ASTRALPOOL

Astral Pool COMMERICAL *95* KW Heat Pump

Rainbow Pool Products
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A division of FLUIDRA

Contents

NOTICE TO INSTALLERS

Heat Pump must be located outdoors with sufficient ventilation as explained on page 6.

This appliance must be installed by an authorized person.

This appliance must be installed in accordance with the installation instructions, the National Wiring Rules and any other relevant statutory authorities.

Refer to data plate for details of operating voltage and current.

A multi-pole isolating switch must be installed that operates in all live conductors so that it isolates the entire equipment from the supply.

SAFETY RULES

1. Spa or hot tub water temperature should never exceed 40˚C.
2. Drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness and subsequently result in drowning.
3. Pregnant women beware! Soaking in water above 38˚C can cause foetal damage during the first three months of pregnancy.
4. Before entering the spa or hot tub, the user should check the water temperature with an accurate thermometer, spa or hot tub thermostats may be inaccurate by as much as 2˚C.
5. Persons with a medical history of heart disease, circulatory problems, diabetes or blood pressure problems should obtain their physician's advice before using spas or hot tubs.
6. Persons taking medications which induce drowsiness, such as tranquillisers, antihistamines or anticoagulants, should not use spas or hot tubs. If in doubt seek medical advice.

Phase rotation must be checked on 3 phase units. Incorrect rotation will damage the compressor and void any warranties.
Performance data of Swimming Pool Heat Pump Unit

CHEMICAL BALANCE

It is imperative that correct chemical balance be maintained in your pool and spa water, otherwise corrosion of your heater may occur. **Corrosion due to chemically imbalanced water or excessive sanitiser is detectable and will void warranty.** Your local pool shop specialist or spa retailer can advise correct chemical balance. Your water should be checked and maintained regularly by a pool water professional. As a guide the following parameters may be used.

pH	7.6 to 7.8
Total Alkalinity	80 to 120 ppm
Calcium Hardness	150 ppm

You should test your water chemical balance at least on a weekly basis.

Excessive sanitiser can damage your heater. Chlorine should not exceed 3 ppm and bromine should not exceed 5 ppm. Salt chlorinators, especially when used on spa pools or indoor or covered pools, can easily produce excessive chlorine levels which will damage the heater internals.

WINTER OPERATION

If the pool won't be used for a month or more, turn the heater off at the main isolating switch. For areas where there is no danger of freezing, water should circulate through your heater all year long even though you are not heating your pool.

Where freezing is possible, it is necessary to drain the water from the heater. This may be done by loosening the inlet or outlet barrel union. If the heater is below water level, isolate it from the pool first by closing shut off valves before and after the heater.

CAUTION: If the heater has been drained for freezing conditions, do not turn on until the system is circulating water.

- 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 manufacture 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 center personnel or an authorized dealer.

- 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.

- Swimming Pool Heat Pump Unit heats the swimming pool water and keeps the temperature constant. For split type unit, the indoor unit can be Discretely hidden or semi-hidden to suit a luxury house.

  Our heat pump has following characteristics:

  1 Durable
  The heat exchanger is made of PVC & Titanium tube which can withstand prolonged exposure to swimming pool water.
  2 Installation flexibility
  The unit can be installed outdoors or indoors.
  3 Quiet operation
  The unit comprises an efficient rotary/ scroll compressor and a low-noise fan motor, which guarantees its quiet operation.
  4 Advanced controlling
  The unit includes micro-computer controlling, allowing all operation parameters to be set. Operation status can be displayed on the LED wire controller. Remote controller can be chosen as future option.

INTRODUCTION

Congratulations on the purchase of an Astral Pool Heat Pump, Pool and Spa Heater. Proper installation and service of your new heating system and correct chemical maintenance of the water will ensure many years of service. It is equipped with features that take advantage of new technology developed exclusively by Astral Pool.

This unit can safely be connected to PVC pipe. In addition, the unit is equipped with an accurate electronic thermostat to ensure ease of use and accurate temperature control. The electronic display tells at a glance the operational status of the heater.

Your heat pump works by extracting heat from the surrounding air. The heat pump works most efficiently in warm weather. So, it is best to operate the heat pump during the warmest part of the day rather than overnight or early in the morning.

It is important to ensure an adequate supply of air and to avoid recirculation of the cooled air exiting the top of the unit. For this reason, the heat pump should not be installed in confined spaces and must have a minimum of 1050mm clearance above it and 700mm clearance to the sides and 300 mm to the rear. A clearance of 2500mm is required to the front of the unit to allow access to the controls and service panel.

Although the unit is weatherproof, it is recommended some protection from the harsh effects of direct exposure to the elements be provided.

The heat pump **must** be installed outdoors on a level concrete pad.

In most circumstances where heating is required, the heat pump will need to run longer than the filtration. For the most effective heating it may be necessary to install a small pump to circulate water through the heat pump independent of the filtration system. Since the heat pump uses electricity so efficiently, it is a pity to waste electricity running an oversized pump. For this reason, the small added cost of a dedicated pump can be recouped and a great deal of energy saved over the life of the heater.

Note:

The appliance is not intended for use by young children or infirm person without supervision. Please ensure that young children are supervised to ensure that they do not play with the appliance.

2.SPECIFICATION

2.1 Performance data of Swimming Pool Heat Pump Unit

*** REFRIGERANT : R410A

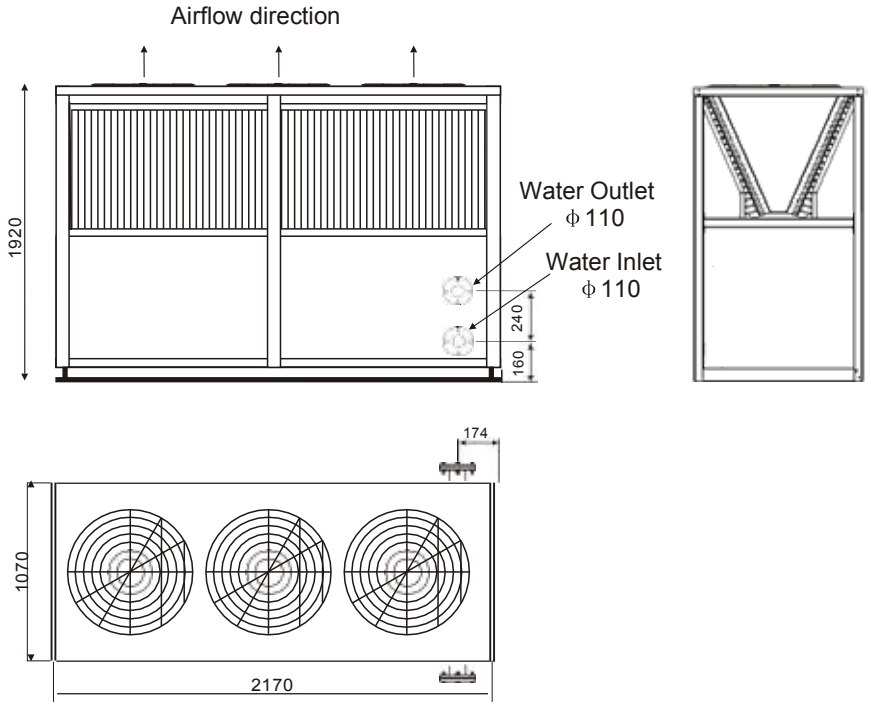
Unit	Model	78552
Heating Capacity	kW	95
	BTU/h	323000
Heating Power Input	kW	16.1
Running Current	A	28.8
Power Supply		415V/3N～/50Hz
Compressor Quantity		4
Compressor		scroll
Fan Quantity		3
Fan PowerInput	W	200 ×3
Fan Rotate Speed	RPM	750
Fan Direction		vertical
Noise	dB(A)	61
Water Connection	mm	110
Water Flow Volume	m^3/h	28
Water Pressure Drop(MAX)	kPa	16
Unit Net Dimensions(L/W/H)	mm	see the drawing of the units
Unit Shipping Dimensions(L/W/H)	mm	see package label
Net Weight	kg	see nameplate
Shipping Weight	kg	see package label

Heating: Outdoor air ℃/19 ℃, Inletwater ℃

2.SPECIFICATION

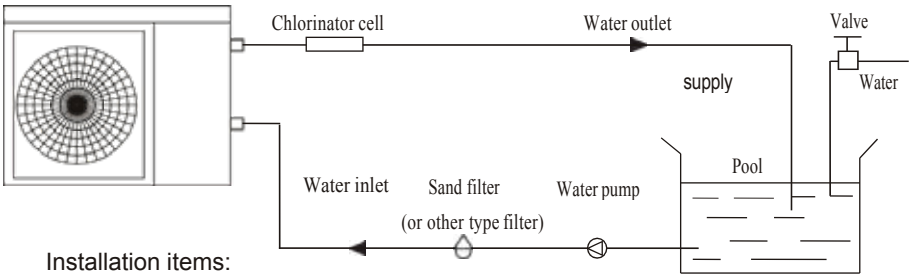
2.2 The dimensions for Swimming Pool Heat Pump Unit

Models : 78551



3.INSTALLATION AND CONNECTION

3.1 Installation illustration



Installation items:

The factory only provides the main unit and the water unit; the other items in the illustration are necessary spare parts for the water system, that are 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 is higher than the pool surface.

