

# SWIMMING POOL HEAT PUMP UNIT

## *Installation & Instruction Manual*



### Applicable Model:

HP3.8B

HP5.6B

HP7.8B

HP9.5B

HP12.5B

HP14B

HP17B

HP21B

HP26B

HP9.5A

HP12.5A

HP14A

HP17A

HP21A

HP26A

HP35A

HP50A

HP90A

HP105A

HP135A

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### Contents

<b>1. PREFACE</b>	<b>1</b>
<b>2. SPECIFICATION</b>	<b>2</b>
2.1 Parameter of swimming pool heat pump unit	2
2.2 Dimension of swimming pool heat pump unit	3
<b>3. INSTALLATION</b>	<b>5</b>
3.1 Heat pump location	5
3.2 How to close to the pool	5
3.3 Distance from the pool	6
3.4 Installation of the check-valve	6
3.5 Pool system set up	7
3.6 Connecting the by-pass	7
3.7 Electrical wiring	8
3.8 Initial start-up	8
3.9 Condensation	8
<b>4. GUIDELINES</b>	<b>9</b>
4.1 Water chemistry	9
4.2 Winterizing	9
4.3 Spring startup	9
4.4 Owner Inspection	10
<b>5. Operating Instructions</b>	<b>11</b>
<b>6. Unit status checking</b>	<b>14</b>
<b>7. Factory parameter</b>	<b>15</b>
<b>8. Fault code table</b>	<b>16</b>
<b>9. Wiring Diagram</b>	<b>17-20</b>

# 1. Preface

\* In order to provide our customers with quality, reliability and versatility, this product has been made to strict producing standards. This manual includes all 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. Only a qualified person could install the unit.

\* A qualified installer, centre, personnel or an authorized dealer, can only repair the unit.

\* 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 void warranty.

\* The swimming pool heat pump unit heats the swimming pool water and keeps the temperature constant.

## **Our heat pump has following characteristics:**

### **Durable**

The heating exchanger is made of PVC & Titanium tube, which can withstand prolonged exposure to swimming pool water.

### **Easy operation**

The unit is very easy to operate: switch it on and set the desired pool water temperature.

### **Quiet operation**

The unit comprises an efficient rotary compressor and a low-noise fan motor, which guarantees its quiet operation. The unit can heat your swimming pool water when the air temperature is 10°C or higher.

### **Low cost**

The operational cost is very low due to its high performance

## 2. Specifications

### 2.1 Parameter of Swimming Pool Heat Pump Unit

Model		HP3.8B	HP5.6B	HP7.8B	HP9.5B	HP12.5B	HP14B1
Heating Capacity	KW	3.8	5.6	7.8	9.5	12.5	14
	KBTU	13	18	26.5	32.5	42.5	48
Heating Input Power	KW	0.8	1	1.6	1.9	2.5	2.8
Heating Running Current	A	3.6	5	7.5	8.8	11.7	13.3
Cooling Capacity	KW	2.3	3.2	4.8	5.9	7.7	8.6
	KBTU	7.8	11	16.5	20	26.5	29.5
Cooling Input Power	KW	0.75	1	1.5	1.9	2.6	2.9
Cooling Running Current	A	3.4	4.7	7.1	8.7	12.5	13.8
Power Supply	V/Ph/Hz	220V/1Ph/50Hz					
Compressor Type		Rotary					
Controller		Intelligent LCD Controller					
Codensor		PVC Titanium Heat Exchanger					
Noise	dB(A)	48	48	48	48	50	50
Water Connection	mm	50	50	50	50	50	50
Water Flow Volume	m³/h	2-4	3-5	3-5	4-7	4-7	5-8
Water Pressure Drop( Max)	kpa	10	12	12	15	15	15
Unit Dimension	L / W / H mm	940 / 365 / 550	940 / 365 / 550	940 / 365 / 550	1010 / 374 / 610	1100/440/700	1100/440/700
Packing Size	L / W / H mm	1045 / 390 / 590	1045 / 390 / 590	1045 / 390 / 590	1120 / 395 / 655	1260/500/730	1260/500/730
Net / Gross Weight	kg	37 / 40	53/ 56	54/ 57	63 /67	70/78	80/88

Model		HP14A	HP17A	HP21A	HP26A	HP50A	HP90A
Heating Capacity	KW	14	17	21	26	50	90
	KBTU	48	60	73	89	170	306
Heating Input Power	KW	2.88	3.5	4.25	5.2	10.3	17.5
Heating Running Current	A	5.8	6.5	7.9	9.3	16.4	31.2
Cooling Capacity	KW	8.6	10.3	13.5	14	36	58
	KBTU	29.3	35	46	48	123	200
Cooling Input Power	KW	2.98	3.6	4.65	6.2	12.1	18.8
Cooling Running Current	A	6	6.8	8.3	11	19.3	33.5
Power Supply	V/Ph/Hz	380V/3Ph/50Hz					
Compressor Type		Scroll					
Controller		Intelligent LCD Controller					
Codensor		PVC Titanium Heat Exchanger					
Noise	dB(A)	52	54	58	58	61	62
Water Connection	mm	50	50	50	50	63	75
Water Flow Volume	m³/h	6-9	7-10	8-11	8-14	8-15	35-55
Water Pressure Drop( Max)	kpa	15	16	16	16	18	28
Unit Dimension	L / W / H mm	660 / 660 / 850	660 / 660 / 950	660 / 660 / 950	660/660/950	1448/730/1260	2150/760/1330
Packing Size	L / W / H mm	750 / 700 / 860	750 / 700 / 960	750 / 700 / 960	750/700/960	1630/810/1380	2275/900/1500
Net / Gross Weight	kg	98 /115	106 / 120	106 / 120	106/120	260/290	510/570

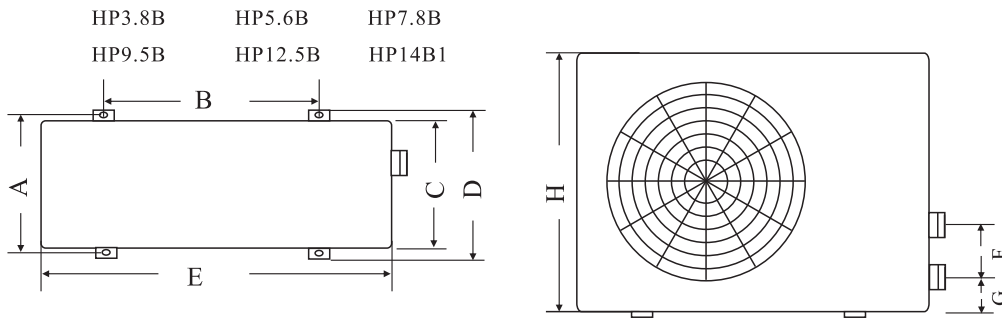
Above parameters is only for reference, exact details please as per nameplate.

