SWIMMING POOL HEAT PUMP UNIT

Installation & Instruction Manual

Models HP50A
HP50HA

3149010

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CONTENTS

1. PREFACE

In order to provide our customers with quality, reliability and versatility, this product has been made to strict production standards. This manual contains installation, service and maintenance. Please read this manual carefully before you open or maintain the unit. The manufacturer of this product will not be held responsible if someone is injured or the unit is damaged as a result of improper installation, service or unnecessary maintenance. It is vital that the instructions within this manual are adhered to at all times. The unit must be installed by qualified personnel.

The unit can only be repaired by qualified installer center personnel or an authorized dealers (HVAC).

- Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.
- Use genuine standard spare parts only.
- Failure to comply with these recommendations will invalidate the warranty.
- The Swimming Pool Heat Pump Unit heats the swimming pool water and keeps the temperature constant.

This type of heat pump has the following characteristics:

1. Durable

The heat exchanger is made of PVC & titanium; the tube can withstand prolonged exposure to corrosives such as chlorine.

2. Quiet operation

The unit contains efficient rotary compressor and a low noise fan motor, which assures its quiet operation

3. Electronic control board

The unit is controlled by an internal micro-controller, allowing all operation parameters to be set. Operation status can be displayed on the control panel.

2. SPECIFICATIONS

2.1 Performance Data of Swimming Pool Heat Pump Unit

*** REFRIGERANT: R410A

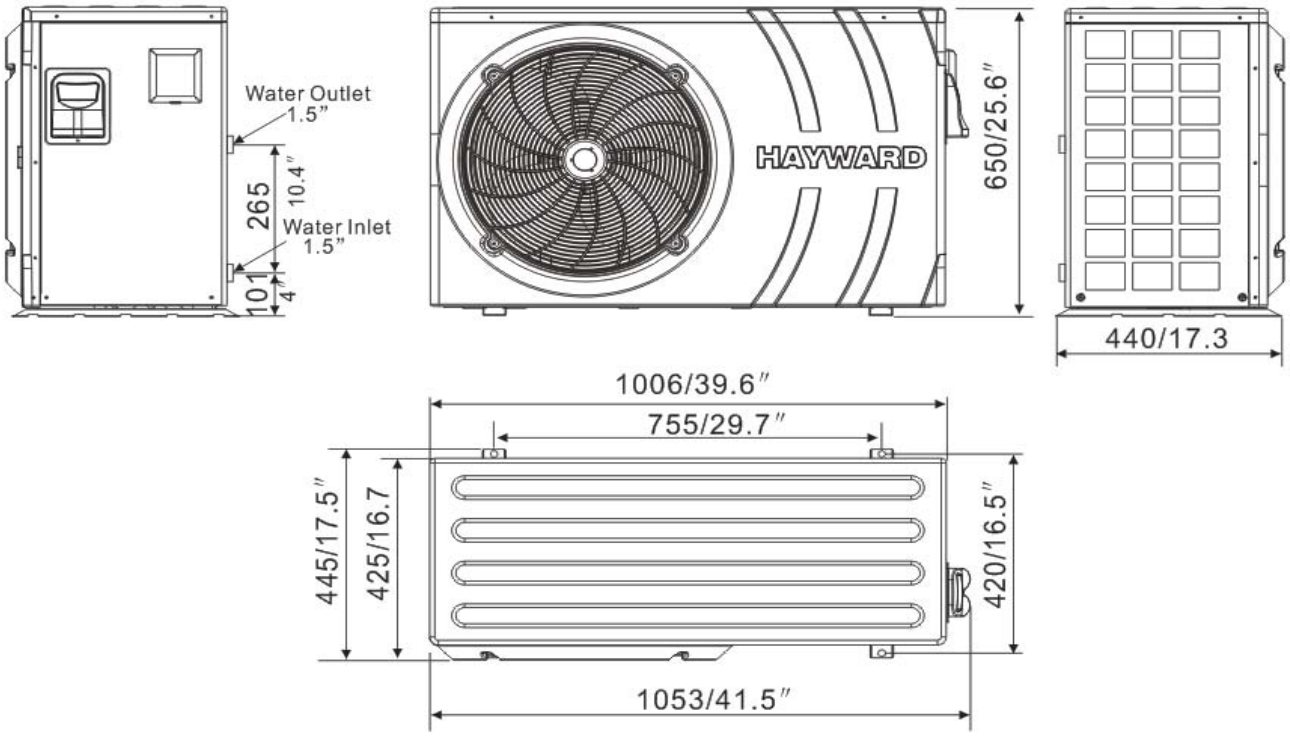
Unit	Model	HP50A/HP50HA
Heating Capacity	kW	14.7
	BTU/h	50,000
Heating Power Input	kW	2.68
Running Current	A	12
Power Supply	V/Hz	208-230V~/60Hz
Compressor Quantity		1
Compressor(s)		Rotary
Fan Quantity		1
Fan Power Input	W	120
Fan Rotate Speed	RPM	850
Fan Direction		Horizontal
Noise (at 1 meter)	dB(A)	54
Water Connection	inch	1.5
Water Flow Volume Imperial/US	m^3/h/gpm	4.5 / 20
Water Pressure Drop (max)	kPa/psi	10 / 1.5
Unit Net Dimensions (L/W/H)	mm/in	1053x420x650 / 41.5x16.5x25.6
Unit Shipping Dimensions (L/W/H)	mm	1110x470x670 / 43.7x18.5x26.4
Net Weight/Shipping Weight	kg/lbs	58 / 128