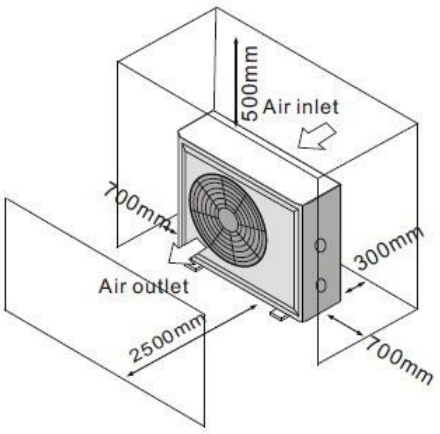
3.2 Swimming Pool Heat Pumps Location

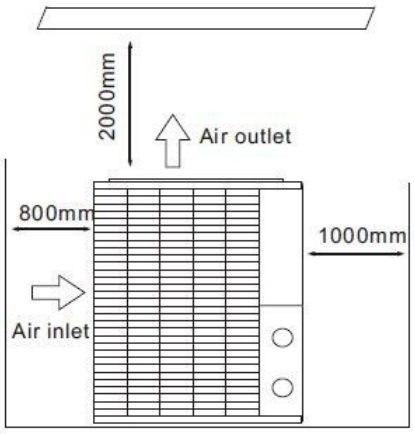
The unit will perform well in any outdoor location provided that the following three factors are presented:

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

The unit may be installed virtually anywhere outdoors. For indoor pools please 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 to shrubs which can block air inlet. These locations deny the unit of a continuous source of fresh air which reduces it efficiency and may prevent adequate heat delivery.





3.3 How Close To Your Pool?

Normally, the pool heat pump is installed within 7.5 meters 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 meters (15 meters to and from the pump = 30 meters total), unless the ground is wet or the water table is high. A very rough estimate of heat loss per 30 meters is 0.6 kW-hour,(2000BTU) for every 5 ℃ difference in temperature between the pool water and the ground surrounding the pipe, which translates to about 3% to 5% increase in run time.

3.INSTALLATION AND CONNECTION

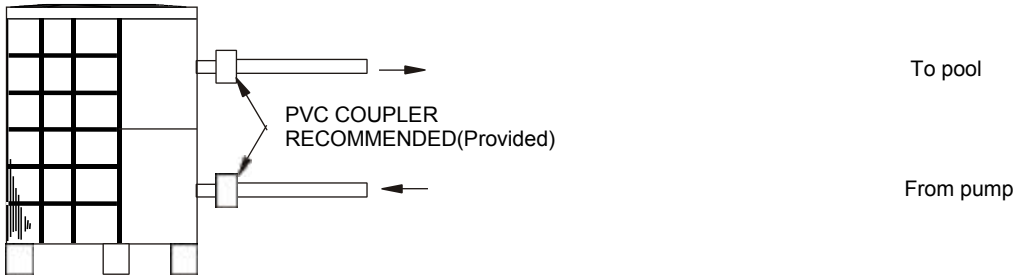
3.4 Swimming Pool Heat Pumps Plumbing

The Swimming Pool Heat Pumps exclusive rated flow titanium heat exchanger requires no special plumbing arrangements except by-pass(please set the flow rate according to the nameplate). The water pressure drop is less than 10kPa at max. Flow rate. Since there is no residual heat or flame Temperatures, The unit does not need copper heat sink piping. PVC pipe 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.

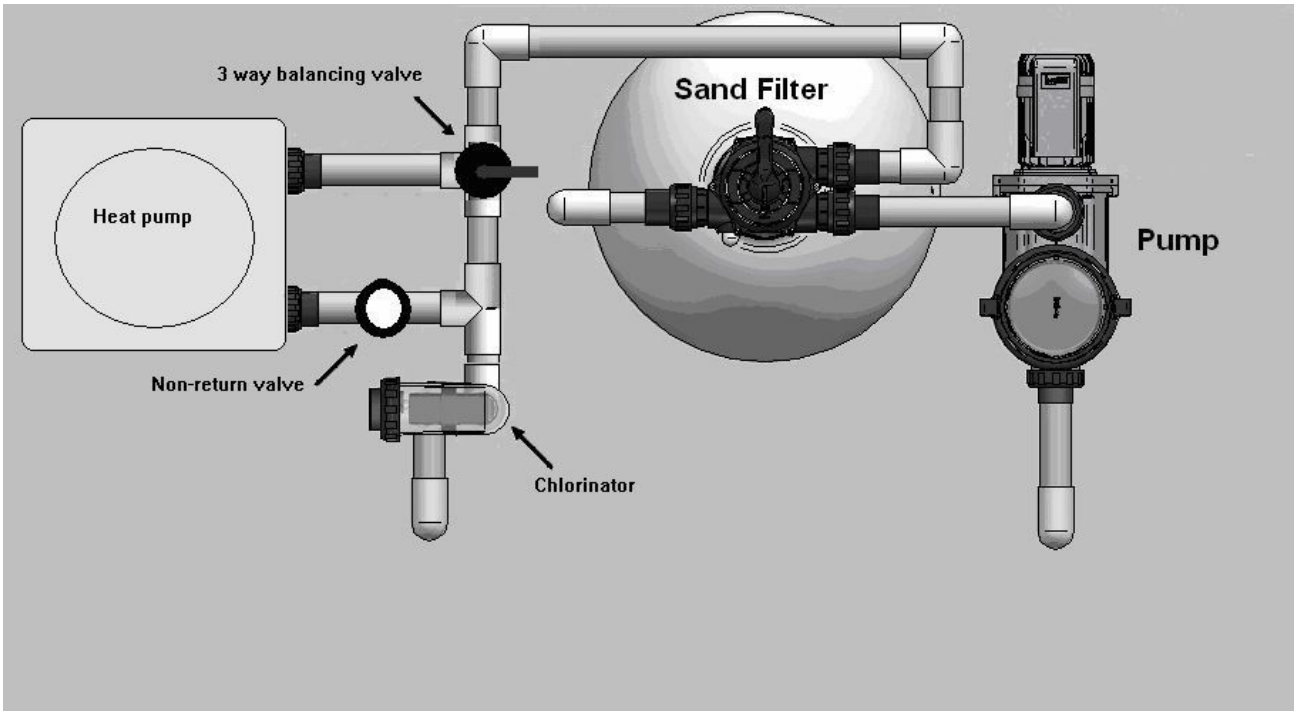
Standard model have slip glue fittings which accept 40mm NB PVC pipe for connection to the pool or spa filtration piping. By using a 50 NB to 40NB you can plumb 50NB PVC piping straight into the unit.

Give serious consideration to adding a quick coupler fitting at the unit inlet and outlet to allow easy draining of unit for winterizing and to provide easier access should servicing be required.



Condensation: Since the Heat pump cools down the air about 4 ,water may condense on the fins of the horseshoe shaped evaporator. If the relative humidity is very high, this could be as much as several liters an hour. The water will run down the fins into the base pan and drain out through the barbed plastic condensation drain fitting on the side of the base pan.
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 base pan, it is condensation. AN EVEN QUICKER WAY IS to TEST THE DRAIN WATER FOR CHLORINE - if the is no chlorine
present, then it's condensation.



WATER CONNECTIONS

Where the heat pump is installed in the filtration circuit, the heater should always be installed after the pump and filter. The water connections are located on the right hand side of the heater. The inlet and outlet are clearly marked. Water connections supplied are for 50mm PVC glue in plumbing.

All automatic sanitising devices must be installed after the heater and in such a way that the sanitiser cannot enter the heater without first mixing with the water in the pool or spa. Sanitisers that are connected prior to the heater will void heater warranty.

The Astral Pool Heat Pump Pool Heater is only suitable for outdoor installation.

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3.5 Swimming Pool Heat Pumps Electrical Wiring

NOTE: Although the unit heat exchanger is electrically isolated from the rest of the unit, it 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. Bonding is also required.

The unit has a separate molded-in junction box with a standard electrical conduit nipple already in place. Just remove the screws and the front panel, feed your supply lines in through the conduit nipple and wire-nut the electric supply wires to the three connections already in the junction box (four connections if three phase). To complete electrical hookup, connect Heat Pump by electrical conduit, UF cable or other suitable means as specified (as permitted by local electrical authorities) to a dedicated AC power supply branch circuit equipped with the proper circuit breaker, disconnect or time delay fuse protection.

Disconnect - A disconnect means (circuit breaker , fused or un-fused switch) should be located within sight of and readily accessible from the unit, This is common practice on commercial and residential air conditioners and heat pumps. It prevents remotely-energizing unattended equipment and permits turning off power at the unit while the unit is being serviced.

3.6 Initial startup of the Unit

NOTE- In order for the unit to heat the pool or spa, the filter pump must be running to circulate water through the heat exchanger.

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

1. Turn on your filter pump. Check for water leaks and verify flow to and from the pool.
2. Turn on the electrical power supply to the unit, then press the key ON/OFF of wire controller, It should start in several seconds.
3. After running a few minutes make sure the air leaving the top(side) of the unit is cooler(Between 5-10 ℃)
4. With the unit operating turn the filter pump off. The unit should also turn off automatically,
5. Allow the unit and pool pump to run 24 hours per day until desired pool water temperature is reached. When the water-in temperature reach setting, The unit just shuts off. The unit will now automatically restart (as long as your pool pump is running) when the pool temperature drops more than 2 ℃ below set temperature.

Time Delay- The unit is equipped with a 3 minute built-in solid state restart delay included 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 solid state 3 minute restart delay and prevent the unit from starting until the 5 minute countdown is completed. Power interruptions during the delay period will have no effect on the 3 minute countdown.

GUIDE TO HEAT PUMP NOISE

Determining Distance to Neighbour's Boundary
Heat Pumps are designed for slow heat up times and maintenance heating. The limitation of power supply in nearly all residential homes means that a Heat Pump's maximum size for most homes is about 6 hp. A unit of this size will typically generate around 25 kW of pool heating at maximum efficiency. For most swimming pools, this means the Heat Pump will operate for 2 or 3 days continuously for the initial heat up period and then between 12 and 24 hours each day to maintain the swimming pool temperature.

Heat Pumps are very similar to air conditioners. An evaporator fan and compressor operate during their "on" time and as the "on" time can be 12 to 24 hours per day, care must be taken to locate the Heat Pump so that the noise produced during its operation does not interfere with sensitive areas - not only in your own home but in your neighbour's home.

Each State in Australia has municipal, state and EPA laws which govern the installation and operation of outdoor appliances in residential areas. In general, noise from an appliance such as a Heat Pump must not unreasonably interfere with the health, welfare, convenience, comfort and amenity of any person having regard to the nature and duration of the noise emission and the time of day at which the noise is emitted.

Criteria for noise emissions generally take into account back ground noise at the time of day, but the most stringent criteria applies at night – and take into account, the Heat Pump will most likely need to operate at night during cooler months of the year to maintain the pool temperature.