Measurement conditions:

Heating: Dry bulb 24° C, web bulb 19° C, inlet water temp. 27° C

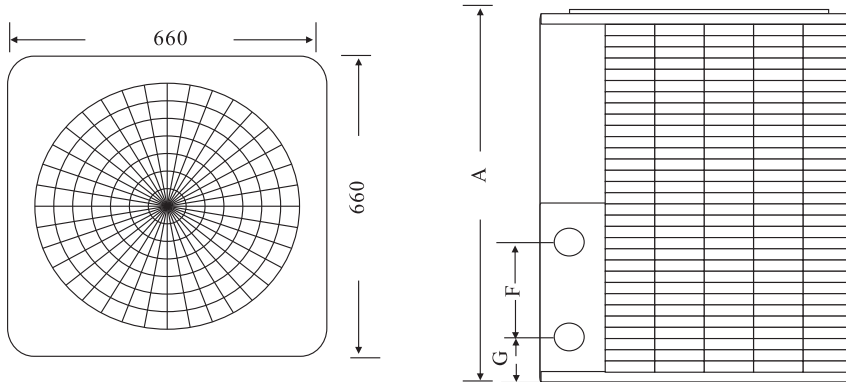
Cooling: Dry bulb 35° C, web bulb 24° C, inlet water temp. 27° C

## 2.2 Dimension of swimming pool heat pump unit



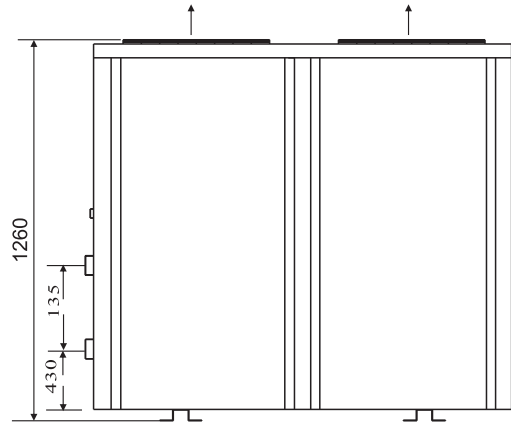
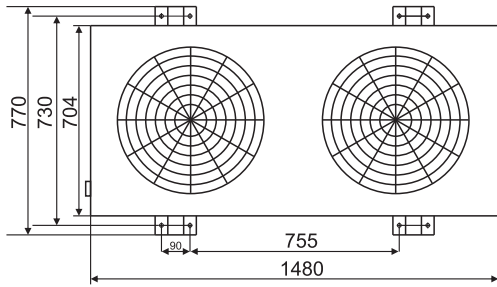
Model	HP3.8B HP5.3B HP7.8B	HP9.5B	HP12.5B HP14B1
A	330	340	440
B	680	650	760
C	290	300	420
D	360	370	470
E	950	1010	1110
F	220	270	320
G	110	110	110
H	550	610	670

HP9.5A    HP12.5A  
 HP14A    HP17A  
 HP21A    HP26A



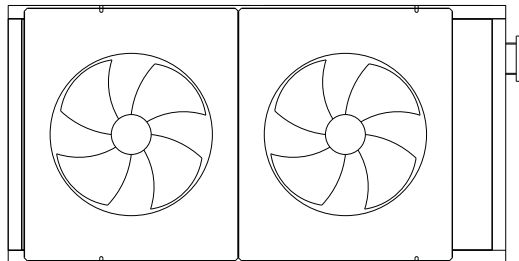
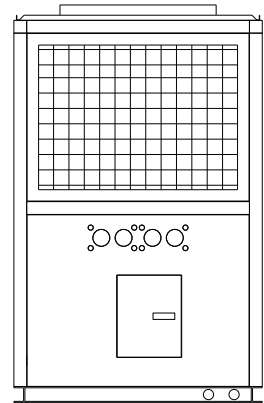
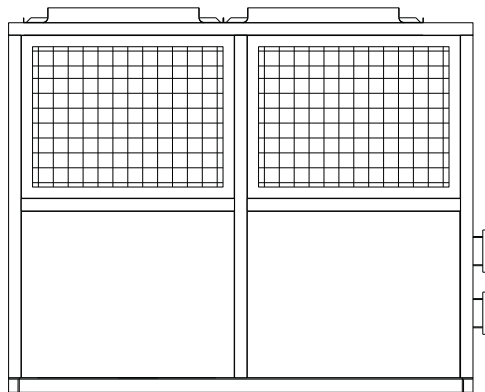
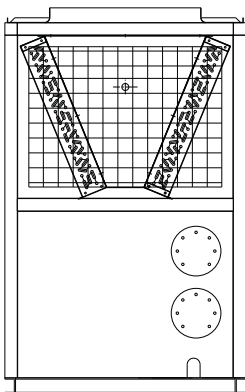
Model	HP9.5A HP12.5A HP14A HP17A	HP21A HP26A
A	850	955
G	110	110
F	320	450

HP35A HP45A HP50A HP90A



Model		HP35A	HP45A	HP50A	HP90A
Dimension (L *w * H)	mm	1448*730*1060	1448*730*1260	1448*730*1260	2150*760*1300
Packing Size (L *w * H)	mm	1630*810*1180	1630*810*1380	1630*810*1380	2275*900*1500
Water connection	mm	63	63	63	75
Net Weight / Gross Weight	kg	240 / 270	250 / 280	260 / 290	510 / 570

HP105A HP135A



Model		HP105A	HP135A
Dimension (L *w * H)	mm	2000*900*1820	2000*900*1920
Packing Size (L *w * H)	mm	2150*1020*1980	2150*1020*2080
Water connection	mm	110	110
Net Weight / Gross Weight	kg	820 / 880	850 / 920

### 3.Installation

The factory only provides the heat pump unit; the other items including an eventual bypass, in the illustration are necessary parts for the water system, provided by users or the installers.

