



SWIMMING POOL HEAT PUMP UNIT

Installation & Instruction Manual

Models HP50A1
 HP70A1

CONTENTS

1. Preface	1
<hr/>	
2. Specifications	2
2.1 Performance Data of Swimming Pool Heat Pump Unit	2
2.2 Dimensions for Swimming Pool Heat Pump Unit	3
<hr/>	
3. Installation and Connection	5
3.1 Installation of System	5
3.2 Swimming Pool Heat Pumps: Location	6
3.3 How Close to your Pool?	6
3.4 Swimming Pool Heat Pumps: Plumbing	7
3.5 Swimming Pool Heat Pumps: Electrical Connection	8
3.6 Initial Start-Up of the Unit	8
3.7 Water Flow Setting	9
<hr/>	
4. User Interface	10
4.1 General presentation	10
4.2 Clock settings	12
4.3 Timer function settings	12
4.4 Operating mode selection	13
4.5 Setting and visualisation of the set point	14
<hr/>	
5. Maintenance and Inspection	15
5.1 Maintenance	15
5.2 Winterising	15
<hr/>	
6. Appendix	16
6.1 Connection of PCB: Illustration	16
6.2 Wiring Diagram	17
6.3 Exploded View and Spare Parts List	19

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

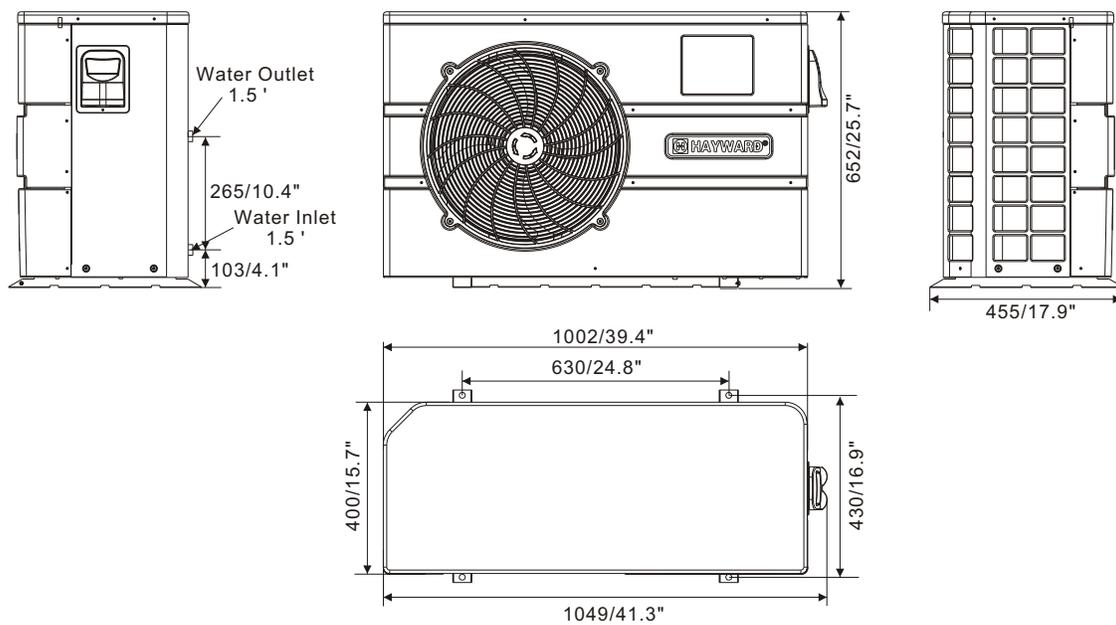
Unit	Model	HP50A1	HP70A1
Heating Capacity	kW	14.7	22.0
	BTU/h	50,000	75,000
Heating Power Input	kW	2.68	4.2
Running Current	A	12	19
Power Supply	V/Hz	208-230V~/60Hz	208-230V~/60Hz
Compressor Quantity		1	1
Compressor(s)		Rotary	Rotary
Fan Quantity		1	1
Fan Power Input	W	120	120
Fan Rotate Speed	RPM	850	850
Fan Direction		Horizontal	Horizontal
Noise (at 1 meter)	dB(A)	54	56
Water Connection	inch	1.5	1.5
Water Flow Volume Imperial/US	m ³ /h/gpm	4.5/20	6/26
Water Pressure Drop (max)	kPa/psi	10/1.5	12/1.5
Unit Net Dimensions (L/W/H)	mm/in	1049x400x652 / 41.3x15.7x25.7	1162x470x865 / 45.7x18.5x34
Unit Shipping Dimensions (L/W/H)	mm	1130x470x680 / 44.5x18.5x26.8	1220x490x880 / 48x19.3x34.6
Net Weight/Shipping Weight	kg	58/71	106/123

Heating: Ambient temp (DB/WB): 80°F (26.7°C) / 75.8°F (24.3°C)
 Water temp (in/out): 80°F (26.7°C) / 92°F (28°C)

