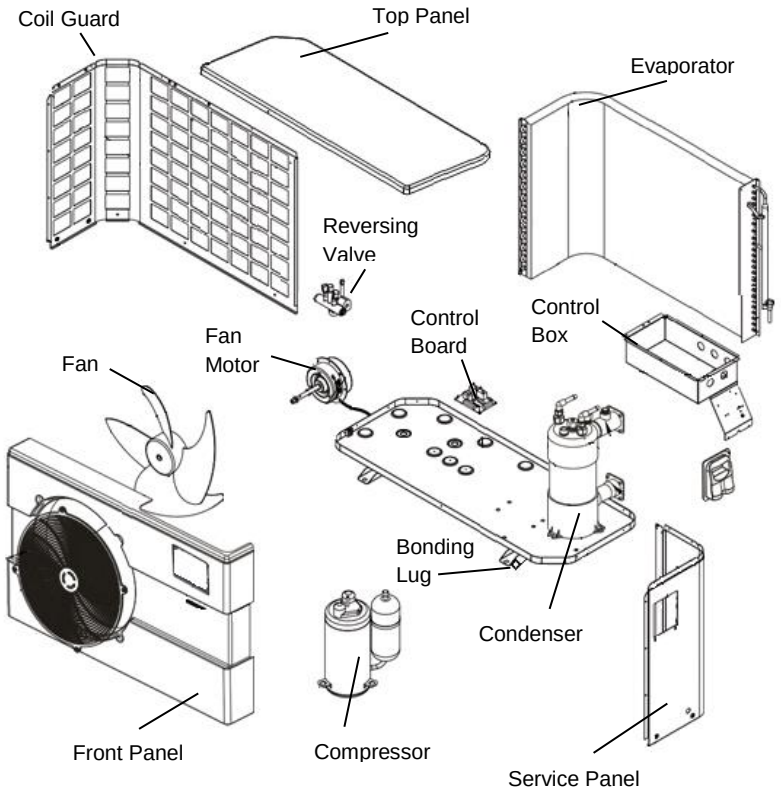
⚠ **CAUTION** warns about hazards that **could** cause minor or moderate personal injury and/or property damage and if ignored presents a potential hazard. It can also make consumers aware of actions that are unpredictable and unsafe.

NOTICE indicates special instructions that are important but not related to hazards.

See product rating plate for manufactures information.

HEATER CONSTRUCTION

Figure1: Names of heat pump heater components

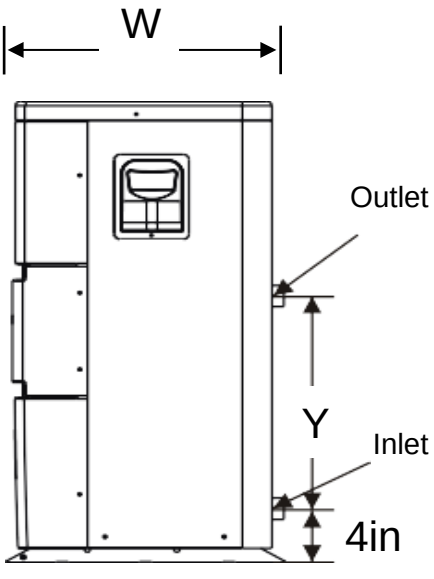


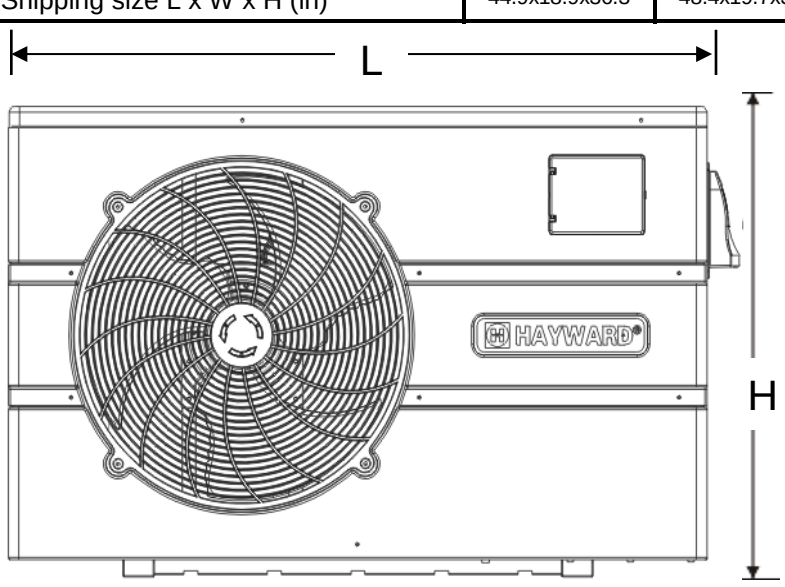
Features:

- **Titanium heat exchanger withstands the harshest water conditions**
- **Quiet/Reliable R410A Compressor**
- **Digital Electronic Control with**
  - **Easy to read display;**
  - **Auto mode for automatic heating and cooling operation**
  - **Display of diagnostic codes**
- **UV resistant cabinet for long life**
- **Defrost function to manage evaporator coil frosting for low ambient temperature operation**
- **High (590PSI) and low (80PSI) refrigerant pressure switches monitoring extreme operation**
- **Corrosion resistant evaporator fins**

Table1: SPECIFICATIONS

Models	**HP50HA2**	**HP70HA2**
Voltage/Phase/Hz	208-230/1/60	208-230/1/60
Capacity (btu/h) 80A-80RH-80W	47,100	73,780
Power Input, KW (80A-80RH-80W)	2.3	3.9
COP 80A-80RH-80W	6.0	5.6
Capacity (btu/h) 80A-63RH-80W	44,200	69,190
COP 80A-63RH-80W	5.8	5.4
Capacity (btu/h) 50A-63RH-80W	28,800	47,830
COP 50A-63RH-80W	4.0	4.1
Compressor/Fan Motor/System RLA (amp)	14.5/0.5/15	19.5/0.8/20.5
Compressor/Fan Motor/System LRA (amp)	60	70
Min. Circuit Ampacity (amp)	22	30
Recommended Breaker Size (amp)	35	45
Max Fuse Breaker Size (amp)	35	45
Recommended water flow (gpm)	20.3	31.2
Minimum water flow (gpm)	16	25
Maximum water flow (gpm)	25	38
Operating water temperature(℉)	48.2/104	48.2/104
Min/Max. operating water pressure(PSI)	43.5/435	43.5/435
Water Connector (dia. in)	1.5” & barb	2” TriStar
Connection Height Y (in)	10.4	15.7
Unit size L x W x H (in)	44.5x18.5x31.1	48.0x19.3x34.6
Weight (lbs)	152	230
Shipping Weight (lbs)	185	270
Shipping size L x W x H (in)	44.9x18.9x36.3	48.4x19.7x39.8





Wiring Connection Diagram

⚠ WARNING – **Risk of Electric Shock** Before working on any electrical equipment, turn off power supply to the equipment.

⚠ WARNING – **Risk of Electric Shock.** All electrical wiring MUST conform to applicable local codes, regulations, and the National Electric Code (NEC). Hazardous voltage can cause death, shock, burn, and/or serious property damage. To reduce the risk of electric shock, do NOT use an extension cord to connect unit to electric supply. Provide a properly located electrical receptacle. To reduce the risk of electric shock replace damaged wiring immediately. Locate conduit to prevent abuse from lawn mowers, hedge trimmers and other equipment. Do NOT ground to a gas supply line.