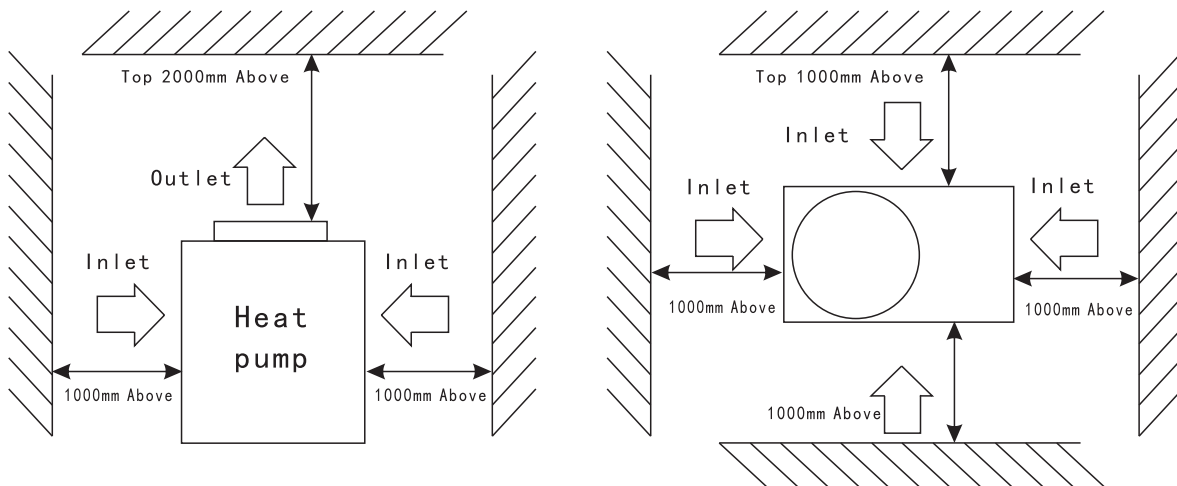
Attention:

Please follow these steps when installing the heat pump:

1. All feeding of chemicals to the pool water has to be done downstream of the heat pump.
2. Install a bypass when the flow of the pool pump is more than 20% above the rated flow of the heat exchanger of the heat pump.
3. Install the heat pump above the level of the pool water.
4. Install the heat pump on a solid foundation and use the damping rubbers to eliminate vibrations and noise.
5. Always keep the unit straight up. If the unit has been tilted or put on his side, allow 24h before starting the unit.

#### 3.1 Heat pump location

The unit may be installed virtually anywhere outdoors. For indoor pools please consult your suppliers. DO NOT put the unit in an enclosed area with a limited air volume where the unit discharge air will be re-circulated. DO NOT put the unit next to shrubs, which can block the air inlet, Such locations deny a continuous source of fresh air, which reduce its efficiency and may prevent adequate heat delivery. The picture below give the minimum required distances from each side of the heat pump.



#### 3.2 How to close to the pool

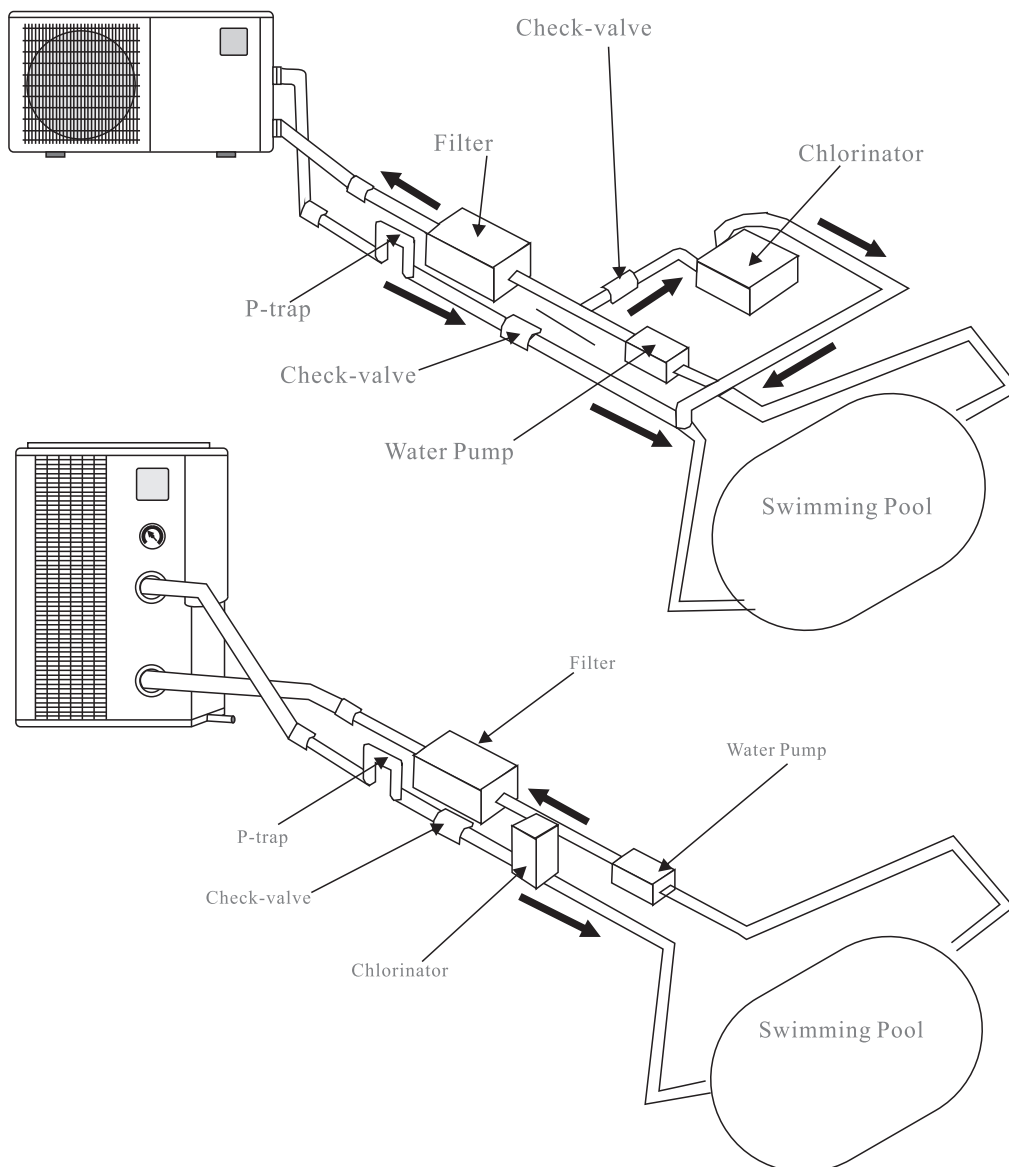
Install the heat pump as close to the swimming pool as possible to minimize the loss of heat through the piping. Put it on a solid base and place the rubber blocks under the heat pump to eliminate vibrations.

### 3.3 Distance from the pool

Normally, the pool heat pump is installed within a 7.5 meter radius of the pool. The greater the distance from the pool, the greater the heat loss from the piping. Since the piping is buried for the most part, heat loss is minimal for distances of up to 30 meters (15 meters to and from the pump= 30 meters total), unless the soil is wet or the water level is high. Heat loss per 30 meters could roughly be estimated at 0.6kw-hour (2000 BTU) for every 5 °C temperature difference between the pool water and the soil surrounding the pipe, which translates to an operation time increase of 3-5%.