2. SPECIFICATIONS

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

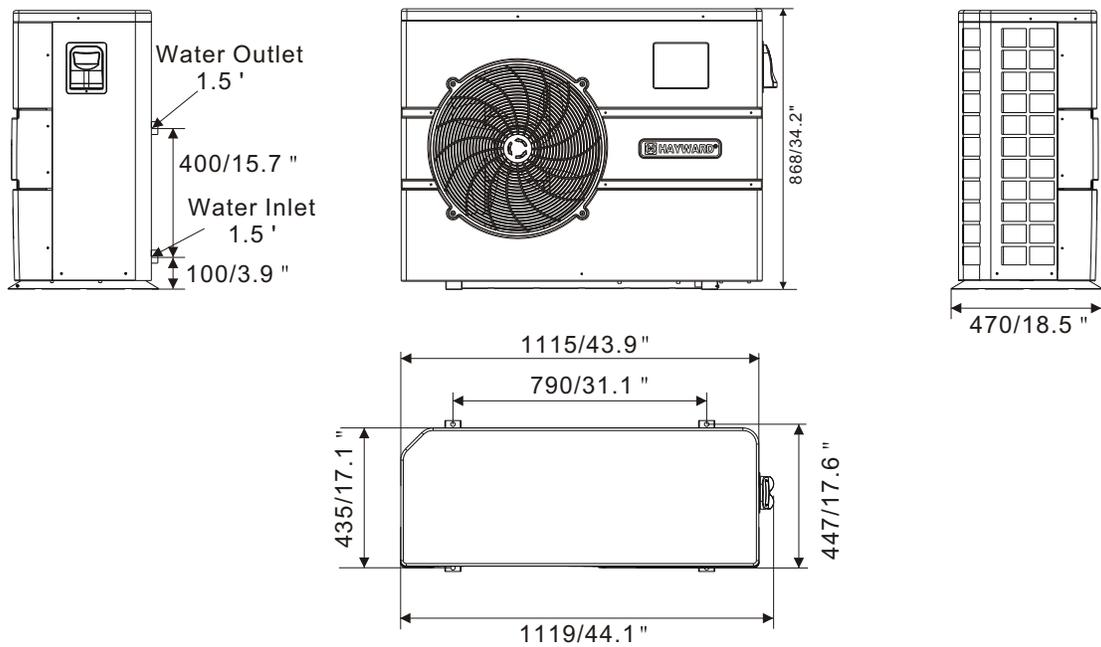
Model: HP50A1



2. SPECIFICATIONS

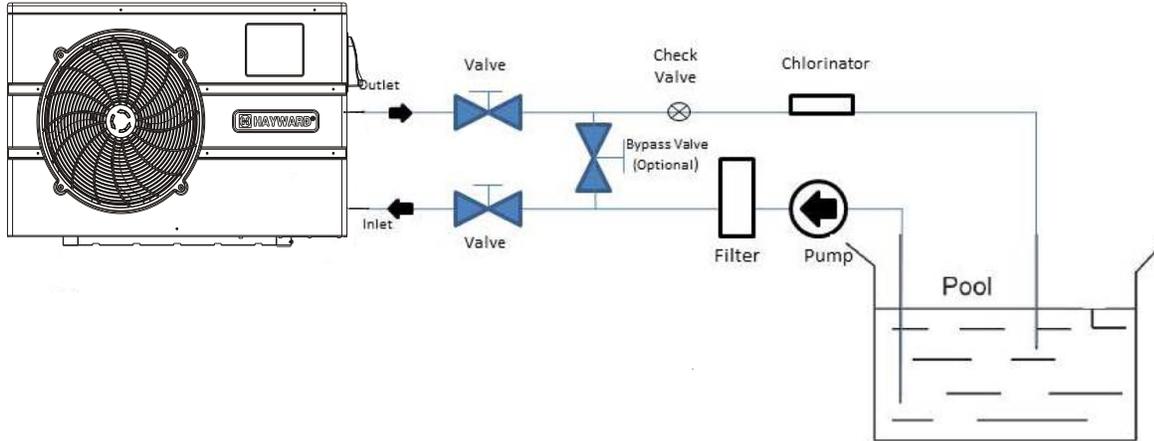
2.2 Dimensions (mm/inches) for the Swimming Pool Heat Pump Unit

Model: HP70A1



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

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

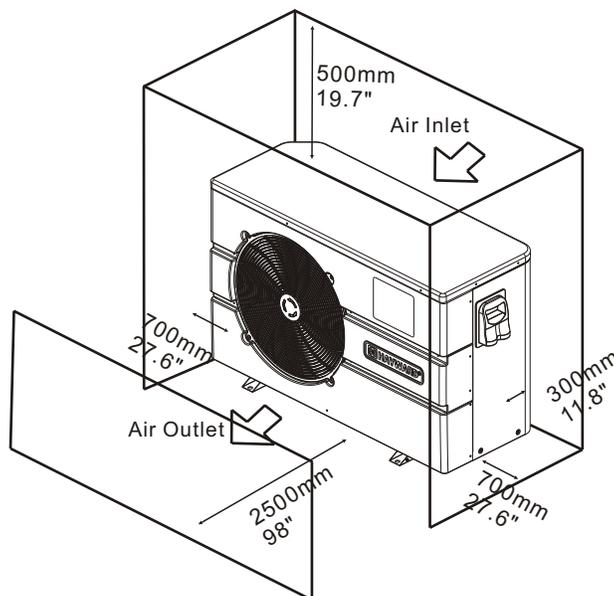
The unit will perform well in any outdoor location provided that the following three factors are present:

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

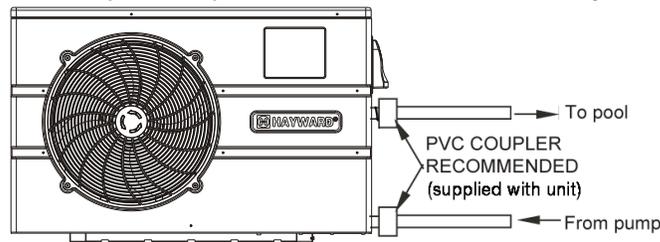
The titanium heat exchanger requires no special plumbing except bypass (please set the flow rate according to the nameplate). The water pressure drop is less than 1.5psi (10KPa) at maximum flow rate. Since there are no residual heat or flame temperatures, the unit does not need copper heat sink piping. 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 4-5°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 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 and two connections for the filtering pump control (208-230V only).

- 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.