Figure2a Single Phase Wiring Diagram HP50HA2

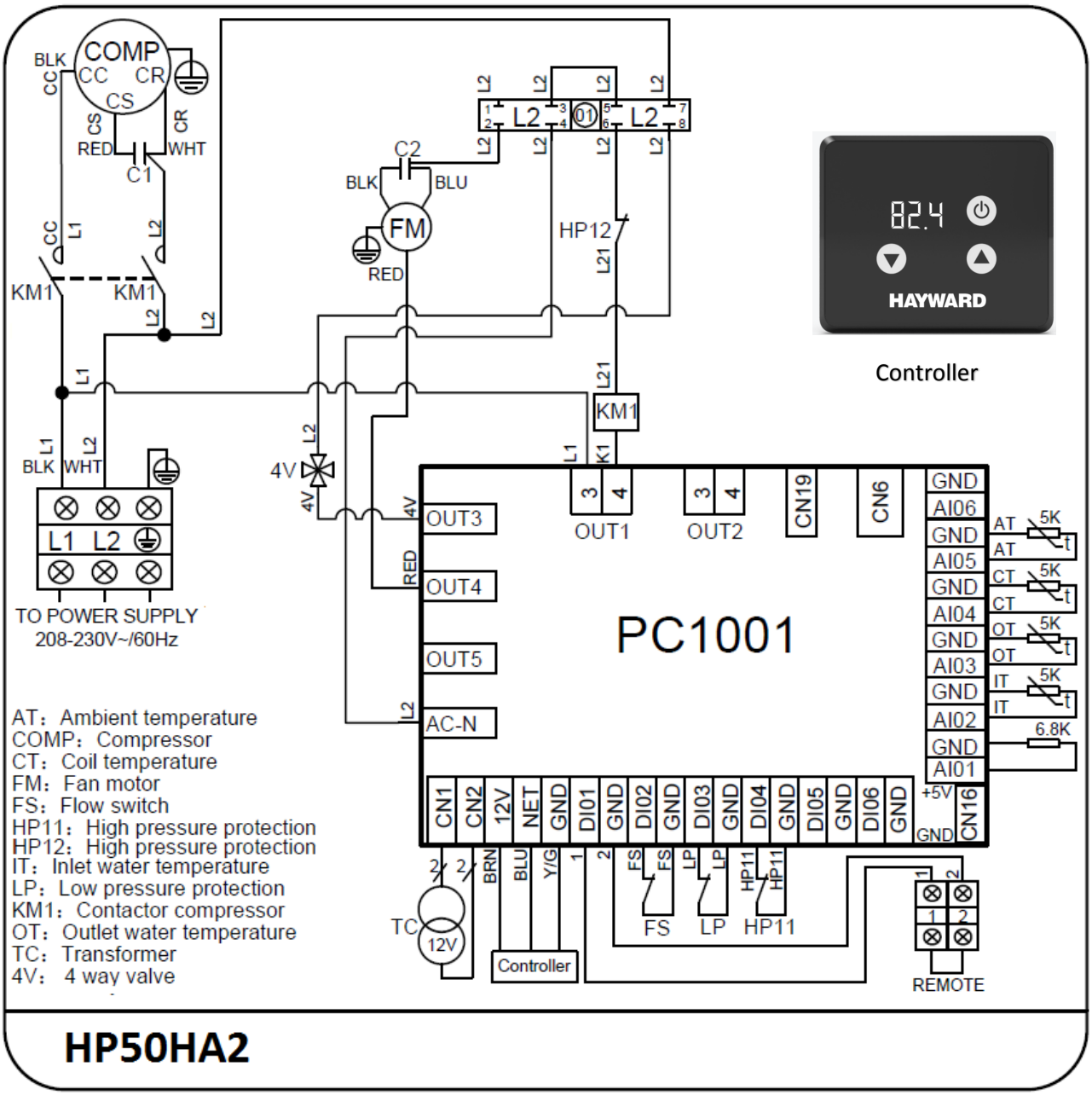


Figure2b Single Phase Wiring Diagram HP70HA2

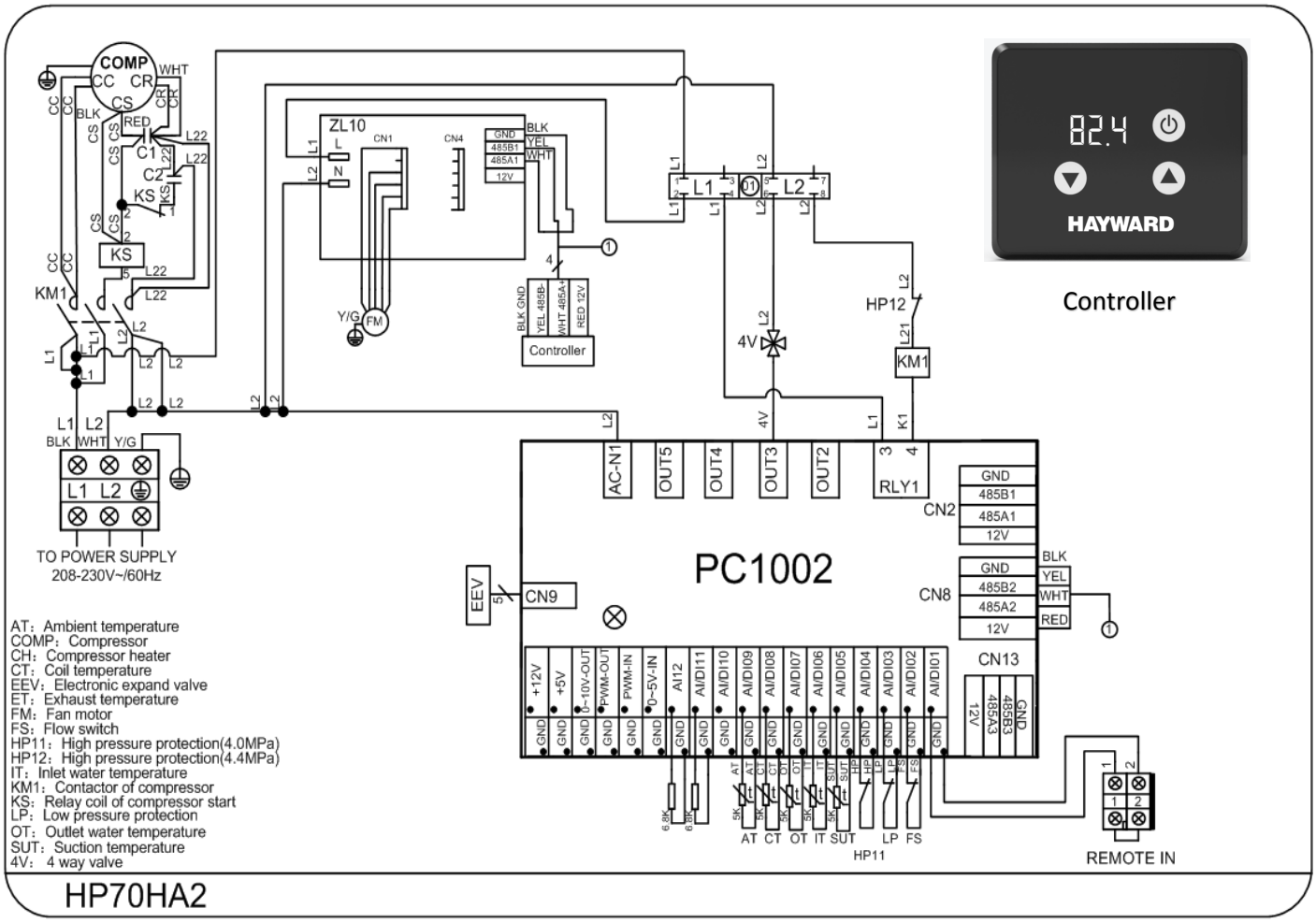


Table2: CERTIFICATION AND COMPLIANCE

CERTIFICATION CODES AND STANDARDS	USA	CANADA
DESIGN CERTIFIED	**ETL/ITS**	**ETL/ITS**
DESIGN COMPLIANT	UL 60335-1 and UL 60335-2-40	C22.2 No. 60335-1 and 60335-2-40
INSTALLATION COMPLIANT ELECTRIC	**ANSI/NFPA 70 NEC**	**CSA C22.1 – Canadian Electrical Code, Part I**

CONFORMANCE WITH CODES: The heater shall be installed in accordance with all local and state codes and with the requirements of the authority having jurisdiction of the installing site. The heater installation must conform to the latest edition of the above listed installation codes.

SAFETY INFORMATION

⚠ **WARNING** – **Read, Understand, and Follow all Instructions in this manual and on the equipment. Failure to follow instructions can cause death, severe injury and/or serious property damage**.

⚠ **WARNING – Suction Entrapment Hazard.** Suction in suction outlets and/or suction outlet covers which are, damaged, broken, cracked, missing, or unsecured can cause death and/or severe injury due to the following entrapment hazards:



Hair Entrapment- Hair can become entangled in suction outlet cover.



Limb Entrapment- A limb inserted into an opening of a suction outlet sump or suction outlet cover that is damaged, broken, cracked, missing, or not securely attached can result in a mechanical bind or swelling of the limb.

Body Suction Entrapment- A negative pressure applied to a large portion of the body or limbs can result in an entrapment.

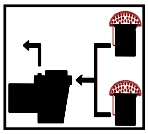


Evisceration/ Disembowelment - A negative pressure applied directly to the intestines through an unprotected suction outlet sump or suction outlet cover which is, damaged, broken, cracked, missing, or unsecured can result in evisceration/ disembowelment.



Mechanical Entrapment- There is potential for jewelry, swimsuit, hair decorations, finger, toe or knuckle to be caught in an opening of a suction outlet cover resulting in mechanical entrapment.

⚠ **WARNING** - **To Reduce the risk of Entrapment Hazards:**



- o When outlets are small enough to be blocked by a person, a minimum of two functioning suction outlets per pump must be installed. Suction outlets in the same plane (i.e. floor or wall), must be installed a minimum of three feet (3') [1 meter] apart, as measured from near point to near point.
- o Dual suction fittings shall be placed in such locations and distances to avoid "dual blockage" by a user.
- o Dual suction fittings shall not be located on seating areas or on the backrest for such seating areas.
- o The maximum system flow rate shall not exceed the flow rating of as listed on Table 1.
- o Never use Pool or Spa if any suction outlet component is damaged, broken, cracked, missing, or not securely attached.
- o Replace damaged, broken, cracked, missing, or not securely attached suction outlet components immediately.
- o In addition two or more suction outlets per pump installed in accordance with latest ASME, APSP Standards and CPSC guidelines, follow all National, State, and Local codes applicable.
- o Installation of a vacuum release or vent system, which relieves entrapping suction, is recommended.

⚠ **WARNING – Failure to remove pressure test plugs and/or plugs used in winterization of the pool/spa from the suction outlets can result in an increase potential for suction entrapment as described above.**

⚠ **WARNING – Failure to keep suction outlet components clear of debris, such as leaves, dirt, hair, paper and other material can result in an increase potential for suction entrapment as described above.**

⚠ **WARNING – Suction outlet components have a finite life, the cover/grate should be inspected frequently and replaced at least every seven years or if found to be damaged, broken, cracked, missing, or not securely attached.**

⚠ **CAUTION – Components such as the filtration system, pumps and heater must be positioned so as to prevent their being used as means of access to the pool by young children.** To reduce risk of injury, do not permit children to use or climb on this product. Closely supervise children at all times. Components such as the filtration system, pumps, and heaters must be positioned to prevent children from using them as a means of access to the pool.
This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.



⚠ **WARNING – Hazardous Pressure.** Pool and spa water heating and circulation systems operate under hazardous pressure during start up, normal operation, and after pump shut off. Stand clear of circulation system equipment during pump start up. Failure to follow safety and operation instructions could result in violent separation of the pump housing and cover, and/or filter housing and clamp due to pressure in the system, which could cause death, severe personal injury and/or property damage, Before servicing pool and spa water circulation system, all system and pump controls must be in off position and filter manual air relief valve must be in open position. Before starting system pump, all system valves must be set in a position to allow system water to return back to the pool. Do not change filter control valve position while system pump is running. Before starting system pump, fully open filter manual air relief valve. Do not close filter manual air relief valve until a steady stream of water (not air or air and water) is discharged.



⚠ **WARNING – Separation Hazard.** Failure to follow safety and operation instructions could result in violent separation of pump and/or filter components. Strainer cover must be properly secured to pump housing with strainer cover lock ring. Before servicing pool and spa circulation system, filters manual air relief valve must be in open position. Do not operate pool and spa circulation system if a system component is not assembled properly, damaged, or missing. Do not operate pool and spa circulation system unless filter manual air relief valve body is in locked position in filter upper body. **Never operate or test the circulation system at more than 50 PSI. Do not purge the system with compressed air**. Purging the system with compressed air can cause components to explode, with risk of severe injury or death to anyone nearby. Use only a low pressure (below 5 PSI), high volume blower when air purging the pump, filter, or piping.



⚠ **WARNING** – **Risk of Electric Shock.** All electrical wiring MUST be in conformance with applicable local codes, regulations, and the National Electric Code (NEC). Hazardous voltage can shock, burn, and cause death

or serious property damage. To reduce the risk of electric shock, do NOT use an extension cord to connect unit to electric supply. Provide a properly located electrical receptacle. Before working on any electrical equipment, turn off power supply to the equipment. To reduce the risk of electric shock replace damaged wiring immediately. Locate conduit to prevent abuse from lawn mowers, hedge trimmers and other equipment. Do NOT ground to a gas supply line.

⚠ **WARNING – Risk of Electric Shock.** Failure to ground all electrical equipment can cause serious or fatal electrical shock hazard. Electrical ground all electrical equipment before connecting to electrical power supply.

⚠ **WARNING** – **Risk of Electric Shock.** Failure to bond all electrical equipment to pool structure will increase risk for electrocution and could result in injury or death. To reduce the risk of electric shock, see installation instructions and consult a professional electrician on how to bond all electrical equipment. Also, contact a licensed electrician for information on local electrical codes for bonding requirements.