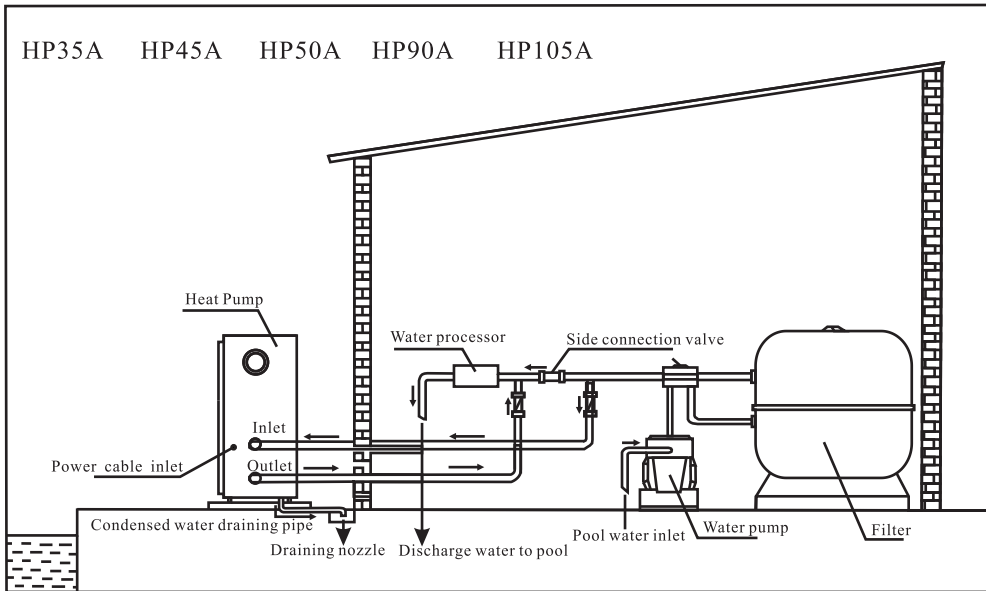
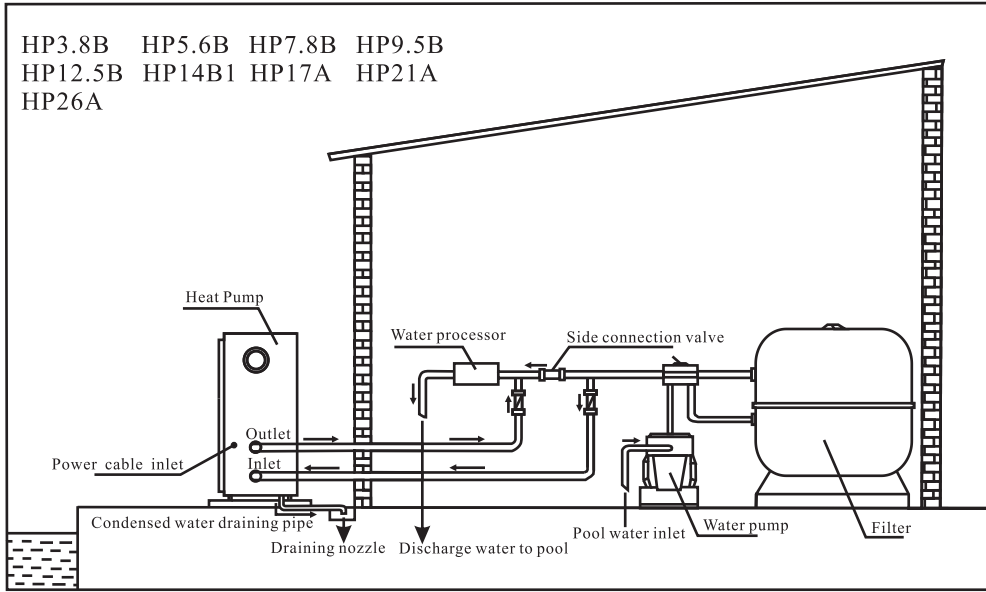
### 3.4 Installation of the check-valve

**Attention-** When using automatic chlorine and PH dosage systems, it is of uttermost importance to protect the heat pump from high concentrations of these chemicals that could corrode the heat exchanger. Therefore, such systems should add the chemicals in the conduits located DOWNSTREAM of the heat pump and it is recommended to install a check-valve in order to prevent backflow when there is no water circulation. Damage to the heat pump caused by disregarding any of these recommendations will invalidate the warranty.





### 3.5 Pool system set up



### 3.6 Connecting the by-pass

**VALVE1-**

Slightly closed( water pressure increased with just 100 to 200gr)

**VALVE2-**

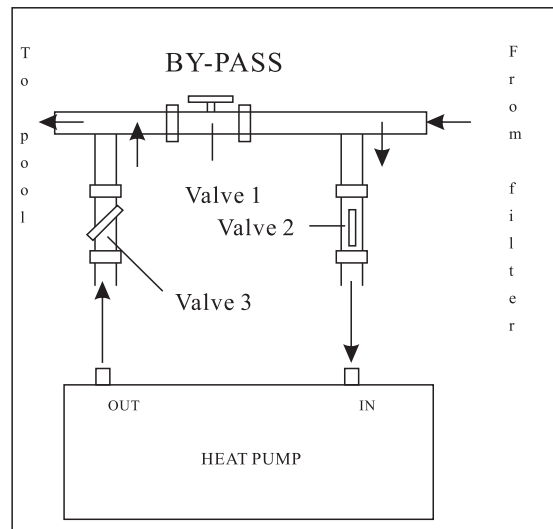
Completely open

**VALVE3-**

Half way open

**Setting the valve of the by-pass:**

- Set all 3 valves entirely open
- Slightly close valve 1 ( see also 3.6)
- Close valve 3 about half way to adjust the refrigerant pressure



## 3.7 Electrical wiring

Note:-Verify the local power supply and the operating voltage of the heat pump. It is recommended to use a separate circuit breaker(slow type-D curve)for the heat pump together with the proper wiring characteristics (see table below). The current to the heat pump should only be applied when the filter pump is running. For example a relay controlled by the filter pump could be used to activate the current to the heat pump. Further connect the electrical supply to the junction box inside the unit. All PRO heat pumps require single-phase connection.

**Grounding** the heat pump is required to protect you against electrical shock caused by an eventual short circuit inside the unit.

The heat pump is not equipped with a flow switch or any other kind of water flow detection. Therefore, the heat pump has to be wired electrically together with the filter pump to ensure water flow while the heat pump is running.

## 3.8 Initial start-up

**Start up procedure- after the installation is completed, you should follow these steps:**

1. Turn on the filter pump, check for leaks and verify flow to and from the pool.
2. Turn on the electrical power supply to the unit, then press the ON/ OFF key on the electronic control panel. The unit should start when the time delay period has lapsed .
3. When the unit has been running for a couple of minutes, check if the air leaving the unit is cooler.
4. Check the performance of the flow switch as follows: with the unit running, turn the filter pump off. The unit should also switch off automatically. If not, the flow switch must be readjusted.
5. All the unit and filter pump to run 24 hours a day until the desired pool water temperature is reached. When the set temperature is reached, the unit switches itself off. The unit will now automatically restart (as long as your filter pump is running) when the temperature of the pool water experiences a drop of more than 1°C below set temperature.