Heating: Ambient temp (DB/WB): 75°F (24°C) / 66°F (19°C)
Water temp (in/out): 79°F (26°C) / 82°F (28°C)

2. SPECIFICATIONS

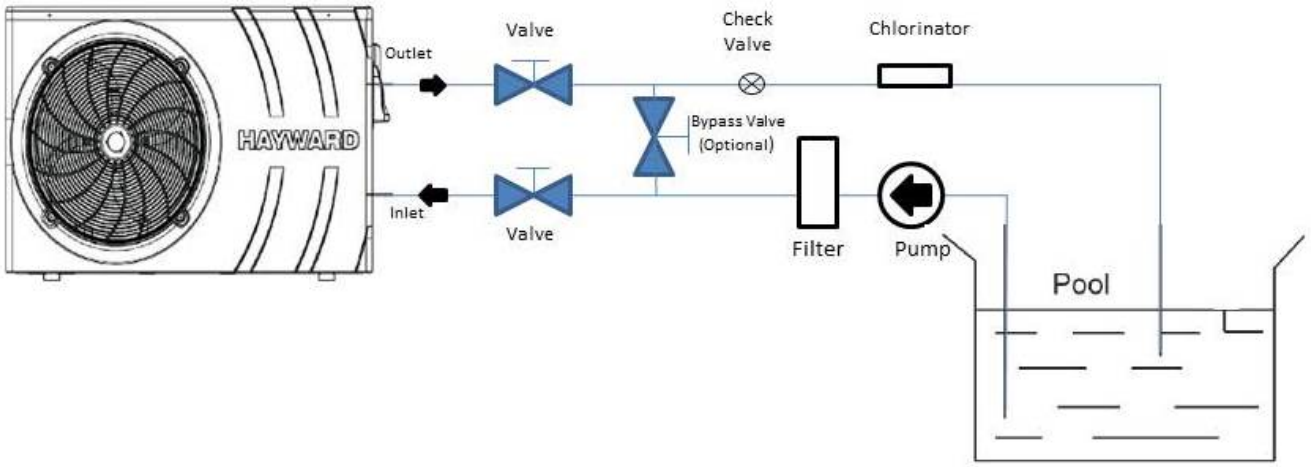
2.2 Dimensions (mm/inches) for the Swimming Pool Heat Pump Unit

Model: HP50A/HP50HA



3. INSTALLATION AND CONNECTION

3.1 Installation Illustration



Installation items:

The factory only provides the heat pump unit; the other items in the illustration are necessary spare parts for the water system, provided by users or the installer.

Attention:

Please follow these steps when using for the first time

1. Open valve and charge water
2. Make sure that the pump and the water-in pipe have been filled with water
3. Close the valve and start the unit

ATTN: It is necessary that the water-in pipe inlet be higher than the pool surface.

Installation must be performed in accordance with the requirements of NEC and CEC by authorized personnel only.

3. INSTALLATION AND CONNECTION

3.2 Swimming Pool Heat Pumps: Location

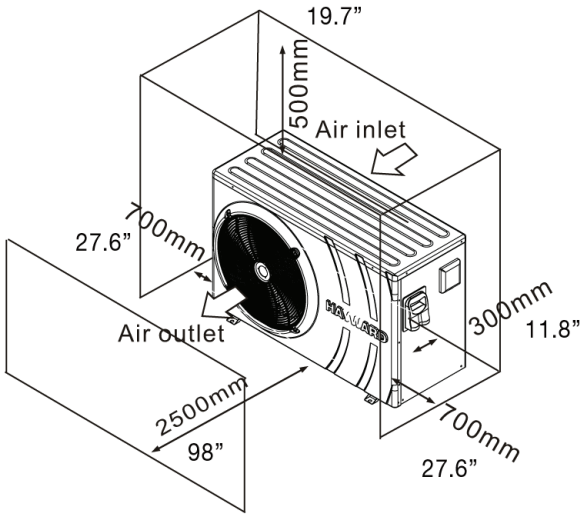
The unit will perform well in any outdoor location provided that the following three factors are present:

1. Fresh Air - 2. Electricity - 3. Pool filter piping

The unit may be installed virtually anywhere outdoors. For indoor pools consult the supplier.

DO NOT place the unit in an enclosed area with a limited air volume, where the units discharge air will be re-circulated.

DO NOT place the unit next to shrubs which can block the air inlet. These locations deny the unit a continuous source of fresh air which reduces its efficiency and may prevent adequate heat delivery.