Notes to electrician: Use a solid copper conductor, size 8 or larger. Run a continuous wire from external bonding lug to reinforcing rod or mesh. Connect a No. 8 AWG (8.4 mm^2) [No. 6 AWG (13.3 mm^2) for Canada] solid copper bonding wire to the pressure wire connector provided on the electrical equipment and to all metal parts of swimming pool, spa, or hot tub, and metal piping (except gas piping), and conduit within 5 ft. (1.5 m) of inside walls of swimming pool, spa, or hot tub.
IMPORTANT - Reference NEC codes for all wiring standards including, but not limited to, grounding, bonding and other general wiring procedures.

⚠ **CAUTION –** These heaters are intended for use with permanently-installed pools and may 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.

⚠ **WARNING** – **Risk of Hyperthermia.** To avoid hyperthermia the following “Safety Rules for Hot Tubs” are recommended by the U.S. Consumer Product Safety Commission.

1. Spa or hot tub water temperatures should never exceed 104°F [40°C]. A temperature of 100°F [38°C] is considered safe for a healthy adult. Special caution is suggested for young children. Prolonged immersion in hot water can induce hyperthermia.
2. Drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness, which could lead to unconsciousness and subsequently result in drowning.
3. Pregnant women beware! Soaking in water above 100°F [38°C] can cause fetal damage during the first three months of pregnancy (resulting in the birth of a brain-damaged or deformed child). Pregnant women should adhere to the 100°F [38°C] maximum rule.
4. Before entering the spa or hot tub, users should check the water temperature with an accurate thermometer; spa or hot tub thermostats may err in regulating water temperatures by as much as 4°F (2.2°C).
5. Persons taking medications, which induce drowsiness, such as tranquilizers, antihistamines or anticoagulants, should not use spas or hot tubs.
6. If the pool/spa is used for therapy, it should be done with the advice of a physician. Always stir pool/ spa water before entering the pool/spa to mix in any hot surface layer of water that might exceed healthful temperature limits and cause injury. Do not tamper with controls, because scalding can result if safety controls are not in proper working order.
7. Persons with a medical history of heart disease, circulatory problems, diabetes or blood pressure problems should obtain a physician’s advice before using spas or hot tubs.
8. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above normal body temperature of 98.6°F [37°C]. The symptoms of Hyperthermia include: drowsiness, lethargy, dizziness, fainting, and an increase in the internal temperature of the body.

The effects of Hyperthermia include:

- Unawareness of impending danger.
- Failure to perceive heat.
- Failure to recognize the need to leave the spa.
- Physical inability to exit the spa.
- Fetal damage in pregnant women.
- Unconsciousness resulting in danger of drowning.

INSTALLATION

This manual contains instructions for installation, operation, maintenance, troubleshooting, and parts lists for the proper operation of the swimming pool heaters. Manufacturer strongly recommends that the installer read the manual before installing the swimming pool heater. If after reviewing the manual any questions remain unanswered, contact the factory or local representative. Following heater installation, the installer should leave all manuals with the consumer for future reference.

NOTICE: The installation instructions are intended for the use of a qualified technician, specifically trained and experienced in the installation of this type of heating equipment. Some states or provinces require that installer be licensed. If this is the case in the state or province where heater is located, the contractor must be properly certified.

SPRINKLER HEADS: The heater is designed to handle the wettest weather conditions that are typical of rain and high humidity. Sprinkler heads force high-pressure water into the unit from the side at an odd angle. Make sure there are no sprinkler heads near the heater that will spray on or into the unit. Many sprinkler systems are connected to a well system, whose water is high in minerals, Sulphur, salt and other aggressive contaminates, that will leave a buildup on the unit and electronics causing corrosion and shortens life.

NOTICE: Damage from sprinkler interaction is not covered under the warranty agreement. Make sure that sprinklers are placed at a sufficient distance away so that normal wind will not carry the mist to the heat pump.

NOTICE: If located in an oceanfront area, the heat pump should be placed out of direct spray of sand and salt. This will clog, damage, and corrode the unit. You may also consider protecting the unit by creating a physical barrier outside of the minimum clearances between the unit and the prevailing beachfront wind. Damage caused by sand or salt spray is not covered by the warranty.

THE USE OF A POOL COVER IS RECOMMENDED. A pool cover reduces heat loss, conserves chemicals, lowers the load on filter systems and may provide a valuable safety feature

EQUIPMENT INSPECTION: On receipt of the heater, inspect the heater carton(s) for damage. If any carton(s) is damaged, note it when signing for it. Remove the heater from the carton(s) inspect it and advise the carrier of any damages at once.

NOTICE: Do not drop the heater from a pickup truck tailgate to the ground. This may damage the heater.

NOTICE: The heat pump must not be tipped or transported on its side as evaporator “oil logging” may occur.

MATERIALS NEEDED FOR INSTALLATION

Installer is responsible for providing all external to unit electrical supplies. Extra hardware items may also be required for anchoring. Additional plumbing items needed:

For in ground installations: 2 inch PVC pipe Schedule 40 and 2 inch fittings and components as follows:

- 2 inch Isolation Valves qty(3)
- 2 inch Check Valve qty(1)
- 2 x 2 x 2 PVC Tee’s qty(2)
- 2 x 1 1/2 PVC Adapter qty(2) as required

For above ground installations: 1 1/2inch PVC pipe Schedule 40 or 1 1/2 in clear vinyl tubing. The HP50HA2 comes with the required barb adapter for tubing connection. Included barbed plastic condensation drain fitting is for use on underside of unit base. This fitting is designed to accept 3/4” clear vinyl tubing and should be run to a suitable drain.

NOTICE: Pipe fittings such as reducers, tees, and elbows cause pressure to drop as water flows through them. Plan the plumbing layout carefully, using as few fittings as possible to connect your heat pump. See pad plumbing layout in the WATER PIPING section for further direction.

LOCATING THE HEAT PUMP:

The installation location of the heat pump is very important for its efficient operation. The heat pump will perform more efficiently when placed in direct sunlight with ample air intake and the avoidance of air re-circulation. Locate the pool heater in an area where its condensation will not result in damage to the area adjacent to the heater or a nearby structure.

NOTICE: DO NOT install the heat pump in a fully enclosed space (i.e. garage, shed etc.). Such an installation will void its warranty

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

OUTDOOR INSTALLATION AND SERVICE CLEARANCES The heater must be installed outdoors such that the installation and service clearances shown in Table3 and Figure3 are maintained. Additional installation requirements are as listed;

1. Level surface for proper draining.
2. Suitable electrical supply line. See rating plate on the heat pump units for electrical specifications. A junction box is not needed at the heat pump; connections are made inside the heat pump electrical compartment. Minimum wire size to be selected per NEC based on unit MCA.
3. Electric disconnect switch that will interrupt all power to the unit. This switch MUST be within line of sight of the heat pump
4. Do not install in a location where growing shrubs may in time obstruct a heater's air flow areas (sides or top).
5. Do not install the heater where water spray from ground level can contact the heater. The water could damage coil or reach the controls causing electrical damage.
6. Do not install under a deck.
7. Do not install within 24in of any outdoor HVAC equipment.
8. Do not install where water may run-off a roof into the heater. A gutter may be needed to protect the heater.

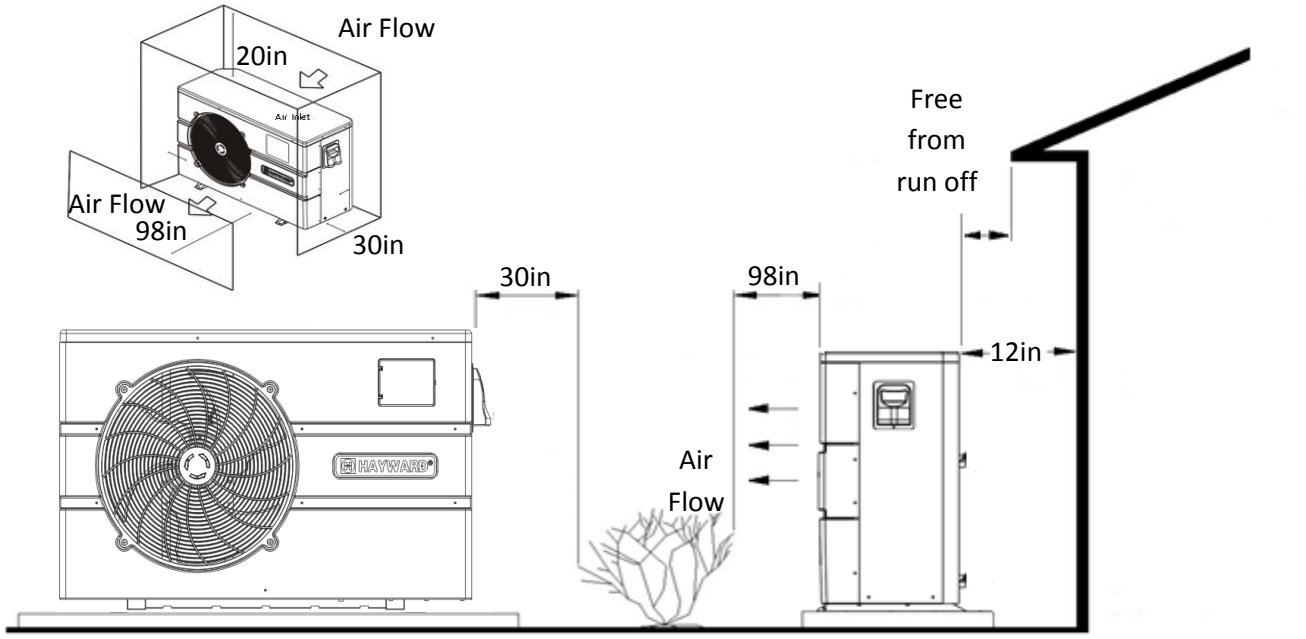
⚠ **CAUTION:** Make sure the heat pump is not located where large amounts of water may run-off from the roof into the unit. Sharp sloping roofs without gutters will allow massive amounts of rainwater, mixed with debris from the roof to be forced through the unit. Failure to follow the instructions may result in property damage and a voided warranty.

1. A minimum of 24in [610mm] of clearance on all sides.
2. If the heat pump is to be installed under a vertical overhang, the unit must have a minimum of 20in. [500mm] of clearance from the top of the heat pump to the bottom of the cover or overhang.
3. Install the heat pump a minimum of 60in. [1.5m] from the inside wall of the pool, spa, solid fence, or permanent barrier. (not shown in Figure3)
   Canadian installations require a minimum of 120 in. [3 m] of clearance from pool water.

Table3: Installation Required Clearances

Heater Panel	Outdoor Clearance
Top	20
Front (control)	98
Back (coil)	12
Rest of Perimeter	30

Figure3: Outdoor Minimum Clearances



EQUIPMENT PAD: Place the heat pump on a level surface such as concrete or a fabricated slab (pad). This allows proper drainage of condensation and rainwater from the base of the unit. If possible, the pad should be placed at the same level or slightly higher than the filter system equipment pad.