This guide provides an estimate only and should not be taken as definite advice on the location and installation of your Heat Pump. Should any doubt exist, seek advice from an Acoustical Consultant which can be found in the Yellow Pages.

The ASTRAL POOL Heat Pump has a sound power level of 66 dB(A) at 1 metre distance. The following factors should be taken into account when working out where to locate the Heat Pump.

6 db(A)	–	Barrier Factor	+	Reflection Factor	=	Distance Factor
		B1		B2		B3

A fence or barrier can reduce the level of the Heat Pump's noise heard in neighbouring premises. To do this, the barrier or fence needs to be continuous with few or no gaps and go down to ground level. It must also prevent the Heat Pump from being seen from noise sensitive locations on neighbouring premises. Noise sensitive locations include bedroom and living room windows (including second storey dwellings) and outdoor entertaining/relaxing areas.

Box 1

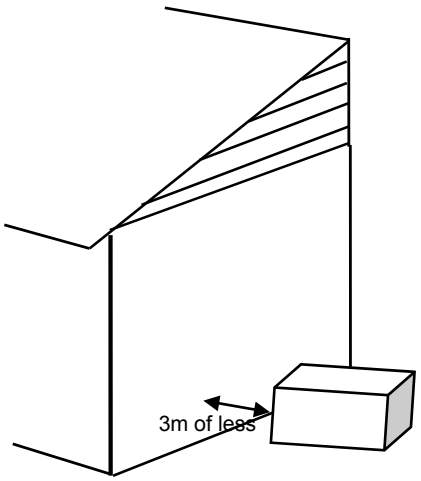
Carefully read through the fence/barrier descriptions below. Select a value that corresponds to the fence/barrier description applicable to your situation. Put this value in Box 2 above.

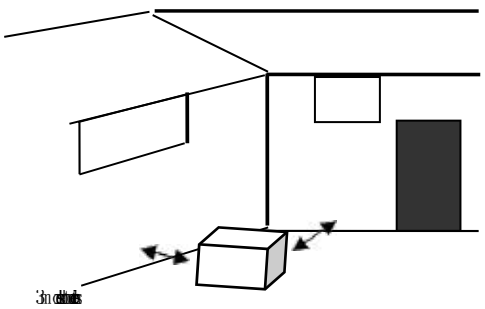
		Value for Box 1
1	The fence/barrier does not prevent the Heat Pump from being seen from noise sensitive locations on neighbouring properties	0
2	The fence/barrier blocks line of sight but is made of material having large gaps, such as a picket fence, or brick wall with openings or fancy inserts.	0
3	The fence/barrier blocks line of sight of the Heat Pump from noise sensitive location eg: Typical paling fence with small gaps due to warping.	5
4	The fence/barrier blocks line of sight of the Heat Pump from noise sensitive location e.g. "Colorbond" fencing, concrete block/masonary/brick, Fibre cement sheeting	10

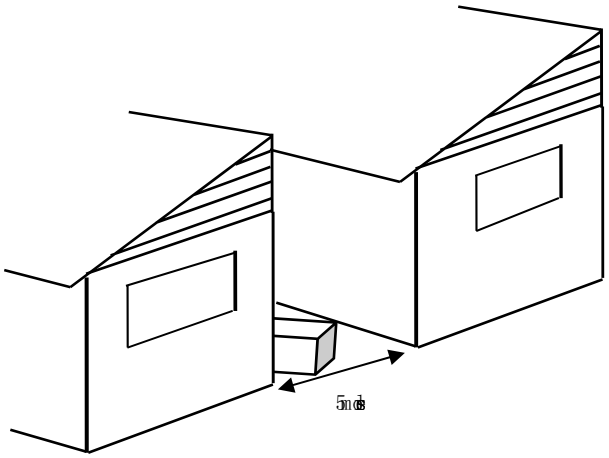
Box 3

Noise can reflect from walls, roofs, sheds etc. This can have the effect of making the noise seem louder that what it is. Put the corresponding value in Box 3.

Box 2







Distance Factor

An example may look like this:

A Timber Paling fence that goes right to the ground with some small gaps due to age, is worth a barrier factor of 5.

One reflective surface adjacent to the Heat Pump is worth a factor or 3.

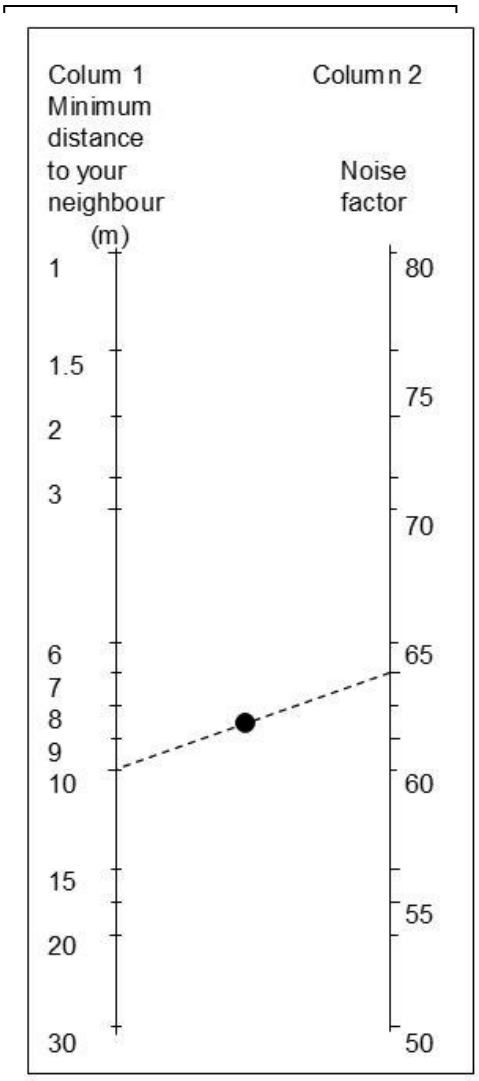
The ASTRAL POOL Heat Pump has a sound power level of 66 db(A).

Therefore your equation will now look like this:

66 - 5 + 3 = 58

The distance factor is 58 which should be written in Box 3.

The final step is to mark 64 on Column 2 below and draw a straight line through the middle X to reach Column 1. Column 1 is the minimum distance the Heat Pump should be installed from a noise sensitive area in your neighbour's residence.



With one reflective surface and a timber paling fence with small gaps, the Heat Pump needs to be installed at least 10 metres from a noise sensitive area in your neighbour's property.

This calculation is intended as a guide only and no warranty is made or implied by Astral Pool as to its accuracy. Please consult an Acoustical Consultant or phone your Astral Pool branch office if in any doubt.

Further Guidelines for installation of Heat Pumps

- ASTRAL POOL Heat Pumps must be installed outdoors – never install inside a plant room, garage etc.
- Allow a minimum of 500mm clearance from the sides and rear of the heat pump and a minimum of 1000mm service access from the front of the Heat Pump.
- Ensure an electrical isolation switch is located nearby the Heat Pump.
- On Three Phase models, ensure the phase rotation of the compressor is checked before commissioning of the unit.
- Ensure the water pressure switch operation is checked at least 6 times prior to handing over the Heat Pump.
- Refer to Installation and Operating Instructions for full installation, commissioning and operating procedures.

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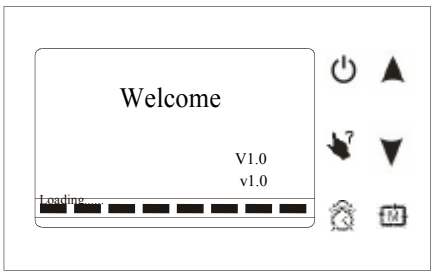
4. USAGE AND OPERATION

4.1 Function of wire controller



Button	Name	Function
	ON/OFF	Press this button to start up/shut off the unit cancel current operation or back to upper interface.
	HELP	Press this button to check button function or system state.
	MODE	Press this button to change the current mode, page up or confirm current operation.
	CLOCK	Press the button to set the clock, the timer on or timer off
	Up	Press this key to select the upward option or increase the parameter value.
	Down	Press this key to select the downward option or decrease the parameter value.

4. USAGE AND OPERATION

4.2 Usage of wire controller

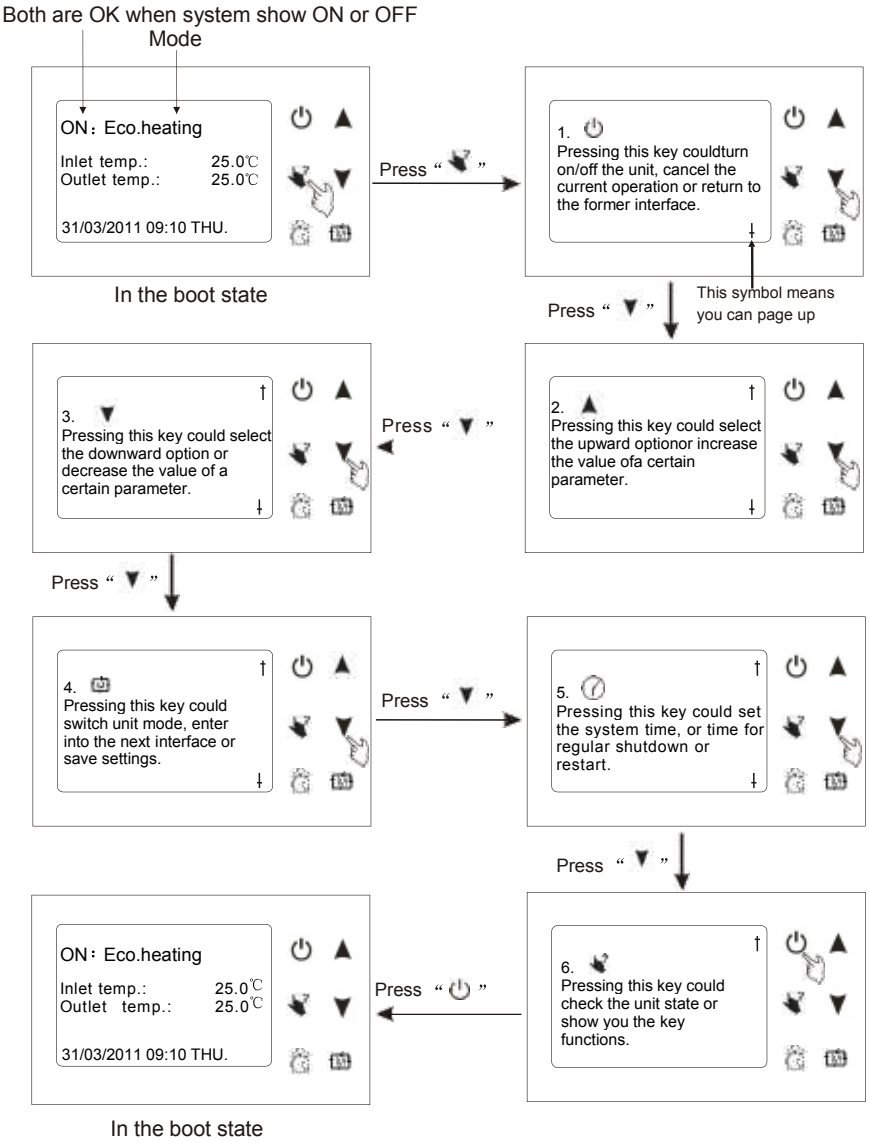
4.2.1 The way to use

You can use " " at any interface, it will show relevant button function of current interface.