3.3 How Close To Your Pool?

Normally, the pool heat pump is installed within 24.6ft (7.5 metres) of the pool. The longer the distance from the pool, the greater the heat loss from the piping.

3. INSTALLATION AND CONNECTION

3.4 Swimming Pool Heat Pumps: Plumbing

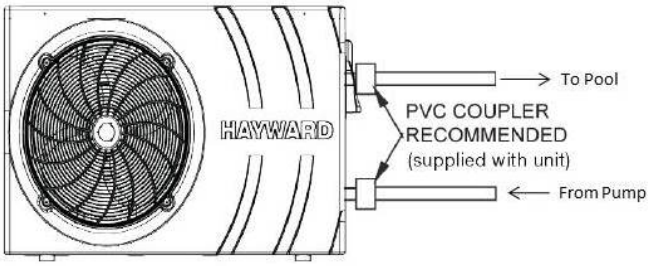
The titanium heat exchanger requires no special plumbing except bypass (please set the flow rate according to the nameplate). The water pressure drop is less than 1.5psi (10KPa) at maximum flow rate. Since there are no residual heat or flame temperatures, the unit does not need copper heat sink piping. PVC pipes can be run straight into the unit.

Location: connect the unit in the pool pump discharge (return) line downstream of all filter and pool pumps, and upstream of any chlorinators, ozonators or chemical pumps. Install the rubber feet onto the bottom of the unit.

*You will need to use 1½" male PVC adapter to connect to the heat pump.

Consider adding a quick coupler fitting at the unit inlet and outlet to allow easy draining of the unit for winterizing and to provide easier access should servicing be required (coupler supplied with unit).

Condensation: since the heat pump cools the air down about 4-5ºC water may condense on the fins of the horseshoe shaped evaporator. If the relative humidity is



Horizontal view

very high, this could be as much as several gallons/litres an hour. Verify the unit is level so that water will run down the fins into the basepan and drain out through the barbed plastic condensation drain fitted on the side of the basepan. This fitting is designed to accept 3/4" clear vinyl tubing and run to a suitable drain. It is easy to mistake the condensation for a water leak inside the unit.

NB: a quick 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 basepan, it is condensation. An EVEN QUICKER WAY IS TO TEST THE DRAIN WATER FOR CHLORINE - if there is no chlorine present, then it's condensation.

3. INSTALLATION AND CONNECTION

3.5 Swimming Pool Heat Pumps: Electrical Connection

NOTE: although the unit heat exchanger is electrically insulated from the rest of the unit, this simply prevents the flow of electricity to or from the pool water. Grounding the unit is still required to protect you against short circuits inside the unit.

NOTE: ensure that the available electrical Power supply and the network frequency are matched to the required operating current, taking account of the appliance's specific location and the current required to supply any other appliances connected to the same circuit.

1) See the wiring diagram chapter 6.2
2) Ensure that the unit is supplied with the specified voltage. The terminal block is located on the right side of the unit. There are three connections for the Power supply and two connections for the filtering pump control (Enslavement). The Power supply line must be properly matched with a motor supply type fuse or a main circuit breaker to protect the circuit against voltage surges (refer to the nameplate for the voltage);
3) Always shut down the main Power supply before opening the electrical control box.

3.6 Initial Start-Up

Start-up Procedure. After installation is completed, you should follow these steps:

1) Switch on the filtering pump; verify flow to and from the pool.
2) Check that all the water valves are open and that the water flows into the unit before switching on heating or cooling;
3) Ensure that the unit is connected correctly to the main Power supply (refer to the wiring diagram or chapter 6);
4) Rotate the fan by hand to ensure that it turns freely and that the turbine is properly tightened with the motor shaft;
5) Check that the condensate drainage hose is properly attached and free of any blockages;
6) Switch on the power supply to the unit, then press the On/Off key on the wire controller;
7) Ensure that no ALARM code is displayed when the unit is ON (see Trouble shooting guide);
8) Set the water flow using the by-pass valve (see chapter 3.1) to obtain a 2°C difference in water temperature. Note the valve position would change if flow changes such as when using a two-speed pump
9) After running a few minutes make sure the air leaving the unit is cooler (between 41°F - 50°F [5-10°C])
10) With the unit operating turn the filter pump off. The unit should also turn off automatically;
11) Allow the unit and pool pump to run 24 hours per day until desired pool water temperature is reached. When the set water-inlet temperature is reached, the unit shuts off. The unit will now automatically restart (as long as your pool pump is running) when the pool temperature drops more than 2°C below set temperature.

Water Flow Switch - the unit is equipped with a flow switch that turns it on when the pool pump is running and shuts it off when the pump shuts off. This switch is the same type used in all gas pool heaters and is factory adjusted for normal pool installations. If the pool water level is more than a few feet above or below the thermostat knob of the unit, your dealer may need to adjust it at initial start-up.

