SWIMMING POOL HEAT PUMP UNIT

Installation & Instruction Manual

Model HP50A
HP85A

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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 includes all the necessary information about installation, debugging, discharging 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, debugging, 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 centre personnel or an authorised dealer (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 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 comprises an efficient rotary compressor and a low noise fan motor, which guarantees its quiet operation.

3. Electronic control board

The unit is controlled by a 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

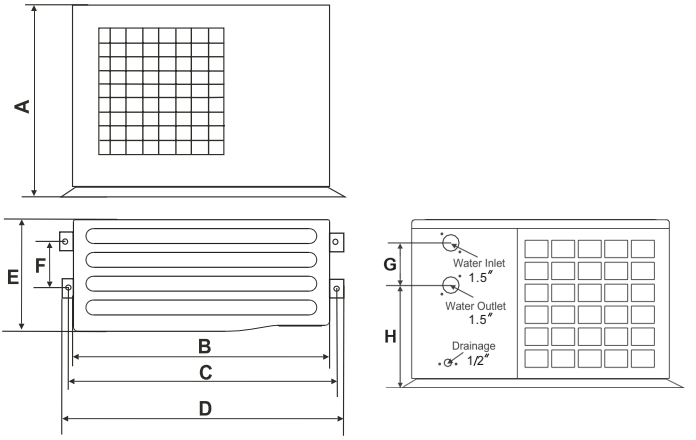
***** REFRIGERANT: R410A**

Unit	Model	HP50A	HP85A
Heating Capacity	kW BTU/h	14.7 50,000	24.9 85,000
Heating Power Input	kW	2.6	4.9
Running Current	A	11.8	23.3
Compressor Rating Load	A	11.3	22.3
Compressor Locked Rotor Load	A	60	139
Minimum Circuit Ampactiy	A	20	34
Max.Fuse	A	30	55
Power Supply	V/Ph/Hz	208-230V~/60Hz	208-230V~/60Hz
Compressor Quantity		1	1
Compressor(s)		Rotary	Scroll
Fan Quantity		1	2
Fan Power Input	W	120	120
Fan Rotate Speed	RPM	850	850
Fan Direction		horizontal	horizontal
Noise (at 1 meter)	dB(A)	54	58
Water Connection	inch	1.5	1.5
Water Flow Volume Imperial/US	GPM	20	33
Water Pressure Drop(max)	PSI	1.5	1.74
Unit Net Dimensions(L/W/H)	inch	40.8/16.4/25.6	41.2/17.9/49.2
Unit Shipping Dimensions(L/W/H)	inch	44.5/18.5/27.2	44.5/18.5/51.2
Net Weight/Shipping Weight	lb.	143/154	276/298