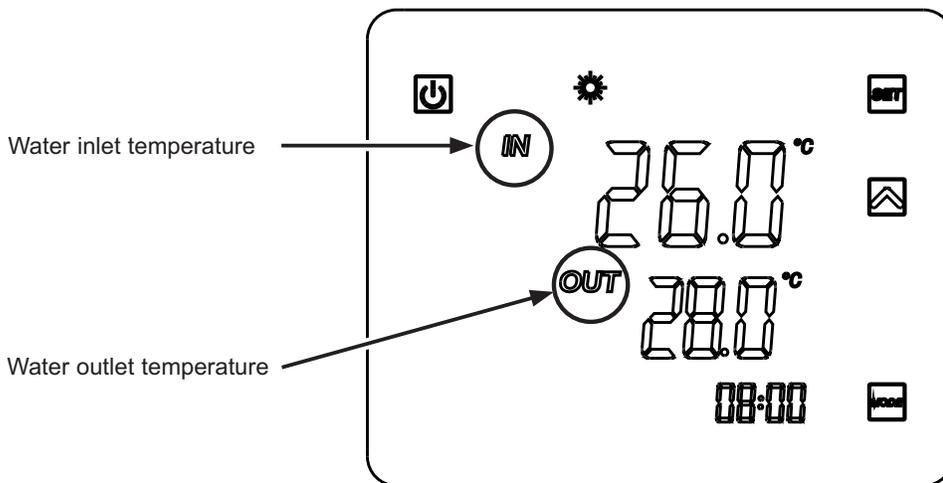
Water Flow Switch - the unit is equipped with a flow switch that turns it on when the pool pump is running and shuts it off when the pump shuts off. This switch is the same type used in all gas pool heaters and is factory adjusted for normal pool installations. If the pool water level is more than a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

With the water entry and exit valves being open, adjust the by-pass valve in order to obtain a difference of 2°C between the inflow and outflow temperature (see principle diagram § 3.1). You can verify the switch by seeing the entry/exit temperatures directly on the control panel.

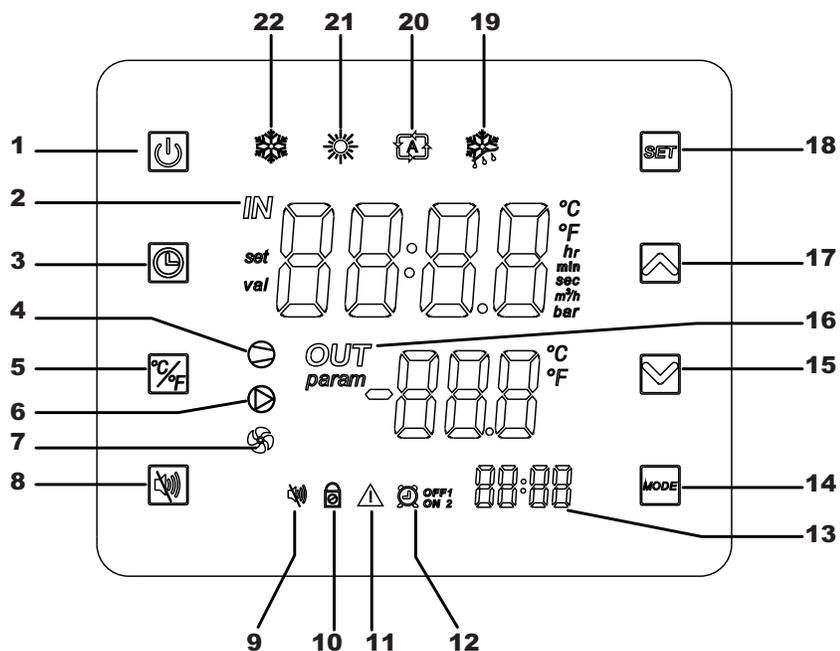


Note: Opening the by-pass valve creates a weaker flow, which leads to an increase in ΔT .
Closing the by-pass valve creates a stronger flow, which leads to a decrease in ΔT .

4. USER INTERFACE

4.1 General presentation

The heat pump is equipped with a digital control panel with a touch screen, electronically connected and pre-set at the factory in heating mode.



Legend

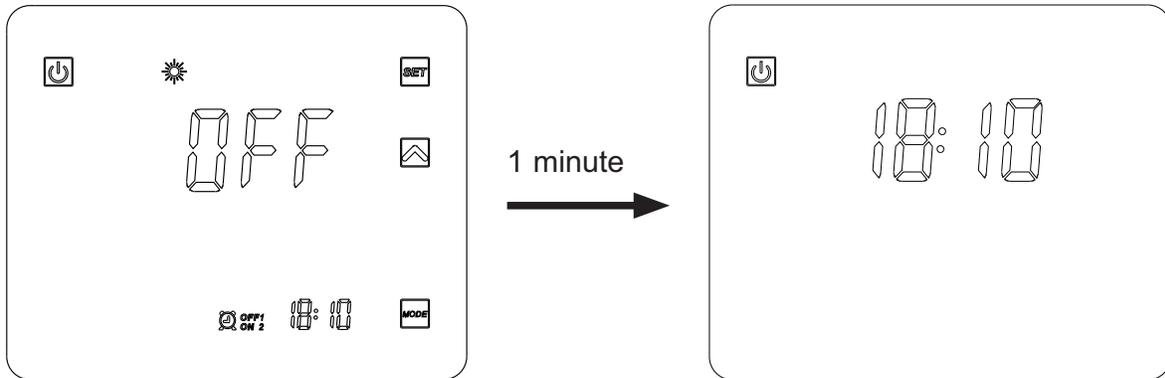
1		On/Off	12		Timers 1 and 2
2		Water inlet	13		Timers' time
3		Clock and timer settings	14		Mode selection
4		Compressor ON	15		Scroll down / Decrease
5		Conversion °C/°F	16		Water outlet
6		Dry contact OUT2	17		Scroll up / Increase
7		Fan ON	18		Save / settings
8		Silent mode (*)	19		Defrost mode
9		Silent mode indicator	20		Automatic mode
10		Locked screen	21		Heating mode
11		Alarm	22		Cooling mode

(*) Function not available on this model.