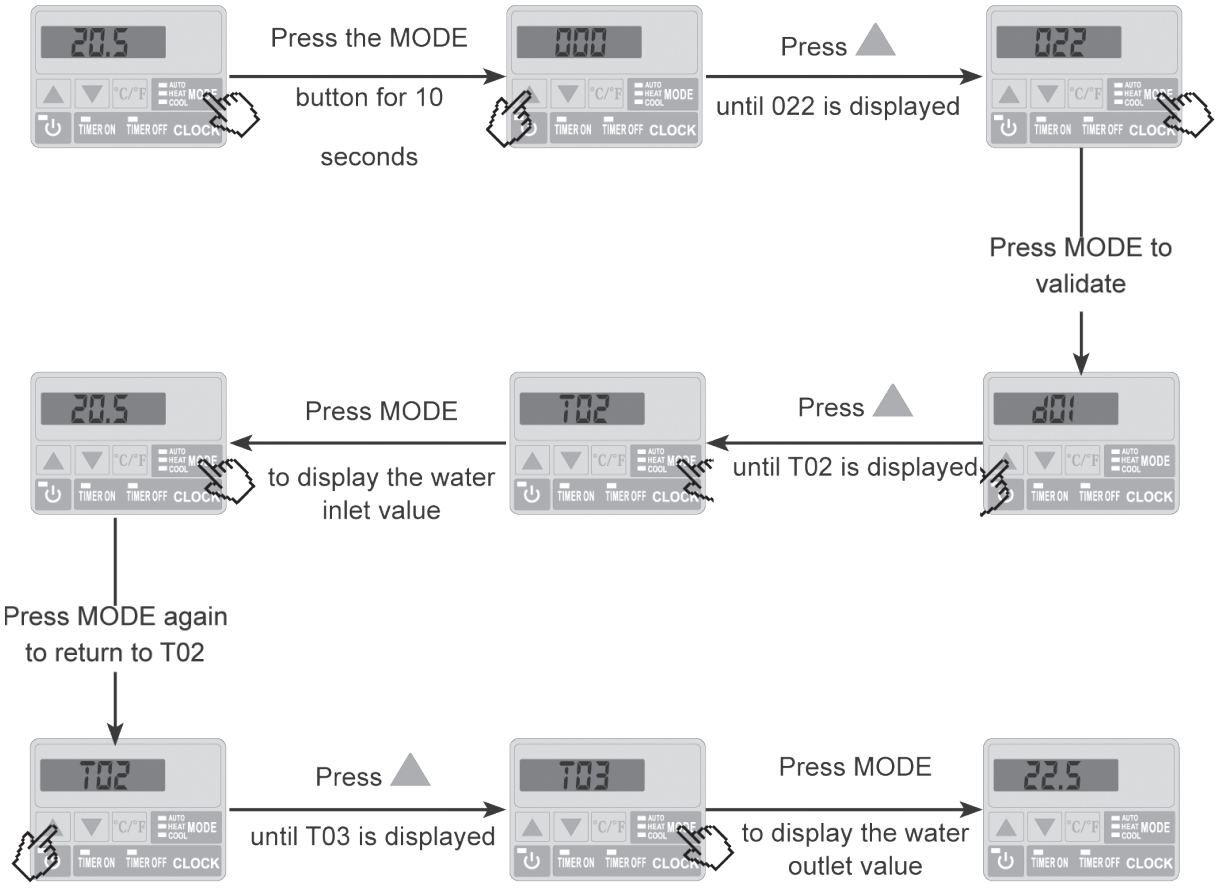
Time Delay - the unit is equipped with a 3 minute built-in solid state restart delay to protect control circuit components and to eliminate restart cycling and contactor chatter. This time delay will automatically restart the unit approximately 3 minutes after each control circuit interruption. Even a brief power interruption will activate the 3 minute restart delay and prevent the unit from starting until the 3 minute countdown is completed. Power interruptions during the delay period will have no effect on the 3 minute countdown.

3. INSTALLATION AND CONNECTION

3.7 Water Flow Setting

While the heat pump is running and the water inlet and outlet valves are open, adjust the by-pass valve to obtain a difference of 2ºC between the water inflow and outflow temperatures (see Functional Diagram Section 3.1). You can check the setting by viewing the inflow (T02)/outflow (T03) temperatures directly on the control panel by following the procedure below.

Then adjust the by-pass to obtain a difference of 2ºC between T03 and T02



(T03-T02 = ΔT = 2).

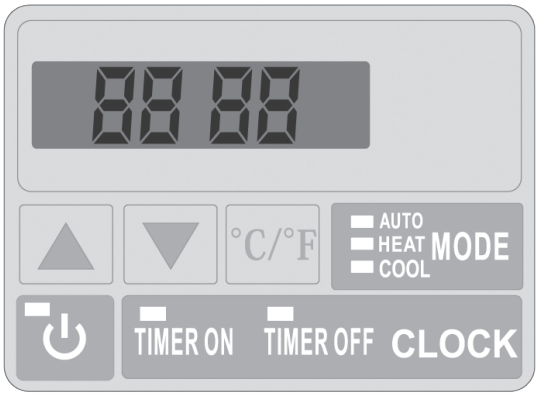
Press ⏻ twice to exit the menu

Note: Opening the by-pass valve creates a weaker flow which results in an increased ΔT.
Closing the by-pass valve creates a stronger flow which results in a decreased ΔT.