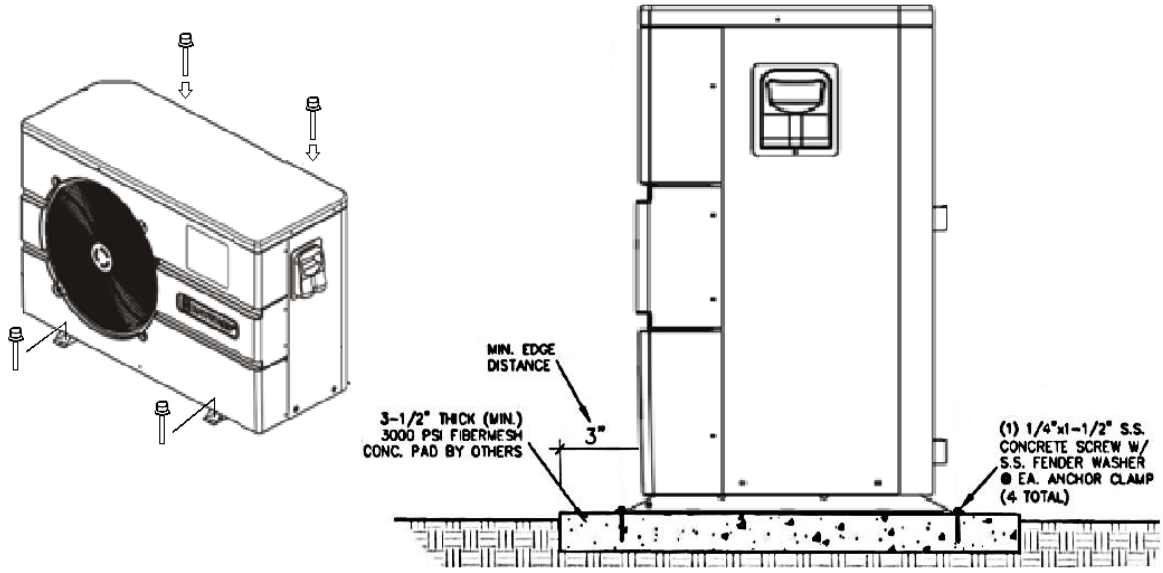
FLOORING: This heater may be installed on either non-combustible flooring or combustible flooring that does not reduce the bottom clearance of the heater. Ultralite™ or equivalent concrete-over-foam HVAC pads are acceptable.

DRAINAGE AND CONDENSATION: Condensation will be produced by the evaporator coil when the unit is heating water and drain at a steady rate, usually three to five gallons per hour, depending upon ambient air temperature and humidity. The more humid the conditions, the more condensation will be produced. Use the supplied condensate drain to route the condensate away from the unit and dispose appropriately. It is easy to mistake the condensation for a water leak inside the unit. A way to verify that the water is condensation is to shut off the unit and keep the pool pump running. If the water stops running out of the base pan, it is condensation collecting around the unit. A quicker way is to check the water for CHLORINE. If there is no chlorine present in the water around the unit, then it's condensation.

ANCHORING: The heater is equipped for installation of anchoring screws when required by local codes. Follow all relevant Local, State and National requirements regarding wind load anchoring. When anchoring is required to secure the heat pump to concrete pad, use the specified hardware shown in the figure4. To complete the installation use the following;

Concrete tapping screws	(FIELD SUPPLIED; Tapcons® stainless steel, qty (4), size to be ¼in diameter with a minimum length of 1-1/2in)
Fender washers	(FIELD SUPPLIED; stainless steel, qty (4), size to be 1-1/2in)

Figure4: Equipment Pad and Anchoring

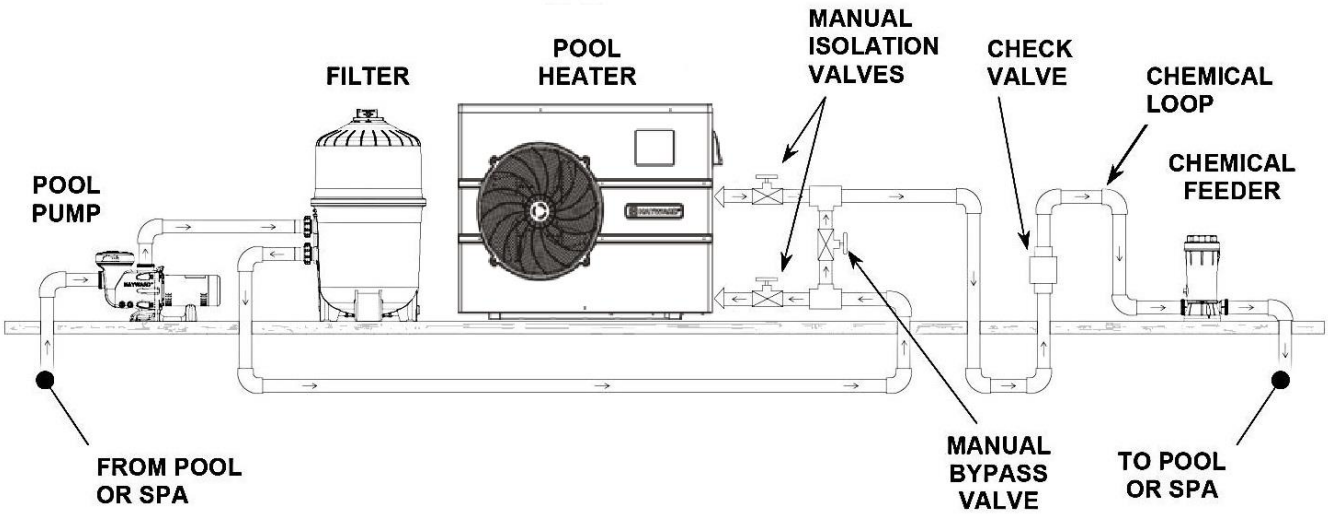


WATER PIPING

General: The heater is for use with pool and spa/hot tub water furnished by municipal water distribution systems only. The use of mineral water, seawater (PPM>5000), or other non-potable waters will invalidate the warranty. These heat pumps are designed for nominal water flows through the condenser. See specifications for minimum and maximum flow requirements to ensure sufficient heat removal and water erosion of heat exchanger tubing. The minimum flow rate is to be calculated or measured with the in-floor cleaning system in use, if the pool is so equipped, as well as any other jets or other demands on the water flow. Flow rates above specified maximum will create excessive pressure drop through the condenser and require unnecessarily high pumping energy. Bypass valve setting may be accomplished by temporarily installing a flow meter on the outlet line of the heater. Then adjust the manual bypass valve until the flowrate through the heater is within the flow rate range specified. Once the manual bypass valve is set, note the position and remove the valve handle to prevent accidental adjustment. Failure to install an External Bypass Assembly with flow rates above the specified maximum will void the warranty. Do not install any restriction in the water pipe between the heater outlet and the pool with the exception of; three-way switching valve, in-line chlorinator and/or chlorinator check valve as shown in figure5 below.

AUTOMATIC CHLORINATORS AND CHEMICAL FEEDERS: If used, a chlorinator must be installed downstream from the heater in the pool return line and at a lower elevation than the heater as shown in Figure5. Install a separate positive seal corrosion resistant check valve between the heater outlet and the chlorinator to prevent highly concentrated sanitizer from back siphoning into the heater. Back siphoning may occur when the pump is shut off and a pressure differential is created.

Figure5: Pad Plumbing Layout



⚠ **CAUTION:** Improperly adjusted manual bypass valves will result in damage to the heater if the flow rates are not maintained under all operating conditions as specified in listed SPECIFICATION. The heat exchanger will fail and this damage will not be covered under the manufacturer's warranty.

⚠ **CAUTION:** The heat pump must be protected from back siphoning of water. If there is any chance of back siphoning, provide a check valve between the pool and the filter pump inlet. Failure to follow the instructions may result in property damage due to flooding.

⚠ **CAUTION:** Automatic erosion type chlorinators, if used, must be installed downstream (between the heat pump and the pool) of the heat pump, and a check valve (or Hartford Loop) installed in a manner that will not allow the raw chlorine to drain back to the heat pump when the water pump is off. Failure to follow the instructions may result in property damage.

⚠ **CAUTION:** Do not pour chemicals directly into the skimmer. It could result in damage to your system and heat pump.

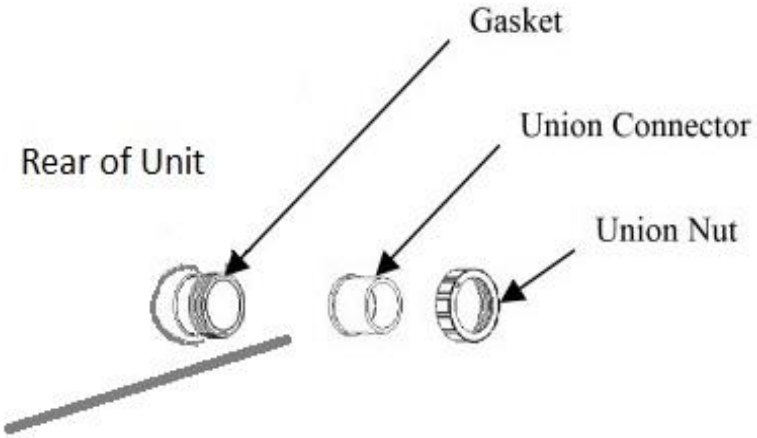
Arrangement of pool system components other than as illustrated in figure5 can affect the operation of the heat pump's water pressure switch. Location of the heat pump above or below the elevation of the pool water surface can also affect operation of the switch. In general, the pressure switch can be adjusted to accommodate this effect if the heat pump water connections are no more than six (6) feet [1,8 m] below the pool water surface or no more than fifteen (15) feet [4,6 m] above it. See instructions for pressure switch adjustment in the START-UP section of this manual. If the heat pump is installed outside of this range, an external pressure switch may need to be installed in the plumbing upstream of the heat pump.