Depending on the starting temperature of the pool water and the air temperature, it can take several days for the water to reach the desired temperature. Covering the pool can drastically reduced this period.

**Water flow switch**—the unit is equipped with a flow switch that is switched on when enough water has flowed through the unit and that is switched off when the water flow becomes too low. (e. g. when the filter pump is switched off) .

**Time delay**—the unit is equipped with a built-in 3-minute start delay included to protect electrical components and contacts. After this time delay, the unit will automatically be restarted. Even a brief interruption of the power supply will activate the start delay and prevent the unit from starting immediately. Additional interruptions of the power supply during the delay period will have no effect on the 3-minute countdown.

## 3.9 Condensation

When the swimming pool water is being heated by the heat pump, the incoming air is cooled down quite a bit, which can cause condensation on the fins of the evaporator. Condensed volumes can attain several litres per hour underhigh atmospheric humidity. Sometimes, this is wrongfully interpreted as a water leak.

## 4. Guidelines

### 4.1 Water chemistry

Special attention should be paid to the chemical balance of the pool water. The pool water values should always stay within the following limits:

	Min	Max
pH	7.0	7.4
Free chlorine(mg/l)	0.5	1.2
TAC(mg/l)	80	120
Salt(g/l)		3

**Important: failure to comply with these limits will invalidate the warranty.**

**Note: exceeding one or several limits can damage the heat pump beyond repair. Always install water treatment equipment past the heat pump's water outlet, especially if the chemicals are automatically added to the water.**

**A check-valve should also be installed between the outlet of the heat pump and this equipment in order to prevent products from flowing back into the heat pump if the filter pump stops.**

### 4.2 Winterizing

**Important: failure to winterizing could damage the heat pump and will void warranty**

The heat pump, filter pump, filter and conduits must be protected in areas where the temperature can drop below the freezing point, Evacuate all water from the heat pump as follows:

1. Turn off the electrical power supply to the heat pump
2. Close the water supply to the heat pump: completely close valves 2 and 3 of the by-pass
3. Disconnect the water inlet and outlet coupler fittings of the heat pump and let the water drain out of the unit

### 4.3 Spring startup

If your heat pump has been winterized, perform the following steps when starting the system in the spring:

1. Inspect the system for any debris or structural problems.
2. Connect the water inlet and outlet unions firmly.
3. Turn on the filter pump to supply water to the heat pump. Adjust the by-pass to allow water flow through the heat pump.
4. Turn on the electrical power to the heat pump at the main breaker panel.

## 4.4 Owner inspection

The PRO heat pumps are designed and constructed to provide long performance life when installed and operated properly under normal conditions. Periodic inspection are important to keep your heat pump running safe and efficiently all the years.

The following basic guidelines are suggested for your inspection:

1. Make sure the front of the unit is accessible for future service.
2. Keep the surrounding areas of the heat pump clear of all debris.
3. Keep all plants and shrubs trimmed and away from the heat pump.
4. Keep lawn sprinkler heads from spraying on the heat pump to prevent corrosion and damage.
5. If the unit is installed under a very sharp roof pitch or under a roof without a gutter, a gutter or diverter should be fitted to prevent excessive water from pouring down onto the unit.
6. Do not use the heat pump if any parts has been under water. Immediately call a qualified professional technician to inspect the heat pump and replace any part of the control system, which has be submerged.

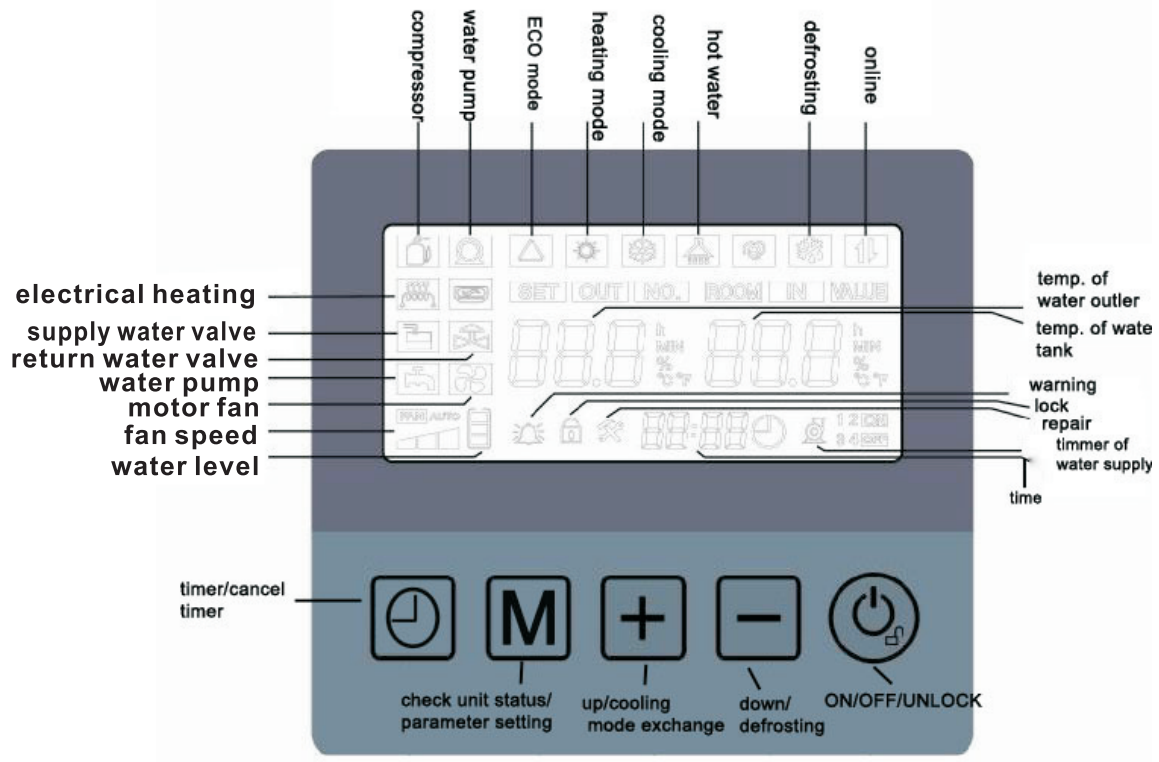
The heat pump will produce condensation(water) while in operation. The heat pump base is designed to allow the condensation to exit through the bottom drain port. The condensation will increase as the outdoor air humidity level increase. Check the following at regular intervals to ensure proper condensate drainage:

1. Visually inspect and clear the bottom drain port of any debris that could clog the port.
2. Keep the air intake area and discharge area clear of debris so the airflow through the heat pump is not restricted. The cooler discharge air should not accumulate and be drawn into the side air intake coils.