4. USER INTERFACE

4.1 Overview

The heat pump is fitted with an electronic control panel, electronically connected and pre-set at the factory to heating mode.



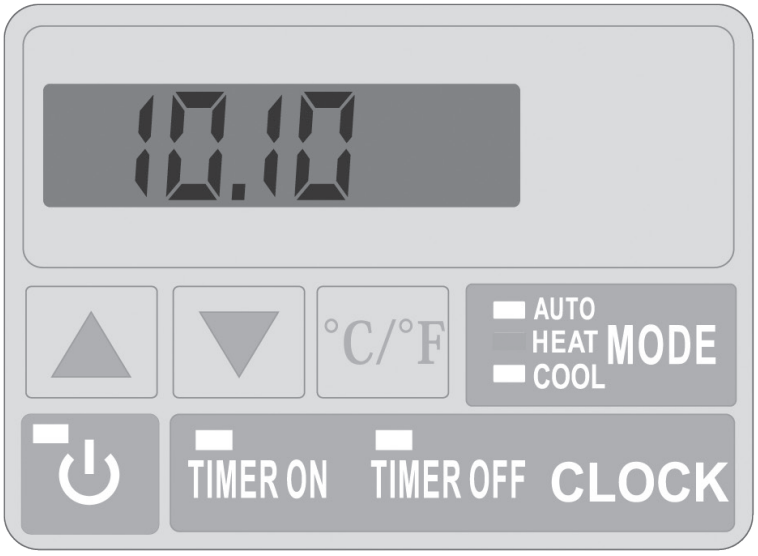
Key

COOL	Cooling Mode symbol
HEAT	Heating Mode symbol
AUTO	Automatic mode
CLOCK	Clock and Timer settings
MODE	Selection and settings button
	On/Off and Return/Validation button
	Scroll down
	Scroll up
TIMER ON	On time setting
TIMER OFF	Off time setting

4. USER INTERFACE (continued)

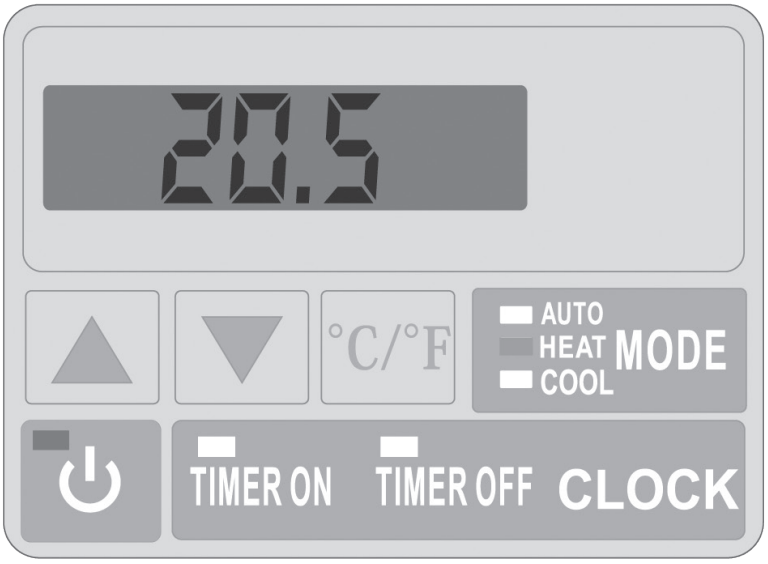
OFF Mode

When the heat pump is on standby (OFF Mode), the time and operating mode are displayed on the control screen.



ON Mode

When the heat pump is running or adjusting (ON Mode), the red light on the ON button is lit and the water inlet temperature is displayed on the screen.



4. USER INTERFACE (continued)

4.2 Setting the Clock

The clock can be set in ON or OFF mode. Press CLOCK once and the display flashes then press CLOCK again and the hours flash. Set the hour using the arrows ▲ or ▼ then press CLOCK again to select minutes. Set the minutes using the arrows ▲ or ▼. Press CLOCK again to confirm. The display returns to its previous status.

Note: Settings are saved by pressing the CLOCK button or are saved automatically if no button is pressed after 5 seconds.

4.3 Setting the Timer Function

This function needs to be set if you want to run your heat pump for a shorter period than the one set by the filtration clock. You can therefore program a delayed start and an early shutdown or simply stop a particular period from running (e.g. the night).

Start Programme (Timer ON) / Start

1) Press Timer ON, the hour flashes.

2) Press Timer ON to set the hour using the buttons ▲ ▼.

3) Press Timer ON to set the minutes using the buttons ▲ ▼.

Settings are saved by pressing the Timer ON button or are saved automatically if no button is pressed after 5 seconds.
A green light indicates that the timer is on.

Stop programme (Timer OFF)/Stop

1) Press Timer OFF, the hour flashes.

2) Press Timer OFF to set the hour using the buttons ▲ ▼.

3) Press Timer OFF to set the minutes using the buttons ▲ ▼.