NOTICE: Be advised, that when pool equipment is located below the pool surface, a leak at this lower level can result in large-scale water loss or flooding. Manufacturer is not responsible for water loss or damage it causes

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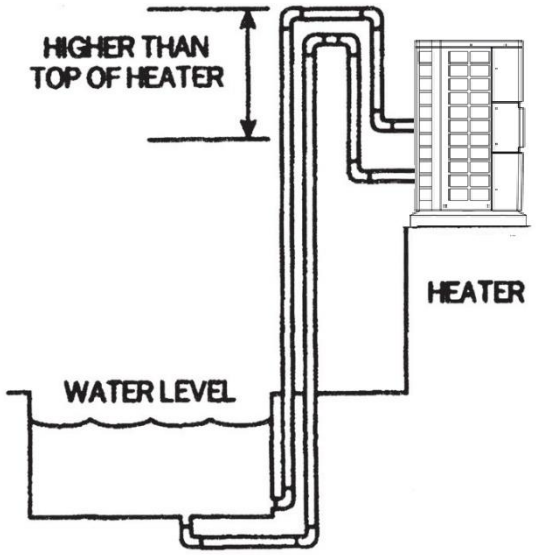
UNIONS: The heater is equipped with two detachable union connectors, (2 union nuts and 2 gaskets) included with the heat pump. These fittings must be installed on the heat pump water inlet and outlet to facilitate servicing and winterizing the unit. (See figure6). Heat sinks, heat tapes, firemen switches, and check valves are not required on the heater. However, if there is any chance of "back-siphoning" of hot water when the pump stops running, it is suggested that a check valve be used on the heater outlet pipe down stream of bypass system

Figure6: In Ground Included Union Connectors



INSTALLATION ABOVE POOL/SPA SURFACE: If the heater is installed less than three (3) feet above the surface of the pool/spa water, install eyeball fittings or directional flow fittings on the end of the return water line to the pool/spa to create adequate back pressure at the heater to operate the pressure safety switch when the pump is running. If the heater is installed more than three (3) feet above the surface of the pool/spa water, install a loop as shown in Figure7 to prevent drainage of water in the heater during a filter change. For installation above or below the pool/spa surface, refer to START UP section for proper pressure switch setup.

Figure7: Heater Installation Above Pool



TYPICAL POOL ARRANGEMENT:

Figure8 illustrates a typical pool piping diagram and layout for the pool equipment. Also shown is implementation of an optional Gas or Solar heater system for additional capacity. Other pool heaters, such as gas-fired or solar-powered devices must be installed in a parallel circuit and operated independently (only one at a time) for your warranty to be valid.

NOTICE - Because of the intense heat that can be generated by gas and solar units, isolating it with a shut-off valve and a check valve when gas or solar heater is in operation protects the heat pump. Failure to follow the instructions may result in property damage.

Notes:

1. Isolate the heat pump from hot water flow of heating devices such as gas or solar heater.
2. Install bypass loop for heat pump unit.

Figure8: Typical Plumbing to Pool

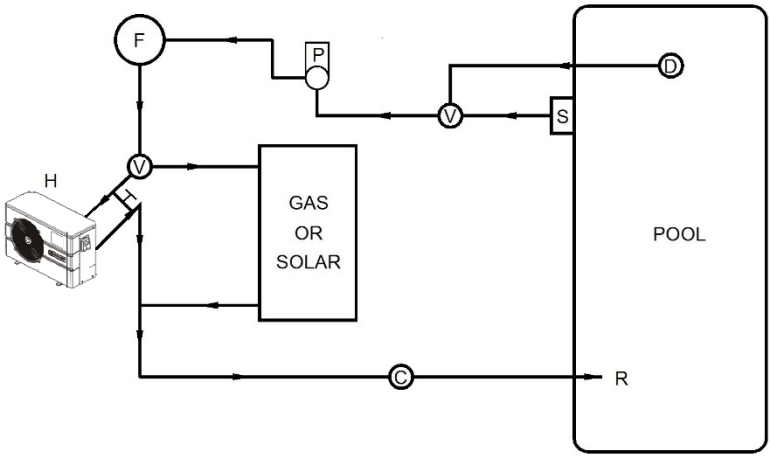
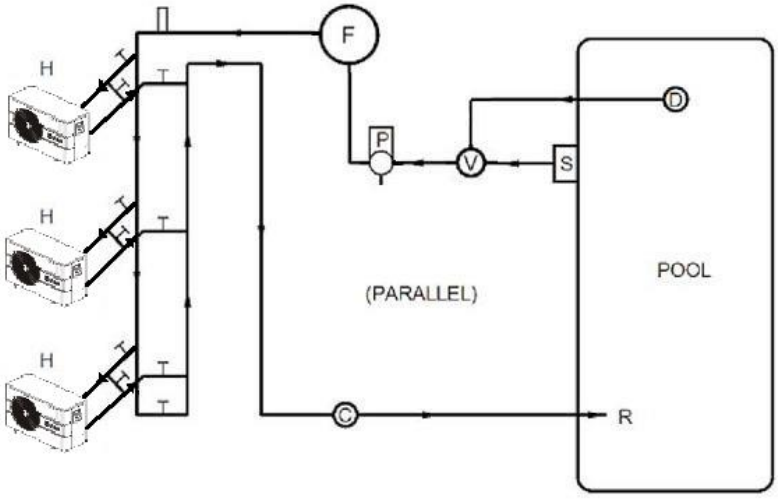


Figure9 illustrates a multiple heater installation for very large pools with and without a manual bypass valve.

1. Maintain 4-6ft [1,2-1,8 m] clearance between the units, 2ft [0,6 m] around perimeter, and at least 6ft [1,8 m] over them. Refer to LOCATING THE HEATER section for more details.
2. Install bypass loops for each unit.
3. Install union style fittings from the heat pump CONSUMER KIT adjacent to the unit to facilitate easy service procedures

Figure9: Multiple Heater System



ELECTRICAL CONNECTIONS:

GENERAL INFORMATION: An external supply of power is required to operate the pool heater system. Review SPECIFICATIONS for this heater in the GETTING STARTED section to properly size field power connections. All wiring connections to the heater must be made in accordance with the latest edition of the National Electrical Code ANSI/NFPA 70, unless local code requirements specify otherwise. In Canada, follow CSA C22.1 Canadian Electrical Code, Part 1. The heater must be electrically grounded and bonded in accordance with local codes or, in the absence of local codes, with National Electrical Code, ANSI/NFPA 70. Wiring connections must be made as shown in the wiring diagram found inside the heater cabinet, and a copy is provided for convenience in the GETTING STARTED section at the beginning of the manual. The heater must also have an independent ground and bond connections. There is a ground lug inside the control box adjacent to the power connections and a bonding lug on the side of the heater. Use a solid copper conductor, size 8 or larger. Run a continuous wire from external bonding lug to reinforcing rod or mesh. Connect a No. 8 AWG (8.4 mm2) solid copper bonding wire to the grounding lug provided on the heat pump and to all metal parts of swimming pool or spa, and to all electrical equipment, metal piping (except gas piping), and conduit within 5 ft. (1.5 m) of inside walls of swimming pool or spa. IMPORTANT - Reference NEC codes for all wiring standards including, but not limited to, grounding, bonding and other general wiring procedures.

⚠ **WARNING:** Risk of Electric Shock Review all safety information provided in the GETTING STARTED section of this manual prior to servicing. Always disconnect power circuit before connecting the heat pump, or working on the heat pump. This equipment contains wiring that carries high voltage. Contact with these wires could result in death or personal injury and/or may also cause property damage.

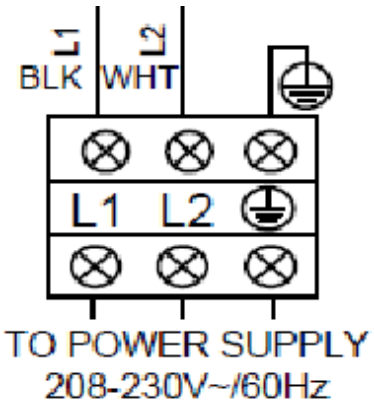
⚠ **WARNING**: All electrical wiring MUST be in conformance with all applicable local codes, regulations and the National Electric Code (NEC), in particular NEC Article 680: *Swimming Pools, Fountains & Similar Installations* and Article 440: *Air-Conditioning & Refrigeration Equipment*.

NOTICE: Manufacturer does not recommend the use of ground fault protective devices in conjunction with heat pumps. Most service calls regarding tripping of ground fault devices, are found to be “nuisance” calls. GFCI nuisance trips are not covered under warranty.

NOTICE: If voltage drops below 208V, this may damage the heat pump and void the warranty. Take proper steps to ensure correct voltage at the heat pump during operation

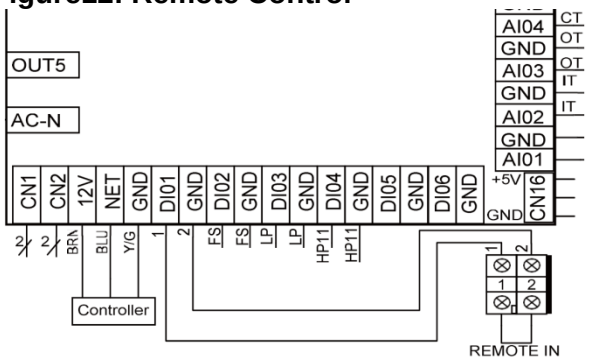
ELECTRICAL CONNECTIONS: Turn OFF source power to the heat pump before working on electrical connections. Any unused openings must be plugged and all wiring secured for proper strain relief. The power connections are to be made on the contactor terminals located in the control box (see Figure11 Power Connections). A damaged cord be replaced with one supplied by the unit manufacture and not repaired Use supply wires suitable for -7~43 °C

Figure11: Power Connections



REMOTE CONTROL CONNECTION: The heater is equipped for remote control via an independent 2-wire connection. (See Figure12 for remote in connection). The unit is factory shipped with the jumper in place. The jumper can be replaced with a remote switch to activate the unit. It is recommended the unit be placed in Auto mode if only a remote switch closure is used. Temperature is set at the unit controller.

Figure12: Remote Control



If the unit is controlled with remote on/off connection with remote temperature control;
For heating, set mode to Heat set thermostat to 104°F
For cooling, set mode to Cool set thermostat to 65°F.
The remote on/off can then activate the unit as needed for remote temperature control.

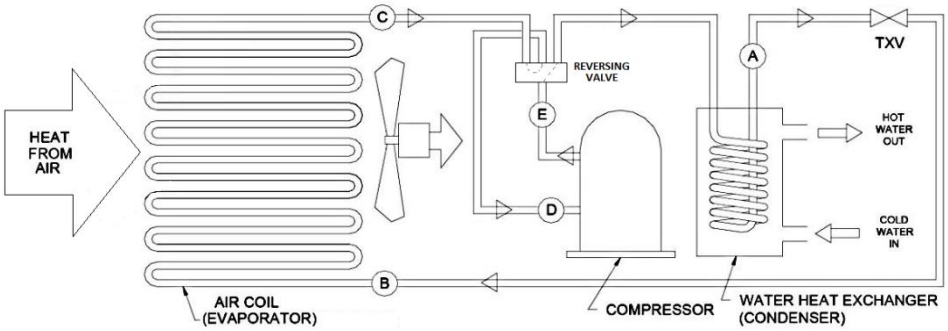
NOTICE: Pump must be running for unit to operate with remote control connection.

All remote wiring must be run in a conduit separate from incoming power. Use 22 AWG wire for runs less than 30 feet. Use 20 AWG wire for runs over 30 feet. The maximum allowable run is 200 feet.