4. USER INTERFACE (continued)

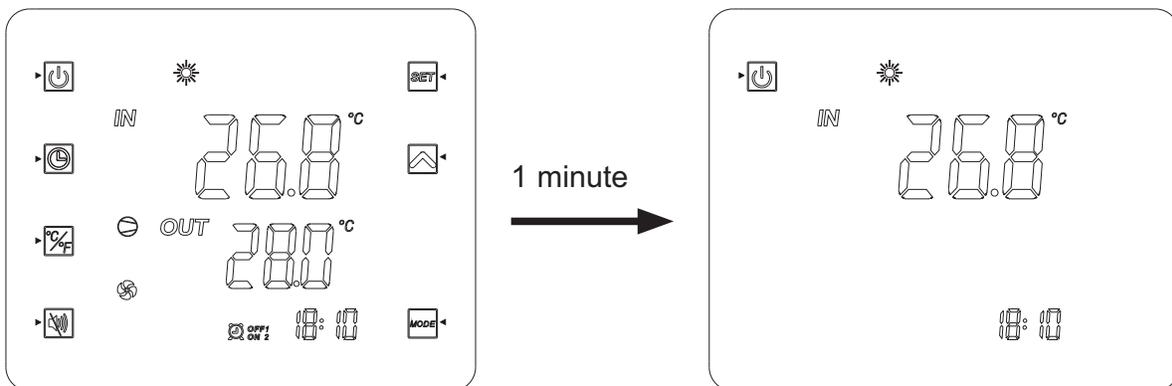
OFF Mode

When the heating pump is in sleep mode (OFF Mode) “OFF” is displayed on the command screen.



ON Mode

When the heating pump is running or regulating (ON Mode), the inlet and outlet water temperatures are displayed on the command screen.



4. USER INTERFACE (continued)

At the end of a setting, press  to validate.

The settings will be automatically saved if no button is pressed during 20s.

4.2 Clock settings

If the display is in standby mode, press briefly on .

- 1) Press  to bring up the symbol .
- 2) Press  to make the time display flash. Set the hour using the buttons  .
- 3) Press  then set the minutes with the buttons  .
- 4) Press  to validate.

4.3 Timer function settings

Setting this function is necessary if you would like to run the heat pump for a shorter period than what is defined by the filtration clock. Therefore, you can program a deferred start and an anticipated stop or simply stop a certain timeframe from running (at night, for example).

It is possible to set 2 Start Timers (ON1 et ON2) and 2 Stop Timers (OFF1 et OFF2).

Timer 1 setting – Start

- 1) Press  for 2s, Timer ON1  ¹ flashes (*).
- 2) Press  to set the hours with the buttons  .
- 3) Press  to set the minutes with the buttons  .
- 4) Press  to validate.

Timer 1 setting – Stop

- 1) Press  for 2s, Timer ON1  ¹ flashes (*).
Press  once, Timer OFF1  ^{OFF1} flashes.
- 2) Press  to set the hours with the buttons  .
- 3) Press  to set the minutes with the buttons  .
- 4) Press  to validate.

(*) To access Timer ON2  ^{ON 2} directly, press  for 2s, then press  twice.

4. USER INTERFACE (continued)

Timer 2 settings

After the Timer 1 settings, you will access directly the settings for Timer 2:

 and .

Proceed in the same manner as for Timer 1.

Nota: To access directly Timer ON2 , press  for 2s, then press twice on .

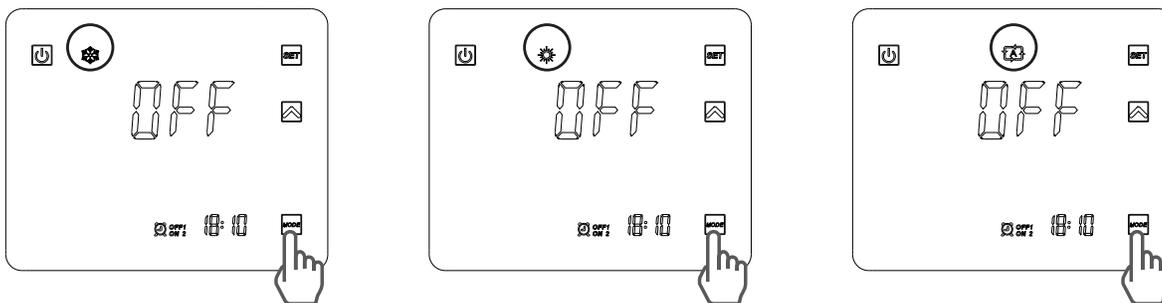
Timers suppression (Start and Stop)

- 1) Press  for 2s, Timer ON1  flashes.(*)
 - 2) Press  to make the time display flash.
 - 3) Press  to suppress the Timer .
 - 4) Press  to validate.
 - 5) Press  for 2s, the Timer  flashes.
Press once , the Timer  flashes.(*)
 - 6) Press  to make the time display flash.
 - 7) Press  to suppress the Timer .
- (*) To access Timers 2  or , follow steps 1) or 4) then press twice . Proceed in the same manner as above.

4.4 Operating mode selection cooling, heating or automatic

In Mode “OFF” or “ON”

Press the button  to change mode: cooling, heating or automatic.

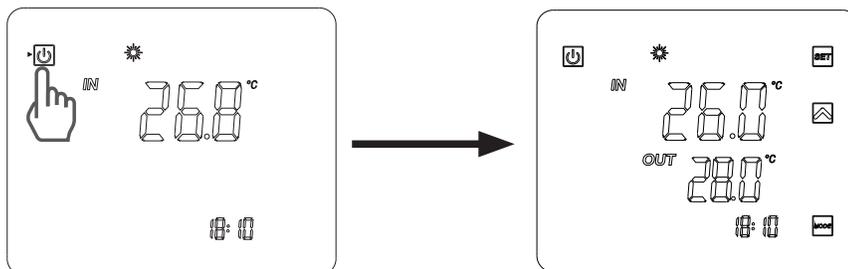


If the heat pump is set in heating only or cooling only, changing mode is not possible.

4. USER INTERFACE (continued)

4.5 Setting and visualisation of the set point (wished water temperature)

If the button  is not visible on the screen, press  briefly.
(While operating or stopped, simply press the button  to view the set point)



In Mode “OFF” or Mode “ON”

Press the button  to display the set point, then press  or  to set the set point you wish.

The setting is made with a precision of 0.5 °C.



It is recommended to never exceed 30°C to avoid alteration of the liners.

4.6 Locking and unlocking the touch screen

Press the button  for 5 s until it beeps and this symbol appears .