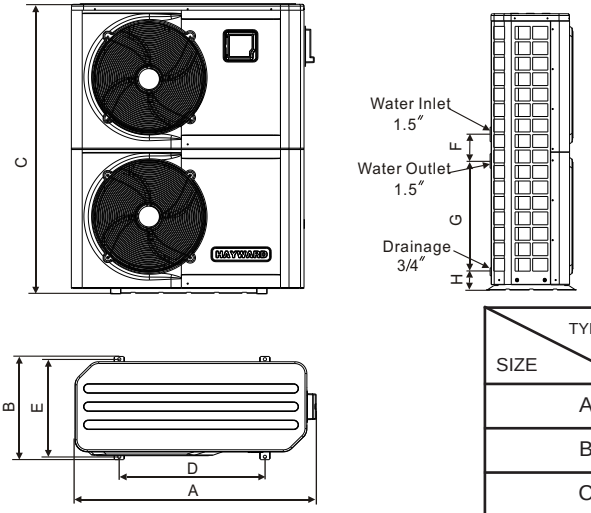
2. SPECIFICATIONS

2.2 Dimensions for the Swimming Pool Heat Pump Unit

Model:HP50A



Model:HP85A

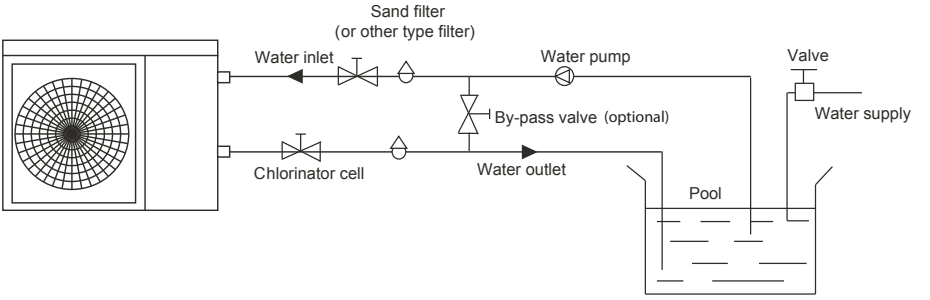


Unit : mm / inch

TYPE / SIZE	HP50A	HP85A
A	650/25.6	1045/41.2
B	1000/39.4	455/17.9
C	1015/40.0	1250/49.2
D	1035/40.8	630/24.8
E	415/16.3	430/17.0
F	220/8.7	120/4.8
G	150/5.9	500/19.7
H	338/13.3	82/3.3

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

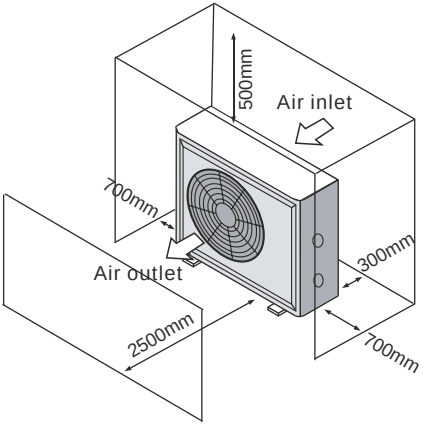
The unit will perform well in any outdoor location provided that the following three factors are present:

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

The unit may be installed virtually anywhere outdoors. For indoor pools consult the supplier. Unlike a gas heater, it has no draft or pilot light problem in a windy area.

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 7.5 metres of the pool. The longer the distance from the pool, the greater the heat loss from the piping. For the most part, the piping is buried. Therefore, the heat loss is minimal for runs of up to15 metres (15 metres to and from the pump = 30 metres total), unless the ground is wet or the water table is high. A very rough estimate of heat loss per 30 metres is 0.6 Kw-hour (2000BTU) for every 5°C difference in temperature between the pool water and the ground surrounding the pipe, which translates to 3% to 5% increase in operating time for the water to reach the desired temperature.

3. INSTALLATION AND CONNECTION

3.4 Swimming Pool Heat Pumps: Plumbing

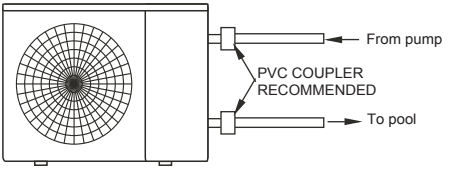
The Swimming Pool Heat Pumps exclusive rated flow titanium heat exchanger requires no special plumbing except bypass (please set the flow rate according to the nameplate). The water pressure drop is less than 1.5psi (10KPa) at maximum flow rate. Since there are no residual heat or flame temperatures, 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.

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

Condensation: since the heat pump cools the air down about 4-5°C, 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 litres an hour. The 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 which can be pushed on by hand 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 6.3;
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) as described for each different model (see the control panel or chapter 2) to obtain a 2°C difference in water temperature.;
9) After running a few minutes make sure the air leaving the unit is cooler (between 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.