You can press " " to exit the "help" interface.

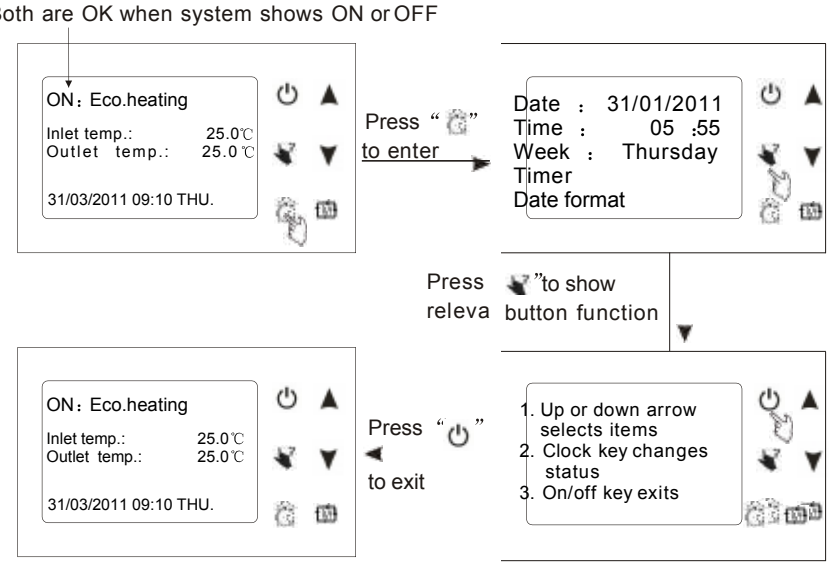
For example：

Press " " at main interface, system will show all button function; Press " " at clock interface, system will show " " 、 " " 、 " " and " " button function.



4. USAGE AND OPERATION

Press " " at clock interface, the screen shows as follow:

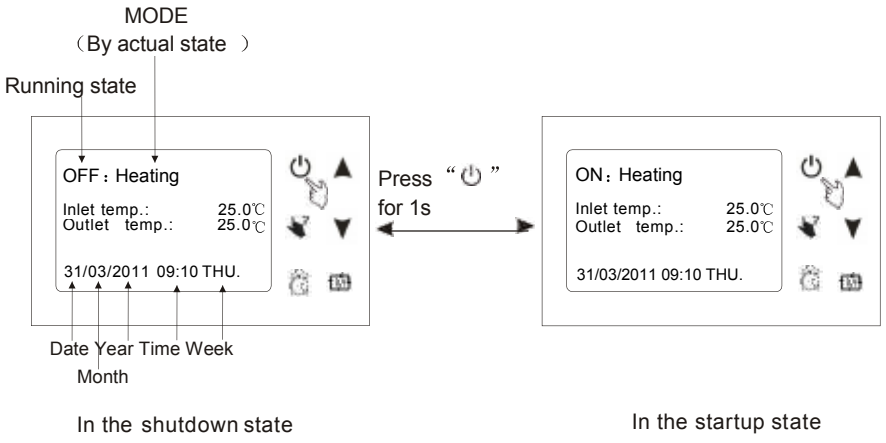


4.2.2 Starting up and shutting down

Press " " in the shutdown state for 1s to start up the system;

Press " " in the startup state for 1s to shut down the system.

For example：



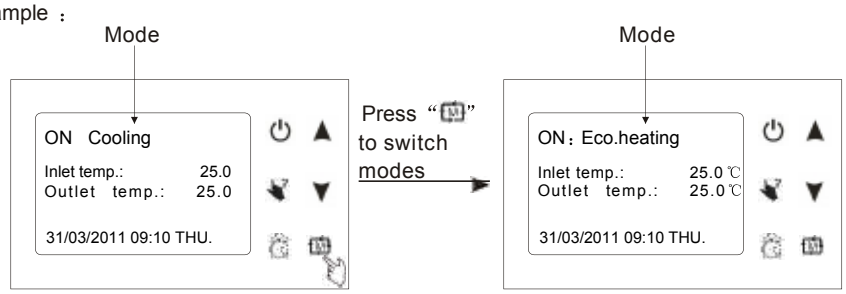
4. USAGE AND OPERATION

4.3 The operation of mode switching

At main interface, you can switch modes of cooling, economic heating, heating, rapid heating by pressing " " . Or switch modes of cooling, economic heating and automatic. The different unit gets different mode types.

Attention the operation of mode is invalid when the unit you buy is cooling only or heating only.

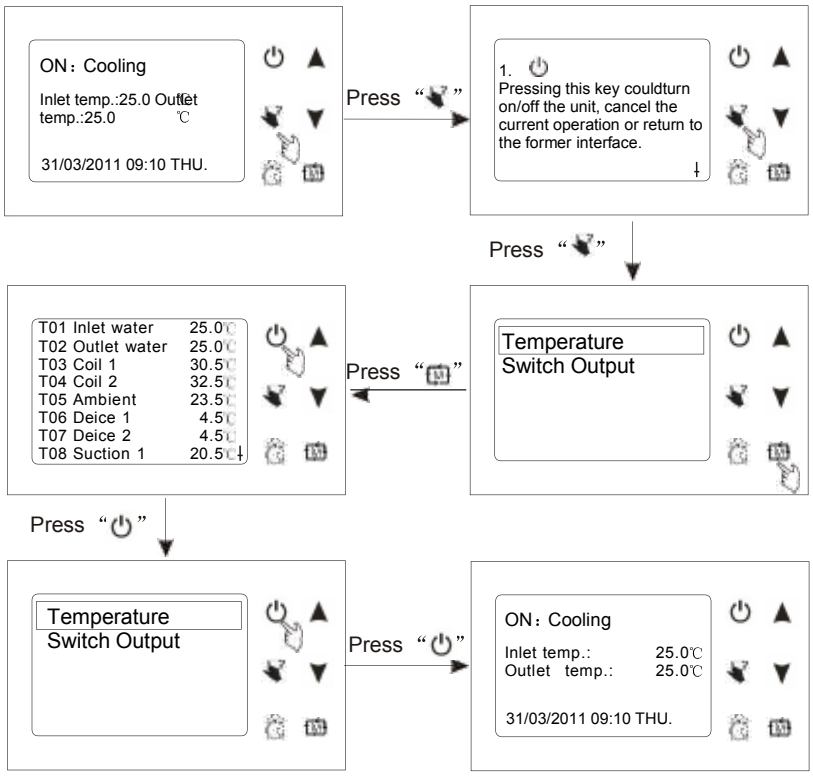
For example ：



4.4 The operation of system state checking

At any interface, you can enter system working state by pressing " " twice, press" " （pageup）or " " （pagedown）to select the needing parameter, press " " to enter, and press " " to exit.

For example：

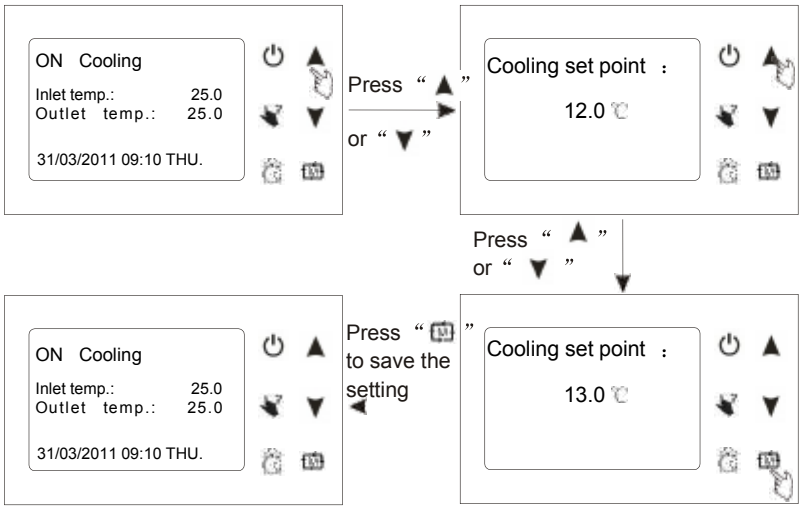


4. USAGE AND OPERATION

4.5 The operation of parameter setting

At main interface, press " ▲ " or " ▼ " to enter parameter setting interface, press " ▲ " (increasing) or " ▼ " (decreasing) can change parameter value, press " M " to save the setting and exit. Press " ⏻ " can not save the setting but exit. (You can refer to parameter table to set relevant temperature.)