Settings are saved by pressing the Timer OFF button or are saved automatically if no button is pressed after 5 seconds.
A red light indicates that the timer is on.

Turning off Timer settings (ON and OFF Timer)/Off and On

1) Press Timer ON, Timer ON flashes

2) Press  to delete the program

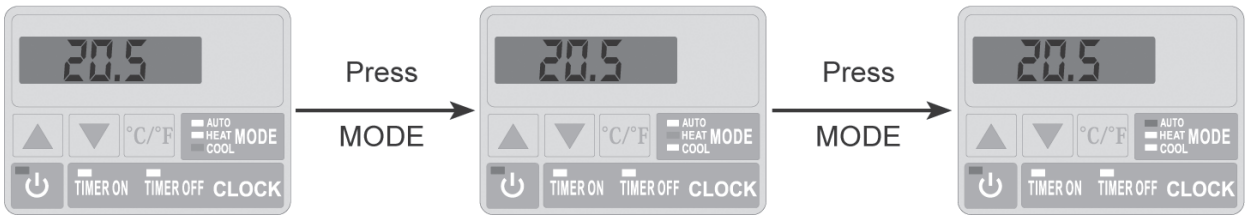
3) Press Timer OFF, Timer OFF flashes

4) Press  to delete the program

4.4 Choice of Operating Mode: Heating, Cooling or Automatic

In "OFF" or "ON" Mode

Press the MODE button to switch between cooling mode (green light), heating mode (orange light) and automatic mode (red light).



4. USER INTERFACE (continued)

4.5 Settings and viewing the set point (Desired water temperature)

In "OFF" and "ON" Mode

Press the buttons ▲ or ▼ to set the desired set point. Settings are made to an accuracy of 0.5°C

Do not heat pool water in excess of 104°F (40°C). A temperature of 100°F (38°C) is considered safe for a healthy adult. Hotter water increases the risk of hyperthermia. Special caution is suggested for younger children.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.

Note: Whether on or off, all you need to do is press the ▲ or ▼ button to view or change the set point.

4.6 Locking and unlocking the touch screen

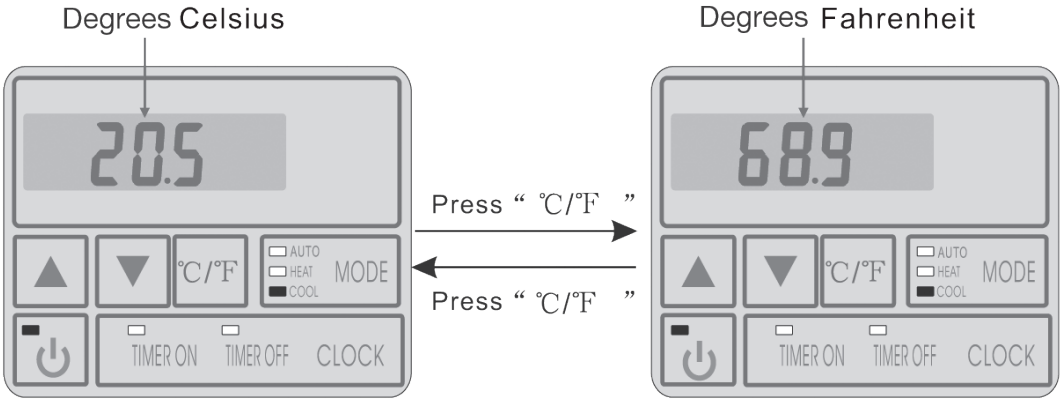
Press the On/Off button for 5 seconds until it beeps. The buttons become inactive.

To unlock, press for 5 seconds until it beeps.

The buttons become active again.

4.7 Temperature Display Change

When the unit is on, please press the button ℃/℉ to choose Celsius between or Fahrenheit display



5. MAINTENANCE AND INSPECTION

5.1 Maintenance

- Check the water supply device and the release often. You should avoid the condition of no water or air entering into the system as this will influence the unit's performance and reliability. You should clear the pool/spa filter regularly to avoid damage to the unit as a result of a clogged filter.
- The area around the unit should be dry, clean and well ventilated. Clean the side heating exchanger regularly to maintain good heat exchange and conserve energy. Do not pressure wash or use undue force in cleaning as this may damage fins and reduce efficiency and capacity of heat pump.
- The operation pressure of the refrigerant system should only be serviced by a certified technician.
- Check the power supply and cable connection often. Should the unit begin to operate abnormally, switch it off and contact your qualified technician.
- Discharge all water in the water pump and water system so that freezing of the water-inlet the pump or water system does not occur. You should discharge the water at the bottom of the water pump if the unit will not be used for an extended period of time. You should check the unit thoroughly and fill the system with water fully before using it for the first time after a prolonged period of no usage.
- Installation must be performed in accordance with the NEC/CEC by authorized person only.