To unlock, press  for 5 s until it beeps and this symbol disappears .

5. MAINTENANCE AND WINTERISING

5.1 Maintenance

These maintenance operations must be carried out once per year in order to guarantee the longevity and the good working condition of the heat pump.

- Clean the coil with the help of a soft brush or jet of air or water (**Warning, never use a high pressure cleaner**).
- Verify that the drains flow well.
- Verify the tightening of the hydraulic and electrical connections
- Verify the hydraulic sealing of the condenser.



Before any maintenance operation, the heating pump must be disconnected from any electrical current source. The maintenance operations must only be carried out by personnel that is qualified and authorised to handle liquid refrigerants.

5.2 Winterising

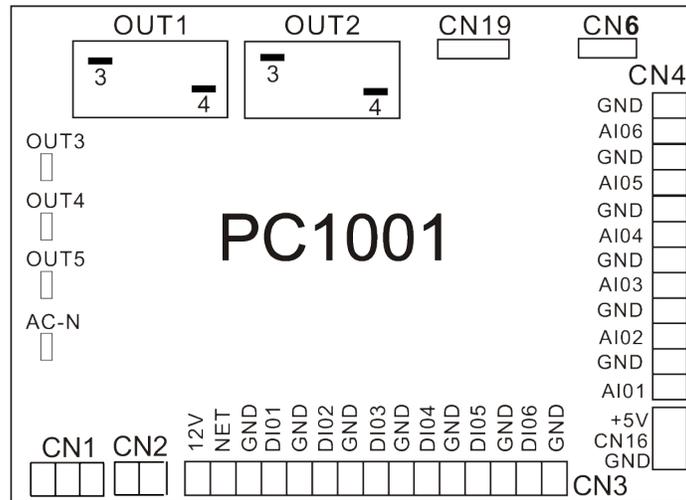
- Put the heat pump in “OFF” mode.
- Cut the power supply to the heat pump.
- Empty the condenser with the help of the drain to avoid any risk of deterioration. (high risk of freezing).
- Close the by-pass valve and unscrew the entry/exit connection unions.
- Eliminate the maximum amount of residual stagnant water from the condenser with the help of an air gun.
- Close the water entry and exit areas of the heating pump to avoid introducing foreign bodies.
- Cover the heating pump with a dedicated winterising case.



Any damage caused by poor winterising maintenance will lead to cancellation of the warranty.