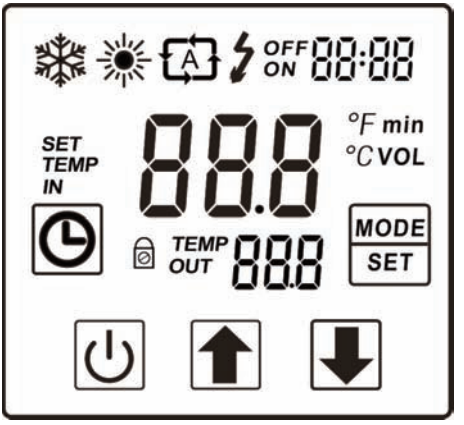
Water Flow Switch - the unit is equipped with a flow switch that turns it on when the pool pump is running and shuts it off when the pump shuts off. This switch is the same type used in all gas pool heaters and is factory adjusted for normal pool installations. If the pool water level is more than a 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.

4. USAGE AND OPERATION

4.1 Function of the LCD controller

User Interface and Usage as the following:



Directions

Refrigeration symbols,Displayed when refrigeration (ON/OFF No LIMIT)

Heating Symbols,Displayed when heating (ON/OFF NO LIMIT)

Automatic mode symbol(Temporarily useless)

Clock, timer function button

MODE SET Tool button

ON/OFF key、cancel key(cancel the current operation, Back to the previous step of the operation)

Down key

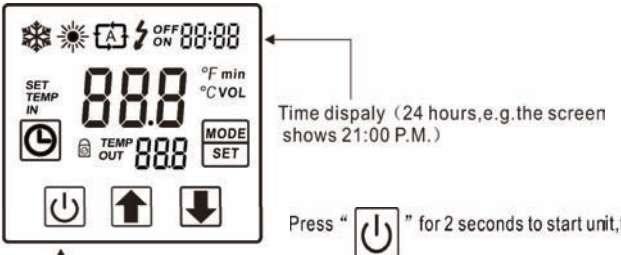
Up key

Closing screen if no action in two minutes

4.2 Usage of the controller

1) Electrify

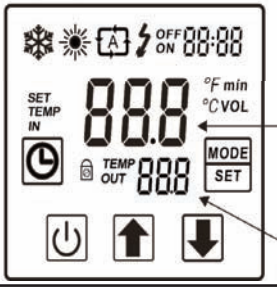
After checking everything is okay, electrify and enter into standby state, with the screen showing as the following:



Time dispaly（24 hours,e.g.the screen shows 21:00 P.M.）

Press " " for 2 seconds to start unit,the screen showing as the following:

Switch Key

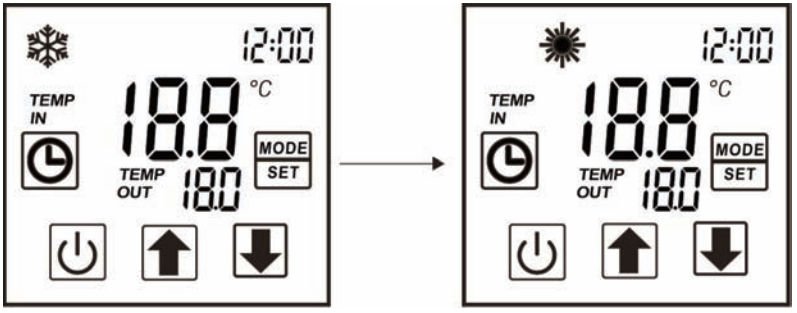


Inlet of the tank temperature

Outlet of the tank temperature

4. USAGE AND OPERATION

2) Switch mode
on the main screen, a long press on " MODE SET " for 2S, the unit switches between cooling or heating mode



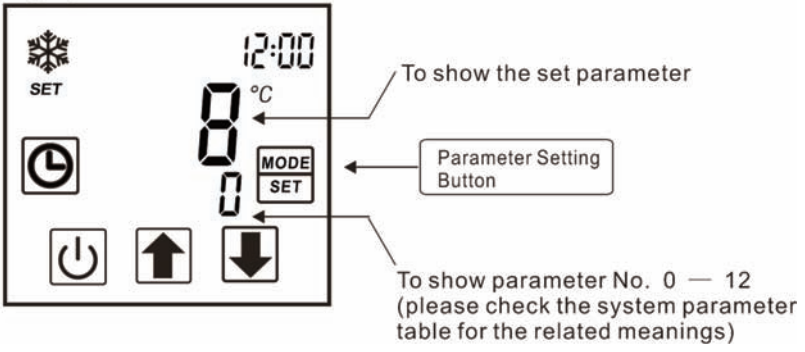
3)Parameter setting
1. In Cooling mode,on the main screen,pressing" ↑ "or" ↓ " can directly change the setting value of current parameter 00.