During normal operation, the heat pump produces ten to twenty liters of condensate per hour. If condensate drainage is above this range during operation or if water continues to drain from the base when the heat pump is not in operation for more than an hour, a leak in the internal plumbing may have occurred. Call a qualified heat pump technician to investigate the problem.

NOTE: A quick way to verify that the water running through the drain is condensation water 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 water. AN EVEN QUICKER WAY TEST THE DRAIN WATER FOR CHLORINE--if there is no chlorine present, then it's condensation.

## 5. Operating Instructions



ON/OFF



Under unlock status,press it for one second to “ON/OFF”.

Under other setting status,press it can reture to home page

Under lock status,press it for 5 seconds to unlock.

Function key



In the home page,press it can enter to check the data.

## Page up and Page down

Page up and down, check and modify the parameters

You can check and set the parameters with the function key

Press “+” and “-” can set the temperature when the unit is running.

## Timer setting

Press it 5 seconds to enter time setting

## Controller operation

### Parameter setting and checking

Parameter checking and set (can setting under “ON/OFF” status)

In the home page, press “function” key 3 seconds to enter parameter checking page. press “+” and “-” can check parameter.

In checking page, press “function” key can enter current parameter setting, press “+” and “-” to change the parameter, press it again to exit.

It will exit to checking/setting page without press any key in 30 seconds. Press “ON/OFF” key can exit to home page.

### Factory parameter checking and setting

Under factory parameter checking page, press function key to enter current parameter setting, press “+” or “-” to modification parameter, press it again to exit.

It will exit to checking/setting page without press any key in 30 seconds, then return to home page. Press “ON/OFF” can exit to home page.

## Time setting

Under home page, press timer key 5 seconds to enter time setting.

In time setting page, press “timer” key, the hour setting will flash, press “+” or “-” to set the parameter data.

Finish the hour setting, press “timer” again, the minute setting will flash, press “+” or “-” to set the parameter data.

When the minute setting is finished, press “timer” key again will confirm the time setting and exit to home page.

Please note that no motion on display for 30 seconds, it will confirm the time setting and exit to home page.

Under time setting status, press “ON/OFF” key will confirm time setting and exit to home page.

## Timer setting of “ON/OFF”

Under home page,press timer key can enter timer setting,you can setting 5 different timer.

When the first timer setting is flashing, press timer key to set hour to open the unit. When hour setting is flashing,press “+” and “-” key to set the hour.

When the hour setting is finish,press timer key again to set the minute to open the unit. When the minute setting is flashing,press “+” and “-” key to set the minute.

When the minute setting of first timer is finish,press timer key again to enter the hour setting of shut off the unit of the first timer.

The other timer setting is the same as the first timer setting.

Under the timer setting status,press “timer” key for 5 seconds to cancel the current timer setting.

Under timer setting status,no motion on the display for 30 seconds,it will confirm the timer setting and exit to home page.(It has memory for setting when the power is cut off)

Note:The first timer setting is “ON/OFF” of the unit. The second、 third、 fourth timer setting is “ON/OFF” of water refill.The fifth timer setting is “ON/OFF” of the water supply.

## Lock /Unlock



Under lock status,press “ON/OFF” key for 5 seconds,you will hear a sound bee,then the controller will unlock.No motion on the display for 30 seconds,the LCD will lock.

## Cooling Mode



When It’s using in swimming pool model,Press “+” key for 5 seconds can change cooling/heating model.

## Forced defrost



Under running status,press “-” key for 5 seconds can enter forced defrost(every coil temp. must lower than parameter H6)

Stop the unit can exit the forced defrost status,or when the defrosting time reach parameter H5 can exit.

press timer and “ ON/OFF” key for 3 seconds to start/stop electric heating

## How to clear fault code history

Under fault code checking status,press “ON/OFF” key and function key for 5 seconds,can clear fault code history.

## 6. Unit status checking

Display	Meaning(dual system)	Display	Meaning(dual system)
A1	coil 1 temperature	B2	return temp.of system 2(dual system)
A2	return temp.of system 1	B3	Exhaust temp. of system 2(dual system)
A3	Exhaust temp. of system 1	B8	Compressor current of system 2
A4	Ambient temperature	B9	expansion valve opening angle of system
A5	Water outlet temperature	E1	Fault code record
A6	Return water temperature	E2	Fault code record
A7	Ground source water outlet temperature	E3	Fault code record
A8	Compressor current of system 1	E4	Fault code record
A9	expansion valve opening angle of system	E5	Fault code record
A10	reserve	E6	Fault code record
B1	coil 2 temperature(dual system)		

## Parameter setting(can setting and change by user)

Code	Meaning	Range	Default
L2	Compressor start and return temp.setting	2°C ~ 18°C	3°C
L3	Temp. setting (Heating Model)	20°C ~ parameter F1	27°C
L4	Temp. setting (Cooling Model)	8°C ~ 28°C	12°C
L5	Ambient temperature of electric heating work	0°C ~ 35°C	0°C
L6	Temp. setting of return water	30°C ~ 65°C	30°C
L7	Temp.setting Of auto water supply	20°C ~ 60°C	48°C
L8	Running Current of compressor	0 ~ 40A	15



## 7.Factory parameter(Only setting by professional Technician)

Parameter	meaning	Range	Default	Remark
H2	Freezing protection temp.setting	-30℃~0℃	-10℃	
H3	Total working time of compressor after frosting	20min~90min	45min	
H4	Setting initialization temp. for defrosting	-15℃~-1℃	-3℃	
H5	Defrosting time setting	5min~20min	8min	
H6	Temp. of exit defrost	1℃~40℃	20℃	
H7	Entrance defrost Temp.setting of temp.different between ambient and coil	0℃~15℃	0℃	
H8	Ambient temp.of entrance defrost	0℃~20℃	20℃	
P1	Cycle setting of electronic expansion valve	20S~90S	45S	
P2	Overheat setting	-5℃~10℃	1℃	
P3	expansion valve	80℃~110℃	88℃	
P4	Electronic expansion valve opening angle setting when defrosting	2~45	40	Number of steps is the displayed value * 10
P5	Minimum opening setting of Electronic expansion valve	5~20	12	Number of steps is the displayed value * 10
P6	Electronic expansion valve manual / automatic	0/1	0	0>manual/1:automatic
P7	Electronic expansion valve manual steps	2~45	reserved	
F1	Water tank temp.setting	50℃~90℃	55℃	
F2	cycle water pump setting under electric heating	0/1	0	0:OFF 1:ON
F3	Temp. difference setting between water tank and LCD display	-5℃~15℃	2℃	
F4	water flow switch setting(online)	0~1	0	0:Single 1:online
F5	Water pump mode(swimming pool heat pump)	0/1	1	0:Ordinary / 1:Special
F6	By-pass valve setting (obligate)	-30℃~45℃	5℃	
F7	Single/dual system	1/2	2	