6. APPENDIX

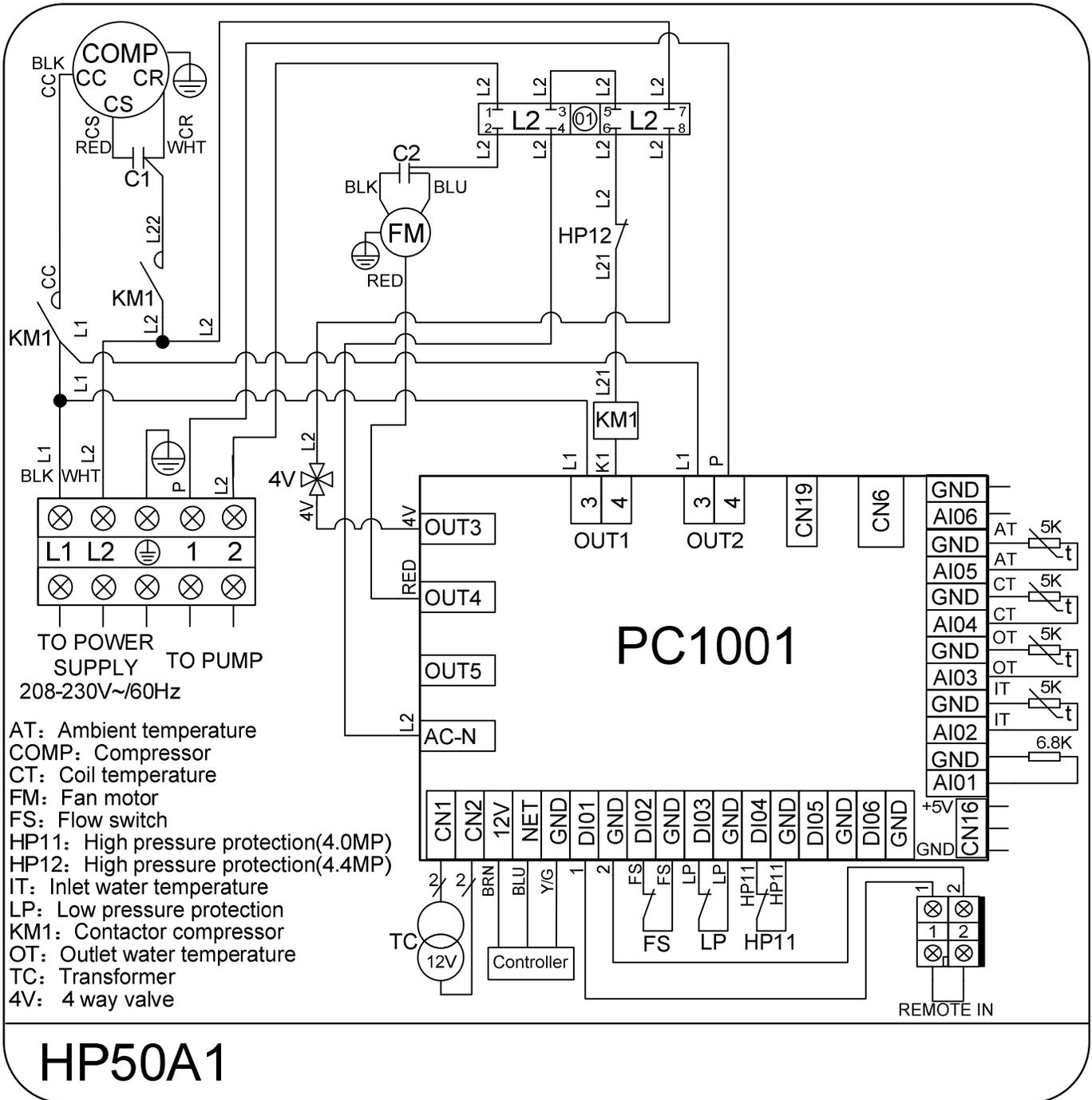
6.1 Connection of PCB Illustration



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	DI01 GND	On/Off Switch(input)(no use)
9	DI02 GND	Flow switch (input)(normal close)
10	DI03 GND	Low pressure protect
11	DI04 GND	High pressure protect
12	DI05 GND	No use
13	DI06 GND	No use
14	AI01 GND	Suction temp.(input)
15	AI02 GND	Water in temp.(input)
16	AI03 GND	Water out temp.(input)
17	AI04 GND	Temp. Of coil (input)
18	AI05 GND	Ambient temp.(input)
19	AI06 GND	No use
20	CN1	Primary transformer
21	CN2	Secondary transformer
22	CN6	Without use
23	CN19	Electronic expansion valve
24	5V CN16 GND	Flow meter