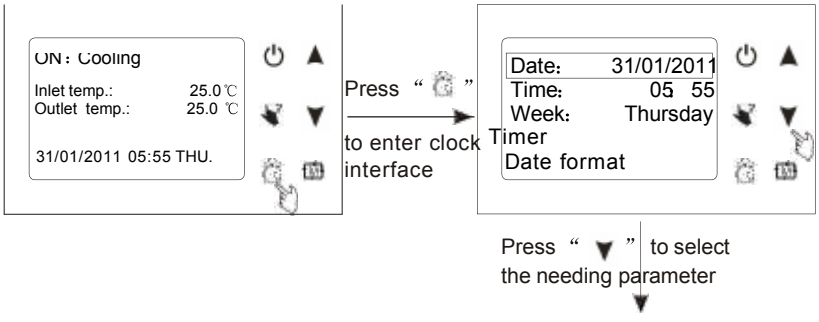
For example :



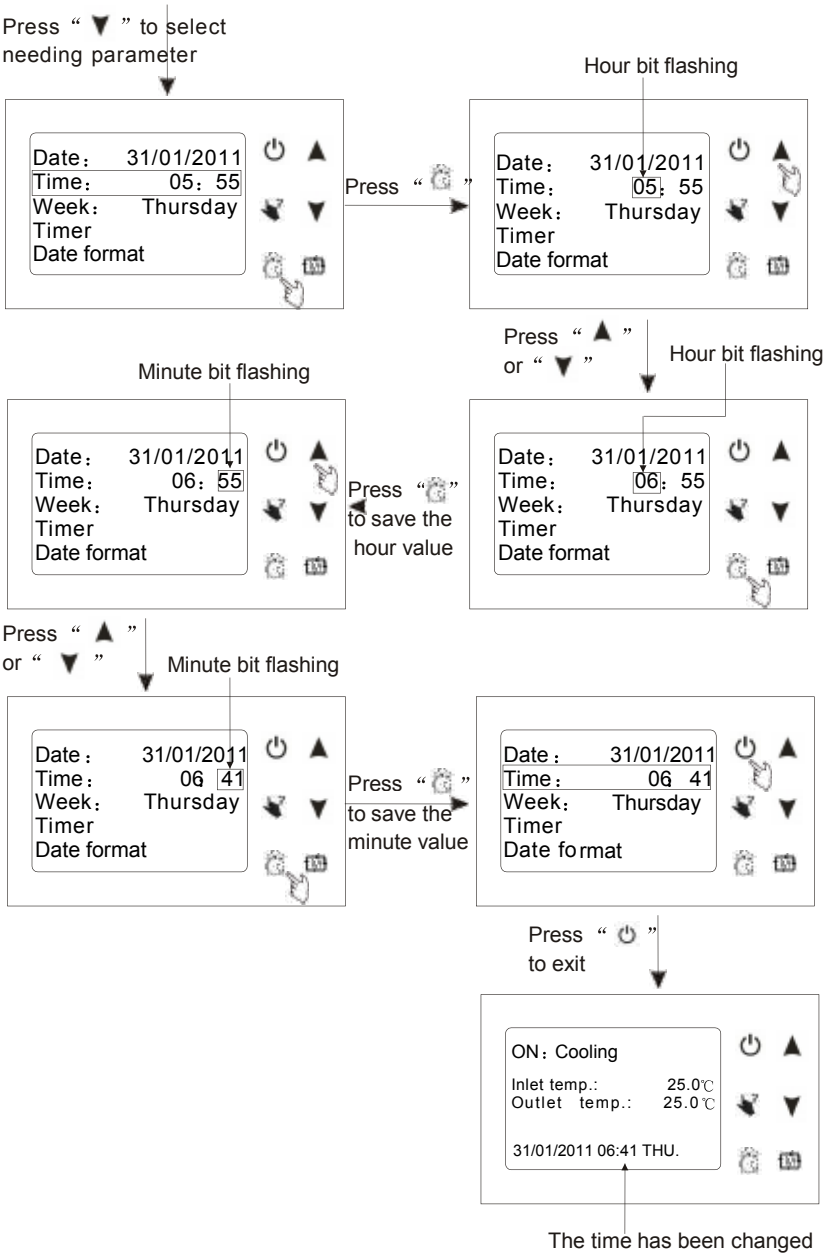
4.6 The operation of clock setting

At main interface, press " ⏱ " to enter clock setting interface, select the needing parameter and press " ⏱ " . at this time, parameter value flashing, press " ▲ " (increasing)or " ▼ " (Decreasing) can change parameter value, then press " ⏱ " to save, press " ⏻ " can cancel the setting or back to the main interface. ("timer setting" refer to timer operation)

For example :



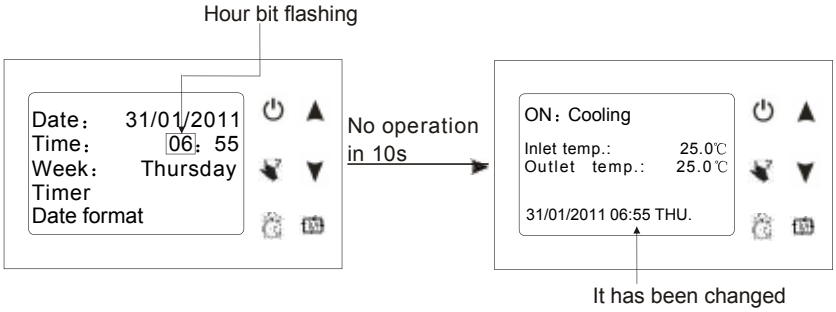
4. USAGE AND OPERATION



Tips: The setting of date and week is the same with clock;
If there is no operation in 10s, system will remember parameter setting automatic and back to the main interface.,

As follow :

4. USAGE AND OPERATION



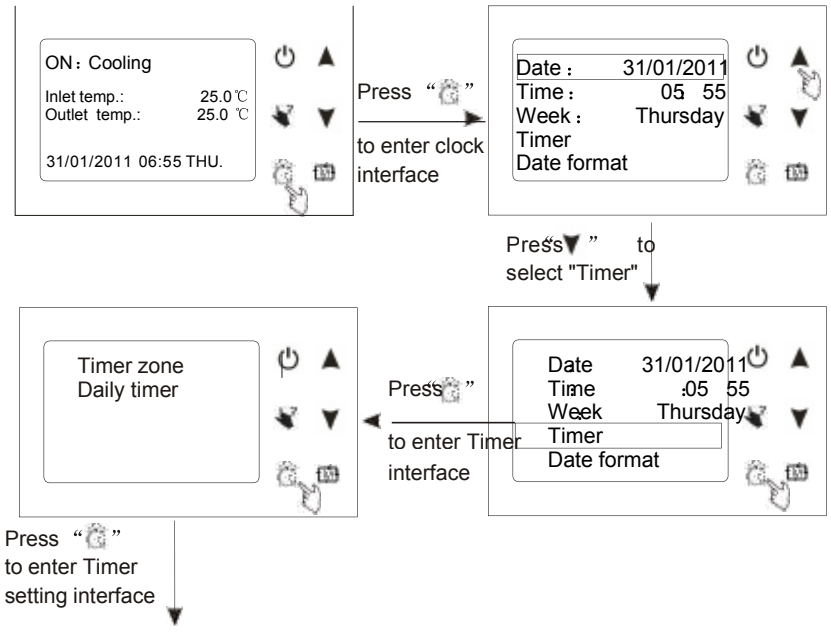
4.7 The operation of timer setting

You can set four timer on and timer off according to you needing.

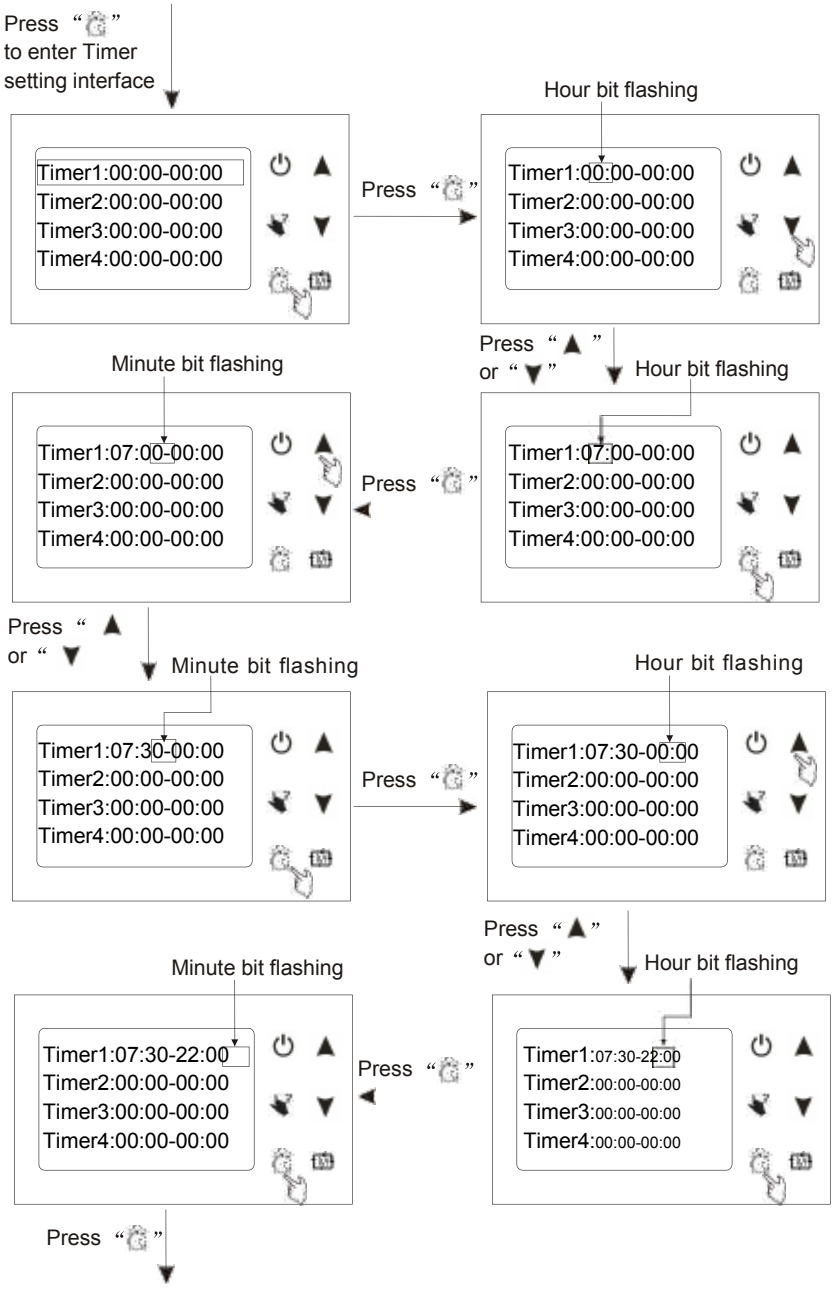
At main interface, press " " to enter timer setting, press " " to select "Timer", then press " " to enter timer setting interface, (timer setting: you can set four timer on and timer off, and the time you set can from Monday to Sunday.) , the operation is the same with clock setting.