## 8. Fault code table

Fault code	Meaning(Dual system)	Fault code	Meaning(Dual system)
Er01	Phase error	Er23	Refrigeration overcooling protection
Er02	Default Phase		
Er03	Water flow switch fault of indoor water outler	Er25	Level switch failure
Er04	Winter frost protection	Er26	Antifreeze protection of outdoor water inlet
Er05	High pressure protection of system 1	Er27	Water outlet sensor failure
Er06	Low pressure protection of system 1	Er28	
Er07	High pressure protection of system 2	Er29	Return temp. sensor failure of system 1
Er08	Low pressure protection of system 2	Er30	Return temp. sensor failure of system 2
Er09	Communication fault	Er31	Pressure switch failure
Er11	Time lock		
Er12	Exhaust temperature protection of system 1		
Er13	Exhaust temperature protection of system 2	Er35	Current protection of compressor1
		Er36	Current protection of compressor2
Er15	Water tank/water inlet sensor failure	Er37	temp. difference protection of water indoor inlet/indoor outlet
Er16	Coil sensor failure of system 1	Er38	outdoor water outlet temp. overcooling protection
Er17	Coil sensor failure of system 2	Er39	water flow switch failure of outdoor water inlet
Er18	Exhaust sensor failure of system 1	Er40	
Er19	Exhaust sensor failure of system 2	Er41	
Er21	Ambient sensor failure	Er43	
Er22	Water return sensor failure	Er44	