2. In Heating mode,on the main screen,pressing" ↑ "or" ↓ " can directly change the setting value of current parameter 01.

3.Single click" MODE SET "to enter Parameter Interface, press" ↑ "or" ↓ "can select diverse paraments,single click the tool button again, immediately modify the parameters.00 and 01 parameters can be modified in the boot state.Other parameters that non-factory commissioning officers can not enter. De-bug interface with

long-term key" MODE SET "10s,the remote control unit Auto-Jump factory debug interface.

In the interface,All parameters can be modified in the boot state.After re-power, Factory debugging interface will not be allowed to re-enter.



4. USAGE AND OPERATION

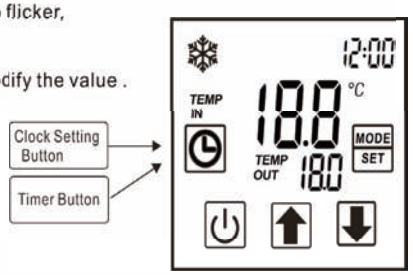
4) Set Clock

Single click " " , two numpads of the clock will flicker, single click " " again,

hours bit starts to flicker, this moment pressing " " or " " can modify the value;

single click " " once more, minutes bit starts to flicker,

this moment press " " or " " can modify the value .



5) Timer

single click " " , two keypads of the clock flicker,this moment pressing" " or "

can select timing switch settings.If ON and clock`s Hours and minutes-bit flicker together,then continous t

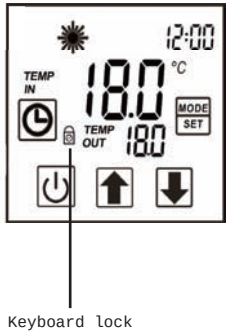
singly click " " to enter timer-power-set(Next steps mode is the same as clock set);If OFF and cloc

Hours and minutes-bit flicker together,then continous to singly click" " "enter timer-power-set.

6) KEYLOCK

a long press on " " for 5Seconds on the main screen, the keyboard can be locked,

displaying an Icon "🔒" .



4.3 Parameter table

Digit	meaning	Range	default	Adjust(yes/no)
R01	Return water temp. Setting(cooling mode)	/	27℃	Adjustable
R02	Return water temp. Setting(heating mode)	18-35	27℃	Adjustable
R03	Return water temp. Setting(auto mode)	/	27℃	Adjustable
T02	Inlet water temp.	/	True testing figure	
T03	Outlet water temp.	/	True testing figure	
T04	Pipe temp.	/	True testing figure	
T05	Ambient temp.	/	True testing figure	
T01	Evaporator temp.	/	True testing figure	

5. MAINTENANCE AND INSPECTION

5.1 Maintenance

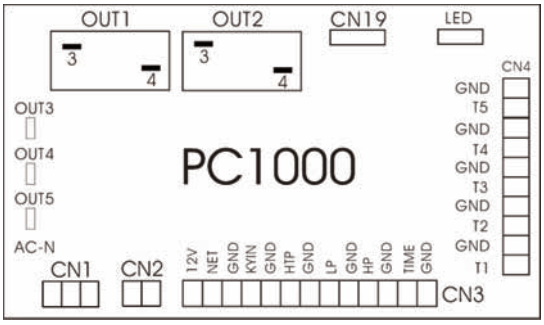
- Check the water supply device and the release often. You should avoid the condition of no water or air entering into the system as this will influence the unit's performance and reliability. You should clear the pool/spa filter regularly to avoid damage to the unit as a result of a clogged filter.
- 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.
- 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 Trouble Shooting 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 flow volume, 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