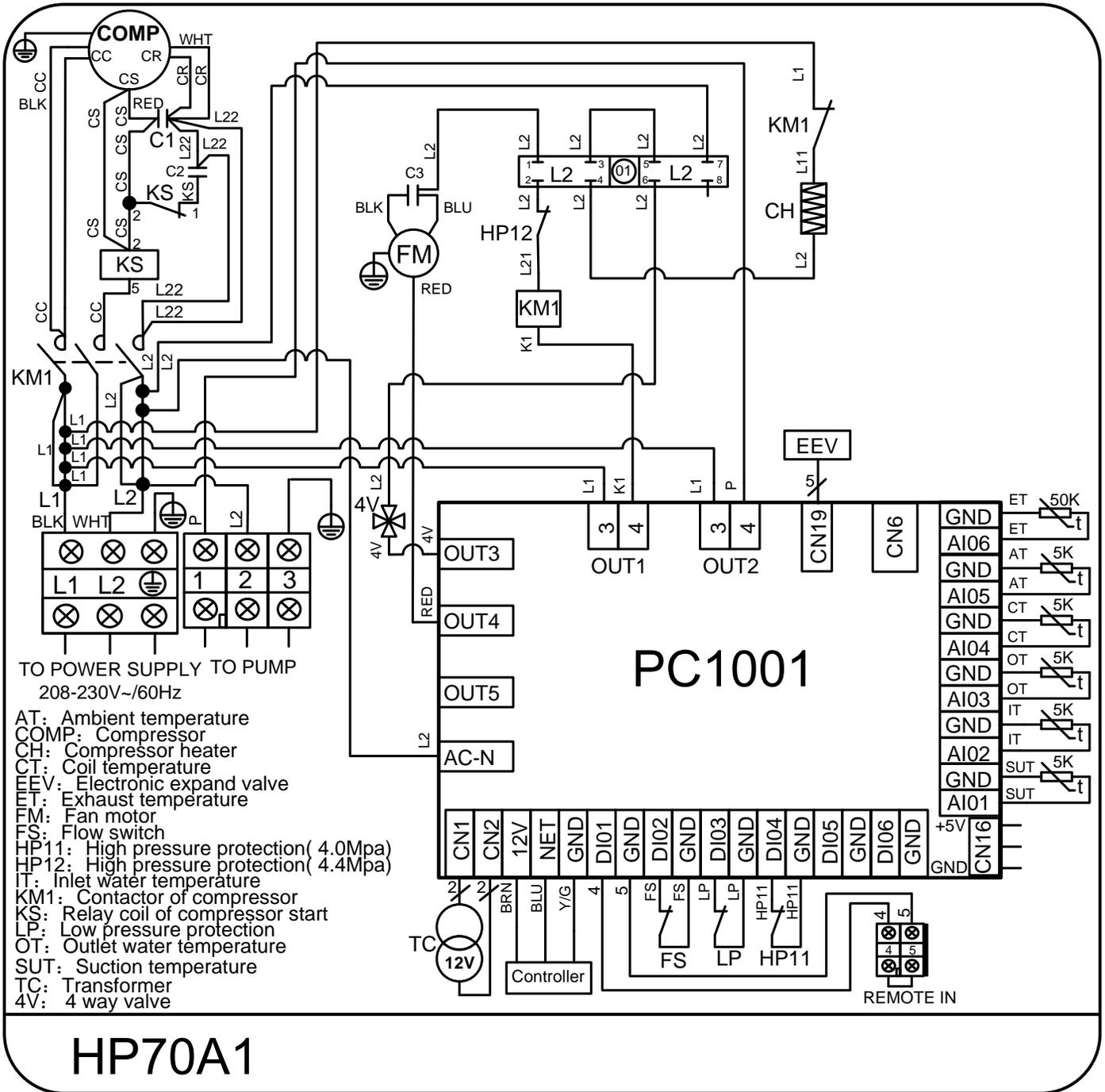
6. APPENDIX

6.2 Wiring Diagram - HP50A1



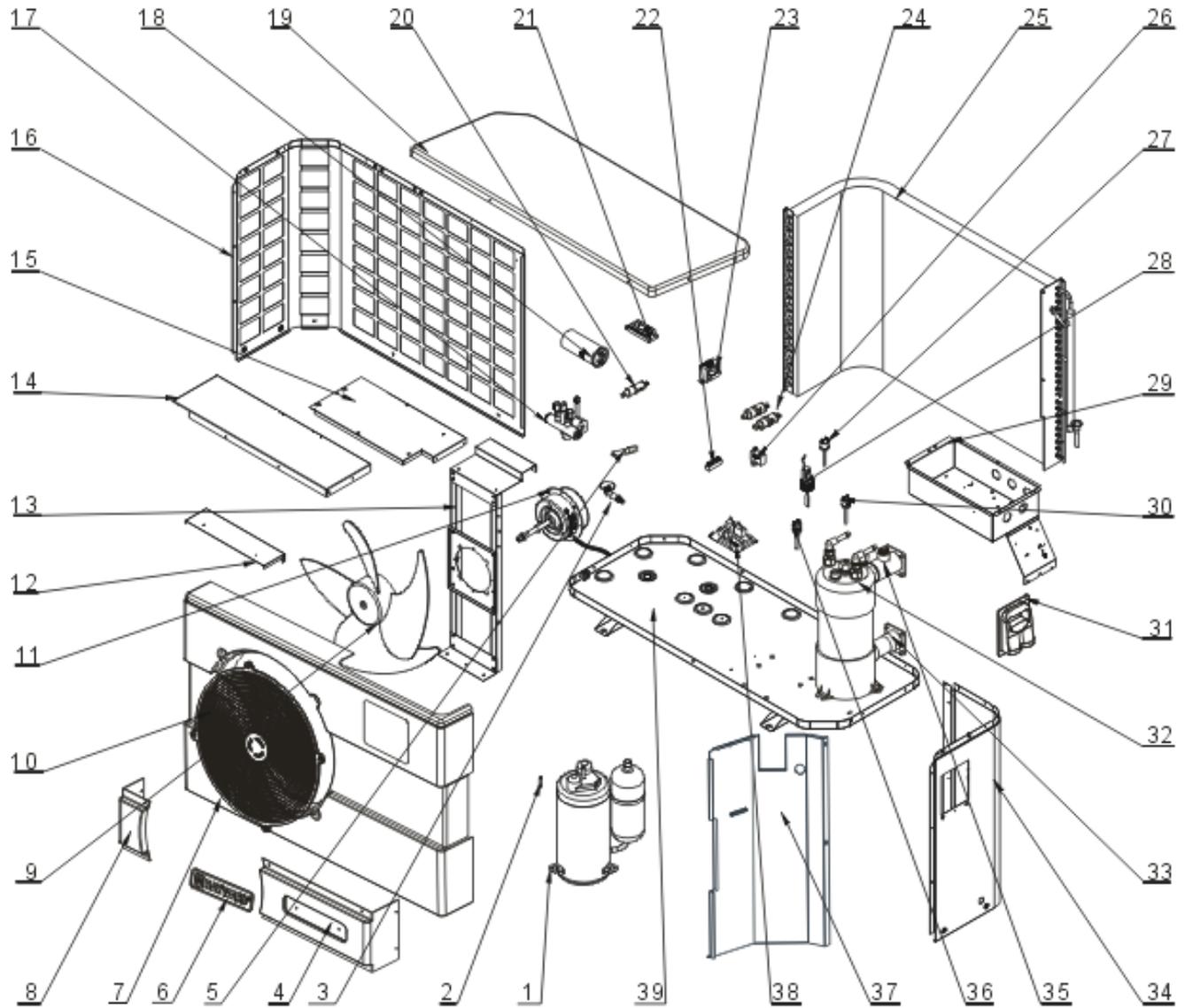
6. APPENDIX

6.2 Wiring Diagram - HP70A1



6. APPENDIX

6.3 Exploded View and Spare Parts - HP50A1



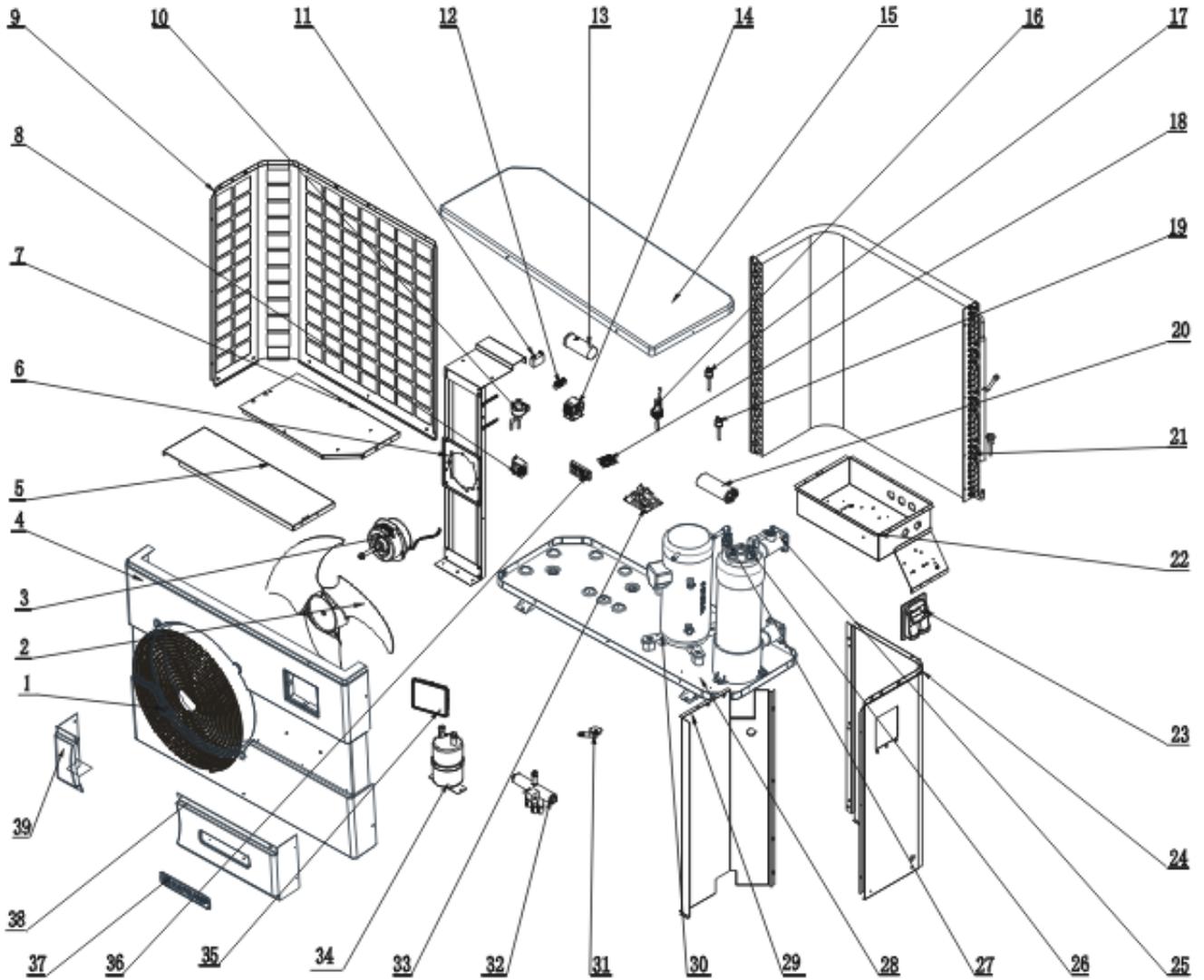
6. APPENDIX

6.3 Spare Parts List & Spare Parts - HP50A1

SN	Part Name	Part Code	Part Number
1	Compressor	20000-110041	HPX20000-110041
2	steel sleeve	2002-8881	HPX2002-8881
3	Drainage	3400-2203	HPX3400-2203
4	Front frame decoration 2	32008-220053	HPX32008-220053
5	Double capillary joint	20000-140067	HPX20000-140067
6	Mark(hayward)	20000-230596	HPX20000-230596
7	Front	32008-220051	HPX32008-220051
8	Front frame decoration 1	32008-220052	HPX32008-220052
9	Fan	3500-2701	HPX3500-2701
10	Fan retainer	20000-220188	HPX20000-220188
11	Fan machinery	20000-330124	HPX20000-330124
12	Before the fixed plate	32008-210069	HPX32008-210069
13	Motor bracket	32012-210742	HPX32012-210742
14	Mounting plate	32012-210737	HPX32012-210737
15	Electric box cover plate	32012-210740	HPX32012-210740
16	Back stop	32012-210736	HPX32012-210736
17	Four-way valve	2001-1418	HPX2001-1418
18	Compressor capacitance	2000-3505	HPX2000-3505
19	Head cover	32008-220054	HPX32008-220054
20	Check valve	2001-1499	HPX2001-1499
21	Five-connector	20000-390231	HPX20000-390231
22	Two-connector	2000-3909	HPX2000-3909
23	Power transformer	20000-370006	HPX20000-370006
24	Filter	2004-1444	HPX2004-1444
25	Fin type heat exchanger	32012-120165	HPX32012-120165
26	Fan capacitance	2000-3501	HPX2000-3501
27	Pressure switch	2000-3603	HPX2000-3603
28	Water switch	20000-360005	HPX20000-360005
29	Electrical box	32012-210739	HPX32012-210739
30	Pressure switch	2001-3605	HPX2001-3605
31	Terminal box	32009-220029	HPX32009-220029
32	Titanium tubular exchanger	32012-120036	HPX32012-120036
33	Water inlet sensor	2000-3242	HPX2000-3242
34	Right-side plate	32012-210735	HPX32012-210735
35	Water outlet sensor	2000-3242	HPX2000-3242
36	Pressure switch	20000-360059	HPX20000-360059
37	Median septum	32012-210738	HPX32012-210738
38	Pc1001	95005-310145	HPXPC1001
39	Chassis	32012-210741	HPX32012-210741

6. APPENDIX

6.3 Exploded View and Spare Parts - HP70A1



6. APPENDIX

6.3 Spare Parts List & Spare Parts - HP70A1

SN	Part Name	Part Code	Part Number