For example :

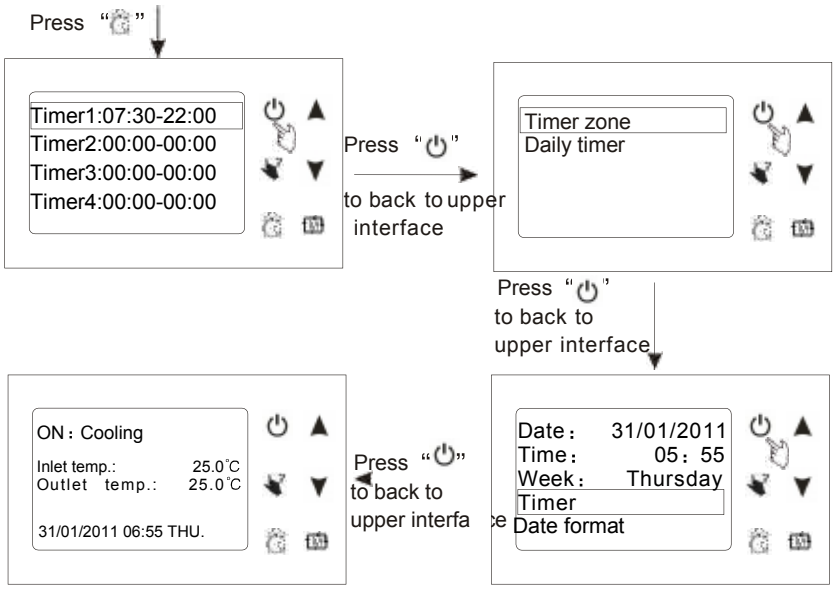
A. Timer setting



4. USAGE AND OPERATION

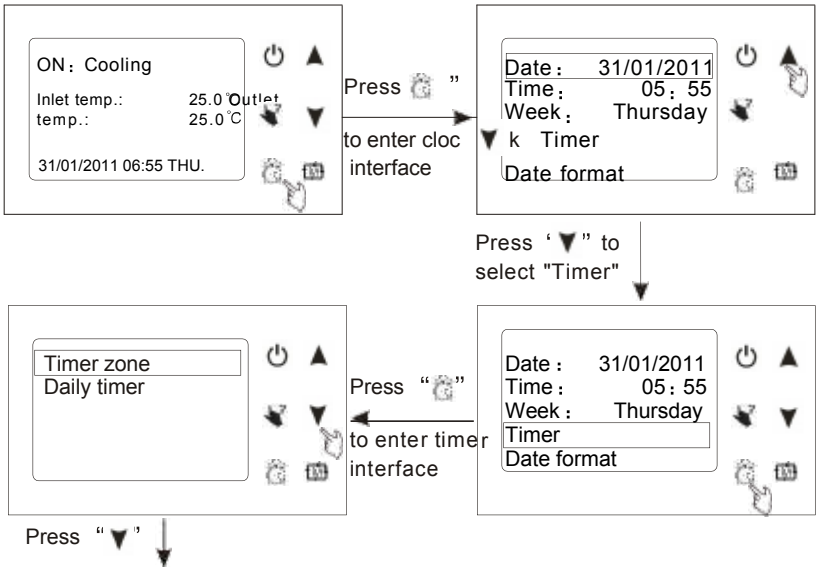


4. USAGE AND OPERATION

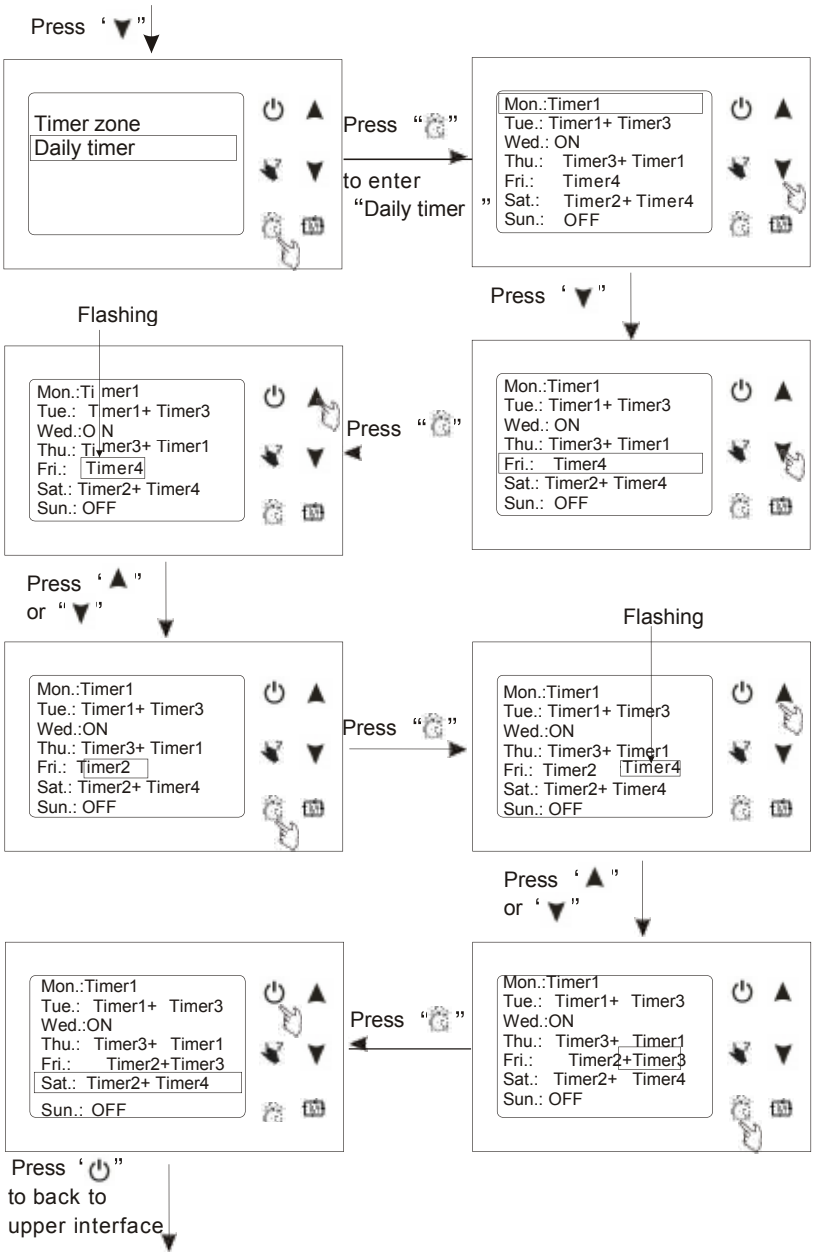


Tips：1) The operation of Timer2, Timer3, Timer4 is the same with Timer1;
2) Timer1 :07:30-22:00 means system starts up at 7:30, and shut down at 22:00 automaticly;
3) If there is no operation in 10s, system will memory parameter setting automaticly.

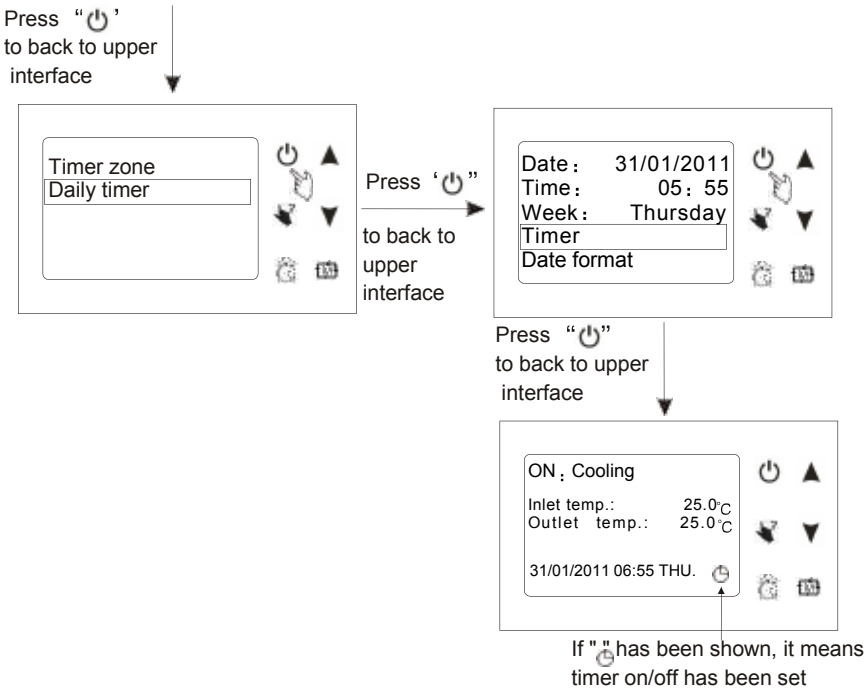
B. The operation of daily timer



4. USAGE AND OPERATION



4. USAGE AND OPERATION



Tips：The Timer operations of Monday, Tuesday, Wednesday, Thursday, Saturday, Sunday is the same with Friday.