6. APPENDIX

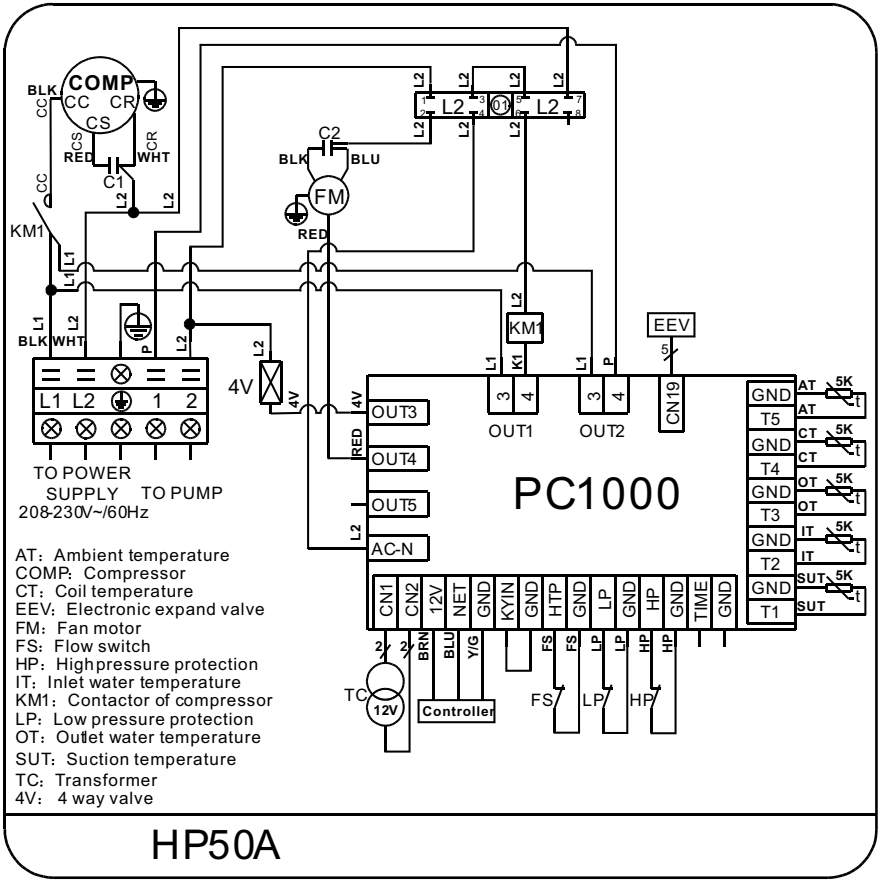
6.1 Connection of PCB Illustration



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)