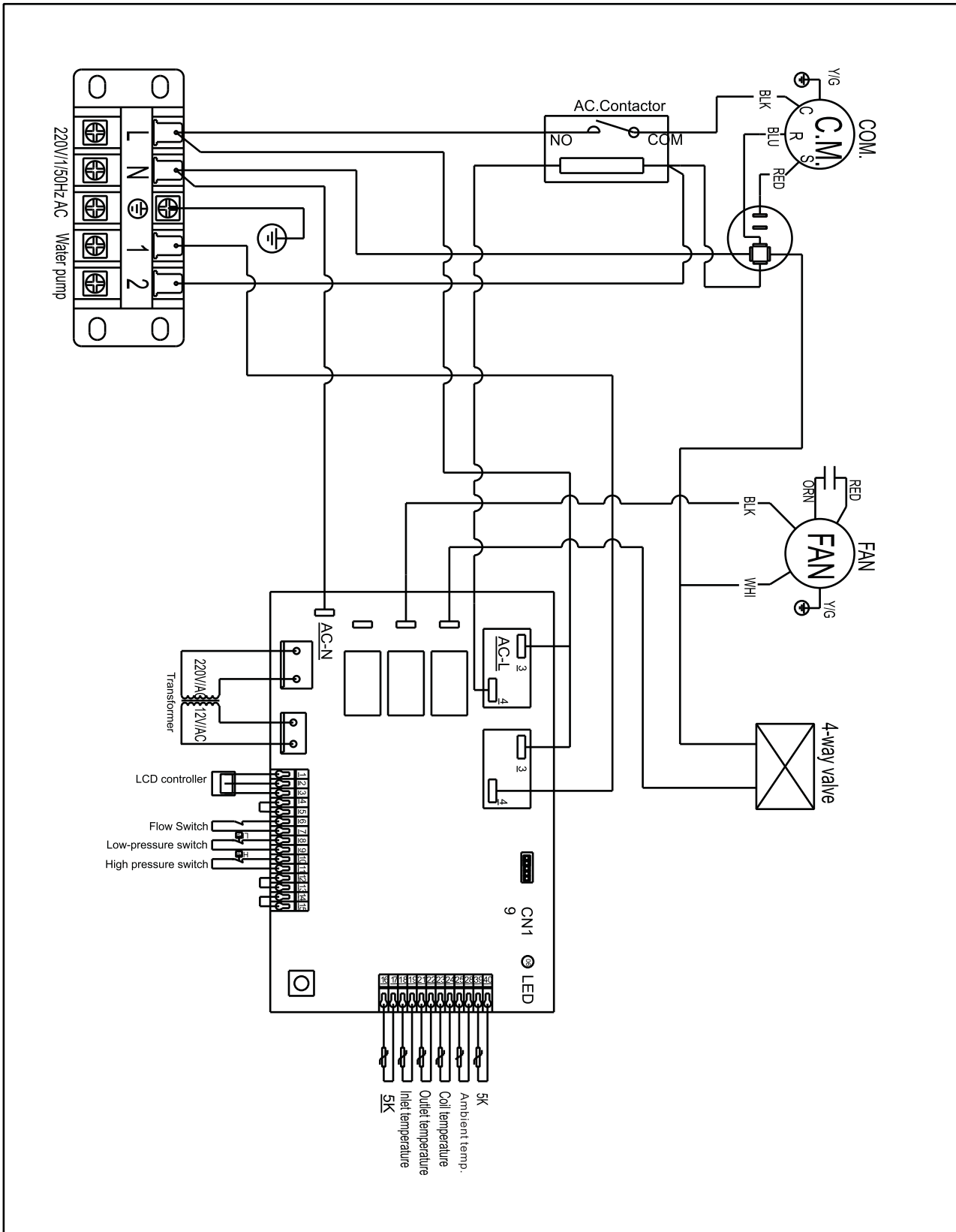
## 9. Wiring Diagram

Model: HP3.8B

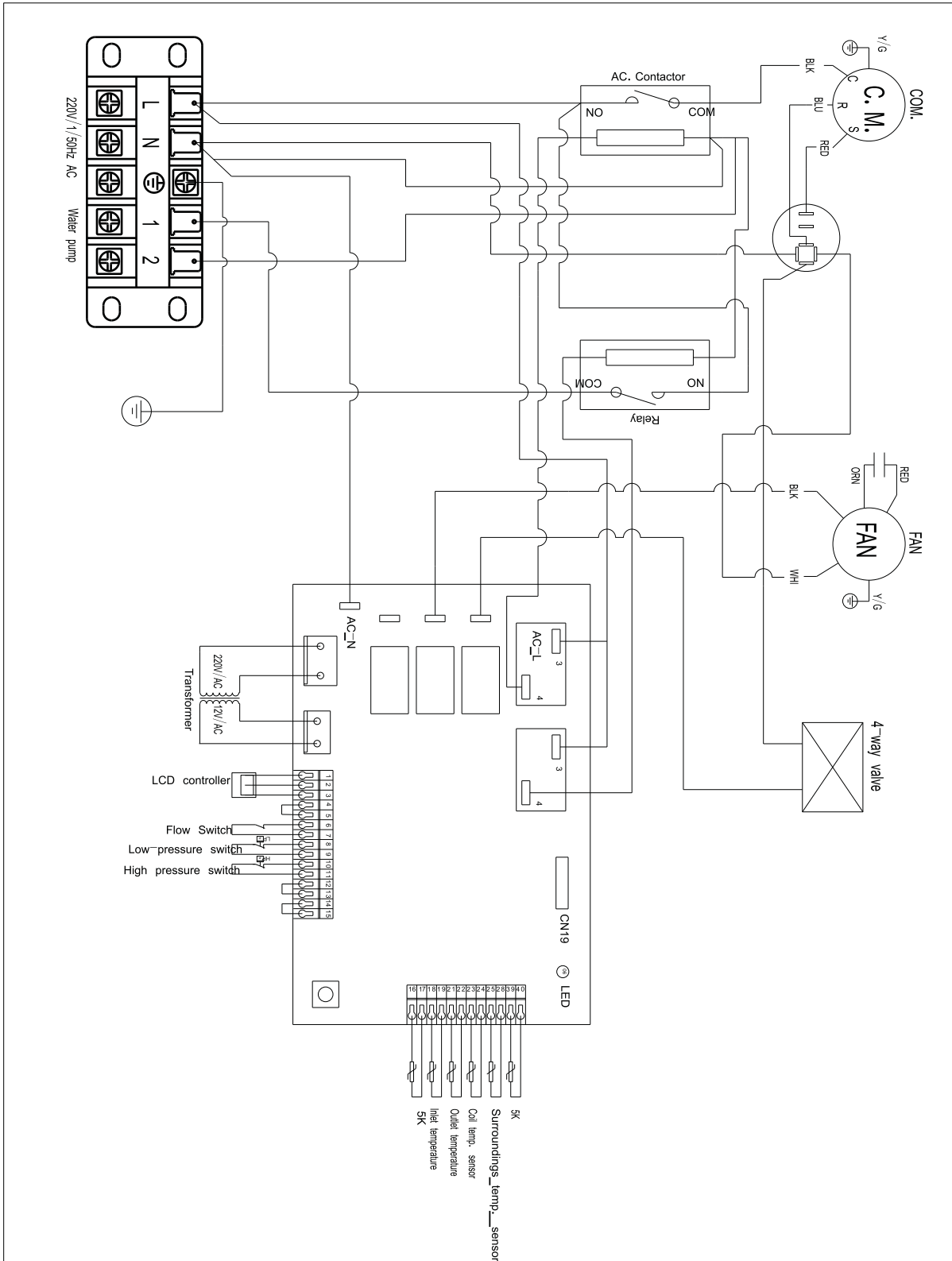
HP5.6B

HP7.8B

HP9.5B

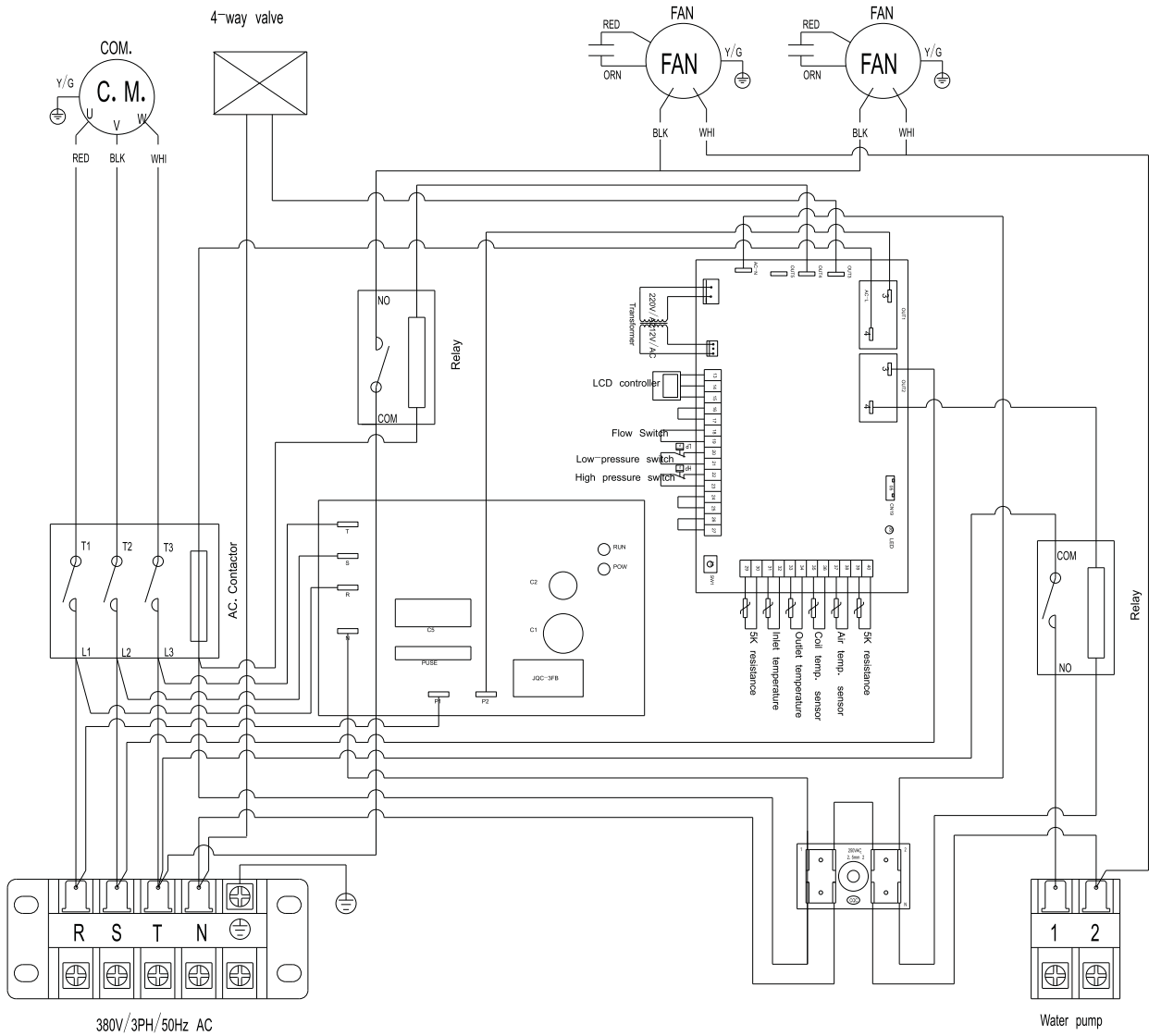


Model:HP12.5B HP14B1 HP17B



Model: HP21B

HP26B



# Model:HP50A