Monday OFF : means Monday Timer hasn't been set, and the running state is the same with Sunday at 24:00, for example, if system is running at 24:00 on Sunday, then it will be running the whole day on Monday, and vice versa;

Wednesday ON : means system will be running the whole day on Wednesday

Thursday OFF : means system will be off the whole day on Thursday;

Saturday ：Timer1+Timer2 : means the time to start up and to shut down is according to Timer1 and Timer2.

If there is no operation in 10s, system will memory the parameter setting automaticly and back to main interface.

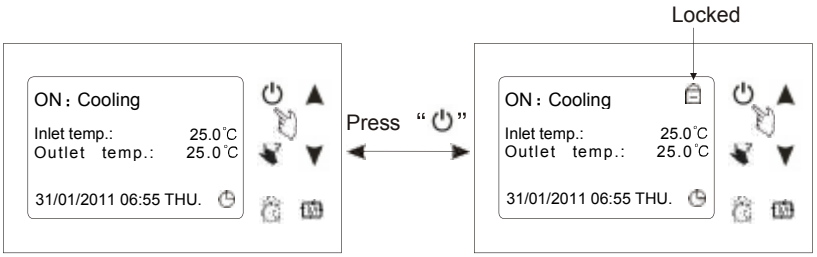
4. USAGE AND OPERATION

4.8 Keyboard lock

To avoid mis-operations, please lock the controller after parameter setting.

At the main interface, pressing "⏻" for 5 seconds, the keyboard will be locked.

When the keyboard is locked, pressing "⏻" for 5 seconds, the keyboard will be unlocked.



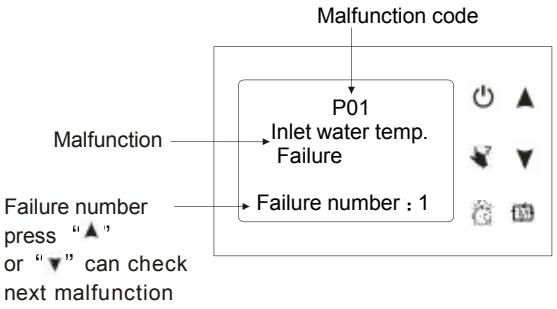
NOTES:

When the unit is in alarming state, the key lock can be removed automaticly.

4.9 Malfunction display

There will be malfunction code showing on the controller screen when relative malfunction occurs.

You can refer to the malfunction table to find out the failure cause and solution. For example ：



4.10 Parameter table

Meaning	Default	Remarks
Set-point of cooling target temp.	27℃	Ajustable
Set-point of heating target temp.	27℃	Ajustable
Set-point of auto mode target temp.	27℃	Ajustable

5. MAINTENANCE AND INSPECTION

5.1 Malfunction table

You can refer to the malfunction table to find out the failure cause and solution.

Malfunction	Display	Reason	Resolution
Power on			
Normal working			
Inlet temp. Sensor failure	P01	The temp. Sensor isbroken or short circuit	Check or change the temp. Sensor
Outlet temp. Sensor failure	P02	The temp. Sensor isbroken or short circuit	Check or change the temp. Sensor
Ambient temp. Failure	P04	The temp. Sensor isbroken or short circuit	Check or change the temp. Sensor
System 1/2/3/4 Coil temp. Failure	P15(system1),P25(system2) P35(system3),P45(system4)	The temp. Sensor isbroken or short circuit	Check or change the temp. Sensor
System 1/2/3/4 absorb Temp. Failure	P17(system1),P27(system2) P37(system3),P47(system4)	The temp. Sensor isbroken or short circuit	Check or change the temp. Sensor
System 1/2/3/4 anti-freeze Temp. Failure	P19(system1),P29(system2) P39(system3),P49(system4)	The temp. Sensor isbroken or short circuit	Check or change the temp. Sensor
Using side system 1 /2/3/4 Anti-freeze temp. Failure	P191(system1),P291(system2) P391(system3),P491(system4)	The temp. Sensor isbroken or short circuit	Check or change the temp. Sensor
System 1/2/3/4 coil inlet Temp. Failure	P151(system1),P251(system2) P351(system3),P451(system4)	The temp. Sensor isbroken or short circuit	Check or change the temp. Sensor
System 1/2/3/4 high Pressure protection	E11(system1),E21(system2) E31(system3),E41(system4)	The high-preesure switch isbroken	Check the pressure switchand cold circuit
System 1/2/3/4 low Pressure protection	E12(system1),E22(system2) E32(system3),E42(system4)	The low-preesure switch isbroken	Check the pressure switchand cold circuit
Water flow failure	E03	No water/little water inwater system	Check the pipe waterflow and water pump
Electric-heater Overheat protection	E04	Electrical-heat is over heat	Check or change electrical-heat
Water inlet and outlet Temp. Too big	E06	Water flow is not enough and low differential pressure	Check the pipe waterflow and whether water system is jammedor not
System 1/2/3/4 anti-freeze Protection	E06	Water flow is not enough and low differential pressure	Check the pipe waterflow and whether water system is jammedor not
System 1/2/3/4 source side Anti-freeze protection	E17(system1),E27(system2) E37(system3),E47(system4)	Water flow is not enough	Check the pipe waterflow and whether water system is jammedor not
System 1/2/3/4 using side Anti-freeze protection	E171(system1),E271(system2) E371(system3),E471(system4)	Water flow is not enough	Check the pipe waterflow and whether water system is jammedor not
Anti-freeze protect level 1	E19	The ambient temp. Islow	/
Anti-freeze protect level 2	E29	The ambient temp. Islow	/
System protection	E05	The protection system isfailure	Check each protection pointof the system
Communication failure	E08	Communication failure between wire controller and mainboard	Check the wire connection between remote wire controller andmain board

5. MAINTENANCE AND INSPECTION

5.2 BHB10 malfunction Table

5.2.1 The common failure cause and solution.

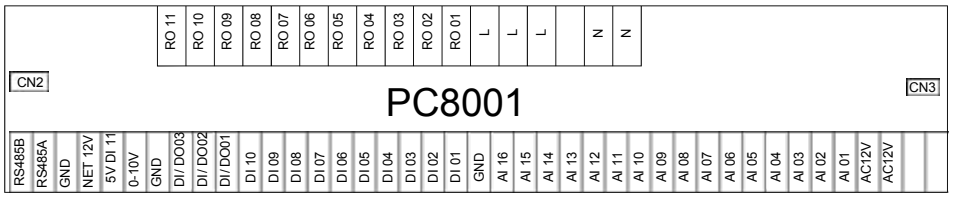
Malfunction	Digital display	Detector display	Canse	Solution
System 1 exhaust temp.failure	81	P181	The sensor is open or short circuit	Check or change the sensor
System 2 exhaust temp.failure	81	P281	The sensor is open or short circuit	Check or change the sensor
Ambient temp.sensor failure	4	P04	The sensor is open or short circuit	Check or change the sensor
System 1 anti-freeze temp.failure	9	E171	The sensor is open or short circuit	Check or change the sensor
System 2 anti-freeze temp.failure	9	E271	The sensor is open or short circuit	Check or change the sensor
System 1 economizer inlet temp.failure	01	P101	The sensor is open or short circuit	Check or change the sensor
System 2 economizer inlet temp.failure	01	P201	The sensor is open or short circuit	Check or change the sensor
System 1 economizer outlet temp.failure	02	P102	The sensor is open or short circuit	Check or change the sensor
System 2 economizer outlet temp.failure	02	P202	The sensor is open or short circuit	Check or change the sensor
System 1 anti-freeze protection	71	P19	Water flow volume not enough	Check the flow volume,water system is jammed or not
System 2 anti-freeze protection	71	P29	Water flow volume not enough	Check the flow volume,water system is jammed or not
Communication failure	\	E08	Communication failure between remote wire controller and main board	Check the wire connection between remote wire controller and main board
System 1 current protection	51	E151	Current through compressor too heavy	Check through the power supply for compressor or short circuit
System 2 current protection	51	E251	Current through compressor too heavy	Check through the power supply for compressor or short circuit
System 1 exhaust high temp.protection	82	P182	Compressor exhaust temp.too high	Check through the refrigerant system
System 2 exhaust high temp.protection	82	P282	Compressor exhaust temp.too high	Check through the refrigerant system

5.2.2 The indicator light display of failure cause.

Malfunction	Indicator light
System 1 failure	1 on 1 off
System 1 failure	2 on 1 off
Ambient failure	3 on 1 off