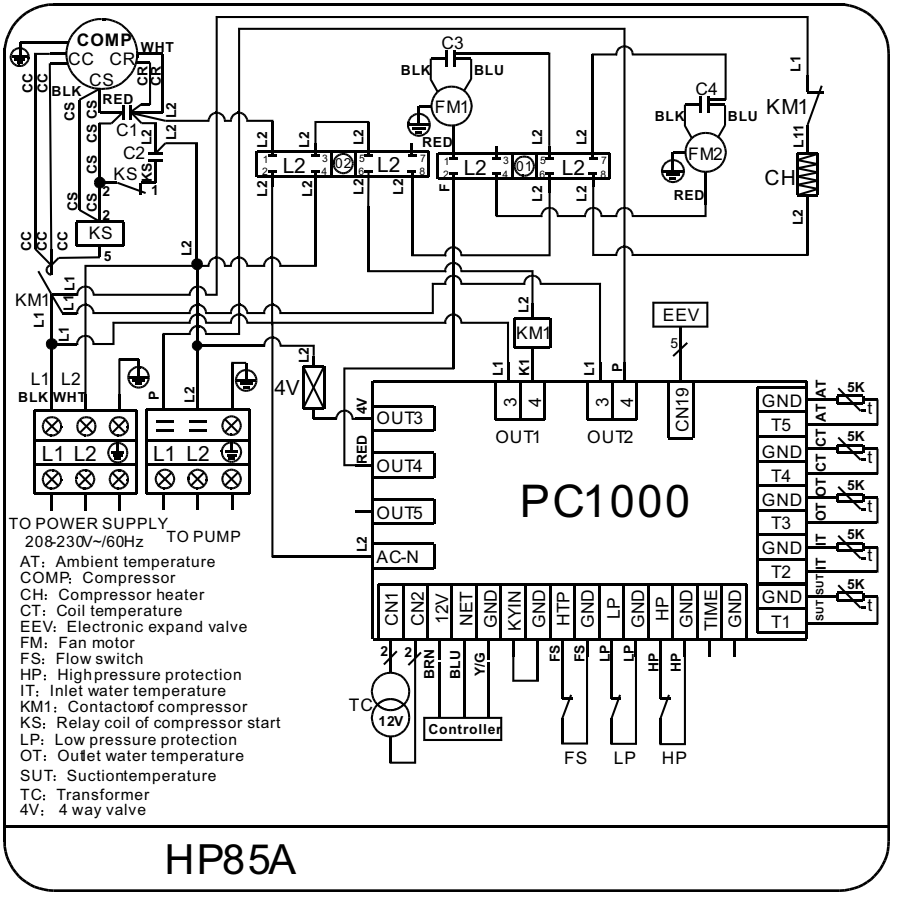
6. APPENDIX

6.2 Wiring Diagram



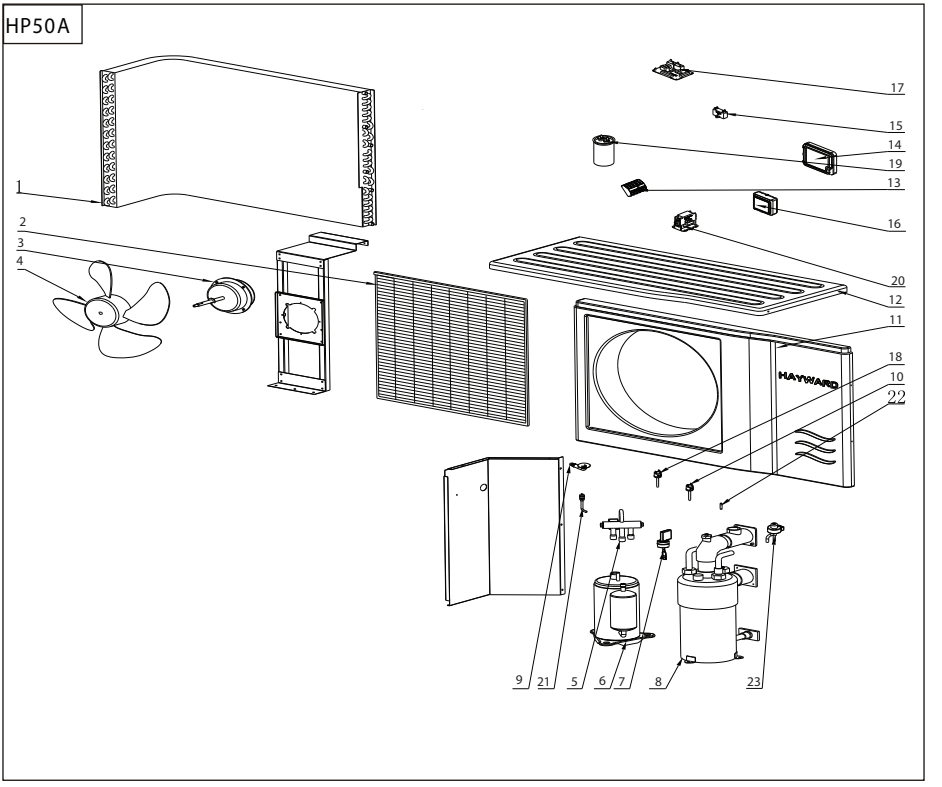
6. APPENDIX

6.2 Wiring Diagram



6. APPENDIX

6.3 Exploded view and spare parts



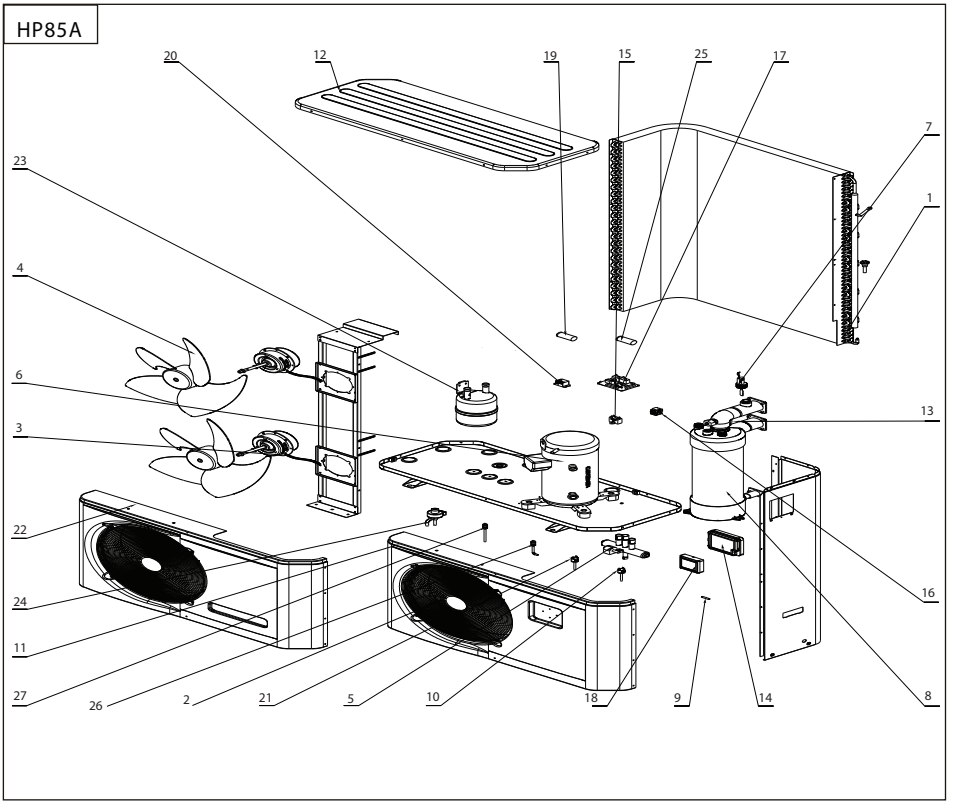
6. APPENDIX

6.5 Main Parts List & Spare Parts - HP50A

SN	Part Code	Part Name	Part Number
1	3407-1202	Evaporator	HPCxCND1930
2	3512-2213	Fan net	HPCxFPR1930
3	3404-3301	Fan motor	HPCxAFM1930
4	3500-2701	Axis blower fan	HPCxFAN1930
5	2004-1437	4 way valve	HPCxVAL1931
6	20000-110041	Compressor	HPCxCMP1931
7	20000-360005	Water flow switch	HPCxWFS1931
8	32012-120009	Titanium tube heat exchanger	HPCxHEX1931
9	2001-1351	Drain plug	HPCxPLG1930
10	2001-3605	High pressure switch	HPCxHPS1931
11	32012-220002	Front panel	HPCxFPL1930
12	32012-220001	Cover	HPCxCOV1930
13	2001-3907	Terminal	HPCxTER1931
14	20000-220068	Water proof cover	HPCxMCB1930
15	2000-3501	Fan capacitor	HPCxCAP1930
16	95005-310152	LCD controller	HPCxWCL1931
17	35005-310031	Main control board	HPCxMCL1931
18	2000-3603	Low pressure switch	HPCxLPS1930
19	2000-3505	Compressor capacitor	HPCxCOM1930
20	20000-360006	AC contactor	HPCxCON1930
21	20000-140153	Needle valve	HPCxNVL1931
22	2000-3242	Sensor, water, air	HPCxTEM1930
23	2003-1402	Electronic expansion valve	HPX2000-1402