CHECK-OUT & START-UP

GENERAL: After completing the installation connections to the pool heater, follow the procedures outlined below to ensure that the pool heater is functioning properly. Before proceeding, MAKE CERTAIN there are no water leaks in any plumbing connections or piping and water flow is within the proper flow rate ranges. The heater is equipped with a control system that automatically monitors the water temperature set points and safety devices. As water conditioning is needed, it turns on the compressor to start the appropriate transfer of heat to the water. Figure13 provides a summary of heater components and their locations in the system. Check that the pump is operating and the system is filled with water prior to starting the heater.

Figure13: Location of Components (heating operation flow shown)



The heat pump takes heat from the environment and uses it to heat the pool water. During heat pump operation, high temperature, high-pressure sub cooled liquid Refrigerant (A) is throttled by Metering Device (TXV) and turned into low temperature, low-pressure saturated liquid (B). The two-phase Refrigerant flows through the Air Coil (Evaporator), where the liquid refrigerant evaporates into vapor by absorbing heat from the surrounding air. At the outlet of the Air Coil (Evaporator) it becomes a low temperature, low-pressure superheated vapor (C). The Compressor receives this flow at the suction line (D), and compresses it into a high temperature, high pressure superheated vapor, which is discharged from the Compressor (E) and flows through the reversing valve into the Water Heat Exchanger (Condenser). The heat carried by the flow is then released to the pool water. At the same time, the high temperature, high-pressure superheated vapor is then condensed back to high-pressure sub cooled liquid (A), which completes the cycle. The water, which is being forced through the Water Heat Exchanger (Condenser) by the pool pump, is thus heated as it passes through.

HEAT PUMP PROTECTION FEATURES: These heat pumps are equipped with safeguards that will stop heater operation to protect the unit in case of the following events:

- Excessively high refrigerant pressure
- Excessively high water temperature
- Loss of refrigerant
- Evaporator Freeze-up
- Low Ambient Temperature

CONTROL SETUP

This pool heater is equipped with a digital thermostat which allows the user to select the desired water temperature. The heater will then function automatically to maintain the desired temperature. The heater has 3 modes of operation:

1. HEATING: in this mode, the heater will automatically function to manage a minimum water temperature setting.
2. COOLING: in this mode, the heater will automatically function to manage a maximum water temperature setting.
3. AUTO: In this mode the heat pump will automatically respond to either a call for heating or cooling as described above.

USER INTERFACE PANEL AND INPUTS: The control displays temperatures, mode selections, diagnostic codes and accepts user inputs via the three buttons of the user panel.

ON/OFF Button Press the ⏻ key to activate the unit. The ⏻ will also cancel the present selection when making adjustments.

LED Display When power is supplied to the unit, the display will either show sensor temperature (in degrees F or C), operation mode or the diagnostic code.

Up / Down Arrow Buttons Raises or lowers the temperature set point or toggles the selection.

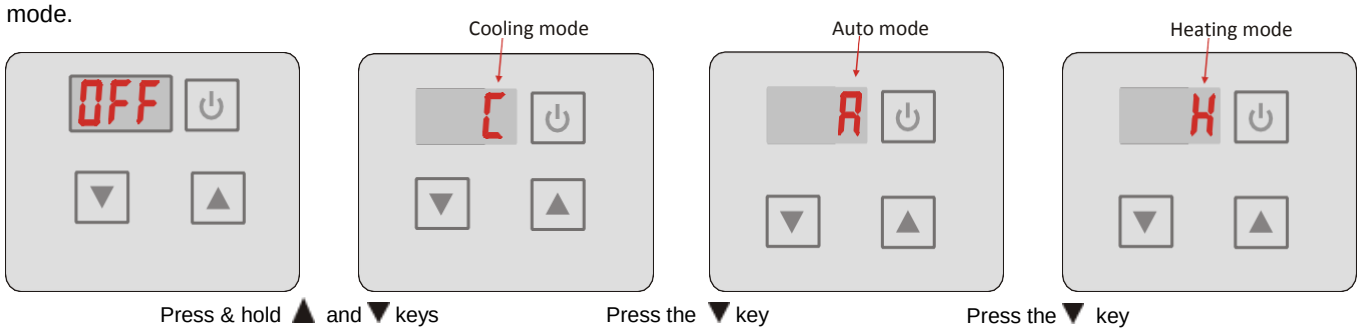
Figure14: User Interface Panel



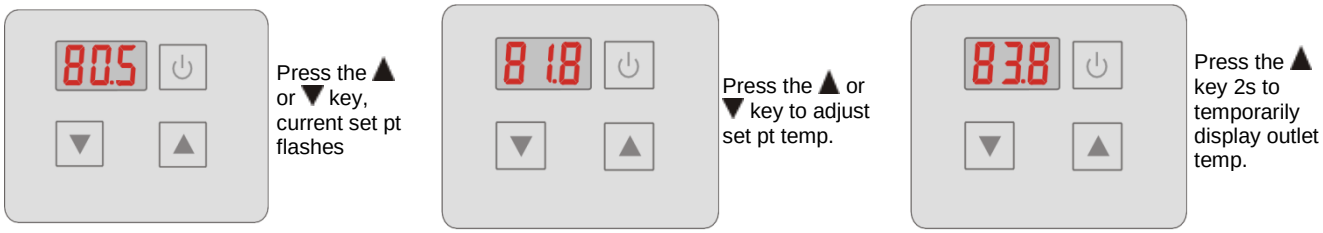
Turn Unit ON/OFF: When the unit is off, press the ⏻ key to turn the unit ON; when the unit is on, press the ⏻ key to turn the unit OFF. Pressing the ⏻ key will also cancel the any selection when making a change or adjustment.

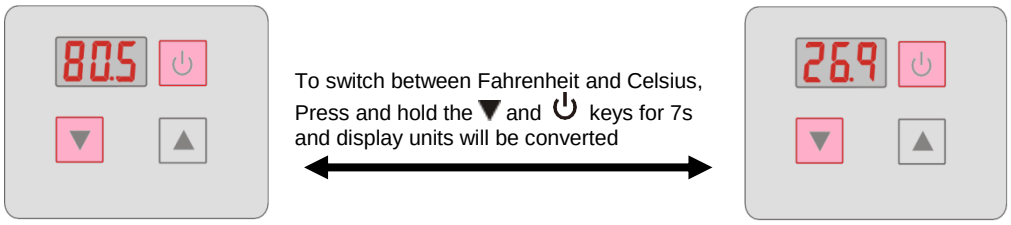


Mode Setting: When unit is operating press and hold ▲ and ▼ to display the current mode, then press ▲ or ▼ to cycle through the mode selections. Pressing ⏻ will cancel the change and return operation to the original temperature display mode. To save the new mode, do not press a key for 5s and the displayed value will be saved and operation will return to temperature display mode.



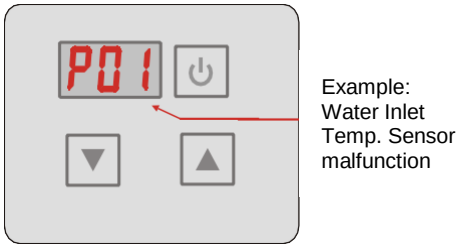
Setting/Displaying Temperatures: When unit is operating, press either ▲ or ▼ and the current temperature set point flashes. Then press either ▲ or ▼ to increase or decrease the temperature set point. Pressing ⏻ will cancel the change and return operation to the original temperature display mode. To save the new temperature set point, do not press a key for 5s and the displayed value will be saved and operation will return to temperature display mode. To view the outlet temperature while in the temperature display mode press and hold ▲ for 2s. The outlet temperature is temporarily displayed, and then the display is returned to temperature display mode.





Keyboard Lock: To avoid unintended operations, the controller keys may be locked after parameter setting. At the main interface, press and hold the ⏻ key for 5s. After beep, the keys are locked. Repeat to unlock keys. When the unit is displaying error codes, the key lock is unlocked automatically to allow immediate cycling through codes.

Error and Operation Codes: If multiple error or operation codes are available for display, Press the ▲ or ▼ key to cycle through codes. See Display Code Index for descriptions.



TWO-SPEED PUMP: In a few cases the flow from a two-speed pump is below the minimum required to operate the water flow switch on the heater. In these cases the pump must be run at high speed to operate the heater. If the pump and piping arrangement are such that the required minimum flow cannot be obtained, do not attempt to operate the heater. Correct the installation.

NOTICE: Heater installation, checkout, and start-up should now be completed. BE SURE to leave this manual with the pool owner.

MAINTENANCE & SERVICE

PERIODIC INSPECTION: The heater is designed and built for long performance life when installed and operated according to the manufacturer's directions. Regular inspection by qualified service personnel is recommended to keep the heater working properly. The following inspection points are suggested to help maximize heater life.

1. Periodically check the fan discharge area. The fan discharge must never be obstructed in any way and minimum clearances must be observed. Remember that shrubs grow and in time may obstruct
2. Keep the entire pool heater area clean and free of all debris, corrosive materials, and other flammable vapors and liquids. Remove any leaves or paper from around the heater.
3. Do not store chlorine, other pool chemicals, or other corrosives in the vicinity of the heater.
4. Do not use the heater if any part has been under water. Contact a qualified service technician to inspect the entire heater and replace any part of the control system that was under water. If heater has been totally submerged in water it must be removed and the entire heater must be replaced.
5. An inspection program is a good preventative maintenance measure. Keep this manual in a safe place for future reference for yourself as well as for a service technician to consult when inspecting or servicing the heater. Additional inspection procedures to be performed by a qualified service technician.

WATER CHEMISTRY:

⚠ **WARNING: WATER CHEMISTRY.** Failure to maintain proper water chemistry may cause premature heat exchanger damage or failure

The heat exchanger in your pool heater is made from the highest quality of materials. The titanium condenser is a premium material and the processes used to manufacture the heat exchanger are state of the art in pool heater design and manufacture. However, it remains vital that the heat exchanger be protected from damaging or corrosive chemicals, insufficient water flow or improperly balanced water chemistry. Heat exchanger damage or failure resulting from improper flow, improperly balanced pool water or the improper addition of sanitizer into the water is NOT covered under the terms of the warranty. The following factors are critical to heat exchanger protection. Follow these guidelines to help prevent pre-mature damage or failure to your heater and heat exchanger.

1. **WATER FLOW THROUGH HEATER** Water must be flowing through the heater at the minimum rated flow rate during operation. Check that the pump is operating and the system is filled with water and purged of all air prior to starting the heater. The minimum rated flow rates are listed in the specifications section. Some installations may require an adjustment to the water pressure switch for proper low-flow protection. Test your system and if necessary, adjust the water pressure switch as described in WATER TESTING SECTION OF MANUAL.