5.2 Troubleshooting Guide

Malfunction	LCD Controller	Reason	Resolution
Water inlet temp. Sensor failure	P01	The sensor is open or short circuit	Check or change the sensor
Water outlet temp. Sensor failure	P02	The sensor is open or short circuit	Check or change the sensor
Coil sensor failure	P05	The sensor is open or short circuit	Check or change the sensor
Ambient sensor failure	P04	The sensor is open or short circuit	Check or change the sensor
Temp. differential between water-in and water-out is too large	E06	Water flow volume not enough,water pressure difference is too low	Check the water flow volume, or system obstruction.
Anti freezing under cooling mode	E07	Outlet water is too low	Check the water flow volume or outlet water temp. sensor
The first class freezing protection in winter	E19	Ambient or inlet water temp. is too low	
The second class freezing protection in winter	E29	Ambient or inlet water temp. is too lower	
High pressure protect	E01	Gas System pressure is too high	Check through the high pressure switch and the gas system pressure to judge whether the gas loop is blocked or the freon is suitable
Low pressure protect	E02	Gas System pressure is too low	Check through the low pressure switch and the gas system pressure to judge whether there is leaking or the freon is not enough;
Flow switch failure	E03	No water/little water in water system.	Check the water flowvolume, water pump and flowswitch is failure ornot
3times water-in and water-out temp.differece protectionin 30 minutes	E06	Water flow rate not enough	Check the water flow rate, or water system is jammed or not
Defrosting	Defrost Code Display		
Communication failure	E08	LED controller and The PCB connection failure	Check the wire connection

5. MAINTENANCE AND INSPECTION

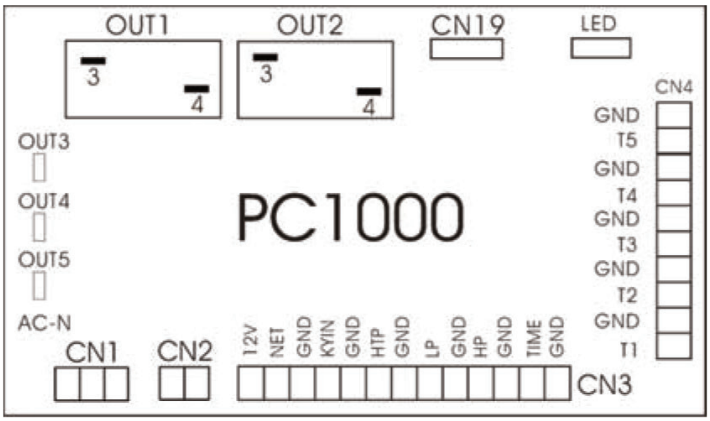
5.3 Winterization

- Switch the heat pump to “OFF” Mode.
- Turn off the power supply to the heat pump.
- Drain the coil to avoid any risk of deterioration. (High risk of freezing).
- Close the by-pass valve and unscrew the inlet/outlet union connections.
- Drain as much of the residual stagnant water as possible from the coil
- Close the water inlet and outlet on the heat pump to stop foreign bodies entering.
- Cover the heat pump with a winter cover (not supplied).

Any damage caused by poor winterization invalidates the warranty.