6. APPENDIX

6.3 Exploded view and spare parts



6. APPENDIX

6.4 Main Parts List and Spare Parts - HP85A

SN	Part Code	Part Name	Part Number
1	32018-120002	Evaporator	HPX32018-120002
2	32012-210080	Fan net	HPX32012-210080
3	3404-3301	Fan motor	HPCxAFM1930
4	3500-2701	Axis blower fan	HPCxFAN1930
5	2001-1491	4 way valve	HPCx2001-1491
6	20000-110039	Compressor	HPX20000-110039
7	20000-360005	Water flow switch	HPCxWFS1931
8	32018-120003	Titanium tube heat exchanger	HPX32018-120003
9	2001-1345	Drain plug	HPX2001-1345
10	2001-3605	High pressure switch	HPCxHPS1931
11	32018-220003	Upper front panel	HPX32018-220003
12	32008-220021	Cover	HPX32008-220021
13	2000-3242	Sensor, air & water	HPCxTEM1930
14	20000-220068	Waterproof cover	HPX20000-220068
15	2000-3501	Fan capacitor	HPCxCAP1930
16	20000-360007	AC Contactor	HPCx20000-36007
17	95005-310145	Main control board	HPCX95005-31145
18	95005-310152	LCD Controller	HPCX95005-310152
19	2000-3510	Compressor capacitor 60μF	HPCX2000-3510
20	20000-360035	Relay	HPCX2000-36035
21	2000-3603	Low pressure switch	HPCXLPS1930
22	32018-220004	Lower front panel	HPX32018-220004
23	2000-1440	Liquid separator	HPX2000-1440
24	20000-140177	Electronic expansion valve	HPX20000-140177
25	2000-3524	Compressor capacitor 98μF	HPCX2000-3524
26	20000-140150	High pressure needle valve	HPX20000-140150
27	20000-140153	Low pressure needle valve	HPCXNVL1931

6. Appendix

6.4 Warranty

HAYWARD® HEAT PUMP POOL HEATERS LIMITED WARRANTY

The HAYWARD heat pump pool heater is warranted to be free of defects in materials and workmanship for a period of one (1) year for parts and (1) one year for labor.
Warranty is applicable to the original location and owner only and is not transferable. The *compressor* component has a two (2) year limited warranty with parts and labor warranted the first two years and (1) year labor.
The *titanium tube* component of the heat exchanger has a five (5) year warranty. HAYWARD will not void this warranty due to improper pool chemistry.
This warranty is valid only if the product is installed according to the HAYWARD specifications.

This warranty does not include refrigerant or other expendable materials, or services such as inspection, maintenance, or unnecessary service calls due to erroneous operational reports, external valve position, or electrical service. It also does not include the repair of damage due to negligence, accident, freezing, or other conditions beyond the normal intended use of the unit. This warranty is void if the product is repaired or altered in any way by any persons or agencies other than those authorized by HAYWARD, and is in lieu of all other warranties, expressed or implied, written or oral. There are no implied warranties of merchantability or fitness for a particular purpose that apply to this product. This warranty applies only within Canada.

At its option, HAYWARD will replace or repair any HAYWARD part that proves defective if such parts are returned to our factory, freight collect, within the warranty period. It is agreed that such replacement or repair is the exclusive remedy available from HAYWARD. Unless authorized by HAYWARD and performed by a factory authorized service center, HAYWARD is not liable for any labor involved in the removal of defective parts or the installation of replacement parts. HAYWARD is not liable for damages of any sort whatsoever, including incidental and consequential damages. Parts returned and services performed under terms of this warranty must be approved by HAYWARD. All parts returned under terms of this warranty will be repaired or replaced and returned transportation charges prepaid, by best and most economical means.

Hayward Pool Products Canada, Inc.
2880 Plymouth Drive
Oakville, ON L6H 5R4

Retain this Warranty Certificate in a safe and convenient location for your records