Table4: Water Chemistry

Chemical	Recommended Level	Effect of Low Levels	Effect of High Levels
Chlorine	1 - 3 ppm	hazy water, algae growth, bacteria causing infections	swimmer irritation, bleaching of clothes/hair, corrosive to heat exchanger
Bromine	2 - 4 ppm		
pH	7.4 - 7.6	corrosive to heat exchanger, swimmer irritation	cloudy water, scaling of heat exchanger, reduced sanitizer effectiveness
Total Alkalinity	80 - 120 ppm	corrosive to heat exchanger, large fluctuations in pH	scaling of heat exchanger
Calcium Hardness	200 - 400 ppm	corrosive to heat exchanger	scaling of heat exchanger
Salt	2700 - 5000 ppm	poor salt chlorinator performance	corrosive to heat exchanger

2. **WATER CHEMISTRY** The chemistry balance and mineral content of swimming pool and spa water changes rapidly due to the addition of sanitizing chemicals, user loads, exposed rain, runoff and the amount of sun - to name a few. Improper chemistry (See Table4) balance and mineral content can cause scaling and deposits to form on pool walls, in the filtration system, in the heat exchanger tubes and additionally can promote corrosive action to all metals in the water path. Changing spa water regularly and maintaining the correct chemical balance in your pool/spa will keep the pool/spa safe and sanitary, and will help the heat exchanger longevity. Use a 4-way pool/spa water test kit to check your water frequently (at least weekly). Use the following guidelines to help maintain proper water chemistry:
3. **SKIMMER CHLORINATION** Placing chlorine or bromine Tablets directly into the skimmer may result in high chemical concentrations flowing through the heater. DO NOT place chlorine or bromine Tablets in the skimmer.
4. **CHLORINATOR INSTALLATION** Chlorinators must be installed downstream of the heater, and a check valve must be installed between the heater and chlorinator to prevent high chemical concentrations from back flowing into the heater. Make sure your piping arrangement meets the chlorinator installation requirements shown on page 26.
5. **USE BYPASS** Until water chemistry is properly balanced, so that corrosive and potentially damaging water will not flow through the heater and therefore the heat exchanger. Close the bypass valve once the water is properly balanced.

⚠ **WARNING BYPASS.** Failure to close the bypass valve when attempting to operate the heater will result in extensive damage to the heat exchanger

Ensure water flow through the heater is restored before operating the heater. A bypass feature is also advantageous for service needs and for the ability to remove the heater from the water path when not heating.

WINTERIZATION:

In moderate climates, the heater can continue to operate during short-term cold spells. Do not use the heater to maintain the water temperature just above freezing or for freeze protection. Care must be taken to avoid freeze-up in the heater. When it is used during freezing weather, the pump must run continuously. The heater is not warranted against freeze-ups. In regions where freezing temperatures are encountered, all water must be drained from the heater when it is out of service, to prevent damage to the heater and piping. Draining the heat exchanger is recommended as part of the season's shutdown procedures.

NOTICE: A heater damaged by freezing is not covered under the manufactures warranty.

DRAINING THE HEAT EXCHANGER: This procedure applies to installations where the heater is located higher than the pool water level. If itis necessary to drain a pool heater located below the pool water level, you must either partially drain the pool, or isolate the pool heater from the pool using valves, then perform draining the heat exchanger.

1. Set the heater to OFF mode using the keypad.
2. Turn the electricity to the heater OFF at the circuit breaker panel.
3. Be sure the circulating pump is OFF.
4. If no drain plug is provided, open lower inlet water union and allow all water to drain from the heater.
5. Re-install the drain plug or reattach the water union.

SPRING START-UP: This procedure should be performed annually to ready your heater for the upcoming season. In addition to the steps outlined below, it is recommended that a PERIODIC INSPECTION also be performed.

1. Inspect and clean the heater, being sure the heater is free of leaves and debris prior to startup.
2. Properly attached inlet and outlet piping and confirm the drain valve is closed.
3. Turn the filtration system pump ON and allow the system to run long enough to purge all the air from the lines.
4. Turn the electricity to the heater ON at the circuit breaker panel.
5. Set the heater to H mode and adjust the set point to the desired temperature setting.
6. If operating difficulties are encountered, contact a qualified service company for assistance.

COMPONENT SERVICE

NOTICE: Only qualified service technicians, with appropriate test equipment, should be allowed to service the heater. For conditions where refrigerant must be managed, an EPA certified technician is required. All of the components that comprise the system have an effect on heater operation. Before proceeding with heater related troubleshooting tips, be certain that the pump is operating correctly, the filters and strainers are not blocked, the valves in the piping are properly positioned, and the time clocks are properly set.



⚠ **WARNING: EXPLOSION HAZARD** Do not attempt to repair broken or faulty components of this heater. Do not modify the heater or its components in any manner. To do so may result in a malfunction that could result in death, personal injury, or property damage. Check with the pool owner to see if any part of the heater has been under water. Replace any electrically operated component that has been under water.



⚠ **WARNING: Risk of Electric Shock** Review all safety information provided in the GETTING STARTED section of this manual prior to servicing. Always disconnect power circuit before connecting the heat pump, or working on the heat pump. This equipment contains wiring that carries high voltage. Contact with these wires could result in death or personal injury and/or may also cause property damage.

TROUBLESHOOTING

ERROR and OPERATION CODES: See Table 5: Display Code Index.

TROUBLESHOOTING: See Table 6: Troubleshooting Lookup Chart.

AUTOMATIC RESET TIME: The heater will automatically reset when an error condition is corrected and resume operation.

NOTICE: These instructions are intended for the use of qualified personnel trained and experienced in the installation and servicing of this type of heating equipment and its related system components. Some states may require installation and service personnel to be licensed. Persons not qualified should not attempt to repair this equipment according to these instructions. These instructions and procedures are not for the use of “do-it-yourself” consumers.

NOTICE: As a preliminary check, make sure that all wire connections are clean and tight and that all wiring conforms to the wiring diagram.

INTERNAL WIRING: If the heater display is blank after the electrical has been installed, refer to Troubleshooting Lookup Chart to determine the cause. Note, the cable between the display board and the control board is keyed to ensure correct connection.

Table 5: Display Code Index			
Display	**Malfunction**	**Possible Cause**	**Information**
(blank)	No power to heat pump	Tripped circuit breaker/ no power supply	Check breaker and ensure that the unit is properly installed.
		Faulty electrical component	Call for service.
	Unit will not turn on	Display module failure	Call for service.
E01	High Pressure Switch, circuit open.	Low water flow	Check water flow to heat pump. Ensure pool pump is on.
			Clean your filter
			Make sure all valves are fully open and bypass valve is closed
			Turn off fountains, etc.
		High water temp	Check pool temp. confirm within allowable limits for heating and cooling.
			Call for service.
E02	Low Pressure Switch, circuit open.	Air flow obstruction	Remove debris and other items restricting air flow to heat exchanger
		Low Ambient Temperature cutoff	Wait for outside temperature to reach 50°F.
		Unit low on refrigerant	Call for service.
E03	Flow Switch circuit open	Low or no water flow or remote on/off in use	Check water flow to heat pump. Ensure pool pump is on.
			Make sure all valves are fully open and bypass valve is closed
			Clean your filter
E06	Unit water temperature rise to great	Low water flow	Call for service
E07	Freeze up during cooling mode	Low water flow	Call for service
E08	Communication failure	No communication between display and controller	Call for service or check connection points of display and controller
E19	Primary anti-freezing protection heating mode	Ambient temperature too low for operation	Call for service
E29	Primary anti-freezing protection heating mode	Ambient temperature too low for operation	Call for service
P01	Inlet temperature sensor failure	Sensor short circuit, open circuit or not connected	Call for service or replace sensor
P02	Outlet temperature sensor failure	Sensor short circuit, open circuit or not connected	Call for service or replace sensor
P04	Ambient temperature sensor failure	Sensor short circuit, open circuit or not connected	Call for service or replace sensor
P05	Pipe temperature sensor failure	Sensor short circuit, open circuit or not connected	Call for service or replace sensor
P07	Evaporator temperature sensor failure	Sensor short circuit, open circuit or not connected	Call for service or replace sensor

⚠ **WARNING:** To avoid possible outer jacket damage or injury: (1) no materials should be stored against the jacket and (2) care should be taken to avoid unnecessary contact (especially by children) with the jacket.

Table 6: Troubleshooting Lookup Chart		
Problem	**Possible Cause**	**Possible Solution(s)**
Unit is not operating.	No power to unit	Make sure power is on.
	Breaker is tripped	Check the breaker / see note above
	Thermostat not turned up high enough	Turn thermostat up until unit comes on
	3 minute compressor delay timer still running	Be sure the delay has passed
	Low water flow	Make sure filter is clean
		Make sure filter pump is on
		Unhook cleaning devices
	Outside temperature too low	Check outside ambient temperature or wait for warmer temperatures to operate. (refer to Operating section)
	Fan not functioning	Call for service.
Heat pump is running but Display LEDs do not come on.	System Component failure.	Call for service.
Heat pump runs continually	Thermostat set too high for ambient temperature	Turn thermostat down
	Evaporator is dirty.	Clean by running tap water over the coil without additional nozzle attachment. Do not use pressurized water as it can damage the coil and void warranty.
	Electrical component failure	Turn off pump. If the unit is still running after 3 minutes, turn off the power to the unit and call for service.
Heat pump is cycling (on / off too quickly)	Bad bypass valve or improper water flow	Ensure water flow is sufficient (is the filter pump running continually?) If heat pump continues to cycle, turn unit off to prevent compressor damage.
	Low refrigerant, low ambient temp, or high humidity with low ambient temp	Check evaporator coil for severe frost. Turn unit off to prevent compressor damage.
		If heat pump continues to cycle, turn unit off to prevent compressor damage. Call for service.
Water is coming from bottom of unit	Condensation	This is normal and there is no reason to be concerned
	Possible water leak	Turn the unit off for several hours, but leave the filter pump running continuously. If water quantity decreases, then it is only condensation. Otherwise there is a possible leak.