6.APPENDIX

APPENDIX27. Connection of PCB illustration

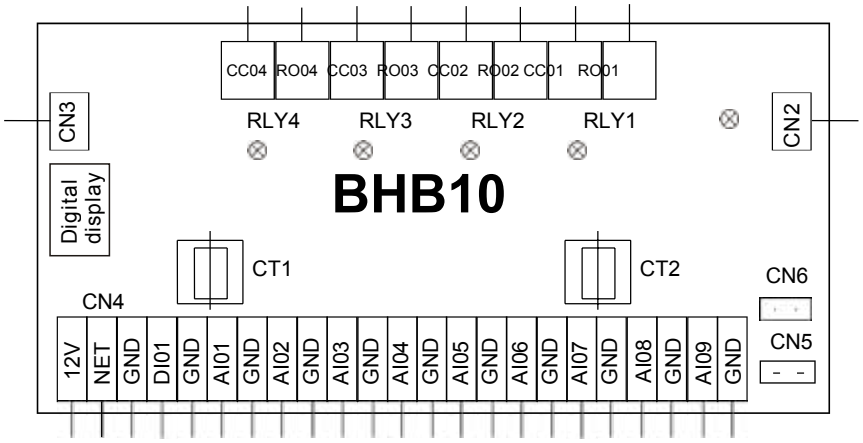


Connections explanation ：

NO.	Symbol	Meaning	NO.	Symbol	Meaning
	L	Live line	27	DI11	System protection signal
2	N	Null line	28	AI 01	Water input temperature input
3	RO 01	Compressor 1 output(220VAC)	29	AI 02	Water output temperature output
4	RO 02	Compressor 2 output(220VAC)	30	AI 03	System 1 fan coil temperature input
5	RO 03	Compressor 3 output(220VAC)	31	AI 04	System 2 fan coil temperature input
6	RO 04	Compressor 4 output(220VAC)	32	AI 05	System 3 fan coil temperature input
7	RO 05	High speed /souce pump output(220VA	)33	AI 06	System 4 fan coil temperature input
8	RO 06	Low speed output (220VAC)	34	AI 07	Ambient temperature input
9	RO 07	Water pump output(220VAC)	35	AI 08	System 1 antifreeze temperature input
10	RO 08	4-way valve output(220VAC)	36	AI 09	System 2 antifreeze temperature input
11	RO 09	Electric heater output(250VAC)	37	AI 10	System 3 antifreeze temperature input
12	RO 10	Spray valve output(220VAC)	38	AI 11	System 4 antifreeze temperature input
13	RO 11	Alarm system output(220VAC)	39	AI 12	System 1 suction temperature input
14	DI/DO 1	Emergency switch output	40	AI 13	System 2 suction temperature input
15	DI/DO 2	Mode indicator output	41	AI 14	System 3 suction temperature input
16	DI/DO 3	Emergency switch input	42	AI 15	System 4 suction temperature input
17	DI 01	System 1 high pressure protection input	43	AI 16	No use
18	DI 02	System 2 high pressure protection input	44	GND	Connecting to the remote controller
19	DI 03	System 3 high pressure protection input	45	NET	
20	DI 04	System 4 high pressure protection input	46	12V	
21	DI 05	System 1 low pressure protection input	47	RS485A	485 connection
22	DI 06	System 2 low pressure protection input	48	RS485B	
23	DI 07	System 3 low pressure protection input	49	AC12V	12V power input
24	DI 08	System 4 low pressure protection input	50	AC12V	
25	DI 09	Water flow switch protection input	51	CN2	System 1 electric expansion valve outpu t
26	DI 10	Electric heater overload protection input	52	CN3	System 2 electric expansion valve outpu t

6.APPENDIX

APPENDIX28. Connection of PCB illustration



Connections explanation ：

No.	Symbol	Meaning
1	RO01	System1 mangtic valve outlet 220-230VAC ）
2	RO02	System2 mangtic valve outlet 220-230VAC ）
3	RO03	System1 alert outlet 220-230VAC ）
4	RO04	System2 alert outlet 220-230VAC ）
5	CC01	System1 mangtic valve inlet 220-230VAC ）
6	CC02	System2 mangtic valve inlet 220-230VAC ）
7	CC03	System1 alert inlet 220-230VAC ）
8	CC04	System2 alert inlet 220-230VAC ）
9	NET GND 12V	Wire controller
10	DI01 GND	Mode/conmunication
11	AI01 GND	System 1 anti-freeze temp.(input)
12	AI02 GND	System 2 anti-freeze temp.(input)
13	AI03 GND	System 1 economizer inlet temp.failure(input)
14	AI04 GND	System 1 economizer outlet temp.failure(input)
15	AI05 GND	System 2 economizer inlet temp.failure(input)
16	AI06 GND	System 2 economizer outlet temp.failure(input)
17	AI07 GND	System 1 exhaust temp.(input)
18	AI08 GND	System 2 exhaust temp.(input)
19	AI09 GND	Ambient temp.(input)

6.APPENDIX

APPENDIX3. Caution & Warning

1. The unit can only be repaired by qualified installer centre personnel or an authorised dealer.（for Europe market）
2. This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.（for Europe market）
   Children should be supervised to ensure that they do not play with the appliance.
3. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
4. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in orderto avoid a hazard.
5. Directive 2002/96/EC (WEEE):
   The symbol depicting a crossed-out waste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling centre for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
6. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
7. The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas , fire can be occur.
8. Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
9. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow for the unit to start for at least 3 minutes from a previous stoppage.
10. The unit can only be repaired by the qualified personnel of an installer center or an authorized dealer.（for North America market）
11. Installation must be performed in accordance with the NEC/CEC by authorized person only.（for North America market）
12. USE SUPPLY WIRES SUITABLE FOR .
13. Caution: Single wall heat exchanger, not suitable for potable water connection.

Rainbow Pool Products

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6.APPENDIX

APPENDIX4. Cable specification

1. Single phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	2×1.5mm^2	1.5mm^2	20A	30mA less than 0.1 sec	n×0.5mm^2
10~16A	2×2.5mm^2	2.5mm^2	32A	30mA less than 0.1 sec	
16~25A	2×4mm^2	4mm^2	40A	30mA less than 0.1 sec	
25~32A	2×6mm^2	6mm^2	40A	30mA less than 0.1 sec	
32~40A	2×10mm^2	10mm^2	63A	30mA less than 0.1 sec	
40 ~63A	2×16mm^2	16mm^2	80A	30mA less than 0.1 sec	
63~75A	2×25mm^2	25mm^2	100A	30mA less than 0.1 sec	
75~101A	2×25mm^2	25mm^2	125A	30mA less than 0.1 sec	
101~123A	2×35mm^2	35mm^2	160A	30mA less than 0.1 sec	
123~148A	2×50mm^2	50mm^2	225A	30mA less than 0.1 sec	
148~186A	2×70mm^2	70mm^2	250A	30mA less than 0.1 sec	
186~224A	2×95mm^2	95mm^2	280A	30mA less than 0.1 sec	

2. Three phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	3×1.5mm^2	1.5mm^2	20A	30mA less than 0.1 sec	n×0.5mm^2
10~16A	3×2.5mm^2	2.5mm^2	32A	30mA less than 0.1 sec	
16~25A	3×4mm^2	4mm^2	40A	30mA less than 0.1 sec	
25~32A	3×6mm^2	6mm^2	40A	30mA less than 0.1 sec	
32~40A	3×10mm^2	10mm^2	63A	30mA less than 0.1 sec	
40 ~63A	3×16mm^2	16mm^2	80A	30mA less than 0.1 sec	
63~75A	3×25mm^2	25mm^2	100A	30mA less than 0.1 sec	
75~101A	3×25mm^2	25mm^2	125A	30mA less than 0.1 sec	
101~123A	3×35mm^2	35mm^2	160A	30mA less than 0.1 sec	
123~148A	3×50mm^2	50mm^2	225A	30mA less than 0.1 sec	
148~186A	3×70mm^2	70mm^2	250A	30mA less than 0.1 sec	
186~224A	3×95mm^2	95mm^2	280A	30mA less than 0.1 sec	

When the unit will be installed at outdoor, please use the cable which can against UV.

WARRANTY TERMS AND CONDITIONS

AstralPool Australia Pty Ltd (ABN 97 007 284 504) ("AstralPool") provides the following warranty in relation to its Astralpool Heat Pump

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The benefits of this warranty are in addition to any rights and remedies imposed by Australian state and federal legislation that cannot be excluded. Nothing in this warranty is to be interpreted as excluding, restricting or modifying any state or federal legislation applicable to the supply of goods and services which cannot be excluded, restricted or modified.

WARRANTY

AstralPool warrants that, subject to the exclusions and limitations below, the product will be free from defects in materials and workmanship during the warranty period. The warranty periods are set out below and commence 30 days after the date of purchase (to allow for installation). The warranty period may vary for different parts of the Product.

Parts	Warranty Period
Cabinet, heat exchange	10 years
Compressor and evaporator	3 years
Thermostat, switches, and other components	12 months

If a defect appears in the product before the end of the warranty period and AstralPool finds the product to be defective in materials or workmanship, AstralPool will, in its sole discretion, either:

(a) Replace or repair the product or the defective part of the product free of charge; or
(b) Cause the product or the defective part of the product to be replaced or repaired by an authorised AstralPool Service Agent free of charge.

AstralPool reserves the right to replace defective parts of the product with parts and components of similar quality, grade and composition where an identical part or component is not available.

Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair the goods.

WARRANTY CLAIMS

1. If a fault covered by warranty occurs, the customer must first contact AstralPool at the contact address listed below, or an Authorised AstralPool Service Agent.

2. Any warranty claim must be accompanied by:
   (a) Proof of purchase;
   (b) Full details of the alleged defect; and
   (c) Appropriate documentation (such as historical and maintenance records).

3. The customer must make the product available to AstralPool or its authorised AstralPool service agent for inspection and testing. AstralPool or its authorised AstralPool service agent will attend the premises where the product is installed for inspection and testing. If the product is installed:
   (a) Outside a capital city metropolitan area; and
   (b) Is not within a 20 km radius of an Authorised AstralPool Service Agent;

   Then the customer may have to pay a travel fee.

4. If such inspection and testing finds no defect in the product, the customer must pay AstralPool's usual costs of service work and testing. If such inspection and testing finds a defect that is not covered by this warranty, the customer must pay AstralPool's usual costs of service work plus any parts and labour required to repair the Product, unless recoverable from AstralPool on the failure of any statutory guarantee under the ACL.

Exclusions
The warranty will not apply where:
(a) The customer is in breach of the Terms and Conditions of Sale;
(b) The Product was used for a purpose other than one it was intended for;
(c) The Product was repaired, modified or altered by any person other than AstralPool;
(d) The Product has not been installed, maintained and/or operated in complete compliance with the installation and operating instructions and any instructions by AstralPool;
(e) The Product has been subject to accident, negligence, alteration, abuse or misuse.

The warranty does not extend to:
a) Normal wear and tear;
b) Weather and other environmental conditions including but not limited to storm, flood, and/or heat wave damage; or
c) Service and maintenance items.
d) Installations in countries outside of Australia and its associated territories

Examples of exclusions include but are not limited to:

- Incorrect/insufficient ventilation
- Incorrect water balance

Commercial Installations
On commercial installations, such as health clubs, motels/hotels and hydrotherapy facilities, the warranty is limited to parts and in field labour (within capital city metropolitan areas or 20 km radius of Authorised AstralPool Service
Agents) for a period of 12 months from the date of purchase plus 30 days to allow for installation.

LIMITATIONS
AstralPool makes no express warranties or representations other than set out in this warranty.

The repair or replacement of the Product or part of the Product is the absolute limit of AstralPool's liability under this express warranty.

Rainbow Pool Products
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