1	Fan protection grille	20000-220169	HPX20000-220169
2	Fan blade	20000-270004	HPX20000-270004
3	Fan motor	20000-330134	HPX20000-330134
4	Front panel	32017-220001	HPX32017-220001
5	Support panel	32009-210219	HPX32009-210219
6	Fan motor bracket	32009-210634	HPX32009-210634
7	Electrical box cover	32009-210635	HPX32009-210635
8	Transformer 230V-12V	20000-370003	HPX20000-370003
9	Back panel	32017-210010	HPX32017-210010
10	Electronic expansion valve	20000-140237	HPX20000-140237
11	Fan motor capacitor (5uF)	2000-3509	HPX2000-3509
12	Terminal block 2 connections	2000-3909	HPX2000-3909
13	Compressor capacitor	2000-3524	HPX2000-3524
14	Compressor contactor	20000-360222	HPX20000-360222
15	Top cover	32017-220004	HPX32017-220004
16	Flowswitch	20000-360005	HPX20000-360005
17	High pressure switch	2001-3605	HPX2001-3605
18	Terminal block 3 connections	2000-390237	HPX2000-390237
19	Lowpressure switch	2000-3603	HPX2000-3603
20	Compressor capacitor	20000-3510	HPX20000-3510
21	Fin coil	35012-120001	HPX35012-120001
22	Electrical box	32009-210633	HPX32009-210633
23	Protection cover	32009-220029	HPX32009-220029
24	Right panel	32009-210630	HPX32009-210630
25	PVC-Titanium condenser	32010-120012	HPX32010-120012
26	Water outlet sensor	2000-3242	HPX2000-3242
27	Water inlet sensor	2000-3242	HPX2000-3242
28	Bottom panel	32009-210632	HPX32009-210632
29	Center wall	32009-210631	HPX32009-210631
30	Compressor	20000-110142	HPX20000-110142
31	Drain connector	3400-2203	HPX3400-2203
32	4 ways valve	2001-1491	HPX2001-1491
33	Pc1001	95005-310145	HPXPC1001
34	Gas-Liquid separator	3500-1401	HPX3500-1401
35	LED controller	95005-310261	HPXLED
36	Terminal block 3 connections	20000-390237	HPX20000-390237
37	Brand	20000-230596	HPX20000-230596
38	Stripe 2 of front panel	32017-220003	HPX32017-220003
39	Stripe 1 of front panel	32017-220002	HPX32017-220002

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 & labour warranted the first year and parts only warranted in year two.

The *titanium tube* component of the heat exchanger has a five (5) year parts only warranty.

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.

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 Dr., Oakville, ON L6H 5R4
Haywardpool.ca
1.888.238.7665

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