PARTS

Figure16a: Service Parts Exploded View HP50HA2

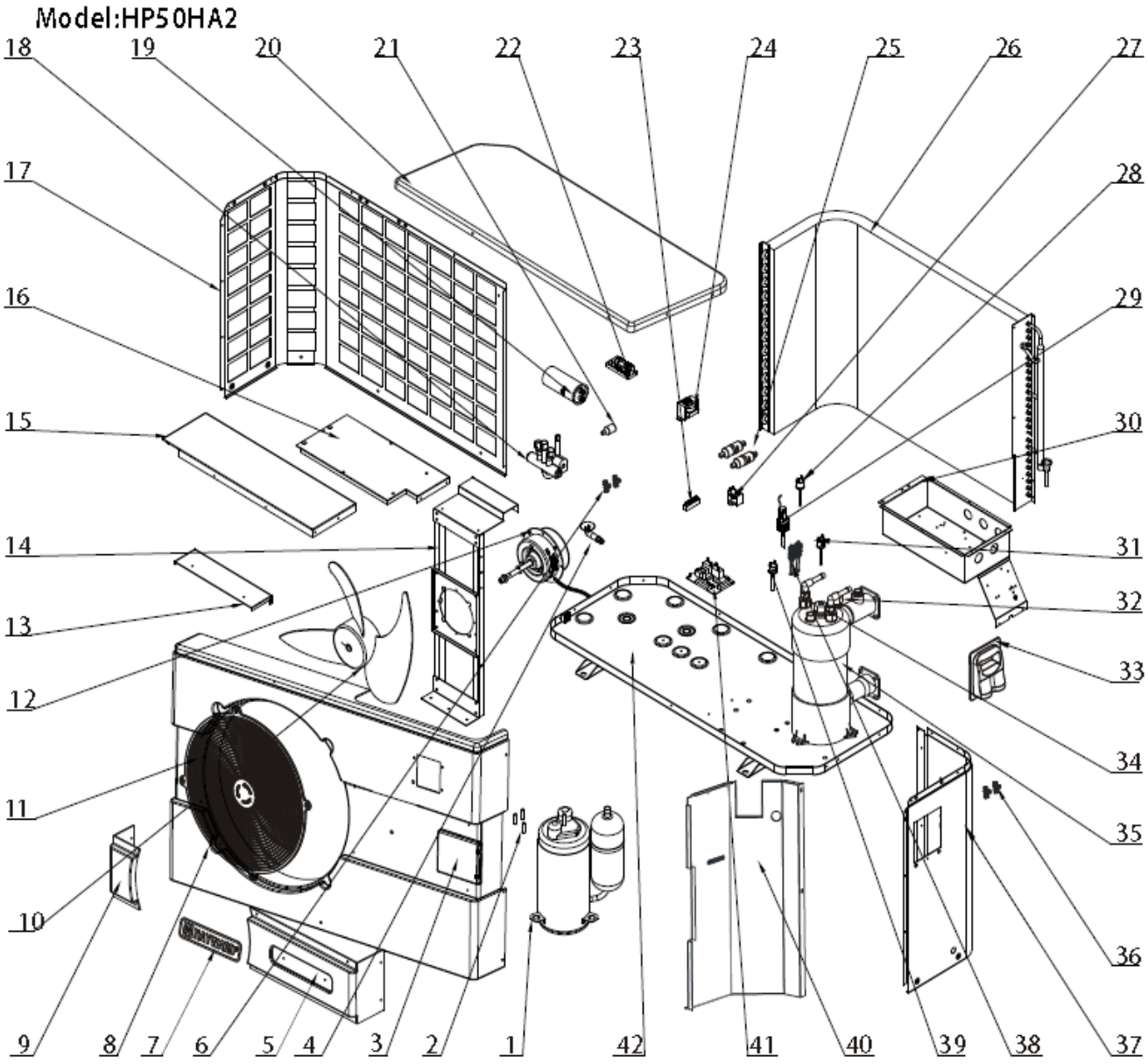


Figure16b: Service Parts HP50HA2

Item No.	Part No.	Description
1	HPX20000-110041	Compressor
2	HPX2002-8881	Steel sleeve
3	HPX72200268	User Interface
4	HPX3400-2203	Drainage Adapter
5	HPX32008-220053	Logo Mounting Plate
6	HPX2000-1460	Tee
7	HPX20000-230596	Hayward Logo
8	HPX80900662	Front Panel
9	HPX32008-220052	Front Trim
10	HPX80300003	Fan
11	HPX20000-220188	Fan guard
12	HPX80200144	Fan motor
13	HPX32008-210069	Front Cover
14	HPX32012-210742	Motor bracket
15	HPX32012-210737	Top Cover
16	HPX32012-210740	Control Top Cover
17	HPX32012-210736	Coil Guard
18	HPX2001-1418	Four-way valve
19	HPX2000-3505	Compressor capacitor
20	HPX32008-220054	Top Panel
21	HPX2002-1443	Variable diameter
22	HPX20000-390231	Five-connector
23	HPX2000-3909	Two-connector
24	HPX20000-370006	Power transformer
25	HPX2004-1446	Filter
26	HPX80600627	Evaporator heat exchanger
27	HPX2000-3501	Fan capacitor
28	HPX2000-3603	Pressure switch (0.30MPa/0.15MPa)
29	HPX20000-360005	Water flow switch
30	HPX32012-210739	Electrical box
31	HPX2001-3605	Pressure switch (3.2 MPa / 4.4 Mpa)
32	HPX2000-3242	Water outlet sensor
33	HPX32009-220029	Terminal box
34	HPX2000-3242	Water inlet sensor
35	HPX80600622	Titanium tubular exchanger
36	HPX304030-00000002	Tee
37	HPX32012-210735	Right-side plate
38	HPX20000-140150	Needle Valve
39	HPX20000-360059	Pressure switch (3.2 MPa / 4.0 Mpa)
40	HPX32012-210738	Median septum
41	HPX95005-310145	PC1001
42	HPX32012-210741	Chassis

PARTS

Figure16a: Service Parts Exploded View HP70HA2

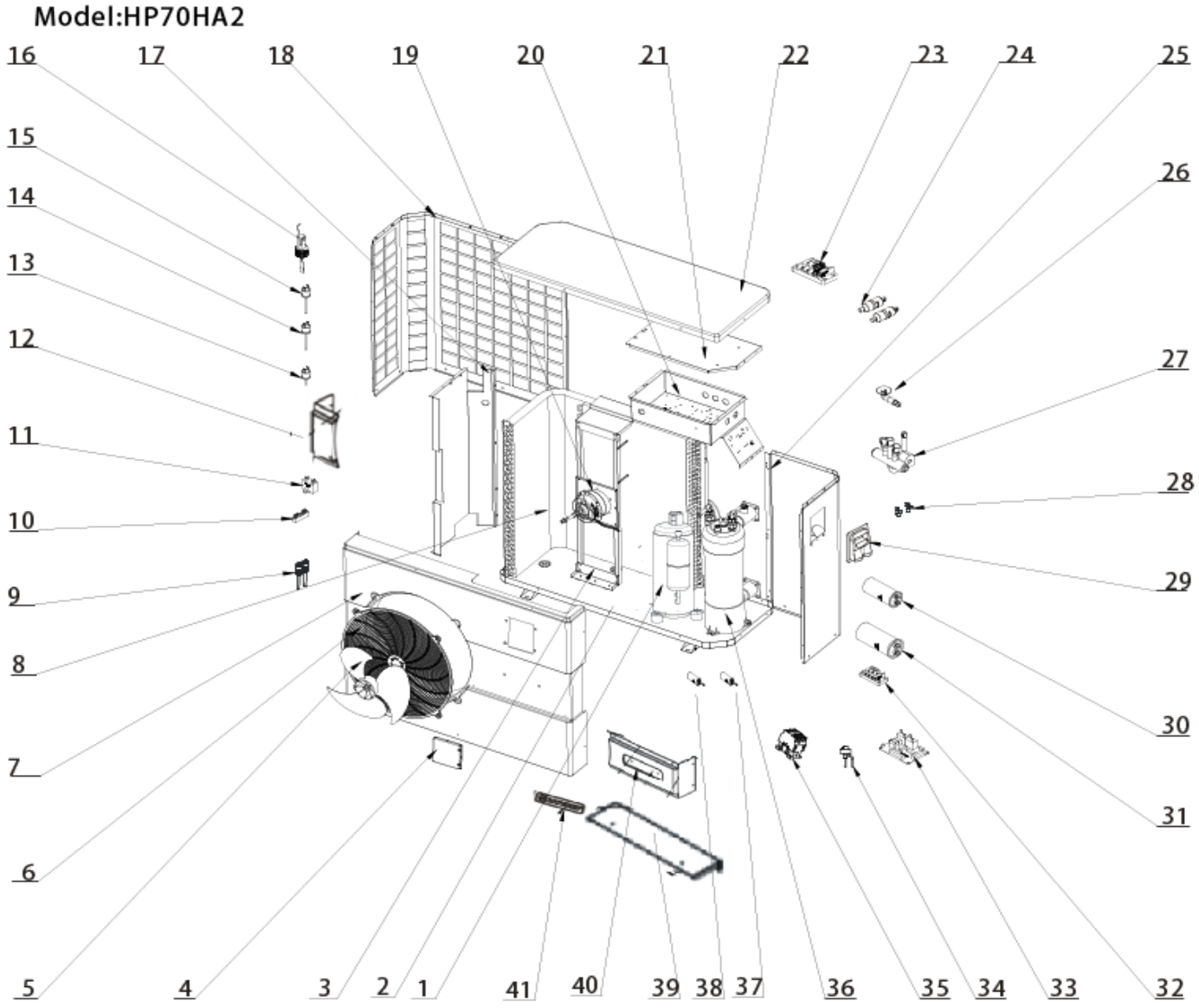


Figure16b: Service Parts HP70HA2

Item No.	Part No.	Description
1	HPX20000-110429	Compressor
2	HPX80707301	Chassis
3	HPX32009-210634	Motor bracket
4	HPX95005-310598	User Interface
5	HPX20000-270004	Fan
6	HPX20000-220169	Fan guard
7	HPX80900640	Front Panel
8	HPX80600667	Evaporator heat exchanger
9	HPX20000-140150	Needle Valve
10	HPX2000-3909	Two-connector
11	HPX20000-360297	Relay
12	HPX32017-220002	Front frame decoration 1
13	HPX2000-3603	Pressure switch (0.30MPa/0.15MPa)
14	HPX20000-360059	Pressure switch (3.2 MPa / 4.0 Mpa)
15	HPX2001-3605	Pressure switch (3.2 MPa / 4.4 Mpa)
16	HPX20000-360005	Water flow switch
17	HPX32009-210631	Median septum
18	HPX32017-210010	Rear panel
19	HPX20000-330132	Fan motor
20	HPX32009-210633	Electrical box
21	HPX32009-210635	Control Top Cover
22	HPX32017-220004	Top Panel
23	HPX72200052	DC speed control module
24	HPX2004-1444	Filter
25	HPX32009-210630	Right-side plate
26	HPX3400-2203	Drainage Adapter
27	HPX2001-1491	Four-way valve
28	HPX2000-1460	Tee
29	HPX32009-220029	Terminal box
30	HPX2000-3524	Compressor capacitor 1
31	HPX2000-3510	Compressor capacitor 2
32	HPX20000-390237	Three-connector
33	HPX72200101	PC1002
34	HPX20000-140237	Electronic expansion valve
35	HPX20000-360226	Ac contactor
36	HPX80600624	Titanium tubular exchanger
37	HPX2000-3242	Water inlet temperature sensor
38	HPX2000-3242	Water outlet temperature sensor
39	HPX32009-210219	Support panel
40	HPX32017-220003	Front frame decoration 2
41	HPX20000-230596	Hayward Logo

NOTE

NOTE