6. APPENDIX

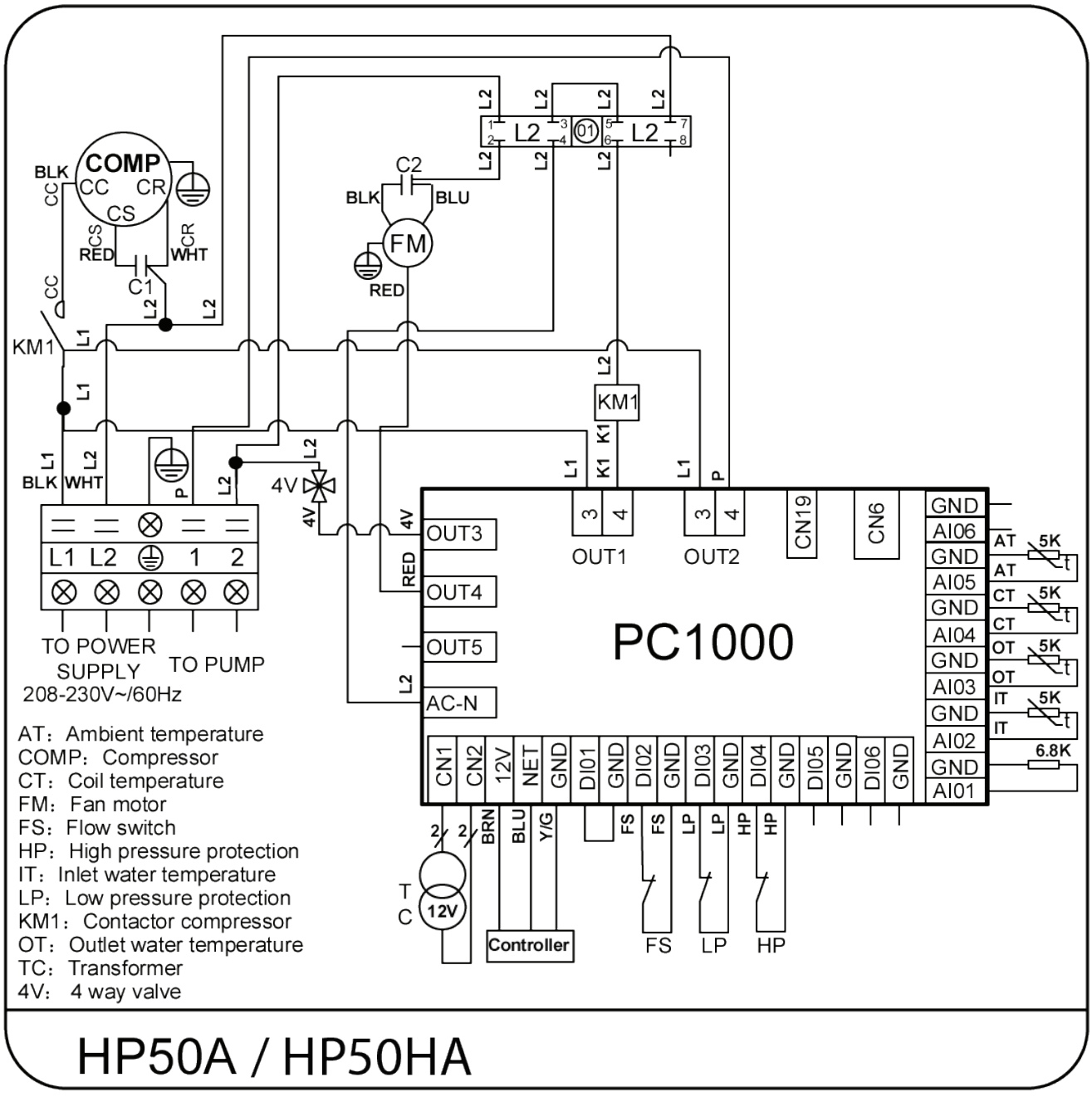
6.1 Connection of PCB Illustration



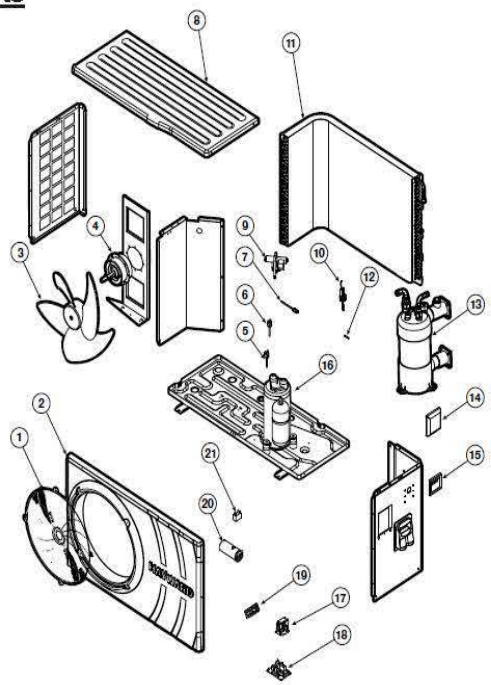
No.	symbol	meaning
1	OUT1	Compressor of system1 (220-230VAC)
2	OUT2	Water pump (220-230VAC)
3	OUT3	4way valve (220-230VAC)
4	OUT4	High speed of fan motor (220-230VAC)
5	OUT5	Low speed of fan motor (220-230VAC)
6	AC-N	Neutral wire
7	NET GND 12V	Wire controller
8	KYIN	On/Off Switch(input)(no use)
9	HTP GND	Flow switch (input)(normal close)
10	LP GND	Low pressure protect
11	HP GND	High pressure protect
12	TIME GND	No use
13	T1 GND	Suction temp.(input)
14	T2 GND	Water in temp.(input)
15	T3 GND	Water out temp.(input)
16	T4 GND	Temp. Of coil (input)
17	T5 GND	Ambient temp.(input)

6. APPENDIX

6.2 Wiring Diagram - HP50A/HP50HA



Replacement Parts



Ref #	Part #	Description
1	HPX20000-220188	Fan Guard
2	HPX32012-220044	Front Panel Cover
3	HPX3500-2701	Fan Blade
4	HPX20000-330124	Fan Motor
5	HPX2000-3603	Low Pressure Switch
6	HPX2001-3605	High Pressure Switch
7	HPX20000-140153	Needle Valve
8	HPX32012-220045	Top Panel Cover
9	HPX2001-1418	4 Way Valve
10	HPX20000-360005	Water Pressure Switch
11	HPX32012-120031	Evaporator
12	HPX2000-3242	Temperature Sensor
13	HPX32012-120014	Titanium Tube Heat Exchanger
14	HPX2000-2111	Water Proof Cover for Display
15	HPX95005-310188	LCD Control Display
16	HPX20000-110041	Compressor
17	HPX20000-360006	Contactor
18	HPXMCB50	Main Control Board
19	HPX2001-3907	Wiring Terminal
20	HPX2000-3505	Compressor Capacitor
21	HPX20000-350012	Fan Capacitor